



Exploring meteorological droughts in Brazil from 1980 to 2013

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Brazil is a country of continental scale and over the past few decades several drought events have caused severe environmental and socioeconomic consequences in the country. Even though these drought events have been increasingly studied in the country, the focus is usually on the northeastern and the southeastern parts of the country. Therefore, it is important that we analyze droughts in the entire Brazilian territory and how they relate to climatic variability and changes. The objective of this study was to identify the occurrences of drought events in Brazil. We analyze the spatial and temporal variability of characteristics such as duration, intensity, and frequency of droughts. We used monthly precipitation and potential evapotranspiration data grid for the period of 1980 to 2013 in order to calculate the Standardized Precipitation Index (SPI) and the Standardized Precipitation and Evapotranspiration Index (SPEI). The drought events were defined considering a threshold of -1 for both indices. Results shows that the SPI and SPEI have a similar spatial distribution of the average duration of drought events. It indicates that the precipitation rather than the potential evapotranspiration is the most decisive variable for the duration of droughts. Although the northeastern region is where the society is historically mostly impacted by droughts, only 20% of the drought events occurred in this region. The remaining 50% of the events occurred in the Amazon and 30% in the central and southern parts of the country. Also, the analysis shows that droughts events with the longest duration occur in the amazon region. The highest annual frequency, considering a short time scale (3-6 months), occur in the amazon and northeastern region, for a long-time scale (12-24 months), in the central and southern. We hope that those results might give a better understanding of the characteristics of the drought events and perhaps inform how to do water resources management and monitoring in such a large scale country.