Extreme temperatures analysis: A study for Campinas, Brazil

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Extreme events such as heat waves have adverse effects on human health, especially on vulnerable groups, which can lead to deaths, thus they must be faced as a huge threat. Many studies show general mean temperature increase, notably, minimum temperatures. The scope of this work was to assess daily data of a historical series (1890-2018) available on the Instituto Agronômico de Campinas (IAC), in Campinas, using a suite of indices derived from daily temperature and formulated by the Expert Team on Climate Change Detection and Indices (ETCCDI) and evaluate trends. To compute the extreme indices RClimDex 1.1 was used. The significance test is based on a t test, with a significance level of 95% (p-value<0,05). Temperature increase is undoubtedly through many indices, especially from 1980, as there is a continuous rise of the temperature. Annual mean maximum temperature rose from 26°C to 29°C, whereas many years consistently have more than 50 days with maximum temperatures as high as 31°C and more than 20% of the days within a year are beyond the 90th percentile of the daily maximum temperatures. Annual mean minimum temperature rose from 14°C to 18°C, whereas many years consistently have more than 150 days with minimum temperatures as high as 18°C and more than 30% of the days within a year are beyond the 90th percentile of the daily minimum temperatures. Therefore, results indicate the increase of minimum temperature is greater than the increase of maximum temperatures.