



Synoptic Environment Associated With Heavy Rainfall Events on the Coastland of Northeast Brazil

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The Northeast Brazil (NEB) has a large coastal area, which is often affected by natural disasters that causes many social and economic losses. The objective of this work was to study the synoptic environment associated with heavy precipitation events (HRE) on the coast of NEB. We used a set composed by 42 rain gauges, divided into two sub-regions: north and south coast. This data were obtained of the hydrometeorological network managed by the Agência Nacional de Águas, from 1979 to 2002. To characterize the synoptic environment, we used daily data reanalysis ERAInterim reanalysis from the European Center for Medium-Range Weather Forecasts, which was determined the anomaly of the composition for three days preceding the event. We use the 95th percentile of daily rainfall to select the HRE. A HRE was selected when at least one rain gauge recorded precipitation above 95th percentile. The interannual distribution of events present negative trend for both regions, but without statistical significance. The maximum occurrence was observed during La Niña years, conversely the minimal occurrence during El Niño years. The synoptic environment at 850 hPa associated with EPI was different for each region: to the north coast a high anomalous presented well configured over the continent, centered around 30°S and 45°W, while a cyclonic circulation is semi-stationary over the Atlantic Ocean, centered around 50°S and 10°W. This configuration causes moisture convergence over northern coast area. Concerning the southern coast, an anomalous cyclonic circulation at 850 hPa centered around 20°S and 45°W is observed. This configuration is similar to the South Atlantic Convergence Zone, which favoring the precipitation over the southern coast of NEB. At 200 hPa the wind anomalies are compatible with the systems formed at low levels for the two regions, thus contributing to the development and maintenance of convective activity. Analysis of anomalies of the composites indicated that EPI occurrence in each regions is associated to different synoptic features; basically, the southern coast was influenced by systems that moved from mid-latitudes of South Hemisphere, while the north coast is influenced by both, North and South Hemisphere.

Key-words: heavy rainfall events, composite.