



## 2.b. SOP-TEWS: DMO Utilizing NTWC Product in DMO SOP

**Ardito M Kodijat**

*IOTIC UNESCO-IOC*

**Suci Dewi Anugrah**

*Chair of Working Group 3*

**Manneela Vijaya Sunanda**

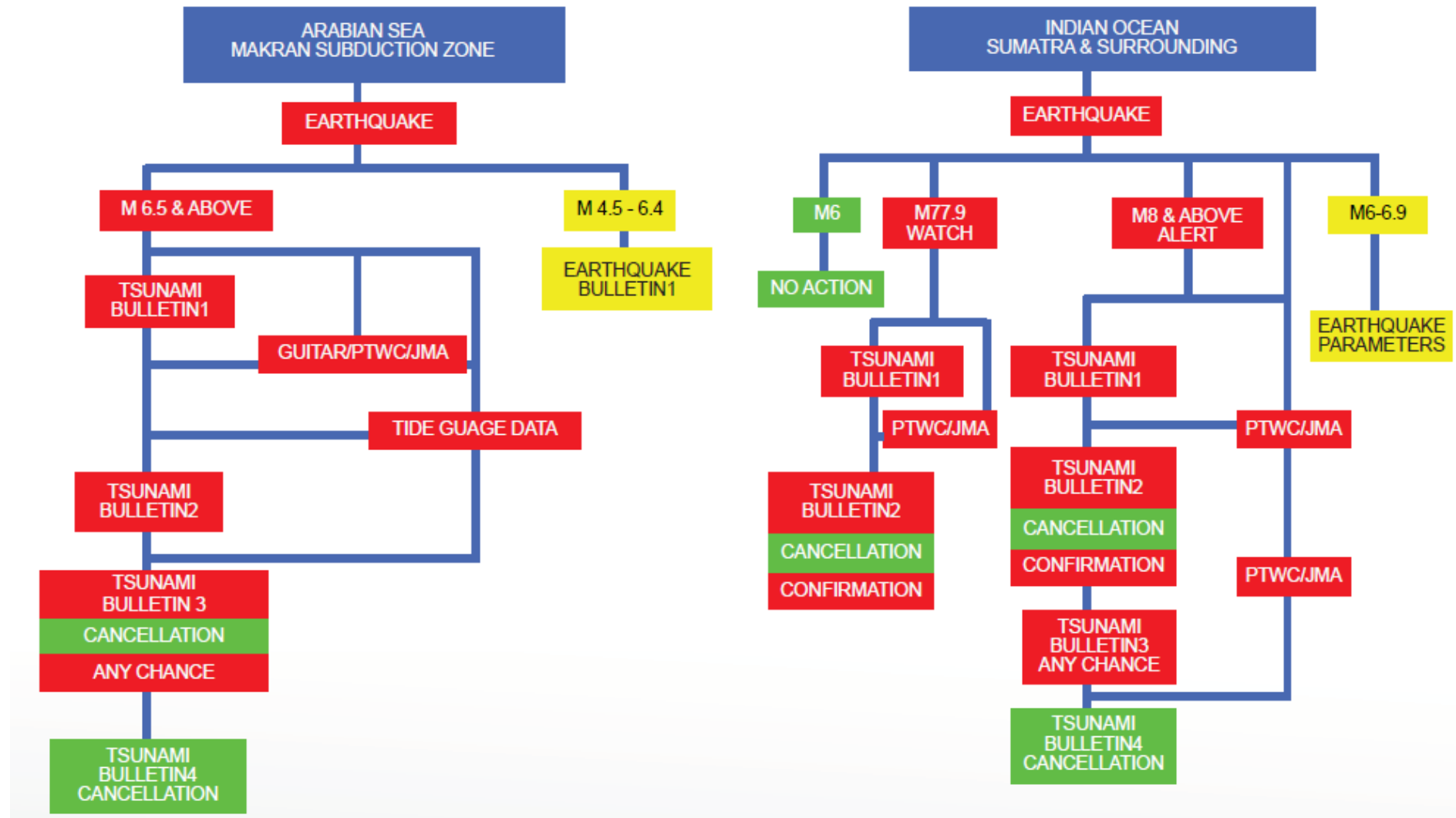
*Chair of RW NWIO*

# Understanding the NTWC product

- **What communication means NTWC-DMO**
  - Multi mode of communication: Email, WRS, Text Message, interagency networks, VHF, Vsat, fix-line phone, cell phone,
- **What kind of information**
  - Technical parameter:
    - Warning Level information
    - ETA,
    - Tsunami Height,
    - Affected Areas
  - Guidance for action
  - Maps: travel time, inundation
- **Time-line for warning bulletin**

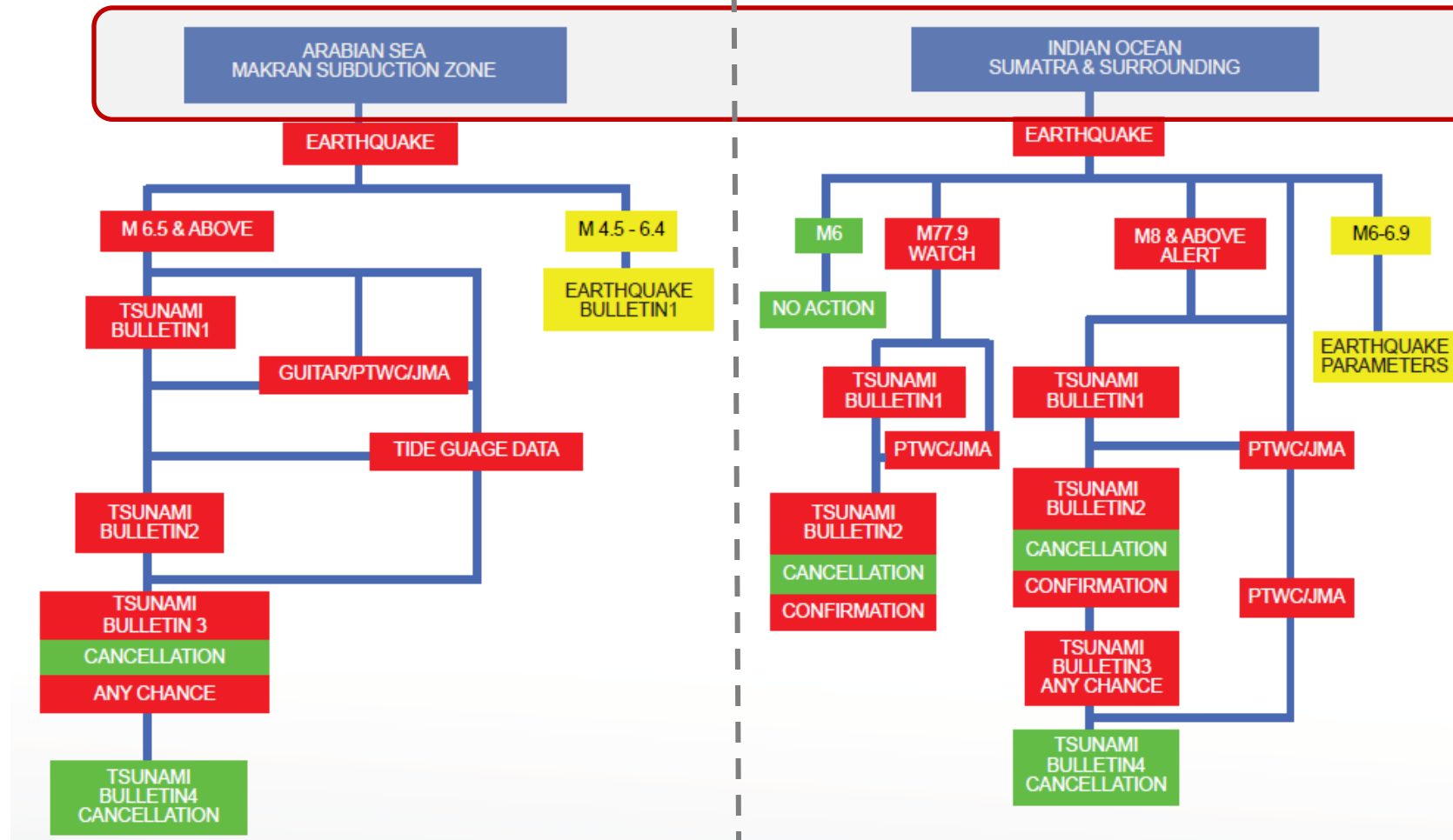
Bulletins 1 – 2 – 3 (3.1-3.n) – 4

# NTWC SOP- Pakistan

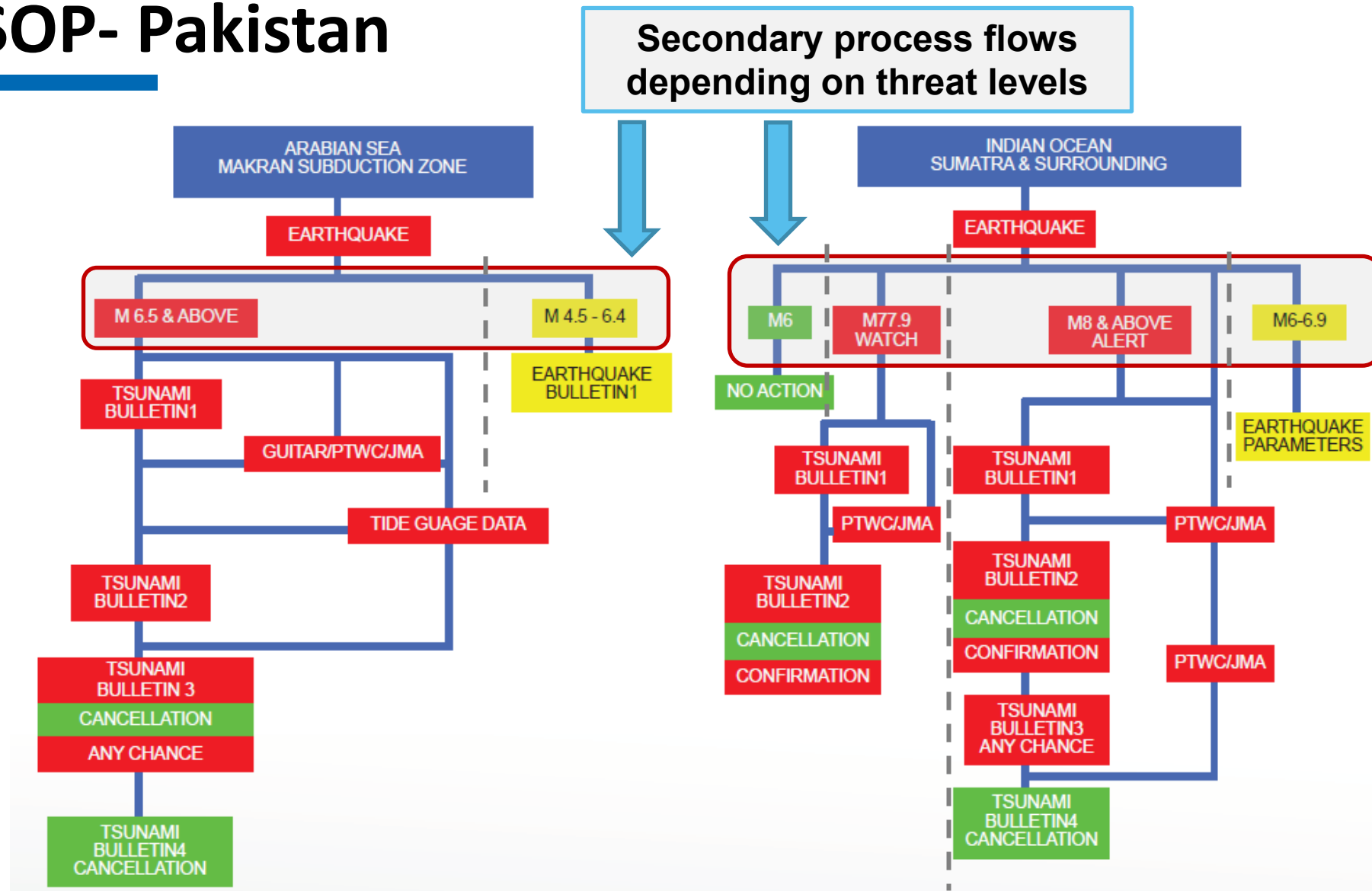


# NTWC SOP- Pakistan

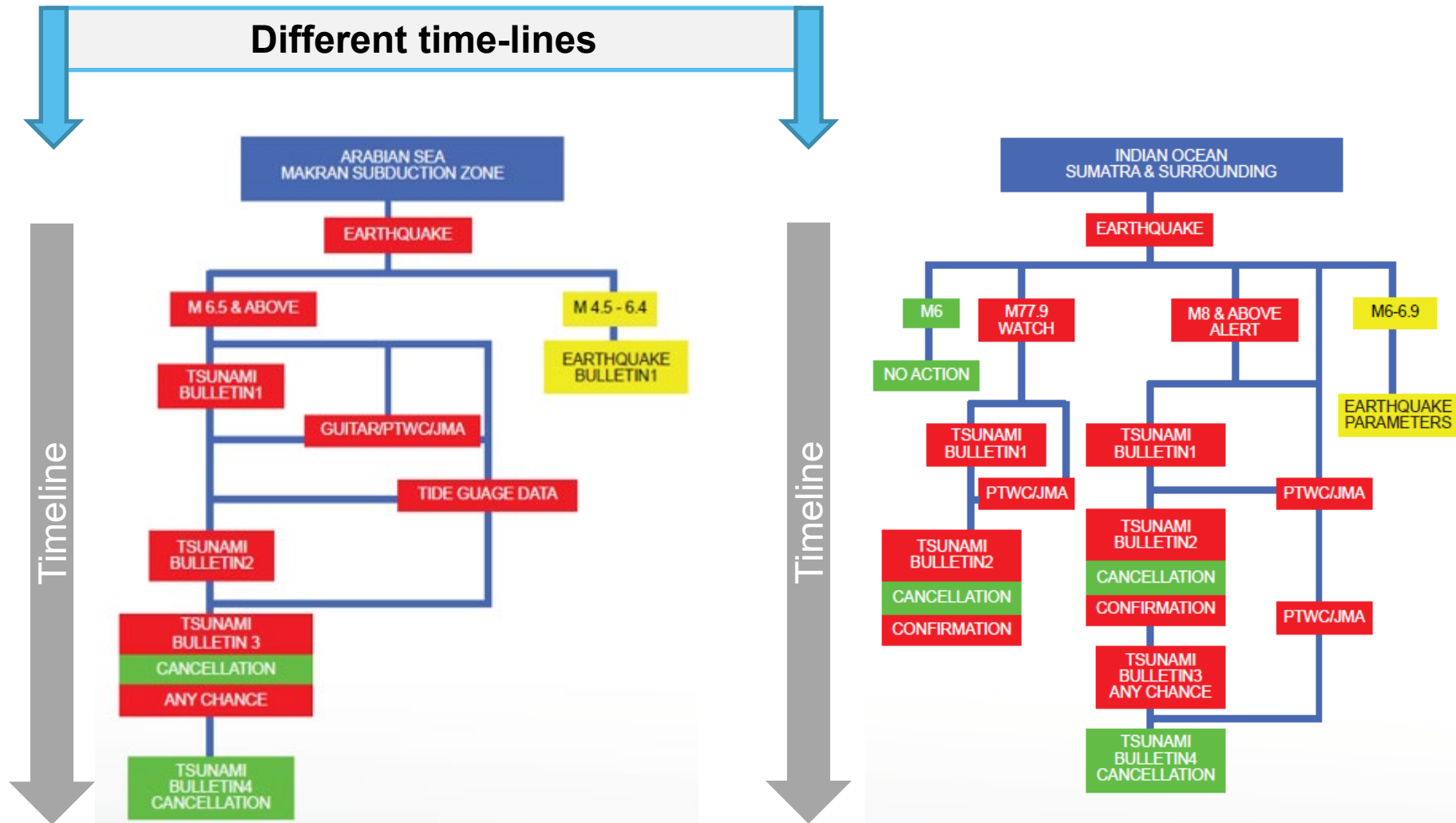
2 main process flows  
in accordance with  
near-field and far-field  
scenarios



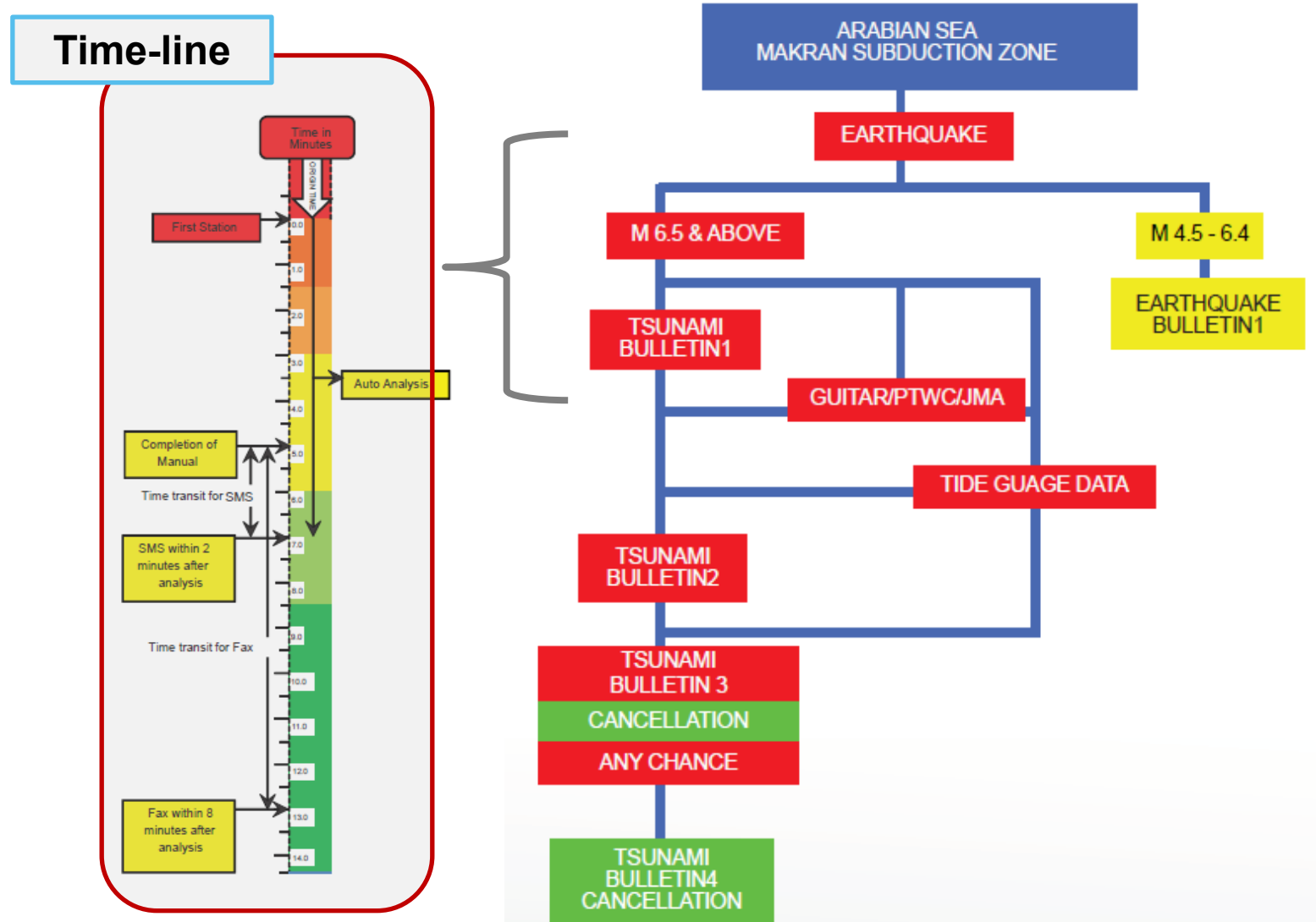
# NTWC SOP- Pakistan



# NTWC SOP- Pakistan

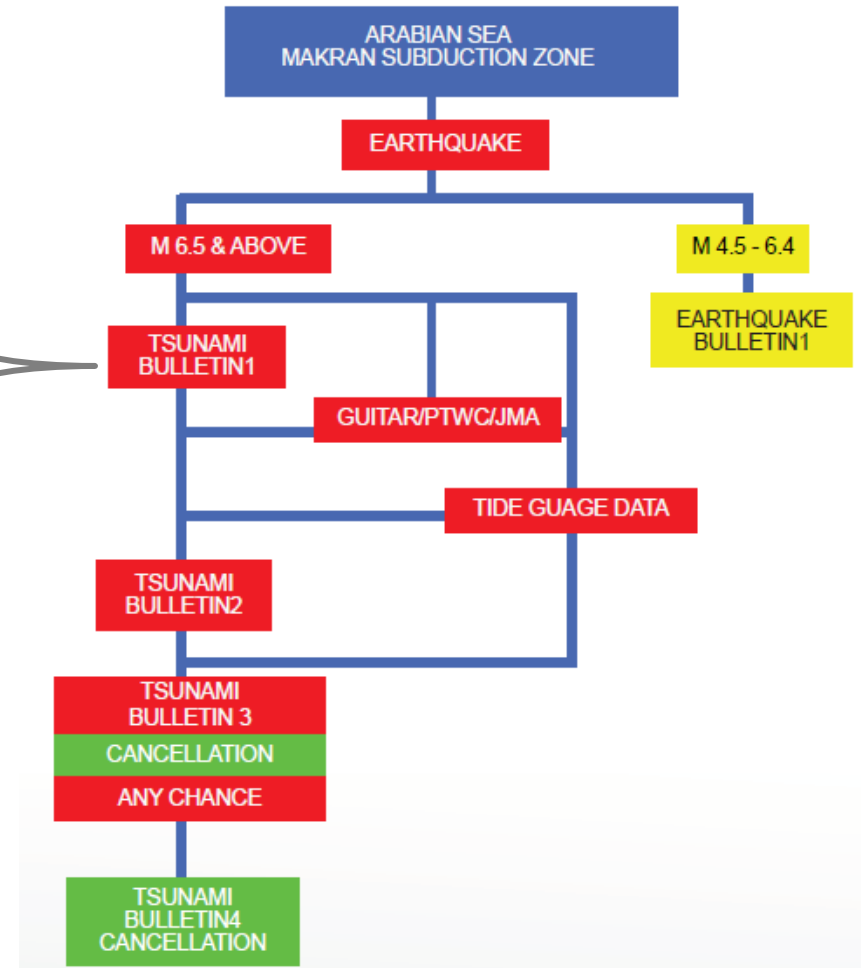


# NTWC SOP- Pakistan for Near-Field threats



# NTWC SOP- Pakistan Output: Bulletin 1

People in coastal areas of Balochistan especially Jiwani, Gwadar, Pasni, Ormara and neighbourhood are **STRONGLY ADVISED TO EVACUATE IMMEDIATELY** to higher grounds or go far inland.  
People in coastal areas of Sindh are **advised to standby for evacuation**. Boats and Ships at sea are advised to stay in the deeper parts of the sea until the threat is over. If there is sufficient time, boats and ships in harbours and bays are advised to go to the deeper parts of the sea until the threat is over.

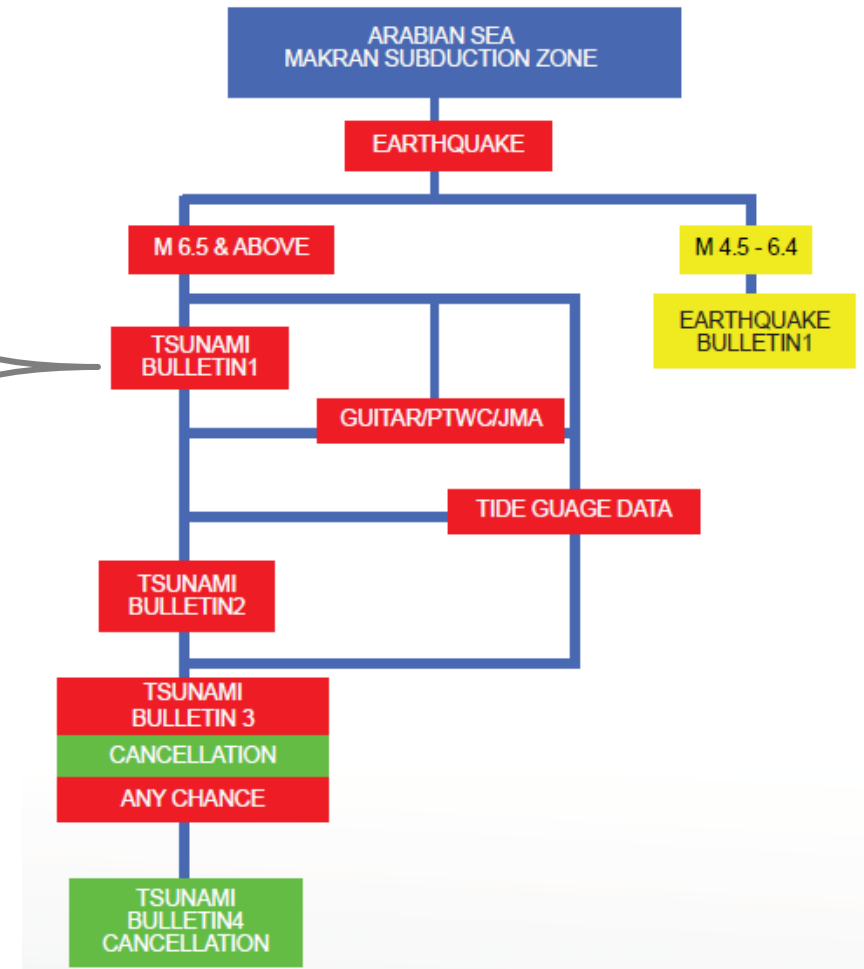




# NTWC SOP- Pakistan Output: Bulletin 1

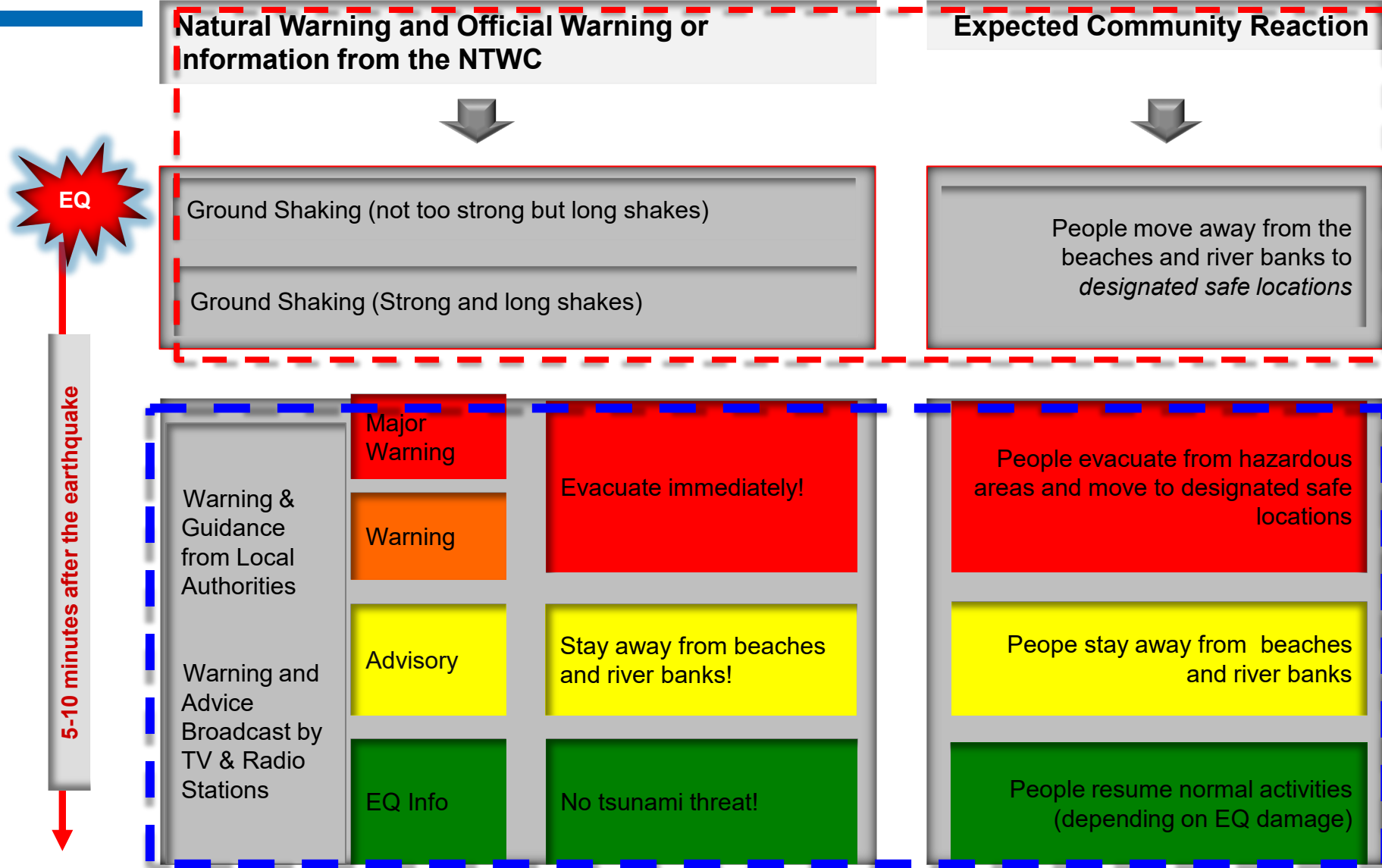
People in coastal areas of Balochistan especially Jiwani, Gwadar, Pasni, Ormara and neighbourhood are **STRONGLY ADVISED TO EVACUATE IMMEDIATELY** to higher grounds or go far inland.

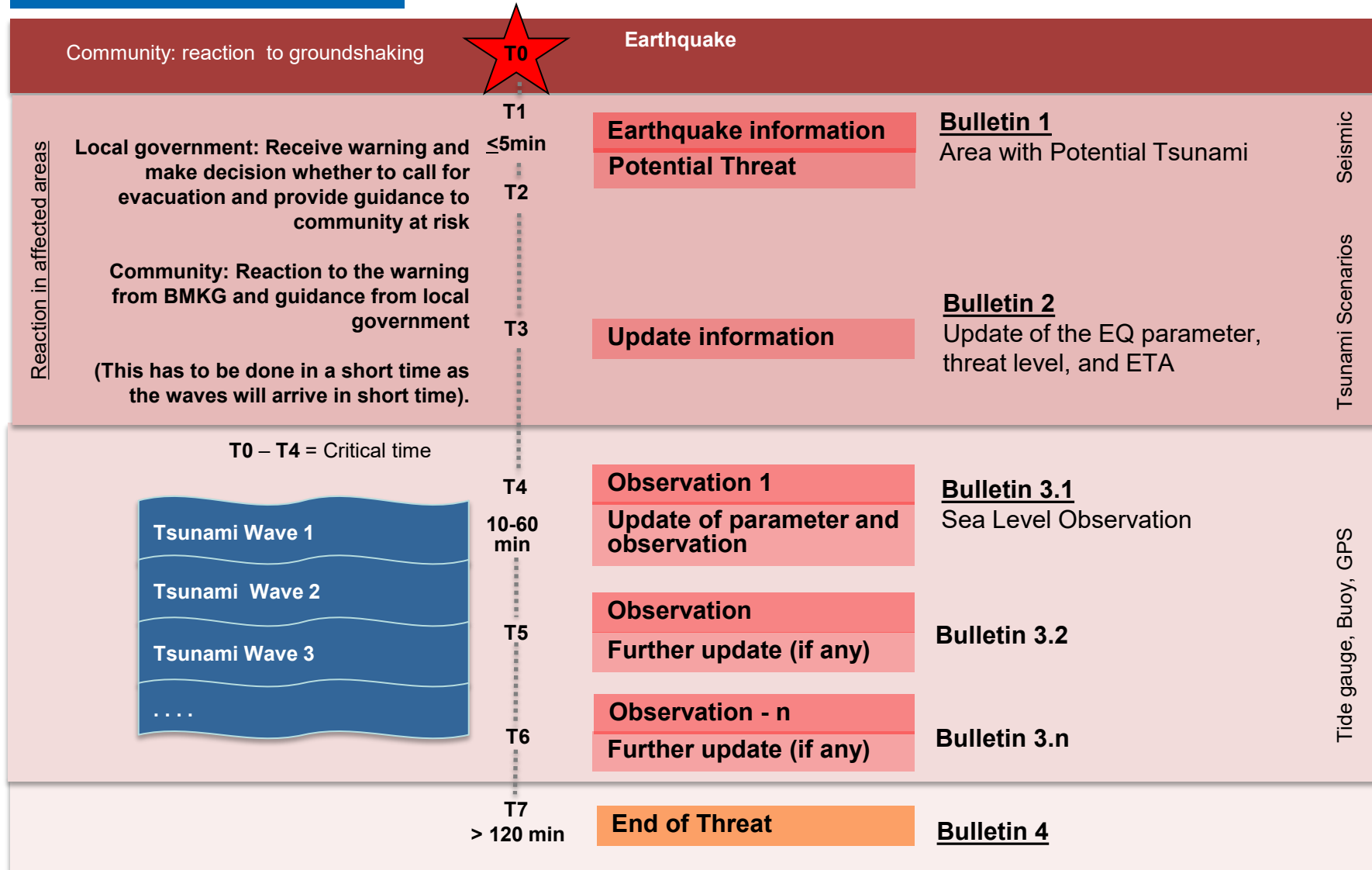
People in coastal areas of Sindh are **advised to standby for evacuation**. Boats and Ships at sea are advised to stay in the deeper parts of the sea until the threat is over. If there is sufficient time, boats and ships in harbours and bays are advised to go to the deeper parts of the sea until the threat is over.



**Input for DMO & Media**

# NTWC Indonesia





## Example of NTWC Product in 3 Modes of Communications

- Warning Receiver System
  - DMO - Dedicated
  - Media-Broadcast
  - Community-web based
  - Public-Mobile Phone.
- Emails
- Text Message

Warning level and advice to local government by the BMKG

Warning Level	Saran dari BMKG pada PEMDA
<b>AWAS</b> (Major Warning)	Provincial/District/City governments that are at “Major Warning” level are expected to pay attention to this warning and immediately guide their communities for full evacuation.
<b>SIAGA</b> (Warning)	Provincial/District/City governments that are at “Warning” level are expected to pay attention to this warning and immediately guide their communities for evacuation.
<b>WASPADA</b> (Advisory)	Provincial/District/City governments that are at “Advisory” level are expected to pay attention to this warning and immediately guide their communities to move away from beaches and river banks.



# NTWC Indonesia

## Warning Message Via Warning Receiver System for Stakeholder Organizations



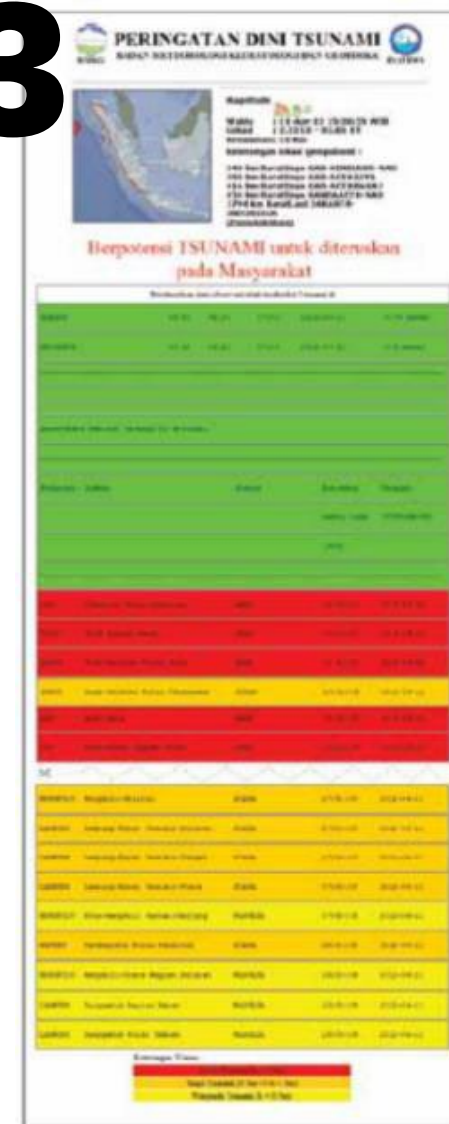
1



2



3



# NTWC Indonesia

## Warning Message Via Warning Receiver System for Stakeholder Organizations



4





# NTWC Indonesia to Broadcasting Media

## Warning Message Via Warning Receiver System for Broadcasting Media (MCR)



HOW TO READ THE MESSAGE

### TSUNAMI WARNING FROM BMKG.

AN EARTHQUAKE WITH A MAGNITUDE OF 8.9 ON THE RICHTER SCALE WITH A DEPTH OF 10 KILOMETRES OCCURRED ON 11 APRIL 2012 AT 15:38:33 WESTERN INDONESIA TIME (WIB), EPICENTER IN THE REGION OF SOUTHWEST SIMEULUE REGENCY ACEH PROVINCE AND HAS THE POTENTIAL TO CAUSE A TSUNAMI. THE COMMUNITY IS URGED TO FOLLOW DIRECTIONS FROM THE AUTHORITIES OR THE LOCAL GOVERNMENT.

EARTHQUAKE PARAMETERS ARE TEMPORARY AND WILL CONTINUE TO BE UPDATED BY THE BMKG.

COMMUNITIES HAVING WARNING OR MAJOR WARNING STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND. COMMUNITIES WITH ADVISORY LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.



Look out for the word "Update", if this word appears, it means that the message contains updated information and replaces the information sent previously.

HOW TO READ THE MESSAGE

### TSUNAMI WARNING FROM BMKG.

UPDATED INFORMATION ON THE EARTHQUAKE, WHICH OCCURRED ON 11 APRIL 2012 AT 15:38:33 WIB, WITH A MAGNITUDE OF 8.5 ON THE RICHTER SCALE AND A DEPTH OF 10 KILOMETRES, EPICENTER IN THE SOUTHWEST REGION SIMEULUE REGENCY ACEH PROVINCE AND WITH THE POTENTIAL TO CAUSE A TSUNAMI. FOLLOW INSTRUCTIONS FROM AUTHORITIES:

COMMUNITIES HAVING MAJOR WARNING OR WARNING STATUS, INDICATED IN THE MAP BY ORANGE OR RED COLORS, ARE ADVISED TO IMMEDIATELY EVACUATE TO A SAFE PLACE OR HIGHER GROUND. COMMUNITIES WITH ADVISORY LEVEL INDICATED BY YELLOW COLOR ARE ADVISED TO STAY AWAY FROM BEACHES AND WATERWAYS INCLUDING RIVERS.



# NTWC Indonesia to Broadcasting Media

## Warning Message Via Warning Receiver System for Broadcasting Media (MCR)



### HOW TO READ THE MESSAGE

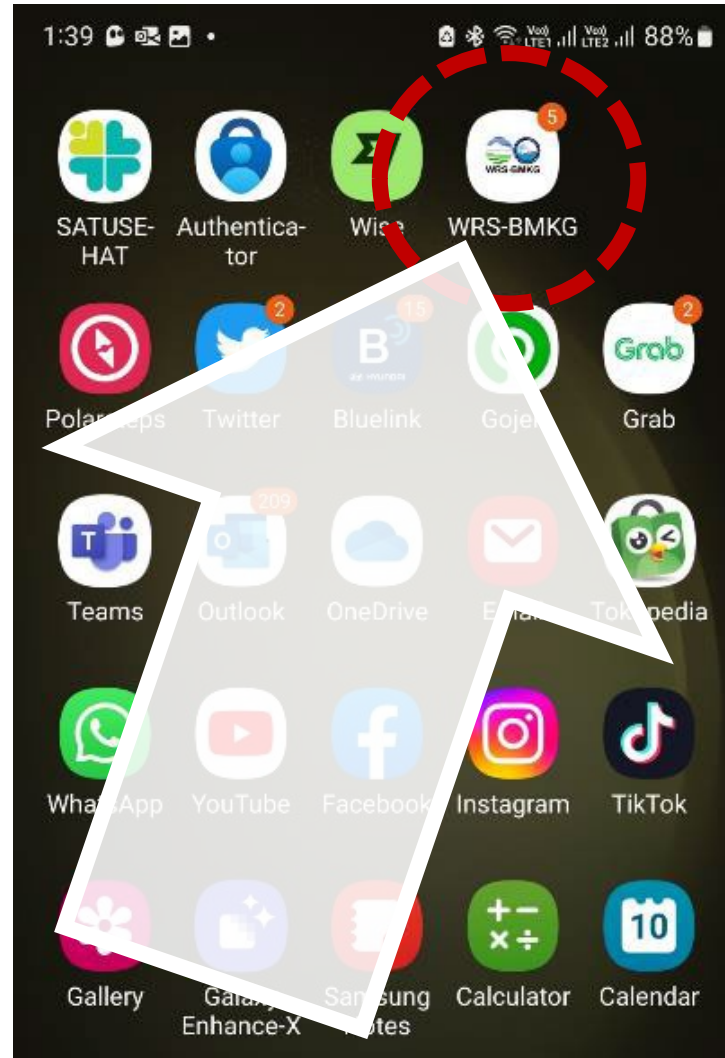
TSUNAMI WARNING FROM BMKG.

TSUNAMI EARLY WARNING DUE TO THE EARTHQUAKE ON DATE 11-APR-12 TIME 15:38:33WIB, IN ACEH, NORTH SUMATRA, WEST SUMATRA, BENGKULU, LAMPUNG WITH A MAGNITUDE 8.1SR, HAS ENDED. THE END OF THIS WARNING APPLIES TO ALL AREAS IN INDONESIA.



# NTWC Indonesia to Public

## Warning Message Via Warning Receiver System of Mobile Phone



# NTWC Indonesia to Public

## Warning Message Via Warning Receiver System of Mobile Phone



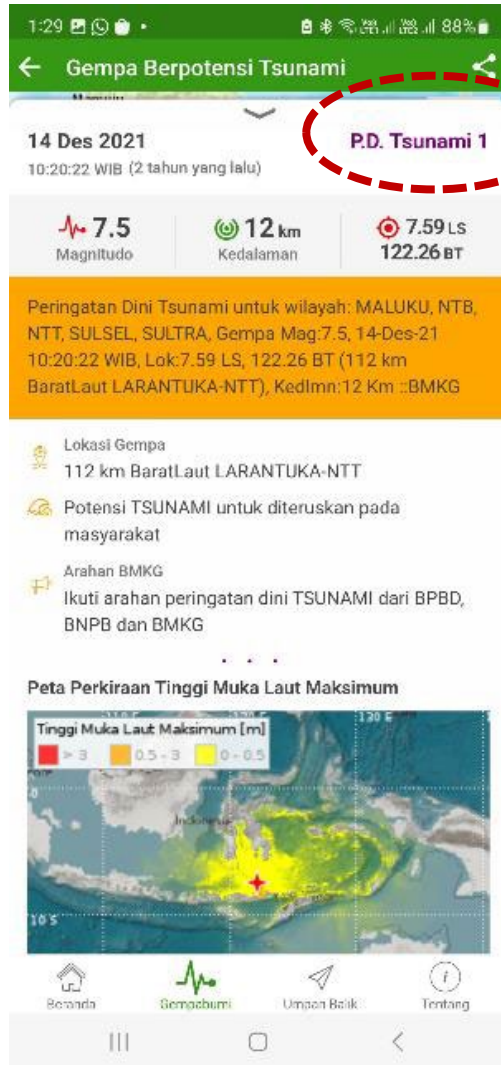
**Bulletin 4**

**Bulletin 3**

**Bulletin 2**

**Bulletin 1**

# NTWC Indonesia to Public





# NTWC Indonesia to Public



# NTWC Indonesia to Public



# NTWC Indonesia by Email

## Warning Message Via Email Bulletin 1

-----BMKG-----BMKG-----BMKG-----BMKG-----BMKG-----

Indonesian Tsunami Early Warning System (InaTEWS)  
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY  
Address: Jl. Angkasa 1 no.2 Kemayoran, Jakarta, Indonesia, 10720  
Telp.: (+62-21) 4246321/6546316, Fax: (+62-21) 6546316/4246703  
P.O. Box 3540 Jkt, Website: <http://www.bmkg.go.id>

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Issued date: 11 April 2012, 15:43:05 WIB (UTC=WIB-7)  
Bulletin-1  
No.: 103/warning/InaTEWS/IV/2012

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS:

Magnitude	: 8.9 RS	} Earthquake parameter
Date	: 11-Apr-2012	
Waktu Origin Time	: 08:38:29 UTC	
Latitude	: 2.31 N	
Longitude	: 92.67 E	
Depth	: 10 Km	

Location	: Off West Coast of Northern Sumatra	} Distance from epicenter
Remarks	: 434 km SOUTHWEST of Meulaboh	
	: 463 km SOUTHWEST of Banda Aceh	
	: 493 km SOUTHWEST of Sabang	
	: 497 km SOUTHWEST of Sigli	
	: 550 km SOUTHWEST of Bireun	

Evaluation:

THERE IS THE POSSIBILITY OF A TSUNAMI IN THE FOLLOWING AREAS:

Province	Location	Warning Level
BENGKULU	Bengkulu-Selatan	MAJOR WARNING
BENGKULU	Bengkulu-Utara Bagian Utara	MAJOR WARNING
BENGKULU	Bengkulu-Utara Pulau Enggano	MAJOR WARNING
BENGKULU	Kaur	MAJOR WARNING
BENGKULU	Kota-Bengkulu Pantai-Panjang	MAJOR WARNING
BENGKULU	Mukomuko	MAJOR WARNING

Warning Level for Affected Areas  
(Warning segments are usually equal to district borders, although there are exceptions)

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---	---	---
---	---	---
LAMPUNG	Tanggamus Pulau Tabuan	WARNING
SUMBAR	Agam	WARNING
SUMBAR	Kota-Padang	WARNING
SUMBAR	Kota-Padang Bagian Selatan	WARNING
SUMBAR	Kota-Padang Bagian Utara	WARNING
SUMBAR	Padang-Pariaman Bagian Selatan	WARNING
SUMBAR	Padang-Pariaman Bagian Utara	WARNING
SUMBAR	Pasaman-Barat	WARNING
SUMBAR	Pesisir-Selatan Bagian Selatan	WARNING
SUMBAR	Pesisir-Selatan Bagian Utara	WARNING
BANTEN	Lebak	ADVISORY
JABAR	Cianjur Sindangbarang	ADVISORY
LAMPUNG	Lampung-Selatan Kep. Krakatau	ADVISORY
LAMPUNG	Lampung-Selatan Kep. Sebuku	ADVISORY

### Advice:

Province/District/City governments that are at "Major Warning" level are expected to pay attention to this warning and immediately guide their communities for full evacuation.

Province/District/City governments that are at "Warning" level are expected to pay attention to this warning and immediately guide their communities for evacuation.

Province/District/City governments that are at "Advisory" level are expected to pay attention to this warning and immediately guide their communities to move away from the beach and river banks.

-----BMKG-----BMKG-----BMKG-----BMKG-----BMKG-----



# NTWC Indonesia by Email

## Warning Message Via Email Bulletin 2

-----BMKG-----BMKG-----BMKG-----BMKG-----BMKG-----

Indonesian Tsunami Early Warning System (InaTEWS)  
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY  
Address: Jl. Angkasa I no.2 Kemayoran, Jakarta, Indonesia, 10720  
Telp.: (+62-21) 4246321/6546316, Fax: (+62-21) 6546316/4246703  
P.O. Box 3540 Jkt, Website : <http://www.bmkg.go.id>

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Issued date: 11 April 2012, 15:47:45 WIB (UTC=WIB-7)  
Bulletin-2  
No.:104/warning/InaTEWS/IV/2012

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS:

Magnitude	: 8.5 RS
Date	: 11-Apr-2012
Origin Time	: 08:38:33 UTC
Latitude	: 2.40 N
Longitude	: 92.99 E
Depth	: 10 Km

Location : Off West Coast of Northern Sumatra  
Remarks : 398 km SOUTHWEST Meulaboh  
433 km SOUTHWEST Banda Aceh  
464 km SOUTHWEST Sabang  
465 km SOUTHWEST Sigli  
515 km SOUTHWEST Bireun

Evaluation:

THERE IS THE POSSIBILITY OF A TSUNAMI IN THE FOLLOWING AREAS:

Province	Warning Segment	Warning Level	ETA [UTC]	Date [YYYY-MM-DD]
NAD	Simeulue Pulau Simeulue	MAJOR WARNING	09:00:13	2012-04-11
SUMUT	Nias Bagian Barat	MAJOR WARNING	09:16:58	2012-04-11
SUMUT	Nias-Selatan Pulau Nias	MAJOR WARNING	09:22:03	2012-04-11

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Be aware of the possibility that the status levels in each area may change from Advisory to Warning or Major Warning, or vice-versa

BENGKULU	Bengkulu-Utara Bagian Utara	WARNING	10:48:22	2012-04-11
BENGKULU	Kaur	WARNING	10:48:43	2012-04-11
BENGKULU	Seluma	WARNING	10:49:43	2012-04-11
SUMUT	Mandailing-Natal Bagian Selatan	WARNING	10:51:43	2012-04-11
BENGKULU	Bengkulu-Selatan	WARNING	10:51:52	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Selatan	WARNING	10:54:28	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Tengah	WARNING	10:54:28	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Utara	WARNING	10:55:37	2012-04-11
BENGKULU	Kota-Bengkulu Pantai-Panjang	WASPADA	10:58:18	2012-04-11
BANTEN	Pandeglang Pulau Panaitan	WARNING	11:01:43	2012-04-11
BENGKULU	Bengkulu-Utara Bagian Selatan	ADVISORY	11:03:13	2012-04-11
BANTEN	Pandeglang Bagian Selatan	NO THREAT	11:03:52	2012-04-11
JABAR	Sukabumi Pelabuhan-Ratu	NO THREAT	11:05:18	2012-04-11
JABAR	Sukabumi Ujung-Genteng	NO THREAT	11:05:18	2012-04-11
LAMPUNG	Lampung-Selatan Kep. Krakatau	NO THREAT	11:05:22	2012-04-11
LAMPUNG	Lampung-Selatan Kep. Sebuku	NO THREAT	11:05:22	2012-04-11
LAMPUNG	Tanggamus Bagian Barat	ADVISORY	11:05:48	2012-04-11
LAMPUNG	Tanggamus Pulau Tabuan	ADVISORY	11:05:48	2012-04-11
LAMPUNG	Lampung-Selatan Bagian Barat	NO THREAT	11:06:22	2012-04-11
LAMPUNG	Tanggamus Bagian Timur	NO THREAT	11:06:22	2012-04-11
JABAR	Cianjur Sindangbarang	NO THREAT	11:06:33	2012-04-11
BANTEN	Lebak	NO THREAT	11:06:52	2012-04-11

(ETA: estimated time of arrival)

ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST.

Advice:

Province/District/City governments that are at "Major Warning" level are expected to pay attention to this warning and immediately guide their communities for full evacuation.

Province/District/City governments that are at "Warning" level are expected to pay attention to this warning and immediately guide their communities for evacuation.

Province/District/City governments that are at "Advisory" level are expected to pay attention to this warning and immediately guide their communities to move away from the beach and river banks.

-----BMKG-----BMKG-----BMKG-----BMKG-----BMKG-----

# NTWC Indonesia by Email



unesco

Intergovernmental  
Oceanographic  
Commission

## Warning Message Via Email Bulletin 3

.....BMKG.....BMKG.....BMKG.....BMKG.....BMKG.....

Indonesian Tsunami Early Warning System (InaTEWS)  
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY  
Address: Jl. Angkasa I no.2 Kemayoran, Jakarta, Indonesia, 10720  
Telp.: (+62-21) 4246321/6546316, Fax: (+62-21) 6546316/4246703  
P.O. Box 3540 Jkt, Website : <http://www.bmkg.go.id>

-----  
Issued date: 11 April 2012, 18:15:03 WIB (UTC=WIB-7)  
Bulletin-3  
No.:113/warning/InaTEWS/IV/2012

### UPDATING OF EARTHQUAKE PARAMETERS::

Magnitude : 8.3 RS  
Date : 11-Apr-2012  
Origin Time: : 08:38:35 WIB  
Latitude : 2.33 N  
Longitude : 93.05 E  
Depth : 10 Km

Location : Off West Coast of Northern Sumatra  
Remarks : 396 km SOUTHWEST Meulaboh  
435 km SOUTHWEST Banda Aceh  
465 km SOUTHWEST Sigli  
467 km SOUTHWEST Sabang  
514 km SOUTHWEST Bireun

### Evaluation:

Based on sea level observations, tsunami has detected in the following areas:

Location	Latitude	Longitude	Time[UTC] [HH:NN]	Date [YYYY-MM-DD]	Height
SABANG	05.80	95.00	10:00	2012-04-11	0.06 meter
MEULABOH	04.32	96.22	10:04	2012-04-11	0.8 meter

Information  
that tsunami  
waves had  
been observed indicat-  
ing location,  
wave height  
and arrival  
time

### BERPOTENSI TERJADI TSUNAMI DI WILAYAH:

Province	Warning Segment	Warning Level	ETA [WIB]	Date [YYYY-MM-DD]
NAD	Simeulue Pulau Simeulue	MAJOR WARNING	16:00:20	2012-04-11
SUMUT	Nias Bagian Barat	MAJOR WARNING	16:16:50	2012-04-11
SUMUT	Nias-Selatan Pulau Nias	MAJOR WARNING	16:21:54	2012-04-11

Be aware of the possibility that the status levels in each area may change from  
Advisory to Warning or Major Warning, or vice-versa

SUMBAR	Kota-Padang	ADVISORY	17:31:20	2012-04-11
SUMBAR	Kota-Padang Bagian Selatan	ADVISORY	17:31:20	2012-04-11
SUMBAR	Padang-Pariaman Bagian Selatan	ADVISORY	17:31:20	2012-04-11
BENGKULU	Bengkulu-Utara Pulau Enggano	WARNING	17:32:20	2012-04-11
SUMUT	Kota-Sibolga	WARNING	17:34:05	2012-04-11
SUMUT	Tapanuli-Tengah Bagian Selatan	WARNING	17:34:05	2012-04-11
BENGKULU	Mukomuko	WARNING	17:35:00	2012-04-11
NAD	Aceh-Timur	WARNING	17:39:30	2012-04-11
SUMUT	Mandailing-Natal Bagian Utara	WARNING	17:41:54	2012-04-11
SUMUT	Tapanuli-Selatan	WARNING	17:41:54	2012-04-11
SUMBAR	Pasaman-Barat	ADVISORY	17:42:09	2012-04-11
BENGKULU	Bengkulu-Utara Bagian Utara	WARNING	17:48:20	2012-04-11
BENGKULU	Kaur	WARNING	17:48:39	2012-04-11
BENGKULU	Seluma	WARNING	17:49:39	2012-04-11
SUMUT	Mandailing-Natal Bagian Selatan	WARNING	17:51:45	2012-04-11
BENGKULU	Bengkulu-Selatan	WARNING	17:51:50	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Selatan	WARNING	17:54:20	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Tengah	WARNING	17:54:20	2012-04-11
LAMPUNG	Lampung-Barat Pesisir-Utara	WARNING	17:55:30	2012-04-11
BENGKULU	Kota-Bengkulu Pantai-Panjang	ADVISORY	17:58:15	2012-04-11
BANTEN	Pandeglang Pulau Panaitan	WARNING	18:01:35	2012-04-11
BENGKULU	Bengkulu-Utara Bagian Selatan	ADVISORY	18:03:09	2012-04-11
LAMPUNG	Tanggulus Bagian Barat	ADVISORY	18:05:39	2012-04-11
LAMPUNG	Tanggulus Pulau Tabuan	ADVISORY	18:05:39	2012-04-11

(ETA: estimated time of arrival)

ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST.

### Advice:

Province/District/City governments that are at "Major Warning" level are expected to pay attention to this warning and immediately guide their communities for full evacuation.

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Province/District/City governments that are at "Advisory" level are expected to pay attention to this warning and immediately guide their communities to move away from the beach and river banks.

.....BMKG.....BMKG.....BMKG.....BMKG.....BMKG.....



# NTWC Indonesia by Email

## Warning Message Via Email Bulletin 4

-----BMKG-----BMKG-----BMKG-----BMKG-----BMKG-----

Indonesian Tsunami Early Warning System (InaTEWS)  
METEOROLOGICAL CLIMATOLOGICAL AND GEOPHYSICAL AGENCY  
Address: Jl. Angkasa I no.2 Kemayoran, Jakarta, Indonesia, 10720  
Telp.: (+62-21) 4246321/6546316, Fax: (+62-21) 6546316/4246703  
P.O. Box 3540 Jkt, Website: <http://www.bmg.go.id>

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Issued date : 04-Apr-2011, 05:10:45 WIB (UTC=WIB-7)

Bulletin - 4

No.:120/warning/InaTEWS/IV/2012

The Tsunami threat caused by the earthquake :

Magnitude : 7.1 RS

Date : 03-April-2011 20:06:39 UTC

is over.

This is the final message issued by the Indonesia Tsunami Early Warning System, unless new information becomes available.

Do not reply to this email, please address any inquiry to : [info\\_inatews@bmg.go.id](mailto:info_inatews@bmg.go.id)

-----BMKG-----BMKG-----BMKG-----BMKG-----BMKG-----

### HOW TO READ THE MESSAGE

TSUNAMI WARNING FROM BMKG.

TSUNAMI EARLY WARNING DUE TO THE EARTHQUAKE ON DATE 11-APR-12  
TIME 15:38:33WIB, IN ACEH, NORTH SUMATRA, WEST SUMATRA, BENGKULU,  
LAMPUNG: WITH A MAGNITUDE: 8.1SR, HAS ENDED. THE END OF THIS WARNING  
APPLIES TO ALL AREAS IN INDONESIA.

# NTWC Indonesia by Text Message

## Warning Message Via Text Message and Website



### HOW TO READ THE MESSAGE

#### TSUNAMI WARNING FROM BMKG.

TSUNAMI EARLY WARNING FOR THE AREAS OF BENGKULU, LAMPUNG, ACEH, WEST SUMATRA, AND NORTH SUMATRA AS A RESULT OF AN 8.9-MAGNITUDE EARTHQUAKE AT A DEPTH OF 10 KILOMETRES OCCURRING ON 11 APRIL 2012 AT 15:38:33 WIB.

#### NOTES:

SMS MESSAGES ONLY LIST UP TO 5 PROVINCES WITH TSUNAMI WARNING STATUS BUT NO WARNING LEVELS. THIS IS NOT SUFFICIENT FOR PUBLIC INFORMATION PURPOSES. THEREFORE MEDIA NEED TO IMMEDIATELY CONSULT LONG VERSION MESSAGES (AS DISTRIBUTED BY E-MAIL OR FAX).



**unesco**

Intergovernmental  
Oceanographic  
Commission

# THANK YOU



IOWave25