



Assessing the Change in Rainfall Characteristics and Trends for the Southern African ITCZ Region

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Southern Africa is strongly influenced by the movement and intensity of the Intertropical Convergence Zone (ITCZ) thus determining the climate in this region with distinct seasonal and inter-annual rainfall dynamics. The amount and variability of rainfall affect the various ecosystems by controlling the hydrological system, regulating water availability and determining agricultural practices. Changes in rainfall characteristics potentially caused by climate change are of uppermost relevance for both ecosystem functioning and human well-being in this region and, thus, need to be investigated. To analyse the rainfall variability governed by the ITCZ in southern Africa, observational daily rainfall datasets with a high spatial resolution of $0.25^\circ \times 0.25^\circ$ (about 28 km x 28 km) from satellite-based Tropical Rainfall Measuring Mission (TRMM) and Global Land Data Assimilation System (GLDAS) are used. These datasets extend from 1998 to 2008 and 1948 to 2010, respectively, and allow for the assessment of rainfall characteristics over different spatial and temporal scales. Furthermore, a comparison of TRMM and GLDAS and, where available, with observed data will be made to determine the differences of both datasets. In order to quantify the intra- and inter-annual variability of rainfall, the amount of total rainfall, duration of rainy seasons and number of dry spells along with further indices are calculated from the observational datasets. Over the southern African ITCZ region, the rainfall characteristics change moving from wetter north to the drier south, but also from west to east, i.e. the coast to the interior. To address expected spatial and temporal variabilities, the assessment of changes in the rainfall parameters will be carried out for different transects in zonal and meridional directions over the region affected by the ITCZ. Revealing trends over more than 60 years, the results will help to identify and understand potential impacts of climate change on rainfall characteristics for the southern African ITCZ region. The findings of this study will feed into various ecosystem assessment and biodiversity change studies in Angola and Zambia.