



Large scale mechanisms associated with heat wave occurrences in Senegal

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The coastal location of the Senegal induces specific heat wave (HW) events. HWs are defined as daily temperature (daily maximum or minimum temperature, or mean apparent temperature) higher than the 95th moving percentile during at least three consecutive days over the boreal spring period (Mars-April-May, 1979-2014). A hierarchical classification enables to define three homogeneous regions in terms of HW occurrences over Senegal (Zone #1, #2 and #3, from West to East). In order to study how atmospheric circulation is linked to these HW occurrences, composites of anomaly fields of ERA-Interim reanalysis have been computed using as reference date the starting day of each HW detected in GSOD (Global Summary of the Day) observations database. Results show that two patterns control the occurrence of HWs: regional-scale positive pressure anomalies centered around 35°N-10°W, and more local negative anomalies around 20°N-15°W. This structure leads to enhanced north-easterly winds advecting higher temperatures and moister air over the three zones of Senegal, and lower temperatures and drier air over the central Sahel. The intensity of this relationship is the largest for Zone #1, intermediate for #2 and the weakest for #3. The increased moisture signal over Senegal is highest for the composites associated with minimum and apparent temperature. Indices linked to this structure can be used to evaluate the predictability of such HW events.

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