

Figure S1: Timeseries of (a) SON and (b) DJF seasonal-mean temperature anomalies at 100hPa over Antarctica in ERAI (red dashed lines) and data from Screen and Simmonds (2012; hereafter “SS12”) (black dashed line). The SS12 data are an average of timeseries from eight stations on the Antarctic continent with long radiosonde records, included in a number of homogenized datasets described by SS12. The ERAI data were integrated over 65°S-90°S, and spatially averaged using cosine of latitude weighting. Trends in the timeseries during the 1979-2010 period of overlap are -0.10 ± 0.19 , -0.17 ± 0.27 , -0.10 ± 0.05 , and -0.12 ± 0.05 °C/year for ERAI-SON, SS12-SON, ERAI-DJF and SS12-DJF, respectively.

Figure S2: Caption next page

Figure S2: Latitude-height plots of DJF zonal-mean zonal wind (left column) and temperature trends (right column) for 1960-2000, comparing six estimates of the forced response to ozone. Single-forcing results are from first two sensitivity experiments listed in Table 1. Differenced results are obtained by differencing the ensemble means of the Full Forcing and Partial Forcing integrations. Both methods were applied separately to ensembles using the SPARC and WACCM datasets. The single forcing combined results (panels a and b), the basis of most of the discussion in the main text, are obtained by averaging all 10 single forcing ozone runs. In all panels, color shading corresponds to the trend, black contours indicate the climatology, and green stippling indicates that the trend is significant at or above the 95% level. Note the non-linear colorscale. The zonal wind contour interval is 3.0 m s⁻¹.

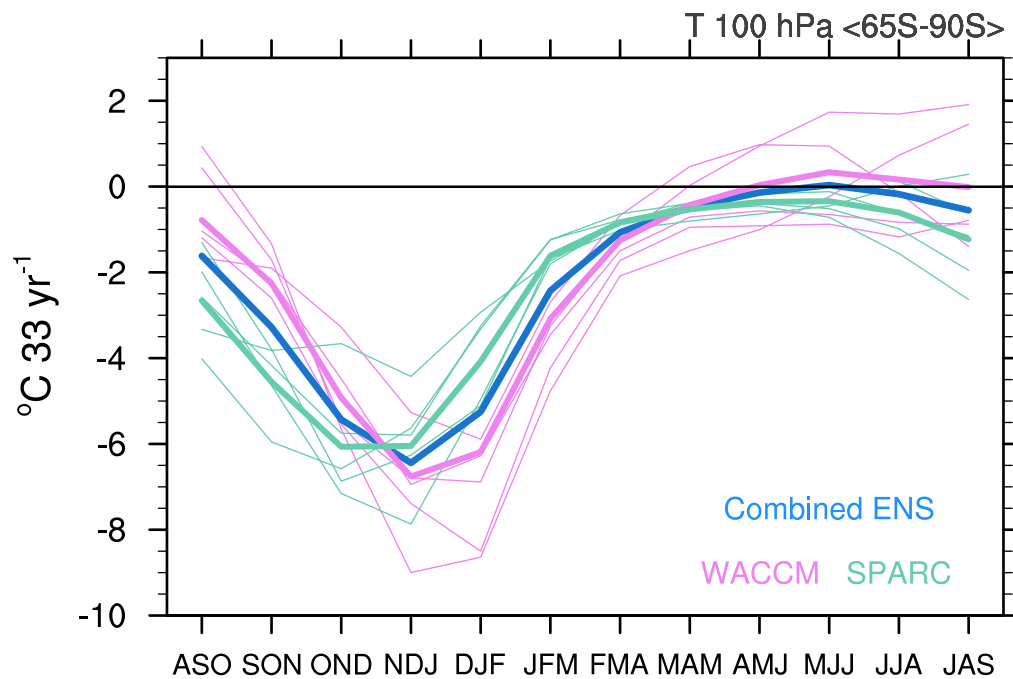


Figure S3: Seasonal, lower stratospheric temperature trends over the polar cap (65°S-90°S, 100hPa) during 1979-2011 in the single-forcing ozone runs. The thin lines are individual runs. The thick green and purple lines are the ensemble mean of the SPARC-forced, and WACCM-forced runs, respectively.