



Evaluation of soil moisture and Palmer Drought Severity Index in Brazil

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Soil moisture is one of the main factors for the study of drought, climate and vegetation. In the case of drought, this is a regional phenomenon and affects food security more than any other natural disaster. Therefore, monitoring of different types of drought has been based on indexes that standardize on temporal and spatial scales. Currently, the monitoring of different types of drought is based on indexes that attempt to encapsulate on temporal and regional levels allowing thereby the comparison of water conditions in different areas. Therefore, in order to assess the impact of soil moisture during periods of drought, the Palmer Drought Severity Index was estimated for the entire Brazilian territory, using meteorological (precipitation and evapotranspiration) and soil (field capacity, permanent wilting point and water storage in the soil) data. The data field capacity and permanent wilting point were obtained from the physical properties of the soil, while the water storage in the soil was calculated considering the water balance model. Analyses were made for the years 2000 through 2014, which includes periods with and without occurrence of drought, respectively. The results showed that the PDSI had higher negative indices for the years 2003 and 2012 in Brazil's Northeast region, and this region was strongly affected by drought during those years. These indices can serve as a basis for assessing future drought projections, considering different scenarios. The results also show that soil moisture constitutes one of the limiting factors for obtaining high agricultural productivity, in order to reduce the effects caused by drought. Therefore, these indices can serve as a basis for assessing future drought projections, considering different scenarios. It would be desirable to assist decision makers in action plans with more effective strategies, allowing farmers to live with drought without losing their livelihood.