Phytoplankton data documentation and methods since 2007:

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- For features of Lake Tegel and for methods sampling, see the file "Lake Tegel – features and sampling".
- For physical and chemical data, see the excel spreadsheets "nutrients_LLBB_007 ff" and "in_situ_LLBB_2007_ff";
  for physical and chemical methods see the word file "Methods for Analyses_Tegel"

Lake Tegel phytoplankton data base 2007 ff

The data cover the years starting 2007 and ongoing, by the LLBB (State Laboratory of Berlin and Brandenburg) under contract from the Berlin Senate Department for the Environment, Transport and Climate Protection.

Phytoplankton data are given in separate excel spreadsheets, each covering several years. Relevant column headings are self-explanatory; columns for internal purposes of LLBB are retained (in case they prove necessary to clarify questions that may arise) but are given in light grey (and will usually be irrelevant to users).

Workers identifying taxa and counting

Since 2007 taxonomic identification, counting and determination of cell volumes was conducted by experienced technicians Ina Henke and Susanne Dahrendorf-Langenhof

Counting and biovolume determination:

Samples conserved with Lugol's iodine solution were homogenized and sedimented at room temperature in chambers of 3 – 25 mL (HydroBios), with the volume depending on cell density and chlorophyll a concentration respectively (for more than 10 mL we used the HydroBios tubes that can be removed before counting). If necessary, samples had to be diluted. Counting was done following the Utermöhl method (DIN 15204:2006) using an inverted microscope at 100-fold to 1000-fold magnification; e.g. Olympus IXS8F (NA 0,55); equipped with phase contrast (Ph1, Ph2) and DIC (40; 100). Generally we counted two transects at right angles using 200-fold to 400-fold magnification, at least 400 cells and 10 dominant taxa per sample. Colonies and voluminous species were counted at 100-fold magnification (half to whole chamber). Transect boundaries were defined by the border of the counting grid, and all cells partially within the grid on one side were included while all cells partially outside of the other side of the grid were excluded.

Filamentous taxa were first counted as the sum of filament-segment-lengths along the analysed transects and afterwards divided by the mean cell length. For *Aphanizomenon*/*Cuspidothrix* and other defined filamentous cyanobacteria the cell length was assumed as 10 µm. Cyanobacteria forming colonies (e.g. *Microcystis*) were counted in subsets of similar size comprising an estimated average number of cells.

Taxa with highly varying sizes were counted in defined size classes (e.g. Bacillariophyceae, Cryptophyceae). Bacillariophyceae species determination was carried out in a second step after diatom preparation according to DIN EN 13946:2014-07 (M13).

The determination of species-specific cell volumes followed calculation formula for geometrical shapes given in Tümpling & Friedrich (1999), Arbeitsgemeinschaft Trinkwassertalsperren e.V. (ATT, 1998, 2005) and DIN EN 16695:2015-12, respectively. In routine measurements standardized biovolumes were used for all frequently found taxa.

Mean cell volumes were determined by measuring linear dimensions at 400-fold magnification using imaging software technology consistent with Olympus camera (e.g. UC-30).

Species determination

The taxonomic determination level complied with specifications given in the harmonized taxa list (HTL) of Mischke et al. (using the current version in the respective year). Indicative taxa were preferably determined down to the prescribed level. For species identification we used the taxonomic keys given therein.

- DIN EN 15204 M41: 2006 Wasserbeschaffenheit – Anleitung für die Zählung von Phytoplankton mittels der Umkehrmikroskopie (Utermöhl-Technik); Deutsche Fassung EN 15204:2006 in Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlammuntersuchung – Biologisch-ökologische Gewässeruntersuchung (Gruppe M).
- DIN EN 16695:2015-12. Wasserbeschaffenheit-Anleitung zur Abschätzung des Phytoplankton-Biovolumens.
- Arbeitskreis Biologie der Arbeitsgemeinschaft Trinkwassertalsperren e.V. (ATT), 1998. Erfassung und Bewertung von Planktonorganismen. Technische Information Nr. 7. München. Oldenbourg-Verlag. ISBN 3-486-26369-2.
- Mischke, U.& W.-H. Kusber, 2009: Die harmonisierte Taxaliste des Phytoplanktons für Seen und Flüsse in Deutschland. Excel Datei. Liste zur Kodierung des Phytoplanktons für die EG-WRRL und die Anwendung des Auswertungsprogrammes PhytoSee 4.0 mit ausführlichen Anmerkungen. Stand 20.05.2009.
- Mischke, U.; Kasten, J.; Dürselen,C.-D.; Täuscher, L.; Riedmüller, U.; Tworeck, A.; Oschwald, L.; Hoehn, E.; Schilling, P. & Kusber W.-H. (2020 and earlier versions): Taxaliste Phytoplankton (HTL_2020) in Ergänzung zur Bundestaxaliste für die WRRL-Bewertungsverfahren PhytoSee und PhytoFluss – Elektronische Veröffentlichung auf http://www.gewaesser-bewertung.de
- Tümpling, W. von & G. Friedrich, 1999. Biologische Gewässeruntersuchung. Methoden der Biologischen Wasseruntersuchung, Band 2. Jena, Stuttgart. Gustav Fischer Verlag.