

EMEP assessment report - LITHUANIA

Dalia Sopauskiene

Abstract:

Due to the dynamic nature of the atmosphere, substantial amounts of gaseous and particulate pollutants are transported to the areas distant from their sources. In order to assess the background air pollution level continuous monitoring of regional air pollution as well as chemical composition of atmospheric precipitation at station Peila has been carried out by the Institute of Physics in Lithuania since 1981. The station Preila ($55^{\circ}22'$ N and $21^{\circ}02'$ E) is located in western Lithuania on the Baltic Sea coast (Curonian Spit). Continuous monitoring (1981-2000) of concentrations of sulphur and nitrogen components both in air and precipitation in Lithuania has allowed us to evaluate the temporal changes using trend template MAKESENS for annual values. We revealed different tendencies in the pollutant concentration changes.

The large variation in sulphur dioxide and sulphate concentrations shows that there were differences in factors governing the background pollution level in the region. Both sulphur components data indicate very clear seasonality with higher concentrations during the cold season and lower concentrations during the warm season. The ratio of cold season to warm season is obtained 2.4 for SO_2 and 1.4 for particulate sulphate. In general, concentration of SO_2 undergo considerable change since 1989 with a significant decrease of concentrations measured during the cold seasons. The annual mean concentrations of SO_2 varied from 2.67-4.55 in the 1980's and have decreased to value about $1.0 \mu\text{gS}/\text{m}^3$ during the last two years. The fluctuation of annual means of SO_4 was generally from 2.2 to $3.5 \mu\text{gS}/\text{m}^3$ during 1981-1994. The obvious decrease in sulphate concentration is seen from 1994 and now annual means of SO_4 are below $1.0 \mu\text{gS}/\text{m}^3$. The significant negative trend for SO_2 is evident for cold period and less for warm period. The highest concentrations of both sulphur components ($3.0 \mu\text{gS}/\text{m}^3$) occur when the trajectories originate in the south, southwest and west directions during the period 1985-1996.

The decrease of both sulphur components in air has resulted in downward trend in sulphate concentration in precipitation. The increasing trend in pH is obtained.

Considerable change of NO_2 concentration has been evident since 1998. The annual means of NO_2 varied 2.37 to 4.05 during 1983-1998 and have decreased to value below $1.5 \mu\text{gN}/\text{m}^3$ during the last two years. The highest concentrations of NO_2 are calculated in air masses from SW-W and the lowest in air from N-NW.