The South America (SA) climate is characterized by different precipitation regimes and its variability has large influences of the large scale phenomena in the interannual (El Niño South Oscillation/ENSO) and intraseasonal (Madden Julian Oscillation/MJO) timescales. Normally, the global coupled models (GCM) use low horizontal resolution and present difficult in the representation of these low frequency variability phenomena. The goal of this work is to evaluate the performance of two versions of the High-Resolution Global Environmental Model, HiGEM (~90 Km) and HadGEM1 (~135 Km), in capturing the signal of interannual and intraseasonal variability of precipitation over SA. GCM simulations were compared with precipitation data from Climate Prediction Center – Merged Analysis of Precipitation (CMAP) for the period 1979 to 2007. The precipitation time-series were filtered on the interannual (period > 365 days) and intraseasonal (30-90 days) timescales. The occurrence of extreme precipitation events and droughts were analyzed in six sub-regions of SA. The criterion for selection of extremes was based on the quartiles of rainfall anomalies in the bands of interest. Both HiGEM and HadGEM1 capture the observed signal of these two oscillations. This highlights the importance of increase the horizontal resolution of the GCMs. The simulation of ENSO in both GCMs can be attributed to their high resolution, mainly in the oceanic component, which contributes to the better solution of the small scale vortices in the ocean. This implies in improvements in the forecasting of sea surface temperature and as consequence in the ability of atmosphere to respond to this feature.