# Yuqiao phytoplankton

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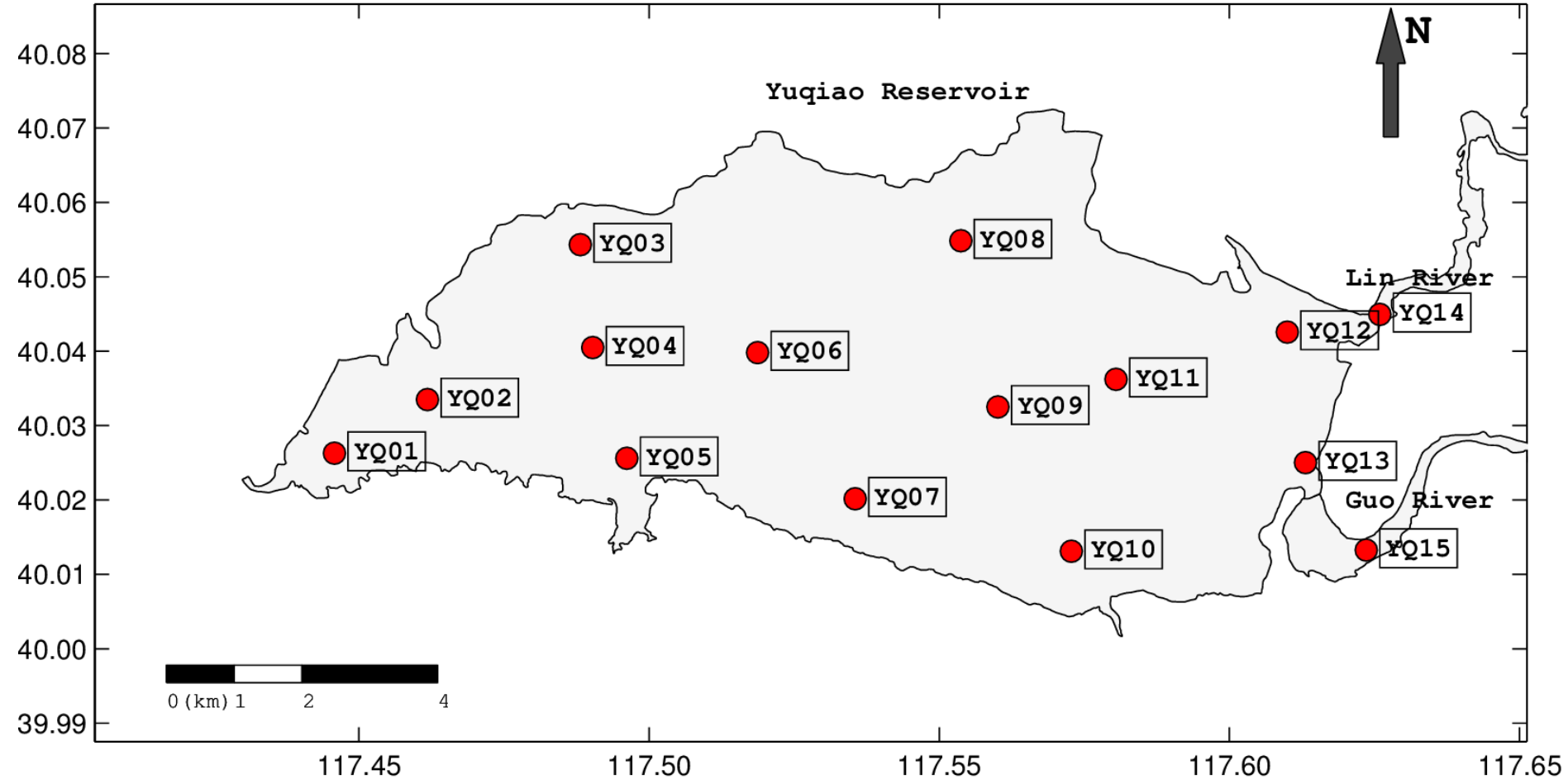
# 15 station, 15 dates

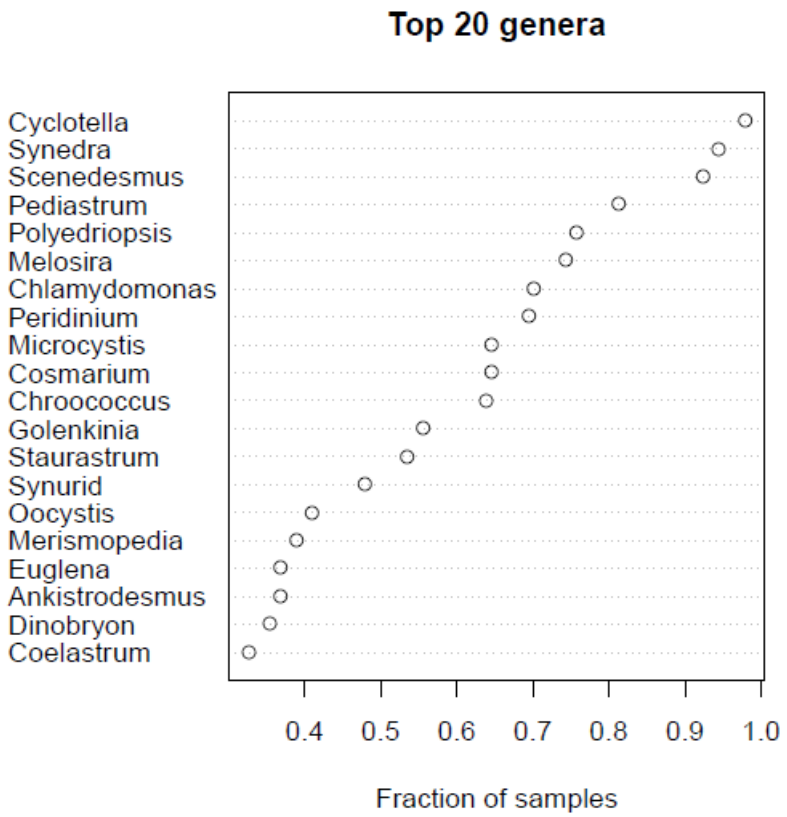


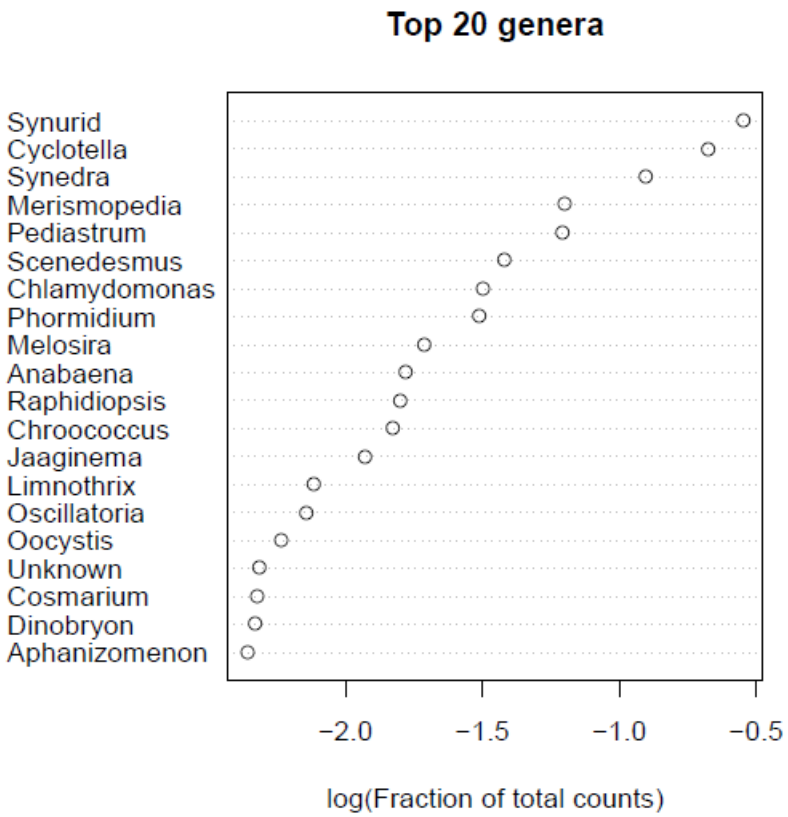
# Phytoplankton counts

- Lugol (iodine) fixed samples
- Utermöhl's method (inverted microscope)
- Cells and cell colonies counted
  - No biovolume estimates (= bias for small cells)
- Counts resolved to genus level
    - 258 samples, 58 genera

- Averaged over depth by date and station
- Genera present in < 10 samples removed
    - 143 samples, 37 genera

# Top 20 genera

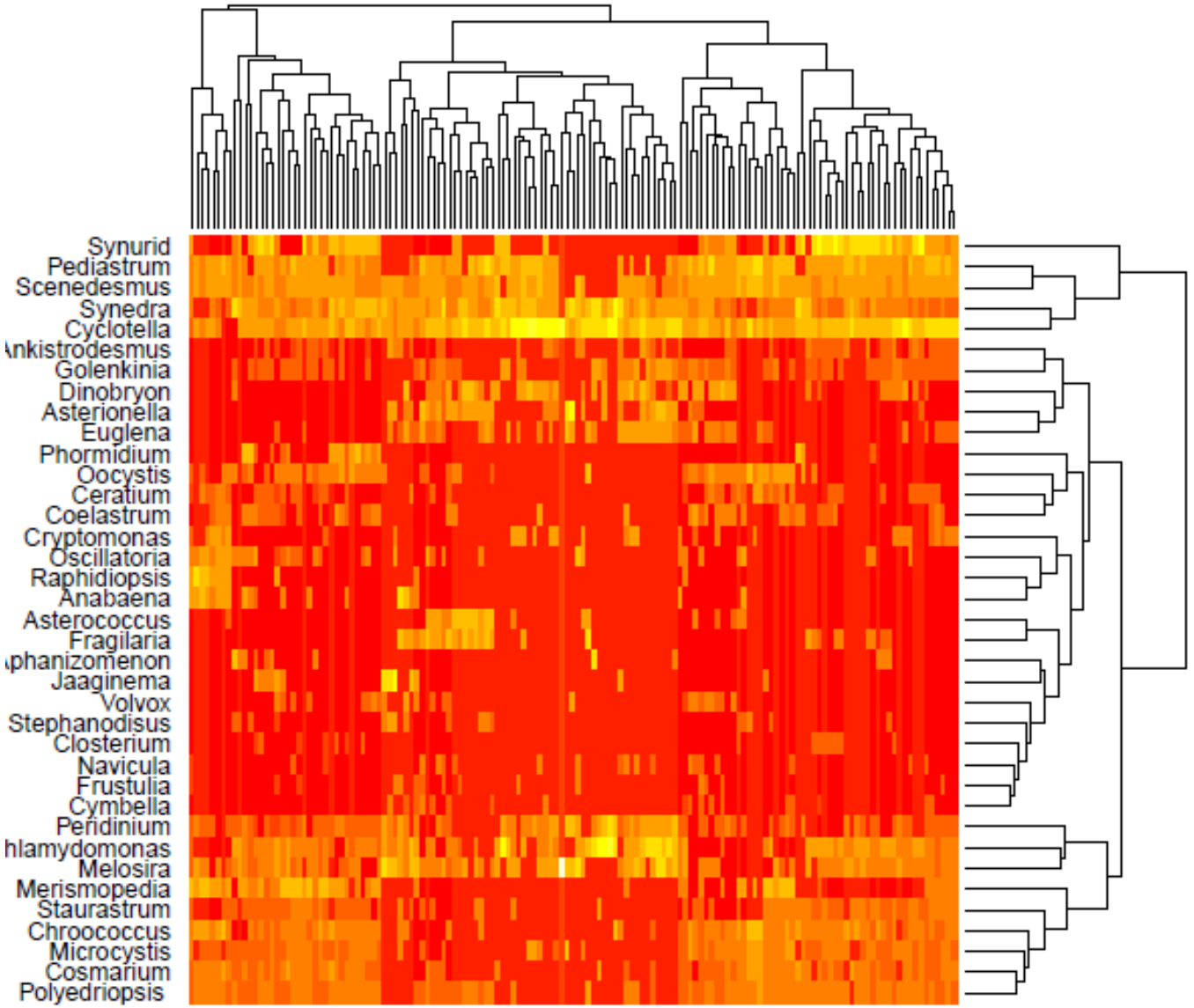


# Relative importance

- 50% of most frequently occurring genera are green algae (**chlorophytes**), but only 25% of the most abundant genera
- 50% of the most abundant genera are **cyanobacteria**
    - probably underestimated due to different counting units
- Odour-producing **chrysophytes** (synurids) are present in only 50% of the samples but has highest relative abundance
- **Diatoms** (*Synedra, Cyclotella*) are both frequent and abundant

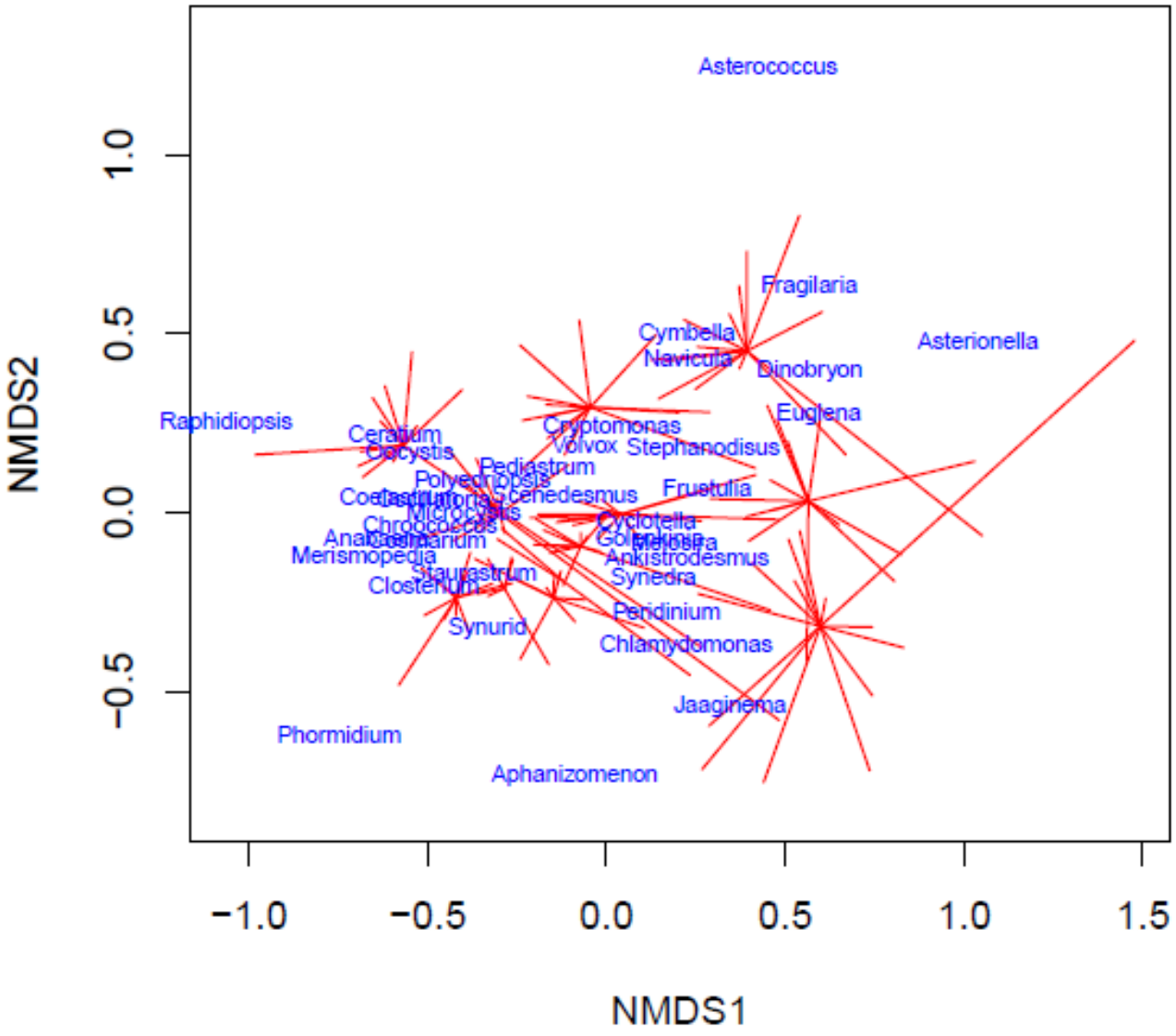
# Heatmap (clustering)



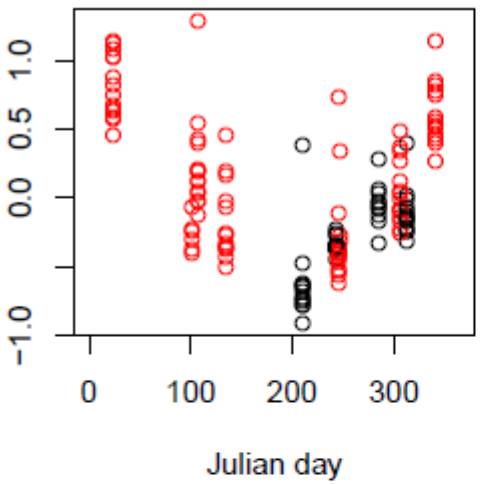
# Ordination

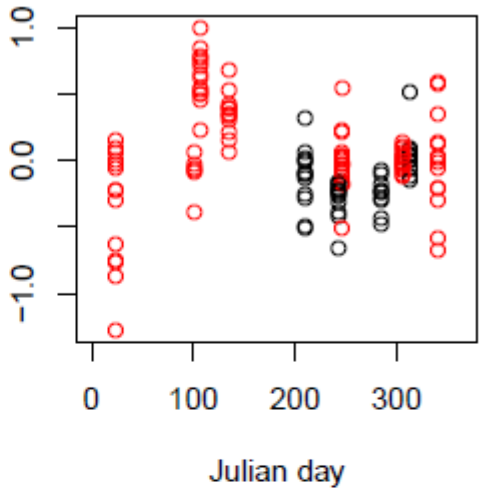
- Non-metric multidimensional scaling (NMDS)
- Arrange sample positions in 2D according to a similarity measure (Bray-Curtis distance)
- Assign genus positions as weighted averages of sample positions
- Show stations as rays from date centroid

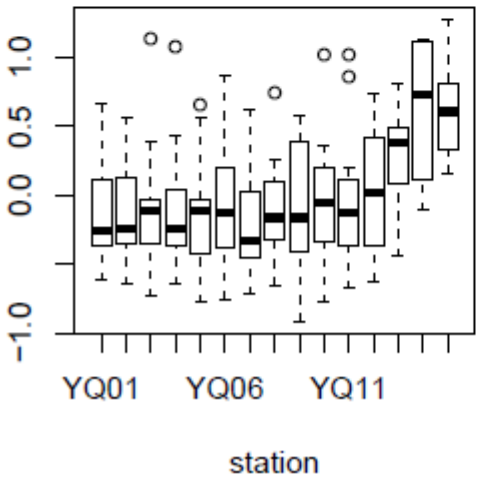
# NMDS

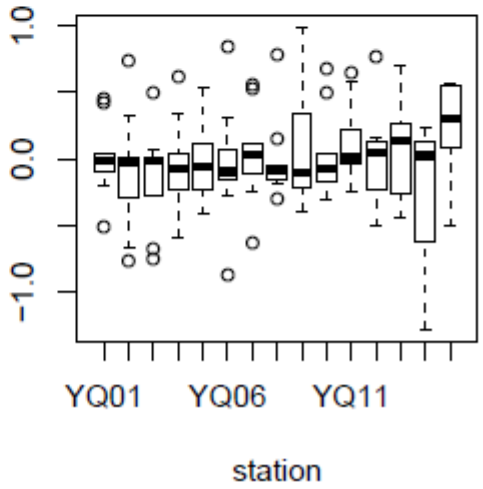

Asterococcus
Fragilaria
Cymbella
Navicula
Asterionella
Dinobryon
Euglena
Raphidiopsis
Cryptomonas
Volvox
Stephanodiscus
Ceratium
Oocystis
Pediastrum
Fruetulia
Scenedesmus
Cyclotella
Chroococcus
Ankistrodesmus
Merismopedia
Synedra
Staurastrum
Closterium
Peridinium
Synurid
Chlamydomonas
Jaaginema
Phormidium
Aphanizomenon
NMDS2
NMDS1
1.0
0.5
0.0
−0.5
−1.0
−0.5
0.0
0.5
1.0
1.5

# Seasonal and spatial patterns



# Phytoplankton patterns

- Cyclical seasonal pattern
  - NMDS1 separates winter (+) and summer (-)
    - Cyanobacteria and chlorophytes in summer
    - Diatoms, chrysophytes, and euglenids in winter
  - NMDS2 separates spring (+)
    - *Asterococcus*, *Dinobryon*, and diatoms in spring
- Spatial variation is less than seasonal variation
  - Stations close to Guo and Lin rivers (YQ12-15) are different from the other stations