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Impact of new ozone data sets on the modelled stratosphere and troposphere

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Most current ozone data sets used in general circulation models (GCMs) do not fully represent the magnitude of the decrease in stratospheric ozone over the previous ∼30 years. These shortcomings are not limited to polar regions, and also include an under-representation of downward trends at tropical and mid latitudes. As a consequence, the radiative impact of ozone on the stratosphere and any coupling to the troposphere are most likely to be underestimated in these models, limiting their ability to capture recent climatic variability in phenomena such as the southern annular mode (SAM).

Currently, there is an international effort to improve the ozone data sets used in GCMs, using a mixture of satellite data and a wider network of ozone sonde measurements. Here, we use the National Centre for Atmospheric Research's community atmospheric model (NCAR CAM) to investigate the impact of these new data sets on the modelled tropospheric and stratospheric climate over the last 3 decades.