



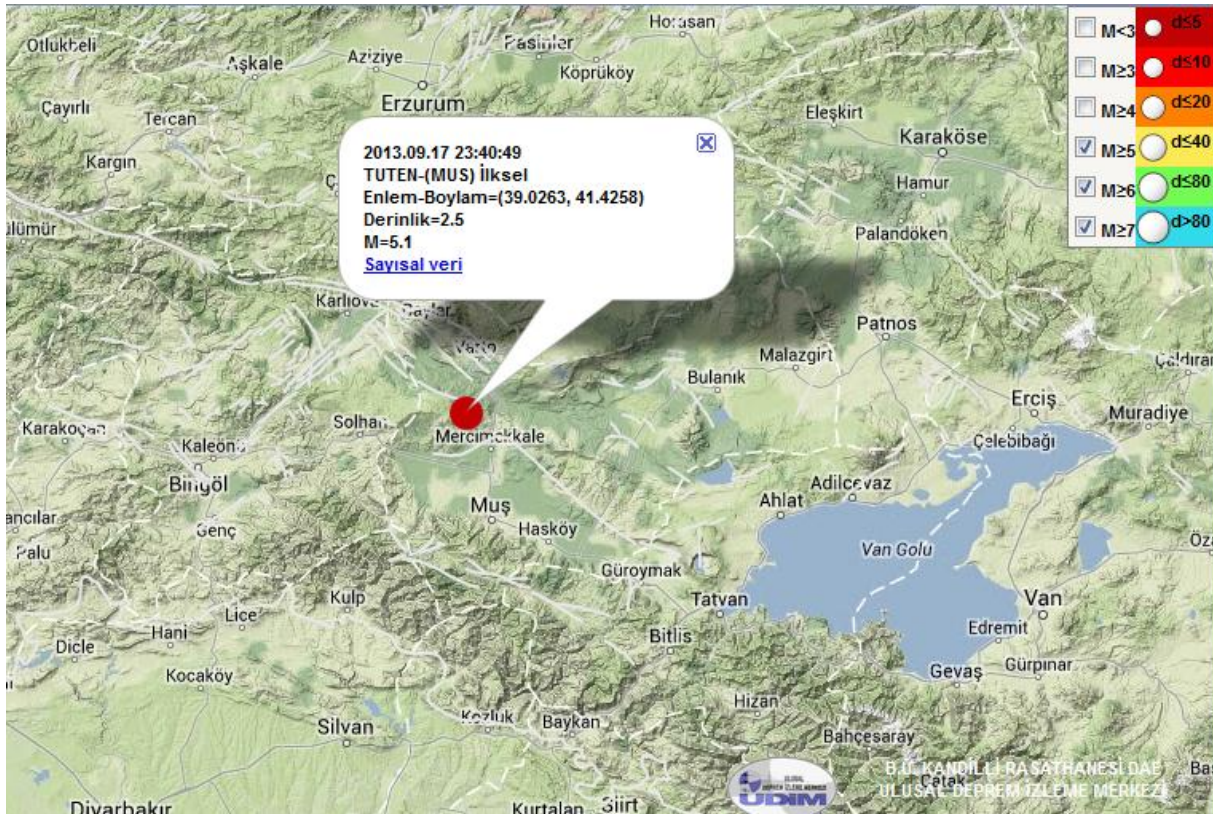
B.U. KANDİLLİ OBSERVATORY and E.R.I. NATIONAL EARTHQUAKE MONITORING CENTRE

SEPTEMBER, 17, 2013 MUŞ-TÜTEN EARTHQUAKE (Mw=5.1): EASTERN TURKEY

PRELIMINARY REPORT

A moderate size earthquake with magnitude $M_l=5.1$, $M_w=5.1$ occurred at local time 23:40 on September, 17, 2013. Epicentral coordinates of the earthquake was determined as 39.0263 N - 41.4258 E. The magnitude of earthquake was identified with National Earthquake Monitoring Center (NEMC) network and AFAD. The earthquake was felt in Muş and surrounding region, Bitlis, Erzurum and Ağrı. It didn't caused loss of life and damage. Search and rescue and medical teams have been shipped to the epicenter of the earthquake Tüten village.

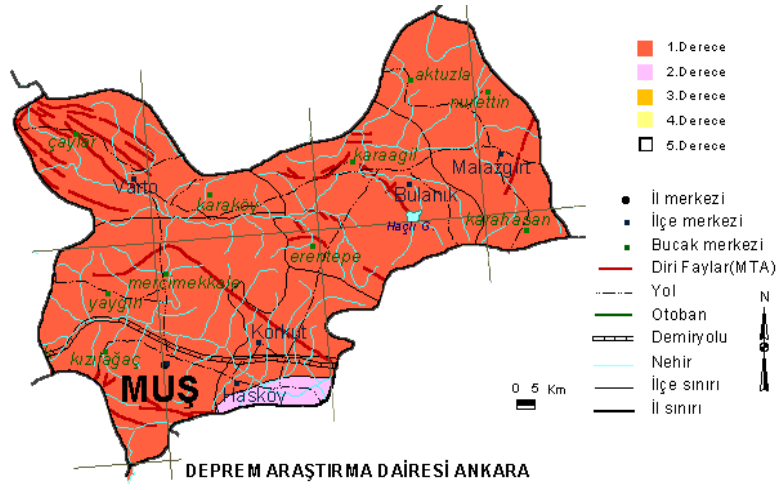
Preliminary Earthquake Parameters:



Just right after this earthquake, 19 small sized aftershocks were determined with magnitude range 1.2- 3.7 near Tüten village and Bahçeköy. As will be remembered an earthquake with $M_l=4.5$ occurred at local time 13:31 on September, 16, 2013 in the same area.

TECTONIC AND SEISMOLOGIC SETTINGS

Muş and the surrounding region is in the 1st degree of earthquake zone, and is a seismologically active area with important earthquakes.



Location of Muş in the earthquake zonation map.

(Reference: BİB-DAD, 1996)

During the instrumental period important earthquakes occurred in the region specially in Malazgirt, Varto, Hınıs and Çaldıran. But there is no important earthquake occurred in Tüten.

Instrumental period earthquakes that occurred in the last century

31.5.1946 Varto-Hınıs Eartquake (Ms=5.7; Io= VIII) : The mainshock and the aftershocks of the earthquake have affected 1500 people and 2000 buildings. 833 people have lost their lives, 349 people have injured, 1991 buildings have collapsed (Eyidoğan et. al., 1991).

27.8. 1950 Varto Eartquake (Mw=5.2; Io=VII) : Eartquake has affected Erzurum, Muş and Bingöl. 2 people were dead 5 were injured.

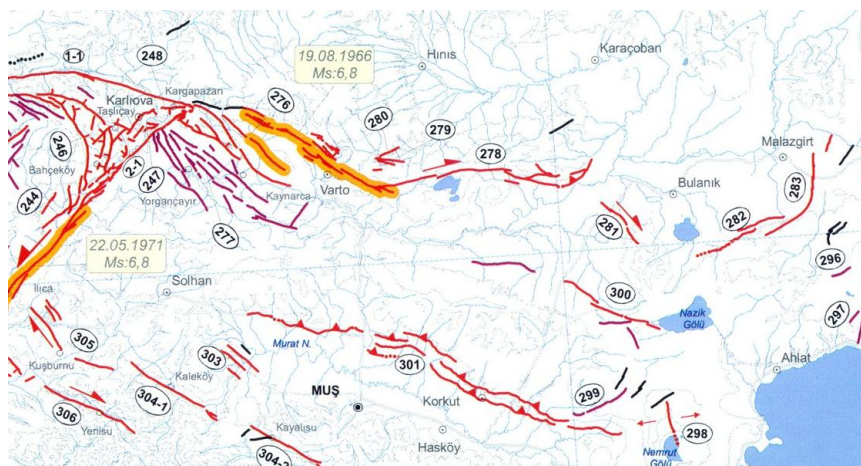
25.10.1959 Varto-Hınıs Eartquake (Mw=5.3; Io= VIII) : Has affected Hınıs and villages. 12 people died and 15 injured. More than 1000 building have damaged, fifty one has totally collapsed. (Eyidoğan et. al., 1991).

7.3.1966 Varto-Hınıs Eartquake (Mw=5.6; Io= VIII) : Earthquake has destructed Muş-Varto Erzurum-Hınıs, and Tekman. 15 loss of life, 25 injuries, more than 7500 damaged buildings (Eyidoğan et. al., 1991).

19.8.1966 Varto Eartquake (Ms=6.8; Io= IX) : The mainshock and the aftershocks of the earthquake have affected 21700 people and 34000 buildings. More than 100 000 people have lost their houses. More than 19000 adobe buildings have damaged and 2529 people have lost their lives, 1500 people have injured. Big landslides ocuored after the earthquake.

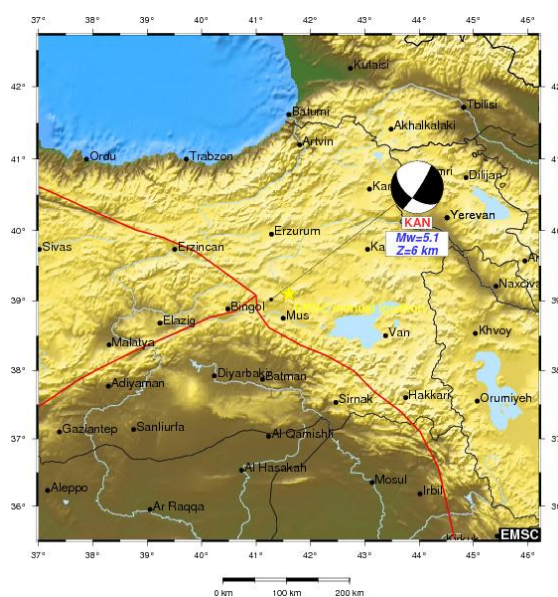
27.3.1982 Bulanık-Muş Eartquake (Ms=5.1; Io= VII) : Eartquake has damaged 8 villages of Bulanık county. Damage concentrated in Dokuzpınar, Bostancılar, Doğantepe, Depirkapı, Meşeici, Pekme, Koyunbağılı. 30 buildings have damaged in Dokuzpınar. (Eyidoğan et. al., 1991).

The region is a complex deformation area under the influence of North Anatolian Fault Zone and East Anatolian Fault Zone. That is why the earthquakes occur in the area are characterized by strike-slip faulting.



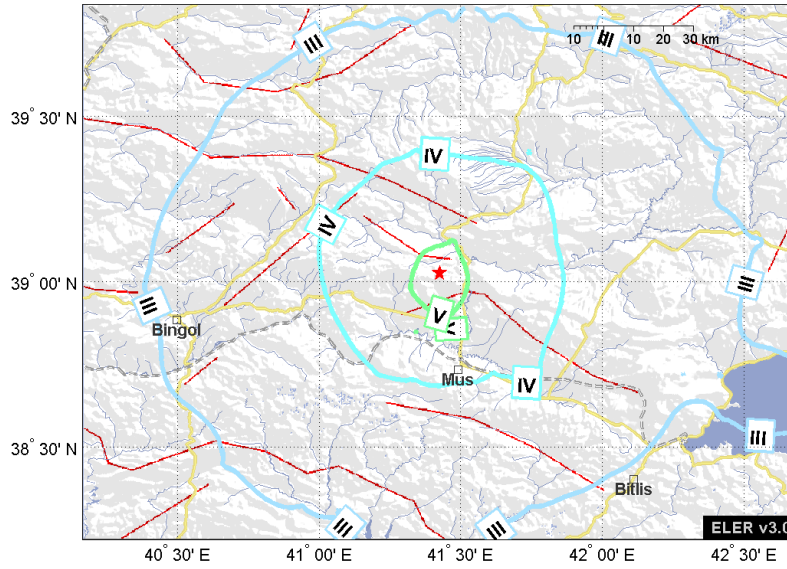
Active Faults in the region
(MTA, 2013 Active Faults; Emre et. al., 2013)

Fast Focal Mechanism Solutions performed by NEMC shows that the fault which caused the earthquake is right lateral strike slip.



Focal mechanism solution of 17.09.2013 Muş earthquake
(Mw=5.1) according to MT Solution by KOERI

M5.1 Depth= 2.5 Lat= 39.0263 Lon= 41.4258
Map of: INTENS



Boğaziçi Üniversitesi									
Kandilli Rasathanesi ve Deprem Araştırma Enstitüsü									
Hissedilen sarsıntı	Hissedilmez	Zayıf	Hafif	Orta	Güçlü	Çok Güçlü	Şiddetli	Çok Şiddetli	Aşırı Şiddetli
Potansiyel Hasar	Hasarsız	Hasarsız	Hasarsız	Çok Hafif	Hafif	Orta	Ortal/Ağır	Ağır	Çok Ağır
Aletsel Şiddet	I	II-III	IV	V	VI	VII	VIII	IX	X-XI

Seismic intensity map created right after September, 17, 2013 Muş earthquake. $I_0=V$ in the earthquake-epicenter area and its vicinity.

Such moderate earthquakes occur time to time in the region. Muş and the surrounding region is in the 1st degree of earthquake zone, so the safest precaution to be taken against disaster for the citizens living in the area will be to live in or buy earthquake-resistant buildings.