

# Antarctic ozone healing, but climate change poses new threat

By **Luqman Hakim** April 20, 2026 @ 5:53pm



Malaysian-led research finds ozone layer improving after decades of global action, though climate change may slow long-term gains. – NSTP file pic

KUALA LUMPUR: A Malaysian-led scientific study has confirmed that the ozone layer above Antarctica is gradually recovering, but warns that climate change is introducing new risks that could affect its long-term stability.

The research, led by Justin Sentian of Universiti Malaysia Sabah, was published this year in the journal Atmospheric Research.

Analysing 19 years of Nasa satellite data, the international research team found that ozone levels over Antarctica are increasing at a measurable rate – offering fresh evidence that global efforts under the Montreal Protocol are working.

However, the study found that recovery is uneven throughout the year.

"As sunlight returns to Antarctica in late winter, it triggers chemical reactions that destroy ozone.

"While winter shows strong ozone concentration, the spring phase sees a decline, with the upward trend weakening significantly. This narrow window remains when the atmosphere is most vulnerable to ultraviolet (UV) penetration," the study noted.

The ozone layer acts as Earth's natural shield against harmful UV radiation. Without it, higher levels of UV rays would reach the surface, increasing risks such as skin cancer, eye damage and weakened immune systems, while also affecting crops, marine life and ecosystems.

Beyond seasonal variation, researchers identified a new factor influencing recovery – changes in atmospheric circulation linked to global warming.

The study found that a strengthening of the Brewer-Dobson Circulation is transporting more water vapour into the polar stratosphere, potentially accelerating chemical processes that contribute to ozone depletion.

Despite these emerging challenges, the study concludes that the reduction of ozone-depleting substances – particularly chlorine and bromine – remains the dominant driver of recovery.

The ozone hole, first identified in the 1980s, became a defining symbol of environmental damage caused by human activity. Malaysia ratified the Montreal Protocol in 1989 as part of the global response.

Sentian, who heads the Climate Change Research Lab and Polar Research Group at UMS, was also recognised in 2023 as the first Malaysian to conduct winter research in Antarctica, spending seven months on the continent.

He is also the grant recipient of the Yayasan Penyelidikan Antartika Sultan Mizan.