

Centimeter-scale stream substratum heterogeneity and metabolic rates

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et al. (2001) compared variation in nutrient concentrations across spatial scales ranging from 1 to 25 m and found the greatest variation in nitrate concentration at the smallest (1 m) scale in a Sonoran Desert stream. These studies focused on heterogeneity at spatial scales

(14.5 cm W9

conditions, the bottom of the grids, or a rock (in stream transects) were reached, or to a depth of 20 mm. Anoxia was defined as \

The Shannon–Weaver (H^0) index (Shannon & Weaver, [1963](#))

levels. Greater O₂ penetration could have allowed larger interstitial spaces in gravel, whereas in the sand, O₂ could not infiltrate as deeply, resulting in a consistently shallower depth to anoxia. Contact time of water with subsurface sediment can be negatively correlated with O₂ water content (Findlay, [1995](#)).

Natural stream O₂ flux rates were similar to grid O₂ flux rates, in that they showed little variation between sand and gravel substratum types, but natural stream substrata had lower O₂ flux rates overall. Depth to

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