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## Bacterial biomass and cell size distributions in lakes: More and larger cells in anoxic waters

*Jonathan J. Cole, Michael L. Pace, Nina F. Caraco, and  
Gail S. Steinhart*

Institute of Ecosystem Studies, Cary Arboretum, Millbrook, New York 12545

### *Abstract*

We measured bacterial abundance, cell size distribution, and related microbiological and geochemical parameters in 20 stratified lakes from three regions in the U.S. Both largest cell size and greatest bacterial abundance occurred in anoxic waters. Bacterial size distributions from the hypolimnia of lakes that were oxic were identical to those in surface waters. Bacteria from anoxic hypolimnia were 2–10 times larger than those from oxic water and cell size was independent of temperature under either oxic or anoxic conditions. For all lakes and strata, bacterial abundance was strongly related to the concentration of total phosphorus (TP). Cell size was not related to TP or to bacterial abundance, suggesting that abundance and size may be regulated by different processes. Bacterial biomass (calculated from the product of mean cell size and bacterial abundance) was typically 4 times greater in anoxic than in oxic waters of lakes.