WMO Antarctic Ozone Bulletin #3/2002

Issued on 4 September 2002

1. **Meteorological conditions:** Meteorological data show that the late August and early September Antarctic vortex is the smallest observed in more than 20 years. Contrasting the circular vortex of 2001, in recent days the vortex has been centred on the pole but elongated. Minimum stratospheric temperatures have remained similar to recent years during the past 2 weeks, with temperatures low enough for polar stratospheric cloud (PSC) formation covering about 50% of the vortex area, down from the 60% to 70% in the previous 2 week period. This area will further decrease in the coming weeks as the sun continues to rise and to warm the stratosphere over Antarctica.

2. **Ozone observations:** The region of low ozone that covered much of Argentina in mid to late August moved eastward over the Atlantic and Southern Oceans, leaving normal to somewhat elevated ozone levels over the southern cone of South America. Compared to the pre-ozone hole norms (during 1964-76), ground-based measurements of ozone in the past few days were up to 10% above normal over Buenos Aires, while further south, at Comodoro Rividavia and Ushuaia ozone was about 15% above norms. These higher than usual values are within the expected range of natural variations in ozone distributions. During this same early September period, ground-based measurements along the Antarctic Peninsula continued this pattern, with Marambio and Vernadsky now near the edge of the ozone hole and showing near normal ozone values. Moving away from the South American side of Antarctica eastward around the Antarctic perimeter we find that Syowa ozone is near norms while Dumont d'Urville on the Australian side has been as much as 25% above the pre-ozone hole norms. During the last 10 days of August and into early September, ozone values from 10 to 30% above norms have been common in a broad collar surrounding much of Antarctica.

3. **Ozone hole:** With the Australian side of the Antarctic perimeter currently well above norms, ground-based and satellite ozone measurements indicate that much of Antarctica is not currently under the ozone hole. The ozone hole remains small for early September, only about half of the size found in the past 2 years. Using previous years as a guide, it is expected that the ozone hole will continue to expand and deepen during September and into October, but perhaps not to the proportions of recent years. The size, depth and persistence of the ozone hole are expected to vary substantially from year to year, and are strongly influenced by corresponding natural meteorological variations. For this reason, as was the case in 2000 when the ozone hole was the largest on record, a single year should not be used to infer a general trend in ozone hole characteristics.

4. **The Secretariat of the World Meteorological Organization (WMO)** distributes Bulletins providing current Antarctic ozone hole conditions during August-December each year. Bulletins are distributed via the WMO-Global Telecommunication System (GTS) and are also available through the Atmospheric Research and Environment Programme web page at www.wmo.ch/web/arep/ozone.html. In addition to the National Meteorological Services, the information in these Bulletins should be made available to the national bodies representing their countries with UNEP and that support or implement the Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol.

5. **Acknowledgements:** These Bulletins use provisional data from the WMO Global Atmosphere Watch (GAW) stations operated within or near Antarctica by: Argentina (Comodoro Rivadavia, Ushuaia), Argentina/Finland (Marambio), Argentina/Italy/Spain (Belgrano), France (Dumont D'Urville and Kerguelen Island), Germany (Neumayer), Japan (Syowa), New Zealand (Arrival Heights), Ukraine (Vernadsky), UK (Halley, Rothera), and USA (South Pole). Satellite ozone data are also used and provided by NASA – Total Ozone Mapping Spectrophotometer (TOMS) and by the National Oceanic and Atmospheric Administration (NOAA) – TIROS Operational Vertical Sounder (TOVS). Potential vorticity maps are provided by ECMWF and their ERA-15 and daily T106 meteorological fields are analysed by the Norwegian Institute for Air Research (NILU) Kjeller, Norway, to provide vortex extent and extreme temperature information. Ozone data analyses are prepared in collaboration with the WMO World Ozone and Ultraviolet Data Centre in Toronto, Canada through the co-operation and support of the Meteorological Service of Canada (MSC). UV data is provided by the U.S. National Science Foundation's (NSF) UV Monitoring Network. For supporting graphics and information go to http://exp-studies.tor.ec.gc.ca/cgi-bin/selectMap (MSC) and http://www.nilu.no/projects/nadir/o3hole (NILU).

Questions regarding the scientific content of this Bulletin should be addressed to
Dr. Michael Proffitt, Senior Scientific Officer of WMO: e-mail proffitt@wmo.ch

END of WMO Antarctic Ozone Bulletin 3/2002