Multiparameter probe data at Lake Breiter Luzin 1978-2020

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Data origin Data were collected by IGB (Marén Lentz, Uta Mallok).

Data

Sampling site

Lake Breiter Luzin is a mesotrophic hard-water lake located in the Feldberg Lake District Nature Park (Naturpark Feldberger Seenlandschaft), Mecklenburg-Vorpommern, Germany (53°21‘19“N, 13°27‘55“E). The lake has a maximum depth of 58.3 m, a mean depth of 22.8 m, a surface area of 3.37 km^2 and a volume of 76.89 x 10^6 m^3. The catchment area has a size of 22.6 km^2 (Morphometric and catchment size data from Umweltministerium M-V, calculation base 2015). Lake Breiter Luzin is divided into two basins. The Northwestern shore is relatively steep and mainly populated with beech, the opposite shore exhibits a well developed reed bed (Nixdorf et al. 2004).

Time span 1978-2020

Sampling method

Measurements were taken from a buoy at the center of the lake (Deep measurement point, (BL), 53°21’31.1“N, 13°28‘0.7“E) between 1978 and 2020. The temporal resolution varied over time. Samples were taken monthly, although fortnightly measurements are occasionally available between May and September. Measurements were made between the surface and deepest point (48 m) at varying resolution (1-5 m). Between 1994 and Nov 2012 regular monthly surface layer measurements (0m) were made at the southern outflow channel (Schmaler Luzin outflow, 53°20'37.2"N, 13°27'36.8"E), which flows into the adjacent Schmaler Luzin lake. Regular monthly epilimnic and hypolimnic water samples were collected from multiple locations in both the upstream Feldberger Haussee (53°20'44.4"N, 13°26'35.2"E) and downstream Schmaler Luzin (53°19'14.1"N, 13°26'15.3"E) since 1978, but are not part of this data package. All water samples were taken using a 2.6 L or 3.5 L Limnos water sampler (Limnos Oy, Turku, Finland).

Field measurements

Before 1992, water temperature was measured using the mercury thermometer of the Ruttner sampler (Mothes 1981) and dissolved oxygen concentrations were determined by the Winkler method (Mothes 1981, Legler 1986). From 1992 onwards, multi-parameter probes were used to obtain vertical profiles (1-5 m depth intervals) of temperature, dissolved oxygen, oxygen saturation, pH, specific conductivity, and, from 2013 onwards, turbidity, chlorophyll *a* (chl *a*) and phycocyanin (PC).Hand-held WTW multiprobes (OXI-197, Weilheim, Germany) were used until March 2011, and YSI multiprobes (YSI 6600, Yellow Springs, OH, USA) since April 2011. Sensors were regularly calibrated in the lab according to the user manuals.

Water transparency was determined as Secchi depth on each sampling occasion. A white disc 20 cm in diameter was lowered in the water column until it was no longer visible, then raised, and the depth recorded both when the disc disappeared and when it re-appeared. The mean of both values is reported as Secchi depth. Readings were taken with a bathyscope on the shady side of a boat to reduce the influence of reflections and glittering.

Parameters

- lake – sampled lake
- date – date of measurement [YYYY-MM-DD]
- depth – depth of measurement [m]
- wtemp – water temperature [°C]
- o2 – dissolved oxygen [mg L-1]
- so2 – oxygen saturation [%]

- ph – pH value
- conductivity – electrical conductivity [µS cm^{-1}]
- turbidity – turbidity [NTU]
- chla – chlorophyll a [µg L^{-1}]
- bga_pc – blue-green algae [cells L^{-1}]
- secchi – secchi depth [m]
- site – measurement site
- probe – type of multiparameter probe
- comment – comments
- std_depth – standardized depth (rounded depth value to the integers digit)

References

Nixdorf B, Hemm M, Hoffmann A, Richter P. 2004. “Breiter Luzin”, Dokumentation von Zustand und Entwicklung der wichtigsten Seen Deutschlands. Teil 2 Mecklenburg-Vorpommern. Umweltbundesamt. UBA-Bericht Forschungsbericht 29924274, UBA-FB 000511, p. 26.

Umweltministerium M-V, calculation base 2015, Abteilung Integrierter Umweltschutz und Nachhaltige Entwicklung - Seenprojekt, 2002: Mathes, J. & Korczynski, I. Pampower Str. 66/68, 19061 Schwerin.

Change log

- 2020/2021 Silke R. Schmidt: These data are not yet quality-controlled. There are known issues in the data, such as values of 0 instead of NA are values beyond physical limits. Less flawed data are available in the raw data files.
- 2022 Sabine Wollrab/ Jason N. Woodhouse: Quality control, checking and correcting for data beyond physical limits. Additional column with rounded depth measurements was added (column “std_depth”) as from 2010 onwards the exact depth measurements, while in previous years the standard discrete depths were entered from which also water samples were taken (column “depth”).