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Ozone hole over Antarctica grows again

Stratospheric levels of harmful CFCs will take between 40 and 100 years to dissipate and have only dropped a few per cent since reaching a peak in 2000, scientists warn

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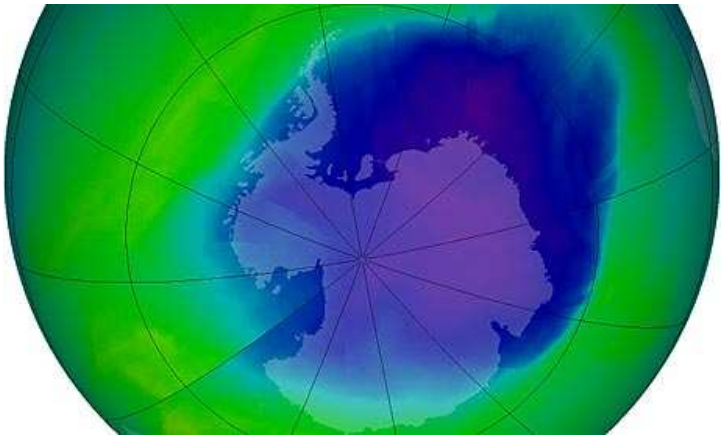

The ozone hole on November 1: the hole is recovering from its September minimum (Image: Nasa)

The ozone hole over Antarctica grew to the size of North America this year – the fifth largest on record – according to the latest satellite observations.

US government scientists from the National Oceanic and Atmospheric Administration (NOAA) say this year's ozone hole reached its maximum level on September 12, extending to 10.5m sq miles and four miles deep. That is bigger than 2007 but smaller than 2006, when the hole covered over 11.4m sq miles.

Scientists blamed colder-than-average temperatures in the stratosphere for the ozone hole's unusually large size this year. "Weather is the most important factor in the fluctuation of the size of the ozone hole from year to year," said Bryan Johnson, a scientist at NOAA's Earth System Research Laboratory in Boulder, which monitors ozone, ozone-depleting chemicals, and greenhouse gases around the globe. "How cold the stratosphere is and what the winds do determine how powerfully the chemicals can perform their dirty work."

The main cause of the ozone hole is human-produced compounds called chlorofluorocarbons, or CFCs, which release ozone-destroying chlorine and bromine into the atmosphere. The Earth's protective ozone layer acts like a giant parasol, blocking the sun's ultraviolet-B rays. Though banned for the past 21 years to reduce their harmful build up, CFCs still take many decades to dissipate from the atmosphere

The 1987 Montreal Protocol and other regulations banning CFCs reversed the build-up of chlorine and bromine, first noticed in the 1980s.

"These chemicals – and signs of their reduction – take several years to rise from the

lower atmosphere into the stratosphere and then migrate to the poles," said NOAA's Craig Long, a research meteorologist at NOAA's National Centers for Environmental Prediction. "The chemicals also typically last 40 to 100 years in the atmosphere. For these reasons, stratospheric CFC levels have dropped only a few per cent below their peak in the early 2000s."

"The decline of these harmful substances to their pre–ozone hole levels in the Antarctic stratosphere will take decades," said NOAA atmospheric chemist Stephen Montzka of the Earth System Research Laboratory. "We don't expect a full recovery of Antarctic ozone until the second half of the century."

Starting in May, as Antarctica moves into a period of 24-hour-a-day darkness, winds create a vortex of cold, stable air centred near the South Pole that isolates CFCs over the continent. When spring sunshine returns in August, the sun's ultraviolet light sets off a series of chemical reactions inside the vortex that consume the ozone. The colder and more isolated the air inside the vortex, the more destructive the chemistry. By late December the southern summer is in full swing, the vortex has crumbled, and the ozone has returned – until the process begins anew the following winter.