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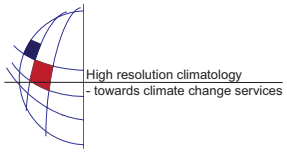

Climatic indicators over Catalonia during the last century

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The Meteorological Service of Catalonia releases a yearly bulletin whose main objective is to try to detect climate trends over Catalonia during the last decades. Climate indicators are obtained from the analysis of historical daily air temperature, sea temperature and rainfall series. Those series have been first completed, analyzed for quality control and homogenized to ensure its final reliability. Regarding homogenization, monthly air temperature series have been tested and corrected according to the methodology proposed by Caussinus and Mestre (2004). For the two longest air temperature series, the calculated correction factors have been transferred to the daily values following Vincent et al. (2002) recommendations, while no significant inhomogeneities have been detected for precipitation series.

The analysis of temperature trends, for the period 1950-2010, of 17 selected climatic series spread across the territory shows a common temperature increase between +0.19 to +0.24 ºC/decade. This warming trend is uniform and no specific sub-regional trends are detected. Furthermore, the seasonal approach reveals that mean maximum temperature increases at a higher rate than mean minimum temperature. The summer temperature rise is the most significant, between +0.32 and +0.44 ºC/decade, while autumn is the only season showing no significant positive trend. The summer maximum temperature shows the highest increase, exceeding +0.39 ºC/decade in all the 17 series.

The climatic extremes analysis of the longest Catalan series (Ebre Observatory in Roquetes, Tarragona, since 1905 and Fabra Observatory in Barcelona since 1913) reveals an increase in the number of summer days, tropical nights, minimum of maximum temperature, warm days and warm nights, and a decrease in the number of frost days, cold nights, cold days and cold spell duration indicator. Concerning precipitation, the only significant trend is the reduction of snow days. These trends were calculated according to the Expert Team on Climate Change Detection and Indices (ETCCDI).

The sea temperature trend in l'Estartit (NE coast of Catalonia, Costa Brava) since 1974 shows a steady increment in all the measured levels (surface, -20 m, -50 m and -80 m) of +0,33 ºC/decade on average. Temperature increment is maximum at -20 m, with +0.36 ºC/decade variation. Moreover, there is an increase in the sea level of +3.35 cm/decade.

CAUSSINUS, H. and MESTRE, O. (2004): Detection and correction of artificial shifts in climate series. Journal of the Royal Statistical Society Series C - Applied Statistics, 53, 405-425.

VINCENT, L.A., ZHANG, X., BONSAL, B.R., HOGG, W.D. (2002): Homogenization of daily temperatures over Canada. Journal of Climate, 15, 1322-1334