

Lago di Lugano: fioriture dei cianobatteri

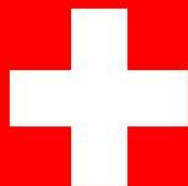


Camilla Capelli

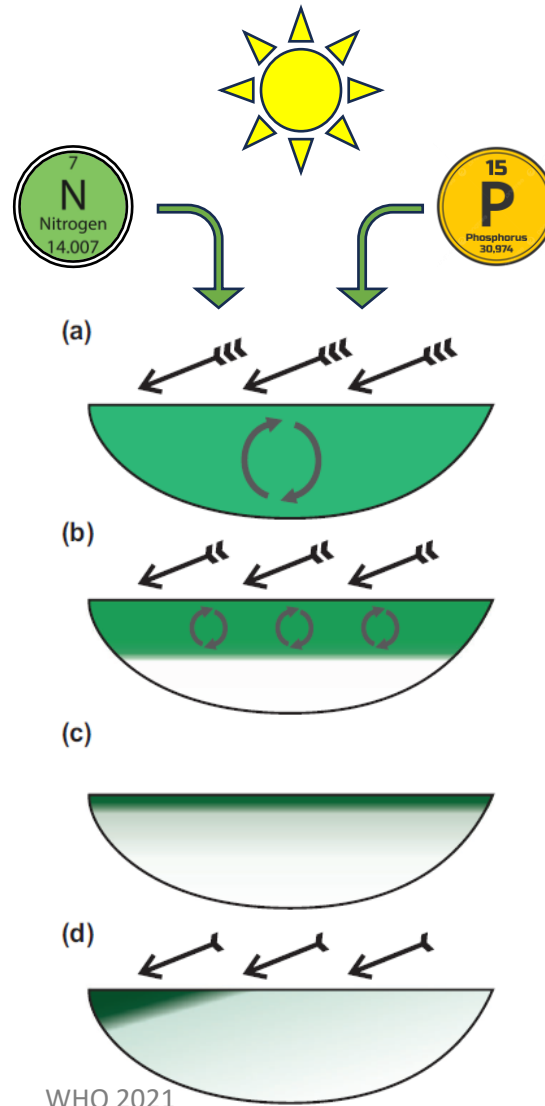
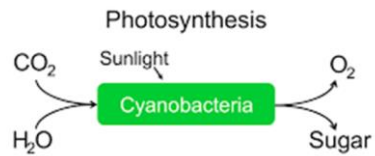
Settore Ecologia acquatica
Istituto scienze della Terra, SUPSI

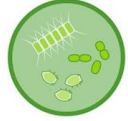
Scuola universitaria professionale
della Svizzera italiana

SUPSI

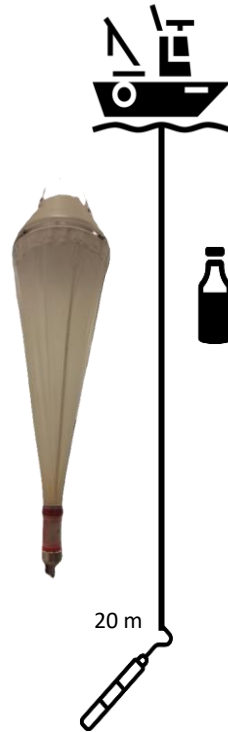
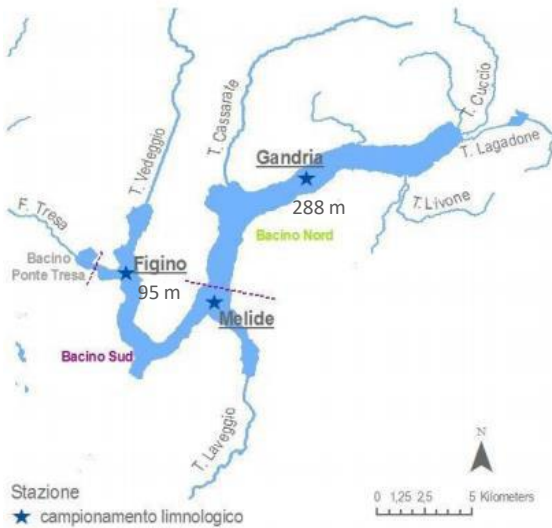


Cyanobacteria...



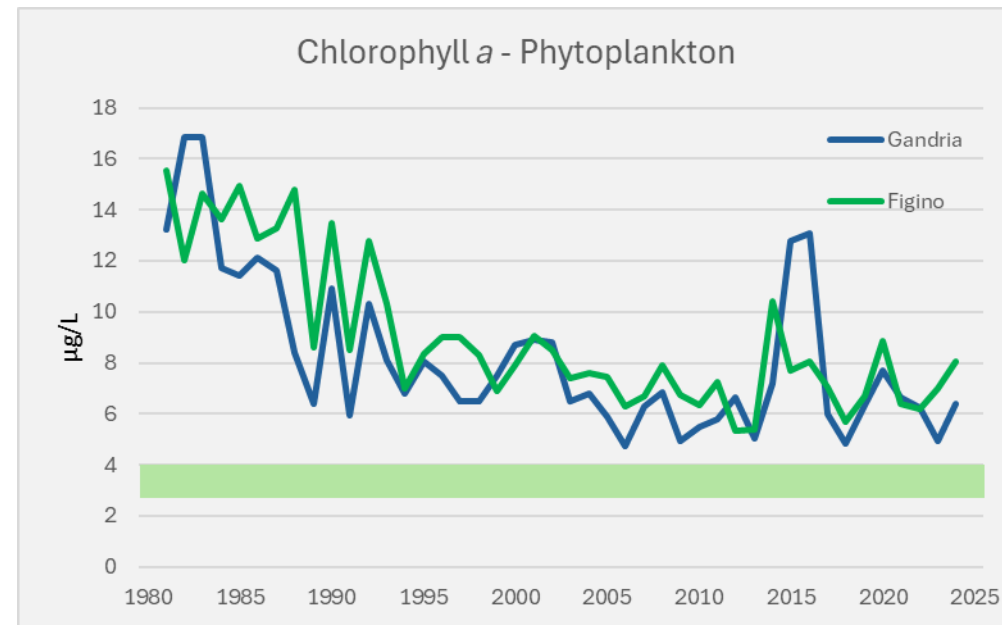
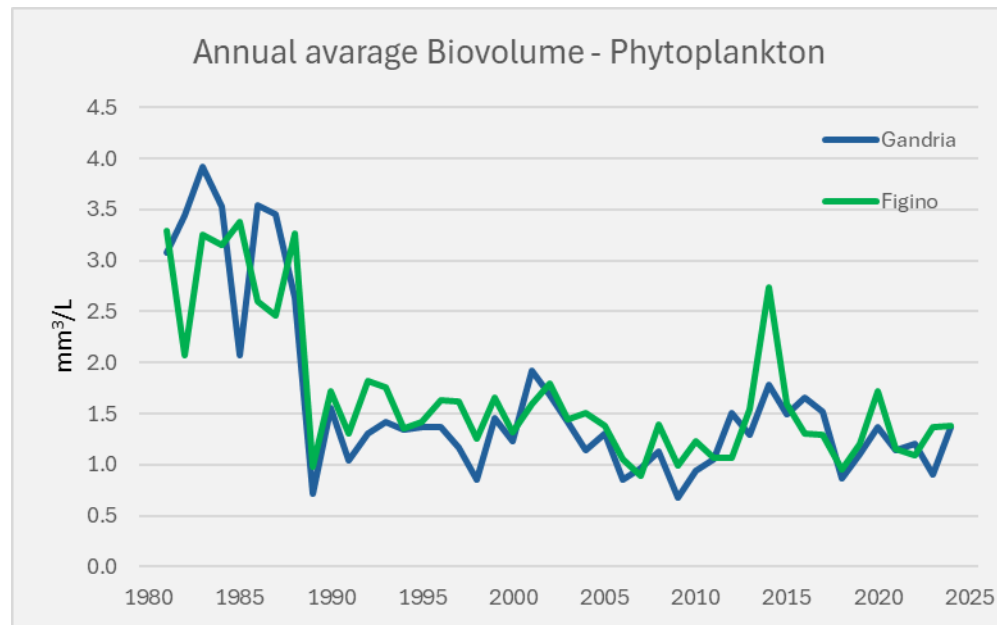


Phytoplankton



- Transparency
- Phytoplankton composition and biovolume
- Chlorophyll *a*
- Pigments profile (Chlorophyll-*a*, Phycocyanin)
- Primary production (14C)
- Cyanotoxins (MCs)

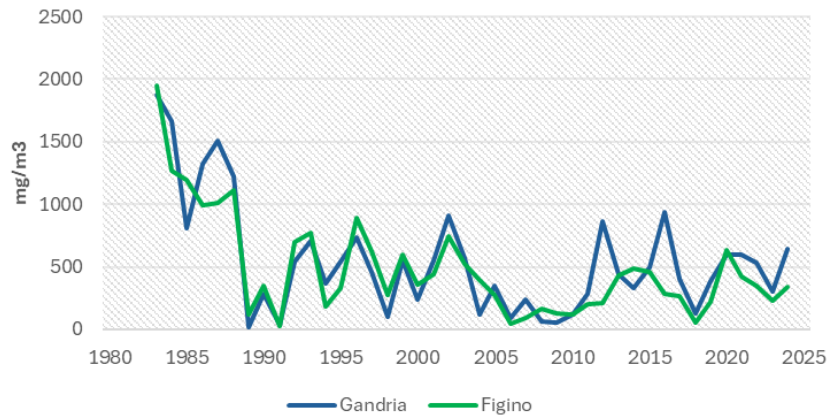
Phytoplankton – Lake Lugano



CIP AIS objective

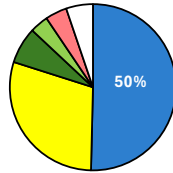
Cyanobacteria

Cyanobacteria Biomass

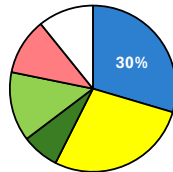


GANDRIA

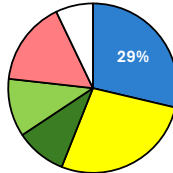
1981-1988



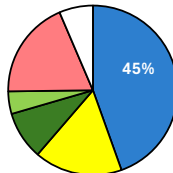
1989-2005



2006-2021

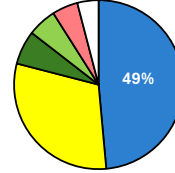


2022-2024

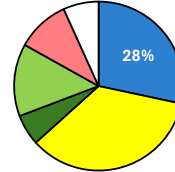


FIGINO

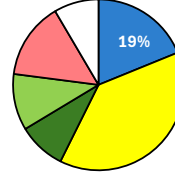
1981-1988



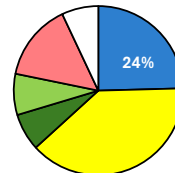
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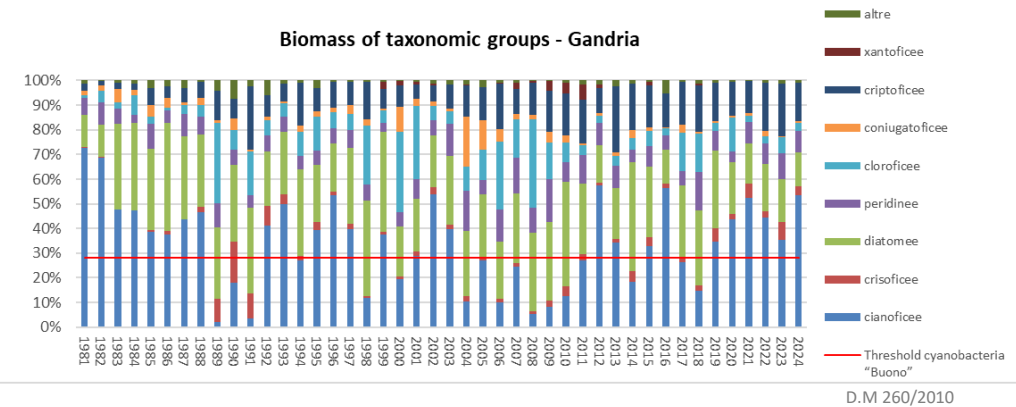


2022-2024

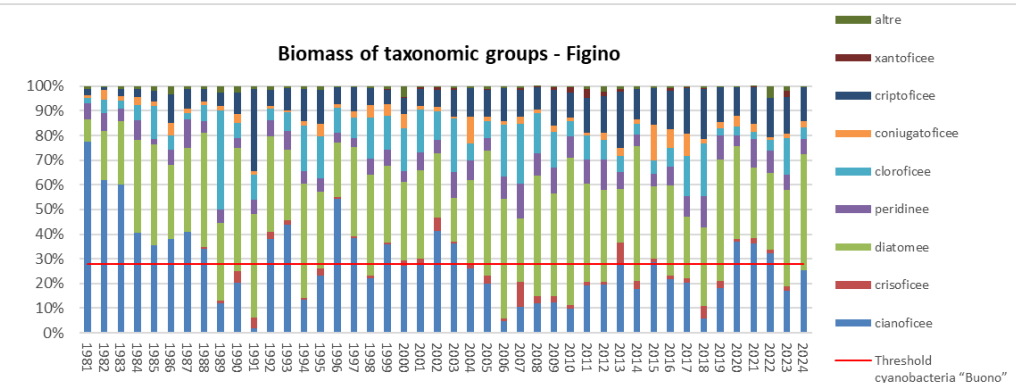


■ cianoficee ■ diatomee ■ peridinee ■ cloroficee ■ criptoficee ■ altre

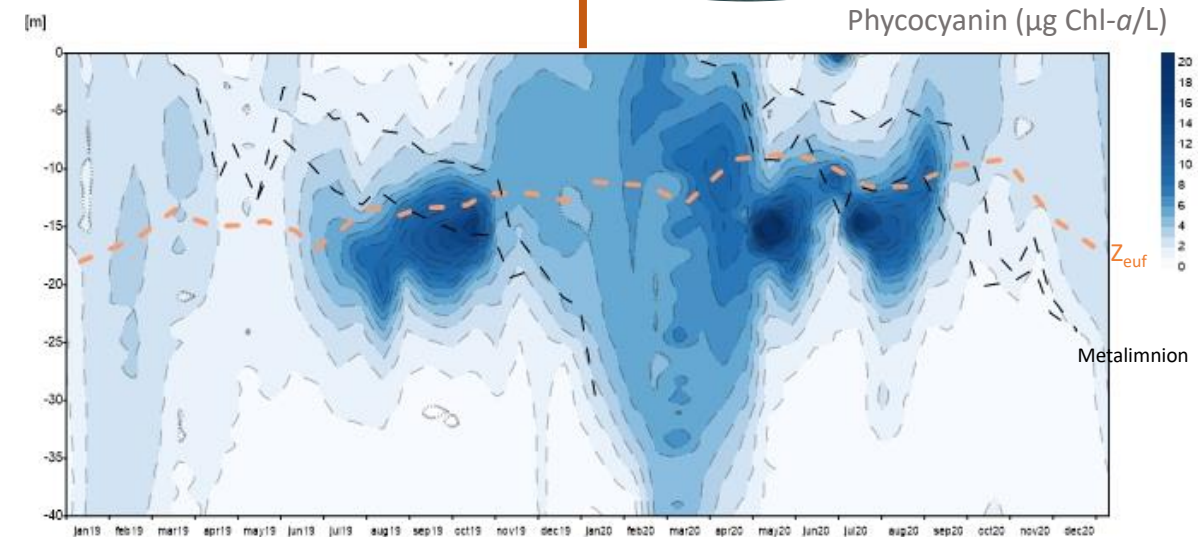
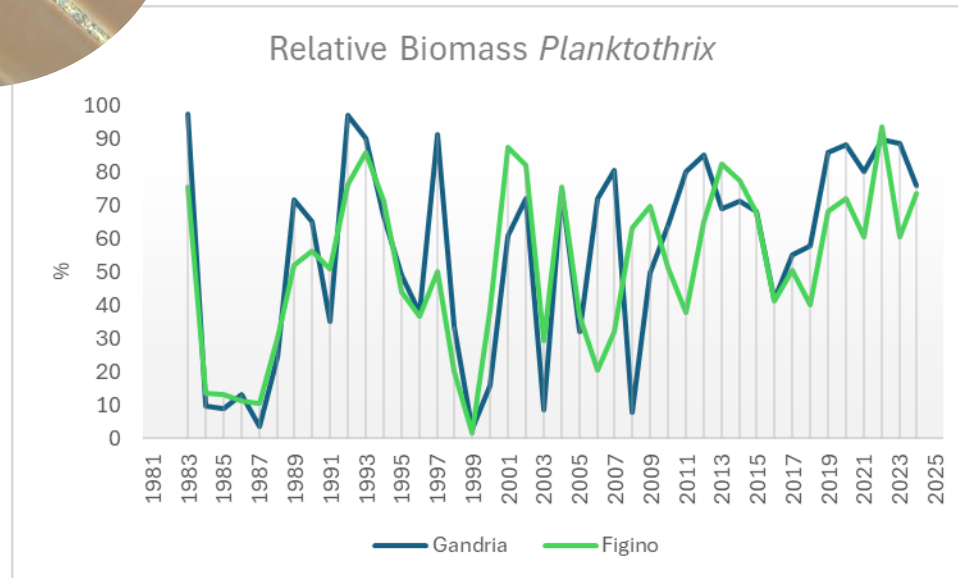
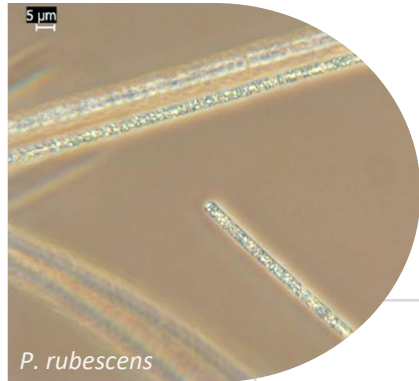
Biomass of taxonomic groups - Gandria



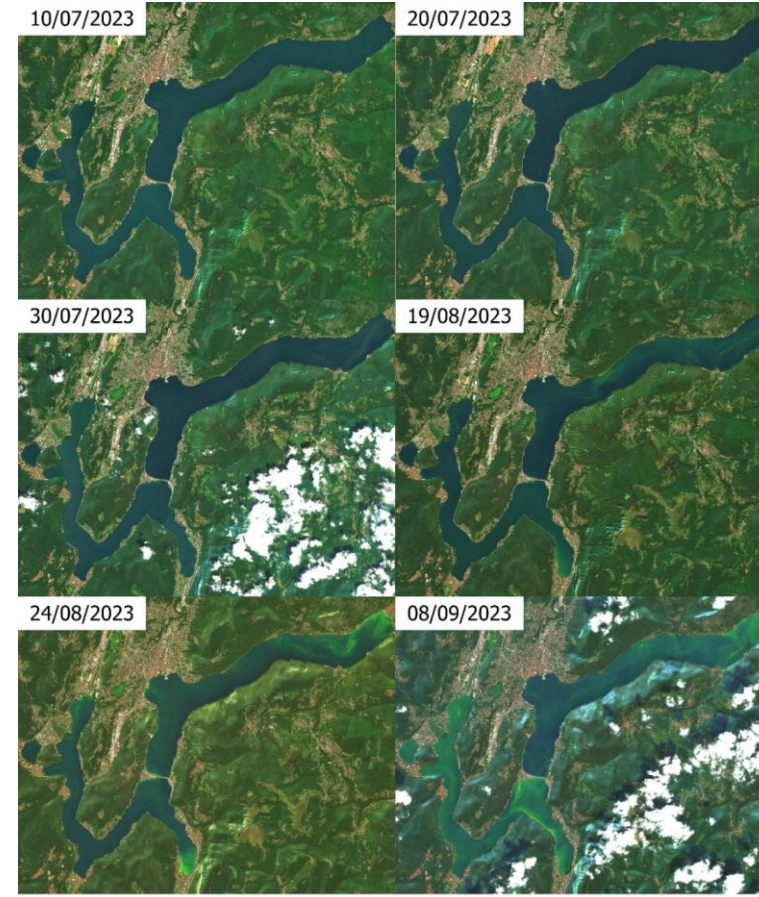
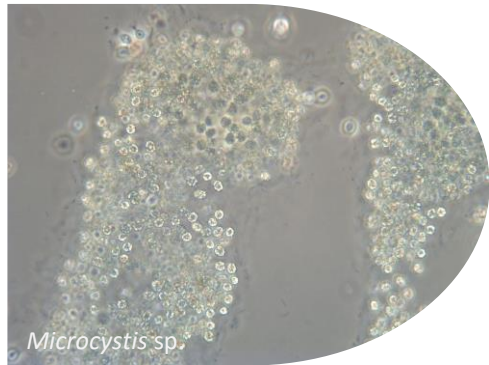
Biomass of taxonomic groups - Figino



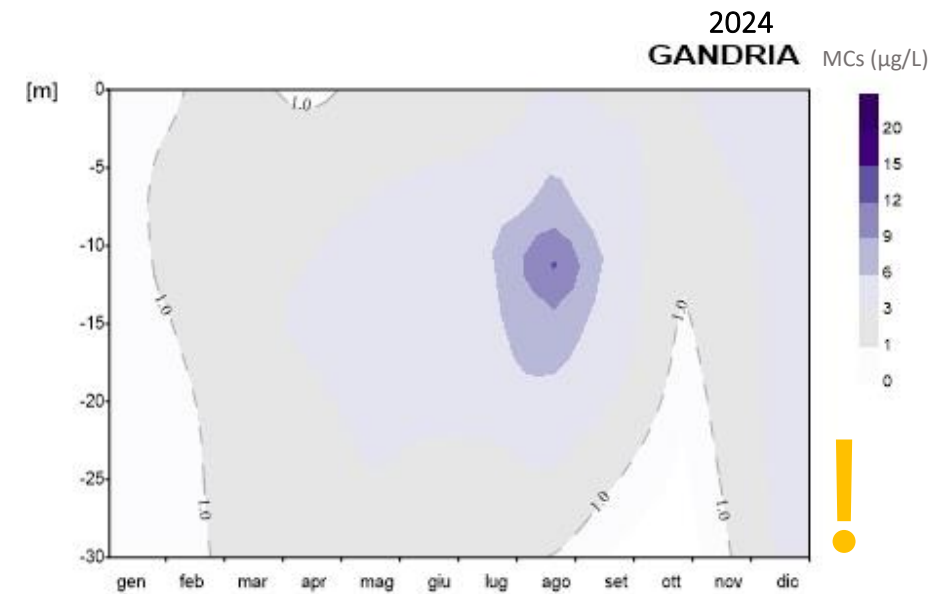
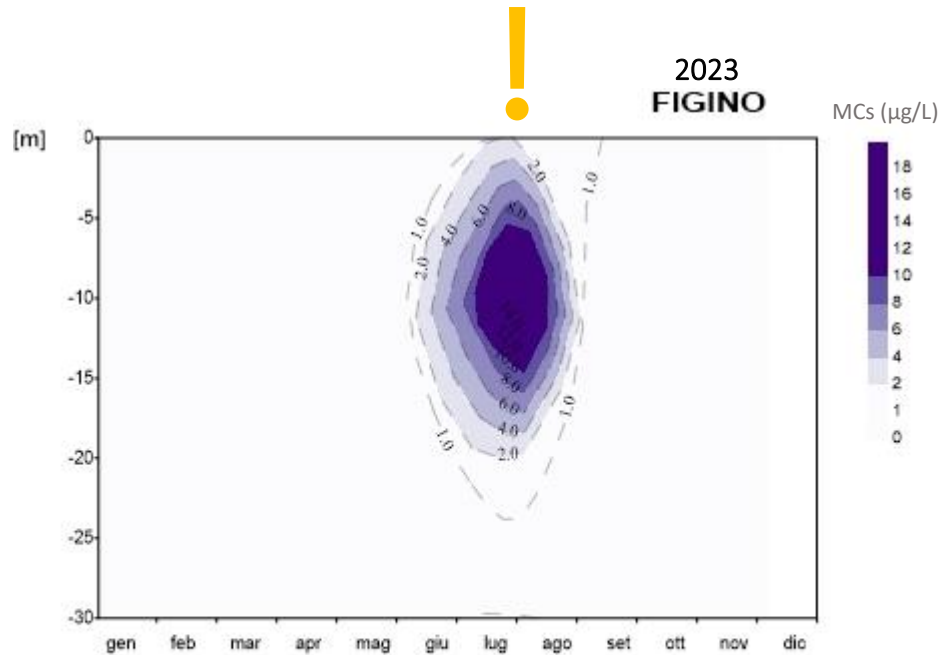
Cyanobacteria – Dominant genus



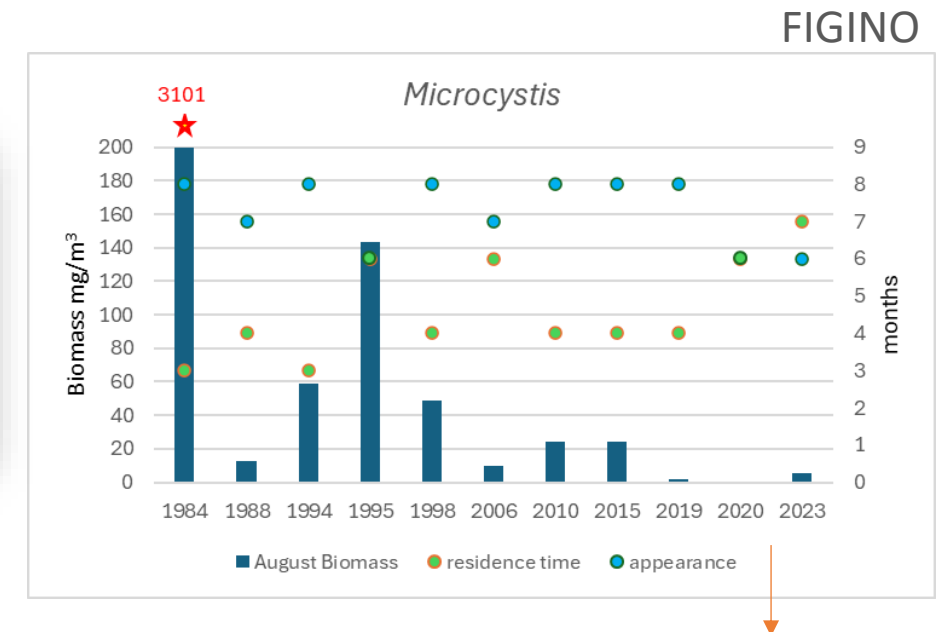
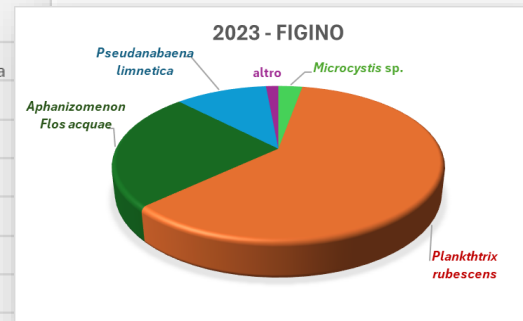
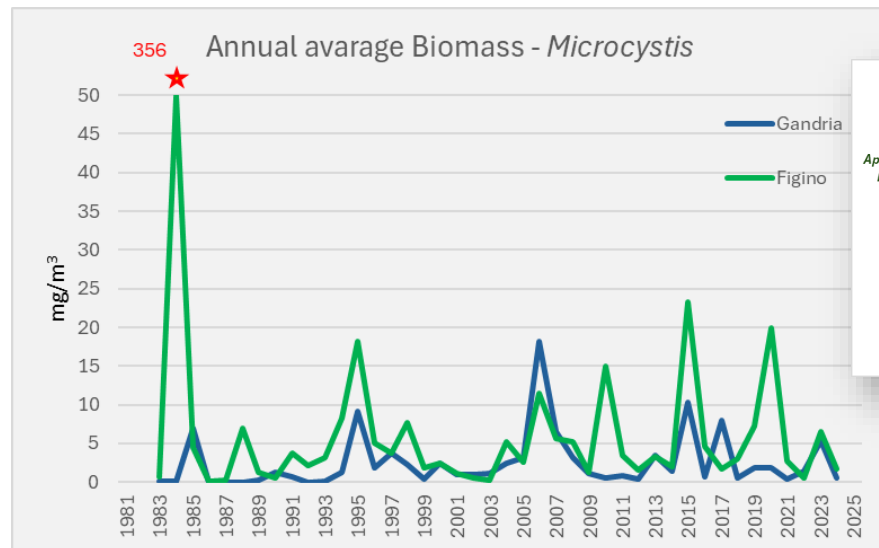
Cyanobacteria – Summer Blooms



Cyanotoxins - Microcystins



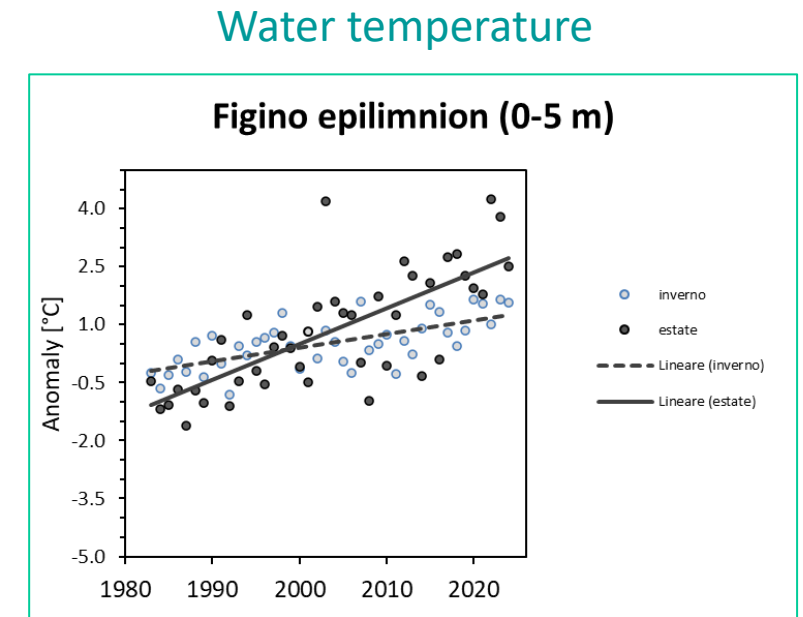
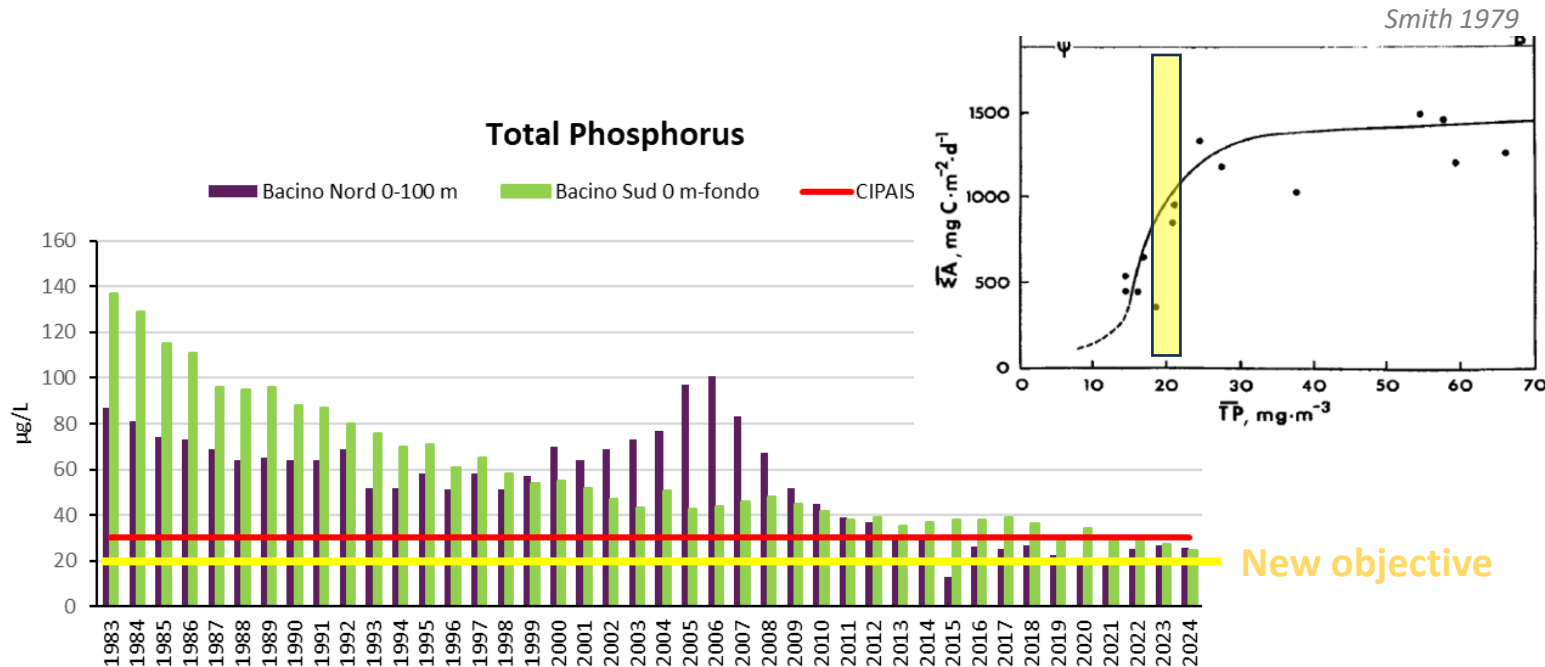
The story of *Microcystis*



The growth of *Microcystis* started earlier and lasted longer

- !! During years with blooms, surface water temperature in summer exceeded 25°C (since 2019 for a couple of months)
- !! Blooms have not appeared in dry years, indicating that warm temperatures alone are not sufficient to trigger a bloom

Phosphorus or Climate change?



Summer +0.9 ($^{\circ}\text{C}/\text{decade}$)

- Blooms are favored in warm years with normal precipitation (nutrient input)
- Persistent warm waters in summer ($> 25^{\circ}\text{C}$) support cyanobacterial blooms over long period

? Phytoplankton

? “Perfect storm scenario”

? Winter mixing

? Extreme weather events

? Cyanobacterial community

Long-term monitoring is crucial to better understand lake dynamics and enhance water quality in the face of increasing and diversified anthropogenic pressures

➤ *High-frequency observations could improve management decisions*

Acknowledgements

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