



Diurnal Temperature Range (DTR)

Key Message

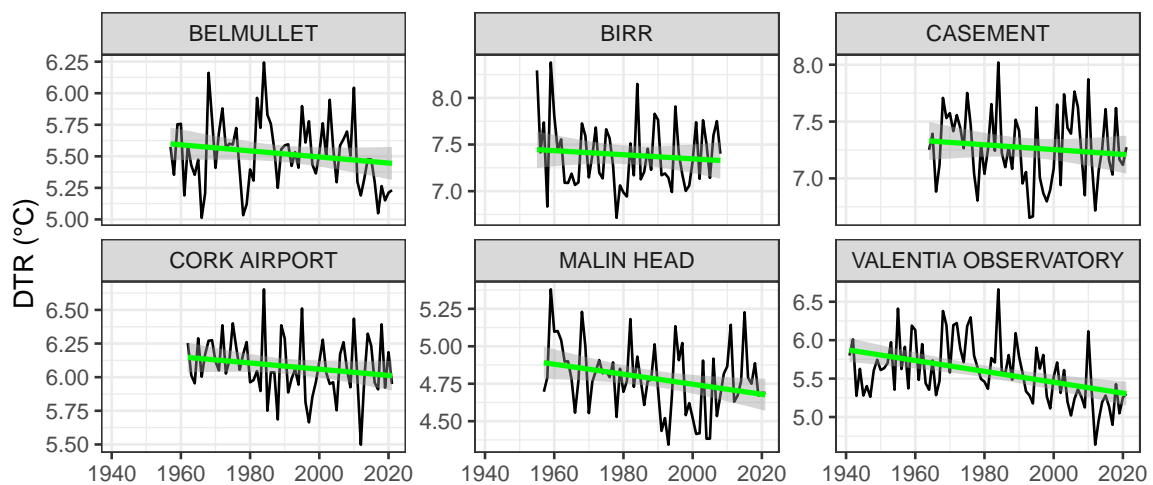
- The diurnal temperature range is decreasing at the majority of weather stations, though these trends are often not statistically significant.

Definition

- The Diurnal Temperature Range (**DTR**) index is calculated as the average difference between the maximum (TX) and minimum (TN) temperatures during the period of interest (year, season or month).
- Defined as: $DTR = \overline{(TX - TN)}$

Trends

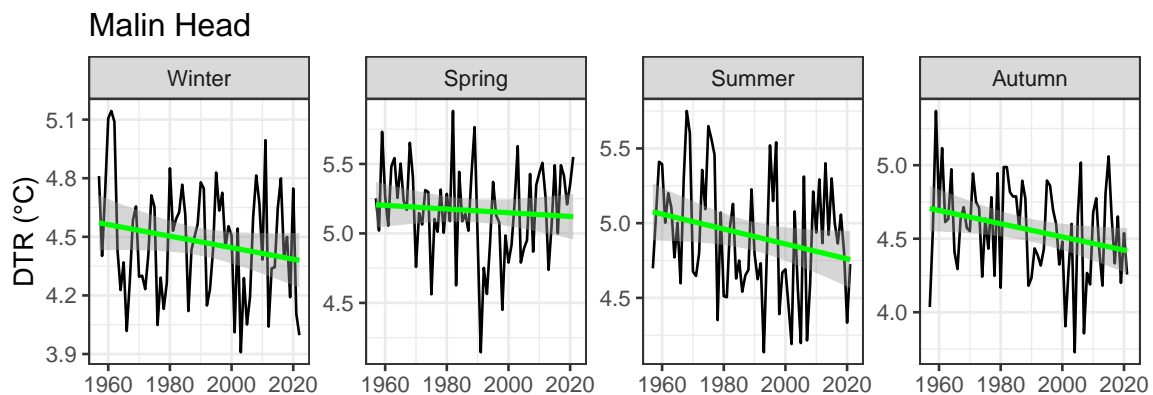
- There is a small decreasing trend in **DTR** at the majority of Met Éireann's synoptic weather stations, as minimum temperatures are increasing at a greater rate than maximum temperatures. A minority of these trends were found to be statistically significant.
- The 30-year average value of **DTR** has decreased by an average of 0.14°C, between 1961-1990 and 1991-2020, at the six stations in the graphs below.
- Global trends vary spatially for this index and the results found here are in agreement with findings for similar areas in other studies, [Thorne et al., 2016, Dunn et al. [2020]].





Seasonality

- The decreasing trend in **DTR** is present for most seasons at the majority of stations, shown below for Malin Head, but with a large degree of uncertainty associated with these trends.



Data Access

Data for this index can be downloaded through the web-page below (or the QR code in the header):

- <https://www.met.ie/climate/climate-change-indices-etccdi/>

For further information contact Met Éireann Climate Enquiries: enquiries@met.ie

References

Robert JH Dunn et al. Development of an updated global land in situ-based data set of temperature and precipitation extremes: HadEX3. *Journal of Geophysical Research: Atmospheres*, 125(16):e2019JD032263, 2020. doi: <https://doi.org/10.1029/2019JD032263>.

PW Thorne et al. Reassessing changes in diurnal temperature range: Intercomparison and evaluation of existing global data set estimates. *Journal of Geophysical Research: Atmospheres*, 121(10):5138–5158, 2016. doi: <https://doi.org/10.1002/2015JD024584>.