



Data rescue and quality control of the long-term summer and winter, maximum and minimum, daily air temperature records in Ireland

Carla Mateus (1), Mary Curley (2), and Aaron Potito (1)

(1) Department of Geography, National University of Ireland Galway, Ireland, (2) Met Éireann, Glasnevin Hill, Dublin, Ireland

This PhD research is the first to achieve data and metadata recovery, digitisation, quality control and homogenisation of available summer and winter long-term instrumental daily, monthly and seasonal maximum and minimum air temperature. The twelve long-term records of daily air temperature observations dated back to the early and mid 19th century to the present: Phoenix Park (1831-2016), Trinity College Dublin (1840-2016), Armagh Observatory (1844-2016), Botanic Gardens (1848-2016), NUI Galway (1861-2016), Fitzwilliam Square (1869-2016), Birr Observatory (1872-2016), Roches Point (1872-2016), Valentia Observatory (1872-2016), Markree Observatory (1875-2016), Blacksod Point/Belmullet (1885-2016) and Malin Head (1885-2016). Short-term series dated back to the 19th century were also analysed, e.g.: George Yeates, Grafton Street (1843-1849), Goldoon (1860s-1880s), Greencastle (1872-1879), Mullaghmore (1879-1893), Donaghadee (1872-1935).

This is a fundamental research as most of the daily air temperature records have not been digitised prior to the 1950s, and existed in the original observations manuscripts and scattered publications in extremely fragile journals and books stored in various archives across Ireland.

The aims of this poster presentation are to:

- (1) Explain the procedures for data and metadata discovery, rescue and digitisation;
- (2) Present the quality control process.

The objectives of this presentation are to:

- (1) Highlight the importance of the rescued metadata to an exemplary quality control process, e.g. different thermometers, distinct screens, changes in exposure, re-location of station or changes in its surroundings and observing practices, diverse observation times and conversion from manual to automatic station;
- (2) Explain the relevance of the rescued parallel measurements and their quality control procedures;
- (3) Present the spatial comparison of long-term records prior and after the application of quality control.

For the daily homogenisation process: the software MASH v3.03 will be applied in conjugation with the station metadata.

The final homogenised daily air temperature series will be used to reconstruct past climate extremes such as heat and cold waves, extreme air temperature indices, climate variability and air temperature trend analysis.

Keywords: data rescue, quality control, daily homogenisation, air temperature extremes, climate modelling.