Earthquake Information Report
(4 March 2024 Yenice-Gönen Earthquake M4.9)

Table 1. Major features of the earthquake (KOERI)

Magnitude	4.9
Country	Yenice-Gönen (Balıkesir)
Date Time	2024-03-04 18:38:55.0 UTC
Epicenter	39.977°N,27.443°E
Depth	14 km

Table 2.Important urban settlements in the earthquake affected region

Nearby Settlements and Their Populations
Gönen, Türkiye , 13 km, population: 75,572
Çan, Türkiye, 40 km, population: 47,624
Balya, Türkiye, 36 km, population: 13000
Biga, Türkiye, 30 km, population: 93,778
Manyas, Türkiye, 39 km, population: 18,599

An earthquake of magnitude M4.9 occurred 13 km SW of Gönen, Balıkesir on March 4th, 2024, at 18:38 (UTC). The event is located on the Yenice-Gönen fault zone ruptured by the 1953 earthquake (M7.2). The earthquake parameters reported are given in Table 1 while Table 2 shows the densely populated urban settlements near the earthquake epicenter. The location of the event is shown in Figure 1. The event was largely felt in Balıkesir, Çanakkale, Manisa, Bursa, İstanbul, Tekirdağ, and İzmir provinces.

The North Anatolian Fault Zone (NAFZ) extends as a narrow deformation zone from the Karlıova triple junction to Mudurnu Valley. Then it splays into three branches, namely the northern, middle, and southern branches of NAFZ. The seismicity around the middle and southern branches is shown in Figure 2.

The temporal distribution of the events of magnitüde M>2.5 since 2004 reported by Kandilli Observatory and Earthquake Research Institute (KOERI) is used to indicate the number of events taking place each year. The frequency of the events within each magnitüde bin is indicated by different colors. Note the decrease in the seismicity rate from 2010 to 2013 and the almost constant rate since then (Figure 2). It is noteworthy to state the increase of the seismicity along the middle and southern branches of NAF since the December 4, 2023, M5.1 Mudanya earthquake.

The southern branch where the recent M4.9 event took place accommodated two large earthquakes in the last century; the 1953 Yenice-Gönen (M7.2) and the 1964 Karacabey-Manyas (M6.9) earthquake. Yet another earthquake on the southern branch had been the February 28, 1855, major event (M7.0) that ruptured faults near Bursa City. The largest aftershock occurred on April 11, 1855 (M6.6) which ruptured the fault segments on the middle strand affecting the region between Gemlik Bay and Mudanya.

The middle branch of NAF extends from Mudurnu Valley toward Geyve, Lake Iznik, and Gemlik Bay and follows the southern shoreline of the Sea of Marmara. Besides the largest aftershock of the 1855 Bursa event, the middle branch has been seismically quiet for several hundreds of years. As already pointed out, recently noticeable seismic activity emerged along the middle branch of NAF between Gemlik (Bursa) and Biga (Canakkale).

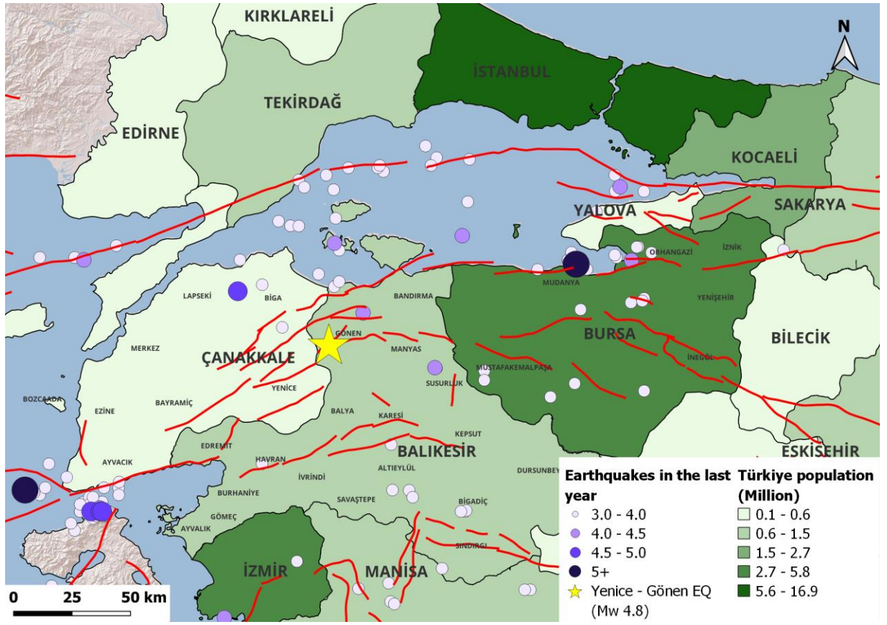
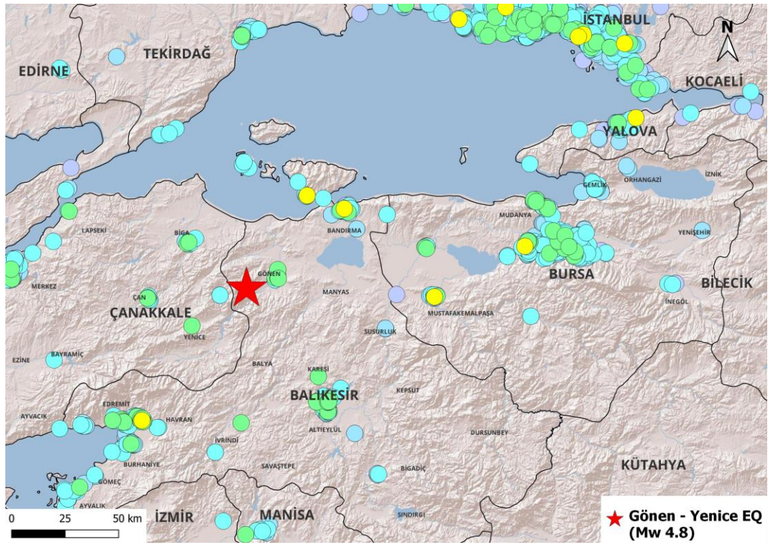


Figure 1. The seismic activity of the region during the last year. Epicentral locations of the March 4, 2024, Yenice-Gönen earthquake (M4.8) shown by yellow star.



Intensity	Shaking
I	Not Felt
II	Weak
III	Weak
IV	Light
V	Moderate
VI	Strong
VII	Very Strong
VIII	Severe
IX	Violent
X	Extreme

Figure 3. MMI map of the earthquake affected region based on felt reports acquired by EMSC-CSEM.

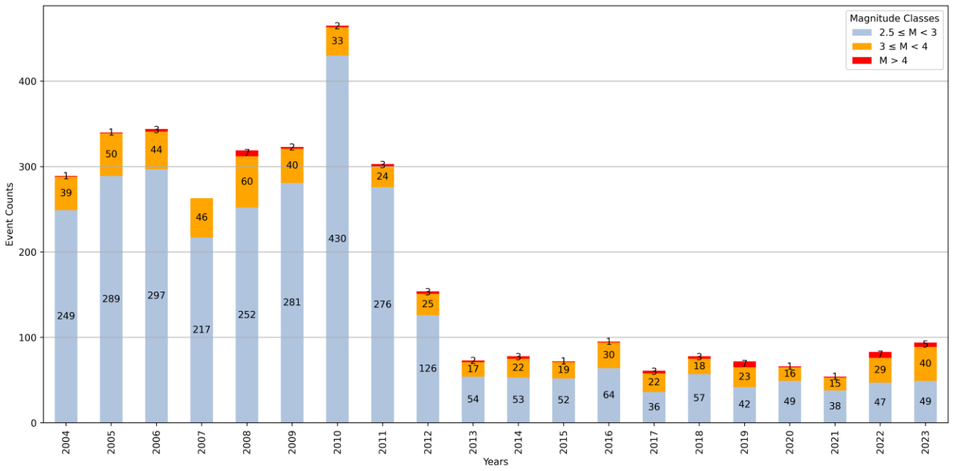


Figure 2. The temporal distribution of the events taking place arround the middle and southern branch of North Anatolian Fault zone. Shown are the earthquakes of magnitüde M>2.5 since 2004 as reported by Kandilli Observatory and Earthquake Research Institute (KOERI). The frequency of the events within each magnitüde bins are showin by different colors. Note the decrease in the seismicity rate from 2010 to 2013 and the almost constant rate since then.

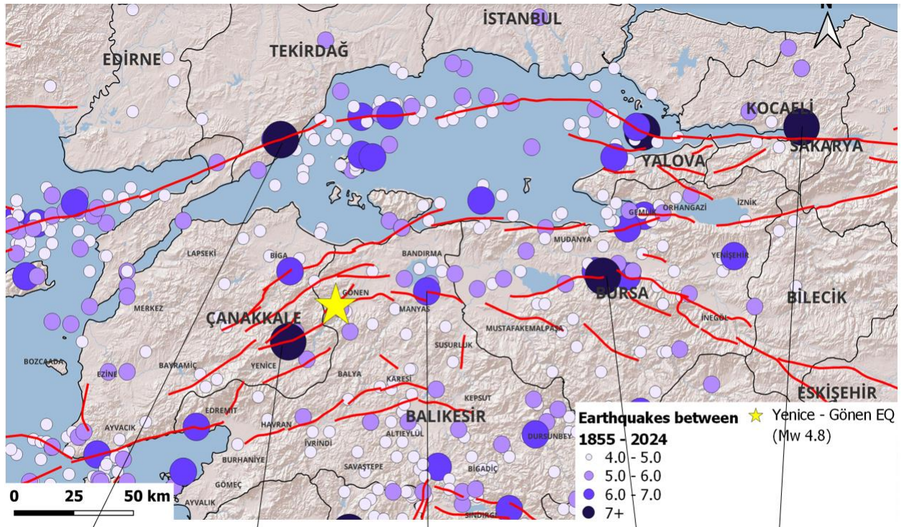


Figure 4. The seismic activity of the region during the last 169 years(1855 – 2024).

Figure 4. The seismic activity of the region during the last 100 years.