

## Exploration of the lightning climatology over the University of Colombo and its surrounding area

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A study of spatiotemporal variation of lightning activities over a particular area is a critical investigation to explore lightning risks and to propose and implement appropriate safety guidelines for the community. Lightning climatology over the University of Colombo (6.9000<sup>o</sup> N, 79.8588<sup>o</sup> E) and its surrounding region covering an area of 20 km × 20 km was studied using lightning flash data obtained from the Lightning Imaging Sensor (LIS) onboard NASA's Tropical Rainfall Measuring Mission (TRMM) satellite. Lightning satellite data for the period 1998 to 2014 were gridded in an area of 5 km × 5 km, to analyze the lightning flash density over the study area and a raster lightning flash density map was designed using ArcGIS 10.1 software. The maximum lightning flash density was 20.0 flashes km<sup>-2</sup> year<sup>-1</sup> recorded at 3.52 km and 10.58 km away from the university premises. Moreover, the overhead annual lightning flash density over the university area was 10.0 flashes km<sup>-2</sup> year<sup>-1</sup>. Furthermore, the maximum number of lightning flashes (49%) had occurred in the first inter-monsoon season with an overhead flash density of 6.0 flashes km<sup>-2</sup> year<sup>-1</sup> over the university premises in the months of March and April for the period of 1998-2014. On the other hand, a lesser number of lightning flashes of 7% had been recorded over the study area during the southwest monsoon season. The maximum number of lightning hits had occurred in April and the second highest number during November. It is suggested that the university should avoid outdoor activities in the period of the first inter-monsoon season to avoid high lightning hazard risks. It would be better if the university can schedule their work during the southwest monsoon season predominantly in May, June, July, August and September as a lesser number of lightning activities are shown during this season. The diurnal variation shows that 59% of the total lightning flashes occurred in the afternoon hours (12.00 to 18.00 LT) over the university premises. Consequently, afternoon outdoor activities impose higher risks to students' safety, especially during April and November which are the two highly active months for lightning. Results based on satellite data were compared with the thunder data available for the respective period.

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