

Balloon-Borne Ozonesonde Measurements at South Pole in 2009: Ozone Hole 7th Lowest in 24-Year Record

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Total column ozone at South Pole dropped from 241 Dobson Units (DU) in August to 98 DU measured on September 25, 2009 (Figure 1). This minimum places 2009 as the 7th lowest ozone hole in the 24-year ozonesonde record from Amundsen Scott South Pole Station. The NOAA ESRL has measured vertical profiles of ozone and temperature at South Pole using balloon-borne electrochemical concentration cell ozonesondes since 1986. Balloon flights are done weekly, then increase to 2-3 per week during the ozone hole period in September and October. Typically, the lowest amount of ozone over South Pole is observed between September 26 and October 11, and can fluctuate each year depending on the position and stability of the polar vortex and stratospheric temperatures. The 24-year average minimum is 112 DU, with the record low at 89 DU measured on October 6, 1993. NOAA and the NASA Ozone Monitoring Instrument satellite observations showed that the 2009 ozone hole area (regions with <220 DU) was about average, reaching a maximum of 23.7 million sq. km (9.2 million square miles), just under the size of North America. Longer-term ozone hole conditions are determined by chlorine and bromine concentrations in the stratosphere. Chlorine levels are on a slow decline since 1995 (Global Monitoring Division/Halocarbons & other Atmospheric Trace Species Group), but this year's low ozone indicates the halogen levels remain high enough for severe ozone depletion each spring over South Pole Station, Antarctica.

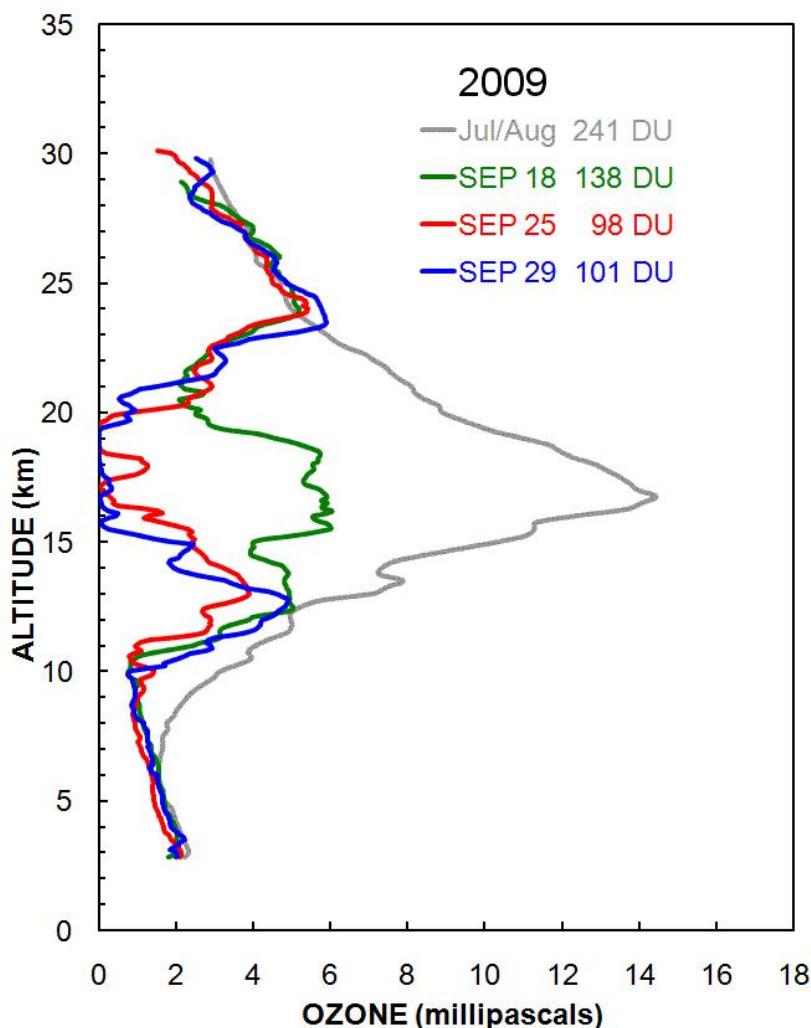


Figure 1. Four selected profiles of altitude vs ozone partial pressure (millipascals) measured by ozonesondes at South Pole Station. The profiles show the pre-ozone hole average in July and August (241 Dobson Units), a mid-September profile and the minimum values of 98 and 101 DU measured at the end of September.