

MODELLING OF LONDON OZONE LEVELS WITH MM5/CMAQ

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Understanding urban air pollution remains a challenging task in atmospheric science research. Air pollution in urban areas has important implications for health and environmental management and for methodologies for its assessment. Traditionally, simple approaches such as the box model or the Gaussian plume have been used to assess urban air quality. The use of Eulerian grid models, which provide a more realistic and comprehensive description of the urban atmosphere, has been increasing over the past few years. This paper reports on the use of the MM5/CMAQ modelling system to predict hourly ozone levels over London, UK. Domain resolutions of 9km, 3km and 1km (inner) have been employed for this study. Summer periods in July and August 2002 have been simulated and the predicted results have been compared to several urban background stations across London. Input data for emissions have been derived from the UK National Emissions inventory and from the outputs of the EMIMO emission model. The CBM-IV chemical scheme has been used to simulate the atmospheric reactions for ozone. The model results have been evaluated with measured data through a range of statistical measures. Overall, MM5/CMAQ reproduces the temporal trends quite well for both periods. However, it over-estimates the night-time ozone concentrations. The paper discusses the model performance and reasons for any discrepancies in terms of the various input data including emissions and meteorological parameters.