

(a) Vertical Resolution of Pollutant Distributions

The vertical distribution of pollutants is generally more important for model applications at intermediate-range distances; therefore, the majority of the long-range transport models do not include attempts to resolve them. However, some regional models (both long-term and episodic), which include vertical resolution, do exist and these are more suitable for intermediate-range modeling provided that data input resolution is adequate for these scales. From the survey of the 42 regional models each was categorized according to its vertical resolution treatment. This information is presented in Table 1. No attempt has been made to rank models within each category.

(b) Accommodation of Urban Emissions

A recent emissions inventory compiled for the EPRI/SURE region (Klemm and Brennan, 1981) indicates that minor point sources and area sources (residential, commercial, industrial, and transportation) contribute 17% of the total sulfur emissions, 62% of the total nitrogen emissions, and 56% of the total particulate emissions. A large majority of these emissions occur in urban areas. In order to treat urban emissions adequately, the model must provide for area source emissions and surface-based emissions.

None of the 42 models surveyed specifically focused on urban emissions, and very few mentioned these emissions at all. This is not surprising because the primary concern was sulfur emissions over large spatial scales. Over intermediate distances, urban influences play a significant role, depending on the particular pollutant being considered. Some of the models have the capability to treat urban emissions with little or no modification. These are the Eulerian grid models, and more specifically, the grid models with some vertical resolution.

Lagrangian models may easily incorporate urban emissions if they are receptor-oriented. In these models, emissions are gridded and input into a trajectory segment, or air parcel, as it flows toward a receptor. However,