



Homogenisation of Monthly Maximum and Minimum Air Temperatures in Ireland

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Reliable long temperature series are essential for all climate change research. However these series are usually influenced by inhomogeneities which are caused by changes in the measurement conditions such as relocation of the enclosure, new observer, changes in instrumentation, automation etc. As the artificial shifts often have the same magnitude as the climate signal, such as long-term variations, trends or cycles, a direct analysis of the raw data series can lead to wrong conclusions about climate change. Unfortunately not all of these changes (station metadata) have been documented so it is necessary to use statistical techniques, along with the available metadata to determine these inhomogeneities, remove them from the series and adjust the series so that they are homogeneous.

Met Éireann have rescued metadata for synoptic, climate and rainfall stations from old station files, instrument service records etc. and digitised this information. This metadata has been used along with HOMER to homogenised monthly maximum and minimum air temperatures in Ireland for the period 1961 to 2010. 100 maximum and 99 minimum temperature series with 17 years or more of data were examined; 22 of these stations had a complete 50 years series of both maximum and minimum temperature. Using HOMER in semi-automatic mode it was found that 69% of the minimum temperature series and 63% of the maximum series had at least one break. Of these series with breaks, 57% of the minimum temperature series and 49% of the maximum temperature series had just one break. Station metadata accounted for approximately 37% of the shifts for both maximum and minimum series. Results from the study, including the magnitudes of the breaks, the causes of the breaks- if known and whether or not a break has the same affect on maximum and minimum temperature will be presented. The affect of homogenisation on the temperature trends for stations with long data series will also be discussed.