

Key indicators of climate change in Ireland

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This primary objective of this research project is to investigate the magnitude and direction of ongoing changes in Irish climate. The study utilises the Irish observational climate data sources supported by Met Éireann. An extensive array of data from the synoptic, climatological and rainfall station network throughout Ireland, from 1890 to the present, has been collected with a primary focus on daily data from the period starting in the 1940s and 1950s. The analysis has involved the compilation of suitable indicators which have enabled the identification of possible climate trends. The detection of trends in Irish climate is more difficult due to the influence of the North Atlantic Ocean. Therefore, a range of climate variables and indices need to be investigated. Only small changes are detectable when using mean monthly data, while a greater magnitude of variation is evident by using daily data to detect more extreme climatic events. In response to this, a number of indices have been calculated using STARDEX (Statistical and Regional Dynamic Downscaling of Extremes for European regions) extremes indices software (<http://www.cru.uea.ac.uk/cru/projects/stardex/>). These include absolute indices (e.g. greatest 3-day rainfall totals), percentiles (e.g. number of rainfall events greater than the 90th percentile) and duration indices (e.g. heat wave duration) among others.

Analyses of surface climate records in Ireland appear to support global climate trends. Annual temperature records indicate an increase of 0.7°C during the period 1890-2005. This is similar to global trends with rapid warming in the last two decades. Analysis of Irish precipitation change also appears to support the predictions of Global Climate Models (GCMs) with evidence of a trend towards winter increases and summer decreases. There are generally wetter conditions on the western and northern coastal regions due to increases in rainfall intensity and persistence.