

7.1. McMurdo Station

Figure 7.1.1 shows total column ozone over McMurdo Station as measured by TOMS. Until mid-October, ozone values in 1999 were generally close to the minimum values observed during the period 1991-1998. Values in 1999 were comparable to average values between mid-October and mid-November, but dropped slightly below historic minima on 11/14/99, 11/23/99, and 12/02/99.

The drop in ozone on the three days in November and December lead to high UV values that appear both in the 298.51 - 303.03 nm integral (Figure 7.1.2) and erythemally weighted irradiance (Figure 7.1.3). After 12/4/99, ozone values compare well to the long-term average and UV levels are therefore similar than in previous years.

A pattern similar to that observed for noontime values is also visible in daily doses, i.e., irradiance integrated over one day. Values of daily DNA-weighted dose (Figure 7.1.4) and daily erythemally weighted dose (Figure 7.1.5) also peak on the three days in November and December mentioned above. Note that the variability of both doses is much lower between January and March than it is between September and November, the period affected by the ozone hole. Note further that UV levels are significantly increased in January 2000, specifically on 01/05/00, 01/10/00, and between 01/13/00-01/18/00. These comparatively high values are correlated with the lowest ozone values that have been observed on these days during the 1991-2000 period. The reason for this drop in ozone is unknown since total column ozone values should have returned to normal by January.

In Figure 7.1.6, daily doses in the 400-600 nm range are shown. Since radiation in the visible is not affected by atmospheric ozone concentrations Volume 9 measurements agree well with measurements from previous years. Note that clear sky conditions mark a well-defined envelope of the annual cycle.

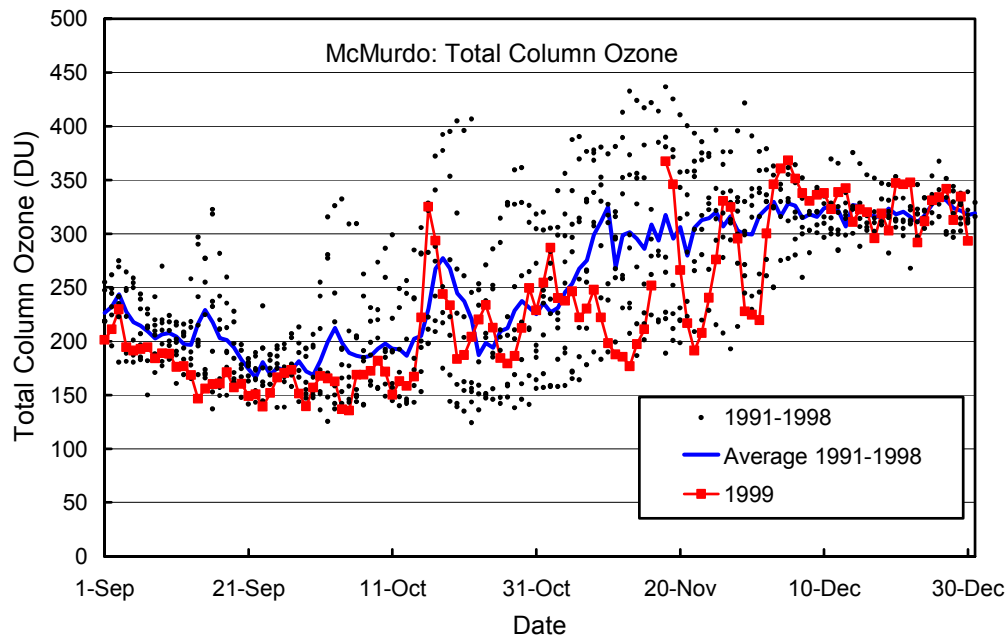


Figure 7.1.1. Total column ozone in McMurdo. TOMS/Earth Probe measurements from 1999 are contrasted with ozone data from the years 1991-1998 recorded by TOMS/Nimbus-7(1991-1993), TOMS/Meteor-3 (1993-1994), NOAA/TOVS (1995-1996), and TOMS/Earth Probe (1997-1998) satellites.

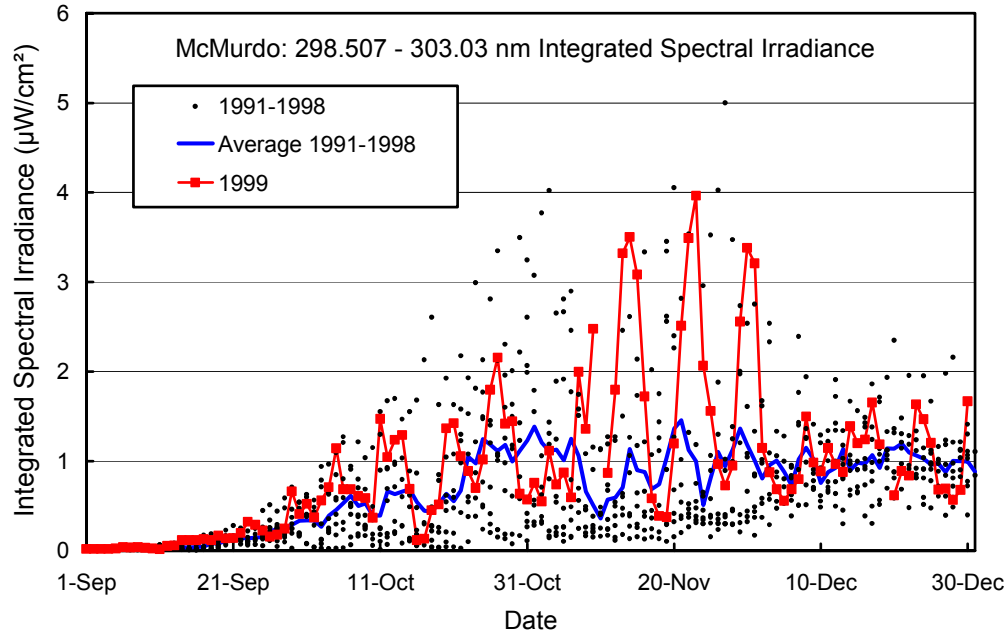


Figure 7.1.2. Noontime integrated spectral UV irradiance (298.51 - 303.03 nm) at McMurdo. Measurements from 1999 (squares) are contrasted with individual data points and the average of measurements taken between 1991 and 1998.

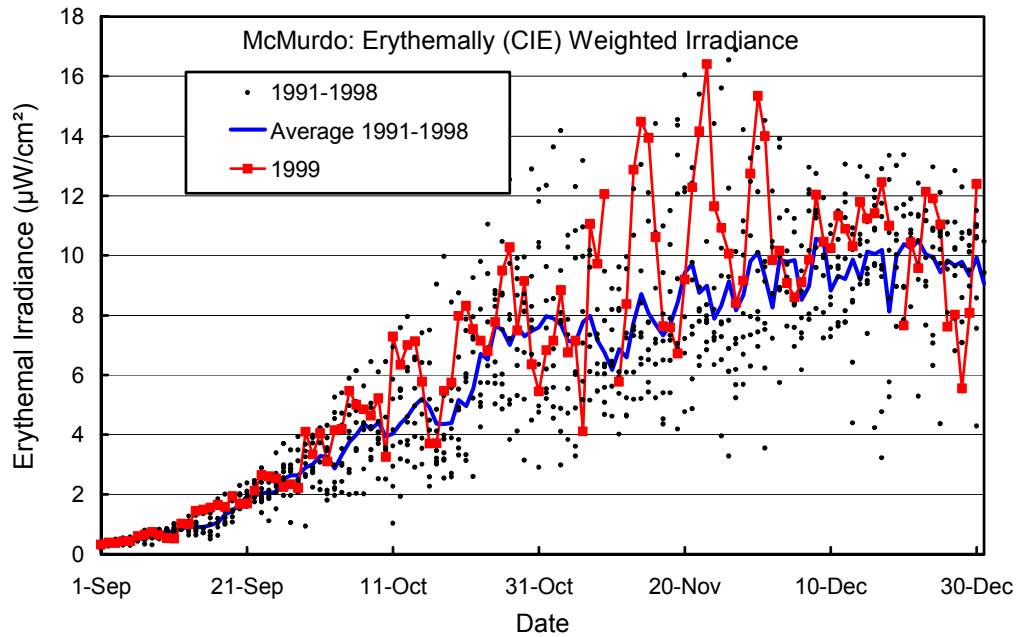


Figure 7.1.3. Erythemally (CIE) weighted irradiance at McMurdo. Measurements from 1999 (squares) are contrasted with individual data points and the average of measurements taken between 1991 and 1998.

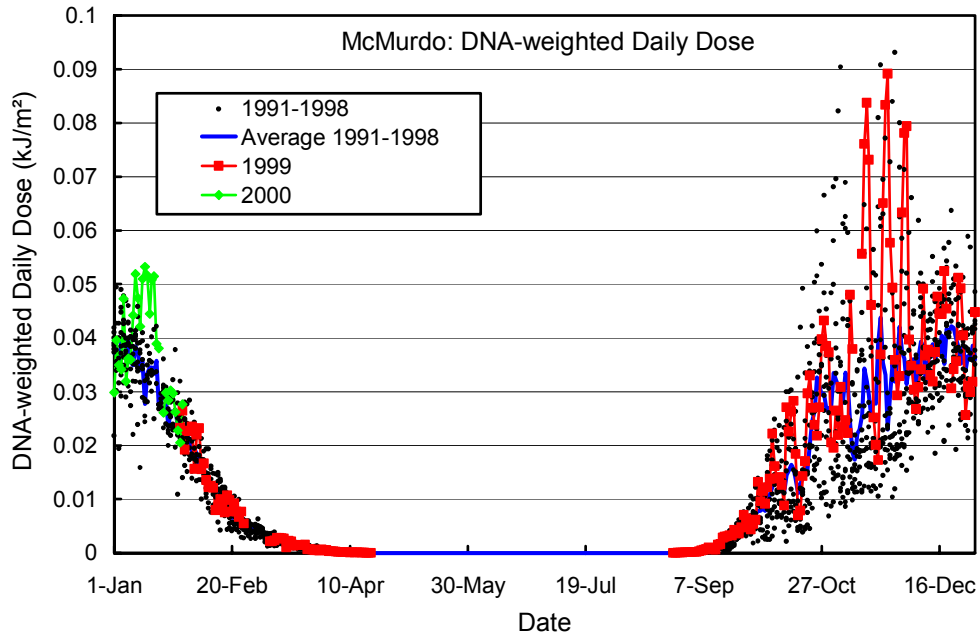


Figure 7.1.4. Daily DNA-weighted dose for McMurdo. Volume 9 measurements from 1999 and 2000 are contrasted with individual data points and the average of measurements taken between 1991 and 1998.

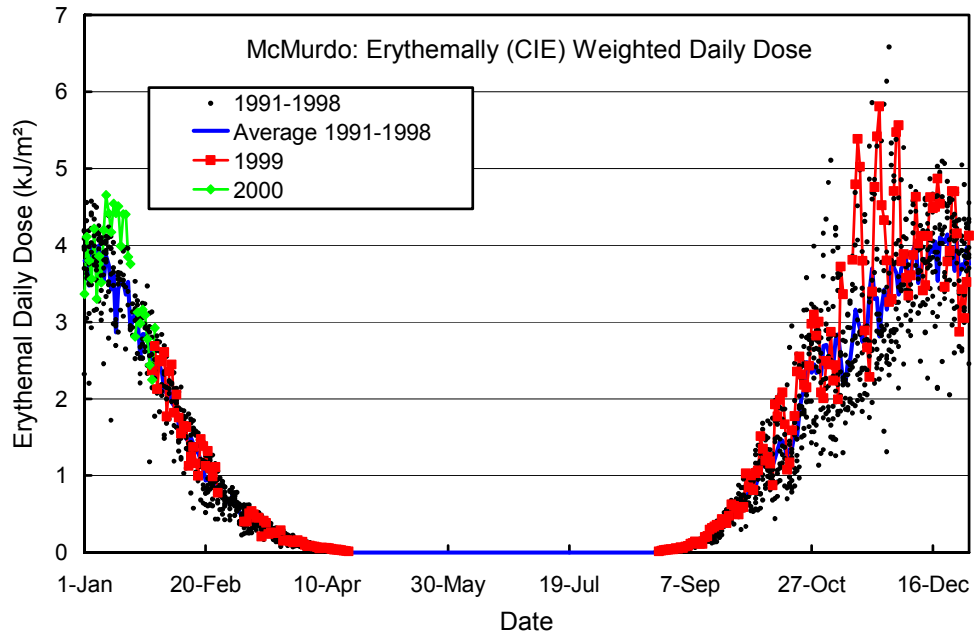


Figure 7.1.5. Daily erythemal dose for McMurdo. Volume 9 measurements from 1999 and 2000 are contrasted with individual data points and the average of measurements taken between 1991 and 1998.

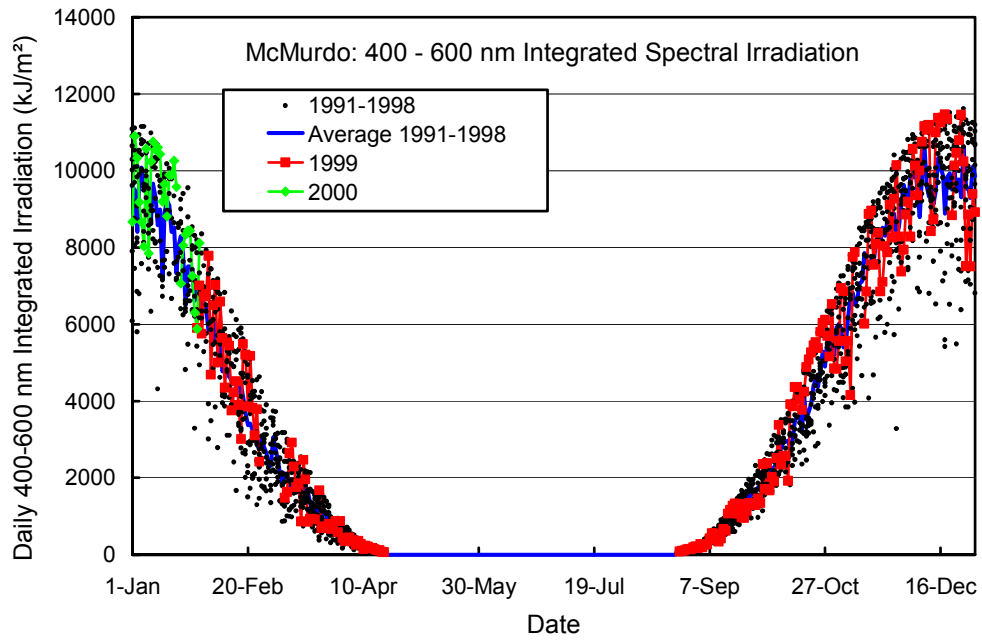


Figure 7.1.6. Daily irradiation of the 400-600 nm band for McMurdo. Volume 9 measurements from 1999 and 2000 are contrasted with individual data points and the average of measurements taken between 1991 and 1998.