

# Report on Real Time Earthquake Location

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National Center for Seismology  
Ministry of Earth Sciences  
Government of India

# Report of Earthquakes occurred in the month of October 2020

## 1) Introduction:

National Center for Seismology maintains National Seismological Network of 115 stations each having state of art equipment and spreading all across the country. Using these stations during the period 01<sup>st</sup> -31<sup>st</sup> October 2020 a total number of 161 earthquakes have been located and disseminated from the center, out of which 147 earthquakes has occurred in India and its neighborhood region bounded by the coordinates 0° - 40°N & 60°-100°E.

## 2) Seismicity:

During the period, the density of earthquakes in India and its neighborhood region bounded by the coordinates 0- 40°N & 60-100°E; can largely be seen in Hindu Kush region, North Eastern part of India and south of Andaman Nicobar island region as shown in Fig1.

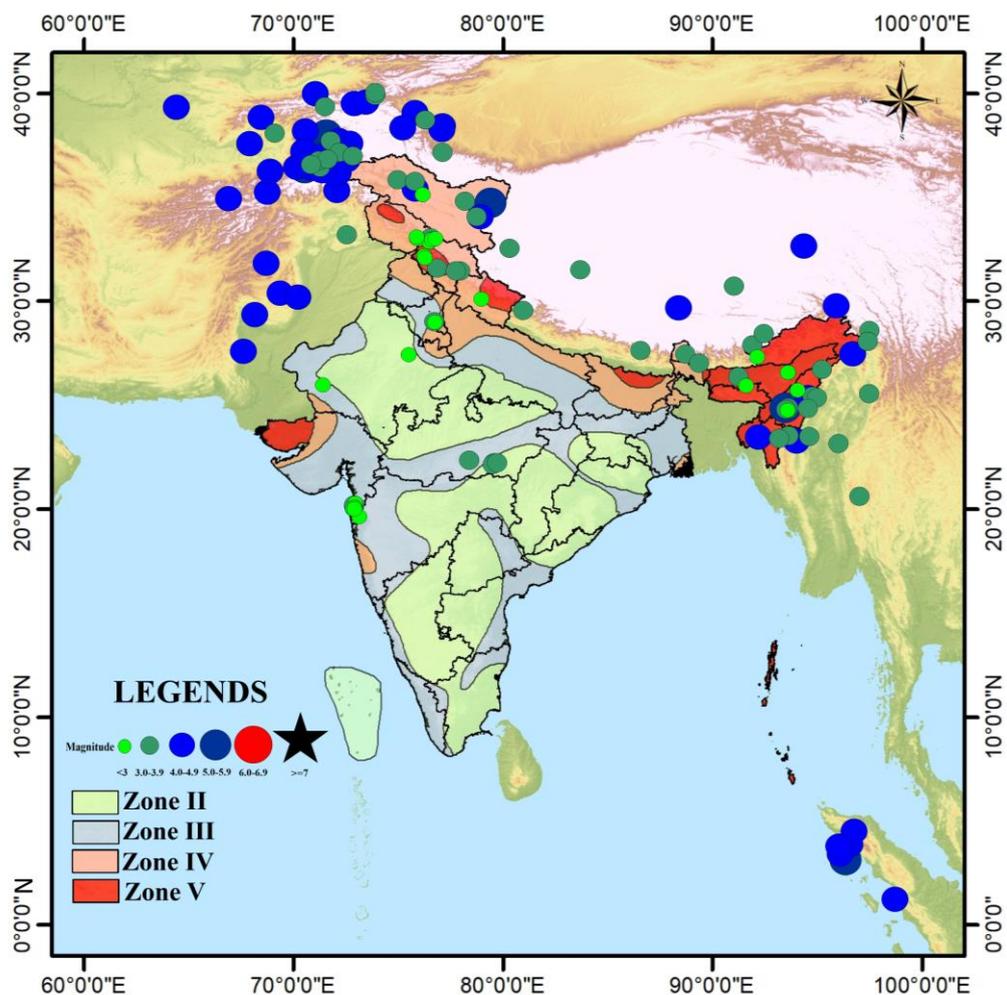


Figure No: 1 Map showing the seismicity during the period 01<sup>st</sup> – 31<sup>st</sup> October 2020 occurred in India and its neighbour region along with the seismic zone of India.

Two small pockets in central India, namely Palghar, Maharashtra and Seoni, Madhya Pradesh were active. Palghar region produced, two earthquakes with magnitude more than three and 12 earthquakes in the range 2.0-2.9 during the month. Another region which was active during the month was Seoni, Madhya Pradesh. Four earthquakes of  $M > 3.0$  occurred during the month, in the region. Since 1950 within 50km radius of this earthquake location, five earthquakes in the range 2.5-3.5 have occurred, the largest earthquake occurred on 01<sup>st</sup> August 2009 (18:49:57) with **ML: 3.5** and epicentre 22.30 °N and 79.70°E.

Out of total 161 earthquakes, 90% of events have magnitude less than 4.9, whereas only nine, six and one earthquakes occurred in the magnitude range 5.0-5.9, 6.0-6.9 and  $>7.0$  respectively, as shown in Fig 2. Detail list of earthquakes occurred during the month is available at <https://seismo.gov.in/>

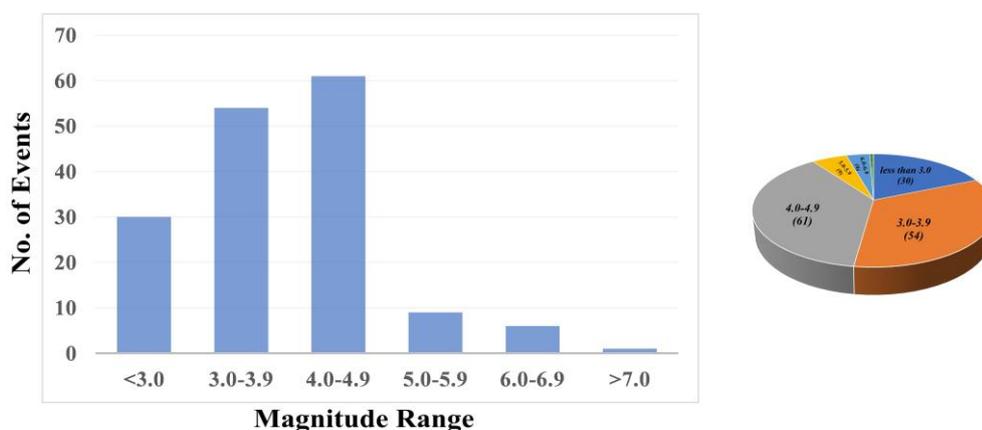


Figure 2: Pie-Chart and Bar-Diagram showing the number of earthquakes (in brackets) occurred in the magnitude range during the period 01<sup>st</sup> – 31<sup>st</sup> October 2020 that was disseminated.

### 3) Significant Earthquakes:

During the period 01<sup>st</sup>-31<sup>st</sup> October 2020 two small pockets in central India, namely Palghar, Maharashtra and Seoni, Madhya Pradesh was active. Apart from this one earthquake each, of magnitude more than five occurred in Tamenglong, Manipur and Ladakh. Other than India one great earthquake of **M 7.3** occurred at South of Alaska on 19<sup>th</sup> October 2020 (20:54:36).

#### 1) Tamenglong, Manipur:

An earthquake of magnitude **M 5.3** occurred on 10<sup>th</sup> October 2020 (23:08:00 IST), near Tamenglong District, Manipur. The epicentre of the earthquake is **24.69°N and 93.47°E** with a focal depth of **28 km**. The epicentre was about 40 km East-North-East (ENE) of Imphal and 30 km West-North-West (WNW) of Bishnupur, and the epicentral area lies in Zone-V as per seismic zoning map of India. The epicentre location and intensity map of the earthquake are given in

Figure 3.

The epicentre of the earthquake lies in the vicinity of Churachandpur Mao Fault (CMF), which is N-S trending strike-slip fault and runs from approximately 22.1°N, 93.1°E to 26.0°N, 93.6°E. The fault-plane solution obtained from waveform inversion suggests that the dominant strike-slip mechanism for the event (Table 1 and Figure 3) and confirm the CMF is the causative source of the event.

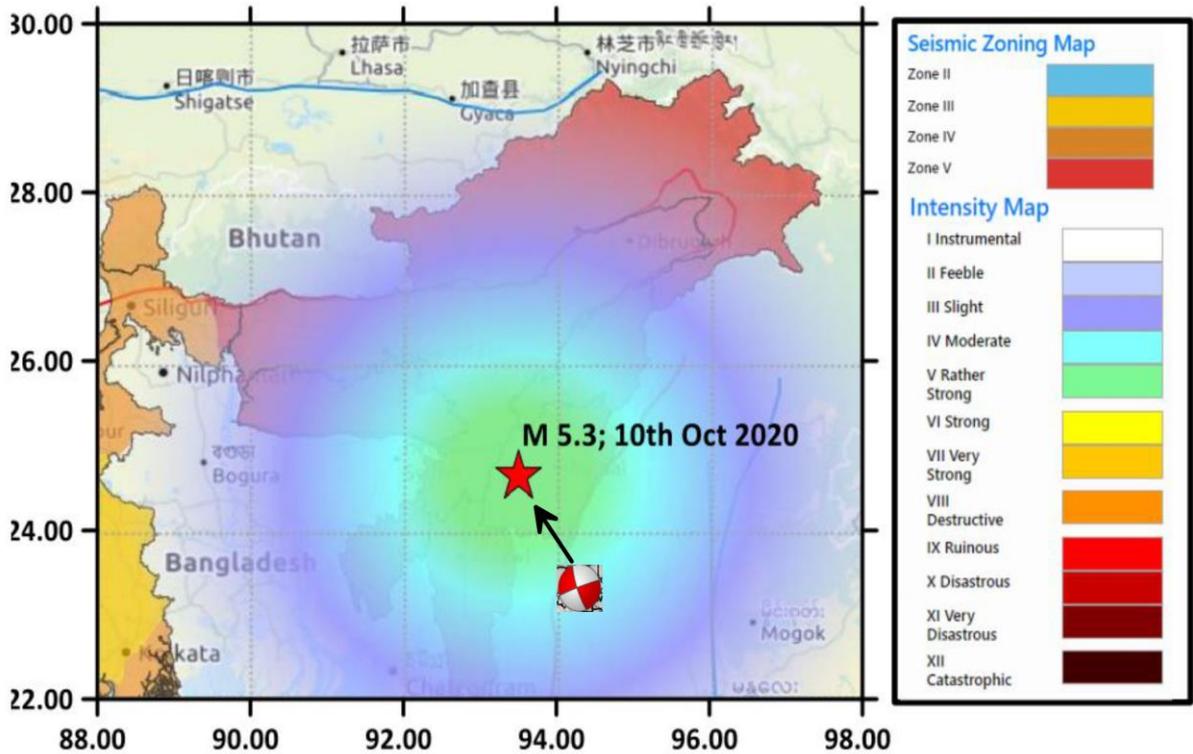


Figure 3: Map showing the epicentre (red star), fault plane solution (circle) and intensity of Tamenglong earthquake occurred on 10th October 2020. Zonation (zone V) of the North-East India can also be seen.

During the past 20 years within 50km radius of this earthquake location, two earthquakes of M:5.0 and above occurred on 3<sup>rd</sup> January 2016 (**M:6.6**) and on 2<sup>nd</sup> August 2017 (**M:5.2**). During this period, about 10 earthquakes occurred in the magnitude range of 4.0 and 4.9. Felt responses reported are in the range of II to III on the scale of Modified Mercalli Intensity (MMI) within 18 hours at a distance from 30 to 190 km from the epicentre (Figure 4).

Table 1: Fault Plane Solution (FPS) of Tamenglong earthquake occurred on 10th October 2020

Nodal Plane (NP)	Strike(°)	Dip(°)	Rake(°)	Seismic Moment (Nm)	Mw	Depth(km)
NP 1	160	80	176	1.23E+17	5.4	30
NP 2	250	86	9			

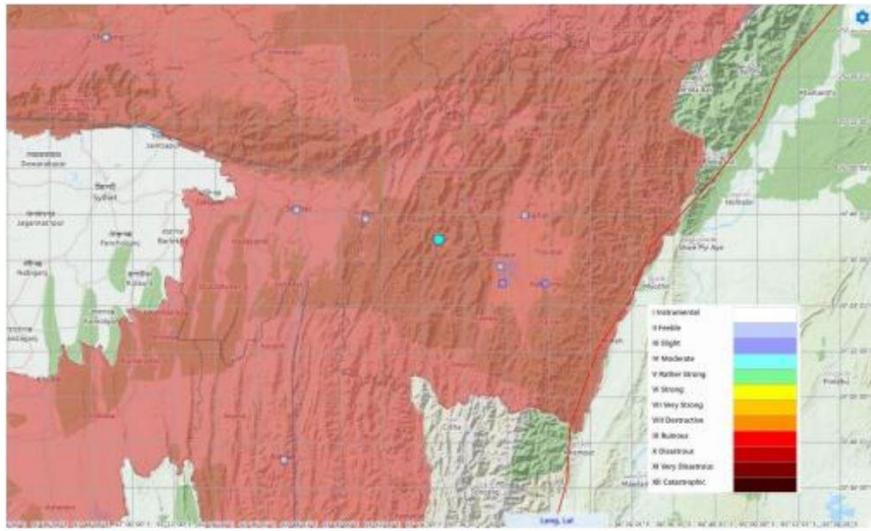


Figure 4: Map showing the epicentre of the earthquake (blue colour circle) and felt responses (squares) received within 18 hours from the occurrence of the earthquake.