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Are subseasonal temperature trends in Europe determined by changes in atmospheric circulation?

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Changes in frequency of daily atmospheric circulation types during the second half of the 20th century are well documented applying both subjective and objective classification techniques on daily observed atmospheric fields. We study the effect of such changes on trends of daily maximum and minimum temperature (TX and TN, respectively) and daily temperature range (DTR) at 70 stations in Europe in the period 1961–2000.
Linear trends of TX, TN, and DTR are calculated for moving "subseasons" of differing lengths (10, 20, 30, 60, and 90 days), each shifted by one day. Trend magnitudes vary between subseason lengths, between regions, and also during the year. The warming is not ubiquitous: we found several non-warming periods in different regions apart from the well-documented autumn cooling in Southeastern Europe.
We use one classification of daily atmospheric circulation from the COST733cat database (SANDRA – optimized cluster analysis) performed over 11 European regions. We employed several variants of this classification method using different prescribed numbers of circulation types (9, 18, and 27) and different input variables for classification (sea-level pressure, 500-hPa geopotential height, vorticity at the 500 hPa level, and thickness between the 850 hPa and 500 hPa levels).
The ratio of circulation-induced and observed trends varies among regions and seasons: the highest ratio is found over the British Isles in winter, while values close to zero occur in case of TN in the Baltics in summer, and also in the central and eastern Mediterranean all year round. The greatest influence is usually achieved by a classification with 27 types that is based on a combination of all input variables. In most of the studied regions, the rate of influence is highest for trends calculated for shortest subseasons of 10 days.