

INFLUENCE OF LOCAL CIRCULATION ON SPATIAL AND TEMPORAL DISTRIBUTION OF THE PRECIPITATION NEAR THE NEGRO AND SOLIMÕES RIVERS CONFLUENCE REGION

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ABSTRACT

Local circulation in the Amazon region have been observed close to large water bodies, such as the Balbina Lake and Negro, Solimões and Amazonas rives. Near these aquatic surfaces, the spatial and temporal distribution of precipitation is modulated by river breeze circulations, as shown in previous studies. Some previous results have also emphasized that the form, orientation and width of rivers play an important role on the intensity of the river breeze. In this paper we analyse the role of the local circulations on the spatial and temporal distribution of precipitation close to the Manaus city region, where confluence of the Negro and Solimões rivers occur. The data used for the analysis is the estimates of the precipitation rate from TRMM (Tropical Rainfall Measuring Mission, product 3B42_V7), whose grid space is about 25x25 km and data frequency is 3 hours. The data period used is from January 1998 to December 2012. The composites of the accumulated precipitation, in afternoon period and early night, showed minimum values over the rivers and maximum values over the land due to the action of the river breeze, which transports moist air to land, leading to convergence, clouds development and consequently precipitation. At dawn and early morning, the accumulated maximum values were found over rivers, due to the convergence caused by the action of the land breeze. The diurnal cycle in the studied region was characterized by maximum precipitation values over Amazonas River (to the East of the region) at dawn and morning period. In early night and afternoon periods, the maximum values were observed in the western part of the region, specifically, near the margin of the Negro and Solimões rivers. The influence of the local circulations on spatial distribution of precipitation was more evident during the rainiest quarter (March, April and May).

Key Words: river/land breeze; convection; spatial and temporal rain variability