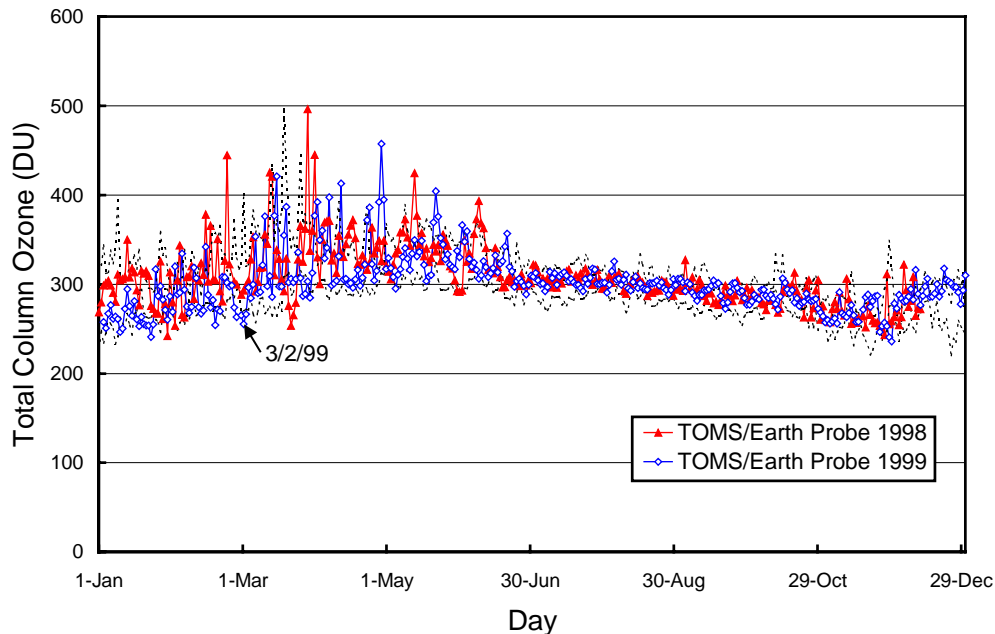


## 7.5. San Diego, California

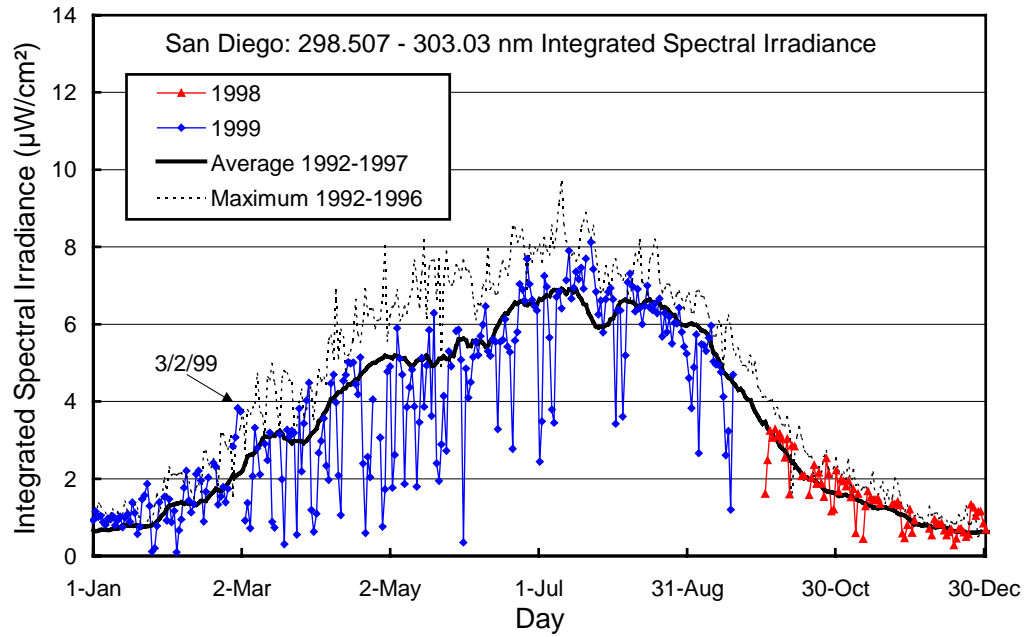
San Diego is the only network site at low latitude. In contrast to the other locations, data is presented over the whole year. Figure 7.5.1 shows the seasonal variation of total column ozone in San Diego. The variability in ozone is much smaller when compared to the Arctic and Antarctic sites and there is virtually no trend in ozone over the period considered (1991-99). The average ozone levels and variability in the ozone column are clearly larger in spring than in fall.

Figure 7.5.2 shows spectral irradiance measurements integrated over the wavelength range 298.51 - 303.03 nm. Of all measurements presented, this integral is the most sensitive to changes in total column ozone and solar angle. For example, the comparatively high UV levels 3/2/99 anti-correlate well with relative low ozone value on this day. In general, measurements of DNA-weighted irradiance (Figure 7.5.3), and UV-B irradiance (Figure 7.5.4), as well as measurements in the visible (Figure 7.5.5) performed during Volume 8 compare well to data of previous years. Data from the 298.51 - 303.03 nm range and DNA-weighted irradiance are clearly higher in fall than in spring. This is partly due to the lower ozone levels in fall. Another contributor to the spring-fall difference is the degree of variability of cloudiness, which is seen in the visible: Data from the 400-600 nm band indicates higher variability in February-July than during August-January, which is caused by seasonal differences in coastal fog and cloudiness.

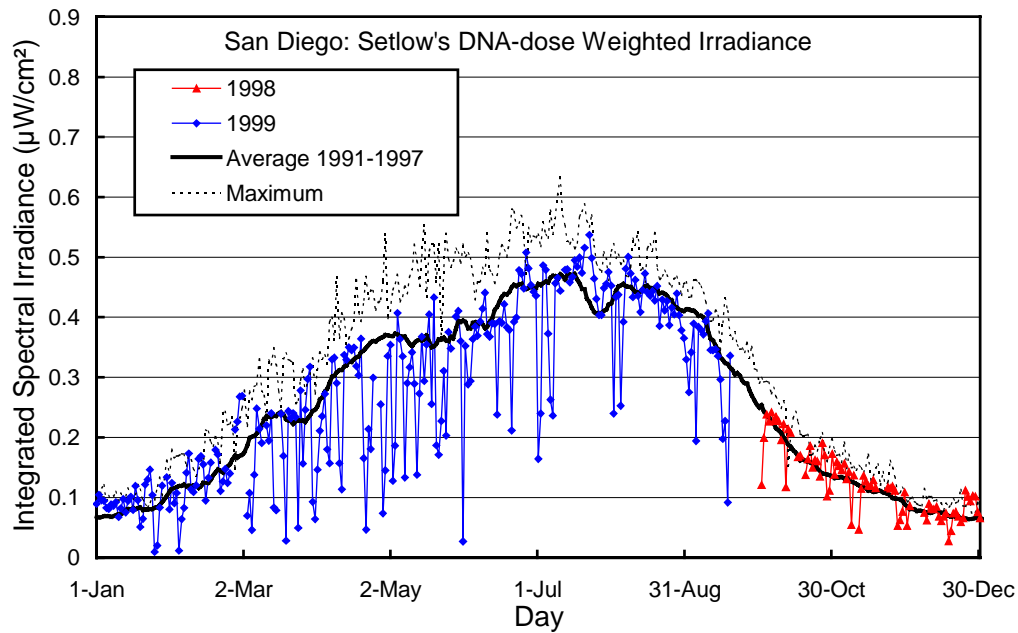
The general pattern seen in noon-time measurements can also be seen in daily doses (Figures 7.5.6 – 7.5.8). The variability in daily dose is higher in spring than in fall, both for short-wave UV and visible irradiation. The difference in DNA dose and irradiation in the 400-600 nm band is depicted in Figure 7.5.9. There is no clear asymmetry between spring and fall in the visible range. DNA-dose data, however, is generally higher in fall than in spring. There is also a difference of roughly a factor of nine in DNA-dose measured in summer and winter, principally due to differences in the solar zenith angle during these opposite parts of the year.



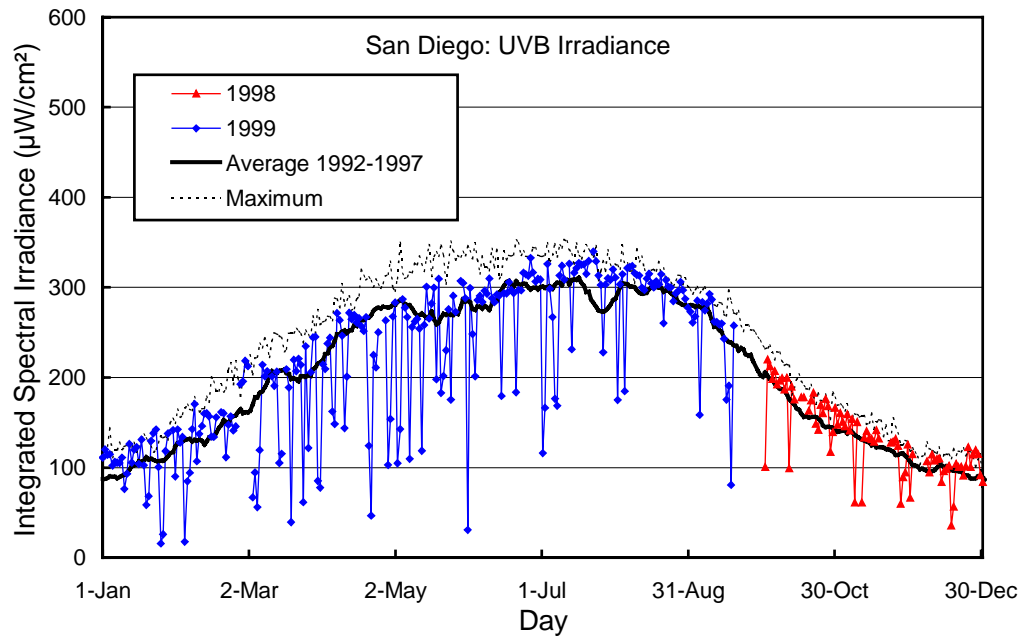
**Figure 7.5.1.** Total column ozone at San Diego. TOMS/Earth Probe measurements from 1998 and 1999 are contrasted with minimum and maximum values (broken lines) from the years 1991-1994 recorded by TOMS onboard NASA's Nimbus-7 and Meteor-3 satellites. A 1.5 year gap in data occurred after the loss of the Meteor-3 satellite in December 1994. No TOMS ozone values exist between 12/13/98 and 12/31/98 because of TOMS instrumental problems.



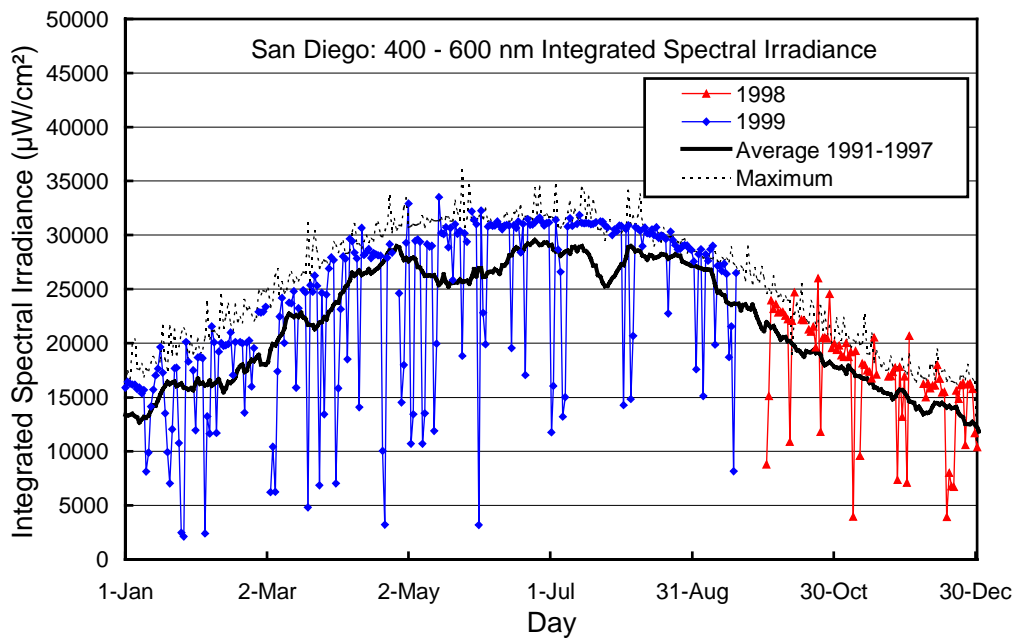
**Figure 7.5.2.** Noontime integrated spectral UV irradiance (298.51 - 303.03 nm) at San Diego. The measurements from 1998 (triangles) and 1999 (diamonds) are contrasted with the mean of measurements taken between 1992 and 1997 (thick line) and the maximum levels from this period (broken line). A ten-day running average was applied to the mean to reduce day-to-day fluctuations in order to make the presentation clearer.



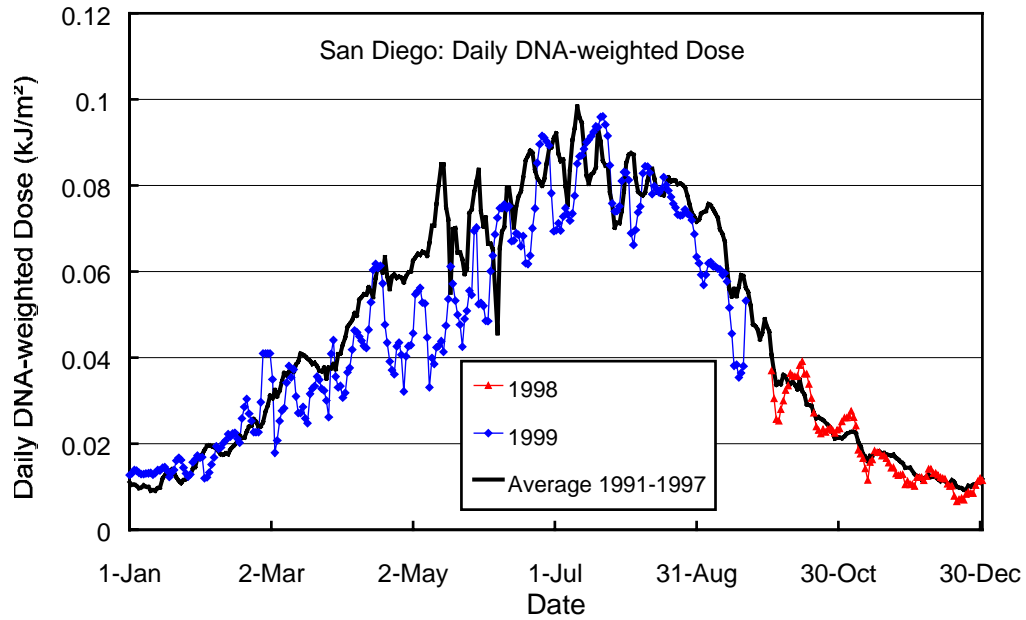
**Figure 7.5.3.** Setlow's DNA-weighted irradiance at San Diego. Volume 8 measurements from 1998 and 1999 are contrasted to the mean and maximum measurements between 1991 and 1997.



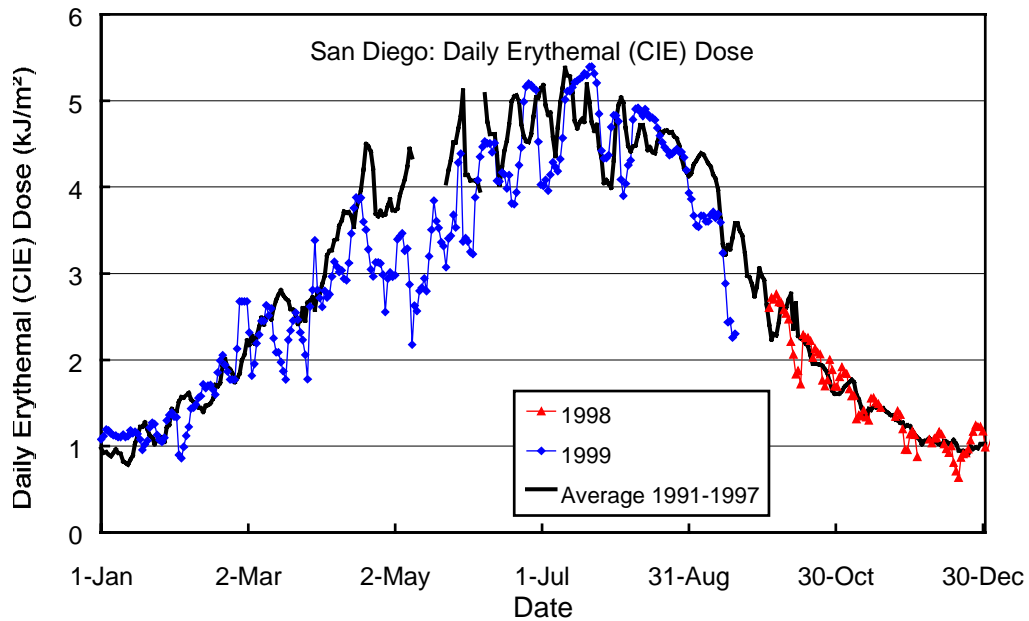
**Figure 7.5.4.** Noontime San Diego UV-B irradiance. Volume 8 measurements from 1998 and 1999 are contrasted to the mean and maximum measurements between 1991 and 1997.



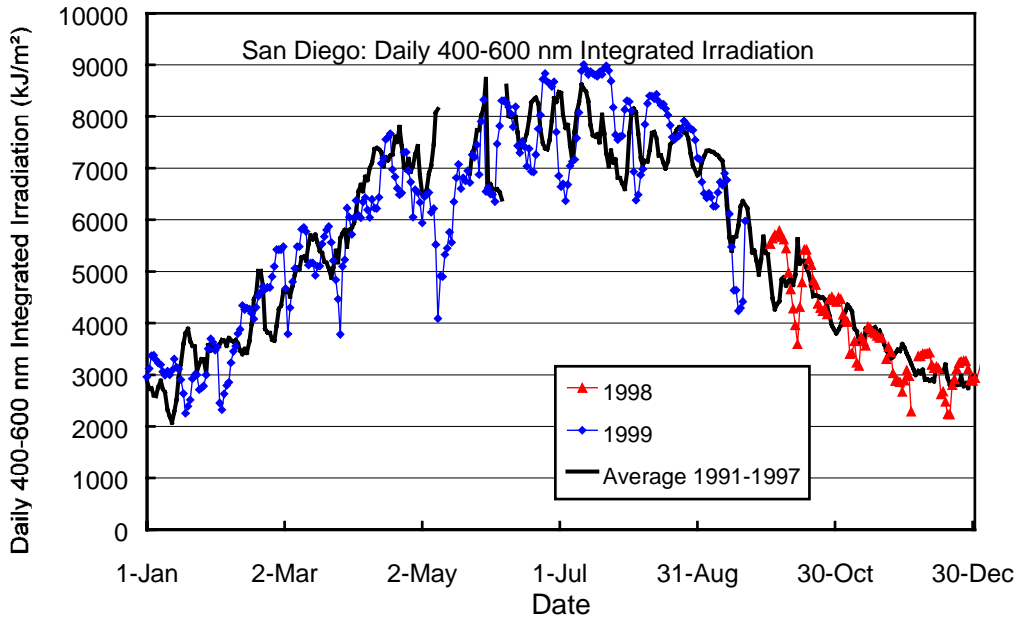
**Figure 7.5.5.** Noontime broadband visible irradiance (400 - 600 nm) at San Diego. Volume 8 measurements from 1998 and 1999 are contrasted to the mean and maximum measurements between 1991 and 1997.



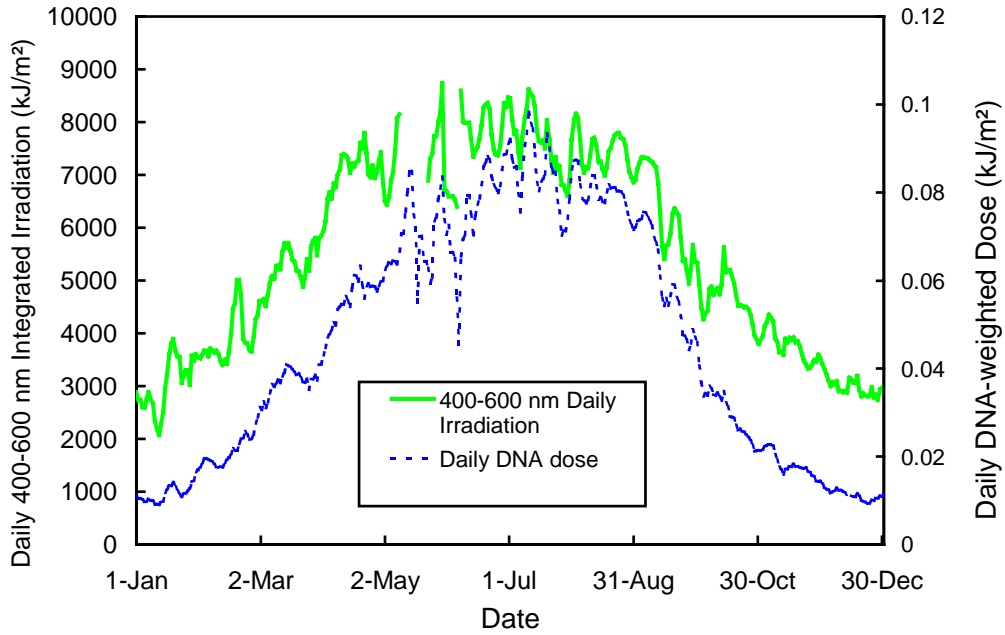
**Figure 7.5.6.** Daily DNA-weighted dose for San Diego. The Volume 8 measurements from 1998 and 1999 are contrasted to the mean of measurements taken between 1991 and 1997 (thick line). A five-day running average was applied to all curves to reduce day-to-day fluctuations and make the presentation clearer.



**Figure 7.5.7.** Daily erythemal dose for San Diego. Measurements from 1998 are contrasted with the mean of measurements taken between 1991 and 1997 (thick line).



**Figure 7.5.8.** Daily irradiation of the 400-600 nm band for Barrow. Measurements from 1998 are contrasted with the mean of measurements taken between 1991 and 1997 (thick line).



**Figure 7.5.9.** Comparison of DNA-weighted dose (right axis) with daily irradiation in the 400-600 nm spectral range (left axis) at San Diego. Both curves represent the mean values from the period 1991-1997 with a 5-day running average smoothing applied.