

## **A climate model's trend in Sahel rainfall**

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When forced with the observed record of sea surface temperature only, NSIPP, the atmospheric model developed at NASA's Goddard Space Flight Center in the framework of the Seasonal to Interannual Prediction Project, exhibits unparalleled skill at reproducing the interannual variability of northern summer precipitation over tropical Africa during 1930-2000. The two leading modes of variability, as captured by Principal Component Analysis, are statistically and dynamically separate, and compare well with observations. The first mode represents the well-known negative trend in Sahel (10-20N) rainfall and is tied to SST variability in all the tropical basins. The second mode represents rainfall variability along the Gulf of Guinea coast (0-10N) coherent with local SST variability that strongly projects onto the Atlantic El Nino. The dynamics of the two modes are discussed in detail.

Given the experimental set-up (only SST varies interannually, while the atmospheric CO<sub>2</sub> concentration is held fixed, at 350ppm, and vegetation is prescribed to vary seasonally, but not interannually), and the successful reproduction of interannual rainfall variability, it is concluded that SST variability was indeed responsible for the decadal variability exhibited by rainfall variability over Africa during the recent period, with land-atmosphere interaction acting to reinforce the remote signal.

**Tuesday III (Talk)**