

# **Some effects of mesoscale processes on regional transport of pollutants**

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Mesoscale features and resultant flows, strongly affect the regional transport of pollutants, yet little is still known about the full extent of their influence. Because of computational constraints, many studies on the subject, consider input data to dispersion and air quality models, that is at a too coarse resolution to capture mesoscale flows or are run on too small a domain, thus excluding regional transport of pollution. A sufficiently complex, high resolution model is required to adequately describe the mesoscale processes as well as the emissions. As an example, the pollution in many European cities is influenced by complex topography and its effect on the flow. Moreover, various mesoscale flows such as fronts and sea breezes affect the mixing and transport of pollutants along their path. Most of these effects are lost, if the model resolution is not adequate to resolve them. Aspects of the effect high resolution data has on pollutant concentrations are examined in this work. The Met Office Unified Model, UM, is used coupled with the Met Office Lagrangian dispersion model, NAME III, to examine some of the influence mesoscale features exert on regional pollutant transport. The UM is first run at various spatial and time resolutions, providing meteorological data with different degrees of refined information to the dispersion model. Although various mesoscale type flows are examined, our aim is to give emphasis on the effects of mesoscale topography.