

# Seismic Observations of Nepal

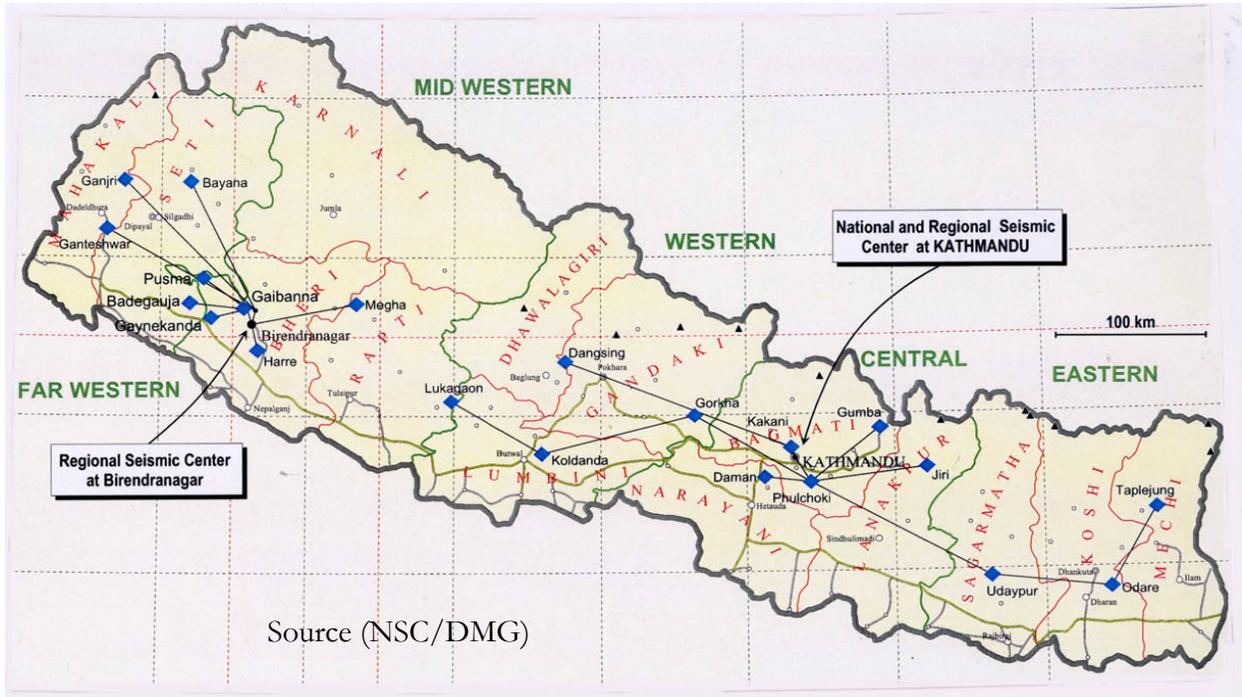
Mr. Mukunda BHATTARAI (2013-2014 Seismology Course)  
National Seismological Center, Nepal

## 1. National Seismic Network

Department of Mines and Geology (DMG) of HMG of Nepal established the seismological laboratory in 1978 in technical cooperation with Laboratory of Geophysics, France. The first short period vertical seismometer (ZM 500) was installed at Phulchowki hilltop in southern border of Kathmandu. Two more stations were installed during the year 1980 so as to form tripartite network of about 30 km aperture. Then in 1985 two more stations were added installing one in Gorkha and other in Gumba.

To cover the entire country by seismic stations, 12 more telemetric seismic stations were added by 1994 under French cooperation. Out of 17 seismic stations, five seismic stations were installed in the West and Far West of Nepal. Data from these five stations are recorded at Seismological Centre, Birendranagar, Surkhet. The seismic signals are recorded in digital form utilizing a PC based data acquisition system. The seismic data from 12 remaining seismic stations are centrally recorded at National Seismological Centre, Lainchour, Kathmandu. At the National Seismological Center (NSC) in Lainchour the final processing of seismic data obtained from both the Networks is done and weekly local and teleseism bulletins are prepared. In the year 1999 four more stations were added in the National Network in the Far West of the country. The recording of data from these stations is done in the Seismological Centre, Birendranagar, Surkhet. So at present there are 21 seismic stations operating within the National Network (Figure 1). 21 short period velocimetric stations provide seismic alert and localization of regional and global seismic events. National seismological Center is the only one organization in Nepal to inform the earthquake magnitude and epicenter to the public through media and National Emergency Operation Center (NEOC) just after the earthquake.

By the end of 2012, National Seismic network have been recorded total 151,667 earthquakes out of which 100,814 are teleseisms and 51,053 are local or regional.



**Figure 1.** National Seismic Network of Nepal



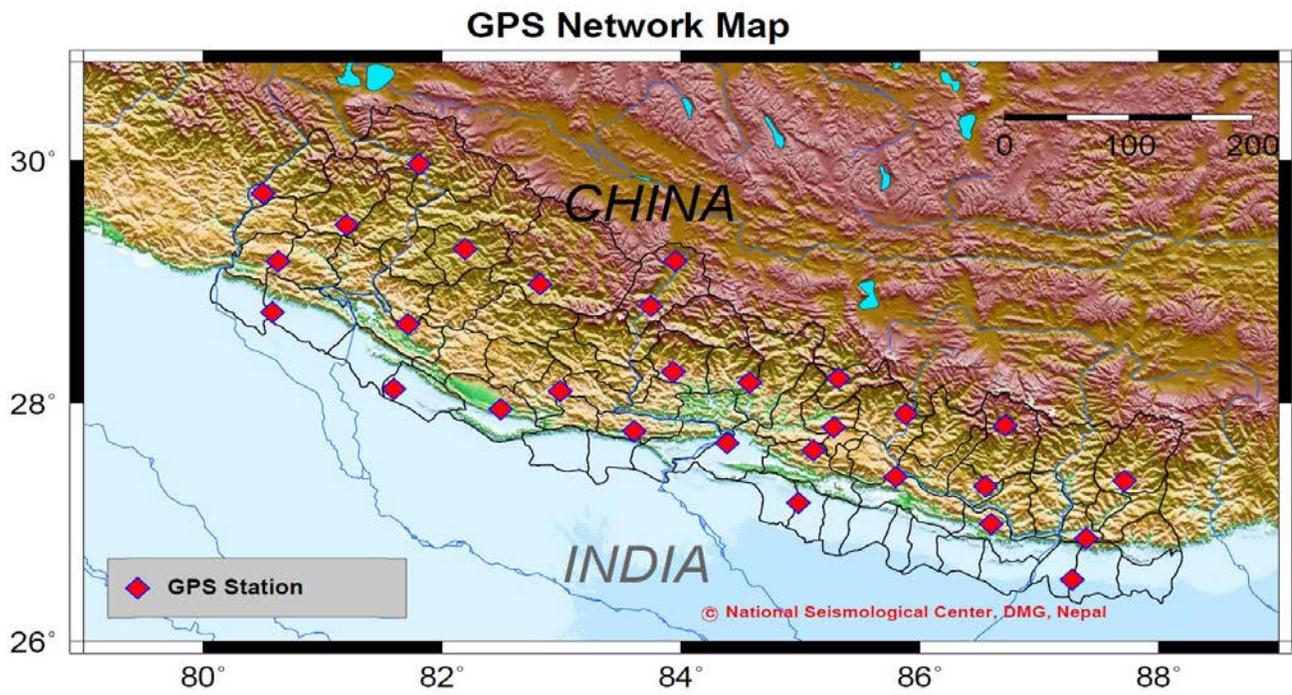
**Figure 2.** (ZM 500) Seismometer in the Vault



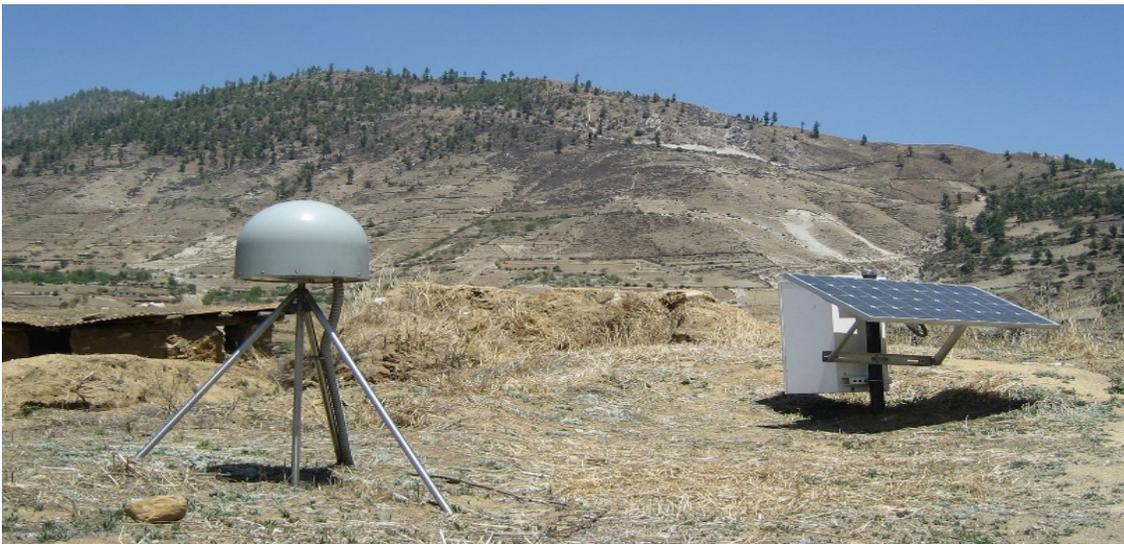
**Figure 3.** Typical Seismic Station

## 2. GPS Network

29 continuous GPS stations have been installed throughout the country to monitor the crustal deformation in collaboration with California Institute of Technology (Caltech USA) and Departement Analyse Surveillance Environnement (DASE), France.



**Figure 4.** GPS Network (29 Continuous GPS Stations)



**Figure 5.** Typical GPS Station

### 3. Accelerometric Network

To monitor the strong ground motion 7 accelerometers have already been installed in the country and NSC is planning to install few more stations in collaboration with Departement Analyse Surveillance Environnement (DASE) France in coming years.

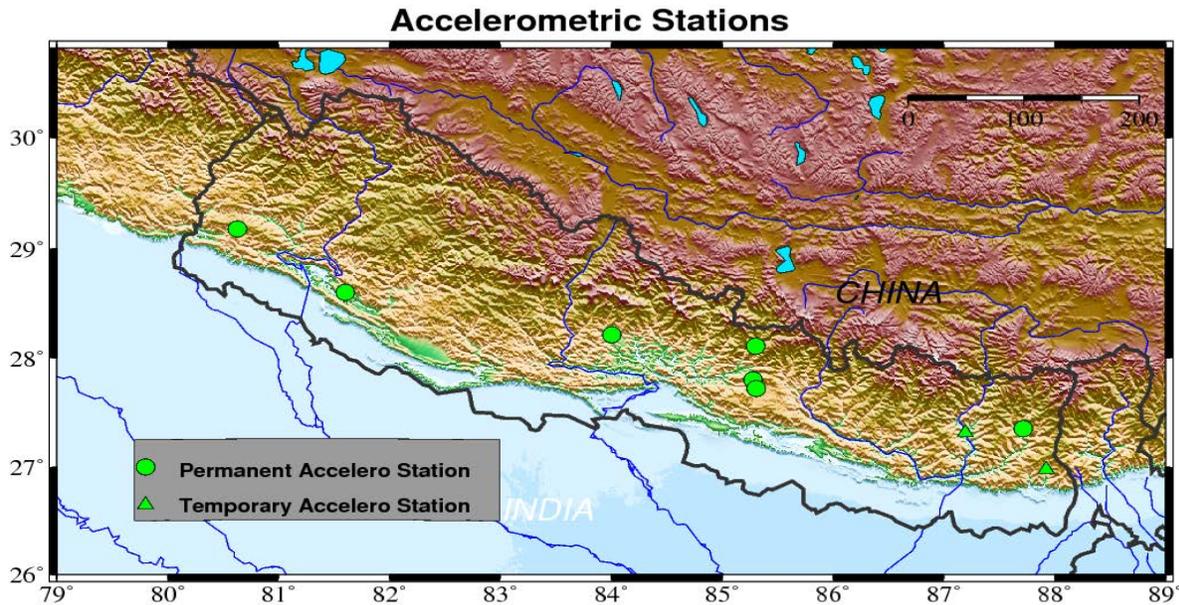


Figure 6. Accelerometric Network. (7 Permanent Stations)

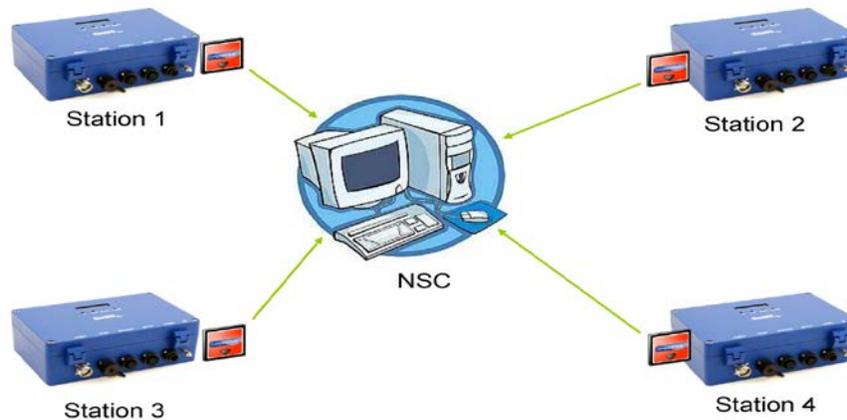


Figure 7. Manual data acquisition system at NSC from different Accelerometric stations.  
(Geosig Ac23 sensor, GSR 24 digitizer)