



## **Evaluation of the high resolution DEHM/UBM model system over Denmark and assessment of trends in air pollution levels over 36 years**

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Air pollutant levels over Denmark are simulated using the high resolution DEHM/UBM model system for the years 1979 to 2014. The system employs a hemispheric chemistry-transport model, the Danish Eulerian Hemispheric Model (DEHM) that runs on a 150 km resolution over the Northern Hemisphere, with nesting capability for higher resolutions over Europe, Northern Europe and Denmark on 50 km, 16.7 km and 5.6 km resolutions, respectively. DEHM is coupled to the Urban Background Model (UBM) that covers the whole of Denmark with a 1 km x 1 km spatial resolution. Over Denmark, the system uses data from the SPREAD emission model on a 1 km x 1 km resolution grid covering Denmark and its national sea territory. The study will describe the model system and will evaluate the performance of the model system in simulating hourly, daily and monthly mean ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) concentrations against surface measurements from eight monitoring stations. We will then investigate the spatial and temporal variability of air pollutants and emissions in order to better understand the observed air pollution trends over Denmark during this 36-year period.