

## Trends in Near-Surface Ozone at Cape Grim and in the Southern Hemisphere Troposphere

I.E. Galbally<sup>1</sup>, C.P. Meyer<sup>1</sup>, S.T. Bentley<sup>1</sup>, I.A. Weeks<sup>1</sup>, and Cape Grim Staff<sup>2</sup>

<sup>1</sup>CSIRO Atmospheric Research, PMB1, Aspendale, Victoria 3195, Australia; +61-3-9239 4684;  
Fax: +61-3-9239 4444; E-mail: Ian.Galbally@csiro.au

<sup>2</sup>Cape Grim Baseline Air Pollution Station, Smithton, Tasmania 7330, Australia

Ozone concentration has been measured in the surface air at Cape Grim Tasmania, 41°S, with ultraviolet adsorption methods since December 1981. Dual instruments and a separate calibrator have been maintained over most of the period. A brief description of the evolution of the Cape Grim measurement system, its performance and external calibration checks traceable to primary standards in 1986 and 2002, will be presented. Results from the first year of measurement with a higher precision (0.1 ppb) Thermo Instruments Model 49C will be presented. These results include new information on ozone variability in baseline air (Figure 1).

The ozone concentration measured in the surface air at Cape Grim has increased since the early 1980s by 10% in winter time, and less in other seasons. Analysis of the Cape Grim data including simple seasonal average trends, changes in the diurnal cycle and autocorrelations will be presented and used to identify the drivers of the changes.

Similar increases in surface ozone have been observed at Cape Point, South Africa, over the southern Atlantic Ocean, and over Antarctica. It appears that tropospheric ozone has been increasing since the pre-industrial period and will continue to increase during the 21st century. The likely causes of the observed southern hemisphere surface ozone increases will be discussed, including the effects of changed sources and changed sinks, as well as the impact of ongoing tropospheric ozone changes.

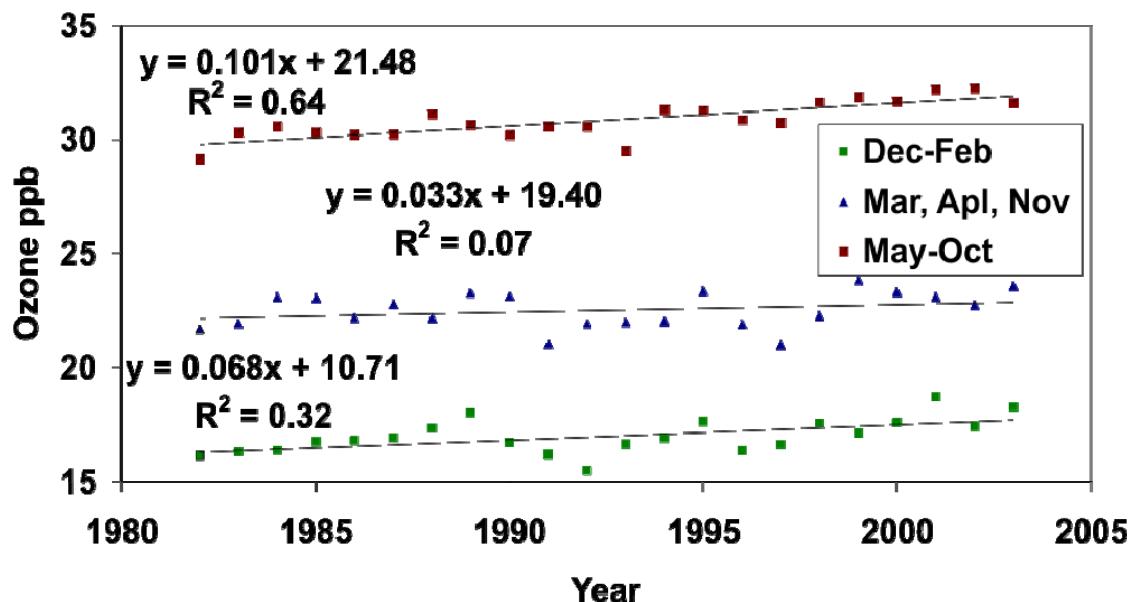


Figure 1. The trends in seasonal average surface ozone at Cape Grim 1982-2003 in baseline (oceanic) conditions and linear regression fits to the observations.