

A New Global Database of Trace Gases and Aerosols at High Vertical Resolution

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A new database of trace gases and aerosols with global coverage, derived from high vertical resolution profile measurements, has been assembled; hereafter referred to as the 'Binary DataBase of Profiles' (BDBP). Version 1.0 of the BDBP includes measurements from different satellite- (HALOE, POAM II and III, SAGE I and II) and ground-based measurement systems (ozonesondes). In addition to the primary product of ozone, secondary measurements of other trace gases, aerosol extinction, and temperature are included. All data are subjected to very strict quality control and for every measurement a percentage error on the measurement is included. To facilitate analyses, each measurement is added to 3 different instances (3 different grids) of the database where measurements are indexed by: (1) geographic latitude, longitude, altitude (in 1 km steps) and time, (2) geographic latitude, longitude, pressure (at levels ~ 1 km apart) and time, (3) equivalent latitude, potential temperature (8 levels from 300K to 650 K) and time.

In contrast to existing zonal mean databases, by including a wider range of measurement sources (both satellite and ozonesondes), the BDBP is sufficiently dense to permit calculation of changes in ozone by latitude, longitude and altitude. In addition, by including other trace gases such as water vapour, this database can be used for comprehensive radiative transfer calculations. By providing the original measurements rather than

derived monthly means, the BDBP is applicable to a wider range of applications than databases containing only monthly mean data. The presentation will describe the BDBP, show examples of the data stored in the data base (see Figure 1), and will discuss planned future applications of the data base including extending the database for use in constraining global climate model simulations.

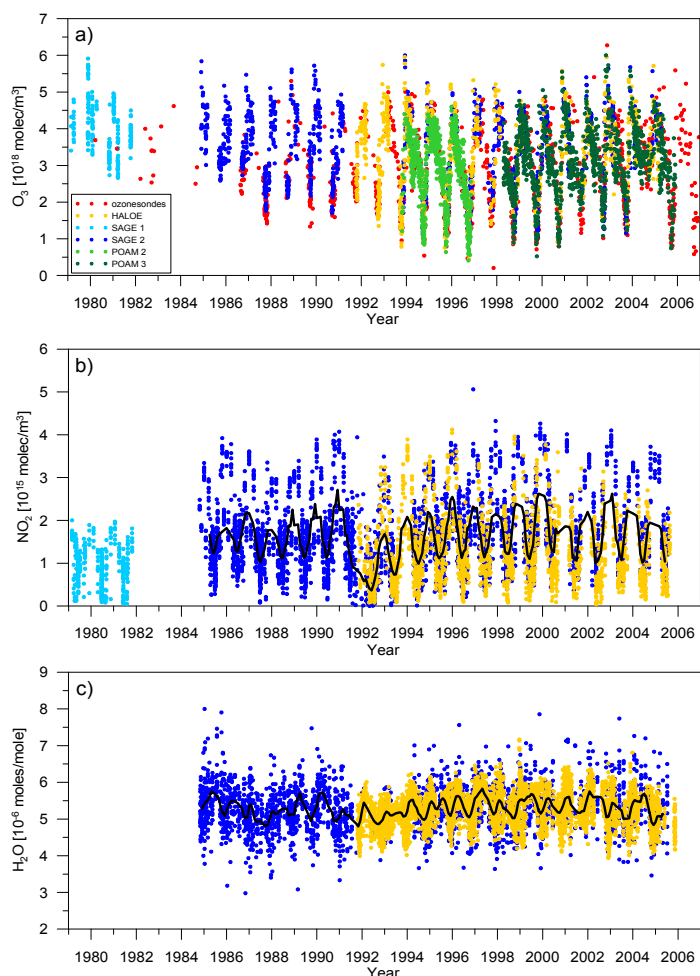


Figure 1. Individual data values extracted from the database for three different species. The different data sources are colour coded. **a)** Ozone (in 10^{18} molec/ m^3) at 550K for equivalent latitudes south of 70° S. For clarity only every 5th data point of SAGE II, HALOE, POAM II and POAM III is plotted. **b)** NO_2 (in 10^{15} molec/ m^3) at 25 km between $44-46^\circ$ S. **c)** H_2O (in 10^{-6} moles/mole) between 7-9 hPa for $30-40^\circ$ N. For clarity only every 5th data point from SAGE II and HALOE is plotted. The thick black lines represent the 3-month running mean of monthly means calculated from all data.