

BULETIN TAHUNAN GEMPABUMI DAN TSUNAMI TAHUN 2020



**BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA
STASIUN GEOFISIKA KLAS I WINANGUN MANADO**

Jl. Harapan No. 42 Winangun, Manado

Telp: 0431-823342, 0431-836060, 0431-825667

Fax: 0431-836060

e-mail : *stageof.winangun@bmkg.go.id*

BULETIN GEMPABUMI 2020

TIM PENYUSUN

Penanggung jawab : Tony Agus Wijaya

Redaksi : Edward Henrry Mengko
Sesar Prabu Dwi Sriyanto
Febriani Saputri
Nurfitriani

Desain Grafis : Alva Rottie

Diterbitkan : Januari 2020

Diterbitkan oleh : BMKG Stasiun Geofisika Manado
Jl.Harapan no.42 Winangun Manado
Nomor telepon : 0431-836060

Alamat e-mail : stageof.winangun@bmkg.go.id

KATA PENGANTAR

Puji dan syukur kehadiran Tuhan Yang Maha Esa, Badan Meteorologi, Klimatologi, dan Geofisika (BMKG), Stasiun Geofisika Klas 1 Manado yang selanjutnya disebut Stasiun Geofisika Manado pada awal tahun 2021 dapat menerbitkan Buletin Gempabumi dan Tsunami tahun 2020 sebagai salah satu produk informasi.

Buletin Gempabumi dan Tsunami Stasiun Geofisika Manado tahun 2020 ini dibuat berdasarkan hasil analisa gempabumi menggunakan perangkat lunak Sesicomp3. Besar harapan kami, agar buletin ini dapat memenuhi kebutuhan masyarakat dalam pelayanan data gempabumi beserta seluruh parameternya.

Ucapan terimakasih ditujukan kepada seluruh pihak yang telah mendukung terbitnya buletin ini.

Manado, Januari 2021
Kepala Stasiun Geofisika Manado

Tony Agus Wijaya, S.Si
NIP. 19760802 199803 1 001

DAFTAR ISI

DAFTAR ISI	II
DAFTAR TABEL	III
DAFTAR GAMBAR	V
DATA STASIUN SEISMIK	VIII
DAFTAR ISTILAH	X
I. PENDAHULUAN	1
II. REKAPITULASI KEJADIAN GEMPABUMI TAHUN 2020	2
III. DATA KEJADIAN GEMPABUMI BULANAN TAHUN 2020	10
A. DATA GEMPABUMI BULAN JANUARI 2020	10
B. DATA GEMPABUMI BULAN FEBRUARI 2020	17
C. DATA GEMPABUMI BULAN MARET 2020	24
D. DATA GEMPABUMI BULAN APRIL 2020	32
E. DATA GEMPABUMI BULAN MEI 2020	40
F. DATA GEMPABUMI BULAN JUNI 2020	49
G. DATA GEMPABUMI BULAN JULI 2020	58
H. DATA GEMPABUMI BULAN AGUSTUS 2020	66
I. DATA GEMPABUMI BULAN SEPTEMBER 2020	74
J. DATA GEMPABUMI BULAN OKTOBER 2020	82
K. DATA GEMPABUMI BULAN NOVEMBER 2020	89
L. DATA GEMPABUMI BULAN DESEMBER 2020	97
IV. PETA GONCANGAN GEMPABUMI TERASA DI WILAYAH REGIONAL 10 TAHUN 2020	105
A. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN JANUARI 2020	106
B. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN FEBRUARI 2020	110
C. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN MARET 2020	115
D. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN APRIL 2020	119
E. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN MEI 2020	126
F. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN JUNI 2020	127
G. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN JULI 2020	134
H. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN AGUSTUS 2020	137
I. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN SEPTEMBER 2020	139
J. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN OKTOBER 2020	143
K. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN NOVEMBER 2020	147
L. PETA GONCANGAN (<i>SHAKEMAP</i>) GEMPABUMI BULAN DESEMBER 2020	154
LAMPIRAN	160

DAFTAR TABEL

TABEL 1 REKAPITULASI KEJADIAN GEMPABUMI TAHUN 2020	2
TABEL 2 REKAPITULASI KEJADIAN GEMPABUMI DIRASAKAN TAHUN 2020.....	5
TABEL 3 DATA KEJADIAN GEMPABUMI BULAN JANUARI 2020.....	10
TABEL 4 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN JANUARI 2020.....	15
TABEL 5 DATA KEJADIAN GEMPABUMI BULAN FEBRUARI 2020	17
TABEL 6 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN FEBRUARI 2020	22
TABEL 7 DATA KEJADIAN GEMPABUMI BULAN MARET 2020	24
TABEL 8 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN MARET 2020	30
TABEL 9 DATA KEJADIAN GEMPABUMI BULAN APRIL 2020	32
TABEL 10 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN APRIL 2020	38
TABEL 11 DATA KEJADIAN GEMPABUMI BULAN MEI 2020	40
TABEL 12 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN MEI 2020	47
TABEL 13 DATA KEJADIAN GEMPABUMI BULAN JUNI 2020	49
TABEL 14 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN JUNI 2020	56
TABEL 15 DATA KEJADIAN GEMPABUMI BULAN JULI 2020.....	58
TABEL 16 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN JULI 2020	64
TABEL 17 DATA KEJADIAN GEMPABUMI BULAN AGUSTUS 2020.....	66
TABEL 18 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN AGUSTUS 2020	72
TABEL 19 DATA KEJADIAN GEMPABUMI BULAN SEPTEMBER 2020	74
TABEL 20 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN SEPTEMBER 2020	80
TABEL 21 DATA KEJADIAN GEMPABUMI BULAN OKTOBER 2020	82
TABEL 22 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN OKTOBER 2020	87
TABEL 23 DATA KEJADIAN GEMPABUMI BULAN NOVEMBER 2020.....	89
TABEL 24 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN NOVEMBER 2020.....	95
TABEL 25 DATA KEJADIAN GEMPABUMI BULAN DESEMBER 2020	97
TABEL 26 REKAPITULASI GEMPABUMI BERDASARKAN MAGNITUDO BULAN DESEMBER 2020	103
TABEL 27 ATENUASI INTENSITAS GEMPA BUMI 2 JANUARI 2020 PUKUL 21:03:17 WIB	106
TABEL 28 ATENUASI INTENSITAS GEMPA BUMI 19 JANUARI 2020 PUKUL 23:58:20 WIB	108
TABEL 29 ATENUASI INTENSITAS GEMPA BUMI 30 JANUARI 2020 PUKUL 06:46:58 WIB	109
TABEL 30 ATENUASI INTENSITAS GEMPA BUMI 6 FEBRUARI 2020 PUKUL 20:40:09 WIB.....	110
TABEL 31 ATENUASI INTENSITAS GEMPA BUMI 6 FEBRUARI 2020 PUKUL 20:45:41 WIB.....	111
TABEL 32 ATENUASI INTENSITAS GEMPA BUMI 18 MARET 2020 PUKUL 10:13:32 WIB	116
TABEL 33 ATENUASI INTENSITAS GEMPA BUMI 4 APRIL 2020 PUKUL 05:14:17 WIB.....	119
TABEL 34 ATENUASI INTENSITAS GEMPA BUMI 6 APRIL 2020 PUKUL 01:37:13 WIB.....	120
TABEL 35 ATENUASI INTENSITAS GEMPA BUMI 22 APRIL 2020 PUKUL 22:30:09 WIB.....	125
TABEL 36 ATENUASI INTENSITAS GEMPA BUMI 6 JUNI 2020 PUKUL 20:40:52 WIB.....	128
TABEL 37 ATENUASI INTENSITAS GEMPA BUMI 14 JUNI 2020 PUKUL 20:25:25 WIB.....	130
TABEL 38 ATENUASI INTENSITAS GEMPA BUMI 15 JUNI 2020 PUKUL 09:50:40 WIB.....	131
TABEL 39 ATENUASI INTENSITAS GEMPA BUMI 15 JUNI 2020 PUKUL 11:15:44 WIB.....	132
TABEL 40 ATENUASI INTENSITAS GEMPA BUMI 23 JUNI 2020 PUKUL 14:43:29 WIB.....	133
TABEL 41 ATENUASI INTENSITAS GEMPA BUMI 11 JULI 2020 PUKUL 14:17:01 WIB	135
TABEL 42 ATENUASI INTENSITAS GEMPA BUMI 7 SEPTEMBER 2020 PUKUL 15:06:51 WIB	140
TABEL 43 ATENUASI INTENSITAS GEMPA BUMI 26 OKTOBER 2020 PUKUL 15:26:37 WIB.....	144
TABEL 44 ATENUASI INTENSITAS GEMPA BUMI 28 OKTOBER 2020 PUKUL 16:09:01 WIB.....	145
TABEL 45 ATENUASI INTENSITAS GEMPA BUMI 29 OKTOBER 2020 PUKUL 08:54:18 WIB.....	146
TABEL 46 ATENUASI INTENSITAS GEMPA BUMI 09 NOVEMBER 2020 PUKUL 22:22:55 WIB	147

TABEL 47 ATENUASI INTENSITAS GEMPA BUMI 28 NOVEMBER 2020 PUKUL 21:14:21 WIB.....	149
TABEL 48 ATENUASI INTENSITAS GEMPA BUMI 29 NOVEMBER 2020 PUKUL 00:26:11 WIB	150
TABEL 49 ATENUASI INTENSITAS GEMPA BUMI 29 NOVEMBER 2020 PUKUL 00:32:38 WIB	151
TABEL 50 ATENUASI INTENSITAS GEMPA BUMI 29 NOVEMBER 2020 PUKUL 00:37:25 WIB	152
TABEL 51 ATENUASI INTENSITAS GEMPA BUMI 10 DESEMBER 2020 PUKUL 22:04:51 WIB.....	155
TABEL 52 ATENUASI INTENSITAS GEMPA BUMI 16 DESEMBER 2020 PUKUL 06:21:59 WIB.....	155
TABEL 53 ATENUASI INTENSITAS GEMPA BUMI 17 DESEMBER 2020 PUKUL 15:30:52 WIB.....	156
TABEL 54 ATENUASI INTENSITAS GEMPA BUMI 20 DESEMBER 2020 PUKUL 18:40:46 WIB.....	157
TABEL 55 ATENUASI INTENSITAS GEMPA BUMI 24 DESEMBER 2020 PUKUL 08:24:14 WIB.....	158

DAFTAR GAMBAR

GAMBAR 1 REGIONALISASI SUMBER GEMPABUMI DI INDONESIA	1
GAMBAR 2 KEJADIAN GEMPABUMI MENURUT KEKUATAN MAGNITUDO.....	3
GAMBAR 3 PROSENTASE KEJADIAN GEMPABUMI MENURUT MAGNITUDO.....	3
GAMBAR 4 PETA SEBARAN EPISENTER GEMPABUMI WILAYAH PGR 10 TAHUN 2020	4
GAMBAR 5 SEBARAN EPISENTER GEMPABUMI BULAN JANUARI 2020.....	14
GAMBAR 6 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN JANUARI 2020.....	16
GAMBAR 7 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN JANUARI 2020	16
GAMBAR 8 SEBARAN EPISENTER GEMPABUMI BULAN FEBRUARI 2020	21
GAMBAR 9 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN FEBRUARI 2020	23
GAMBAR 10 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN FEBRUARI 2020.....	23
GAMBAR 11 SEBARAN EPISENTER GEMPABUMI BULAN MARET 2020.....	29
GAMBAR 12 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN MARET 2020.....	31
GAMBAR 13 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN MARET 2020	31
GAMBAR 14 SEBARAN EPISENTER GEMPABUMI BULAN APRIL 2020.....	37
GAMBAR 15 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN APRIL 2020.....	39
GAMBAR 16 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN APRIL 2020.....	39
GAMBAR 17 SEBARAN EPISENTER GEMPABUMI BULAN MEI 2020	46
GAMBAR 18 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN MEI 2020	48
GAMBAR 19 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN MEI 2020	48
GAMBAR 20 SEBARAN EPISENTER GEMPABUMI BULAN JUNI 2020	55
GAMBAR 21 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN JUNI 2020	57
GAMBAR 22 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN JUNI 2020.....	57
GAMBAR 23 SEBARAN EPISENTER GEMPABUMI BULAN JULI 2020.....	63
GAMBAR 24 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN JULI 2020	65
GAMBAR 25 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN JULI 2020	65
GAMBAR 26 SEBARAN EPISENTER GEMPABUMI BULAN AGUSTUS 2020.....	71
GAMBAR 27 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN AGUSTUS 2020.....	73
GAMBAR 28 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN AGUSTUS 2020	73
GAMBAR 29 SEBARAN EPISENTER GEMPABUMI BULAN SEPTEMBER 2020	79
GAMBAR 30 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN SEPTEMBER 2020	81
GAMBAR 31 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN SEPTEMBER 2020	81
GAMBAR 32 SEBARAN EPISENTER GEMPABUMI BULAN OKTOBER 2020	86
GAMBAR 33 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN OKTOBER 2020	88
GAMBAR 34 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN OKTOBER 2020	88
GAMBAR 35 SEBARAN EPISENTER GEMPABUMI BULAN NOVEMBER 2020.....	94
GAMBAR 36 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN NOVEMBER 2020.....	96
GAMBAR 37 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN NOVEMBER 2020	96
GAMBAR 38 SEBARAN EPISENTER GEMPABUMI BULAN DESEMBER 2020	102
GAMBAR 39 GRAFIK GEMPABUMI BERDASARKAN MAGNITUDO BULAN DESEMBER 2020	104
GAMBAR 40 GRAFIK PERSENTASE GEMPABUMI BERDASARKAN MAGNITUDO BULAN DESEMBER 2020.....	104
GAMBAR 41 PERBANDINGAN ANTARA SKALA MMI DENGAN PERCEPATAN TANAH MAKSIMUM	105
GAMBAR 42 PETA GUNCANGAN GEMPABUMI 2 JANUARI 2020 PUKUL 21:03:17 WIB.....	106
GAMBAR 43 PETA GUNCANGAN GEMPABUMI 9 JANUARI 2020 PUKUL 22:31:17 WIB.....	107
GAMBAR 44 PETA GUNCANGAN GEMPABUMI 10 JANUARI 2020 PUKUL 07:13:11 WIB	107
GAMBAR 45 PETA GUNCANGAN GEMPABUMI 19 JANUARI 2020 PUKUL 23:58:20 WIB	108
GAMBAR 46 PETA GUNCANGAN GEMPABUMI 30 JANUARI 2020 PUKUL 06:46:58 WIB	109
GAMBAR 47 PETA GUNCANGAN GEMPABUMI 6 FEBRUARI 2020 PUKUL 20:40:09 WIB	110

GAMBAR 48 PETA GUNCANGAN GEMPABUMI 6 FEBRUARI 2020 PUKUL 20:45:41 WIB	111
GAMBAR 49 PETA GUNCANGAN GEMPABUMI 15 FEBRUARI 2020 PUKUL 22:36:47 WIB	111
GAMBAR 50 PETA GUNCANGAN GEMPABUMI 18 FEBRUARI 2020 PUKUL 13:22:01 WIB	112
GAMBAR 51 PETA GUNCANGAN GEMPABUMI 23 FEBRUARI 2020 PUKUL 09:08:07 WIB	112
GAMBAR 52 PETA GUNCANGAN GEMPABUMI 23 FEBRUARI 2020 PUKUL 10:39:56 WIB	113
GAMBAR 53 PETA GUNCANGAN GEMPABUMI 26 FEBRUARI 2020 PUKUL 02:13:04 WIB	113
GAMBAR 54 PETA GUNCANGAN GEMPABUMI 29 FEBRUARI 2020 PUKUL 16:28:26 WIB	114
GAMBAR 55 PETA GUNCANGAN GEMPABUMI 29 FEBRUARI 2020 PUKUL 22:54:34 WIB	114
GAMBAR 56 PETA GUNCANGAN GEMPABUMI 4 MARET 2020 PUKUL 16:29:52 WIB	115
GAMBAR 57 PETA GUNCANGAN GEMPABUMI 14 MARET 2020 PUKUL 17:42:37 WIB	115
GAMBAR 58 PETA GUNCANGAN GEMPABUMI 18 MARET 2020 PUKUL 10:13:32 WIB	116
GAMBAR 59 PETA GUNCANGAN GEMPABUMI 22 MARET 2020 PUKUL 10:34:55 WIB	117
GAMBAR 60 PETA GUNCANGAN GEMPABUMI 22 MARET 2020 PUKUL 15:15:50 WIB	117
GAMBAR 61 PETA GUNCANGAN GEMPABUMI 25 MARET 2020 PUKUL 09:20:06 WIB	118
GAMBAR 62 PETA GUNCANGAN GEMPABUMI 26 MARET 2020 PUKUL 22:38:03 WIB	118
GAMBAR 63 PETA GUNCANGAN GEMPABUMI 4 APRIL 2020 PUKUL 05:14:17 WIB	119
GAMBAR 64 PETA GUNCANGAN GEMPABUMI 6 APRIL 2020 PUKUL 01:37:13 WIB	120
GAMBAR 65 PETA GUNCANGAN GEMPABUMI 13 APRIL 2020 PUKUL 13:44:23 WIB	121
GAMBAR 66 PETA GUNCANGAN GEMPABUMI 13 APRIL 2020 PUKUL 21:59:34 WIB	121
GAMBAR 67 PETA GUNCANGAN GEMPABUMI 16 APRIL 2020 PUKUL 04:03:37 WIB	122
GAMBAR 68 PETA GUNCANGAN GEMPABUMI 18 APRIL 2020 PUKUL 20:35:48 WIB	122
GAMBAR 69 PETA GUNCANGAN GEMPABUMI 19 APRIL 2020 PUKUL 00:45:39 WIB	123
GAMBAR 70 PETA GUNCANGAN GEMPABUMI 19 APRIL 2020 PUKUL 20:09:32 WIB	123
GAMBAR 71 PETA GUNCANGAN GEMPABUMI 20 APRIL 2020 PUKUL 08:05:05 WIB	124
GAMBAR 72 PETA GUNCANGAN GEMPABUMI 22 APRIL 2020 PUKUL 22:30:09 WIB	124
GAMBAR 73 PETA GUNCANGAN GEMPABUMI 30 MEI 2020 PUKUL 20:06:28 WIB	126
GAMBAR 74 PETA GUNCANGAN GEMPABUMI 4 JUNI 2020 PUKUL 15:49:40 WIB	127
GAMBAR 75 PETA GUNCANGAN GEMPABUMI 4 JUNI 2020 PUKUL 20:12:33 WIB	127
GAMBAR 76 PETA GUNCANGAN GEMPABUMI 6 JUNI 2020 PUKUL 20:40:52 WIB	128
GAMBAR 77 PETA GUNCANGAN GEMPABUMI 8 JUNI 2020 PUKUL 09:34:34 WIB	129
GAMBAR 78 PETA GUNCANGAN GEMPABUMI 14 JUNI 2020 PUKUL 11:57:47 WIB	129
GAMBAR 79 PETA GUNCANGAN GEMPABUMI 14 JUNI 2020 PUKUL 20:25:25 WIB	130
GAMBAR 80 PETA GUNCANGAN GEMPABUMI 15 JUNI 2020 PUKUL 09:50:40 WIB	131
GAMBAR 81 PETA GUNCANGAN GEMPABUMI 15 JUNI 2020 PUKUL 11:15:44 WIB	132
GAMBAR 82 PETA GUNCANGAN GEMPABUMI 23 JUNI 2020 PUKUL 14:43:29 WIB	133
GAMBAR 83 PETA GUNCANGAN GEMPABUMI 2 JULI 2020 PUKUL 16:23:06 WIB	134
GAMBAR 84 PETA GUNCANGAN GEMPABUMI 5 JULI 2020 PUKUL 12:34:04 WIB	134
GAMBAR 85 PETA GUNCANGAN GEMPABUMI 6 JULI 2020 PUKUL 18:17:57 WIB	135
GAMBAR 86 PETA GUNCANGAN GEMPABUMI 11 JULI 2020 PUKUL 14:17:01 WIB	135
GAMBAR 87 PETA GUNCANGAN GEMPABUMI 16 JULI 2020 PUKUL 09:42:54 WIB	136
GAMBAR 88 PETA GUNCANGAN GEMPABUMI 19 JULI 2020 PUKUL 22:53:32 WIB	136
GAMBAR 89 PETA GUNCANGAN GEMPABUMI 8 AGUSTUS 2020 PUKUL 23:57:05 WIB	137
GAMBAR 90 PETA GUNCANGAN GEMPABUMI 12 AGUSTUS 2020 PUKUL 17:26:22 WIB	137
GAMBAR 91 PETA GUNCANGAN GEMPABUMI 15 AGUSTUS 2020 PUKUL 17:53:21 WIB	138
GAMBAR 92 PETA GUNCANGAN GEMPABUMI 6 SEPTEMBER 2020 PUKUL 07:21:13 WIB	139
GAMBAR 93 PETA GUNCANGAN GEMPABUMI 6 SEPTEMBER 2020 PUKUL 22:23:43 WIB	139
GAMBAR 94 PETA GUNCANGAN GEMPABUMI 7 SEPTEMBER 2020 PUKUL 15:06:51 WIB	140
GAMBAR 95 PETA GUNCANGAN GEMPABUMI 9 SEPTEMBER 2020 PUKUL 10:41:21 WIB	141
GAMBAR 96 PETA GUNCANGAN GEMPABUMI 9 SEPTEMBER 2020 PUKUL 14:18:43 WIB	141

GAMBAR 97 PETA GUNCANGAN GEMPABUMI 15 SEPTEMBER 2020 PUKUL 14:10:18 WIB	142
GAMBAR 98 PETA GUNCANGAN GEMPABUMI 30 SEPTEMBER 2020 PUKUL 07:41:22 WIB	142
GAMBAR 99 PETA GUNCANGAN GEMPABUMI 18 OKTOBER 2020 PUKUL 13:01:31 WIB	143
GAMBAR 100 PETA GUNCANGAN GEMPABUMI 19 OKTOBER 2020 PUKUL 08:06:36 WIB	143
GAMBAR 101 PETA GUNCANGAN GEMPABUMI 26 OKTOBER 2020 PUKUL 15:26:37 WIB	144
GAMBAR 102 PETA GUNCANGAN GEMPABUMI 28 OKTOBER 2020 PUKUL 16:09:01 WIB	145
GAMBAR 103 PETA GUNCANGAN GEMPABUMI 29 OKTOBER 2020 PUKUL 08:54:18 WIB	146
GAMBAR 111 PETA GUNCANGAN GEMPABUMI 09 NOVEMBER 2020 PUKUL 22:22:55 WIB	147
GAMBAR 112 PETA GUNCANGAN GEMPABUMI 15 NOVEMBER 2020 PUKUL 17:49:23 WIB	148
GAMBAR 113 PETA GUNCANGAN GEMPABUMI 25 NOVEMBER 2020 PUKUL 22:20:35 WIB	148
GAMBAR 114 PETA GUNCANGAN GEMPABUMI 28 NOVEMBER 2020 PUKUL 21:14:21 WIB.....	149
GAMBAR 115 PETA GUNCANGAN GEMPABUMI 29 NOVEMBER 2020 PUKUL 00:26:11 WIB	150
GAMBAR 116 PETA GUNCANGAN GEMPABUMI 29 NOVEMBER 2020 PUKUL 00:32:38 WIB	151
GAMBAR 117 PETA GUNCANGAN GEMPABUMI 29 NOVEMBER 2020 PUKUL 00:37:25 WIB	152
GAMBAR 118 PETA GUNCANGAN GEMPABUMI 29 NOVEMBER 2020 PUKUL 19:14:15 WIB	153
GAMBAR 133 PETA GUNCANGAN GEMPABUMI 4 DESEMBER 2020 PUKUL 21:38:57 WIB	154
GAMBAR 134 PETA GUNCANGAN GEMPABUMI 10 DESEMBER 2020 PUKUL 22:04:51 WIB.....	154
GAMBAR 135 PETA GUNCANGAN GEMPABUMI 16 DESEMBER 2020 PUKUL 06:21:59 WIB.....	155
GAMBAR 136 PETA GUNCANGAN GEMPABUMI 17 DESEMBER 2020 PUKUL 15:30:52 WIB.....	156
GAMBAR 137 PETA GUNCANGAN GEMPABUMI 20 DESEMBER 2020 PUKUL 18:40:46 WIB.....	157
GAMBAR 138 PETA GUNCANGAN GEMPABUMI 24 DESEMBER 2020 PUKUL 08:24:14 WIB.....	158
GAMBAR 139 PETA GUNCANGAN GEMPABUMI 28 DESEMBER 2020 PUKUL 14:31:10 WIB.....	159

DATA STASIUN SEISMIK
DALAM WILAYAH STASIUN GEOFISIKA MANADO

1. Alamat Stasiun : Jl. Harapan No.42 Winangun, Manado, Sulawesi Utara
2. Koordinat Stasiun : 01°26'35" LU dan 124°50'21" BT
3. Kode Stasiun : MNI
4. Batuan : Basalt Peroksin
5. Ketinggian : 128 Meter DPL
6. Sistem Monitoring : Seiscomp3

DAFTAR SENSOR SEISMOMETER DAN AKSELEROMETER TANGGUNG
JAWAB STASIUN GEOFISIKA MANADO

1. Kode stasiun : MNI
Lokasi : Manado, Sulawesi Utara
Digitizer : Nanometrics Taurus
Sensor : Trilium-120P (seismometer)
2. Kode stasiun : SLMl
Lokasi : Manado, Sulawesi Utara
Digitizer : Nanometrics Taurus
Sensor : Metrozet TSA-100S (akselerometer)
3. Kode stasiun : TMSI
Lokasi : Tondano, Sulawesi Utara
Digitizer : Trident-305
Sensor : Trilium-120P (seismometer) dan Titan (akselerometer)
4. Kode stasiun : KMSI
Lokasi : Kotamobagu, Sulawesi Utara
Digitizer : Trident-305
Sensor : Trilium-120Q (seismometer) dan TSA-100S (akselerometer)
5. Kode stasiun : SGSI
Lokasi : Sangihe, Sulawesi Utara
Digitizer : Trident-305
Sensor : Trilium-120Q (seismometer) dan BBAS-2 (akselerometer)
6. Kode stasiun : MGAI
Lokasi : Melonguane, Sulawesi Utara
Digitizer : Trident-305
Sensor : Trilium-120P (seismometer) dan TitanOpen (akselerometer)
7. Kode stasiun : PSSI
Lokasi : Siau, Sulawesi Utara
Digitizer : Centaur

- Sensor : Trilium-120Q (seismometer) dan Titan (akselerometer)
8. Kode stasiun : PBCI
 Lokasi : Molibagu, Bolaang Mongondow Selatan
 Digitizer : Centaur
 Sensor : Horizon (seismometer) dan Titan (akselerometer)
9. Kode stasiun : TBMCM
 Lokasi : Tutuyan, Bolaang Mongondow Timur
 Digitizer : Kinematics Q330S+
 Sensor : Metrozet MBB-2 (seismometer) dan Episensor FBA-ES-T (akselerometer)
10. Kode stasiun : SAMI
 Lokasi : Sam Ratulangi, Sulawesi Utara
 Digitizer : Titan
 Sensor : Titan AG (akselerometer)
11. Kode stasiun : KWSI
 Lokasi : Kayuwatu, Sulawesi Utara
 Digitizer : Titan
 Sensor : Titan AG (akselerometer)
12. Kode stasiun : BTSI
 Lokasi : Bitung, Sulawesi Utara
 Digitizer : Titan
 Sensor : Titan AG (akselerometer)

DAFTAR ISTILAH

Daftar istilah yang digunakan dalam memahami hasil analisa dan informasi gempabumi adalah sebagai berikut:

- a. *Date*
Menunjukkan tanggal terjadinya gempabumi.
- b. *OT (Origin Time)*
Menunjukkan waktu terjadinya gempabumi yang terdiri atas HH:MM:SS
HH : Jam terjadinya gempabumi
MM : Menit terjadinya gempabumi
SS : Detik terjadinya gempabumi
- c. *Latitude*
Menunjukkan lokasi lintang sumber gempabumi (episenter).
- d. *Longitude*
Menunjukkan lokasi bujur sumber gempabumi (episenter).
- e. *Depth*
Menunjukkan kedalaman sumber gempabumi, dinyatakan dalam kilometer.
- f. *Magnitudo* atau *mag*
Menunjukkan Magnitudo atau kekuatan gempabumi.
- g. *TypeMag*
Menunjukkan tipe magnitudo yang digunakan dalam perhitungan kekuatan gempabumi.
- h. *Region*
Menunjukkan daerah zona seismik berdasarkan pembagian yang dilakukan oleh Flinn-Engdahl.
- i. *Intensitas*
Menunjukkan dampak gempabumi di permukaan bumi misalnya, di suatu tempat terjadi kerusakan atau hanya dirasakan getarannya.
- j. *MMI*
Modified Mercally Intencity (MMI) merupakan salah satu jenis skala intensitas gempabumi
- k. *SIG*
Skala Intensitas Gempabumi (SIG) merupakan salah satu jenis skala intensitas gempabumi.

l. *Epicenter* atau *epic*

Titik lokasi di permukaan bumi yang merupakan hasil proyeksi dari pusat terjadinya gempa di dalam bumi.

m. PGN

Pusat Gempa Nasional, sebagai pusat informasi gempabumi nasional yang bertempat di Jakarta.

n. PGR

Pusat Gempa Regional, sebagai pusat informasi gempabumi di masing-masing regional.

o. Gempa Tele

Kejadian gempa dengan jarak lebih dari 2° (± 220 km) dari lokasi stasiun.

p. Gempa Lokal

Kejadian gempa dengan jarak kurang dari 2° (± 220 km) dari lokasi stasiun.

q. *Shakemap*

Peta tingkat guncangan akibat kejadian gempabumi.

r. Seismisitas

Katalog yang memuat persebaran lokasi pusat gempabumi

s. *WRS*

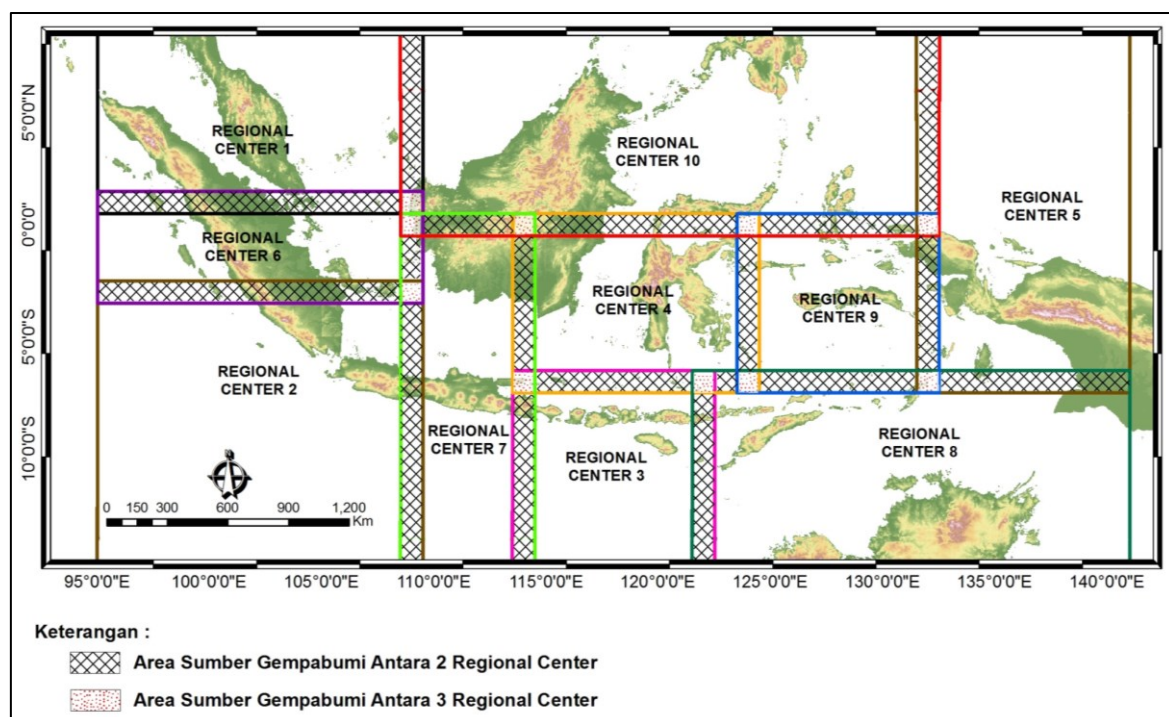
Warning Receiver System, sistem peringatan dini tsunami yang terdiri dari 2 jenis yaitu *WRS2Way* dan *WRS DVB (WRS-Digital Video Broadcast)*.

I. PENDAHULUAN

Gempabumi merupakan fenomena alam yang tidak dapat dihindarkan dan jika terjadi dengan kekuatan signifikan membawa bencana bagi umat manusia. Dampak gempabumi merusak dapat menyebabkan korban jiwa dan kerusakan infrastruktur.

Badan Meteorologi Klimatologi dan Geofisika (BMKG) sebagai instansi pemerintah yang salah satu tugasnya adalah melakukan pengamatan fenomena gempabumi, wajib memberikan informasi yang tepat dan akurat untuk keselamatan masyarakat. Buletin tahunan ini adalah salah satu informasi BMKG untuk masyarakat dan para *stakeholder* yang berisi hasil analisa seismogram berupa kejadian gempabumi yang terjadi di wilayah pemantauan Stasiun Geofisika Manado sebagai Pusat Gempa Regional (PGR) 10, yang meliputi bagian Utara dari Pulau Kalimantan, sebagian Sulawesi Tengah, Gorontalo, Sulawesi Utara, dan Maluku Utara.

Stasiun Geofisika Manado yang juga sebagai PGR 10, dalam fungsi pemantauan kejadian gempabumi di wilayahnya melakukan koordinasi dengan Stasiun Geofisika Gorontalo dan Stasiun Geofisika Ternate. Parameter gempabumi yang dimasukkan dalam buletin ini dikeluarkan oleh Pusat Gempabumi Regional untuk gempabumi dengan Magnitudo kurang dari 5 ($M < 5$), sementara untuk gempabumi dengan kekuatan $M \geq 5$ dikeluarkan oleh Pusat Gempabumi Nasional (PGN) di kantor pusat BMKG Jakarta. Pembagian wilayah pemantauan kejadian gempabumi dari setiap regional BMKG di Indonesia adalah seperti digambarkan dalam Gambar 1.



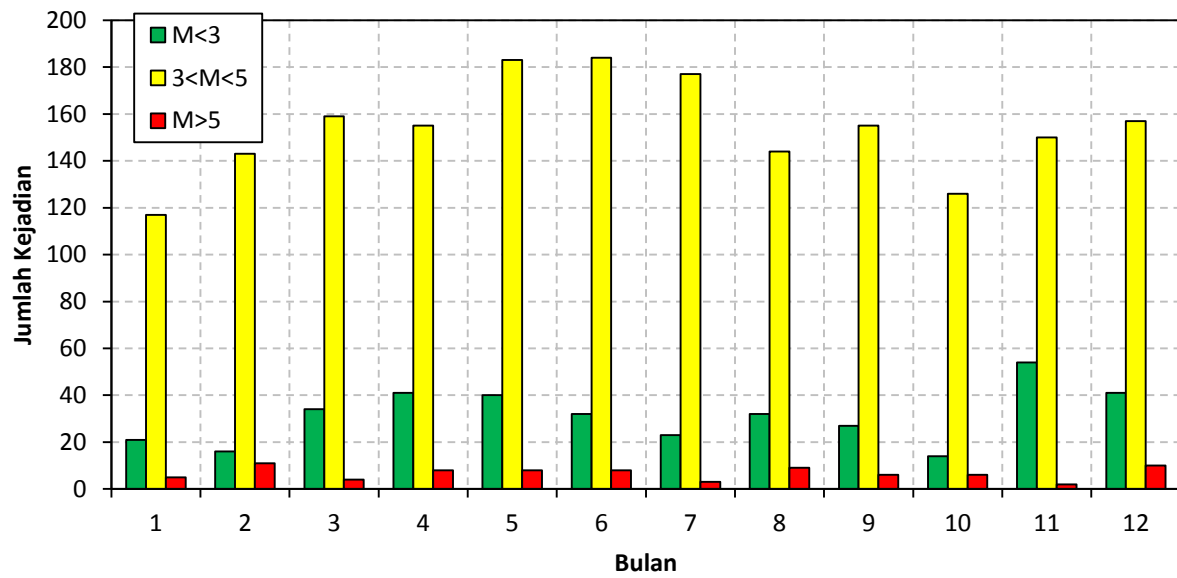
Gambar 1 Regionalisasi sumber gempabumi di Indonesia

II. REKAPITULASI KEJADIAN GEMPABUMI TAHUN 2020

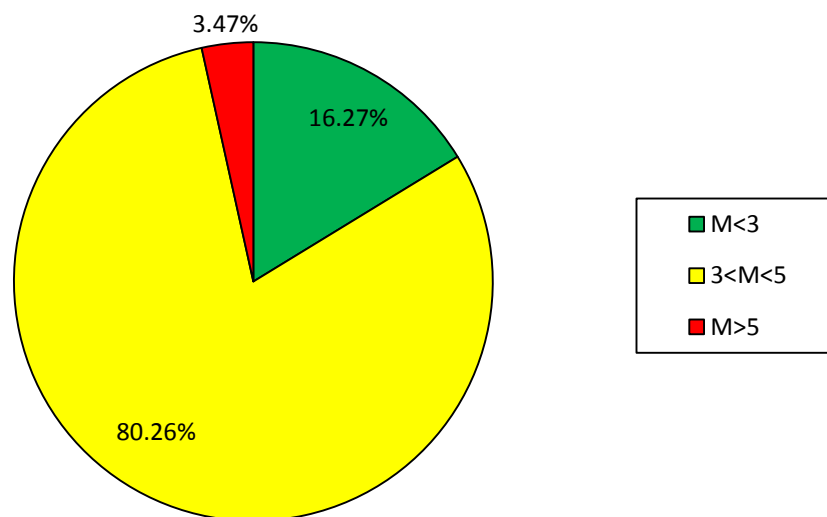
Jumlah gempabumi yang tercatat di Stasiun Geofisika Manado pada tahun 2020 berjumlah total 2305 kejadian, dengan bulan Mei menunjukkan jumlah gempabumi terbanyak sebanyak 231 kejadian dan terendah pada bulan Januari sebanyak 143 kejadian. Dari sisi Magnitudo, kejadian gempabumi dengan magnitudo antara 3 hingga 5 paling sering terjadi sebanyak 1850 kejadian. Selanjutnya diikuti oleh gempabumi dengan magnitudo $M < 3$ sebanyak 375 kejadian, dan magnitudo $M \geq 5$ sebanyak 80 kejadian. Dari sisi dampaknya, pada tahun 2020 terjadi sebanyak 77 gempabumi yang guncangannya dirasakan oleh masyarakat. Bahkan, salah satu kejadian gempabumi menyebabkan kerusakan beberapa bangunan. Gempabumi ini terjadi pada tanggal 9 September 2020 di Kab. Kepulauan Talaud. Pada Tabel 1 ditunjukkan rekapitulasi jumlah kejadian gempabumi setiap bulan serta jumlah gempabumi dirasakan yang parameter rincinya dijelaskan pada Tabel 2. Gambar 2 dan 3 masing-masing menunjukkan grafik kejadian gempabumi berdasarkan klasifikasi magnitudo setiap bulan dan prosentase kejadian gempabumi berdasarkan klasifikasi magnitudo. Peta sebaran episenter gempabumi di wilayah PGR 10 selama tahun 2020 digambarkan pada Gambar 4.

Tabel 1 Rekapitulasi kejadian gempabumi tahun 2020

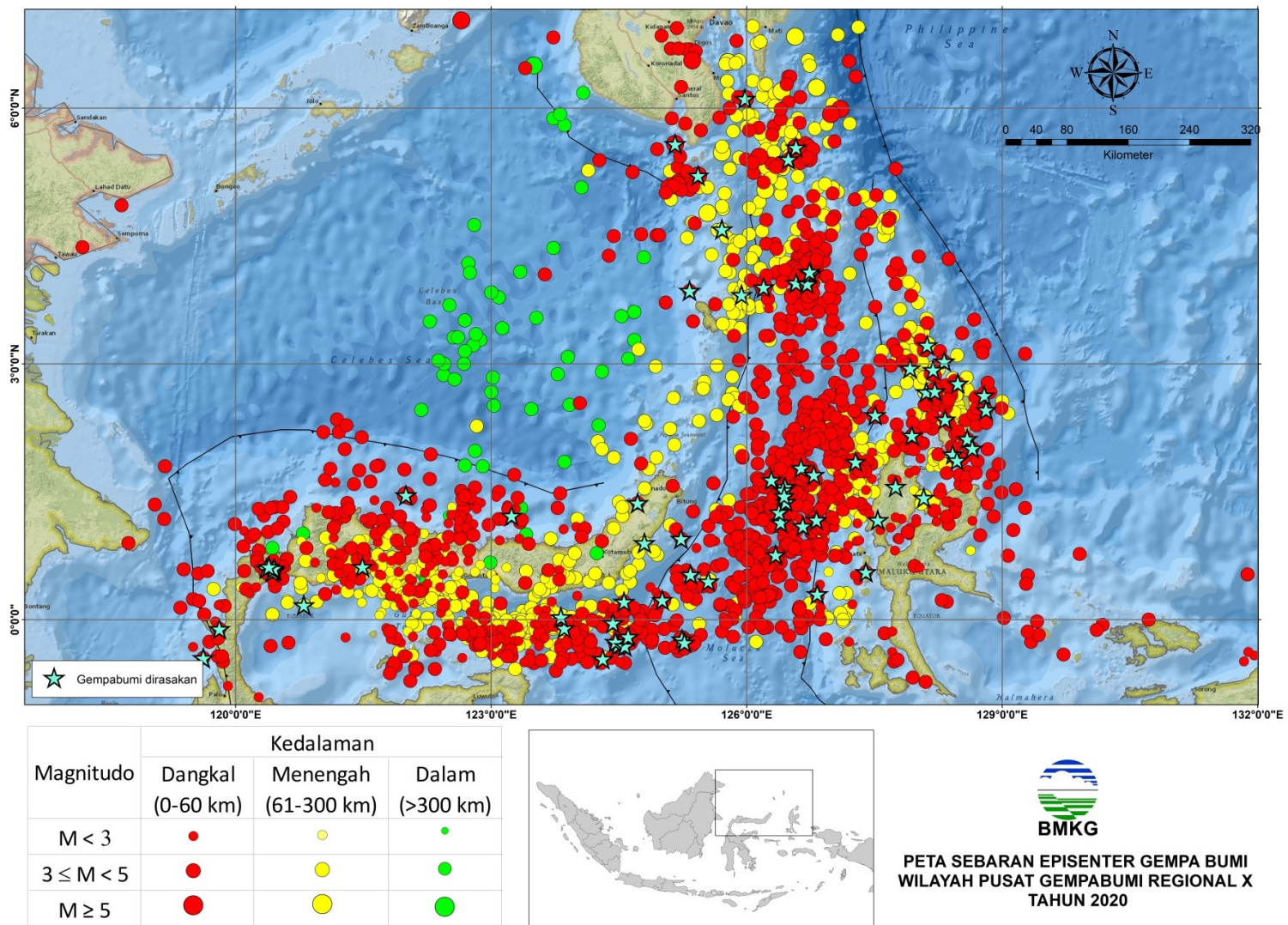
Bulan	Berdasarkan Magnitudo			Gempa Signifikan		Jumlah Total
	$M < 3$	$3 \leq M < 5$	$M \geq 5$	Dirasakan	Merusak	
Januari	21	117	5	5	0	143
Februari	16	143	11	9	0	170
Maret	34	159	4	7	0	197
April	41	155	8	10	0	204
Mei	40	183	8	1	0	231
Juni	32	184	8	9	0	224
Juli	23	177	3	6	0	203
Agustus	32	144	9	3	0	185
September	27	155	6	7	1	188
Oktober	14	126	6	5	0	146
November	54	150	2	8	0	206
Desember	41	157	10	7	0	208
Total	375	1850	80	77	1	2305



Gambar 2 Kejadian gempa bumi menurut kekuatan Magnitudo



Gambar 3 Prosentase kejadian gempa bumi menurut magnitudo



Gambar 4 Peta sebaran episenter gempabumi wilayah PGR 10 tahun 2020

Tabel 2 Rekapitulasi kejadian gempabumi dirasakan tahun 2020

NO	TANGGAL	WAKTU (WIB)	LINTANG	BUJUR	MAG	KED (Km)	DIRASAKAN (MMI)	KETERANGAN
1	02/01/2020	21:03:17	2.63	128.79	4.9	10	Morotai (II MMI)	85 km Timur Laut Daruba - Malut
2	09/01/2020	22:31:17	2.46	128.81	4.7	10	Morotai Utara (III MMI)	73 km Timur Laut Daruba - Malut
3	09/01/2020	06:13:11	2.40	127.51	5.3	23	Galela (II MMI)	93 km Barat Laut Daruba - Malut
4	19/01/2020	23:58:20	-0.10	123.86	6.2	129	Luwuk (IV-V MMI) Bitung, Manado, Kotamobagu, Gorontalo dan Malili (II-III MMI)	57 km Selatan Bolaang Uki - Sulut
5	29/01/2020	06:46:58	0.76	126.34	5.8	55	Manado, Ternate, Sofifi, Jailolo, Tidore (III MMI)	115 km Barat Kota Ternate - Malut
6	06/02/2020	20:40:08	5.54	126.58	6.1	36	Miangas (IV MMI) Melonguane (II-III MMI) Tahuna (II-III MMI)	168 km Utara Melonguane - Sulut
7	06/02/2020	20:45:41	5.40	126.49	4.9	10	Miangas (IV MMI)	19 km Barat Daya Pulau Miangas - Sulut
8	15/02/2020	22:36:47	1.56	126.45	5.5	53	Bitung dan Manado (II MMI) Ternate, Mayau, dan Jailolo (III MMI)	133 km Barat Laut Jailolo - Malut
9	18/02/2020	13:22:01	2.16	127.94	4.9	10	Halmahera Utara, Daruba Morotai (III MMI)	40 km Barat Laut Daruba - Malut
10	23/02/2020	09:08:04	-0.23	125.24	5.3	10	Kotamobagu, Bolaang Uki, Bitung, dan Tomohon (II-III MMI)	169 km Tenggara Bolaang Uki - Sulut
11	23/02/2020	10:39:54	-0.27	125.27	5.2	10	Kotamobagu, Bolaang Uki (II-III MMI)	172 km Tenggara Bolaang Uki - Sulut
12	27/02/2020	02:13:04	3.81	125.94	5.6	138	Sangihe (III MMI)	53 km Timur Laut Kota Tahuna - Sulut
13	29/02/2020	16:28:26	3.22	128.12	5.5	140	Bitung, Minahasa Utara, Tomohon, Tondano, Minahasa Tenggara, Tutuyan, Manado, Tobelo dan Morotai (III MMI)	124 km Utara Daruba - Malut
14	29/02/2020	22:54:34	1.94	128.42	4.3	25	Morotai (II-III MMI)	15 km Tenggara Daruba - Malut
15	04/03/2020	16:29:52	1.56	127.75	4.4	130	Kecamatan Ibu, Halmahera Barat (II MMI)	17 km Barat Laut Halmahera Utara - Malut
16	14/03/2020	17:42:37	3.03	128.32	4.9	31	Morotai Utara (III MMI)	99 km Utara Daruba - Malut

17	18/03/2020	10:13:32	2.95	127.92	5.5	138	Morotai (III MMI) Tobelo (II MMI)	109 km Barat Laut Daruba - Malut
18	22/03/2020	10:34:55	1.46	122	5.1	10	gorontalo utara (II MMI) buol (III-IV MMI)	74 km Timur Laut Kota Buol - Sulteng
19	22/03/2020	15:15:50	1.22	123.24	4.5	10	Bone Bolango (II-III MMI)	35 km Barat Laut Boroko - Sulut
20	25/03/2020	16:54:42	1.17	127.54	2.1	3	Jailolo (II-III MMI)	16 km Utara Jailolo - Malut
21	26/03/2020	22:38:03	5.58	125.16	6.3	10	Talaud, Melonguane (III-IV MMI) Siau, Manado, Bitung (II-III MMI)	222 km Utara Tahuna - Sulut
22	03/04/2020	05:14:17	1.87	128.47	4.3	29	Daruba-Malut (II MMI)	27 km Tenggara Daruba - Malut
23	05/04/2020	01:37:13	1.52	126.43	6.1	67	Bitung (III-IV MMI)	145 km Timur Laut Bitung - Sulut
24	13/04/2020	13:44:23	3.86	125.33	5.0	10	Tahuna (III-IV MMI)	33 km Barat Laut Tahuna - Sulut
25	13/04/2020	21:59:34	0.30	126.83	4.9	17	Makian (IV MMI) Ternate, Tidore (III-IV MMI) Sofifi, Weda (III MMI) Labuha (I-II MMI)	81 km Barat Daya Ternate - Malut
26	15/04/2020	04:03:39	1.14	126.4	5.6	63	Pulau Mayau, Ternate, Sofifi (III-IV MMI) Galela, Manado (II-III MMI)	85 km Barat Daya Ternate - Malut
27	18/04/2020	20:35:48	1.10	126.66	4.0	14	Ternate (II MMI)	87 km Barat laut Ternate - Malut
28	18/04/2020	00:45:39	0.45	125.55	5.1	85	Kotamobagu (II MMI)	113 km Tenggara Minahasa Tenggara - Sulut
29	19/04/2020	20:09:32	3.90	126.2	5.2	19	Talaud (III MMI) Siau (II MMI)	54 km Barat Daya Melonguane - Sulut
30	20/04/2020	08:05:05	3.95	126.58	4.0	41	Talaud (III MMI)	12 km Barat Daya Melonguane - Sulut
31	22/04/2020	22:30:09	2.12	128.59	4.2	10	Daruba (II MMI)	34 km Timur Daruba - Malut
32	30/05/2020	20:06:25	3.94	126.71	5.7	10	Tahuna, talaud (II-III MMI)	10 km Selatan Melonguane - Sulut
33	04/06/2020	15:49:40	2.93	128.19	6.8	111	Morotai (IV MMI) Manado, Bitung, Minahasa, Bolmong, Ternate, Sitato, Tahuna, Tobelo, Sofifi, Talaud (II-III MMI)	99 km Utara Daruba - Malut

34	04/06/2020	20:12:33	1.26	126.38	4.7	10	Ternate (I-II MMI) Pulau Mayau (III MMI)	122 km Barat Laut Ternate - Maluku
35	06/06/2020	20:40:52	2.01	128.65	4.8	18	Morotai (III-IV MMI)	39 km Timur Laut Daruba - Maluku
36	08/06/2020	09:34:34	-0.46	124.31	5.1	76	Bitung, Minahasa, Bolmong, Kotamobagu, Taliabu (II MMI)	125 km Tenggara Bolaang Mongondow - Sulawesi
37	14/06/2020	11:57:47	2.35	128.33	4.9	10	Morotai (III MMI)	33 km Timur Laut Daruba - Maluku
38	14/06/2020	20:25:26	2.67	128.11	5.3	111	Tobelo (III MMI)	100 km Utara Tobelo - Maluku
39	15/06/2020	09:50:40	0.21	124.56	4.5	10	Kotamobagu, Boltim, Mitra (II MMI)	61 km Barat Daya Boltim - Sulawesi
40	15/06/2020	11:15:44	1.43	128.08	5.6	109	Tobelo (III-IV MMI)	22 km Tenggara Halmahera Utara - Maluku
41	23/06/2020	14:43:29	0.03	123.82	6.0	109	Bone Bolango, Bolaang Uki, Luwuk (IV MMI) Gorontalo, Lolak, Ampana, Minahasa Tenggara, Tutuyan (III-IV MMI) Kotamobagu, Malili, Sorowako, Taliabu, Labuha (III MMI) Pasang Kayu, Palu, Bitung, Toraja, Masamba, Manado, Toli-toli (II MMI)	75 km Tenggara Bone Bolango - Gorontalo
42	02/07/2020	16:23:06	0.53	125.34	4.6	10	Minahasa Tenggara, Kotamobagu (II MMI)	85 km Tenggara Minahasa Tenggara - Sulawesi
43	05/07/2020	12:34:04	2.68	128.21	5.0	27	Morotai (III MMI)	71 km Utara Daruba - Maluku
44	06/07/2020	18:17:57	1.38	126.46	4.6	10	Pulau Mayau (IV MMI)	121 km Barat Laut Ternate - Maluku
45	11/07/2020	14:17:01	0.17	120.8	4.6	102	Toli - Toli (I - II MMI)	39 km Barat Daya Lambunu - Kab. Parigi Moutong
46	16/07/2020	09:42:54	1.85	117.39	4.0	10	Berau (II-III MMI)	19 km Tenggara Berau - Kalimantan Timur
47	19/07/2020	22:53:32	-0.11	119.81	3.1	8	Tambu (II - III MMI)	10 km Barat Daya Tambu - Donggala - Sulteng
48	08/08/2020	23:57:05	0.90	124.8	4.9	129	Bitung (II MMI)	16 km Selatan Ratahan - Mitra - Sulawesi
49	12/08/2020	17:26:22	1.45	126.44	5.2	44	Pulau Mayau (III-IV MMI) Ternate (II-III MMI) Bitung, Tomohon, Manado (II MMI)	122 km Barat Kota Jailolo - Maluku

50	15/08/2020	17:53:19	4.58	125.71	5.0	125	Tahuna (II MMI)	130 km Barat Laut Melonguane - Sulut
51	06/09/2020	07:21:14	1.78	126.64	6.0	59	Ternate, Tidore, Sofifi, Halmahera Barat, Halmahera Utara, Tikep (III-IV MMI) Bitung (II-III MMI) Manado, Siau, Tahuna (II MMI)	121 km Barat Laut Jailolo - Malut
52	06/09/2020	22:23:43	6.11	125.98	6.9	10	Tahuna, Siau (III MMI)	280 km Utara Melonguane - Sulut
53	07/09/2020	15:06:52	-0.04	124.43	4.9	57	Kotamobagu, Bolaang Uki (II - III MMI)	63 km Tenggara Bolaang Uki - Sulut
54	09/09/2020	10:41:21	4.06	126.75	5.5	57	Melonguane (III - IV MMI)	8 km Timur Laut Melonguane - Sulut
55	09/09/2020	14:18:47	4.08	126.74	5.7	74	Pulutan-Talaud (VI MMI) Melonguane-Talaud (III-IV MMI) Naha-Sangihe (II MMI)	11 km Timur Laut Melonguane - Sulut
56	15/09/2020	14:10:18	-0.45	119.62	4.3	14	Palu, Donggala (III MMI)	17 km Barat Tibo, Donggala - Sulteng
57	30/09/2020	07:41:22	1.37	124.72	3.6	10	Tomohon, Kawangkoan (III MMI)	14 km Barat Laut Tomohon - Sulut
58	18/10/2020	13:01:31	2.77	128.48	4.9	8	Daruba, Tobelo (II - III MMI)	82 km Timur Laut Daruba - Malut
59	19/10/2020	08:06:36	1.17	126.82	4.5	35	Ternate (I - II MMI)	72 km Barat Laut Jailolo - Malut
60	26/10/2020	15:26:37	0.62	121.49	5.0	79	Gorontalo Utara, Buol (III MMI) Bone Bolango, Parigi Moutong (II - III MMI)	53 km Barat Kota Marisa - Gorontalo
61	28/10/2020	16:08:58	-0.30	124.49	5.7	10	Bolaang Uki, Kotamobagu, Tutuyan (II - III MMI) Manado (II MMI)	91 km Tenggara Bolaang Uki - Sulut
62	29/10/2020	08:54:17	-0.26	124.46	4.8	10	Mobagu (I - II MMI)	105 km Tenggara Kotamobagu - Sulut
63	09/11/2020	22:22:55	0.95	125.23	4.6	10	Bitung (II MMI)	50 km Tenggara Ratahan - Mitra - Sulut
64	15/11/2020	17:49:23	0.56	127.4	3.3	4	Kota Tidore Kepulauan (III MMI)	13 km Barat Daya Tidore - Malut
65	25/11/2020	22:20:35	1.85	127.28	5.4	77	Siau (II MMI)	64 km Barat Laut Halmahera Barat - Malut

66	28/11/2020	21:14:21	0.60	120.36	4.4	6	Parigi Moutong (III MMI)	49 km Barat Laut Parigi Moutong - Sulteng
67	28/11/2020	00:26:11	0.58	120.46	4.7	10	Parigi Moutong (III MMI)	38 km Barat Daya Parigi Moutong - Sulteng
68	28/11/2020	00:32:38	0.58	120.45	4.2	10	Parigi Moutong (II MMI)	39 km Barat Daya Parigi Moutong - Sulteng
69	28/11/2020	00:37:25	0.56	120.43	4.3	4	Parigi Moutong (III MMI)	41 km Barat Daya Parigi Moutong - Sulteng
70	29/11/2020	19:14:15	0.60	120.45	4.5	10	Parigi Moutong (III-IV MMI)	39 km Barat laut Parigi Moutong - Sulteng
71	04/12/2020	21:38:57	0.62	120.39	3.7	10	Parigi Moutong (III MMI)	16 km Utara Pasala - Sulteng
72	10/12/2020	22:04:50	1.64	126.29	5.1	10	Ternate, Manado (II MMI)	135 km Timur Laut Bitung - Sulut
73	15/12/2020	06:21:58	5.21	125.43	6.2	10	Tahuna (II-III MMI)	178 km Utara Tahuna - Sulut
74	17/12/2020	14:30:50	0.23	125.01	5.1	24	Tutuyan, Manado, Bolssel (II MMI)	75 km Tenggara Boltim - Sulut
75	20/12/2020	18:40:46	1.70	126.79	4.9	13	Jailolo, Ternate (II - III MMI)	97 km Barat Laut Halmahera Barat - Malut
76	24/12/2020	08:24:11	-0.31	124.57	5.3	24	Pagimana (II MMI)	96 km arah Tenggara Kota Bolaang Uki, Sulut
77	28/12/2020	14:31:09	-0.20	124.61	5.4	10	Kotamobagu, Banggai Laut, Luwuk (II-III MMI) Modayag , Lolak, Manado, Bitung, Sumalata, Talibu, Gorontalo (II MMI)	90 km arah Tenggara Kota Bolaang Uki, Sulut

III. DATA KEJADIAN GEMPABUMI BULANAN TAHUN 2020

A. Data Gempabumi Bulan Januari 2020

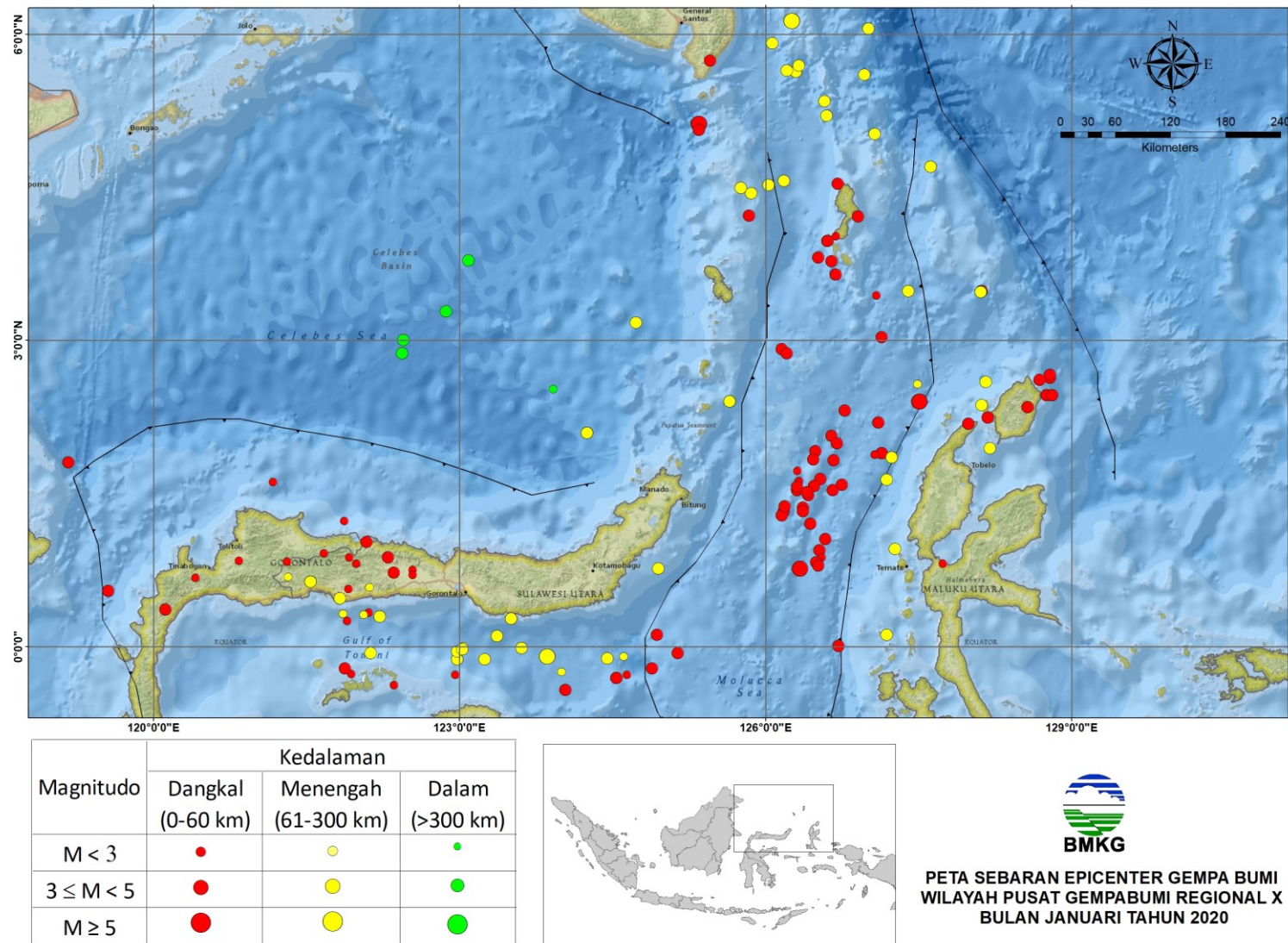
Tabel 3 Data kejadian gempabumi bulan Januari 2020

No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/01/2020	04:38:04	2.06	126.65	10	4.1	0.09383	0.06446	0.10589	Northern Molucca Sea
2	01/01/2020	12:28:33	0.47	121.83	131	4.1				Minahassa Peninsula
3	01/01/2020	14:36:23	1.99	126.70	10	4.2	0.07962	0.07258	0.06397	Northern Molucca Sea
4	02/01/2020	05:09:12	1.53	126.66	38	3.7				Northern Molucca Sea
5	02/01/2020	14:03:17	2.63	128.79	10	4.9				Halmahera
6	02/01/2020	14:10:35	2.61	128.69	10	4.2				Halmahera
7	02/01/2020	16:08:12	0.00	123.04	113	3.3				Minahassa Peninsula
8	02/01/2020	18:55:16	0.67	120.41	14	2.7				Minahassa Peninsula
9	02/01/2020	19:50:47	1.48	126.42	10	3.5				Northern Molucca Sea
10	02/01/2020	21:13:00	3.48	127.40	80	4.0				Talaud Island
11	02/01/2020	23:59:16	2.66	128.79	10	4.3				Halmahera
12	03/01/2020	02:44:46	1.36	126.37	32	3.4				Northern Molucca Sea
13	03/01/2020	03:09:28	-0.07	125.14	10	4.7				Southern Molucca Sea
14	03/01/2020	12:13:17	4.21	126.91	19	4.2				Talaud Island
15	03/01/2020	12:38:06	4.49	125.76	119	4.4				Talaud Island
16	03/01/2020	19:03:59	2.36	128.12	120	4.0				Halmahera
17	03/01/2020	20:44:48	5.74	125.46	16	4.3				Talaud Island
18	03/01/2020	23:36:09	4.56	126.18	97	4.9				Talaud Island
19	04/01/2020	03:40:46	1.53	126.31	10	4.1				Northern Molucca Sea
20	04/01/2020	12:40:09	6.69	125.33	37	4.7				Mindanao, Philippines
21	05/01/2020	07:40:51	3.97	126.61	28	4.5				Talaud Island
22	05/01/2020	14:30:30	-0.31	124.54	22	4.2				Southern Molucca Sea
23	05/01/2020	17:25:26	-0.13	122.98	104	4.6				Minahassa Peninsula
24	05/01/2020	18:58:52	6.13	126.26	85	5.2				Mindanao, Philippines
25	06/01/2020	03:35:44	2.18	127.99	4	4.0				Halmahera
26	06/01/2020	06:04:00	5.34	126.58	156	4.3				Talaud Island
27	06/01/2020	07:25:34	5.12	125.35	10	5.1				Talaud Island
28	06/01/2020	11:42:39	2.40	125.65	82	3.6				Talaud Island
29	06/01/2020	14:07:15	1.89	127.14	17	3.9				Halmahera
30	06/01/2020	20:09:23	3.47	128.11	88	4.0				Halmahera
31	07/01/2020	08:27:12	1.85	127.24	96	4.5				Halmahera
32	07/01/2020	20:20:17	2.09	124.25	275	4.7				Celebes Sea
33	08/01/2020	01:40:19	0.63	121.54	77	3.6				Minahassa Peninsula
34	08/01/2020	04:11:44	5.06	125.35	10	4.9				Mindanao, Filipina
35	08/01/2020	06:55:21	0.27	123.51	133	3.5				Minahassa Peninsula

36	08/01/2020	13:43:35	5.63	126.30	109	4.9				Talaud Island
37	09/01/2020	01:57:09	2.46	128.76	10	4.6				Halmahera
38	09/01/2020	13:49:36	4.70	127.62	116	4.5				Talaud Island
39	09/01/2020	14:30:49	2.24	128.18	10	3.8				Halmahera
40	09/01/2020	14:32:29	0.81	121.99	44	3.0				Minahassa Peninsula
41	09/01/2020	15:31:17	2.46	128.81	10	4.7				Halmahera
42	09/01/2020	17:57:32	1.62	126.33	10	3.2				Northern Molucca Sea
43	09/01/2020	21:44:17	2.34	128.57	31	3.5				Halmahera
44	09/01/2020	23:13:11	2.40	127.51	23	5.3				Halmahera
45	10/01/2020	17:16:42	3.48	128.12	10	4.9				Halmahera
46	10/01/2020	23:25:47	1.88	127.07	28	3.2				Halmahera
47	11/01/2020	12:30:20	-0.05	122.98	135	4.7				Minahassa Peninsula
48	11/01/2020	15:16:56	0.58	122.12	83	2.4				Minahassa Peninsula
49	11/01/2020	17:12:10	1.72	126.31	20	3.1				Northern Molucca Sea
50	11/01/2020	22:47:08	1.05	126.59	10	3.5				Northern Molucca Sea
51	12/01/2020	02:54:45	2.59	128.16	139	4.3				Halmahera
52	12/01/2020	16:03:19	1.56	126.31	10	4.1	0.21637	0.20249	0.14510	Northern Molucca Sea
53	12/01/2020	18:03:49	-0.28	122.96	10	2.4				Minahassa Peninsula
54	12/01/2020	21:59:41	0.75	122.54	33	2.9				Minahassa Peninsula
55	13/01/2020	00:31:33	1.64	126.54	10	3.8				Northern Molucca Sea
56	13/01/2020	05:39:21	1.94	128.20	128	3.9				Halmahera
57	13/01/2020	06:10:48	1.32	126.18	18	3.7				Northern Molucca Sea
58	13/01/2020	10:19:17	3.64	126.69	29	3.7				Talaud Islands
59	13/01/2020	15:47:13	0.83	121.31	27	2.0				Minahassa Peninsula
60	13/01/2020	21:05:50	1.28	126.16	10	3.7				Northern Molucca Sea
61	14/01/2020	00:06:46	5.02	127.07	80	4.8				Philippine Island Region
62	14/01/2020	01:54:24	5.64	126.21	137	4.5				Mindanao, Philippines
63	14/01/2020	06:08:49	0.81	127.74	10	2.8				Halmahera
64	14/01/2020	22:00:16	0.91	121.67	26	2.9				Minahassa Peninsula
65	15/01/2020	01:43:49	2.57	127.49	112	3.4				Halmahera
66	15/01/2020	02:40:11	5.60	126.97	148	4.7				Mindanao, Philippines
67	15/01/2020	05:21:29	1.37	126.19	29	3.6				Northern Molucca Sea
68	15/01/2020	10:51:08	-0.02	123.61	98	3.7				Minahassa Peninsula
69	15/01/2020	12:15:35	3.28	122.87	515	4.1				Celebes Sea
70	15/01/2020	13:37:58	0.94	126.53	19	3.4				Northern Molucca Sea
71	15/01/2020	19:51:00	0.87	126.55	18	3.1				Northern Molucca Sea
72	15/01/2020	19:52:06	3.77	126.65	10	3.8				Talaud Island
73	15/01/2020	20:18:51	1.80	119.17	10	3.4				Celebes Sea
74	16/01/2020	11:20:20	2.19	127.11	20	4.0				Halmahera
75	16/01/2020	14:05:29	0.54	119.56	10	4.2				Minahassa Peninsula
76	17/01/2020	03:24:58	1.61	121.17	19	2.7				Minahassa Peninsula
77	17/01/2020	03:39:48	6.05	127.01	176	4.8				Philippine Island Region
78	17/01/2020	04:28:07	5.91	126.07	154	4.8				Mindanao, Philippines
79	17/01/2020	05:32:33	0.31	122.06	175	2.8				Minahassa Peninsula

80	17/01/2020	09:31:09	0.25	121.90	55	2.4				Minahassa Peninsula
81	17/01/2020	10:56:58	0.36	120.12	10	3.5				Minahassa Peninsula
82	17/01/2020	11:03:23	5.69	126.33	105	4.9				Mindanao, Philippines
83	17/01/2020	17:42:22	3.03	127.14	10	3.8				Talaud Island
84	17/01/2020	20:24:46	4.02	126.69	37	2.9				Talaud Island
85	17/01/2020	20:34:56	0.84	120.84	59	2.6				Minahassa Peninsula
86	18/01/2020	03:31:17	0.11	124.94	13	4.5	0.22030	0.21046	0.12954	Northern Molucca Sea
87	18/01/2020	17:41:50	1.02	122.09	28	3.4				Minahassa Peninsula
88	18/01/2020	21:00:35	0.32	121.86	150	2.2				Minahassa Peninsula
89	18/01/2020	21:26:16	2.52	123.92	356	3.4				Northern Molucca Sea
90	19/01/2020	03:06:39	0.10	123.37	115	4.3				Minahassa Peninsula
91	19/01/2020	07:08:06	2.87	122.44	477	4.2				Celebes Sea
92	19/01/2020	12:10:51	-0.13	123.25	117	4.3				Minahassa Peninsula
93	19/01/2020	16:58:20	-0.10	123.86	129	6.2	1.30910	1.21317	1.09771	Minahassa Peninsula
94	19/01/2020	23:34:53	2.91	126.16	24	4.1				Northern Molucca Sea
95	20/01/2020	21:12:36	0.29	122.22	157	4.0				Minahassa Peninsula
96	21/01/2020	03:36:15	0.87	122.30	37	3.4				Minahassa Peninsula
97	21/01/2020	06:24:42	4.22	125.84	26	4.0				Talaud Island
98	21/01/2020	14:52:02	1.91	126.49	10	4.1				Northern Molucca Sea
99	21/01/2020	17:11:44	0.70	122.54	10	3.2				Minahassa Peninsula
100	21/01/2020	19:32:53	0.33	122.11	10	2.5				Minahassa Peninsula
101	22/01/2020	13:34:27	1.83	126.47	18	4.4	0.13412	0.12778	0.09723	Northern Molucca Sea
102	22/01/2020	17:03:29	0.76	124.95	81	4.8				Minahassa Peninsula
103	23/01/2020	08:25:58	-0.03	123.03	95	4.6				Minahassa Peninsula
104	23/01/2020	16:30:42	0.00	126.72	10	3.8				Northern Molucca Sea
105	23/01/2020	16:33:11	0.68	121.32	94	2.6				Minahassa Peninsula
106	23/01/2020	21:59:07	3.78	123.09	525	4.6				Celebes Sea
107	24/01/2020	04:56:15	-0.28	124.64	27	3.3				Southern Molucca Sea
108	24/01/2020	09:44:13	4.53	126.71	31	4.5				Talaud Island
109	24/01/2020	15:36:58	1.58	126.75	12	3.8				Northern Molucca Sea
110	25/01/2020	01:59:18	2.87	126.21	10	3.5				Northern Molucca Sea
111	25/01/2020	03:30:55	-0.07	122.13	262	4.0				Minahassa Peninsula
112	25/01/2020	06:55:26	1.57	126.48	10	3.7				Northern Molucca Sea
113	25/01/2020	07:44:17	1.63	127.19	106	4.0				Halmahera
114	25/01/2020	11:15:31	-0.25	124.00	119	3.2				Minahassa Peninsula
115	25/01/2020	16:30:06	-0.12	124.45	90	4.1				Southern Molucca Sea
116	25/01/2020	18:11:25	2.31	126.78	10	3.5				Northern Molucca Sea
117	26/01/2020	02:24:11	0.72	122.36	58	3.4				Minahassa Peninsula
118	26/01/2020	02:47:06	3.17	124.73	262	4.3				Celebes Sea
119	26/01/2020	04:51:12	-0.22	124.89	10	4.2				Minahassa Peninsula
120	26/01/2020	06:41:26	1.82	126.67	30	4.1				Northern Molucca Sea
121	27/01/2020	02:32:35	0.82	126.50	15	3.7				Northern Molucca Sea
122	27/01/2020	03:32:35	0.79	126.52	14	3.7				Northern Molucca Sea
123	27/01/2020	09:00:03	3.81	126.52	10	4.4				Northern Molucca Sea
124	27/01/2020	14:58:06	5.20	126.60	211	3.6				Talaud Island

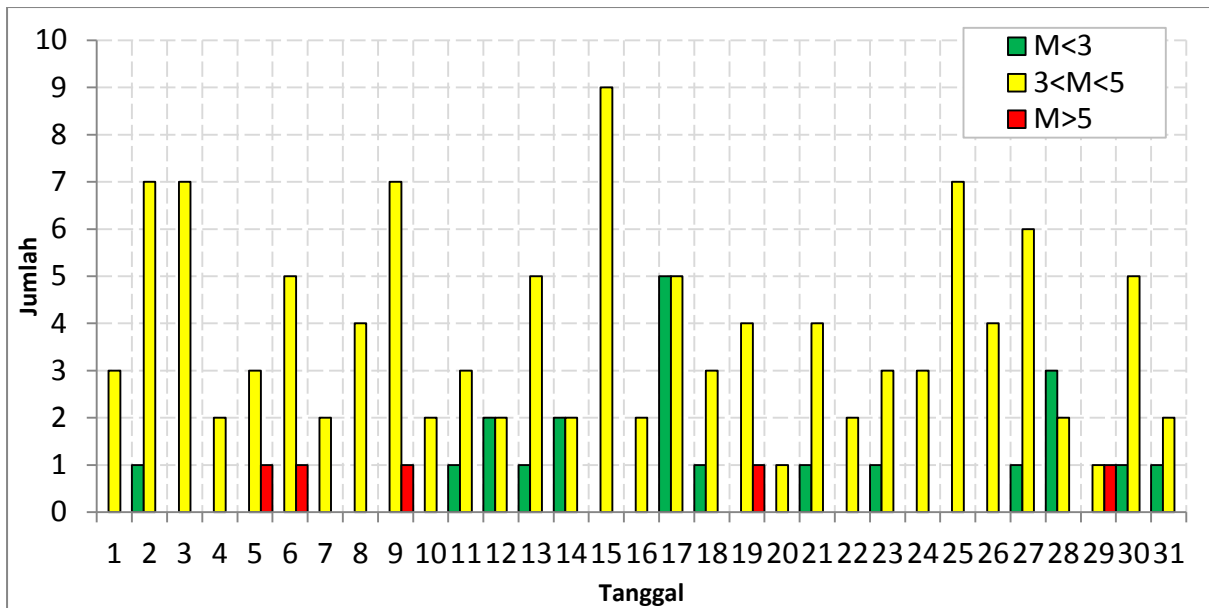
125	27/01/2020	16:09:07	-0.10	124.61	65	3.3				Minahassa Peninsula
126	27/01/2020	16:16:54	3.44	127.09	10	2.9				Talaud Island
127	27/01/2020	20:46:08	0.11	127.19	111	4.0				Halmahera
128	28/01/2020	07:49:13	-0.27	121.94	14	2.7				Minahassa Peninsula
129	28/01/2020	16:20:44	-0.38	122.36	10	2.3				Minahassa Peninsula
130	28/01/2020	17:14:41	3.00	122.45	539	4.0				Celebes Sea
131	28/01/2020	19:17:03	0.56	121.91	51	2.6				Minahassa Peninsula
132	28/01/2020	23:40:34	4.52	126.03	106	4.1				Talaud Island
133	29/01/2020	02:51:08	-0.22	121.88	10	3.8				Minahassa Peninsula
134	29/01/2020	23:46:58	0.76	126.34	55	5.8	1.66647	1.44746	1.21635	Northern Molucca Sea
135	30/01/2020	01:02:46	1.51	126.41	10	4.5	0.26967	0.34474	0.19684	Northern Molucca Sea
136	30/01/2020	03:12:45	4.44	125.86	161	4.1				Talaud Island
137	30/01/2020	06:25:21	6.76	126.12	134	4.8				Mindanao, Philippines
138	30/01/2020	11:30:44	1.23	121.87	10	2.4				Minahassa Peninsula
139	30/01/2020	13:37:10	0.95	127.27	143	4.3				Halmahera
140	30/01/2020	15:37:06	-0.43	124.04	58	4.3				Southern Molucca Sea
141	31/01/2020	04:00:08	1.20	126.44	10	4.3	0.11881	0.13736	0.11268	Northern Molucca Sea
142	31/01/2020	04:44:46	0.87	121.92	24	2.8				Minahassa Peninsula
143	31/01/2020	06:44:46	1.32	126.37	10	3.5				Northern Molucca Sea



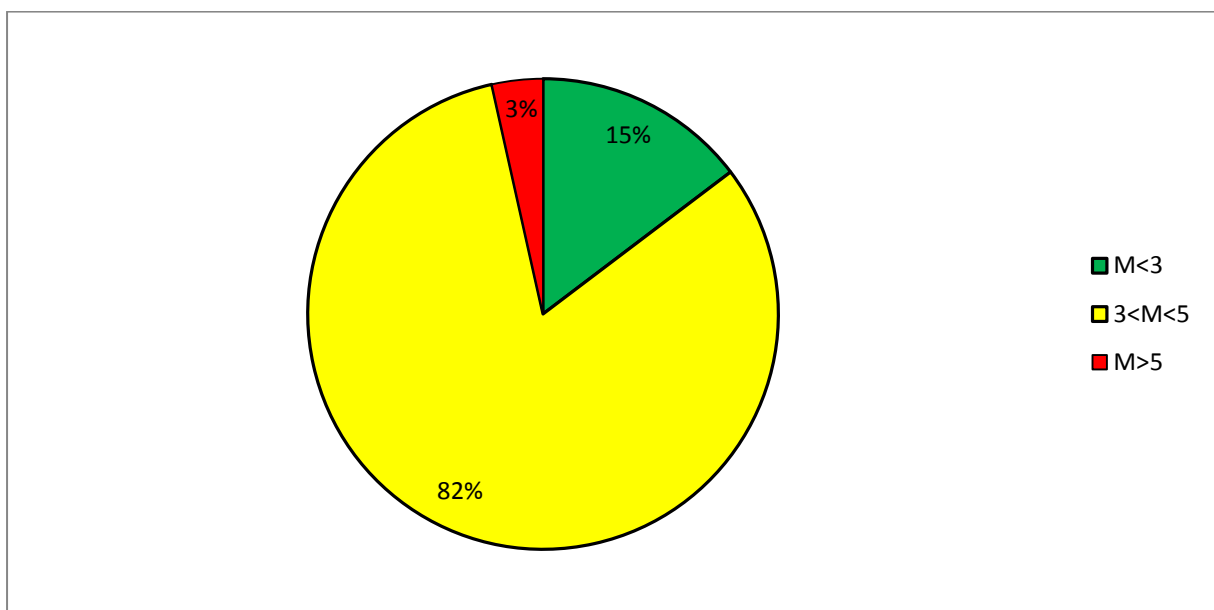
Gambar 5 Sebaran episenter gempabumi bulan Januari 2020

Tabel 4 Rekapitulasi gempabumi berdasarkan magnitudo bulan Januari 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	0	3	0	3	0	0
2	1	7	0	8	1	0
3	0	7	0	7	0	0
4	0	2	0	2	0	0
5	0	3	1	4	0	0
6	0	5	1	6	0	0
7	0	2	0	2	0	0
8	0	4	0	4	0	0
9	0	7	1	8	2	0
10	0	2	0	2	0	0
11	1	3	0	4	0	0
12	2	2	0	4	0	0
13	1	5	0	6	0	0
14	2	2	0	4	0	0
15	0	9	0	9	0	0
16	0	2	0	2	0	0
17	5	5	0	10	0	0
18	1	3	0	4	0	0
19	0	4	1	5	1	0
20	0	1	0	1	0	0
21	1	4	0	5	0	0
22	0	2	0	2	0	0
23	1	3	0	4	0	0
24	0	3	0	3	0	0
25	0	7	0	7	0	0
26	0	4	0	4	0	0
27	1	6	0	7	0	0
28	3	2	0	5	0	0
29	0	1	1	2	1	0
30	1	5	0	6	0	0
31	1	2	0	3	0	0
Jumlah gempa	21	117	5	143	5	0



Gambar 6 Grafik gempabumi berdasarkan magnitudo bulan Januari 2020



Gambar 7 Grafik persentase gempabumi berdasarkan magnitudo bulan Januari 2020

B. Data Gempabumi Bulan Februari 2020

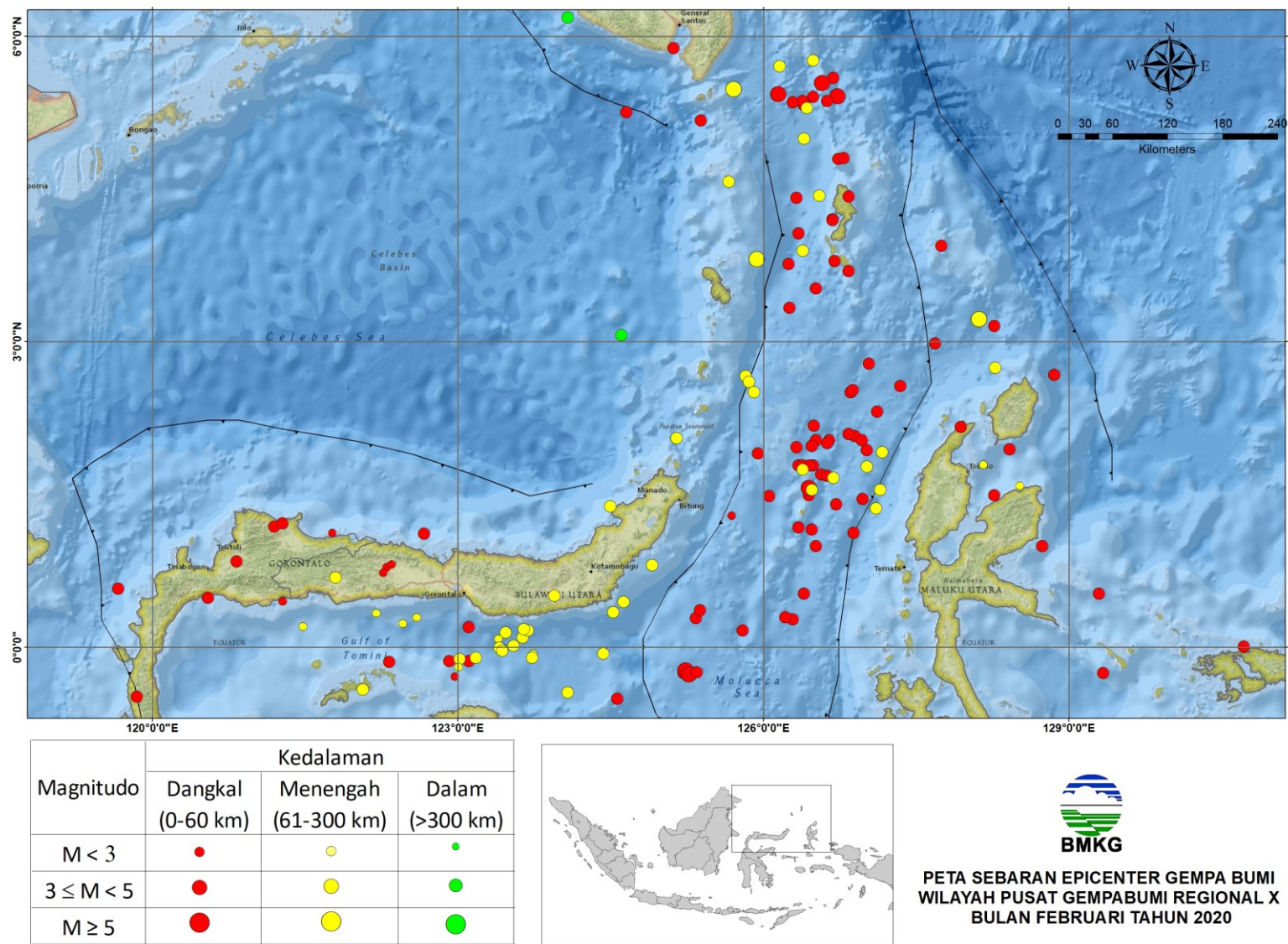
Tabel 5 Data kejadian gempabumi bulan Februari 2020

No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLM I			Region
			Lat	Long			X	Y	Z	
1	01/02/2020	04:19:26	4.41	126.33	21	4.1				Talaud Islands
2	01/02/2020	13:26:30	-0.45	124.08	101	3.7				Southern Molucca Sea
3	01/02/2020	14:14:05	5.76	126.49	128	4.7				Talaud Islands
4	01/02/2020	16:27:34	0.78	122.30	33	2.9				Minahassa Peninsula
5	01/02/2020	19:20:05	0.29	122.60	153	2.9				Minahassa Peninsula
6	01/02/2020	19:54:27	4.20	126.68	16	4.5				Talaud Islands
7	01/02/2020	21:05:49	4.43	126.55	97	4.4				Talaud Islands
8	01/02/2020	22:18:49	0.48	120.55	23	4.7				Minahassa Peninsula
9	02/02/2020	02:05:57	1.12	121.77	10	2.9				Minahassa Peninsula
10	02/02/2020	08:28:48	0.08	123.40	98	3.0				Minahassa Peninsula
11	02/02/2020	18:56:14	1.90	125.95	27	4.3	0.18636	0.17979	0.30907	Northern Molucca Sea
12	03/02/2020	07:39:38	-0.29	122.97	48	3.0				Minahassa Peninsula
13	03/02/2020	11:58:43	2.07	126.90	10	3.2				Northern Molucca Sea
14	03/02/2020	12:12:39	-0.26	125.22	10	5.0	0.14111	0.19879	0.28342	Southern Molucca Sea
15	03/02/2020	13:02:04	1.49	126.45	10	3.8				Halmahera, Indonesia
16	03/02/2020	13:22:14	2.67	128.86	10	4.1				Halmahera, Indonesia
17	03/02/2020	17:51:58	6.69	125.29	27	4.8				Mindanao, Philippines
18	03/02/2020	22:49:06	4.06	126.35	19	4.5				Talaud Islands
19	03/02/2020	23:47:05	1.81	127.16	98	4.0				Halmahera, Indonesia
20	04/02/2020	04:13:12	5.70	126.16	103	4.8				Mindanao, Philippines
21	04/02/2020	06:35:00	2.03	126.65	11	3.7				Northern Molucca Sea
22	04/02/2020	10:53:05	0.57	119.67	10	4.1				Minahassa Peninsula
23	04/02/2020	12:28:30	3.94	127.75	10	4.4				Talaud Islands
24	04/02/2020	16:17:36	1.96	126.33	10	4.3				Northern Molucca Sea
25	04/02/2020	16:33:14	2.74	128.28	195	3.8				Halmahera, Indonesia
26	04/02/2020	20:13:01	2.98	127.69	32	3.9				Northern Molucca Sea
27	04/02/2020	21:58:12	0.33	122.20	165	2.7				Minahassa Peninsula
28	04/02/2020	23:38:13	-0.03	123.44	119	4.8	0.38495	0.23641	0.23554	Minahassa Peninsula
29	05/02/2020	01:42:11	4.57	125.66	135	4.2				Talaud Islands
30	05/02/2020	05:19:12	1.11	122.67	10	3.2				Minahassa Peninsula
31	06/02/2020	05:48:10	0.52	129.30	15	3.9				Halmahera, Indonesia
32	06/02/2020	06:43:30	-0.15	122.33	5	3.6				Minahassa Peninsula
33	06/02/2020	13:40:08	5.54	126.58	36	6.1	0.15871	0.23638	0.22594	Mindanao, Philippines
34	06/02/2020	13:45:41	5.40	126.49	10	4.9				Mindanao, Philippines
35	06/02/2020	14:20:46	5.29	126.43	69	4.7				Mindanao, Philippines
36	06/02/2020	14:37:28	1.54	126.48	82	3.2				Northern Molucca Sea
37	06/02/2020	15:28:13	-0.26	129.34	11	3.4				Halmahera, Indonesia
38	06/02/2020	16:32:51	1.49	128.27	10	4.5				Halmahera, Indonesia

39	06/02/2020	18:27:22	5.35	126.40	48	4.7				Mindanao, Philippines
40	06/02/2020	22:13:49	1.69	126.57	60	3.3				Northern Molucca Sea
41	06/02/2020	23:20:45	4.99	126.40	88	4.2				Mindanao, Philippines
42	07/02/2020	02:03:34	5.32	126.40	10	4.5				Talaud Islands
43	07/02/2020	08:44:26	0.09	123.64	67	4.1				Minahassa Peninsula
44	07/02/2020	13:03:03	5.36	126.39	10	4.6				Talaud Islands
45	07/02/2020	17:18:14	-0.07	123.74	189	2.9				Minahassa Peninsula
46	07/02/2020	22:26:43	2.03	126.97	27	3.3				Northern Molucca Sea
47	08/02/2020	02:08:20	0.19	123.11	10	3.3				Minahassa Peninsula,
48	08/02/2020	05:51:22	1.78	126.35	30	3.7				Northern Molucca Sea
49	08/02/2020	09:11:47	4.42	126.84	46	4.2				Talaud Islands
50	08/02/2020	13:23:12	0.28	125.34	10	3.6				Northern Molucca Sea
51	08/02/2020	14:47:03	0.16	123.69	75	3.2				Minahassa Peninsula,
52	08/02/2020	16:10:17	4.79	126.74	43	4.6				Talaud Islands
53	08/02/2020	17:08:02	1.29	125.69	35	2.9				Northern Molucca Sea
54	08/02/2020	17:58:28	-0.91	120.27	10	3.0				Minahassa Peninsula,
55	08/02/2020	20:02:30	0.16	125.80	43	3.2				Northern Molucca Sea
56	08/02/2020	20:38:11	1.58	128.52	96	2.7				Halmahera, Indonesia
57	09/02/2020	04:14:06	3.79	126.70	59	3.9				Talaud Islands
58	09/02/2020	16:10:16	4.80	126.79	30	4.6				Talaud Islands
59	09/02/2020	20:38:09	1.79	128.16	112	2.6				Halmahera, Indonesia
60	09/02/2020	23:53:15	-0.01	123.41	99	4.5				Minahassa Peninsula,
61	10/02/2020	04:59:44	3.89	126.39	75	4.2				Talaud Islands
62	11/02/2020	01:27:50	1.78	126.39	10	3.8				Northern Molucca Sea
63	11/02/2020	03:04:57	-0.11	123.73	116	4.3				Minahassa Peninsula,
64	11/02/2020	15:13:28	0.17	123.65	110	4.5				Minahassa Peninsula,
65	11/02/2020	15:45:11	1.18	121.20	60	3.7				Minahassa Peninsula,
66	11/02/2020	17:25:26	1.40	126.72	31	3.2				Northern Molucca Sea
67	11/02/2020	17:37:56	-0.42	131.96	10	2.8				Irian Jaya
68	11/02/2020	17:55:18	1.74	126.39	83	3.2				Northern Molucca Sea
69	11/02/2020	18:21:05	1.17	126.35	10	3.3				Northern Molucca Sea
70	11/02/2020	18:22:53	1.93	127.02	10	3.7				Halmahera, Indonesia
71	11/02/2020	21:36:04	0.00	130.72	16	4.0				Irian Jaya
72	12/02/2020	03:40:49	0.44	124.63	209	3.1				Minahassa Peninsula,
73	12/02/2020	08:41:21	0.80	124.91	93	4.6				Minahassa Peninsula,
74	12/02/2020	09:02:16	2.66	125.83	106	3.6				Talaud Islands
75	12/02/2020	14:29:00	5.25	124.66	10	4.3				Talaud Islands
76	12/02/2020	19:08:03	0.20	121.48	146	2.6				Minahassa Peninsula,
77	13/02/2020	14:14:58	0.73	122.27	60	3.0				Minahassa Peninsula,
78	14/02/2020	17:03:43	-0.11	123.18	139	4.3				Minahassa Peninsula,
79	14/02/2020	17:10:11	-0.14	123.11	11	3.8				Minahassa Peninsula,
80	14/02/2020	23:41:48	0.52	126.40	10	3.3				Northern Molucca Sea
81	15/02/2020	09:45:56	3.69	126.84	45	4.7				Talaud Islands
82	15/02/2020	11:40:52	0.99	126.52	10	3.6				Northern Molucca Sea
83	15/02/2020	15:36:47	1.56	126.45	53	5.5	1.04138	1.42464	1.42517	Northern Molucca Sea

84	15/02/2020	16:50:46	2.56	127.35	10	4.5				Northern Molucca Sea
85	15/02/2020	17:46:58	1.68	126.63	10	4.3				Northern Molucca Sea
86	16/02/2020	03:23:21	1.38	124.50	201	3.8				Minahassa Peninsula,
87	16/02/2020	05:46:57	0.50	123.95	159	3.7				Minahassa Peninsula,
88	16/02/2020	06:28:48	3.52	126.52	40	4.0				Talaud Islands
89	16/02/2020	16:20:41	1.78	126.49	26	3.6				Northern Molucca Sea
90	16/02/2020	16:49:09	0.45	121.28	57	2.3				Minahassa Peninsula,
91	16/02/2020	16:55:40	1.54	127.15	133	3.7				Halmahera, Indonesia
92	16/02/2020	18:07:07	6.32	126.07	69	4.5				Mindanao, Philippines
93	16/02/2020	18:11:53	2.50	126.86	10	3.4				Northern Molucca Sea
94	16/02/2020	22:08:55	-0.04	123.44	125	4.3				Minahassa Peninsula,
95	17/02/2020	16:20:40	1.78	126.46	26	3.6				Northern Molucca Sea
96	17/02/2020	16:49:08	0.45	121.28	57	2.3				Minahassa Peninsula,
97	17/02/2020	18:07:06	6.32	126.07	69	4.5				Mindanao, Philippines
98	17/02/2020	18:11:52	2.50	126.86	10	3.4				Northern Molucca Sea
99	17/02/2020	22:08:55	0.14	123.47	132	4.3				Minahassa Peninsula,
100	18/02/2020	02:58:07	5.35	126.29	10	4.8				Mindanao, Philippines
101	18/02/2020	06:22:01	2.16	127.94	10	4.9	0.32023	0.22728	0.25400	Northern Molucca Sea
102	18/02/2020	11:55:40	6.56	126.72	126	4.3				Mindanao, Philippines
103	18/02/2020	14:46:57	-0.51	124.57	10	3.1				Southern Molucca Sea
104	18/02/2020	16:49:25	0.34	124.53	92	3.4				Minahassa Peninsula,
105	18/02/2020	17:02:34	1.66	126.69	92	3.9				Northern Molucca Sea
106	19/02/2020	09:47:21	-0.12	123.02	96	4.8				Minahassa Peninsula,
107	19/02/2020	13:04:27	-0.42	122.07	142	3.2				Minahassa Peninsula,
108	19/02/2020	23:40:25	0.84	120.83	10	3.5				Minahassa Peninsula,
109	20/02/2020	04:56:12	2.60	125.86	110	4.5				Talaud Islands
110	20/02/2020	05:33:21	1.36	127.11	90	3.8				Halmahera, Indonesia
111	20/02/2020	09:54:09	5.48	125.71	183	5.4				Mindanao, Philippines
112	20/02/2020	14:02:53	1.29	132.78	10	4.4				Irian Jaya
113	20/02/2020	18:51:16	1.91	127.17	108	3.8				Halmahera, Indonesia
114	20/02/2020	22:23:22	2.03	126.52	8	3.6				Halmahera, Indonesia
115	21/02/2020	02:28:54	-0.20	123.01	61	2.9				Minahassa Peninsula,
116	21/02/2020	14:27:18	3.76	126.25	43	4.1				Talaud Islands
117	22/02/2020	06:18:07	-0.07	124.43	139	4.5				Southern Molucca Sea
118	22/02/2020	07:20:50	2.52	126.88	11	3.6				Halmahera, Indonesia
119	22/02/2020	09:17:49	3.06	124.61	346	4.1				Talaud Islands
120	22/02/2020	15:29:52	5.41	126.73	10	5.2				Mindanao, Philippines
121	22/02/2020	15:34:47	5.43	126.15	10	5.4	0.14469	0.12393	0.16591	Talaud Islands
122	22/02/2020	15:37:01	0.60	111.25	90	3.5				Borneo
123	22/02/2020	15:39:06	5.59	126.69	10	4.9	0.14470	0.12392	0.16597	Talaud Islands
124	22/02/2020	16:29:35	5.36	126.63	6	4.8				Talaud Islands
125	22/02/2020	17:47:55	2.17	126.50	16	4.0				Talaud Islands
126	22/02/2020	20:14:22	0.27	126.29	10	4.0				Halmahera, Indonesia
127	22/02/2020	22:02:04	2.31	127.12	10	3.9				Halmahera, Indonesia
128	23/02/2020	02:08:04	-0.23	125.24	10	5.3	0.28691	0.32638	0.37570	Southern Molucca Sea

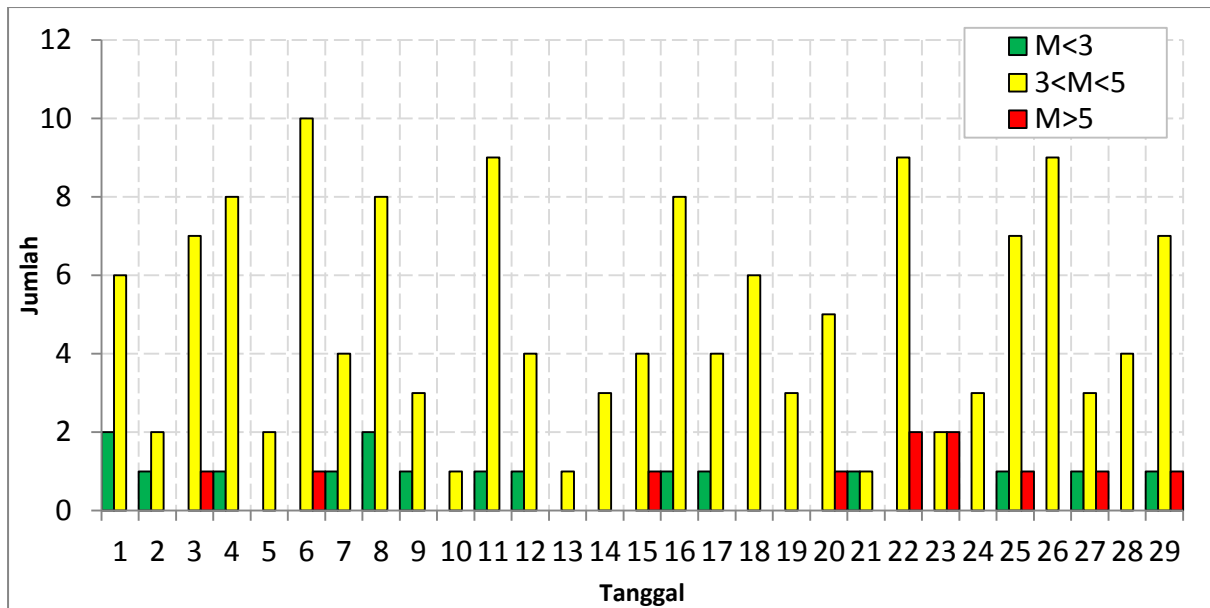
129	23/02/2020	03:39:54	-0.27	125.27	10	5.2	0.14173	0.16490	0.18122	Southern Molucca Sea
130	23/02/2020	16:50:29	1.12	126.89	14	4.0				Northern Molucca Sea
131	23/02/2020	20:22:59	-0.49	119.85	10	3.4				Minahassa Peninsula,
132	24/02/2020	00:23:58	5.88	125.12	10	4.6				Mindanao, Philippines
133	24/02/2020	15:56:18	4.19	126.68	29	4.1				Talaud Islands
134	24/02/2020	23:34:21	5.93	126.98	146	4.5				Talaud Islands
135	25/02/2020	00:18:28	1.77	127.02	106	3.8				Northern Molucca Sea
136	25/02/2020	00:39:10	0.23	122.46	123	2.8				Minahassa Peninsula,
137	25/02/2020	02:03:42	1.45	126.98	29	3.1				Northern Molucca Sea
138	25/02/2020	09:25:46	0.75	126.20	10	3.7				Northern Molucca Sea
139	25/02/2020	13:13:10	6.18	124.08	537	4.6				Mindanao, Philippines
140	25/02/2020	15:36:09	-0.25	125.35	18	4.0				Southern Molucca Sea
141	25/02/2020	16:14:01	5.52	126.23	153	4.2				Talaud Islands
142	25/02/2020	19:11:52	0.01	123.55	98	3.8				Minahassa Peninsula,
143	25/02/2020	20:50:49	5.17	125.39	31	5.0				Mindanao, Philippines
144	26/02/2020	00:34:00	2.78	127.04	10	3.9				Northern Molucca Sea
145	26/02/2020	01:44:36	1.21	121.28	10	3.1				Minahassa Peninsula,
146	26/02/2020	05:13:52	4.42	125.89	98	4.2				Talaud Islands
147	26/02/2020	08:09:29	2.50	125.91	107	4.1				Talaud Islands
148	26/02/2020	09:11:04	3.15	128.27	10	4.5				North of Halmahera,
149	26/02/2020	11:38:24	3.33	126.26	10	3.5				Talaud Islands
150	26/02/2020	12:17:43	0.81	125.86	10	3.6				Northern Molucca Sea
151	26/02/2020	15:03:18	1.48	126.06	27	3.7				Northern Molucca Sea
152	26/02/2020	19:38:17	1.85	127.03	23	3.8				Halmahera, Indonesia
153	27/02/2020	02:36:20	0.68	121.80	89	4.5				Minahassa Peninsula,
154	27/02/2020	16:14:51	0.81	122.35	30	2.6				Minahassa Peninsula,
155	27/02/2020	19:13:04	3.81	125.94	138	5.6	0.29784	0.43286	0.59052	Talaud Islands
156	27/02/2020	19:20:56	1.97	126.48	10	4.9				Northern Molucca Sea
157	27/02/2020	20:30:34	0.36	125.38	10	3.6				Northern Molucca Sea
158	28/02/2020	09:44:32	2.00	126.63	24	3.9				Northern Molucca Sea
159	28/02/2020	10:07:20	1.15	126.48	18	4.2				Northern Molucca Sea
160	28/02/2020	10:54:04	2.09	126.84	10	4.5				Northern Molucca Sea
161	28/02/2020	16:28:28	-0.46	123.94	33	3.8				Minahassa Peninsula,
162	29/02/2020	04:18:44	0.29	126.22	10	4.0				Northern Molucca Sea
163	29/02/2020	05:32:13	4.51	124.94	10	4.2				Talaud Islands
164	29/02/2020	09:28:26	3.22	128.12	140	5.5	0.74737	1.52056	1.82033	North of Halmahera,
165	29/02/2020	12:09:27	0.99	127.91	12	2.7				Halmahera, Indonesia
166	29/02/2020	15:54:37	2.07	128.07	10	3.8				Halmahera, Indonesia
167	29/02/2020	17:53:38	0.99	128.74	10	3.3				Halmahera, Indonesia
168	29/02/2020	17:56:07	-0.17	123.04	94	4.0				Minahassa Peninsula,
169	29/02/2020	18:30:16	2.05	125.15	171	4.0				Talaud Islands
170	29/02/2020	18:56:10	-0.14	122.92	47	4.6	0.11436	0.05206	0.05902	Minahassa Peninsula,



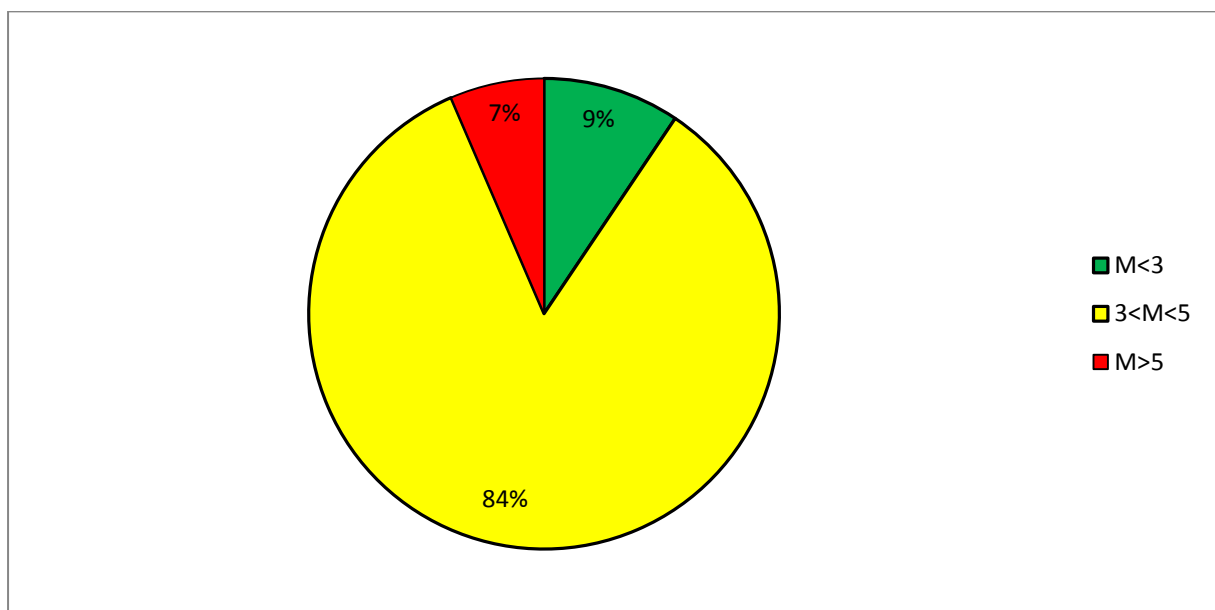
Gambar 8 Sebaran episenter gempabumi bulan Februari 2020

Tabel 6 Rekapitulasi gempabumi berdasarkan magnitudo bulan Februari 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	2	6	0	8	0	0
2	1	2	0	3	0	0
3	0	7	1	8	0	0
4	1	8	0	9	0	0
5	0	2	0	2	0	0
6	0	10	1	11	2	0
7	1	4	0	5	0	0
8	2	8	0	10	0	0
9	1	3	0	4	0	0
10	0	1	0	1	0	0
11	1	9	0	10	0	0
12	1	4	0	5	0	0
13	0	1	0	1	0	0
14	0	3	0	3	0	0
15	0	4	1	5	1	0
16	1	8	0	9	0	0
17	1	4	0	5	0	0
18	0	6	0	6	1	0
19	0	3	0	3	0	0
20	0	5	1	6	0	0
21	1	1	0	2	0	0
22	0	9	2	11	0	0
23	0	2	2	4	2	0
24	0	3	0	3	0	0
25	1	7	1	9	0	0
26	0	9	0	9	0	0
27	1	3	1	5	1	0
28	0	4	0	4	0	0
29	1	7	1	9	2	0
Jumlah gempa	16	143	11	170	9	0



Gambar 9 Grafik gempabumi berdasarkan magnitudo bulan Februari 2020



Gambar 10 Grafik persentase gempabumi berdasarkan magnitudo bulan Februari 2020

C. Data Gempabumi Bulan Maret 2020

Tabel 7 Data kejadian gempabumi bulan Maret 2020

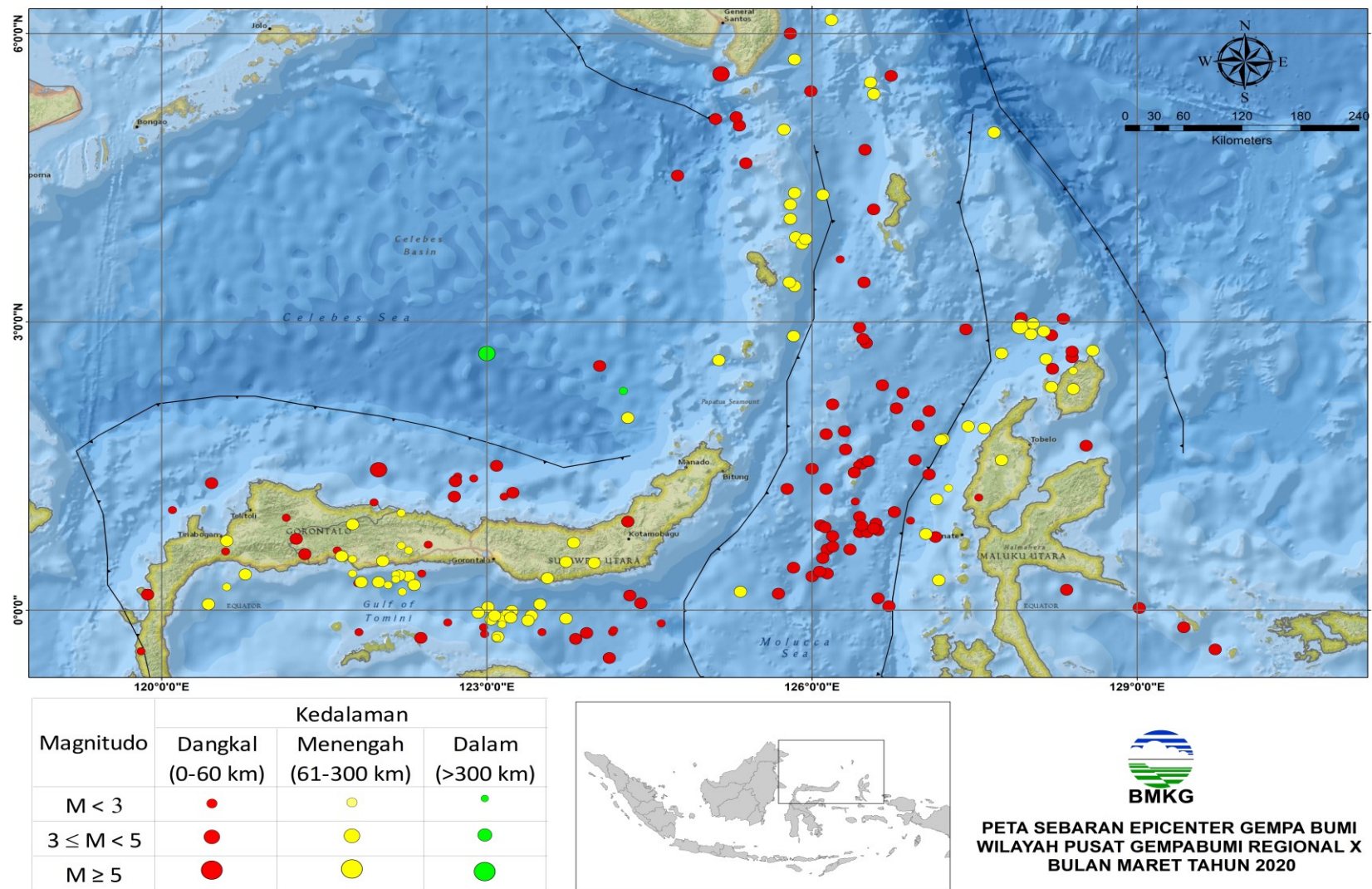
No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/03/2020	10:10:26	1.27	127.26	73	2.8				Halmahera
2	01/03/2020	11:01:38	5.49	126.54	84	4.6				Talaud Islands
3	01/03/2020	16:08:47	0.63	126.14	10	3.5				Northern Molucca Sea
4	01/03/2020	17:11:03	-0.18	129.43	13	3.7				Halmahera
5	01/03/2020	23:31:57	0.24	120.60	62	2.7				Minahasa Peninsula
6	02/03/2020	08:27:43	0.88	126.08	10	4.1	0.27602	0.23158	0.24646	Northern Molucca Sea
7	02/03/2020	16:53:09	2.28	124.26	336	3.7				Celebes Sea
8	02/03/2020	20:37:38	0.63	126.35	10	3.5				Northern Molucca Sea
9	02/03/2020	22:31:15	0.35	122.28	95	3.3				Minahasa Peninsula
10	02/03/2020	23:21:10	1.15	127.15	89	4.0				Halmahera
11	03/03/2020	03:46:45	0.50	123.73	253	4.0				Minahasa Peninsula
12	03/03/2020	06:52:32	0.81	126.44	10	4.0				Northern Molucca Sea
13	03/03/2020	06:55:50	0.97	126.44	16	4.4				Northern Molucca Sea
14	03/03/2020	13:47:24	0.72	120.60	68	3.2				Minahasa Peninsula
15	03/03/2020	14:55:37	7.82	122.25	16	4.9				Mindanao, Phillipines
16	03/03/2020	16:48:35	0.44	125.83	10	3.3				Northern Molucca Sea
17	03/03/2020	18:17:26	0.81	126.51	29	3.4				Northern Molucca Sea
18	03/03/2020	18:34:55	0.90	126.59	28	3.3				Northern Molucca Sea
19	03/03/2020	22:56:31	4.34	125.84	70	4.0				Talaud Islands
20	04/03/2020	09:29:52	1.56	127.75	130	4.4				Halmahera
21	04/03/2020	10:29:17	4.07	125.80	144	4.5				Talaud Islands
22	04/03/2020	11:59:28	5.56	126.73	10	4.5				Talaud Islands
23	04/03/2020	15:51:50	-0.10	123.04	109	4.5				Minahasa Peninsula
24	04/03/2020	18:42:03	1.91	127.44	124	3.4				Halmahera
25	04/03/2020	18:57:56	1.83	126.13	10	3.2				Northern Molucca Sea
26	04/03/2020	20:16:22	4.79	126.49	12	4.4				Talaud Islands
27	05/03/2020	04:23:40	2.90	128.14	137	3.4				Halmahera
28	05/03/2020	10:51:09	1.47	126.00	31	3.7				Northern Molucca Sea
29	05/03/2020	11:36:23	3.65	126.26	44	3.0				Talaud Islands
30	05/03/2020	11:59:57	-0.14	124.61	10	2.9				Southern Molucca Sea
31	05/03/2020	16:27:48	2.32	128.21	123	4.3				Halmahera
32	06/03/2020	03:38:51	1.78	127.21	113	3.6				Halmahera, Indonesia
33	06/03/2020	18:13:29	0.51	122.04	105	3.7				Minahasa Peninsula
34	07/03/2020	01:59:46	0.37	120.77	94	3.7				Minahasa Peninsula
35	07/03/2020	02:15:38	0.29	122.00	166	3.3				Minahasa Peninsula
36	07/03/2020	05:05:11	6.83	123.73	10	4.6				Talaud Islands
37	07/03/2020	14:59:36	5.40	125.99	10	4.3				Mindanao
38	07/03/2020	20:51:58	5.04	125.33	26	3.8				Mindanao

39	07/03/2020	22:47:14	0.36	122.19	183	3.7				Minahasa Peninsula
40	08/03/2020	08:20:27	2.34	126.65	10	3.6				Northern Molucca Sea
41	08/03/2020	16:57:17	0.61	120.59	10	2.7				Minahasa Peninsula
42	08/03/2020	18:58:28	2.67	123.00	488	3.8				Celebes Sea
43	08/03/2020	21:36:38	-0.09	123.73	107	4.1				Minahasa Peninsula
44	08/03/2020	21:57:25	0.31	127.17	84	4.0				Halmahera, Indonesia
45	09/03/2020	00:44:59	-0.50	124.13	22	3.5				Southern Molucca Sea
46	09/03/2020	00:45:02	-0.24	123.92	23	3.5				Minahasa Peninsula
47	09/03/2020	01:57:49	-0.04	123.24	139	2.6				Minahasa Peninsula
48	09/03/2020	10:04:14	1.41	127.08	47	3.7				Halmahera, Indonesia
49	09/03/2020	10:43:27	2.78	126.50	8	4.3				Northern Molucca Sea
50	09/03/2020	14:12:28	0.79	127.05	77	3.2				Halmahera, Indonesia
51	09/03/2020	21:24:23	0.76	127.14	10	3.1				Halmahera, Indonesia
52	10/03/2020	08:34:31	-0.13	122.64	10	2.7				Minahasa Peninsula
53	10/03/2020	11:55:23	1.12	121.96	10	2.6				Minahasa Peninsula
54	10/03/2020	15:53:09	0.04	126.71	25	4.3				Northern Molucca Sea
55	10/03/2020	16:56:36	-0.01	123.23	135	3.4				Minahasa Peninsula
56	10/03/2020	17:01:04	-0.23	121.82	14	2.6				Minahasa Peninsula
57	10/03/2020	20:49:09	2.92	127.42	17	3.7				Northern Molucca Sea
58	11/03/2020	03:03:58	0.38	126.14	10	4.2				Northern Molucca Sea
59	11/03/2020	07:48:05	2.51	128.22	50	4.2				Halmahera, Indonesia
60	11/03/2020	07:59:23	0.53	121.76	73	2.7				Minahasa Peninsula
61	11/03/2020	10:16:15	0.06	123.49	145	3.3				Minahasa Peninsula
62	11/03/2020	16:24:13	-0.06	123.20	123	4.1				Minahasa Peninsula
63	11/03/2020	19:42:06	4.32	126.10	130	4.3				Talaud Islands, Indonesia
64	12/03/2020	04:24:26	0.15	124.32	21	3.2				Minahasa Peninsula
65	12/03/2020	19:37:27	3.37	125.84	142	4.5				Talaud Islands, Indonesia
66	12/03/2020	21:14:30	1.52	126.46	35	3.2				Northern Molucca Sea
67	13/03/2020	03:24:30	0.26	122.33	173	3.8				Minahasa Peninsula
68	13/03/2020	09:04:47	2.94	126.44	10	4.5				Northern Molucca Sea
69	13/03/2020	10:22:12	0.07	124.42	28	4.5				Minahasa Peninsula
70	13/03/2020	12:38:05	0.66	126.19	10	3.9				Northern Molucca Sea
71	13/03/2020	18:53:59	-0.06	123.41	126	3.4				Minahasa Peninsula
72	14/03/2020	05:56:10	1.26	125.77	50	3.6				Northern Molucca Sea
73	14/03/2020	10:18:04	2.86	128.21	13	4.3				Halmahera, Indonesia
74	14/03/2020	10:42:37	3.03	128.32	31	4.9				North of Halmahera
75	14/03/2020	10:51:57	7.54	126.61	199	4.7				Mindanao, Phillipines
76	14/03/2020	14:30:05	0.83	126.61	10	3.3				Northern Molucca Sea
77	14/03/2020	14:37:01	0.93	126.91	50	2.8				Northern Molucca Sea
78	14/03/2020	17:03:00	2.14	126.19	10	3.5				Northern Molucca Sea
79	14/03/2020	22:24:54	1.71	128.53	17	3.9				Halmahera, Indonesia
80	15/03/2020	04:44:59	1.55	126.52	10	3.4				Northern Molucca Sea
81	15/03/2020	08:22:51	4.52	124.76	51	3.8				Celebes Sea
82	15/03/2020	10:14:55	1.92	126.98	8	3.7				Northern Molucca Sea
83	15/03/2020	10:45:53	1.02	126.76	51	4.5				Northern Molucca Sea

84	15/03/2020	12:41:44	-0.25	122.98	17	2.9				Minahasa Peninsula
85	15/03/2020	18:51:34	0.03	123.01	269	4.3				Minahasa Peninsula
86	15/03/2020	22:56:26	4.22	125.80	149	3.5				Talaud Islands, Indonesia
87	16/03/2020	00:03:06	0.67	122.21	80	3.0				Minahasa Peninsula
88	16/03/2020	07:56:12	0.54	126.10	10	3.5				Northern Molucca Sea
89	16/03/2020	09:35:50	0.35	126.00	12	3.8				Northern Molucca Sea
90	16/03/2020	16:10:48	0.16	119.87	33	4.4				Minahasa Peninsula
91	17/03/2020	20:18:36	1.04	120.10	10	2.7				Minahasa Peninsula
92	17/03/2020	20:24:44	2.30	128.41	213	3.2				Halmahera, Indonesia
93	17/03/2020	20:36:26	1.51	126.42	23	2.9				Northern Molucca Sea
94	18/03/2020	03:13:32	2.95	127.92	138	5.5	0.37655	0.81714	0.76094	Northern Molucca Sea
95	18/03/2020	03:27:50	3.04	127.93	10	4.9				Talaud Islands, Indonesia
96	18/03/2020	05:26:04	-0.08	123.15	155	3.3				Minahasa Peninsula
97	18/03/2020	18:35:02	-0.30	123.82	20	3.2				Minahasa Peninsula
98	18/03/2020	18:52:45	1.26	126.13	10	3.7				Northern Molucca Sea
99	18/03/2020	20:58:31	5.73	125.84	186	4.4				Mindanao, Phillipines
100	19/03/2020	01:05:01	0.68	122.46	44	3.0				Minahasa Peninsula
101	19/03/2020	16:49:01	2.54	124.04	10	4.2				Celebes Sea
102	20/03/2020	02:52:38	-0.03	123.18	129	3.0				Minahasa Peninsula
103	20/03/2020	05:02:06	3.41	126.48	10	5.0				Northern Molucca Sea
104	20/03/2020	06:50:19	-0.28	123.10	71	3.2				Minahasa Peninsula
105	20/03/2020	13:16:47	2.67	127.75	81	3.9				Northern Molucca Sea
106	20/03/2020	17:15:07	0.29	121.84	199	3.3				Minahasa Peninsula
107	20/03/2020	20:53:45	-0.06	123.07	102	3.2				Minahasa Peninsula
108	21/03/2020	00:37:29	1.01	122.21	118	2.5				Minahasa Peninsula
109	21/03/2020	03:52:46	1.77	127.19	96	4.8				Halmahera
110	21/03/2020	05:00:39	0.28	121.81	10	2.4				Minahasa Peninsula
111	21/03/2020	10:19:35	0.74	121.24	25	3.1				Minahasa Peninsula
112	21/03/2020	16:36:52	6.50	126.74	180	4.6				Mindanao
113	21/03/2020	17:07:44	0.88	126.46	14	3.4				Northern Molucca Sea
114	21/03/2020	20:03:04	2.00	124.30	283	3.4				Celebes Sea
115	21/03/2020	23:16:15	3.88	125.85	103	3.8				Talaud Islands
116	22/03/2020	03:34:55	1.46	122.00	10	5.1				Minahasa Peninsula
117	22/03/2020	08:01:22	2.82	126.47	12	3.7				Talaud Islands
118	22/03/2020	08:15:50	1.22	123.24	10	4.5				Minahasa Peninsula
119	22/03/2020	09:08:41	1.39	122.73	10	2.2				Minahasa Peninsula
120	22/03/2020	11:17:05	-0.18	122.97	28	2.7				Minahasa Peninsula
121	22/03/2020	11:53:22	0.19	122.22	148	2.2				Minahasa Peninsula
122	22/03/2020	13:09:32	2.70	128.59	223	3.4				Halmahera
123	22/03/2020	13:31:54	5.11	125.11	10	4.7				Mindanao
124	22/03/2020	16:21:44	0.70	123.80	257	3.9				Minahasa Peninsula
125	22/03/2020	16:34:45	7.32	125.04	89	4.8				Mindanao
126	22/03/2020	17:05:10	0.77	126.19	10	4.0	0.12445	0.11299	0.17440	Northern Molucca Sea
127	22/03/2020	17:31:51	5.13	125.30	19	4.8				Talaud Islands
128	23/03/2020	21:36:49	0.96	121.15	10	2.6				Minahasa Peninsula

129	24/03/2020	01:24:46	0.40	126.07	10	3.3				Northern Molucca Sea
130	24/03/2020	05:33:54	0.37	122.16	115	2.9				Minahasa Peninsula
131	24/03/2020	06:06:29	2.60	125.14	165	3.8				Talaud Islands
132	24/03/2020	10:34:15	1.86	126.30	16	3.6				Northern Molucca Sea
133	24/03/2020	16:02:44	0.56	121.66	110	3.9				Minahasa Peninsula
134	24/03/2020	17:51:46	0.38	121.76	209	2.3				Minahasa Peninsula
135	24/03/2020	21:07:02	0.62	121.62	60	2.2				Minahasa Peninsula
136	24/03/2020	22:54:22	0.92	124.30	28	3.7				Minahasa Peninsula
137	24/03/2020	23:08:36	1.43	126.39	10	3.5				Northern Molucca Sea
138	25/03/2020	00:08:39	0.02	129.02	10	3.5				Halmahera
139	25/03/2020	00:33:10	-0.23	124.16	10	3.0				Minahasa Peninsula
140	25/03/2020	01:43:36	2.61	128.16	129	4.7				Halmahera
141	25/03/2020	02:20:06	2.87	128.02	106	4.8				Halmahera
142	25/03/2020	06:50:22	0.33	123.56	226	3.5				Minahasa Peninsula
143	25/03/2020	09:54:42	1.17	127.54	3	2.1				Halmahera
144	25/03/2020	21:07:32	0.38	122.40	41	2.3				Minahasa Peninsula
145	25/03/2020	23:58:38	2.63	128.40	9	3.6				Halmahera
146	26/03/2020	01:48:21	1.18	123.16	10	3.0				Minahasa Peninsula
147	26/03/2020	06:42:51	-0.29	122.39	10	3.6				Minahasa Peninsula
148	26/03/2020	07:12:47	4.97	127.68	249	4.4				Talaud Islands
149	26/03/2020	14:37:11	-0.21	124.17	22	2.5				Southern Molluca Sea
150	26/03/2020	15:38:03	5.58	125.16	10	6.3	1.49837	3.01614	2.02213	Mindanao
151	26/03/2020	16:41:26	3.41	125.79	170	4.3				Talaud Islands
152	26/03/2020	18:17:51	1.50	123.09	10	4.5				Minahasa Peninsula
153	26/03/2020	18:48:42	1.89	127.59	134	3.3				Halmahera
154	26/03/2020	19:00:15	2.49	128.41	184	2.9				Halmahera
155	26/03/2020	19:01:46	-0.43	119.81	10	1.8				Minahasa Peninsula
156	26/03/2020	22:29:31	1.18	122.70	36	3.3				Minahasa Peninsula
157	26/03/2020	22:34:50	0.32	122.16	179	2.9				Minahasa Peninsula
158	26/03/2020	23:57:11	0.49	123.99	142	3.5				Minahasa Peninsula
159	27/03/2020	05:37:04	1.56	126.95	21	3.6				Northern Molucca sea
160	27/03/2020	07:09:53	0.21	128.35	10	3.8				Halmahera
161	27/03/2020	17:13:26	-0.11	123.38	129	3.6				Minahassa Peninsula
162	27/03/2020	19:04:55	2.10	126.78	10	3.4				Northern Molucca sea
163	27/03/2020	19:15:19	0.85	126.57	51	3.2				Northern Molucca sea
164	28/03/2020	00:12:24	5.37	126.57	137	4.3				Talaud Islands
165	28/03/2020	02:42:13	0.19	125.34	162	4.1				Northern Molucca sea
166	28/03/2020	03:00:44	-0.15	123.14	92	2.7				Minahassa Peninsula
167	28/03/2020	05:57:33	-0.23	123.51	21	2.8				Minahassa Peninsula
168	28/03/2020	06:00:38	-0.29	123.09	92	3.0				Minahassa Peninsula
169	28/03/2020	08:49:44	0.86	126.12	10	4.1				Northern Molucca sea
170	28/03/2020	10:43:58	0.17	125.69	24	3.6				Northern Molucca sea
171	28/03/2020	13:59:35	0.58	121.32	47	3.7				Minahassa Peninsula
172	28/03/2020	20:59:16	3.81	125.91	132	3.8				Talaud Islands
173	28/03/2020	22:18:02	2.26	126.84	6	4.1				Northern Molucca sea

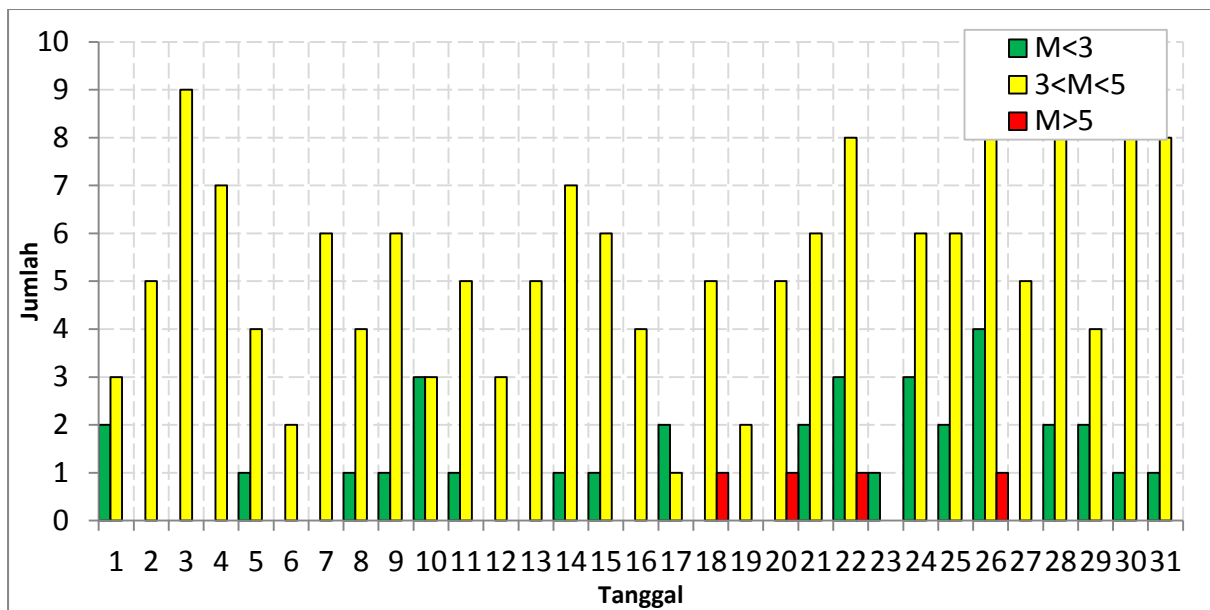
174	29/03/2020	01:58:31	2.98	128.04	132	4.5				Halmahera
175	29/03/2020	03:02:28	1.34	122.71	10	3.7				Minahassa Peninsula
176	29/03/2020	11:51:51	0.62	122.28	87	2.9				Minahassa Peninsula
177	29/03/2020	15:24:29	0.26	122.09	152	2.5				Minahassa Peninsula
178	29/03/2020	18:44:37	-0.41	129.72	9	3.2				Halmahera
179	29/03/2020	21:00:00	2.69	128.40	21	4.0				Halmahera
180	30/03/2020	03:41:44	6.00	125.80	10	4.4				Talaud Islands
181	30/03/2020	06:21:15	4.17	126.57	32	4.0				Talaud Islands
182	30/03/2020	07:15:34	5.00	125.74	200	4.3				Mindanao
183	30/03/2020	07:21:14	1.32	120.46	10	3.1				Minahassa Peninsula
184	30/03/2020	11:56:33	0.12	126.61	10	3.1				Northern Molucca sea
185	30/03/2020	15:24:55	-0.07	123.20	150	3.0				Minahassa Peninsula
186	30/03/2020	15:37:55	-0.03	122.92	150	3.5				Minahassa Peninsula
187	30/03/2020	16:11:14	1.13	126.40	10	2.9				Northern Molucca sea
188	30/03/2020	23:57:07	0.89	121.76	86	4.0				Minahassa Peninsula
189	31/03/2020	02:32:34	2.07	127.08	28	3.1				Northern Molucca sea
190	31/03/2020	02:42:21	2.85	125.83	126	3.7				Talaud Islands
191	31/03/2020	07:27:54	4.65	125.39	10	4.7				Talaud Islands
192	31/03/2020	09:28:57	3.86	125.94	106	4.2				Talaud Islands
193	31/03/2020	11:07:24	1.37	122.88	10	2.8				Minahassa Peninsula
194	31/03/2020	15:15:10	1.67	126.31	10	3.3				Northern Molucca sea
195	31/03/2020	15:31:01	-0.08	123.22	146	3.7				Minahassa Peninsula
196	31/03/2020	20:01:23	0.06	120.43	123	3.7				Minahassa Peninsula
197	31/03/2020	22:47:56	6.14	126.18	201	4.2				Talaud Islands



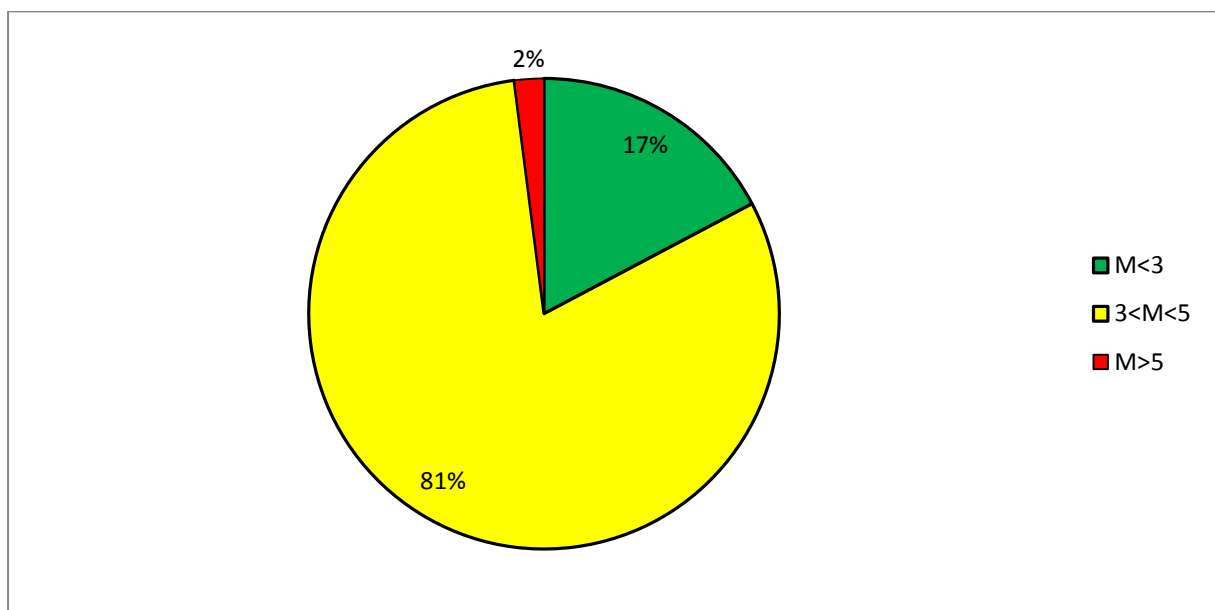
Gambar 11 Sebaran episenter gempabumi bulan Maret 2020

Tabel 8 Rekapitulasi gempabumi berdasarkan magnitudo bulan Maret 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	2	3	0	5	0	0
2	0	5	0	5	0	0
3	0	9	0	9	0	0
4	0	7	0	7	1	0
5	1	4	0	5	0	0
6	0	2	0	2	0	0
7	0	6	0	6	0	0
8	1	4	0	5	0	0
9	1	6	0	7	0	0
10	3	3	0	6	0	0
11	1	5	0	6	0	0
12	0	3	0	3	0	0
13	0	5	0	5	0	0
14	1	7	0	8	1	0
15	1	6	0	7	0	0
16	0	4	0	4	0	0
17	2	1	0	3	0	0
18	0	5	1	6	1	0
19	0	2	0	2	0	0
20	0	5	1	6	0	0
21	2	6	0	8	0	0
22	3	8	1	12	2	0
23	1	0	0	1	0	0
24	3	6	0	9	0	0
25	2	6	0	8	1	0
26	4	8	1	13	1	0
27	0	5	0	5	0	0
28	2	8	0	10	0	0
29	2	4	0	6	0	0
30	1	8	0	9	0	0
31	1	8	0	9	0	0
Jumlah gempa	34	159	4	197	7	0



Gambar 12 Grafik gempabumi berdasarkan magnitudo bulan Maret 2020



Gambar 13 Grafik persentase gempabumi berdasarkan magnitudo bulan Maret 2020

D. Data Gempabumi Bulan April 2020

Tabel 9 Data kejadian gempabumi bulan April 2020

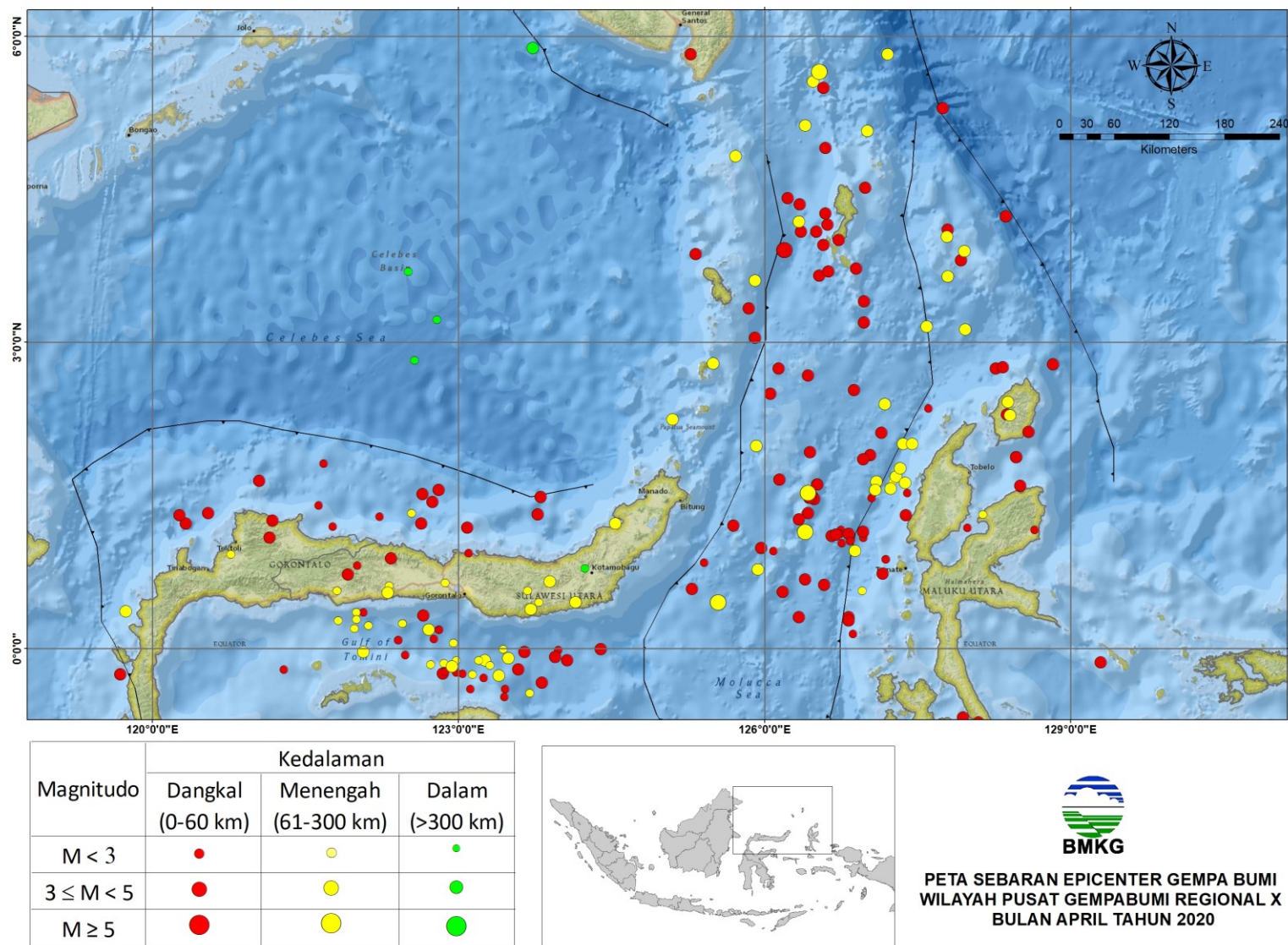
No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/04/2020	09:14:07	1.52	127.40	55	2.7				Halmahera
2	01/04/2020	13:03:43	3.33	125.85	9	4.0				Talaud Islands
3	01/04/2020	17:30:21	-0.40	123.12	60	2.3				Minahassa Peninsula
4	01/04/2020	18:55:27	-0.21	121.29	23	2.6				Minahassa Peninsula
5	01/04/2020	19:22:58	5.82	125.28	29	4.1				Mindanao
6	01/04/2020	20:57:51	2.00	127.36	113	3.5				Halmahera
7	02/04/2020	10:55:41	1.20	125.70	30	3.2				Northern Molucca sea
8	02/04/2020	12:59:20	1.03	126.76	28	3.1				Northern Molucca sea
9	02/04/2020	12:59:48	1.19	121.77	10	2.9				Minahassa Peninsula
10	02/04/2020	22:50:53	0.30	126.34	10	3.6				Northern Molucca sea
11	03/04/2020	04:03:43	0.08	122.41	18	2.5				Minahassa Peninsula
12	03/04/2020	11:39:33	0.18	122.81	10	3.0				Minahassa Peninsula
13	03/04/2020	12:50:22	1.60	126.52	10	4.2	0.1633	0.1441	0.1564	Northern Molucca sea
14	03/04/2020	17:13:49	0.24	122.45	137	2.8				Minahassa Peninsula
15	03/04/2020	20:12:07	0.56	121.81	76	2.7				Minahassa Peninsula
16	03/04/2020	22:14:17	1.87	128.47	29	4.3				Halmahera
17	03/04/2020	22:25:10	0.87	127.19	27	2.1				Halmahera
18	05/04/2020	18:37:13	1.52	126.43	67	6.1	7.31315	6.5529	-4.1933	Northern Molucca sea
19	05/04/2020	20:50:00	-0.68	127.95	10	3.2				Halmahera
20	05/04/2020	21:14:13	-0.73	128.10	10	3.2				Halmahera
21	05/04/2020	22:42:24	1.49	126.47	10	3.2				Northern Molucca sea
22	05/04/2020	22:57:45	1.46	126.49	49	3.7				Northern Molucca sea
23	06/04/2020	02:34:24	0.98	125.97	10	3.6				Northern Molucca sea
24	06/04/2020	03:19:00	1.63	127.26	77	2.4				Halmahera
25	06/04/2020	04:38:50	-0.01	123.44	129	3.2				Minahassa Peninsula
26	06/04/2020	05:31:01	1.47	126.44	5	4.6	0.44452	0.3823	0.2961	Northern Molucca sea
27	06/04/2020	13:35:23	0.61	122.32	86	2.4				Minahassa Peninsula
28	06/04/2020	14:36:24	1.32	126.43	29	3.3				Northern Molucca sea
29	06/04/2020	16:04:05	5.29	127.75	59	4.2				Philippine Islands Region
30	06/04/2020	16:41:36	0.84	125.41	34	2.8				Northern Molucca sea
31	06/04/2020	16:44:56	0.55	126.18	10	3.8				Northern Molucca sea
32	06/04/2020	17:14:06	0.35	122.07	10	2.5				Minahassa Peninsula
33	06/04/2020	19:32:56	2.00	127.45	95	3.3				Northern Molucca sea
34	06/04/2020	22:32:47	-0.29	123.25	59	2.8				Minahassa Peninsula
35	06/04/2020	23:09:38	0.58	125.29	20	3.8				Northern Molucca sea
36	07/04/2020	10:52:16	0.64	122.87	81	2.6				Minahassa Peninsula
37	07/04/2020	11:11:04	1.48	123.81	10	3.6				Minahassa Peninsula
38	07/04/2020	14:36:00	-0.48	123.45	10	2.3				Minahassa Peninsula

39	07/04/2020	18:08:17	1.63	127.10	146	3.4				Halmahera
40	07/04/2020	18:37:40	1.98	125.92	71	3.5				Northern Molucca sea
41	07/04/2020	18:43:42	1.16	128.65	16	2.3				Halmahera
42	07/04/2020	18:57:06	1.32	122.54	154	2.0				Minahassa Peninsula
43	07/04/2020	20:17:46	-0.01	124.40	8	4.0				Northern Molucca sea
44	08/04/2020	04:42:03	3.60	125.91	134	4.4				Talaud Islands
45	08/04/2020	07:05:17	5.55	126.48	118	4.1				Mindanao, Philippines
46	08/04/2020	11:50:09	1.56	127.24	116	4.3				Halmahera
47	09/04/2020	12:26:51	1.22	120.33	13	3.8				Minahassa Peninsula
48	09/04/2020	17:06:08	-0.12	124.07	10	3.2				Southern Molucca Sea
49	09/04/2020	20:34:11	3.72	126.90	10	4.1				Talaud Islands
50	09/04/2020	20:37:30	0.81	122.01	10	3.0				Minahassa Peninsula
51	10/04/2020	01:05:57	2.35	127.61	6	2.7				Halmahera
52	10/04/2020	01:48:06	0.35	122.00	170	2.6				Minahassa Peninsula
53	10/04/2020	07:15:55	3.22	122.79	528	3.9				Celebes Sea
54	10/04/2020	09:25:50	1.22	122.64	6	3.3				Minahassa Peninsula
55	10/04/2020	09:55:00	5.88	123.73	527	4.4				Talaud Island
56	10/04/2020	11:48:46	3.04	125.91	56	3.8				Talaud Island
57	10/04/2020	14:24:15	0.32	122.66	52	4.2	0.04634	0.0345	0.062	Minahassa Peninsula
58	10/04/2020	15:26:26	1.89	127.04	28	3.2				Halmahera
59	10/04/2020	18:45:51	5.65	126.54	90	5.3				Mindanao, Philippines
60	10/04/2020	19:59:13	-0.78	119.91	10	2.9				Minahassa Peninsula
61	11/04/2020	00:28:12	-0.07	122.48	38	3.0				Minahassa Peninsula
62	11/04/2020	00:44:36	4.41	126.23	25	4.2	0.12262	0.1224	0.2287	Talaud Island
63	11/04/2020	01:13:04	1.85	126.97	10	3.5				Halmahera
64	11/04/2020	14:24:35	2.79	125.50	171	4.2				Talaud Island
65	11/04/2020	20:23:48	2.39	127.18	86	5.0	0.21927	0.2145	0.2066	Northern Molucca Sea
66	11/04/2020	21:03:50	3.40	126.98	48	3.7				Talaud Island
67	12/04/2020	12:14:29	-0.34	123.82	10	3.4				Minahassa Peninsula
68	12/04/2020	16:22:20	-0.12	122.98	126	2.7				Minahassa Peninsula
69	13/04/2020	00:40:06	2.78	128.83	26	3.8				Halmahera
70	13/04/2020	02:12:08	2.41	128.39	218	4.4				Halmahera
71	13/04/2020	04:17:10	-0.12	123.26	132	3.7				Minahassa Peninsula
72	13/04/2020	06:44:23	3.86	125.33	10	5.0				Talaud Island
73	13/04/2020	14:22:19	1.43	122.75	10	4.5				Minahassa Peninsula
74	13/04/2020	14:37:27	1.51	122.65	10	3.2				Minahassa Peninsula
75	13/04/2020	14:59:34	0.30	126.83	17	4.9	0.11058	0.0891	0.1163	Halmahera
76	13/04/2020	15:10:55	0.14	126.87	30	2.5				Minahassa peninsula
77	13/04/2020	15:26:18	1.22	124.54	219	3.6				Halmahera
78	13/04/2020	15:32:30	1.55	122.81	10	3.5				Minahassa Peninsula
79	13/04/2020	16:33:29	0.27	126.83	10	4.3				Northern Molucca Sea
80	13/04/2020	19:04:50	5.12	126.40	163	3.8				Talaud Island
81	13/04/2020	20:46:16	0.09	122.76	54	2.7				Minahassa Peninsula
82	13/04/2020	20:52:00	0.45	123.79	220	2.6				Minahassa Peninsula
83	14/04/2020	04:10:57	0.72	121.92	17	3.3				Minahassa Peninsula

84	14/04/2020	04:41:36	-0.27	123.40	71	4.1				Minahassa Peninsula
85	14/04/2020	10:27:52	2.28	128.41	212	4.1				Halmahera
86	14/04/2020	13:52:19	0.27	121.82	193	2.7				Minahassa Peninsula
87	14/04/2020	19:20:34	2.74	128.27	52	4.8	0.04672	0.0387	0.0635	Halmahera
88	14/04/2020	20:04:25	4.86	118.66	10	4.5				Borneo
89	14/04/2020	20:12:49	2.75	128.34	21	3.3				Halmahera
90	14/04/2020	22:11:52	0.56	123.68	217	2.9				Minahassa Peninsula
91	15/04/2020	00:28:00	4.37	118.20	38	4.2				Borneo
92	15/04/2020	00:29:14	1.65	126.15	10	3.5				Northern Molucca Sea
93	15/04/2020	01:40:43	3.89	127.96	158	4.4				Talaud Island
94	15/04/2020	01:44:24	1.55	127.09	119	3.9				Halmahera
95	15/04/2020	01:58:55	0.22	122.12	164	3.0				Minahassa Peninsula
96	15/04/2020	06:58:26	-0.25	122.85	55	3.5				Minahassa Peninsula
97	15/04/2020	07:53:44	4.03	127.79	141	3.9				Talaud Island
98	15/04/2020	13:44:09	-0.02	123.98	10	3.1				Minahassa Peninsula
99	15/04/2020	19:49:30	0.67	126.40	10	3.4				Northern Molucca Sea
100	15/04/2020	21:03:39	1.14	126.40	63	5.6				Northern Molucca Sea
101	15/04/2020	22:10:02	1.07	126.85	13	2.7				Northern Molucca Sea
102	15/04/2020	22:32:12	1.16	126.75	16	2.8				Northern Molucca Sea
103	16/04/2020	05:57:13	1.92	126.45	10	4.2				Northern Molucca Sea
104	16/04/2020	08:33:35	-0.17	123.31	86	3.2				Minahassa Peninsula
105	16/04/2020	13:59:24	1.59	128.51	10	4.4				Halmahera
106	16/04/2020	14:36:09	1.81	121.68	16	3.1				Minahassa Peninsula
107	16/04/2020	19:55:57	-0.26	123.14	73	3.0				Minahassa Peninsula
108	16/04/2020	21:17:21	1.12	126.74	21	3.1				Northern Molucca Sea
109	16/04/2020	21:59:00	3.15	127.59	119	3.8				Talaud Island
110	16/04/2020	23:46:16	1.08	126.97	44	3.0				Northern Molucca Sea
111	16/04/2020	23:50:48	1.32	120.55	10	3.5				Minahassa Peninsula
112	17/04/2020	01:57:45	2.29	128.38	20	4.3				Halmahera, Indonesia
113	17/04/2020	09:26:42	-0.15	122.86	67	2.8				Minahassa Peninsula
114	17/04/2020	10:44:21	2.74	126.14	19	3.5				Talaud Islands
115	17/04/2020	12:19:48	0.88	122.34	46	3.2				Minahassa Peninsula
116	17/04/2020	15:09:49	1.68	127.29	131	3.9				Halmahera, Indonesia
117	17/04/2020	15:28:40	1.30	127.39	37	3.7				Halmahera, Indonesia
118	17/04/2020	23:04:04	-0.09	123.95	17	3.5				Minahassa Peninsula
119	18/04/2020	06:31:10	0.77	125.94	111	4.1				Northern Molucca Sea
120	18/04/2020	09:29:17	1.64	121.05	10	4.4				Minahassa Peninsula
121	18/04/2020	10:22:55	3.65	126.54	3	3.9				Talaud Islands
122	18/04/2020	10:40:54	4.15	126.62	37	3.4				Talaud Islands
123	18/04/2020	10:54:06	1.31	128.14	71	3.0				Halmahera, Indonesia
124	18/04/2020	11:02:28	4.18	126.34	105	3.7				Talaud Islands
125	18/04/2020	12:37:40	-0.24	122.98	10	2.9				Minahassa Peninsula
126	18/04/2020	12:58:48	-0.26	119.69	10	3.7				Minahassa Peninsula
127	18/04/2020	13:35:48	1.10	126.66	14	4.0				Northern Molucca Sea
128	18/04/2020	17:45:39	0.45	125.55	85	5.1	1.20339	1.3524	0.8005	Northern Molucca Sea

129	18/04/2020	19:37:20	0.62	126.59	3	3.5				Northern Molucca Sea
130	19/04/2020	00:44:24	1.47	127.05	6	2.8				Halmahera, Indonesia
131	19/04/2020	03:34:19	-0.23	122.87	44	3.1				Minahassa Peninsula
132	19/04/2020	08:42:50	-0.16	122.73	132	2.4				Minahassa Peninsula
133	19/04/2020	13:09:32	3.90	126.20	19	5.2	0.14968	0.1693	0.1609	Talaud Islands
134	19/04/2020	16:12:09	-0.14	129.30	10	4.2				Halmahera, Indonesia
135	19/04/2020	18:05:33	3.80	127.93	10	3.9				Talaud Islands
136	19/04/2020	21:29:42	1.12	126.83	45	4.2				Northern Molucca Sea
137	19/04/2020	21:43:34	0.36	119.74	157	3.7				Minahassa Peninsula
138	20/04/2020	00:05:44	1.40	121.63	10	3.0				Minahassa Peninsula
139	20/04/2020	01:05:05	3.95	126.58	41	4.0				Talaud Islands
140	20/04/2020	02:03:37	4.00	126.73	39	3.3				Talaud Islands
141	20/04/2020	03:57:11	-0.10	123.49	123	3.3				Minahassa Peninsula
142	20/04/2020	06:49:38	1.62	127.38	95	4.4				Halmahera, Indonesia
143	20/04/2020	13:31:51	1.11	126.70	24	3.6				Northern Molucca Sea
144	20/04/2020	15:01:00	5.49	126.58	10	4.2				Talaud Islands
145	21/04/2020	05:26:24	-0.12	123.20	70	2.6				Minahassa Peninsula
146	21/04/2020	08:00:49	0.05	122.95	141	2.9				Minahassa Peninsula
147	21/04/2020	10:51:34	1.26	126.34	10	4.5	0.57134	0.4584	0.4519	Northern Molucca Sea
148	21/04/2020	14:56:14	1.18	127.99	4	2.5				Halmahera, Indonesia
149	21/04/2020	17:29:58	0.38	123.71	232	3.3				Minahassa Peninsula
150	21/04/2020	20:45:49	1.76	127.33	115	3.6				Halmahera, Indonesia
151	22/04/2020	01:02:47	1.18	123.09	25	4.0				Minahassa Peninsula
152	22/04/2020	01:24:49	0.78	124.24	485	3.4				Minahassa Peninsula
153	22/04/2020	14:04:44	4.82	125.72	73	4.3				Talaud Islands
154	22/04/2020	15:30:09	2.12	128.59	10	4.2				Halmahera, Indonesia
155	22/04/2020	17:14:35	2.67	126.43	11	3.9				Northern Molucca Sea
156	22/04/2020	22:10:36	0.56	126.96	67	2.5				Halmahera, Indonesia
157	22/04/2020	22:59:10	-0.21	123.59	14	3.4				Minahassa Peninsula
158	23/04/2020	03:35:08	0.95	126.09	10	2.8				Northern Molucca Sea
159	23/04/2020	04:34:00	1.30	120.27	10	3.9				Minahassa Peninsula
160	23/04/2020	07:32:06	-0.18	122.94	142	3.6				Minahassa Peninsula
161	23/04/2020	11:06:46	7.43	124.73	10	4.5				Mindanao
162	23/04/2020	12:41:31	1.29	122.23	10	3.0				Minahassa Peninsula
163	23/04/2020	18:07:22	-0.04	122.07	272	3.5				Minahassa Peninsula
164	23/04/2020	18:57:11	4.23	128.37	10	3.9				North of Halmahera
165	24/04/2020	02:22:54	1.14	126.97	34	3.5				Northern Molucca Sea
166	24/04/2020	02:46:38	0.19	121.98	141	2.6				Minahassa Peninsula
167	24/04/2020	06:14:25	0.93	123.10	16	2.6				Minahassa Peninsula
168	24/04/2020	08:20:50	4.26	126.60	21	4.0				Talaud Islands
169	24/04/2020	14:06:07	2.11	127.15	26	3.6				Halmahera
170	24/04/2020	20:46:08	0.45	124.15	173	4.0				Minahassa Peninsula
171	24/04/2020	23:15:37	4.10	127.80	31	3.9				Talaud Islands
172	25/04/2020	00:33:43	3.64	127.80	159	4.3				Talaud Islands
173	25/04/2020	02:23:48	2.53	126.88	10	3.7				Northern Molucca Sea

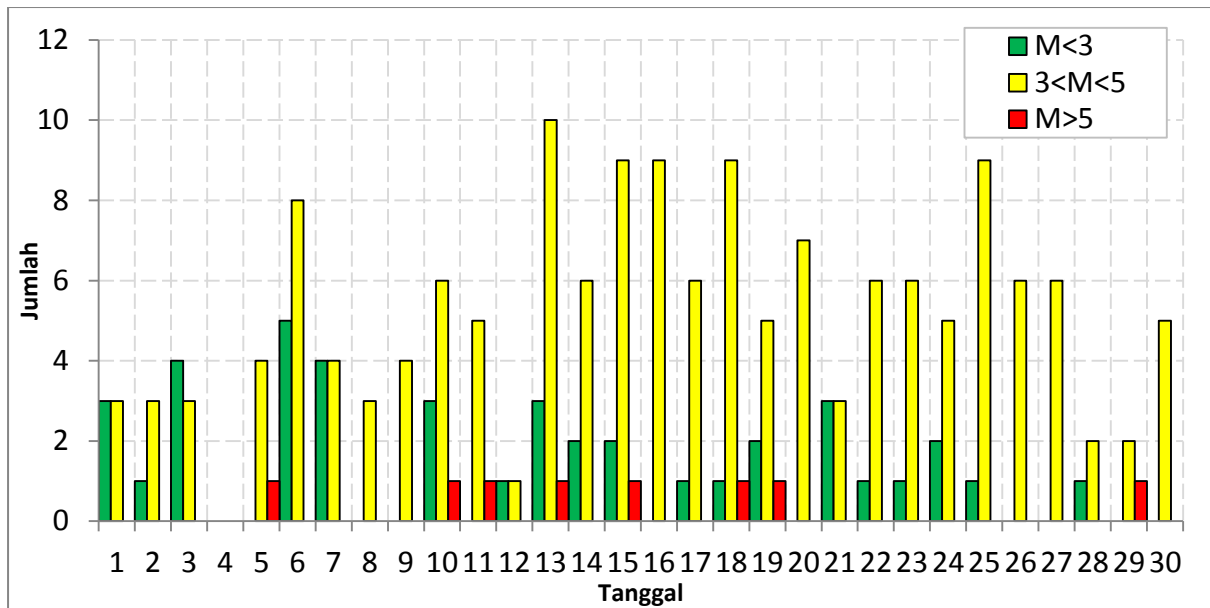
174	25/04/2020	03:42:18	0.95	126.89	127	3.7				Halmahera
175	25/04/2020	07:25:12	0.73	127.16	8	3.4				Halmahera
176	25/04/2020	07:41:44	2.24	125.10	174	3.4				Minahassa Peninsula
177	25/04/2020	10:27:04	1.31	123.78	10	3.5				Minahassa Peninsula
178	25/04/2020	14:06:00	1.05	126.84	19	3.0				Northern Molucca Sea
179	25/04/2020	20:57:17	2.49	126.06	28	3.7				Talaud Islands
180	25/04/2020	21:33:20	0.92	120.77	63	2.3				Minahassa Peninsula
181	25/04/2020	21:47:05	3.19	126.98	10	3.5				Talaud Islands
182	26/04/2020	01:47:20	0.11	132.42	10	4.3				Irian Jaya
183	26/04/2020	04:04:39	4.08	126.51	26	3.8				Talaud Islands
184	26/04/2020	09:08:12	0.18	122.71	127	3.3				Minahassa Peninsula
185	26/04/2020	10:31:14	4.08	126.36	13	3.5				Talaud Islands
186	26/04/2020	12:37:21	0.54	122.31	105	3.5				Minahassa Peninsula
187	26/04/2020	13:34:17	5.82	127.21	118	4.2				Philippine Islands Region
188	27/04/2020	02:11:34	0.65	123.90	245	3.9				Minahassa Peninsula
189	27/04/2020	13:11:33	3.69	122.51	490	4.0				Celebes Sea
190	27/04/2020	14:24:47	-0.40	123.46	10	3.0				Minahassa Peninsula
191	27/04/2020	14:58:22	1.25	121.18	16	3.4				Minahassa Peninsula
192	27/04/2020	16:34:27	-0.25	123.04	10	3.1				Minahassa Peninsula
193	27/04/2020	23:50:04	1.08	121.15	20	3.6				Minahassa Peninsula
194	28/04/2020	10:33:29	2.82	122.57	513	3.9				Celebes Sea
195	28/04/2020	15:29:24	4.35	126.35	14	4.2				Talaud Islands
196	28/04/2020	18:52:40	0.28	122.00	166	2.7				Minahassa Peninsula
197	29/04/2020	17:47:08	4.51	126.99	21	5.0	0.0438	0.0364	0.0521	Talaud Islands
198	29/04/2020	21:34:50	3.12	127.97	115	3.9				Talaud Islands
199	29/04/2020	22:57:21	1.47	126.45	10	3.8				Northern Molucca Sea
200	30/04/2020	00:08:51	4.90	126.60	10	3.6				Talaud Islands
201	30/04/2020	01:52:36	-0.04	123.65	21	4.5				Minahassa Peninsula
202	30/04/2020	03:19:39	-0.44	123.70	71	3.1				Minahassa Peninsula
203	30/04/2020	10:21:31	5.07	127.01	102	4.4				Philippine Islands Region
204	30/04/2020	11:40:54	3.69	126.63	10	3.8				Talaud Islands



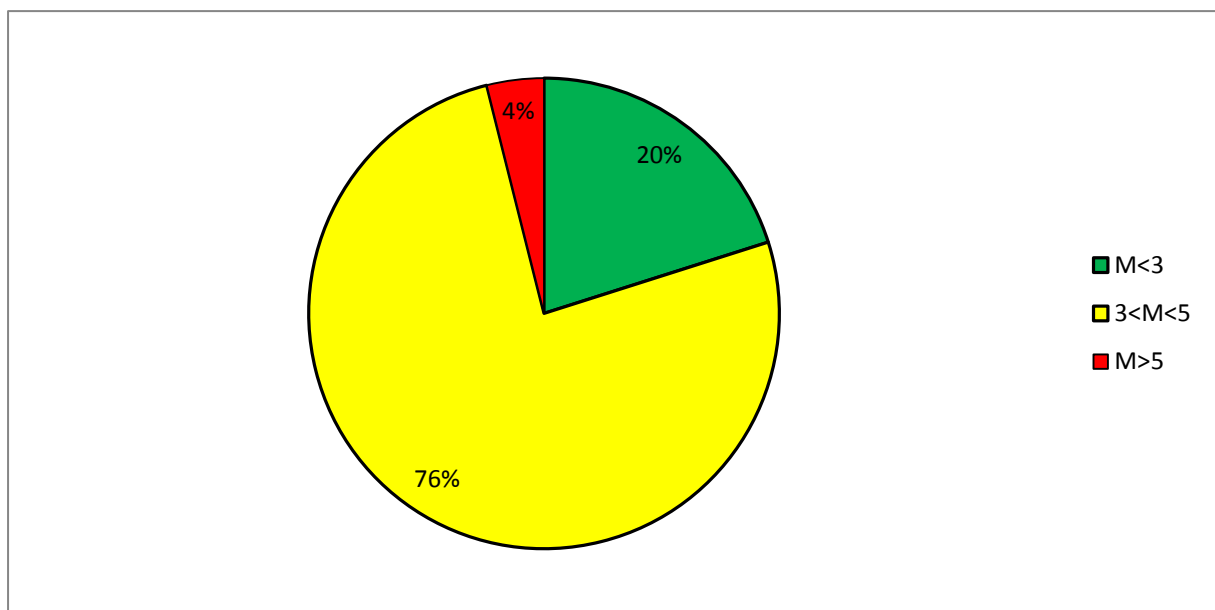
Gambar 14 Sebaran episenter gempabumi bulan April 2020

Tabel 10 Rekapitulasi gempabumi berdasarkan magnitudo bulan April 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	3	3	0	6	0	0
2	1	3	0	4	0	0
3	4	3	0	7	1	0
4	0	0	0	0	0	0
5	0	4	1	5	1	0
6	5	8	0	13	0	0
7	4	4	0	8	0	0
8	0	3	0	3	0	0
9	0	4	0	4	0	0
10	3	6	1	10	0	0
11	0	5	1	6	0	0
12	1	1	0	2	0	0
13	3	10	1	14	2	0
14	2	6	0	8	0	0
15	2	9	1	12	1	0
16	0	9	0	9	0	0
17	1	6	0	7	0	0
18	1	9	1	11	2	0
19	2	5	1	8	1	0
20	0	7	0	7	1	0
21	3	3	0	6	0	0
22	1	6	0	7	1	0
23	1	6	0	7	0	0
24	2	5	0	7	0	0
25	1	9	0	10	0	0
26	0	6	0	6	0	0
27	0	6	0	6	0	0
28	1	2	0	3	0	0
29	0	2	1	3	0	0
30	0	5	0	5	0	0
Jumlah gempa	41	155	8	204	10	0



Gambar 15 Grafik gempabumi berdasarkan magnitudo bulan April 2020



Gambar 16 Grafik persentase gempabumi berdasarkan magnitudo bulan April 2020

E. Data Gempabumi Bulan Mei 2020

Tabel 11 Data kejadian gempabumi bulan Mei 2020

No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/05/2020	03:24:41	0.48	121.45	17	3.1				Minahasa Peninsula
2	01/05/2020	09:37:34	0.31	122.47	123	3.6				Minahasa Peninsula
3	01/05/2020	10:05:52	1.37	126.43	10	3.3				Northern Molucca Sea
4	01/05/2020	13:48:41	4.60	127.02	79	5.0				Talaud Islands
5	01/05/2020	15:57:01	-0.07	122.85	130	3.1				Minahasa Peninsula
6	01/05/2020	18:48:19	1.81	127.18	102	2.9				Halmahera
7	01/05/2020	19:06:24	-0.15	123.03	33	2.3				Minahasa Peninsula
8	01/05/2020	20:46:15	1.56	126.89	64	4.0				Halmahera
9	01/05/2020	21:22:14	1.85	127.08	106	3.5				Halmahera
10	01/05/2020	21:46:52	-0.18	123.30	66	4.1				Minahasa Peninsula
11	02/05/2020	02:16:19	4.48	125.30	189	4.5				Talaud Islands
12	02/05/2020	10:31:08	3.05	127.77	118	3.5				Halmahera
13	02/05/2020	10:50:35	5.74	126.41	149	4.3				Philippine Islands Region
14	02/05/2020	12:26:26	0.53	120.47	14	2.9				Minahasa Peninsula
15	02/05/2020	15:04:04	0.18	127.24	7	2.6				Halmahera
16	02/05/2020	18:50:03	0.35	122.19	19	3.1				Minahasa Peninsula
17	03/05/2020	00:58:29	2.52	126.68	10	3.6				Northern Molucca Sea
18	03/05/2020	01:13:21	-0.49	127.73	4	4.0				Halmahera
19	03/05/2020	05:18:13	3.10	127.24	10	3.6				Talaud Islands
20	03/05/2020	14:03:34	-0.27	120.62	7	3.4				Minahasa Peninsula
21	03/05/2020	15:24:54	-0.43	119.79	10	3.6				Minahasa Peninsula
22	03/05/2020	15:25:34	-0.43	119.84	10	3.7				Minahasa Peninsula
23	03/05/2020	16:58:38	2.41	127.98	192	4.1				Halmahera
24	04/05/2020	05:57:25	0.35	121.55	165	2.6				Minahasa Peninsula
25	04/05/2020	06:42:49	-0.27	123.90	10	3.2				Minahasa Peninsula
26	04/05/2020	07:13:22	2.05	126.94	29	4.3	0.15941	0.10572	-0.09737	Northern Molucca Sea
27	04/05/2020	10:21:08	0.40	121.96	139	2.9				Minahasa Peninsula
28	04/05/2020	22:05:16	-0.04	122.77	135	3.0				Minahasa Peninsula
29	04/05/2020	22:40:23	0.94	122.43	75	3.2				Minahasa Peninsula
30	05/05/2020	00:33:44	0.30	121.96	158	2.5				Minahasa Peninsula
31	05/05/2020	01:01:48	1.30	126.28	3	2.5				Northern Molucca Sea
32	05/05/2020	02:56:30	4.93	127.27	23	4.4				Talaud Island
33	05/05/2020	09:13:34	4.24	126.77	14	3.9				Talaud Island
34	05/05/2020	16:28:05	-0.31	124.54	11	3.5				Minahasa Peninsula
35	05/05/2020	20:10:24	-0.27	124.02	17	4.1				Minahasa Peninsula
36	05/05/2020	23:57:50	0.36	126.18	4	3.0				Northern Molucca Sea
37	06/05/2020	00:19:32	0.24	121.85	209	3.4				Minahasa Peninsula
38	06/05/2020	00:52:19	1.22	122.49	427	2.9				Minahasa Peninsula

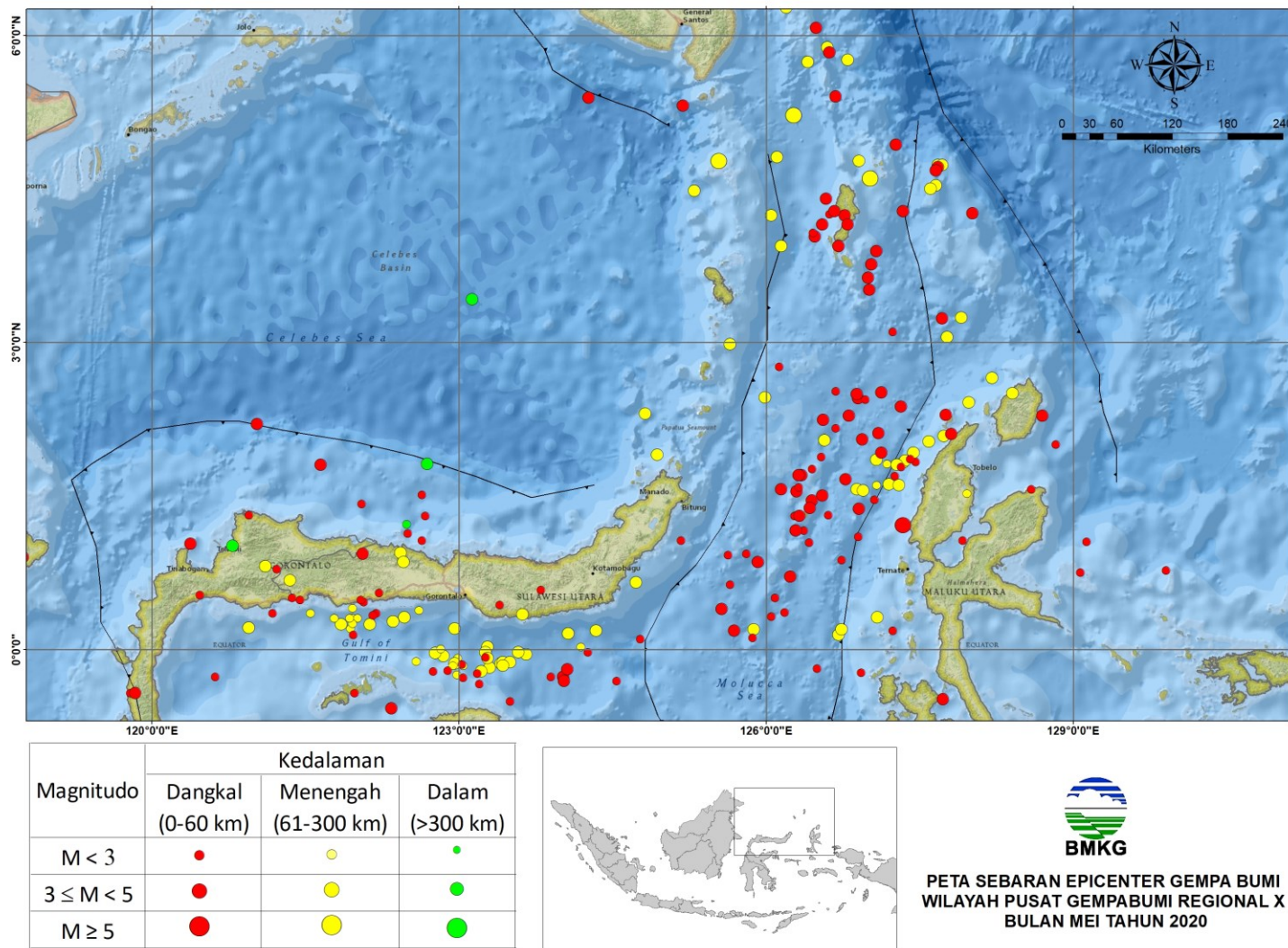
39	06/05/2020	01:43:47	1.45	126.45	10	4.8	0.50425	0.43905	0.33848	Northern Molucca Sea
40	06/05/2020	02:50:47	-0.08	123.26	10	3.1				Minahasa Peninsula
41	06/05/2020	02:54:01	6.95	127.31	116	4.7				Talaud Island
42	06/05/2020	10:45:45	0.14	126.71	83	3.1				Northern Molucca Sea
43	06/05/2020	19:30:12	1.82	127.34	90	4.9	0.53729	0.34576	0.43520	Halmahera
44	06/05/2020	23:48:05	0.30	122.01	173	2.6				Minahasa Peninsula
45	07/05/2020	00:23:11	0.53	131.88	10	3.2				Irian Jaya
46	07/05/2020	00:23:55	0.78	121.22	59	3.0				Minahasa Peninsula
47	07/05/2020	01:28:40	0.65	124.73	113	4.3				Minahasa Peninsula
48	07/05/2020	03:07:13	-0.20	124.06	10	3.7				Minahasa Peninsula
49	07/05/2020	04:32:43	-0.31	124.03	10	4.3				Minahasa Peninsula
50	07/05/2020	13:11:20	1.78	127.32	10	3.4				Halmahera
51	08/05/2020	00:18:36	1.55	126.95	98	4.4				Northern Molucca Sea
52	08/05/2020	01:07:43	1.10	126.90	36	3.3				Northern Molucca Sea
53	08/05/2020	02:29:39	0.55	122.22	18	2.7				Minahasa Peninsula
54	08/05/2020	03:44:50	2.08	127.74	195	3.1				Northern Molucca Sea
55	08/05/2020	06:49:53	1.38	126.43	23	4.2	0.18249	0.16849	0.18429	Northern Molucca Sea
56	08/05/2020	08:07:22	-0.05	123.66	83	3.0				Minahasa Peninsula
57	08/05/2020	09:02:31	2.50	128.41	197	4.3				Halmahera, Indonesia
58	08/05/2020	13:48:52	1.92	127.13	20	4.4				Halmahera, Indonesia
59	08/05/2020	17:10:10	1.83	127.46	24	3.5				Halmahera, Indonesia
60	08/05/2020	17:23:12	1.86	127.41	18	3.2				Halmahera, Indonesia
61	08/05/2020	17:28:38	2.16	126.68	10	3.1				Northern Molucca Sea
62	08/05/2020	17:34:19	1.05	129.13	10	3.1				Halmahera, Indonesia
63	08/05/2020	17:40:50	0.31	127.09	114	4.5				Halmahera, Indonesia
64	08/05/2020	18:34:45	0.18	124.34	135	3.3				Minahasa Peninsula
65	09/05/2020	04:47:29	-0.14	123.41	83	3.2				Minahasa Peninsula
66	09/05/2020	06:48:52	-0.09	122.99	95	2.6				Minahasa Peninsula
67	09/05/2020	13:41:46	0.77	129.91	27	3.3				Halmahera, Indonesia
68	09/05/2020	15:41:47	2.45	126.90	10	3.8				Northern Molucca Sea
69	10/05/2020	00:57:26	1.92	127.44	119	4.8				Halmahera, Indonesia
70	10/05/2020	21:09:49	1.03	120.38	2	3.9				Minahasa Peninsula
71	11/05/2020	11:03:03	4.53	127.66	107	4.3				Talaud Islands
72	11/05/2020	12:32:01	0.63	125.65	10	3.5				Minahasa Peninsula
73	11/05/2020	13:16:46	1.70	126.35	10	4.1				Northern Molucca Sea
74	11/05/2020	13:33:43	-0.14	122.96	104	4.0				Minahasa Peninsula
75	11/05/2020	13:36:24	4.73	127.68	93	4.8				Talaud Islands
76	11/05/2020	13:59:34	1.76	126.45	22	3.6				Northern Molucca Sea
77	11/05/2020	15:20:52	4.40	126.59	10	3.8				Talaud Islands
78	11/05/2020	16:21:24	1.54	126.30	10	4.7	0.46777	0.45974	0.36630	Northern Molucca Sea
79	11/05/2020	18:27:47	2.10	127.81	10	3.7				Halmahera, Indonesia
80	11/05/2020	20:07:03	2.29	127.76	10	3.8				Halmahera, Indonesia
81	11/05/2020	23:57:54	0.90	118.74	10	3.7				Borneo
82	12/05/2020	02:13:08	0.11	125.87	10	3.4				Northern Molucca Sea
83	12/05/2020	02:16:12	1.37	126.91	36	4.4				Northern Molucca Sea

84	12/05/2020	02:20:32	-0.16	123.04	132	2.8				Minahasa Peninsula
85	12/05/2020	03:27:31	-0.13	123.43	126	3.0				Minahasa Peninsula
86	12/05/2020	03:34:55	2.28	126.81	8	3.9				Northern Molucca Sea
87	12/05/2020	10:18:11	0.24	122.13	112	3.0				Minahasa Peninsula
88	12/05/2020	12:11:02	0.30	121.78	188	2.9				Minahasa Peninsula
89	12/05/2020	14:55:19	0.75	129.07	10	3.4				Halmahera, Indonesia
90	12/05/2020	15:21:56	-0.25	122.98	75	2.7				Minahasa Peninsula
91	12/05/2020	16:35:46	1.31	120.95	17	3.0				Minahasa Peninsula
92	12/05/2020	19:01:51	0.20	121.94	180	2.7				Minahasa Peninsula
93	13/05/2020	03:41:04	5.83	126.62	10	4.1				Mindanao, Philippines
94	13/05/2020	06:03:04	0.50	126.09	10	3.3				Northern Molucca Sea
95	13/05/2020	06:41:44	0.19	125.88	130	3.3				Northern Molucca Sea
96	13/05/2020	15:33:47	0.92	125.63	37	2.7				Northern Molucca Sea
97	13/05/2020	16:13:29	-0.16	122.94	126	2.8				Minahasa Peninsula
98	13/05/2020	16:45:13	2.03	127.59	202	4.2				Northern Molucca Sea
99	13/05/2020	18:15:20	2.44	126.97	10	3.6				Northern Molucca Sea
100	13/05/2020	18:51:54	2.00	128.83	10	3.4				Halmahera, Indonesia
101	13/05/2020	22:26:02	-0.19	126.50	10	3.1				Southern Molucca Sea
102	14/05/2020	01:08:39	1.90	124.94	211	3.6				Minahasa Peninsula
103	14/05/2020	05:53:11	0.46	122.07	7	2.8				Minahasa Peninsula
104	14/05/2020	11:00:37	3.42	123.13	554	3.9				Celebes Sea
105	14/05/2020	13:21:03	-0.13	123.50	104	3.6				Minahasa Peninsula
106	14/05/2020	14:00:24	0.93	122.06	23	4.0				Minahasa Peninsula
107	14/05/2020	18:55:46	6.27	126.20	141	4.4				Mindanao, Philippines
108	14/05/2020	20:41:55	1.81	122.69	481	4.0				Minahasa Peninsula
109	14/05/2020	21:28:39	1.42	122.05	10	3.6				Minahasa Peninsula
110	15/05/2020	02:12:51	1.16	126.37	6	3.5				Northern Molucca Sea
111	15/05/2020	02:38:26	1.61	127.20	116	4.9	0.70003	0.43024	0.30192	Halmahera, Indonesia
112	15/05/2020	20:13:58	1.46	127.06	32	3.2				Halmahera, Indonesia
113	16/05/2020	03:03:22	-0.23	126.93	10	3.6				Southern Molucca Sea
114	16/05/2020	05:42:27	4.03	126.48	23	3.8				Talaud Islands
115	16/05/2020	06:20:55	4.07	126.46	20	3.1				Talaud Islands
116	16/05/2020	07:14:50	0.10	124.77	10	3.6				Minahasa Peninsula
117	16/05/2020	18:12:14	-0.22	123.22	104	3.5				Minahasa Peninsula
118	17/05/2020	10:28:46	0.32	126.05	10	3.5				Northern Molucca Sea
119	17/05/2020	12:39:55	0.35	121.18	6	3.0				Minahasa Peninsula
120	17/05/2020	13:26:14	0.25	121.96	194	2.8				Minahasa Peninsula
121	17/05/2020	16:41:09	0.50	121.37	15	2.8				Minahasa Peninsula
122	17/05/2020	16:54:25	-0.16	123.43	152	3.2				Minahasa Peninsula
123	17/05/2020	20:37:49	4.28	127.34	15	4.2				Talaud Islands
124	18/05/2020	01:42:19	1.51	122.64	10	2.9				Minahasa Peninsula
125	18/05/2020	03:01:19	4.71	127.68	43	5.0				Talaud Islands
126	18/05/2020	04:01:18	4.73	127.72	85	4.7				Talaud Islands
127	18/05/2020	16:29:59	2.49	126.89	10	3.7				Northern Molucca Sea
128	18/05/2020	16:50:17	1.50	126.55	10	4.8				Northern Molucca Sea

129	18/05/2020	17:28:47	0.34	123.62	243	3.4				Minahasa Peninsula
130	18/05/2020	19:14:39	4.26	128.02	48	4.5				Talaud Islands
131	18/05/2020	19:19:59	0.21	120.95	164	4.1				Minahasa Peninsula
132	19/05/2020	05:38:53	0.43	123.40	10	3.2				Minahasa Peninsula
133	19/05/2020	06:55:38	1.30	126.33	10	3.7				Northern Molucca Sea
134	19/05/2020	07:04:18	1.84	127.36	107	3.8				Halmahera
135	19/05/2020	11:27:49	4.68	127.66	25	4.3				Talaud Islands
136	19/05/2020	19:38:15	5.31	125.19	40	4.9				Mindanao, Philippines
137	19/05/2020	22:26:39	0.48	122.04	34	2.7				Minahasa Peninsula
138	19/05/2020	22:59:10	1.88	126.54	9	3.5				Northern Molucca Sea
139	20/05/2020	00:38:46	5.40	126.68	23	4.5				Mindanao, Philippines
140	20/05/2020	02:30:26	1.80	127.28	106	3.0				Halmahera
141	20/05/2020	08:33:36	2.51	127.13	11	3.9				Northern Molucca Sea
142	20/05/2020	10:30:54	2.28	128.70	10	4.3				Halmahera
143	20/05/2020	12:45:08	5.22	126.27	101	5.1				Mindanao, Philippines
144	20/05/2020	13:56:45	6.54	125.78	167	5.6				Mindanao, Philippines
145	20/05/2020	17:31:56	1.06	127.92	10	2.4				Halmahera
146	20/05/2020	20:47:14	1.06	125.17	10	3.3				Northern Molucca Sea
147	20/05/2020	22:56:50	-0.34	123.20	46	3.1				Minahasa Peninsula
148	21/05/2020	06:03:35	0.85	125.92	10	4.2				Northern Molucca Sea
149	21/05/2020	07:46:01	2.11	127.10	21	3.9				Northern Molucca Sea
150	21/05/2020	10:13:03	1.80	121.65	10	3.8				Minahasa Peninsula
151	21/05/2020	11:27:49	-0.43	121.98	10	3.1				Minahasa Peninsula
152	21/05/2020	19:00:13	2.98	125.65	106	3.7				Talaud Islands
153	22/05/2020	06:28:07	3.76	127.03	19	4.7				Talaud Islands
154	22/05/2020	07:05:20	3.89	127.08	33	4.5				Talaud Islands
155	22/05/2020	11:15:30	3.63	127.00	10	4.0				Talaud Islands
156	22/05/2020	12:22:35	4.24	126.05	129	4.2				Talaud Islands
157	22/05/2020	13:55:11	-0.21	122.89	13	3.1				Minahasa Peninsula
158	22/05/2020	17:01:03	2.65	128.21	148	3.7				Halmahera, Indonesia
159	22/05/2020	18:12:47	2.04	126.57	169	3.6				Northern Molucca Sea
160	22/05/2020	18:40:09	0.02	123.28	123	4.2				Minahasa Peninsula
161	22/05/2020	22:43:08	0.67	121.35	89	4.0				Minahasa Peninsula
162	23/05/2020	03:53:46	0.27	122.36	132	3.2				Minahasa Peninsula
163	23/05/2020	04:37:15	1.66	126.78	46	4.2				Northern Molucca Sea
164	23/05/2020	07:00:41	-0.28	123.04	58	2.6				Minahasa Peninsula
165	24/05/2020	02:04:21	0.18	125.69	10	3.9				Southern Molucca Sea
166	24/05/2020	04:27:15	1.52	127.96	80	2.3				Halmahera, Indonesia
167	24/05/2020	08:14:30	1.56	128.59	10	2.7				Halmahera, Indonesia
168	24/05/2020	10:04:46	-0.24	123.18	51	2.6				Minahasa Peninsula
169	24/05/2020	10:36:31	0.58	123.80	51	2.4				Minahasa Peninsula
170	24/05/2020	13:56:54	1.69	127.26	13	2.3				Halmahera, Indonesia
171	24/05/2020	14:54:51	6.84	126.57	157	5.1				Mindanao, Philippines
172	24/05/2020	17:26:59	0.93	125.81	13	3.4				Northern Molucca Sea
173	24/05/2020	19:10:58	1.04	126.42	13	2.8				Northern Molucca Sea

174	25/05/2020	01:28:20	1.60	127.30	121	4.1				Halmahera, Indonesia
175	25/05/2020	10:42:26	0.39	125.57	10	4.6	0.29822	0.19342	0.23387	Northern Molucca Sea
176	25/05/2020	11:14:51	-0.03	123.58	138	3.3				Minahasa Peninsula
177	26/05/2020	01:28:45	0.00	122.82	152	2.6				Minahasa Peninsula
178	26/05/2020	03:39:36	0.02	124.19	65	2.9				Minahasa Peninsula
179	26/05/2020	08:04:58	-0.03	124.26	5	3.5				Minahasa Peninsula
180	26/05/2020	09:20:58	0.38	122.61	124	2.9				Minahasa Peninsula
181	26/05/2020	10:13:50	4.77	126.91	87	4.5				Talaud Islands
182	26/05/2020	18:10:58	6.94	125.18	58	4.6				Mindanao, Philippines
183	26/05/2020	20:07:32	0.15	124.07	104	3.5				Minahasa Peninsula
184	27/05/2020	03:20:33	1.30	122.67	30	3.5				Minahasa Peninsula
185	27/05/2020	07:33:06	6.07	126.49	10	4.8				Mindanao, Philippines
186	27/05/2020	07:46:56	4.77	125.54	175	5.1				Talaud Islands
187	27/05/2020	08:47:52	-0.03	123.26	140	3.0				Minahasa Peninsula
188	27/05/2020	10:20:11	2.24	126.56	10	3.9				Northern Molucca Sea
189	27/05/2020	10:45:07	0.85	122.46	60	3.0				Minahasa Peninsula
190	27/05/2020	10:59:05	0.33	122.16	20	3.1				Minahasa Peninsula
191	27/05/2020	12:50:39	1.31	126.61	10	2.9				Northern Molucca Sea
192	27/05/2020	13:28:37	1.13	122.50	4	2.8				Minahasa Peninsula
193	27/05/2020	15:02:42	3.23	127.72	10	3.7				Northern Molucca Sea
194	27/05/2020	17:13:04	4.50	127.61	87	4.0				Talaud Islands
195	27/05/2020	19:25:29	0.30	121.93	167	2.7				Minahasa Peninsula
196	27/05/2020	20:47:07	1.56	126.15	17	3.8				Northern Molucca Sea
197	28/05/2020	00:22:34	2.76	126.13	42	3.4				Northern Molucca Sea
198	28/05/2020	00:39:24	5.88	126.60	139	4.3				Mindanao, Philippines
199	28/05/2020	01:19:41	0.71	126.24	10	3.8				Northern Molucca Sea
200	28/05/2020	02:47:35	4.81	126.11	153	4.3				Talaud Islands
201	28/05/2020	05:40:16	2.30	124.82	199	4.0				Celebes Sea
202	28/05/2020	07:04:15	2.20	121.03	10	4.4				Minahasa Peninsula
203	28/05/2020	09:53:03	3.24	127.91	155	3.9				Northern Molucca Sea
204	28/05/2020	14:35:55	-0.12	122.58	84	2.5				Minahasa Peninsula
205	28/05/2020	16:52:47	1.21	127.34	150	5.0				Halmahera, Indonesia
206	29/05/2020	00:29:41	3.51	127.01	10	3.7				Talaud Islands
207	29/05/2020	02:13:39	0.14	121.97	10	2.5				Minahasa Peninsula
208	29/05/2020	08:05:10	5.39	124.27	10	4.6				Mindanao, Philippines
209	29/05/2020	11:40:13	1.16	126.29	10	3.7				Northern Molucca Sea
210	29/05/2020	11:51:41	1.01	120.79	545	3.4				Minahasa Peninsula
211	29/05/2020	20:09:58	4.15	126.80	18	3.8				Talaud Islands
212	30/05/2020	01:44:53	0.19	126.74	61	4.1				Northern Molucca Sea
213	30/05/2020	03:18:46	-0.51	123.50	10	3.6				Minahasa Peninsula
214	30/05/2020	09:24:45	3.94	126.15	60	3.9				Talaud Islands
215	30/05/2020	09:51:11	0.81	121.11	77	3.9				Minahasa Peninsula
216	30/05/2020	11:04:28	0.20	122.96	140	4.2				Minahasa Peninsula
217	30/05/2020	11:44:04	-0.58	122.34	11	3.9				Minahasa Peninsula
218	30/05/2020	13:06:25	3.94	126.71	10	5.7	0.30068	0.34737	0.17709	Talaud Islands

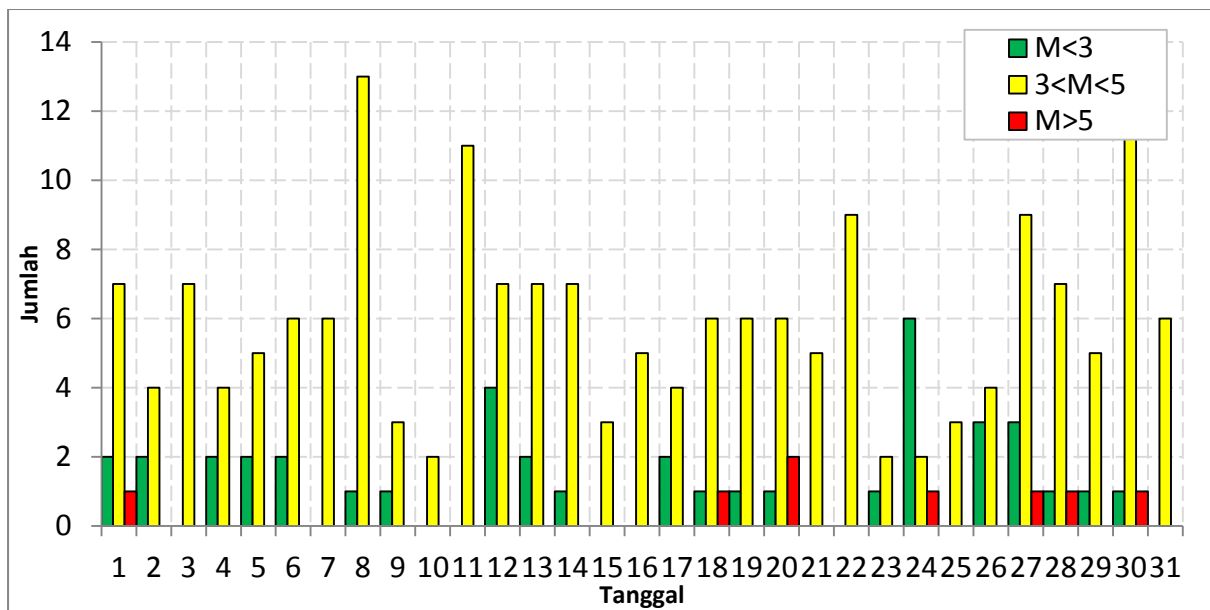
219	30/05/2020	13:34:28	4.25	126.62	36	3.3				Talaud Islands
220	30/05/2020	13:37:15	4.15	126.55	10	3.9				Talaud Islands
221	30/05/2020	15:10:56	4.28	126.67	30	3.7				Talaud Islands
222	30/05/2020	17:34:52	1.70	126.32	10	3.7				Northern Molucca Sea
223	30/05/2020	21:20:54	1.58	126.32	10	3.6				Northern Molucca Sea
224	30/05/2020	21:31:54	2.46	125.99	64	3.0				Talaud Islands
225	30/05/2020	21:52:53	1.60	127.08	103	2.7				Halmahera
226	31/05/2020	06:21:42	-0.22	122.75	10	3.0				Minahasa Peninsula
227	31/05/2020	12:39:40	1.06	122.64	39	3.5				Minahasa Peninsula
228	31/05/2020	14:11:46	-0.09	123.28	137	3.3				Minahasa Peninsula
229	31/05/2020	18:38:49	0.87	126.74	15	3.1				Northern Molucca Sea
230	31/05/2020	19:42:12	5.76	126.80	122	3.9				Mindanao, Philippines
231	31/05/2020	20:12:49	2.37	127.32	18	3.7				Halmahera



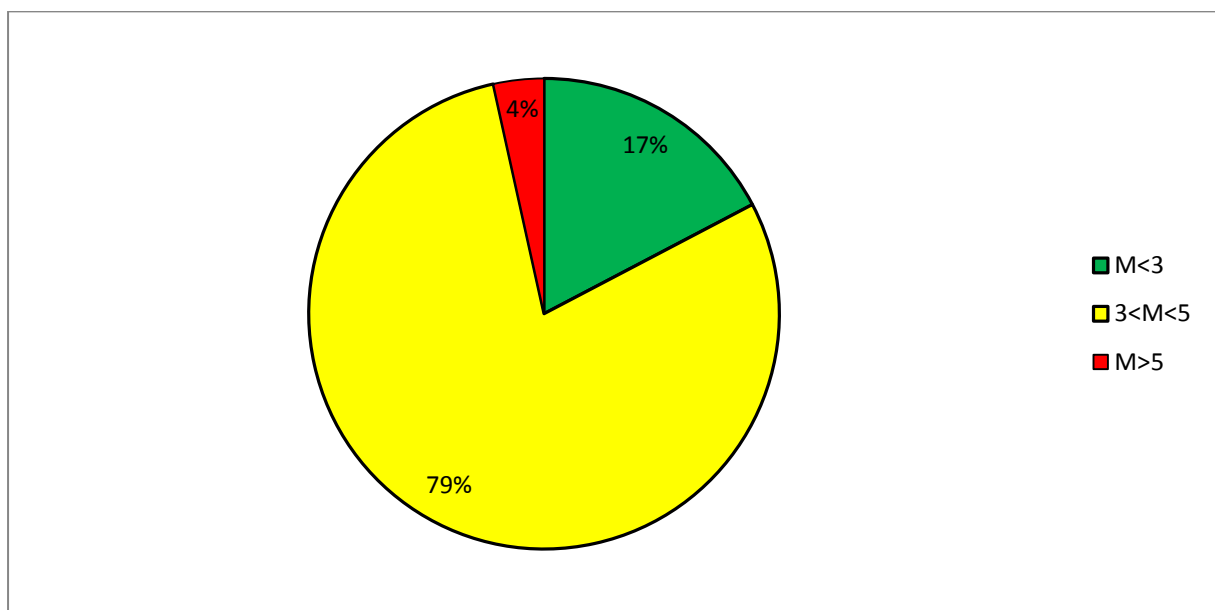
Gambar 17 Sebaran episenter gempabumi bulan Mei 2020

Tabel 12 Rekapitulasi gempabumi berdasarkan magnitudo bulan Mei 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	2	7	1	10	0	0
2	2	4	0	6	0	0
3	0	7	0	7	0	0
4	2	4	0	6	0	0
5	2	5	0	7	0	0
6	2	6	0	8	0	0
7	0	6	0	6	0	0
8	1	13	0	14	0	0
9	1	3	0	4	0	0
10	0	2	0	2	0	0
11	0	11	0	11	0	0
12	4	7	0	11	0	0
13	2	7	0	9	0	0
14	1	7	0	8	0	0
15	0	3	0	3	0	0
16	0	5	0	5	0	0
17	2	4	0	6	0	0
18	1	6	1	8	0	0
19	1	6	0	7	0	0
20	1	6	2	9	0	0
21	0	5	0	5	0	0
22	0	9	0	9	0	0
23	1	2	0	3	0	0
24	6	2	1	9	0	0
25	0	3	0	3	0	0
26	3	4	0	7	0	0
27	3	9	1	13	0	0
28	1	7	1	9	0	0
29	1	5	0	6	0	0
30	1	12	1	14	1	0
31	0	6	0	6	0	0
Jumlah gempa	40	183	8	231	1	0



Gambar 18 Grafik gempabumi berdasarkan magnitudo bulan Mei 2020



Gambar 19 Grafik persentase gempabumi berdasarkan magnitudo bulan Mei 2020

F. Data Gempabumi Bulan Juni 2020

Tabel 13 Data kejadian gempabumi bulan Juni 2020

No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/06/2020	04:57:56	3.71	125.91	138	4.2				Talaud Islands
2	01/06/2020	07:41:00	4.13	126.67	34	4.3				Talaud Islands
3	01/06/2020	14:52:58	4.14	126.53	28	4.3				Talaud Islands
4	01/06/2020	21:41:37	1.10	125.55	27	3.1				Northern Molucca Sea
5	02/06/2020	07:13:00	3.28	128.04	10	4.4				Halmahera
6	02/06/2020	07:42:11	5.43	125.22	10	4.5				Talaud Islands
7	02/06/2020	16:33:24	-0.10	123.20	142	3.2				Minahasa Peninsula
8	02/06/2020	16:37:38	2.14	121.48	10	4.3				Minahasa Peninsula
9	02/06/2020	18:41:15	2.84	123.02	468	3.9				Celebes Sea
10	02/06/2020	21:17:07	1.39	126.40	10	3.2				Northern Molucca Sea
11	03/06/2020	02:50:11	1.94	128.64	10	2.9				Halmahera
12	03/06/2020	06:58:27	4.67	127.48	117	5.0				Talaud Islands
13	03/06/2020	20:08:44	0.13	126.15	27	3.5				Northern Molucca Sea
14	03/06/2020	20:13:50	4.63	122.80	552	4.5				Celebes Sea
15	04/06/2020	02:50:24	5.93	126.02	160	4.6				Mindanao, Philippines
16	04/06/2020	03:18:13	2.58	128.24	29	4.1				Halmahera
17	04/06/2020	04:39:26	0.10	123.10	126	3.8				Minahasa Peninsula
18	04/06/2020	08:49:40	2.93	128.19	111	6.8	4.4103	4.2126	3.3068	Halmahera
19	04/06/2020	09:32:03	1.35	119.05	10	4.5				Celebes Sea
20	04/06/2020	13:12:33	1.26	126.38	10	4.7	1.1648	1.8899	0.9542	Northern Molucca Sea
21	04/06/2020	13:43:02	3.36	128.53	10	3.4				Halmahera
22	04/06/2020	17:15:21	-0.19	122.96	87	3.6				Minahasa Peninsula
23	04/06/2020	21:32:37	1.19	126.62	25	2.8				Northern Molucca Sea
24	04/06/2020	21:53:59	1.93	127.16	63	4.6				Northern Molucca Sea
25	05/06/2020	00:19:18	3.96	127.90	142	3.8				Talaud Islands
26	05/06/2020	03:17:43	1.65	127.71	10	2.9				Halmahera
27	05/06/2020	07:51:24	0.26	122.04	168	3.2				Minahasa Peninsula
28	05/06/2020	13:56:09	4.11	126.59	36	3.9				Talaud Islands
29	05/06/2020	21:28:34	-0.29	122.92	74	3.4				Minahasa Peninsula
30	06/06/2020	04:32:46	3.03	127.83	10	3.8				Talaud Islands
31	06/06/2020	11:26:45	2.41	126.79	10	3.4				Northern Molucca Sea
32	06/06/2020	13:40:52	2.01	128.65	18	4.8				Halmahera
33	06/06/2020	14:27:27	1.18	119.16	11	4.1				Celebes Sea
34	06/06/2020	15:26:52	0.52	121.15	92	3.5				Minahasa Peninsula
35	06/06/2020	15:58:24	2.02	128.61	11	3.8				Halmahera
36	06/06/2020	19:02:32	-0.19	122.79	26	3.4				Minahasa Peninsula
37	06/06/2020	20:28:21	1.18	127.82	10	2.1				Halmahera
38	06/06/2020	20:32:41	1.12	122.79	30	2.8				Minahasa Peninsula

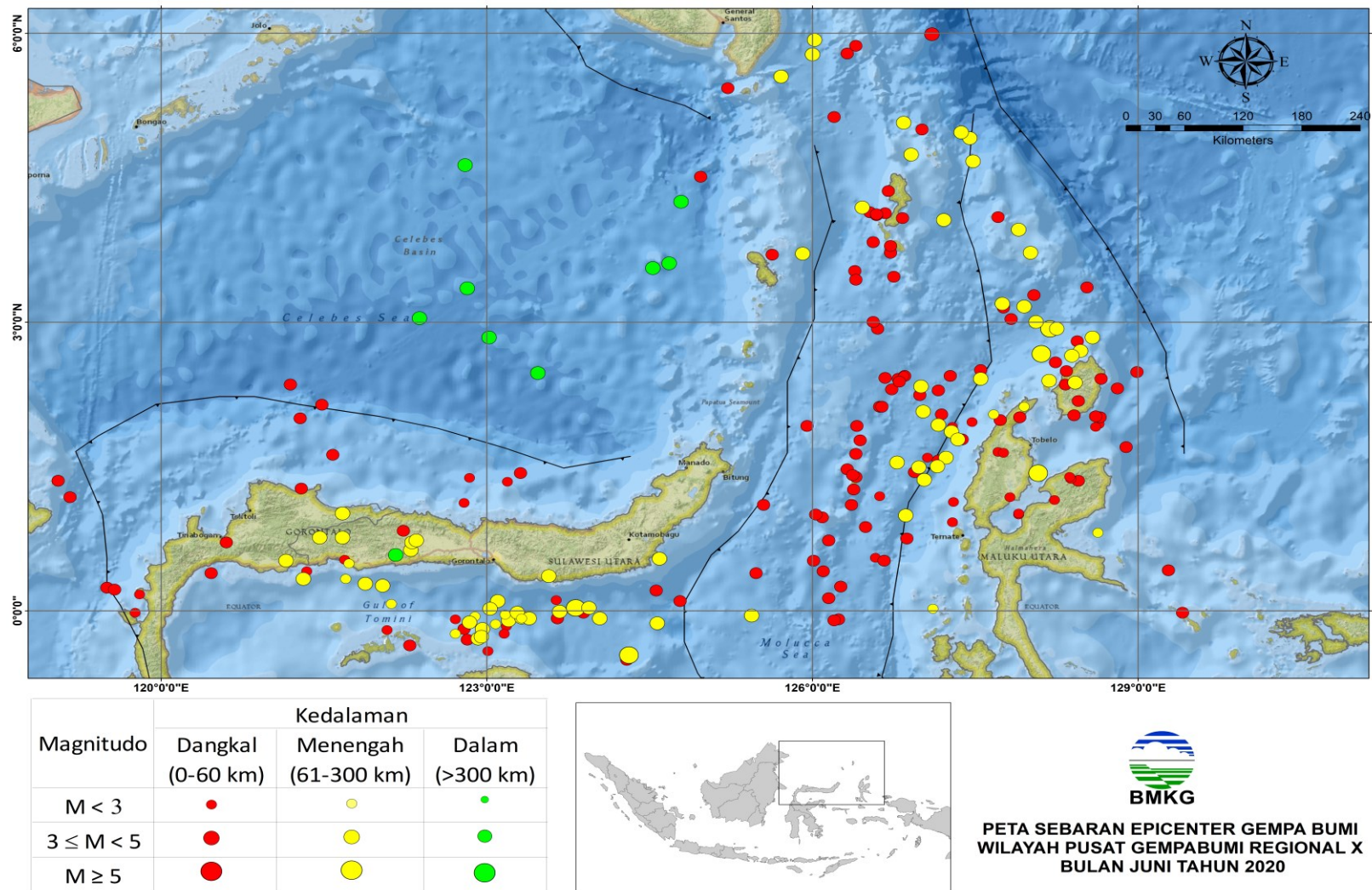
39	07/06/2020	07:56:00	0.49	121.73	108	3.0				Minahasa Peninsula
40	07/06/2020	23:31:04	4.06	127.21	109	4.5				Talaud Islands
41	08/06/2020	02:34:34	-0.46	124.31	76	5.1	0.5075	0.5173	0.4086	Southern Molucca Sea
42	08/06/2020	08:06:39	4.74	126.91	112	4.4				Talaud Islands
43	08/06/2020	08:47:12	1.78	127.38	16	4.1				Halmahera
44	08/06/2020	09:07:53	1.13	127.30	21	3.0				Northern Molucca Sea
45	08/06/2020	09:36:41	6.78	126.16	136	4.4				Mindanao, Philippines
46	08/06/2020	10:47:08	2.01	127.91	10	3.4				Northern Molucca Sea
47	08/06/2020	13:10:45	0.55	126.58	8	3.0				Northern Molucca Sea
48	08/06/2020	13:56:16	2.31	128.81	10	3.7				Halmahera
49	08/06/2020	17:06:13	-0.08	124.04	95	3.1				Minahasa Peninsula
50	08/06/2020	22:12:58	1.10	126.36	10	3.3				Northern Molucca Sea
51	08/06/2020	23:17:51	-0.51	124.29	20	4.1				Southern Molucca Sea
52	09/06/2020	21:18:17	0.63	122.30	96	3.6				Minahasa Peninsula
53	10/06/2020	09:59:15	2.47	123.47	421	3.9				Celebes Sea
54	10/06/2020	14:44:26	-0.09	126.24	10	4.1				Southern Molucca Sea
55	10/06/2020	14:59:27	-0.10	126.20	24	3.6				Southern Molucca Sea
56	10/06/2020	18:18:29	0.99	126.86	109	4.7	0.4316	0.3521	0.2293	Northern Molucca Sea
57	10/06/2020	23:07:23	4.08	126.83	19	4.1				Talaud Islands
58	10/06/2020	23:11:46	-0.08	123.65	22	3.8				Minahasa Peninsula
59	11/06/2020	04:22:59	-0.07	123.32	126	3.3				Minahasa Peninsula
60	11/06/2020	04:34:46	2.35	121.19	16	4.0				Celebes Sea
61	11/06/2020	05:46:30	-0.06	122.89	160	3.0				Minahasa Peninsula
62	11/06/2020	08:28:12	2.44	126.85	10	3.6				Northern Molucca Sea
63	11/06/2020	13:54:19	0.02	127.11	89	2.9				Halmahera
64	11/06/2020	14:41:17	4.36	126.70	32	3.7				Talaud Islands
65	11/06/2020	16:21:36	2.39	128.18	173	3.7				Halmahera
66	11/06/2020	18:51:32	0.24	119.50	10	4.5				Minahasa Peninsula
67	11/06/2020	19:41:17	0.22	119.57	10	3.5				Minahasa Peninsula
68	11/06/2020	20:23:17	5.07	126.84	62	4.6				Mindanao, Philippines
69	12/06/2020	01:49:17	0.39	120.46	7	3.1				Minahasa Peninsula
70	12/06/2020	03:20:49	5.55	125.71	186	4.4				Talaud Island
71	12/06/2020	05:23:01	0.17	119.80	9	3.0				Minahasa Peninsula
72	12/06/2020	08:07:00	-0.05	125.44	122	3.7				Northern Molucca Sea
73	12/06/2020	15:45:43	4.12	126.59	30	4.1				Talaud Island
74	12/06/2020	17:50:12	2.04	127.19	20	4.2				Northern Molucca Sea
75	12/06/2020	18:26:50	-0.01	123.67	111	3.7				Minahasa Peninsula
76	12/06/2020	20:59:21	1.43	123.31	1	4.0				Minahasa Peninsula
77	12/06/2020	21:06:13	0.28	121.88	164	3.7				Minahasa Peninsula
78	12/06/2020	23:53:59	1.34	123.19	10	3.0				Minahasa Peninsula
79	13/06/2020	01:41:27	1.38	122.84	33	2.7				Minahasa Peninsula
80	13/06/2020	02:10:43	5.99	127.10	10	5.2				Talaud Island
81	13/06/2020	04:34:05	1.92	126.41	10	4.2				Northern Molucca Sea
82	13/06/2020	10:17:34	3.61	124.68	304	4.1				Celebes Sea
83	13/06/2020	10:50:56	-0.16	123.18	10	2.9				Minahasa Peninsula

84	13/06/2020	11:57:17	3.70	125.63	30	4.4				Talaud Island
85	13/06/2020	15:32:24	-0.04	123.17	140	2.8				Minahasa Peninsula
86	13/06/2020	18:11:27	3.16	127.95	92	4.2				Halmahera
87	13/06/2020	18:20:57	2.70	128.47	207	4.0				Halmahera
88	13/06/2020	22:16:24	0.39	125.48	2	3.6				Northern Molucca Sea
89	13/06/2020	22:54:17	0.76	121.46	91	3.9				Minahasa Peninsula
90	14/06/2020	04:57:47	2.35	128.33	10	4.9				Halmahera
91	14/06/2020	05:13:21	1.59	127.06	10	3.0				Halmahera
92	14/06/2020	10:46:20	0.07	122.12	162	2.9				Minahasa Peninsula
93	14/06/2020	13:25:26	2.67	128.11	111	5.3	0.5306	0.4809	0.277	Halmahera
94	14/06/2020	13:30:16	0.75	126.87	11	3.3				Halmahera
95	14/06/2020	13:49:34	0.97	126.09	10	3.5				Northern Molucca Sea
96	14/06/2020	18:24:51	1.86	127.28	102	3.6				Halmahera
97	14/06/2020	18:52:14	2.30	126.73	6	4.0				Northern Molucca Sea
98	14/06/2020	19:58:41	1.00	127.90	11	2.9				Halmahera
99	14/06/2020	20:12:52	1.01	127.90	10	2.2				Halmahera
100	14/06/2020	20:53:49	2.00	121.28	10	3.3				Minahasa Peninsula
101	14/06/2020	20:58:16	1.64	127.76	18	2.0				Halmahera
102	14/06/2020	21:50:29	1.44	126.94	34	3.6				Halmahera
103	14/06/2020	23:43:20	2.04	127.67	98	2.8				Halmahera
104	15/06/2020	00:19:53	0.33	121.70	195	2.9				Minahasa Peninsula
105	15/06/2020	02:18:21	-0.02	129.41	20	3.5				Halmahera
106	15/06/2020	02:50:40	0.21	124.56	10	4.5	0.2038	0.2015	0.1865	Minahasa Peninsula
107	15/06/2020	04:15:44	1.43	128.08	109	5.6				Halmahera
108	15/06/2020	07:24:36	2.80	128.44	10	3.7				Halmahera
109	15/06/2020	07:28:08	2.18	128.45	10	3.6				Halmahera
110	15/06/2020	08:53:38	2.44	127.27	30	3.2				Northern Molucca Sea
111	15/06/2020	15:50:19	1.96	127.47	25	2.7				Halmahera
112	15/06/2020	16:29:54	0.33	121.31	174	3.3				Minahasa Peninsula
113	15/06/2020	17:11:34	-0.12	122.84	144	3.3				Minahasa Peninsula
114	15/06/2020	17:19:15	4.51	124.97	6	4.4				Talaud Island
115	15/06/2020	18:33:43	1.49	126.98	110	3.2				Northern Molucca Sea
116	15/06/2020	19:46:04	2.44	126.84	10	2.8				Northern Molucca Sea
117	15/06/2020	22:23:28	1.62	121.58	10	3.8				Minahasa Peninsula
118	15/06/2020	22:47:49	1.47	126.32	10	3.1				Northern Molucca Sea
119	16/06/2020	03:04:04	1.35	128.45	7	3.8				Halmahera
120	16/06/2020	05:00:57	-0.02	123.28	140	3.1				Minahasa Peninsula
121	16/06/2020	09:03:08	1.56	127.16	10	3.1				Halmahera
122	16/06/2020	09:05:27	2.33	127.00	63	3.3				Northern Molucca Sea
123	16/06/2020	13:22:10	1.37	128.38	15	2.2				Halmahera
124	16/06/2020	18:55:10	0.41	121.34	27	3.0				Minahasa Peninsula
125	16/06/2020	21:23:02	2.37	128.42	216	3.4				Halmahera
126	16/06/2020	21:40:15	0.83	122.23	4	3.2				Minahasa Peninsula
127	17/06/2020	04:15:23	3.53	126.39	29	3.4				Talaud Island
128	17/06/2020	14:42:49	0.87	126.49	12	3.4				Northern Molucca Sea

129	17/06/2020	16:26:25	4.25	124.79	318	4.0				Celebes Sea
130	17/06/2020	17:48:18	2.03	128.41	52	4.2				Halmahera
131	17/06/2020	20:45:29	-0.08	123.39	128	3.2				Minahasa Peninsula
132	18/06/2020	00:43:20	5.13	126.20	25	4.3				Talaud Island
133	18/06/2020	04:40:26	1.39	128.37	22	2.6				Halmahera
134	18/06/2020	06:52:36	2.48	128.99	10	4.3				Halmahera
135	18/06/2020	10:24:23	3.15	127.76	29	4.4				Halmahera
136	18/06/2020	20:51:57	-0.02	119.76	10	2.9				Minahasa Peninsula
137	18/06/2020	21:48:51	2.12	127.95	113	2.7				Northern Molucca Sea
138	18/06/2020	21:52:23	0.42	129.28	7	3.2				Halmahera
139	18/06/2020	22:08:29	1.91	128.61	10	3.0				Halmahera
140	19/06/2020	07:19:15	2.12	126.62	13	3.6				Northern Molucca Sea
141	19/06/2020	07:58:27	2.49	128.34	2	3.7				Halmahera
142	19/06/2020	16:49:42	5.78	126.00	154	4.3				Talaud Islands
143	20/06/2020	00:10:36	0.92	127.29	25	2.9				Halmahera
144	20/06/2020	00:28:24	0.02	123.03	142	3.3				Minahasa Peninsula
145	20/06/2020	04:22:06	2.29	127.16	30	3.6				Northern Molucca Sea
146	20/06/2020	05:09:03	3.83	126.56	12	4.2				Talaud Islands
147	20/06/2020	15:17:22	1.15	128.23	14	2.8				Halmahera
148	20/06/2020	18:04:55	2.38	126.80	10	3.7				Northern Molucca Sea
149	21/06/2020	06:26:12	4.91	127.45	158	3.6				Talaud Islands
150	21/06/2020	06:29:54	0.10	124.78	13	3.7				Minahasa Peninsula
151	21/06/2020	07:44:33	1.01	121.67	85	4.4				Minahasa Peninsula
152	21/06/2020	14:54:15	3.19	127.75	151	3.9				Halmahera
153	21/06/2020	15:30:58	-0.36	122.29	48	3.4				Minahasa Peninsula
154	21/06/2020	17:07:19	4.19	126.46	97	3.8				Talaud Islands
155	21/06/2020	20:22:27	-0.09	122.71	10	2.8				Minahasa Peninsula
156	22/06/2020	04:21:15	0.52	126.66	11	3.2				Northern Molucca Sea
157	22/06/2020	04:36:44	3.72	126.72	33	4.1				Talaud Islands
158	22/06/2020	10:56:03	3.79	126.72	31	4.7				Talaud Islands
159	22/06/2020	15:33:38	4.97	127.37	67	4.5				Talaud Islands
160	22/06/2020	17:20:20	3.56	124.53	324	4.1				Celebes Sea
161	22/06/2020	17:32:49	0.54	124.59	94	3.4				Minahasa Peninsula
162	22/06/2020	18:44:49	1.92	125.95	14	3.4				Northern Molucca Sea
163	22/06/2020	18:53:38	2.50	127.55	26	3.3				Northern Molucca Sea
164	22/06/2020	19:07:49	3.00	128.06	150	4.3				Halmahera
165	22/06/2020	21:54:02	2.24	126.99	14	3.6				Northern Molucca Sea
166	22/06/2020	22:10:59	-0.13	124.57	78	4.2				Southern Molucca sea
167	22/06/2020	23:05:40	-0.08	123.32	126	2.4				Minahasa Peninsula
168	22/06/2020	23:05:41	1.59	127.23	117	3.8				Halmahera
169	22/06/2020	23:30:07	-0.02	123.89	10	3.3				Minahasa Peninsula
170	23/06/2020	04:05:32	-0.24	123.16	58	2.6				Minahasa Peninsula
171	23/06/2020	04:17:13	2.07	127.02	159	3.4				Northern Molucca Sea
172	23/06/2020	05:18:12	4.09	127.71	10	4.4				North of Halmahera
173	23/06/2020	05:55:11	2.93	126.60	10	4.3				Northern Molucca Sea

174	23/06/2020	07:43:29	0.03	123.82	109	6.0	0.8696	1.0093	1.0591	Minahasa Peninsula
175	23/06/2020	10:16:05	1.54	126.78	101	4.1				Northern Molucca Sea
176	23/06/2020	14:00:30	1.70	128.89	10	3.5				Halmahera
177	23/06/2020	14:26:53	0.11	123.64	10	2.6				Minahasa Peninsula
178	23/06/2020	14:41:37	-0.42	123.01	10	2.8				Minahasa Peninsula
179	23/06/2020	14:55:59	3.00	126.56	10	3.9				Northern Molucca Sea
180	23/06/2020	23:05:33	3.44	126.40	21	3.7				Talaud Islands
181	24/06/2020	00:40:55	2.93	128.25	160	3.5				Halmahera
182	24/06/2020	03:50:18	1.36	127.03	101	4.4				Halmahera
183	24/06/2020	05:25:21	2.65	128.39	206	4.1				Halmahera
184	24/06/2020	05:32:03	-0.20	122.08	10	2.9				Minahasa Peninsula
185	24/06/2020	05:56:16	1.27	121.29	9	3.3				Minahasa Peninsula
186	24/06/2020	15:19:06	1.91	127.29	31	2.7				Halmahera
187	24/06/2020	19:15:38	3.35	122.82	529	4.1				Celebes Sea
188	24/06/2020	22:32:48	0.71	122.31	99	3.2				Minahasa Peninsula
189	24/06/2020	23:48:04	-0.14	123.08	107	2.8				Minahasa Peninsula
190	25/06/2020	01:14:23	3.72	128.01	67	4.1				Halmahera
191	25/06/2020	06:59:32	1.98	127.73	10	3.4				Halmahera
192	25/06/2020	09:08:54	0.53	121.69	10	2.9				Minahasa Peninsula
193	25/06/2020	09:50:35	5.79	126.32	10	4.5				Talaud Islands
194	25/06/2020	15:17:25	0.52	126.01	10	3.2				Northern Molucca Sea
195	25/06/2020	16:19:00	0.25	126.26	10	4.1				Northern Molucca Sea
196	25/06/2020	22:08:16	0.81	128.63	111	3.0				Halmahera
197	26/06/2020	01:15:45	0.76	121.67	62	3.8				Minahasa Peninsula
198	26/06/2020	07:05:14	1.78	127.34	84	3.3				Halmahera
199	26/06/2020	12:45:03	2.12	126.64	21	3.7				Northern Molucca Sea
200	26/06/2020	15:40:48	1.41	126.37	10	4.0				Northern Molucca Sea
201	26/06/2020	18:36:42	6.55	127.20	10	4.8				Philippine Islands
202	26/06/2020	20:40:28	5.87	126.40	10	4.5				Mindanao, Philippines
203	26/06/2020	21:55:43	1.77	126.44	20	3.8				Northern Molucca Sea
204	27/06/2020	01:56:31	3.47	126.75	45	3.9				Talaud Islands
205	27/06/2020	02:30:46	2.41	127.55	99	3.8				Northern Molucca Sea
206	27/06/2020	09:55:20	1.63	126.40	10	3.8				Northern Molucca Sea
207	27/06/2020	12:04:07	0.36	123.57	240	4.2				Minahasa Peninsula
208	27/06/2020	22:52:02	-0.30	122.82	10	3.4				Minahasa Peninsula
209	28/06/2020	09:38:39	5.00	127.01	10	4.2				Philippine Islands
210	28/06/2020	10:40:07	0.41	126.10	10	3.1				Northern Molucca Sea
211	28/06/2020	13:05:18	0.73	122.35	90	3.1				Minahasa Peninsula
212	28/06/2020	13:14:51	0.73	126.15	10	4.0				Northern Molucca Sea
213	28/06/2020	15:27:25	1.00	126.03	55	3.5				Northern Molucca Sea
214	29/06/2020	15:03:01	2.84	128.58	222	3.8				Halmahera
215	29/06/2020	18:02:37	0.58	122.16	353	4.1				Minahasa Peninsula
216	29/06/2020	23:03:35	-0.27	122.95	76	3.4				Minahasa Peninsula
217	30/06/2020	01:12:56	0.03	123.94	70	3.9				Minahasa Peninsula
218	30/06/2020	01:58:30	7.00	116.36	623	5.1				Borneo

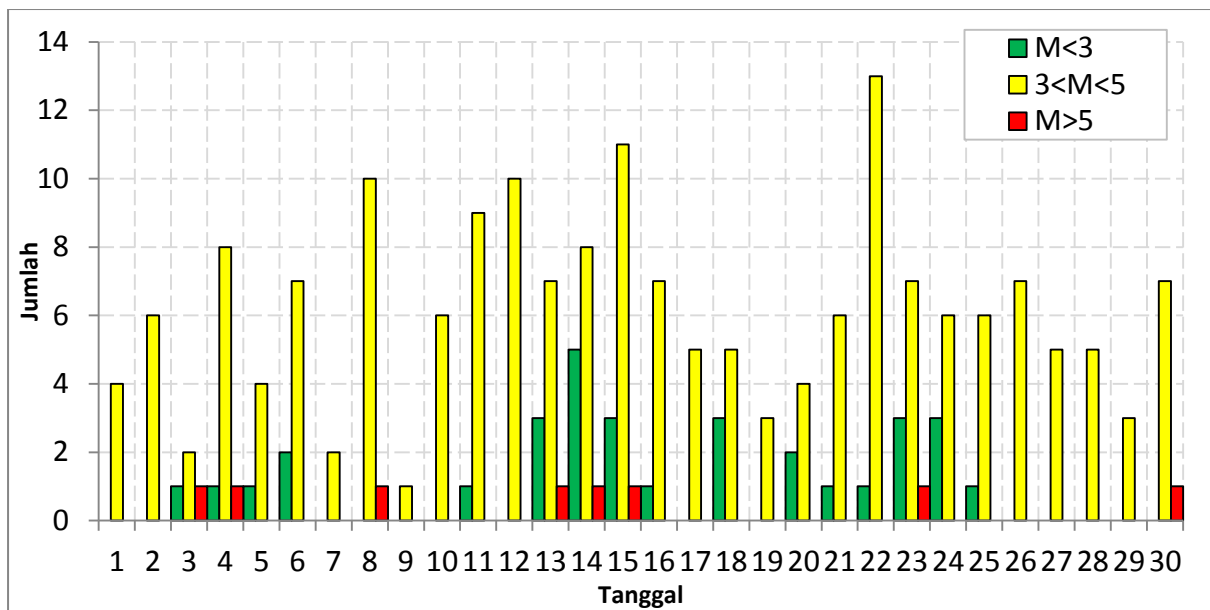
219	30/06/2020	04:55:21	2.42	126.67	33	3.9				Northern Molucca Sea
220	30/06/2020	14:41:39	-0.24	122.71	63	3.0				Minahasa Peninsula
221	30/06/2020	16:13:42	3.04	122.38	538	4.0				Celebes Sea
222	30/06/2020	16:50:41	2.41	128.66	13	3.4				Halmahera
223	30/06/2020	19:37:32	1.50	127.15	120	3.6				Halmahera
224	30/06/2020	21:52:43	0.71	120.60	10	4.2				Minahasa Peninsula



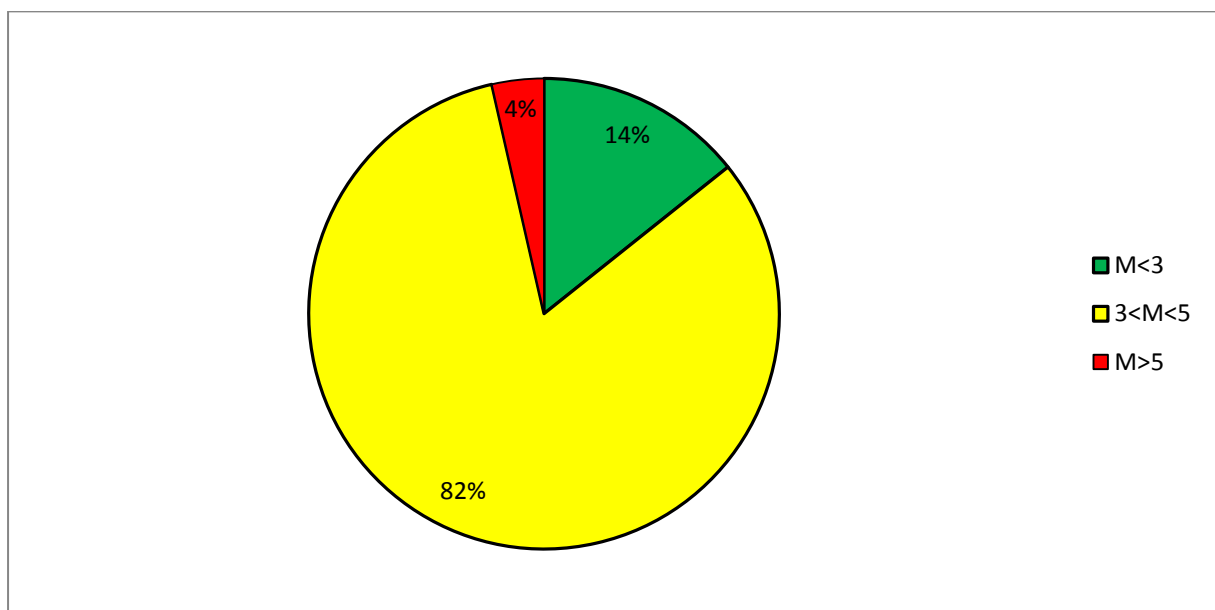
Gambar 20 Sebaran episenter gempabumi bulan Juni 2020

Tabel 14 Rekapitulasi gempabumi berdasarkan magnitudo bulan Juni 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	0	4	0	4	0	0
2	0	6	0	6	0	0
3	1	2	1	4	0	0
4	1	8	1	10	2	0
5	1	4	0	5	0	0
6	2	7	0	9	1	0
7	0	2	0	2	0	0
8	0	10	1	11	1	0
9	0	1	0	1	0	0
10	0	6	0	6	0	0
11	1	9	0	10	0	0
12	0	10	0	10	0	0
13	3	7	1	11	0	0
14	5	8	1	14	2	0
15	3	11	1	15	2	0
16	1	7	0	8	0	0
17	0	5	0	5	0	0
18	3	5	0	8	0	0
19	0	3	0	3	0	0
20	2	4	0	6	0	0
21	1	6	0	7	0	0
22	1	13	0	14	0	0
23	3	7	1	11	1	0
24	3	6	0	9	0	0
25	1	6	0	7	0	0
26	0	7	0	7	0	0
27	0	5	0	5	0	0
28	0	5	0	5	0	0
29	0	3	0	3	0	0
30	0	7	1	8	0	0
Jumlah gempa	32	184	8	224	9	0



Gambar 21 Grafik gempabumi berdasarkan magnitudo bulan Juni 2020



Gambar 22 Grafik persentase gempabumi berdasarkan magnitudo bulan Juni 2020

G. Data Gempabumi Bulan Juli 2020

Tabel 15 Data kejadian gempabumi bulan Juli 2020

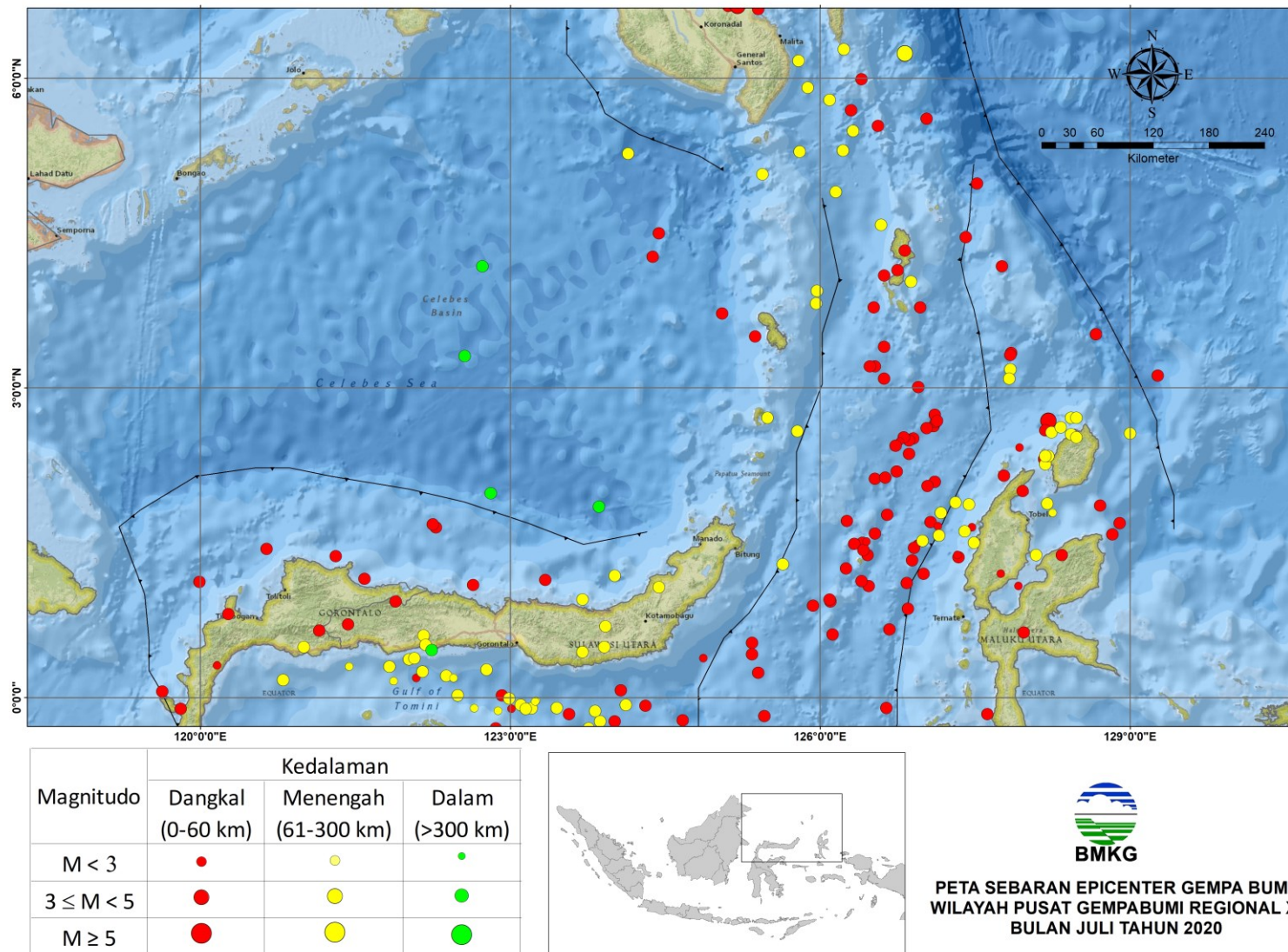
No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/07/2020	00:58:58	0.24	125.40	10	4.0				Northern Molucca Sea
2	01/07/2020	01:14:58	1.12	119.99	10	3.8				Celebes Sea
3	01/07/2020	02:15:05	0.02	122.49	136	3.6				Minahasa Peninsula
4	01/07/2020	05:41:14	-0.23	124.01	21	4.5				Southern Molucca Sea
5	01/07/2020	07:07:04	-0.22	124.67	34	3.4				Minahasa Peninsula
6	01/07/2020	14:54:34	2.42	127.93	10	2.9				Northern Molucca Sea
7	01/07/2020	16:23:19	2.51	126.90	10	3.7				Northern Molucca Sea
8	02/07/2020	09:23:06	0.53	125.34	10	4.6	0.54213	0.57562	0.34749	Minahasa Peninsula
9	02/07/2020	16:54:34	1.50	127.49	181	3.7				Halmahera
10	02/07/2020	19:00:32	5.49	126.32	122	4.6				Mindanao, Philippines
11	02/07/2020	19:14:50	1.77	126.65	10	4.1				Northern Molucca Sea
12	02/07/2020	21:47:20	1.98	122.81	422	4.1				Minahasa Peninsula
13	03/07/2020	07:41:09	2.49	126.86	10	3.3				Northern Molucca Sea
14	03/07/2020	22:27:33	1.38	128.34	10	3.0				Halmahera
15	04/07/2020	03:00:37	0.21	122.38	122	3.1				Minahasa Peninsula
16	04/07/2020	05:50:57	2.52	126.81	10	3.6				Northern Molucca Sea
17	04/07/2020	18:14:56	-0.07	123.10	112	3.6				Minahasa Peninsula
18	04/07/2020	20:26:12	2.48	126.77	27	2.8				Northern Molucca Sea
19	04/07/2020	20:43:52	2.44	126.73	10	3.6				Northern Molucca Sea
20	04/07/2020	20:49:10	0.38	124.87	10	2.5				Minahasa Peninsula
21	05/07/2020	00:09:52	2.26	128.18	150	3.2				Halmahera
22	05/07/2020	02:29:08	1.09	122.64	40	4.4				Minahasa Peninsula
23	05/07/2020	02:52:05	0.65	121.15	38	4.8				Minahasa Peninsula
24	05/07/2020	05:34:04	2.68	128.21	27	5.1				Halmahera
25	05/07/2020	14:22:53	3.52	128.67	10	4.2				North of Halmahera
26	05/07/2020	16:23:03	1.20	127.75	6	2.9				Halmahera
27	06/07/2020	01:01:27	-0.16	127.62	10	3.4				Halmahera
28	06/07/2020	03:32:47	5.07	125.44	89	4.3				Mindanao, Philippines
29	06/07/2020	04:55:05	2.12	126.53	10	3.4				Northern Molucca Sea
30	06/07/2020	06:21:22	3.21	126.53	9	4.2				Talaud Islands
31	06/07/2020	07:34:13	3.78	126.97	32	4.0				Talaud Islands
32	06/07/2020	11:17:57	1.38	126.46	10	4.6	0.20543	0.23889	0.13944	Northern Molucca Sea
33	06/07/2020	15:00:02	1.08	127.92	4	2.9				Halmahera
34	06/07/2020	20:11:29	2.59	128.18	22	3.0				Halmahera
35	07/07/2020	05:02:46	0.02	122.92	17	3.4				Minahasa Peninsula
36	07/07/2020	16:22:09	2.00	127.96	10	3.3				Halmahera
37	07/07/2020	19:25:19	-0.10	122.65	75	2.5				Minahasa Peninsula

38	07/07/2020	19:26:49	1.49	126.94	10	2.8				Halmahera
39	07/07/2020	19:36:12	1.45	126.91	30	4.0				Halmahera
40	08/07/2020	11:29:43	0.16	121.87	178	2.5				Minahasa Peninsula
41	08/07/2020	16:32:32	6.17	125.79	117	4.5				Mindanao, Philippines
42	08/07/2020	22:29:26	1.33	126.89	29	3.5				Northern Molucca Sea
43	09/07/2020	01:42:08	-0.10	123.21	134	3.2				Minahasa Peninsula
44	09/07/2020	05:15:20	0.37	122.02	152	3.1				Minahasa Peninsula
45	09/07/2020	07:06:54	0.31	120.16	5	2.9				Minahasa Peninsula
46	09/07/2020	18:41:54	1.71	126.26	10	3.0				Northern Molucca Sea
47	09/07/2020	18:51:46	6.85	125.00	10	4.9				Mindanao, Philippines
48	10/07/2020	01:09:46	0.89	125.93	47	4.3				Northern Molucca Sea
49	10/07/2020	12:41:34	0.19	122.45	142	2.4				Minahasa Peninsula
50	10/07/2020	18:16:40	6.70	125.11	20	4.8				Mindanao, Philippines
51	11/07/2020	00:33:13	3.40	126.62	10	4.0				Talaud Islands
52	11/07/2020	01:30:34	3.82	125.96	130	4.2				Talaud Islands
53	11/07/2020	07:17:01	0.17	120.80	102	4.6				Minahasa Peninsula
54	11/07/2020	11:11:38	6.67	125.40	17	4.6				Mindanao, Philippines
55	11/07/2020	12:51:21	4.58	126.59	107	4.1				Talaud Islands
56	11/07/2020	15:02:42	-0.11	123.15	127	4.5				Minahasa Peninsula
57	11/07/2020	15:28:30	-0.13	122.88	96	2.3				Minahasa Peninsula
58	11/07/2020	17:43:44	-0.23	123.87	68	4.3				Minahasa Peninsula
59	11/07/2020	17:48:44	1.50	126.41	10	3.1				Northern Molucca Sea
60	11/07/2020	20:45:54	-0.38	126.63	43	3.3				Southern Molucca Sea
61	11/07/2020	23:46:10	1.14	123.34	11	3.2				Minahasa Peninsula
62	12/07/2020	07:13:02	0.66	126.67	15	4.1				Northern Molucca Sea
63	12/07/2020	17:44:42	-0.49	131.84	11	2.7				Irian Jaya Region
64	12/07/2020	18:55:47	2.34	128.21	123	3.0				Halmahera, Indonesia
65	12/07/2020	19:22:03	-0.38	131.89	21	2.6				Irian Jaya Region
66	12/07/2020	20:42:56	1.15	121.59	10	3.0				Minahasa Peninsula
67	12/07/2020	23:57:14	3.01	126.95	31	3.8				Talaud Islands
68	13/07/2020	06:15:31	5.27	124.14	212	4.4				Mindanao, Philippines
69	13/07/2020	11:00:31	1.79	127.17	103	4.1				Halmahera, Indonesia
70	13/07/2020	11:58:01	0.93	126.10	15	3.0				Northern Molucca Sea
71	13/07/2020	14:52:07	0.49	123.91	180	3.7				Minahasa Peninsula
72	13/07/2020	16:46:12	3.18	127.84	116	4.1				Talaud Islands
73	13/07/2020	17:30:16	3.09	127.83	117	4.0				Talaud Islands
74	13/07/2020	18:07:34	3.21	126.48	40	3.7				Talaud Islands
75	14/07/2020	00:24:37	1.79	128.25	71	2.8				Halmahera, Indonesia
76	14/07/2020	04:54:54	-0.48	123.45	10	3.6				Minahasa Peninsula
77	14/07/2020	12:20:54	3.12	129.27	10	4.3				North of Halmahera
78	14/07/2020	12:59:36	8.85	126.00	75	4.5				Mindanao, Philippines
79	14/07/2020	14:47:32	-0.13	123.82	107	3.0				Minahasa Peninsula
80	14/07/2020	18:01:41	1.49	126.33	10	3.8				Northern Molucca Sea
81	14/07/2020	18:51:57	3.09	126.62	10	3.7				Talaud Islands
82	14/07/2020	18:56:58	-0.10	126.64	30	3.1				Southern Molucca Sea

83	14/07/2020	21:03:33	2.56	129.00	217	3.6				Halmahera, Indonesia
84	14/07/2020	22:57:47	2.36	126.86	10	4.1				Northern Molucca Sea
85	15/07/2020	01:56:33	1.38	128.09	95	3.8				Halmahera, Indonesia
86	15/07/2020	07:35:15	1.59	126.53	10	3.5				Northern Molucca Sea
87	15/07/2020	08:36:09	2.09	127.11	8	3.3				Northern Molucca Sea
88	15/07/2020	09:36:09	2.09	127.11	8	3.3				Northern Molucca Sea
89	15/07/2020	13:28:05	3.31	122.56	528	4.5				Celebes Sea
90	15/07/2020	15:13:22	5.99	126.40	10	4.2				Mindanao, Philippines
91	15/07/2020	16:07:03	0.95	126.09	12	3.3				Northern Molucca Sea
92	15/07/2020	18:48:58	4.90	126.15	116	4.0				Talaud Islands
93	15/07/2020	23:55:31	4.27	124.38	34	4.6				Celebes Sea
94	15/07/2020	23:57:53	1.44	120.64	33	3.9				Minahasa Peninsula
95	16/07/2020	00:34:52	6.70	125.20	10	5.0				Mindanao, Philippines
96	16/07/2020	02:42:54	1.85	117.39	10	4.0				Borneo
97	16/07/2020	04:53:12	1.08	126.47	20	3.0				Northern Molucca Sea
98	16/07/2020	09:15:21	5.54	126.56	10	4.6				Mindanao, Philippines
99	16/07/2020	16:25:34	0.60	122.16	236	4.3				Minahasa Peninsula
100	16/07/2020	16:33:18	3.34	127.85	10	4.2				Talaud Islands
101	16/07/2020	17:02:03	-0.03	123.25	134	2.3				Minahasa Peninsula
102	16/07/2020	20:00:56	-0.27	132.29	10	4.0				Irian Jaya Region
103	16/07/2020	21:21:28	1.65	122.28	10	3.3				Minahasa Peninsula
104	16/07/2020	21:58:53	0.63	127.97	35	3.5				Halmahera, Indonesia
105	16/07/2020	23:47:49	0.69	123.92	252	3.3				Minahasa Peninsula
106	17/07/2020	09:57:41	1.88	128.20	82	4.5				Halmahera, Indonesia
107	17/07/2020	15:00:30	0.19	122.09	10	2.5				Minahasa Peninsula
108	17/07/2020	17:40:40	0.81	120.27	19	3.5				Minahasa Peninsula
109	17/07/2020	19:57:42	1.18	124.01	265	4.1				Minahasa Peninsula
110	17/07/2020	22:12:48	3.72	125.05	10	4.2				Talaud Islands
111	17/07/2020	23:56:51	1.52	126.99	103	3.5				Northern Molucca Sea
112	18/07/2020	02:34:13	3.94	125.97	96	3.6				Talaud Islands
113	18/07/2020	04:51:58	0.30	121.83	195	3.7				Minahasa Peninsula
114	18/07/2020	06:42:51	2.57	128.24	161	3.8				Halmahera, Indonesia
115	18/07/2020	21:14:44	1.37	121.31	10	3.7				Minahasa Peninsula
116	18/07/2020	21:30:18	4.14	126.75	10	4.1				Talaud Islands
117	18/07/2020	23:28:24	4.33	126.82	10	4.3				Talaud Islands
118	19/07/2020	00:17:28	2.71	128.43	219	3.9				Halmahera, Indonesia
119	19/07/2020	08:57:05	5.30	126.22	121	4.6				Mindanao, Philippines
120	19/07/2020	10:07:52	0.93	121.89	11	3.6				Minahasa Peninsula
121	19/07/2020	11:11:23	2.55	128.43	214	4.2				Halmahera, Indonesia
122	19/07/2020	11:22:40	0.30	121.44	156	2.4				Minahasa Peninsula
123	19/07/2020	12:26:23	1.61	127.40	102	3.5				Halmahera, Indonesia
124	19/07/2020	13:51:44	2.13	126.63	10	3.7				Northern Molucca Sea
125	19/07/2020	15:53:32	-0.11	119.81	8	3.1				Minahasa Peninsula
126	19/07/2020	15:59:03	1.65	127.47	35	2.3				Halmahera, Indonesia
127	19/07/2020	16:33:36	0.49	121.00	121	3.0				Minahasa Peninsula

128	19/07/2020	17:15:05	-0.30	123.76	107	3.2				Minahasa Peninsula
129	19/07/2020	19:16:10	4.18	127.76	17	4.0				Talaud Islands
130	20/07/2020	00:04:11	-0.01	122.99	146	3.2				Minahasa Peninsula
131	20/07/2020	04:13:38	-0.11	123.01	5	2.7				Minahasa Peninsula
132	20/07/2020	05:32:40	5.69	126.30	10	4.5				Mindanao, Philippines
133	20/07/2020	12:46:39	0.25	122.15	138	3.3				Minahasa Peninsula
134	20/07/2020	15:39:25	-0.16	123.57	47	3.7				Minahasa Peninsula
135	20/07/2020	17:12:07	-0.37	125.20	10	3.3				Southern Molucca Sea
136	20/07/2020	17:30:02	6.86	127.07	61	4.9				Philippine Islands Region
137	21/07/2020	00:11:00	-0.60	123.76	10	4.5				Minahasa Peninsula
138	21/07/2020	01:26:11	2.63	127.10	10	4.4				Northern Molucca Sea
139	21/07/2020	02:26:12	2.67	127.12	10	4.7				Northern Molucca Sea
140	21/07/2020	07:01:39	3.50	125.37	20	3.5				Northern Molucca Sea
141	21/07/2020	07:27:48	2.74	127.11	10	4.5				Northern Molucca Sea
142	21/07/2020	08:27:48	2.61	127.03	10	4.3				Northern Molucca Sea
143	21/07/2020	09:26:34	0.42	125.34	10	3.3				Northern Molucca Sea
144	21/07/2020	19:08:02	-0.07	124.12	65	3.8				Southern Molucca Sea
145	21/07/2020	19:48:20	3.78	126.52	6	3.7				Talaud Islands
146	21/07/2020	20:22:37	-0.10	123.45	136	3.1				Minahasa Peninsula
147	21/07/2020	21:33:11	2.71	125.49	132	4.1				Talaud Islands
148	22/07/2020	04:04:59	1.86	128.71	11	3.4				Halmahera, Indonesia
149	22/07/2020	04:40:06	4.98	127.52	10	4.2				Talaud Islands
150	22/07/2020	08:33:08	2.62	128.33	209	4.0				Halmahera, Indonesia
151	22/07/2020	08:36:57	2.52	128.48	194	4.3				Halmahera, Indonesia
152	22/07/2020	14:36:28	4.46	127.41	10	4.8				Talaud Islands
153	22/07/2020	15:23:13	5.61	127.03	13	4.1				Talaud Islands
154	22/07/2020	16:20:40	5.91	125.88	143	4.5				Mindanao, Philippines
155	22/07/2020	16:26:38	2.34	128.18	142	3.2				Halmahera, Indonesia
156	22/07/2020	17:27:39	1.69	128.90	10	3.0				Halmahera, Indonesia
157	22/07/2020	18:45:22	0.06	119.63	10	3.7				Minahasa Peninsula
158	23/07/2020	05:44:07	2.68	127.13	10	3.9				Northern Molucca Sea
159	23/07/2020	09:14:41	1.89	127.31	84	4.5				Halmahera, Indonesia
160	23/07/2020	19:55:18	7.40	126.03	88	4.6				Mindanao, Philippines
161	24/07/2020	08:23:57	0.27	122.77	258	3.4				Minahasa Peninsula
162	24/07/2020	10:57:37	-0.08	124.31	36	3.7				Minahasa Peninsula
163	24/07/2020	11:54:58	2.19	126.74	10	4.4				Northern Molucca Sea
164	24/07/2020	12:46:24	4.18	122.73	565	4.8				Celebes Sea
165	24/07/2020	15:19:12	1.36	127.34	8	3.1				Halmahera
166	24/07/2020	15:41:12	1.70	127.07	31	3.0				Halmahera
167	24/07/2020	15:52:50	1.38	127.33	12	2.6				Halmahera
168	25/07/2020	03:12:29	6.24	126.82	69	5.6				Mindanao
169	25/07/2020	17:51:38	2.58	125.78	83	3.6				Talaud Island
170	25/07/2020	20:58:19	0.38	122.07	149	3.6				Minahasa Peninsula
171	25/07/2020	23:54:32	1.66	127.14	22	2.5				Halmahera

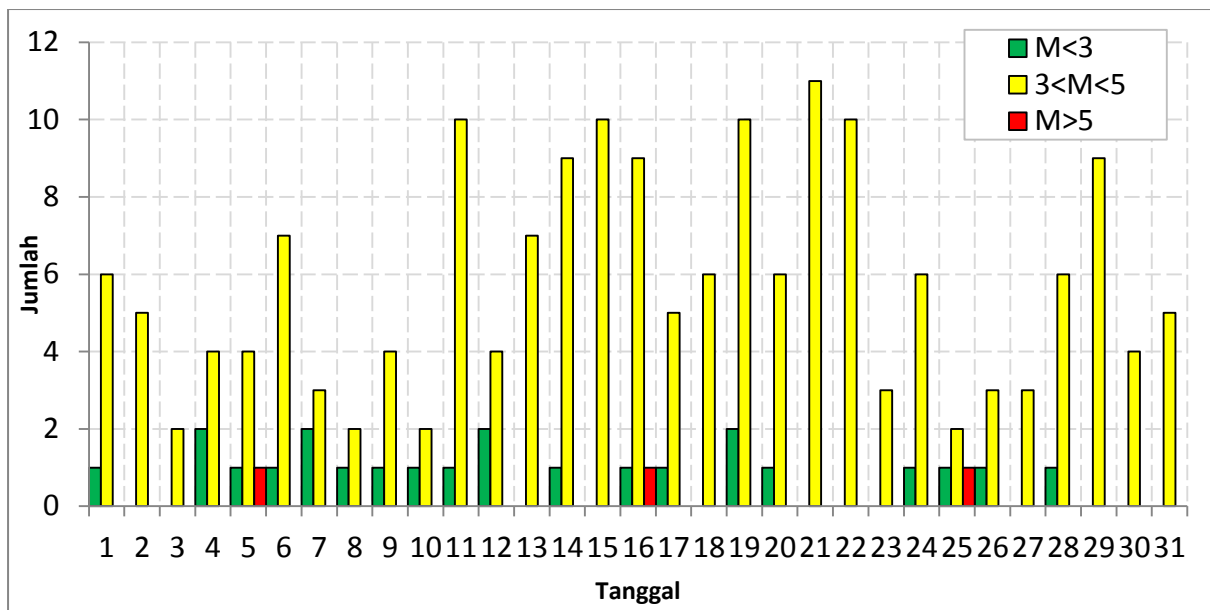
172	26/07/2020	03:43:00	1.87	127.44	110	4.0				Halmahera
173	26/07/2020	11:38:19	1.43	126.42	10	3.6				Northern Molucca Sea
174	26/07/2020	17:29:08	1.51	126.45	6	2.7				Northern Molucca Sea
175	26/07/2020	20:55:39	6.28	126.23	143	4.7				Mindanao
176	27/07/2020	00:04:17	-0.18	125.46	10	3.6				Southern Molucca Sea
177	27/07/2020	20:05:20	4.50	124.44	10	4.7				Celebes Sea
178	27/07/2020	22:37:06	1.57	127.15	121	3.5				Halmahera
179	28/07/2020	02:48:40	1.25	126.25	20	3.4				Northern Molucca Sea
180	28/07/2020	02:55:03	1.29	125.64	75	3.9				Northern Molucca Sea
181	28/07/2020	11:14:10	2.15	127.78	10	3.6				Halmahera
182	28/07/2020	11:27:09	5.79	126.09	147	4.4				Talaud Island
183	28/07/2020	11:45:22	-0.38	127.71	10	2.6				Halmahera
184	28/07/2020	17:49:37	0.61	126.12	19	3.4				Northern Molucca Sea
185	28/07/2020	19:59:32	2.31	128.17	10	3.0				Halmahera
186	29/07/2020	00:16:04	1.11	126.84	29	3.6				Northern Molucca Sea
187	29/07/2020	00:28:32	0.44	123.70	242	4.3				Minahasa Peninsula
188	29/07/2020	07:53:59	0.71	121.43	42	4.1				Minahasa Peninsula
189	29/07/2020	09:02:19	0.07	124.07	9	3.4				Minahasa Peninsula
190	29/07/2020	10:37:54	2.71	128.48	198	3.6				Halmahera
191	29/07/2020	11:46:02	1.07	124.44	233	3.9				Minahasa Peninsula
192	29/07/2020	16:27:40	5.29	125.80	101	4.7				Mindanao
193	29/07/2020	20:29:31	1.20	127.00	17	3.7				Halmahera
194	29/07/2020	21:04:59	-0.30	122.86	30	3.5				Minahasa Peninsula
195	30/07/2020	16:47:03	4.03	126.88	68	3.9				Talaud Island
196	30/07/2020	17:28:30	4.09	126.62	10	3.9				Talaud Island
197	30/07/2020	18:05:20	1.85	123.86	343	3.9				Minahasa Peninsula
198	30/07/2020	19:32:29	2.05	127.04	26	3.2				Northern Molucca Sea
199	31/07/2020	07:55:06	0.46	122.24	304	3.8				Minahasa Peninsula
200	31/07/2020	08:37:34	0.86	126.85	14	3.0				Northern Molucca Sea
201	31/07/2020	10:55:50	1.58	128.83	10	3.0				Halmahera
202	31/07/2020	11:13:58	1.13	126.40	9	3.5				Northern Molucca Sea
203	31/07/2020	23:14:21	0.95	123.70	295	4.2				Minahasa Peninsula



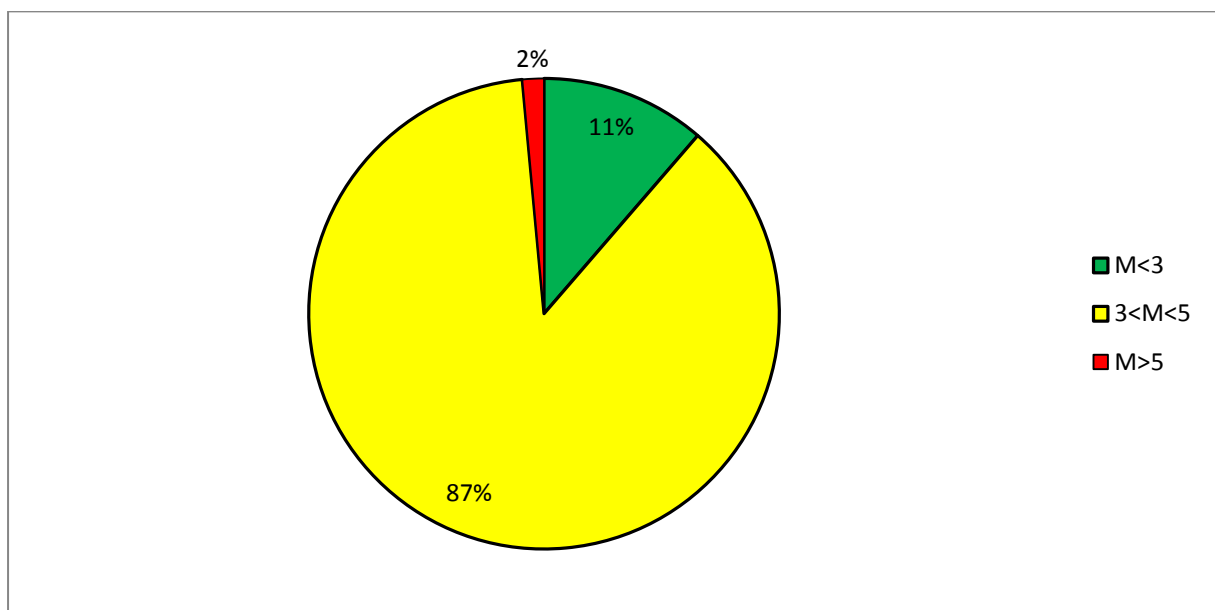
Gambar 23 Sebaran episenter gempabumi bulan Juli 2020

Tabel 16 Rekapitulasi gempabumi berdasarkan magnitudo bulan Juli 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	1	6	0	7	0	0
2	0	5	0	5	1	0
3	0	2	0	2	0	0
4	2	4	0	6	0	0
5	1	4	1	6	1	0
6	1	7	0	8	1	0
7	2	3	0	5	0	0
8	1	2	0	3	0	0
9	1	4	0	5	0	0
10	1	2	0	3	0	0
11	1	10	0	11	1	0
12	2	4	0	6	0	0
13	0	7	0	7	0	0
14	1	9	0	10	0	0
15	0	10	0	10	0	0
16	1	9	1	11	1	0
17	1	5	0	6	0	0
18	0	6	0	6	0	0
19	2	10	0	12	1	0
20	1	6	0	7	0	0
21	0	11	0	11	0	0
22	0	10	0	10	0	0
23	0	3	0	3	0	0
24	1	6	0	7	0	0
25	1	2	1	4	0	0
26	1	3	0	4	0	0
27	0	3	0	3	0	0
28	1	6	0	7	0	0
29	0	9	0	9	0	0
30	0	4	0	4	0	0
31	0	5	0	5	0	0
Jumlah gempa	23	177	3	203	6	0



Gambar 24 Grafik gempabumi berdasarkan magnitudo bulan Juli 2020



Gambar 25 Grafik persentase gempabumi berdasarkan magnitudo bulan Juli 2020

H. Data Gempabumi Bulan Agustus 2020

Tabel 17 Data kejadian gempabumi bulan Agustus 2020

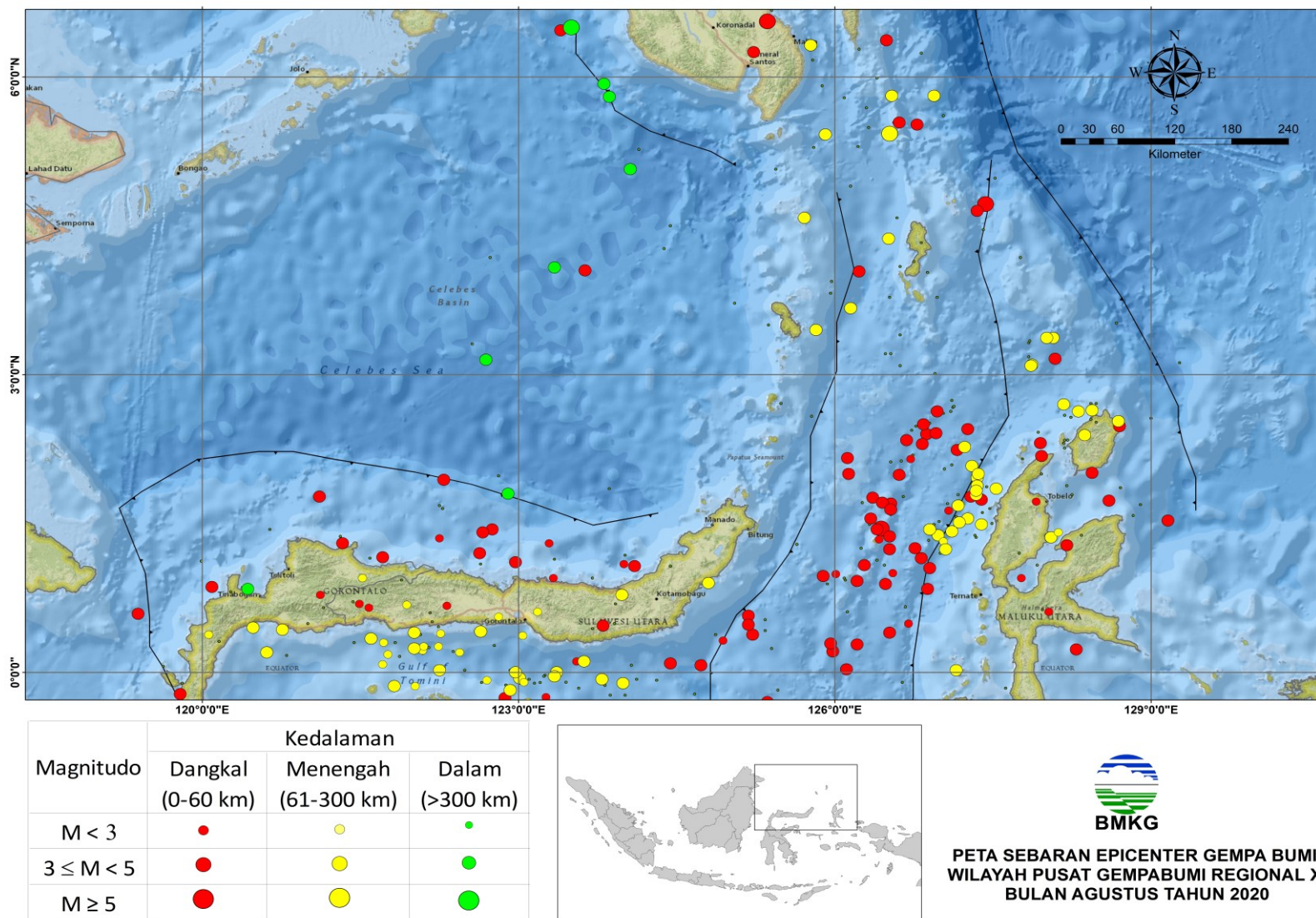
No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/08/2020	02:04:00	1.15	126.82	29	3.7				Northern Molucca Sea
2	01/08/2020	07:48:22	0.95	121.52	70	3.0				Minahasa Peninsula
3	01/08/2020	07:51:43	1.96	127.35	107	3.4				Halmahera
4	01/08/2020	07:56:37	-0.18	122.92	135	4.7				Minahasa Peninsula
5	01/08/2020	15:01:33	1.88	127.35	87	4.5				Halmahera
6	01/08/2020	17:09:02	7.32	124.17	489	6.4	0.39905	0.44089	0.62743	Mindanao, Philippines
7	01/08/2020	17:38:17	3.45	125.82	99	4.7				Talaud Island
8	02/08/2020	09:22:40	0.92	126.21	10	3.4				Northern Molucca Sea
9	02/08/2020	10:25:12	-0.07	123.79	136	3.8				Minahasa Peninsula
10	02/08/2020	14:34:26	2.63	128.31	208	4.2				Halmahera
11	02/08/2020	16:36:36	2.40	126.87	10	3.8				Northern Molucca Sea
12	02/08/2020	16:44:24	-0.45	124.41	10	5.0	0.28013	0.22214	0.19459	Southern Molucca Sea
13	02/08/2020	16:52:41	0.89	126.48	8	3.6				Northern Molucca Sea
14	02/08/2020	19:32:27	-0.26	122.87	53	4.0				Minahasa Peninsula
15	02/08/2020	20:53:53	0.86	120.09	10	3.9				Minahasa Peninsula
16	03/08/2020	00:52:55	0.59	119.39	14	4.4				Minahasa Peninsula
17	03/08/2020	01:42:58	0.03	126.11	10	4.2				Northern Molucca Sea
18	03/08/2020	03:24:16	5.52	126.78	10	4.4				Talaud Island
19	03/08/2020	11:29:08	0.21	125.98	10	3.2				Northern Molucca Sea
20	03/08/2020	18:27:50	-0.43	123.24	48	3.1				Minahasa Peninsula
21	04/08/2020	02:39:53	3.15	122.69	530	4.6				Celebes Sea
22	04/08/2020	06:11:24	0.47	123.80	25	3.2				Minahasa Peninsula
23	04/08/2020	18:41:17	1.00	126.55	13	2.6				Northern Molucca Sea
24	04/08/2020	18:42:22	0.00	123.36	111	3.2				Minahasa Peninsula
25	04/08/2020	19:32:36	0.28	126.21	10	4.4	-0.04962	0.04279	-0.04420	Northern Molucca Sea
26	05/08/2020	02:35:12	3.10	127.87	144	4.3				Halmahera
27	05/08/2020	05:04:11	1.11	122.97	14	3.8				Minahasa Peninsula
28	05/08/2020	10:16:28	2.16	126.12	16	3.3				Northern Molucca Sea
29	05/08/2020	14:08:34	1.55	127.26	99	4.7				Halmahera
30	05/08/2020	18:13:38	1.70	126.53	10	4.2	0.06240	0.10221	-0.05656	Northern Molucca Sea
31	05/08/2020	19:07:50	1.38	126.98	91	3.5				Northern Molucca Sea
32	05/08/2020	23:00:13	-0.25	123.26	20	2.8				Minahasa Peninsula
33	06/08/2020	03:59:26	0.45	120.48	66	3.5				Minahasa Peninsula
34	06/08/2020	07:56:13	0.41	122.64	108	3.9				Minahasa Peninsula
35	06/08/2020	14:03:15	3.67	126.15	94	4.5				Talaud Island
36	06/08/2020	15:33:32	0.68	121.94	100	2.9				Minahasa Peninsula
37	06/08/2020	15:40:39	4.72	127.43	10	5.2				Talaud Island
38	06/08/2020	17:49:07	1.30	121.33	10	3.7				Minahasa Peninsula

39	06/08/2020	23:38:54	0.40	122.01	114	3.2				Minahasa Peninsula
40	06/08/2020	23:43:18	0.49	126.70	33	2.8				Northern Molucca Sea
41	07/08/2020	06:30:46	2.34	126.68	10	4.5				Northern Molucca Sea
42	08/08/2020	09:59:24	1.36	128.05	113	4.3				Halmahera
43	08/08/2020	14:08:38	-0.22	119.79	10	3.5				Minahasa Peninsula
44	08/08/2020	14:14:09	0.02	127.15	106	3.5				Halmahera
45	08/08/2020	16:57:05	0.90	124.80	129	4.9	0.66297	0.90270	2.27908	Minahasa Peninsula
46	08/08/2020	21:54:27	1.43	126.43	10	4.7	0.42933	0.44719	0.29899	Northern Molucca Sea
47	09/08/2020	02:43:16	2.30	126.83	10	3.6				Northern Molucca Sea
48	09/08/2020	04:28:08	0.56	122.81	69	2.5				Minahasa Peninsula
49	09/08/2020	05:36:30	1.77	121.11	10	3.3				Minahasa Peninsula
50	09/08/2020	06:17:54	4.65	127.35	25	4.2				Talaud Islands
51	09/08/2020	12:15:30	5.42	125.91	191	4.3				Mindanao
52	09/08/2020	14:45:56	0.20	122.44	133	2.7				Minahasa Peninsula
53	09/08/2020	15:40:39	0.65	121.58	55	3.0				Minahasa Peninsula
54	09/08/2020	16:48:09	1.73	128.60	13	3.2				Halmahera
55	09/08/2020	17:49:19	0.09	124.44	42	3.4				Minahasa Peninsula
56	09/08/2020	18:16:06	0.99	126.01	16	2.9				Northern Molucca Sea
57	10/08/2020	03:09:47	2.31	127.95	6	3.7				Halmahera
58	10/08/2020	07:14:52	2.70	128.17	171	4.1				Halmahera
59	10/08/2020	08:45:50	1.35	122.25	10	2.7				Minahasa Peninsula
60	10/08/2020	15:54:41	-0.06	123.01	90	3.2				Minahasa Peninsula
61	10/08/2020	22:37:41	0.40	126.52	11	3.1				Northern Molucca Sea
62	11/08/2020	02:26:58	0.84	126.88	21	3.6				Northern Molucca Sea
63	11/08/2020	07:56:09	2.50	126.84	10	4.4				Northern Molucca Sea
64	11/08/2020	18:24:59	1.79	127.34	114	3.4				Halmahera
65	12/08/2020	00:10:21	1.09	124.00	10	2.6				Minahasa Peninsula
66	12/08/2020	10:26:22	1.45	126.44	44	5.2	1.70756	1.86197	1.14586	Northern Molucca Sea
67	12/08/2020	13:23:06	1.51	127.18	114	3.8				Halmahera
68	12/08/2020	14:37:31	2.53	128.69	211	3.3				Halmahera
69	12/08/2020	15:04:31	4.05	123.63	10	4.5				Celebes Sea
70	12/08/2020	18:09:49	1.34	126.42	23	2.9				Northern Molucca Sea
71	12/08/2020	18:21:49	1.94	122.29	10	4.4				Minahasa Peninsula
72	13/08/2020	10:06:06	-0.30	125.36	10	4.5				Southern Molucca Sea
73	13/08/2020	14:51:10	2.64	128.44	207	4.5				Halmahera
74	13/08/2020	19:49:18	0.22	122.09	182	2.7				Minahasa Peninsula
75	14/08/2020	03:11:59	5.80	123.86	514	4.5				Talaud Islands
76	14/08/2020	18:46:33	2.01	128.44	41	3.3				Halmahera
77	14/08/2020	21:51:36	3.16	128.09	41	3.9				Halmahera
78	15/08/2020	02:46:05	2.08	127.30	62	3.1				Northern Molucca Sea
79	15/08/2020	03:11:58	5.93	123.81	506	4.2				Mindanao
80	15/08/2020	07:54:15	0.38	120.06	72	2.5				Minahasa Peninsula
81	15/08/2020	10:53:19	4.58	125.71	125	5.0				Talaud Islands
82	15/08/2020	13:35:44	0.57	125.18	8	3.9				Northern Molucca Sea
83	15/08/2020	17:39:02	0.11	123.62	126	3.6				Minahasa Peninsula

84	15/08/2020	18:10:39	2.15	126.72	10	3.0				Northern Molucca Sea
85	16/08/2020	00:54:44	1.42	127.11	114	4.1				Halmahera
86	16/08/2020	01:13:38	1.32	127.03	83	2.3				Minahasa Peninsula
87	16/08/2020	06:26:32	1.80	122.90	405	4.9	0.29216	0.28853	0.18753	Minahasa Peninsula
88	16/08/2020	07:22:29	6.50	123.50	584	5.4				Mindanao
89	16/08/2020	07:58:26	0.39	122.26	160	3.0				Minahasa Peninsula
90	16/08/2020	16:00:02	1.24	126.52	7	3.5				Northern Molucca Sea
91	16/08/2020	16:11:01	-0.34	125.27	10	4.5				Southern Molucca Sea
92	17/08/2020	02:02:46	6.32	125.77	165	4.8				Mindanao
93	17/08/2020	06:08:56	1.53	129.16	10	3.8				Halmahera
94	17/08/2020	21:32:45	0.29	125.96	10	3.8				Northern Molucca Sea
95	18/08/2020	10:20:24	-0.38	121.92	204	3.3				Minahasa Peninsula
96	18/08/2020	10:44:18	0.78	121.12	39	2.5				Minahasa Peninsula
97	18/08/2020	13:15:54	1.41	128.12	86	2.6				Halmahera
98	18/08/2020	16:37:44	0.97	125.89	20	3.4				Northern Molucca Sea
99	18/08/2020	21:51:56	4.37	126.51	77	3.8				Talaud Islands
100	19/08/2020	00:28:33	1.30	123.29	30	3.0				Minahasa Peninsula
101	19/08/2020	00:37:14	3.37	128.07	101	4.4				Halmahera
102	19/08/2020	01:25:29	2.18	127.96	11	3.3				Halmahera
103	19/08/2020	05:00:30	0.08	121.71	183	2.9				Minahasa Peninsula
104	19/08/2020	06:12:03	1.77	127.29	25	3.6				Halmahera
105	19/08/2020	09:32:00	1.44	122.75	10	3.9				Minahasa Peninsula
106	19/08/2020	09:56:38	1.41	122.66	4	3.3				Minahasa Peninsula
107	19/08/2020	10:54:43	6.25	125.23	10	4.3				Mindanao
108	19/08/2020	11:35:51	1.44	126.40	10	3.5				Northern Molucca Sea
109	19/08/2020	21:32:13	-0.08	122.70	115	2.4				Minahasa Peninsula
110	19/08/2020	22:33:56	1.74	127.39	39	3.1				Halmahera
111	19/08/2020	23:03:36	1.76	126.36	10	3.6				Northern Molucca Sea
112	19/08/2020	23:57:13	1.07	124.10	10	4.0				Minahasa Peninsula
113	20/08/2020	08:43:21	6.47	123.40	10	4.8				Mindanao
114	20/08/2020	12:15:21	0.67	122.32	18	2.7				Minahasa Peninsula
115	20/08/2020	12:36:24	2.00	127.36	72	3.4				Halmahera
116	20/08/2020	17:40:19	0.26	122.24	155	2.4				Minahasa Peninsula
117	20/08/2020	18:17:52	1.63	127.08	13	2.4				Halmahera
118	20/08/2020	20:48:01	1.05	126.90	13	3.4				Halmahera
119	21/08/2020	01:13:58	1.08	126.28	10	3.5				Northern Molucca Sea
120	21/08/2020	01:45:19	1.28	128.20	15	3.1				Halmahera
121	21/08/2020	02:31:31	0.32	124.94	10	3.0				Minahasa Peninsula
122	21/08/2020	02:45:19	1.85	127.53	62	3.1				Halmahera
123	21/08/2020	06:27:22	0.37	123.04	115	2.6				Minahasa Peninsula
124	21/08/2020	07:22:29	1.25	126.76	32	3.9				Northern Molucca Sea
125	21/08/2020	08:28:48	3.37	128.01	142	3.9				Halmahera
126	21/08/2020	12:32:06	5.81	126.94	147	4.7				Talaud Islands
127	21/08/2020	13:06:47	0.07	124.73	14	3.3				Minahasa Peninsula
128	21/08/2020	13:35:40	0.30	121.72	160	2.6				Minahasa Peninsula

129	21/08/2020	15:46:52	0.95	123.33	10	2.4				Minahasa Peninsula
130	21/08/2020	21:29:49	0.69	121.49	16	2.7				Minahasa Peninsula
131	21/08/2020	23:53:57	0.24	122.01	159	3.7				Minahasa Peninsula
132	22/08/2020	00:01:03	4.04	126.23	10	3.8				Talaud Islands
133	22/08/2020	02:09:16	3.09	127.86	147	4.0				Halmahera
134	22/08/2020	03:44:23	-0.04	123.34	106	4.8				Minahasa Peninsula
135	22/08/2020	04:26:06	5.81	126.54	149	4.3				Talaud Islands
136	22/08/2020	04:26:53	6.37	126.49	11	4.8				Talaud Islands
137	22/08/2020	11:49:27	0.78	123.98	283	3.1				Minahasa Peninsula
138	23/08/2020	00:05:51	1.99	126.61	20	3.8				Northern Molucca Sea
139	23/08/2020	09:37:15	0.20	120.61	70	3.6				Minahasa Peninsula
140	23/08/2020	12:11:01	1.20	122.63	10	3.1				Minahasa Peninsula
141	23/08/2020	15:45:26	4.08	123.34	552	4.2				Celebes Sea
142	23/08/2020	16:09:12	2.00	126.13	23	3.6				Northern Molucca Sea
143	23/08/2020	18:03:38	5.07	124.06	458	4.7				Mindanao
144	23/08/2020	20:42:45	0.00	122.97	152	3.4				Minahasa Peninsula
145	23/08/2020	22:24:31	0.61	128.03	10	2.6				Halmahera
146	24/08/2020	00:16:59	2.41	126.96	10	3.3				Northern Molucca Sea
147	24/08/2020	00:24:14	8.51	126.87	123	5.2				Mindanao, Philippines
148	24/08/2020	05:26:27	-0.30	123.09	71	2.9				Minahasa Peninsula
149	24/08/2020	05:43:16	0.38	125.22	10	3.5				Northern Molucca Sea
150	24/08/2020	08:43:02	1.88	127.35	72	3.2				Halmahera
151	24/08/2020	19:28:13	1.49	127.39	123	3.9				Halmahera
152	24/08/2020	20:43:03	1.83	127.34	75	3.9				Halmahera
153	25/08/2020	02:10:59	2.63	126.97	10	3.9				Northern Molucca Sea
154	26/08/2020	01:54:11	5.43	126.52	99	5.1				Melonguane
155	26/08/2020	08:38:47	0.34	121.60	166	3.6				Minahasa Peninsula
156	26/08/2020	11:16:23	1.72	127.91	10	2.9				Halmahera
157	26/08/2020	13:04:09	0.18	121.76	171	2.8				Minahasa Peninsula
158	26/08/2020	13:15:17	0.48	125.18	10	3.8				Northern Molucca Sea
159	26/08/2020	13:27:49	2.48	128.70	10	3.8				Halmahera
160	26/08/2020	21:52:24	1.44	126.90	102	4.0				Northern Molucca Sea
161	26/08/2020	22:58:49	0.23	128.29	10	3.7				Halmahera, Indonesia
162	26/08/2020	23:33:06	0.43	120.76	64	3.5				Minahasa Peninsula
163	27/08/2020	00:43:42	2.24	127.16	10	4.4				Northern Molucca Sea
164	27/08/2020	02:16:55	1.55	126.34	10	3.5				Northern Molucca Sea
165	27/08/2020	05:35:51	1.16	121.71	10	3.9				Minahasa Peninsula
166	27/08/2020	07:05:26	1.71	126.45	10	3.9				Northern Molucca Sea
167	27/08/2020	10:39:26	-0.14	122.02	264	2.7				Minahasa Peninsula
168	27/08/2020	18:45:25	1.37	126.52	10	4.5	0.41348	0.51530	0.31220	Northern Molucca Sea
169	27/08/2020	19:31:37	2.45	127.26	10	3.2				Northern Molucca Sea
170	27/08/2020	22:45:16	0.95	127.77	14	2.4				Halmahera, Indonesia
171	28/08/2020	13:15:36	0.11	123.55	31	3.0				Minahasa Peninsula
172	28/08/2020	19:48:08	1.68	127.17	69	3.1				Halmahera, Indonesia
173	28/08/2020	22:44:02	0.02	122.25	233	3.6				Minahasa Peninsula

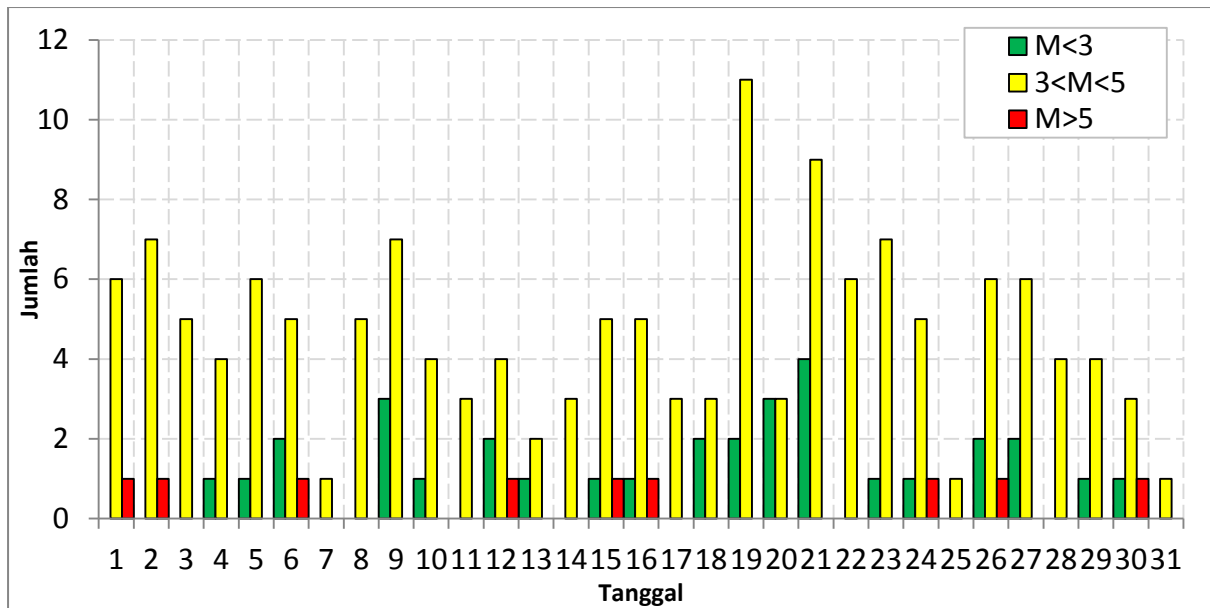
174	28/08/2020	23:06:00	2.39	128.37	213	4.3				Halmahera, Indonesia
175	29/08/2020	07:06:17	1.24	127.05	112	3.7				Halmahera, Indonesia
176	29/08/2020	08:10:30	2.27	127.23	79	4.8				Halmahera, Indonesia
177	29/08/2020	08:31:43	-0.11	123.99	73	3.9				Minahasa Peninsula
178	29/08/2020	14:08:52	-0.10	123.05	119	2.7				Minahasa Peninsula
179	29/08/2020	23:31:53	0.26	122.10	141	3.0				Minahasa Peninsula
180	30/08/2020	09:59:11	-0.14	121.82	186	3.5				Minahasa Peninsula
181	30/08/2020	12:01:04	0.84	120.43	635	4.8				Minahasa Peninsula
182	30/08/2020	13:13:54	0.61	123.18	63	1.9				Minahasa Peninsula
183	30/08/2020	17:35:17	5.54	126.61	21	4.3				Mindanao, Philippines
184	30/08/2020	17:44:09	6.56	125.36	10	5.1	0.09184	0.10216	-0.05853	Mindanao, Philippines
185	31/08/2020	16:39:33	1.64	126.53	10	3.4				Northern Molucca Sea



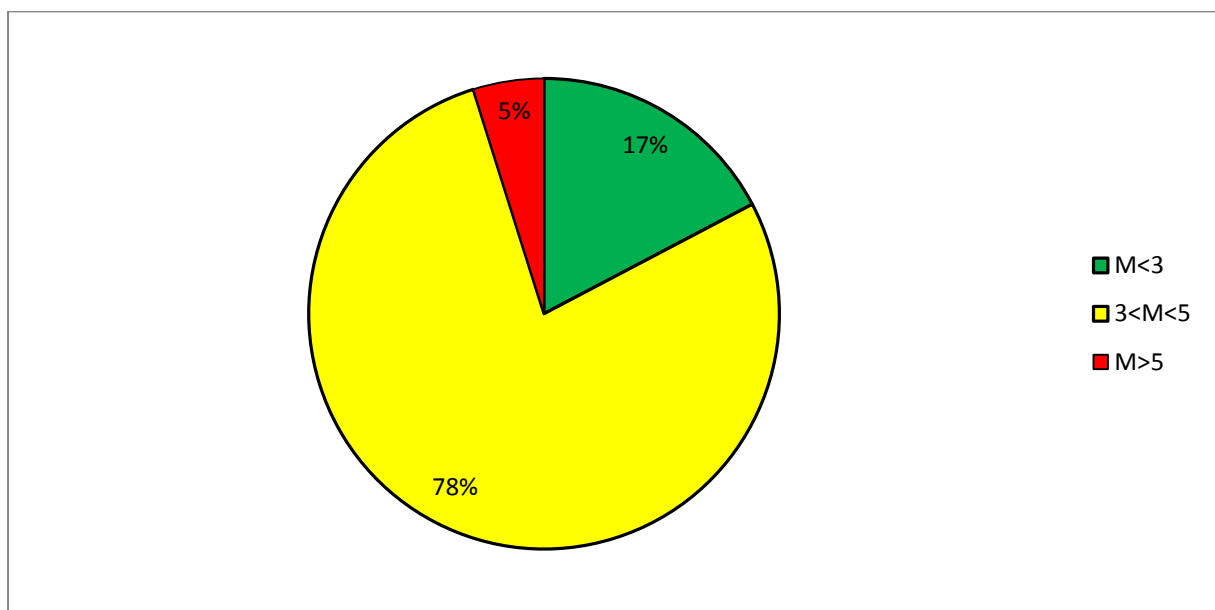
Gambar 26 Sebaran episenter gempabumi bulan Agustus 2020

Tabel 18 Rekapitulasi gempabumi berdasarkan magnitudo bulan Agustus 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	0	6	1	7	0	0
2	0	7	1	8	0	0
3	0	5	0	5	0	0
4	1	4	0	5	0	0
5	1	6	0	7	0	0
6	2	5	1	8	0	0
7	0	1	0	1	0	0
8	0	5	0	5	1	0
9	3	7	0	10	0	0
10	1	4	0	5	0	0
11	0	3	0	3	0	0
12	2	4	1	7	1	0
13	1	2	0	3	0	0
14	0	3	0	3	0	0
15	1	5	1	7	1	0
16	1	5	1	7	0	0
17	0	3	0	3	0	0
18	2	3	0	5	0	0
19	2	11	0	13	0	0
20	3	3	0	6	0	0
21	4	9	0	13	0	0
22	0	6	0	6	0	0
23	1	7	0	8	0	0
24	1	5	1	7	0	0
25	0	1	0	1	0	0
26	2	6	1	9	0	0
27	2	6	0	8	0	0
28	0	4	0	4	0	0
29	1	4	0	5	0	0
30	1	3	1	5	0	0
31	0	1	0	1	0	0
Jumlah gempa	32	144	9	185	3	0



Gambar 27 Grafik gempa bumi berdasarkan magnitudo bulan Agustus 2020



Gambar 28 Grafik persentase gempa bumi berdasarkan magnitudo bulan Agustus 2020

I. Data Gempabumi Bulan September 2020

Tabel 19 Data kejadian gempabumi bulan September 2020

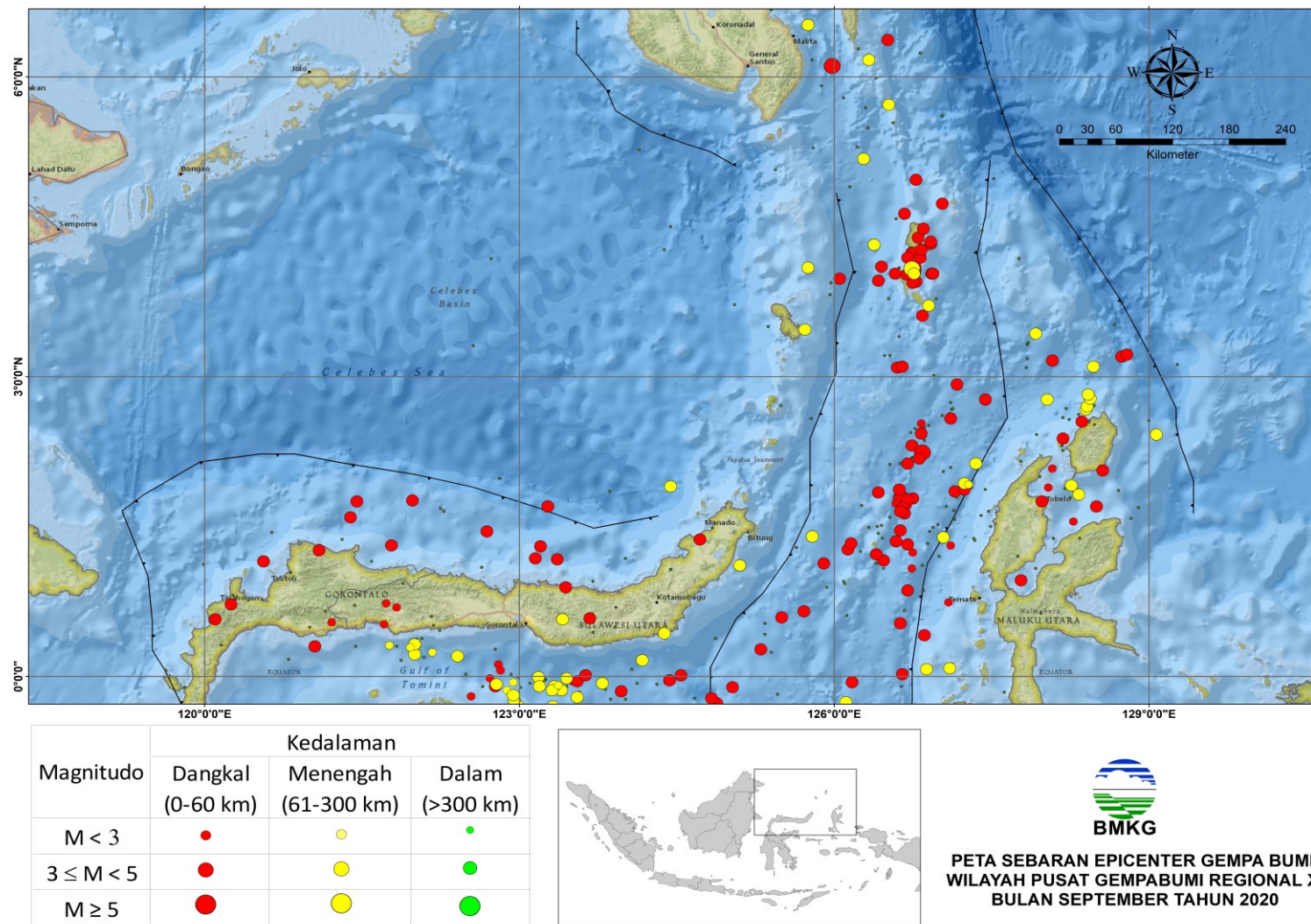
No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	02/09/2020	00:00:32	2.13	126.70	3	3.2				Northern Molucca Sea
2	02/09/2020	12:43:49	0.96	127.78	13	3.0				Halmahera, Indonesia
3	02/09/2020	17:45:29	1.31	121.78	11	4.3				Minahasa Peninsula
4	03/09/2020	00:49:42	0.07	126.88	92	4.2				Northern Molucca Sea
5	03/09/2020	04:03:58	1.32	126.70	14	3.9				Northern Molucca Sea
6	03/09/2020	06:21:00	3.47	125.72	155	4.4				Talaud Islands
7	03/09/2020	10:50:02	-0.02	123.45	135	3.0				Minahasa Peninsula
8	03/09/2020	11:47:41	3.16	128.08	10	3.6				Halmahera, Indonesia
9	04/09/2020	01:12:35	3.50	122.28	587	4.8				Celebes Sea
10	04/09/2020	06:14:43	0.57	120.10	5	3.4				Minahasa Peninsula
11	04/09/2020	12:46:44	-0.20	122.54	16	2.5				Minahasa Peninsula
12	04/09/2020	15:36:00	1.91	128.26	89	3.7				Halmahera, Indonesia
13	04/09/2020	17:38:31	-0.05	123.51	19	2.8				Minahasa Peninsula
14	05/09/2020	03:56:24	0.08	127.10	115	3.3				Halmahera, Indonesia
15	05/09/2020	09:45:38	3.61	126.84	10	4.1				Talaud Islands
16	05/09/2020	18:30:24	0.12	122.80	16	2.7				Minahasa Peninsula
17	05/09/2020	19:18:13	-0.08	122.78	142	3.8				Minahasa Peninsula
18	05/09/2020	22:27:08	2.67	128.40	204	4.3				Halmahera, Indonesia
19	05/09/2020	23:57:21	0.07	132.46	11	3.4				Irian Jaya Region
20	06/09/2020	00:21:14	1.78	126.64	59	6.0	1.52226	2.14794	0.90692	Northern Molucca Sea
21	06/09/2020	05:54:28	-0.10	122.77	24	3.3				Minahasa Peninsula
22	06/09/2020	07:54:08	1.76	121.98	10	3.7				Minahasa Peninsula
23	06/09/2020	15:23:43	6.11	125.98	10	6.9	0.49093	0.48070	0.31445	Mindanao, Philippines
24	06/09/2020	17:06:11	1.78	126.75	10	4.6	0.11696	0.09641	0.07700	Northern Molucca Sea
25	06/09/2020	17:27:10	1.71	126.67	21	3.3				Northern Molucca Sea
26	06/09/2020	17:33:13	1.73	126.59	10	2.8				Northern Molucca Sea
27	06/09/2020	18:15:24	1.72	126.68	10	3.8				Northern Molucca Sea
28	06/09/2020	19:48:30	-0.14	122.88	79	2.6				Minahasa Peninsula
29	07/09/2020	03:29:47	1.77	126.70	10	4.2				Northern Molucca Sea
30	07/09/2020	08:06:52	-0.04	124.43	57	4.9	0.16887	0.16302	0.16749	Southern Molucca Sea
31	07/09/2020	12:21:57	0.22	122.00	184	3.5				Minahasa Peninsula
32	07/09/2020	19:48:44	1.39	127.04	101	3.1				Halmahera, Indonesia
33	08/09/2020	00:21:03	1.46	126.63	8	3.3				Northern Molucca Sea
34	08/09/2020	04:34:38	-0.37	122.89	79	3.4				Minahasa Peninsula
35	08/09/2020	07:09:26	-0.29	122.98	149	3.0				Minahasa Peninsula
36	08/09/2020	09:43:53	1.69	126.65	10	4.3				Northern Molucca Sea
37	08/09/2020	18:27:40	-0.05	123.55	59	3.0				Minahasa Peninsula
38	08/09/2020	18:49:22	0.02	126.65	10	3.3				Southern Molucca Sea
39	08/09/2020	18:53:21	4.63	126.67	14	4.1				Talaud Islands
40	08/09/2020	22:28:35	1.85	127.15	32	3.2				Halmahera, Indonesia

41	09/09/2020	00:52:03	1.87	126.62	10	3.6				Northern Molucca Sea
42	09/09/2020	01:32:02	4.09	125.75	186	4.5				Talaud Islands
43	09/09/2020	03:41:21	4.06	126.75	57	5.5				Talaud Islands
44	09/09/2020	04:13:57	2.31	126.74	10	3.2				Northern Molucca Sea
45	09/09/2020	07:18:47	4.08	126.74	74	5.7				Talaud Islands
46	09/09/2020	07:41:19	4.03	126.58	10	4.4				Talaud Islands
47	09/09/2020	07:43:38	3.71	126.90	69	4.4				Talaud Islands
48	09/09/2020	07:48:31	4.10	126.77	10	4.5				Talaud Islands
49	09/09/2020	08:04:01	4.24	126.74	10	4.5				Talaud Islands
50	09/09/2020	08:51:47	4.39	126.80	10	4.6				Talaud Islands
51	09/09/2020	10:26:06	4.33	126.92	10	4.4				Talaud Islands
52	09/09/2020	12:37:39	0.58	123.67	10	3.2				Minahasa Peninsula
53	09/09/2020	12:41:10	-0.24	122.95	119	3.0				Minahasa Peninsula
54	09/09/2020	13:59:42	3.95	126.78	34	3.8				Talaud Islands
55	09/09/2020	14:17:20	4.24	126.76	44	4.3				Talaud Islands
56	09/09/2020	15:07:07	0.24	122.17	105	2.9				Minahasa Peninsula
57	09/09/2020	16:25:11	0.72	120.25	10	3.1				Minahasa Peninsula
58	09/09/2020	16:28:18	2.42	129.07	78	3.3				Halmahera, Indonesia
59	09/09/2020	18:31:04	0.01	123.63	56	3.1				Minahasa Peninsula
60	09/09/2020	18:46:57	4.48	126.85	17	4.1				Talaud Islands
61	09/09/2020	19:04:04	4.03	126.76	198	3.8				Talaud Islands
62	09/09/2020	20:44:00	0.59	125.50	10	3.3				Northern Molucca Sea
63	09/09/2020	21:06:12	4.73	127.03	35	4.0				Talaud Islands
64	10/09/2020	09:28:24	-0.27	124.88	26	3.4				Minahasa Peninsula
65	10/09/2020	09:58:52	0.73	121.73	18	2.8				Minahasa Peninsula
66	10/09/2020	14:50:43	1.82	128.33	122	3.3				Halmahera, Indonesia
67	10/09/2020	22:12:05	4.97	126.78	10	4.2				Talaud Islands
68	10/09/2020	23:24:33	1.15	120.56	10	3.7				Minahasa Peninsula
69	12/09/2020	00:19:47	3.09	126.60	36	3.9				Northern Molucca Sea
70	12/09/2020	13:12:16	1.70	128.50	24	4.2				Halmahera
71	12/09/2020	13:38:11	0.43	124.38	130	4.9				Minahasa Peninsula
72	12/09/2020	14:33:43	6.37	126.51	10	4.8				Mindanao
73	12/09/2020	14:34:22	-0.19	122.94	86	3.2				Minahasa Peninsula
74	12/09/2020	22:22:06	3.94	126.75	10	4.0				Talaud Islands
75	13/09/2020	00:41:47	4.02	126.69	10	4.6				Talaud Islands
76	13/09/2020	02:06:52	0.52	121.71	32	2.7				Minahasa Peninsula
77	13/09/2020	06:33:05	2.58	127.11	40	4.0				Northern Molucca Sea
78	13/09/2020	16:50:30	4.03	126.93	10	4.7				Talaud Islands
79	13/09/2020	19:04:24	0.89	123.44	23	3.1				Minahasa Peninsula
80	13/09/2020	20:18:22	0.65	125.71	10	4.3				Northern Molucca Sea
81	13/09/2020	20:41:59	4.03	126.94	10	4.8				Talaud Islands
82	13/09/2020	22:16:37	6.96	126.07	107	4.7				Mindanao
83	14/09/2020	02:47:48	4.19	126.70	10	4.6				Talaud Islands
84	14/09/2020	03:25:14	0.86	126.70	10	3.8				Northern Molucca Sea
85	15/09/2020	07:10:18	-0.45	119.62	14	4.3				Selat Makassar

86	15/09/2020	12:13:54	0.20	122.41	132	3.2				Minahasa Peninsula
87	15/09/2020	12:30:51	-0.15	123.97	14	4.2				Minahasa Peninsula
88	15/09/2020	14:30:05	4.32	126.38	217	4.4				Talaud Islands
89	15/09/2020	18:41:50	2.13	127.35	115	4.0				Northern Molucca Sea
90	16/09/2020	01:01:24	1.59	121.39	10	3.9				Minahasa Peninsula
91	16/09/2020	02:56:35	-0.14	123.40	127	3.8				Minahasa Peninsula
92	16/09/2020	14:13:15	1.45	122.69	56	4.0				Minahasa Peninsula
93	16/09/2020	14:43:38	1.24	126.75	24	2.9				Northern Molucca Sea
94	17/09/2020	18:24:10	-0.21	123.55	99	4.3				Minahasa Peninsula
95	18/09/2020	17:43:31	2.24	126.84	10	5.1				Northern Molucca Sea
96	18/09/2020	23:11:18	1.18	123.15	20	3.8				Minahasa Peninsula
97	18/09/2020	23:52:57	2.55	128.36	20	4.2				Halmahera
98	19/09/2020	06:47:29	1.75	121.45	10	3.1				Minahasa Peninsula
99	19/09/2020	10:14:12	3.20	128.74	1	3.7				Halmahera
100	19/09/2020	18:20:06	-0.06	126.17	18	3.4				Southern Molucca Sea
101	19/09/2020	18:46:50	2.43	126.83	10	3.8				Northern Molucca Sea
102	19/09/2020	19:24:27	4.19	126.82	46	4.0				Talaud Islands
103	20/09/2020	01:11:53	0.16	124.17	93	3.8				Minahasa Peninsula
104	20/09/2020	02:44:40	1.27	126.13	10	3.6				Northern Molucca Sea
105	20/09/2020	08:14:17	5.72	126.52	136	4.8				Mindanao, Philippines
106	20/09/2020	09:57:12	-0.50	124.51	10	2.9				Southern Molucca Sea
107	20/09/2020	12:52:50	0.32	122.03	160	2.9				Minahasa Peninsula
108	20/09/2020	14:29:16	0.69	121.83	28	2.6				Minahasa Peninsula
109	20/09/2020	15:57:21	1.90	124.44	268	4.1				Minahasa Peninsula
110	20/09/2020	17:23:45	3.10	128.47	213	3.9				Halmahera
111	20/09/2020	18:08:46	2.70	128.41	207	3.7				Halmahera
112	21/09/2020	10:21:19	4.35	126.92	10	4.1				Talaud Islands
113	21/09/2020	12:54:56	0.32	122.00	170	3.0				Minahasa Peninsula
114	21/09/2020	15:02:18	-0.45	123.84	41	3.9				Minahasa Peninsula
115	21/09/2020	19:23:49	1.13	125.90	27	3.2				Northern Molucca Sea
116	21/09/2020	19:59:00	3.22	128.79	10	3.9				Halmahera
117	21/09/2020	23:04:24	2.92	127.17	17	3.9				Northern Molucca Sea
118	22/09/2020	04:32:54	3.10	126.65	10	3.8				Northern Molucca Sea
119	22/09/2020	06:06:23	-0.47	127.77	10	4.7				Halmahera
120	22/09/2020	14:09:50	2.77	127.44	23	3.3				Northern Molucca Sea
121	22/09/2020	19:49:04	1.33	126.16	10	3.5				Northern Molucca Sea
122	22/09/2020	22:53:02	7.62	126.94	10	4.8				Mindanao, Philippines
123	23/09/2020	01:52:59	1.75	127.98	24	3.0				Halmahera
124	23/09/2020	03:13:29	2.08	128.08	24	2.3				Halmahera
125	23/09/2020	05:31:09	2.78	128.44	171	3.4				Halmahera
126	23/09/2020	06:52:51	4.10	126.45	27	4.3				Talaud Islands
127	23/09/2020	20:59:33	3.96	126.42	58	4.2				Talaud Islands
128	23/09/2020	22:03:35	-0.01	123.18	136	3.4				Northern Molucca Sea
129	23/09/2020	22:07:54	2.18	126.81	10	4.5				Northern Molucca Sea
130	24/09/2020	00:26:35	1.30	123.20	10	3.1				Minahasa Peninsula

131	24/09/2020	01:34:09	2.77	128.03	111	4.3				Halmahera
132	24/09/2020	02:26:08	8.95	127.07	10	5.3				Philippine Islands Region
133	24/09/2020	07:06:27	-0.02	122.72	10	2.9				Minahasa Peninsula
134	24/09/2020	10:44:10	1.70	123.27	11	4.0				Minahasa Peninsula
135	24/09/2020	13:07:48	1.26	121.09	4	4.0				Minahasa Peninsula
136	24/09/2020	14:31:32	8.79	127.01	94	4.7				Philippine Islands Region
137	24/09/2020	15:23:06	-0.06	122.94	163	2.7				Minahasa Peninsula
138	24/09/2020	15:27:18	0.31	121.76	188	2.4				Minahasa Peninsula
139	24/09/2020	15:41:01	0.06	122.82	10	2.6				Minahasa Peninsula
140	24/09/2020	16:29:41	-0.10	123.33	133	3.5				Minahasa Peninsula
141	24/09/2020	17:00:39	-0.22	124.83	10	3.9				Southern Molucca Sea
142	24/09/2020	17:47:14	1.87	127.24	28	3.7				Halmahera, Indonesia
143	24/09/2020	18:27:18	0.54	121.21	52	2.8				Minahasa Peninsula
144	24/09/2020	19:27:47	2.53	126.83	10	2.8				Northern Molucca Sea
145	24/09/2020	23:02:01	1.31	123.35	372	4.2				Minahasa Peninsula
146	24/09/2020	23:03:12	0.57	123.41	75	3.9				Minahasa Peninsula
147	24/09/2020	23:15:59	1.84	126.42	10	3.3				Northern Molucca Sea
148	25/09/2020	03:17:19	0.29	121.96	164	2.9				Minahasa Peninsula
149	25/09/2020	06:01:11	0.74	127.09	10	2.4				Halmahera, Indonesia
150	25/09/2020	06:46:48	1.40	125.79	63	3.2				Northern Molucca Sea
151	25/09/2020	07:03:25	-0.11	125.03	10	3.5				Southern Molucca Sea
152	25/09/2020	08:46:57	5.18	126.28	102	4.4				Mindanao, Philippines
153	25/09/2020	09:06:26	-0.48	123.07	75	3.6				Minahasa Peninsula
154	25/09/2020	09:13:39	-0.26	126.11	151	3.3				Southern Molucca Sea
155	25/09/2020	11:06:19	-0.10	123.19	169	3.6				Minahasa Peninsula
156	25/09/2020	14:35:40	0.53	126.63	11	3.2				Northern Molucca Sea
157	25/09/2020	19:28:46	1.93	127.24	96	4.5	0.14770	0.12973	0.09718	Halmahera
158	25/09/2020	20:39:17	2.06	128.56	38	4.1				Halmahera
159	25/09/2020	20:57:13	1.92	127.28	126	2.7				Halmahera, Indonesia
160	26/09/2020	00:51:30	0.41	126.86	10	3.0				Northern Molucca Sea
161	26/09/2020	08:48:35	-0.07	123.79	120	4.0				Minahasa Peninsula
162	26/09/2020	09:35:07	8.10	127.39	10	4.6	0.27140	0.16235	0.27508	Philippine Islands Region
163	26/09/2020	10:38:46	2.82	128.42	190	3.2				Halmahera, Indonesia
164	26/09/2020	13:25:54	-0.30	123.32	66	4.1				Minahasa Peninsula
165	26/09/2020	14:17:33	-0.14	123.31	147	3.2				Minahasa Peninsula
166	26/09/2020	15:19:27	1.35	126.59	15	3.6				Northern Molucca Sea
167	26/09/2020	20:37:27	1.08	126.74	10	2.9				Northern Molucca Sea
168	26/09/2020	23:17:38	1.11	125.10	108	3.8				Southern Molucca Sea
169	27/09/2020	01:03:55	-0.40	124.25	2	3.6				Northern Molucca Sea
170	27/09/2020	05:28:35	6.52	125.75	143	4.6				Mindanao, Philippines
171	27/09/2020	06:26:36	4.27	126.83	10	3.9				Talud Islands
172	27/09/2020	10:46:35	0.27	125.30	10	3.4				Minahasa Peninsula
173	27/09/2020	14:39:09	1.31	127.11	10	2.6				Halmahera, Indonesia
174	27/09/2020	14:51:12	6.17	126.33	174	4.2				Mindanao, Philippines

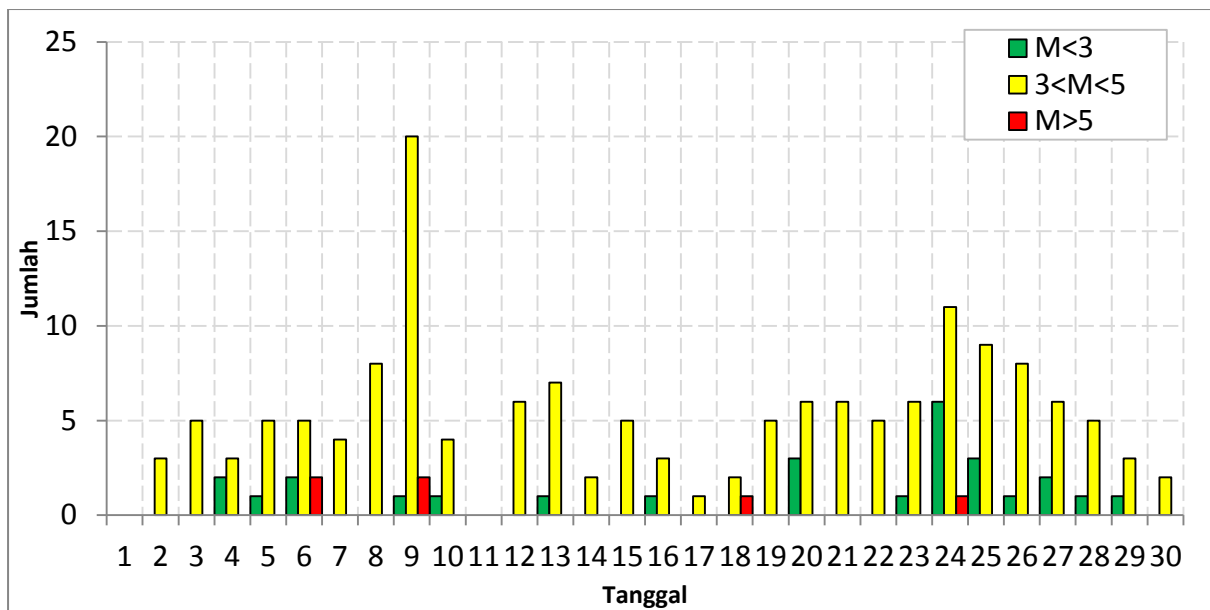
175	27/09/2020	18:30:59	1.16	126.47	19	3.0				Northern Molucca Sea
176	27/09/2020	20:09:49	-0.09	123.37	143	2.8				Minahasa Peninsula
177	28/09/2020	03:15:08	0.30	121.05	29	3.1				Minahasa Peninsula
178	28/09/2020	03:33:07	1.89	128.04	2	2.9				Halmahera, Indonesia
179	28/09/2020	04:37:38	3.43	127.92	111	4.3				Talaud Islands
180	28/09/2020	07:21:18	1.17	123.36	10	4.2				Minahasa Peninsula
181	28/09/2020	20:51:09	0.01	124.54	18	3.5				Minahasa Peninsula
182	28/09/2020	23:20:38	2.38	128.18	18	3.3				Halmahera, Indonesia
183	29/09/2020	13:26:21	3.98	126.05	49	4.3				Talaud Islands
184	29/09/2020	14:17:31	1.55	128.28	7	2.8				Halmahera, Indonesia
185	29/09/2020	15:21:53	1.22	126.40	10	4.0				Northern Molucca Sea
186	29/09/2020	18:35:30	1.63	126.67	10	3.3				Northern Molucca Sea
187	30/09/2020	00:41:22	1.37	124.72	10	3.6				Minahasa Peninsula
188	30/09/2020	09:00:49	1.65	126.63	16	4.0				Northern Molucca Sea



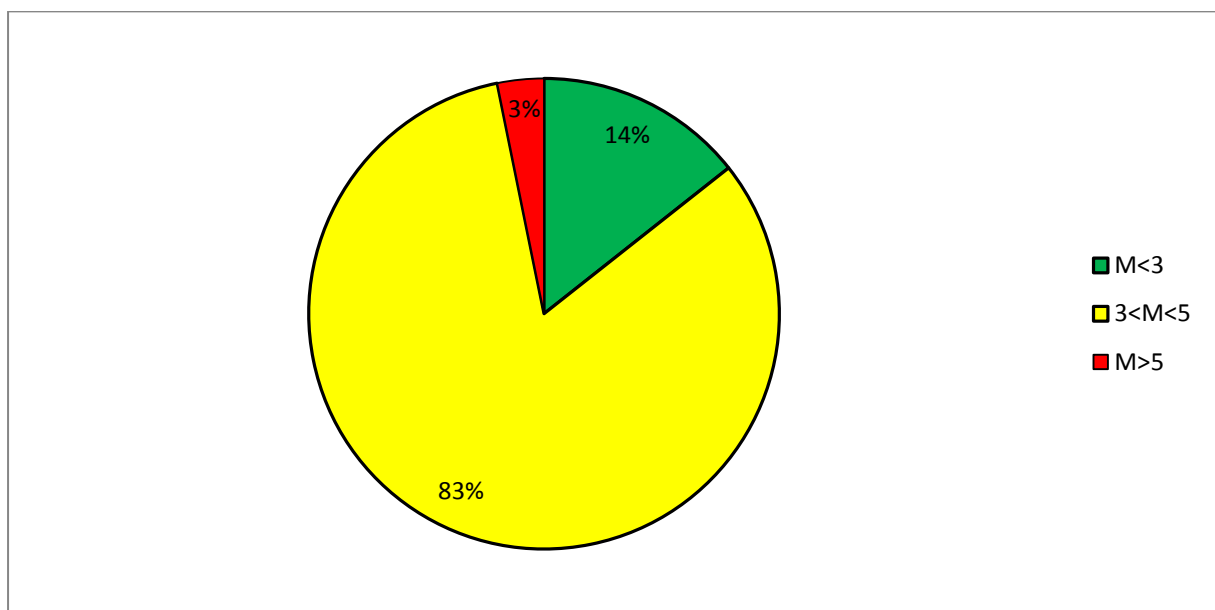
Gambar 29 Sebaran episenter gempabumi bulan September 2020

Tabel 20 Rekapitulasi gempa bumi berdasarkan magnitudo bulan September 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	0	0	0	0	0	0
2	0	3	0	3	0	0
3	0	5	0	5	0	0
4	2	3	0	5	0	0
5	1	5	0	6	0	0
6	2	5	2	9	2	0
7	0	4	0	4	1	0
8	0	8	0	8	0	0
9	1	20	2	23	2	1
10	1	4	0	5	0	0
11	0	0	0	0	0	0
12	0	6	0	6	0	0
13	1	7	0	8	0	0
14	0	2	0	2	0	0
15	0	5	0	5	1	0
16	1	3	0	4	0	0
17	0	1	0	1	0	0
18	0	2	1	3	0	0
19	0	5	0	5	0	0
20	3	6	0	9	0	0
21	0	6	0	6	0	0
22	0	5	0	5	0	0
23	1	6	0	7	0	0
24	6	11	1	18	0	0
25	3	9	0	12	0	0
26	1	8	0	9	0	0
27	2	6	0	8	0	0
28	1	5	0	6	0	0
29	1	3	0	4	0	0
30	0	2	0	2	1	0
Jumlah gempa	27	155	6	188	7	1



Gambar 30 Grafik gempabumi berdasarkan magnitudo bulan September 2020



Gambar 31 Grafik persentase gempabumi berdasarkan magnitudo bulan September 2020

J. Data Gempabumi Bulan Oktober 2020

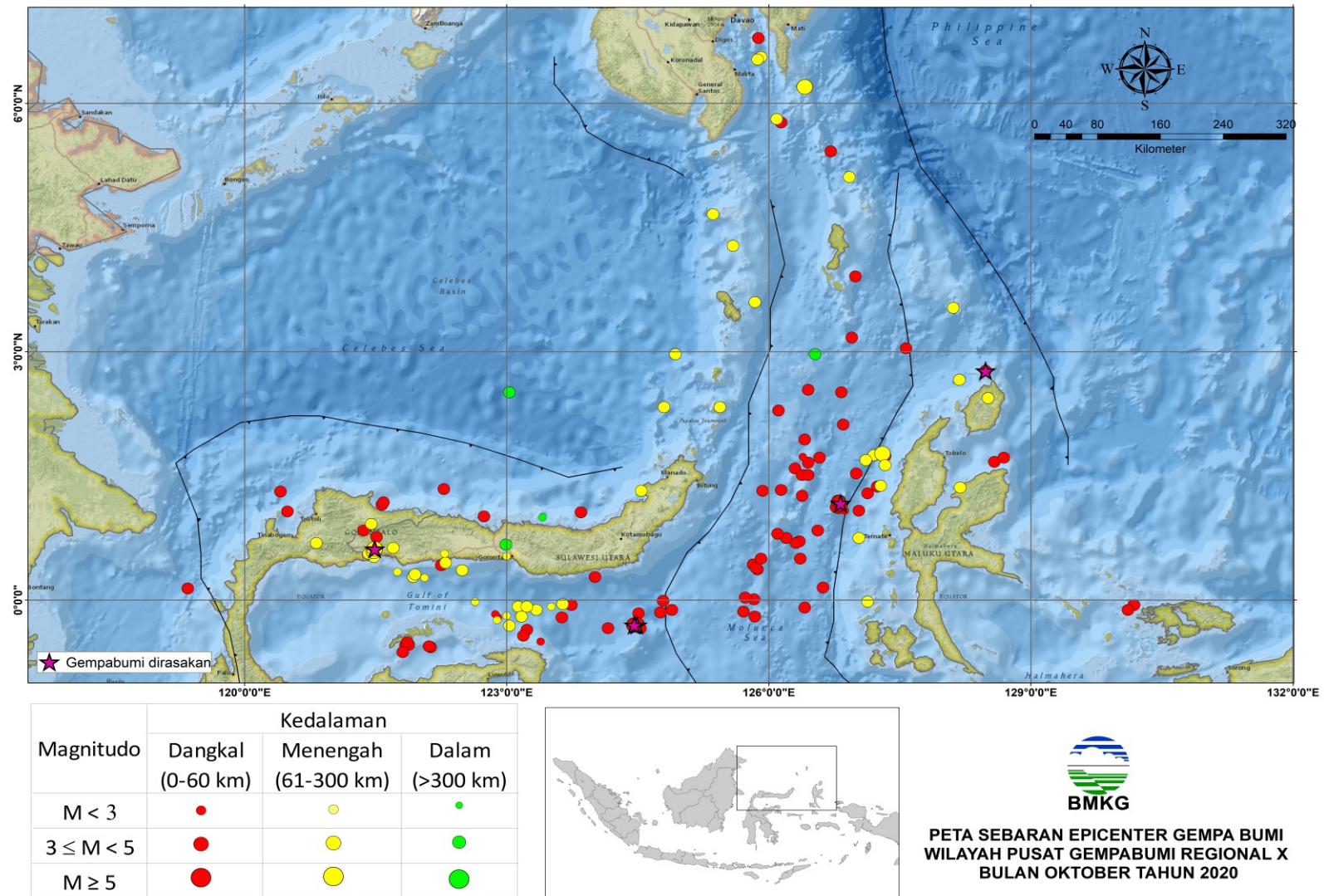
Tabel 21 Data kejadian gempabumi bulan Oktober 2020

No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/10/2020	22:33:35	0.45	122.30	106	3.2				Minahasa Peninsula
2	02/10/2020	00:45:11	-0.34	124.16	52	3.5				Southern Molucca Sea
3	02/10/2020	08:56:59	0.92	121.45	66	4.5				Minahasa Peninsula
4	02/10/2020	09:56:32	-0.21	122.90	31	2.7				Minahasa Peninsula
5	02/10/2020	14:00:05	1.26	126.38	10	3.1				Northern Molucca Sea
6	02/10/2020	22:35:48	0.34	121.75	188	2.8				Minahasa Peninsula
7	03/10/2020	03:25:12	6.20	126.41	131	5.2				Mindanao, Philippines
8	03/10/2020	04:09:11	-0.36	123.23	56	4.3				Minahasa Peninsula
9	03/10/2020	07:22:37	-0.06	123.74	11	3.5				Minahasa Peninsula
10	03/10/2020	12:29:48	5.42	126.71	28	4.5				Mindanao, Philippines
11	04/10/2020	00:18:14	1.00	123.41	355	3.3				Minahasa Peninsula
12	04/10/2020	10:18:02	2.12	126.85	12	3.7				Northern Molucca Sea
13	04/10/2020	12:41:41	-0.57	122.13	10	3.7				Minahasa Peninsula
14	04/10/2020	17:06:57	-0.56	122.11	10	4				Minahasa Peninsula
15	04/10/2020	22:19:13	3.91	126.99	10	4				Talaud Islands
16	05/10/2020	00:51:14	-0.12	123.34	151	3.3				Minahasa Peninsula
17	05/10/2020	02:39:17	1.31	120.41	10	4.1				Minahasa Peninsula
18	05/10/2020	07:30:51	2.33	124.80	206	4.7	0.15532	0.13281	0.18770	Celebes Sea
19	05/10/2020	11:28:04	1.38	127.28	140	3.2				Halmahera
20	05/10/2020	16:42:53	-0.02	127.13	95	3.8				Halmahera
21	05/10/2020	23:24:34	1.79	127.30	127	4				Halmahera
22	06/10/2020	05:52:21	0.28	124.01	10	3				Minahasa Peninsula
23	06/10/2020	08:47:01	0.75	127.03	91	4.7	0.14609	0.11946	0.16284	Halmahera
24	06/10/2020	11:46:20	6.56	125.91	297	4.4				Mindanao, Philippines
25	06/10/2020	21:47:52	1.75	127.20	125	4				Halmahera
26	07/10/2020	11:58:21	0.52	121.48	96	4.5				Minahasa Peninsula
27	07/10/2020	18:27:26	0.43	125.82	10	4.7	0.42317	0.40605	0.19789	Northern Molucca Sea
28	07/10/2020	23:27:51	0.42	122.25	16	3				Minahasa Peninsula
29	08/10/2020	00:09:21	0.37	125.87	13	4				Northern Molucca Sea
30	08/10/2020	04:21:52	1.67	128.58	12	3.6				Halmahera
31	08/10/2020	14:32:42	2.97	126.53	750	4				Northern Molucca Sea
32	08/10/2020	14:47:52	0.56	122.29	119	2.8				Minahasa Peninsula
33	09/10/2020	00:17:09	-0.19	123.00	142	2.6				Minahasa Peninsula
34	09/10/2020	08:39:54	1.74	127.33	10	3.5				Halmahera
35	09/10/2020	17:13:19	-0.55	121.84	10	3.4				Minahasa Peninsula
36	09/10/2020	17:37:38	1.59	126.30	10	3.7				Northern Molucca Sea
37	09/10/2020	19:40:55	0.71	126.35	10	3.4				Northern Molucca Sea
38	09/10/2020	21:35:33	2.97	124.93	253	4				Celebes Sea

39	10/10/2020	08:26:04	2.51	123.03	441	4.3				Celebes Sea
40	10/10/2020	12:37:58	-0.54	121.88	10	4.1				Minahasa Peninsula
41	11/10/2020	06:24:08	0.36	122.49	81	3.6				Minahasa Peninsula
42	11/10/2020	06:43:01	1.66	126.45	10	3.4				Northern Molucca Sea
43	11/10/2020	13:37:37	1.94	126.41	10	3.9				Northern Molucca Sea
44	11/10/2020	19:25:33	-0.01	124.79	10	3.7				Southern Molucca Sea
45	11/10/2020	22:59:35	0.56	121.42	71	3.1				Minahasa Peninsula
46	12/10/2020	01:05:28	-0.51	121.86	10	3.7				Minahasa Peninsula
47	12/10/2020	13:30:42	1.29	127.13	22	3.6				Halmahera
48	12/10/2020	19:47:19	-0.63	121.81	10	3.5				Minahasa Peninsula
49	12/10/2020	22:31:55	0.84	121.36	56	3.2				Minahasa Peninsula
50	13/10/2020	16:19:02	0.84	126.56	10	3.2				Northern Molucca Sea
51	13/10/2020	18:44:09	1.15	121.57	10	3.1				Minahasa Peninsula
52	13/10/2020	18:44:09	1.18	121.59	10	3.3				Minahasa Peninsula
53	13/10/2020	19:10:09	-0.08	123.13	149	3.2				Minahasa Peninsula
54	14/10/2020	03:43:30	6.53	125.87	130	4.7				Mindanao
55	14/10/2020	08:14:46	2.44	128.51	219	4.1				Halmahera
56	14/10/2020	20:16:27	1.12	126.80	31	4.9	0.23335	0.35895	0.24730	Northern Molucca Sea
57	14/10/2020	20:24:19	1.11	126.80	36	3				Northern Molucca Sea
58	14/10/2020	21:52:18	1.18	126.78	28	3.2				Northern Molucca Sea
59	15/10/2020	01:04:31	-0.08	123.23	154	3.1				Minahasa Peninsula
60	15/10/2020	03:37:21	-0.21	123.63	26	3				Minahasa Peninsula
61	15/10/2020	08:51:44	6.79	125.88	10	4.9				Mindanao, Philippines
62	15/10/2020	10:47:42	2.66	128.18	116	4.2				Halmahera
63	15/10/2020	10:57:56	0.76	121.51	10	3.1				Northern Molucca Sea
64	15/10/2020	11:05:15	1.33	126.14	21	3.4				Northern Molucca Sea
65	15/10/2020	15:19:21	5.11	126.92	156	4.7				Mindanao
66	15/10/2020	16:29:41	-0.08	123.51	113	2.9				Minahasa Peninsula
67	15/10/2020	18:24:54	-0.50	123.39	10	2.7				Minahasa Peninsula
68	15/10/2020	18:34:10	1.53	127.00	29	3.7				Halmahera, Indonesia
69	15/10/2020	18:43:49	3.04	127.57	13	3.3				Talaud Islands
70	15/10/2020	19:04:31	-0.17	122.87	10	2.8				Minahasa Peninsula
71	15/10/2020	22:07:27	2.29	126.11	10	3.9				Northern Molucca Sea
72	16/10/2020	04:23:25	-0.06	130.18	10	3.9				Irian Jaya Region
73	16/10/2020	22:52:57	0.69	126.31	10	3.4				Northern Molucca Sea
74	17/10/2020	05:44:27	1.72	126.58	10	4.6	0.14793	0.15857	0.10959	Southern Molucca Sea
75	17/10/2020	14:58:15	4.28	125.59	206	4.7				Talud Island
76	18/10/2020	03:23:09	3.53	128.11	161	4.4				North of Halmahera
77	18/10/2020	03:51:09	-0.31	123.03	75	4.6				Minahasa Peninsula
78	18/10/2020	06:01:31	2.77	128.48	8	4.9				Halmahera
79	18/10/2020	15:01:41	0.15	126.62	10	3.5				Northern Molucca Sea
80	18/10/2020	19:54:42	2.33	125.44	152	3.5				Talud Island
81	18/10/2020	20:13:45	1.72	128.69	10	3.5				Halmahera
82	18/10/2020	20:31:53	1.20	126.81	42	3.2				Northern Molucca Sea
83	19/10/2020	01:06:36	1.17	126.82	35	4.5	0.09982	0.09345	0.23666	Northern Molucca Sea

84	19/10/2020	04:35:13	1.20	126.79	26	3.1				Northern Molucca Sea
85	19/10/2020	08:22:09	-0.20	125.84	10	4.3				Southern Molucca Sea
86	19/10/2020	08:26:32	-0.12	124.89	10	3.8				Southern Molucca Sea
87	19/10/2020	09:00:59	0.01	125.83	10	3.8				Southern Molucca Sea
88	19/10/2020	12:23:51	1.51	126.38	12	3.9				Southern Molucca Sea
89	19/10/2020	15:18:26	1.12	126.77	40	3.2				Northern Molucca Sea
90	20/10/2020	01:00:18	0.69	120.82	80	4.2				Minahasa Peninsula
91	20/10/2020	02:12:50	1.77	127.30	70	5.1				Halmahera
92	20/10/2020	04:26:11	0.50	126.36	10	3.7				Northern Molucca Sea
93	20/10/2020	09:27:03	1.69	127.11	104	3.8				Halmahera
94	20/10/2020	12:30:51	1.36	128.19	98	3.4				Halmahera
95	20/10/2020	15:11:43	1.32	125.93	18	3.6				Northern Molucca Sea
96	20/10/2020	19:13:53	1.20	126.78	33	2.6				Northern Molucca Sea
97	20/10/2020	19:27:07	-0.15	124.76	10	4.9	0.15464	0.17782	0.14221	Southern Molucca Sea
98	21/10/2020	14:28:36	-0.14	125.71	10	3.4				Southern Molucca Sea
99	21/10/2020	15:25:16	-0.20	123.17	134	3.4				Minahasa Peninsula
100	21/10/2020	15:32:46	1.63	127.33	114	4.1				Halmahera
101	21/10/2020	17:06:07	0.67	122.99	308	4.9	0.03394	0.03584	0.05193	Minahasa Peninsula
102	21/10/2020	19:49:00	-0.16	124.51	10	4.3				Southern Molucca Sea
103	21/10/2020	19:52:09	4.66	125.36	183	4.3				Talud Island
104	21/10/2020	20:10:27	5.77	126.14	52	4.7				Mindanao, Philippines
105	21/10/2020	21:04:05	0.28	121.93	178	3.8				Minahasa Peninsula
106	21/10/2020	21:21:04	0.31	121.95	221	3.7				Minahasa Peninsula
107	22/10/2020	10:10:54	3.60	125.84	141	4.5				Talud Island
108	22/10/2020	10:56:29	0.39	125.85	10	3.6				Northern Molucca Sea
109	22/10/2020	12:17:20	1.08	126.87	34	2.9				Northern Molucca Sea
110	22/10/2020	12:32:57	-0.12	130.11	10	3.7				Irian Jaya Region
111	22/10/2020	18:45:05	0.03	125.73	10	3				Southern Molucca Sea
112	22/10/2020	20:10:26	5.81	126.09	90	4.5				Mindanao, Philippines
113	22/10/2020	22:28:23	0.63	121.70	61	3.2				Minahasa Peninsula
114	23/10/2020	16:53:50	0.75	126.20	10	3.4				Northern Molucca Sea
115	24/10/2020	05:53:50	0.27	122.06	166	2.8				Minahasa Peninsula
116	25/10/2020	01:42:54	1.14	126.83	51	3.5				Northern Molucca Sea
117	25/10/2020	08:26:37	0.59	121.48	62	5				Minahasa Peninsula
118	25/10/2020	12:27:47	1.07	120.49	10	3.8				Minahasa Peninsula
119	25/10/2020	15:22:38	1.06	123.85	10	3				Minahasa Peninsula
120	25/10/2020	19:31:19	1.73	126.39	10	2.8				Northern Molucca Sea
121	26/10/2020	08:26:37	0.62	121.49	79	5				Minahasa Peninsula
122	26/10/2020	12:34:05	2.54	126.45	31	3.9				Northern Molucca Sea
123	26/10/2020	13:39:44	1.14	126.80	31	3				Northern Molucca Sea
124	26/10/2020	16:33:42	-0.24	122.89	78	2.4				Minahasa Peninsula
125	27/10/2020	02:35:02	-0.05	123.64	130	3.5				Minahasa Peninsula
126	27/10/2020	02:51:21	0.14	119.35	10	3.9				Minahasa Peninsula
127	27/10/2020	16:06:26	1.32	124.54	187	3.2				Minahasa Peninsula
128	28/10/2020	03:40:20	1.34	122.28	10	3.9				Minahasa Peninsula

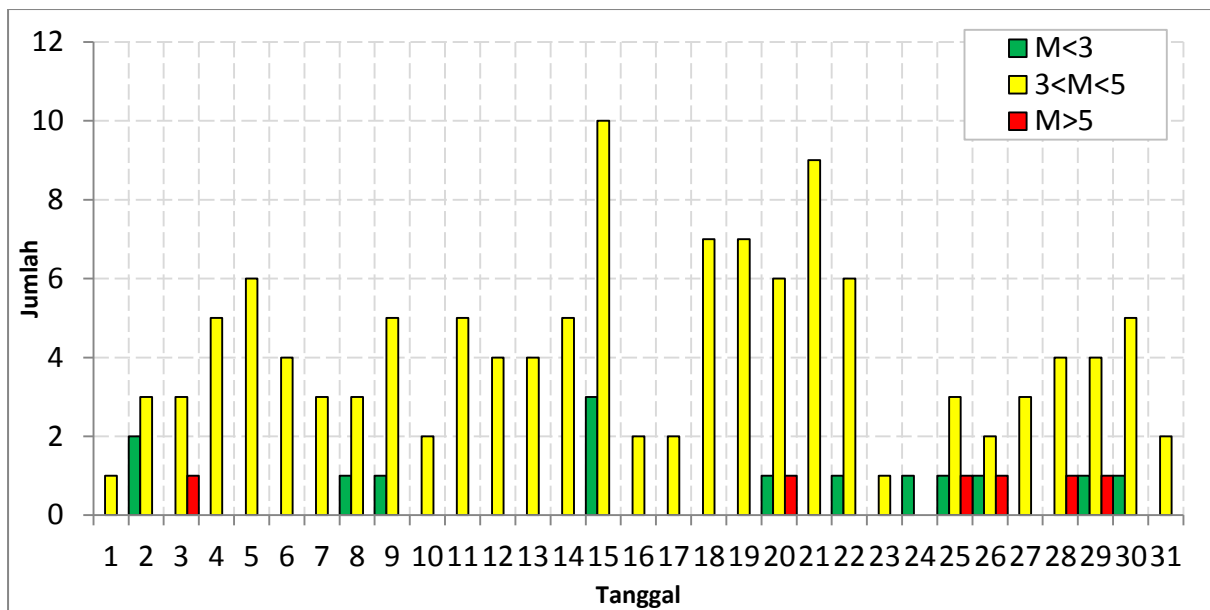
129	28/10/2020	07:31:32	0.50	125.91	12	4.3				Southern Molucca Sea
130	28/10/2020	09:08:58	-0.30	124.49	10	5.7	1.20528	0.70305	0.45723	Southern Molucca Sea
131	28/10/2020	12:35:22	3.17	126.95	10	3.8				Talud Island
132	28/10/2020	19:51:19	-0.09	126.41	10	3.2				Southern Molucca Sea
133	29/10/2020	01:17:54	-0.30	124.46	10	5				Southern Molucca Sea
134	29/10/2020	01:54:18	-0.28	124.50	10	4.7	0.33483	0.21482	0.19934	Southern Molucca Sea
135	29/10/2020	03:46:52	-0.43	123.19	10	3.5				Minahasa Peninsula
136	29/10/2020	11:26:24	0.80	126.10	15	4.5	0.42838	0.32030	0.26408	Northern Molucca Sea
137	29/10/2020	15:37:11	2.51	126.83	10	3.4				Halmahera
138	29/10/2020	16:32:25	-0.02	122.64	181	2.7				Minahasa Peninsula
139	30/10/2020	04:13:18	1.17	126.81	33	3.4				Northern Molucca Sea
140	30/10/2020	11:27:59	1.08	127.03	25	3				Halmahera, Indonesia
141	30/10/2020	13:26:56	-0.34	124.53	10	4.6				Southern Molucca Sea
142	30/10/2020	15:19:42	1.20	126.80	25	3.4				Southern Molucca Sea
143	30/10/2020	17:16:16	0.53	123.00	139	2.8				Minahasa Peninsula
144	30/10/2020	18:27:35	1.51	126.45	23	4.5	0.35134	0.30354	0.22525	Northern Molucca Sea
145	31/10/2020	01:07:14	1.01	122.74	45	3.3				Minahasa Peninsula
146	31/10/2020	02:38:23	1.37	127.24	12	3.5				Halmahera



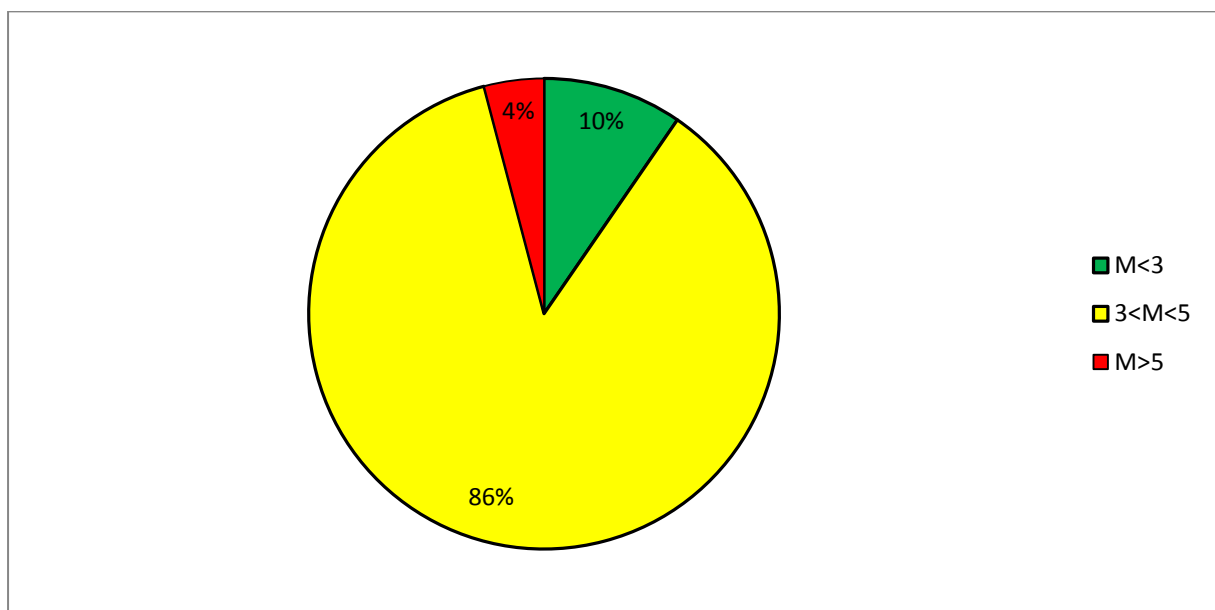
Gambar 32 Sebaran episenter gempabumi bulan Oktober 2020

Tabel 22 Rekapitulasi gempabumi berdasarkan magnitudo bulan Oktober 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	0	1	0	1	0	0
2	2	3	0	5	0	0
3	0	3	1	4	0	0
4	0	5	0	5	0	0
5	0	6	0	6	0	0
6	0	4	0	4	0	0
7	0	3	0	3	0	0
8	1	3	0	4	0	0
9	1	5	0	6	0	0
10	0	2	0	2	0	0
11	0	5	0	5	0	0
12	0	4	0	4	0	0
13	0	4	0	4	0	0
14	0	5	0	5	0	0
15	3	10	0	13	0	0
16	0	2	0	2	0	0
17	0	2	0	2	0	0
18	0	7	0	7	1	0
19	0	7	0	7	1	0
20	1	6	1	8	0	0
21	0	9	0	9	0	0
22	1	6	0	7	0	0
23	0	1	0	1	0	0
24	1	0	0	1	0	0
25	1	3	1	5	0	0
26	1	2	1	4	1	0
27	0	3	0	3	0	0
28	0	4	1	5	1	0
29	1	4	1	6	1	0
30	1	5	0	6	0	0
31	0	2	0	2	0	0
Jumlah gempa	14	126	6	146	5	0



Gambar 33 Grafik gempabumi berdasarkan magnitudo bulan Oktober 2020



Gambar 34 Grafik persentase gempabumi berdasarkan magnitudo bulan Oktober 2020

K. Data Gempabumi Bulan November 2020

Tabel 23 Data kejadian gempabumi bulan November 2020

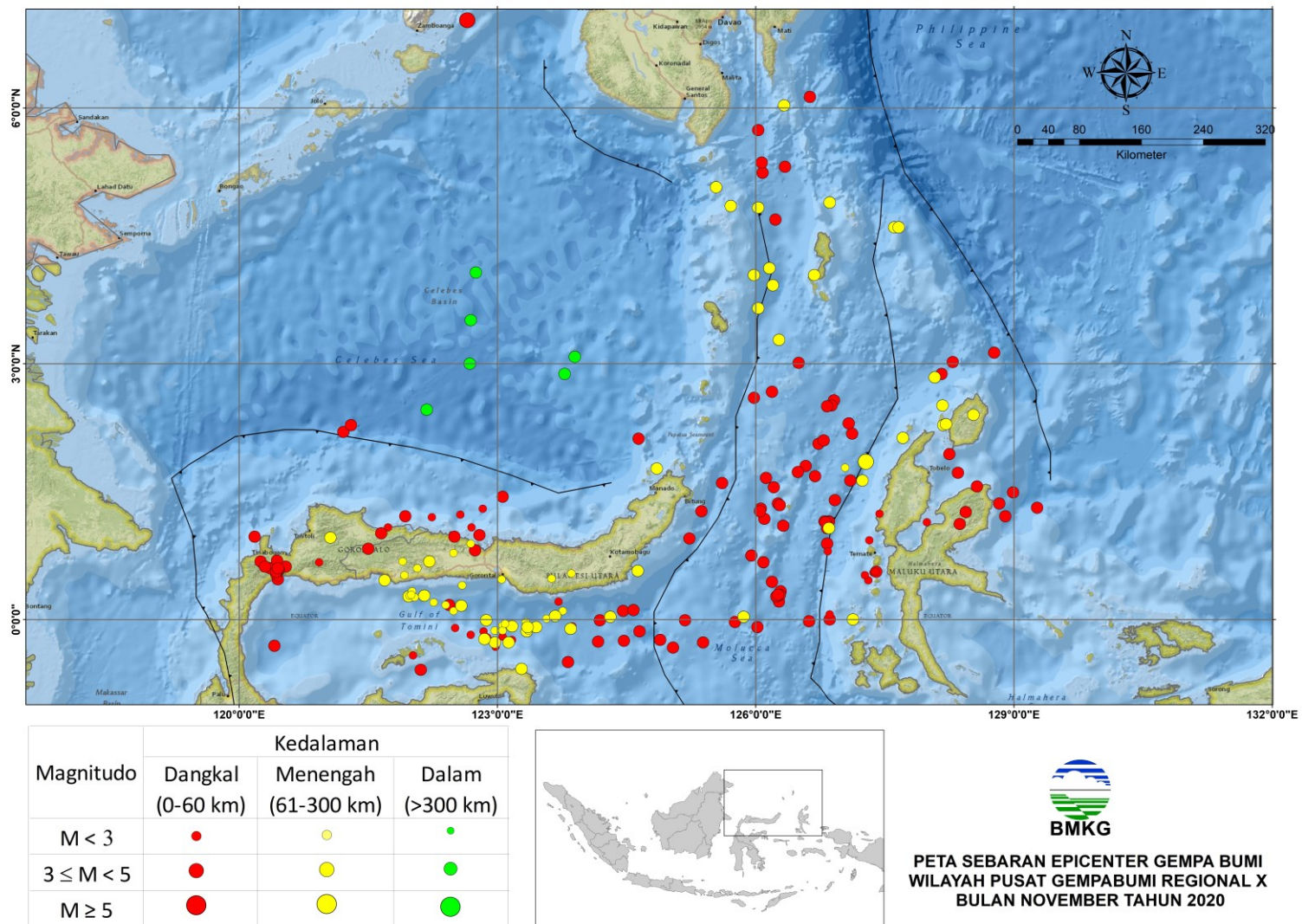
No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/11/2020	00:47:02	3.01	126.50	10	4.1				Talaud Islands
2	01/11/2020	00:51:29	4.60	127.61	125	4.3				Talaud Islands
3	01/11/2020	03:20:16	-0.25	122.95	10	2.4				Minahasa Peninsula
4	01/11/2020	06:51:35	0.96	121.06	75	3.2				Minahasa Peninsula
5	02/11/2020	08:09:56	2.57	126.91	10	4.5				Northern Molucca Sea
6	02/11/2020	17:20:54	1.36	126.26	10	3.5				Southern Molucca Sea
7	03/11/2020	02:02:28	-0.25	124.47	5	4.7	0.16164	0.16811	-0.09528	Southern Molucca Sea
8	03/11/2020	06:27:33	-0.07	123.06	161	2.8				Minahasa Peninsula
9	03/11/2020	08:00:08	0.48	123.63	159	2.9				Minahasa Peninsula
10	03/11/2020	16:00:27	1.15	126.80	33	3.4				Northern Molucca Sea
11	03/11/2020	19:44:16	2.88	128.16	10	3.7				Halmahera
12	03/11/2020	19:59:23	4.12	126.16	143	4.1				Talaud Islands
13	04/11/2020	18:48:43	2.28	128.18	212	3.4				Halmahera
14	04/11/2020	19:09:03	2.88	123.78	382	4.3	0.02754	-0.02912	0.02902	Celebes Sea
15	04/11/2020	22:09:24	-0.01	125.18	10	3.9				Southern Molucca Sea
16	05/11/2020	12:06:47	2.51	128.17	149	4.0				Halmahera
17	05/11/2020	14:13:53	1.26	128.44	10	4.1				Halmahera
18	05/11/2020	16:19:21	-0.50	123.82	39	4.3				Minahasa Peninsula
19	05/11/2020	20:24:56	1.66	126.12	31	3.1				Northern Molucca Sea
20	05/11/2020	22:16:26	2.84	128.08	142	3.7				Northern Molucca Sea
21	05/11/2020	22:24:06	1.07	126.85	65	3.5				Northern Molucca Sea
22	06/11/2020	08:00:52	4.60	127.66	150	4.3				Talaud Island
23	06/11/2020	11:27:59	1.15	126.85	51	4.0				Halmahera, Indonesia
24	06/11/2020	13:26:56	0.57	127.40	10	2.8				Halmahera, Indonesia
25	06/11/2020	18:22:41	7.03	122.65	20	5.1				Mindanao, Philippines
26	06/11/2020	18:23:37	2.20	121.21	10	4.0				Celebes Sea
27	06/11/2020	19:19:15	1.07	126.83	39	4.1	0.04426	0.03687	-0.02526	Northern Molucca Sea
28	07/11/2020	08:01:41	2.12	124.64	10	3.7				Celebes Sea
29	08/11/2020	02:17:43	1.72	128.35	21	3.5				Halmahera, Indonesia
30	08/11/2020	08:34:55	-0.42	122.02	10	2.9				Minahasa Peninsula
31	08/11/2020	13:42:24	1.34	126.28	2	3.5				Northern Molucca Sea
32	08/11/2020	13:46:35	-0.14	123.34	150	3.2				Minahasa Peninsula
33	08/11/2020	17:29:04	1.08	122.70	2	2.5				Minahasa Peninsula
34	08/11/2020	22:40:59	-0.02	126.62	10	3.6				Southern Molucca Sea
35	08/11/2020	22:41:04	0.00	126.86	10	3.7				Halmahera, Indonesia
36	09/11/2020	01:48:34	1.31	129.27	8	3.3				Halmahera, Indonesia
37	09/11/2020	03:24:18	4.85	125.71	194	4.4				Talaud Island
38	09/11/2020	03:33:46	-0.59	122.11	10	4.5				Minahasa Peninsula

39	09/11/2020	07:50:44	0.27	121.97	201	3.3				Minahasa Peninsula
40	09/11/2020	12:56:24	6.13	126.63	10	4.9				Mindanao, Philippines
41	09/11/2020	15:22:55	0.95	125.23	10	4.6				Northern Molucca Sea
42	09/11/2020	17:53:40	0.55	127.37	10	2.7				Halmahera, Indonesia
43	10/11/2020	00:11:08	0.10	122.49	120	2.5				Minahasa Peninsula
44	10/11/2020	07:03:08	1.12	128.37	11	3.6				Halmahera, Indonesia
45	10/11/2020	16:36:11	-0.20	123.06	13	2.8				Minahasa Peninsula
46	10/11/2020	16:48:27	4.69	126.23	10	4.4				Minahasa Peninsula
47	10/11/2020	16:57:15	-0.14	122.84	29	2.7				Minahasa Peninsula
48	10/11/2020	19:40:30	0.89	126.83	26	3.4				Northern Molucca Sea
49	10/11/2020	21:07:44	1.21	121.93	57	4.1				Minahasa Peninsula
50	11/11/2020	08:02:07	0.99	122.79	20	3.3				Minahasa Peninsula
51	11/11/2020	12:54:01	1.18	126.10	20	3.3				Northern Molucca Sea
52	11/11/2020	15:40:42	5.31	126.34	16	4.9				Mindanao, Philippines
53	11/11/2020	18:07:55	0.28	122.15	172	3.1				Minahasa Peninsula
54	11/11/2020	18:48:45	0.46	121.69	142	4.7	0.33059	0.39795	0.22435	Minahasa Peninsula
55	12/11/2020	01:18:38	2.60	125.98	23	4.7				Talaud Island
56	12/11/2020	05:09:38	-0.10	122.51	32	2.8				Minahasa Peninsula
57	12/11/2020	11:03:11	1.80	126.58	10	3.5				Northern Molucca Sea
58	12/11/2020	13:04:41	2.06	126.73	10	4.1				Northern Molucca Sea
59	12/11/2020	13:20:12	3.92	126.20	121	3.9				Talaud Island
60	12/11/2020	13:48:35	0.60	122.07	186	2.8				Minahasa Peninsula
61	12/11/2020	19:19:49	4.07	122.75	558	4.5				Celebes Sea
62	13/11/2020	06:05:40	2.29	128.21	156	3.7				Halmahera
63	13/11/2020	10:17:01	0.44	126.19	11	3.5				Northern Molucca Sea
64	13/11/2020	15:10:39	0.93	127.32	24	2.4				Halmahera
65	13/11/2020	15:25:21	0.10	124.46	46	3.4				Minahasa Peninsula
66	13/11/2020	15:42:56	1.17	126.85	10	2.7				Northern Molucca Sea
67	13/11/2020	16:11:38	0.17	122.40	149	2.8				Minahasa Peninsula
68	13/11/2020	16:35:48	-0.08	123.17	157	4.1				Minahasa Peninsula
69	14/11/2020	02:10:37	4.04	126.68	135	4.3				Talaud Islands
70	14/11/2020	05:49:18	1.08	121.73	10	2.9				Minahasa Peninsula
71	14/11/2020	08:05:48	-0.24	124.89	10	4.0				Southern Molucca Sea
72	14/11/2020	14:03:29	1.21	128.90	10	3.8				Halmahera
73	14/11/2020	14:16:41	0.47	123.05	147	2.3				Minahasa Peninsula
74	14/11/2020	18:03:00	-0.11	123.85	136	3.4				Minahasa Peninsula
75	15/11/2020	00:49:24	0.28	121.98	159	2.9				Minahasa Peninsula
76	15/11/2020	01:53:21	1.55	126.21	10	3.5				Northern Molucca Sea
77	15/11/2020	08:37:26	0.57	124.63	107	4.5				Minahasa Peninsula
78	15/11/2020	10:32:25	-0.01	122.87	194	3.6				Minahasa Peninsula
79	15/11/2020	10:49:23	0.56	127.40	4	3.3				Halmahera
80	15/11/2020	10:51:02	-0.09	126.02	10	4.0				Southern Molucca Sea
81	15/11/2020	11:06:18	5.24	126.08	13	4.3				Mindanao, Philippines
82	15/11/2020	15:06:51	1.49	128.99	10	3.1				Halmahera
83	15/11/2020	15:40:31	3.02	128.29	10	4.0				Nort of Halmahera

84	15/11/2020	17:44:31	3.00	122.68	534	3.4				Celebes Sea
85	15/11/2020	17:49:11	-0.32	122.98	37	2.5				Minahasa Peninsula
86	15/11/2020	17:57:20	-0.58	123.28	73	3.4				Minahasa Peninsula
87	15/11/2020	19:48:56	2.18	127.12	32	3.5				Northern Molucca Sea
88	15/11/2020	21:06:56	1.14	127.99	10	2.7				Halmahera
89	16/11/2020	00:16:18	0.06	126.86	40	2.9				Halmahera
90	16/11/2020	06:11:19	0.46	127.31	6	2.6				Halmahera
91	16/11/2020	10:36:17	-0.27	122.97	89	3.3				Minahasa Peninsula
92	16/11/2020	11:15:09	1.14	126.81	46	3.1				Halmahera
93	16/11/2020	13:37:31	0.29	126.28	10	3.5				Northern Molucca Sea
94	16/11/2020	13:48:23	0.30	126.27	10	4.4	0.05377	0.04444	-0.05022	Northern Molucca Sea
95	16/11/2020	14:50:23	0.21	126.27	10	3.4				Northern Molucca Sea
96	16/11/2020	16:34:13	0.27	126.24	23	3.1				Northern Molucca Sea
97	16/11/2020	17:05:19	1.30	122.83	33	2.7				Minahasa Peninsula
98	16/11/2020	17:48:58	1.27	125.37	10	3.4				Minahasa Peninsula
99	16/11/2020	18:47:21	0.33	126.29	10	3.6				Northern Molucca Sea
100	16/11/2020	20:04:00	-0.01	124.19	44	3.2				Southern Molucca Sea
101	16/11/2020	20:18:18	1.78	127.04	87	2.7				Halmahera
102	16/11/2020	23:06:03	-0.33	125.04	10	4.1				Northern Molucca Sea
103	17/11/2020	00:32:07	0.33	122.01	177	2.9				Minahasa Peninsula
104	17/11/2020	00:34:02	1.73	126.49	25	3.4				Northern Molucca Sea
105	17/11/2020	01:01:38	0.10	123.76	205	2.7				Minahasa Peninsula
106	17/11/2020	01:41:06	0.81	122.74	36	3.1				Minahasa Peninsula
107	17/11/2020	08:41:26	0.29	126.28	11	4.0				Northern Molucca Sea
108	17/11/2020	10:57:47	0.29	126.26	1	3.6				Northern Molucca Sea
109	17/11/2020	11:21:40	5.36	126.07	10	4.1				Mindanao, Philippines
110	17/11/2020	14:15:16	0.97	122.50	17	3.7				Minahasa Peninsula
111	17/11/2020	14:27:08	3.51	122.69	509	4.6				Celebes Sea
112	17/11/2020	16:11:05	0.78	122.49	79	2.8				Minahasa Peninsula
113	17/11/2020	20:48:33	1.30	126.06	10	3.3				Northern Molucca Sea
114	18/11/2020	00:12:25	2.67	126.19	10	3.7				Northern Molucca Sea
115	18/11/2020	01:09:08	4.04	125.98	149	4.4				Talaud Islands
116	18/11/2020	07:50:45	0.68	122.21	83	3.6				Minahasa Peninsula
117	18/11/2020	11:51:59	1.01	121.65	5	3.8				Minahasa Peninsula
118	18/11/2020	15:09:33	1.63	127.24	108	3.5				Halmahera
119	18/11/2020	15:39:39	0.00	127.13	106	3.8				Halmahera
120	18/11/2020	19:38:04	2.10	126.79	6	3.6				Northern Molucca Sea
121	18/11/2020	22:32:16	-0.13	123.36	131	2.9				Minahasa Peninsula
122	19/11/2020	00:36:55	-0.14	124.65	27	3.5				Southern Molucca Sea
123	19/11/2020	04:16:49	1.20	122.24	29	2.9				Minahasa Peninsula
124	19/11/2020	14:35:18	-0.21	122.88	16	2.7				Minahasa Peninsula
125	19/11/2020	15:51:40	2.51	126.88	10	3.8				Southern Molucca Sea
126	19/11/2020	16:32:08	1.60	125.61	24	3.5				Northern Molucca Sea
127	19/11/2020	17:40:05	2.50	126.83	10	3.8				Northern Molucca Sea
128	19/11/2020	20:30:12	0.80	126.84	29	2.8				Northern Molucca Sea

129	19/11/2020	21:17:25	1.40	126.92	45	3.1				Northern Molucca Sea
130	19/11/2020	23:52:01	-0.13	122.97	84	2.5				Minahasa Peninsula
131	20/11/2020	02:19:08	-0.09	123.45	136	3.2				Minahasa Peninsula
132	20/11/2020	08:14:58	1.10	126.32	15	3.6				Northern Molucca Sea
133	20/11/2020	13:47:51	2.30	127.08	10	3.6				Northern Molucca Sea
134	20/11/2020	15:01:56	0.01	123.57	174	2.8				Minahasa Peninsula
135	20/11/2020	16:15:57	0.20	122.26	137	2.3				Minahasa Peninsula
136	21/11/2020	00:48:35	0.21	123.71	12	2.7				Minahasa Peninsula
137	21/11/2020	08:15:42	1.36	128.83	2	3.3				Halmahera
138	21/11/2020	13:11:07	5.07	125.54	147	4.9				Mindanao
139	21/11/2020	14:35:06	5.74	126.03	10	4.2				Mindanao
140	21/11/2020	16:02:55	0.52	121.92	176	2.6				Minahasa Peninsula
141	21/11/2020	18:53:05	0.67	126.09	32	3.0				Northern Molucca Sea
142	21/11/2020	19:07:04	1.68	126.69	10	3.3				Northern Molucca Sea
143	21/11/2020	21:25:51	3.08	123.90	409	4.5				Celebes Sea
144	21/11/2020	22:34:07	-0.27	123.13	77	4.5				Minahasa Peninsula
145	22/11/2020	02:19:07	0.97	120.18	5	3.8				Minahasa Peninsula
146	22/11/2020	04:22:26	-0.24	123.17	35	2.6				Minahasa Peninsula
147	22/11/2020	04:48:45	0.03	125.86	99	3.4				Northern Molucca Sea
148	22/11/2020	07:22:13	0.40	122.59	89	2.6				Minahasa Peninsula
149	22/11/2020	07:34:02	2.46	122.18	549	4.2				Minahasa Peninsula
150	22/11/2020	08:42:25	0.54	123.86	84	2.6				Minahasa Peninsula
151	22/11/2020	11:58:44	0.52	127.27	27	2.2				Halmahera
152	22/11/2020	21:26:59	-0.23	122.85	66	3.5				Minahasa Peninsula
153	22/11/2020	22:07:28	2.28	121.30	10	3.8				Minahasa Peninsula
154	23/11/2020	12:52:12	0.17	122.44	10	3.2				Minahasa Peninsula
155	23/11/2020	14:42:32	1.24	127.44	10	2.7				Halmahera
156	23/11/2020	18:53:24	0.11	124.58	38	3.1				Minahasa Peninsula
157	23/11/2020	19:16:22	0.56	127.39	12	2.4				Halmahera
158	23/11/2020	22:56:05	4.89	126.86	145	4.1				Talaud Islands
159	23/11/2020	23:45:36	0.68	121.90	185	2.9				Minahasa Peninsula
160	24/11/2020	02:30:33	-0.13	123.06	130	2.5				Minahasa Peninsula
161	24/11/2020	02:56:13	0.03	124.31	69	4.1				Minahasa Peninsula
162	24/11/2020	03:21:42	-0.05	123.09	75	2.7				Minahasa Peninsula
163	24/11/2020	09:31:04	1.44	123.06	9	3.0				Minahasa Peninsula
164	24/11/2020	10:38:10	-0.31	120.41	9	3.3				Minahasa Peninsula
165	24/11/2020	11:42:33	0.89	122.69	77	2.9				Minahasa Peninsula
166	24/11/2020	15:05:44	-0.18	122.69	10	1.9				Minahasa Peninsula
167	24/11/2020	18:36:31	3.13	128.77	10	4.3				North of Halmahera
168	24/11/2020	21:54:42	1.77	124.85	175	3.3				Minahasa Peninsula
169	25/11/2020	00:01:57	-0.27	125.39	10	4.3				Southern Molucca Sea
170	25/11/2020	02:33:16	-0.26	124.17	38	4.1				Southern Molucca Sea
171	25/11/2020	04:48:12	1.94	128.25	29	3.7				Halmahera
172	25/11/2020	05:09:40	1.23	122.57	14	2.1				Minahasa Peninsula
173	25/11/2020	07:34:47	0.75	125.95	10	3.7				Northern Molucca Sea

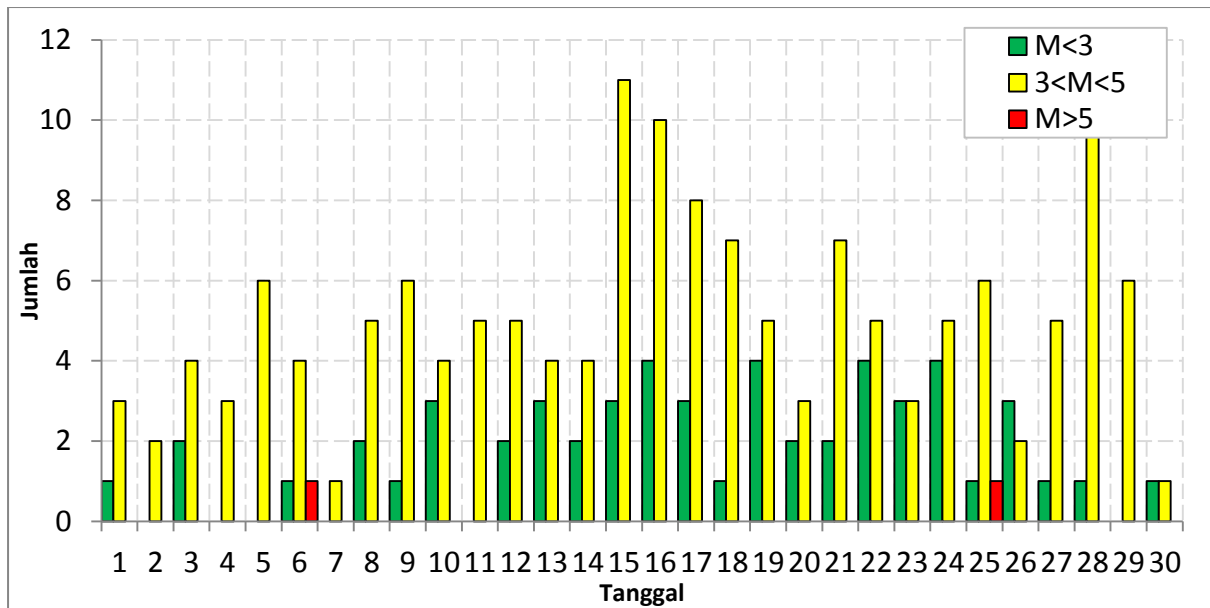
174	25/11/2020	11:01:06	3.65	126.03	97	4.0				Talaud Islands
175	25/11/2020	15:20:35	1.85	127.28	77	5.4	0.98835	0.85633	0.61575	Halmahera
176	25/11/2020	23:01:26	0.83	121.50	37	3.4				Minahasa Peninsula
177	26/11/2020	08:29:06	0.04	123.67	95	3.2				Minahasa Peninsula
178	26/11/2020	09:23:09	0.26	122.04	133	2.6				Minahasa Peninsula
179	26/11/2020	15:13:02	-0.08	123.87	10	2.4				Minahasa Peninsula
180	26/11/2020	16:07:37	-0.03	123.33	140	2.4				Minahasa Peninsula
181	26/11/2020	21:44:50	0.16	122.58	152	3.6				Minahasa Peninsula
182	27/11/2020	11:50:54	0.29	122.00	150	2.7				Minahasa Peninsula
183	27/11/2020	16:16:47	0.61	120.45	10	3.6				Minahasa Peninsula
184	27/11/2020	16:43:32	2.40	128.53	219	4.3				Halmahera
185	27/11/2020	17:19:32	0.47	120.45	10	3.0				Minahasa Peninsula
186	27/11/2020	22:14:31	0.53	120.43	10	3.8				Minahasa Peninsula
187	27/11/2020	23:31:11	6.03	126.33	147	4.2				Mindanao
188	28/11/2020	00:59:58	-0.09	123.35	140	3.8				Minahasa Peninsula
189	28/11/2020	06:41:33	4.83	126.03	216	4.1				Mindanao
190	28/11/2020	08:12:29	2.13	127.71	97	3.3				Halmahera
191	28/11/2020	14:14:21	0.60	120.36	6	4.4				Minahasa Peninsula
192	28/11/2020	16:14:27	0.62	120.54	10	3.5				Minahasa Peninsula
193	28/11/2020	16:19:27	0.69	120.44	10	3.3				Minahasa Peninsula
194	28/11/2020	16:44:59	1.27	126.05	57	3.4				Northern Molucca Sea
195	28/11/2020	16:50:40	0.49	120.45	10	2.9				Minahasa Peninsula
196	28/11/2020	17:26:11	0.58	120.46	10	4.7				Minahasa Peninsula
197	28/11/2020	17:32:38	0.58	120.45	10	4.2				Minahasa Peninsula
198	28/11/2020	17:37:25	0.56	120.43	4	4.3				Minahasa Peninsula
199	29/11/2020	00:46:41	0.68	120.25	10	3.5				Minahasa Peninsula
200	29/11/2020	01:03:00	3.28	126.27	123	4.2				Talaud Islands
201	29/11/2020	12:14:15	0.60	120.45	10	4.5				Minahasa Peninsula
202	29/11/2020	13:31:38	0.62	120.30	10	3.8				Minahasa Peninsula
203	29/11/2020	16:59:07	-0.03	125.76	10	3.8				Southern Molucca Sea
204	29/11/2020	19:41:30	1.56	128.57	10	3.3				Halmahera
205	30/11/2020	01:40:48	1.63	127.10	37	4.2				Halmahera
206	30/11/2020	11:56:58	0.67	120.93	39	2.8				Minahasa Peninsula



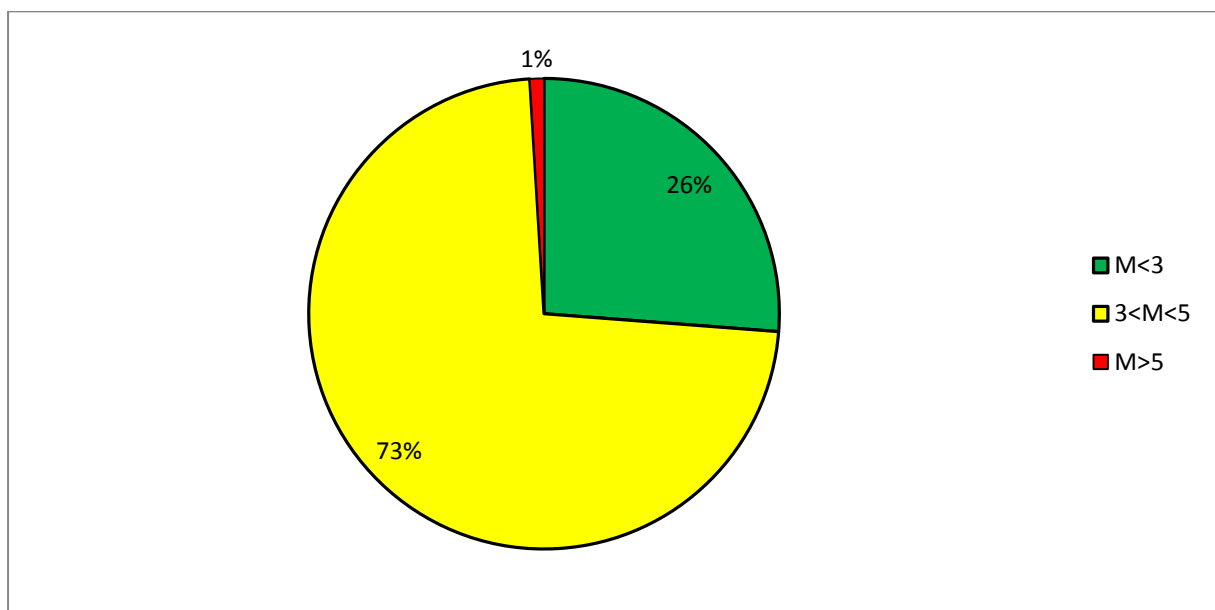
Gambar 35 Sebaran episenter gempabumi bulan November 2020

Tabel 24 Rekapitulasi gempabumi berdasarkan magnitudo bulan November 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	1	3	0	4	0	0
2	0	2	0	2	0	0
3	2	4	0	6	0	0
4	0	3	0	3	0	0
5	0	6	0	6	0	0
6	1	4	1	6	0	0
7	0	1	0	1	0	0
8	2	5	0	7	0	0
9	1	6	0	7	1	0
10	3	4	0	7	0	0
11	0	5	0	5	0	0
12	2	5	0	7	0	0
13	3	4	0	7	0	0
14	2	4	0	6	0	0
15	3	11	0	14	1	0
16	4	10	0	14	0	0
17	3	8	0	11	0	0
18	1	7	0	8	0	0
19	4	5	0	9	0	0
20	2	3	0	5	0	0
21	2	7	0	9	0	0
22	4	5	0	9	0	0
23	3	3	0	6	0	0
24	4	5	0	9	0	0
25	1	6	1	8	1	0
26	3	2	0	5	0	0
27	1	5	0	6	0	0
28	1	10	0	11	4	0
29	0	6	0	6	1	0
30	1	1	0	2	0	0
Jumlah gempa	54	150	2	206	8	0



Gambar 36 Grafik gempabumi berdasarkan magnitudo bulan November 2020



Gambar 37 Grafik persentase gempabumi berdasarkan magnitudo bulan November 2020

L. Data Gempabumi Bulan Desember 2020

Tabel 25 Data kejadian gempabumi bulan Desember 2020

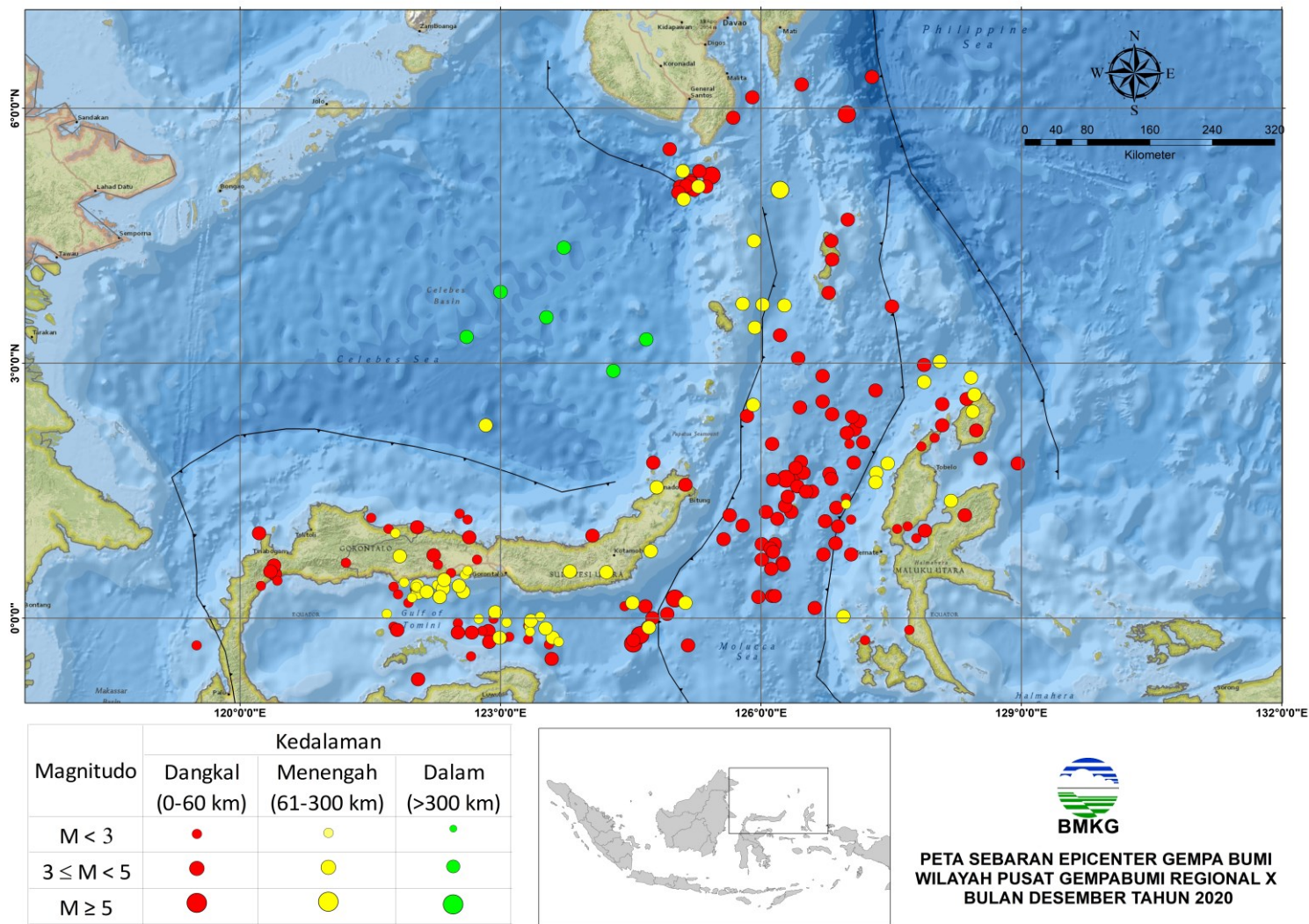
No	Date	OT (UTC)	Episenter		Depth (km)	Mag	PGA (gals) SLMI			Region
			Lat	Long			X	Y	Z	
1	01/12/2020	00:50:43	0.30	122.05	158	3.2				Minahasa Peninsula
2	01/12/2020	00:57:26	0.52	120.40	5	3.7				Minahasa Peninsula
3	01/12/2020	06:53:23	2.52	128.09	8	4.4				Halmahera
4	01/12/2020	08:24:11	0.87	126.01	23	3.6				Northern Molucca Sea
5	01/12/2020	14:09:52	2.63	128.46	225	4.9				Halmahera
6	01/12/2020	15:57:13	2.22	127.08	14	3.4				Northern Molucca Sea
7	01/12/2020	16:38:58	0.05	124.92	15	3.1				Minahasa Peninsula
8	01/12/2020	17:57:36	2.38	125.84	38	3.2				Talaud Islands
9	01/12/2020	23:58:44	-0.09	123.32	29	3.0				Minahasa Peninsula
10	02/12/2020	01:22:03	0.28	121.82	24	2.9				Minahasa Peninsula
11	02/12/2020	04:01:50	1.88	128.53	30	4.2				Halmahera
12	02/12/2020	13:19:49	1.07	122.04	13	3.4				Minahasa Peninsula
13	02/12/2020	13:27:38	0.88	126.86	28	3.3				Northern Molucca Sea
14	02/12/2020	16:29:24	0.39	122.27	113	2.6				Minahasa Peninsula
15	02/12/2020	19:55:13	3.54	123.53	442	4.1				Celebes Sea
16	02/12/2020	23:45:52	1.18	121.51	6	2.9				Minahasa Peninsula
17	02/12/2020	23:56:40	-0.14	127.71	10	3.0				Halmahera
18	03/12/2020	09:38:30	2.05	127.02	33	2.9				Northern Molucca Sea
19	03/12/2020	11:58:55	-0.22	123.10	10	2.7				Minahasa Peninsula
20	03/12/2020	18:30:07	-0.32	119.50	17	2.5				Minahasa Peninsula
21	03/12/2020	20:56:47	2.21	128.48	30	3.3				Halmahera
22	03/12/2020	23:20:23	-0.31	123.56	16	2.7				Minahasa Peninsula
23	04/12/2020	02:03:19	1.69	126.39	10	3.4				Northern Molucca Sea
24	04/12/2020	02:26:43	0.37	121.77	14	2.1				Minahasa Peninsula
25	04/12/2020	05:14:24	0.14	124.43	10	3.0				Minahasa Peninsula
26	04/12/2020	11:49:46	0.05	121.69	190	2.8				Minahasa Peninsula
27	04/12/2020	11:50:47	-0.01	122.75	142	2.6				Minahasa Peninsula
28	04/12/2020	14:38:57	0.62	120.39	10	3.7				Minahasa Peninsula
29	04/12/2020	16:53:48	1.54	124.80	217	3.3				Minahasa Peninsula
30	04/12/2020	17:12:00	0.44	120.43	10	2.5				Minahasa Peninsula
31	04/12/2020	17:29:19	-0.06	122.51	36	1.9				Minahasa Peninsula
32	04/12/2020	19:00:14	0.87	126.16	19	3.2				Northern Molucca Sea
33	04/12/2020	19:32:01	3.84	123.00	564	4.3				Celebes Sea
34	04/12/2020	19:53:38	2.51	125.91	121	3.8				Talaud Islands
35	04/12/2020	23:48:18	0.55	120.35	10	3.8				Minahasa Peninsula
36	05/12/2020	00:42:06	1.71	127.33	89	3.8				Halmahera
37	05/12/2020	01:25:30	2.98	127.88	4	3.7				Northern Molucca Sea
38	05/12/2020	06:22:09	1.03	127.89	10	3.3				Halmahera

39	05/12/2020	09:49:26	0.38	120.24	10	2.9				Minahasa Peninsula
40	05/12/2020	15:13:08	3.70	125.79	84	3.6				Talaud Islands
41	05/12/2020	22:23:23	0.35	122.34	106	3.3				Minahasa Peninsula
42	06/12/2020	01:36:23	0.38	122.04	152	3.4				Minahasa Peninsula
43	06/12/2020	12:59:07	2.18	126.99	30	3.1				Northern Molucca Sea
44	06/12/2020	17:55:17	1.83	127.07	41	3.2				Halmahera
45	06/12/2020	20:03:31	1.49	126.59	13	3.2				Northern Molucca Sea
46	06/12/2020	20:12:00	2.85	126.71	10	3.8				Northern Molucca Sea
47	08/12/2020	04:40:28	0.37	122.03	141	3.0				Minahasa Peninsula
48	08/12/2020	08:04:47	1.08	127.69	12	2.7				Halmahera
49	08/12/2020	09:58:56	1.05	121.71	10	2.9				Minahasa Peninsula
50	08/12/2020	12:21:20	2.27	122.83	78	3.1				Celebes Sea
51	08/12/2020	16:47:53	1.25	126.35	10	3.1				Northern Molucca Sea
52	08/12/2020	17:40:09	2.78	127.88	173	3.4				Northern Molucca Sea
53	08/12/2020	21:14:19	1.08	126.89	27	3.4				Northern Molucca Sea
54	08/12/2020	23:56:12	1.14	126.74	47	3.3				Northern Molucca Sea
55	09/12/2020	01:53:34	0.26	126.13	10	4.1				Northern Molucca Sea
56	09/12/2020	13:16:08	0.45	122.35	155	3.1				Minahasa Peninsula
57	09/12/2020	19:03:41	0.26	126.16	16	4.0				Northern Molucca Sea
58	09/12/2020	19:54:17	6.28	126.47	10	4.4				Mindanao, Philippines
59	09/12/2020	20:29:07	2.55	126.71	12	4.1				Northern Molucca Sea
60	10/12/2020	01:02:50	2.48	126.45	38	4.1				Northern Molucca Sea
61	10/12/2020	08:04:34	3.67	127.51	10	4.0				Talaud Islands
62	10/12/2020	14:07:16	2.05	126.13	12	4.5	0.19916	0.17517	0.13760	Northern Molucca Sea
63	10/12/2020	15:04:50	1.64	126.29	10	5.1	1.34510	1.44378	1.13829	Northern Molucca Sea
64	10/12/2020	19:39:56	2.58	128.37	32	3.8				Halmahera
65	10/12/2020	22:04:52	1.16	122.62	10	2.8				Minahasa Peninsula
66	11/12/2020	01:17:14	0.51	122.59	95	2.6				Minahasa Peninsula
67	11/12/2020	01:50:15	-0.23	123.60	77	3.1				Minahasa Peninsula
68	11/12/2020	04:05:11	1.32	126.28	10	3.4				Northern Molucca Sea
69	11/12/2020	06:04:19	1.23	122.53	29	2.7				Minahasa Peninsula
70	11/12/2020	07:45:27	0.24	121.98	181	2.3				Minahasa Peninsula
71	11/12/2020	08:38:25	1.55	126.42	10	4.4				Northern Molucca Sea
72	11/12/2020	14:43:32	2.32	127.14	10	3.3				Northern Molucca Sea
73	11/12/2020	15:36:29	0.42	121.89	180	2.4				Minahasa Peninsula
74	11/12/2020	20:53:14	2.37	127.05	10	3.3				Northern Molucca Sea
75	12/12/2020	05:24:27	3.68	126.27	138	3.8				Talaud Islands
76	12/12/2020	10:43:48	1.41	126.98	45	2.8				Northern Molucca Sea
77	12/12/2020	12:31:15	0.82	126.11	21	3.6				Northern Molucca Sea
78	12/12/2020	13:05:09	1.84	126.46	26	3.5				Northern Molucca Sea
79	12/12/2020	14:32:26	0.69	126.01	28	4.6	1.40977	1.49395	0.93725	Northern Molucca Sea
80	12/12/2020	15:19:24	3.31	122.61	537	4.2				Celebes Sea
81	12/12/2020	19:24:22	0.93	125.57	25	3.2				Northern Molucca Sea
82	13/12/2020	07:59:24	1.00	121.79	86	3.0				Minahasa Peninsula
83	13/12/2020	11:16:18	1.49	126.52	10	3.1				Northern Molucca Sea

84	13/12/2020	14:17:37	0.53	122.43	51	2.5				Minahasa Peninsula
85	13/12/2020	16:00:23	0.31	122.57	118	3.5				Minahasa Peninsula
86	13/12/2020	16:51:54	1.57	125.13	10	3.5				Northern Molucca Sea
87	14/12/2020	04:26:54	0.95	122.64	10	3.5				Minahasa Peninsula
88	14/12/2020	17:14:13	3.42	125.93	146	4.6				Talaud Islands
89	14/12/2020	18:57:52	1.38	128.19	111	3.8				Halmahera
90	15/12/2020	02:30:33	4.22	126.82	23	4.0				Talaud Islands
91	15/12/2020	06:40:40	0.55	123.80	168	3.3				Minahasa Peninsula
92	15/12/2020	21:28:49	-0.45	122.66	10	2.5				Minahasa Peninsula
93	15/12/2020	23:21:58	5.21	125.43	10	6.2	0.50375	0.60837	0.46567	Mindanao, Philippines
94	16/12/2020	06:06:46	5.52	124.95	23	4.8				Mindanao, Philippines
95	16/12/2020	10:30:58	5.07	125.13	27	4.9				Mindanao, Philippines
96	16/12/2020	12:23:44	0.35	122.04	10	3.1				Minahasa Peninsula
97	16/12/2020	17:04:45	0.18	121.94	10	2.7				Minahasa Peninsula
98	16/12/2020	17:06:35	0.65	121.22	10	2.8				Minahasa Peninsula
99	16/12/2020	19:05:43	1.21	125.64	50	3.7				Northern Molucca Sea
100	16/12/2020	20:51:25	5.08	125.28	103	4.4				Mindanao, Philippines
101	16/12/2020	21:44:53	5.93	126.99	38	5.1				Mindanao, Philippines
102	17/12/2020	01:15:15	0.74	122.23	23	3.1				Minahasa Peninsula
103	17/12/2020	07:30:50	0.23	125.01	24	5.1				Northern Molucca Sea
104	17/12/2020	11:34:38	5.89	125.68	51	4.1				Mindanao, Philippines
105	17/12/2020	12:38:52	5.08	125.37	10	4.9				Mindanao, Philippines
106	17/12/2020	17:42:42	3.33	126.22	13	4.0				Talaud Islands
107	18/12/2020	03:05:18	-0.17	122.51	10	4.1				Minahasa Peninsula
108	18/12/2020	07:44:02	1.21	128.35	17	3.3				Halmahera
109	18/12/2020	07:47:39	1.83	124.76	22	4.0				Minahasa Peninsula
110	18/12/2020	10:04:55	-0.15	122.86	26	3.5				Minahasa Peninsula
111	18/12/2020	16:22:19	0.25	122.30	98	3.2				Minahasa Peninsula
112	19/12/2020	04:37:50	0.73	121.84	79	3.5				Minahasa Peninsula
113	19/12/2020	06:46:03	1.43	126.31	10	4.0				Northern Molucca Sea
114	19/12/2020	07:50:05	0.25	125.97	10	3.7				Northern Molucca Sea
115	20/12/2020	00:09:58	1.00	120.22	10	3.1				Minahasa Peninsula
116	20/12/2020	03:09:19	-0.15	122.79	10	2.9				Minahasa Peninsula
117	20/12/2020	04:26:10	0.78	126.14	6	3.9				Northern Molucca Sea
118	20/12/2020	11:40:46	1.70	126.79	13	4.9	0.15612	0.15945	-0.16593	Northern Molucca Sea
119	20/12/2020	18:43:52	2.02	127.85	10	2.8				Northern Molucca Sea
120	20/12/2020	19:07:38	6.37	127.28	42	5.0				Philippine Islands Region
121	20/12/2020	21:17:27	1.09	125.79	55	3.6				Northern Molucca Sea
122	20/12/2020	22:13:51	-0.23	122.99	66	4.7				Minahasa Peninsula
123	21/12/2020	00:08:48	1.25	126.06	4	3.7				Northern Molucca Sea
124	21/12/2020	03:45:25	2.91	124.30	330	4.1				Celebes Sea
125	21/12/2020	06:11:23	1.64	126.81	51	3.6				Northern Molucca Sea
126	21/12/2020	07:21:04	-0.25	123.32	53	2.9				Minahasa Peninsula
127	21/12/2020	08:54:54	-0.10	123.33	115	3.0				Minahasa Peninsula

128	21/12/2020	11:40:21	0.69	122.73	8	2.4				Minahasa Peninsula
129	21/12/2020	12:00:08	0.18	124.52	76	3.7				Minahasa Peninsula
130	21/12/2020	12:23:58	3.02	128.06	113	4.0				Halmahera
131	22/12/2020	01:19:56	5.15	125.19	10	4.3				Mindanao, Philippines
132	22/12/2020	12:08:03	-0.28	122.87	27	4.3				Minahasa Peninsula
133	22/12/2020	14:33:05	1.17	126.19	9	3.6				Northern Molucca Sea
134	22/12/2020	16:08:20	2.12	128.00	9	2.8				Halmahera
135	22/12/2020	22:52:50	0.65	126.25	5	3.5				Northern Molucca Sea
136	23/12/2020	00:36:39	-0.12	123.52	103	3.6				Minahasa Peninsula
137	23/12/2020	04:49:20	0.38	122.52	101	3.3				Minahasa Peninsula
138	23/12/2020	10:26:41	-0.01	122.92	23	3.0				Minahasa Peninsula
139	23/12/2020	11:50:44	0.97	124.06	10	3.1				Minahasa Peninsula
140	23/12/2020	13:01:29	-0.03	123.35	138	4.0				Minahasa Peninsula
141	23/12/2020	22:02:03	0.94	127.79	11	2.3				Halmahera
142	24/12/2020	00:45:11	1.71	126.49	2	3.3				Northern Molucca Sea
143	24/12/2020	01:24:11	-0.30	124.53	24	5.3	0.30445	0.25343	0.21998	Minahasa Peninsula
144	24/12/2020	01:34:11	-0.11	124.71	67	4.0				Minahasa Peninsula
145	24/12/2020	01:38:22	-0.11	124.70	57	3.6				Minahasa Peninsula
146	24/12/2020	04:53:30	0.54	124.22	150	3.9				Minahasa Peninsula
147	24/12/2020	05:54:48	0.02	123.46	146	2.9				Minahasa Peninsula
148	24/12/2020	11:18:48	-0.48	123.59	13	3.4				Minahasa Peninsula
149	24/12/2020	15:09:34	-0.05	123.07	66	2.9				Minahasa Peninsula
150	24/12/2020	22:52:12	1.82	128.96	4	3.6				Halmahera
151	25/12/2020	01:53:15	1.16	127.04	23	2.8				Halmahera
152	25/12/2020	02:00:34	5.04	126.22	78	5.2				Mindanao, Philippines
153	25/12/2020	12:02:04	-0.24	123.03	16	2.5				Minahasa Peninsula
154	25/12/2020	14:28:35	0.63	126.26	3	4.7	0.08349	0.06275	0.09386	Northern Molucca Sea
155	25/12/2020	16:05:42	1.34	126.98	104	2.9				Northern Molucca Sea
156	25/12/2020	21:56:13	2.27	128.09	10	4.2				Halmahera
157	26/12/2020	00:08:26	6.13	125.90	10	4.9				Mindanao, Philippines
158	26/12/2020	02:01:45	2.43	128.44	211	4.1				Halmahera
159	26/12/2020	06:06:18	1.77	126.40	25	3.2				Northern Molucca Sea
160	26/12/2020	08:02:14	0.63	122.28	5	2.7				Minahasa Peninsula
161	26/12/2020	09:02:50	2.07	127.18	30	4.2				Northern Molucca Sea
162	26/12/2020	09:15:13	-0.32	125.16	9	4.9	0.23240	0.18074	0.15746	Southern Molucca Sea
163	26/12/2020	10:04:36	-0.16	123.34	136	3.0				Minahasa Peninsula
164	26/12/2020	12:16:44	0.79	124.73	116	3.5				Minahasa Peninsula
165	26/12/2020	17:06:57	0.75	127.04	11	3.1				Halmahera
166	26/12/2020	18:34:46	4.93	125.11	94	4.0				Talaud
167	26/12/2020	23:36:20	1.60	127.32	151	4.1				Halmahera
168	27/12/2020	06:02:01	2.83	128.42	222	3.7				Halmahera
169	27/12/2020	07:42:58	0.18	125.13	106	3.3				Northern Molucca Sea
170	27/12/2020	10:31:37	0.31	122.15	161	3.4				Minahasa Peninsula
171	27/12/2020	11:37:45	0.58	126.12	32	3.8				Northern Molucca Sea
172	27/12/2020	15:04:03	3.28	124.68	302	3.8				Celebes Sea

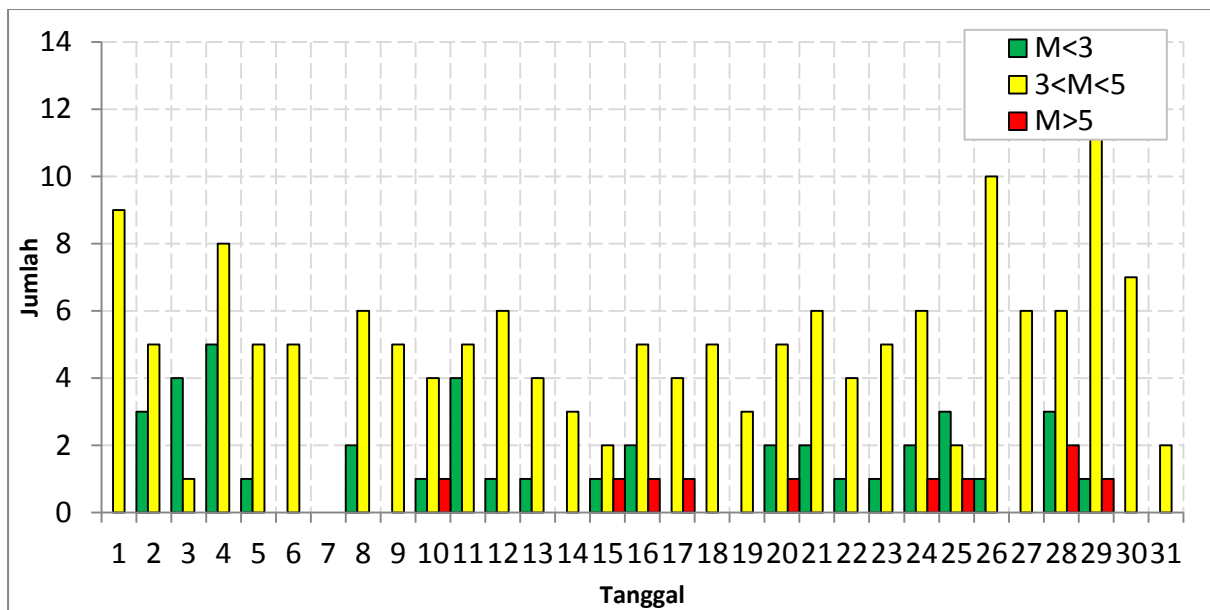
173	27/12/2020	22:13:03	3.83	126.78	27	4.4				Talaud
174	28/12/2020	01:41:10	0.75	126.72	18	3.1				Northern Molucca Sea
175	28/12/2020	02:37:43	4.36	123.73	470	4.8				Celebes Sea
176	28/12/2020	04:46:17	4.44	126.81	10	5.0				Talaud
177	28/12/2020	07:31:09	-0.20	124.61	10	5.4	0.54595	0.35205	0.26793	Minahasa Peninsula
178	28/12/2020	08:45:24	0.00	124.75	27	3.7				Minahasa Peninsula
179	28/12/2020	10:23:40	2.40	126.82	10	4.1				Northern Molucca Sea
180	28/12/2020	14:50:49	-0.26	127.20	47	2.6				Halmahera
181	28/12/2020	16:18:28	-0.26	124.53	10	3.5				Southern Molucca Sea
182	28/12/2020	19:11:57	-0.10	121.77	28	2.4				Minahasa Peninsula
183	28/12/2020	20:21:16	-0.28	123.67	85	2.8				Minahasa Peninsula
184	28/12/2020	22:50:05	3.69	126.02	137	4.4				Talaud
185	29/12/2020	01:46:26	4.69	127.00	10	4.6				Talaud
186	29/12/2020	07:39:09	0.02	126.95	64	4.0				Halmahera
187	29/12/2020	10:08:34	2.68	127.32	19	4.7				Northern Molucca Sea
188	29/12/2020	11:59:50	3.06	126.43	10	3.8				Northern Molucca Sea
189	29/12/2020	12:40:19	0.07	122.94	93	4.3				Celebes Sea
190	29/12/2020	15:01:32	0.12	126.62	21	3.6				Halmahera
191	29/12/2020	16:18:30	0.14	124.67	10	4.5				Southern Molucca Sea
192	29/12/2020	16:21:48	5.10	125.19	18	5.8	0.14014	0.15148	0.12022	Mindanao, Philippines
193	29/12/2020	16:45:12	5.08	125.07	10	4.3				Mindanao, Philippines
194	29/12/2020	17:05:22	5.04	125.23	23	4.7				Mindanao, Philippines
195	29/12/2020	19:08:51	5.09	125.14	26	4.4				Mindanao, Philippines
196	29/12/2020	20:03:12	5.26	125.29	10	3.8				Mindanao, Philippines
197	29/12/2020	20:08:40	1.05	127.57	19	2.2				Halmahera
198	29/12/2020	23:20:12	5.01	125.05	10	4.0				Mindanao, Philippines
199	29/12/2020	23:47:39	1.30	126.87	29	3.2				Northern Molucca Sea
200	30/12/2020	00:58:07	4.44	125.92	154	4.8				Talaud
201	30/12/2020	02:33:12	-0.72	122.05	10	3.7				Minahasa Peninsula
202	30/12/2020	03:39:53	-0.17	122.67	17	3.4				Minahasa Peninsula
203	30/12/2020	10:37:29	-0.14	121.81	10	3.6				Minahasa Peninsula
204	30/12/2020	16:38:04	1.25	126.06	24	3.9				Northern Molucca Sea
205	30/12/2020	20:25:49	1.82	127.46	110	3.2				Halmahera
206	30/12/2020	23:02:57	5.26	125.10	154	4.2				Mindanao, Philippines
207	31/12/2020	08:44:07	1.63	126.14	27	3.6				Northern Molucca Sea
208	31/12/2020	09:16:55	0.56	122.62	134	3.0				Minahasa Peninsula



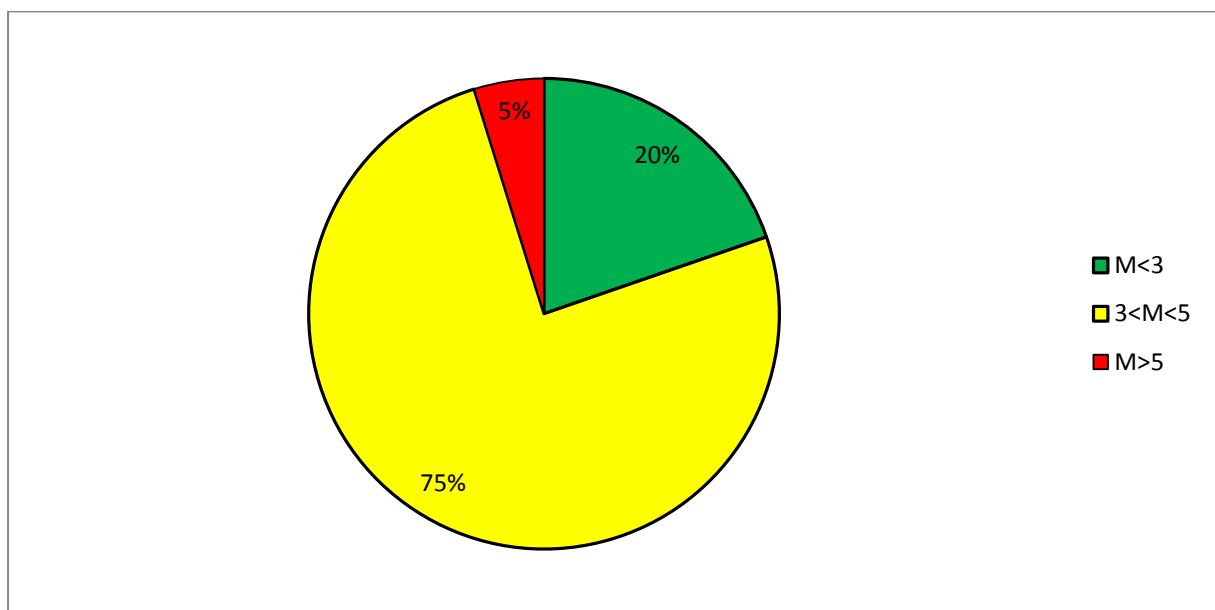
Gambar 38 Sebaran episenter gempabumi bulan Desember 2020

Tabel 26 Rekapitulasi gempabumi berdasarkan magnitudo bulan Desember 2020

Tanggal (UTC)	Magnitudo			Jumlah Total	Jumlah Gempa Signifikan	
	M<3	3≤M<5	M≥5		Dirasakan	Merusak
1	0	9	0	9	0	0
2	3	5	0	8	0	0
3	4	1	0	5	0	0
4	5	8	0	13	1	0
5	1	5	0	6	0	0
6	0	5	0	5	0	0
7	0	0	0	0	0	0
8	2	6	0	8	0	0
9	0	5	0	5	0	0
10	1	4	1	6	1	0
11	4	5	0	9	0	0
12	1	6	0	7	0	0
13	1	4	0	5	0	0
14	0	3	0	3	0	0
15	1	2	1	4	1	0
16	2	5	1	8	0	0
17	0	4	1	5	1	0
18	0	5	0	5	0	0
19	0	3	0	3	0	0
20	2	5	1	8	1	0
21	2	6	0	8	0	0
22	1	4	0	5	0	0
23	1	5	0	6	0	0
24	2	6	1	9	1	0
25	3	2	1	6	0	0
26	1	10	0	11	0	0
27	0	6	0	6	0	0
28	3	6	2	11	1	0
29	1	13	1	15	0	0
30	0	7	0	7	0	0
31	0	2	0	2	0	0
Jumlah gempa	41	157	10	208	7	0



Gambar 39 Grafik gempabumi berdasarkan magnitudo bulan Desember 2020



Gambar 40 Grafik persentase gempabumi berdasarkan magnitudo bulan Desember 2020

IV. PETA GONCANGAN GEMPABUMI TERASA DI WILAYAH REGIONAL 10 TAHUN 2020

Peta Goncangan (*Shakemap*) merupakan Peta yang menggambarkan getaran/guncangan tanah yang diakibatkan oleh gempa. Melalui *shakemap*, daerah yang merasakan getaran akibat gempabumi dapat diketahui secara cepat dan tepat. Untuk gempa dengan kekuatan yang besar hingga menimbulkan korban yang cukup besar, *shakemap* dapat digunakan untuk mengetahui lokasi yang terkena dampak signifikan, sehingga bantuan dapat diberikan secara tepat.

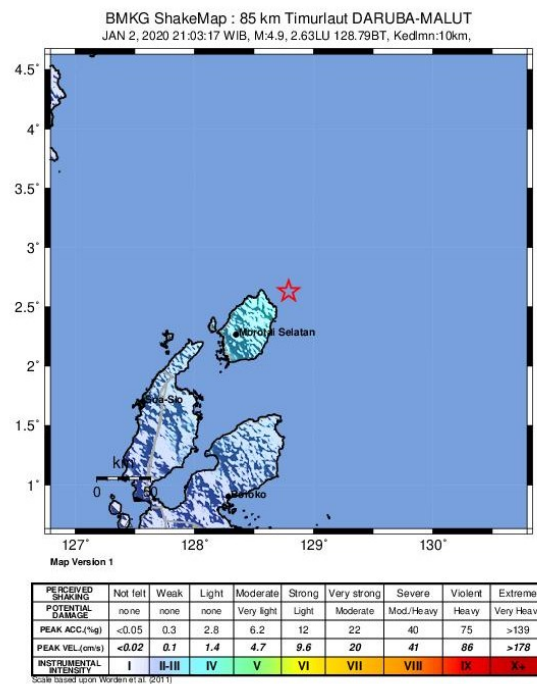
Peta goncangan yang dikeluarkan BMKG memiliki 2 jenis satuan, yaitu MMI (*Modified Mercalli Intensity*) dan SIG BMKG (Skala Intensitas Gempabumi BMKG). Di dalam Buletin Gempabumi Stasiun Geofisika Manado ini, peta guncangan disajikan dengan menggunakan skala MMI. Skala MMI adalah satuan yang dibuat oleh Giuseppe Mercalli pada tahun 1902. Skala MMI dibagi menjadi 12 bagian berdasarkan informasi dari masyarakat yang selamat dari gempa tersebut dan juga dengan melihat serta membandingkan tingkat kerusakan akibat gempa tersebut. Oleh karena itu, Skala MMI bersifat sangat subjektif karena didasarkan pada penilaian manusia. Pada gambar berikut ditunjukkan pembagian skala MMI berdasarkan nilai percepatan tanah dan getaran yang dirasakan.

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC. (%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL. (cm/s)	<0.02	0.1	1.4	4.7	9.6	20	41	86	>178
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

Gambar 41 Perbandingan antara skala MMI dengan percepatan tanah maksimum

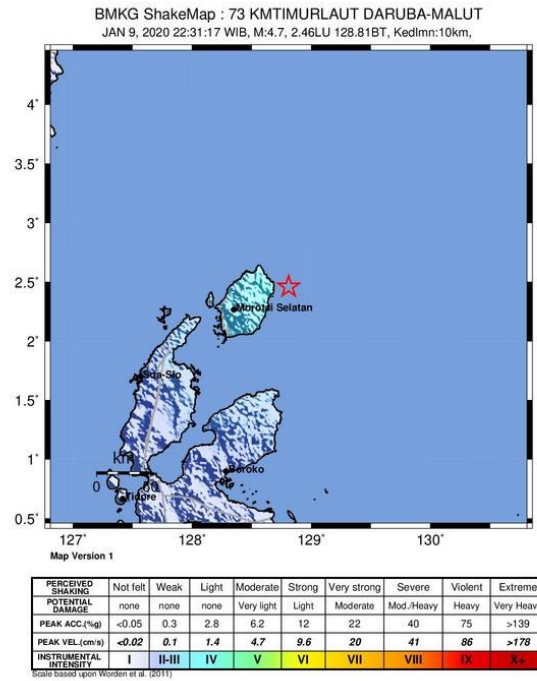
A. Peta Guncangan (*Shakemap*) Gempabumi Bulan Januari 2020



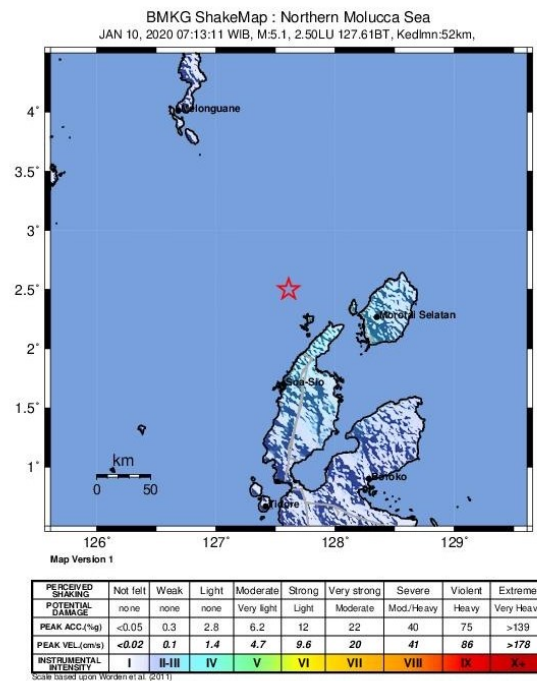
Gambar 42 Peta Guncangan Gempabumi 2 Januari 2020 pukul 21:03:17 WIB

Tabel 27 Atenuasi intensitas gempa bumi 2 Januari 2020 pukul 21:03:17 WIB

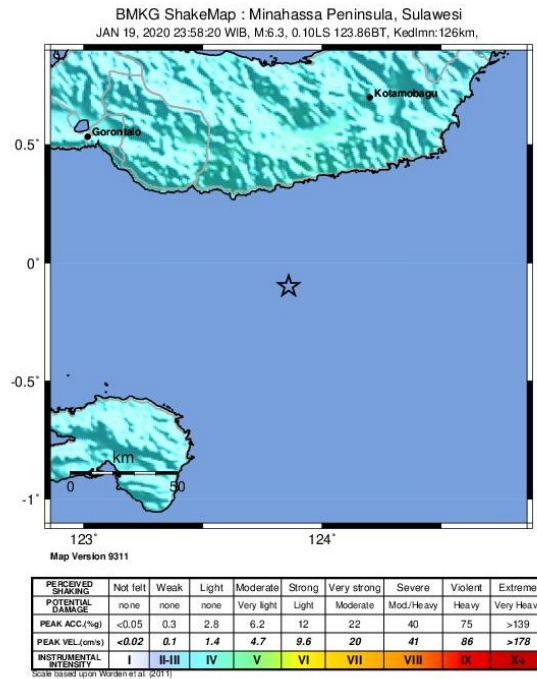
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	TMUN	TIDORE	0.66	127.45	264.72		1
2	SAMI	STAMET SAMRATULANGI MANADO	1.54	124.92	446.66		1



Gambar 43 Peta Guncangan Gempabumi 9 Januari 2020 pukul 22:31:17 WIB



Gambar 44 Peta Guncangan Gempabumi 10 Januari 2020 pukul 07:13:11 WIB

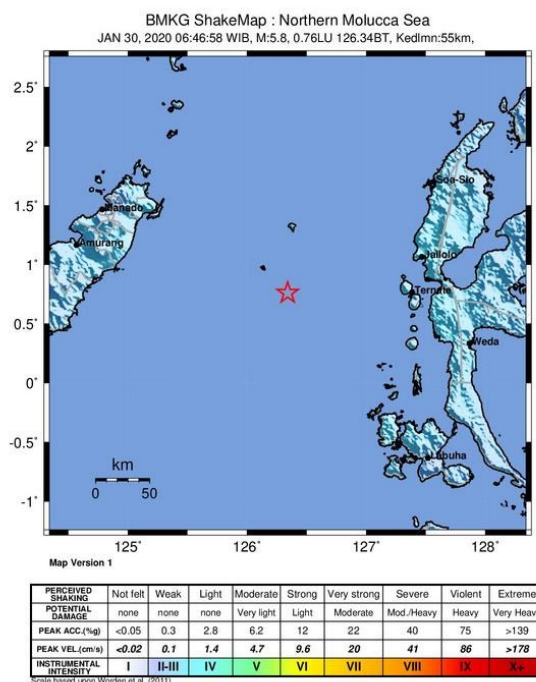


Gambar 45 Peta Guncangan Gempabumi 19 Januari 2020 pukul 23:58:20 WIB

Tabel 28 Atenuasi intensitas gempa bumi 19 Januari 2020 pukul 23:58:20 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	SLMI	STAGEOF MANADO	1.44	124.84	233.98		2
2	SAMI	STAMET SAMRATULANGI MANADO	1.54	124.92	245.8		2
3	MRSI	MARISA GORONTALO	0.48	121.94	250.89		3
4	PMCI	STAMET POSO	-1.42	120.66	400.47		4
5	TMUN	TIDORE	0.66	127.45	421.96		2
6	LBMI	LABUHA	-0.64	127.50	423.44		3
7	MPSI	MAPAGA SABANG PALU	0.34	119.9	456.07		2
8	MSBA	STAMET MASAMBA	-2.55	120.32	490.14		2
9	NLAI	NAMLEA MALUKU	-3.24	127.10	512.4		3
10	KKSI	KOLAKA	-4.17	121.65	525.53		2
11	TTSI	TANA TORAJA	-3.05	119.82	565.32		2
12	KRAI	KAIRATU	-3.32	128.4	626.25		2
13	PAMI	STAMET PATTIMURA AMBON	-3.71	128.1	626.83		4
14	MMSN		-2.67	118.89	630.53		2
15	SPSI	SIDRAP	-3.96	119.77	633.5		1
16	MJNE	STAMET MAJENE	-3.55	118.98	671.59		2
17	MSAI	MASOHI	-3.35	128.93	676.17		3
18	BKSI	BULUKUMBA	-5.32	120.12	720.25		1
19	BSSI	BENTENG SELAYAR	-6.14	120.49	774.78		1
20	RAPI	RAJA AMPAT	-0.41	130.82	780.49		1
21	BGKI	STAGEOF BALIKPAPAN	-1.26	116.91	789.05		1
22	TKUN		3.31	117.58	799.82		1
23	SWI	SORONG	-0.86	131.26	832.15		1

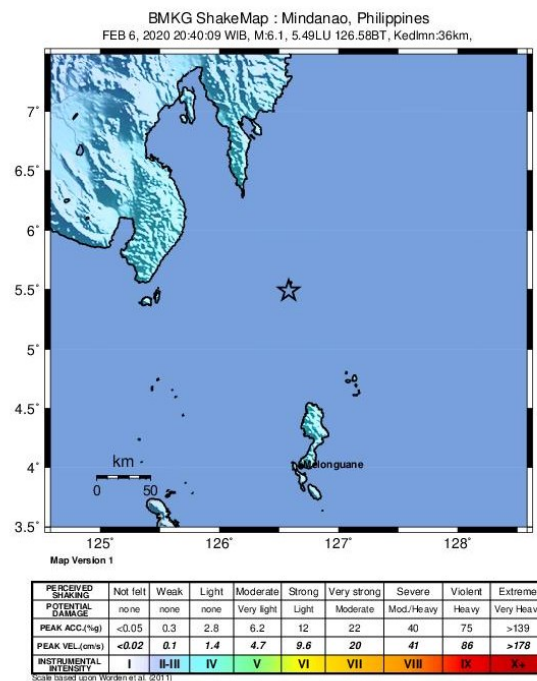
24	BDMI	STAMET BANDANEIRA	-4.52	129.91	837.31		1
25	NNKI	STAMET NUNUKAN	4.14	117.67	838.88		2
26	ALKI	ALOR	-8.14	124.59	902.52		1
27	LFTI	STAMET LARANTUKA FLORES	-8.28	123.00	918.27		1
28	EDFI	ENDE	-8.75	121.69	994.99		1



Gambar 46 Peta Guncangan Gempabumi 30 Januari 2020 pukul 06:46:58 WIB
Tabel 29 Atenuasi intensitas gempa bumi 30 Januari 2020 pukul 06:46:58 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	TMUN	TIDORE	0.66	127.45	132.89		2
2	SAMI	STAMET SAMRATULANGI MANADO	1.54	124.92	185.77		2
3	SLMI	STAGEOF MANADO	1.44	124.84	189.21		2
4	LBMI	LABUHA	-0.64	127.5	207.19		3
5	NLAI	NAMLEA	-3.24	127.10	453.8		1
6	MRSI	MARISA GORONTALO	0.48	121.94	491.07		1
7	RAPI	RAJA AMPAT	-0.41	130.82	515.76		1
8	PMCI	STAMET POSO	-1.42	120.66	676.91		2
9	MPSI	MAPAGA SABANG PALU	0.34	119.90	717.84		1
10	TTSI	TANATORAJA	-3.05	119.82	839.01		1
11	SPSI	SIDRAP	-3.96	119.77	899.14		1
12	KMRS	STAKLIM MAROS	-5.00	119.57	986.89		1

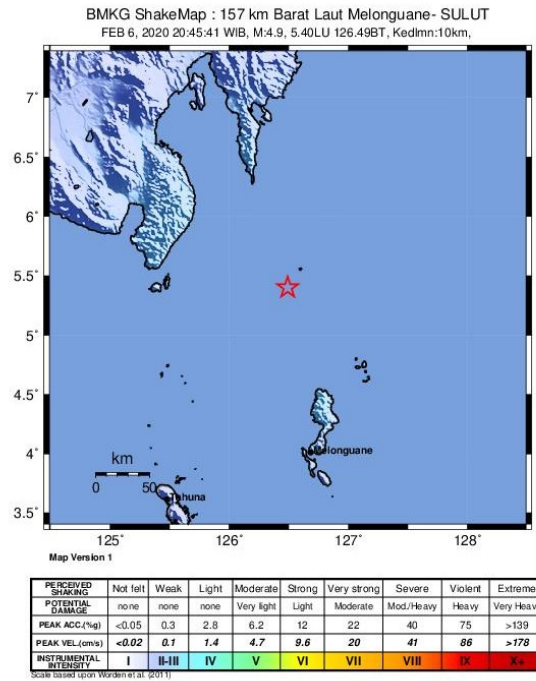
B. Peta Guncangan (*Shakemap*) Gempabumi Bulan Februari 2020



Gambar 47 Peta Guncangan Gempabumi 6 Februari 2020 pukul 20:40:09 WIB

Tabel 30 Atenuasi intensitas gempa bumi 6 Februari 2020 pukul 20:40:09 WIB

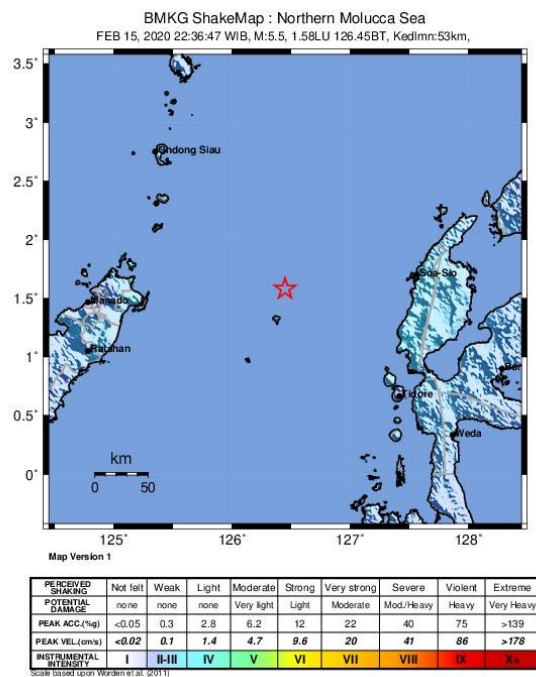
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	LBMI	LABUHA	-0.64	127.50	686.71		1
2	MRSI	MARISA GORONTALO	0.48	121.94	756.50		1
3	MPSI	MAPAGA SABANG PALU	0.34	119.90	934.79		1
4	NLAI	NAMLEA MALUKU	-3.24	127.10	969.82		1



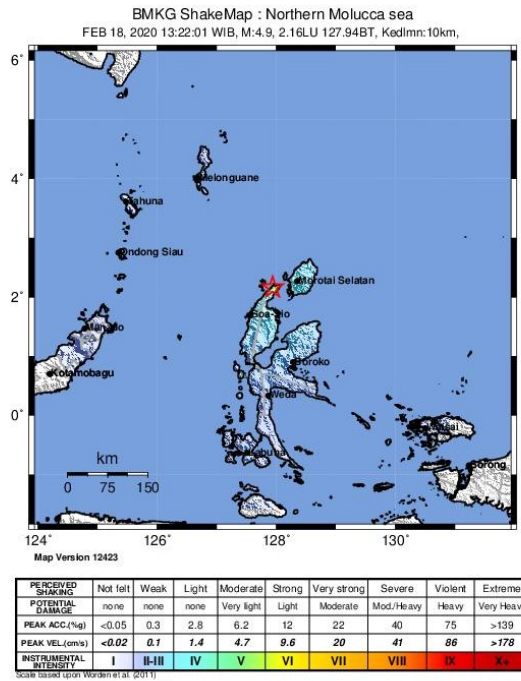
Gambar 48 Peta Guncangan Gempabumi 6 Februari 2020 pukul 20:45:41 WIB

Tabel 31 Atenuasi intensitas gempa bumi 6 Februari 2020 pukul 20:45:41 WIB

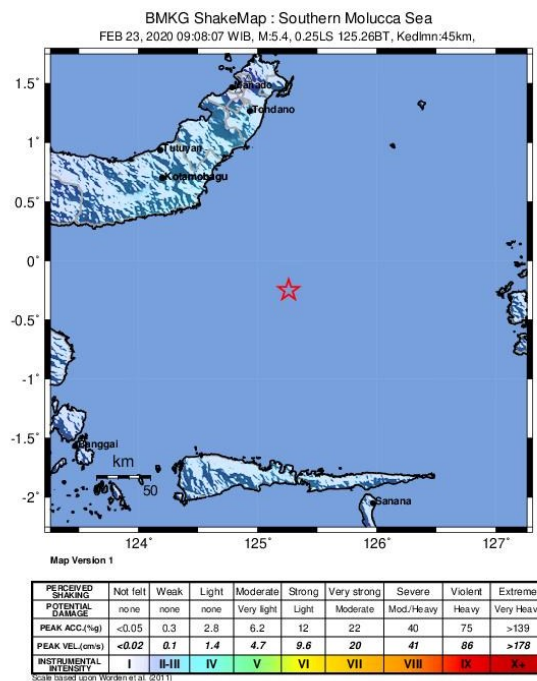
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	MRSI	MARISA GORONTALO	0.48	121.94	744.77		1
2	NLAI	NAMLEA MALUKU	-3.24	127.10	963.00		1



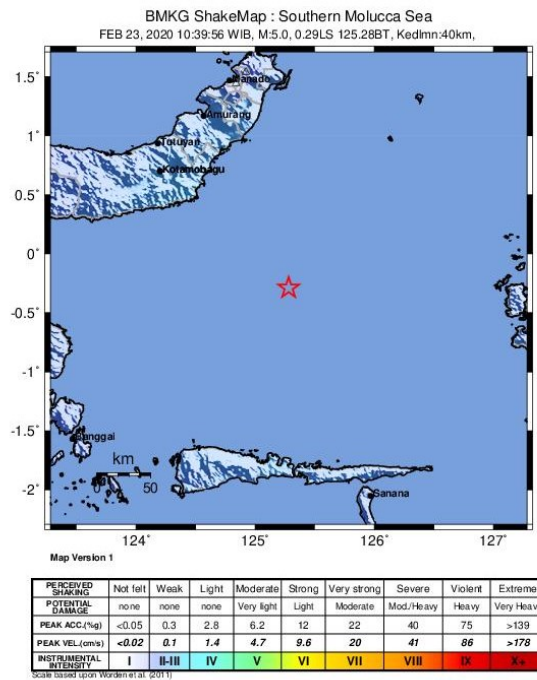
Gambar 49 Peta Guncangan Gempabumi 15 Februari 2020 pukul 22:36:47 WIB



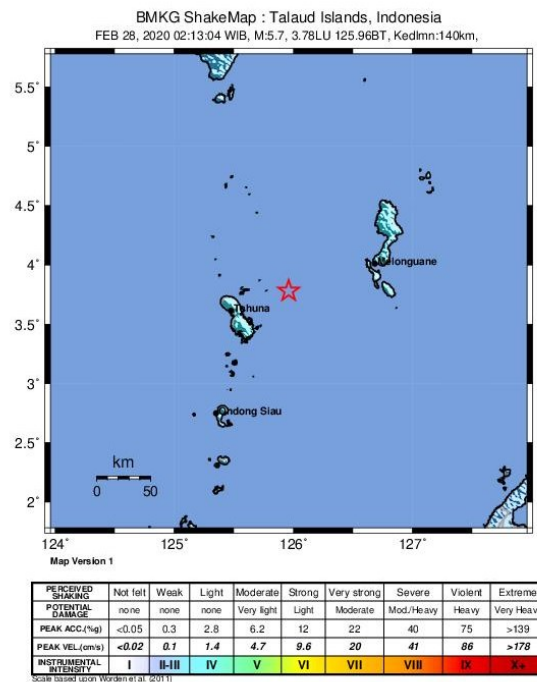
Gambar 50 Peta Guncangan Gempabumi 18 Februari 2020 pukul 13:22:01 WIB



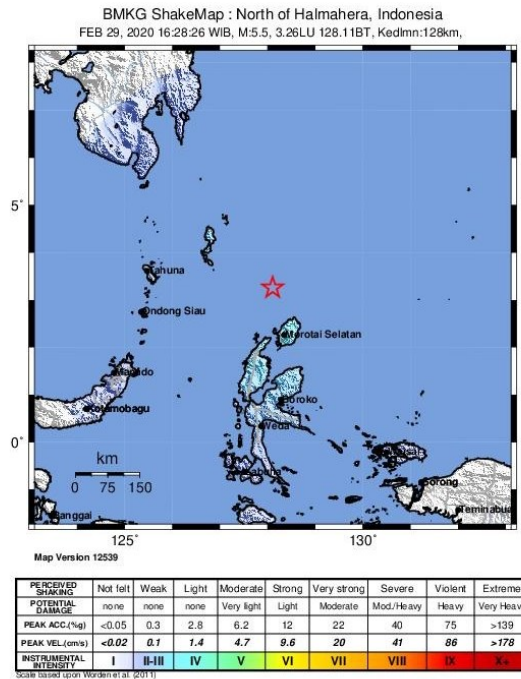
Gambar 51 Peta Guncangan Gempabumi 23 Februari 2020 pukul 09:08:07 WIB



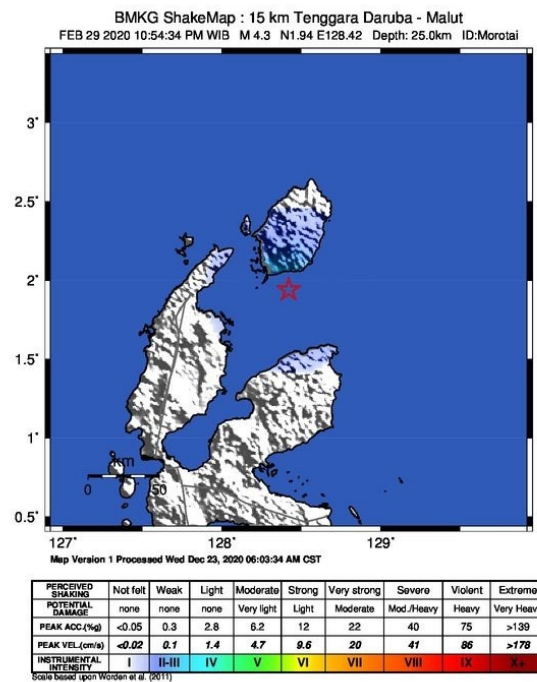
Gambar 52 Peta Guncangan Gempabumi 23 Februari 2020 pukul 10:39:56 WIB



Gambar 53 Peta Guncangan Gempabumi 26 Februari 2020 pukul 02:13:04 WIB

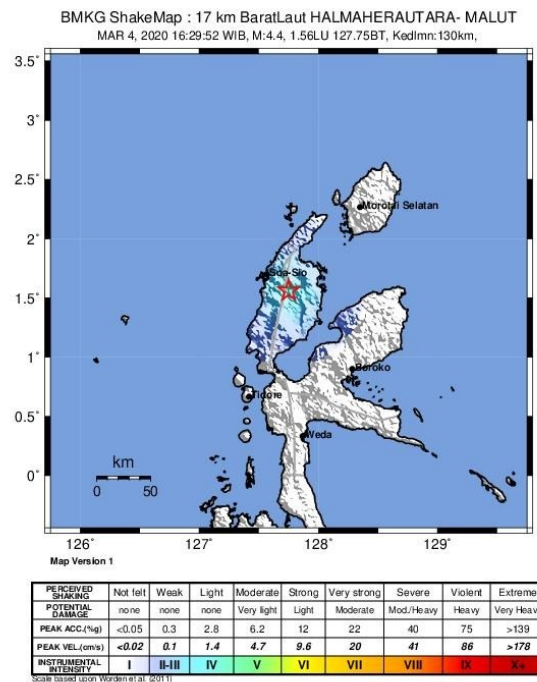


Gambar 54 Peta Guncangan Gempabumi 29 Februari 2020 pukul 16:28:26 WIB

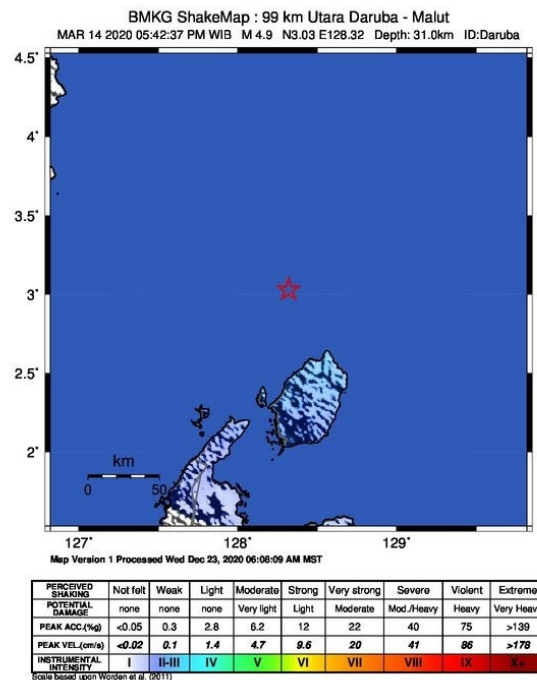


Gambar 55 Peta Guncangan Gempabumi 29 Februari 2020 pukul 22:54:34 WIB

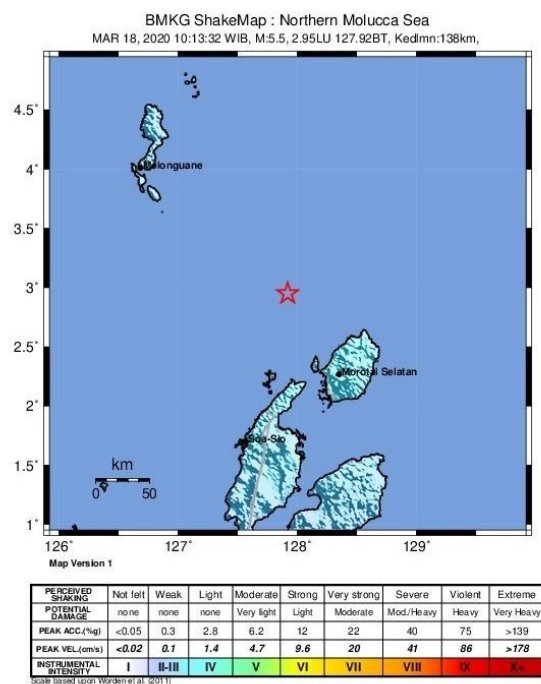
C. Peta Guncangan (*Shakemap*) Gempabumi Bulan Maret 2020



Gambar 56 Peta Guncangan Gempabumi 4 Maret 2020 pukul 16:29:52 WIB



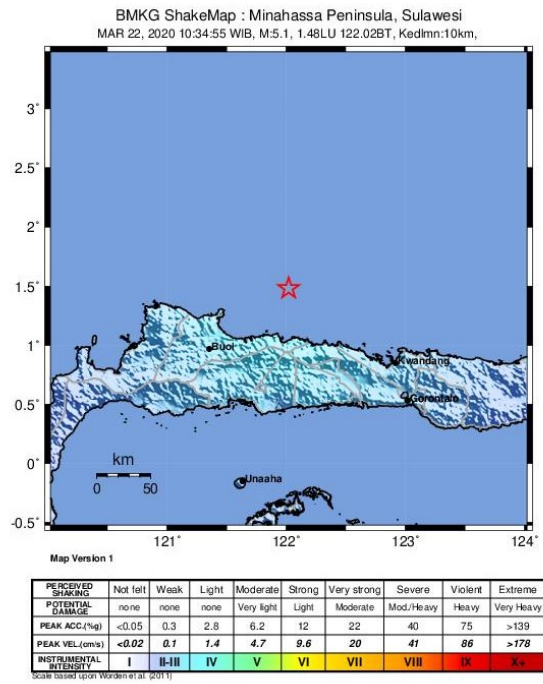
Gambar 57 Peta Guncangan Gempabumi 14 Maret 2020 pukul 17:42:37 WIB



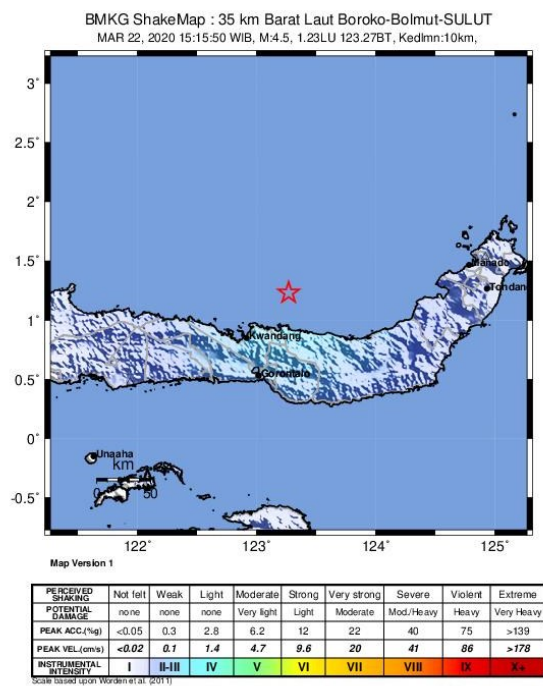
Gambar 58 Peta Guncangan Gempabumi 18 Maret 2020 pukul 10:13:32 WIB

Tabel 32 Atenuasi intensitas gempa bumi 18 Maret 2020 pukul 10:13:32 WIB

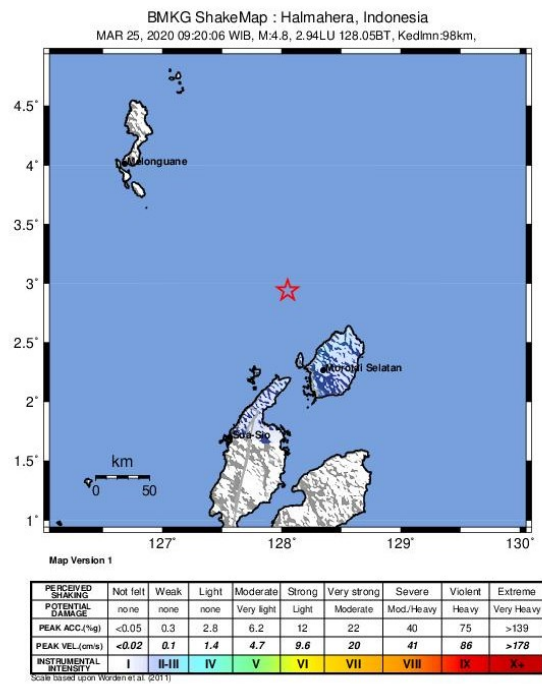
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	TMUN	TIDORE	0.66	127.45	286.67		1
2	SAMI	STAMET SAMRATULANGI MANADO	1.54	124.92	387.54		2
3	SLMI	STAGEOF MANADO	1.44	124.84	399.72		1
4	RAPI	RAJA AMPAT	-0.41	130.82	507.75		1
5	SWI	SORONG	-0.86	131.26	575.81		1
6	NLAI	NAMLEA MALUKU	-3.24	127.10	886.16		1
7	MRSI	MARISA GORONTALO	0.48	121.94	728.57		1
8	MPSI	MAPAGA SABANG PALU	0.34	119.90	944.67		1



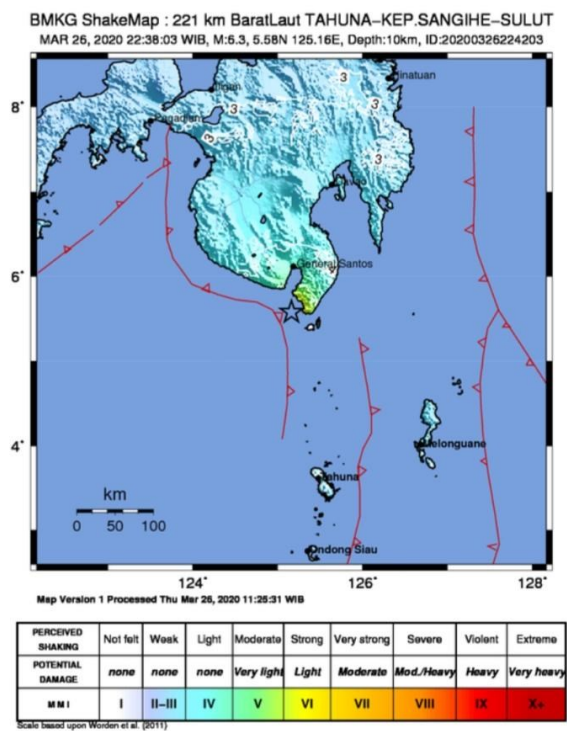
Gambar 59 Peta Guncangan Gempabumi 22 Maret 2020 pukul 10:34:55 WIB



Gambar 60 Peta Guncangan Gempabumi 22 Maret 2020 pukul 15:15:50 WIB

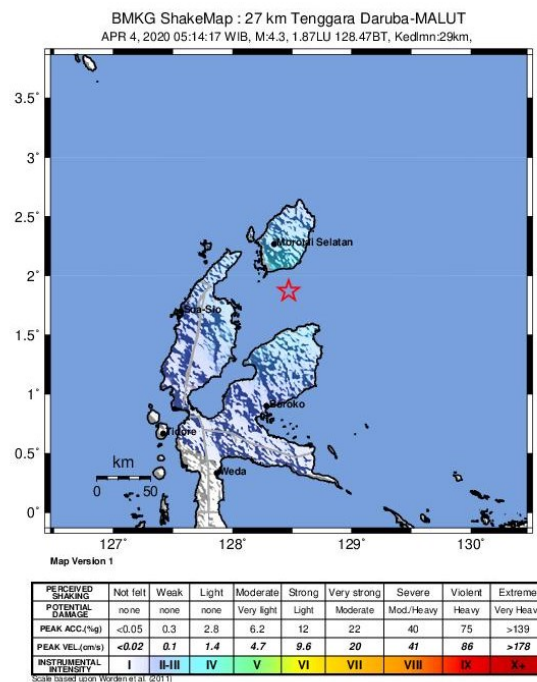


Gambar 61 Peta Guncangan Gempabumi 25 Maret 2020 pukul 09:20:06 WIB



Gambar 62 Peta Guncangan Gempabumi 26 Maret 2020 pukul 22:38:03 WIB

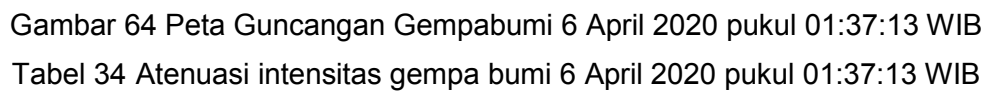
D. Peta Guncangan (*Shakemap*) Gempabumi Bulan April 2020

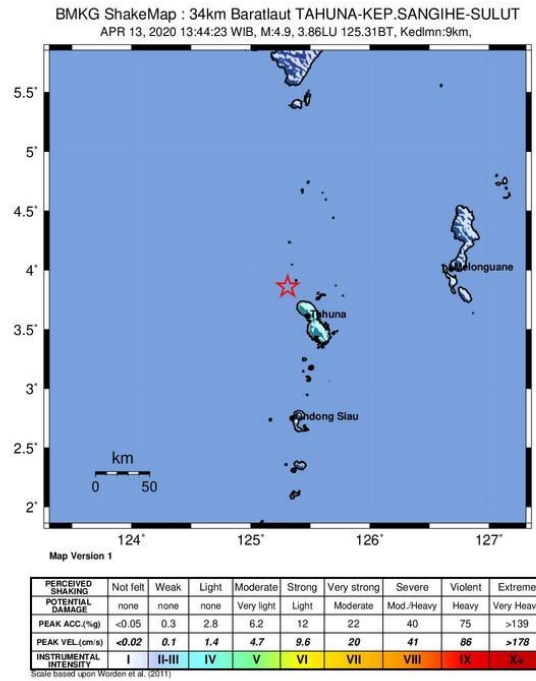


Gambar 63 Peta Guncangan Gempabumi 4 April 2020 pukul 05:14:17 WIB

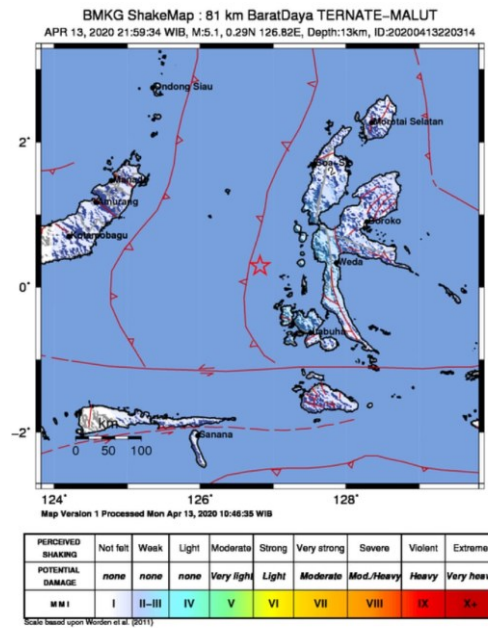
Tabel 33 Atenuasi intensitas gempa bumi 4 April 2020 pukul 05:14:17 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	RAPI	RAJA AMPAT	-0.41	130.82	364.15		1

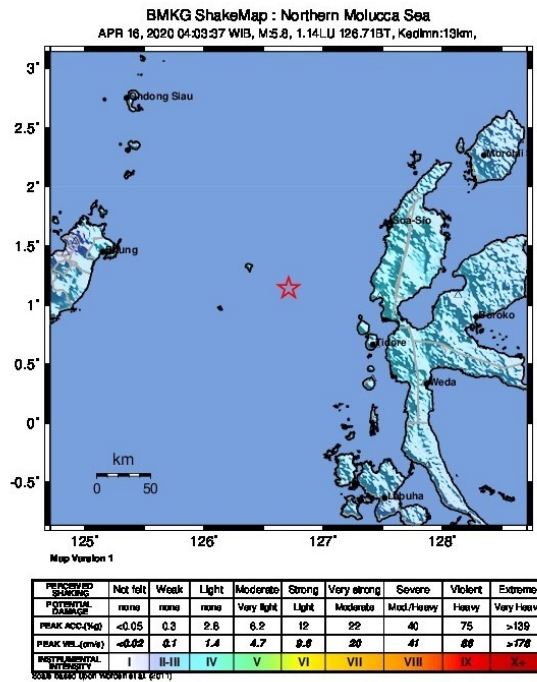
120



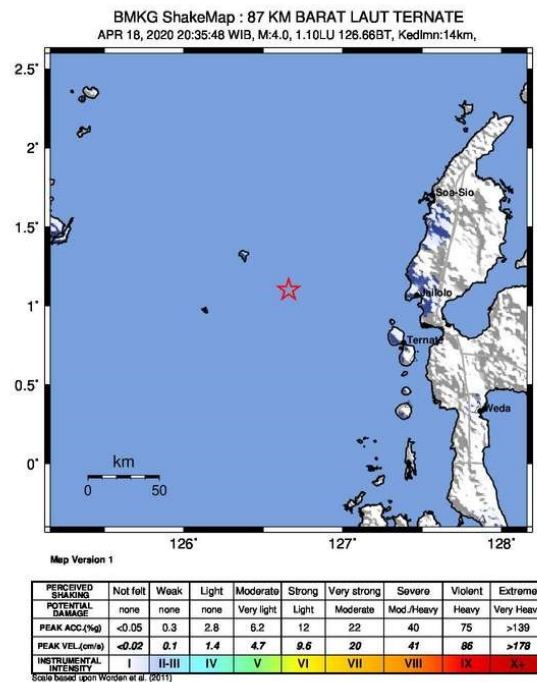
Gambar 65 Peta Guncangan Gempabumi 13 April 2020 pukul 13:44:23 WIB



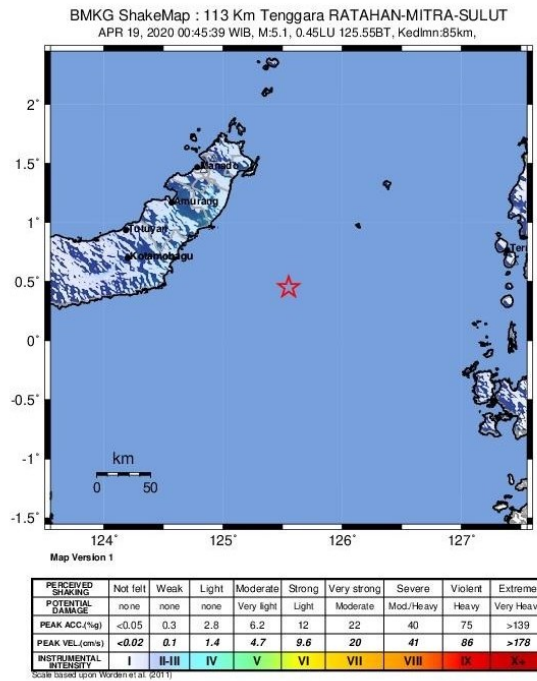
Gambar 66 Peta Guncangan Gempabumi 13 April 2020 pukul 21:59:34 WIB



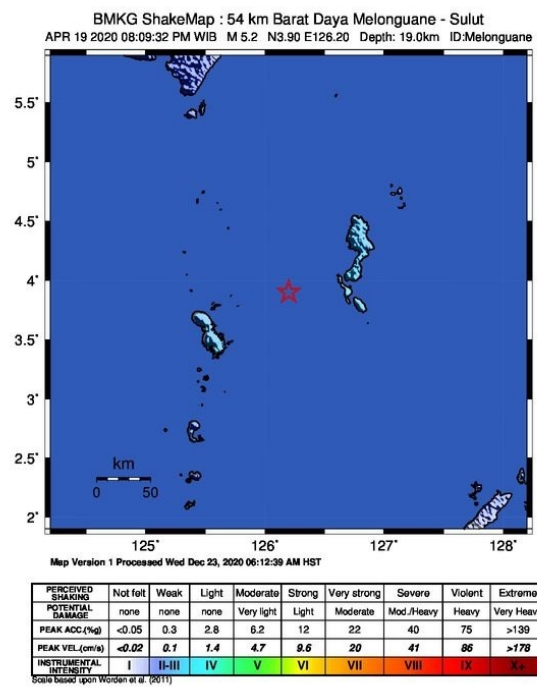
Gambar 67 Peta Guncangan Gempabumi 16 April 2020 pukul 04:03:37 WIB



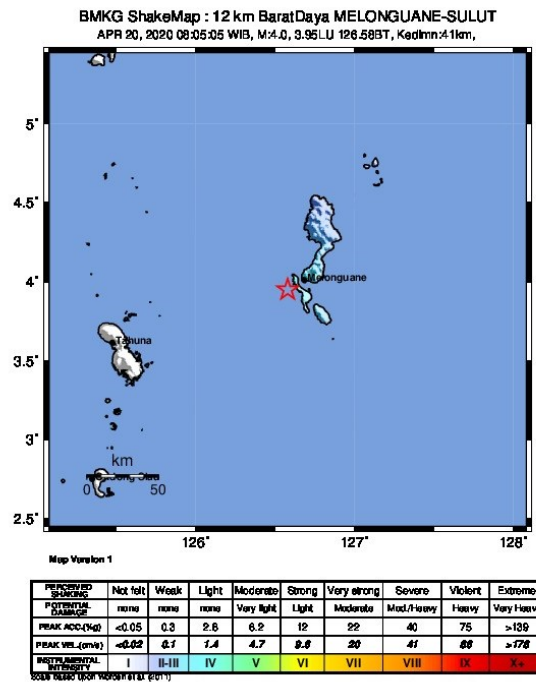
Gambar 68 Peta Guncangan Gempabumi 18 April 2020 pukul 20:35:48 WIB



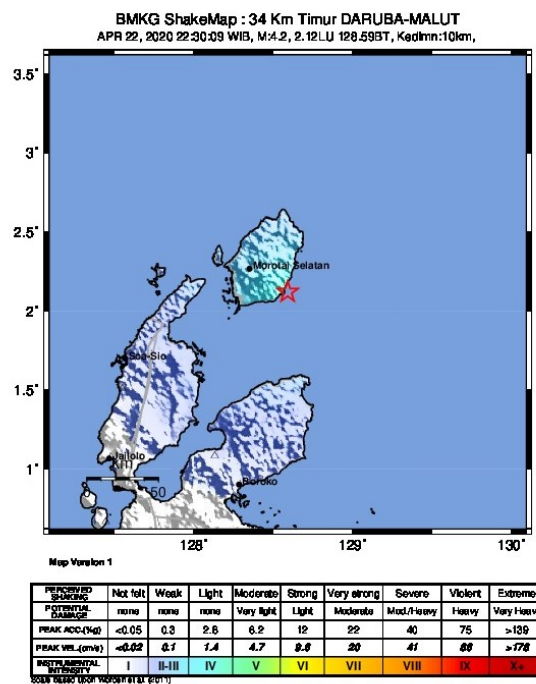
Gambar 69 Peta Guncangan Gempabumi 19 April 2020 pukul 00:45:39 WIB



Gambar 70 Peta Guncangan Gempabumi 19 April 2020 pukul 20:09:32 WIB



Gambar 71 Peta Guncangan Gempabumi 20 April 2020 pukul 08:05:05 WIB

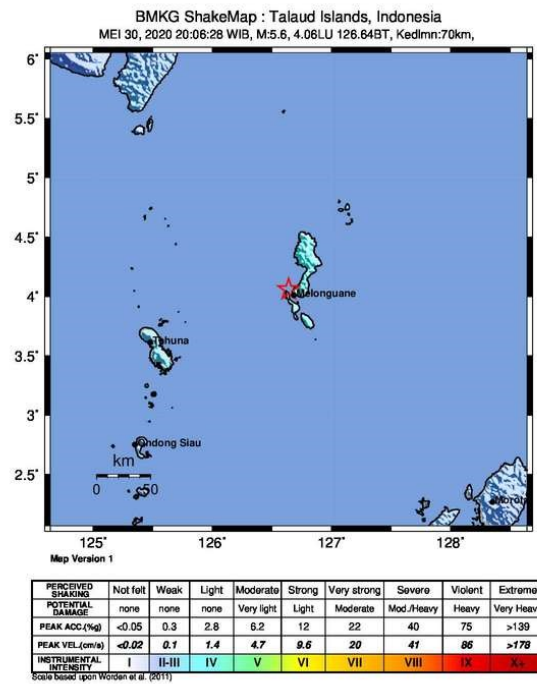


Gambar 72 Peta Guncangan Gempabumi 22 April 2020 pukul 22:30:09 WIB

Tabel 35 Atenuasi intensitas gempa bumi 22 April 2020 pukul 22:30:09 WIB

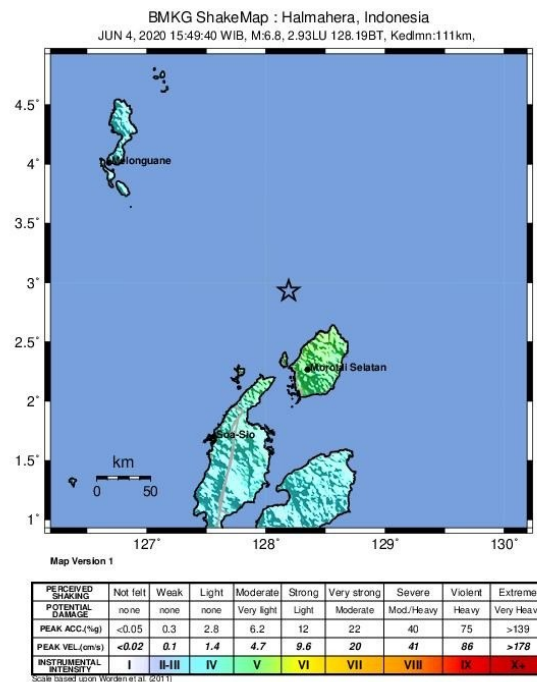
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	DBNI	BIMA	-8.50	118.31	13.42		1
2	TWSI	TALIWANG	-8.74	116.88	146.22		1
3	BASI	BAING	-10.22	120.58	324.30		1
4	JUII	KAMPUS UII YOGYAKARTA	-7.69	110.42	860.67		1

E. Peta Guncangan (*Shakemap*) Gempabumi Bulan Mei 2020

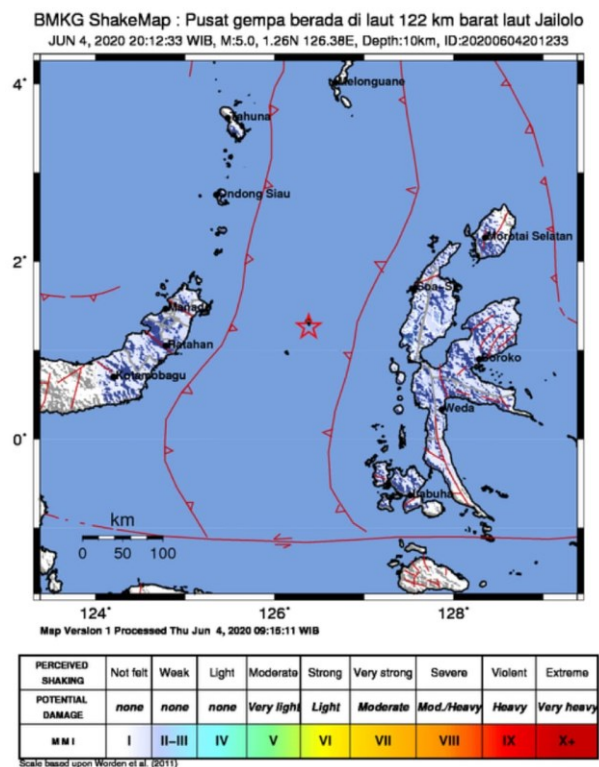


Gambar 73 Peta Guncangan Gempabumi 30 Mei 2020 pukul 20:06:28 WIB

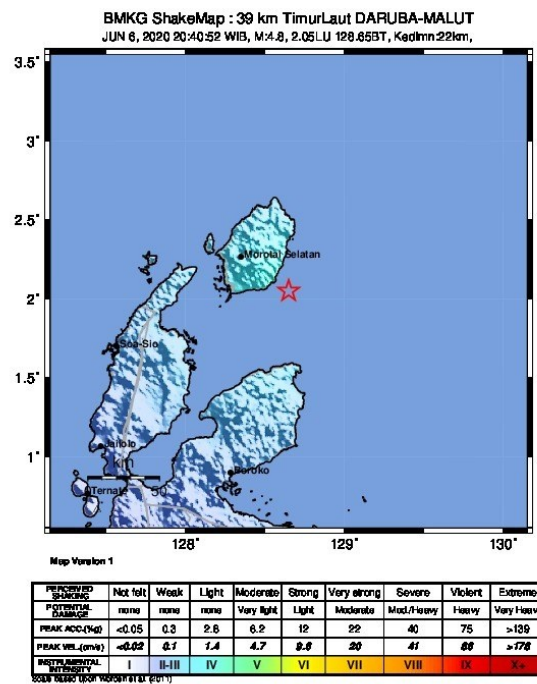
F. Peta Guncangan (*Shakemap*) Gempabumi Bulan Juni 2020



Gambar 74 Peta Guncangan Gempabumi 4 Juni 2020 pukul 15:49:40 WIB



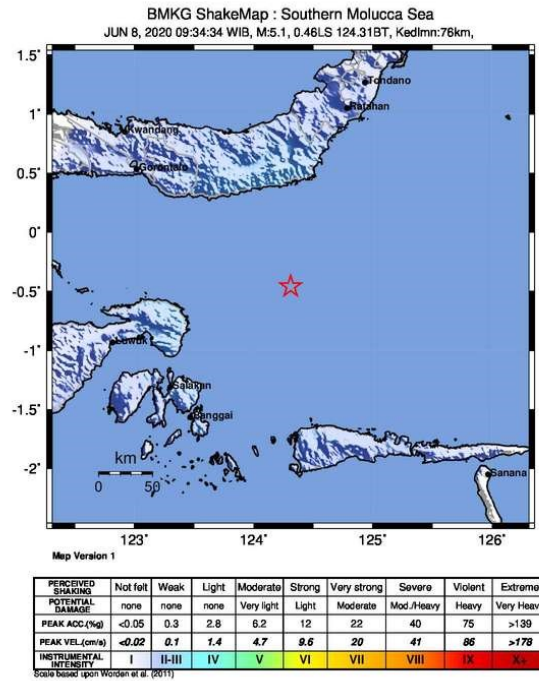
Gambar 75 Peta Guncangan Gempabumi 4 Juni 2020 pukul 20:12:33 WIB



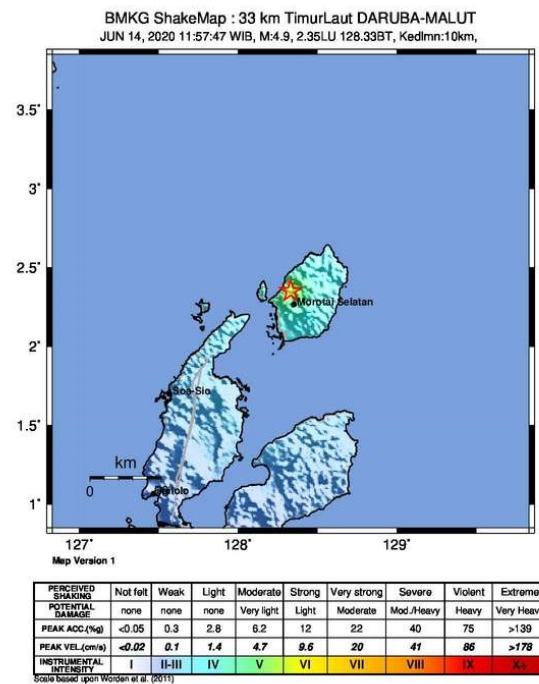
Gambar 76 Peta Guncangan Gempabumi 6 Juni 2020 pukul 20:40:52 WIB

Tabel 36 Atenuasi intensitas gempa bumi 6 Juni 2020 pukul 20:40:52 WIB

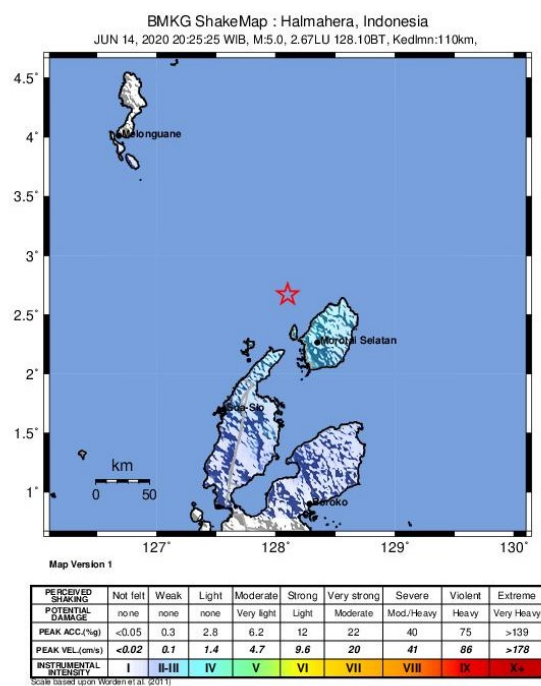
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	TMUN	TIDORE	0.66	127.45	204.07		1
2	RAPI	RAJA AMPAT	-0.41	130.82	364.82		1



Gambar 77 Peta Guncangan Gempabumi 8 Juni 2020 pukul 09:34:34 WIB



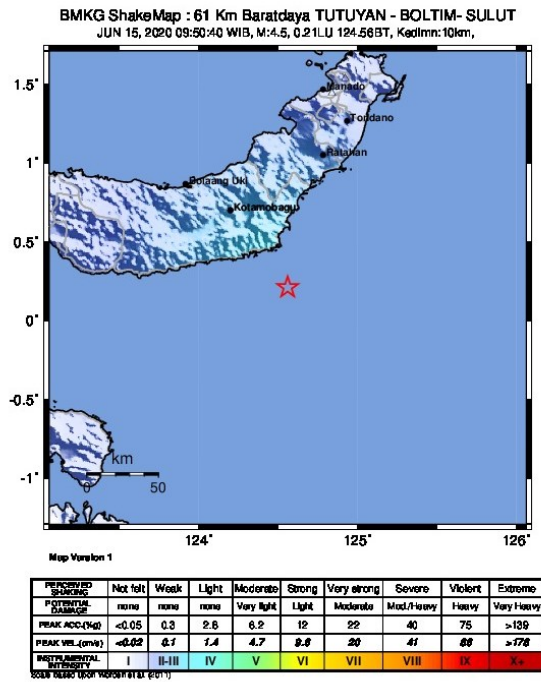
Gambar 78 Peta Guncangan Gempabumi 14 Juni 2020 pukul 11:57:47 WIB



Gambar 79 Peta Guncangan Gempabumi 14 Juni 2020 pukul 20:25:25 WIB

Tabel 37 Atenuasi intensitas gempa bumi 14 Juni 2020 pukul 20:25:25 WIB

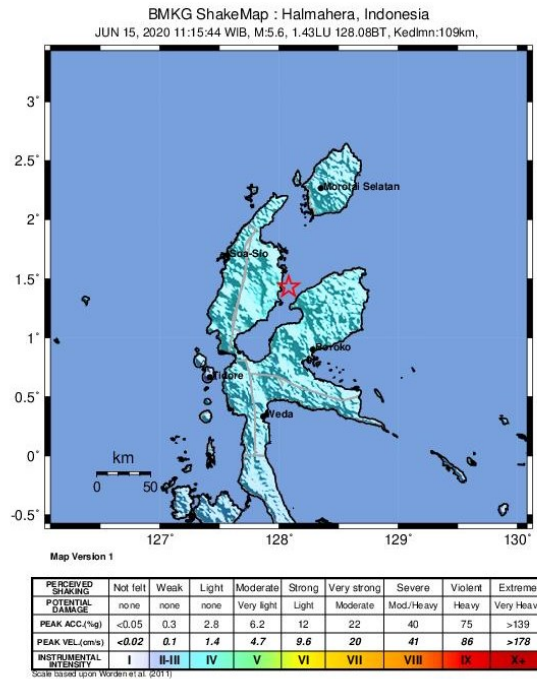
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	TNTI	TERNATE	0.77	127.37	225.47		1
2	TMUN	TIDORE	0.66	127.45	233.80		1
3	SAMI	STAMET SAMRATULANGI MANADO	1.54	124.92	374.19		1
4	SLMI	STAGEOF MANADO	1.44	124.84	386.44		1
5	RAPI	RAJA AMPAT	-0.41	130.82	456.19		1
6	SANI	SANANA	-2.05	125.99	574.18		1
7	NLAI	NAMLEA MALUKU	-3.24	127.10	665.63		1
8	LUWI	LUWUK	-1.04	122.77	721.16		1
9	FAKI	FAK-FAK	-2.92	132.26	774.21		1



Gambar 80 Peta Guncangan Gempabumi 15 Juni 2020 pukul 09:50:40 WIB

Tabel 38 Atenuasi intensitas gempa bumi 15 Juni 2020 pukul 09:50:40 WIB

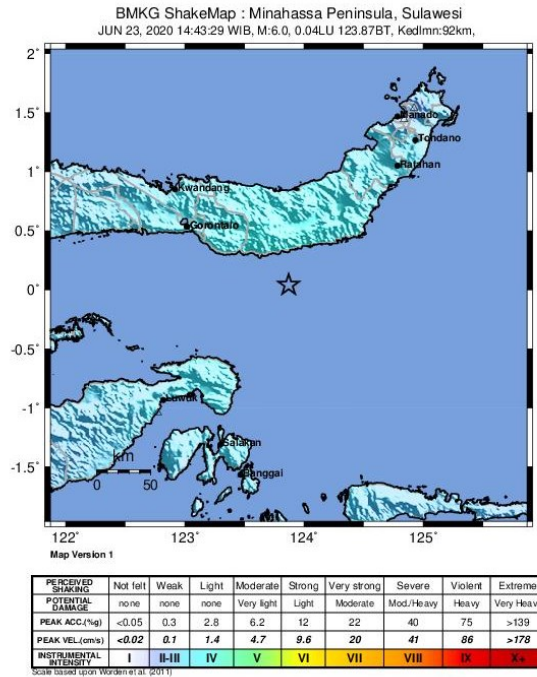
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	SLMI	STAGEOF MANADO	1.44	124.84	140.61		1
2	SAMI	STAMET SAMRATULANGI MANADO	1.54	124.92	152.95		1
3	LUWI	LUWUK	-1.04	122.77	242.59		1
4	SANI	SANANA	-2.05	125.99	297.22		1



Gambar 81 Peta Guncangan Gempabumi 15 Juni 2020 pukul 11:15:44 WIB

Tabel 39 Atenuasi intensitas gempa bumi 15 Juni 2020 pukul 11:15:44 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	TNTI	TERNATE	0.77	127.37	151.70		2
2	TMUN	TIDORE	0.66	127.45	153.57		2
3	SAMI	STAMET SAMRATULANGI MANADO	1.54	124.92	366.15		1
4	SLMI	STAGEOF MANADO	1.44	124.84	374.79		1
5	RAPI	RAJA AMPAT	-0.41	130.82	381.31		1
6	KRAI	KAIRATU	-3.32	128.40	538.68		1
7	MSAI	MASOHI	-3.35	128.93	548.70		1
8	LUWI	LUWUK	-1.04	122.77	658.53		1
9	FAKI	FAK-FAK	-2.92	132.26	678.27		1
10	MPSI	MAPAGA SABANG PALU	0.34	119.90	922.66		1
11	BMPI	STAMET FRANS KAISEPO	-1.19	136.10	943.31		1

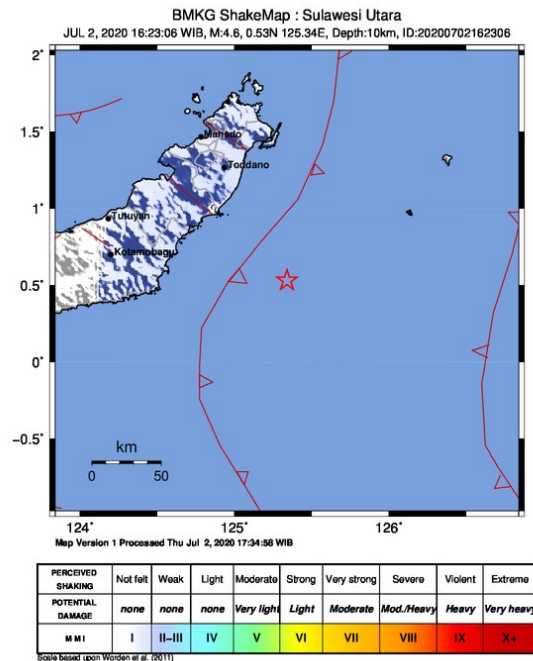


Gambar 82 Peta Guncangan Gempabumi 23 Juni 2020 pukul 14:43:29 WIB

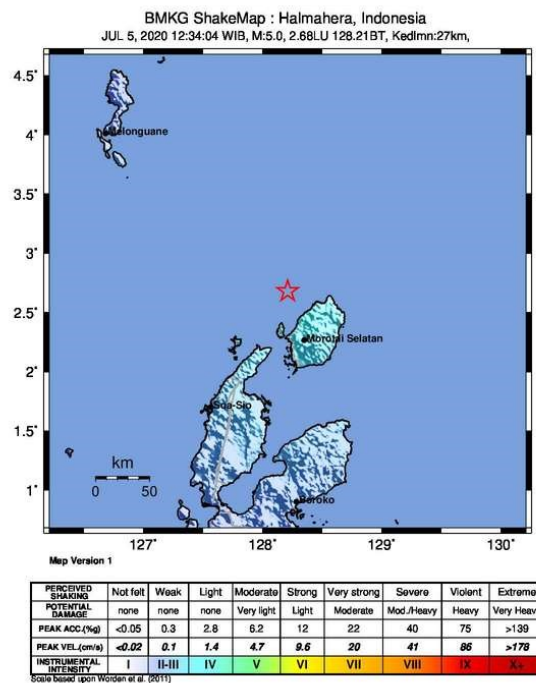
Tabel 40 Atenuasi intensitas gempa bumi 23 Juni 2020 pukul 14:43:29 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	LUWI	LUWUK	-1.04	122.77	191.53		4
2	SLMI	STAGEOF MANADO	1.44	124.84	207.79		2
3	SAMI	STAMET MANADO	1.54	124.92	220.30		2
4	SANI	SANANA	-2.05	125.99	340.45		2
5	TNTI	TERNATE	0.77	127.37	404.89		2
6	TMUN	TIDORE	0.66	127.45	411.11		1
7	MPSI	MAPAGA SABANG PALU	0.34	119.90	449.48		2
8	NLAI	NAMLEA MALUKU	-3.24	127.10	517.01		2
9	KKSI	KOLAKA	-4.17	121.65	534.34		2
10	KRAI	KAIRATU	-3.32	128.40	630.27		1
11	MMSN		-2.67	118.89	634.62		2
12	SPSI	SIDRAP	-3.96	119.77	640.89		2
13	MSAI	MASOHI	-3.35	128.93	679.98		2
14	SUPA	STA MARITIM MAKASSAR	-5.11	119.42	759.22		1
15	SUGO	STAGEOF GOA	-5.22	119.47	764.67		1
16	RAPI	RAJA AMPAT	-0.41	130.82	777.19		1
17	BSSI	BENTENG SELAYAR	-6.14	120.49	785.78		1
18	BKB	BALIKPAPAN	-1.11	116.91	787.45		1
19	BGKI	STAGEOF BALIKPAPAN	-1.26	116.91	789.83		2
20	NNKI	STAMET NUNUKAN	4.14	117.67	828.41		1
21	BNDI	BANDA NEIRA	-4.52	129.91	842.94		1
22	FAKI	FAK-FAK	-2.92	132.26	990.92		1

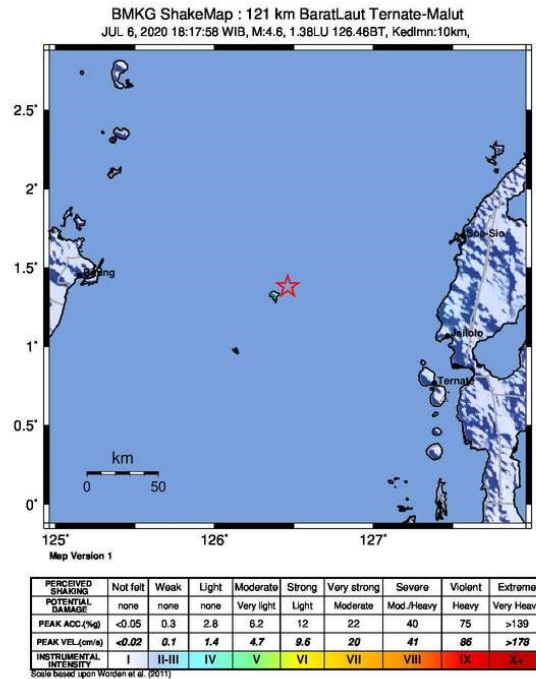
G. Peta Guncangan (*Shakemap*) Gempabumi Bulan Juli 2020



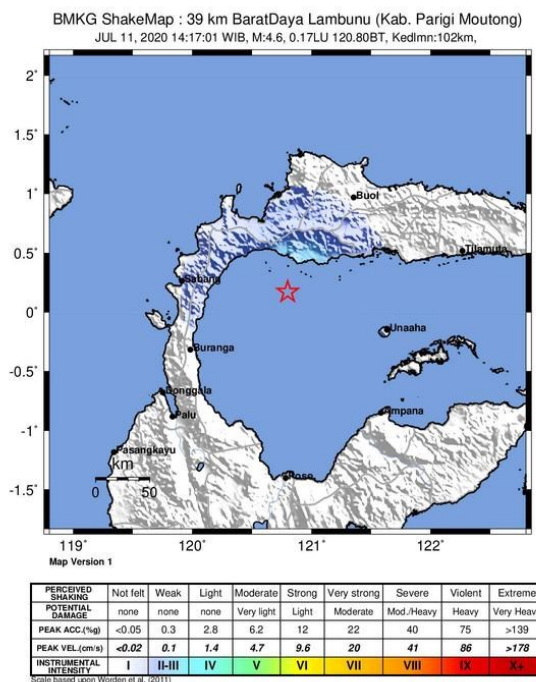
Gambar 83 Peta Guncangan Gempabumi 2 Juli 2020 pukul 16:23:06 WIB



Gambar 84 Peta Guncangan Gempabumi 5 Juli 2020 pukul 12:34:04 WIB



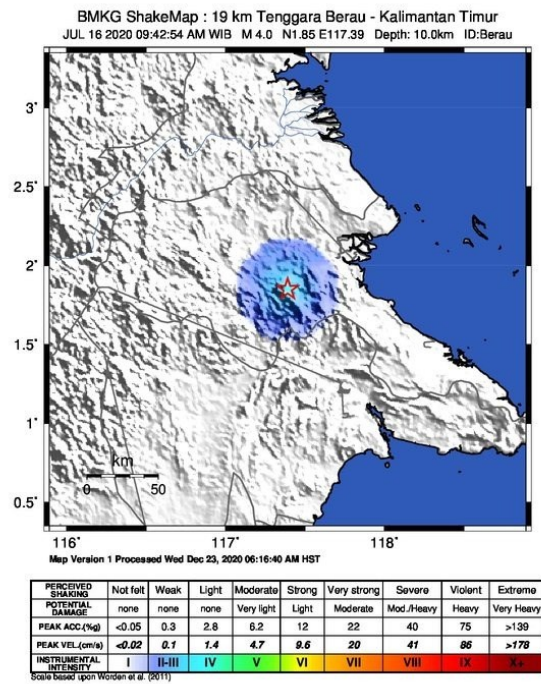
Gambar 85 Peta Guncangan Gempabumi 6 Juli 2020 pukul 18:17:57 WIB



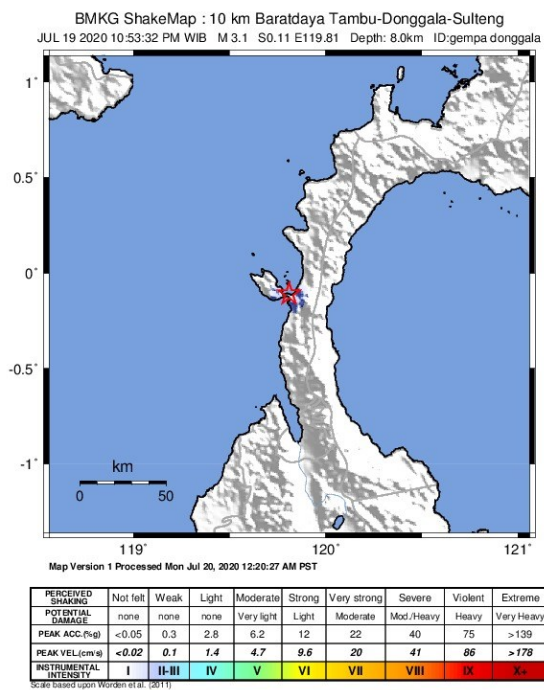
Gambar 86 Peta Guncangan Gempabumi 11 Juli 2020 pukul 14:17:01 WIB

Tabel 41 Atenuasi intensitas gempa bumi 11 Juli 2020 pukul 14:17:01 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	KRAI	KAIRATU	-3.32	128.40	928.94		1

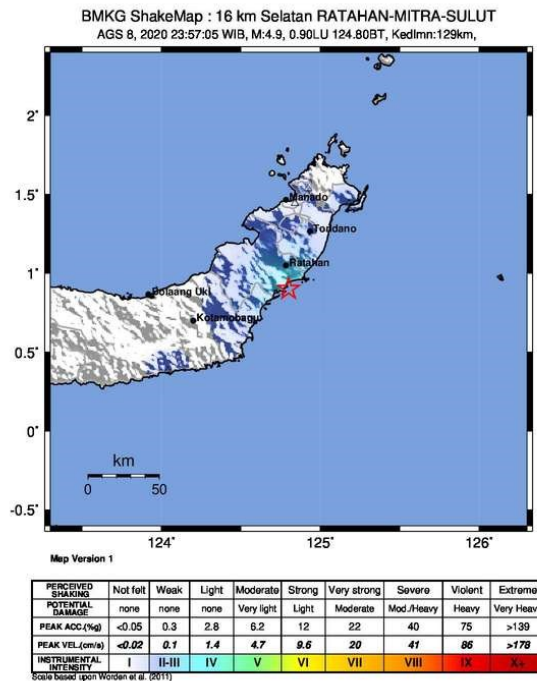


Gambar 87 Peta Guncangan Gempabumi 16 Juli 2020 pukul 09:42:54 WIB

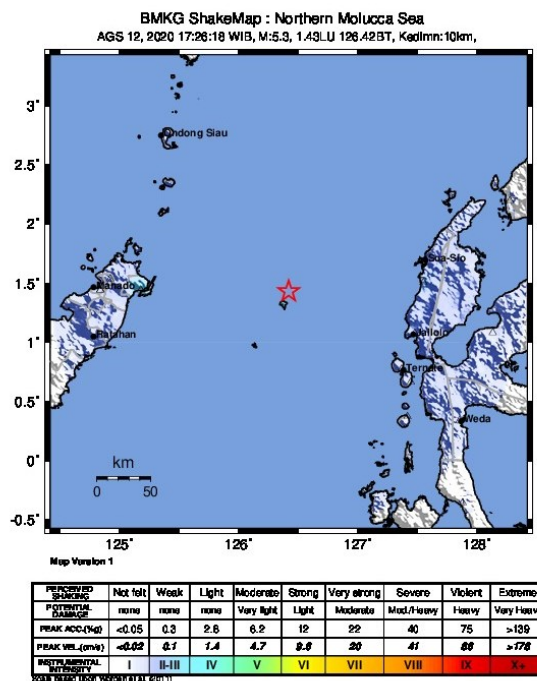


Gambar 88 Peta Guncangan Gempabumi 19 Juli 2020 pukul 22:53:32 WIB

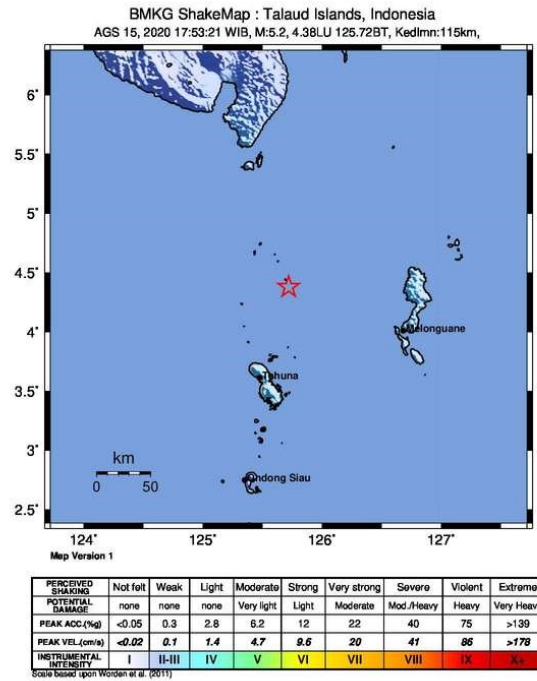
H. Peta Guncangan (*Shakemap*) Gempabumi Bulan Agustus 2020



Gambar 89 Peta Guncangan Gempabumi 8 Agustus 2020 pukul 23:57:05 WIB

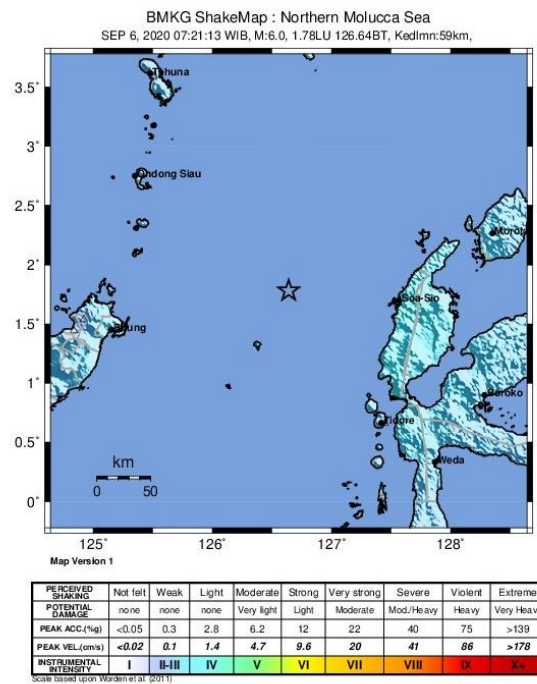


Gambar 90 Peta Guncangan Gempabumi 12 Agustus 2020 pukul 17:26:22 WIB

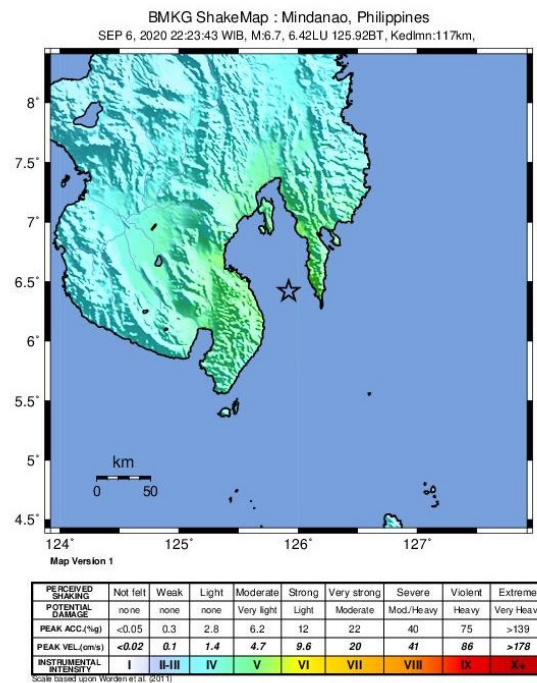


Gambar 91 Peta Guncangan Gempabumi 15 Agustus 2020 pukul 17:53:21 WIB

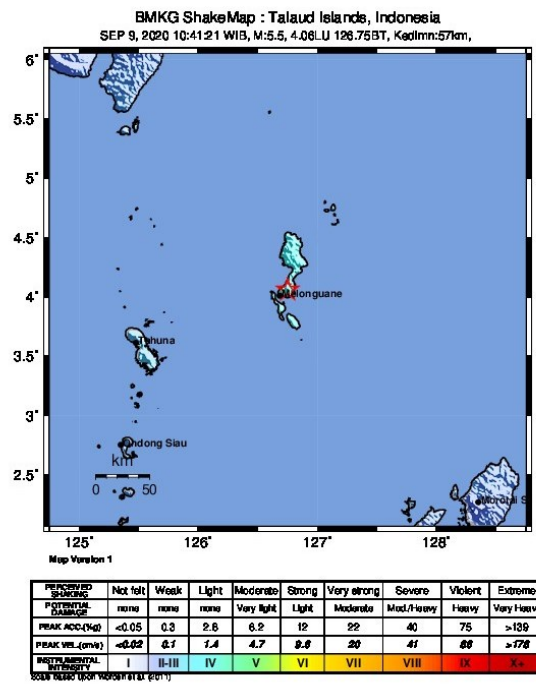
I. Peta Guncangan (*Shakemap*) Gempabumi Bulan September 2020



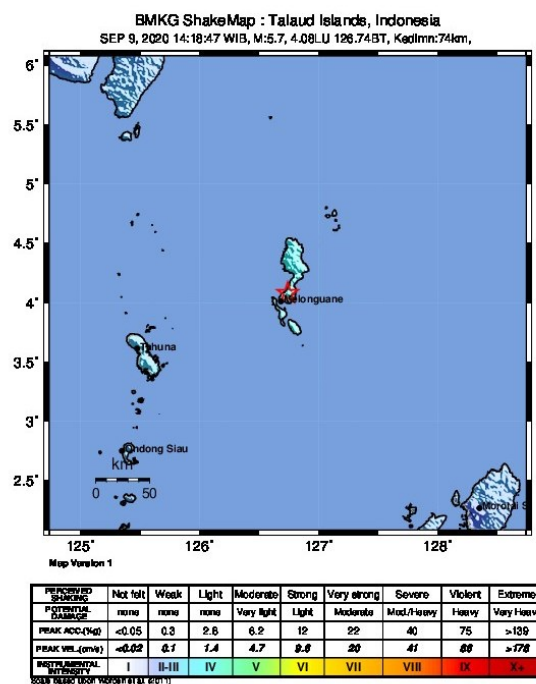
Gambar 92 Peta Guncangan Gempabumi 6 September 2020 pukul 07:21:13 WIB



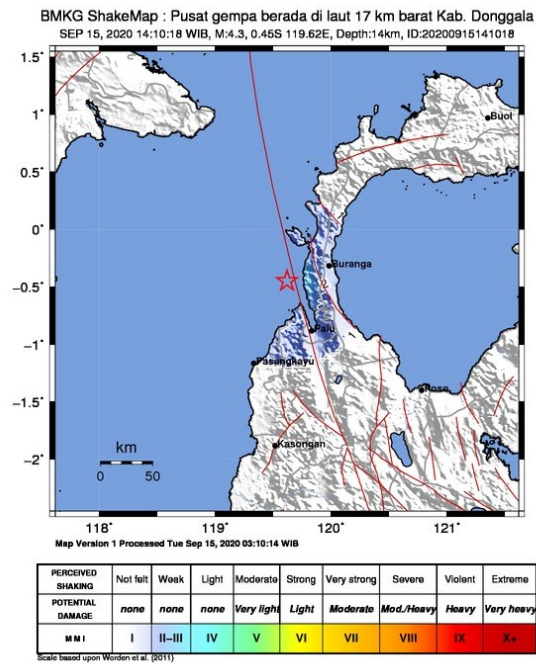
Gambar 93 Peta Guncangan Gempabumi 6 September 2020 pukul 22:23:43 WIB



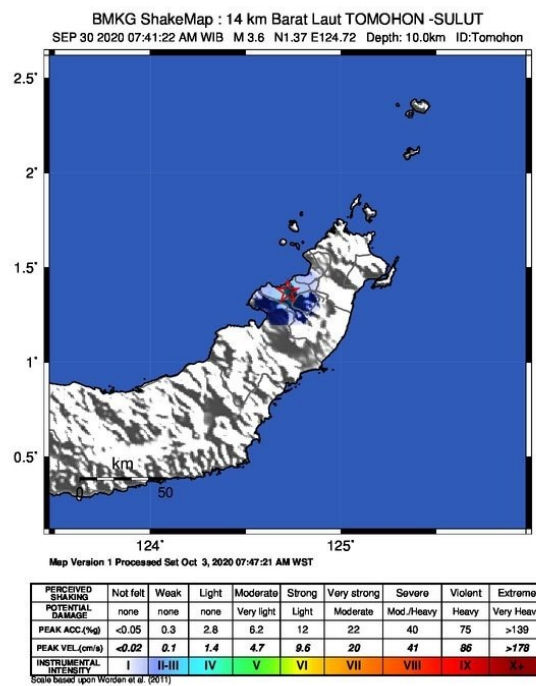
Gambar 95 Peta Guncangan Gempabumi 9 September 2020 pukul 10:41:21 WIB



Gambar 96 Peta Guncangan Gempabumi 9 September 2020 pukul 14:18:43 WIB

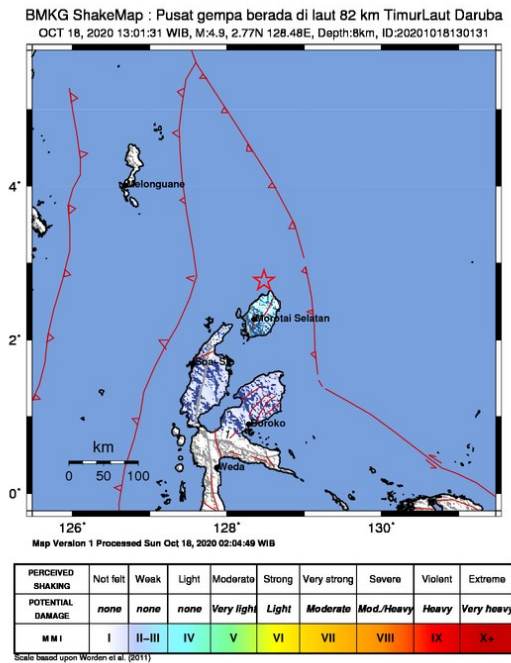


Gambar 97 Peta Guncangan Gempabumi 15 September 2020 pukul 14:10:18 WIB

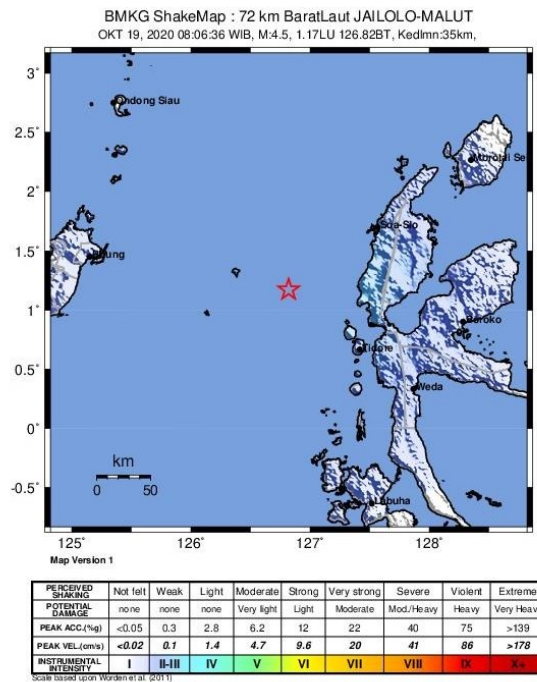


Gambar 98 Peta Guncangan Gempabumi 30 September 2020 pukul 07:41:22 WIB

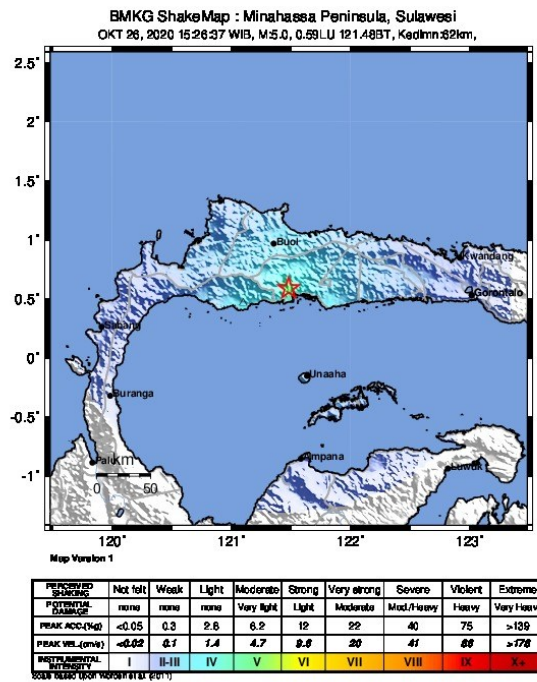
J. Peta Guncangan (*Shakemap*) Gempabumi Bulan Oktober 2020



Gambar 99 Peta Guncangan Gempabumi 18 Oktober 2020 pukul 13:01:31 WIB



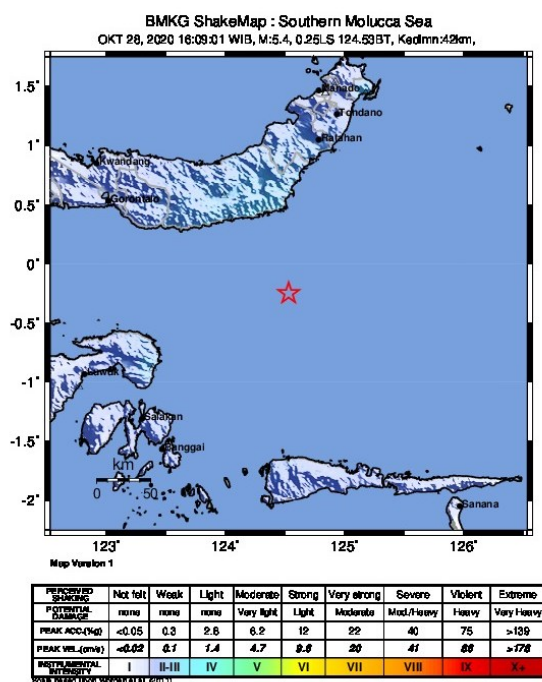
Gambar 100 Peta Guncangan Gempabumi 19 Oktober 2020 pukul 08:06:36 WIB



Gambar 101 Peta Guncangan Gempabumi 26 Oktober 2020 pukul 15:26:37 WIB

Tabel 43 Atenuasi intensitas gempa bumi 26 Oktober 2020 pukul 15:26:37 WIB

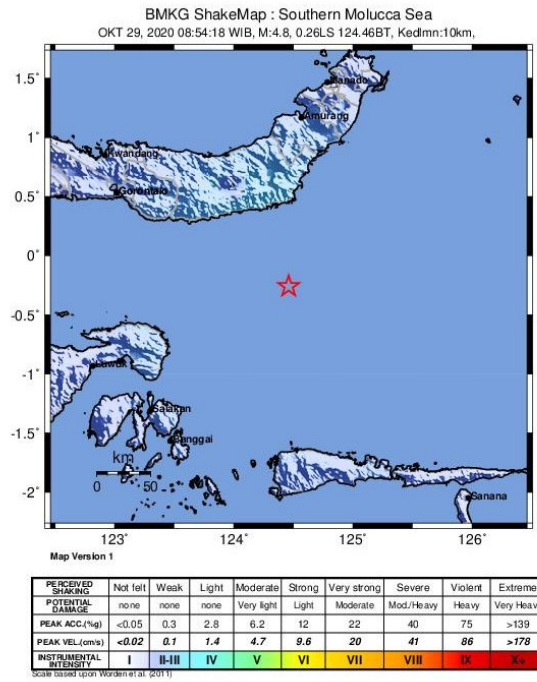
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	KMSI	KOTAMUBAGU	0.57	123.99	276.94		2
2	SLMI	STA GEOF MANADO	1.44	124.84	382.56		1
3	SAMI	STA MET SAMRATULANGI MANADO	1.54	124.92	394.08		1
4	NLAI	NAMLEA MALUKU	-3.24	127.1	756.04		1



Gambar 102 Peta Guncangan Gempabumi 28 Oktober 2020 pukul 16:09:01 WIB

Tabel 44 Atenuasi intensitas gempa bumi 28 Oktober 2020 pukul 16:09:01 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	KMSI	KOTA MUBAGO	0.57	123.98	116.29		3
2	SLMI	STAGEOF MANADO	1.44	124.84	194.75		1
3	SAMI	STAMET SAMRATULANGI MANADO	1.54	124.92	206.51		1
4	LBMI	LABUHA	-0.64	127.50	334.59		2
5	TMUN	TIDORE	0.66	127.45	341.20		1
6	NLAI	NAMLEA MALUKU	-3.24	127.10	439.04		1
7	MPSI	MAPAGA SABANG PALU	0.34	119.90	519.69		1
8	SUGO	STAGEOF GOA	-5.22	119.47	787.87		1

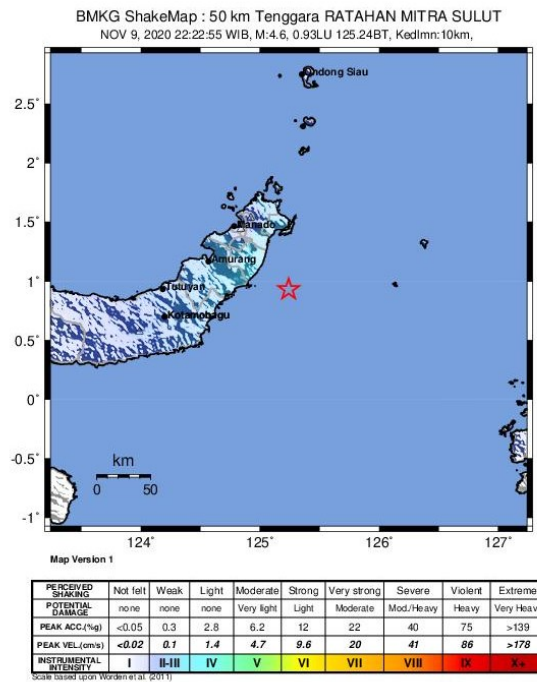


Gambar 103 Peta Guncangan Gempabumi 29 Oktober 2020 pukul 08:54:18 WIB

Tabel 45 Atenuasi intensitas gempa bumi 29 Oktober 2020 pukul 08:54:18 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	KMSI	KOTA MUBAGO	0.57	123.98	106.63		2
2	SLMI	STA GEOF MANADO	1.44	124.84	194.04		1
3	LBMI	LABUHA	-0.64	127.5	340.73		1
4	MPSI	MAPAGA SABANG PALU	0.34	119.9	511.60		1

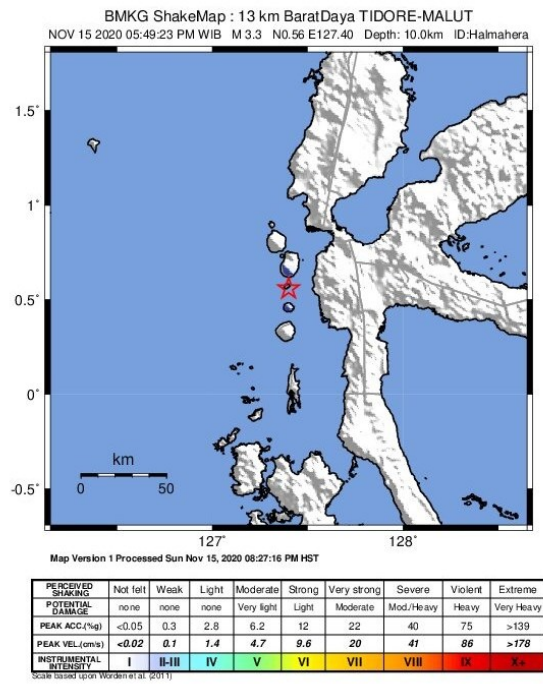
K. Peta Guncangan (*Shakemap*) Gempabumi Bulan November 2020



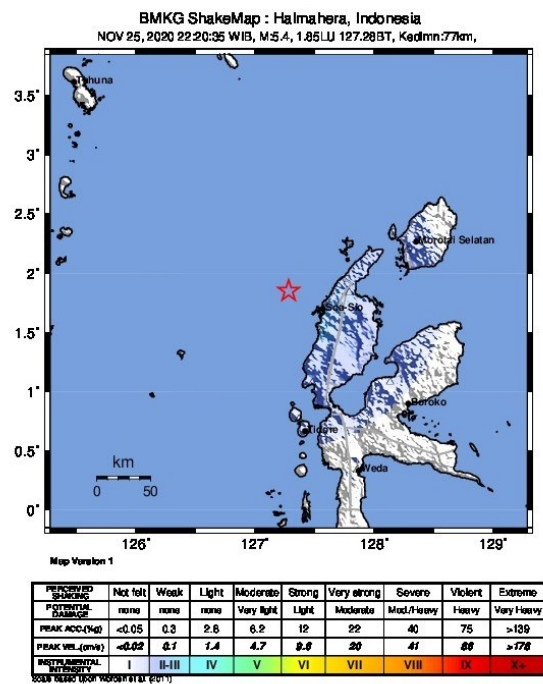
Gambar 104 Peta Guncangan Gempabumi 09 November 2020 pukul 22:22:55 WIB

Tabel 46 Atenuasi intensitas gempa bumi 09 November 2020 pukul 22:22:55 WIB

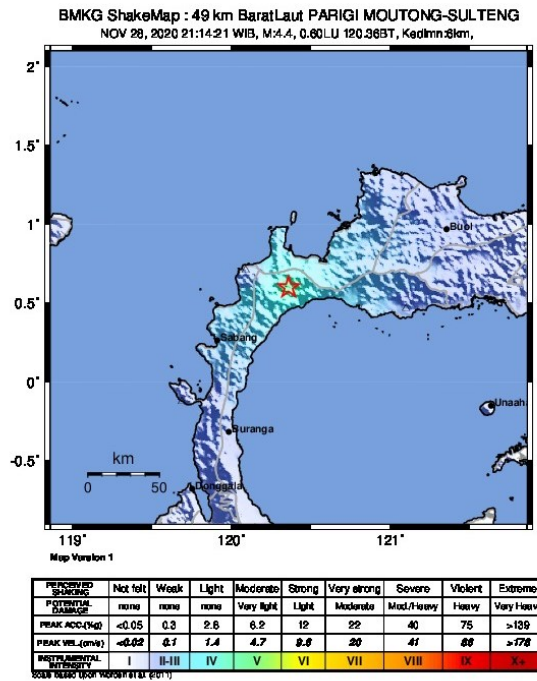
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	SLMI	STA GEOF MANADO	1.44	124.84	72.43		1
2	SAMI	STA MET SAMRATULANGI MANADO	1.54	124.92	76.19		1
3	KMSI	KOTAMOBAGU	0.57	123.99	144.70		2
4	TMUN	TIDORE	0.66	127.45	247.04		1
5	GLMI	GALELA	1.84	127.79	300.7		1
6	KDRI	STAMET KENDARI	-3.97	122.59	619.36		1



Gambar 105 Peta Guncangan Gempabumi 15 November 2020 pukul 17:49:23 WIB



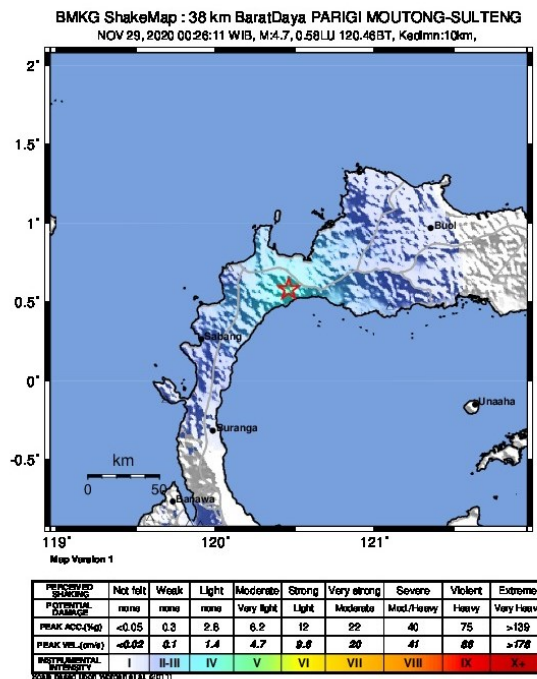
Gambar 106 Peta Guncangan Gempabumi 25 November 2020 pukul 22:20:35 WIB



Gambar 107 Peta Guncangan Gempabumi 28 November 2020 pukul 21:14:21 WIB

Tabel 47 Atenuasi intensitas gempa bumi 28 November 2020 pukul 21:14:21 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	BBCI	BIAU, BUOL, SULAWESI TENGAH	0.71	120.08	32.56		1
2	TPCI	TAOPA, PARIGI, SULAWESI TENGAH	0.46	121.09	83.48		1
3	BGCM	BALAESANG, DONGGALA, SULAWESI TENGAH	-0.08	119.85	94.02		1
4	BLCM	BALAESANG, TANJUNG, DONGGALA, SULAWESI TENGAH	-0.12	119.68	109.83		1
5	LUCM	LORE UTARA, POSO, SULAWESI TENGAH	-1.42	120.32	225.34		1
6	POCI	POSO PESISIR, POSO, SULAWESI TENGAH	-1.42	120.32	225.34		1
7	RDCM	RIO PAKAYA, DONGGALA, SULAWESI TENGAH	-1.29	119.55	229.12		1
8	LOCM	LORE TENGAH, POSO, SULAWESI TENGAH	-1.65	120.18	250.98		1
9	KGCM	KWANDANG, GORONTALO, GORONTALO	0.54	123.01	294.71		1
10	TGCM	TELAGA. GORONTALO, GORONTALO	0.52	123.07	302.23		1

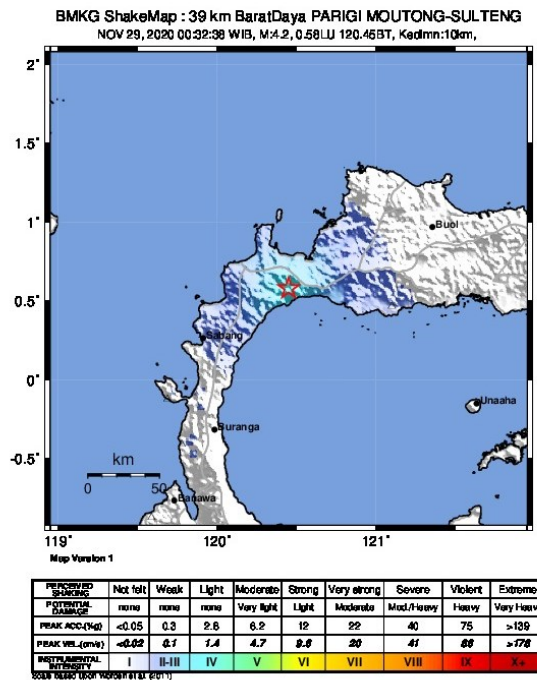


Gambar 108 Peta Guncangan Gempabumi 29 November 2020 pukul 00:26:11 WIB

Tabel 48 Atenuasi intensitas gempa bumi 29 November 2020 pukul 00:26:11 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	BBCI	BIAU, BUOL, SULAWESI TENGAH	0.71	120.08	43.75		1
2	TPCI	TAOPA, PARIGI, SULAWESI TENGAH	0.46	121.09	72.15		2
3	BGCM	BALAESANG, DONGGALA, SULAWESI TENGAH	-0.08	119.85	99.36		2
4	BLCM	BALAESANG, TANJUNG, DONGGALA, SULAWESI TENGAH	-0.12	119.68	116.18		1
5	SDCI	SINDUE, DONGGALA, SULAWESI TENGAH	-0.40	119.77	133.59		1
6	PASI	STAMET MUTIARA PALU	-0.91	119.90	177.42		2
7	PCI	STASIUN PALU, INDONESIA	-0.90	119.83	179.11		1
8	BDCM	BANAWA SELATAN, DONGGALA, SULAWESI TENGAH	-0.87	119.58	188.48		1
9	PTSN	POSO, SULAWESI TENGAH,	-1.42	120.65	223.48		1
10	LUCM	LORE UTARA, POSO, SULAWESI TENGAH	-1.42	120.32	249.89		1
11	POCI	POSO PESISIR, POSO, SULAWESI TENGAH	-1.42	120.32	223.60		1
12	PMCI	PASANG KAYU, MAMUJU UTARA, SULAWESI BARAT	-1.17	119.39	228.07		1
13	LOCM	LORE TENGAH, POSO, SULAWESI TENGAH	-1.65	120.18	249.89		1
14	TGCM	TELAGA. GORONTALO, GORONTALO	0.52	123.07	291.06		1
15	LUWI	GEOFON STASIUN LUWUK	-1.04	122.77	314.02		1
16	TLCM	TOMONI, LUWU TIMUR, SULAWESI SELATAN	-2.49	120.77	343.68		1
17	MSCM	MASAMBA, LUWU UTARA,	-2.53	120.33	346.55		1

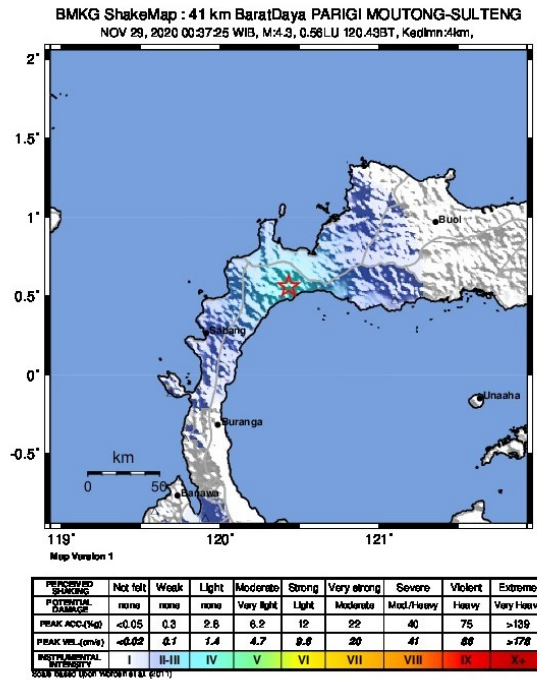
		SULAWESI SELATAN					
18	TBKI	TELUK BAYUR, BERAU, KALIMANTAN TIMUR	2.13	117.42	379.25		3
19	TARAI	STASIUN TARAKAN, KALIMANTAN	3.32	117.57	443.21		1
20	WWCI	WANGI-WANGI, WAKATOBI, SULAWESI TENGGARA	-5.27	123.52	734.40		1



Gambar 109 Peta Guncangan Gempabumi 29 November 2020 pukul 00:32:38 WIB

Tabel 49 Atenuasi intensitas gempa bumi 29 November 2020 pukul 00:32:38 WIB

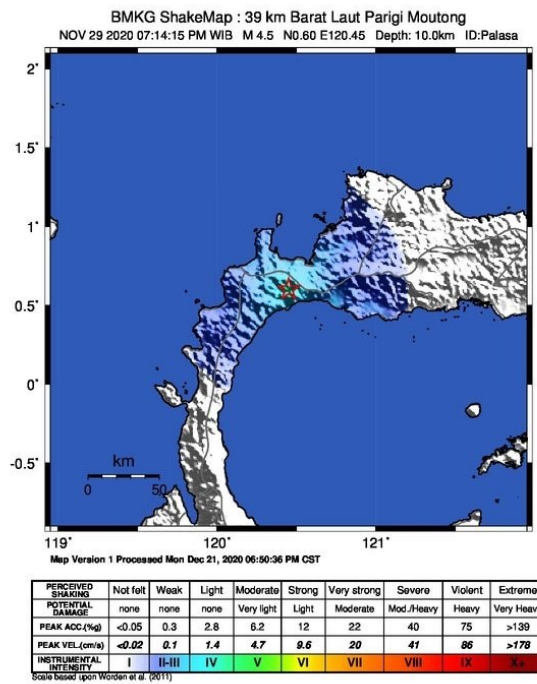
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	TPCI	TAOPA, PARIGI, SULAWESI TENGAH	0.46	121.09	73.24		1
2	BGCM	BALAESANG, DONGGALA, SULAWESI TENGAH	-0.08	119.85	98.62		1
3	BLCM	BALAESANG, TANJUNG, DONGGALA, SULAWESI TENGAH	-0.12	119.68	115.36		1
4	SDCI	SINDUE, DONGGALA, SULAWESI TENGAH	-0.40	119.77	132.96		1
5	BDCM	BANAWA SELATAN, DONGGALA, SULAWESI TENGAH	-0.87	119.58	187.91		1
6	LUCM	LORE UTARA, POSO, SULAWESI TENGAH	-1.42	120.32	223.53		1
7	MNI	STASIUN MANADO, SULAWESI	1.44	124.84	497.43		1
8	KKSI	KOLAKA	-4.17	121.65	544.97		1



Gambar 110 Peta Guncangan Gempabumi 29 November 2020 pukul 00:37:25 WIB

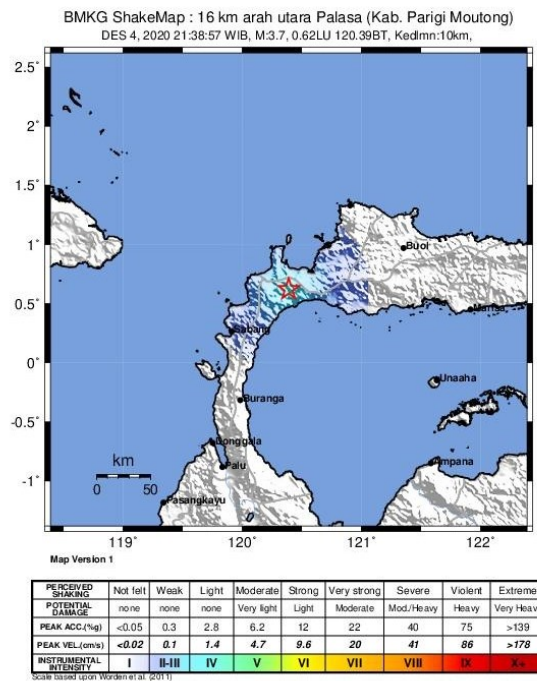
Tabel 50 Atenuasi intensitas gempa bumi 29 November 2020 pukul 00:37:25 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	TPCI	TAOPA, PARIGI, SULAWESI TENGAH	0.46	121.09	75.10		1
2	BGCM	BALAESANG, DONGGALA, SULAWESI TENGAH	-0.08	119.85	95.48		1
3	BLCM	BALAESANG, TANJUNG, DONGGALA, SULAWESI TENGAH	-0.12	119.68	112.22		1
4	SDCI	SINDUE, DONGGALA, SULAWESI TENGAH	-0.40	119.77	129.87		1
5	PASI	STAMET MUTIARA PALU	-0.91	119.90	174.19		1
6	BDCM	BANAWA SELATAN, DONGGALA, SULAWESI TENGAH	-0.87	119.58	184.87		1
7	LUCM	LORE UTARA, POSO, SULAWESI TENGAH	-1.42	120.32	221.18		1
8	POCI	POSO PESISIR, POSO, SULAWESI TENGAH	-1.42	120.32	221.18		1
9	PTSN	POSO, SULAWESI TENGAH,	-1.42	120.65	221.62		1
10	LOCM	LORE TENGAH, POSO, SULAWESI TENGAH	-1.65	120.18	247.29		1
11	KGCM	KWANDANG, GORONTALO	0.54	123.01	286.87		1
12	TGCM	TELAGA, GORONTALO	0.52	123.07	294.35		1
13	LUWI	GBOFON STASIUN LUWUK	-1.04	122.77	315.49		1
14	TBKI	TELUK BAYUR, BERAU, KALIMANTAN TIMUR	2.13	117.42	377.31		1
15	TMUN	KANTOR BPBD TIDORE	0.66	127.44	780.19		1

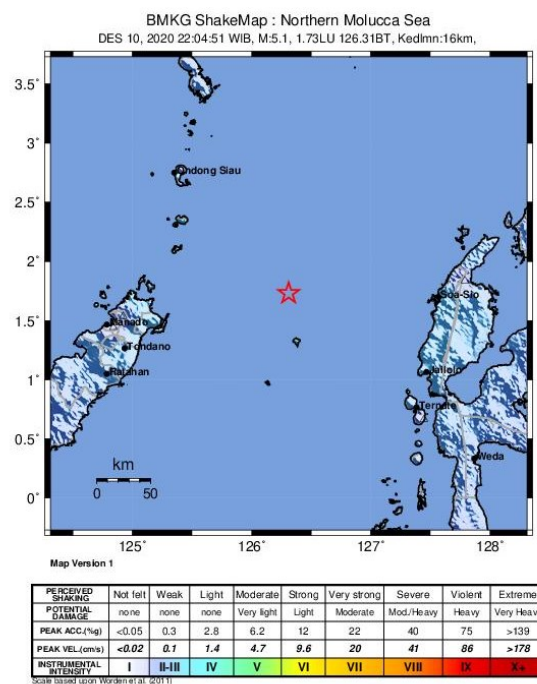


Gambar 111 Peta Guncangan Gempabumi 29 November 2020 pukul 19:14:15 WIB

L. Peta Guncangan (*Shakemap*) Gempabumi Bulan Desember 2020



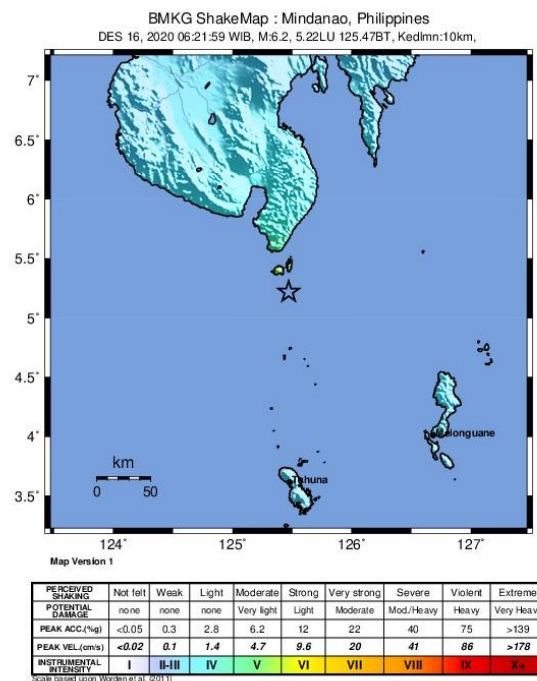
Gambar 112 Peta Guncangan Gempabumi 4 Desember 2020 pukul 21:38:57 WIB



Gambar 113 Peta Guncangan Gempabumi 10 Desember 2020 pukul 22:04:51 WIB

Tabel 51 Atenuasi intensitas gempa bumi 10 Desember 2020 pukul 22:04:51 WIB

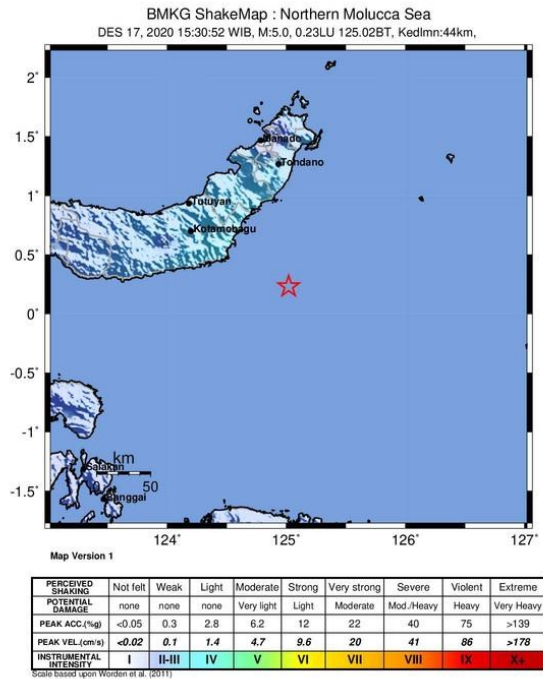
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	SAMI	STA MET SAMRATULANGI MANADO	1.54	124.92	154.90		2
2	GLMI	GALELA	1.84	127.79	163.85		1
3	SLMI	STA GEOF MANADO	1.44	124.84	165.72		1
4	TMUN	TIDORE	0.66	127.45	172.30		1
5	KMSI	KOTAMOBAGU	0.57	123.99	287.48		2
6	LBMI	LABUHA	-0.64	127.5	293.86		1
7	NLAI	NAMLEA MALUKU	-3.24	127.10	558.60		1
8	MSBA	STAMET MASAMBA	-2.55	120.32	817.54		1



Gambar 114 Peta Guncangan Gempabumi 16 Desember 2020 pukul 06:21:59 WIB

Tabel 52 Atenuasi intensitas gempa bumi 16 Desember 2020 pukul 06:21:59 WIB

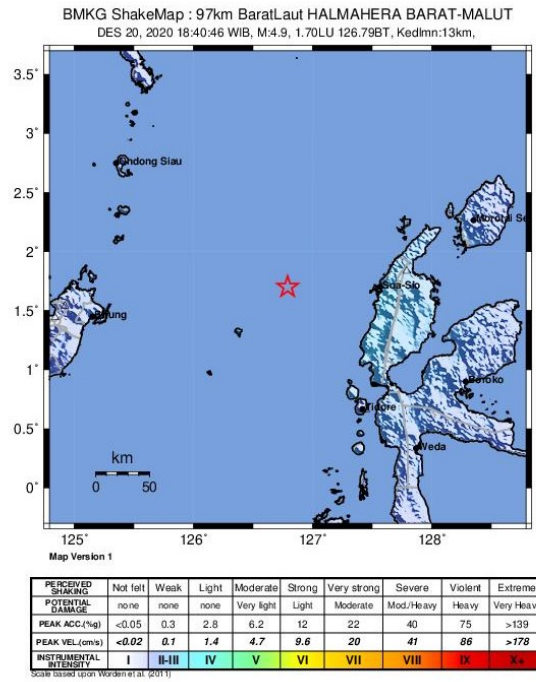
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	SAMI	STA MET SAMRATULANGI MANADO	1.54	124.92	410.27		1
2	SLMI	STA GEOF MANADO	1.44	124.84	421.99		1
3	GLMI	GALELA	1.84	127.79	450.87		2
4	KMSI	KOTAMOBAGU	0.57	123.99	538.39		2
5	TMUN	TIDORE	0.66	127.45	548.29		1
6	LBMI	LABUHA	-0.64	127.5	685.63		1
7	RAPI	RAJA AMPAT	-0.41	130.82	859.52		1



Gambar 115 Peta Guncangan Gempabumi 17 Desember 2020 pukul 15:30:52 WIB

Tabel 53 Atenuasi intensitas gempa bumi 17 Desember 2020 pukul 15:30:52 WIB

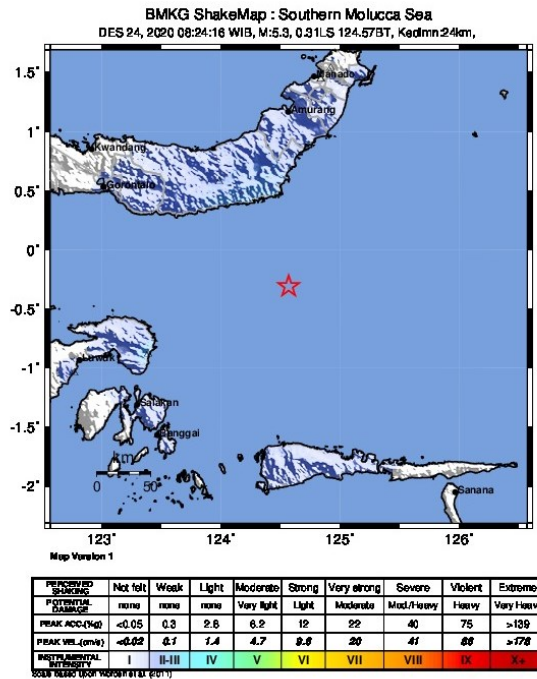
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	KMSI	KOTAMOBAGU	0.57	123.99	120.24		2
2	SLMI	STA GEOF MANADO	1.44	124.84	135.67		1
3	SAMI	STA MET SAMRATULANGI MANADO	1.54	124.92	144.99		1
4	TMUN	TIDORE	0.66	127.45	273.30		1
5	LBMI	LABUHA	-0.54	127.50	291.52		1
6	GLMI	GALELA	1.84	127.79	355.16		1
7	NLAI	NAMLEA MALUKU	-3.24	127.10	448.95		2



Gambar 116 Peta Guncangan Gempabumi 20 Desember 2020 pukul 18:40:46 WIB

Tabel 54 Atenuasi intensitas gempa bumi 20 Desember 2020 pukul 18:40:46 WIB

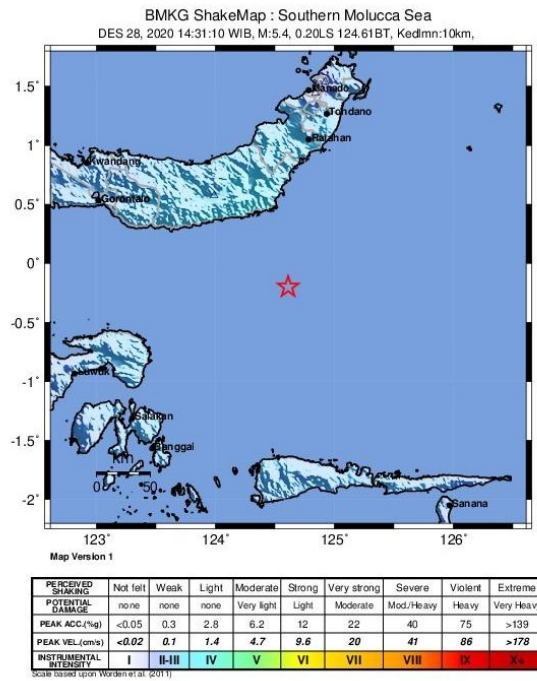
No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	GLMI	GALELA	1.84	127.79	111.98		2
2	TMUN	TIDORE	0.66	127.45	136.29		1
3	SAMI	STA MET SAMRATULANGI MANADO	1.54	124.92	208.42		1
4	SLMI	STA GEOF MANADO	1.44	124.84	218.73		1
5	LBMI	LABUHA	-0.54	127.50	271.72		1
6	KMSI	KOTAMOBAGU	0.57	123.99	335.69		1
7	NLAI	NAMLEA MALUKU	-3.24	127.10	550.27		1



Gambar 117 Peta Guncangan Gempabumi 24 Desember 2020 pukul 08:24:14 WIB

Tabel 55 Atenuasi intensitas gempa bumi 24 Desember 2020 pukul 08:24:14 WIB

No	ID Sta	Stasiun	Koordinat Stasiun		Jarak Ke Hiposenter	Intensitas	
			Lat	Long		Obs	Alat
1	KMSI	KOTAMOBAGU	0.57	123.99	119.14		3
2	SLMI	STA GEOF MANADO	1.44	124.84	197.66		1
3	SAMI	STA MET SAMRATULANGI MANADO	1.54	124.92	209.41		1
4	LBMI	LABUHA	-0.54	127.50	327.78		1
5	TMUN	TIDORE	0.66	127.45	337.47		1
6	GLMI	GALELA	1.84	127.79	429.82		1
7	NLAI	NAMLEA MALUKU	-3.24	127.10	429.90		1
8	MSBA	STAMET MASAMBA	-2.55	120.32	533.41		1
9	SPSI	SIDRAP	-3.96	119.77	669.98		1
10	BKSI	BULUKUMBA	-5.32	120.12	744.00		1
11	SUHA	STAMET HASANUDDIN MAKASSAR	-5.06	119.55	767.61		1
12	BSSI	BENTENG SELAYAR	-6.14	120.49	790.34		1



Gambar 118 Peta Guncangan Gempabumi 28 Desember 2020 pukul 14:31:10 WIB

LAMPIRAN

1. Skala *Modified Mercally Intensity* (MMI)



BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA
Jalan Angkasa I No. 2, Kemayoran, Jakarta 10720 Telp. : (021) 4246321 Fax. : (021) 4246703
 website : <http://www.bmkg.go.id>

MODIFIED MERCALLY INTENSITY

(MMI)



1 MMI

Getaran tidak dirasakan kecuali dalam keadaan luar biasa oleh beberapa orang



2 MMI

Getaran dirasakan oleh beberapa orang, benda-benda ringan yang digantung bergoyang



3 MMI

Getaran dirasakan nyata dalam rumah. Terasa getaran seakan-akan ada truk berlalu.



4 MMI

Pada siang hari dirasakan oleh orang banyak dalam rumah, di luar oleh beberapa orang, gerabah pecah, jendela/pintu gemerincing dan dinding berbunyi



5 MMI

Getaran dirasakan oleh hampir semua penduduk, orang banyak terbangun, gerabah pecah, jendela dan sebagainya pecah, barang-barang terpelanting, tiang-tiang dan barang besar tampak bergoyang, bandul lonceng dapat berhenti.



6 MMI

Getaran dirasakan oleh semua penduduk. Kebanyakan semua terkejut dan lari keluar, plester dinding jatuh dan cerobong asap pada pabrik rusak, kerusakan ringan



7 MMI

Tiap-tiap orang keluar rumah. Kerusakan ringan pada rumah-rumah dengan bangunan dan konstruksi yang baik. Sedangkan pada bangunan dengan konstruksi kurang baik terjadi retak-retak bahkan hancur, cerobong asap pecah. Terasa oleh orang yang naik kendaraan.



8 MMI

Kerusakan ringan pada bangunan dengan konstruksi yang kuat. Retak-retak pada bangunan dengan konstruksi kurang baik, dinding dapat lepas dari rangka rumah, cerobong asap pabrik dan monumen-monumen roboh, air menjadi keruh



9 MMI

Kerusakan pada bangunan yang kuat, rangka-rangka rumah menjadi tidak lurus, banyak retak-retak. Rumah tampak agak berpindah dari pondamennya. Pipa-pipa dalam rumah putus.



10 MMI

Bangunan dari kayu yang kuat rusak, rangka rumah lepas dari pondamennya, tanah terbelah, rel melengkung, tanah longsor di tiap-tiap sungai dan di tanah-tanah yang curam.



11 MMI

Bangunan-bangunan hanya sedikit yang tetap berdiri. Jembatan rusak, terjadi lembah. Pipa dalam tanah tidak dapat dipakai sama sekali, tanah terbelah, rel melengkung sekali.



12 MMI

Hancur sama sekali. Gelombang tampak pada permukaan tanah. Pemandangan menjadi gelap. Benda-benda terlempar ke udara.

2. Skala Intensitas Gempabumi BMKG (SIG-BMKG)

Skala SIG BMKG	Warna	Deskripsi Sederhana	Deskripsi Rinci	Skala MMI	PGA (gal)
I	Putih	TIDAK DIRASAKAN (Not Felt)	Tidak dirasakan atau dirasakan hanya oleh beberapa orang tetapi terekam oleh alat.	I-II	< 2.9
II	Hijau	DIRASAKAN (Felt)	Dirasakan oleh orang banyak tetapi tidak menimbulkan kerusakan. Benda-benda ringan yang digantung bergoyang dan jendela kaca bergetar.	III-V	2.9-88
III	Kuning	KERUSAKAN RINGAN (Slight Damage)	Bagian non struktur bangunan mengalami kerusakan ringan, seperti retak rambut pada dinding, genteng bergeser ke bawah dan sebagian berjatuhan.	VI	89-167
IV	Jingga	KERUSAKAN SEDANG (Moderate Damage)	Banyak Retakan terjadi pada dinding bangunan sederhana, sebagian roboh, kaca pecah. Sebagian plester dinding lepas. Hampir sebagian besar genteng bergeser ke bawah atau jatuh. Struktur bangunan mengalami kerusakan ringan sampai sedang.	VII-VIII	168-564
V	Merah	KERUSAKAN BERAT (Heavy Damage)	Sebagian besar dinding bangunan permanen roboh. Struktur bangunan mengalami kerusakan berat. Rel kereta api melengkung.	IX-XII	> 564