



Changing features of seasonal precipitation in Sudan and the relations to atmospheric circulation during 1948-2005

Zengxin Zhang (1,2) and Chongyu Xu (1)

(1) Department of Geosciences, University of Oslo, PO Box 1047 Blindern, N-0316 45 Oslo, Norway, (2) Jiangsu Key Laboratory of Forestry Ecological Engineering, Nanjing Forestry University, Nanjing 210037, China

The temporal and spatial patterns of precipitation are essential to the understanding of soil moisture status as fundamental factors for vegetation regeneration in the arid ecosystems in Sudan. The purpose of this paper is to understand the temporal and spatial variations of precipitation by using high quality global precipitation data known as Precipitation REConstruction (PREC), which has been constructed at the National Oceanic and Atmospheric Administration (NOAA) Climate Prediction Center and discusses its relevance to regional climate variability and changes. The results showed that the annual and monthly precipitation in Sudan had great spatial variability, and mean annual precipitation varied from almost nil in the North to about 1500 mm at the extreme Southwest. The areal annual precipitation values of the country decreased significantly during 1948-2005. The months of July, August and September were found to constitute the main rainy season of the Sudan and the precipitation decreased significantly in these months. Abrupt change points were found in the annual, July, August and September in the late of 1960s. The decreasing precipitation was associated with the weakening African Summer Monsoon. The summer moisture flux over Sudan tended to be decreasing after the late 1960s which decreased northward propagation of moisture flux in North Africa.