

Nutriëntenbelasting als stuurmechanisme

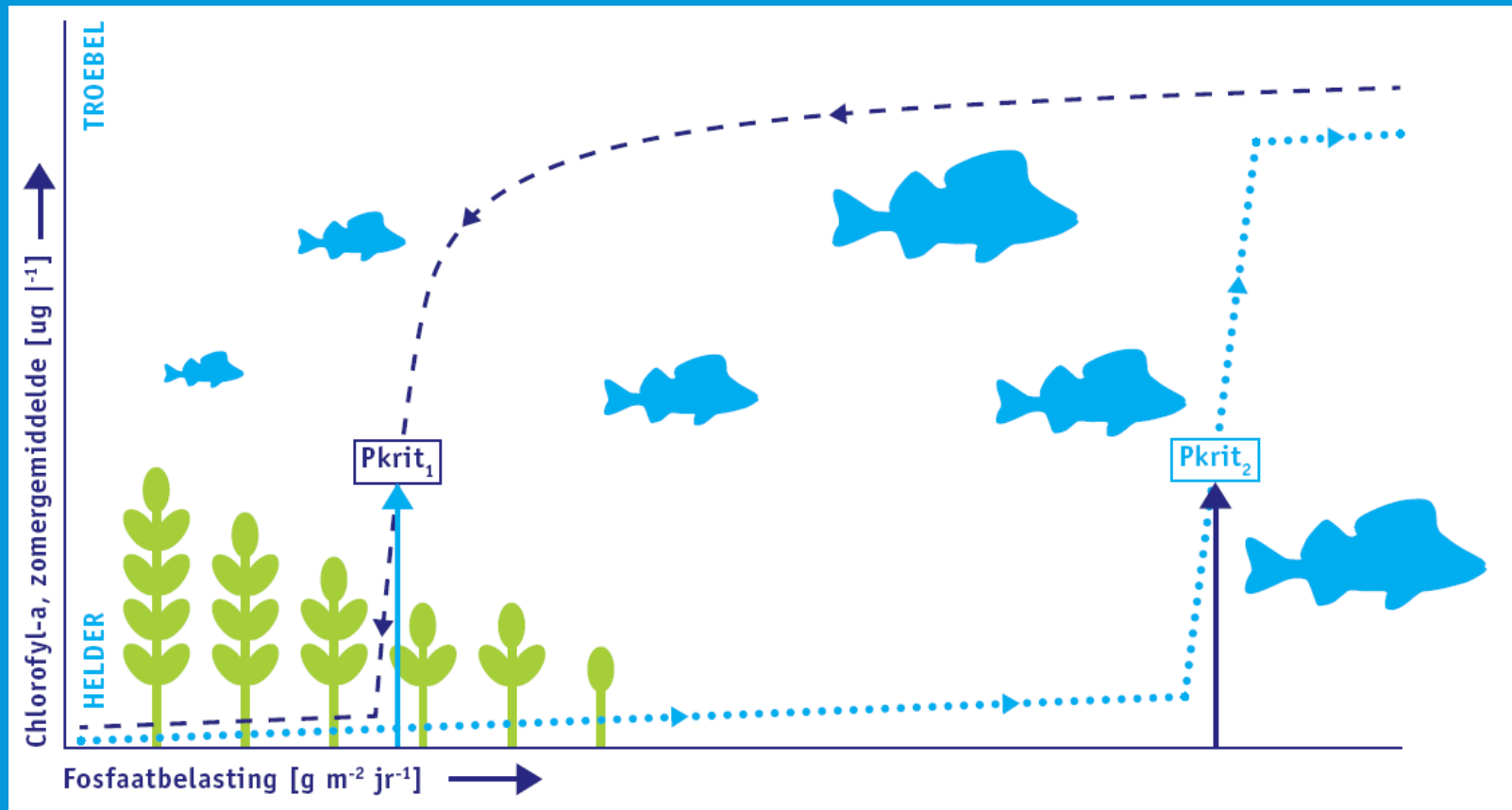


Sebastiaan Schep

Inleiding

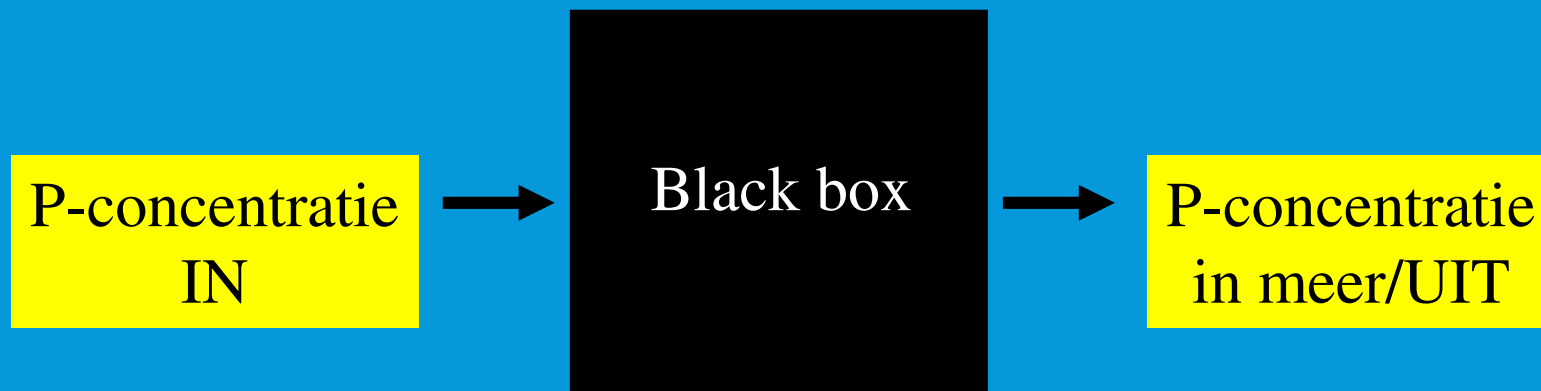
- Van helder naar troebel... en weer terug
- Van concentratie naar belasting... en waarom?
- Cases
 - Oldambtmeer / Blauwe Stad
————> voorbeeld ruimtelijke analyse
 - Loenderveense Plas en Terra Nova
————> voorbeeld historische analyse
————> effect klimaatverandering
 - Eendragtspolder
————> aanpassing uitgangspunten planfase

Van helder naar troebel...

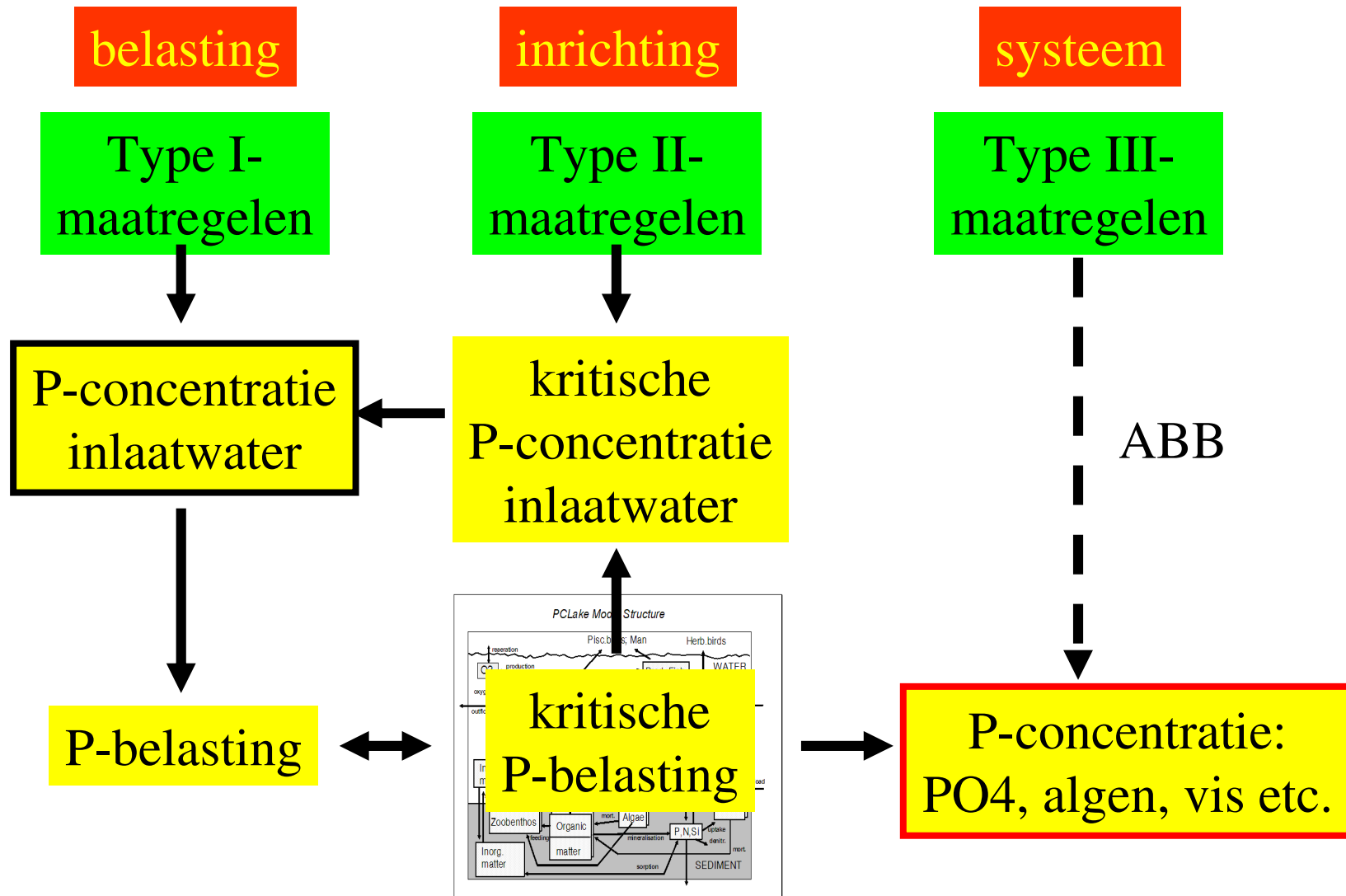


Waarom belasting?

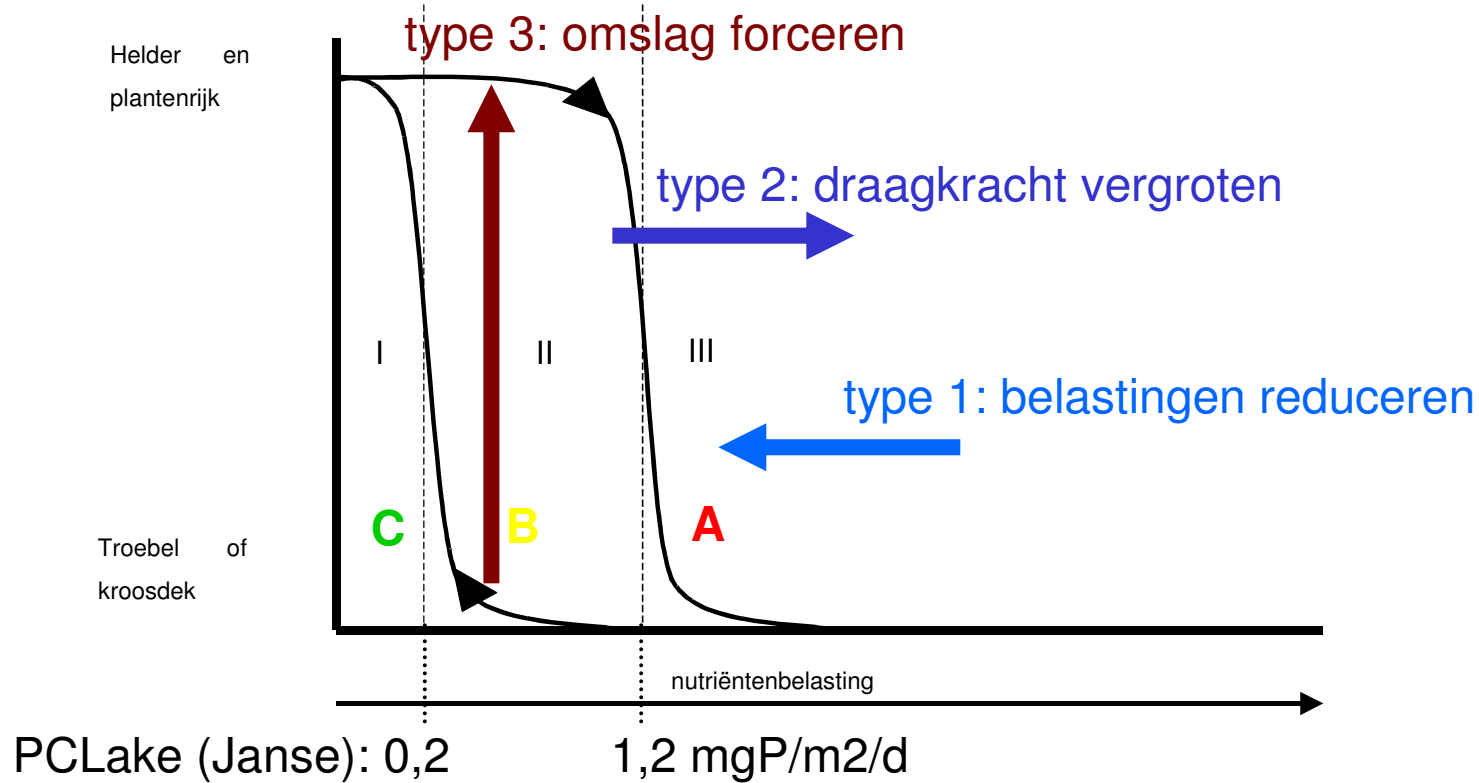
- nutriëntenbelasting in plaats van concentratie:
 - P of N concentratie afhankelijk van toestand (helder of troebel);
 - P of N concentratie afhankelijk van systeemkenmerken;
 - duidelijke koppeling met bronnen en maatregelen, kwantificeerbaar!.



Afh. Systeem, maatregelen



Spoor 1: belastingenspoor

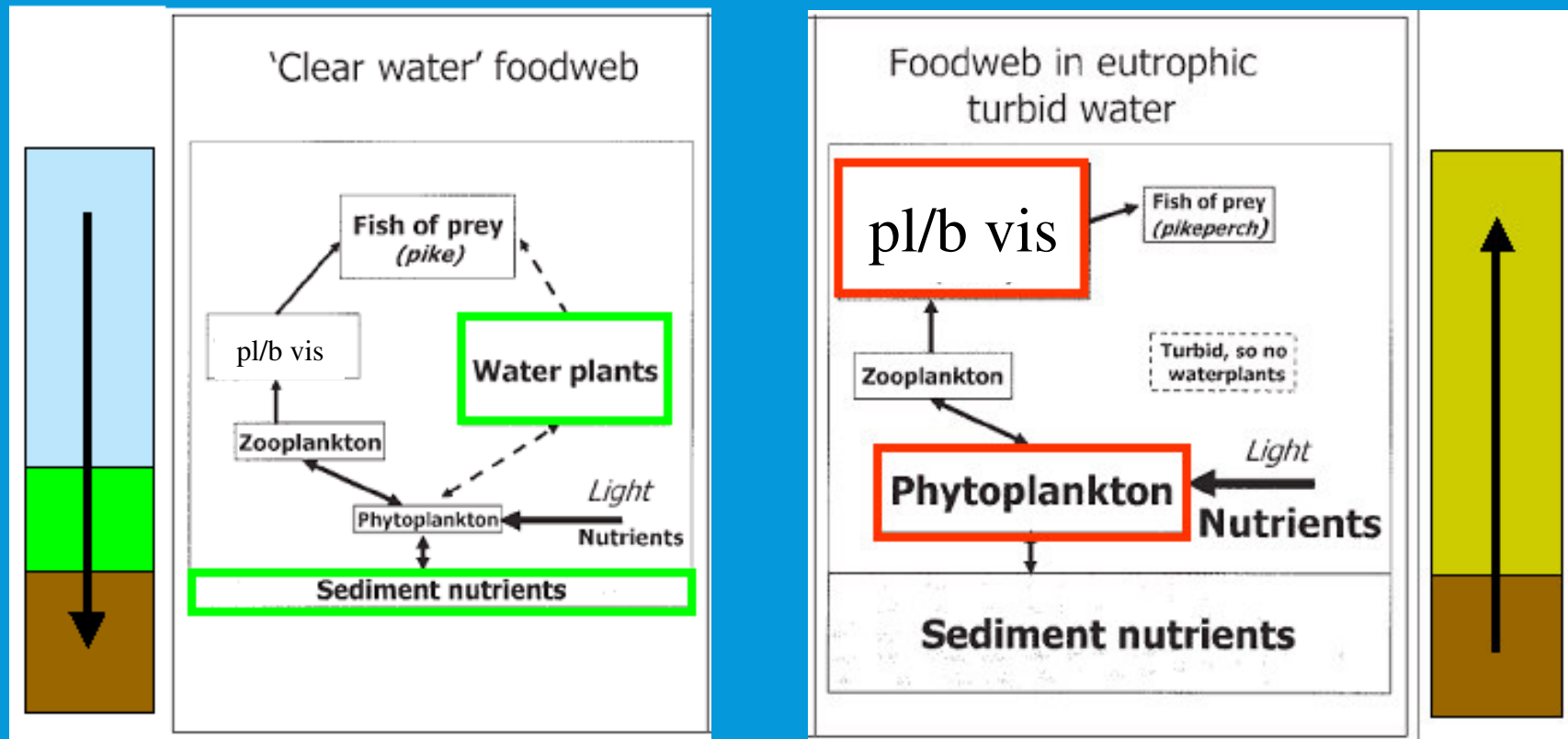


Helder versus troebel

Ecological state

Clear: water plants

Turbid: algae



Wat hebben we nodig?

Systeem op hoofdlijnen

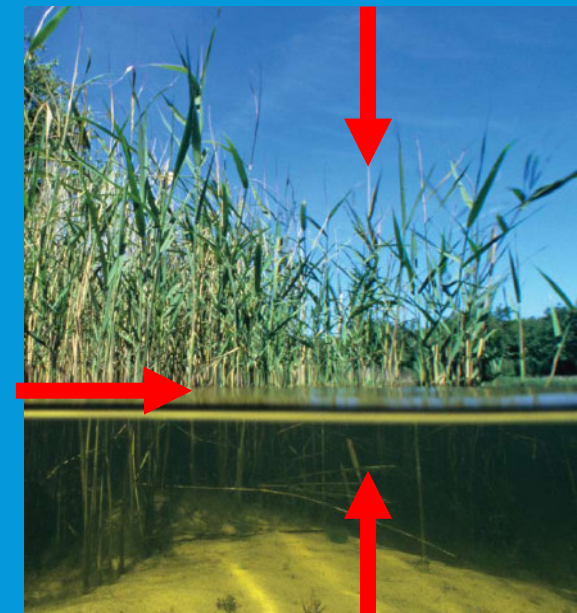
waterbalans:

- neerslag, verdamping;
- kwel en wegzijging;
- in- en uitlaat;
- polders;
- overig: o.a. lozingen;

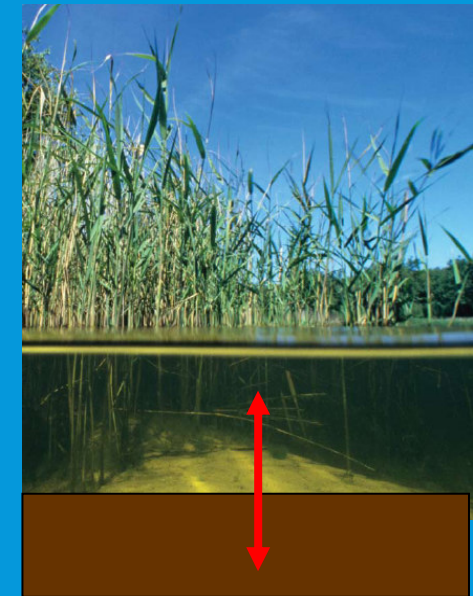
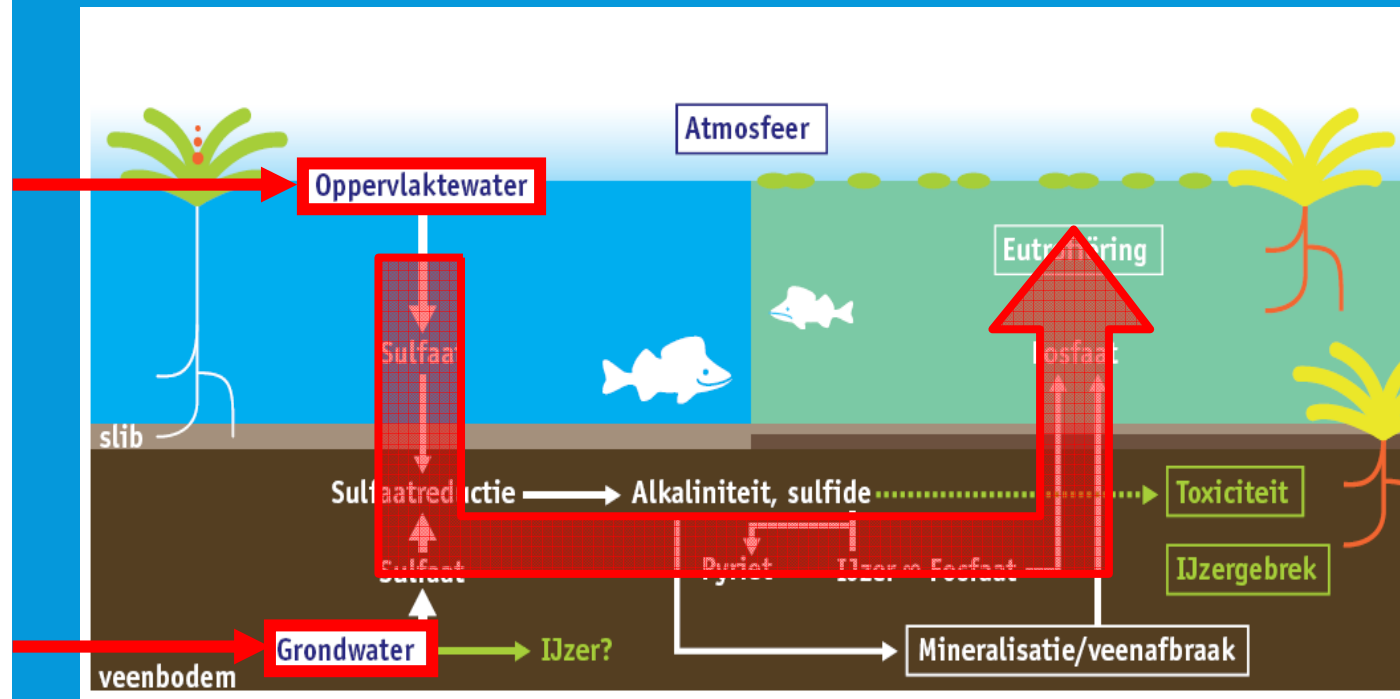
stoffenbalans:

- debieten (m^3/dag , mm/d) en concentraties (g/m^3)

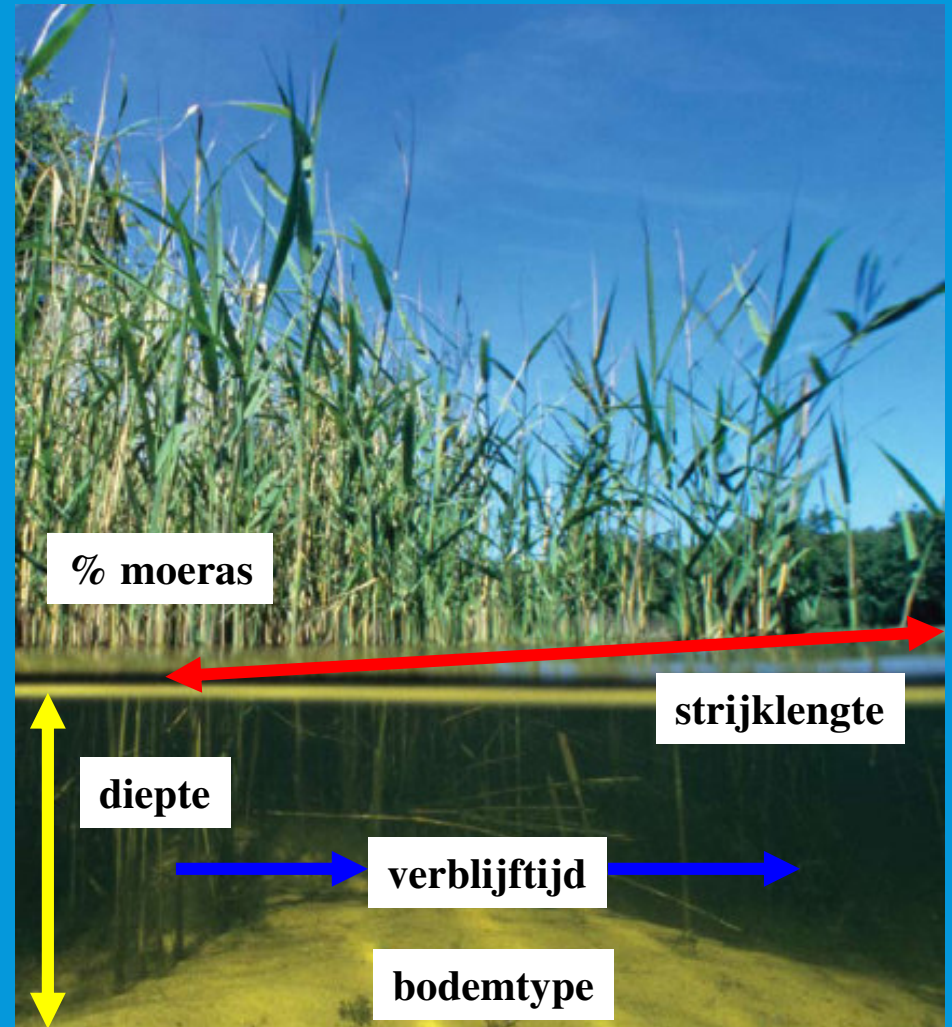
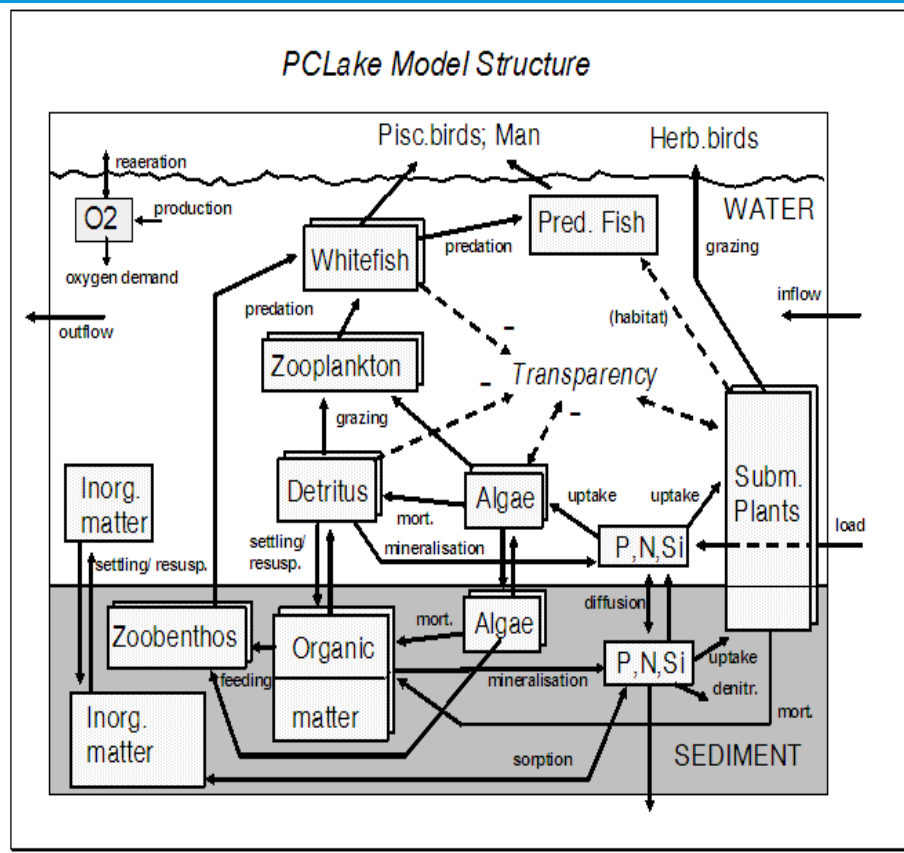
Externe belasting



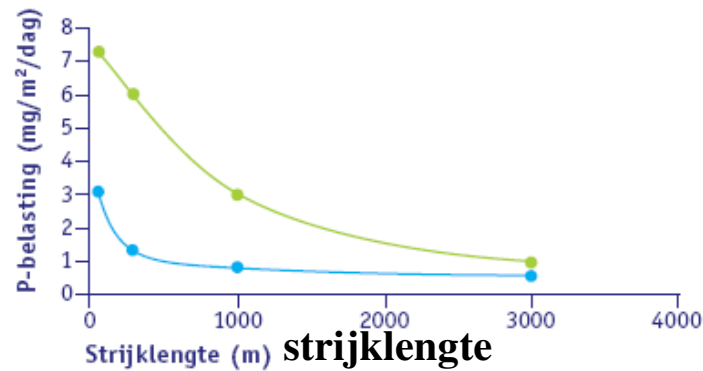
Interne belasting



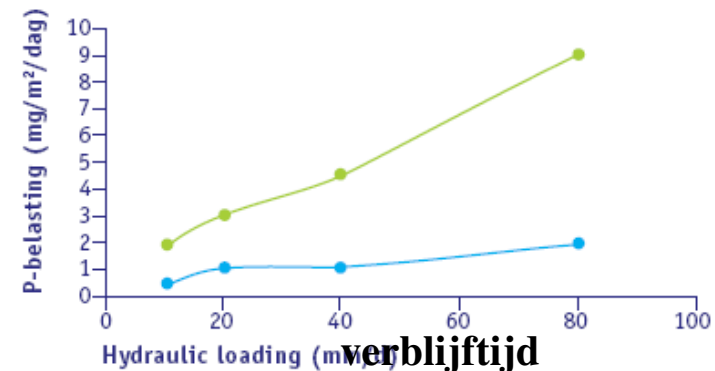
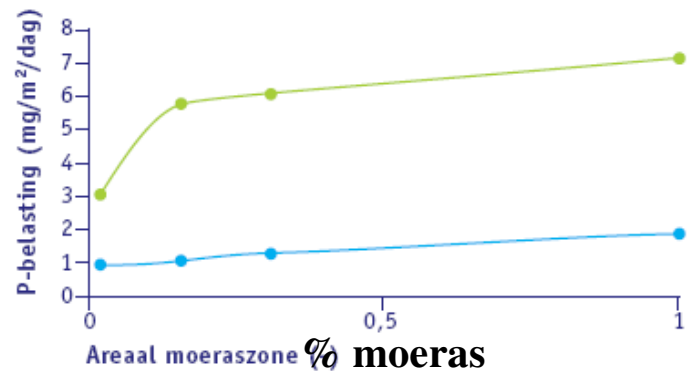
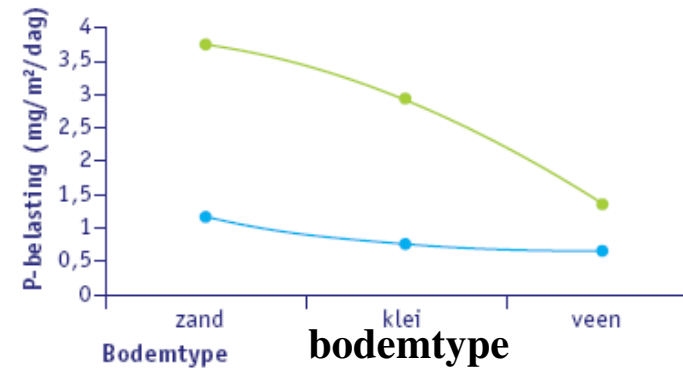
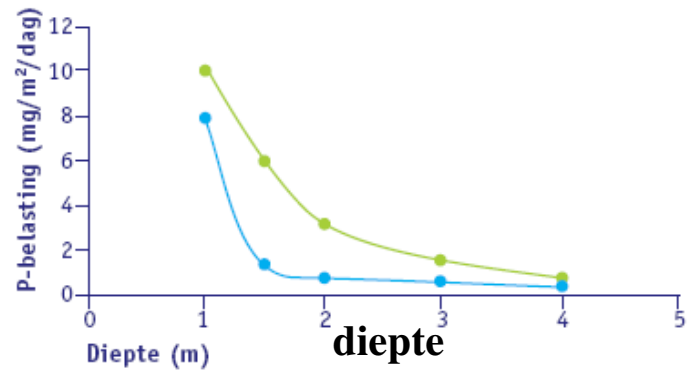
Kritische belasting



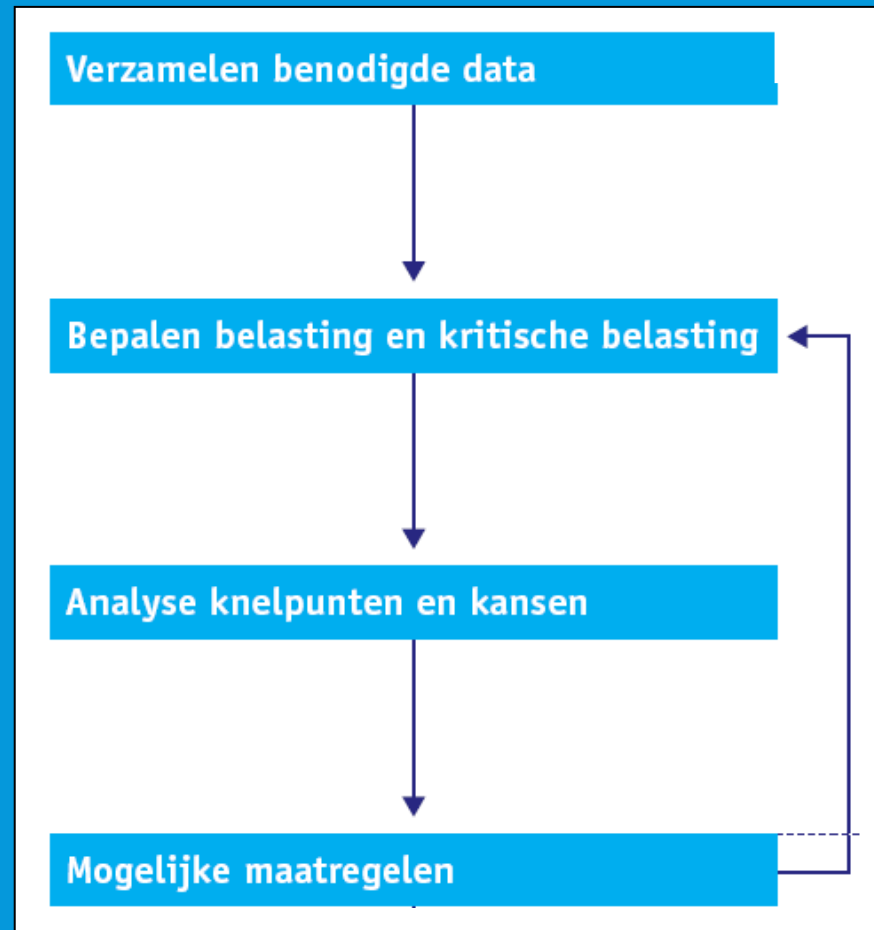
Kritische belasting



— HEEN: van helder naar troebel
— TERUG: van troebel naar helder



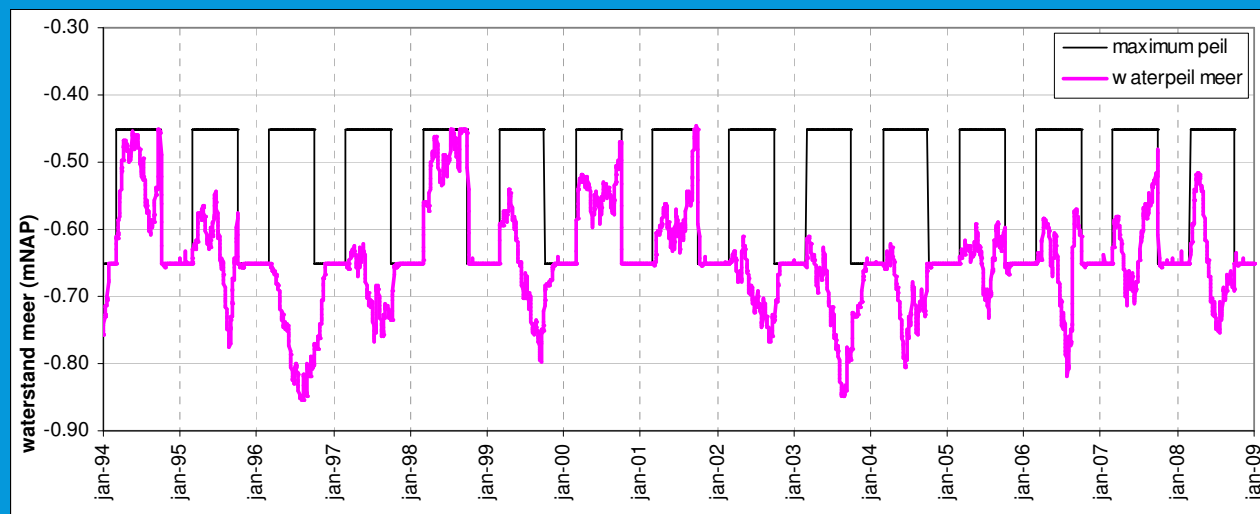
Methodiek



Case Oldambtmeer/Blauwe Stad



Scenario: -0,85 tot -0,45 m NAP



Inlaat:

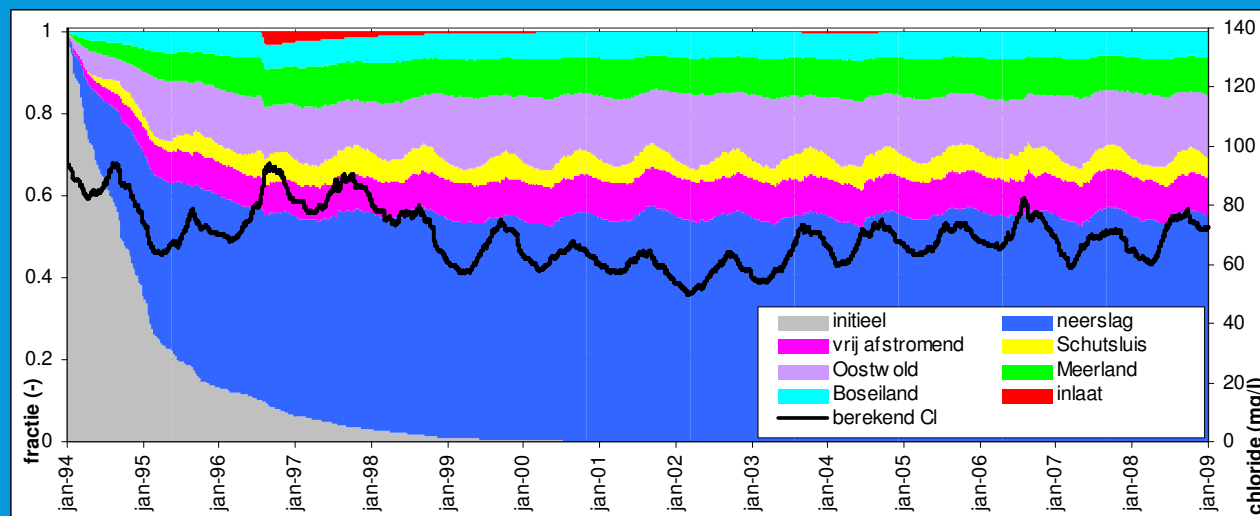
1996: 350.000 m³ (5cm)

2003: 30.500 m³

verblijftijd: 481 dagen

peilfluctuatie: 0 cm

hydr. bel. 3,93 mm/d



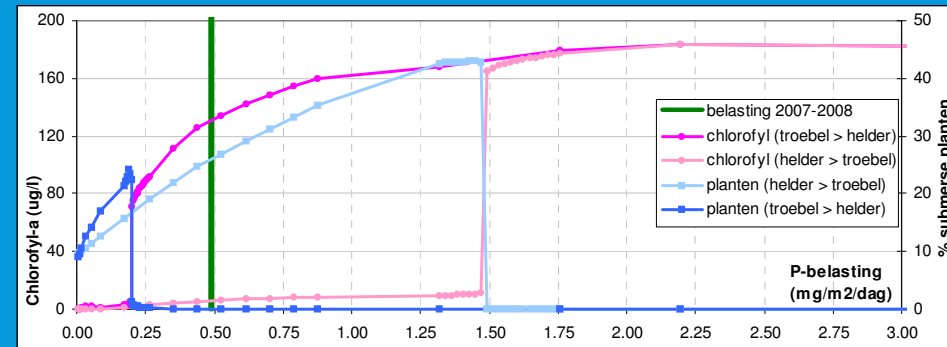
Huidig (2007-2008)

kP1: 1,47

kP2: 0,20

P: 0,49

mgP/m²/dag



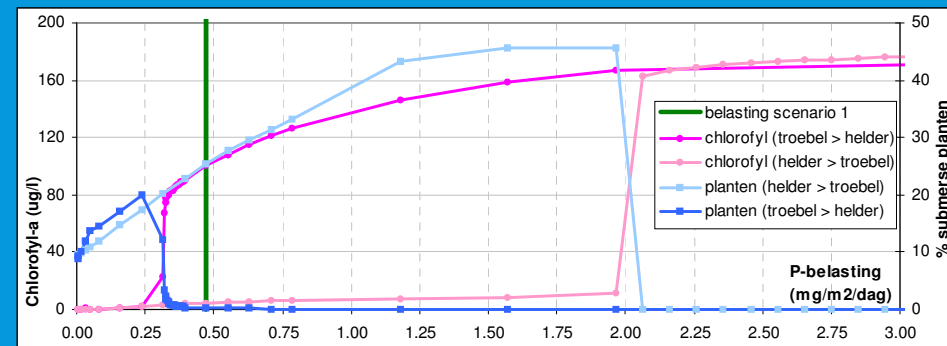
Scenario 1 (-0,85/-0,45)

kP1: 1,97

kP2: 0,31

P: 0,47

mgP/m²/dag



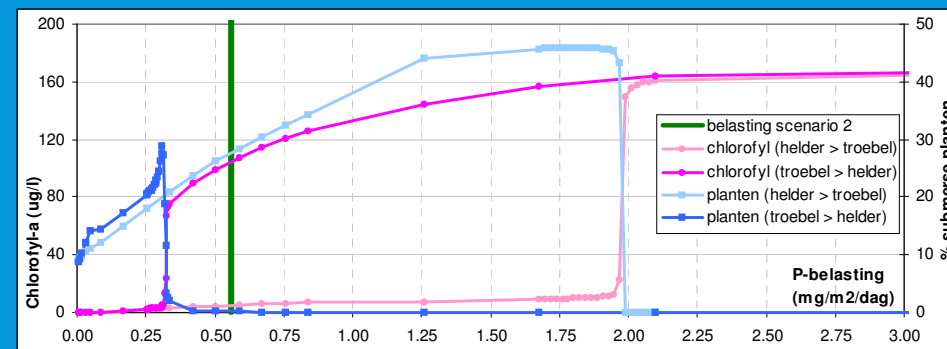
Scenario 2,3 (-0,65/-0,45)

kP1: 1,97

kP2: 0,31

P: 0,56 / 0,49

mgP/m²/dag



Ruimtelijke potentie plantengroei

Uitgangspunten per cel van 10 x 10 meter:

- Kritische P-belasting
 - bodemtype
 - strijklengte
 - gemiddelde winterdiepte
 - peilfluctuatie
 - gemiddeld debiet
- P-belasting

Bodemtype

- klei
- veen
- zand

Oldambtmeer

Gegeneraliseerd bodemtype, zoals gebruikt in PC-lake

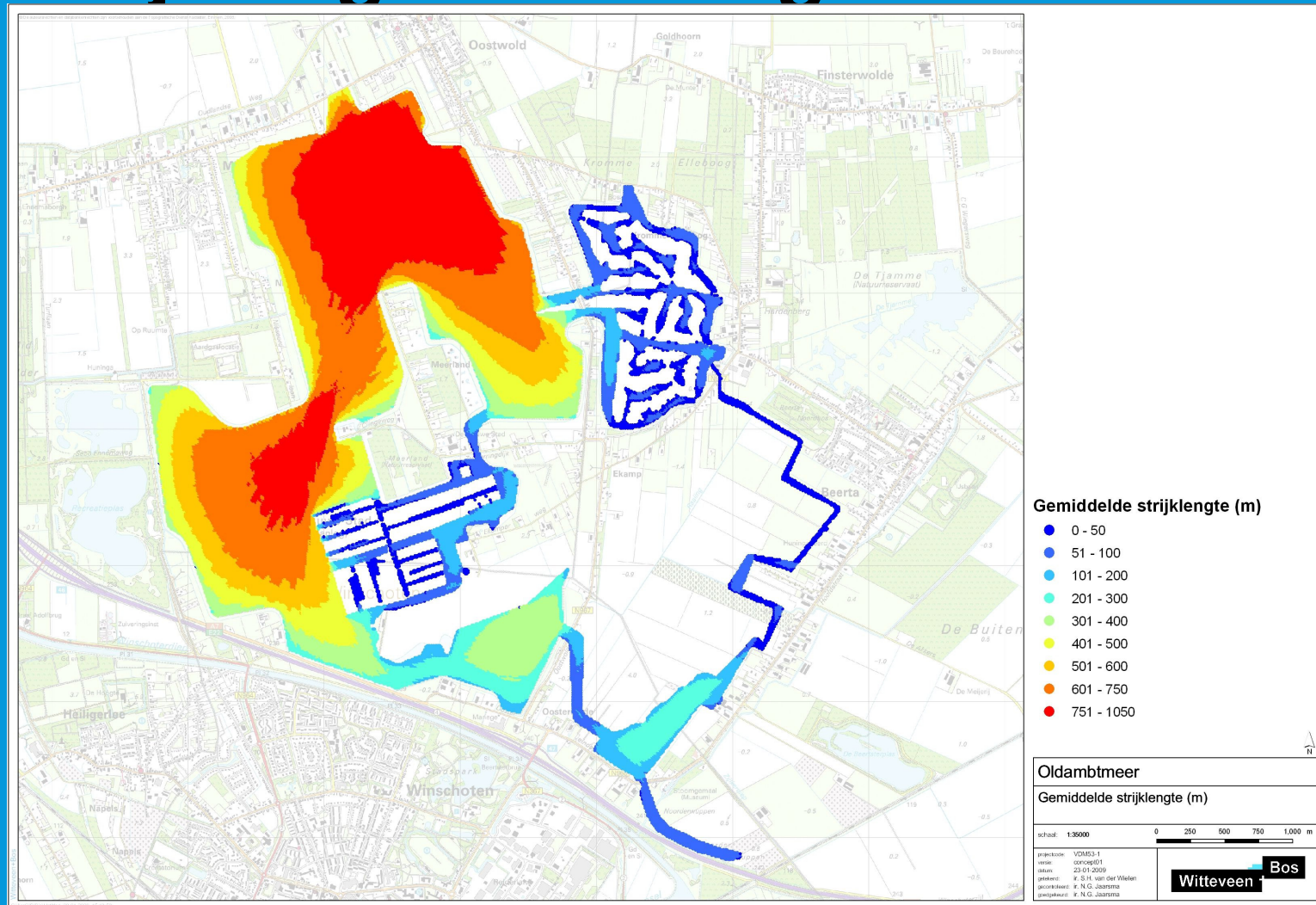
Schaal: 1:30000

0 250 500 750 1000 m

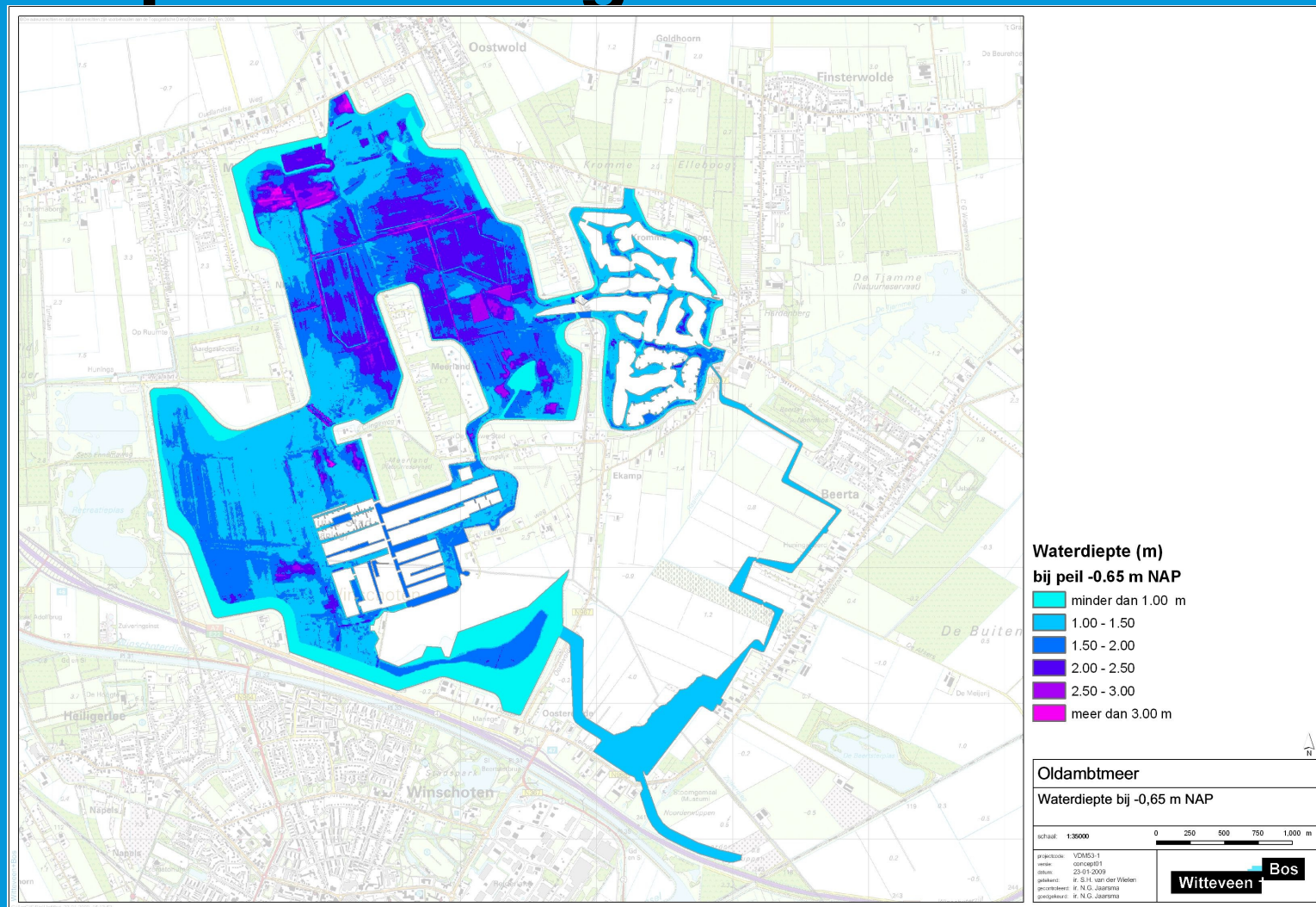
praktische versie: 20-03-2009
 ontwerp: 20-03-2009
 datum: 20-03-2009
 getekend: N.G. Jaarsma
 gecontroleerd: N.G. Jaarsma

Witteveen Bos

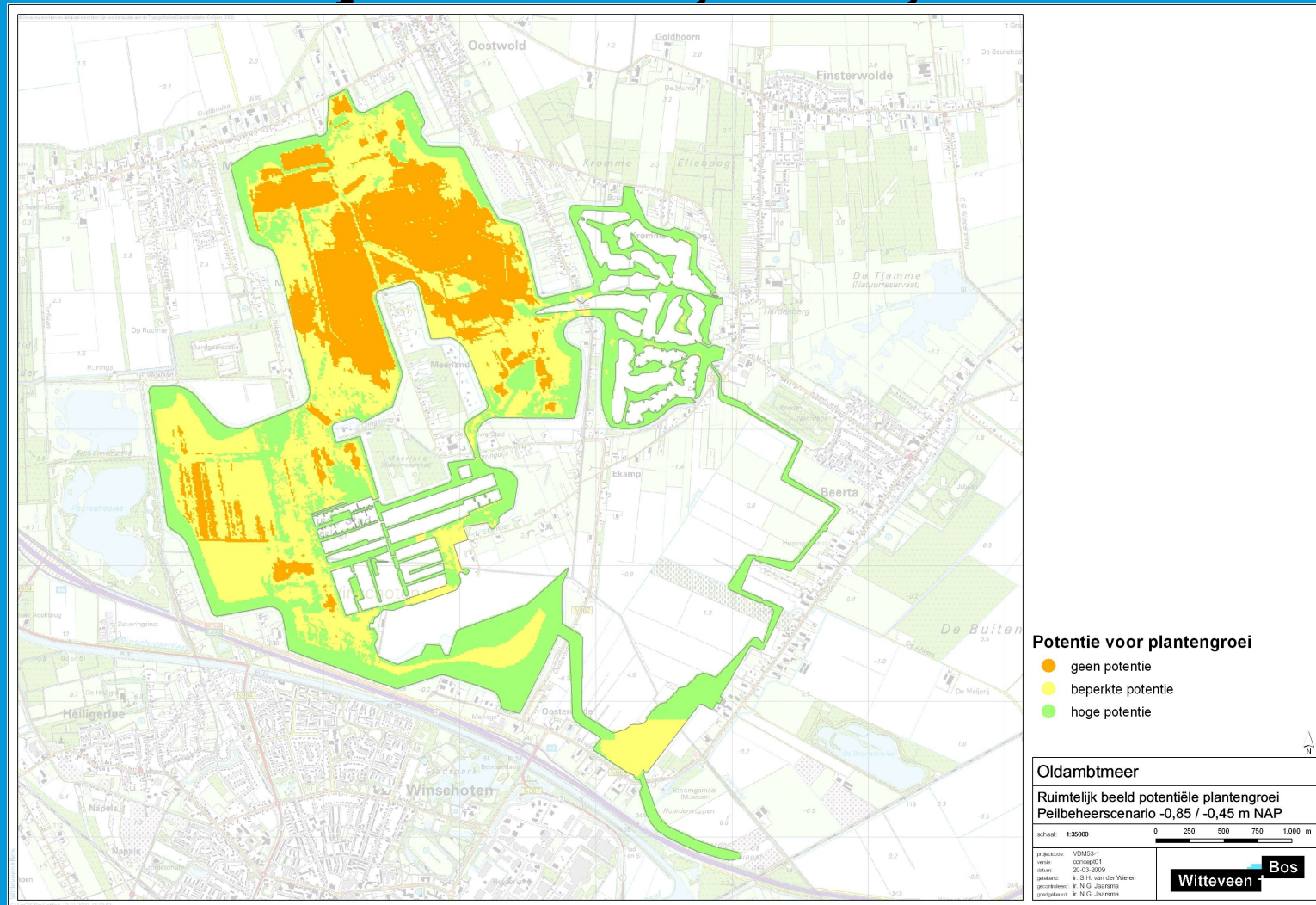
Strijklengteverdeling



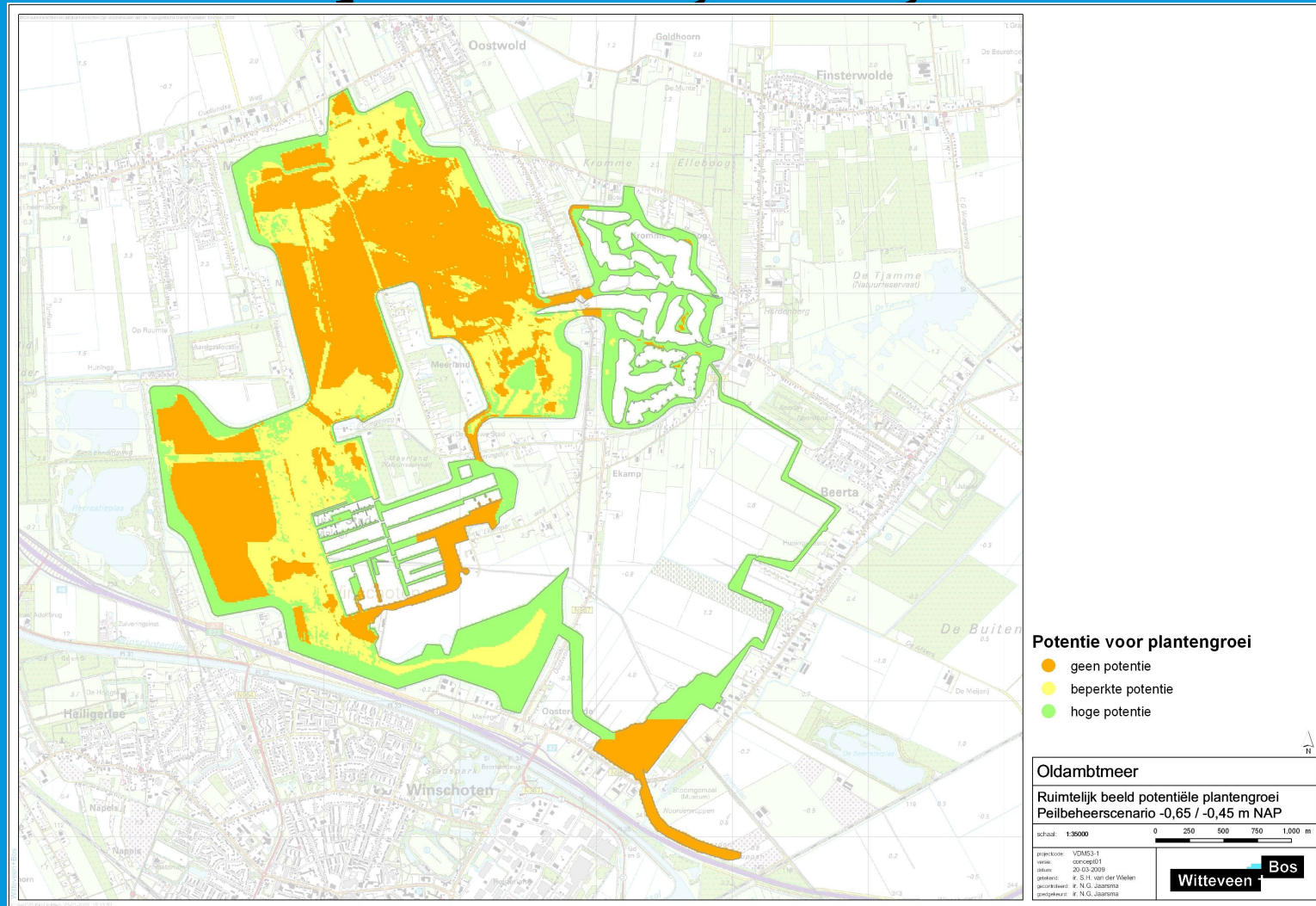
Diepteverdeling



Ruimtelijk sc1: -0,85/-0,45 m NAP



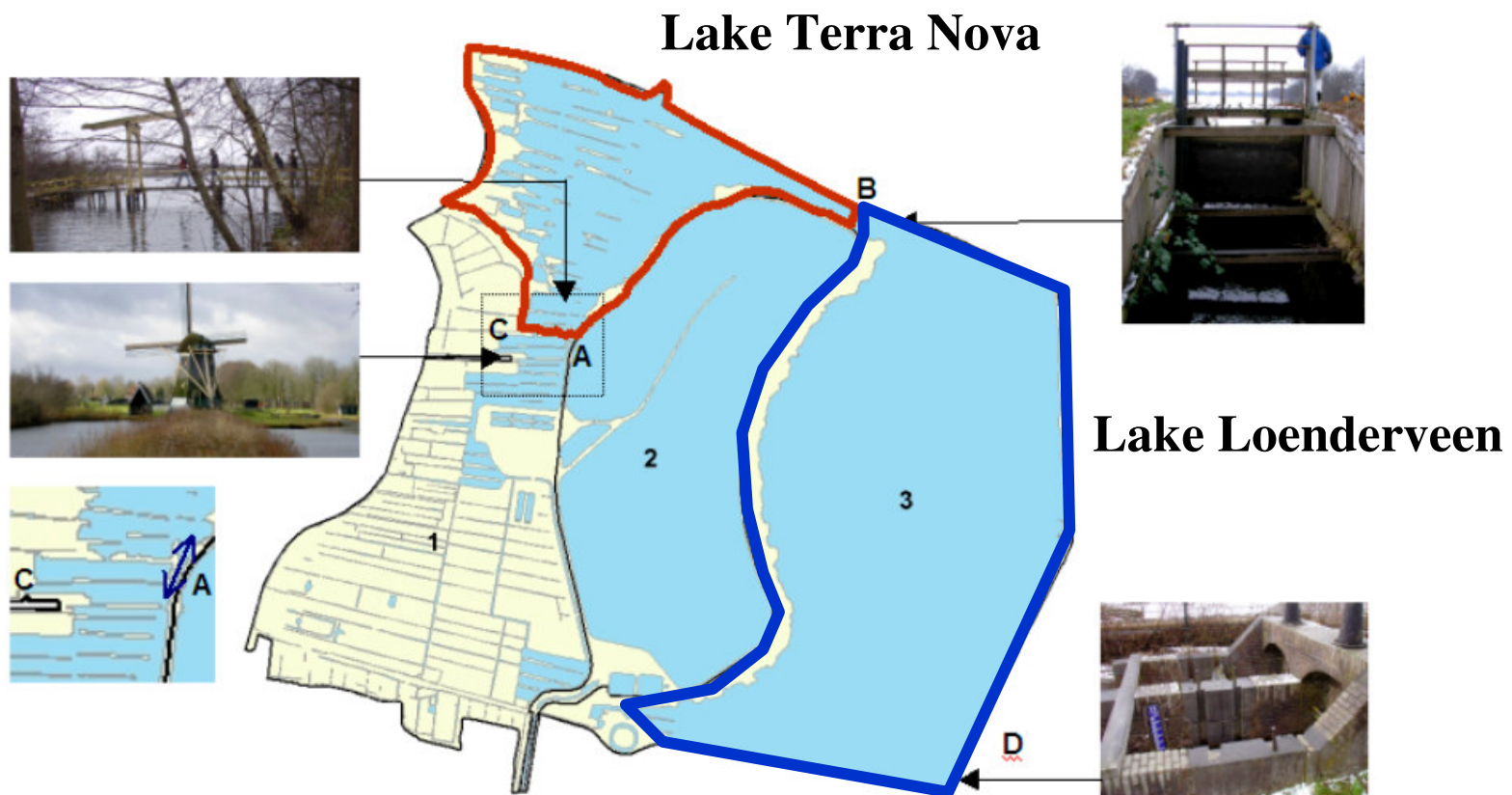
Ruimtelijk sc2: -0,65/-0,45 m NAP



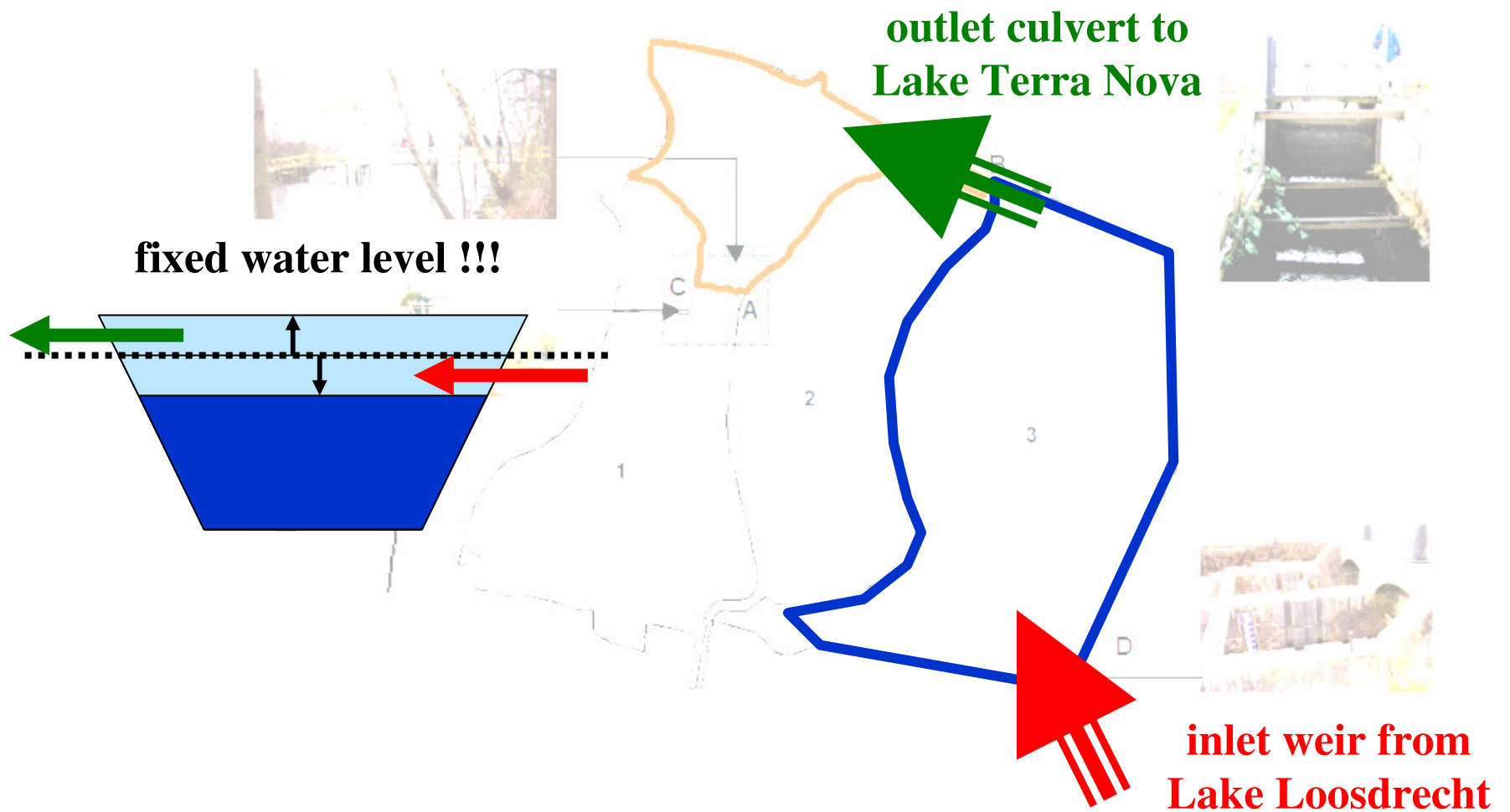
Case Terra Nova



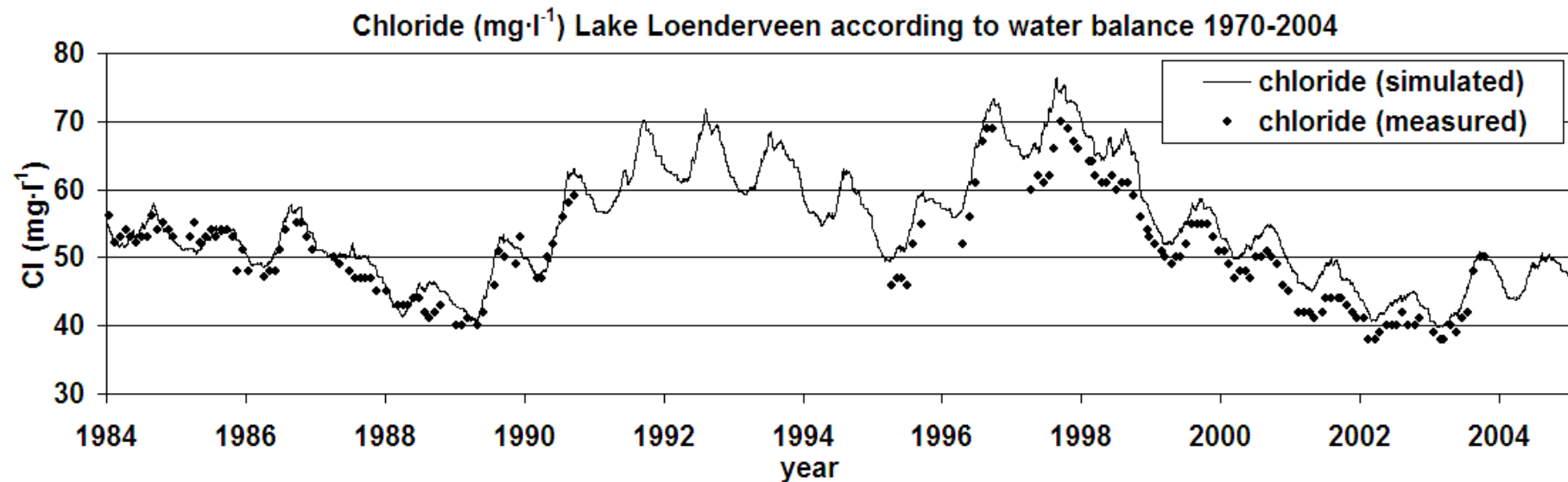
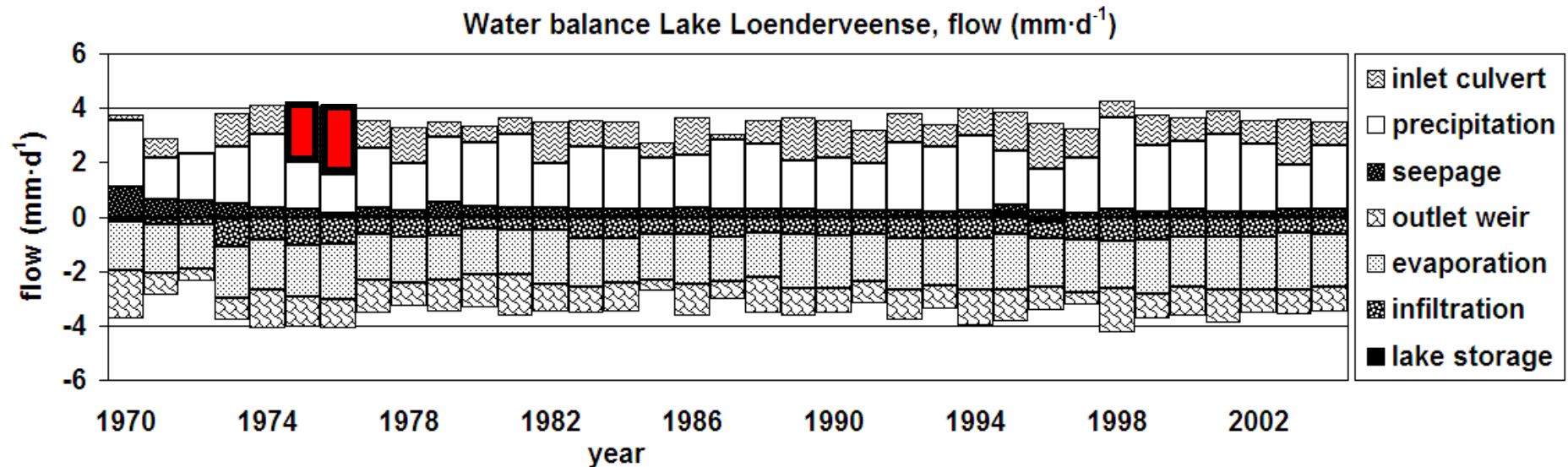
Systeembeschrijving



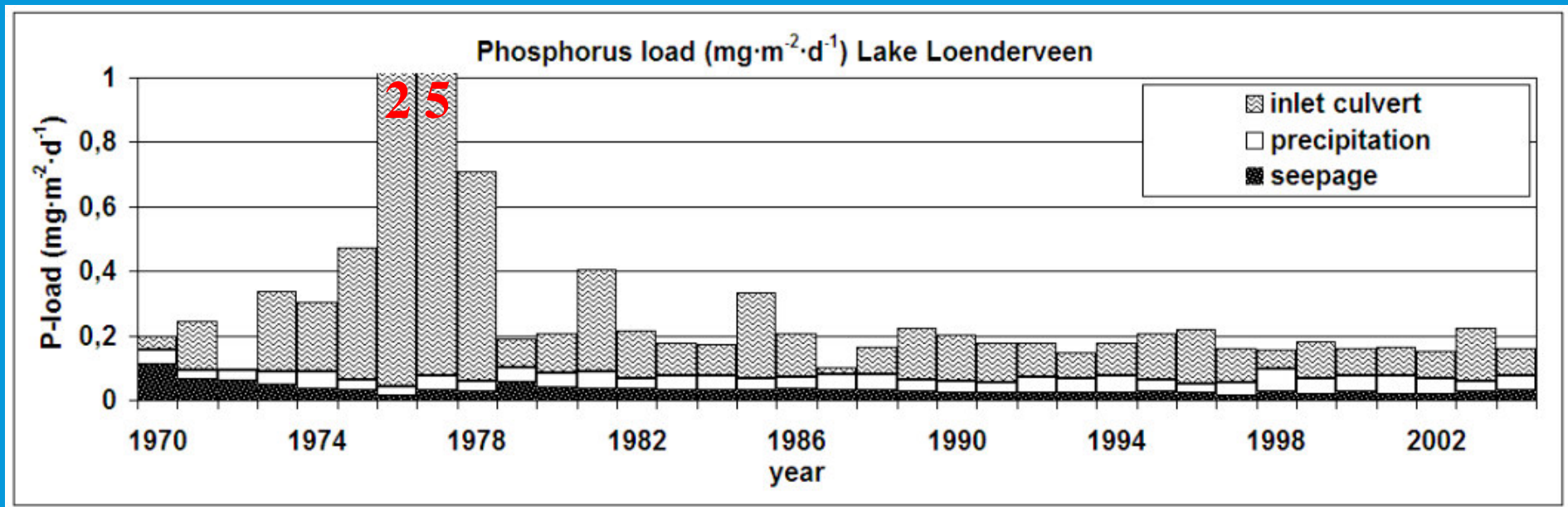
Waterstromen



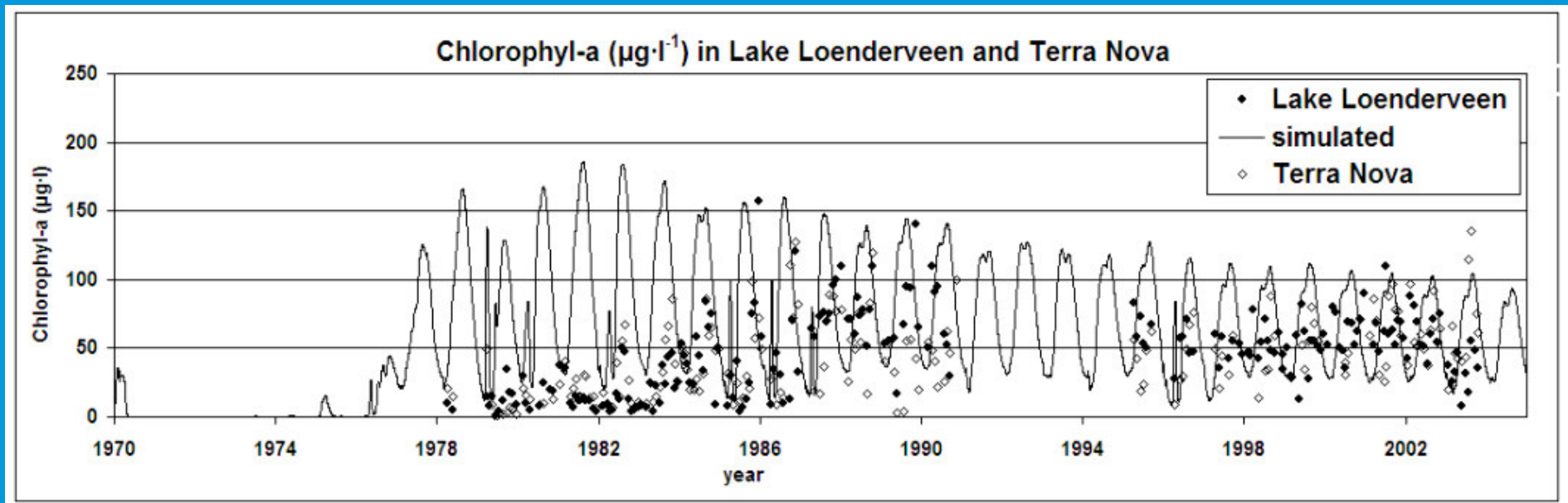
Water- en chloridebalans



P-belasting

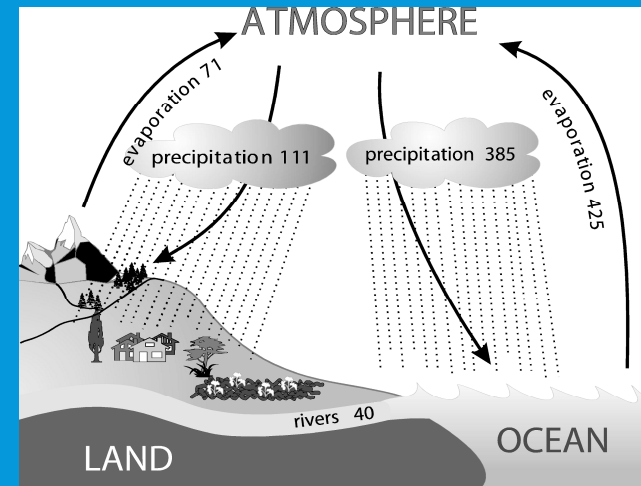
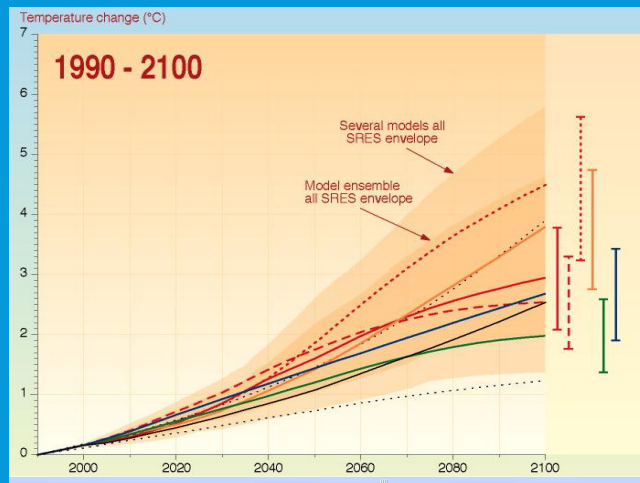


Resultaten: chorofyl



Toepassing: klimaat (2005)

- increasing temperature
- increasing precipitation in winter
- increasing evaporation in summer

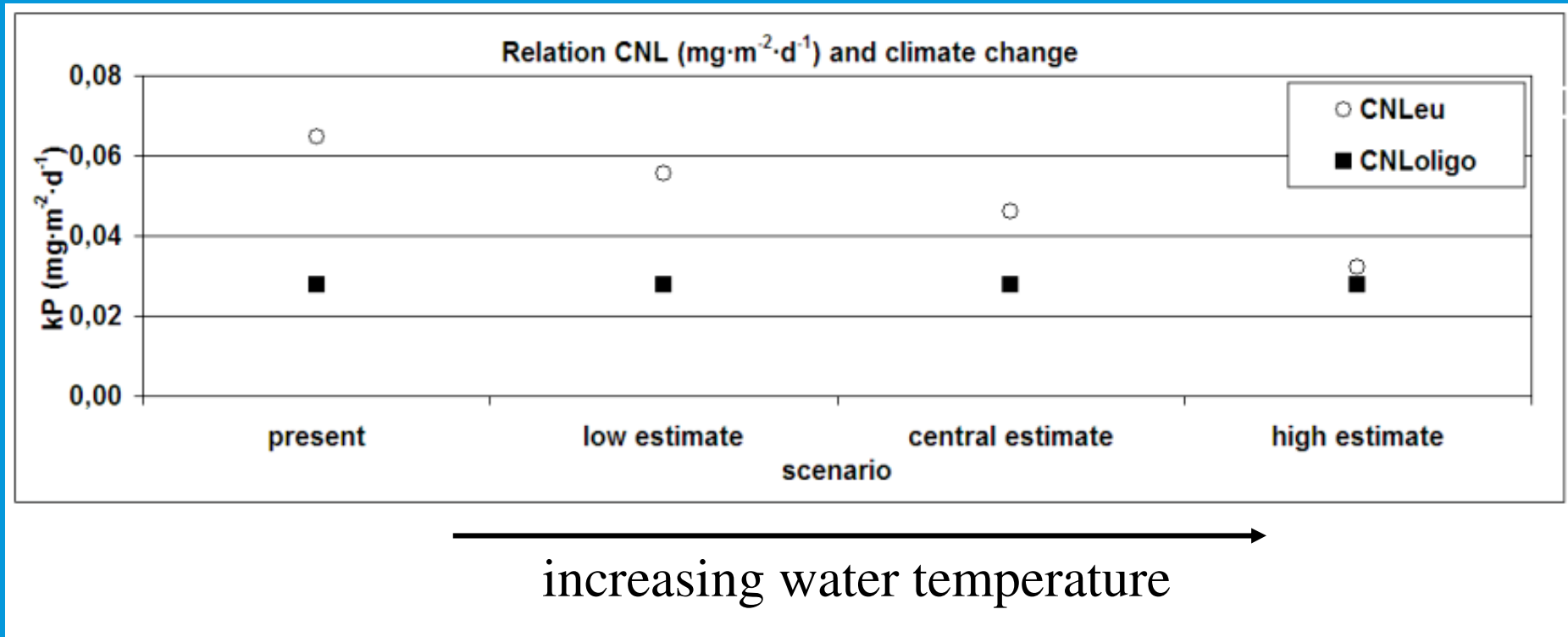


Toepassing: klimaat (2005)

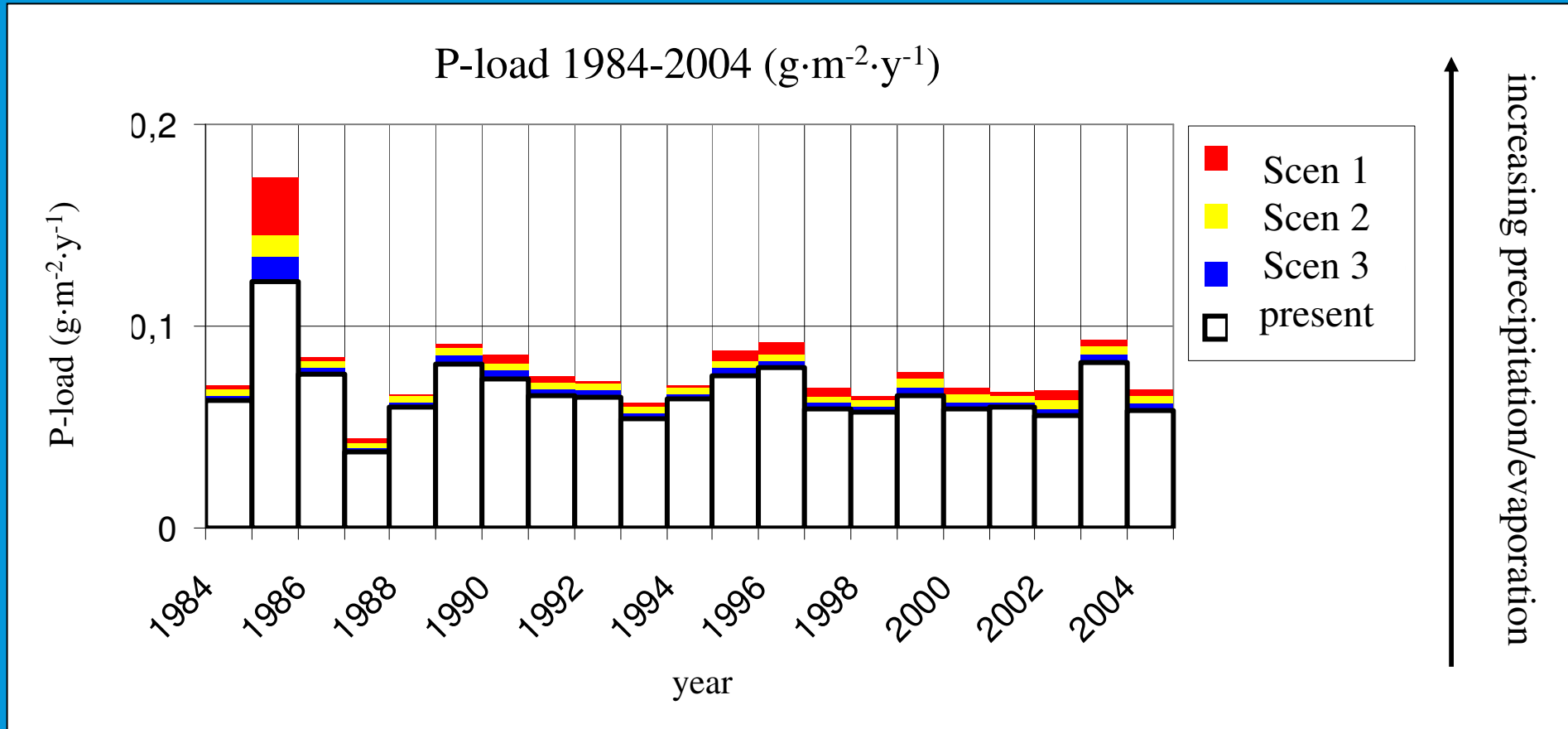
IPCC 2003

Scenario	Temperature	Precipitation	Precipitation	Evaporation	Evaporation
		summer	Winter	summer	winter
present	0	0	0	0	0
Low estimate wet	+0,5 %	+0,5 %	+3 %	+4 %	+4 %
Central wet	+1 %	+1 %	+6 %	+4 %	+4 %
High estimate wet	+2 %	+2 %	+12 %	+8 %	+8 %
High estimate dry	+2 %	-10 %	-10 %	+8 %	+8 %

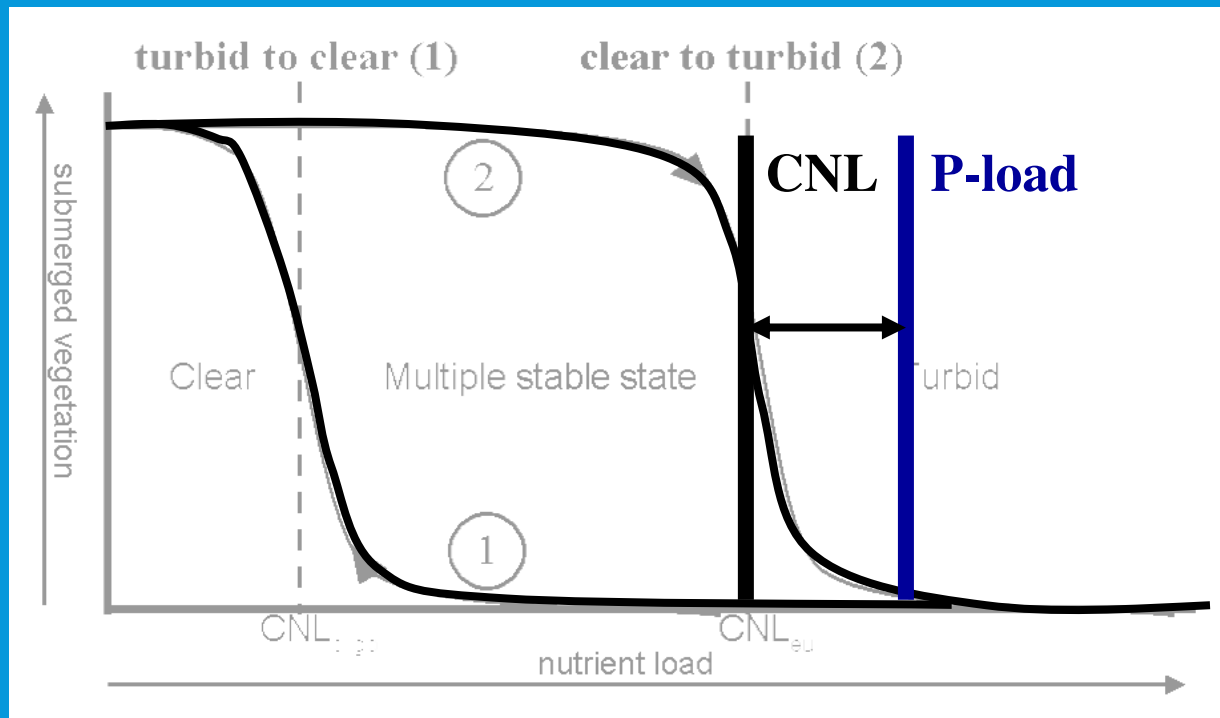
Kritische belasting



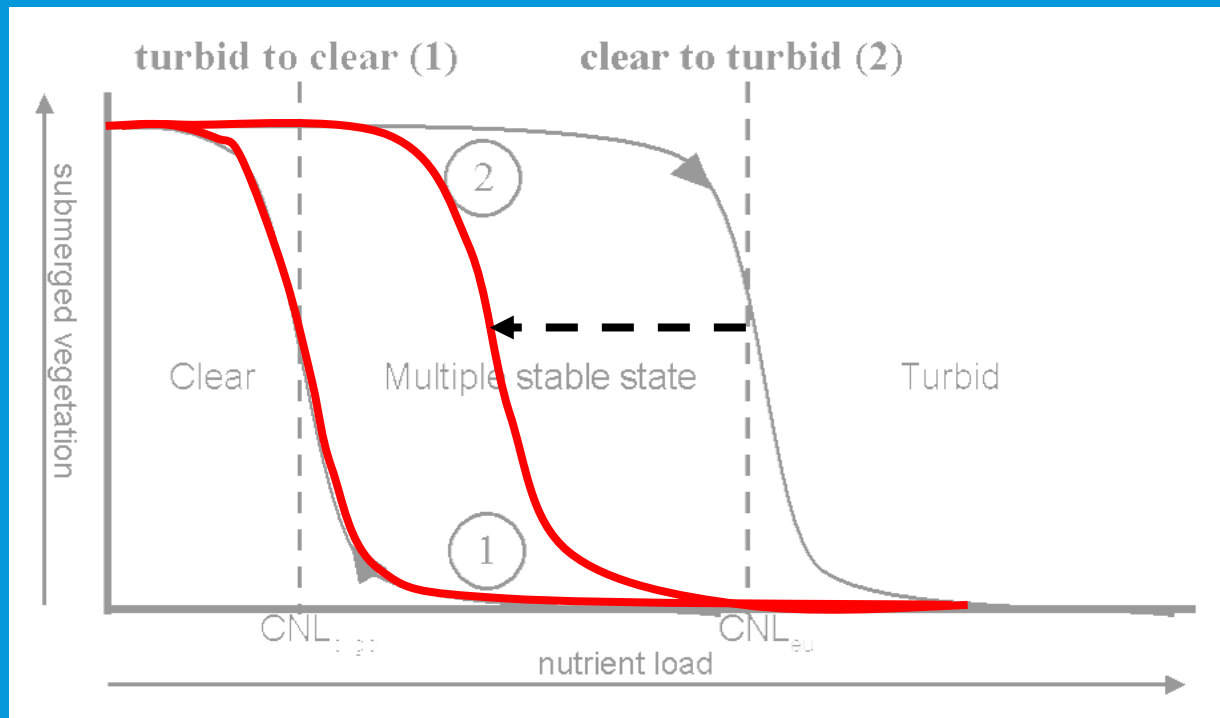
P-belasting



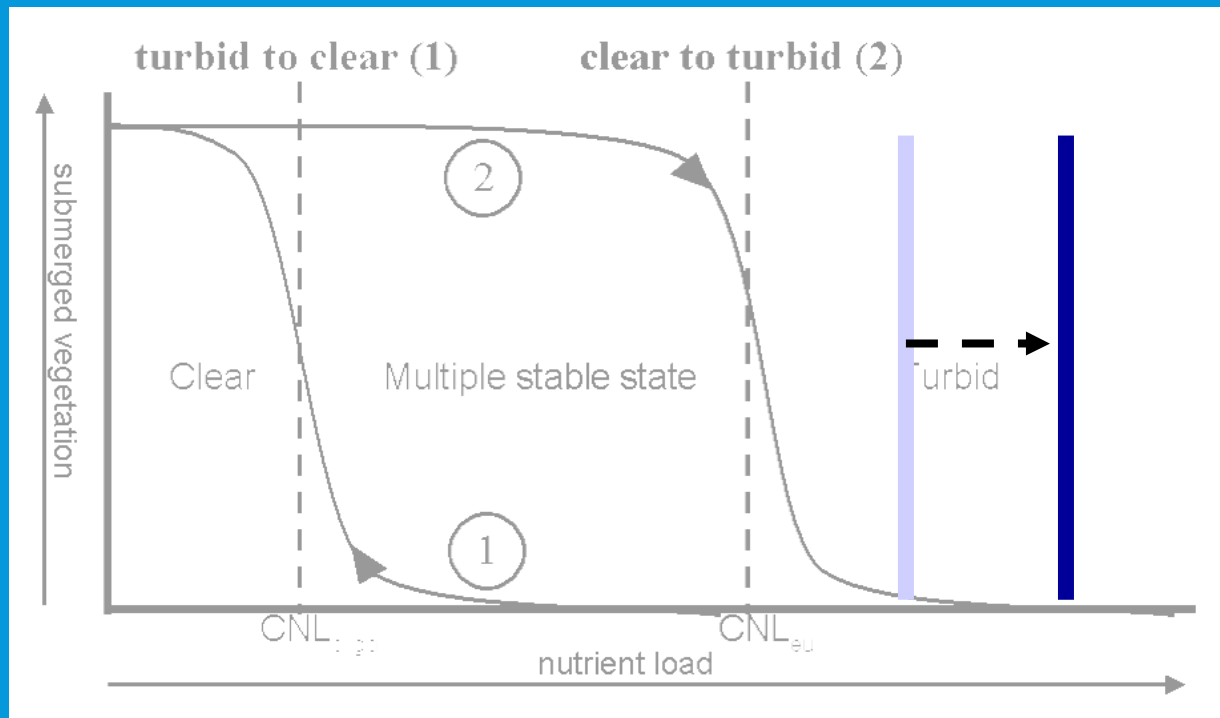
Nutrient load vs. CNL (present)



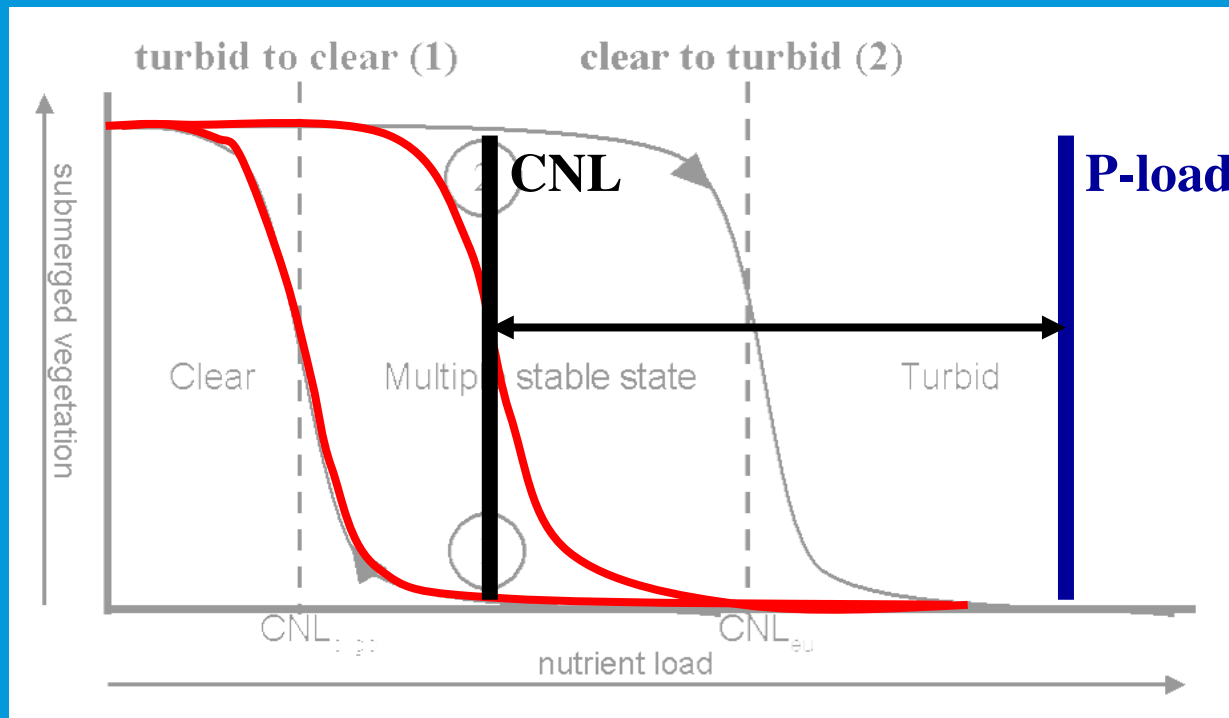
Climate change --> CNL



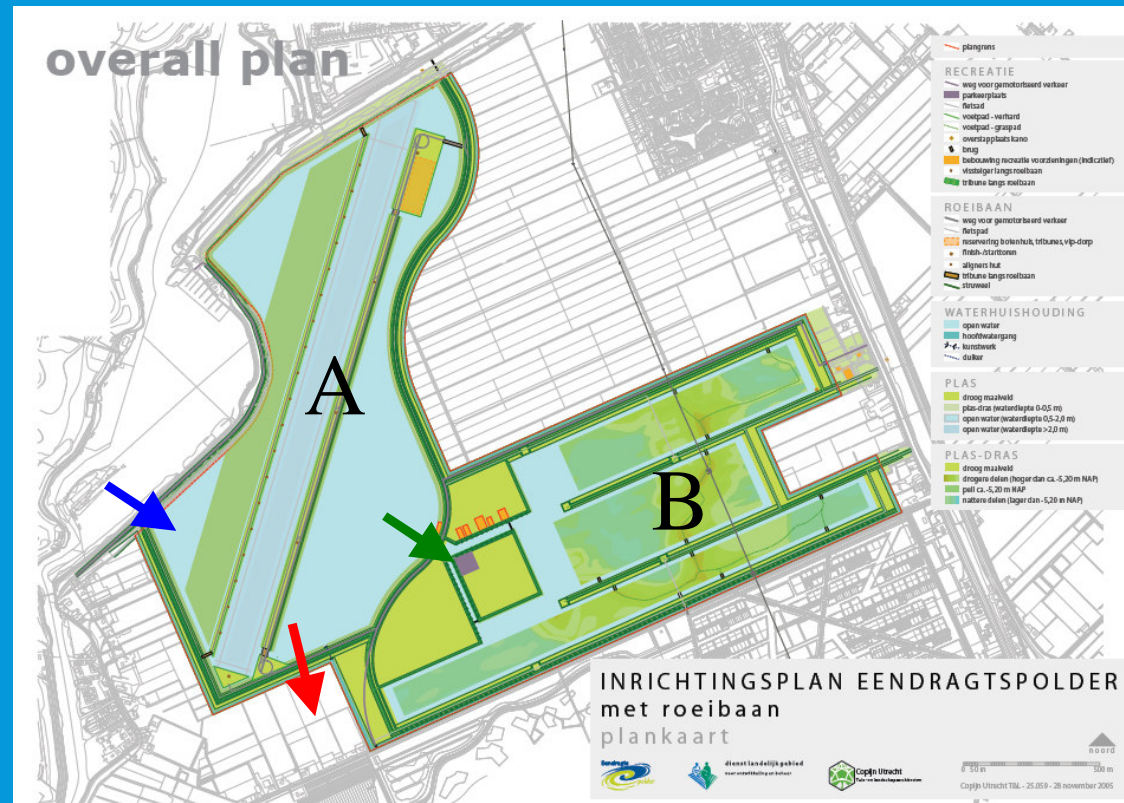
Climate change --> Nutrient load



Nutrient load vs. CNL (climate)



Duurzaam helder Eendragtspolder



Maatregelpakket Eendragtspolder

