Recent rise in CFC emissions could delay ozone hole healing by almost 20 years

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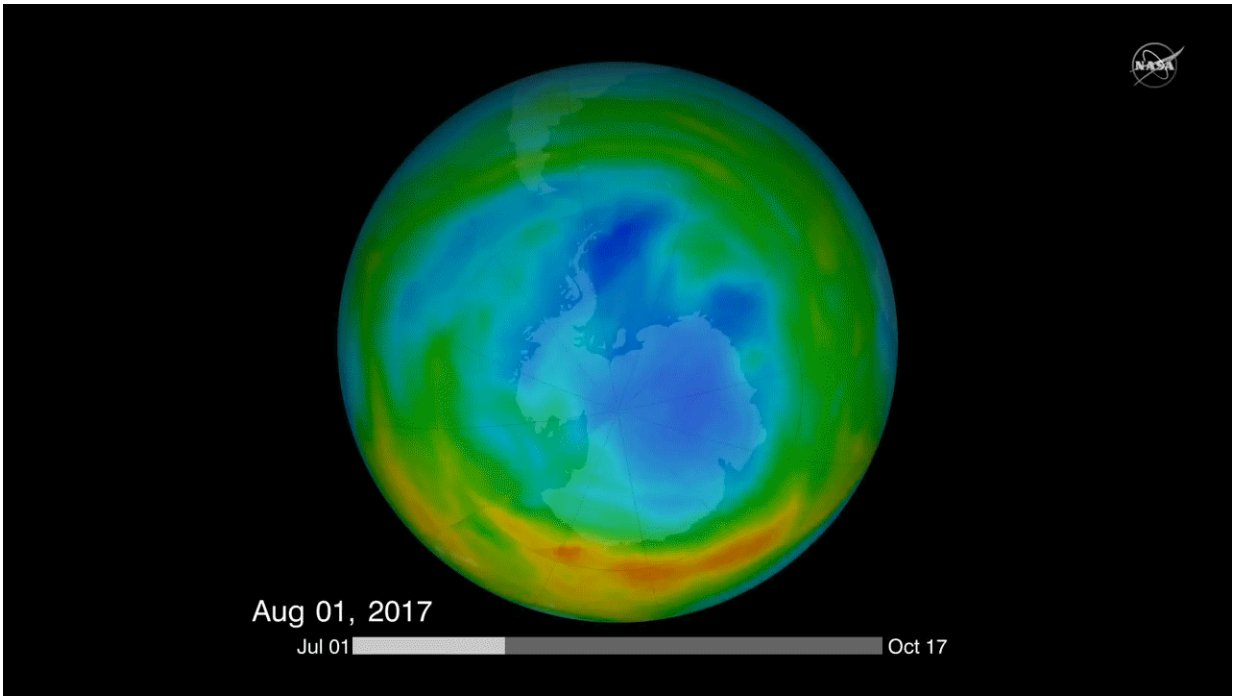

Credit: NASA

The recently discovered increase in emissions of trichlorofluoromethane (CFC-11) may delay the recovery of the Antarctic ozone hole by over a decade if it continues, suggests a modelling study in *Nature Communications*. Although uncertainties exist regarding the levels of CFC-11 emissions and how they may vary, a rapid halt to their occurrence may limit the delay to only a few years.

CFC-11 contributes about one quarter of the anthropogenic chlorine transported into the stratosphere and its production is controlled by the 1987 Montreal Protocol. Following the implementation of the protocol, return of the Antarctic ozone hole to pre-depletion 1980 levels is expected to occur early in the second half of the 21st century. However, in 2018 it was reported that CFC-11 emissions had not been declining as expected since the mid-2000s. This is likely to be related to emissions from unreported production for foam use in China.

Martyn Chipperfield and colleagues used a detailed atmospheric chemical transport model to investigate the impact of these additional emissions on polar ozone recovery. The authors studied three possible CFC-11 emissions pathways: emissions stop immediately, they continue at a constant level, or they are phased out over the next 10 years. The simulations suggest that the impact on the ozone hole has been limited so far. However, if emissions continue at a constant level, this could delay the ozone returning to 1980 values by around 18 years. If the emissions were phased out over the next decade, the delay will likely be no more than two years.

More information: S. S. Dhomse et al. Delay in recovery of the Antarctic ozone hole from unexpected CFC-11 emissions, *Nature Communications* (2019). DOI: 10.1038/s41467-019-13717-x

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