



Temporal, spatial, and taxonomic patterns of crustacean zooplankton variability in unmanipulated north-temperate lakes

Rusak, J. A., N. D. Yan, K. M. Somers, K. L. Cottingham, F. Micheli, S. R. Carpenter, T. M. Frost, M. J. Paterson, D. J. McQueen

Limnol. Oceanogr., 47(3), 2002, 613-625 | DOI: 10.4319/lo.2002.47.3.0613

ABSTRACT: We quantified the spatial and temporal variability of crustacean zooplankton abundance at annual time steps with 261 lake-years of data from 22 lakes in three regions of central North America. None of these lakes had been experimentally manipulated. Using a nested three-way analysis of variance, we apportioned variance among years, regions, lakes, and their interactions for 10 functional groups and 4 larger taxonomic aggregates. We proposed that relative variation in the abundance of zooplankton would be greatest among regions and lakes and least among years. We also explored how variability differed among functional groups and changed with taxonomic aggregation. Spatial sources of variation dominated the analysis, but a large interaction between lakes and years indicated that time cannot be ignored. Regional variation was half that found among lakes. Relative variance components differed widely among functional groups, which indicates that species will differ in their response to environmental controls and sensitivity to perturbation. Total explained variation also differed widely among zooplankton and decreased with increasing aggregation of taxa. Whether choosing ecological indicators or designing experiments and monitoring programs, these results clearly show that large-scale temporal and spatial variability will be an important consideration.

Article Links

[Download Full-text PDF](#)

[Return to Table of Contents](#)

Please Note

Articles in L&O appear in PDF format. Open access articles may be freely downloaded by anyone. Other articles are available for download to subscribers only, or may be purchased for \$10 per article. All L&O articles are moved into Open Access after three years.