

Indicators of Rainfall Recycling in Sudan

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ABSTRACT

The data used in this study belonged to the 1200 UTC re-analysis for August 1988 over Sudan. The retrieved set is of the ERA-40 of ECMWF. It consisted of evaporation, precipitation, precipitable water as surface values beside horizontal wind speed and water vapor mixing ratio for selected tropospheric levels. Moisture fluxes were computed and the budget of the atmospheric branch of the hydrologic cycle was investigated at some grid points. For grid points along longitude 32.5°E precipitation was found more than the converged moisture except at points north of latitude 15.0°N. Similar pattern was observed for points along latitude 15.0°N, mainly at the western portion of the domain. The study noted a threshold value of the precipitable water (35 kg/m²) below which no precipitation was observed. A 1-dimensional precipitation recycling model was applied to the same data along longitude 32.5°E. The recycled water increased from south to north. At the northern areas about one third of the total rainfall came from locally evaporated water.