

Mass Budget Studies and Man-Made versus Natural Sources

- o Gross budget studies over large regions have examined the major input (including natural) and output quantities of sulfur compounds in the atmosphere. Studies for North America indicate that man-made sulfur oxide emissions exceed natural emissions by a factor of 10 to 20. Results derived from simple climatological analyses indicate that about three to five times more sulfur flows north, from the U.S.A. to Canada, than south. The ratio of the USA to the Canadian emissions of sulfur is almost six to one.
- o Budget studies also suggest that in eastern North America the three removal terms, wet deposition, dry deposition and outflow (into the Atlantic), are roughly equal. Further work is underway to determine the validity of this estimated apportionment.
- o Mass budget studies are in progress for nitrogen oxides and other species.

Local Versus Long Range Transport

- o Deposition values at the more remote pristine locations in eastern Canada and in other remote areas worldwide clearly cannot be attributed to local sources, which are negligible, and demonstrate the reality of a long range transport component.
- o While this report concentrates primarily on the long range transport aspects of transboundary pollution, it is recognized that near-source (less than 50 kilometers) and mesoscale (50-300 kilometers) phenomena are important.
- o Areas in eastern North America experiencing high wet deposition are generally situated in the vicinity (less than 300 kilometers) of non-negligible sources of emissions, while, at greater distances, lesser wet deposition rates occur over wider areas. In the context of the acid rain issue both scales must be considered.