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European temperatures and atmospheric circulation during the fall 2006

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Europe witnessed unprecedented warmth persisting throughout fall and winter 2006, comparable in amplitude to the summer 2003 heat wave. *Yiou, P. et al.* [2007] showed, considering temperatures in daily flow analogues in previous fall-winter seasons, that the daily atmospheric flow in fall-winter 2006, which was favorable to warmth but not exceptional, cannot explain alone the extreme observed temperature anomaly. Analyzing data from the NCEP/NCAR model, we notice that the 2006 seasonal (SON) anomalies of meridian wind over Europe and Atlantic SST at north-west of Africa were the highest since 1948. Then we show that computing a linear regression on the SON anomalies of wind and SST from 1948 to 2005 gives a correct approximation of the SON temperature anomaly over Europe, with a correlation of r = 0.83. In particular this regression explains 70% of the 2006 anomaly. The last 30% should likely be explained by local amplification (absence of fog, soil moisture deficit). Thus it seems that the daily flow, which was not exceptional on a daily timescale, was extremely persistent throughout fall 2006, bringing warm air northward over Europe from an extremely high SST region. In this presentation, we explore those hypotheses to explain the exceptional 2006 temperature anomaly in the NCEP reanalysis data.

Reference: P. Yiou, R. Vautard, P. Naveau, and C. Cassou, Inconsistency between atmospheric dynamics and temperatures during the exceptional 2006/2007 fall/winter and recent warming in Europe, Geophys. Res. Lett., VOL. 34, L21808, doi:10.1029/2007GL031981, 2007