



Characterization of deep chlorophyll maxima in stratified lakes of the Scharmützelsee region

Type:	Lab-Research
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Start:	Winter 2023
Students:	1 - 2
Prerequisites:	Knowledge in aquatic ecology

Study project / Bachelor's and Master's Thesis

Based on vertical profiles of the autofluorescence of phototrophic (pigmented) organisms, it was found that both the vertical distribution, intensity (biomass) and species composition of deep chlorophyll maxima (DCM) have changed over the years.

Hypothesis: With decreasing H₂S formation in hypolimnion, DCMs from cyanobacteria have increased, while DCMs from phototrophic sulfur bacteria have decreased. For this purpose, long-term studies are available on the lakes Scharmützelsee, Tiefer See, Springsee and Großer Glubigsee.

In September 2023, vertical profile water samples were taken from these 4 lakes to determine pigment concentrations and species composition. Vertical profiles for autofluorescence and abiotic parameters (temperature, O₂, pH, conductivity, redox potential, H₂S, underwater light) are also available for this campaign.

Tasks of the student(s):

Pigment extraction

Extraction and subsequent photometric determination of the pigments of frozen filters.

Microscopy:

Photographic documentation of plankton composition based on lugol-fixed water samples from different depths. Possibly quantitative determination of selected, easily identifiable species (e.g. *Planktothrix rubescens* and *Limnothrix rosea*) from selected samples.

Data analysis

Comparison of the pigment concentrations determined photometrically or with the fluorescence probe in vivo with the results of the microscopic examination. These results are discussed in relation to the abiotic gradients (temperature, oxygen, redox potential, H₂S and underwater light).

Optionally, long-term data can be included in this study.