



Flux calculations and trends of atmospheric pollutants in the BeNeLux/Rhein-Ruhr area from 2000 – 2009

Hermann Jakobs and Michael Memmesheimer

Universität Köln, Rhenish Institute for Environmental Research, Köln, Germany (Hermann.Jakobs@eurad.Uni-Koeln.DE, 0221-4002320)

The BeNeLux/Rhine-Ruhr area is a strongly industrialized region in Central Europe with high population density. As a part of it, Rhine-Ruhr with about 10 Million inhabitants is one of the regions in Europe which has a megacity character with respect to population density, traffic, industry and environmental issues. The main centre of European steel production and the biggest inland port of the world are located in Duisburg, one of the major cities in the Rhine-Ruhr area. Together with the nearby urban agglomerations of the Benelux area, e.g., Brussels, Amsterdam and Rotterdam as one of the most important sea harbours of the world, it is one of the regions in Europe which is most heavily burdened with air pollutants like ozone, NO₂ and PM₁₀. One major goal with respect to air quality survey within megacities is their temporal variability and the ingoing and outgoing fluxes. Therefore a whole decade (years 2000 – 2009) was simulated with the regional scale model EURAD (European Air pollution Dispersion Model). The model calculates the transport, chemical transformations and deposition of air pollutants in the troposphere from the surface up to about 16 km. Meteorological fields are provided by the meteorological model MM5. The flux and trend calculations are restricted to two areas: the small BeNeLux-Ruhr domain (longitude: 2 deg 30 min E – 8 deg 00 min E, latitude: 49 deg 20 min N - 53 deg 40 min N) and a big BeNeLux-Ruhr domain (longitude: 01 deg 00 min W - 08 deg 00 min E, 48 deg 00 min N - 54 deg 00 min N) including the cities Paris and London. This work was done within the framework of the FP7 project CityZen. Yearly in- and outflow fluxes were calculated at the borders of the megacity domains and compared with respect of interannual variability. In addition annual means and number of exceedances of limit values are compared for the major hot spots within the mentioned domains.