Lake Żabińskie database metadata

About the lake

- **Database code**: zab,
- **Atlas code**[1]**:** C/555,
- **Coordinates**:
  - 54 ˚ 07’54.2” N or 54.1318° N,
  - 21 ˚ 58’56.5” E or 21.9836° E.
- **Elevation**: 117 m a.s.l.,
- **Area**: 0.42 km^2,
- **Max depth**: 44.4 m.

Conventions

- All variable names are lower case,
- All variable names are “snake_case”,
- No units in variable names,
- No inferred variables.

Temperature loggers

Equipment

- HOBO Water Temperature Pro v2 loggers (ONSET, USA); operating at 15 minutes interval.

> **i** HOBO U26 Dissolved Oxygen logger
>
> Temperature data from oxygen logger (1h resolution) was used to fill temperature data at the depth of 40 m between 2020.03.08 and 2021.01.07.

[1] **Jańczak J.**, (ed.), 1999, Atlas Jezior Polski: Jeziora Pojezierza Mazurskiego i Polski Południowej. Vol. 3. Atlas Jezior Polski / Instytut Meteorologii i Gospodarki Wodnej. Praca zbiorowa pod red. Jerzego Jańczaka, Bogucki Wydawnictwo Naukowe.

Variables

Full resolution data

- **date_time** (UTC time): YYYY-MM-DD HH:MM:SS; *date_time*,
- **day**: YYYY-MM-DD; *date*,
- **temp_01** (temperature at 1.0 m): °C; *numeric*,
- **temp_10** (temperature at 10.0 m): °C; *numeric*,
- **temp_20** (temperature at 20.0 m): °C; *numeric*,
- **temp_30** (temperature at 30.0 m): °C; *numeric*,
- **temp_40** (temperature at 40.0 m): °C; *numeric*.
- **series_nn** (series at 1–40 m): number; *integer*,
- **period_nn** (period at 1–40 m): number; *integer*.

> Series and period
>
> - **Series**: one data *series* means that data logger operated continuously without any interruptions from the beginning of logging to the data offload.
>
> - **Period**: one *period* encompasses one or more *series*. Continued *period* means, that the end of one *series* is followed immediately by the beginning of the next *series*. Change from *series* to *series* means that only short logger offload time is introduced into the data. Continued *period* allows uninterrupted data homogenization procedure. Change in the *period* variable means that the next *series* did not follow preceding one immediately and requires reset of the homogenization procedure.

Daily data

- **day**: YYYY-MM-DD; *date*,
- **temp_01** (temperature at 1.0 m): °C; *numeric*,
- **temp_10** (temperature at 10.0 m): °C; *numeric*,
- **temp_20** (temperature at 20.0 m): °C; *numeric*,
- **temp_30** (temperature at 30.0 m): °C; *numeric*,
- **temp_40** (temperature at 40.0 m): °C; *numeric*.

Processing

- Values $>$ **35 °C** are removed from the database (e.g. random readings reaching **100 °C**),
- Values $<$ **0 °C** are corrected to **0 °C**,
- Values exceeding the **1 ‰** (quantiles **0.0005** and **0.9995**) are removed by respective *series* variable,
- A ratio of the means for the last **8** readings from a preceding *series* and the first **8** readings from the following *series* is calculated and used as a correction factor for the next series,
- The homogenization procedure is reset every time a gap (*period* variable) is introduced to account for gaps (e.g., no data recorded) in the series and to avoid artificial shifts.

Limnology

Equipment

- EXO 2 Multiparameter Sonde (YSI, Yellow Spring, OH, USA): 2017.09.25 to 2021.12.20,
- EXO 2 Multiparameter Sonde (YSI, Yellow Spring, OH, USA): 2015.08.07 to 2017.09.01,
- Minitracka II C fluorometer (Chelsea Instruments, West Molesey, UK)[2]: 2012.05.06 to 2015.06.24,
- YSI 6820 Multiparameter sonde (YSI, Yellow Spring, OH, USA): 2012.01.12 to 2015.06.24.

Variables

- **date**: YYYY-MM-DD; *date*,
- **depth**: m; *numeric*,
- **temp** (temperature): °C; *numeric*,
- **sp_cond** (specific conductivity): µS cm^{-1}; *numeric*,
- **do** (dissolved oxygen concentration): mg L^{-1}; *numeric*,
- **p_h**: unitless; *numeric*,
- **chl_a** (chlorophyll): µg L^{-1}; *numeric*.

Flags

- **malfunction**: sensor error,
- **ND**: no data.

Processing

Missing (*malfunction* or *ND*):

Linear interpolation between the non-missing profiles.

Hydrochemistry

Equipment

- Spectroquant Prove 600 spectrophotometer (Merck, Germany): 2018.11.12 to 2021.12.20,
- Spectroquant Pharo 300 spectrophotometer (Merck, Germany): 2018.05.31 to 2018.10.28,
- Spectroquant NOVA 400 spectrophotometer (Merck, Germany): 2012.01.12 to 2018.05.31,
- Ion chromatography (ICS 1100, Dionex, USA): 2012.01.12 to 2021.12.20.

[2]Chlorophyll-a

Variables

- **date**: YYYY-MM-DD; *date*,
- **depth**: m; *numeric*,
- **in_out** (stream id): **I*** – inflow, **O*** – outflow; *character*:
  - **I1**: major inflow from Lake Purwin (54.13590731° N; 21.98398011° E),
  - **I2**: episodic inflow from the direct catchment (54.13160649° N; 21.98812808° E),
  - **I3**: major inflow from Żabinka village (54.12980987° N; 21.98246778° E),
  - **O1**: major outflow to Lake Gołdopiwo (54.13060358° N; 21.97381504° E),
- **tn** (total nitrogen): mg L^{-1}; *numeric*,
- **tp** (total phosphorus): mg L^{-1}; *numeric*,
- **ions**: mg L^{-1}; *numeric*:
  - **na**: sodium (Na^{+}),
  - **k**: potassium (K^{+}),
  - **mg**: magnesium (Mg^{2+}),
  - **ca**: calcium (Ca^{2+}),
  - **cl**: chloride (Cl^{-}),
  - **so4**: sulfate (SO_2^{4-}).

Flags

- **bdl**: below detection limit,
- **ND**: no data.

Sediment trap

Equipment

- CNS analyzer Vario El Cube (Elementar, Germany),
- SoliTIC, TIC solids module for Vario El Cube (Elementar, Germany).

Variables

- **date** (trap retrieval date): YYYY-MM-DD; *date*,
- **days** (sample collection time in days): number; *numeric*,
- **mar** (mass accumulation rate): g m^{-2} day^{-1}; *numeric*,
- **tc** (total carbon concentration): %; *numeric*,
- **toc** (total organic carbon concentration): %; *numeric*,
- **tic** (total inorganic carbon concentration): %; *numeric*,
- **tn** (total nitrogen concentration): %; *numeric*,
- **ts** (total sulfur concentration): %; *numeric*.

Flags

- **ND**: no data.

> Sediment trap installation
>
> Sediment trap was installed 2 m above the lake bottom and deployed on 2012.05.05.

Ice cover

Variables

- **ice_in**: YYYY-MM-DD; *date*,
- **ice_out**: YYYY-MM-DD; *date*.

> Interpretation
>
> **ice_in**: the date of ice cover formation is the first day with the whole central part of the lake covered with ice.
> **ice_out**: the date of ice breakup is the first day with central part of the lake completely free of ice (but discontinuous ice cover still possible in the littoral zone).