

Projected Rainfall and Temperature Changes Over Bungoma County in Western Kenya by the Year 2050 Based on PRECIS Modeling System

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Abstract

This study investigated projected changes in Rainfall and temperature over Bungoma County by the year 2050 based on the Intergovernmental Panel on Climate Change (IPCC) Special Report on Emission Scenarios (SRES) A1B AND A2B emission Scenarios using the Providing Regional Climates for Impacts Studies (PRECIS). The PRECIS regional Climate Model (Hadley RM3P) was configured in $0.22^{\circ} \times 0.22^{\circ}$ horizontal grid resolution was forced at the lateral boundaries by the UKMO-HadAM3P and UKMOHadCM3Q0 global Models. The future projection of temperature indicates warming over Bungoma County by the year 2050 coupled with reduced precipitation. Time series analysis revealed a cyclic and seasonal trend in rainfall and temperature over the area of study. Temporal characteristics revealed a warmer and colder September-October-November (SON) season under A1B and A2B scenarios respectively. The results also revealed increasing temperatures and reducing rainfall across all seasons under both scenarios except in March-April-May (MAM) season where rainfall amounts increased and temperature reduced. A two paired t-test for the two climate variables revealed a value of less than 0.05 (<0.05) suggesting a statistically significant relationship between each pair of the two variables. The study recommends further evaluation of the model performance in simulating the present day climate.

Key Words: *Climate Change, General Circulation Model, Regional Circulation Model, PRECIS, Bungoma County*