province. More recent and spatially detailed modeling work by Wiltshire (1981), shows well-defined maxima of deposition (as estimated by his model) in the vicinity of the strong urban and industrial sources of Atlantic Canada, such as Halifax, Saint John and Port Hawkesbury.

The results that have been summarized above seem to be contradicting. Part of the confusion arises from the fact that the experimental data have been interpreted in different ways. The influence of local sources has been interpreted in terms of (1) increase in local concentrations and deposition over regionally averaged values; and (2) fraction of emitted material deposited during precipitation and of fraction of emissions deposited in the long term. It is, therefore, important to be clear about the way in which local and mesoscale influences are expressed. Most of the papers referred to above seem to say that local sources can increase concentrations in air and precipitation within 10 to 20 km appreciably above regionally averaged values. Most also seem to agree that, on the long term, local sources account for a few, or at most 10 to 25%, of the deposition within a few tens of kilometers of the source. On the other hand, the most disagreement among researchers is with respect to the fraction of the local emissions that is deposited during precipitation; this fraction can vary from a few to virtually 100%. This range of estimates may result from data interpretation, or it may be caused by different factors, both physical and chemical, which are at play at different times and locations. What is needed are more field studies of local and mesoscale effects and perhaps a re-analysis of past studies if future studies shed new light on the matter.

Several workers have discussed the factors affecting the residence time or fallout scales of atmospheric pollutants, especially sulfur. Bolin et al. (1974) have discussed in a theoretical way some of the meteorological factors governing the residence time of pollutants in the atmosphere. A short residence time would imply that pollutants are removed from the atmosphere close to the source. The residence time increased markedly with decreasing deposition velocity and only slightly with increasing height of emission into the atmosphere. The residence time increased with increasing surface roughness. Wind speed was not of great importance. They concluded that dry deposition was likely to be less important than incloud scavenging. Indeed,