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A 40 Year global ozone data set

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Ozone is an important atmospheric parameter both because it is the key absorber of UV radiation which affects the Earth's biosphere and because it is a climate parameter, affecting the heating and dynamics of the stratosphere. NASA and NOAA have been measuring ozone from space since 1970. The paradigm of the NASA Earth system "missions to measurements" shifts the focus from individual instrument data sets to records constructed from multiple instruments and measurement systems. Following this paradigm we have used data from a series of space-based ozone measurement systems to produce consistent, calibrated ozone time series that can be used in a merged ozone time series for trend analysis. A coherent calibration has been applied to radiance data from eight backscatter ultraviolet instruments (BUV on Nimbus 4, SBUV on Nimbus 7, and a series of SBUV/2 instruments on NOAA satellites). The re-processing results in a time series covering the period from 1970 to 2011 that has an accurate latitude/altitude/solar zenith angle dependance. Two other important changes in this processing are that the ozone cross sections of Brion, Daumont, and Malicet have been used, and that a cloud height climatology derived from the Aura OMI retrievals has been used. The result is a more accurate ozone time series for both total column ozone and the ozone vertical distribution.