Balloon-borne Ozonesonde Profile Measurements at South Pole Station, Antarctica During the 2015 Ozone Hole

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Balloon-borne ozonesondes from South Pole Station, Antarctica showed no signs of long-term stratospheric ozone hole recovery in 2015 as total column ozone dropped from 260 Dobson Units (DU) winter average to a minimum of 112 DU on October 15, 2015. This was the 15th lowest minimum in the Earth Systems Research Laboratory, Global Monitoring Division (ESRL/GMD) 30-year record. The September ozone loss rate, within the main ozone altitude layer from 14-21 kilometers, also nearly averaged at 3.2 DU/day compared to the 1990-2014 average of 3.4 ± 0.3 DU/day. However, the 2015 ozone hole season was unique in the record number of days the stratospheric vortex air over South Pole remained undisturbed. The slow linear recovery rate of 0.6 DU/day within the 14-21 km layer began on October 15 and ended abruptly on December 8 when total column ozone increased by over 100 Dobson Units to 288 DU. Above 15 km, the high ozone filaments and much warmer stratosphere indicated the late arrival of midlatitude air over South Pole. The 2 km altitude layers also showed an average ozone hole and the slow break up of the 2015 ozone hole at all levels.

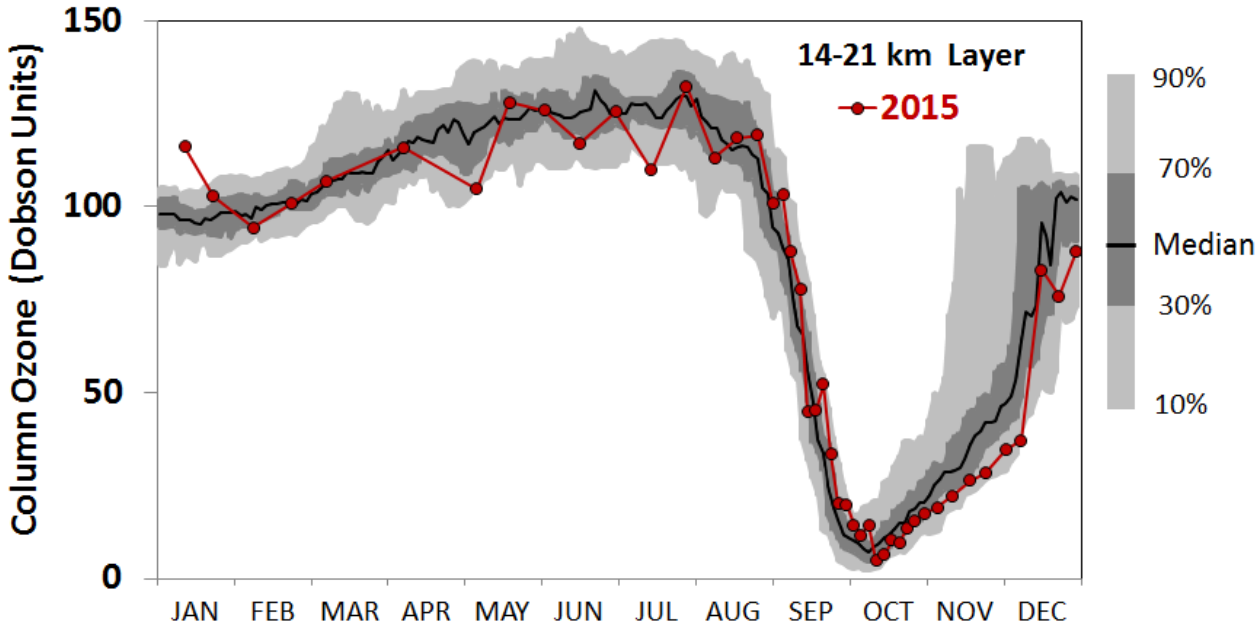

Figure 1. South Pole column ozone within the 14-21 kilometer layer during 2015 (red line) with long term median and percentile envelopes.