

**ATMOSPHERIC CIRCULATION VARIABILITY: IMPLICATIONS FOR AIR QUALITY****S.R. Dorling, M. Doyle***School of Environmental Sciences, University of East Anglia, Norwich, UK*

The variations in weather conditions which occur from one year to another clearly have an important bearing upon the ease with which air quality objectives and limit values may be achieved. Important meteorological controls on air quality extend from the very local scale (for example temperature inversions) to the large synoptic scale (for example regional-scale transport of anthropogenic or natural air pollution). This paper describes a methodology and the results from an automated daily classification of regional-scale atmospheric circulation in north-west Europe, based on 850hPa geopotential height fields. The period covered is 1958-2003 inclusive, incorporating the full duration of the NCEP Reanalysis dataset and updated to incorporate the extreme weather conditions experienced across much of Europe in 2003. The extreme weather of 2003 was accompanied by dangerous levels of some air pollutants, with important health outcomes, and the aim of the paper is to highlight how anomalous atmospheric circulation was in 2003 in the context of the extended 1958-2003 record. The objective is to derive indices which help us to apply 'weather correction factors' to trends in exceedances of air quality limit values. The classification method, based on a Cluster Analysis approach, lends itself to being easy to use in conjunction with climate model output, such that changes in the frequency of key circulation patterns can be analysed for any future scenario of interest.