



BMKG

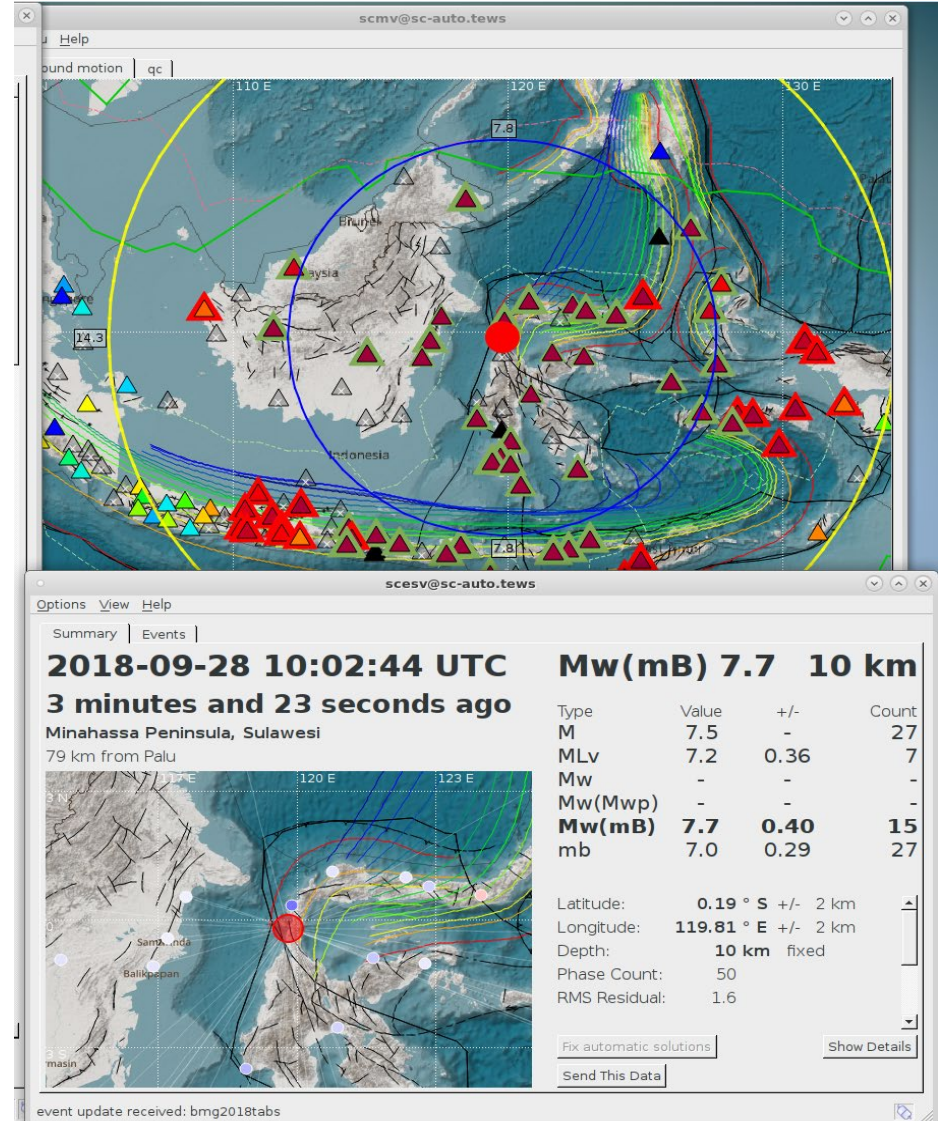
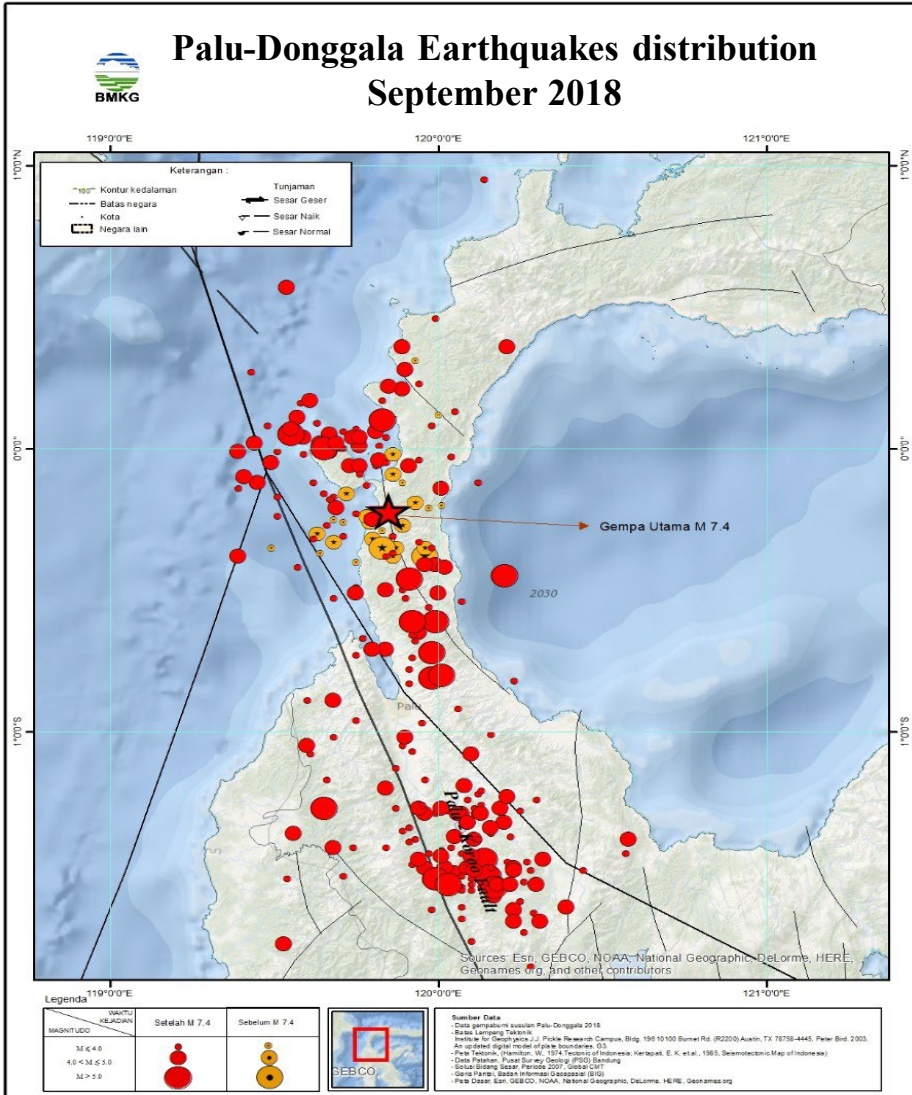
INATEWS: LESSON LEARNT FROM M7.5 PALU – DONGGALA AND SUNDA STRAIT TSUNAMIS

Dr. Karyono
Center for Earthquake and Tsunami BMKG

Jakarta, April 6, 2022



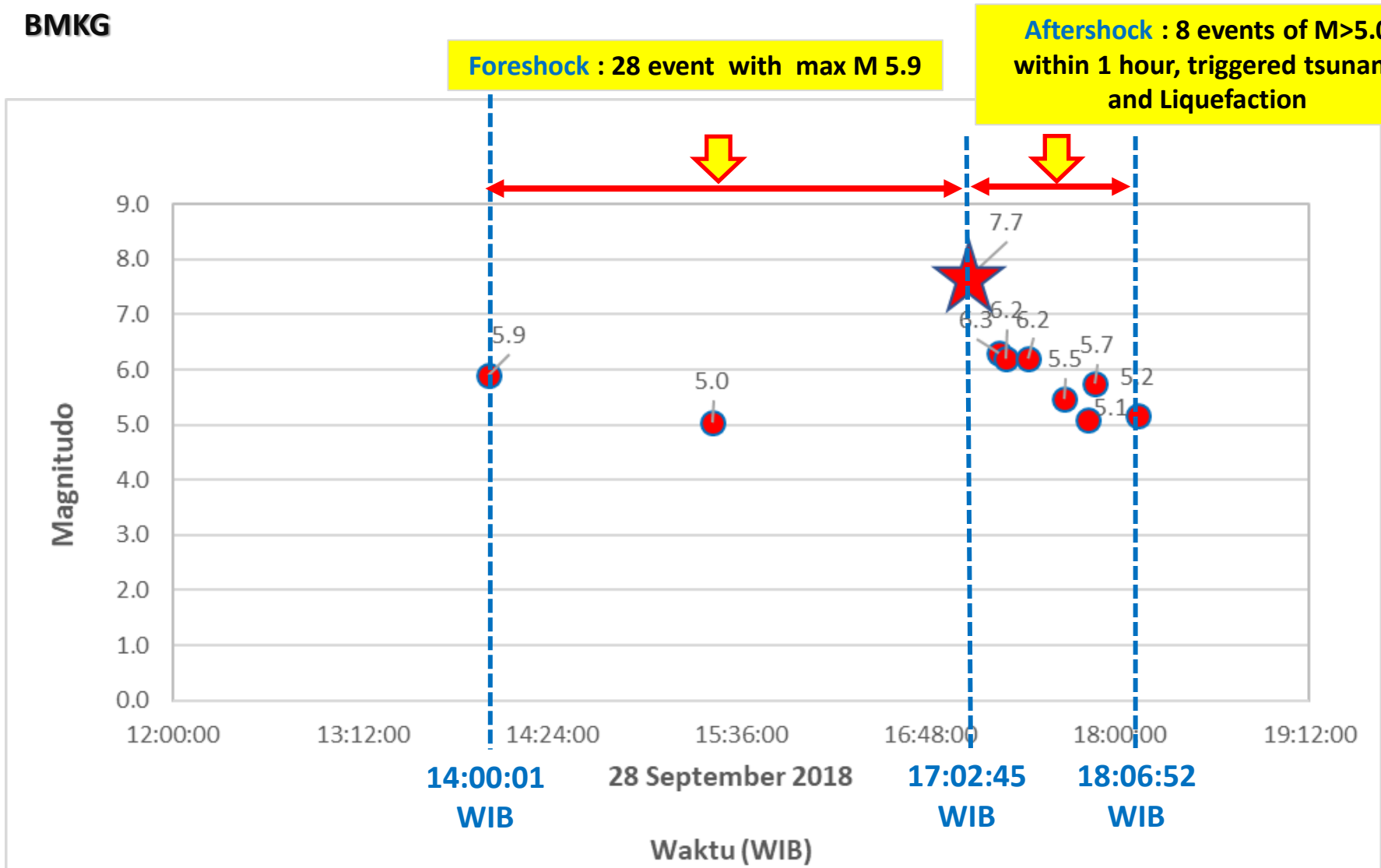
1. M7.5 PALU-DONGGALA EARTHQUAKE, SEP 28, 2018



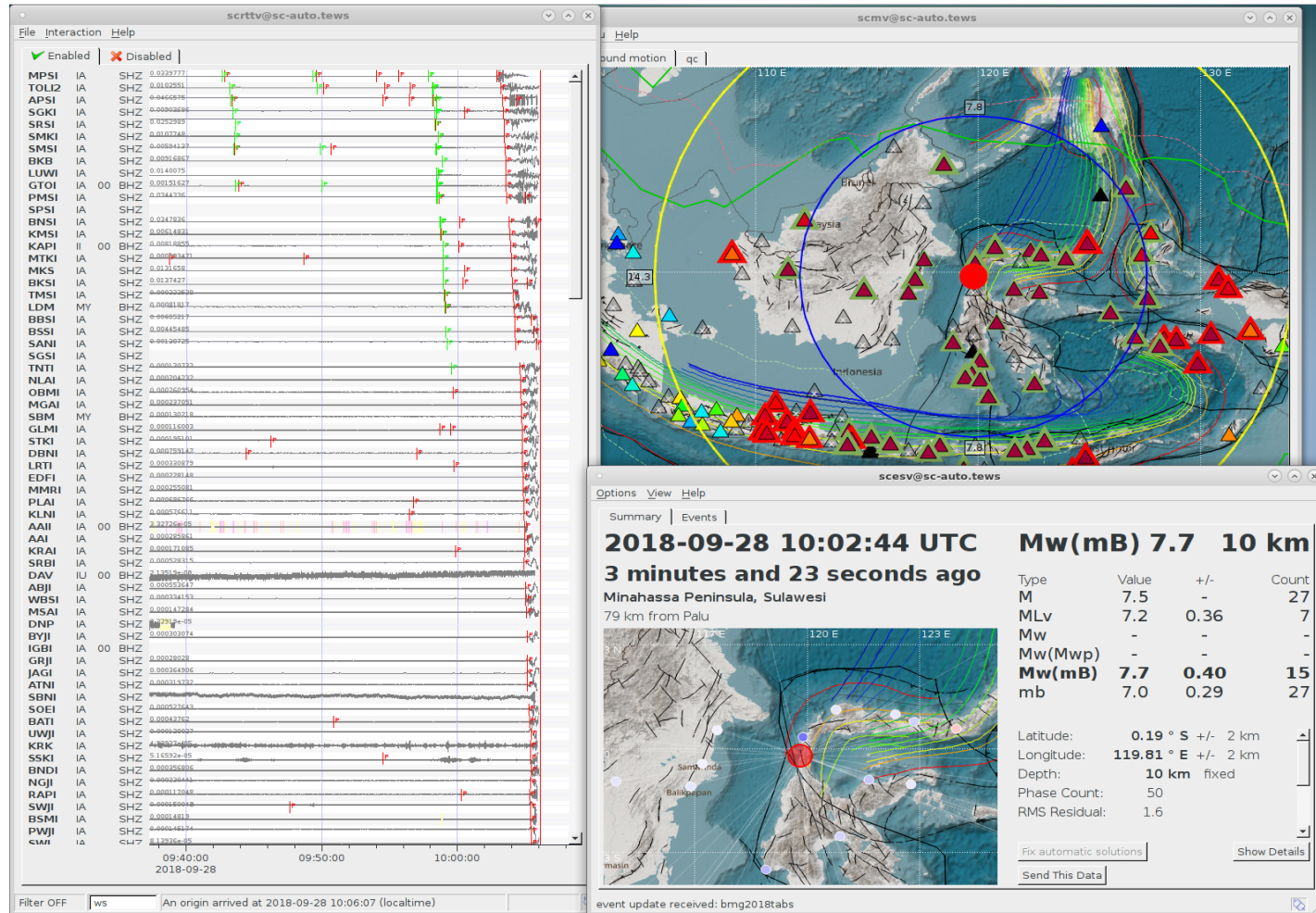


BMKG

THE TIME SEQUENCE OF PALU-DONGALA EARTHQUAKE



ORIGIN TIME OF PALU-DONGGALA EQ.



18:02 WITA

18:07 WITA

BULLETIN 1

INFO GEMPABUMI

Tanggal : 28-Sep-18 17:02:44 WIB

MAGNITUDO
7,7

Lokasi:
0.18 LS - 119.85 BT
Keterangan:
* 27 km TimurLaut DONGGALA-SULTENG
* 80 km BaratLaut PALU-SULTENG
* 123 km TimurLaut MAMUJUUTARA-SULBAR
* 134 km BaratLaut SIGI-SULTENG
* 1593 km TimurLaut JAKARTA-INDONESIA
Kedalaman:
10 Km

BERPOTENSI TSUNAMI

Status Peringatan Tsunami

■ Awas (>3m) ■ Siaga (0.5-3m) ■ Waspada (0-0.5m)


Keterangan Warna :

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

WARNING STATUS :

- ✓ DONGGALA BARAT
(STATUS : **WARNING** DAN ETA 10:22 UTC (18:22 LOCAL TIME))
- ✓ PALU, DONGGALA UTARA AND KAB. MAMUJU
(STATUS : **ADVISORY**)

18:02 WITA

A red star icon inside a white circle with a grey shadow, connected to a red horizontal line ending in a red dot.

18:07 WITA

A pink target icon inside a white circle with a grey shadow, connected to a pink horizontal line ending in a pink dot.

18:10 WITA

A yellow target icon inside a white circle with a grey shadow, connected to a yellow horizontal line ending in a yellow dot.

BULLETIN 1 FOR TSP

as Tsunami Service Provider (TSP), BMKG issued Bulletin 1 to Indian Ocean Countries

Tide Gauge in Mamuju Observed ± 6 cm tsunami wave

18:02 WITA

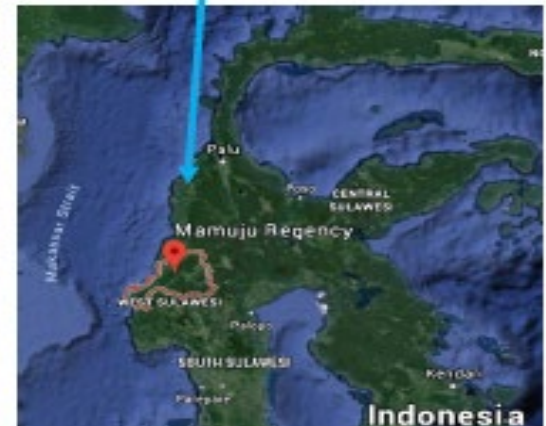
18:07 WITA

18:10 WITA

18:27 WITA



Rekaman observasi tide gauge Mamuju, Sulawesi Barat





ESTIMATED TSUNAMI TIME ARRIVAL BASED ON TSUNAMI MODEL

Name	ID	Place	Province	Country	Seo code	Simulator	Runup	T1 Value	T1 Time	T2 Value	T2 Time	T3 Value	T3 Time	T4 Value
SULTENG	10195	DONGGALA BAGIAN BARAT	SULAWESI T...	INDO...	10195....	EasyWa...	0.580 m	0.010 m	2018-09-28 10:22:43					
SULTENG	10078	DONGGALA BAGIAN UTARA	SULAWESI T...	INDO...	10078....	EasyWa...	0.380 m	0.010 m	2018-09-28 10:08:43					
SULTENG	10202	KOTA-PALU BAGIAN BARAT	SULAWESI T...	INDO...	10202....	EasyWa...	0.360 m	0.010 m	2018-09-28 10:27:43					
SULBAR	10218	MAMUJU BAGIAN UTARA	SULAWESI B...	INDO...	10218....	EasyWa...	0.301 m	0.010 m	2018-09-28 10:26:43					
SULTENG	10310	TOLI-TOLI	SULAWESI T...	INDO...	10310....	EasyWa...	0.201 m	0.010 m	2018-09-28 10:15:43					
KALTIM	10249	KOTA-BALIKPAPAN	KALIMANTA...	INDO...	10249....	EasyWa...	0.156 m	0.010 m	2018-09-28 11:33:43					
KALTIM	10285	KUTAI-TIMUR	KALIMANTA...	INDO...	10285....	EasyWa...	0.130 m	0.010 m	2018-09-28 10:11:43					
SULBAR	10047	MAMUJU	SULAWESI B...	INDO...	10047....	EasyWa...	0.110 m	0.010 m	2018-09-28 10:45:43					
SULBAR	10205	MAJENE	SULAWESI B...	INDO...	10205....	EasyWa...	0.110 m	0.010 m	2018-09-28 10:39:43					
KALTIM	10305	KUTAI-KARTANEGARA	KALIMANTA...	INDO...	10305....	EasyWa...	0.110 m	0.010 m	2018-09-28 10:52:43					
SULTENG	10314	BUOL	SULAWESI T...	INDO...	10314....	EasyWa...	0.101 m	0.010 m	2018-09-28 10:30:43					
KALTIM	10225	KOTA-BONTANG	KALIMANTA...	INDO...	10225....	EasyWa...	0.101 m	0.010 m	2018-09-28 10:40:43					
KALTIM	10215	PENAJAM-PASER-UTARA	KALIMANTA...	INDO...	10215....	EasyWa...	0.060 m	0.010 m	2018-09-28 11:49:43					
KALTIM	10217	PASIR	KALIMANTA...	INDO...	10217....	EasyWa...	0.060 m	0.010 m	2018-09-28 12:04:43					
KALTIM	10329	BERAU	KALIMANTA...	INDO...	10329....	EasyWa...	0.051 m	0.010 m	2018-09-28 10:11:43					
GORONTA...	10262	GORONTALO BAGIAN UTARA	GORONTALO	INDO...	10262....	EasyWa...	0.051 m	0.010 m	2018-09-28 10:41:43					
SULSEL	10144	PANGKAJENE-KEPULAUAN	SULAWESI S...	INDO...	10144....	EasyWa...	0.051 m	0.010 m	2018-09-28 11:16:43					
SULBAR	10182	POLEWALIMAMASA	SULAWESI B...	INDO...	10182....	EasyWa...	0.040 m	0.010 m	2018-09-28 11:04:43					
SULUT	10265	BOLAANGMONGONDOW B...	SULAWESI U...	INDO...	10265....	EasyWa...	0.040 m	0.010 m	2018-09-28 10:54:43					
SULSEL	10355	KOTA-PARE-PARE	SULAWESI S...	INDO...	10355....	EasyWa...	0.040 m	0.010 m	2018-09-28 11:17:43					
SULSEL	10146	KOTA-MAKASSAR	SULAWESI S...	INDO...	10146....	EasyWa...	0.040 m	0.010 m	2018-09-28 12:00:43					
SULSEL	10358	PINRANG	SULAWESI S...	INDO...	10358....	EasyWa...	0.040 m	0.010 m	2018-09-28 11:11:43					
SULSEL	10137	BARRU	SULAWESI S...	INDO...	10137....	EasyWa...	0.040 m	0.010 m	2018-09-28 11:15:43					
KALSEL	10201	KOTABARU	KALIMANTA...	INDO...	10201....	EasyWa...	0.040 m	0.010 m	2018-09-28 11:34:43					
SULTENG	10212	DONGGALA BAGIAN TIMUR	SULAWESI T...	INDO...	10212....	EasyWa...	0.030 m	0.010 m	2018-09-28 12:35:43					
SULTENG	10111	PARIGIMOUTONG BAGIAN ...	SULAWESI T...	INDO...	10111....	EasyWa...	0.025 m	0.010 m	2018-09-28 12:34:43					
PAPUABAR	10107	RAJAAMPAT BAGIAN SELATAN	PAPUA BARAT	INDO...	10107....	EasyWa...	0.020 m	0.010 m	2018-09-28 12:59:43					
SULUT	10309	MINAHASA-SELATAN BAGI...	SULAWESI U...	INDO...	10309....	EasyWa...	0.020 m	0.010 m	2018-09-28 10:53:43					
SULUT	10236	KEPULAUAN SANGIHE	SULAWESI U...	INDO...	10236....	EasyWa...	0.020 m	0.010 m	2018-09-28 11:00:43					

**ETA Mamuju:
18:26 WITA**

BULLETIN 4

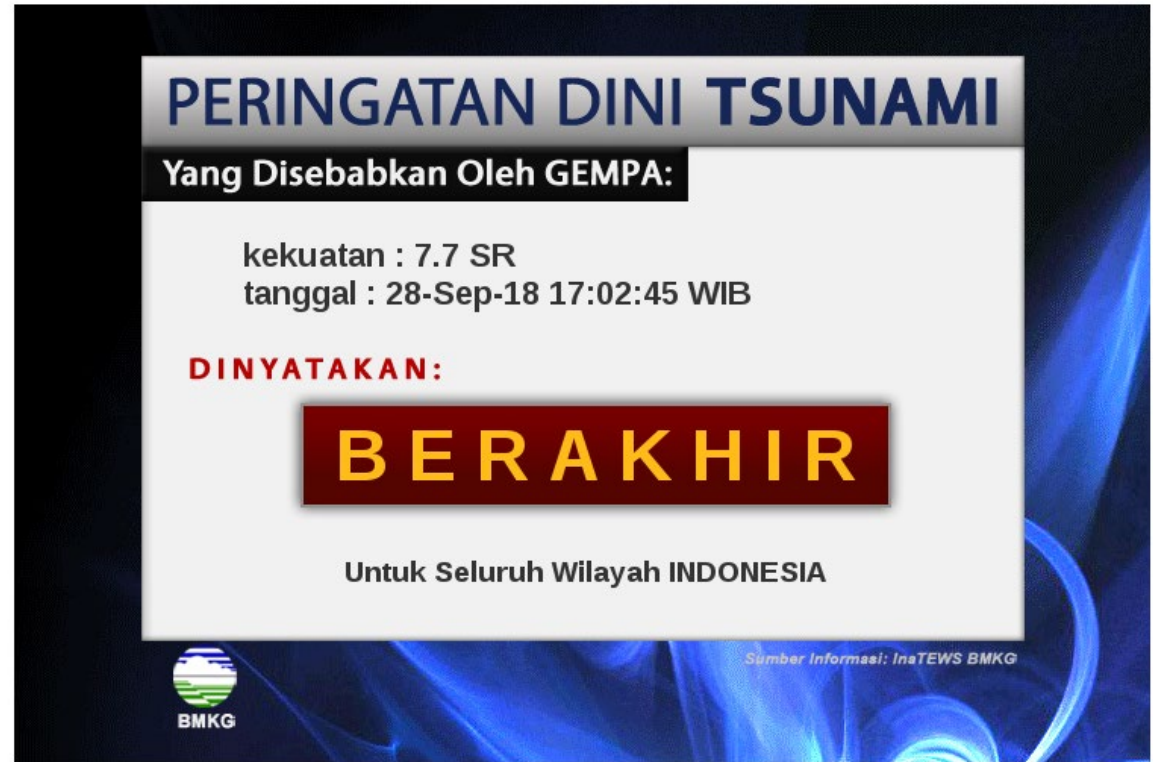
18:02 WITA

18:07 WITA

18:10 WITA

18:27 WITA

18:36 WITA



PERINGATAN DINI TSUNAMI
Yang Disebabkan Oleh GEMPA:

kekuatan : 7.7 SR
tanggal : 28-Sep-18 17:02:45 WIB

DINYATAKAN:

BERAKHIR

Untuk Seluruh Wilayah INDONESIA

Sumber Informasi: InsTEWS BMKG

BMKG

BASED ON OBSERVATION DATA FROM TIDE GAUGE AT MAMUJU (± 6 CM), BMKG ISSUED FINAL BULLETIN AT 10:36 UTC (18:36 LOCAL TIME)

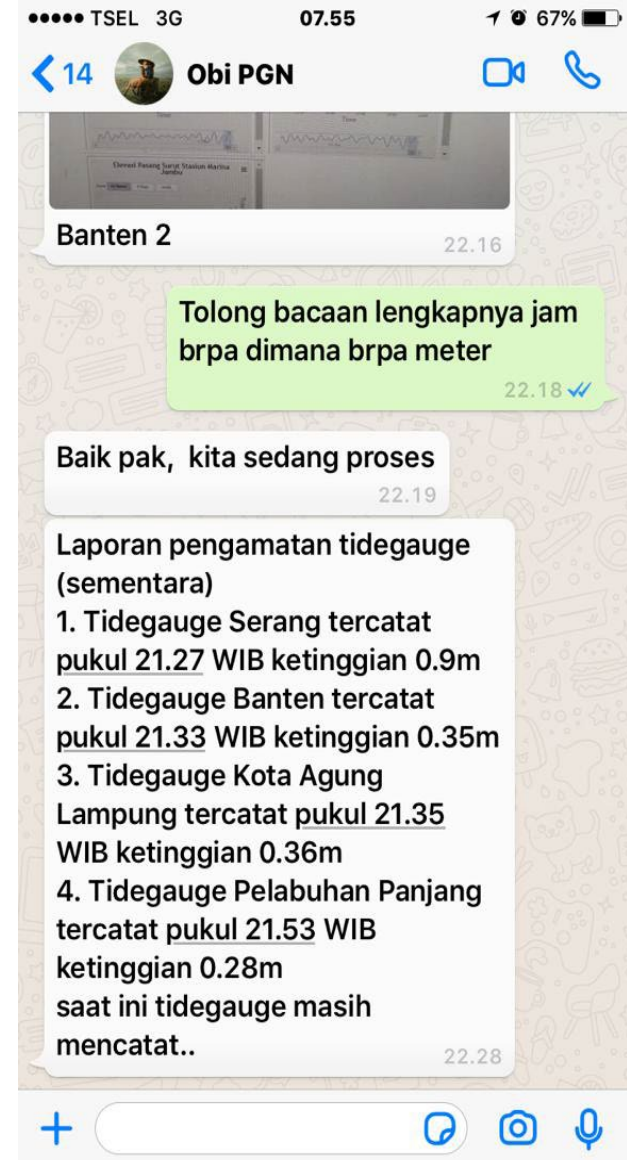
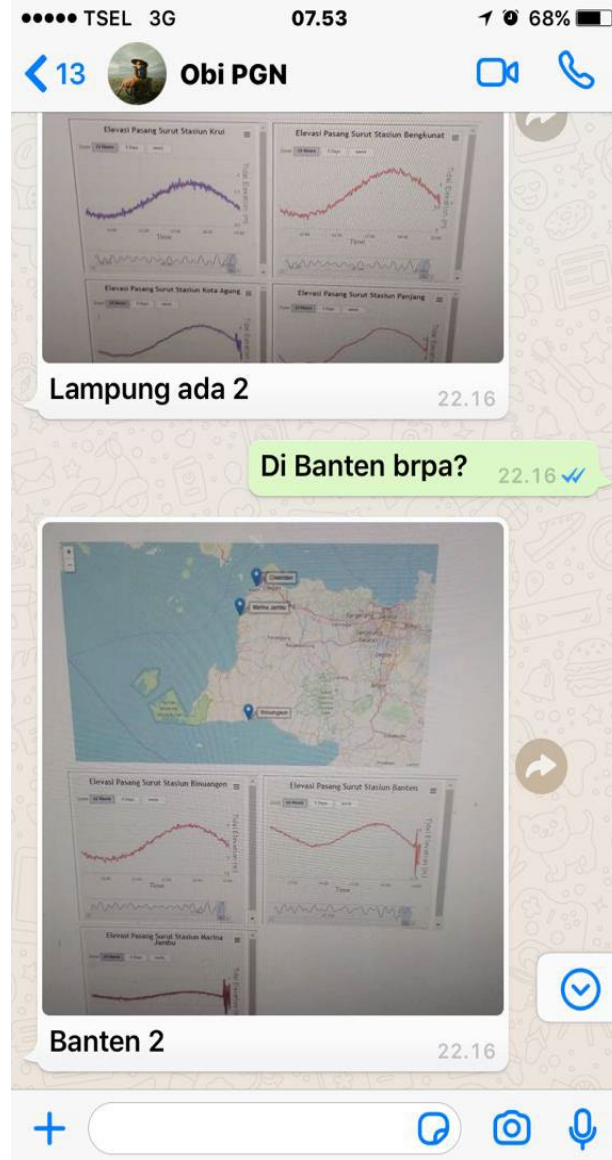
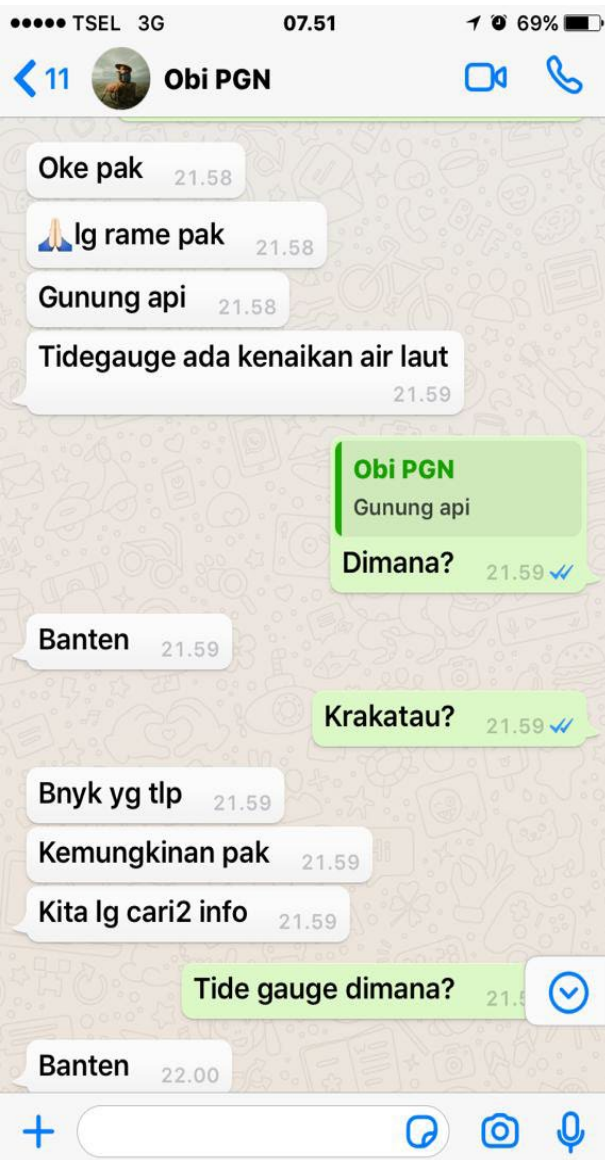


2. SUNDA STRAIT TSUNAMI ON DEC 22, 2018

- At the moment BMKG main task: provide EQ information and tsunami early warning related tectonic activity
- Recently we have tsunami at Sunda strait (caused by landslide, volcanic activity) → the most interesting research
- BMKG have no modeling tsunami by landslide or volcanic activity
- The challenge :How to judge that tsunami caused by land slide, volcanic, tectonic within first 5 minutes.
- How fast and precise the information could be disseminated



Operator *On Duty* report of Sunda Strait Tsunami





Coordination After The Tsunami Event



PT. Madya dan Pratama

Agus, Bambang SUPRAYITNO, Bu Yuni, Dodo, Edison, Edu, Fachry BMG, Guswanto

By @animasiDPBBM 75621 05:57

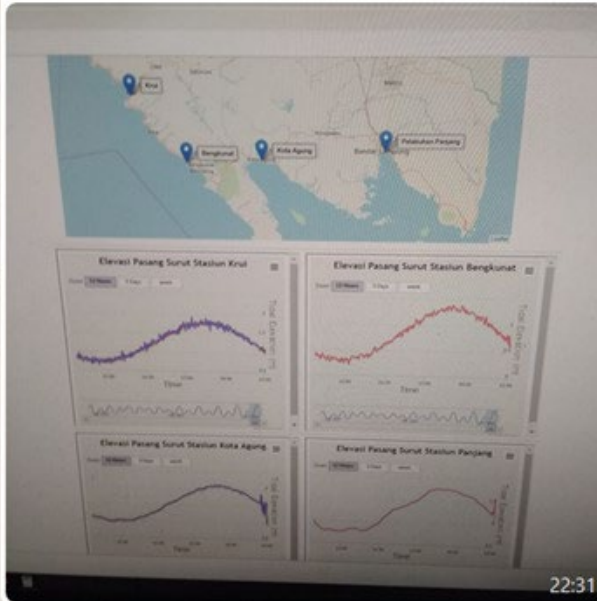
Ibu KBMKG

DG dan Kapus2 mhn segera kumpul di PGN. Tsunami

22:30

Rahmad Triyono Geo

Forwarded



Rahmad Triyono Geo



Type a message

12/22/2018

Suko AMG

Menurut pak Rahmat penyebabnya apa

22:34

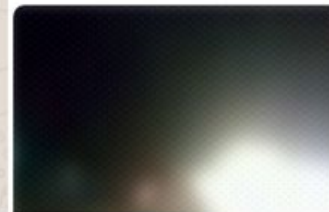
Rahmad Triyono Geo

Forwarded



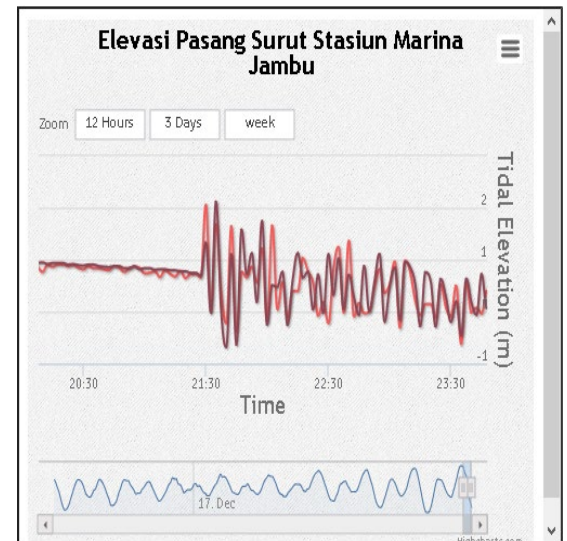
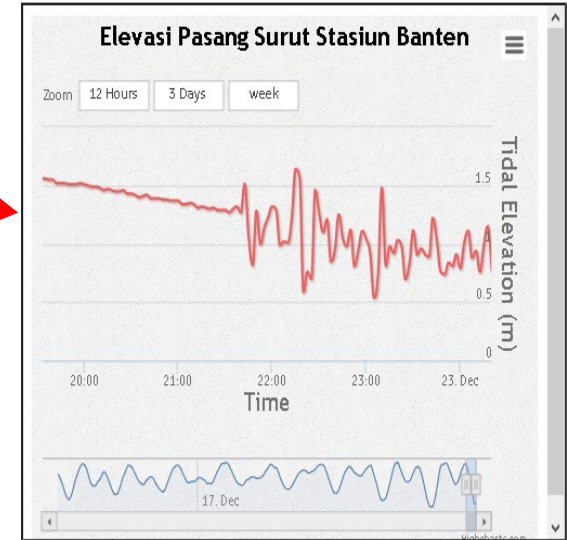
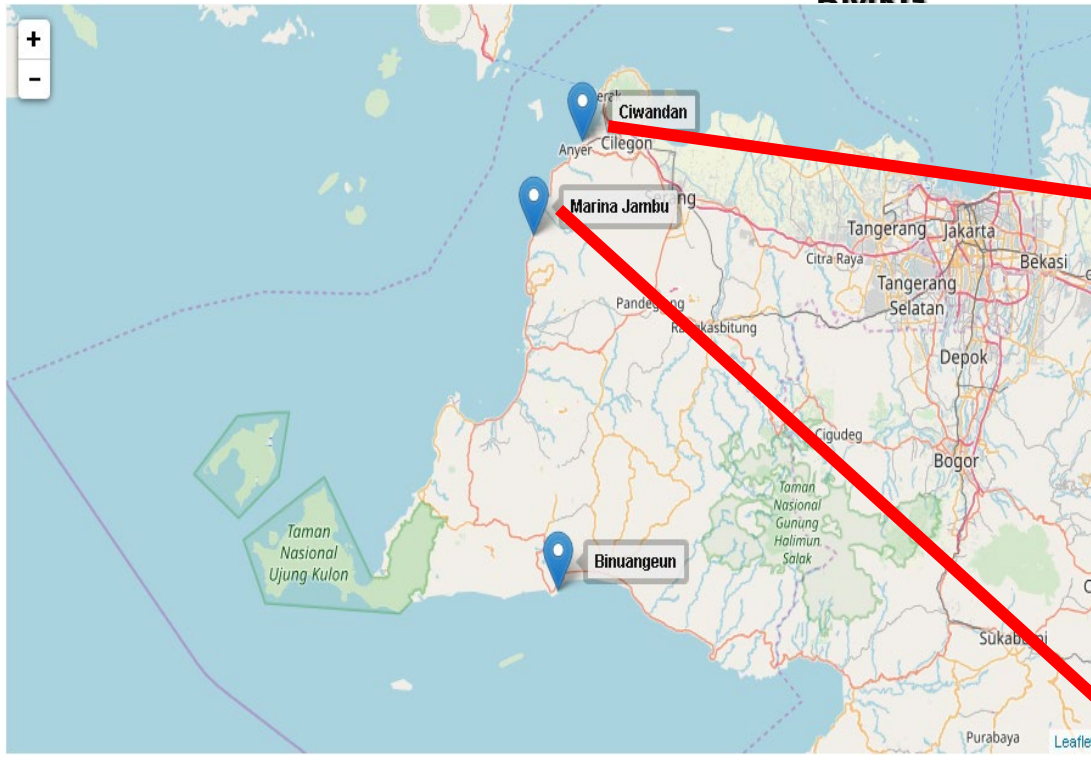
Rahmad Triyono Geo

Forwarded



Type a message

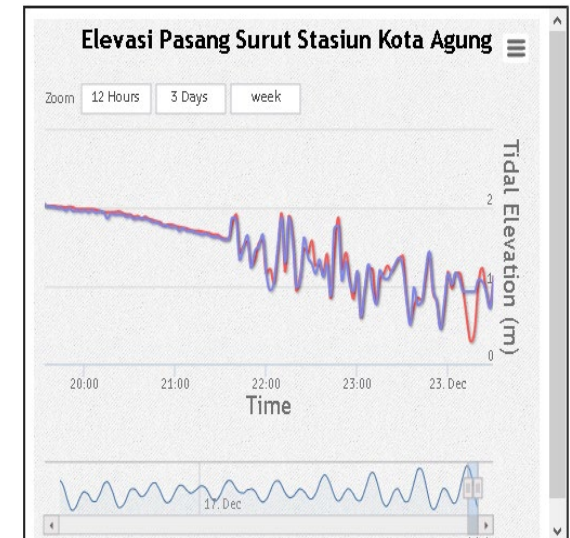
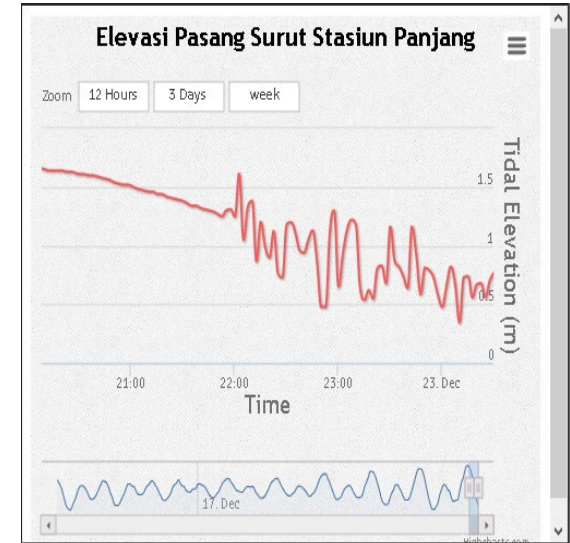
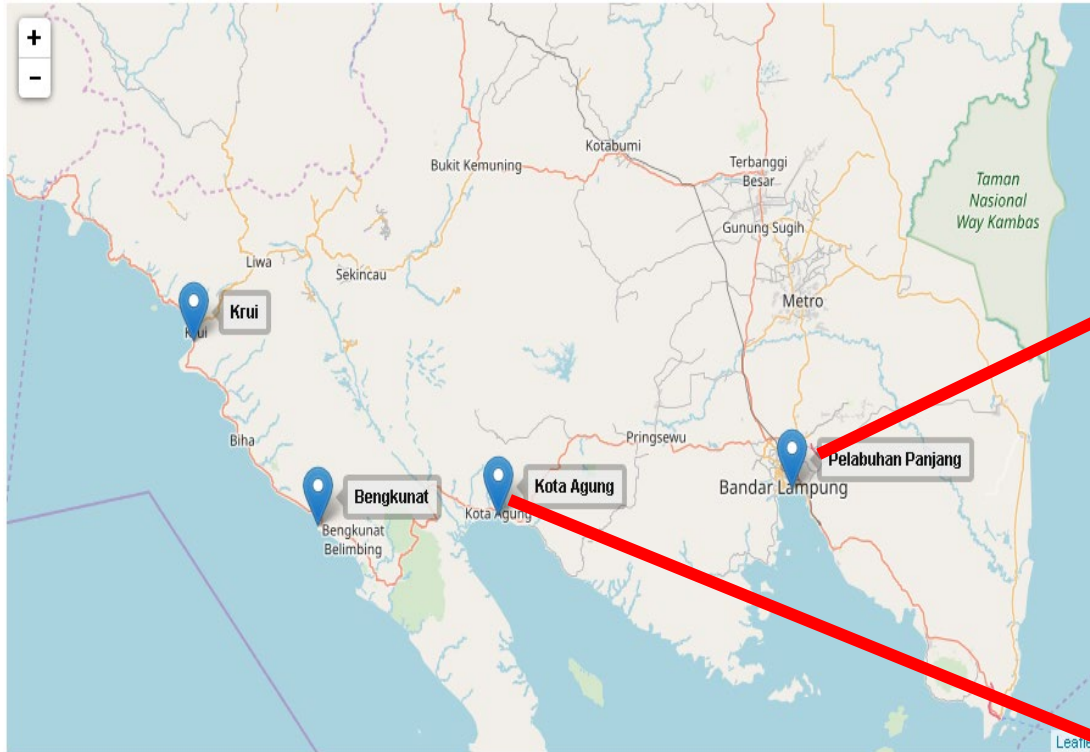
TIDE GAUGE RECORD AT BANTEN



Observation of tidegauge :

1. Tidegauge Serang record at 21.27 WIB Height 0.9 m
2. Tidegauge Banten record at 21.33 WIB height 0.35 m

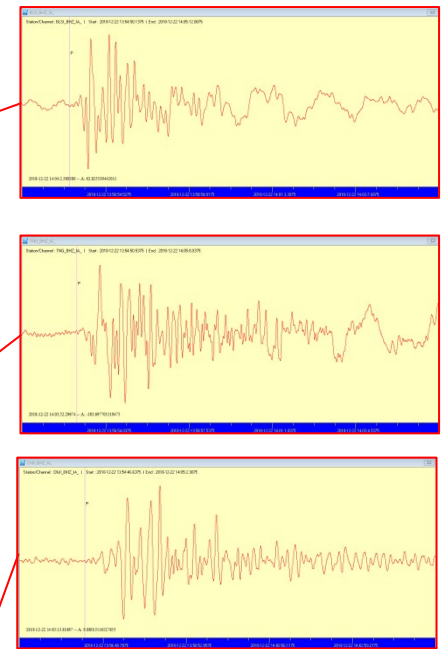
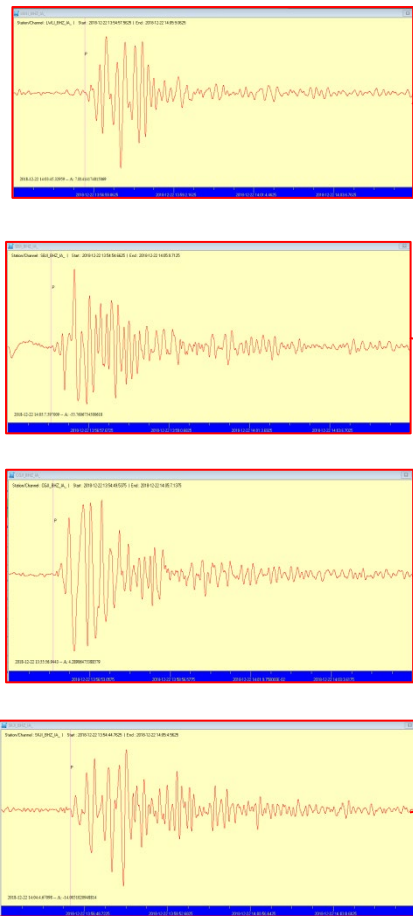
TIDE GAUGE RECORD AT LAMPUNG



Observation of tidegauge :

1. Tidegauge Kota Agung Lampung record at 21.35 WIB height 0.36 m
2. Tidegauge Pelabuhan Panjang record at 21.53 WIB height 0.28 m

SEISMIC RECORD OF KRAKATAU DEC 22, 2018



Filter Signal Bandpass 0.01 Hz – 0.1 Hz

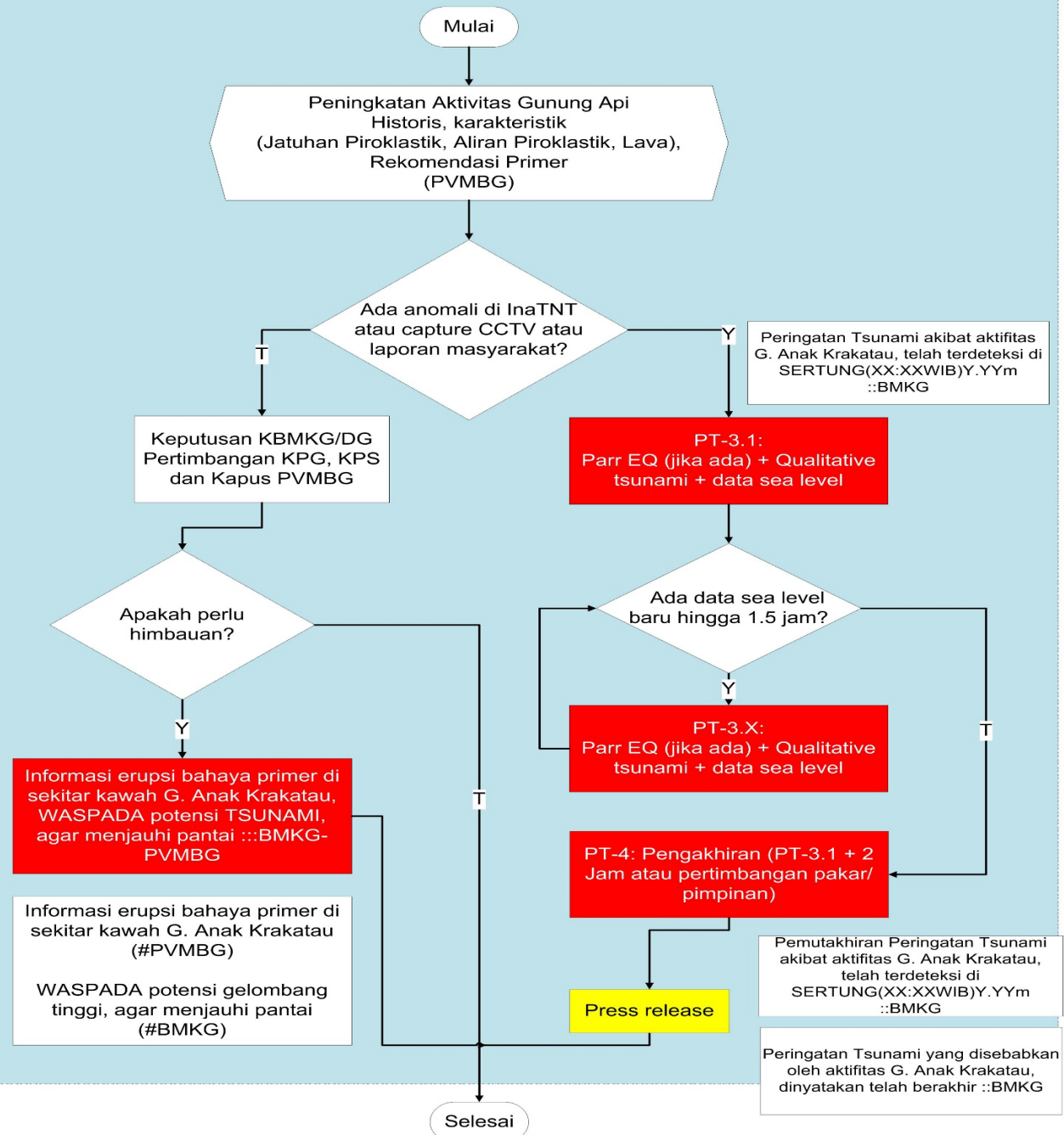
Phase List

Channel	Phase	Phase Time
CGJI_BHZ_IA	P	2018-12-22 13:55:57.06
BLSI_BHZ_IA	P	2018-12-22 13:56:00.44
SBJI_BHZ_IA	P	2018-12-22 13:56:00.45
TNGI_BHZ_IA	P	2018-12-22 13:56:11.45
TNGI_BHZ_IA_00	P	2018-12-22 13:56:20.10
CNJI_BHZ_IA	P	2018-12-22 13:56:23.22
SKJI_BHZ_IA	P	2018-12-22 13:56:28.31
LWLI_BHZ_IA	P	2018-12-22 13:56:46.40



SOP FOR NON TECTONIC TSUNAMIGENIC SOURCE :

1. STILL NO
TSUNAMI MODEL
2. BACK TO SL-1



CONCLUSIONS

- Two tsunami events in 2018, at Palu and Sunda Strait, are triggered by non tectonic activity. Tsunami Palu triggered by land slide under sea affected by strong earthquake $M=7.5$, while tsunami at Sunda strait triggered by flank collapse of G. Anak Krakatau eruption.
- Currently there is no tsunami model affected by land slide.
- Tsunami warning caused by Non Tectonic Source is very important.