

International Association of Meteorology and Atmospheric Sciences (IAMAS)

International Ozone Commission (IO₃C)



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Press Release

Rapid ozone decline over Antarctica in the weeks preceding the International Day for Protection of the Ozone Layer

The United Nations declared the 16th of September as the International Day for the Protection of the Ozone Layer, to commemorate the 16th of September 1987, the date when the Montreal Protocol was first signed. The Protocol controls the production and use of anthropogenic species which, since the early 1970s, have destroyed about 10% of the earth's ozone shield which protects life from the harmful solar ultraviolet radiation. The Protocol is an example of selfless cooperation between the developed and developing countries and provides an excellent paradigm to the international community for cooperation in complex environmental issues of global importance.

The theme of the International Day for the Preservation of the Ozone Layer on **16 September 2001 is: "Save Our Sky: Protect Yourself; Protect the Ozone Layer"** (For more information the reader is referred to http://www.unep.org/ozone/ozone_day2001/ and to <http://lap.physics.auth.gr/ozonemaps>)

Today many people have the impression that the Montreal Protocol has solved the problem and that the issue of the protection of the ozone layer has been settled. As it has been presented this year at the SPARC/IOC Workshop on "Understanding Ozone Trends", held at the University of Maryland in March 2001, global ground-based and satellite measurements show that **ozone continues to decline**. There is evidence that atmospheric dynamics strongly influence ozone in the lower stratosphere at heights between 16 and 22 km above ground. There is need for non-linear statistical models, which could reflect changing chlorine loading and dynamics. Continuous scrutiny for quality and biases between ground and satellite data is a prerequisite for better understanding of the future of the ozone layer. Definitely our understanding of the past changes could be used to identify the recovery of the ozone layer as a result of actions taken under the Montreal Protocol and its Amendments.

In general the decline in the Northern middle and higher latitudes is larger during the winter-spring season (about 6% per decade since 1979) compared to ~2% per decade during the summer time. The largest negative deviations are observed over the Polar Regions in spring. Ozone destruction of more than 50% is observed in the

lower stratosphere for short time-periods over the Arctic, while over Antarctica the ozone loss in the lower stratosphere exceeds even 95% for a few weeks in September through October.

Analysis of total ozone maps based on satellite and ground-based data show that total ozone values over the middle and high latitudes of the Northern hemisphere during the last winter-spring season (2000-2001) were generally within about 5% of their pre-1976 mean values. During the current Austral spring season temperatures in the lower stratosphere of below minus 86°C (that facilitate ozone destruction), have already led to a large depletion of the ozone layer over Antarctica in August and early September 2001.

The size of the **sunlit** area poleward of 60°S with ozone values less than 220 matm-cm, which is commonly called the "ozone hole", was on the average 10 million km² for the last ten days of August, and reached ~19 million km² in the first ten days of September. This is the second largest "ozone hole" area compared to the record setting ~14 and ~25 million km² observed in the same time intervals in 2000. The Ozone Mass Deficiency (O₃MD) from the pre-1976 averages *integrated* for the region poleward of 60°S for 20 August to 10 September this season amounts to ~1090 Mtons compared to the so far record high of 1180 Mtons in the same period of the year 2000. Over the southern middle latitudes, between 35°S and 50°S ozone values are close to their long-term mean, while at poleward latitudes ozone deficiencies up to -25% have been observed.

It should be recalled that all countries at mid- and high latitudes in both hemispheres are vulnerable to solar UV radiation increases due to declining ozone levels. People that live in mid- and high latitudes of both hemispheres have experienced increases in harmful (skin reddening) UV radiation at rates exceeding 5% per decade.

Based on the previous international assessment of ozone depletion published by WMO in 1999, record low ozone values are possible to occur during the next 10 -15 years, depending on the meteorological conditions (e.g. stratospheric temperatures, vortex strength etc). According to modelling predictions it is expected that the ozone layer will not recover to pre-ozone hole levels before the year 2050. The recovery could take longer due to greenhouse gas-induced cooling of the stratosphere, or to the possible occurrence of major volcanic eruptions in the years to come.

The International Ozone Commission (IO₃C) of IAMAS-IUGG urges all national and international Agencies, which support scientific research and monitoring of ozone and related parameters to continue supporting these activities. The IO₃C is ready to collaborate and make significant scientific contributions, as has been continuously done in the preparations of the WMO Ozone Assessments in the past decades.

This text has been last seen by the IO₃C members on 12 September, 2001.

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