

The Ouagadougou flood: Modelling extreme convection in the Sahel

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The capital of Burkina Faso, Ouagadougou, was hit by an catastrophic precipitation event that brought more than 260 mm of rainfall in the morning hours of 01 September 2009.

In a published study, we show that this event was also exceptional from a thermodynamic and dynamical point of view: A succession of two slow-moving African Easterly Waves (AEWs) caused record-breaking values of tropospheric moisture. The second AEW, one of the strongest in recent decades.

Using the ICON model, the role of Mesoscale Convective Systems and synoptic-scale AEW dynamics shall be compared against each other. This will be achieved by first conducting a convection permitting ICON experiment. The results will be compared with ERA-5, the new 5th generation reanalysis analyses, and results of Engel et al. (2017). Sensitivity experiments with ICON will be carried out by, for example, inhibiting the generations of cold pools or by enhancing background moisture and vorticity. These sensitivity experiments will serve two purposes:

- a) the understanding of the role of convective dynamics and
- b) the potential for even stronger extremes in a warmer world with stronger AEW vortices.