Eutrophication in Weeks Bay, AL

MBNEP CAC
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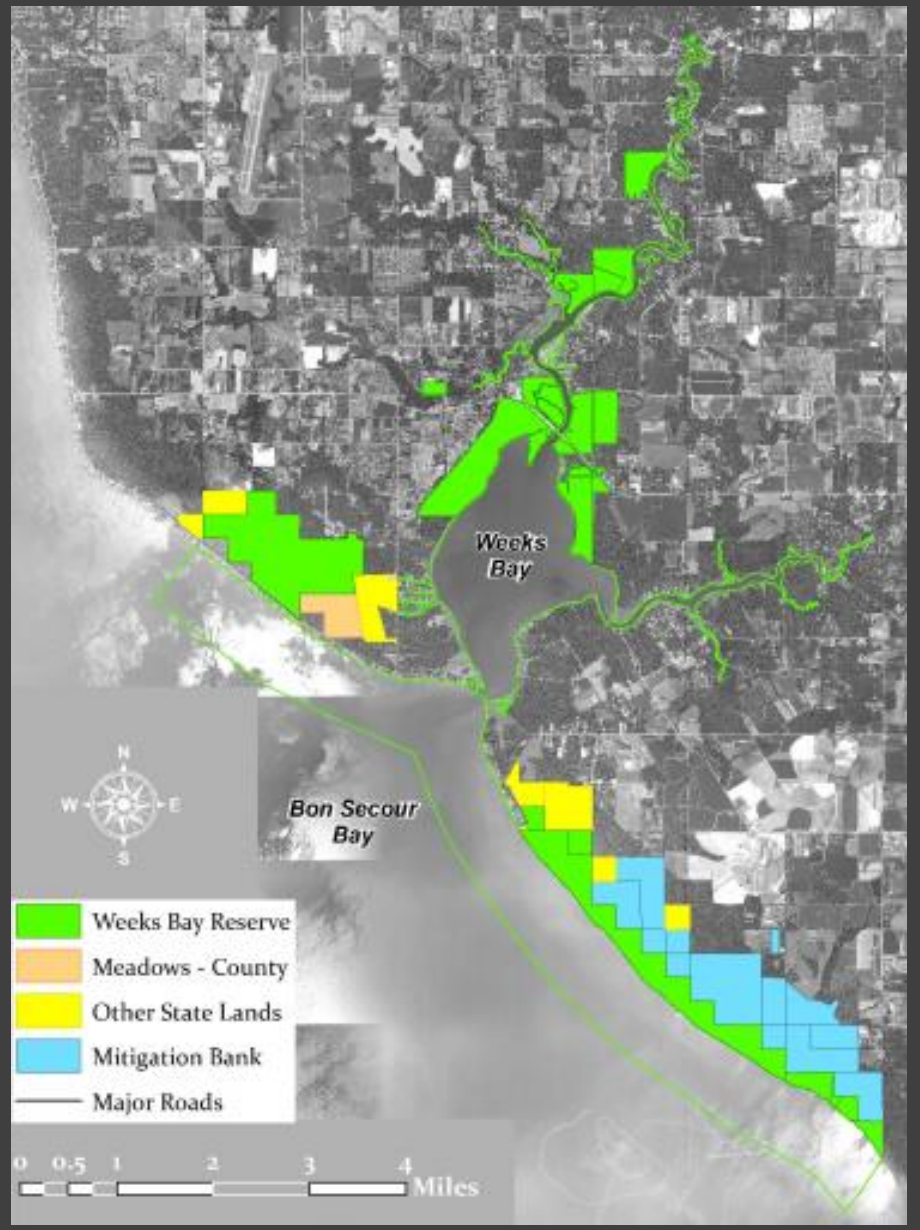
Mai Fung
Dauphin Island Sea Lab
University of South Alabama
Margaret A. Davidson Fellow

Weeks Bay National Estuarine Research Reserve

- Baldwin County
- Alabama Department of Conservation and Natural Resources
- NOAA's NERR System
- 9,317 acres
- Hardwood forests, salt and freshwater marshes, bog habitats



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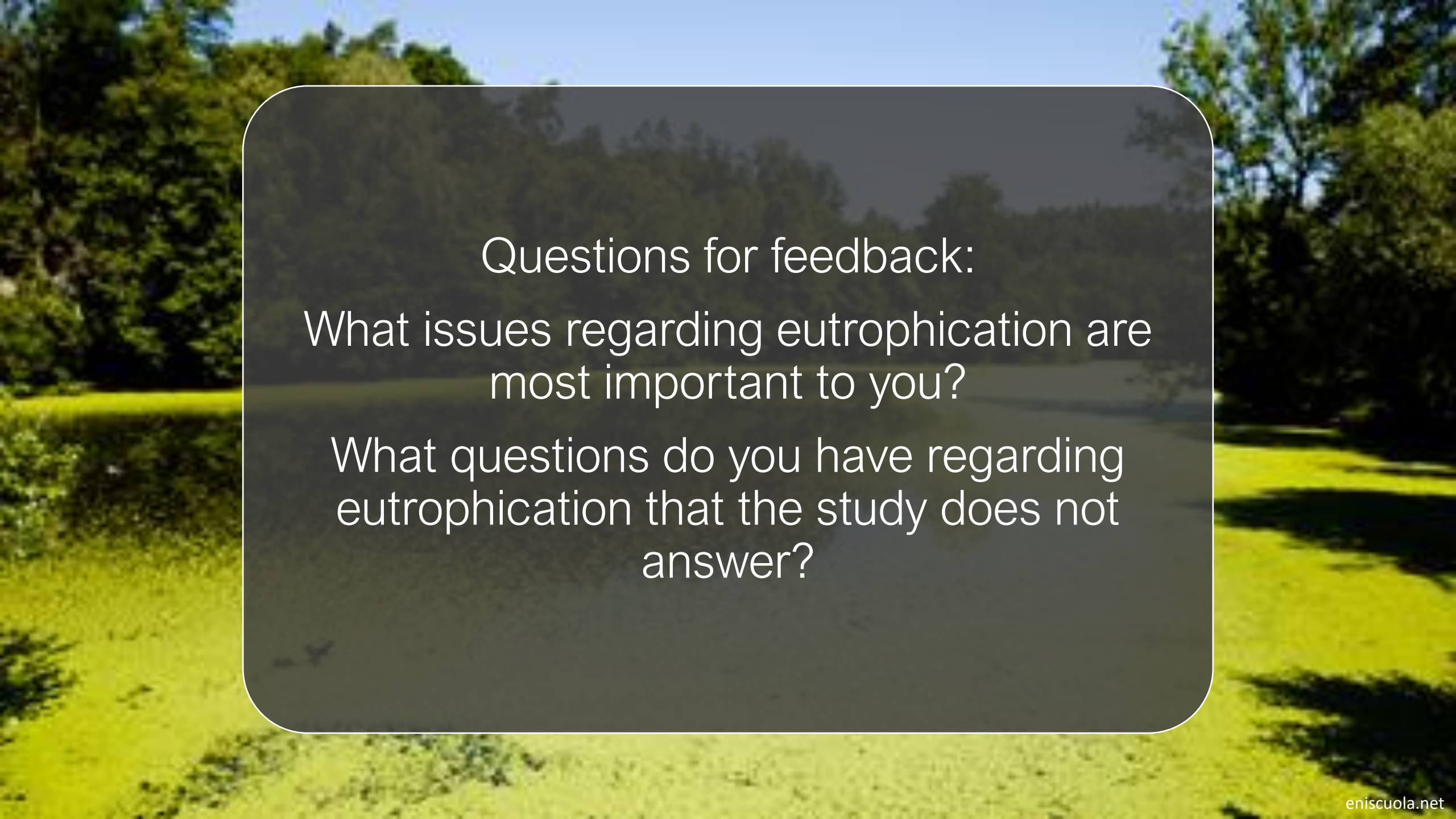
“provide leadership to promote informed management of estuarine and coastal habitats though scientific understanding and encourage good stewardship practices though partnerships, public education, and outreach programs”

outdooralabama.com

What is eutrophication?

- excessive inputs of nutrients → increased phytoplankton growth
- can result changes to community structure, harmful algal blooms, hypoxia, wildlife kills

britannica.com



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Study objective:

Quantify relationships between environmental drivers and eutrophication expressions

- identify most important drivers of eutrophication

- understand how that eutrophication is expressed now, and how it may be expressed in the future

- use data for management decisions

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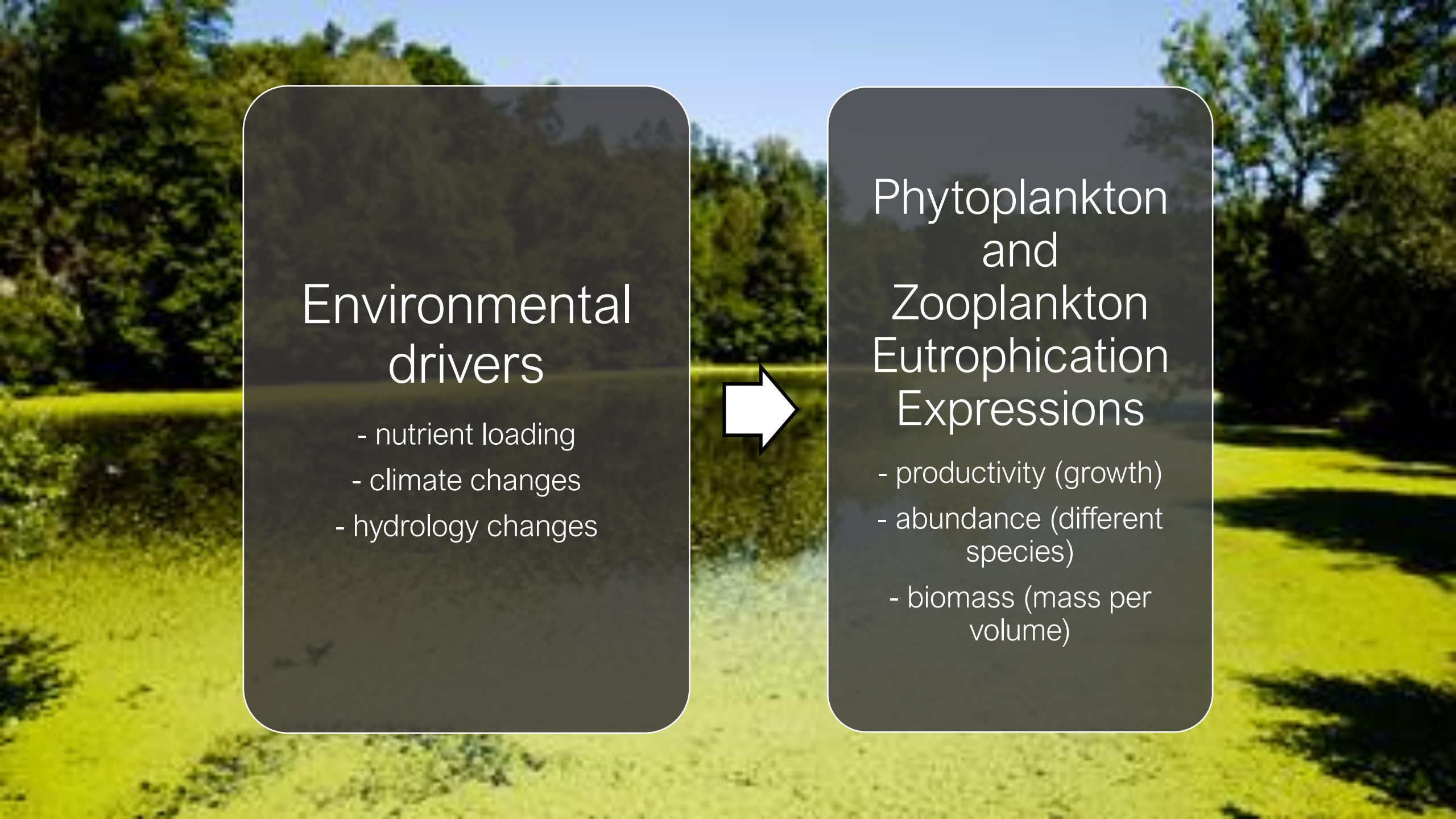
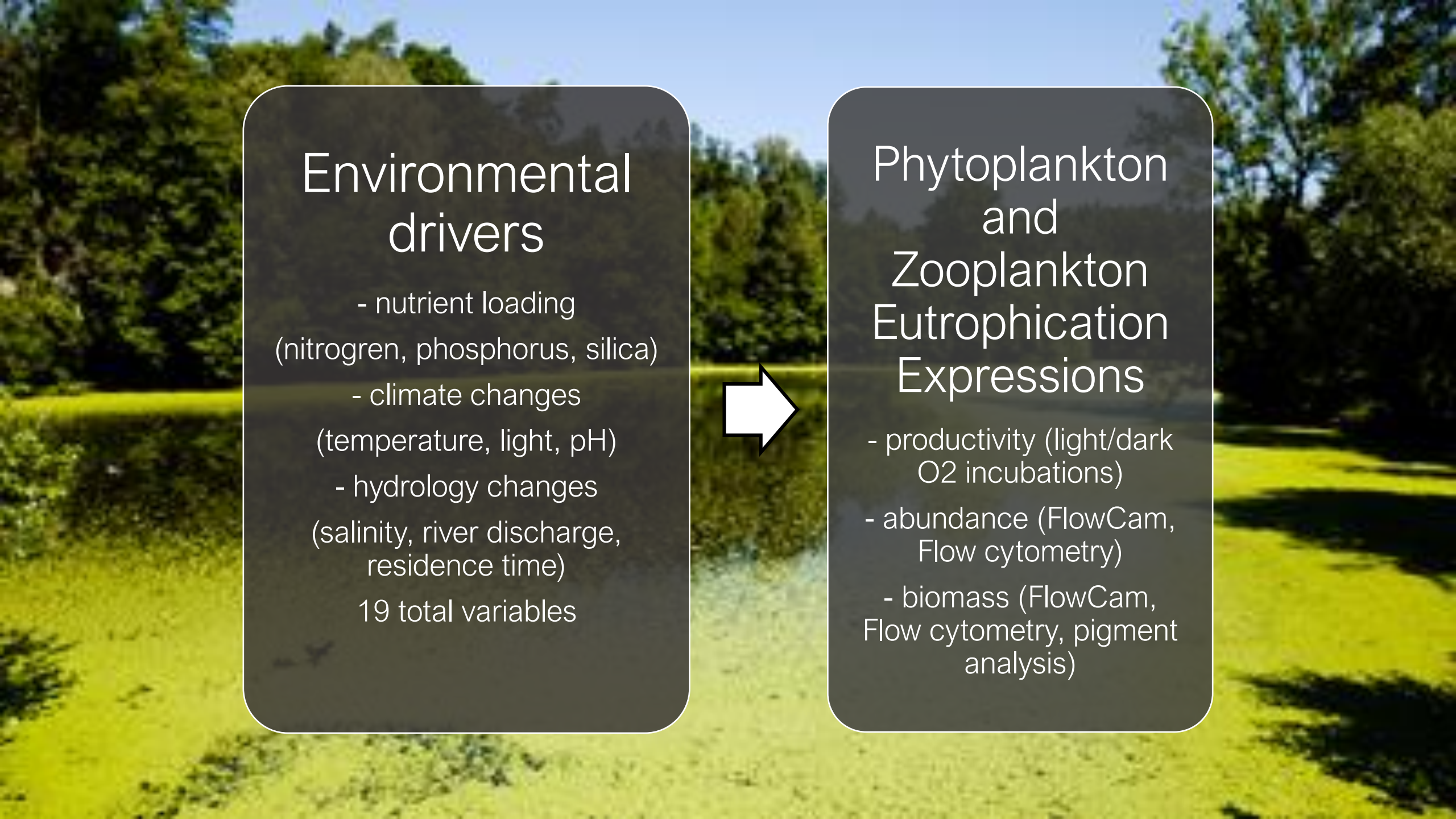
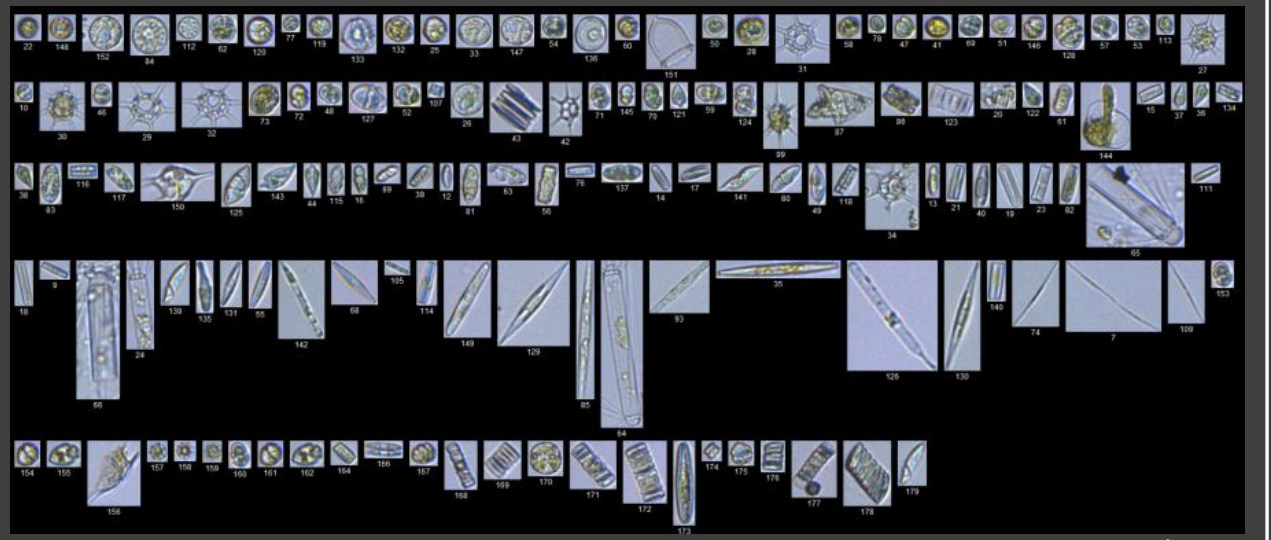

Environmental drivers
- nutrient loading
- climate changes
- hydrology changes
Phytoplankton and Zooplankton Eutrophication Expressions
- productivity (growth)
- abundance (different species)
- biomass (mass per volume)


Environmental drivers
- nutrient loading
(nitrogren, phosphorus, silica)
- climate changes
(temperature, light, pH)
- hydrology changes
(salinity, river discharge, residence time)
19 total variables
Phytoplankton and Zooplankton Eutrophication Expressions
- productivity (light/dark O2 incubations)
- abundance (FlowCam, Flow cytometry)
- biomass (FlowCam, Flow cytometry, pigment analysis)

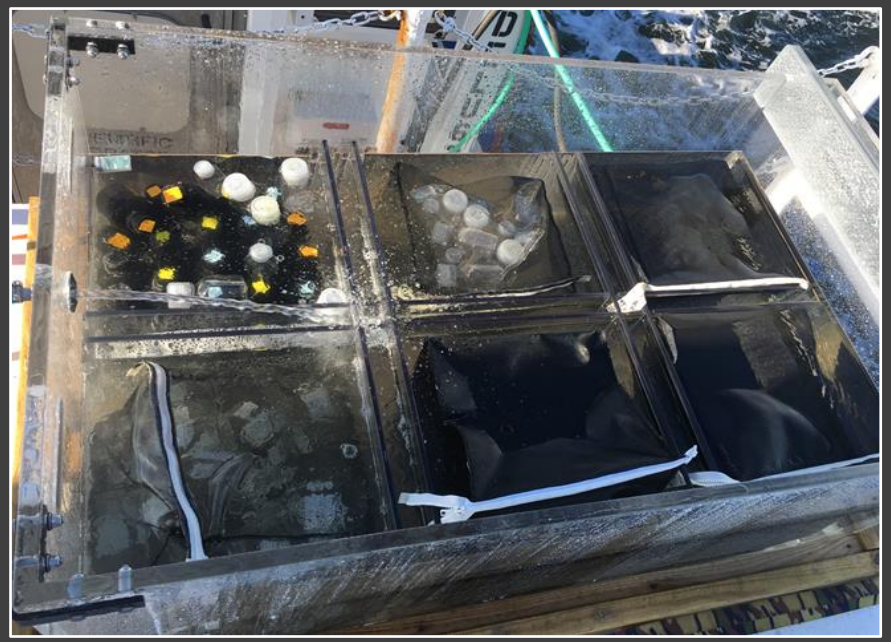
Expression measure examples

- FlowCam imaging



niwa.co.nz

- Light/dark O2 incubations



Field Study

- 10 stations
- Monthly sampling
- October 2020 – October 2021

Expected results

- hierarchy of driver variables
- relationships between driver variables and eutrophication expressions
- identification of dominant phytoplankton groups, abundances, biomass

ec. europa. eu

Historical Analysis

- WBNERR long-term monitoring
- USGS long-term monitoring
- literature

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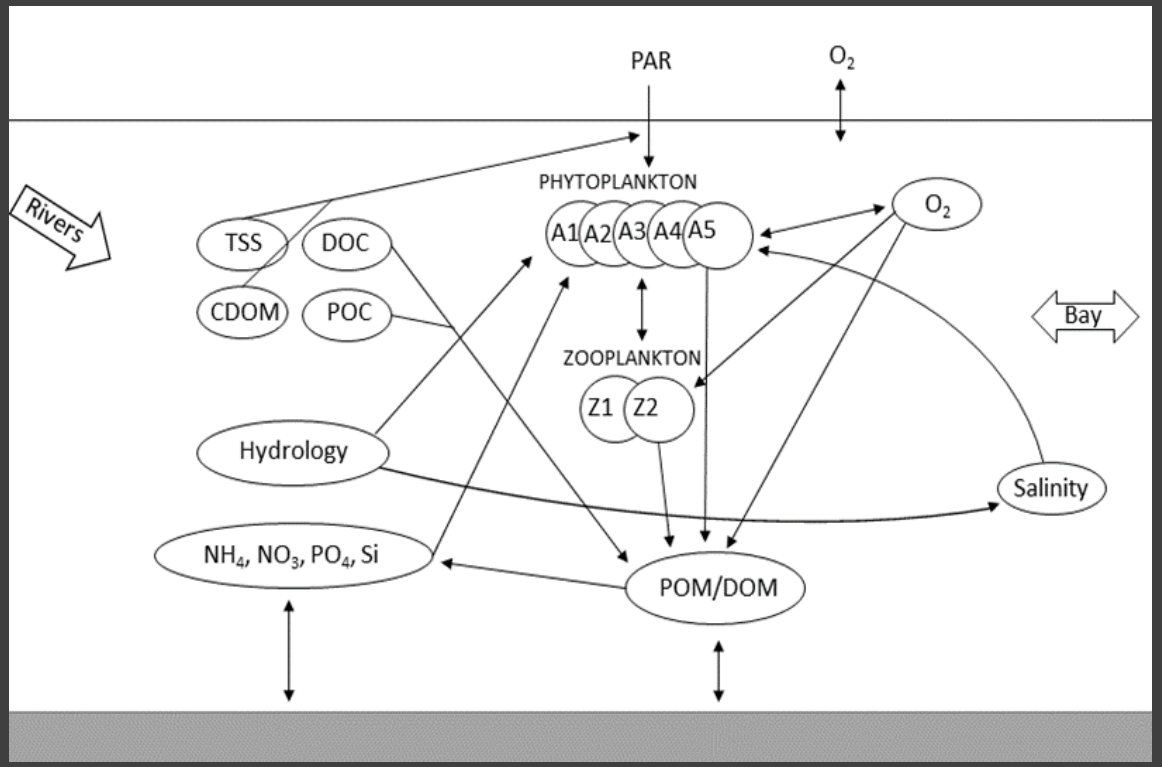
Expected results

- trends in driver variables

Numerical modeling

- Hydrological model (Regional Ocean Modeling System – ROMS)
- Biogeochemical model (Coastal Generalized Ecosystem Model – CGEM)



Expected results

- quantify single and combined effects of drivers
- predict eutrophication expressions in the future
- provide data to help resource managers make decisions

Thank you!

Questions?

Please feel free to contact me with any comments or feedback:

mfung@disl.org