

Von der Alge zum Fisch



Bayerisches Staatsministerium für
Umwelt und Gesundheit

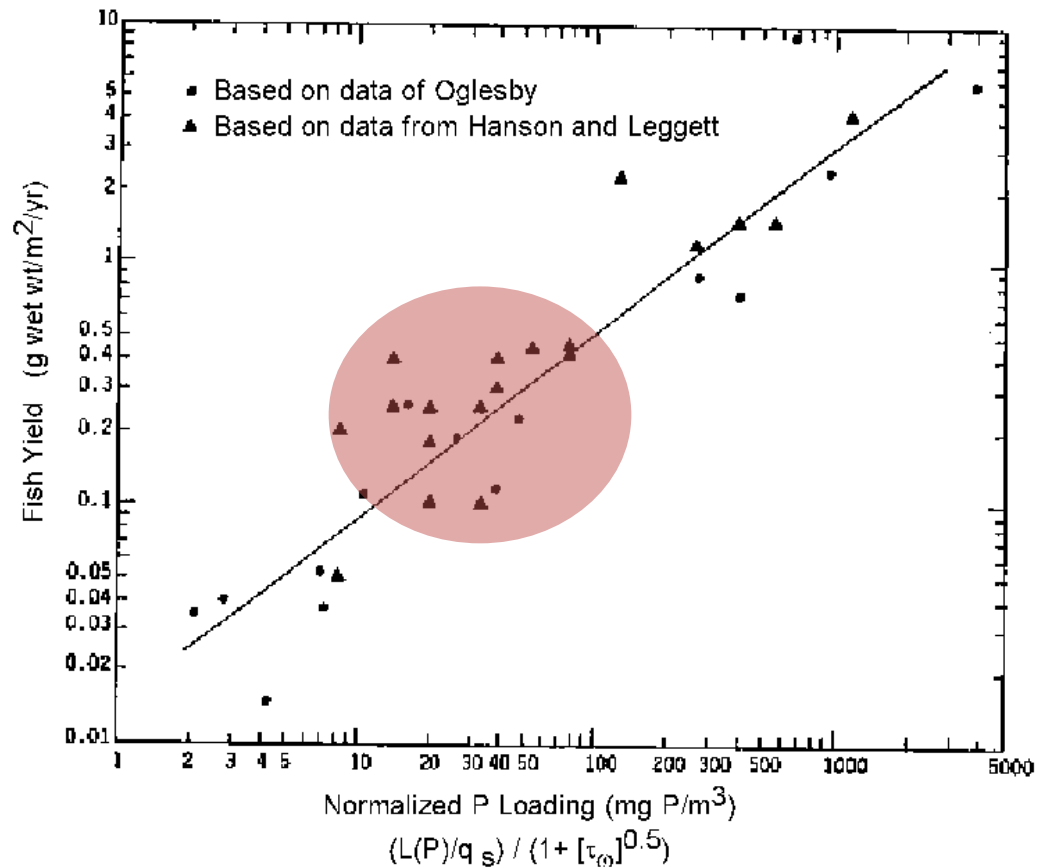


DFG Deutsche
Forschungsgemeinschaft

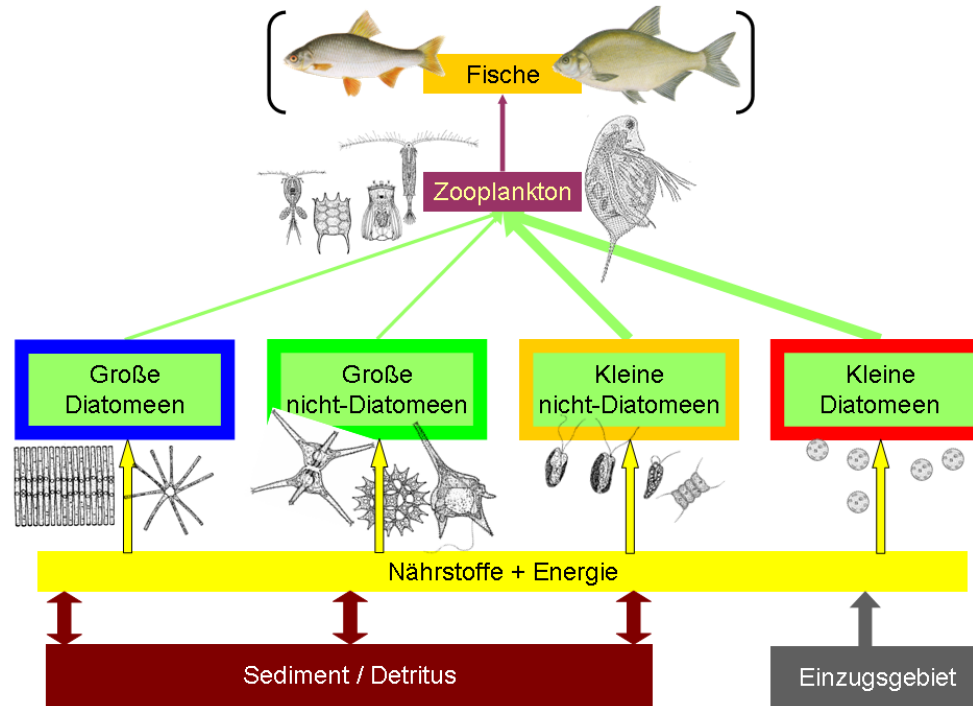
Vom Phosphor zum Fisch

Relationship between Normalized P Loading and Fish Yield

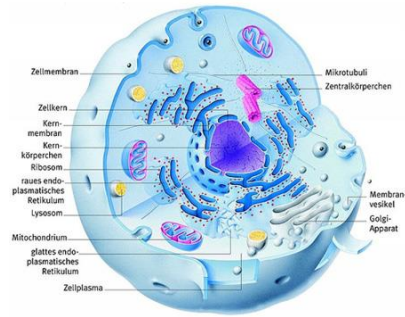
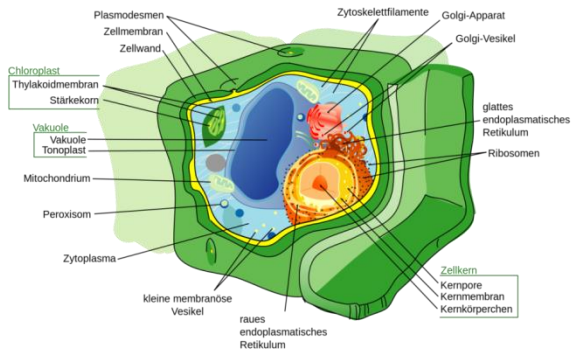
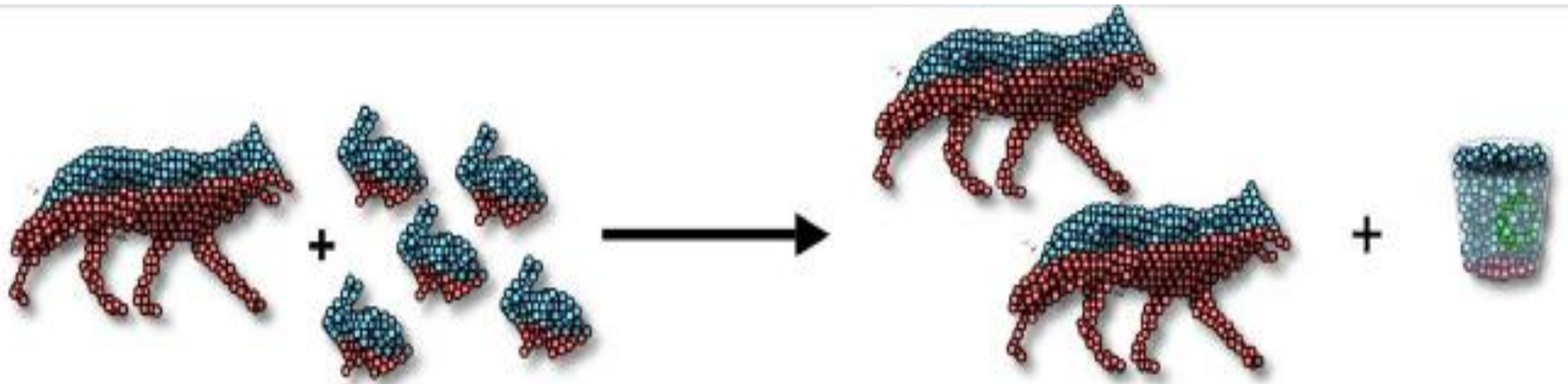
After Jones and Lee, (1986)



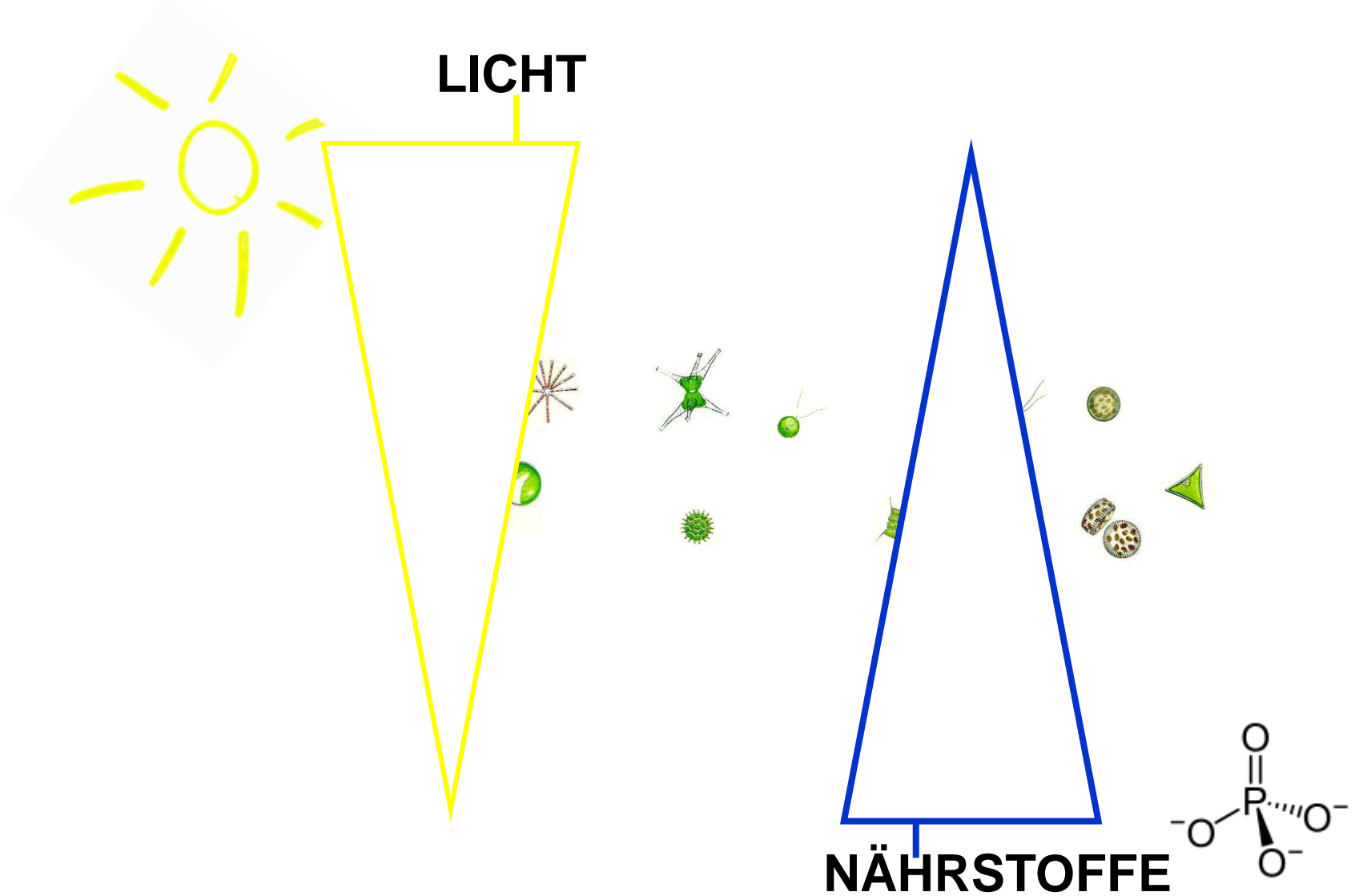
Nahrungsnetz See



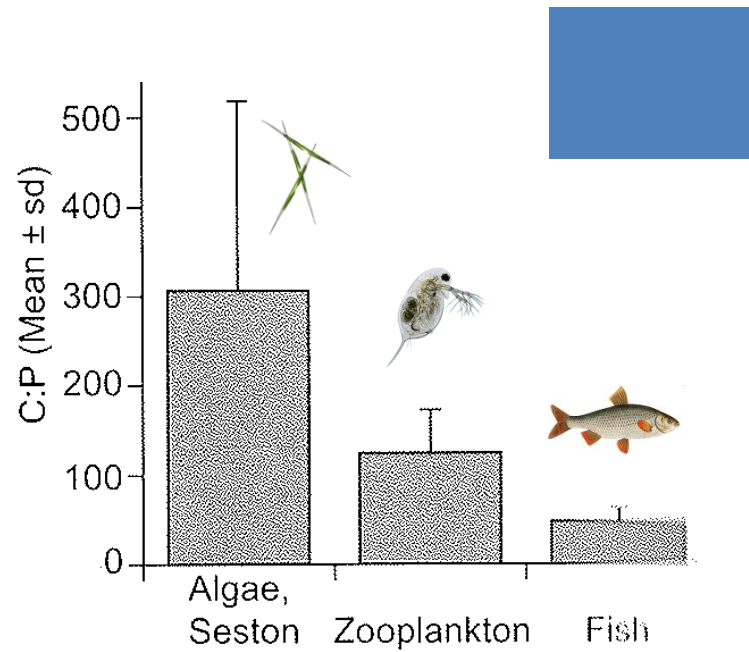
Stöchiometrie



Stöchiometrie



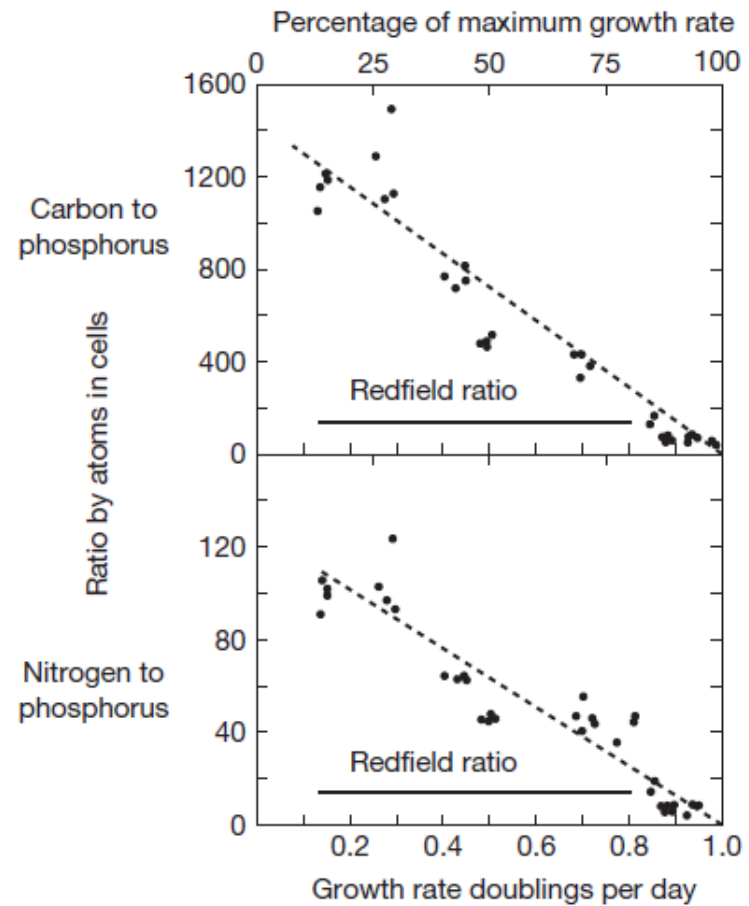
Stöchiometrie



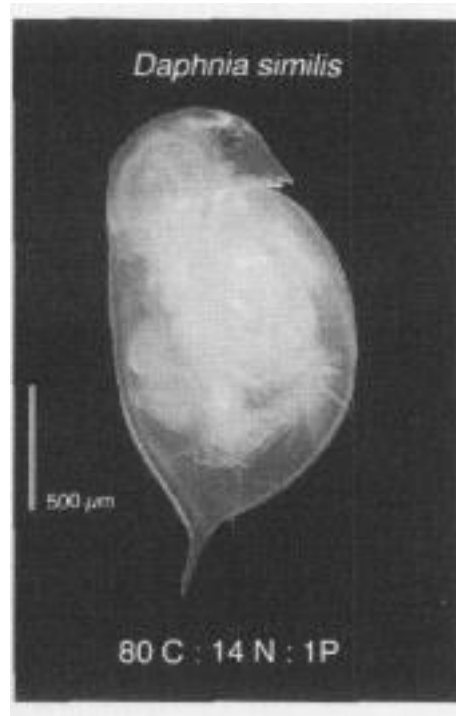
Stöchiometrie

Redfield ratio:

C:N:P = 106:16:1

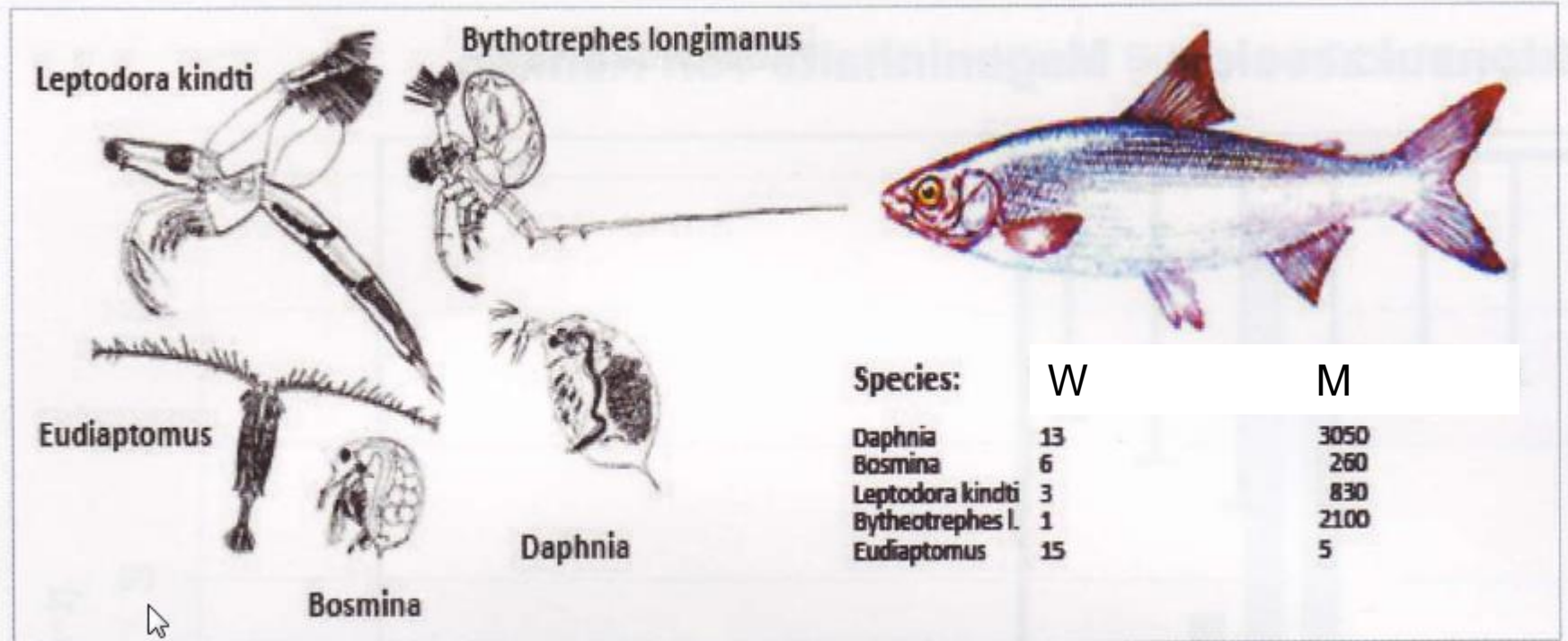


Stöchiometrie



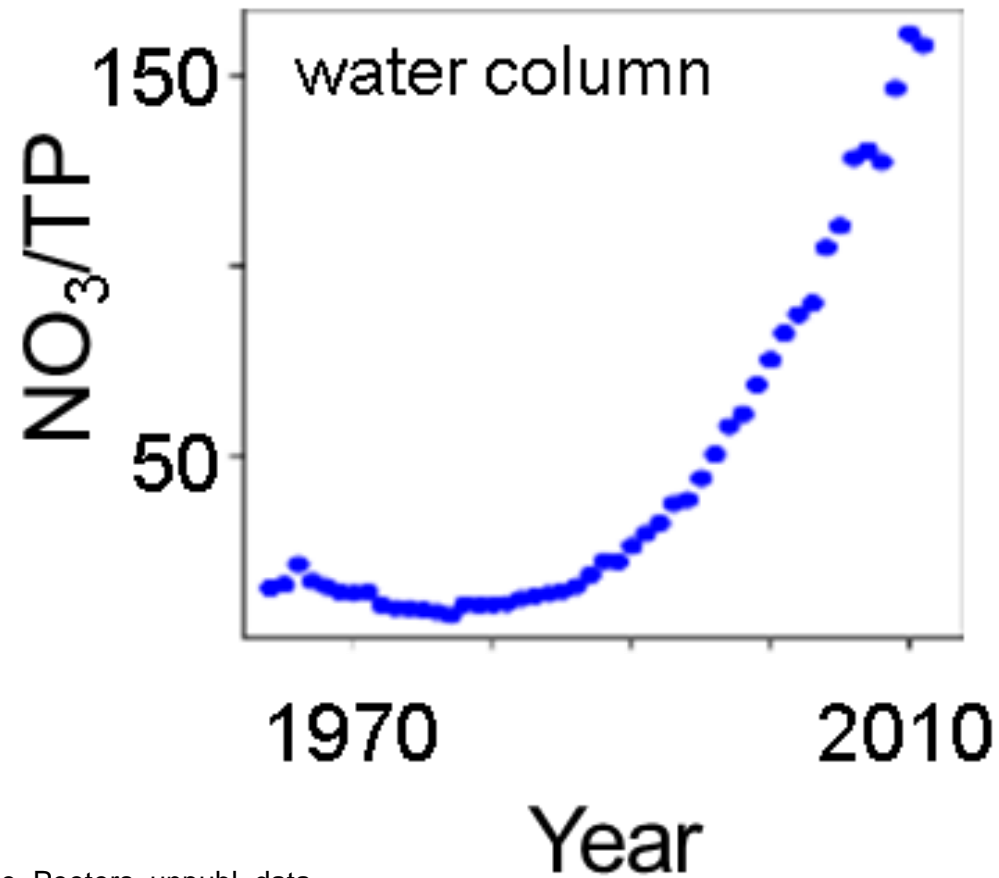
⇒ Daphnia reich an **P**; Copepoden reich an **N**

Selektivität



Die Renken sind sehr wählerisch. Zwischen der mittleren Zusammensetzung der Zooplankter im Chiemsee und im Renkenmagen ergeben sich erhebliche Unterschiede.

Bodensee

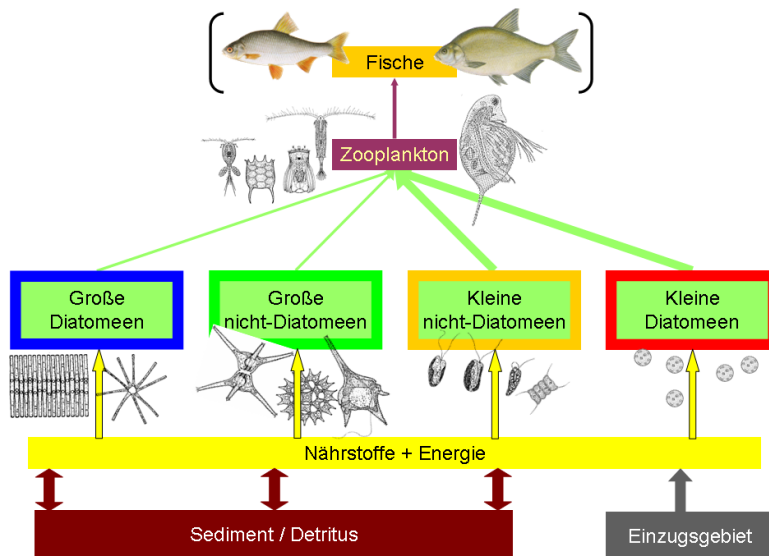
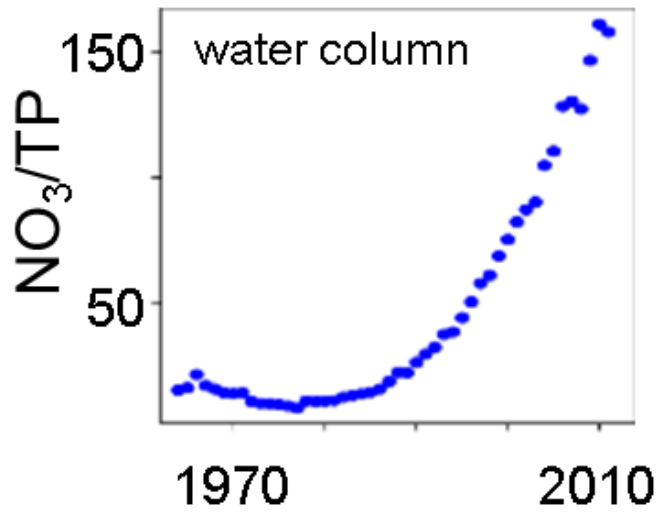


Straile, Peeters, unpubl. data

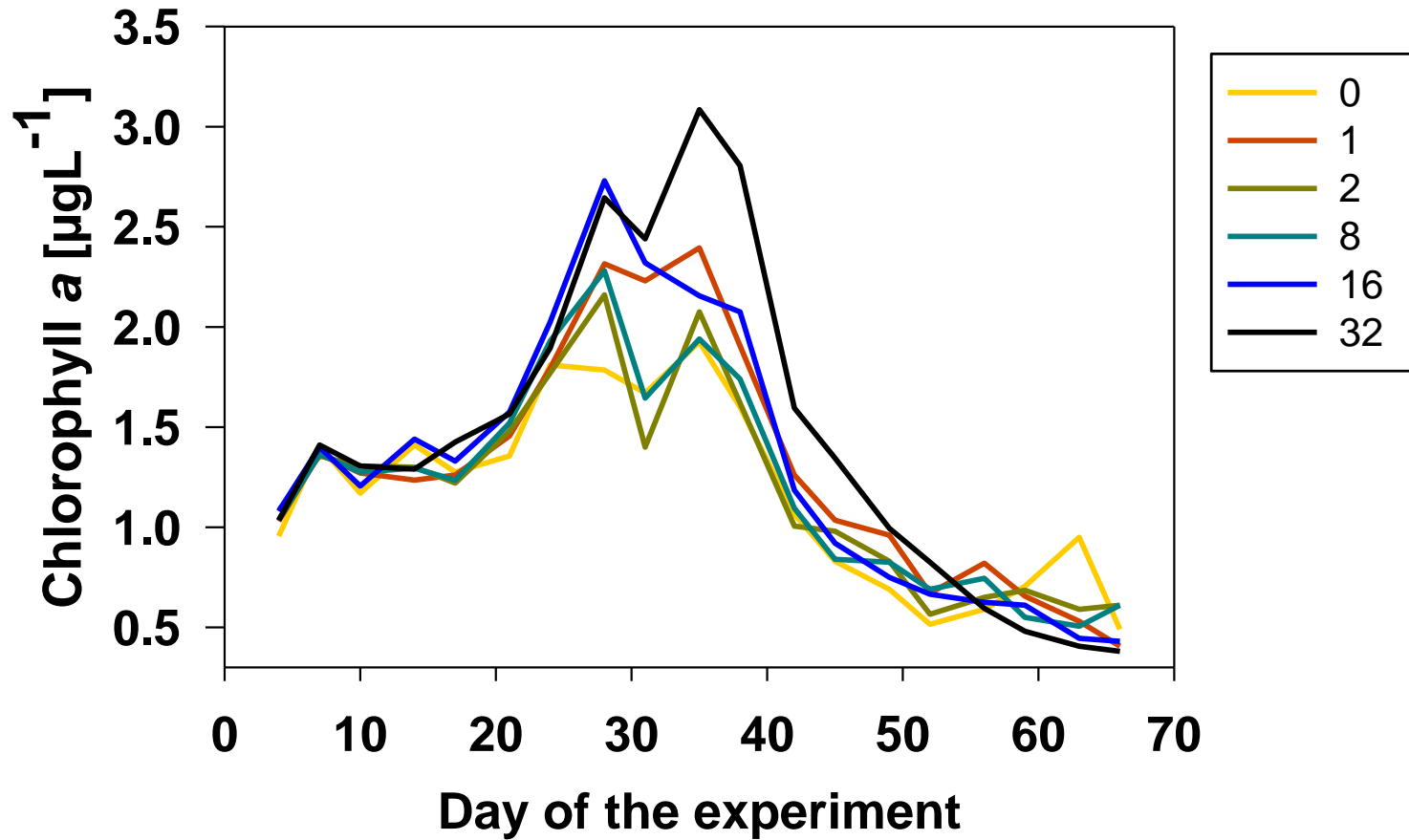
Experimentelle Ansätze



Veränderungen im Plankton

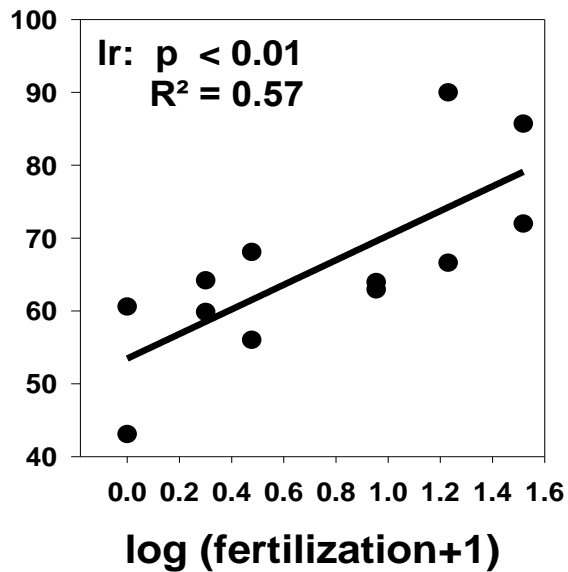


Phytoplankton

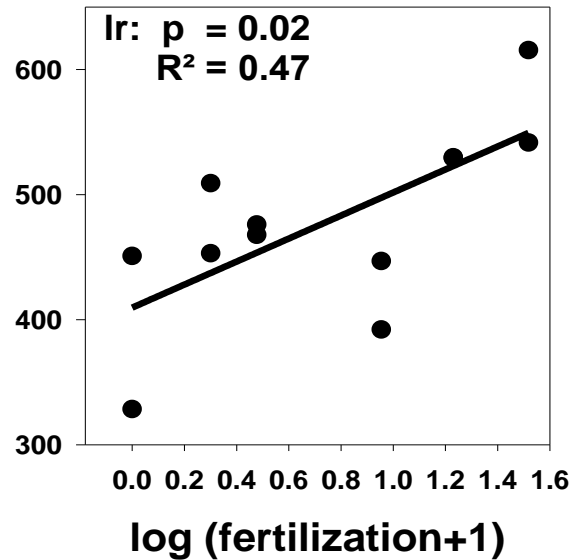


Stöchiometrie

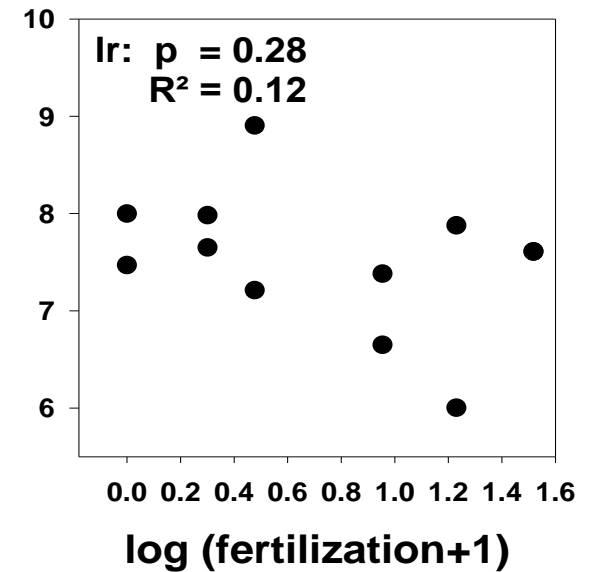
N/P



C/P

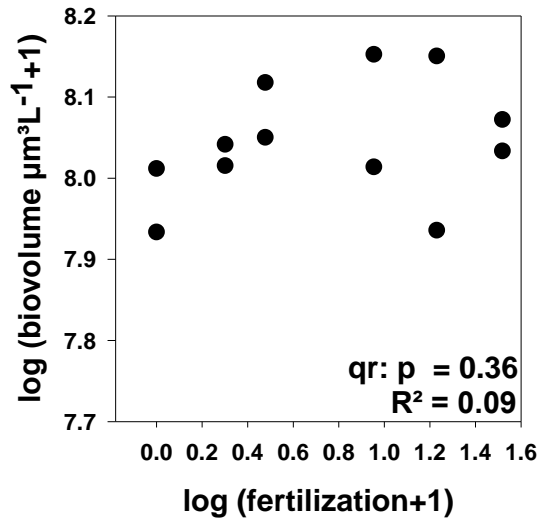


C/N

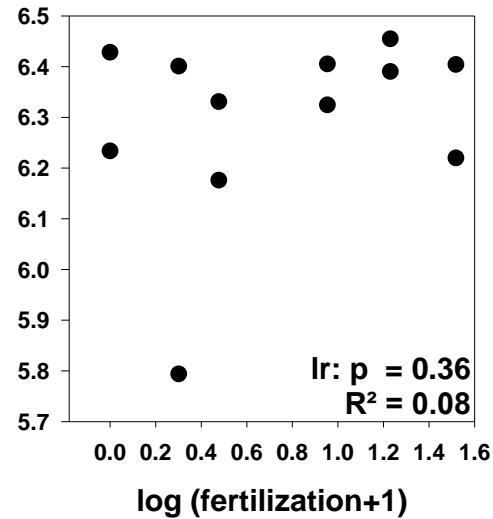


Taxonomische Veränderungen

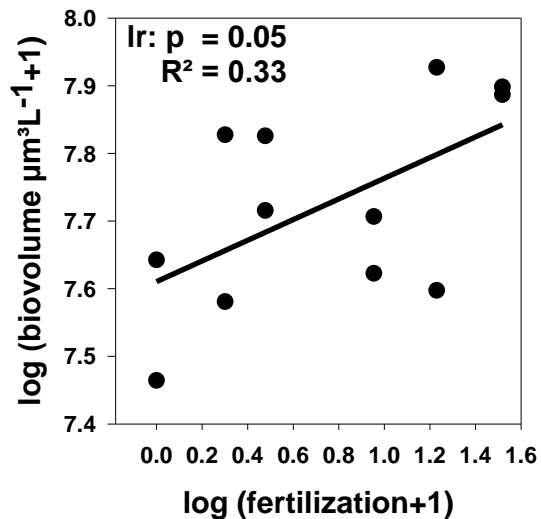
Bacillariophyceae



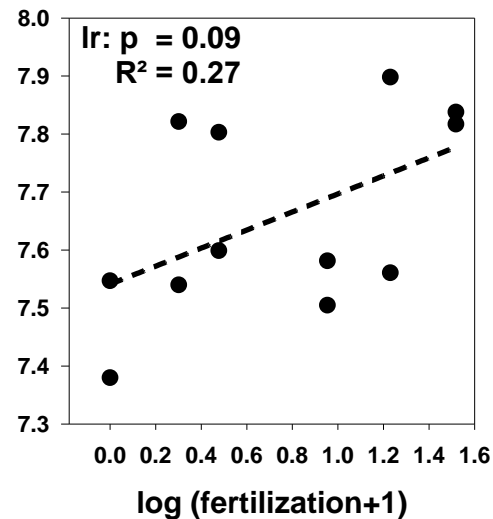
Fragilaria crotonensis



Chrysophytes



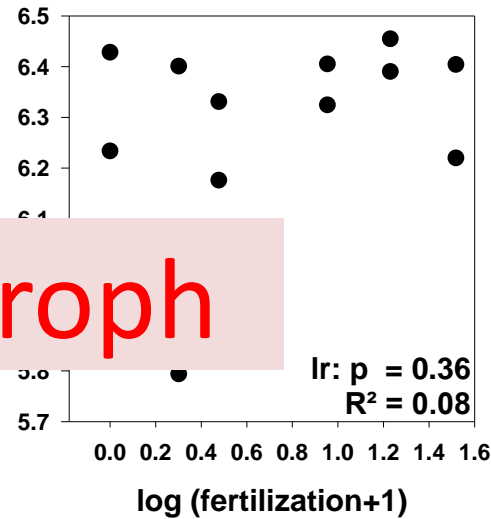
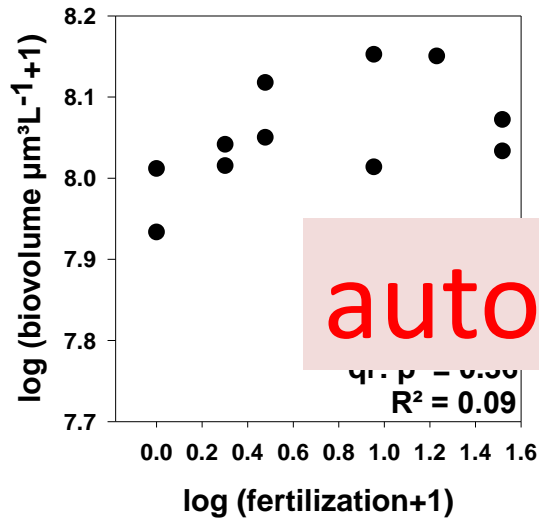
Dinobryon divergens



Taxonomische Veränderungen

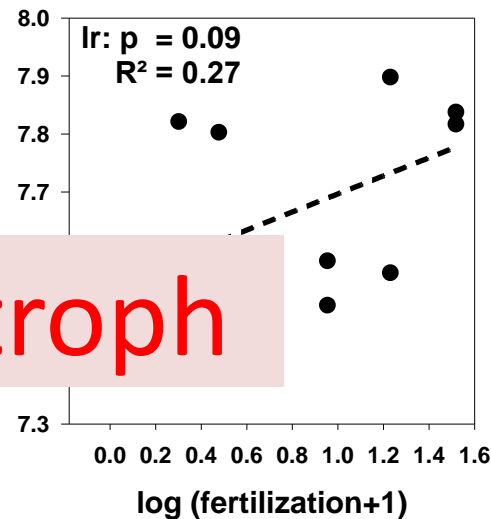
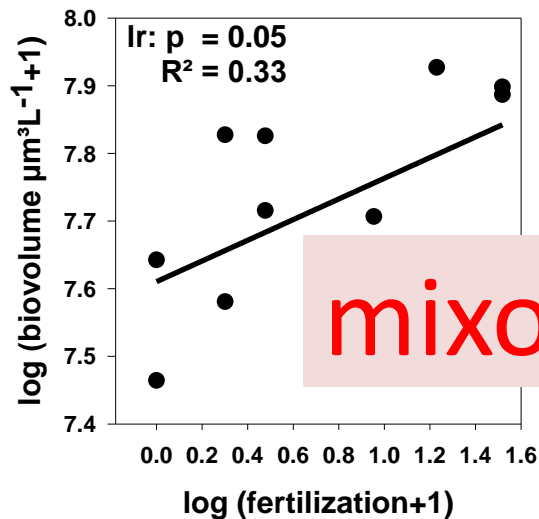
Bacillariophyceae

Fragilaria crotonensis

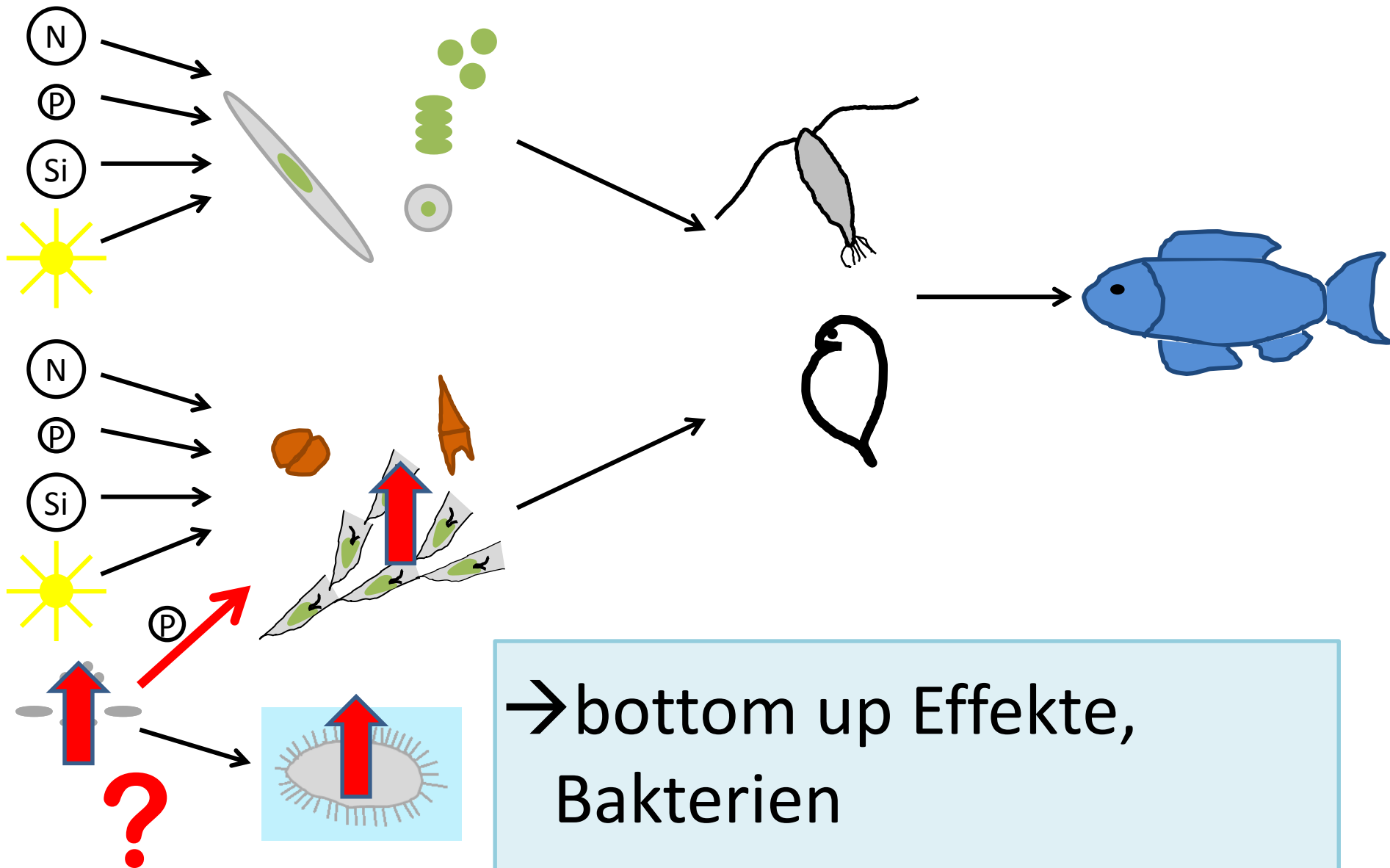


Chrysophytes

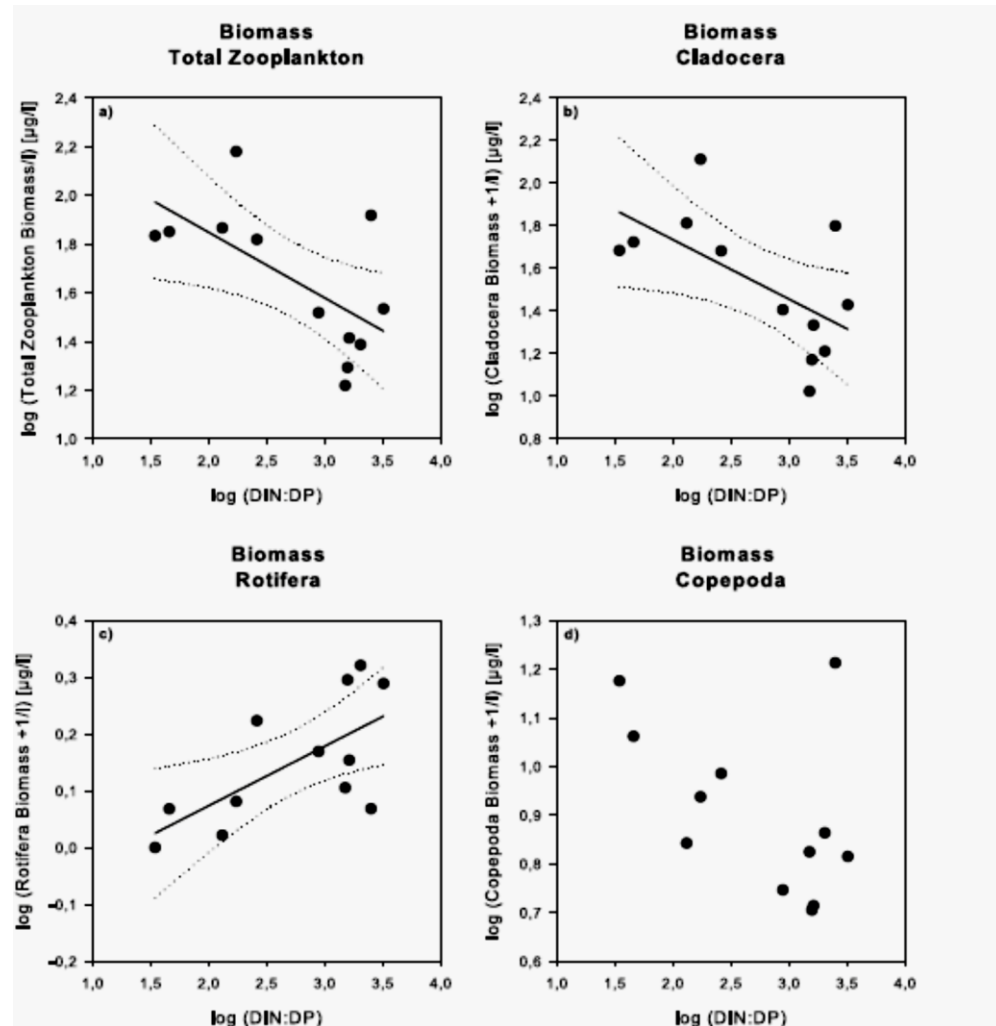
Dinobryon divergens



Mixotrophie

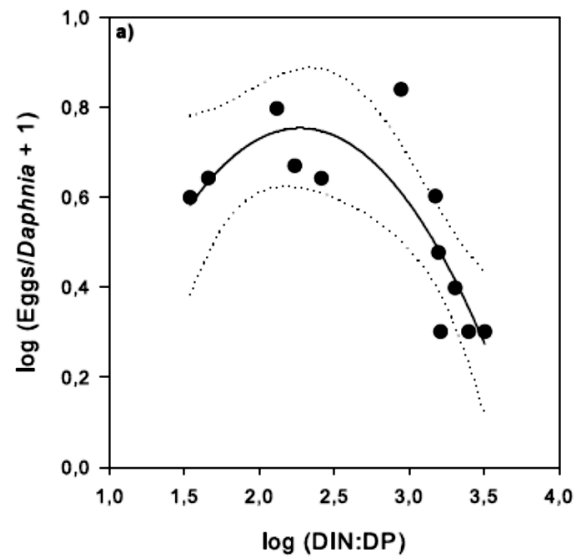


Zooplankton

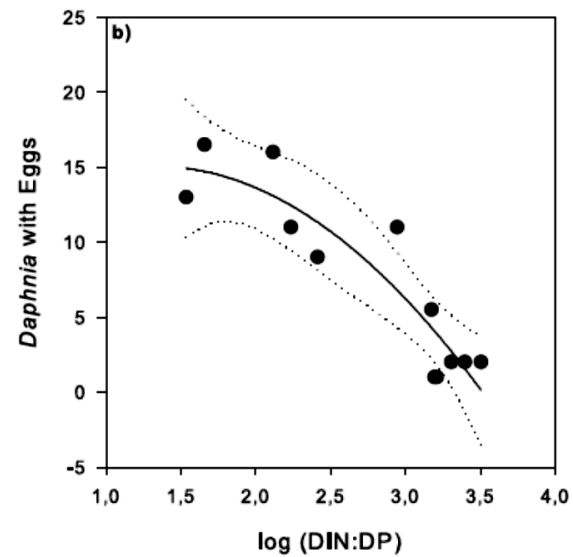


Zooplankton, Daphnia

Egg Production *Daphnia*



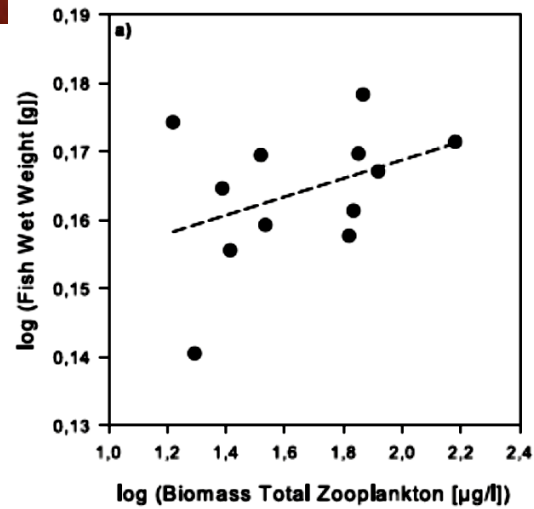
Egg Carrying *Daphnia*



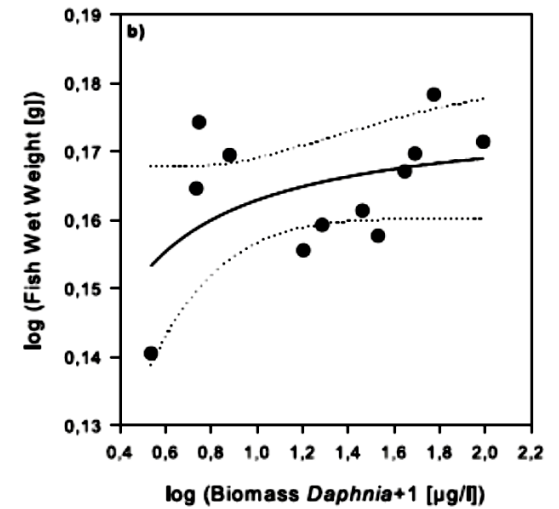
Fischwachstum



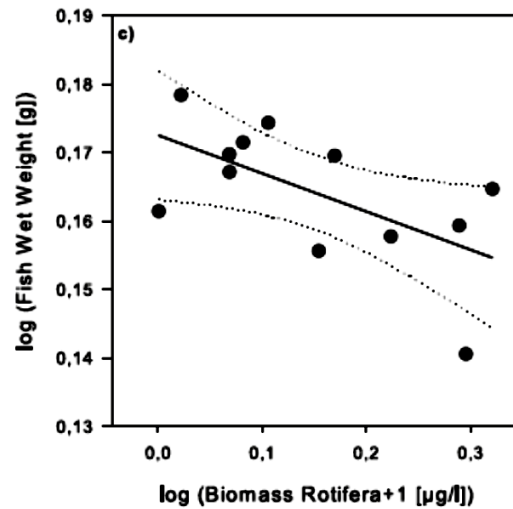
**Biomass
Total Zooplankton**



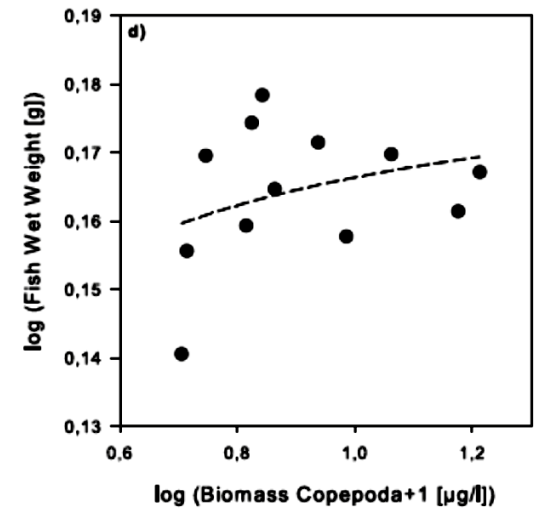
**Biomass
*Daphnia***



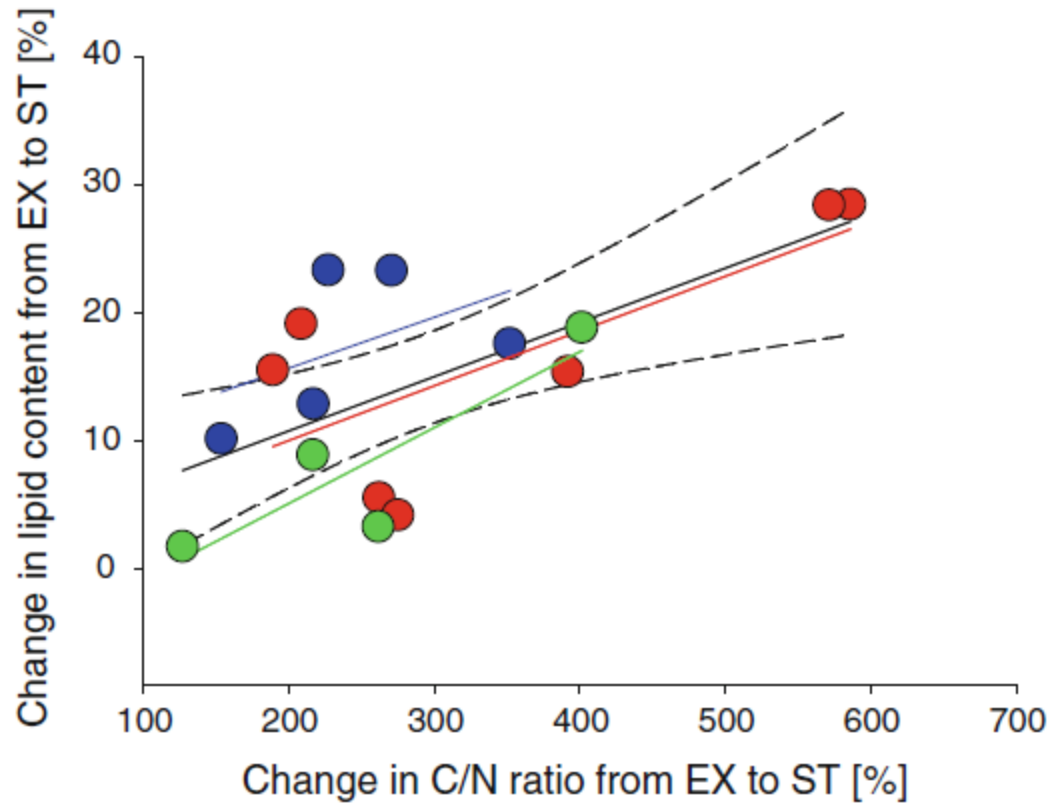
**Biomass
Rotifera**



**Biomass
Copepoda**

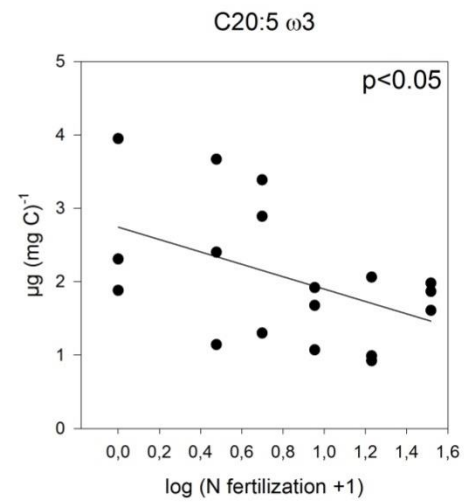
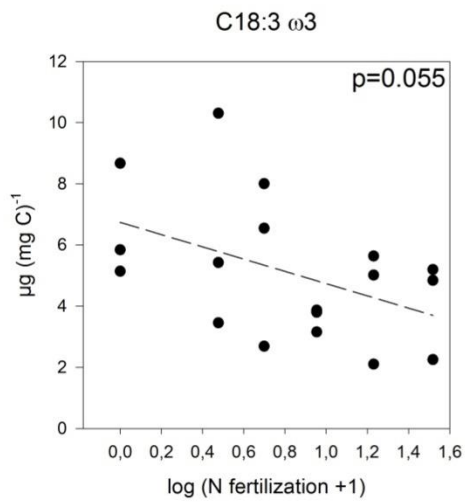


Fettsäuren



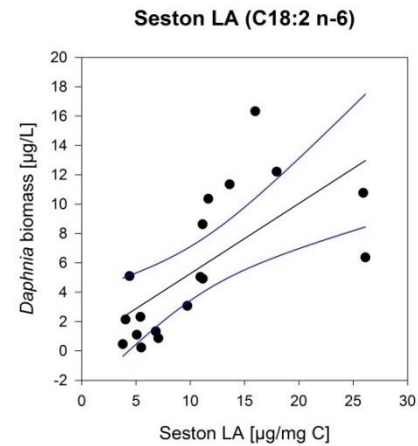
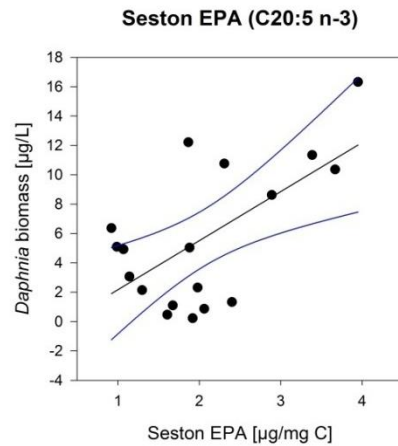
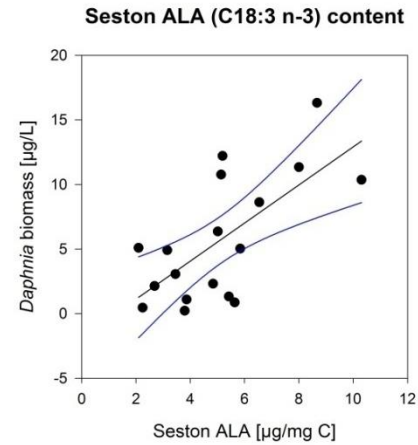
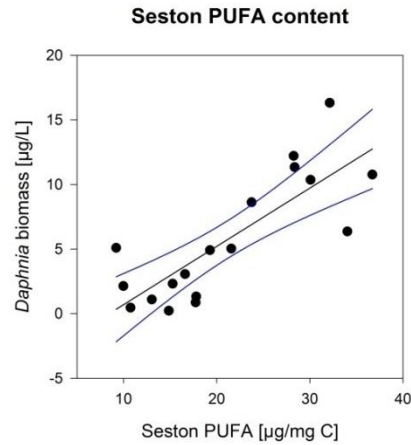
Schwenk et al. 2013, Aquat Ecol, DOI 10.1007/s10452-013-9454-z

Fettsäuren

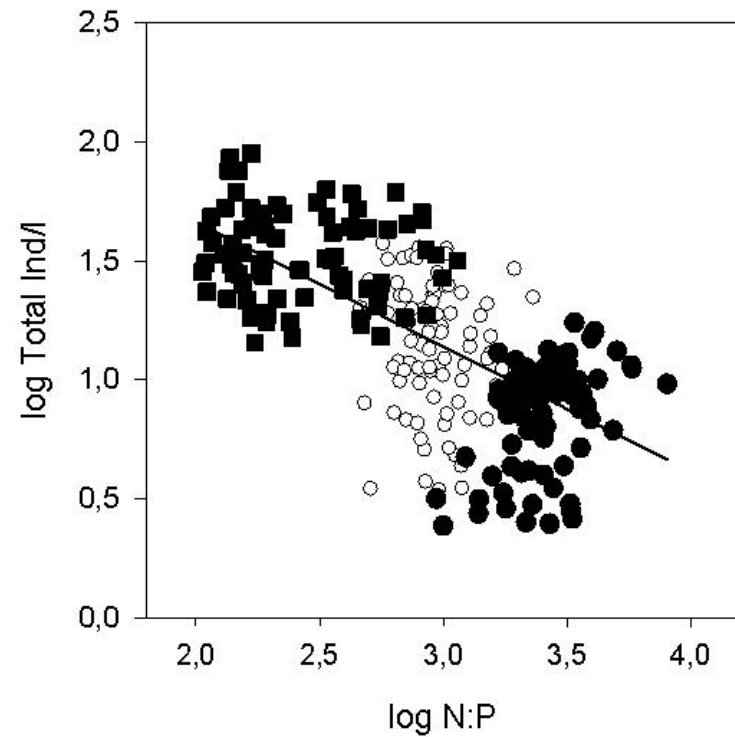
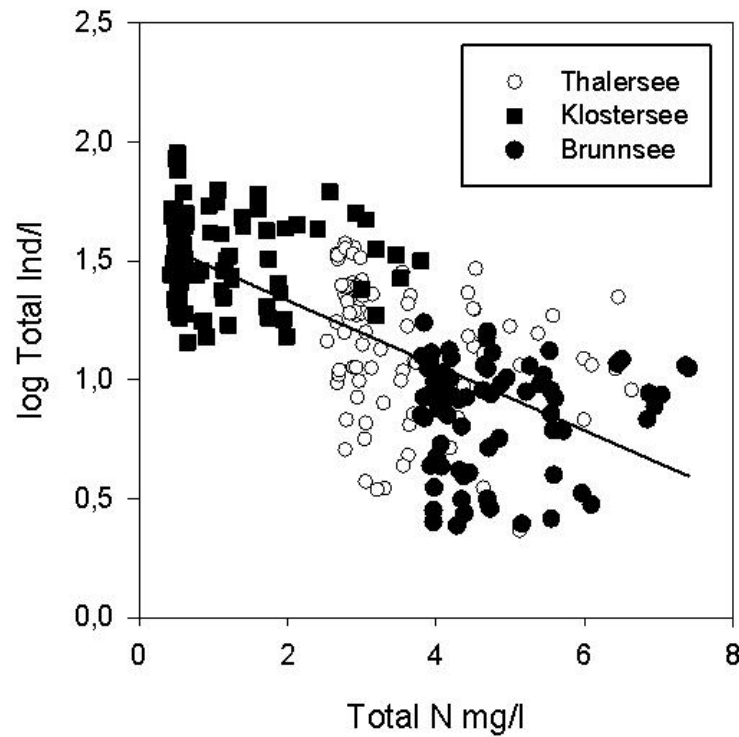


Trommer et al. in prep.

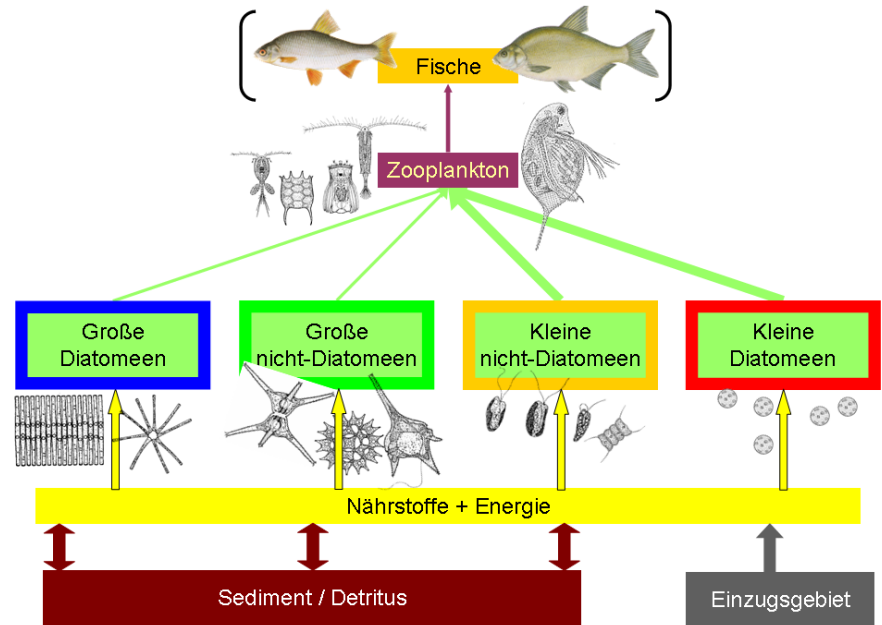
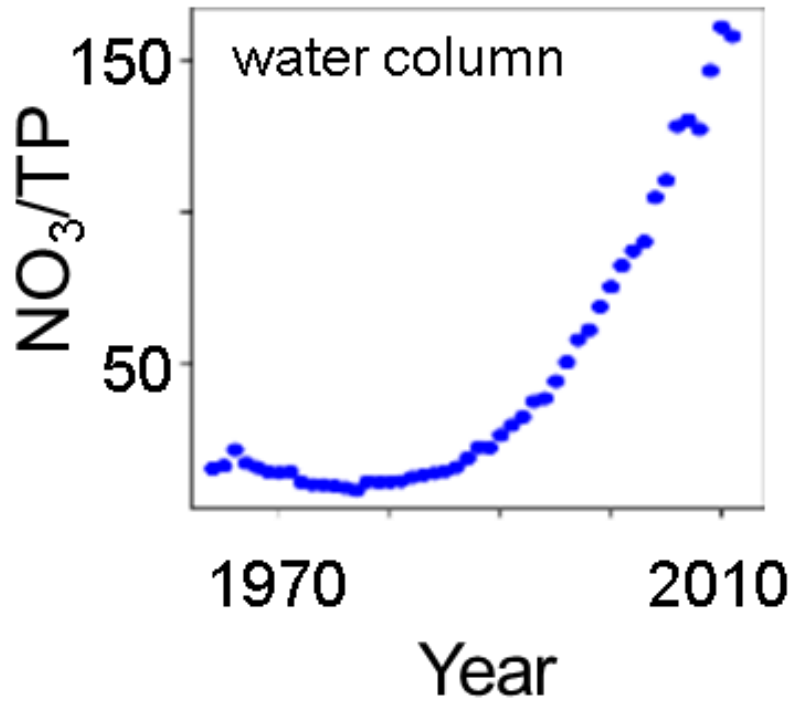
Fettsäuren



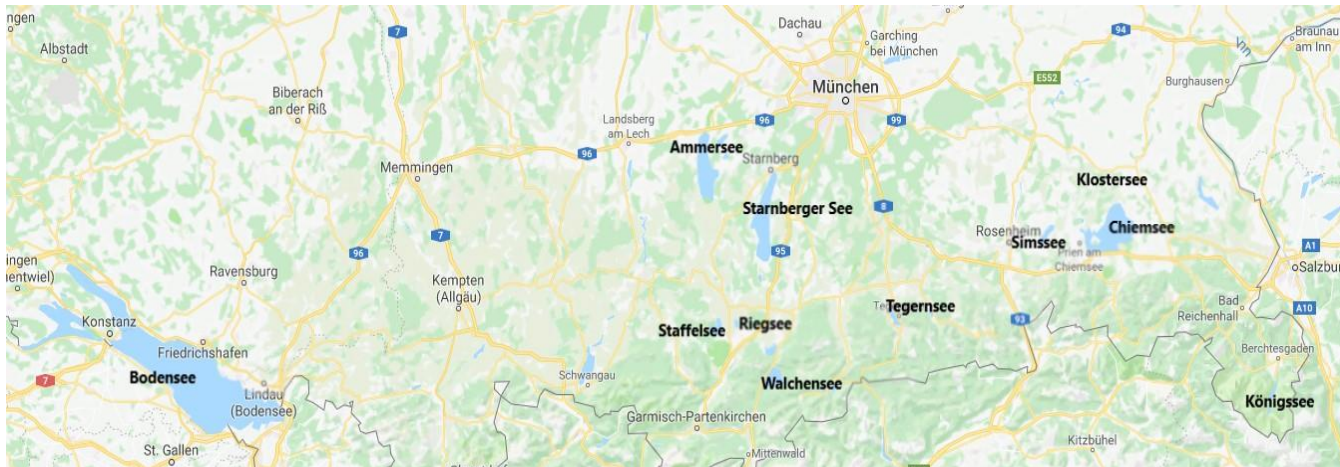
Zooplankton: N, N:P



Freiland?



Bayerische Seen



Übersichtskarte der untersuchten Seen.
(Google Maps, 2018)

11 Seen

Ammersee

Bodensee

Chiemsee

Königssee

Riegsee

Seeoner See

Simssee

Staffelsee

Starnberger See

Tegernsee

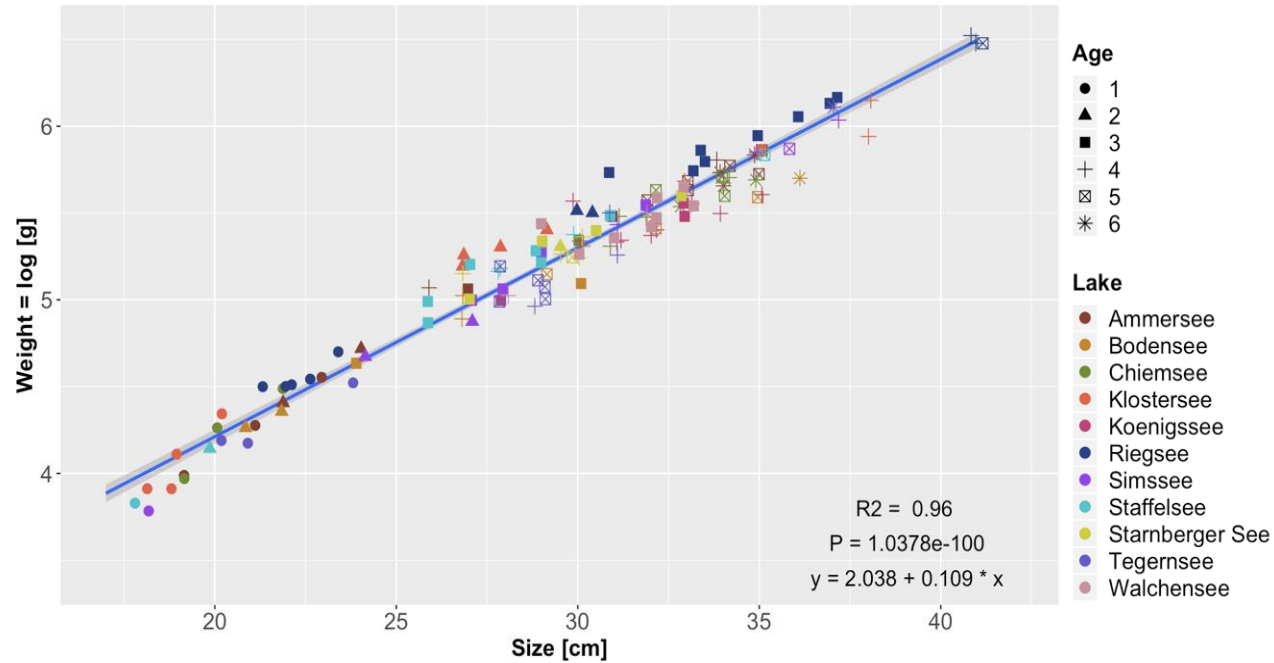
Walchensee

Bayerische Seen

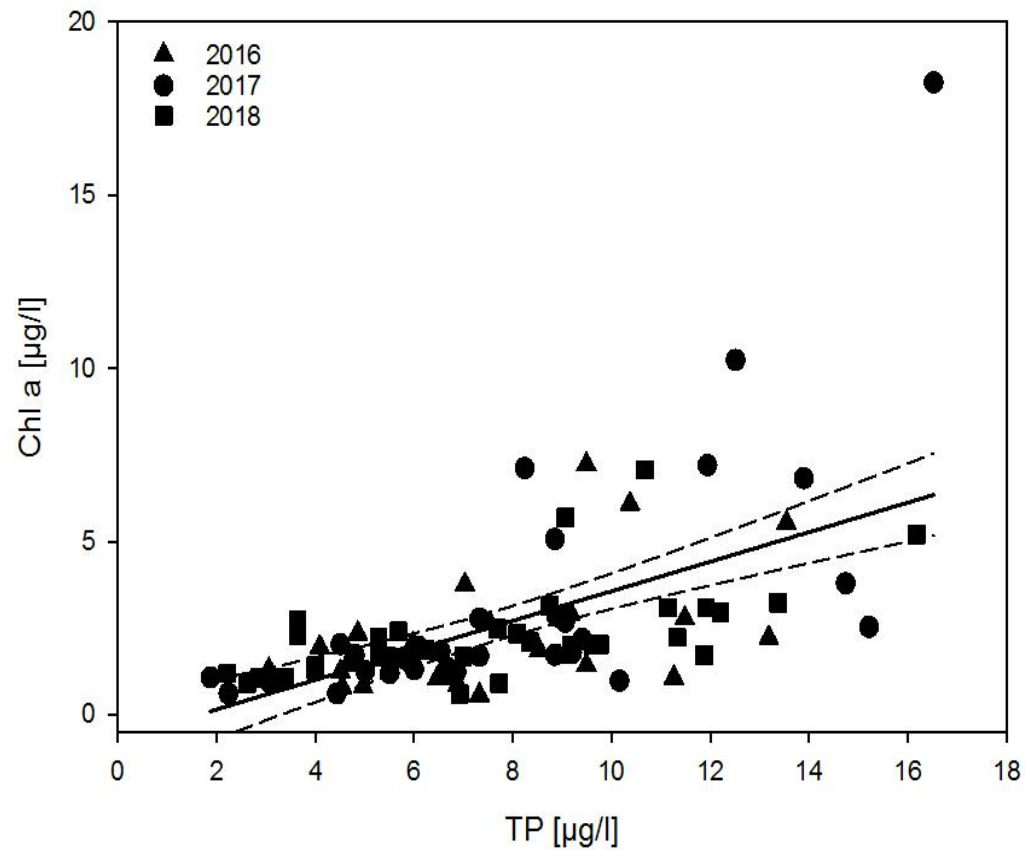
See	Koordinaten	Volumen [Mio. m ³]	Fläche [km ²]	Tiefe _{max} [m]	Durchschnittstiefe [m]	EZG [km ²]	TP [µg/l]	Trophiestufe
Ammersee	48.03°N, 11.11°E	1750	46,6	81,1	37,6	993	6,9	Oligotroph
Bodensee-Obersee	47.35°N, 12.58°E	48522	571,5	254,0	84,9	11488	6,7	Oligotroph
Chiemsee	47.87°N, 12.45°E	2048	79,9	73,4	25,6	1399	5,3	Oligotroph
Klostersee	47.97°N, 12.45°E	2,8	0,5	16	5,9	4,5	16,2	Mesotroph
Königssee	47.33°N, 12.58°E	511	5,3	189	93,1	137,6	3,6	Ultra-oligotroph
Riegsee	47.22°N, 11.14°E	12,8	2,0	15,4	6,8	0,4	10,7	Mesotroph
Simssee	47.88°N, 12.25°E	87	6,6	22,5	13,4	--	9,1	Oligotroph-mesotroph
Staffelsee	47.69°N, 11.16°E	74,9	7,7	39,4	9,8	80,7	9,7	Oligotroph
Starnberger See	47.91°N, 11.31°E	2999	56,4	127,8	53,2	315	5,3	Oligotroph
Tegernsee	47.72°N, 11.73°E	324	9,1	72,2	36,6	210,5	3,4	Ultra-oligotroph
Walchensee	47.59°N, 11.32°E	1324	16,3	189,5	80,8	779,3	2,6	Ultra-oligotroph



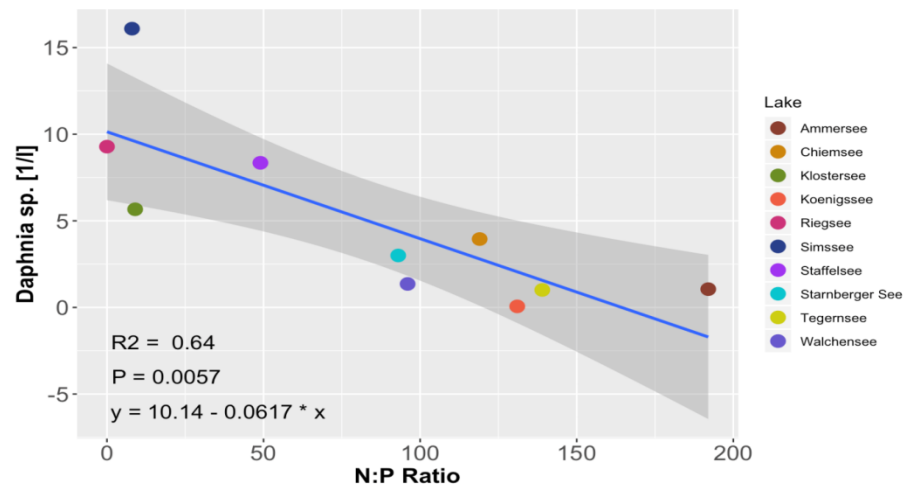
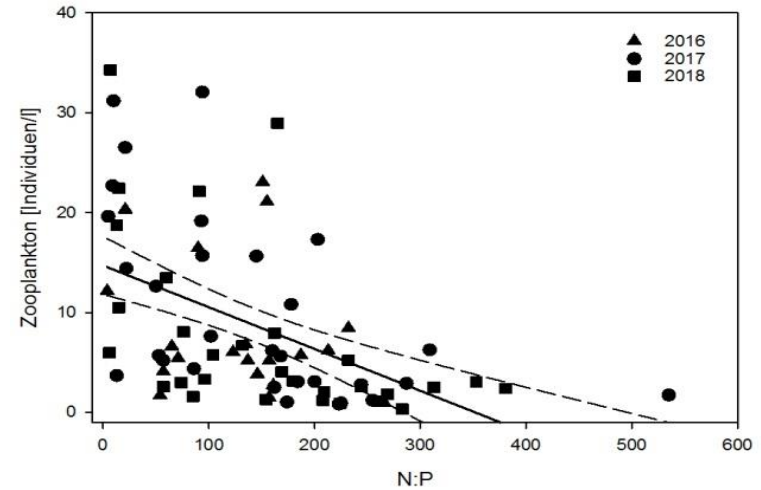
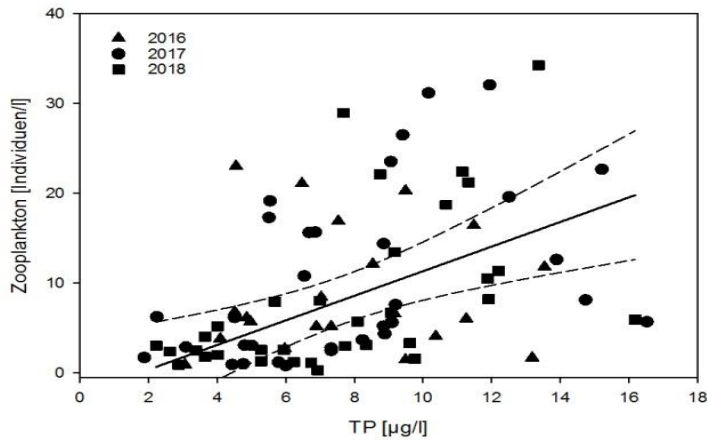
Bayerische Seen: Renkenwachstum



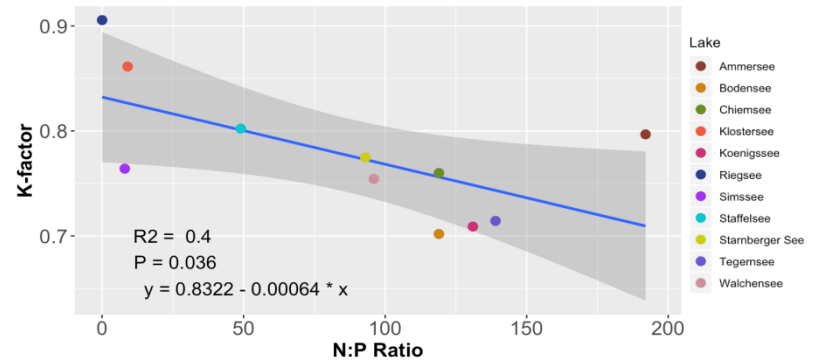
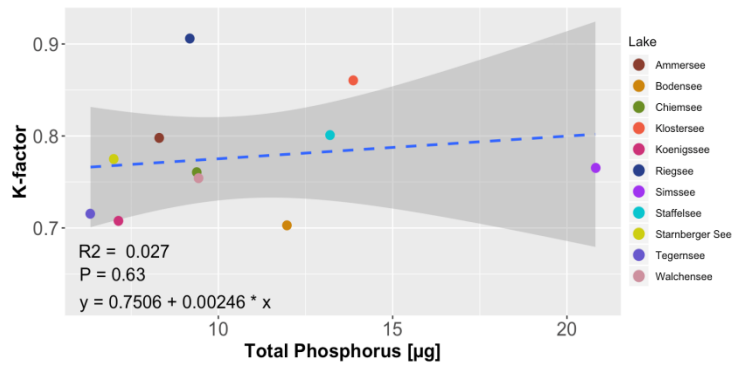
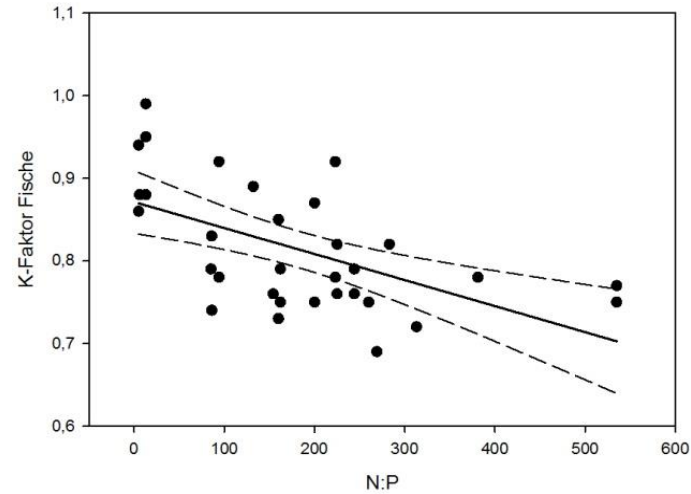
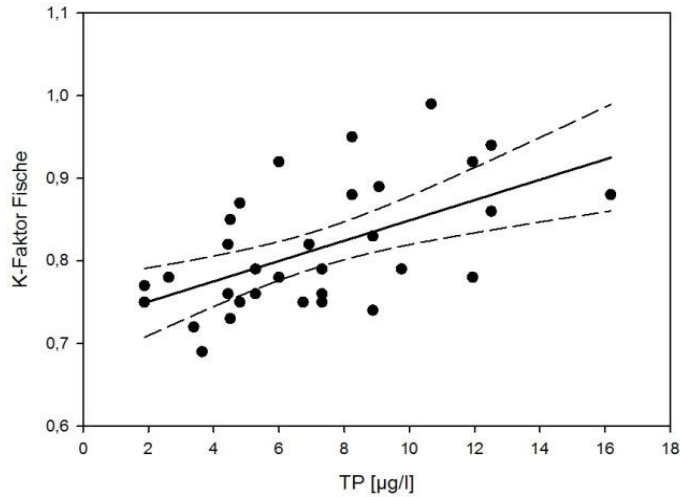
Bayerische Seen: P und Phytoplankton



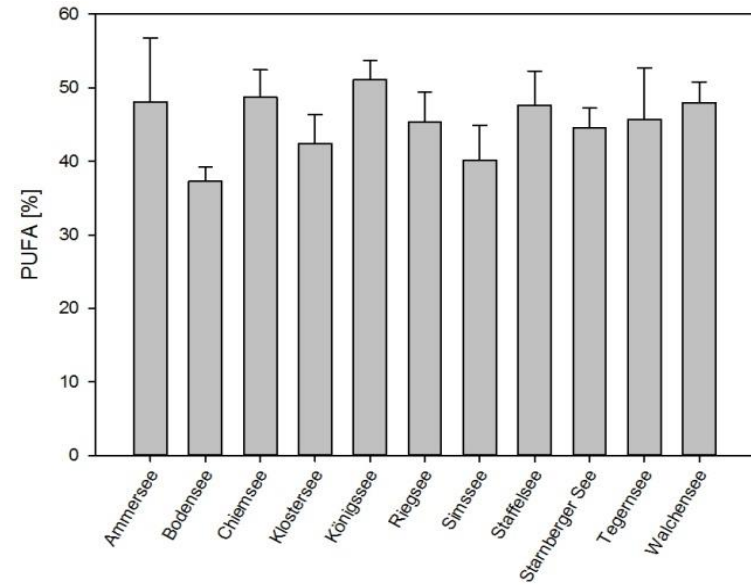
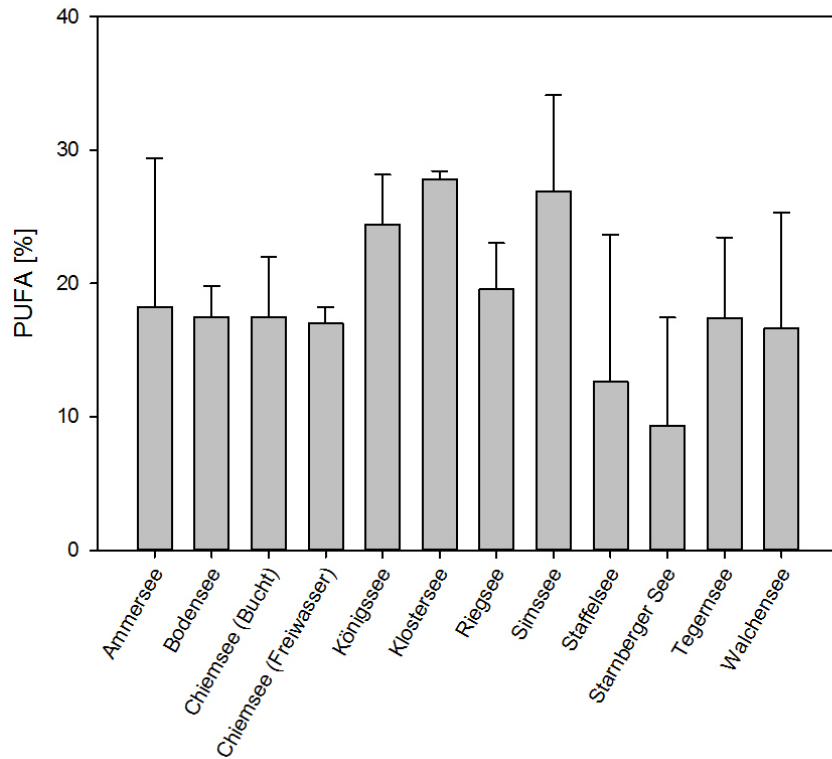
Bayerische Seen: P und Zooplankton



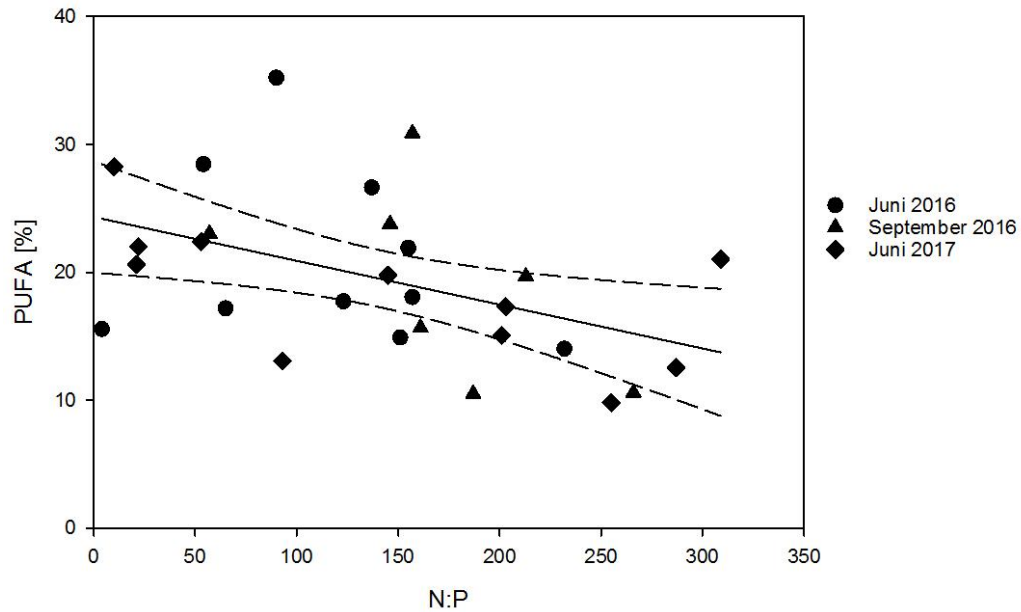
Bayerische Seen: P und Fische



Bayerische Seen: Fettsäuren



Bayerische Seen: Fettsäuren & N:P



Veränderungen im Plankton

