

A statistical investigation of Sahelian onset predictability using NCEP/DOE2 reanalysis (1979-2004)

Lotfi BOUALI

Nathalie PHILIPPON

Bernard FONTAINE

Centre de Recherche de Climatologie

Université de Bourgogne

06, Boulevard Gebriel

21000 Dijon

France

Lotfi.bouali@u-bourgogne.fr

Predictability of the Sahelian rainfall onset is explored using three independent datasets, namely the CMAP and GPCP rainfall estimates and the NCEP2/DOE atmospheric reanalysis one, through the common multiple linear regression method and linear discriminant analysis. The 4 indexes selected as the best predictors of CMAP onset dates depict the zonal wind component at 925hPa and 200 hPa from mid to end of May over the domain 10°S - 20°N / 15°W - 15°E . They portray a delay or advance in the seasonal northward excursion of the southern Hadley cell and of the low level moisture flux at these longitudes. The correlation coefficient between observed and hindcasted CMAP (GPCP) onset dates achieves +0.90 (+0.76) in cross-validation mode. The largest errors occur in years 1987, 88, 98 (underestimation) and years 1985, 90, 97 and 2003 (overestimation) for CMAP onset dates.