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Ozonesonde measurements above McMurdo Station, Antarctica (78 ˚S) during Austral spring 1986-2007

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Balloon-borne ozonesonde measurements from 0 to ∼35 km above McMurdo Station, Antarctica (78 ˚S) have provided vertical profiles of the development of the ozone hole between late August and late October each year since 1986. Here, we present the 22-year history of these measurements and discuss long-term trends occurring in three annual time periods; period A, the time of rapid ozone loss (days 232-265, 21-Aug. – 23-Sept.), period B, time of minimum ozone (266-280, 24-Sept. – 8-Oct.), and period C, the time where vortex recovery begins (days 281-303, 9-Oct. – 31-Oct.).

Preliminary results show that in period A, during rapid ozone loss, column ozone averaged ∼230 DU from 1986 to 1997, dropped below 200 DU from 1998 - 2001, and has averaged ∼230 DU since 2003, but with larger variability. During the same period, ozone between 12-20 km, the region of maximum loss, shows a similar trend averaging ∼90 DU through 1997, dropping to ∼73 DU between 1998-2001, and increasing again since 2003. During period B, when ozone concentration is at a minimum, total column ozone is quite variable, but shows a decreasing trend through 1999, and increasing since then. The 12-20 km column ozone trend is similar, but with a more profound trend reaching a minimum in 1999 and increasing since. Total column ozone for period C is similar to that of period B with an average increase after 1999. 12-20 km ozone for this period showed a decreasing trend until ∼1992. Between 1992-2003,

average ozone concentration was ∼25 DU with little variability. Since 2003, variability has increased.

These observations are consistent with predictions and observations of peaking halogen abundance in the lower stratosphere around 2000. However, large ozone depletion similar to that observed in the late 1990's and early 2000's was expected for another 5 years with a slow decline thereafter. The variability in depletion over McMurdo since then does not fully support that prediction. Rather, the observed trends generally coincide with temperature trends which vary annually due to location and size of the polar vortex. In addition to these results, more specific analyses, including vortex edge location relative to McMurdo Station and vertical depth of total ozone depletion, will be presented and discussed in the context of recovery expectations.