

distance downwind, that is, to the east and northeast. The pH map shows a similar pattern with the lowest values coinciding closely with the greatest sulfate, nitrate and hydrogen ion deposition.

### 6.3 Temporal Variations

The geographical variability was discussed in the previous section mainly on the basis of annual averages. This is just one of the many important time scales and has automatically smoothed out temporal variations on all shorter time scales and resulted in the fairly smooth spatial continuity shown in the maps. However, the pollutant concentrations in air and precipitation are highly variable over a very wide range of time scales. This is not surprising when one considers the total experience of a pollutant as it moves between a source and a receptor. Among the most important factors influencing its behaviour and hence contributing to the variability of the composition of the air and precipitation are:

- o fluctuations and trends in anthropogenic and natural emissions (see Chapter 2 and the Work Group 3B report);
- o the dynamic variability within individual rain systems, their motion and hence the trajectories followed by the polluted air parcels (see Chapter 3), as well as the air motions during dry periods;
- o the variability associated with dry deposition and chemical conversions in the dry air before pollutants encounter precipitating weather systems, and the cloud processes and reactive chemistry within such systems (see Chapters 4 and 5); and
- o the variability of storm types and their mean tracks on a seasonal and annual basis and possible shifts in these patterns on the climatological scale.