

Attenuation Coefficient

Written by Rocky

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One of the most common descriptors of the penetration of sunlight in water is the diffuse attenuation coefficient, $K(\lambda)$, or $K_d(\lambda)$ when calculated from vertical profiles of downwelling irradiance, $E_d(\lambda)$. Where z is depth, this relationship is:

$$K_d(\lambda, z) = \frac{-1}{E_d(\lambda, z)} \left[\frac{dE_d(\lambda, z)}{dz} \right]$$

□

For homogeneous waters, a plot of the logarithm of $E_d(\lambda, z)$ versus z forms a straight line, and

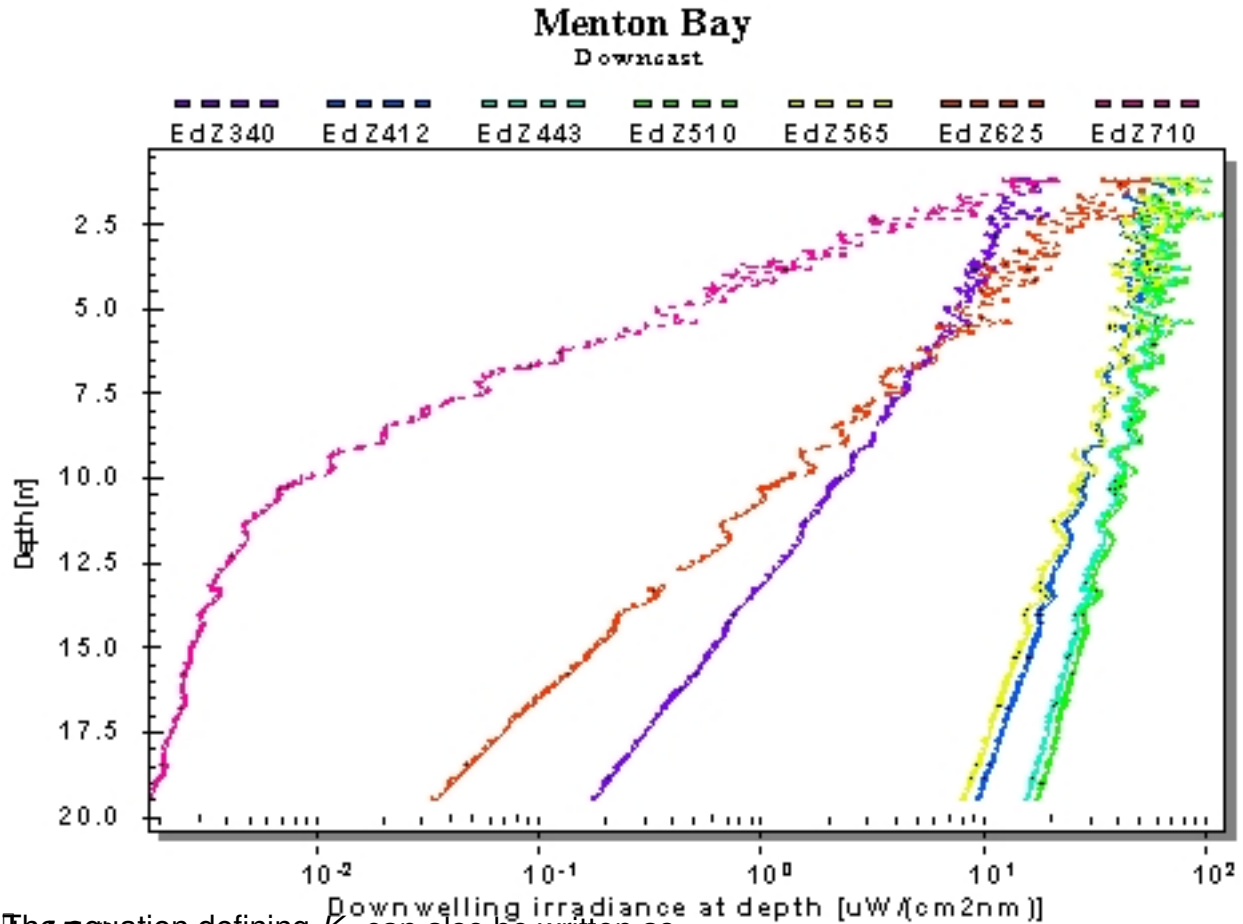
$K_d(\lambda, z)$

) is the localized slope of that line (Figure 1).

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The equation defining K_d can also be written as $\ln(I_z/I_0) = -K_d z$ where $m = K_d$ is the slope. Irradiance values do not have to be calibrated as the irradiance units cancel out.