PRELIMINARY REPORT

JULY, 30, 2013
AEGEAN SEA (GÖKCEADA OFFSHORE WATERS) EARTHQUAKE
Ml=5.3

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REPUBLIC OF TUKEY
PRIME MINISTRY
DISASTER AND EMERGENCY MANAGEMENT
PRESIDENCY
EARTHQUAKE DEPARTMENT

AEGEAN SEA EARTHQUAKE (Ml=5.3)

An earthquake with magnitude Ml=5.3 occurred at local time 08:33 on July, 30, 2013. Epicenteral coordinates of the earthquake was determined as 40.3028 N – 25.7902 E with focal depth 20.01 km. The magnitude of earthquake was identified with AFAD National Seismological Observation Network and Kandilli Observatory and Earthquake Research Institute. After this earthquake, 45 aftershocks were determined with magnitude range between 2.1-4.1 in first six hours. (Fig.1).

This earthquake was also felt in Çanakkkale, Balıkesir and İstanbul. It didn't caused loss of life and any damage.

Focal Mechanism Solutions performed by considering first motion direction of P wave of Ml=5.3 earthquake is emerged from strike slip faulting with normal component (Fig.2). The fault which caused earthquake is related to Ganos Fault which is the branch of North Anatolian Fault Zone with NE-SW direction (Fig.3).

Aegean region has been exposed to destructive earthquakes during the historical and instrumental periods. Destructive earthquakes that occurred in the last century are given in Table 1 and historical period earthquakes which effected to this region are given Figure 4.

July 30, 2013 Aegean Sea Earthquake was recorded by accelerometers at 58 different locations within National Strong Ground Motion Observation Network operated by Earthquake Department at Disaster and Emergency Management Presidency of Turkey. Peak ground acceleration values recorded at Gökçeada station (86.6 gal in NS, 74,43 EW and 60,11 up-down direction) (Figure 5-11).

Peak ground acceleration and seismic intensity values that can be created by July, 30, 2013 Aegean Sea earthquake in the earthquake-hit area and its vicinity are estimated and the maps showing the spatial distribution of these values are prepared (Fig.12,13).

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Earthquake activity of this region (and all of Turkey) has been observed in Disaster and Emergency Management Presidency, Earthquake Department Data Center Ankara 7 days/24 hours with 211 Seismic station and 400 accelerometer. Obtained results are shared with public, press and relevant authorized.

For your information.

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Fig. 1. 30/07/2013 Aegean Sea earthquake and aftershocks distribution (Ml=5.3)

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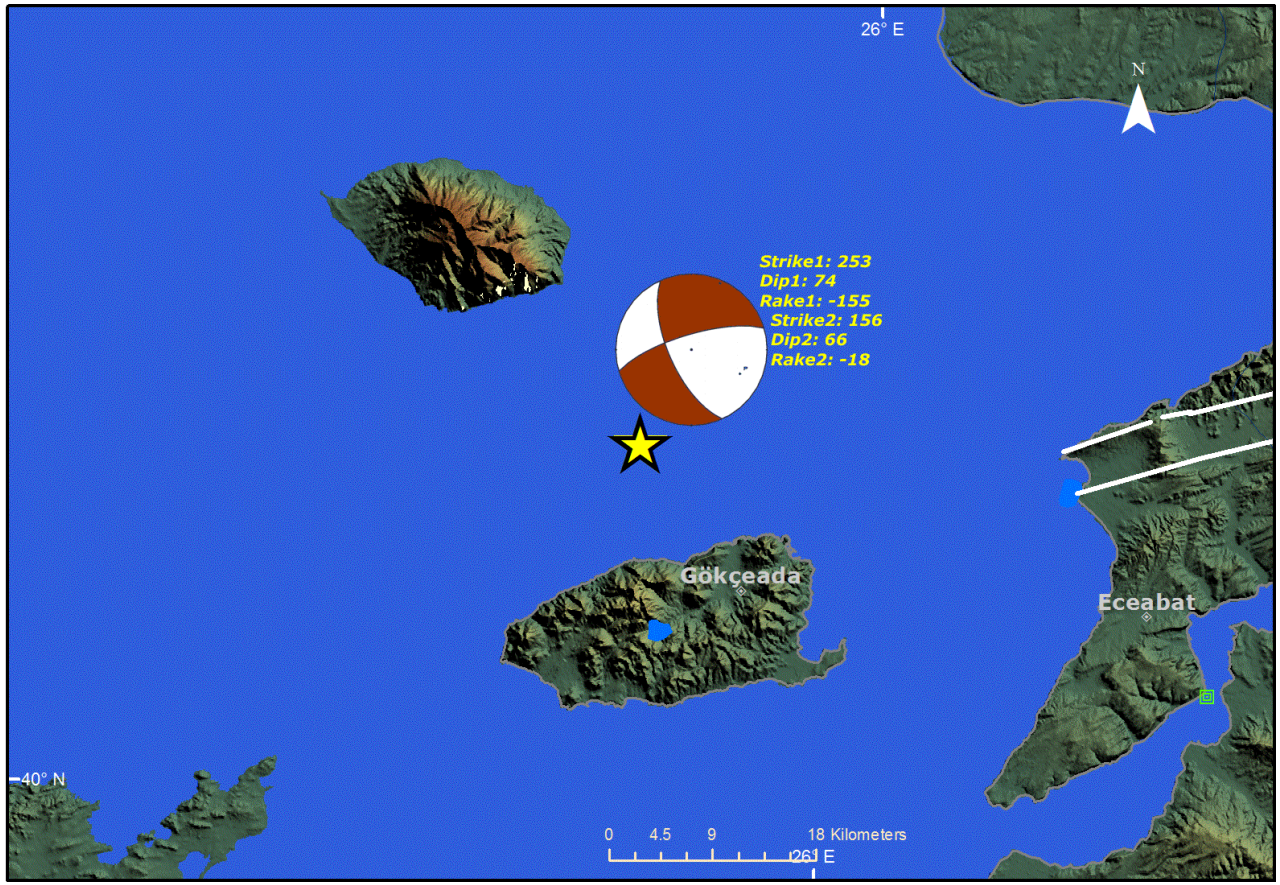

Fig. 2. Focal Mechanism Solution of Aegean Sea earthquake

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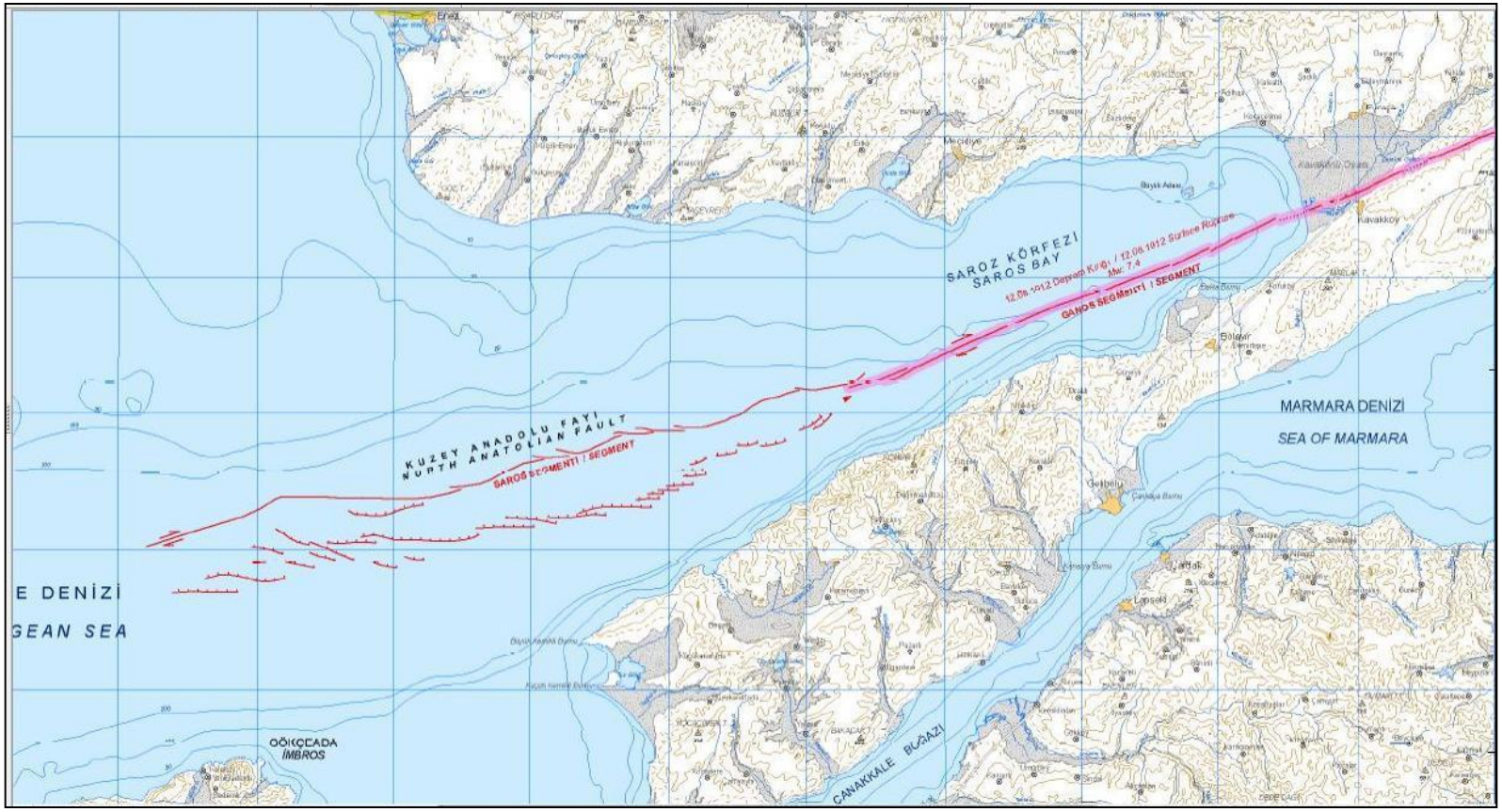

Fig. 3. Tectonic Structure of Ganos Fault (taken from MTA,2013 Active Fault Map)

AEGEAN SEA EARTHQUAKE (Ml=5.3)

REFERENCE	DATE	TIME	LATITUDE	LONGITUDE	DEPTH	Ms
Ambraseys-Finkel	09.08.1912	01:29:00.00	40.7500	27.2000		7.4
Ambraseys-Finkel	10.08.1912	09:22:00.00	40.7500	27.2000		6.2
Ambraseys-Finkel	13.08.1912	23:32:00.00	40.7000	27.0000		6.8
EsenAlsan	20.08.1917	23:02:09.60	40.3000	25.4300	40.0	6.0
EsenAlsan	18.11.1919	21:54:50.30	39.2600	26.7100	10.0	7.0
EsenAlsan	04.01.1935	14:41:30.40	40.4000	27.4900	30.0	6.4
EsenAlsan	04.01.1935	16:20:04.60	40.3000	27.4500	20.0	6.3
EsenAlsan	22.09.1939	00:36:36.60	39.0700	26.9400	10.0	6.6
EsenAlsan	06.10.1944	02:34:48.70	39.4800	26.5600	40.0	6.8
EsenAlsan	18.03.1953	19:06:16.10	39.9900	27.3600	10.0	7.2

Table 1. Instrumental period earthquakes of Aegean Region

AEGEAN SEA EARTHQUAKE (Ml=5.3)

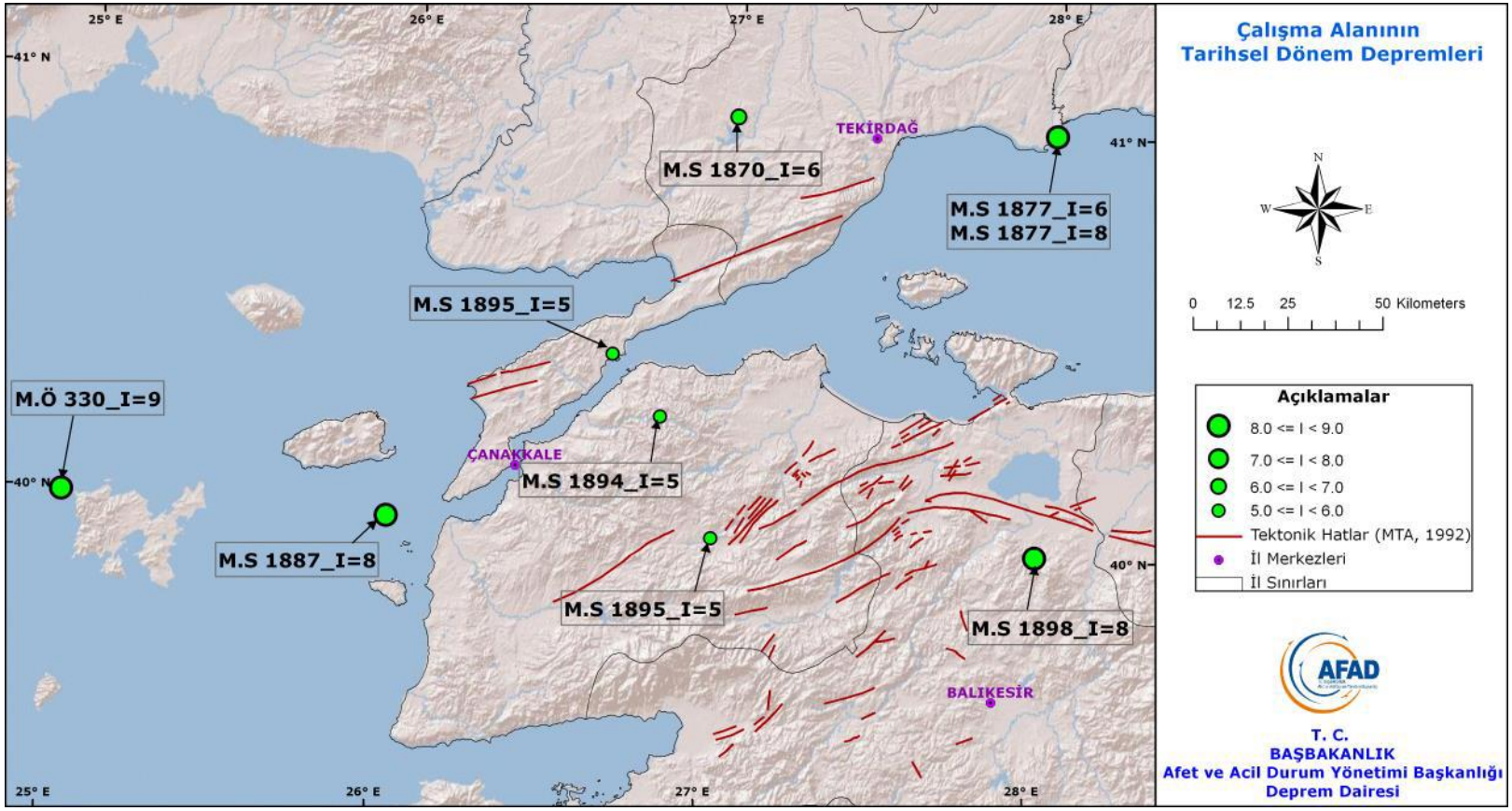

Figure 4. Historical Period Earthquakes of Aegean Region

AEGEAN SEA EARTHQUAKE (Ml=5.3)

STATION			Lat	Lon	Altitude (m)	Type of Acc	Acceleration Values (gal)			Distance R_{epi}(km)	Share Wave Velocity V_{S30} (m/sec)
No	CITY	TOWN					NS	EW	UD		
1	Çanakkale	GOKCEADA	40,19082	25,90783	78	GMSplus	86,59	74,43	60,11	16	
2	Edirne	ENEZ	40,72448	26,08731	15	CMG-5TD	6,13	13,35	3,53	53	
3	Çanakkale	MERKEZ	40,14145	26,39948	1	CMG-5TD	7,85	7,59	3,99	55	192
4	Çanakkale	MERKEZ_2	40,16216	26,41166	53	GMSplus	4,39	5,84	3,31	55	
5	Çanakkale	BOZCAADA	39,8419	26,0528	195	CMG-5TD	2,92	4,38	2,14	56	
6	Çanakkale	GELIBOLU	40,42334	26,66715	40	CMG-5TD	9,78	6,98	2,56	75	286
7	Çanakkale	EZINE	39,77388	26,34563	68	GMSplus	2,7	2,46	1,65	76	403
8	Tekirdağ	SARKOY	40,61485	27,12256	10	CMG-5TD	5,87	5,91	3,38	118	225
9	Çanakkale	BIGA	40,23182	27,26288	24	CMG-5TD	3,01	2,84	1,14	125	304
10	Çanakkale	KARABIGA	40,40421	27,30613	6	GMSplus	2,24	1,94	0,98	129	683
11	Balıkesir	EDREMIT	39,58952	27,01924	22	CMG-5TD	3,45	2,59	2,37	132	223
12	Çanakkale	YENICE	39,92916	27,25908	275	GMSplus	4,13	3,44	1,37	132	324
13	Balıkesir	AYVALIK	39,31134	26,68601	4	CMG-5TD	2,96	2,98	1,89	135	387
14	Balıkesir	GONEN	40,11399	27,64236	33	CMG-5TD	1,25	1,41	0,63	159	397
15	Edirne	MERKEZ	41,67049	26,58585	67	CMG-5TD	1,54	1,39	0,72	166	
16	Balıkesir	EDINCIK	40,33601	27,86104	174	GMSplus	2,47	2,24	0,94	176	330
17	İzmir	BERGAMA	39,10957	27,17064	52	GMSplus	0,47	0,32	0,22	178	
18	Balıkesir	BANDIRMA	40,33193	27,99662	61	CMG-5TD	2,46	2,66	1,54	187	321

Figure 5. Acceleration values of Aegean Sea earthquake

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19	Balıkesir	SAVASTEPE	39,38041	27,65438	284	CMG-5TD	0,79	0,91	0,39	190	
20	Balıkesir	MERKEZ	39,65499	27,86204	158	CMG-5TD	1,51	1,62	0,59	191	456
21	Balıkesir	MERKEZ_2	39,64966	27,85715	262	CMG-5TD	1,77	1,06	0,61	191	662
22	Tekirdağ	CORLU	41,1418	27,77633		GMSplus	1,97	1,96	1,03	191	
23	İzmir	KINIK	39,0883	27,37472	71	GMSplus	0,3	0,35	0,26	192	558
24	İzmir	KARABURUN	38,63903	26,51277	60	CMG-5TD	0,69	0,47	0,37	195	
25	İzmir	ALIAGA	38,79629	26,96323	17	GMSplus	0,87	0,64	0,33	196	
26	Tekirdağ	M. EREGLISI	40,97297	27,95033	15	GMSplus	1,39	1,79	0,4	196	325
27	Kırklareli	MERKEZ	41,73774	27,21509	218	CMG-5TD	0,97	0,87	0,65	199	
28	İzmir	FOCA	38,66241	26,75856	13	GMSplus	2,02	1,47	0,53	201	328
29	İzmir	MENEMEN	38,57823	26,97953	6	CMG-5TD	0,75	0,51	0,34	218	
30	Bursa	M. KEMAL PASA	40,03471	28,39392	41	CMG-5TD	1,04	1,24	0,42	224	265
31	İstanbul	SILIVRI	41,07339	28,25569	31	CMG-5TD	0,57	0,64	0,3	224	639
32	İzmir	CESME	38,30393	26,37256	17	CMG-5TD	0,48	0,29	0,29	228	
33	İzmir	MAVISEHIR	38,46792	27,07636	1	CMG-5TD	0,84	1,13	0,3	233	145
34	Manisa	MERKEZ	38,61259	27,38138	106	CMG-5TD	0,21	0,4	0,23	233	340
35	İzmir	BALCOVA	38,409	27,043	3	CMG-5TD	0,68	0,6	0,19	237	313
36	İzmir	MANAVKUYU	38,478	27,2111	184	CMG-5TD	0,26	0,3	0,15	238	875

Figure 6. Acceleration values of Aegean Sea earthquake

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37	İzmir	BORNOVA	38,45302	27,22444	35	CMG-5TD	0,56	0,44	0,18	241	270
38	İzmir	PINARBASI	38,4213	27,2563	76	CMG-5TD	0,26	0,26	0,16	245	827
39	Balıkesir	DURSUNBEY	39,57798	28,63232	649	CMG-5TD	0,29	0,34	0,24	257	561
40	Yalova	ARMUTLU	40,51305	28,82662	6	GMSplus	0,92	0,92	0,23	258	
41	Bursa	MUDANYA	40,35095	28,92815	34	CMG-5TD	0,67	0,38	0,25	266	
42	Bursa	Merkez	40,22566	29,07518	91	ETNA	1,46	0,1	0,47	279	249
43	Yalova	CINARCIK	40,6422	29,13062	59	GMSplus	0,34	0,21	0,27	284	
44	Bursa	KELES	39,91509	29,23167	1060	CMG-5TD	1,42	0,96	0,38	297	401
45	Bursa	ORHANGAZI	40,42236	29,2907	132	GMSplus	1,03	0,91	0,53	297	348
46	Aydın	KUSADASI	37,85997	27,26501	24	CMG-5TD	0,22	0,18	0,16	301	369
47	Kütahya	EMET	39,33612	29,24905	853	CMG-5TD	0,38	0,45	0,25	316	304
48	Kocaeli	KARAMURSEL	40,6844	29,5888	30	CMG-5TD	0,36	0,41	0,29	323	300
49	Bursa	IZNIK	40,42923	29,71682	95	CMG-5TD	0,49	0,58	0,29	333	251
50	İstanbul	SILE	41,17189	29,60816	50	CMG-5TD	0,46	0,47	0,33	334	
51	Kocaeli	GOLCUK	40,7245	29,84	10	CMG-5TD	0,42	0,56	0,25	344	352
52	Kocaeli	YUVACIK_B	40,68038	29,96998	109	CMG-5TD	0,07	0,07	0,04	355	757
53	Kocaeli	YUVACIK_G	40,67441	29,96935	177	CMG-5TD	0,25	0,45	0,24	355	289
54	Eskişehir	INONU	39,81749	30,146	832	CMG-5TD	0,84	0,7	0,13	376	274

Figure 7. Acceleration values of Aegean Sea earthquake

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55	Denizli	ASAGISAMLI	37,91337	29,03804	156	CMG-5TD	0,11	0,1	0,09	390	
56	Eskişehir	MERKEZ	39,77133	30,4017	836	CMG-5TD	0,22	0,18	0,07	399	
57	Eskişehir	EMIRCE KOYU	39,88012	30,45341	967	CMG-5TD	0,08	0,09	0,08	401	629
58	Eskişehir	BATIKENT	39,78828	30,44295	806	CMG-5TD	0,36	0,35	0,22	402	

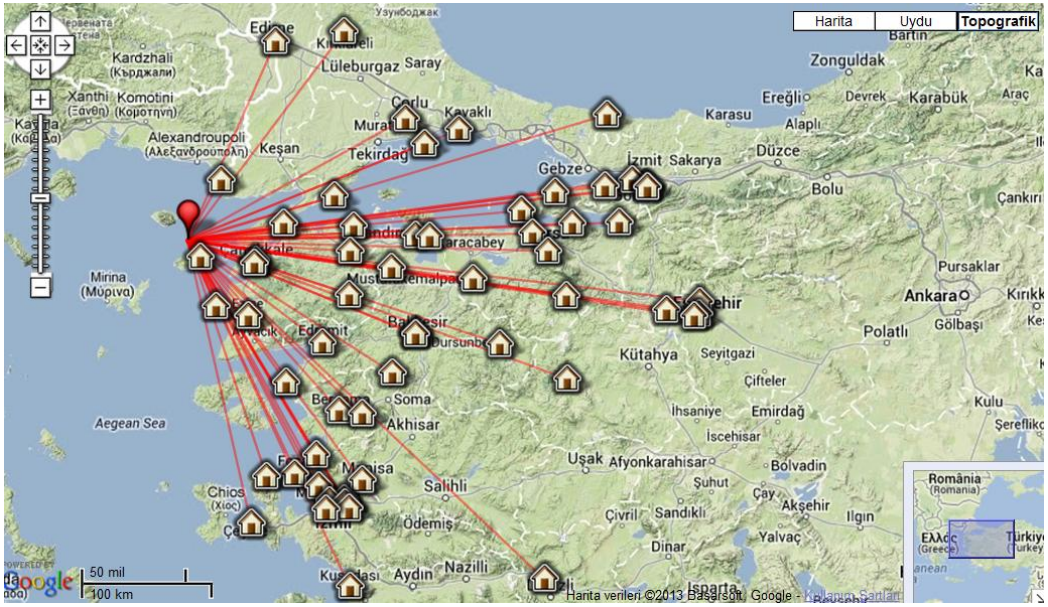

Figure 8. Distribution of accelerometer stations recorded during the Aegean Sea Earthquake. and acceleration values

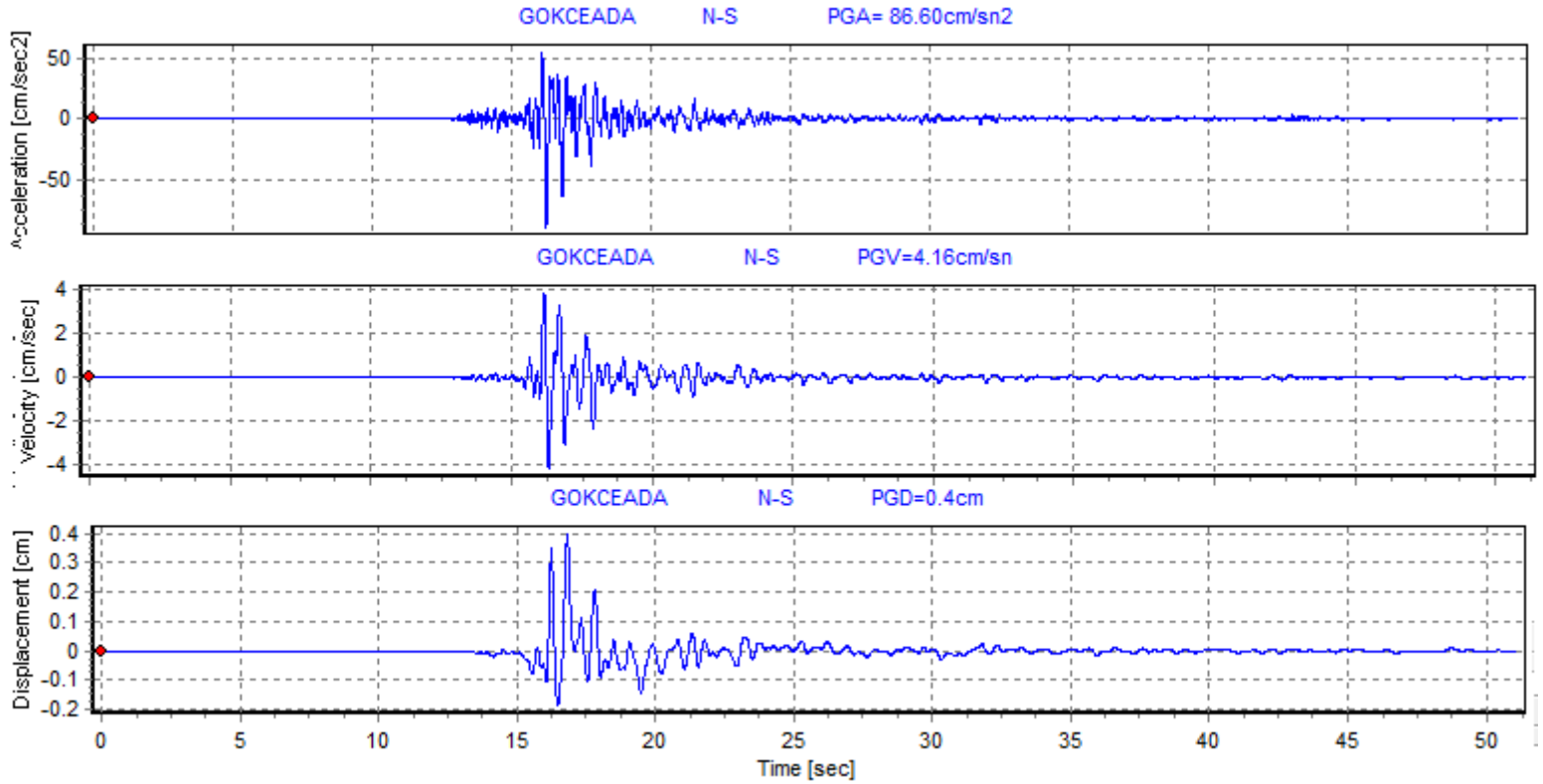

Figure 9. Wave forms of PGA, PGV and PGD applied base line correction and 0.1-25 Hz Butterworth Band Pass filter for Gökçeada Station (N-S component).

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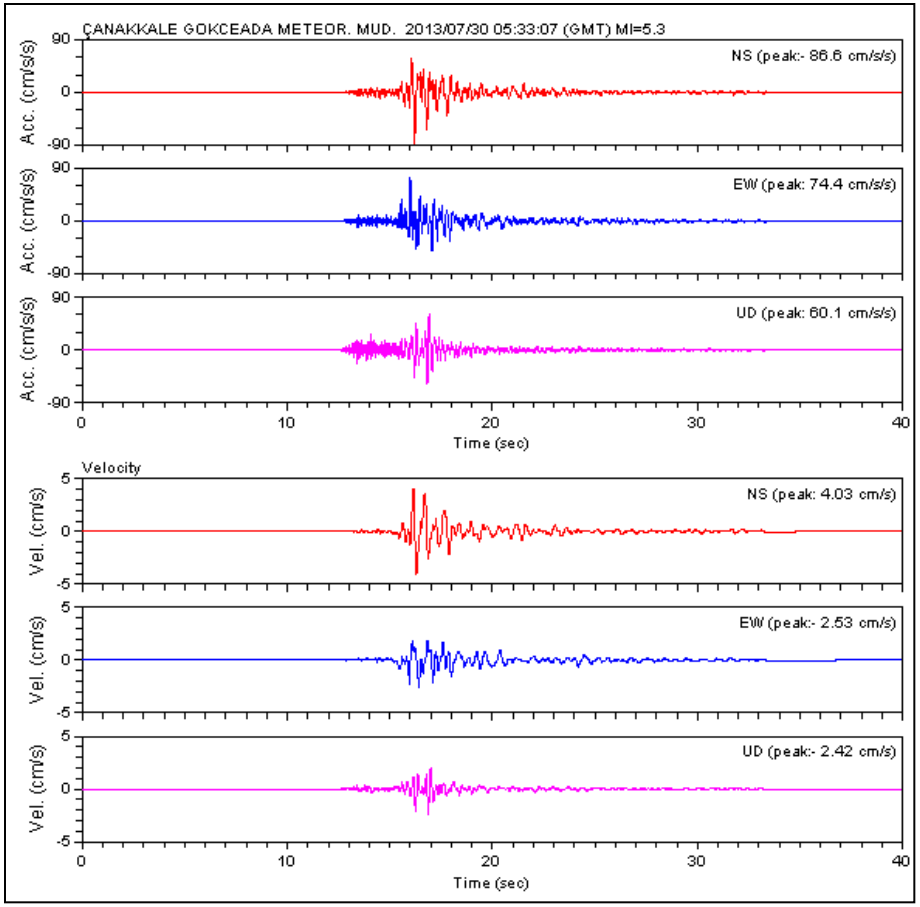

Figure 10. Wave forms of PGA, PGV for Gökçeada Station

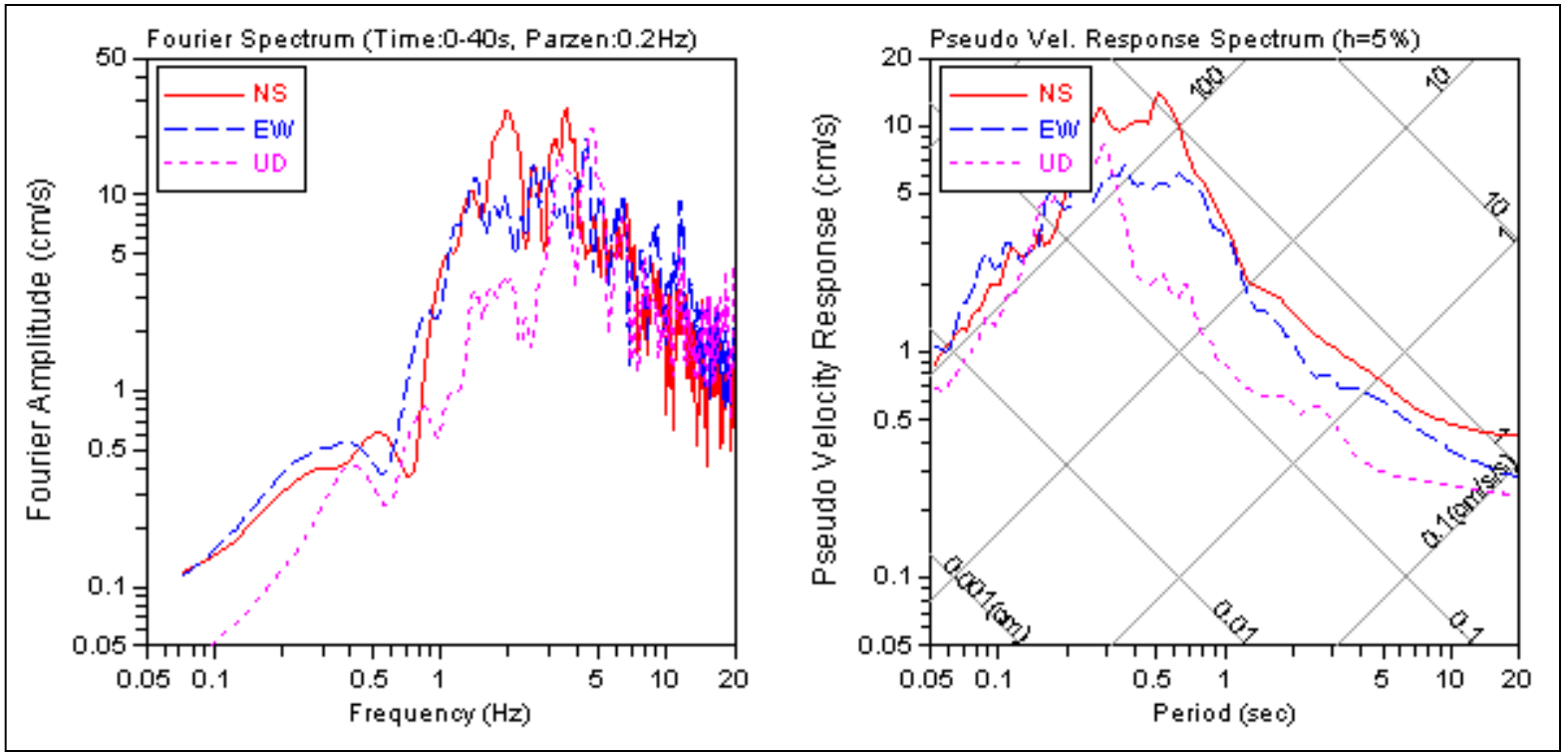

Figure 11. Fourier&Responce Spectrum recorded by Çanakkale-Gökçeada Station

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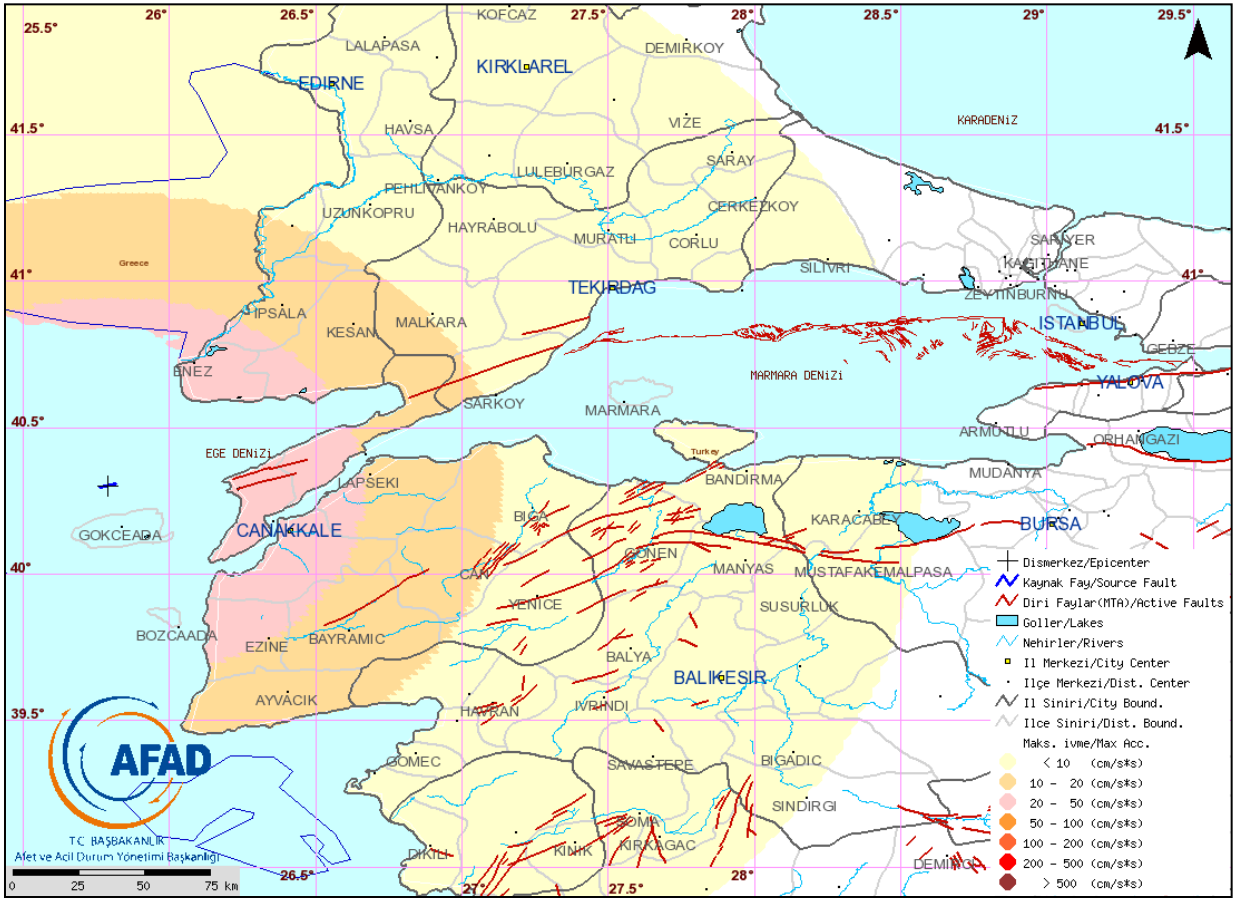

Fig.12. Peak Ground Accelaration Distribution of Eagean Sea Earthqauke (Ml=5.3)

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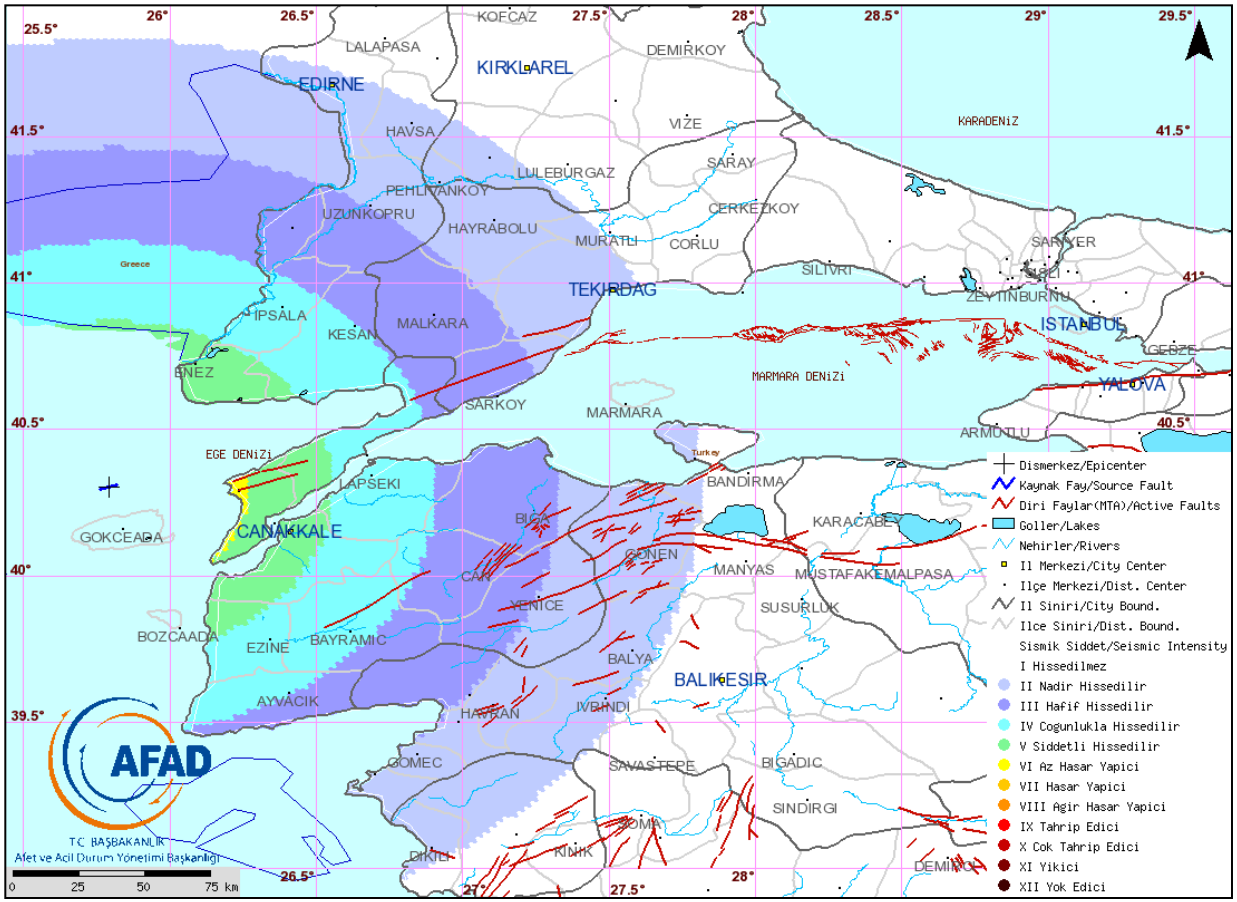

Fig.13. Seismic Intensity Map of Aegean Sea Earthquake (Ml=5.3)

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