Low ozone air forecast over New Zealand

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New Zealand is expected to experience a ‘low ozone event’ on Sunday (24 September). The Royal Dutch Meteorological Institute and the European Space Agency are forecasting that a filament of low ozone air currently circulating in the stratosphere around Antarctica will spin off and pass over much of New Zealand.

The agencies are forecasting about 23% less ozone over New Zealand than the average for this time of year. ‘Ozone values of about 275 Dobson Units are possible, whereas the September average at Lauder, Central Otago, is 358 Dobson Units,’ says Dr Greg Bodeker of the National Institute of Water & Atmospheric Research (NIWA).

The forecast low ozone will push UV levels higher than usual for this time of year. Wendy Billingsley, SunSmart spokesperson, says if the day is clear or partly cloudy, SunSmart protection will be essential. ‘When UV levels are 6 or above we all need to follow the Slip, Slop, Slap, and Wrap rules,’ she says.

According to NIWA, if the skies are clear, the forecast low ozone means that UV levels in the south of New Zealand are likely to increase from a typical September noon-time UV index of 4 to 5.5. In the north of the country, the noon UV index could be as high as 8 compared to the usual September value of around 6.5. At southern ski fields, where the snow covered surface enhances UV levels, the reduced ozone could cause noon-time UV levels to increase from 6 to close to 8.

A UV index of 8 is not extreme by standards of New Zealand’s mid-summer but it still represents very high UV levels. ‘If the sun is hidden by cloud, the risks are not as high, but when the weather is partly cloudy but people can still see the sun, the UV levels may go even higher than for clear skies,’ says Dr Bodeker.

Background

What causes such a low ozone event?

Dr Greg Bodeker of NIWA explains:

‘During spring, the air in the stratosphere at about 60 °S whirls strongly around Antarctica in a westerly direction. This is called the Antarctic Vortex. These strong westerly winds keep the ozone-depleted air concentrated over Antarctica during spring (the ‘ozone hole’).

‘Occasionally, waves of stratospheric air north scrape along the vortex and a filament of this ozone-depleted air peels off and flicks into the mid-latitudes.

‘Imagine mixing two fluids of different colours together in a cup. You can sometimes see long, stringy bits stretching out from the main mass of a fluid. In this case, that filament is ozone-depleted stratospheric air, and it operates much like a weather front does at lower altitude.

‘We do not know precisely how common such events are, but they do not happen often.’

The UV Index

UV levels - Recommended behaviour

Levels 1 & 2: The UV level is low. Low protection is needed and people can stay safely outside. Low – Low protection required. You can safely stay outside.

Levels 3 to 5: This indicates moderate UV levels. Moderate – Protection required when spending long periods in the sun.

Levels 6 & 7: Protection is essential. High – Protection essential. ‘Slip, slop, slap, and wrap.’

Levels 8 to 10: People should take great precaution. Very high – Seek shade between 11am and 4pm. ‘Slip, slop, slap, and wrap.’ Reapply sunscreen regularly.

Level 11+: This is regarded as extreme and full protection is essential. Extreme – Reschedule outdoor activities for early morning/evening. Shade is essential between 11am and 4pm. Reapply sunscreen regularly.

People should remember that you can get sun burnt even on cool days. Temperature is caused by the sun's infrared radiation, while sunburn is caused by UV radiation that cannot be felt.

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