1.131 Data mining of large air quality datasets to improve emission iventories, identify long-term trends, and characterize meteorological influences on pollutant concentration.

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Abstract:

Large datasets of air quality monitoring data in the United States of America and in China contain a wealth of information about emissions of pollutants and atmospheric processes. We combine data mining tools such as inverse modeling, cluster analysis and multiple linear regression to extract detailed information from the datasets. The methods are able to merge weather data, meteorological simulations, particle trajectories and satellite remote sensing with surface concentration measurements to improve the estimates of emissions and to quantify factors impacting air quality. In the United States, the methods are used to characterize intra-urban variability of emissions as well as to obtain estimates of the diurnal profiles of emissions for different days of the week. The analysis was also used to identify factors leading to extreme pollution events as well as meteorological factors influencing atmospheric reactions, for example on the production and removal of secondary organic aerosols as well as reactive mercury. In both China and the USA there have been concerted policy efforts at improving air quality. The impacts of these can be evaluated on a regional to sub-urban scale in order to estimate the effectiveness of control policies and to keep emission inventories up to date with rapid changes.