

# Nanoflagellate trophic strategies in the Run-off experiment in Lake Erken, SITES AquaNet, 2022

This dataset contains information on the response of planktonic nanoflagellates, categorised in trophic groups, to different forms of inorganic nutrients and cDOM addition. We obtained the data during the AQUACOSM-plus Run-off mesocosm experiment in Lake Erken, Sweden, part of the SITES AquaNet infrastructure in July 2022 (<https://meta.fieldsites.se/resources/stations/Erken>).

The mesocosm experimental design consisted of 3 treatments and a control with 4 mesocosms each. All treatments received N, P and cDOM addition at the same final concentration, but with different frequency and intensity: **Daily** small additions, **Extreme** which received all the amount once, and **Intermittent** with stochastic additions.

To produce this dataset, we prepared Fluorescently Labelled Bacteria (FLB) from concentrated bacteria from the natural community of Lake Erken following the protocol of Sherr & Sherr (1993). Water from nine mesocosms was filtered through a 200 µm mesh sieve and incubated in 500 mL clear plastic bags for 30 min, after being spiked with FLB. Start and end samples were collected, fixed with acid Lugol, NaThio and formalin, filtered onto black polycarbonate filters and mounted on microscope slides. Nanoflagellates and bacteria were enumerated under an epifluorescence microscope.

Nanoflagellates were categorized into trophic groups based on their chlorophyll autofluorescence and the presence or absence of FLB. The number of ingested FLB per cell was recorded and ingestion was calculated. Community grazing rates were calculated by multiplying the ingestion rate with the ratio of heterotrophic bacteria to FLB. Biovolume was estimated based on cell size measurements from 30 cells per trophic group.

## Description of the data in the data file

Data file: 'nanoflagellate\_trophic\_data.csv'

Each row contains the measurements from one of the bags incubated in the mesocosms. Columns are:

*ExpDay*: day of the mesocosm experiment when the incubation happened

*Treatment*: treatments applied to the mesocosms; D - daily additions; I - intermittent, stochastic additions; E - extreme pulse addition; C - control with no additions

*Mes\_ID*: mesocosm identifier

*HF\_abund*: abundance of heterotrophic nanoflagellates; cells/mL

*PF\_abund*: abundance of phototrophic nanoflagellates; cells/mL

*MF\_abund*: abundance of mixotrophic nanoflagellates; cells/mL

*HB\_abund*: abundance of heterotrophic bacteria; cells/mL

*CY\_abund*: abundance of cyanobacteria; cells/mL

*HF\_biovol*: biovolume of heterotrophic nanoflagellates;  $\mu\text{m}^3/\text{mL}$

*PF\_biovol*: biovolume of phototrophic nanoflagellates;  $\mu\text{m}^3/\text{mL}$

*MF\_biovol*: biovolume of mixotrophic nanoflagellates;  $\mu\text{m}^3/\text{mL}$

*MF\_Ir*: ingestion rate of mixotrophic nanoflagellates; FLB/cell\*h

*HF\_Ir*: ingestion rate of heterotrophic nanoflagellates; FLB/cell\*h

*MF\_Gr*: grazing rate of mixotrophic nanoflagellates; bacteria/cell\*h

*HF\_Gr*: grazing rate of heterotrophic nanoflagellates; bacteria/cell\*h

## Code and other data

The code to produce this data file, along with the code to all subsequent analyses is archived in <https://zenodo.org/doi/10.5281/zenodo.11148606>

Physiochemical parameters of the mesocosm experiment area available in:

Erken Laboratory (2024). AquaNet – automatic sensors from Erken AquaNet platform, 2022-07-07–2022-08-12 [Data set]. Swedish Infrastructure for Ecosystem Science (SITES). <https://hdl.handle.net/11676.1/mWdvF9JHBQUywC2DHXNd5iIQ>

Erken Laboratory (2024). AquaNet - Chemical parameters from Erken AquaNet platform, 2022-07-07–2022-08-12 [Data set]. Swedish Infrastructure for Ecosystem Science (SITES). <https://hdl.handle.net/11676.1/0aHHCRfwyclqaWavnjZDhUJy>

## References

Sherr, E. B., and B. F. Sherr. 1993. Protistan Grazing Rates via Uptake of Fluorescently Labeled Prey, *In* Handbook of Methods in Aquatic Microbial Ecology. CRC Press.