Heat waves in Senegal : detection, characterization and associated processes.

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Atmospheric configuration and synoptic evolution of patterns associated with Senegalese heat wave (HW) are examined on the period 1979-2014 using the Global Surface Summary of the Day (GSOD) observational database and ERA-Interim reanalysis. Since there is no objective and uniform definition of HW events, threshold methods based on atmospheric variables as daily maximum (Tmax) / minimum (Tmin) temperatures and daily mean apparent temperature (AT) are used to define HW threshold detection. Each criterion is related to a specific category of HW events: Tmax (warm day events), Tmin (warm night events) and AT (combining temperature and moisture). These definitions are used in order to characterize as well as possible the warm events over the Senegalese regions (oceanic versus continental region). Statistics on time evolution and spatial distribution of warm events are carried out over the 2 seasons of maximum temperature (March-May and October-November). For each season, a composite of HW events, as well as the most extended event over Senegal (as a case study) are analyzed using usual atmospheric fields (sea level pressure, geopotential height, total column water content, wind components, 2m temperature). This study is part of the project ACASIS (https://acasis.locean-ipsl.upmc.fr/doku.php) on heat waves occurrences over the Sahel and their impact on health.

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