

Environmental Controls of UV-B Radiation in Forested Streams of Northern Michigan

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ABSTRACT

We examined UV-B radiation flux and its environmental control within and among streams of northern Michigan. UV-B flux was estimated in streams by plastic dosimetry strips, which allow for the simultaneous and repeated *in situ* measurement of solar radiation. During the summer of 2004, UV-B flux was measured across depth gradients and along longitudinal transects in seven streams, which were chosen to encompass a range of dissolved organic carbon (DOC) concentrations and canopy cover. Attenuation coefficients of UV-B (K_d_{UV-B}) were estimated using plastic dosimeters placed along a depth gradient. K_d_{UV-B} were positively correlated with DOC concentration and similar to values obtained with laboratory and *in situ* spectrometry. Along 100 m longitudinal transects, UV-B flux varied along all streams regardless of their canopy cover and DOC concentration. Within-stream fluxes of UV-B were correlated to canopy cover in the only two streams that both had relatively low DOC concentration and variable canopy cover. Large differences were found among streams in the average UV-B flux (corrected for incident solar flux) reaching the dosimeters at 5 cm depth. These among-stream differences were largely accounted for by the stream width, canopy cover, and DOC concentration. Our results illustrate an inherent variability in UV-B flux within and among streams of northern Michigan that is strongly tied to the interactions of DOC concentration, stream size and riparian vegetation.