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Title: Evaluation of climatic extreme indicators forecasted by the regional climate Eta model

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Abstract:

Regional seasonal forecasts have been produced on an operational monthly basis at CPTEC (Centre for Weather Prediction and Climate Studies) of INPE (National Institute for Space Research) over South America using the Eta model since 2002. The model has gone through upgrades. The objective of this work is to evaluate a modified and higher-resolution version for its ability to simulate the frequency of climatic extreme events. Tests with two soil conditions will be evaluated. Evaluation will be carried against observations taken around the upper Sao Francisco river basin, an important for hydropower production in Brazil. The Eta model is set to 15-km horizontal resolution and 38 vertical layers over the area that covers the Brazilian territory. The initial and lateral boundary conditions are taken from Climate Forecast System Reanalysis (CFSR). The simulations are carried out for the rainy season, for the period from November to February, between 1979 and 2010. The model uses the NOAA land-surface scheme. Two soil conditions are tested, one uses climatological initial soil moisture and a coarse soil map, and the other uses initial soil moisture from daily conditions and a new and higher-resolution soil map with modified soil parameters produced by INPE. Simulations using both soil conditions are compared and evaluated. Statistics of extreme events based on indicators such as consecutive dry days, consecutive wet days, extreme accumulated precipitation and extreme temperatures are evaluated. The simulations capture the interannual variability of the indicators of climatic extreme, the frequency of events is in the order of magnitude of observations but it is underestimated.

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