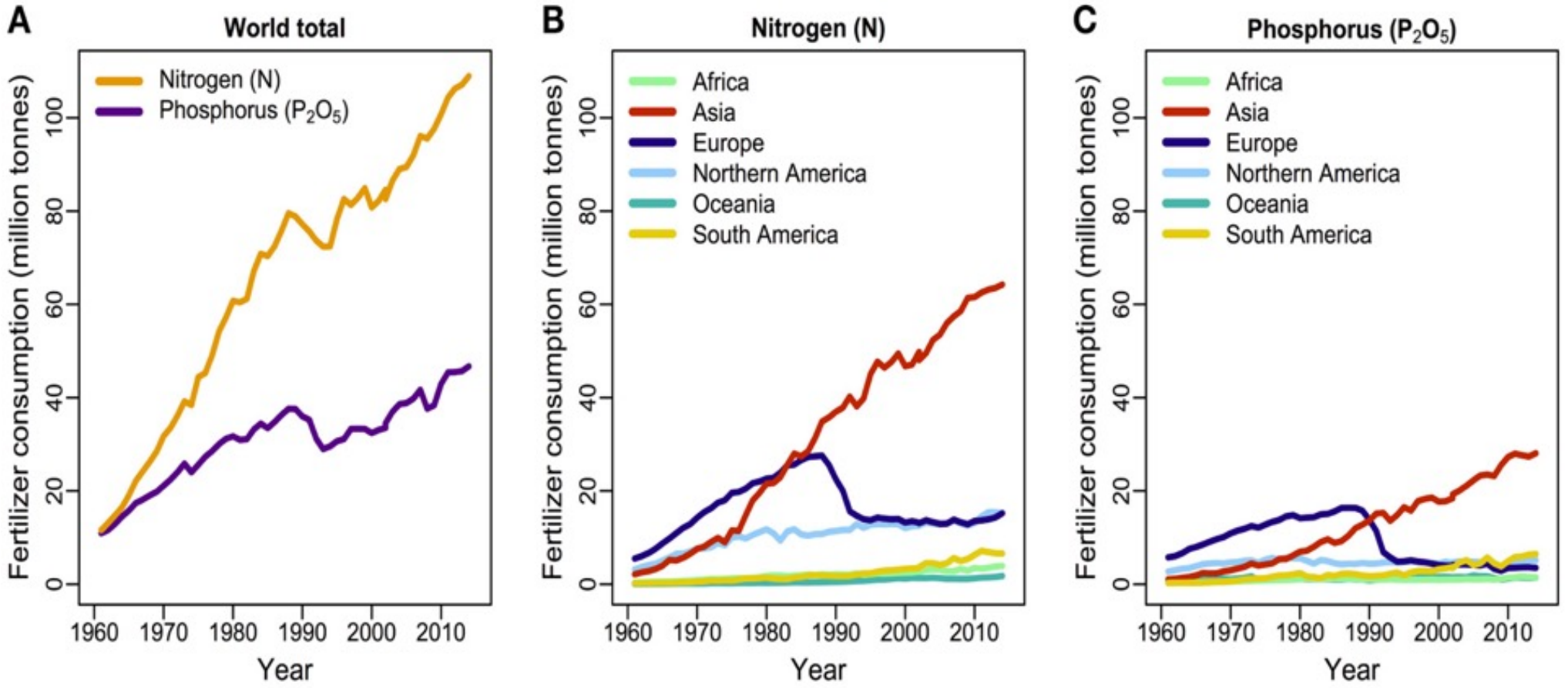
Hva er «passe mye» alger – og hva er effekten av C, N og P?

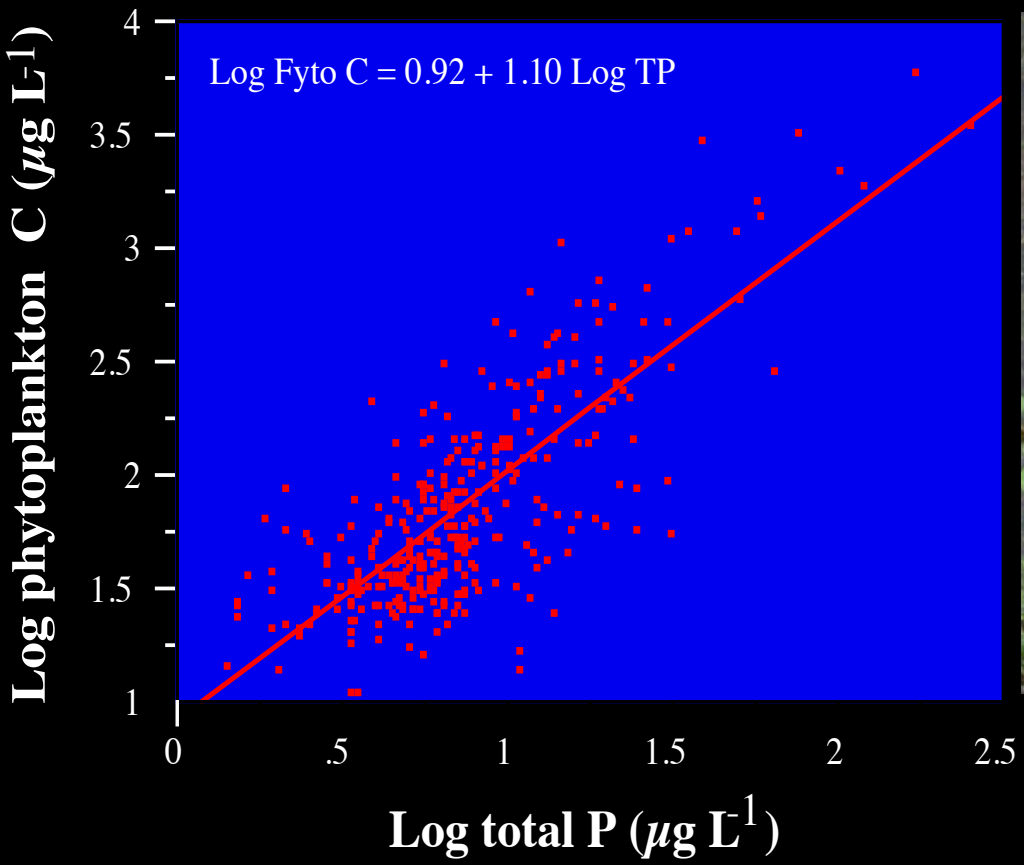
Dag O. Hessen
Univ. Oslo, Dept. Biosciences

Centre for Biogeochemistry in the Anthropocene

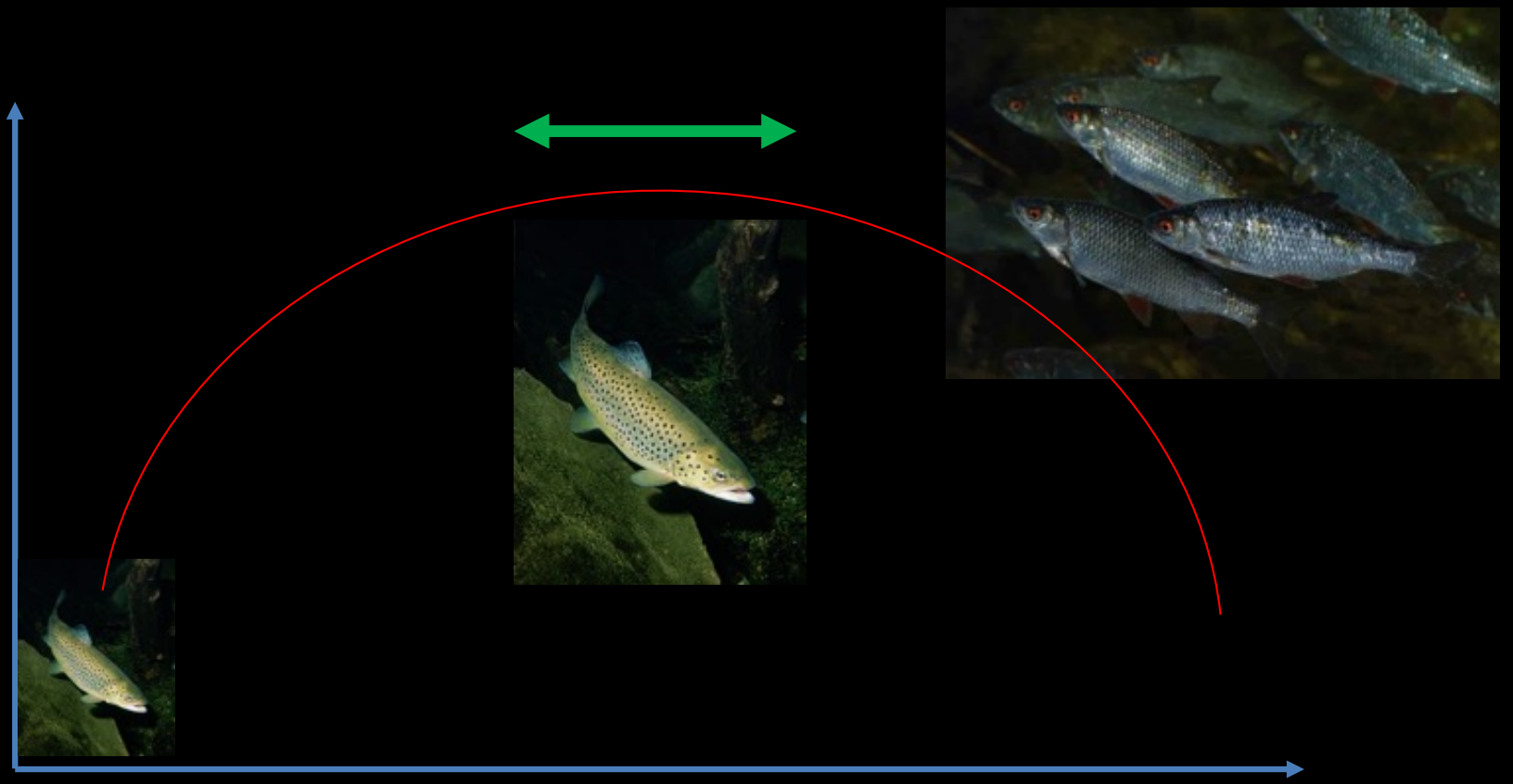
Et storskala gjødslingseksperiment



Eutofiering…

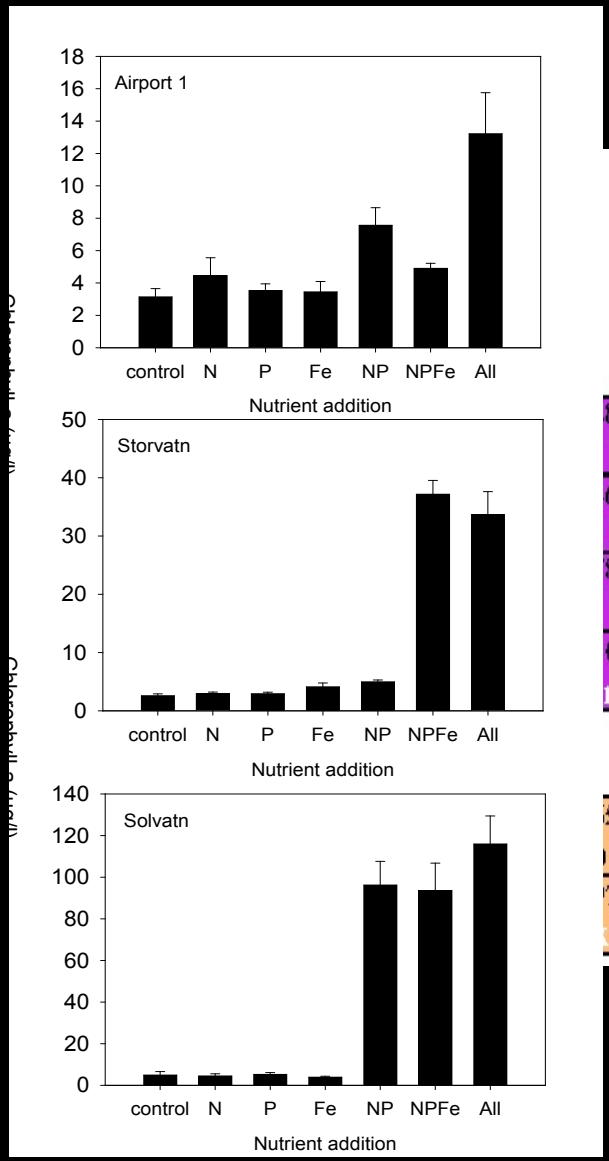


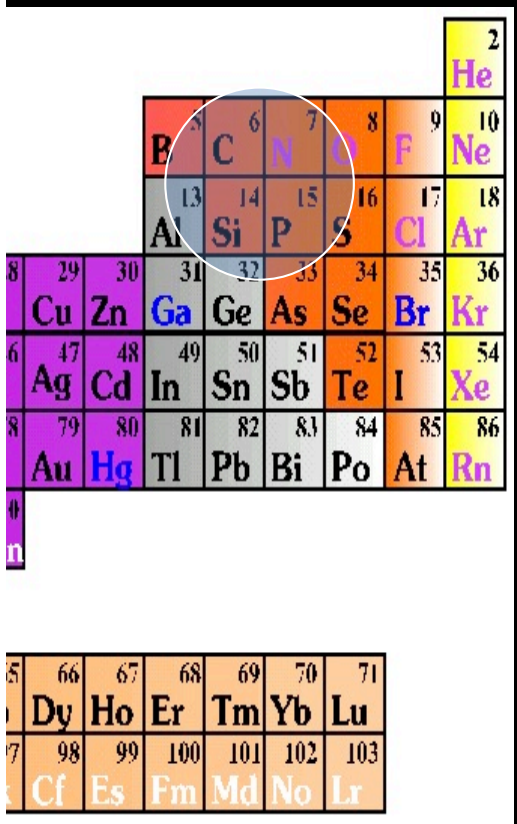
… men er oligotrofiering også et problem?



Hva begrenser vekst?

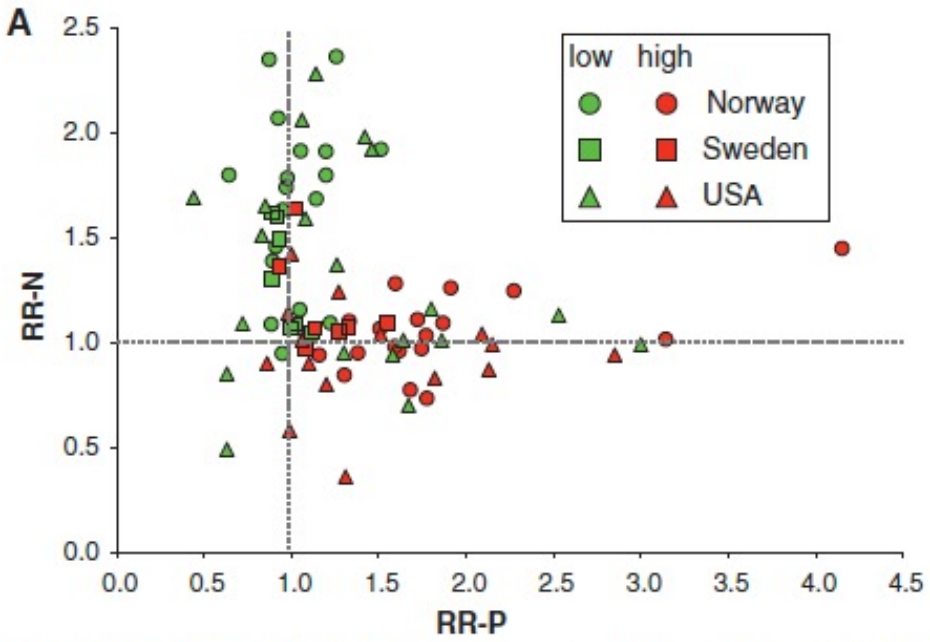
- Lys, vann, næringssalter
- Liebigs minimumsprinsipp
- Mikro- og makronæringsstoffer
- Ofte N-begrensing på land og i hav, P i ferskvann
- Hvordan avgjøre elementbegrensing?
- Kvantitet versus kvalitet





Shifts in Lake N:P Stoichiometry and Nutrient Limitation Driven by Atmospheric Nitrogen Deposition

James J. Elser,[1]* Tom Andersen,[2] Jill S. Baron,[3] Ann-Kristin Bergström,[4] Mats Jansson,[4] Marcia Kyle,[1] Koren R. Nydick,[5] Laura Steger,[1] Dag O. Hessen[2]



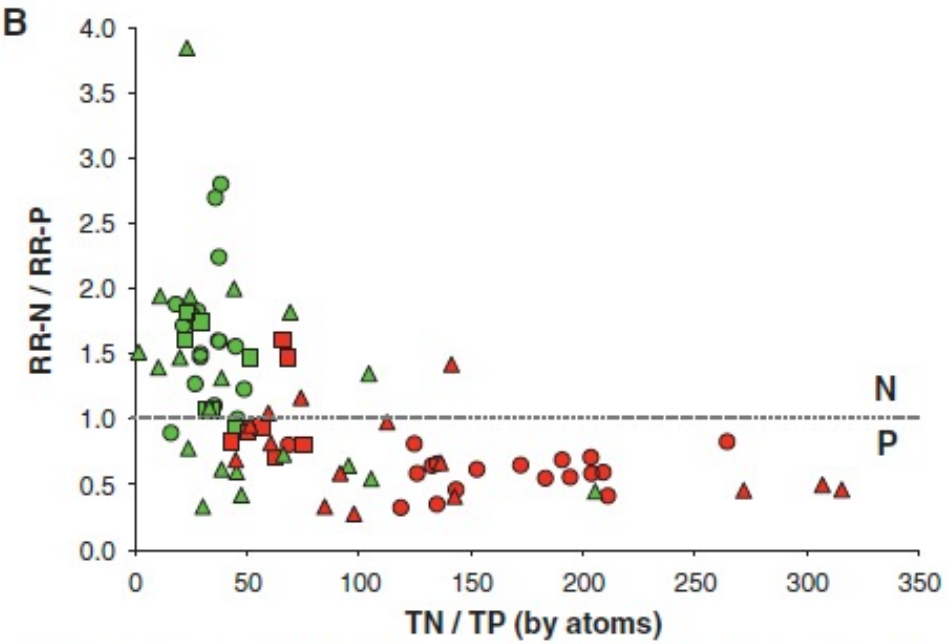


Fig. 2. Phytoplankton N and P limitation as a function of atmospheric N deposition in lakes of Norway (circles), Sweden (squares), and Colorado (triangles). Lake phytoplankton that respond strongly to N have a weak response to P and vice versa (**A**). Horizontal and vertical lines delineate response ratios of 1, indicating no response of phytoplankton biomass to enrichment of that nutrient. Results from low-deposition lakes (green) are clustered on the *y* axis, indicating primary N limitation, whereas those from high-deposition lakes (red) are clustered on the *x* axis, indicating primary P limitation. The relative phytoplankton response to N compared with P (RR-N/RR-P) is strongly dependent on lake TN:TP ratio (**B**), which itself is dependent on N deposition. Values greater than 1 indicate that N limitation predominates in that lake, whereas values less than 1 indicate that P limitation predominates.

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Global analysis of nitrogen and phosphorus limitation of primary producers in freshwater, marine and terrestrial ecosystems

James J. Elser ✉ [illegible] Gruner,

W. Stanley Harp[illegible] . Seabloom,

Jonathan B. Shu[illegible]

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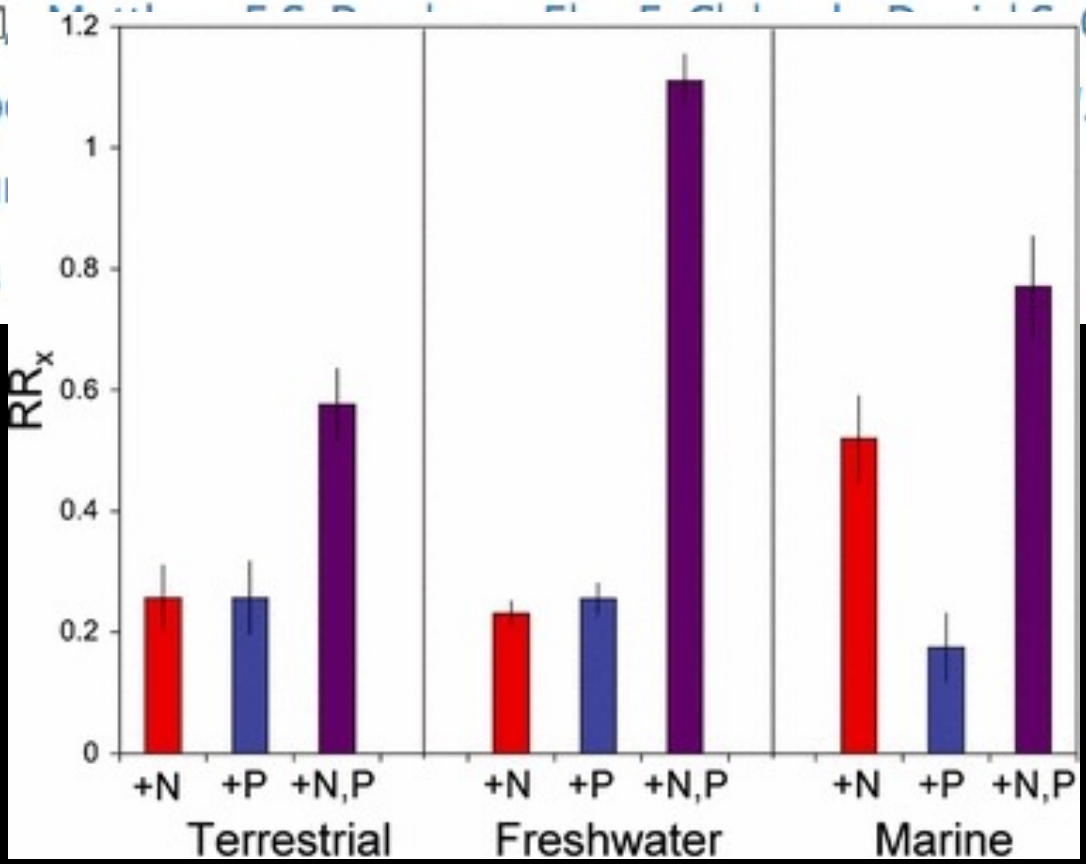
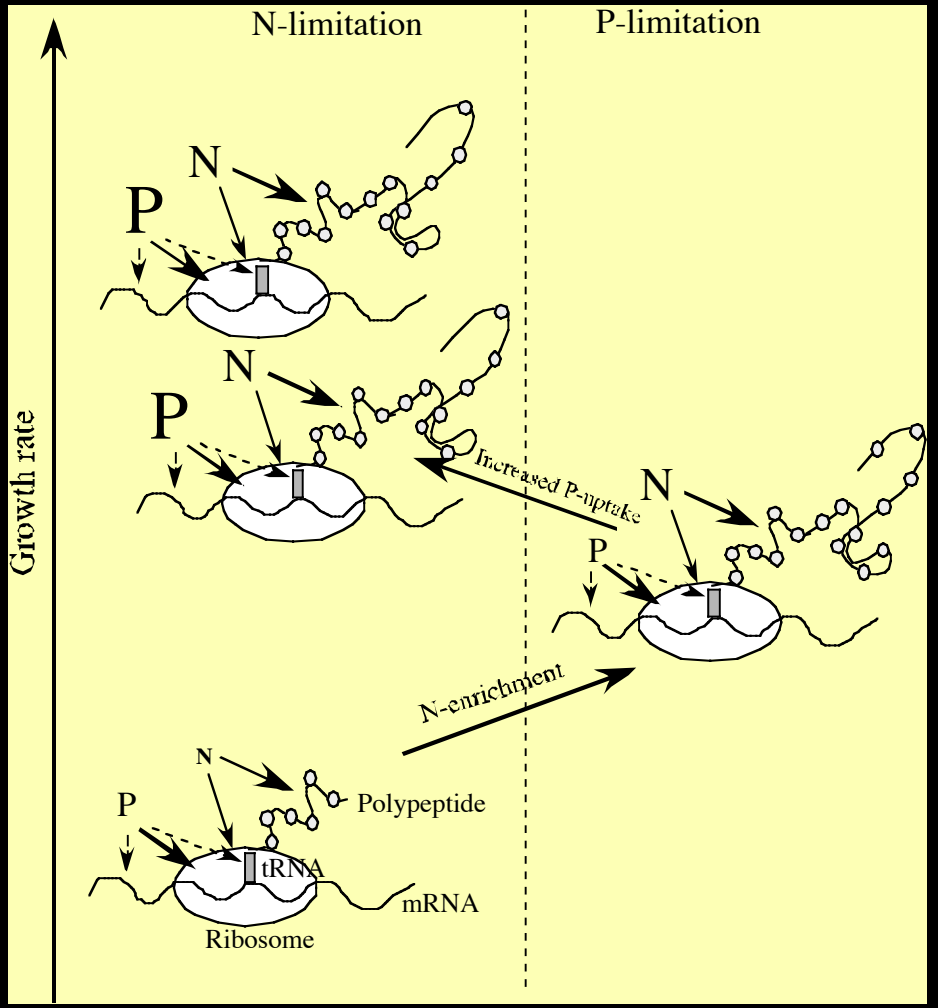
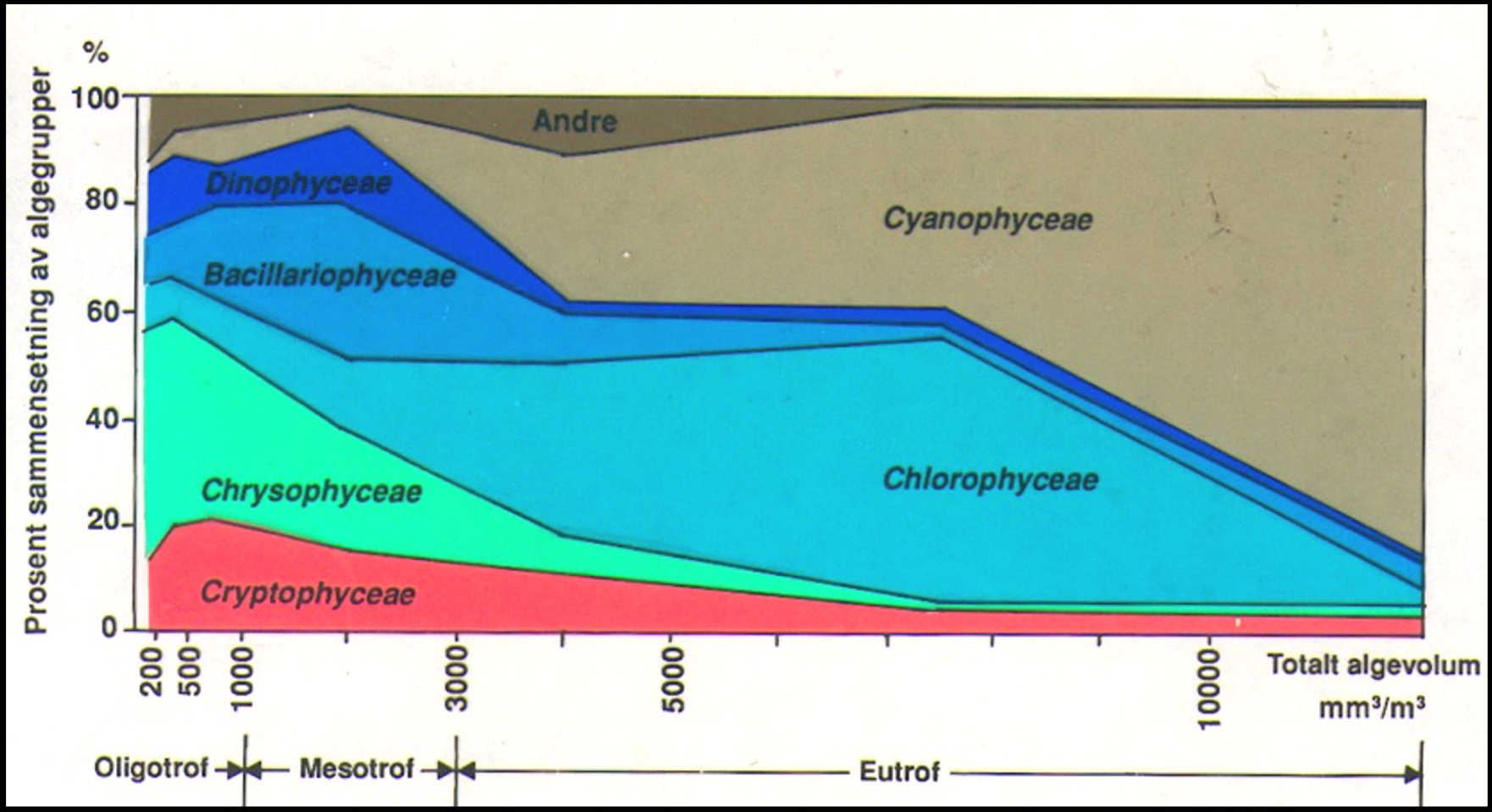


Hvorfor er N og P så tett koblet?

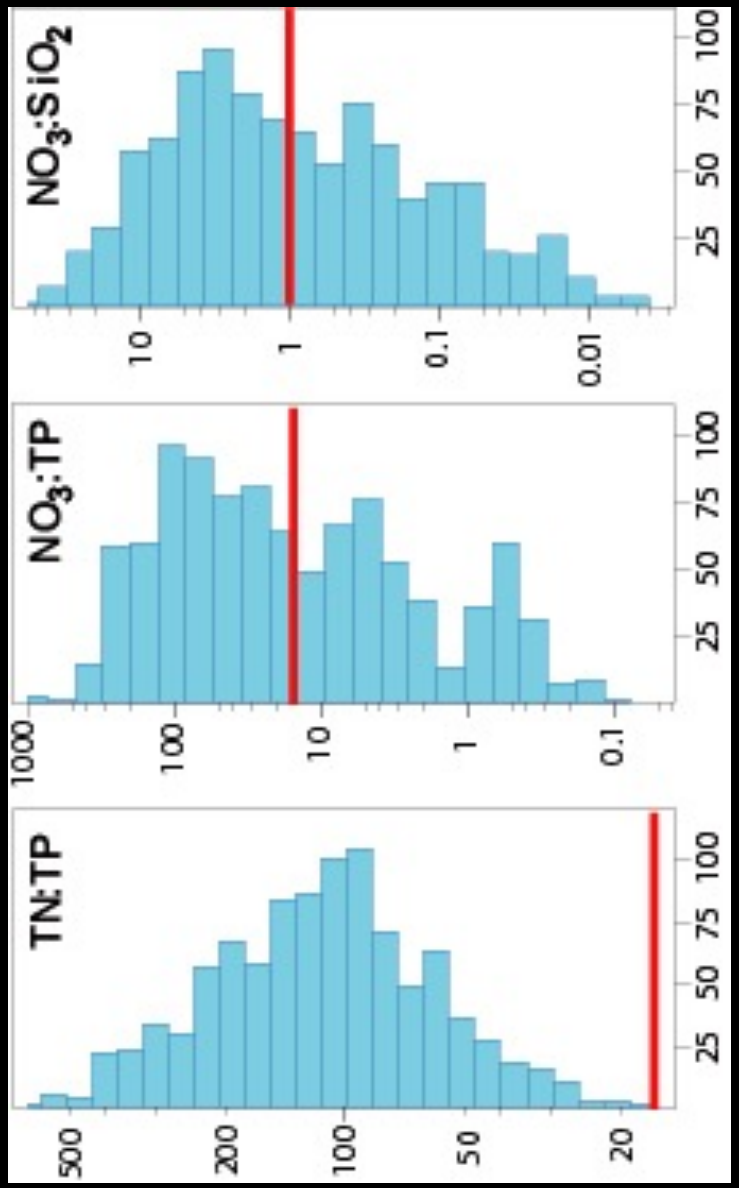


Kvantitet og kvalitet



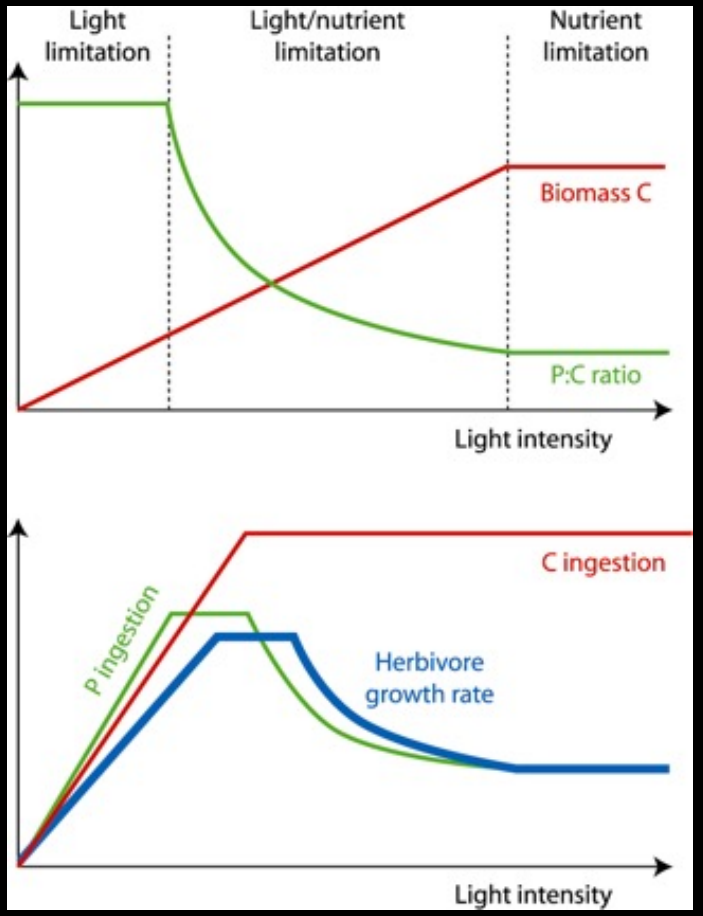
Støkiometri og elementforhold

- N-deposisjon, nedbør og klima påvirker ikke bare konsentrasjoner,
- Men også forhold mellom hovedelementer
- Stor betydning for produksjon og artsdominans i ferskvann og hav



Lys og CO_2-gjødsling

- Fettsyrer, struktur, cellevegg mm er viktig for fødekvalitet og transport I næringskjedfer
- Forholdet mellom C:N:P, støkiometrien, er også viktig, spesielt for høyt C:P gir lav fødekvalitet
- Både mye lys og mye CO2 kan øke C:P (og C:N) med effecter for beitere og høyere trofiske nivå



Passe mye? 1 - 10 mg Chla L^{-1}?