The intense ultraviolet radiation Australia receives contributes to Australia's high incidence rates for related human diseases, but its intense visible-range radiation potentially provides a significant source of electrical power. Aerosols can have significant influence on surface radiation in both wavelength ranges but their effects are spatially and temporally inhomogeneous. Aerosol properties, such as total column aerosol optical depth, have been measured over several years for varying lengths of time at sites across Australia using sunphotometers. Statistical analyses of sunphotometer measurements made near Adelaide, Alice Springs, Canberra, Darwin, and Perth provide information on both the optical characteristics of Australian aerosols and their climatology. The sunphotometers used at these sites make measurements at visible wavelengths which are directly useful for solar energy potential assessments, but they do not make measurements in the UV-B spectral region and have only one channel in the UV-A spectral region, the regions of most interest for assessing human health impact. Consequently, model calculations have been used to estimate the impact of the aerosols found over these sites on surface ultraviolet radiation. The aerosol loading is at times sufficient to significantly reduce the surface ultraviolet radiation, but few such days occur each year. The annual average effect of aerosols on surface ultraviolet radiation, thus, appears to be small compared to lifestyle factors, such as clothing and use of sunscreen.