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The climate of Zaragoza (NE of Spain) in the context of global change

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The IPCC 2013 (AR5) emphasizes that the impact of an increase in temperature will be compounded in large cities by the effect of the urban heat island. Therefore, it suggests the need to study the urban climate in urban planning to anticipate changes and define adaptation strategies.

The aim of this work is to analyze recent trends in temperature in the city of Zaragoza (NE of Spain, 750,000 inhabitants) and the extreme values from climate indices defined by the WMO.

Daily temperature data recorded at 10 observatories located in Zaragoza was homogenized and quality-controlled using 'HOMER, R-Package', developing a single daily series since 1892 to present.

Temperature records show a clear positive trend since the early 80s of 20th century. The first decade of the 21th century is the warmest since the beginning of the instrumental records. There is an increase of +0.07 °C per decade. Furthermore, the temperature rise in this period has been +1.6 ° C. The frequency of tropical nights has also been increased. The number of nights when the minimum temperature was not lower than 20 °C has moved from 89 in the period 1900-1930 to 386 in 1991-2010. Days when the maximum daily exceeds 35ºC are also more frequent. Regarding the cold events, there is a decrease in the number of days with temperatures below 0 °C.

These results reinforce the idea of the IPCC that the challenges of climate change should be recognized as fundamental elements for urban planning in order to reduce risks and promote the welfare of citizens, as well as an instrument to minimize vulnerability and identify ways to maximize opportunities.