

4.3 Recommendations for Future Work

(1) Detailed field studies should be carried out to learn more about the concentration and deposition fields within 100 to 200 km of a major source of sulfur for an extended period to determine how much of the emitted sulfur is being deposited locally. Results should be averaged over both extended and shorter periods during specified meteorological conditions. These studies would include the measurement of concentrations in the ambient air and in precipitation, not only of sulfur compounds but, if possible, other substances that may effect the sulfur chemistry, such as oxides of nitrogen, oxidants, and catalysts such as trace metals. These measurements should be carried out with sufficient spatial extent and resolution to shed insight into the transformation rates of the various chemical species and their budgets.

(2) A careful examination should be made of the existing data on local and mesoscale deposition that can be found in the literature in order that maximum use be made of them.

(3) Existing, less complex, analytical models may be appropriate for use out to distances of a few kilometers. Existing, more complex, Lagrangian, Eulerian, or hybrid models may also be appropriate for distance scales of the order of a few tens to a few hundred kilometers. The local models need to be improved to better account for chemical transformation, and wet and dry deposition processes.

(4) Mesoscale models that are used for large spatial scales with corresponding time scales of the order of several hours to a few days must include chemical transformation, wet and dry deposition processes, and transport and diffusion processes with suitable vertical resolution.

(5) As indicated in the survey, there are numerous models in all of the above categories. It is difficult, however, to select a model, or combination of models, for use in a particular application. With so many models available, which appear to have been developed on sound theoretical principles, the Work Group recommends that research and development of new models be given a lower priority than evaluating the performance of existing