Causes for the extreme precipitation trend

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Opposite trend in precipitation in northern and southern Europe motivated this study about the causes of the trend in precipitation extremes. Particularly, we focus our analysis on consecutive wet days index (CWD) and highest one day precipitation amount (RX1DAY), due to the importance of these extremes in different socio-economic sectors such as agriculture applications. Extreme precipitation indices were computed from daily gridded dataset derived through interpolation of station data (E-OBS) version 4.0 (Haylock et al. 2008, Hofstra et al. 2009) for the period 1950-2010. We explain the different trends and variability of extreme precipitation indices by considering the effects of teleconnection patterns. Firstly, we obtained that the trend of extreme precipitation indices is more significant than the corresponding for accumulated precipitation. Moreover, we obtained stronger relationships between extreme precipitation indices and teleconnetion than the corresponding for accumulated precipitation. These differences are analysed by using composite maps. The North Atlantic Oscillation (NAO) is the teleconnection pattern that presents the highest influence on precipitation extremes over Europe in winter, particularly in southern and northern regions. With regard to other seasons, the Scandinavian teleconnection pattern (SCAND) plays an important role. We extend the study to regional climate model data (RCMs), provided by the European Union-funded ENSEMBLES project, to compare the trend of the simulated and observed extreme precipitation indices. Haylock, M. R., N. Hofstra, A. Tank, E. J. Klok, P. D. Jones, and M.New, 2008: A european daily high-resolution gridded data set of surface temperature and precipitation for 1950-2006. Journal of Geophysical Research-Atmospheres, 113. Hofstra, N., M. Haylock, M.New, and P. D. Jones, 2009: Testing e-obs european high- resolution gridded data set of daily precipitation and surface temperature. Journal of Geophysical Research-Atmospheres, 114.