IGB
Leibniz-Institut für Gewässerökologie
und Binnenfischerei

FRESHWATER RESEARCH AND ENVIRONMENTAL DATABASE

Tollensesee (MV)

Lake Tollense thermistor chain with oxygen

FRED Package 853

In recent years, numerous lakes throughout Germany have been included in a climate impact measurement programme. Long-term climate monitoring that provides continuous series of measurements with high temporal resolution over many years is an essential basis for better understanding the interrelationships in lakes, carrying out trend analyses and developing adaptation strategies from them. In addition to measuring changes, they provide a basis for model-based management scenarios.

Lake Tollense

Lake Tollense is a dimictic meso-eutrophic hardwater lake located in the south of the town of Neubrandenburg in the district of Mecklenburgische Seenplatte, Mecklenburg-Vorpommern, Germany (53°30'40 "N 13°12'50 "E). The lake has a maximum depth of 31 m, a mean depth of 17.7 m, a volume of 316 x 10^6 and a surface area of 17.7 km^2. This makes it the 15th largest lake in germany.

Measuring chain

The measuring chain consists of a rope that is kept in tension by a weight on the bottom and a pressure-resistant buoy located 1.5 m below the water surface. The loggers are attached to the rope at fixed intervals.

The logger depth given indicate the depth below the water surface. Due to the anchoring on the bottom, the distances of the logger from the bottom are always the same, but not when viewed from the surface. This can cause problems if the water level fluctuates, as it changes the real distance between the logger and the water surface.

The coordinates of the measuring chain are 53°30'09.1"N 13°12'23.4"E. This is not the deepest part of the lake but it is about 28.5 metres deep.

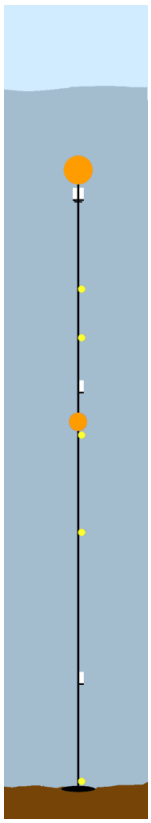

Abb. Scheme of a measurement chain with autonomous loggers

Autonomous datalogger

Between 2001 and 2008, loggers from Hotdog loggres from Elpro-Buchs, Switzerland, were used for the temperature measurements. Since 2020, Tinytag Aquatic 2 TG-4100 underwater data loggers from Gemini Data Loggers, UK, have been used.

miniDOT data loggers from PME (Precision Measurement Engineering, Inc.) are used for the oxygen measurements. To prevent mussel settlement, the 1 m O_2 logger is covered with copper tape and equipped with a miniWIPER, an autonomous antifouling system, since 2019.

Logger specifications

Parameter	name	accuracy	resolution	max. operating depth	
temperature	Tinytag Aquatic 2 TG-4100, Gemini Data Loggers	± 0.5°C according to manufacturer) ± 0.1°C (own experience)*	0.01 °C	500 m	
oxygen and temperature	miniDOT, Precision Measurement Engineering (PME)	according to manufacturer ± 5% ± 0.3 mg/l ± 0.1°C	0.01 mg/L 0.01 °C	100 m	
pressure	Hobo U20L-02, Onset Computer Corporation	max. 2.55 kPa	< 0,04 kPa	30 m	

*only loggers with an accuracy of ± 0.03°C are used

Logger depth distribution 2021 to 2024

Data

Time span 2021-03-17 ongoing

Intervall 30 min. (60 min. for pressure)

The data are stored as individual txt files in the IGB Cloud Nimbus.

Example of the metadata file:

Tollensesee (TOL)							
Datei	**20220728_TOL_data**						
	Logger	**Parameter**	**Logger-Nr.**	**Tiefe (m)**	**Messintervall**	**Messzeitraum**	**Bemerkungen**
miniDot907758_TOL2021_2m.TXT	miniDot USB	O2 + T	7450-907758	2	30	17.03.2021 - 28.07.2022	
miniDot927283_TOL2021_10m.TXT	miniDot USB	O2 + T	7450-927283	10	30	17.03.2021 - 28.07.2022	
miniDot012657_TOL2021_20m.TXT	miniDot USB	O2 + T	7450-012657	20	30	17.03.2021 - 28.07.2022	
Tinytag664476_TOL2021_1m.txt	Tinytag	T	664476	1	30	17.03.2021 - 28.07.2022	
Tinytag664477_TOL2021_5m.txt	Tinytag	T	664477	5	30	17.03.2021 - 28.07.2022	
Tinytag589398_TOL2021_8m.txt	Tinytag	T	589398	8	30	17.03.2021 - 28.07.2022	
Tinytag918797_TOL2021_15m.txt	Tinytag	T	918797	15	30	17.03.2021 - 28.07.2022	
Tinytag656712_TOL2021_27.5m.txt	Tinytag	T	656712	27,5	30	17.03.2021 - 11.06.2022	nur bis 11.06.2021
hobo20936108_TOL2021_15m.csv	hobo	Druck + T	20936108	15	30		
2021-2022_TOL_data.xlsx	alle						Zusammenstellung
Datei	**20230525_TOL_data**						
	Logger	**Parameter**	**Logger-Nr.**	**Tiefe (m)**	**Messintervall**	**Messzeitraum**	**Bemerkungen**
miniDot7450-115918_TOL2022_2m.TXT	miniDot USB	O2 + T	7450-115918	2	30	28.07.2023 - 25.05.2023	
miniDot7450-259867_TOL2022_10m.TXT	miniDot USB	O2 + T	7450-259867	10	30	28.07.2023 - 25.05.2023	
miniDot7392-186076_TOL2022_20m.TXT	miniDot USB	O2 + T	7392-186076	20	30	28.07.2023 - 25.05.2023	
Tinytag632361_TOL2022_6m.txt	Tinytag	T	632361	5	30	28.07.2023 - 25.05.2023	
Tinytag589392_TOL2022_8m.txt	Tinytag	T	589392	8	30	28.07.2023 - 25.05.2023	
Tinytag590527_TOL2022_15m.txt	Tinytag	T	590527	15	30	28.07.2023 - 25.05.2023	
Tinytag897187_TOL2022_27.5m.txt	Tinytag	T	897187	27,5	30	28.07.2023 - 25.05.2023	
Hobo20936106_TOL2022.csv	Hobo	Druck + T	20936106	15	60	28.07.2023 - 25.05.2023	
2022-2023_TOL_data.xlsx	alle						

Contact

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Data responsibility: Sylvia Jordan

Data origin: IGB Berlin

Version 2024-01-05