

The ozone layer and ultraviolet radiation



This Information Sheet is to inform people about the relationship between ozone and ultraviolet radiation (UVR).

Ozone is found throughout the atmosphere, but most of it is in the higher atmosphere. Ozone acts like a giant shield against the sun's harmful rays. Ultraviolet radiation (UVR) is made up of three parts: UVA (long-wave), UVB (medium wave) and UVC (short wave). UVR is known to cause sunburn, skin cancer and eye disease. It can also affect the body's immune system.

Ozone and other gases absorb all UVC and most UVB radiation. UVA radiation is not greatly affected by ozone.

What's happening to the ozone layer?

Prior to the early 1980s, there was a balance between the making and destroying of ozone. Since then the emission of human-made chemicals (such as chlorofluorocarbons used in refrigerators, freezers and air conditioners) has begun to increase the ozone destruction rate.

This upset the natural balance, with ozone being destroyed faster than it was produced. Steps are being taken worldwide to phase out the use of these chemicals. As a result, further ozone depletion is not expected, but it will take many years to repair the damage that has already occurred.

Where is the ozone hole?

In the mid 1980s, concern about the ozone layer led scientists to discover that it had been thinning over Antarctica for many years. This thinning is often called the 'ozone hole'. The ozone hole grew throughout the 1980s and the maximum size was in the mid 1990s.

Since then, its size has fluctuated from year to year. The ozone hole is situated well to the south of New Zealand. During its breakup phase in the early summer, pockets of ozone-poor air can drift to New Zealand.

How can the ozone layer be repaired?

As ozone-destroying chemicals are phased out, the ozone layer will eventually repair itself. The earliest full recovery is unlikely to occur until the middle of the 21st century.

Does New Zealand receive more UVR?

The Earth is closer to the Sun during the Southern Hemisphere summer. Our smog-free air also means we have less pollution to block out UVR.

Overall peak UVR levels in the New Zealand summer, as measured by the Ultraviolet Index (UVI), are about 40 percent more than at countries at similar latitudes in the Northern Hemisphere. There has also been a 10 percent decrease in ozone over New Zealand since the 1970s.

How can we be protected?

The media attention given to the ozone hole has highlighted the risks people face and the likelihood of an increase in health problems, such as skin cancer. With less ozone in the upper atmosphere the amount of harmful UVR reaching the Earth's surface will increase. This could result in an increase in sunburn, skin cancer and eye diseases. We need to be especially careful to protect our skin during Daylight Saving months through the use of shade, clothing, sunhats and a broad spectrum, SPF30+ sunscreen. Also, wrap-around sunglasses will protect the eyes by filtering out the harmful rays.

The Ultraviolet Index (UVI)

The Ultraviolet Index (UVI) is an international, scientific measure of the level of ultraviolet radiation (UVR) in the environment. The higher the number, the greater the risk of skin damage.

The Cancer Society advises sun protection between September and April (especially between 10am and 4pm) or when the UVI is 3 or higher.

UV Index	Sun Protection
1-2 Green LOW	No protection required
3-5 Yellow MODERATE	Protection required when spending extended periods in the sun, especially if you have fair skin
6-7 Amber HIGH	Protection essential between 10am and 4pm. Slip, slop, slap and wrap.
8-10 Red VERY HIGH	Seek shade between 10am and 4pm. Slip, slop, slap and wrap. Cover up. Reapply sunscreen regularly.
11+ Purple EXTREME	Reschedule outdoor activities for early morning and evening. Full protection essential.

For more information

Visit the website: <http://www.niwascience.co.nz/services/uvozone/> or contact: Ministry for the Environment, PO Box 10362, Wellington, New Zealand.

Check out the Sun Protection Alert on the Met Service website: www.metservice.com or in the weather section of your daily newspaper. The Sun Protection Alert includes local real time advice.

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