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## Investigation of combined regional trends of extreme precipitation and temperature in southern Italy

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This contribution proposes an integrated analysis of climate regime trends in southern Italy (Calabria Region), focusing on both extreme precipitation and temperature events. Provided several precipitation and temperature observations available in the period 1955-2023 for a relatively dense monitoring network (approximately a rain gauge station per 110 km<sup>2</sup> and a temperature station per 100 km<sup>2</sup>), four precipitation-related variables like total precipitation (PRCPTOT), maximum one-day precipitation (RX1day), maximum five-day precipitation (RX5day) and Consecutive Dry Days (CDD) were chosen. Also, three temperature-based variables were selected, i.e., the maximum of the maximum daily temperatures (TXx), the mean of the mean daily temperatures (Tmean), and the minimum of the minimum daily temperatures (TNn). The trends of these seven selected variables were assessed and combined through three approaches at the annual and seasonal scales, considering each available monitoring station (namely, 134 precipitation and 148 temperature stations). First, we combined PRCPTOT and RX1day to highlight which stations have an increased probability of both drought and flood risks, developing a novel integrated climate regime index (ICRI). Then, we considered the three temperature indices, TXx, Tmean, and TNn, to pinpoint stations that have experienced more robust rising trends. The third analysis combined PRCPTOT, RX1day and temperature (using alternatively TXx, TNn and Tmean) to investigate the compound risk of flood, drought and, to a certain extent, wildfires. The results indicate a rather homogeneous increase of all temperature-related variables, especially starting from 1990, and that since 1955, a considerable number of stations have experienced increasing trends for RX1day and falling trends for PRCPTOT. Therefore, most of the territory of the region is more likely to confront water stress, flood and forest fires.