

Interannual Variability of Daily Extreme Precipitation Events in the State of São Paulo, Brazil

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ABSTRACT

We study the climatology and interannual variability of heavy, or ‘extreme’, precipitation events, using daily station data from the state of São Paulo, Brazil. An extreme event is defined at each station when daily rainfall exceeds a certain percent of its seasonal or annual mean. It is found that they occur mainly from November - March and that there is a distinct interannual variation in their number. The count of extreme events is not strongly correlated with mean precipitation. The relationship between extreme events and activity in the South Atlantic convergence zone (which, when active is associated with increased precipitation) is therefore not obvious. From October - March, the interannual count of extreme events in the entire state is correlated positively with sea surface temperature (SST) anomalies in the equatorial Pacific from near the Dateline to the west coast of South America. The interannual count at stations near the Atlantic coast from November - February is correlated positively with SST anomalies in the Atlantic Ocean near the latitude of São Paulo. In both cases the relationship between SST and mean precipitation is weak. The associations are confirmed with composites and rank correlations. The relationships described are apparent in the period 1976-77 to 1994-95. There is no correspondence evident between extreme events and SST if data beginning in 1948 are included in the analysis.