

## **Monitoring large-scale rainfall variations across India**

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**Abstract** To understand spatial variability of rainfall fields over India, sequential thematic maps have been prepared in a GIS environment (GeoMedia Professional 5.1) using data from 316 raingauge stations for the period 1871–2006. The thematic maps show interannual expansion/contraction of moisture regions (arid, semi-arid, dry subhumid, moist subhumid, humid and perhumid), and very dry, dry, wet and very wet zones of the four seasons and the twelve calendar months. The annual moisture regions and seasonal as well as monthly wet and dry zones exhibit large interannual variation but in an organized manner. The arid area shows a dry period during 1999–2004, semi-arid during 1964–2004, moist subhumid during 1999–2004, humid during 1998–2004 and perhumid 1995–2006, while the dry subhumid shows a wet period during 1984–2006. Overall during recent years (1995–2006) the climate of the country has been drier. To describe spatio-temporal features of the seasonal and monthly rainfall an integrated Rainfall Spatial Distribution Index (RSDI) has been developed by lumping the areas under very dry, dry, wet and very wet conditions. In winter rainfall, a dry period is seen during 1987–2006 and in the summer monsoon rainfall during 1972–2006, while a wet period is seen in summer rainfall during 1977–2006 and in post monsoon rainfall during 1994–1999. In recent years, declining trends are seen in eight months (January, February, March, July, August, September, November and December) and increasing trends in the other four months.

**Key words** rainfall spatial variability; rainfall monitoring; moisture regions; dry/wet zones; rainfall spatial distribution index