

Multiparameter probe data at Lake Stechlin 1970-2020

Version 2023-03-07

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

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Data

Sampling site

Lake Stechlin is a deep, dimictic, formerly oligotrophic clear-water lake that has been undergoing eutrophication since the early 2000s and especially since 2010. The lake is located in a nature reserve approximately 80 km north of Berlin, Germany (53°9'5.6"N, 13°1'34.2"E) at 59 m altitude. Lake Stechlin has a maximum depth of 69.5 m, a mean depth of 23.3 m, a surface area of 4.3 km² and a volume of 96.9 x 10⁶ m³ (Casper 1985). The lake basin was formed during the last continental glaciation ca. 12,000 years ago and is today situated at the transition between temperate maritime and temperate continental climate (Fraedrich et al. 2001). The catchment has a size of 12.6 km² and is almost completely covered by managed forest (95%). The main species is Scots pine (*Pinus sylvestris*), although beech (*Fagus sylvatica*) is the dominant tree species along the shoreline. Non-forested areas are the site of a former nuclear power plant (KKW Rheinsberg) and the small village of Neuglobsow with about 300 residents (up to 1000 during the tourist season in summer), whose wastewater is diverted to a different catchment. The shoreline is largely undeveloped with no notable infrastructure except on the small beach and the boat rental, the properties of a fisherman, the Federal German Environment Agency and the Leibniz Institute of Freshwater Ecology and Inland Fisheries. The seepage lake is mainly fed by precipitation and

groundwater, resulting in a theoretical water retention time of more than 40 years (Koschel 1995, Holzbecher et al. 1999). There are no river inflows except for occasional discharge from a small stream channel that is dry in most years. The water level of Lake Stechlin is regulated. From 1966 to 1990, the lake received a total of about 300,000 m³ d⁻¹ of cooling water from the nearby nuclear power plant. The cooling water was withdrawn from neighbouring Lake Nehmitz (North basin) and discharged into Lake Stechlin at an average temperature of approximately 10 °C above the ambient surface water temperature. This resulted in an average increase in water temperature by 1-2 °C during the power plant operation (1966-1990) and decreased the retention time of Lake Stechlin. For more information, see Casper (1985), Koschel and Casper (1986), Casper and Koschel (1995), Koschel and Adams (2003) and Kirillin et al. (2013).

Time span 1970-2020

Sampling method

Vertical profiles were collected at the deepest point of the Lake Stechlin (69.5 m) situated in the main basin (53°9'19.5"N, 13°1'52.9"E), from 1982 onwards as well in the West basin (53°9'15.1"N, 13°0'30.5"E) and in the South basin (53°8'37.0"N, 13°1'14.9"E), and between 1994 and 2009 as well at the inlet of Lake Dagow (Dagowsee). In February to March 2010 multiprobe measurements have been performed in the South basin during an ice-covered period marked as "additional site" as it was not at the exact location of the regular monitoring samplings during ice-free conditions. The temporal resolution varied over time. In the main basin, fortnightly samples have usually been taken from May to September. Outside the stratification period monthly sampling was performed even throughout winter (when possible). The temporal resolution at the other sites is irregular. Measurements were performed at variable depths between 0 m and the deepest point at the respective site at a high spatial resolution (1-5 m).

- multi-parameter probes, YSI, Yellow Springs, OH, USA
- Secchi transparency: white disc 25-30 cm in diameter; readings were done on the shady side of the boat. To reduce the impact of reflection and glittering, a bathyscope was used.

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 [$\mu\text{S cm}^{-1}$]
- turbidity – turbidity [NTU]
- chla – chlorophyll a [$\mu\text{g L}^{-1}$]
- 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

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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").