



## Trends of average and extreme temperatures in the Euroregion Galicia-North Portugal

J.J. Taboada (1), A.M. Ramos (2), M.N. Lorenzo (1), M. Gómez-Gesteira (1), M. deCastro (1), I. Alvarez (1), I. Iglesias (1), A.J.C. Crespo (1), and F.E. Santo (3)

(1) EPphysLab (Environmental Physics Laboratory), Universidade de Vigo, Ourense, Spain (isaiglesias@uvigo.es), (2) Meteogalicia. Xunta de Galicia, (3) Instituto de Meteorología, Lisbon, Portugal

Over the last decades great effort has been devoted to the understanding of the climate system. In the precipitation changes there is rather uncertainty because precipitation presents a more variable behaviour, spatially and temporally. However, the observations evidence that global surface temperature increased during the 20th century. But this trend has not been temporally homogeneous. The most important warming took place since mid-70's with the highest values in the last two decades. On the other hand, Europe has warmed slightly more than the global average. A particularly significant warming has been observed in the past 50 years over the Iberian Peninsula. This increase implies changes in extreme values.

In the area under study the evolution of temperature was observed to decrease from mid century till the seventies and to increase from then on. In average, the annual trend of maximum temperature for the period 1974- 2006 was observed to be positive with values ranging from 0.28 to 0.83 °C per decade. This positive trend at annual scale can be analyzed in more detail by means of seasonal trends. The trends were especially important during summer and spring. A similar behavior can be observed for the minimum temperature values. Once again, the annual trend for the period 1974- 2006 was observed to be positive. Seasonally, summer and spring showed the highest increase in minimum temperature. Additional information can be provided by extreme temperatures.

The 1974-2006 trends for seasonal TX90 show a positive trends in spring and summer (from 3 to 6 days per decade) while in winter and autumn the trends are no significant. Trends for the index that represents cold days (TX10) show a negative trend. Seasonally, the most coherent pattern appeared in spring. Moreover, the trend was greater for TX90 than for TX10. The most marked trends for extreme temperatures were obtained for TN90 index associated to hot nights. These trends can be observed in spring and summer. When these trends are compared with the obtained for TX90 it is possible to observe the existence of a larger warming trend in the night index than in the day index, suggesting a negative trend in mean diurnal temperature range. Another interesting point is that warming was mainly observed in spring and summer, both for days and nights. The TN10 index, associated to cold nights, showed a decreasing trend which indicates a warming similar to the one observed for the rest of the indices. In this case, the index was spatially coherent in spring, summer and autumn. The negative trends for cold nights can be observed to be similar to the ones obtained for cold days, although considerably lower, in absolute value, than the TN90. In general, the T10 values were always lower in absolute value than their T90 counterparts.