Geophysical Research Abstracts,
Vol. 11, EGU2009-3249, 2009
EGU General Assembly 2009

Interannual Variation in Ozone Loss Rates During Formation of the Ozone Hole as Observed at South Pole Station Since 1986

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Year-around balloon-borne ozonesondes have been flown at South Pole Station since 1986. Measurements are made weekly except during the ozone hole period (late August to early November) when sounding frequency is increased to every 2-3 days. This has allowed the determination of the September ozone loss rate (DU/day) during the onset of the ozone hole phenomenon for the past 23 years. As observed in the 1986-1995 record (Hofmann et al, 1997), the September ozone loss rate in the heart of the ozone hole increased during the 1990's and showed a biennial variation. Analysis of the 1996-2008 record shows unexpected variability in the September ozone loss rate with large biennial variations. These are believed to be related to the quasi-biennial oscillation (QBO) in tropical stratospheric winds which may be influencing the transport of gases into the south pole vortex. Although effective atmospheric chlorine peaked at the surface in 1994 and was expected to peak in the Antarctic stratosphere about 2000, to date, there are no clear signs of the beginning of ozone hole recovery.

Hofmann, D. J., S. J. Oltmans, J. M. Harris, B. J. Johnson, and J. A. Lathrop, Ten years of ozonesonde measurements at the South Pole: Implications for recovery of springtime Antarctic ozone, J. Geophys. Res., 102, 8931-8943, 1997.