Title

Trends in NP-ratios in Dutch ditches and lakes.

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Introduction

- Scope of this presentation
- PLONS project on ditches
- Datasets
- Trends and spatial differences NP
- Considerations

Focus

- Explore datasets of N and P concentrations
- Trends in NP-ratios 1985 – 2006
- Seasonality
- Connect to ecological data
- Limitation
- What can we learn from large datasets ?

Ditch project

Ecological functioning of ditches

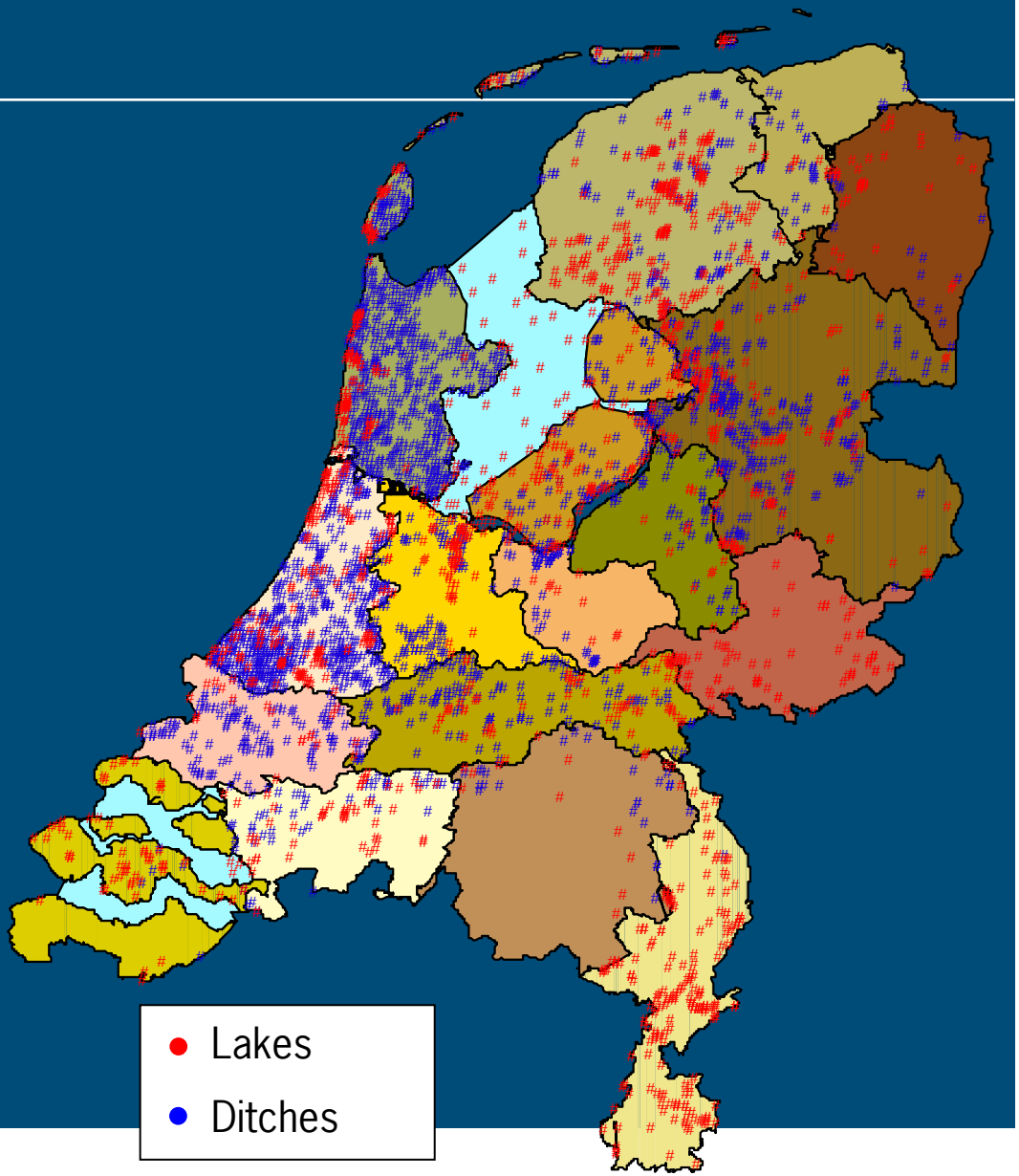
- Nutrient cycling
- Vegetation composition (management and maintenance)
- Biodiversity

- 2 year field survey of 85 locations
- lab and field experiments
- data collection

Ditch project PLONS

Dataset

- National Limno database
- Chemistry and biology
- 1980 - 2007
- data from water boards

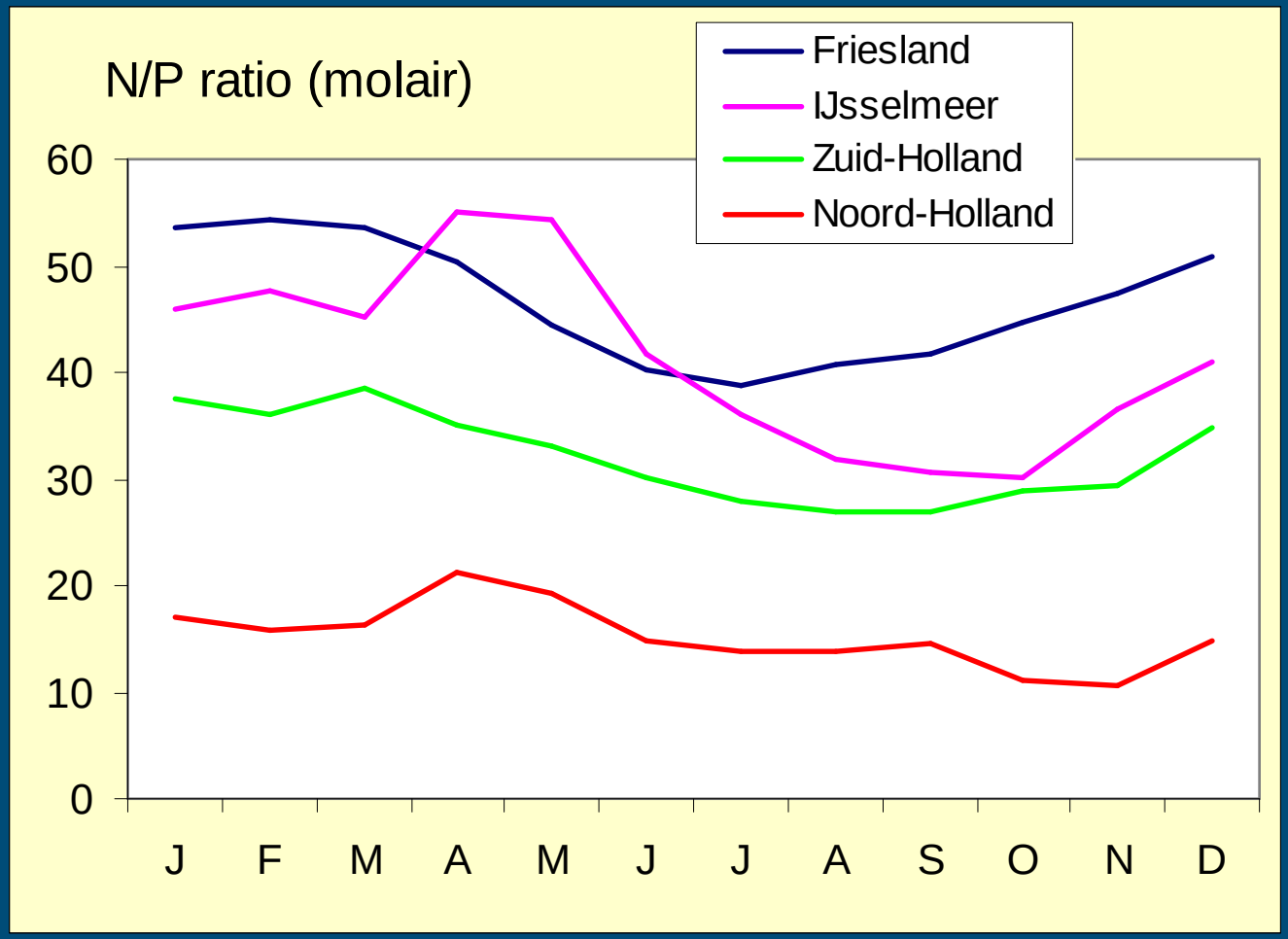


Dataset

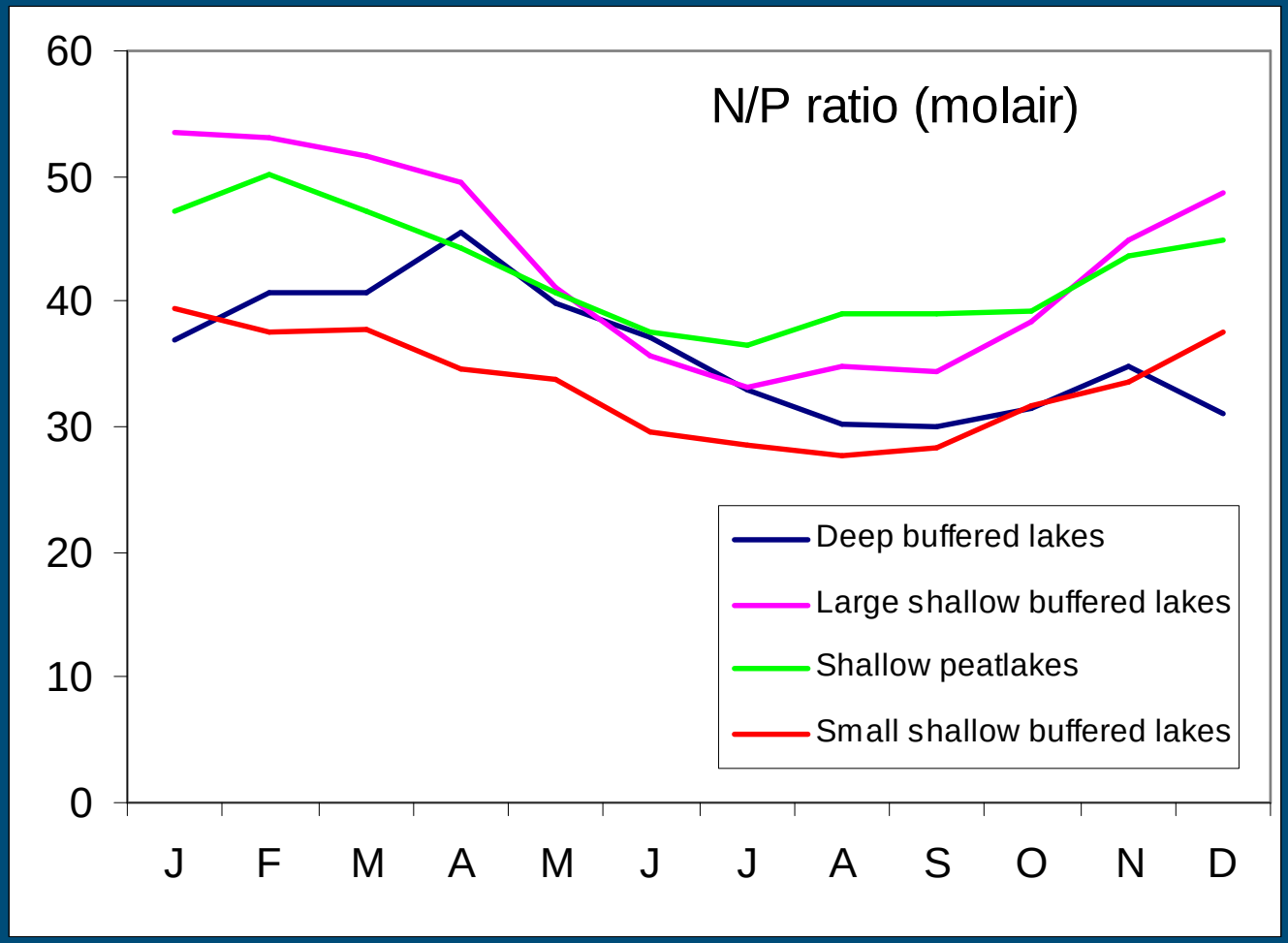
Lake Water type	Locations	Data points
Small shallow buffered lakes	635	19380
Large shallow buffered lakes	125	12040
Deep buffered lakes	196	9537
Moderate large, deep buffered lakes	73	4558
Large deep buffered lakes	41	4042
Small shallow calcareous lakes	61	1086
Shallow peat lakes	168	9178
Weak-buffered peat lakes	37	493
Large shallow peat lakes	64	2682
Total	1400	62996

Ditches: 3300 locations; 2400 with vegetation

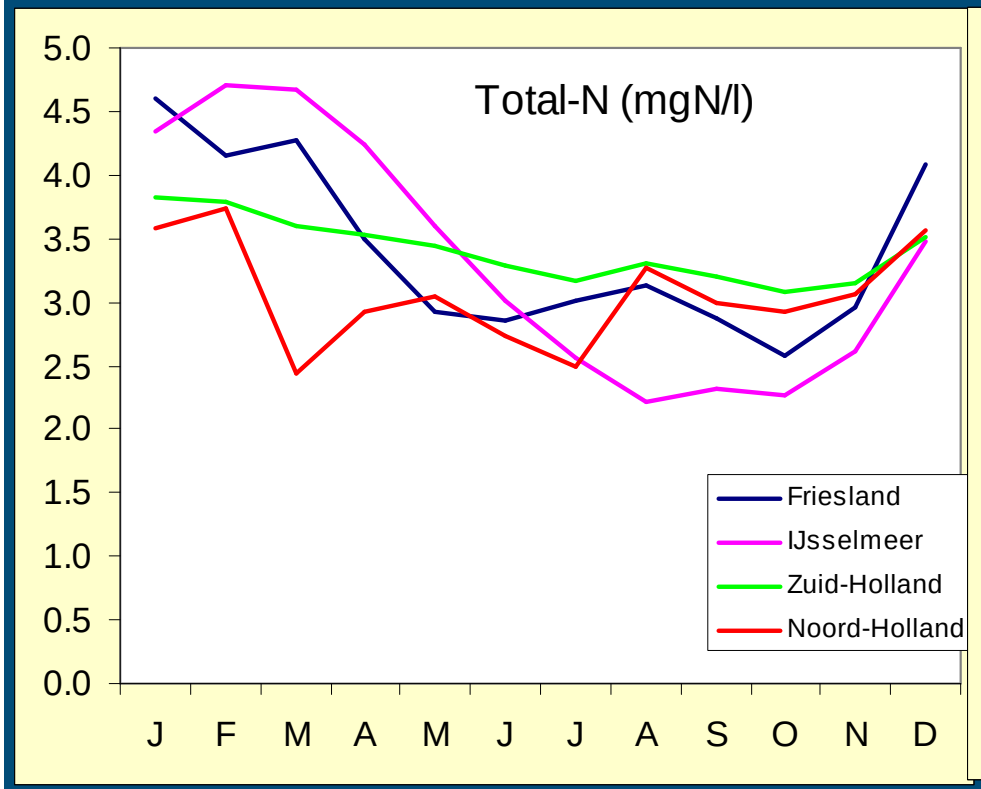
Lakes: Seasonality NP ratio

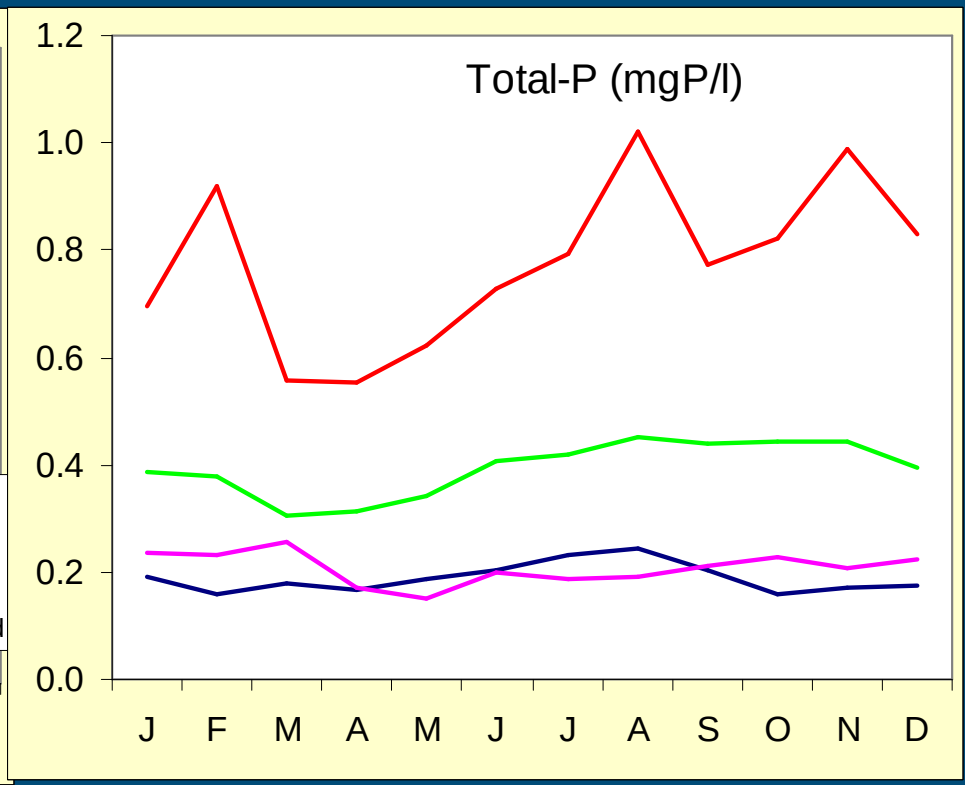


Lakes: Seasonality NP ratio

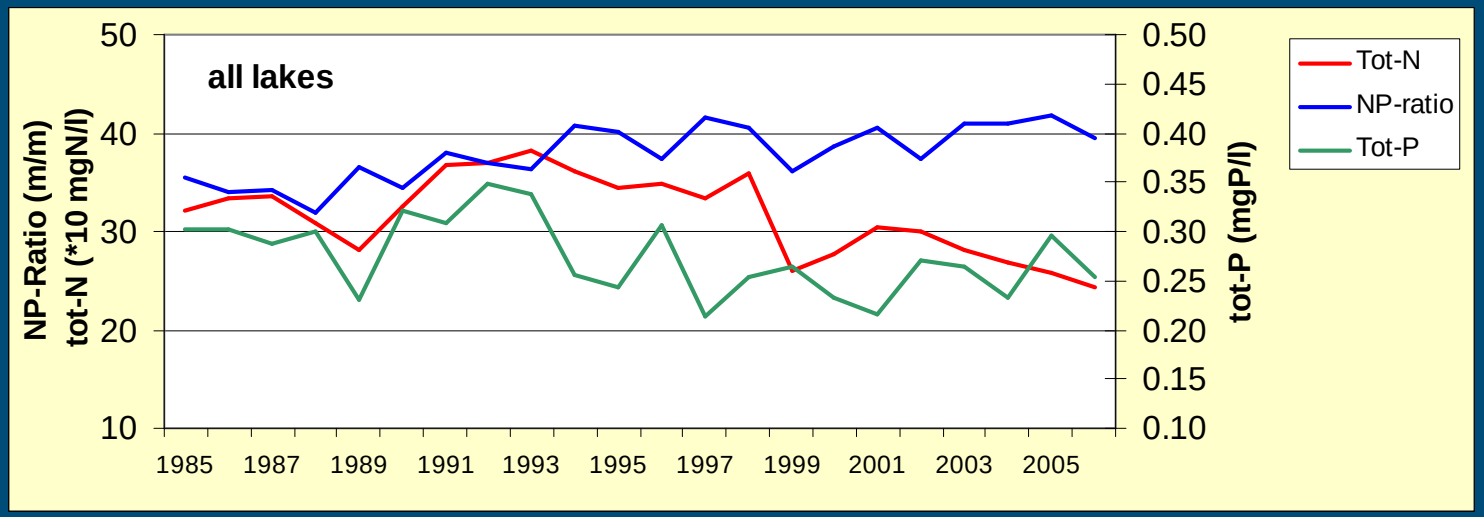


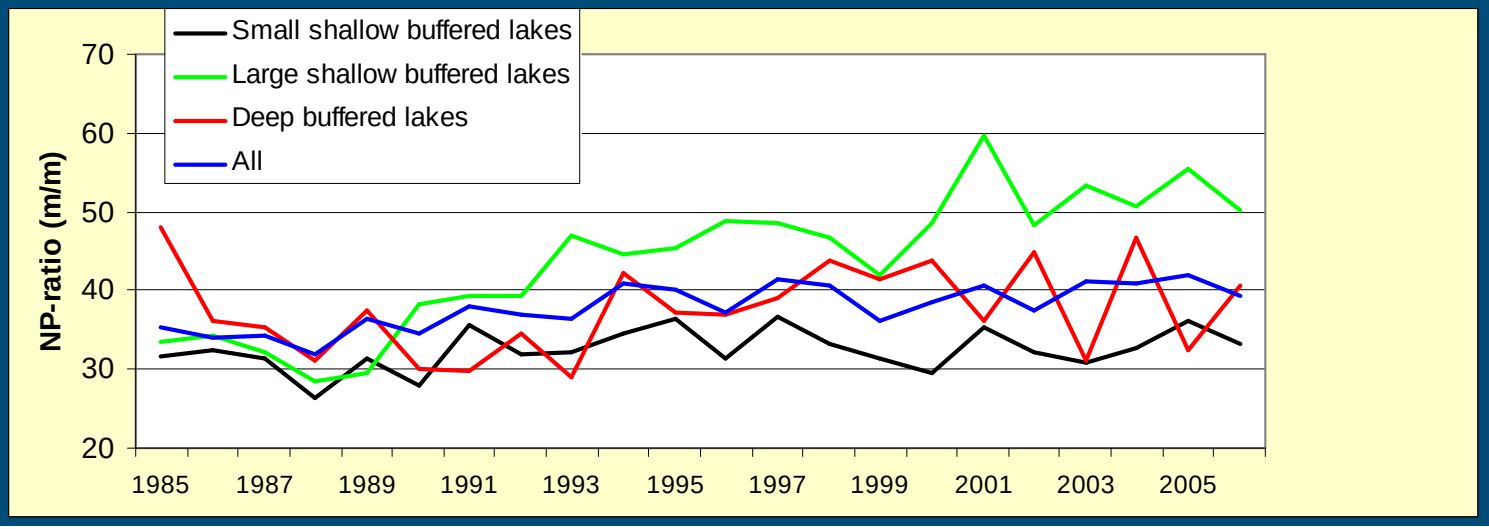
Lakes: Seasonality NP concentrations





Trends NP-ratios for lakes





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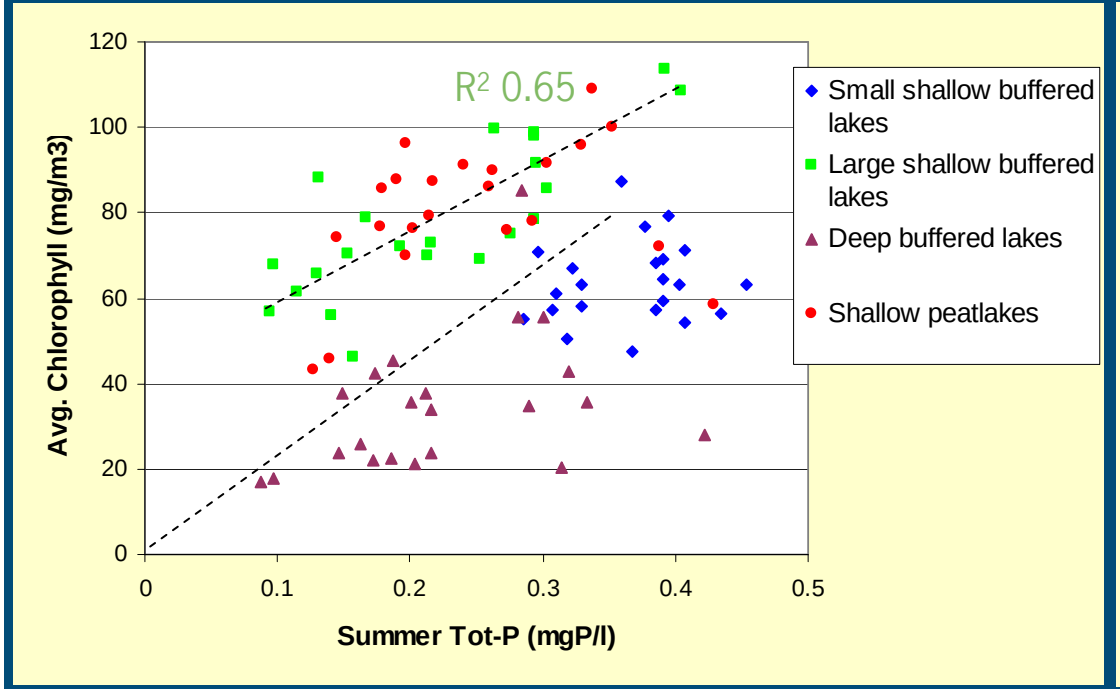
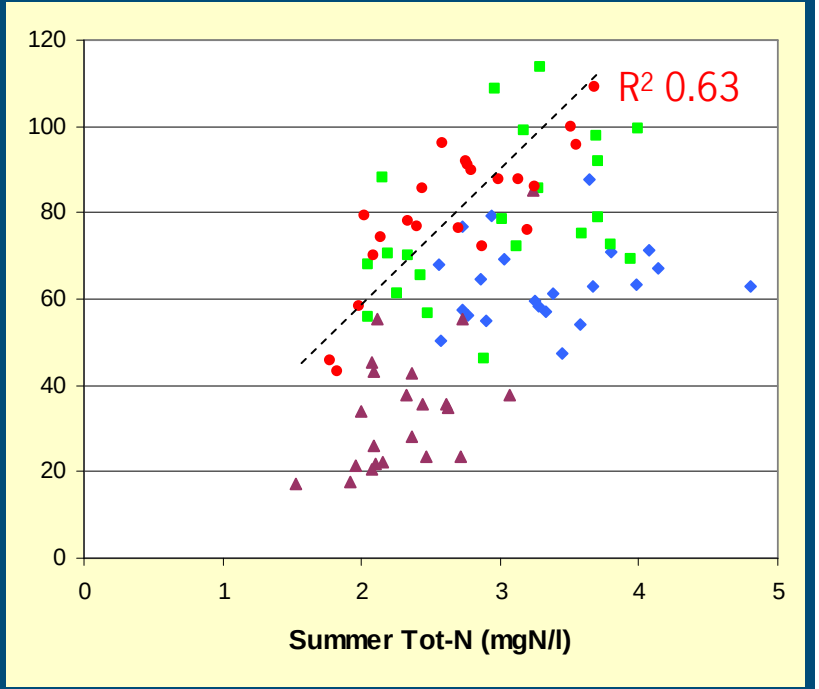
Chlorophyll





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Ditches

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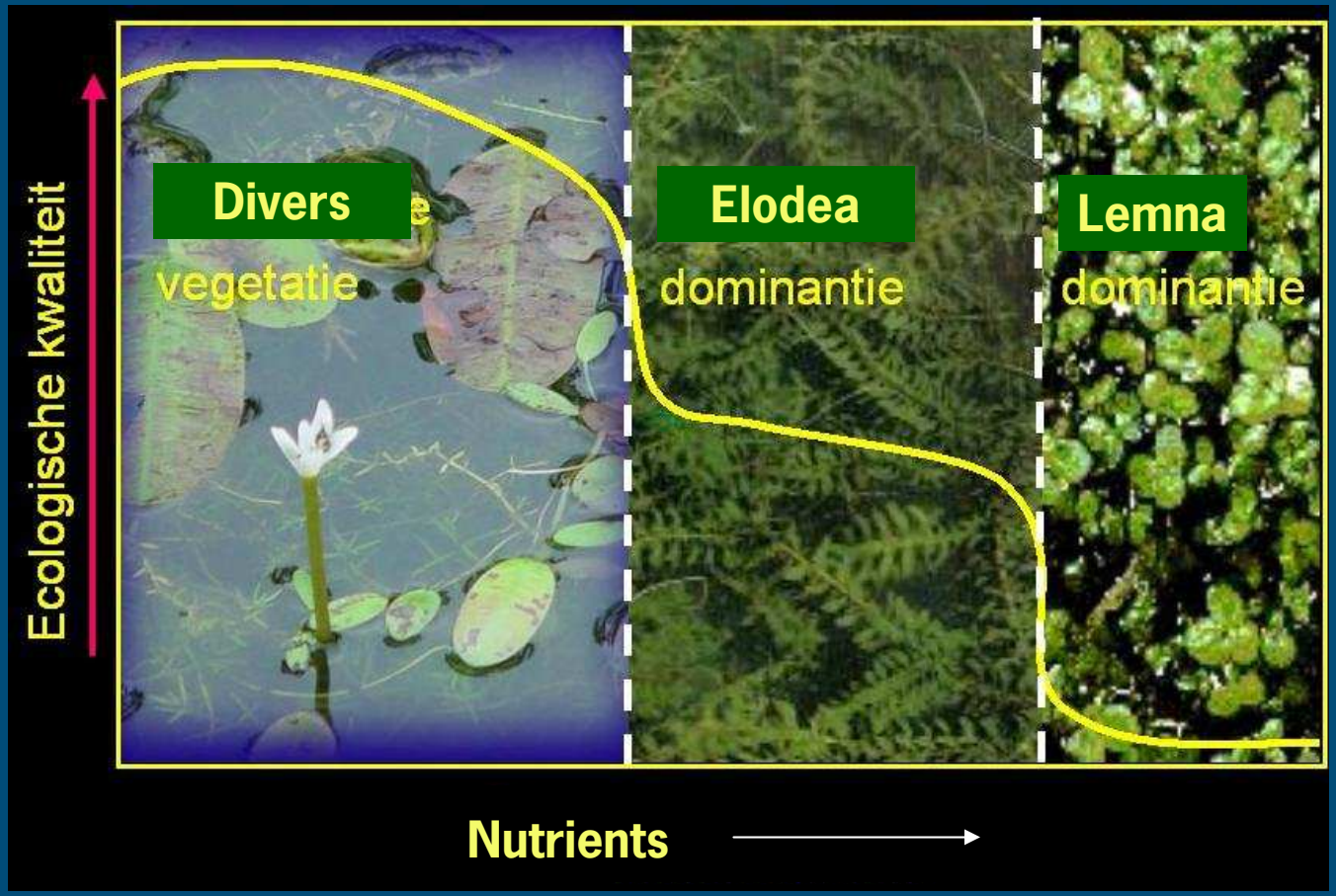
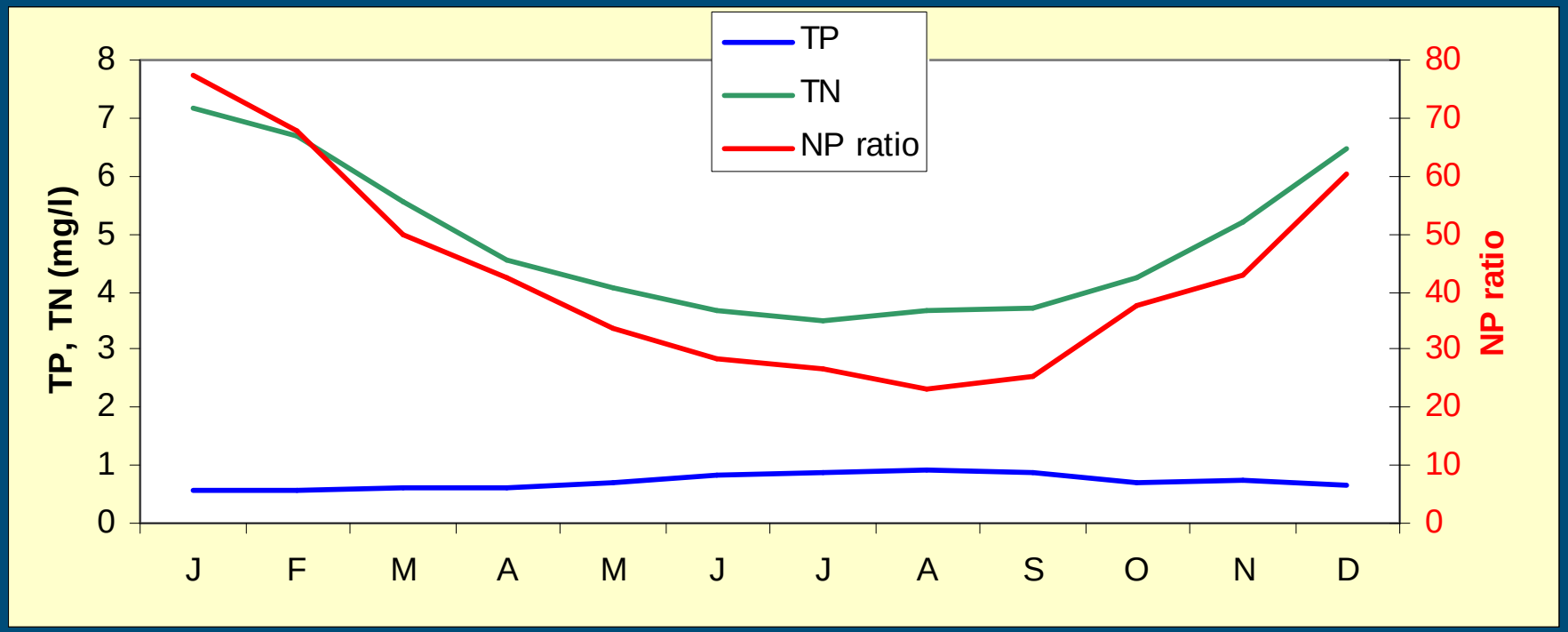
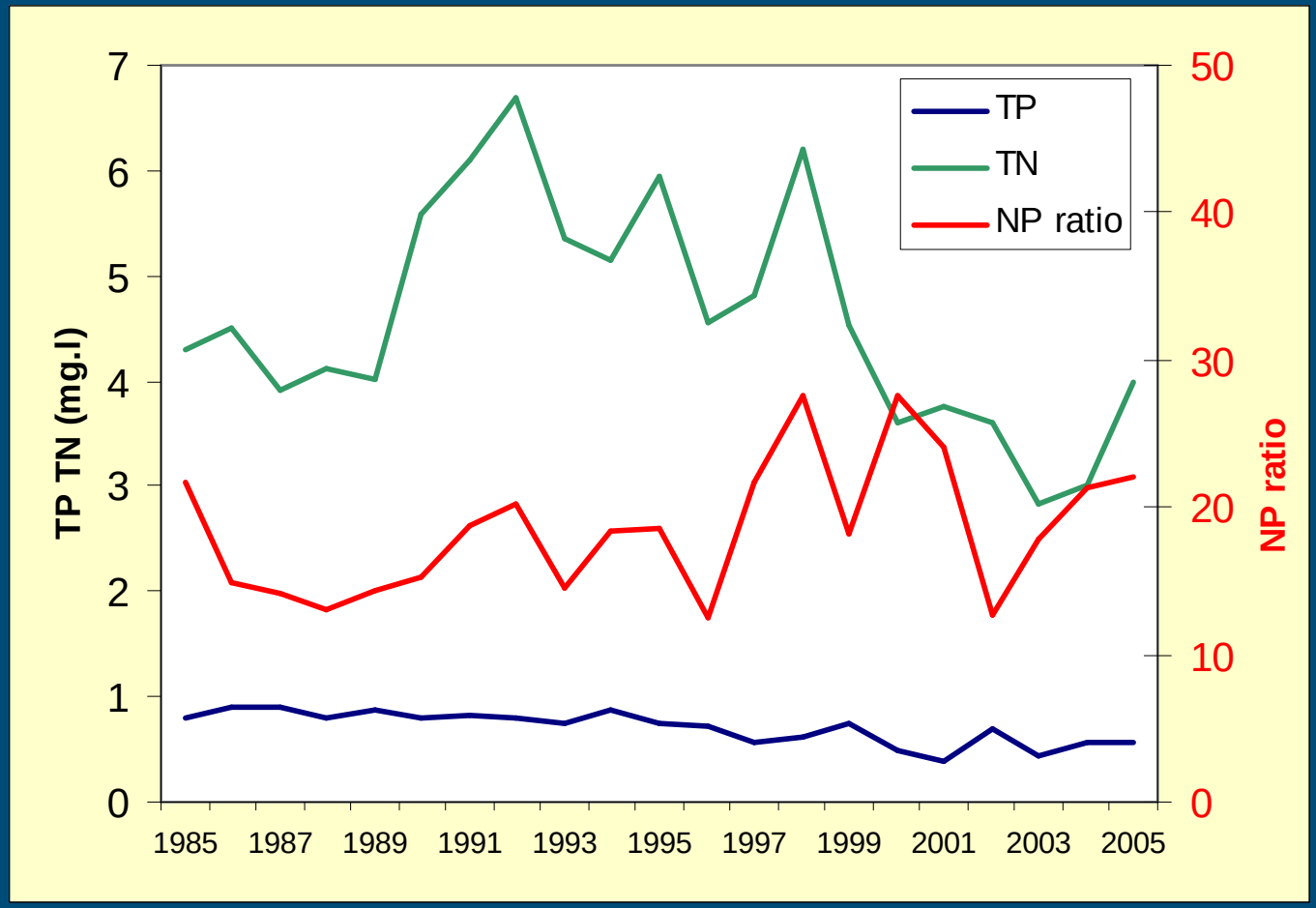
Ditches


Ecologische kwaliteit
Divers
vegetatie
Elodea
dominantie
Lemna
dominantie
Nutrients

Ditches: Seasonality



Ditches: Trends

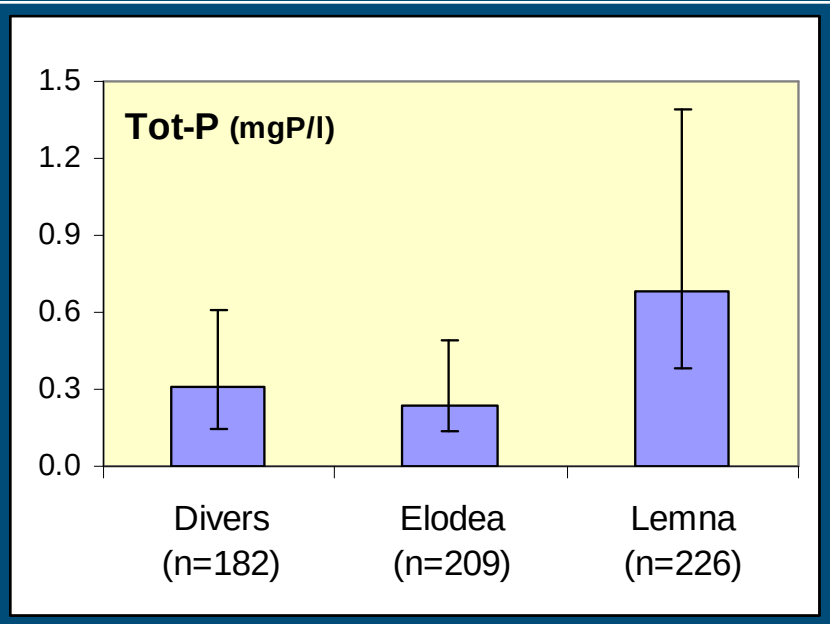


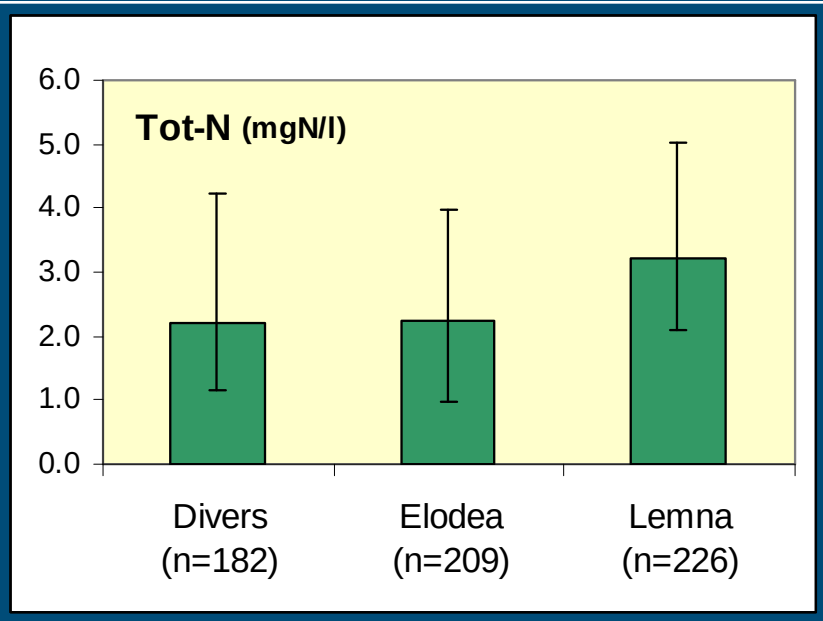
Ditches: nutrients and vegetation

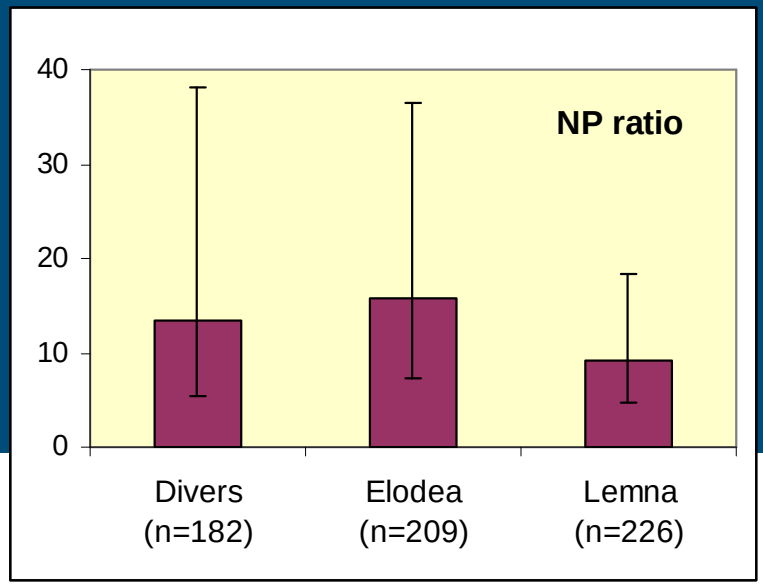
Clustering

- Diverse: >10 species of submerged macrophytes
- Elodea: > 60% coverage
- Lemna: > 60% coverage of small floaters

Ditches: nutrients and vegetation







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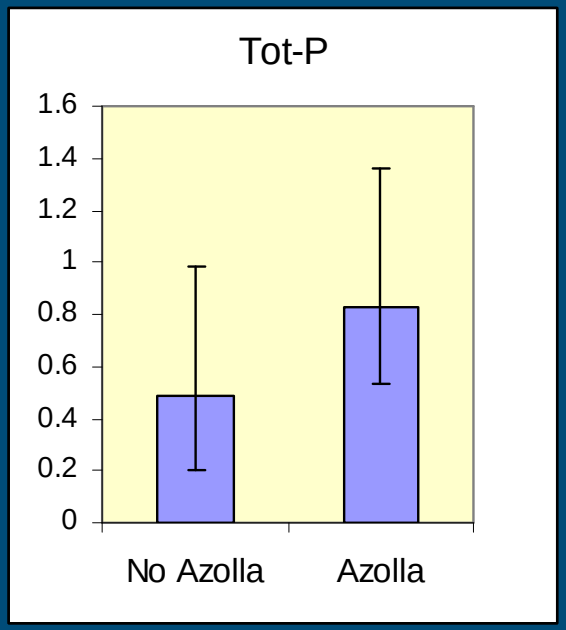
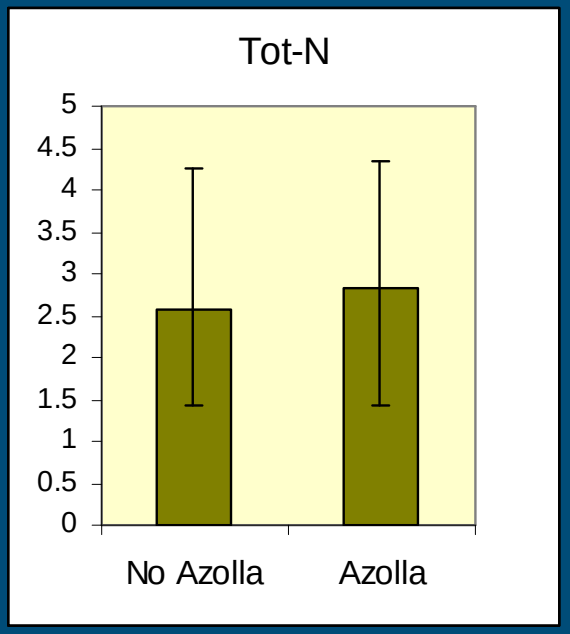
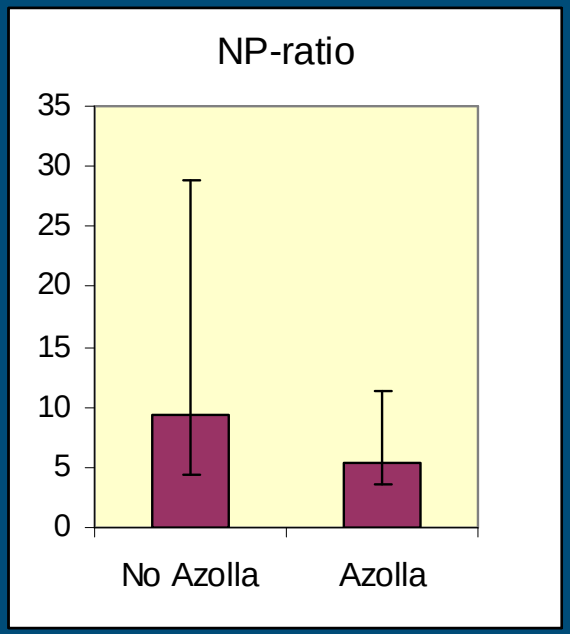
Individual species

Azolla

- sometimes 100% coverage
- associated with eutrophic systems
- N_2 fixer







To summarize

- Statistical analysis of large datasets can indicate changes in N P concentrations and ratios
- Clustering of data might be useful
- Reduction of nutrient emissions is visible in surface water concentrations
- Clear influence of regional (geo)-hydrological conditions
- NP co-limitation of lakes, but different in different lake types
- Ditch data still fuzzy