Preliminary Conceptual Model - Causes of Haze in Viking Lake (VILA1)

Due to the reason that a whole year of aerosol data is not available, no analysis about the 20% worst haze days can be done. Based on the data available from 6/2002-8/2003, sulfate from eastern US in the summer and regional nitrate in the winter are believed to be the important causes of haze.

In Viking Lake, the average $PM_{2.5}$ mass concentration during 6/2002-8/2003 is 11 $\mu g/m^3$, and the average total light extinction coefficient (B_{ext}) is 94 Mm^{-1} (Visual Range ~ 42 Km; Deciview ~ 22). Sulfate and nitrate are two of the largest contributors to haze, with an average contribution of 35% and 29%, respectively. Figure 2 indicates that sulfate in the summer and nitrate in the winter are the major causes of haze. Summertime prevailing transport wind directions are predominantly from the south, a consequence of the semi-permanent Bermuda High of the eastern Atlantic coast that brings maritime tropical air into the Midwest from the direction of the Gulf of Mexico. In the winter and spring this pattern is modified by continental high pressure over the western states, the Great Basin High, that results in a higher frequency of northerly and westerly flow from the direction of the Canadian interior and the western U.S.

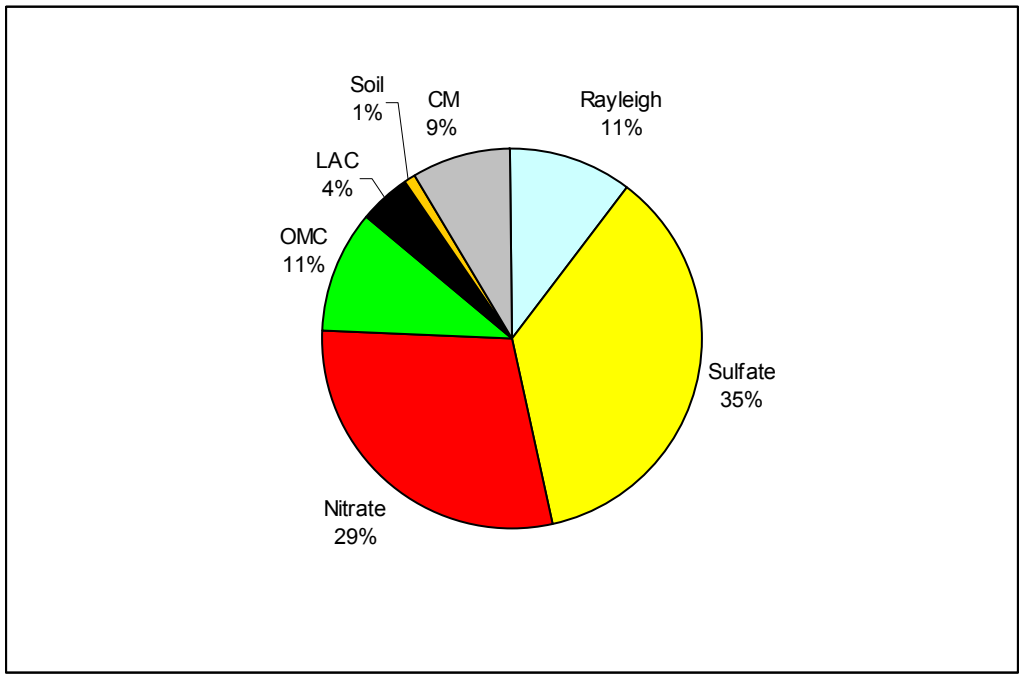

Figure 1. Average contributions of major aerosol chemical components to light extinction

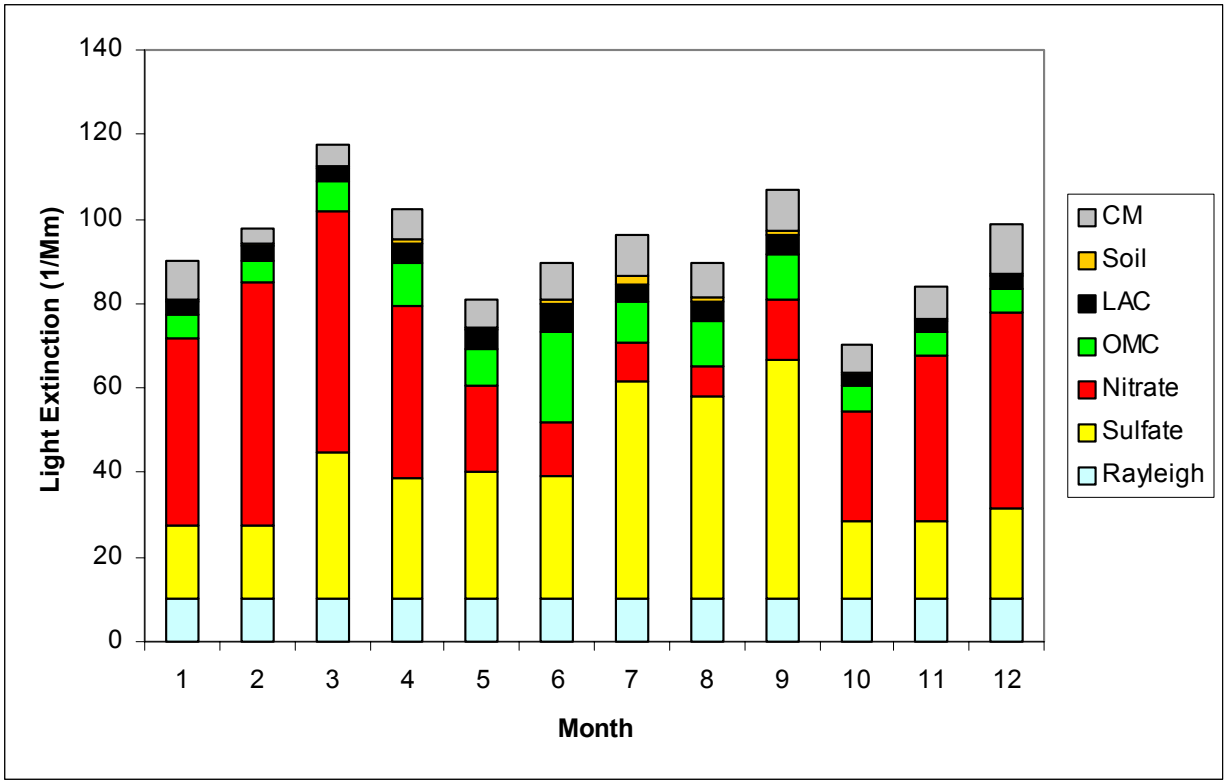

Figure 2. Average contributions of major aerosol chemical components to light extinction in each month