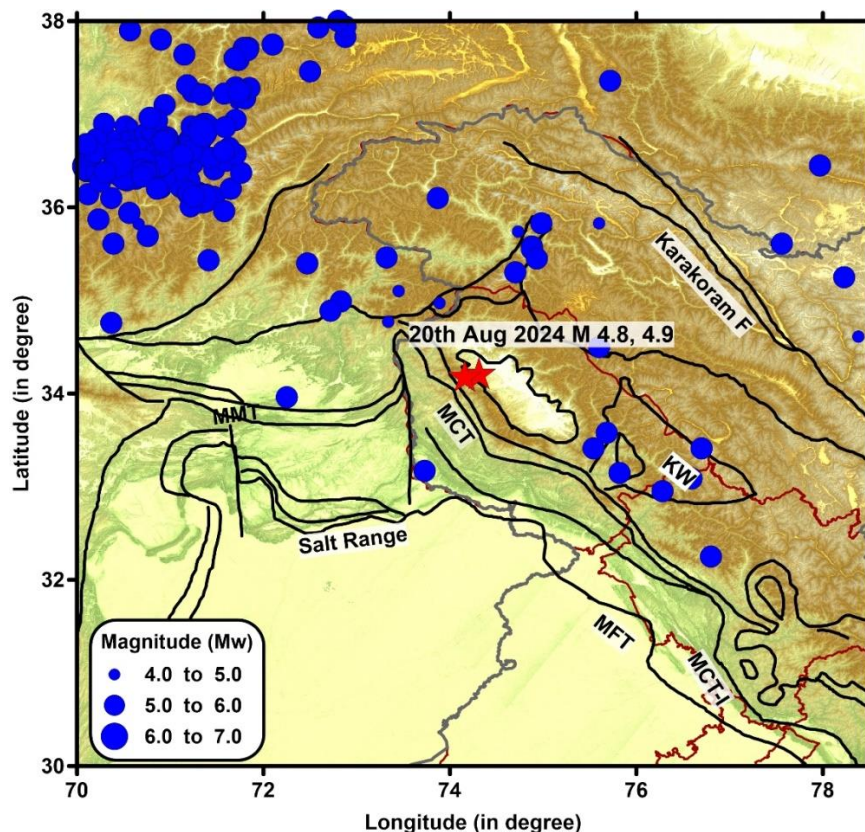


## Report on Twin Moderate Earthquakes of M:4.9 & M:4.8 in Jammu and Kashmir on August 20, 2024

Two moderate-magnitude earthquakes were recorded today (20<sup>th</sup> August 2024), in the Baramulla district of Jammu and Kashmir within a span of approximately seven minutes. The first earthquake, with a magnitude of M:4.9, occurred at 06:45:57 IST, with an epicenter at 34.17° N and 74.16° E at a focal depth of 5 km. This epicenter was approximately 60 km northwest of Srinagar. The second event, with a magnitude of M:4.8, followed at 06:52:29 IST. This epicenter was 34.20° N and 74.31° E with a focal depth of 10 km (**Figure 1**).

Both earthquakes occurred within Seismic Zone V, as delineated by the seismic zoning map of India, indicating a high seismic hazard. Both earthquakes had their epicenters along the Main Central Thrust (MCT), a major NW-SE trending fault line in the Himalayan region. The MCT is a significant tectonic boundary where the Indian Plate is being thrust beneath the Eurasian Plate, leading to frequent seismic activity in the region. Historical data from the past decade show a consistent pattern of seismic events with magnitudes greater than 4.0 in this vicinity, highlighting the area's vulnerability to earthquakes (**Figure1**).



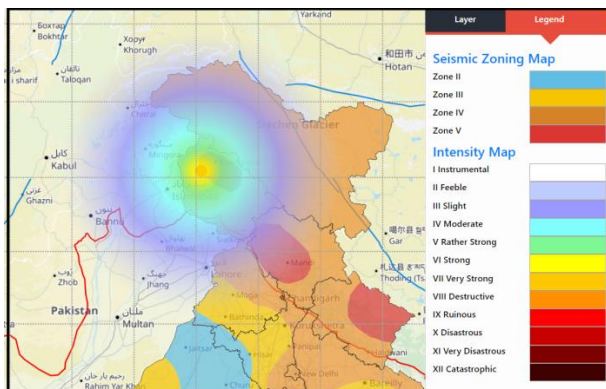
**Figure 1:** Map showing the location of earthquake of M:4.9 and M:4.8 (Red Star) occurred on 20<sup>th</sup> August 2024 at Baramulla District, Jammu and Kashmir. The continuous thick black lines are the major fault system in the epicentral region. Filled blue circles are the last 10-year event occurred in surrounding region to today events.

Preliminary analysis of the fault plane solutions, derived from waveform inversion, indicates that both earthquakes were predominantly caused by thrust faulting. This suggests that the tectonic stress in the region is being released through compressional forces.

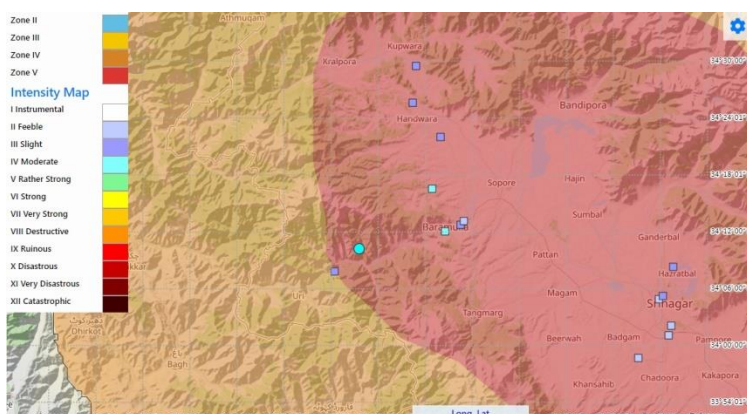
The maximum intensity of M:4.9 earthquake estimated near the source region is MMI VI (**Figure 2**); which typically results in strong shaking felt by most. The tremors were widely felt across Jammu and Kashmir, particularly in areas close to the epicenters. Within two hours of the events, more than 15 felt reports ranging from MMI II to IV were received through NCS website and “BhooKamp” App, indicating light to moderate shaking in the region (**Figure 3**). These earthquakes were relatively shallow, which, combined with their proximity to populated areas, contributed to the noticeable shaking felt by residents in Jammu and Kashmir.

The details of maximum peak ground motion (PGA) recorded, is tabulated below

Site	Maximum PGA	Distance from epicenter (km)
Srinagar	0.006 g	68
Udhampur	0.0006 g	160



**Figure 2:** Expected Intensity map of earthquake of M 4.9 occurred on 20<sup>th</sup> August 2024 at Baramulla District, Jammu and Kashmir.



**Figure 3:** Felt responses (squares) of the 20<sup>th</sup> August 2024 earthquake of M 4.9 (circle) received through [www.seismo.gov.in](http://www.seismo.gov.in) and BhooKamp App.