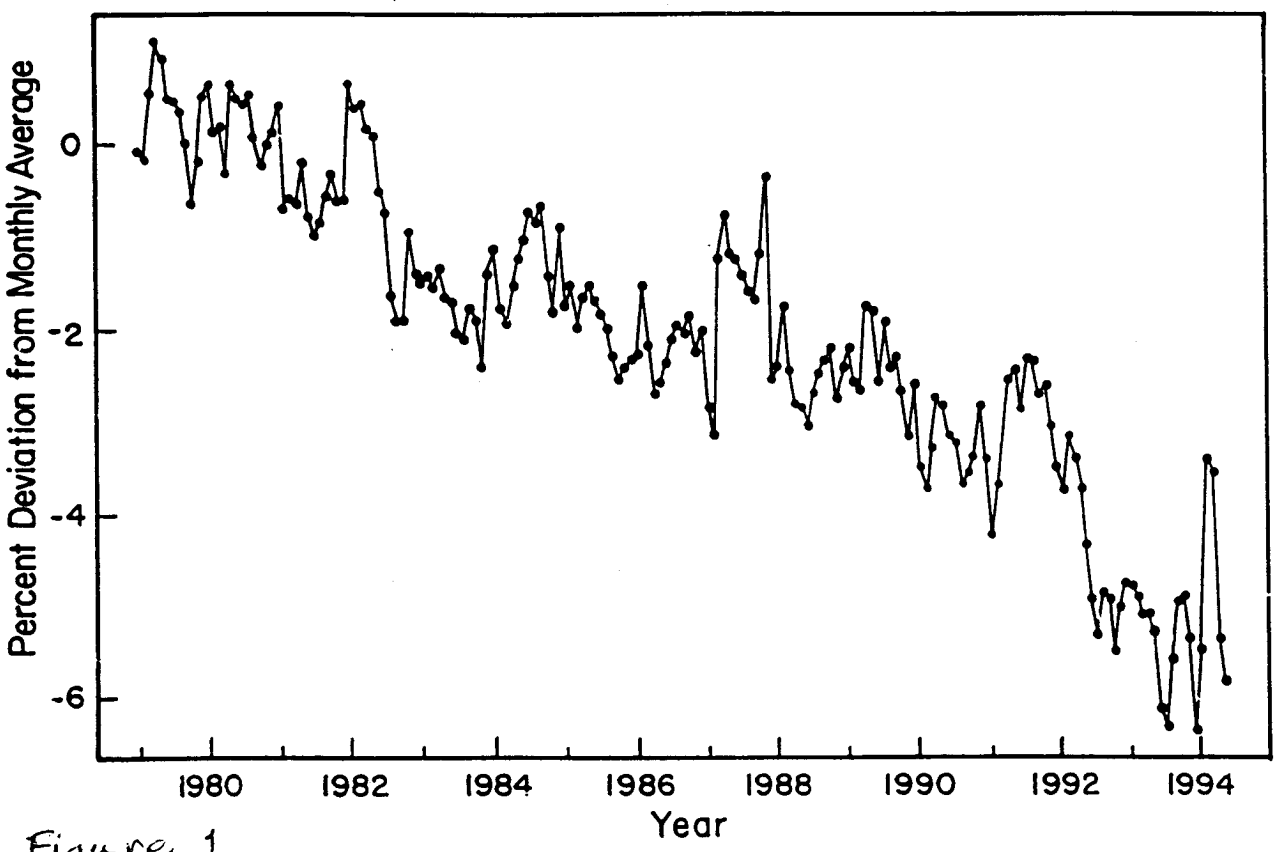
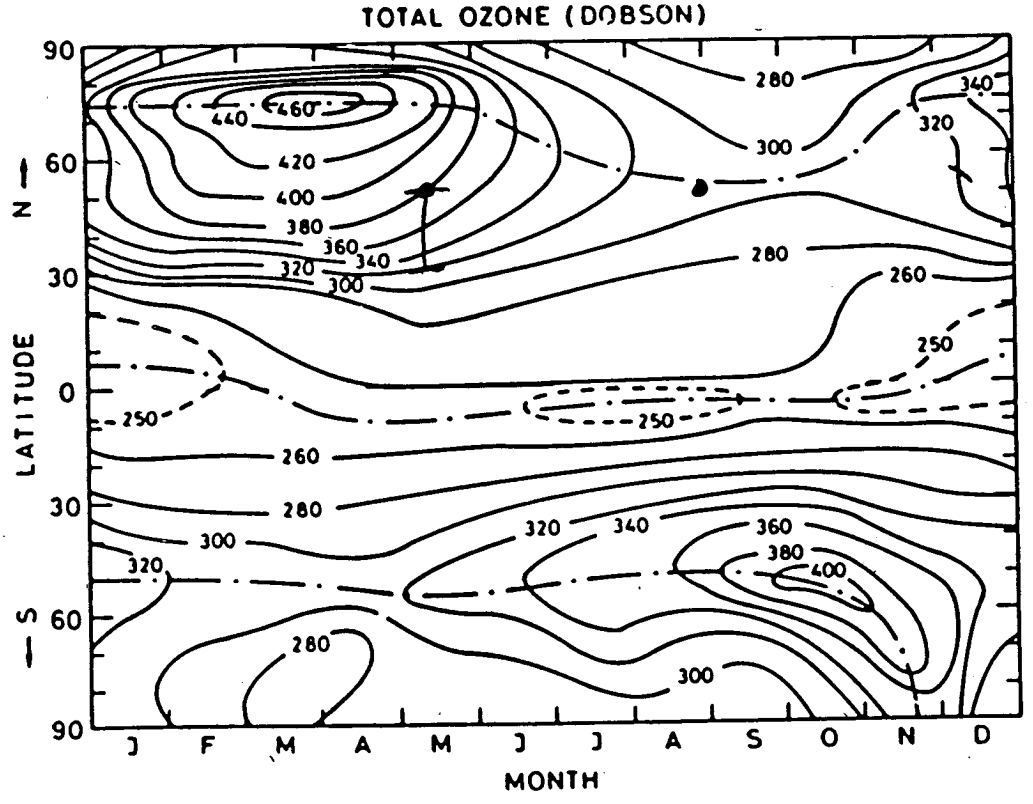


Figure 1.

1 DU = 1 m-atm-cm



2.

Fig. [illegible]. Variation of total ozone with latitude and season. From London (1980).

Antarctic Spring

Cl + PSCs

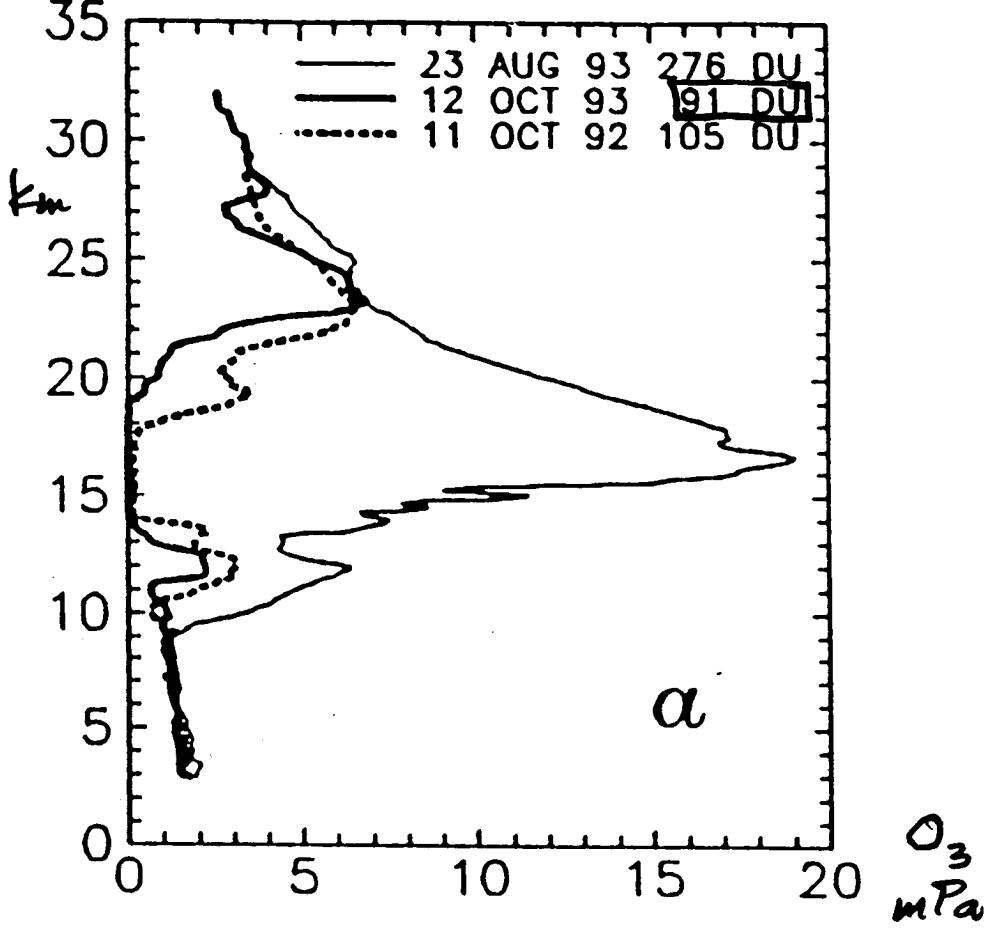


Figure 3

Box 13.4 Photochemical Smog

Nitric oxide and volatile organic compounds are common products of human activities, and are released in large quantities by automobile engines. In urban areas, under stable meteorological conditions (with almost no vertical exchanges and little ventilation), these pollutants tend to accumulate in the boundary layer, and during summer months, when solar ultraviolet radiation is intense, to undergo photochemical transformations. Deleterious products such as ozone, aldehydes, and peroxyacetyl nitrate (PAN) are formed [see Chapters 7 and 9, and Reactions (13.1-13.8)]. Figure 13.7 shows a typical sequence of a smog event in Los Angeles. Ozone precursors (NO_x, hydrocarbons) begin to build up during the morning rush hour, while the abundance of ozone reaches its maximum in the early afternoon. These pollutants are detrimental to the biosphere (plant damage, reduction in crop productivity) and cause health problems (eye and nose irritation, respiratory problems). They can be transported downwind and affect rural environments in the vicinity of metropolitan areas.

Figure 4.

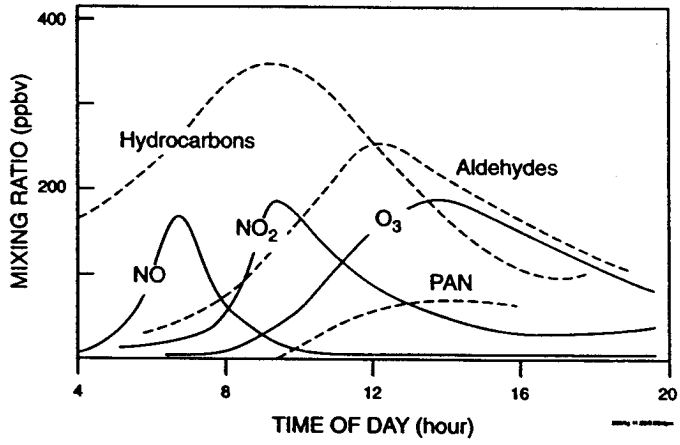


Figure 13.7. *Evolution of the chemical composition of the lower atmosphere during a smog event (Goody, 1995).*