



Estimating drought episodes over South Brasil

J. G. Z. de Mattos, A. Frassoni dos Santos de Mattos, G. G. de Gonçalves, and D. Herdies

National Institute for Space Research, Center for Weather Prediction and Climate Studies, Cachoeira Paulista, Brazil
(joao.gerd@cppec.inpe.br)

One of the more extreme weather events are episodes of drought. This is a natural phenomenon characterized by a significant reduction of the availability of water for a period of time over a large area. Periods of drought can have significant consequences in socio-economic, environmental, agricultural and health. The effects of a sustained period of drought in a given region depend, however, not only the duration and intensity of drought, but also the socio-economic and cultural rights of the affected population. Recently, the State of Rio Grande do Sul, has gone through a period of drought that favored the occurrence of extreme droughts in the south and southwest of the state, leading to various cities cheap in agriculture and livestock. Some of these cities have accumulated losses estimated at U.S. \$ 3.6 million in agricultural production. One way to establish early warning systems for drought episodes is to monitor and forecast indices that incorporate long-term changes in rainfall and hydrological conditions. Among several indices have been developed over the years in order to monitor drought episodes are the Standardized Precipitation Index (SPI) and the Index of Palmer Drought Severity (PDSI). This paper aims to adapt the main indices PDSI and SPI for the State of Rio Grande do Sul, by means of simulations of the surface conditions of numerical results obtained, in order to identify and study the mechanisms responsible for the major episodes of drought, as well as producing a tool for monitoring and forecasting of this type of event on the state of Rio Grande do Sul. A clustering algorithm was used as well to identify individual drought events and their spatial extent from monthly summaries of the simulated data. The results showed the largest area of severity drought during 1968, extending over all south South America and central Brazil. There are other periods with severe drought but with smaller areas of occurrence.