

9. OTHER POLLUTANTS

Acid-forming sulfur and nitrogen compounds are not the only substances of environmental concern which are transported over long distances. Three other groups of substances have been identified for review: photochemical oxidants, primarily ozone; organics; and heavy metals. All three can cause environmental problems when transported over regional or hemispherical distances.

9.1 Ozone

In recent years there have been numerous studies of the generation, build up and dissipation of ozone concentrations across North America. While older studies emphasized human health effects, more recent ecological studies of the effects of ozone have increased the awareness of agricultural crop damage due to excessive ozone concentrations. Furthermore, ozone is an indicator for a variety of oxidants, many of which participate in the formation of acids from sulfur dioxide and nitrogen oxides (see Chapter 4). Ozone can originate from two different sources: (1) two natural ones, through the stratosphere or photooxidation of biogenic hydrocarbons and (2) an anthropogenic one, namely photochemical oxidation of hydrocarbons in the presence of nitrogen oxides. Meteorology plays a key role in how ozone is distributed, especially in the case of episodes of elevated concentrations.

There have been several studies of these episodes, which may occur when a high pressure system dominates the eastern part of North America during the summer. Under conditions of a stagnating air mass simultaneously with a high sun angle, large amounts of ozone will usually be formed and accumulate. However, the number of regional high