The Antarctic ozone hole is the smallest since it was discovered

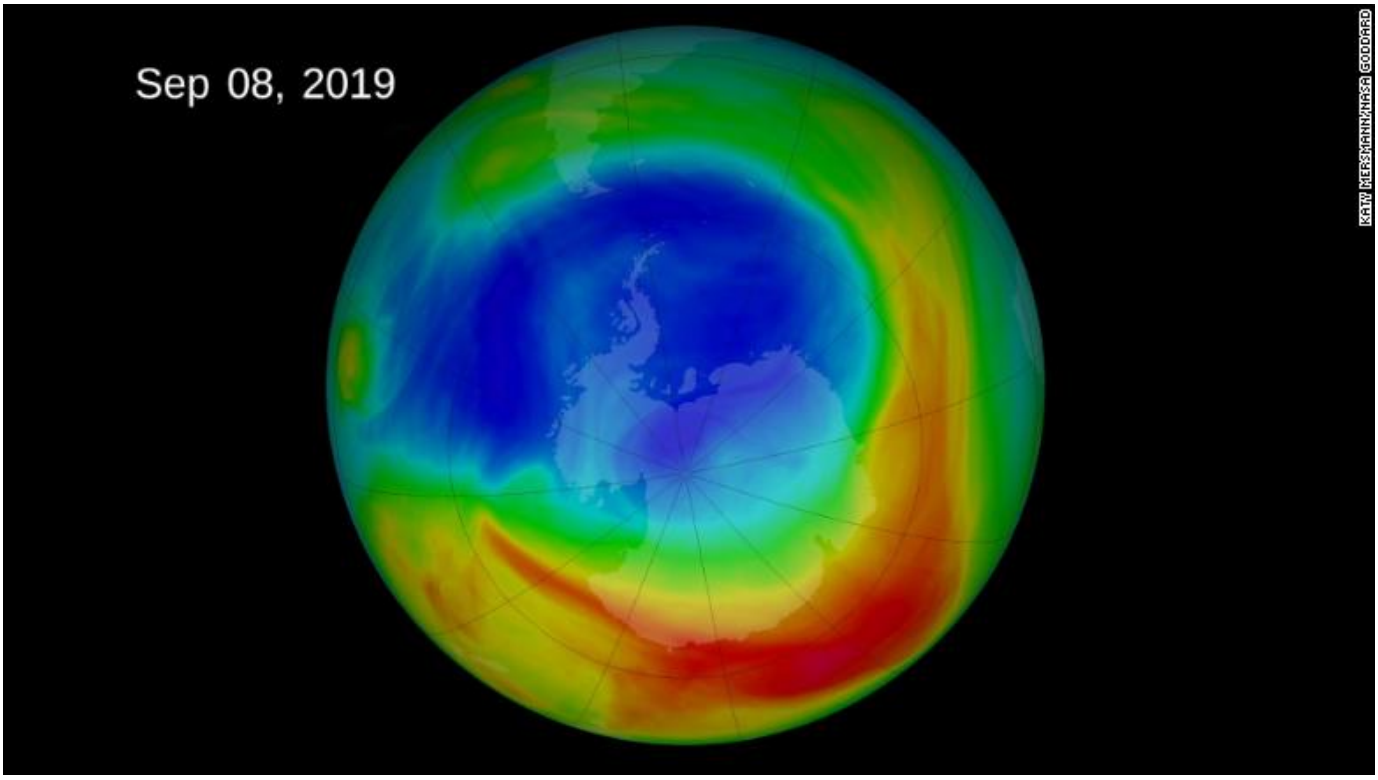
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CNN

Unusual weather patterns in the upper atmosphere limited depletion of ozone, the layer in our atmosphere that acts like sunscreen and protects us from ultraviolet radiation.

On September 8, the ozone hole reached a peak of 6.3 million square miles and then shrank to less than 3.9 million square miles, according to the report. Usually, the hole would grow to reach 8 million square miles.

"It's great news for ozone in the Southern Hemisphere," said Paul Newman, chief scientist for earth sciences at NASA's Goddard Space Flight Center. "But it's important to recognize that what we're seeing this year is due to warmer stratospheric temperatures. It's not a sign that atmospheric ozone is suddenly on a fast track to recovery."

The annual ozone hole forms when rays from the sun interact with the ozone and man-made compounds such as chlorine and bromine to deplete the ozone, according to NASA. This occurs during late winter in the Southern Hemisphere.



Picture Caption: The ozone hole as it began to shrink.

Cloud particles in the cold stratosphere lead to reactions that destroy ozone molecules, which are made of three oxygen atoms. But when temperatures are warmer, these clouds don't form, which limits ozone destruction.

This is only the third time in 40 years when warm temperatures caused by weather systems have actually helped limit the ozone hole, NASA said in a statement. This also occurred in 1988 and 2002. But the scientists say there is no connection they've identified to link the patterns with climate change.

"It's a rare event that we're still trying to understand," said Susan Strahan, an atmospheric scientist with Universities Space Research Association, who works at NASA Goddard. "If the warming hadn't happened, we'd likely be looking at a much more typical ozone hole."

The ozone is monitored by NASA and NOAA through a variety of instruments, including satellites and weather balloons. NOAA's balloons carry "sondes," which can measure the ozone layer.



Picture Caption: A timelapse of weather balloons used to measure ozone.

"This year, ozonesonde measurements at the South Pole did not show any portions of the atmosphere where ozone was completely depleted," said atmospheric scientist Bryan Johnson at NOAA's Earth System Research Laboratory.

About 12 miles up from the surface, temperatures were 29 degrees Fahrenheit warmer, making it the warmest year since observations began. In addition to keeping ozone depletion minimal, the weather systems responsible for the temperature shift reduced the jet stream around Antarctica from 161 miles per hour to 67. This weakened the polar vortex and let it drop down into the lower stratosphere.

This caused less clouds to form and air rich in ozone was actually brought up above the ozone hole.

The ozone layer over the Antarctic is expected to recover by 2070 as compounds used as coolants, called chlorofluorocarbons, decline. They were regulated 32 years ago by the Montreal Protocol.

The ozone hole should disappear and close over the next six weeks, according to NOAA.

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