

## In this issue

### Fog

Fog and haze are becoming one of the major concerns in transport sectors (aviation, railway, road, others), community health, accidents and emergency services due to poor visibility, exposure to pollution and direct economical losses. The reduction in visibility directly affects the society, making fog a challenge to the mankind even in this technological era. Naturally fog has been occurring and dissipating every year since millions of years. It is nothing but simple atmospheric processes in which the water vapour condensed on minute particulate matters. However, this simple natural process is becoming a handle for even advance technology such as aviation, where delays, economic losses and threats to life are common during foggy conditions. Yet fog is not all that wasteful, it can be looked as potential water resources. In some desert, fog are harvested for drinking and



irrigation. And for minute organisms and plants, foggy conditions are the most favourable period for reproduction, growth and other metabolic activities. All these make fog unique phenomena for serious researches even in this 21st century. The article by Gajananda *et al.* shows (page 654) how coastal advection fog occurred and dissipated in an Antarctic Oasis. They utilized techniques such as sodar, radiosonde and surface meteorological parameters to unveil the secret of an advection fog episode. The im-

portance of fog to some poikilohydric organisms are also highlighted.

### Air quality of Kathmandu Valley

Air quality management involves air pollution monitoring requiring considerable finance, skilled expertise. Optimization of setting minimum air-monitoring stations is a welcome effort. Cluster analysis is reliable and simplest method among available statistical methods for classification of objects in a dataset. The aim was to establish a set of cluster such that cases within a cluster are similar to each other than they are to cases in other clusters. Besides this, cluster analysis also points out the sources of pollutants. D. Giri *et al.* (page 684) study the level of PM<sub>10</sub> (particulate matter of mean mass diameter 10 microns) observed during three years at six air-monitoring sites in Kathmandu Valley. The statistical cluster analysis of PM<sub>10</sub> data of the years 2003–05 is analysed. Spatial classification was attempted on the basis of ambient air-quality data. A hierarchical agglomeration schedule using linkages between groups by the Euclidean distance metric was used and Ward's strategy was followed to unite two clusters. Two distinct clusters were formed irrespective of seasons. The pre-monsoon cluster of monitoring sites reflected similar rural characteristics the other cluster comprising the air-monitoring sites was typified in having very densely populated, commercial characteristics with high motor vehicular traffic, urbanized areas. The cluster characteristics of monitoring sites in the monsoon, post-monsoon and winter seasons reflected city-centric and distant area characteristics. The cluster analysis reiterates that it is the nature of sources, how strong influence they exert that matters on the overall air quality of the area. Results of both cluster analysis and non-parametric tests suggest that in Kathmandu Valley there is difference in

pollutant levels across land-use types and topographical characters.

### Histogram of earthquakes on 24 h basis

Electromagnetic emissions related to earthquakes and volcanoes were observed by many workers in a very wide frequency band from VLF to microwave. These were found to be diurnal and semidiurnal type occurring only during certain hours of the day. It was also found in these examples that the occurrences of earthquakes/eruption of volcanoes were simultaneous with the timings of these EM emissions. V. G. Kolvankar briefly discusses (page 710) these two types of EM emissions and concludes that the semidiurnal stresses on the earth and on the moon are solely caused by the position of the Sun. The causes of diurnal stresses are not precisely known. Efforts are made in this paper to study the variation of the stresses developed over a longer period of time. The earthquakes for various regions of the globe were mapped for a number of years on 24 h basis. The histogram of earthquakes thus generated on 24 h basis (HE24H) provided various patterns. It was observed that most earthquakes were aligned to some curvature representing some kind of stress fronts of different strengths and lasting up to over 100 years. The study of HE24H also supports the hypothesis that the occurrence of earthquakes is synchronous to the earth's rotation. The study suggests that although the stresses are built up due to the perpetual motion of the tectonic plates, the acute stresses of diurnal type generated within the body of the earth mainly cause the final act in the occurrence of an earthquake. This paper also suggests the method to monitor these types of earthquake precursors.