

Do *Daphnia* use metalimnetic organic matter in a north temperate lake? An analysis of vertical migration

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Abstract

Diel vertical migration of zooplankton is influenced by a variety of factors including predation, food, and temperature. Research has recently shifted from a focus on factors influencing migration to how migration affects nutrient cycling and habitat coupling. Here we evaluate the potential for *Daphnia* migrations to incorporate metalimnetic productivity in a well-studied northern Wisconsin lake. We use prior studies conducted between 1985 and 1990 and current diel migration data (2008) to compare day and night *Daphnia* vertical distributions with the depth of the metalimnion (between the thermocline and 1% light depth). *Daphnia* migrate from a daytime mean residence depth of between about 1.7 and 2.5 m to a nighttime mean residence depth of between 0 and 2.0 m. These migrations are consistent between the prior period and current measurements. Daytime residence depths of *Daphnia* are rarely deep enough to reach the metalimnion; hence, metalimnetic primary production is unlikely to be an important resource for *Daphnia* in this system.

Key words: allochthonous, *Daphnia*, diel vertical migration, metalimnetic production, nutrient cycling