



FRESHWATER RESEARCH AND ENVIRONMENTAL DATABASE

Feldberger Haussee

Feldberger Haussee thermistor chain with oxygen

FRED Package 630

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 Feldberger Haussee

Lake Feldberger Haussee is a dimictic eutrophic hard-water lake located in the urban area of Feldberg in the Feldberg Lake District Nature Park (Naturpark Feldberger Seenlandschaft), Mecklenburg-Vorpommern, Germany (53°20'30"N, 13°26'55"E). The lake has a maximum depth of 12.5 m, a mean depth of 5.83 m, a surface area of 1.32 km² and a volume of 7.69 x 10⁶ m³. The catchment area has a size of 5.8 km² (Morphometric and catchment size data from Umweltministerium M-V, calculation base 2015). Due to excessive loads of sewage discharge from municipalities and agriculture in the 1960s and 1970s, the originally mesotrophic or slightly eutrophic clear-water lake underwent a eutrophication process with high nutrient loads, massive algal blooms and high oxygen depletion. The lake has been subject to restoration activities through biomanipulation from 1985-2002 (Nixdorf et al. 2004) and a treatment with poly-aluminium chloride (PAC) as precipitant in April 2011 (Kasprzak 2018).

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 m below the water surface. The loggers are attached to the rope at fixed intervals.

Information about the depth values of the loggers

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.

Autonomous datalogger

Tinytag Aquatic 2 TG-4100 underwater data loggers from Gemini Data Loggers, UK, are used for the temperature measurements.

MiniDOT data loggers from PME (Precision Measurement Engineering, Inc.) are used for the oxygen measurements. To prevent mussel settlement, the 1 m O₂ logger is covered with copper tape and equipped with a miniWIPER, an autonomous antifouling system, since 2019.

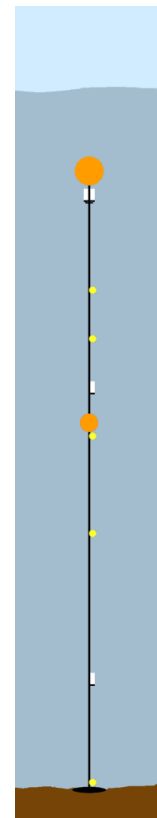




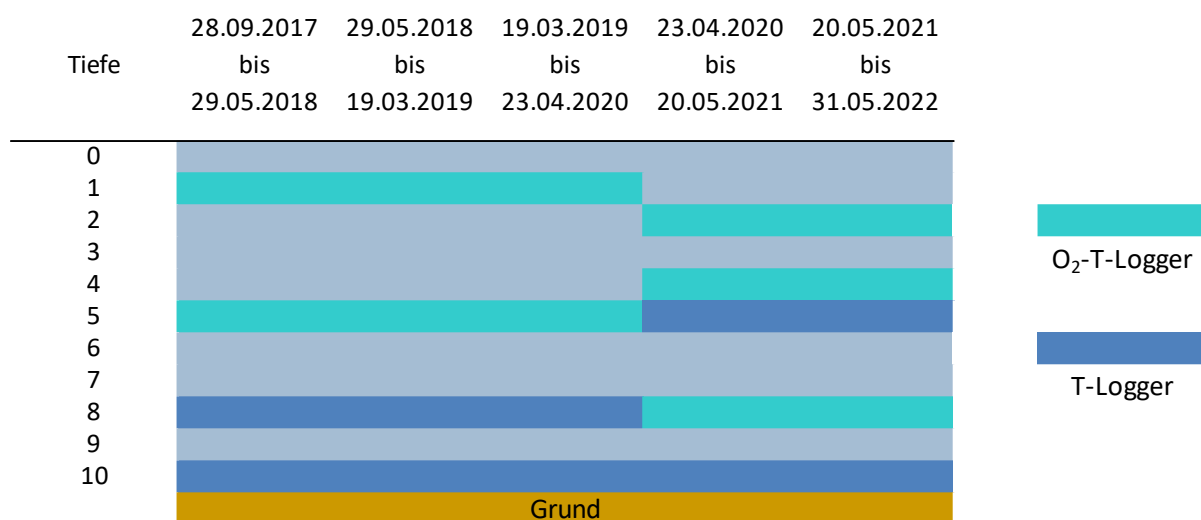
Abb. Scheme of a measurement chain with autonomous loggers

Logger specifications

Parameter	name	accuracy	resolution	max. operating depth	
temperature	Tinytag Aquatic 2 TG-4100 von Gemini Data Loggers	± 0.5°C according to manufacturer) ± 0.1°C (own experience)*	0.01 °C	500 m	
oxygen and temperature	miniDOT von Precision Measurement Engineering (PME)	according to manufacturer ± 5% ± 0.3 mg/l ± 0.1°C	0.01 mg/L 0.01 °C	100 m	

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

Logger depth distribution 2017 to 2022



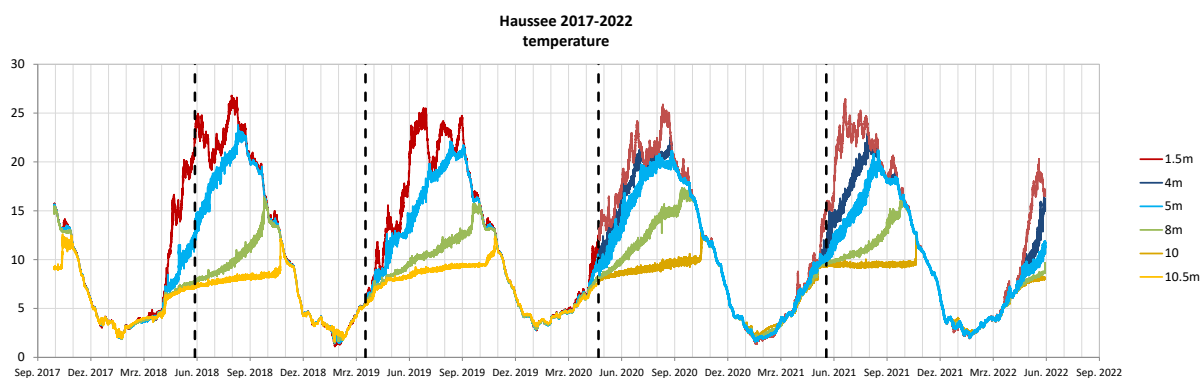
Data

Time span 28.09.2017 ongoing

Intervall first 60 min., later 30 min.

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

Feldberger Haussee							
Ordner	20190319_HAUS_data						
Datei	Logger	Parameter	Logger-Nr.	Tiefe (m)	Messintervall	Messzeitraum	Bemerkungen
Cat1314.txt	miniDot RS232	O2, T	6881-1314	1	60	28.09.2017 - 29.05.2018	ohne Wischer
Cat1329.txt	miniDot RS232	O2, T	6881-1329	5	60	28.09.2017 - 29.05.2018	ohne Wischer
Cat1326.txt	miniDot RS232	O2, T	6881-1326	1	60	29.05.2018 - 19.03.2019	ohne Wischer
Cat1322.txt	miniDot RS232	O2, T	6881-1322	5	60	29.05.2018 - 19.03.2019	ohne Wischer
Tinytag-590715.txt	Tinytag TG-4100	T	590715	8	30	28.09.2017 - 19.03.2019	wurden 2018 nicht gewechselt
Tinytag-658049.txt	Tinytag TG-4100	T	658049	10.5	30	28.09.2017 - 19.03.2019	wurden 2018 nicht gewechselt
Ordner	20200423_HAUS_data						
Cat7450-251830.txt	miniDot USB	O2, T	7450-251830	1	60	19.03.2019 - 23.04.2020	mit Wischer
Cat7450-368446.txt	miniDot USB	O2, T	7450-368446	5	60	19.03.2019 - 23.04.2020	ohne Wischer
Tinytag-632356.txt	Tinytag TG-4100	T	632356	8	30	19.03.2019 - 23.04.2020	ohne Wischer
Tinytag-632354.txt	Tinytag TG-4100	T	632354	10.5	30	19.03.2019 - 23.04.2020	
Cat5958-313436.txt	miniWiper		5958-313436	1	360	19.03.2019 - 23.04.2020	eingeschraenkte Funktion im Juni 2019
Ordner	20210520_HAUS_data						
Cat7392-688166_HAUS_1m.TXT	miniDot USB	O2, T	7392-688166	1.5	30	23.04.2020 - 20.05.2021	mit Wischer
Cat7392-373091_HAUS_4m.TXT	miniDot USB	O2, T	7392-373091	4	30	23.04.2020 - 20.05.2021	ohne Wischer
Cat7450-655839_HAUS_7m.TXT	miniDot USB	O2, T	7450-655839	8	30	23.04.2020 - 20.05.2021	ohne Wischer
Tinytag632358_HAUS_5m.txt	Tinytag TG-4100	T	632358	5	30	23.04.2020 - 20.05.2021	
Tinytag664482_HAUS_10.txt	Tinytag TG-4100	T	664482	10	30	23.04.2020 - 20.05.2021	
Ordner	20220531_HAUS_data						
miniDot6881-1185_HAUS2021_1m.TXT	miniDot RS232	O2, T	6881-1185	1.5	30	20.05.2021 - 31.05.2022	mit Wischer (ab Frühjahr 2022 schlecht)
miniDot6881-0624_HAUS2021_4m.TXT	miniDot RS232	O2, T	6881-0624	4	30	20.05.2021 - 31.05.2022	ohne Wischer
miniDot6881-0646_HAUS2021_8m.TXT	miniDot RS232	O2, T	6881-0646	8	30	20.05.2021 - 31.05.2022	ohne Wischer
Tinytag632361_HAUS2021_6m.txt	Tinytag TG-4100	T	632361	5	30	20.05.2021 - 31.05.2022	
Tinytag589392_HAUS2021_uberGrund.txt	Tinytag TG-4100	T	589392	10	30	20.05.2021 - 31.05.2022	



Contact

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Data responsibility: Sylvia Jordan

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Kasprzak P, Gonsiorczyk T, Grossart HP, Hupfer M, Koschel R, Petzoldt T, Wauer G. 2018. Restoration of a eutrophic hard-water lake by applying an optimised dosage of poly-aluminiumchloride (PAC). *Limnologica* 70: 33-48.

Nixdorf B, Hemm M, Hoffmann A, Richter P. 2004. "Feldberger Haussee", Dokumentation von Zustand und Entwicklung der wichtigsten Seen Deutschlands. Teil 2 Mecklenburg-Vorpommern. Umweltbundesamt. UBA-Bericht Forschungsbericht 29924274, UBA-FB 000511, p. 77.