

## Predicting diel vertical migration of zooplankton

*Abstract*—Amplitude of diel vertical migration is predicted by water clarity measured by Secchi depth. The model assumes that vertical migration serves to minimize mortality from visually feeding fish and to maximize grazing rate within this predation context. Three of the 24 observations of diel vertical migration are outliers which are either ultraoligotrophic, or have minimal populations of plankton-eating fish, or both. The other 21 observations in lakes with average photosynthetic rates  $\geq 300 \text{ mg C m}^{-2} \text{ d}^{-1}$  and more than  $\sim 2 \text{ g m}^{-2}$  of plankton-eating fish showed diel vertical migration proportional to Secchi depth, with a correlation coefficient of about

0.880. The residual of the migration–water clarity relationship is significantly and inversely correlated with percent illumination of the moon. Water clarity and moon intensity together account for 84% of the variation in migration amplitude for the 21 observations.

---