Role of Indian Ocean sea surface temperatures in modulating northwest Indian winter precipitation va

R.K. Yadav[1]**, K. Rupa Kumar**[1] **and M. Rajeevan**[2]

[1]Indian Institute of Tropical Meteorology, Pune, India
[2]India Meteorological Department, Pune, India

Abstract

The northwestern parts of India occupies a vast landmass of about 9,26,607 km^2 which roughly lies in bounded by 69˚E - 85˚E longitudes and 23˚N - 37˚N latitudes of South Asia. It has mainly two rainy summer and winter, when it receives considerable amount of precipitation, separated by the two dr tional seasons of spring and autumn. The winter season spans 4 months from December to March Precipitation during the season is mainly associated with the sequence of mid-latitude synoptic system in Indian meteorological parlance as '*western disturbances*' (WDs). In these months, the mid-latituc bances (WDs) move to their lowest latitudes and in their pathway travel across the North and Cent of India in a phased manner from West to East, disturbing the normal features of circulation pattern low pressure areas are the main source of winter precipitation over northwest India. The precipitatio important for Rabi crops, particularly for wheat, as it supplements the irrigation/moisture and maint temperature for the crops. The precipitation in the form of snow over the hilly regions of northwest In in maintaining the extent of glaciers which melt and serve as a vast store-house of the water in differen for the great rivers which take their birth there. The northwestern parts of India are the main regions f production of the country therefore, the season is critically important for the agrarian economy of the The interannual variability of North-West India Winter Precipitation (NWIWP) has been examined in tion with the variability of sea surface temperature (SST), surface air temperature (SAT) and upper trop (200 hPa) wind patterns over India and the surrounding regions. We have considered data for a peri years (1950-2003). During the years of excess NWIWP, the SST was above normal over the equatori Ocean, SAT was below normal over east Mediterranean Sea and over the Himalayan region and upp spheric westerlies strengthen and shift southwards. Upper tropospheric westerlies over north and cent was found to be related with the SST anomalies over the equatorial Indian Ocean. The decrease of S north India and surroundings may largely be a manifestation of cooling brought about by excessive prec and sweep of cold air advection in rear of the storms. The intensifying of upper troposphere westerlies ded with a jet increases the upper level divergence over north India due to increased horizontal shear in intense anticyclone at upper troposphere.