Quality of UVR exposure for different biological systems along a latitudinal gradient

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The exposure of organisms to ultraviolet radiation (UVR) is characterized by the climatology (annual cycle) and the variance (anomalies) of biologically-weighted irradiances at eight geographical locations in austral South America, from 1995-2002. The net effect of UVR on biological systems is a result of the balance of damage and repair which depends on intensity and duration of irradiance and is modulated by its variability. The emphasis in this study is on day-to-day variability, a time scale of importance to adaptive strategies that counteract UVR damage. The irradiances were weighted with DNA- and phytoplankton photosynthesis-action spectra. Low latitude sites show high average UVR. For all sites, the frequency of days with above average irradiances is higher than below average irradiances. Persistence in anomalies is generally low (?0.36 autocorrelation coefficient), but higher for DNA- than phytoplankton photosynthesis-weighted irradiances due to their higher correspondence to s