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Downscaling seasonal forecasts over South Africa

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The Climate System Analysis Group at the University of Cape Town in South Africa has been issuing a seasonal forecast for southern Africa over the last decade using the Hadley Centre Unified Model, the latest version being the HadAM3P. Currently ten ensemble members are generated for a three month forecast and the results are published online each month. Studies into the skill of this and other seasonal forecasts for the region concerning rainfall have indicated that skillful forecasts are obtained in the north-eastern parts of the country during both El Nino years and more especially La Nina years. However, in the south western region of the country there is no skill in the forecast and it is postulated this is a result of the complex topography of the region as well as the driving mid-latitude synoptics. As a result here is very low uptake of the forecast in this region of the country. The resolution of the HadAM3P is 1.25 x 1.875 degrees so it is not able to capture the complex topography of the region nor the resultant modifications of the regional climate. A regional climate model is used to downscale the seasonal forecast over south western South Africa in an attempt to capture regional climate characteristics at the seasonal scale. The Weather Research and Forecasting model (WRF) is used to downscale the global model to a resolution of 20 km and we compare the results of the downscaling with observed rainfall and temperature data for the region as well as synoptic circulations characteristic of the region using the MERRA reanalysis.