



Light supply, plankton biomass, and seston stoichiometry in a gradient of lake mixing depths

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ABSTRACT: We derive from a dynamic model that light availability, phytoplankton density, and the carbon : nutrient ratio of phytoplankton biomass should all be negatively related to mixed surface layer depth, whereas the areal standing stock of phytoplankton should show a unimodal, and total and dissolved nutrients a horizontal or increasing, relationship to mixing depth. These predictions agree closely with data from 65 central European lakes during summer stratification. In addition, zooplankton biomass was strongly negatively related to mixing depth in a subset of lakes. A decrease in mixing depth is thus a form of enrichment with light of the mixed surface layer, the effects of which could propagate to higher trophic levels.

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