



## **Influence of Different Size European Metropolitan Areas on Meteorological and Chemical Patterns**

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The evaluation of formation and development of meteorological and chemical/aerosol patterns due to influence of the Rotterdam metropolitan area was performed employing the urbanized version of the Enviro-HIRLAM (Environment - High Resolution Limited Area Model). Anthropogenic emissions of gases and aerosols from sources (including from airplane, transport, and shipping activities) are considered. The model is urbanized based on the Building Effects Parameterization module which describes different types of urban districts such as industrial commercial, city center, high density and residential with its own characteristics. Boundary and initial conditions for the downscaling runs are taken from ECMWF and further from the inner domains of nested model runs (with 15, 5, and 2 km resolutions, and higher time steps of 240, 120, and 60 sec).

For the studied period of Jul 2009, several specific dates with low, typical, high wind speed, precipitation, cloud free and overcast conditions were analyzed in more details. The effects of urbanization are analyzed for atmospheric transport, dispersion, deposition, and chemical transformations. Employing GIS, the comparative analysis between selected metropolitan areas – small (Rotterdam), medium (Copenhagen), and large (Rein-Ruhr) sizes – was also performed for different model control vs. urbanized runs.