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Monthly and seasonal predictability of heat waves in West Africa with CNRM-CM

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West Africa, and in particular Sahel, are vulnerable to spring heat waves during which maximum daily temperatures reach over 40°C for several consecutive days. These heat waves have severe consequences on the health and activities of local populations. Moreover, several studies suggest that their frequency and intensity may increase in future decades. The French National Research Agency (ANR) project ACASIS brings together researchers from different backgrounds (geography, climate, meteorology, epidemiology, demography) to improve the understanding of the causes and consequences of these heat waves, as well as their variability and predictability at different time and spatial scales.

In this presentation we wish to assess the predictability of Sahelian heat waves in the sub-seasonal and seasonal forecasts with Météo-France system 5, based on the CNRM-CM coupled model updated from its CMIP5 version. The seasonal forecasts are issued each month as part of the Copernicus C3S initiative ; sub-seasonal runs are released for research purposes in the framework of the WWRP/WCRP S2S project. Both forecasts are calibrated with corresponding hindcasts over the 1993-2014 period. Despite surface temperature biases, and trouble in properly representing the persistence of heat spells over the region, some evidence of predictive skill is found for duration and frequency of heat waves defined as a threshold of consecutive days of daily minimum or maximum temperatures reaching over the 90th percentile.

A more detailed assessment of the spring 2016 real-time forecasts will also be presented, using a weather regime approach to illustrate how the seasonal prediction system managed to capture the large-scale signal for above-normal occurrences and duration of heat waves last year, but failed to correctly pinpoint the geographical location of these anomalies.