

Divergent diel vertical migration in *Mysis diluviana*: is it a plastic or fixed behavior?

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*Mysis diluviana* is a macroinvertebrate (up to ~20 mm) that serves an important function in freshwater food webs. *Mysis* feed omnivorously and exhibit diel vertical migration (DVM), which allows them to alternate feeding between two different habitats on a daily basis. DVM is conventionally viewed as a population level migration from the benthic (lake bottom) habitat occupied during the day, to the pelagic (water column) habitat occupied at night. This behavior has important implications for food web structure, nutrient cycling between benthic and pelagic habitats, and contaminant biomagnification. However, divergent DVM behavior exists in many systems; some *Mysis* do not migrate into the pelagic habitat at night. This divergent behavior may be plastic (i.e., variable) or fixed (i.e., individuals either migrate or do not migrate). We are using stable isotope analyses, a proxy for diet composition, to test if DVM migration is a plastic or fixed behavior. Isotopic signatures of prey differ between benthic and pelagic habitats. If isotope signatures are similar between benthic and pelagic *Mysis* captured at night then we would conclude DVM behavior is plastic. If signatures are different, then we would conclude DVM behavior is fixed. *Mysis* samples were collected at night in pelagic and benthic habitats each month from May to November 2012 in Lake Champlain, Vermont. Preliminary results suggest that *Mysis* exhibit divergent DVM behavior in Lake Champlain in May and July. In May, *Mysis* size may better explain differences in isotopic signatures than habitat. In July, our results suggest divergent DVM behavior

may be fixed. Isotopic analyses of remaining *Mysis* and food web samples are ongoing and will provide a more complete evaluation of divergent DVM behavior, including possible seasonal and ontogenetic components.