

# Modelling dataset for Lake Mueggelsee

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## Meteorology

The data are a mixture of measurements from the Mueggelsee lake station, the weather station on the roof of the IGB building Mueggelseedamm 310, 12587 Berlin, and ERA5-Land hourly reanalysis product. The data were carefully checked and most (but not all) errors were removed or fixed. The lake station is the basis for the data. Where lake measurements were missing or could not be corrected, they were filled by weather data from the roof station, and remaining gaps were filled with ERA5 reanalysis. The roof station and ERA5 reanalysis data were bias corrected with linear regression to the lake station before gap filling. The final series should be a gap-free bias corrected homogeneous hourly data set referenced to the lake station.

*File: meteo\_mueggelsee\_hourly\_corr\_2005-2025.csv*

### Variables:

dt: date and time  
gr: global shortwave radiation downwelling [W/m<sup>2</sup>]  
strd: solar thermal radiation downwelling (longwave) [W/m<sup>2</sup>]  
Tair: Air temperature [°C]  
u: u-component of windspeed (west to east), [m/s]  
v: v-component of windspeed (south to north), [m/s]  
wsv: vector-averaged scalar windspeed ( $=\sqrt{u^2+v^2}$ ), [m/s]  
wd: wind direction of vector averaged windspeed, [degrees]  
pa: Air pressure [hPa]  
relhum: relative humidity [%]  
tcc: Total cloud cover [0..1]  
tp: total precipitation [m/s]

## Inflows

Inflow data were obtained from the Spree River at sampling stations S67 and Rahnsdorf Ferry. Water samples for chemical analyses and Secchi depth measurements were collected at station S67, whereas discharge and daily water temperature data were obtained from Rahnsdorf Ferry.

The concentration data were linearly interpolated to daily resolution from weekly original measurements. An interpolation with the EGRET model was tested, but did not work as well as simple linear interpolation. Censored data (below the detection limit) were replaced by values half of the detection limit. Discharge was measured daily. The Spree river temperature at the lake inflow (Rahnsdorf Ferry) was measured daily from 2016 on, before this the temperature was estimated by the relationship between inflow temp and lake water temp. Discharge and temperature data come from Wasserportal Berlin:

<https://wasserportal.berlin.de/station.php?anzeige=d&station=5827101>

*File: spree\_inflow\_lin\_interp\_nutrients\_wide\_2005\_2025.csv*

### Variables:

Q: Discharge [m<sup>3</sup>/s]  
DOC: dissolved organic carbon [mg/L]  
NH4\_N: ammonium-N [mg/L]  
NO3\_N: Nitrate-N [mg/L]  
SRP: Soluble reactive phosphorus [ug/L]  
Si: Dissolved silicon as Si [mg/L]  
TDN: Total dissolved nitrogen [mg/L]  
TDP: total dissolved phosphorus [ug/L]  
TN: Total nitrogen [mg/L]  
TP: total phosphorus [ug/L]

## In-situ data

In-situ data were measured during the weekly Monday sampling routine of the IGB. There are two different in-situ datasets: the physical and the chemical data.

The physical data were measured by a YSI Exo probe at the deepest point of the lake (point M7) at 0.5 m or 1 m intervals from the surface (0 m) to the bottom (7.5 m). During ice cover, probe measurements were made from the dock of Mueggelseeperle on the southern shore of the lake.

The chemical data are mixed samples from different parts of the lake, which were subsequently analysed in the lab.

*File: mueggelsee\_phys\_M7\_2005-2025.csv*

### Physical variables

sp\_depth: specified depth [m]

Tw: water temperature [°C]

Cond: conductivity [ $\mu$ S/cm]

PH: pH

Turb: NTU

Chla: Chlorophyll a [ $\mu$ g/l]

Phycocyanin: Phycocyanin [RFU]

o2\_sat: saturation of oxygen in %

O2: oxygen concentration [mg/L]

*File: mueggelsee\_chem\_MP\_M7\_2005-2025.csv*

### Chemical variables

ID: sample designation (see below)

DOC: dissolved organic carbon [mg/L]

NH4\_N: ammonium-N [mg/L]

NO3\_N: Nitrate-N [mg/L]

SRP: Soluble reactive phosphorus [ $\mu$ g/L]

Si: Dissolved silicon as Si [mg/L]

TDN: Total dissolved nitrogen [mg/L]

TDP: total dissolved phosphorus [ $\mu$ g/L]

TN: Total nitrogen [mg/L]

TP: total phosphorus [ $\mu$ g/L]

pH: pH

Chla: Chlorophyll a [ $\mu$ g/l]

Pheoph: Pheophytin concentration [ $\mu$ g/l]

O2\_sat: saturation of oxygen in %

O2: oxygen concentration [mg/L]

Layer: vertical water layer or depth. Lake = whole water column mixed sample, epilimnion = surface layer when stratified, hypolimnion = deep layer when stratified, numbers give depth in meters.

### Secchi Depth

*File: mueggelsee\_secchi\_2005-2025.csv*

Always from location M7. Without using a viewscope.

# Sampling locations

Please find the exact sampling locations in Table 1. Please find in Table 2, which locations have been used for which samples.

Table 1. Sampling locations

ID	position	notes
201	52.427, 13.643	Dock at "Müggelseeperle". Used during ice coverage only.
210	52.4461, 13.6500	Müggelsee Station - meteorology, radiation, PAR, profiler
M3	52.438, 13.670	
M5	52.4434, 13.6524	
M7	52.434, 13.658	Deepest point of the lake. Secchi depth, Zooplankton Net sampling. Depth sample (202) only when lake is stratified.
M8	52.4423, 13.6354	
M10	52.4318, 13.6328	
S67	52.432, 13.677	Lake inlet in River Spree. Secchi depth.
S67a	52.432, 13.676	Lake inlet during ice coverage.
Rahnsdorf Ferry	52.4299, 13.6891	Rahnsdorf Ferry Boat Stop. This station is operated by the Berlin authorities and not IGB. <a href="https://wasserportal.berlin.de/station.php?anzeige=i&amp;thema=ows&amp;station=5827101">https://wasserportal.berlin.de/station.php?anzeige=i&amp;thema=ows&amp;station=5827101</a>

Table 2. Water samples

ID	locations used	notes
201	201	Only during ice coverage.
202	M7	Only when lake is stratified. 7m depth.
206	M3, M5, M7, M8, M10	Mixed sample over all lake locations. Epilimnion only (surface to 3.5m). Only when lake is stratified. Synonym: MPO.
207	M3, M5, M7, M8, M10	Mixed sample over all lake locations. Hypolimnion only (4.5 to 7m). Only when lake is stratified. Synonym: MPU.
208	M3, M5, M7, M8, M10	Mixed sample over all lake locations. Only when the lake is mixed / <b>not</b> stratified.

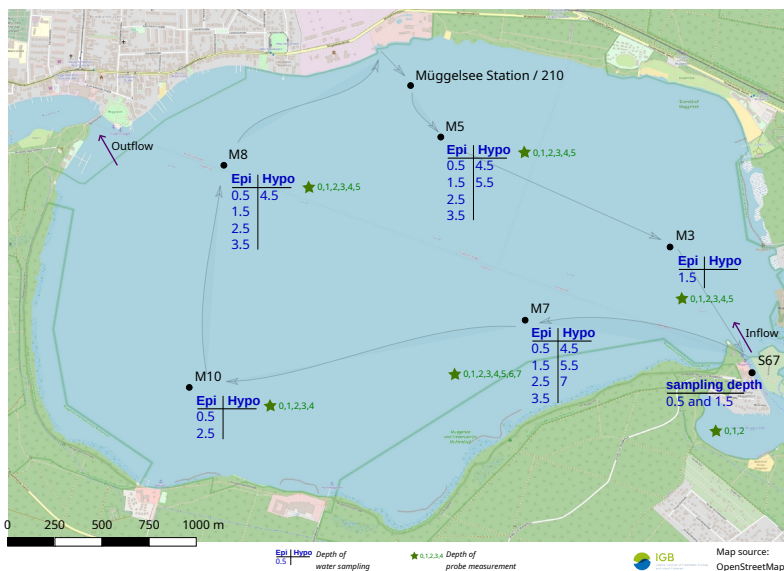


Figure 1. Map of sampling locations.