

Soil Moisture-Temperature Coupling and Extremes in Africa

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Soil moisture is one of the most important variables of the climate system as it constrains evapotranspiration, affecting the water and energy balances at the surface, mainly over transition areas between humid and dry climates. An analysis of the energy and moisture balance, heat waves and droughts for the Africa Coordinated Regional Downscaling Experiment (Africa-CORDEX) is performed in present climate and used to evaluate heat and moisture projections for the future. In the recent past, these transition areas correspond to strong coupling regions, where more heat wave events are expected. In future, more heat waves are expected throughout Africa due to an increase of mean surface temperature, but also due to changes in the spatial distribution of strong coupling regions. Drought is also assessed and, for the future, more and longer lasting dry spells are foreseen for all the African territory. Additionally, a new coupling metric is evaluated, for monthly time-scales, which considers the positive temperature extremes and the negative latent heat flux extremes.

