LARGE SCALE INFLUENCE ON CUMULATIVE PRECIPITATION OVER SRI LANKA

W.L. Sumathipala
Dept. of Physics, Open University, Nawala.

In this study the large scale influence of surface pressure is denoted by Southern Oscillation Index (SOI) which is defined as the pressure diference between Easter island and Darwin, Australia. Monthly mean precipitation values of Principal Meteorological Stations are used for cumulative precipitation.

Lag correlation between SOI and precipitation shows strong negative correlation (surpassing 95% confidence level) at 6-7 months lag while no significant correlation at lag 0. Also lag correlation on seasonal basis indicates significant negative values at 2-3 lags. The general understanding is that when SOI is large, pressure is low, convective activity strong and thus precipitation is above normal over Australia, the Indian Ocean and the Southeast Asia. When SOI is negative, reverse should be true. Time series plots of precipitation and SOI shows that during strong El Nino years, where SOI is very low, the precipitation is near normal. However 2-3 seasons later above normal precipitation is recorded throughout the island.

It is suggested that during strong El Nino-Southern Oscillation (ENSOs) the equational Indian Ocean is under gentle subsidence due to the influence of large scale east-west circulation. Cloud free skies will lead to strong solar heating of the ocean. Heating, with a lag of 2-3 seasons, will influence the regional convective activity. This effect is felt strongly over the island of Sri Lanka and above normal precipitation is produced. Lag can be attributed to the response time of ocean/land/atmosphere system.