

15-year simulation of the December to March rainfall season of the 1980s and 1990s using canonical correlation analysis (CCA)

WA Landman* and E Klopper

Research Group for Seasonal Climate Studies, South African Weather Bureau, Private Bag X097, Pretoria, 0001

Abstract

South African summer rainfall is associated with sea-surface temperature variations in the global oceans. The South African Weather Bureau uses a canonical correlation analysis (CCA) model to make operational seasonal rainfall predictions. Evolutionary features of global-scale sea-surface temperatures, such as a warming equatorial Pacific Ocean, are used as predictors. During the Workshop on the Use and Benefits of Seasonal Outlooks (WUBSO) held on 27 August 1996, it was suggested by the participants that an assessment be made on how the model would have performed during previous El Niño/Southern Oscillation (ENSO) years in order to establish the confidence level that could be employed by end-users of these forecasts. In this study the operational model used by the Research Group for Seasonal Climate Studies (RGSCS) is validated over a 15-year period from 1981/82 to 1995/96 in order to determine how it would have performed if this prediction model had been implemented from the beginning of the 1980s, predicting December to March aggregate rainfall. It is found that the model is highly successful during ENSO years, and has a success hit rate of 40% for the non-ENSO years. Possible explanations for the model's successes and failures are presented.