# Warning Service by BMKG

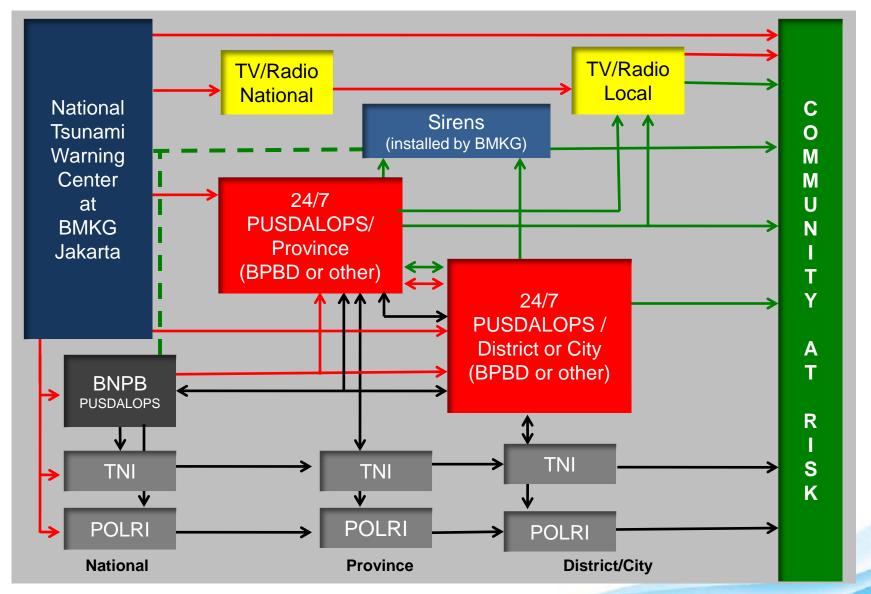






# "Tsunami warnings must reach those at risk in time"

# **Tsunami Warning Chain**



# **Warning Scheme and Timeline**

**Earthquake** Community: reaction to groundshaking **T1** Warning 1 First Warning Seismic <5min EQ parameters & tsunami potential and if available estimation of the Estimation of the threat: threat Local government: receive warnings, **T2** Major Warning Reaction in affected areas make decision whether to call for Warning **Tsunami Scenarios** evacuation and provide guidance to Advisory community at risk No threat Community: reaction to the warning from the BMKG & guidance from local Warning 2 Updated estimation of the threat government Updated EQ parameters, warning level and estimated time of arrival (has to be done very quickly as waves from tsunamis arrive within a short time) (ETA) T0 - T4 = Critical timeWarning 3.1 **T4** First Observation Updated EQ parameters, tsunami 10-60 Update on EQ parameters Tide gauge, Buoy, GPS observation and updated warning and warning level min **Tsunami Wave 1** level **Tsunami Wave 2** Warning 3.2 Second Observation **T5 Tsunami Wave 3** Further update (if any) Warning 3.3 **T6** Third Observation Further update (if any)

T7 > 120 min

End of threat

Warning 4

# **Warning Level**

Warning Level	Estimated Height of the Tsunami Wave
AWAS (Major Warning)	Wave height ≥ 3 meters
SIAGA (Warning)	Wave height between 0.5 and 3 meters
WASPADA (Advisory)	Wave height of < 0.5 meters

# Warning and Advice from NTWC

**Warning Level** 

Advice from BMKG to Local Government

MAJOR WARNING
(AWAS)

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

WARNING (SIAGA)

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

ADVISORY (WASPADA) Province/District/City government 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.

# **InaTEWS Warning Segments**





#### Magnitude

8,9

Waktu : 11-Apr-12 15:38:29 WIB Lokasi : 2.31 LU - 92.67 BT

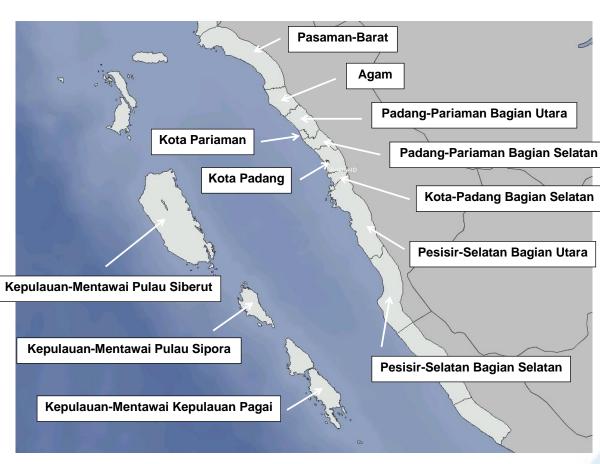
Kedalaman: 10 Km

Keterangan lokasi gempabumi :

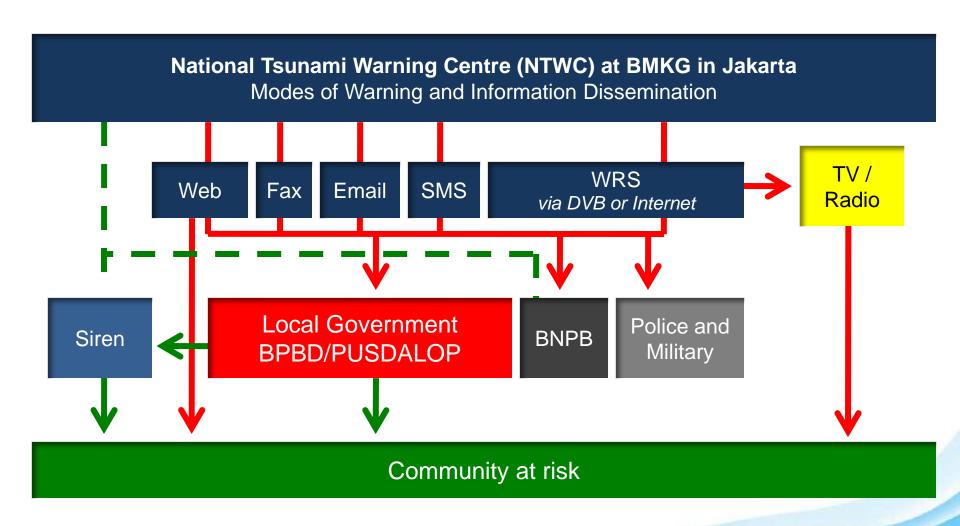
382 km BaratDaya KAB-SIMEULUE-NAD 431 km BaratDaya KAB-ACEHJAYA 453 km BaratDaya KAB-ACEHBARAT 460 km BaratDaya BANDAACEH-NAD 1829 km BaratLaut JAKARTA-INDONESIA

# Berpotensi TSUNAMI untuk diteruskan pada Masyarakat

Berpotensi terjadi Tsunami di wilayah					
SUMBAR	Kepulauan-Mentawai Kep. Pagai	AWAS			
SUMBAR	Kepulauan-Mentawai P. Siberut	AWAS			
SUMBAR	Kepulauan-Mentawai Pulau Sipora	AWAS			
SUMBAR	Agam	SIAGA			
SUMBAR	Kota-Padang	SIAGA			
SUMBAR	Kota-Padang Bagian Selatan	SIAGA			
SUMBAR	Kota-Padang Bagian Utara	SIAGA			
SUMBAR	Padang-Pariaman Bagian Selatan	SIAGA			
SUMBAR	Padang-Pariaman Bagian Utara	SIAGA			
SUMBAR	Pasaman-Barat	SIAGA			
SUMBAR	Pesisir-Selatan Bagian Selatan	SIAGA			
SUMBAR	Pesisir-Selatan Bagian Utara	SIAGA			



# **Modes of Warning Dissemination**



# **Warning Formats & Contents**

Format	Content	Target audience	Mode
Long Version	Earthquake parameter, warning segment, warning level, advise, map	Interface institution, local government, decision maker, media	Email
Long Version	Earthquake parameter, warning segment, warning level, map	Interface institution, local government	WRS
Long Version	Earthquake parameter, warning segment, warning level, advise, map	Interface institution, local government, media	Fax
Media Version	Earthquake parameter, map, "berpotensi tsunami"	Media	WRS
Short Version	Earthquake parameter, warning level at province level	Interface institution, local government, decision maker, media	SMS
Web Version	Earthquake parameter,	public	Website

Peringatan Dini Tsunami di BENGKULU, LAMPUNG, NAD, SUMBAR, SUMUT, Gempa Mag:8.9SR,11-Apr-12 15:38:29 WIB,

Lok:2.31LU,92.67BT,Kdlmn:10km::BMKG

::::BMKG:::::BMKG:::::BMKG::::BMKG::::BMKG::::

Sistem Peringatan Dini Tsunami Indonesia (InaTEWS) BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA

Alamat: 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

Tanggal dikeluarkan: 11 April 2012, 15:43:05 WIB Peringatan dini-1

No.:103/warning/InaTEWS/IV/2012

#### TELAH TERJADI GEMPA BUMI DENGAN PARAMETER SEMENTARA SEBAGAI BERIKUT:

Magnitudo : 8.9 SR Tanggal : 11-Apr-2012 Waktu gempa : 15:38:29 WIB

Garis Lintang: 2.31 LU Garis bujur: 92.67 BT Kedalaman: 10 Km

Lokasi : Off West Coast of Northern Sumatra Keterangan : 434 km BARAT DAYA Meulaboh

> 463 km BARAT DAYA Banda Aceh 493 km BARAT DAYA Sabang 497 km BARAT DAYA Sigli

550 km BARAT DAYA Bireun

Evaluasi:

#### BERPOTENSI TERJADI TSUNAMI DI WILAYAH:

Propinsi Lokasi	Status
BENGKULU Bengkulu-Selatan	AWAS
BENGKULU Bengkulu-Utara Bagian Utara	AWAS
BENGKULU Bengkulu-Utara Pulau Enggano	AWAS
BENGKULU Kaur	AWAS
BENGKULU Kota-Bengkulu Pantai-Panjang	AWAS
BENGKULU Mukomuko	AWAS
BENGKULU Seluma	AWAS





: 11-Apr-12 15:38:29 WIB : 2.31 LU - 92.67 BT Waktu Kedalaman: 10 Km

Keterangan lokasi gempabumi :

382 km BaratDaya KAB-SIMEULUE-NAD 431 km BaratDaya KAB-ACEHJAYA 453 km BaratDaya KAB-ACEHBARAT 460 km BaratDaya BANDAACEH-NAD 1829 km BaratLaut JAKARTA-INDONESIA

#### Berpotensi TSUNAMI untuk diteruskan pada Masyarakat

Berpotensi terjadi Tsunami di wilayah						
BENGKULU	Bengkulu-Selatan	AWAS				
BENGKULU	Bengkulu-Utara Bagian Utara	AWAS				
BENGKULU	Bengkulu-Utara Pulau Enggano	AWAS				
BENGKULU	Kaur	AWAS				
BENGKULU	Kota-Bengkulu Pantai-Panjang	AWAS				
BENGKULU	Mukomuko	AWAS				



/	$\wedge \wedge \wedge \wedge \wedge$	$\wedge \wedge \wedge \vee$
SUMBAR	Kota-Padang Bagian Selatan	SIAGA
SUMBAR	Rota-Padang Bagian Utara	SIAGA
SUMBAR	Padang-Pariaman Bagian Selatan	SIAGA
SUMBAR	Padang-Pariaman Bagian Utara	SIAGA
SUMBAR	Pasaman-Barat	SIAGA
SUMBAR	Pesisir-Selatan Bagian Selatan	SIAGA
SUMBAR	Pesisir-Selatan Bagian Utara	SIAGA
BANTEN	Lebak	WASPADA
JABAR	Cianjur Sindangbarang	WASPADA
LAMPUNG	Lampung-Selatan Kep. Krakatau	WASPADA
LAMPUNG	Lampung-Selatan Kep. Sebuku	WASPADA

#### Keterangan Warna:

Siaga Tsunami ( $0.5m \le h \le 3m$ )





# Warning 2

Pemutakhiran Peringatan Dini Tsunami di NAD, SUMUT, SUMBAR, BENGKULU, LAMPUNG, Gempa Mag:8.5SR, 11-Apr-12 15:38:33 WIB,

Lok:2.04LU,92.99BT,Kdlmn:10km::BMKG

### Warning 2

::::BMKG::::::BMKG:::::BMKG:::::BMKG:::::BMKG::::

Sistem Peringatan Dini Tsunami Indonesia (InaTEWS)
BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA

Alamat: 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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Tanggal dikeluarkan: 11 April 2012, 15:47:45 WIB Peringatan dini-2

No.:104/warning/InaTEWS/IV/2012

#### PERBAIKAN PARAMATER GEMPABUMI:

Magnitudo : 8.5 SR Tanggal : 11-Apr-2012 Waktu gempa : 15:38:33 WIB

Garis Lintang: 2.40 LU Garis bujur: 92.99 BT Kedalaman: 10 Km

Lokasi : Off West Coast of Northern Sumatra Keterangan : 398 km BARAT DAYA Meulaboh 433 km BARAT DAYA Banda Aceh 464 km BARAT DAYA Sabang

465 km BARAT DAYA Sigli 515 km BARAT DAYA Bireun

#### Evaluasi:

#### BERPOTENSI TERJADI TSUNAMI DI WILAYAH:

Propinsi	Lokasi	Status	Estimasi waktu tiba [WIB]	Tanggal [YYYY-MM- DD]
SUMUT SUMUT SUMUT	Simeulue Pulau Simeulue Nias Bagian Barat Nias-Selatan Pulau Nias Nias-Selatan Pulau Tanahmasa Aceh-Jaya	AWAS AWAS AWAS SIAGA AWAS	16:16:58 16:22:03 16:22:48	2012-04-11 2012-04-11 2012-04-11 2012-04-11 2012-04-11
NIAD	Assl Describe Descri	AMMAC	45.07.00	2012 04 11

# Warning 2





Waktu : 11-Apr-12 15:38:33 WIB Lokasi : 2.40 LU - 92.99 BT Kedalaman: 10 Km

#### Keterangan lokasi gempabumi :

346 km BaratDaya KAB-SIMEULUE-NAD 398 km BaratDaya KAB-ACEHDAYA 417 km BaratDaya KAB-ACEHBARAT 431 km BaratDaya BANDAACEH-NAD 1804 km BaratLaut JAKARTA-INDONESIA (Pemutakhiran)

#### Berpotensi TSUNAMI untuk diteruskan nada Masyarakat

	Berpotensi t	erjadi Tsunami di wilayah		
NAD	Simeulue Pulau Simeulue	AWAS	16:00:13	2012-04-11
SUMUT	Nias Bagian Barat	AWAS	16:16:58	2012-04-11
SUMUT	Nias-Selatan Pulau Nias	AWAS	16:22:03	2012-04-11
SUMUT	Nias-Selatan Pulau Tanahmasa	SIAGA	16:22:48	2012-04-11
NAD	Aceh-Jaya	AWAS	16:25:13	2012-04-11
NAD	Aceh-Besar Bagian Barat	AWAS	16:27:03	2012-04-11
NAD	Kota-Sabang Pulau Rondo	SIAGA	16:27:18	2012-04-11
NAD	Aceh-Besar Fulau Breueh	AWAS	16:29:07	2012-04-11
		$\wedge \wedge \wedge$		$\wedge \wedge$
	$\vee$ $\vee$ $\vee$ $\vee$	$\vee$ $\vee$	$\vee$	,
LAMPUNG	Tanggamus Pulau Tabuan	WASPADA	18:05:48	2012-04-11
LAMPUNG				
	Lampung-Selatan Bagian Barat	TAK ADA ANCAMAN	18:06:22	2012-04-11
LAMPUNG	Lampung-Selatan Bagian Barat Lampung-Selatan Kep. Sebuku	TAK ADA ANCAMAN	18:06:22	2012-04-11
LAMPUNG				
	Lampung-Selatan Kep. Sebuku	TAK ADA ANCAMAN	18:05:22	2012-04-11
LAMPUNG	Lampung-Selatan Kep. Sebuku Tanggamus Bagian Barat	TAK ADA ANCAMAN	18:05:22 18:05:48	2012-04-11
LAMPUNG LAMPUNG	Lampung-Selatan Kep. Sebuku Tanggamus Bagian Barat Tanggamus Pulau Tabuan	TAK ADA ANCAMAN WASPADA WASPADA	18:05:22 18:05:48 18:05:48	2012-04-11 2012-04-11 2012-04-11
LAMPUNG LAMPUNG LAMPUNG	Lampung-Selatan Kep, Sebuku Tanggamus Bagian Barat Tanggamus Fulau Tabuan Lampung-Selatan Bagian Barat	TAK ADA ANCAMAN WASPADA WASPADA TAK ADA ANCAMAN	18:05:22 18:05:48 18:05:48	2012-04-11 2012-04-11 2012-04-11 2012-04-11

Siaga Tsunami (0.5m <= h < 3m)

Warning 2



Warning 2

Warning 3

Pemutakhiran Peringatan Dini Tsunami akibat gempa Mag:8.3, 11-APR-2012 15:38:35 WIB telah terdeteksi di SABANG(17:00WIB)0.06m,

MEULABOH(17:04WIB)0.8m::BMKG

### Warning 2

# Warning 3

BMKG BMKG BMKG BMKG BMKG

Sistem Peringatan Dini Tsunami Indonesia (inaTEWS)

BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA

Alamat: 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.bmka.go.id

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Tanggal dikeluarkan: 11 April 2012, 18:15:03 WIB Peringatan dini-3

No.:113/warning/inaTEW8/IV/2012

#### PERBAIKAN PARAMATER GEMPABUMI:

Magnitudo : 8.3 8R Tanggal : 11-Apr-2012 Waktu gempa : 15:38:35 WiB Garls Lintang : 2.33 LU

Garls bujur : 93.05 BT Kedalaman : 10 Km

Lokasi : Off West Coast of Northern Surnatra Keterangan : 396 km BARAT DAYA Meulaboh

435 km BARAT DAYA Banda Aceh 465 km BARAT DAYA Sigil 467 km BARAT DAYA Sabang 514 km BARAT DAYA Bireun

#### Evaluasi:

#### Berdasarkan pengamatan muka air laut, tsunami telah terdeteksi di wilayah berikut ini:

Lokesi	Lintang	Bujur	 Tanggal [YYYY-MM-D	
	05.80 04.32	95.00 96.22	 2012-04-11 2012-04-11	0.06 meter 0.8 meter

#### BERPOTENSI TERJADI TSUNAMI DI WILAYAH:

Propinsi	Lokasi Status			Tanggal [YYYY-MM-DD]
NAD	Simeulue Pulau Simeulue	AWAS	16:00:20	2012-04-11
SUMUT	Nias Bagian Barat	AWAS	16:16:50	2012-04-11
SUMUT	Nias-Selatan Pulau Nias	AWAS	18:21:54	2012-04-11
SUMUT	Nias-Belatan Pulau Tanahmasa	SIAGA	16:22:39	2012-04-11
NAD	Aceh-Jaya	AWAS	16:26:00	2012-04-11
NAD	Aceh-Besar Bagian Barat	AWAS	16:27:54	2012-04-11
NAD	Kota-Sabang Pulau Rondo	SIAGA	16:28:15	2012-04-11
NAD	Aceh-Besar Pulau Breueh	AWAS	16:30:00	2012-04-11
NAD	Aceh-Besar Pulau Penasi	AWAS	16:30:00	2012-04-11
NAD	Kota-Banda-Aceh	AWAS	16:30:00	2012-04-11

Warning 2

Warning 3





#### agnitude 8,8

Waktu : 11-Apr-12 15:38:35 WIB Lokasi : 2.33 LU - 93.05 BT

Keterangan lokasi gempabumi :

340 km BaratDaya KAB-SIMEULUE-NAD 398 km BaratDaya KAB-ACEHJAYA 416 km BaratDaya KAB-ACEHBARAT 434 km BaratDaya BANDACEH-NAD 1794 km BaratLaut JAKARTA-INDONESIA (Pemutakhiran)

### Berpotensi TSUNAMI untuk diteruskan pada Masyarakat

	Berdasarkan data observasi telah terdeteksi Tsunami di:						
SABANG	0:	5.80	95.00	17:00	2012-04-11	0.06 meter	
MEULABOH	0.	1.32	96.22	17:04	2012-04-11	0.8 meter	
BERPOTENS	SI TERJADI TSUNAMI DI 1	WILAYAH:					
Propinsi	Lokasi		St	atus	Estimasi	Tanggal	
					waktu tiba	[YYYY-MM-DD]	
					[WIB]		
NAD	Simeulue Pulau Simeu	lue	AW	AS	16:00:20	2012-04-11	
SUMUT	Nias Bagian Barat		AW	AS	16:16:50	2012-04-11	
SUMUT	Nias-Selatan Pulau N	ias	AW	AS	16:21:54	2012-04-11	
SUMUT	Nias-Selatan Pulau Ta	anahmasa	si si	AGA	16:22:39	2012-04-11	
NAD	Aceh-Jaya		AW	AS	16:26:00	2012-04-11	
	Aceh-Besar Bagian Ba					2012-04-11	



BENGKULU	Bengkulu-Utara Bagian Selatan	WASPADA	18:03:09	2012-04-11
LAMPUNG	Tanggamus Bagian Barat	WASPADA	18:05:39	2012-04-11
LAMPUNG	Tanggamus Pulau Tabuan	WASPADA	18:05:39	2012-04-11

Keterangan Warna

Awas Tsunami (h >= 3m) Siaga Tsunami (0.5m <= h < 3m) Waspada Tsunami (h < 0.5m)

Warning 2

Warning 3



Warning 2

Warning 3

End of threat

Peringatan dini TSUNAMI yang disebabkan oleh gempa mag:8.1SR, tanggal: 11-Apr-12

17:43:11 WIB dinyatakan telah berakhir::BMKG

### Warning 2

# Warning 3

# End of threat

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Sistem Peringatan Dini Tsunami Indonesia (InaTEWS)
                BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA
      Alamat: 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
            Tanggal dikeluarkan: 11 April 2012, 20:05:32 WIB
                        Peringatan dini-4
                 No.:120/warning/InaTEWS/IV/2012
Peringatan dini Tsunami yang disebabkan oleh gempa:
kekuatan : 8.1 SR
tanggal : 11-Apr-12 17:43:11 WIB
dinyatakan telah berakhir.
Demikian informasi terakhir disampaikan oleh Sistem Peringatan Dini Tsunami Indonesia,
kecuali ada informasi baru.
Harap jangan membalas ke alamat email ini, tetapi ke alamat : info inatews@bmg.go.id
-----English Version-----
....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: 11 April 2012, 20:05:32 WIB (UTC=WIB-7)
                         Bulletin-4
                 No.:120/warning/InaTEWS/IV/2012
The Tsunami threat caused by the earthquake :
magnitude : 8.1
date
        : 11-Apr-12 10:43:11 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
```

Warning 2

Warning 3

End of threat





Peringatan dini TSUNAMI yang disebabkan gempa

kekuatan : 8.1 SR

tanggal : 11-Apr-12 17:43:11 WIB

dinyatakan TELAH BERAKHIR

Warning 2

Warning 3

End of threat



# **Reaction Scheme**

**Warning Level** 

Advice from BMKG to Local Government

Guidance from Local
Government to Community

MAJOR WARNING (AWAS)

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

Call for immediate evacuation!

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

ADVISORY (WASPADA ) Province/District/City government 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.

Advice to move away from beaches and rivers!

EARTHQUAKE INFORMATION

Earthquake on land, earthquake with minor magnitude or too deep – **no tsunami threat** 

No Action

# **BMKG Warning Service Guidebook**





# Project for Training, Education and Consulting for Tsunami Early Warning System (PROTECTS) Capacity Development in Local Communities



# www.gitews.org/tsunami-kit

