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Size-selective predation, light transmission, and oxygen stratification: Evidence from the recent sediments of manipulated lakes¹

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Abstract

In an experiment maintained since 1951, half of a divided lake was limed, resulting in a significantly expanded euphotic zone. In both basins native fish were removed and rainbow trout introduced. Quantitative analysis of zooplankton remains preserved in the sediments of both lakes provides evidence of the selectivity of a visually dependent predator at natural and enhanced transparency and oxygen concentrations.

The sediment record effectively documents the known manipulations and the expected responses. In the control lake, no significant changes in zooplankton species composition, species dominance, or size-frequency distribution are recorded. In the alkalized lake, a succession in zooplankton dominance from *Daphnia pulex* to *Daphnia rosea* to *Bosmina* is recorded, as is a reciprocal change in mean size of *D. pulex* and *D. rosea*. The relative position of the thermocline with respect to the oxygen minimum barrier and the light transmission curve accounts for the observed differences in selective predation intensity.