

B. TRENDS IN EMISSIONS: SO₂ AND NO_x

B.1 HISTORICAL EMISSION TRENDS

Introduction

The primary objective in developing historical emission trends is to recreate the emission situation of several decades ago, so that such data can be used in atmospheric models to provide an insight into sulfur deposition rates for those periods. These rates can then be compared to current deposition rates for an indication of the rate of change of the environment with time.

Factors other than strict fluctuations in the magnitude of acid precipitation precursor emissions, however, have also played a role in changes in deposition rates with time and these should not be overlooked. For example, concurrent with increases in SO₂ and NO_x emissions over the past 40 years has been a substantial increase (by a factor of five) in the stack height for utility sources. Also, SO₂ emissions from coal burning have changed in most regions from a wintertime peak to a summertime peak in emission rate. The importance of such factors has not been well determined at this time.

United States

Historically, data records on emissions and emission rates have been maintained only since the early 1970's. Consequently, in order to recreate such emissions, it is necessary to use other information. One of the most accepted approaches to retrospectively calculating emissions is to employ emission factors with industrial production and fuel use data. Records on these data are available and provide an indication of historical industrial production levels and how various fuels have been consumed by different sources. Knowing the emission rates of various sources, the sulfur content of the fuel, and the type of emission controls on a particular source, it is possible to estimate the emissions of various source categories.

Data Uncertainty: It is extremely difficult to provide an accurate estimate of the data uncertainty in making the above calculations. Generally, it is felt that the emission estimates for the utility sector are probably within 25% accuracy for the post-1965 years; however, no accuracy figures are available for the pre-1965 estimates.

No attempt has been made to assess the accuracy of the calculations for other sources, except to examine the general trends exhibited to determine areas where the trends are well outside of what might be expected. Appendix 3 describes a methodology developed to estimate probable errors in current emissions. Errors in historical data would be expected to be significantly greater than in current emission estimates, due to the necessity