Introduction

Long-term studies of atmospheric aerosol are needed to investigate the impact of various substances on climate and human health. This necessitates a long-term simulation of atmospheric pollutants. Long-term simulations are more suited for model evaluation than episodic simulations which extend over a few days or weeks. Another important application is the development of air pollution abatement strategies. The data provided by a long-term simulation enables an air quality assessment of the whole area of investigation, in particular for regions where measurements are incomplete.

Summary

Using the EURAD modeling system a long-term air quality simulation with respect to the year 1997 has been performed. The simulation takes place inside a 100 km by 160 km N1-domain (horizontal resolution of 125 km and 25 km respectively). This model domain is divided into two sub-dominions: the N1-domain and another 25 km–grid (called N2-domain). The N1-domain is used to provide results for the whole area of investigation except for the N2-domain. A more detailed description of the NRLDA and the assessment of emission data is given in [1].

Using data from the Meteo-France network a grid box of 10 km by 10 km is defined in the rock area of Paris. This grid box is used for the internal model comparison of the NRLDA and EURAD. The NRLDA is used to provide results for the whole study area except for the N2-domain. A more detailed description of the NRLDA and the assessment of emission data is given in [1].

Emissions

This figure shows yearly emissions of the two N1-domains and the two N2-domains in the area of investigation. The emissions are divided into two categories: anthropogenic emissions and natural emissions. The emissions are calculated using the RACM mechanism. The anthropogenic emissions are derived from the EMEP emission inventory for 1998 with a horizontal resolution of 50 km by 50 km. The natural emissions are derived from the EMEP emission inventory for 1998 with a horizontal resolution of 50 km by 50 km.

Model Quality

Within MADE the particle size distribution is treated by three hypothetical modes. Each mode represents a population of internally mixed aerosol particles. The mixing ratio of gas-phase species is calculated using the RACM mechanism. A first evaluation of model results has been performed for the region of Northern-Western Europe. The model results have been compared to the EIT directives 96/02 and 96/03. In large areas of middle Europe the limiting value of 35 days per year is exceeded.

Grid Design

The grid design of the NRLDA is used to provide results for the whole study area except for the N2-domain. The grid box is used for the internal model comparison of the NRLDA and EURAD. The NRLDA is used to provide results for the whole study area except for the N2-domain. A more detailed description of the NRLDA and the assessment of emission data is given in [1].

References


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