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Utilizing NTWC products in DMO SOPs

Ardito M Kodijat

Indian Ocean Tsunami Information Centre

UNESCO-IOC

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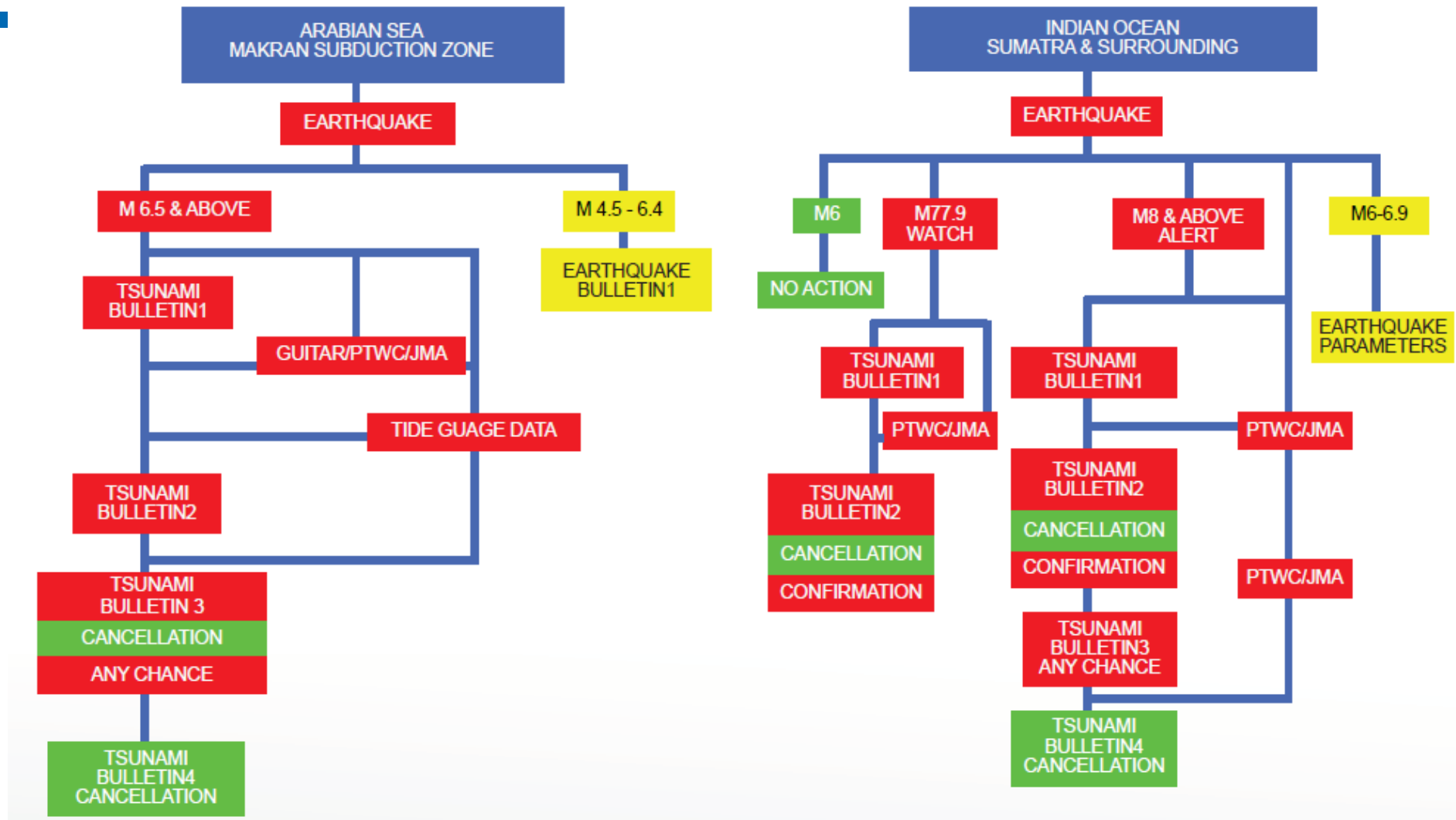
ICG Indian Ocean Tsunami Warning & Mitigation System SOP Workshops July 2023:

*Standard Operating Procedures (SOPs) for
National Tsunami Warning Centres (NTWCs) and
Disaster Management Organisations (DMOs)*

Understanding the NTWC product

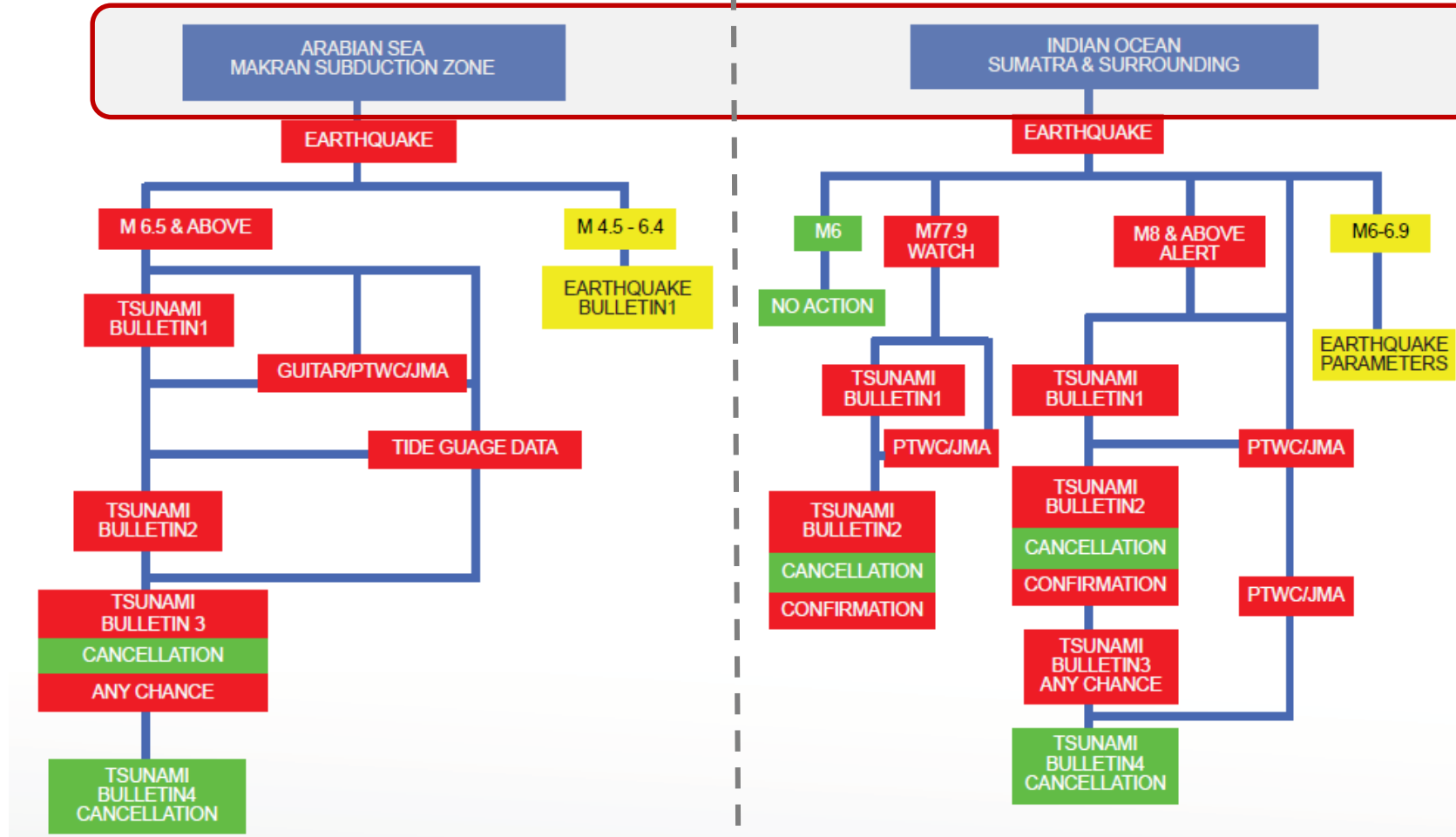
- **What communication means NTWC-DMO**
 - Multi mode of communication: Email, WRS, Text Message, interagency networks, VHF, Vsat, fix-line phone, cell phone,
- **What kind of information**
 - Technical parameter:
 - Warning Level information
 - ETA,
 - Tsunami Height,
 - Affected Areas
 - Guidance for action
 - Maps: travel time, inundation
- **Time-line for warning bulletin**
Bulletins 1 – 2 – 3 (3.1-3.n) – 4

NTWC SOP- Pakistan

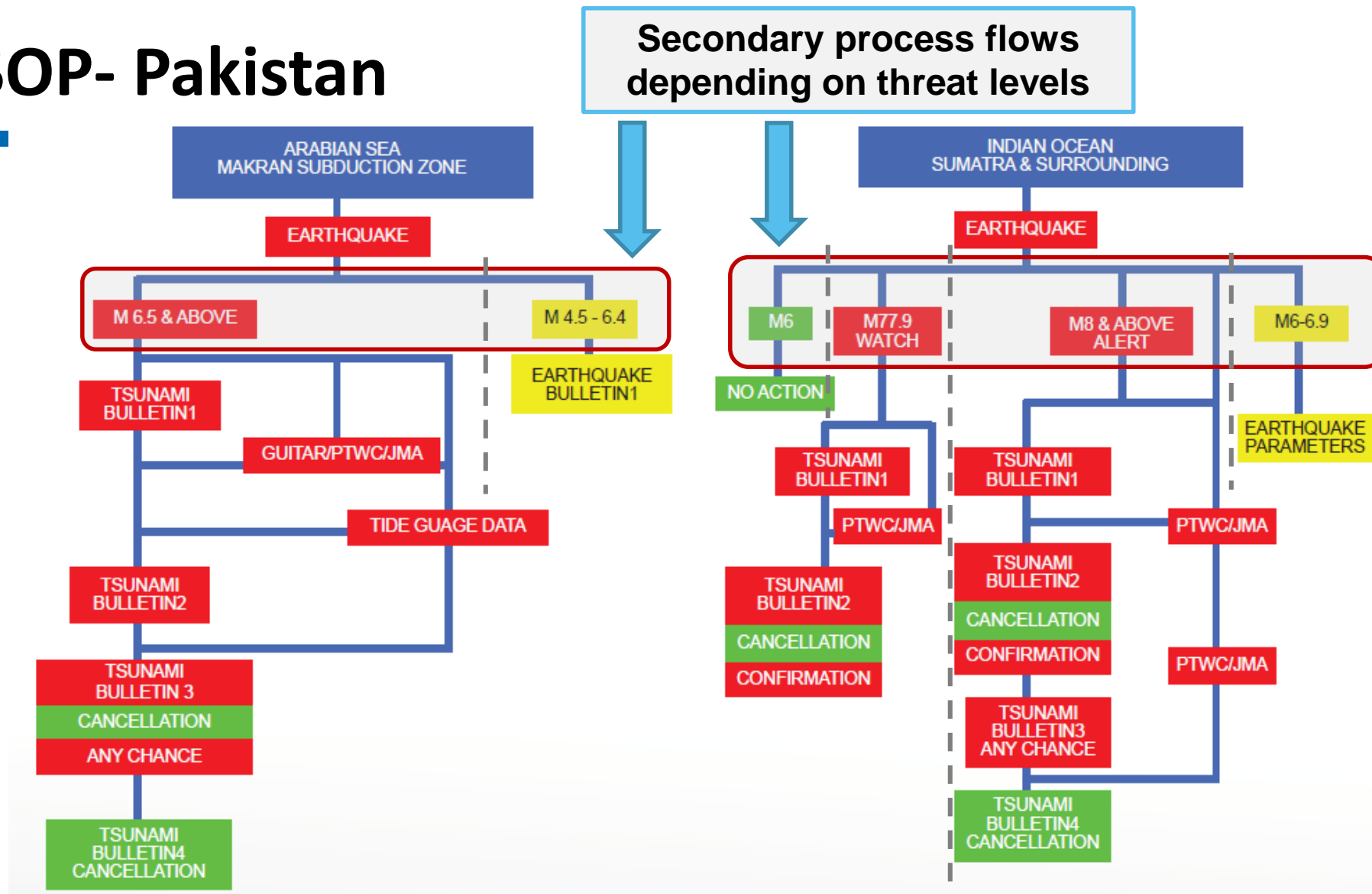


NTWC SOP- Pakistan

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



NTWC SOP- Pakistan

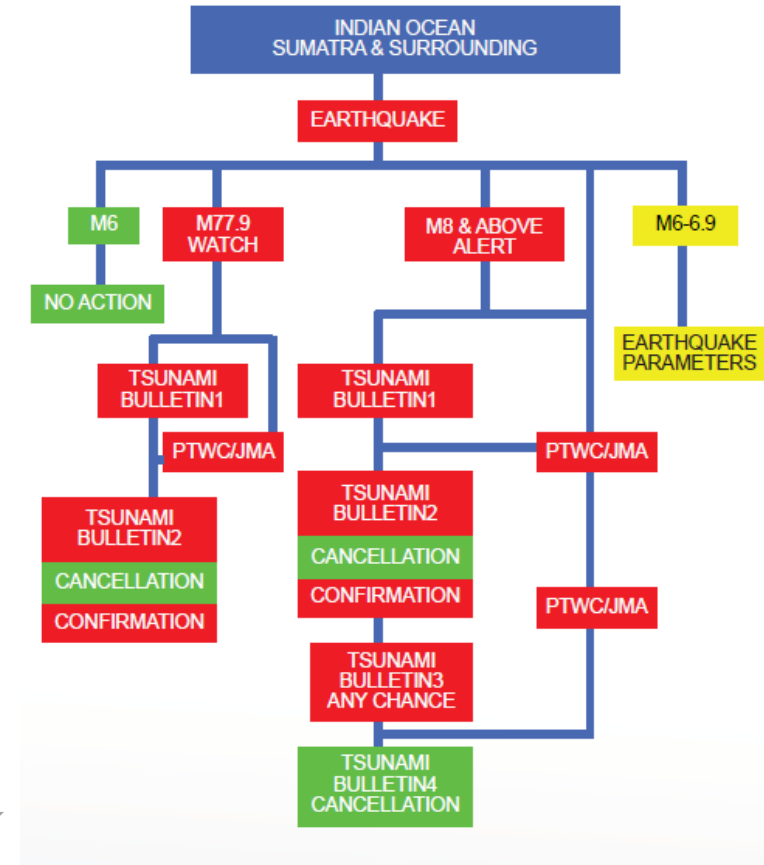
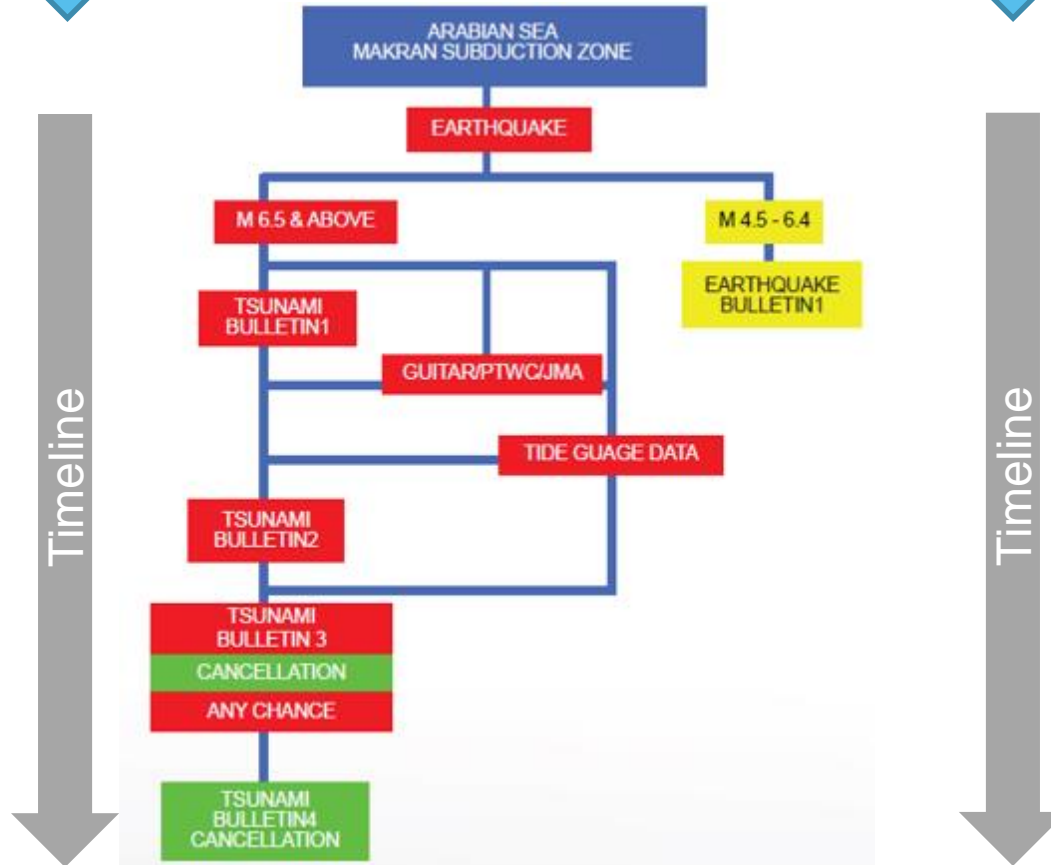
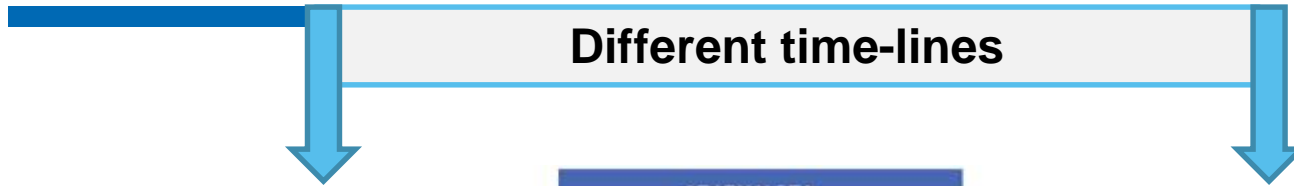


NTWC SOP- Pakistan

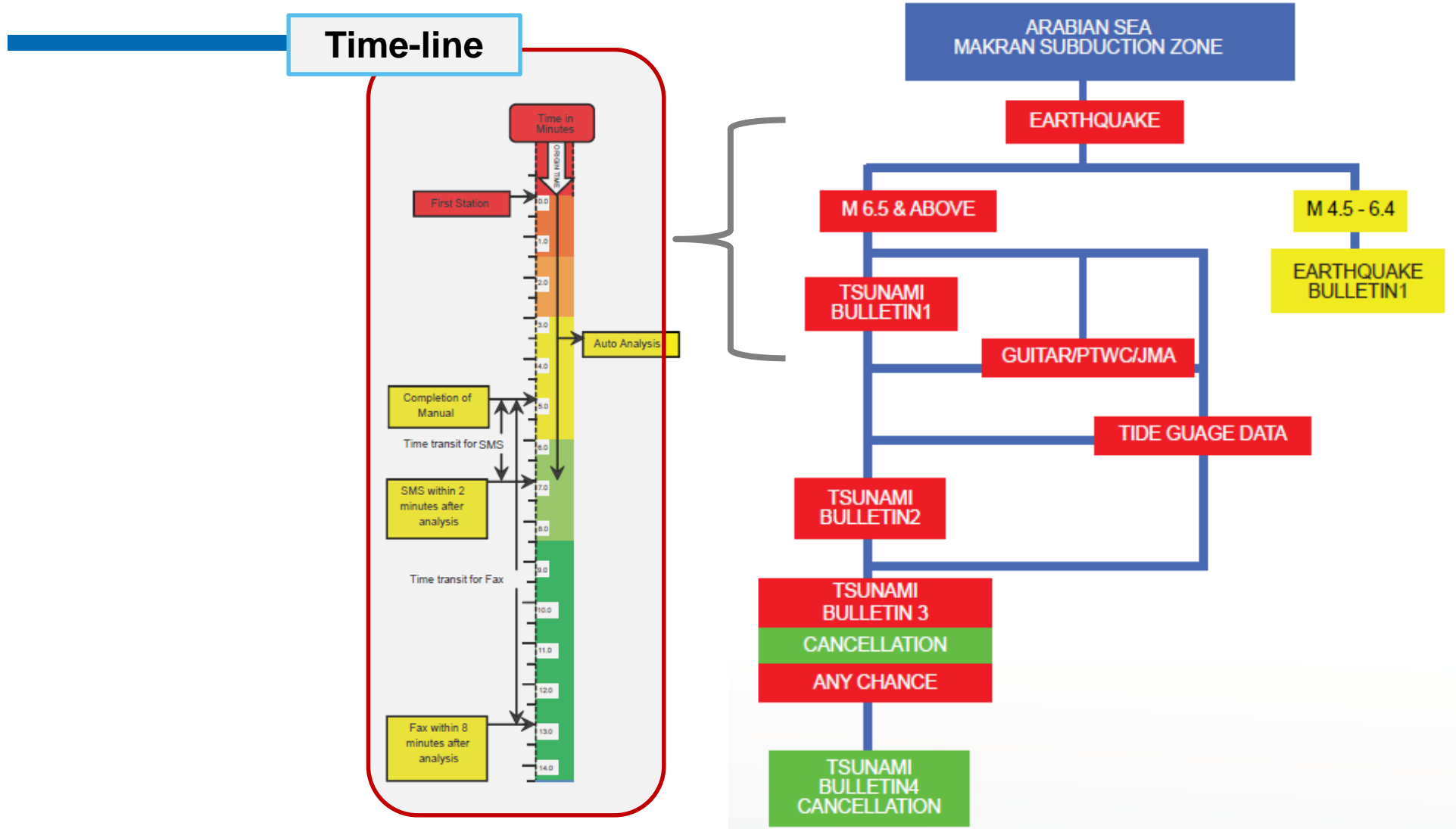


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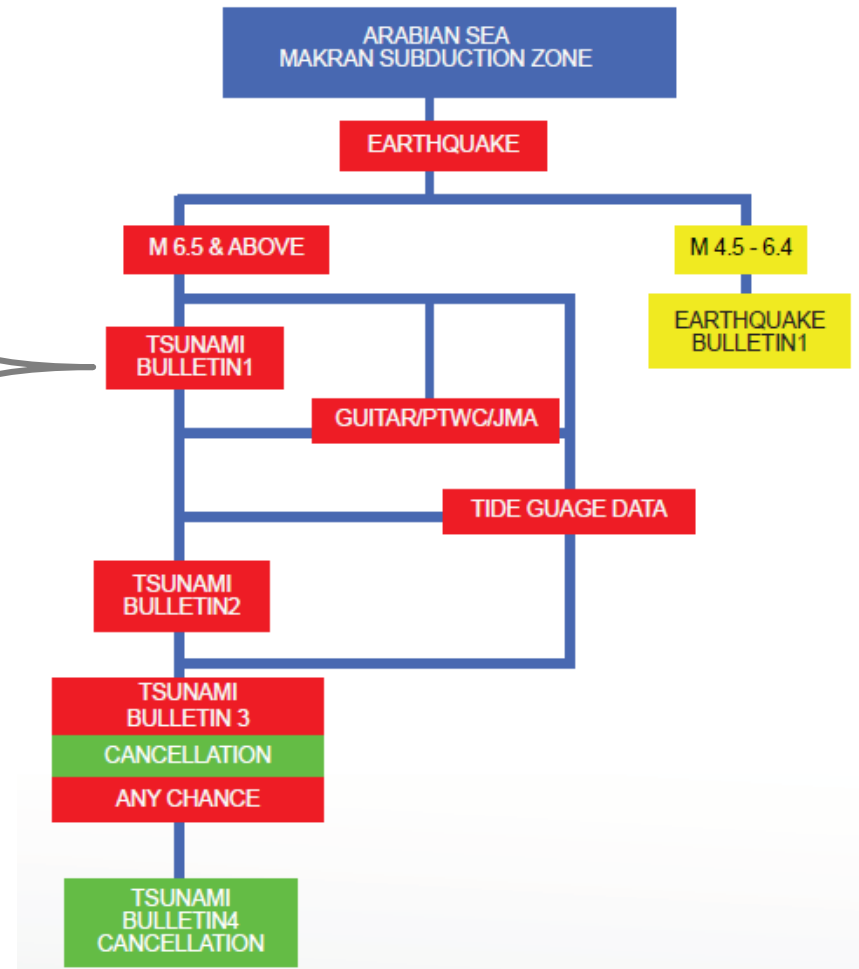


NTWC SOP- Pakistan for Near-Field threats



NTWC SOP- Pakistan Output: Bulletin 1

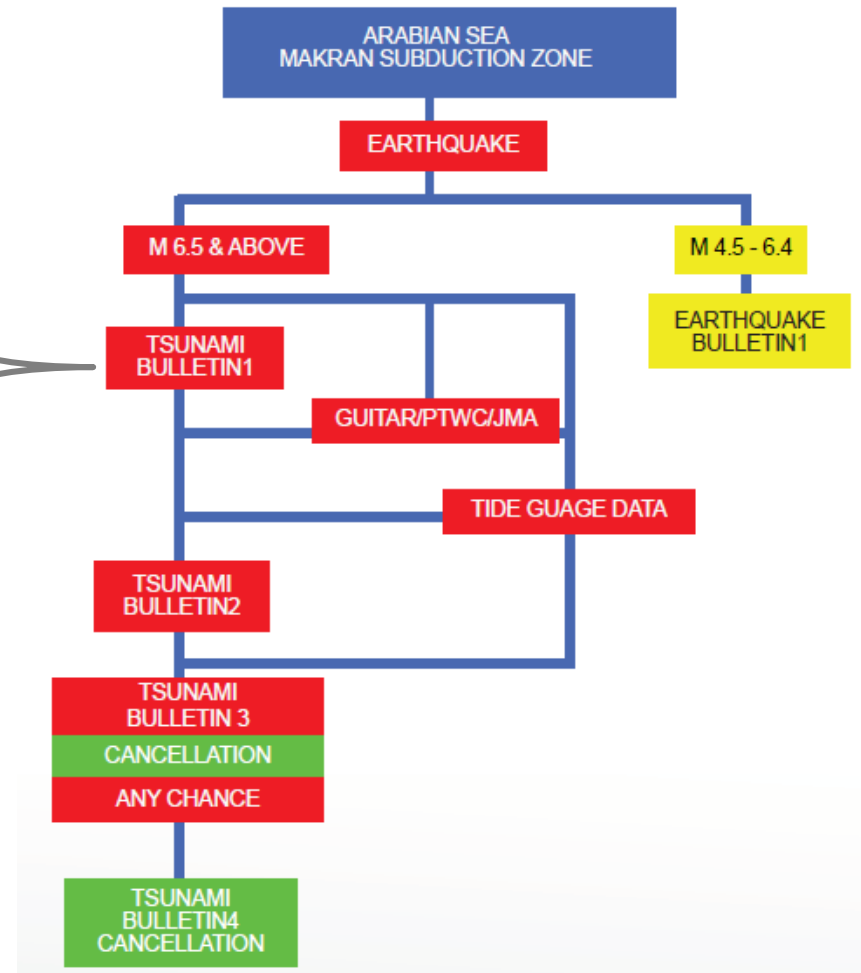
People in coastal areas of Balochistan especially Jiwani, Gwadar, Pasni, Ormara and neighbourhood are **STRONGLY ADVISED TO EVACUATE IMMEDIATELY** to higher grounds or go far inland.
People in coastal areas of Sindh are **advised to standby for evacuation**. Boats and Ships at sea are advised to stay 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.



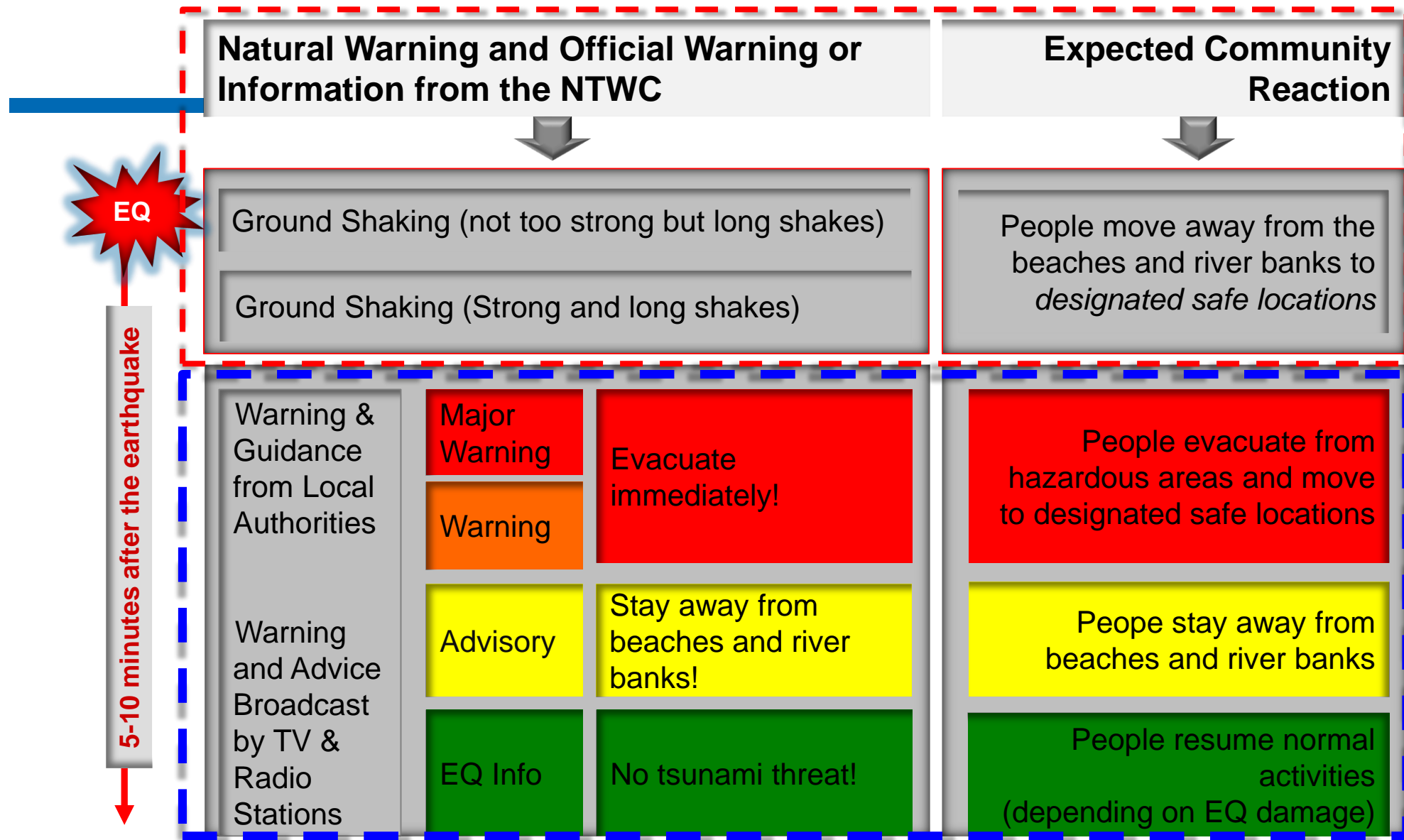
NTWC SOP- Pakistan Output: Bulletin 1

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.

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Input for DMO & Media



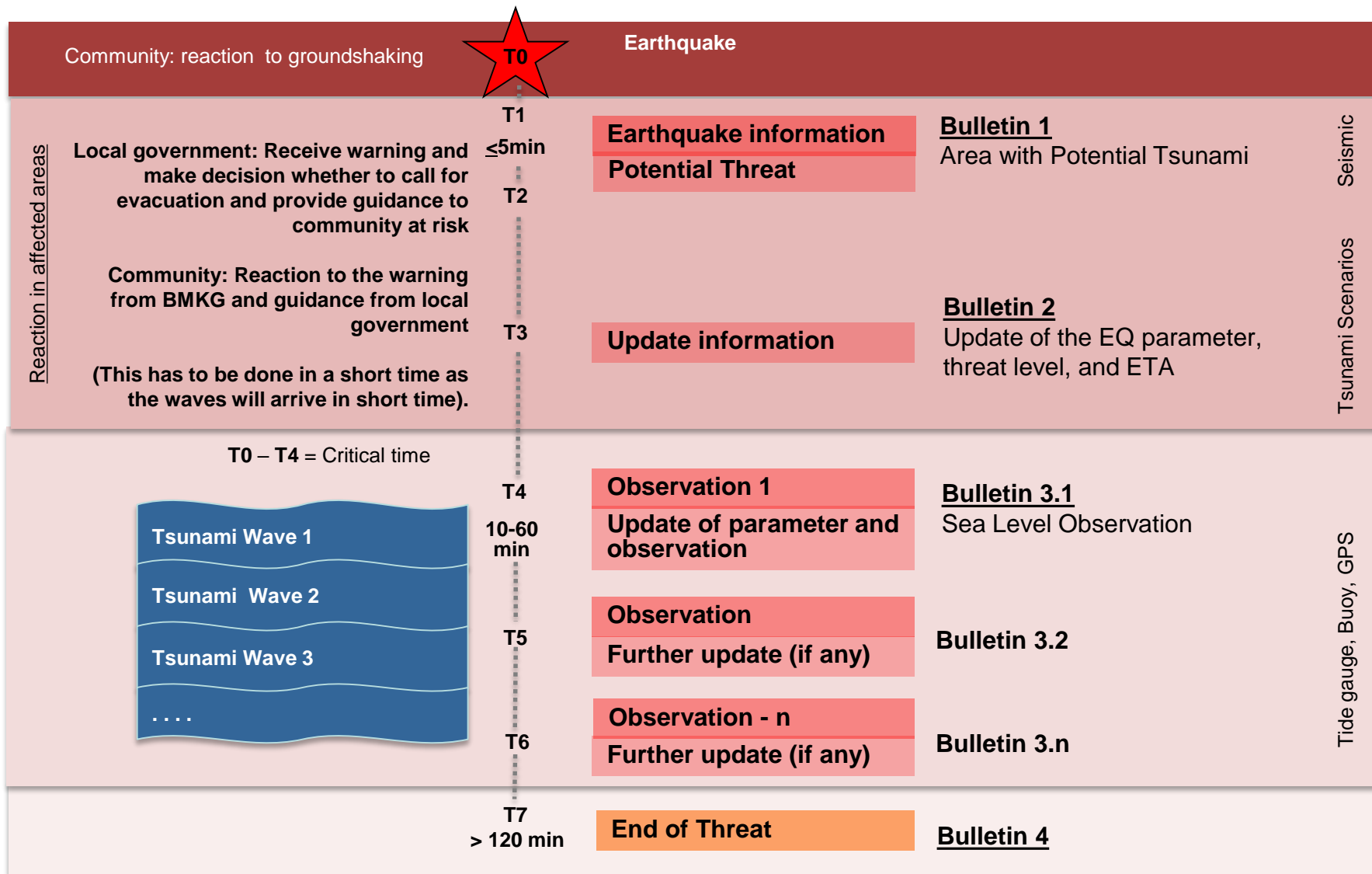
Warning level and advice to local government by the BMKG



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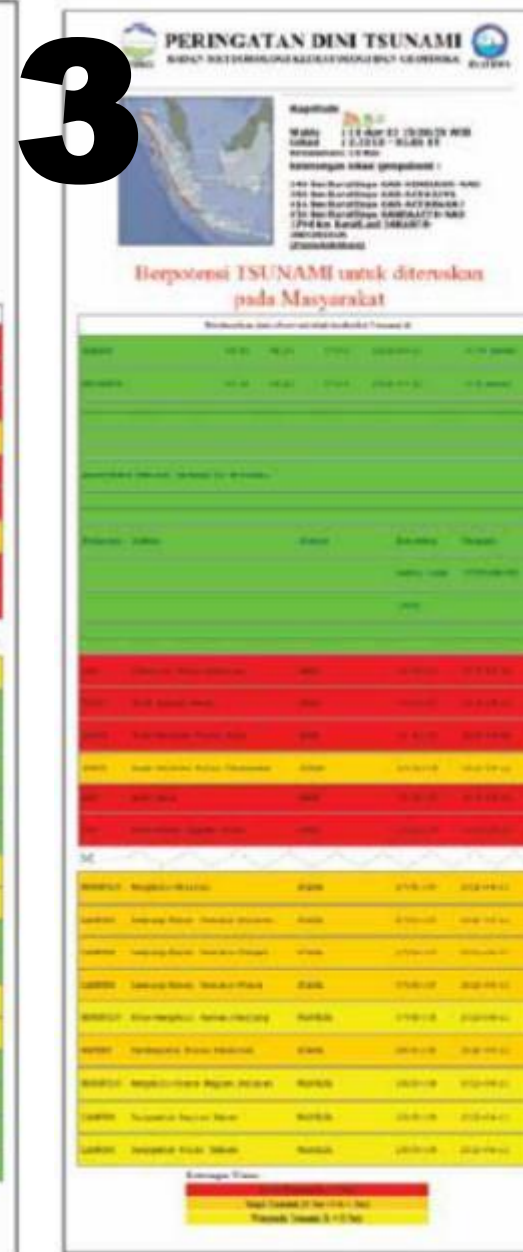
Warning Level	Saran dari BMKG pada PEMDA
AWAS (Major Warning)	Provincial/District/City governments that are at “Major Warning” level are expected to pay attention to this warning and immediately guide their communities for full evacuation.
SIAGA (Warning)	Provincial/District/City governments that are at “Warning” level are expected to pay attention to this warning and immediately guide their communities for evacuation.
WASPADA (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.



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 Message Via Warning Receiver System for Stakeholder Organizations



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Warning Message Via Warning Receiver System for Stakeholder Organizations



4



PERINGATAN DINI TSUNAMI
BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA



Peringatan dini TSUNAMI yang disebabkan gempa
kekuatan : 8.1 SR
tanggal : 11-Apr-12 17:43:11 WIB
dinyatakan TELAH BERAHIR



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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.



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

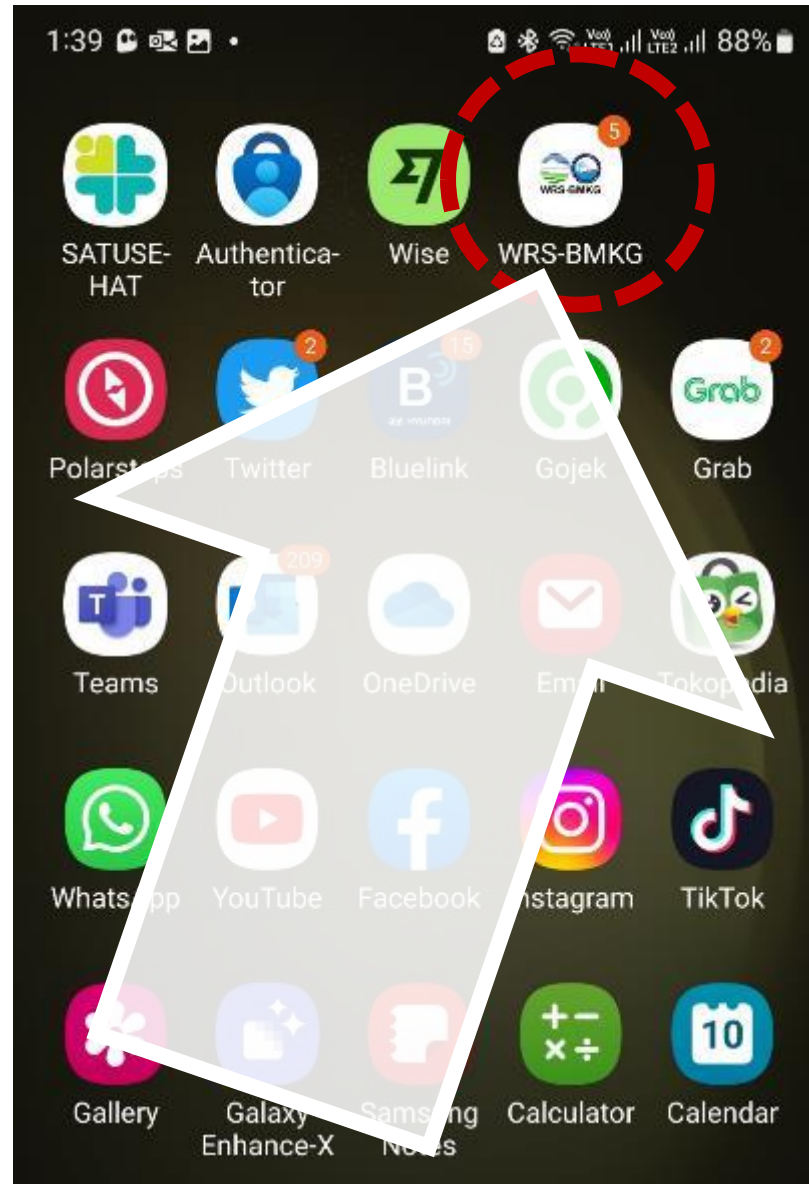


HOW TO READ THE MESSAGE

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.

Warning Message Via Warning Receiver System of Mobile Phone





→ **Bulletin 4**

→ **Bulletin 3**

→ **Bulletin 2**

→ **Bulletin 1**

Warning Message Via Warning Receiver System of Mobile Phone







Warning Message Via Email Bulletin 1

BMKG:..... MKG:..... BMKG:..... BMKG:.....

Indonesia 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



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
 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
 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

Earthquake parameter
 Distance from epicenter

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)

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.

Guidance for local government

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



Warning Message Via Email Bulletin 2

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

Pay attention for the possibility of updates to the earthquake's parameters

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

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.

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 indicating 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-Paripaman 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	18:05:09	2012-04-11
LAMPUNG	Tanggamus Bagian Barat	ADVISORY	18:05:39	2012-04-11
LAMPUNG	Tanggamus 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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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.bmg.go.id>

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

-----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.

Warning Message Via Email Bulletin 4



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Warning Message Via Text Message and Website



This field displays early warning information. At the moment of a tsunami early warning, this field contains the same information that can be obtained via email/ fax

This field displays the parameter of the most recent earthquake that has occurred

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).

NOTES:

THE MEDIA CAN ALSO GET INFORMATION VIA THE WEBSITE. THERE IS A POSSIBILITY THAT DUE TO THE HIGH NUMBER OF PEOPLE TRYING TO ACCESS THE INFORMATION ONLINE, THE INTERNET MAY BE SLOW OR THE WEBSITE MAY NOT FUNCTION WELL. THE MEDIA MUST ENSURE THAT THE INFORMATION CAN BE OBTAINED VIA EMAIL.



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THANK YOU

Ardito M. Kodijat

Programme Officer

Indian Ocean Tsunami Information Centre – UNESCO/IOC

Disaster Risk Reduction and Tsunami Information Unit - UNESCO Jakarta Office

a.kodijat@unesco.org

www.iotsunami.info



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Tsunami Information
Centre of IOC UNESCO