

Extreme events of perceived temperature over Europe: a projected northward extension of dangerous areas

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It is well known that an increase of temperature over Europe, both in terms of averages and extremes, is expected within the current century. In order to consider health impacts under warm conditions, it is important to take into account the combined effect of temperature and humidity on the human body. To this aim a basic index – the humidex - representative of the perceived temperature, under different scenarios and periods, has been investigated in this study. A very low concomitance of extreme temperature events and extreme humidex events is found over the present climate, reinforcing the importance to investigate not only extreme temperature and relative humidity future projections but also the combination of the two parameters. A set of 10-km resolution regional climate simulations provided within the EUR-11 EURO-CORDEX multi-model effort, demonstrates ability in representing the intense and extreme events of the humidex over the present climate and to be eligible as a tool to quantify future changes in geographical patterns of exposed areas over Europe. An enlargement of the domain subject to dangerous conditions is found since the middle of the current century, reaching 60 degrees North when considering really extreme events. The most significant increase in humidex extreme events is found when comparing the 2066-2095 projections under rcp8.5 scenario, to the 1966-2005 period: bearing in mind that changes in relative humidity may either amplify or offset the health effects of temperature extremes, a less pronounced projected reduction of relative humidity intensity in the Northern part of the European domain, associated to extreme temperature and humidex, makes Northern Europe the most prone region to a local increase of the humidex extremes.