



Controlled drainage in Denmark – preliminary results from the Hofmansgave demonstration site

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Controlled drainage demonstration sites in Denmark



Birkelse (2012)

Sandy soil. Ditch drainage

Bredkjaer (2012)

Clay soil. Pipe drains.

Hedemark (2012)

Clay soil. Pipe drains.

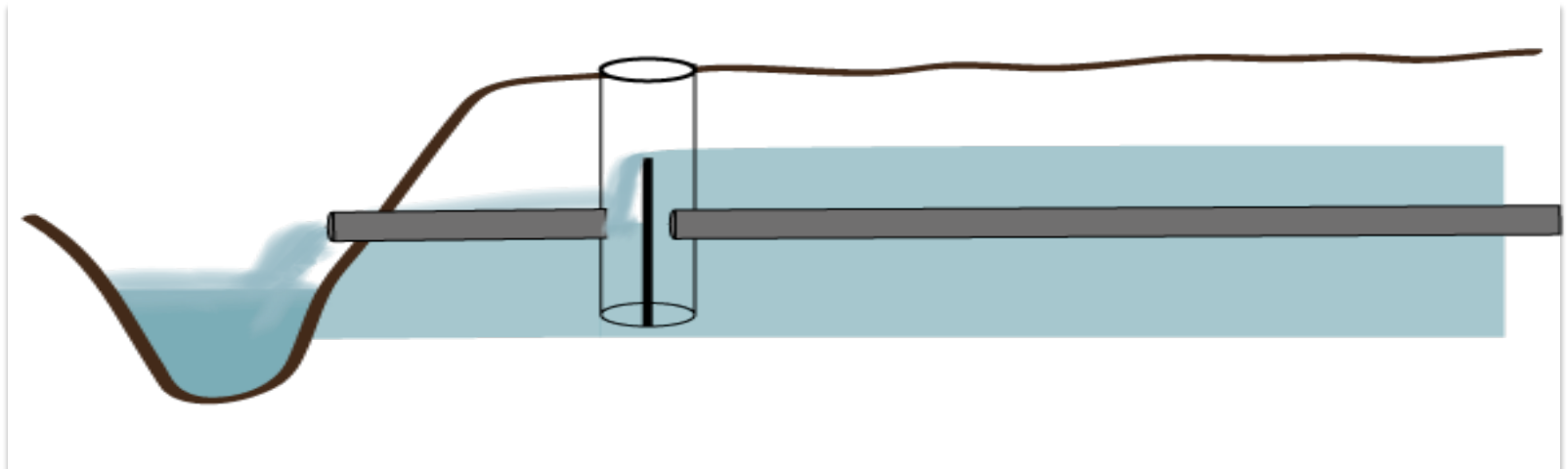
Hofmansgave (2012)

Sandy soil. Pumped area.

Project: Controlled drainage as a measure to reduce the outlet of nitrogen to the aquatic environment (2012-2015)

Objective:

To obtain the necessary documentation so that controlled drainage can be recognized as a measure to reduce the outlet of nitrogen to the aquatic environment (in order to meet the goals of the WFD)



Hofmansgave demonstration site

Crop rotation:
Maize – wheat – maize - wheat
Field size: 20 hectares
Sandy soil. Cattle slurry.

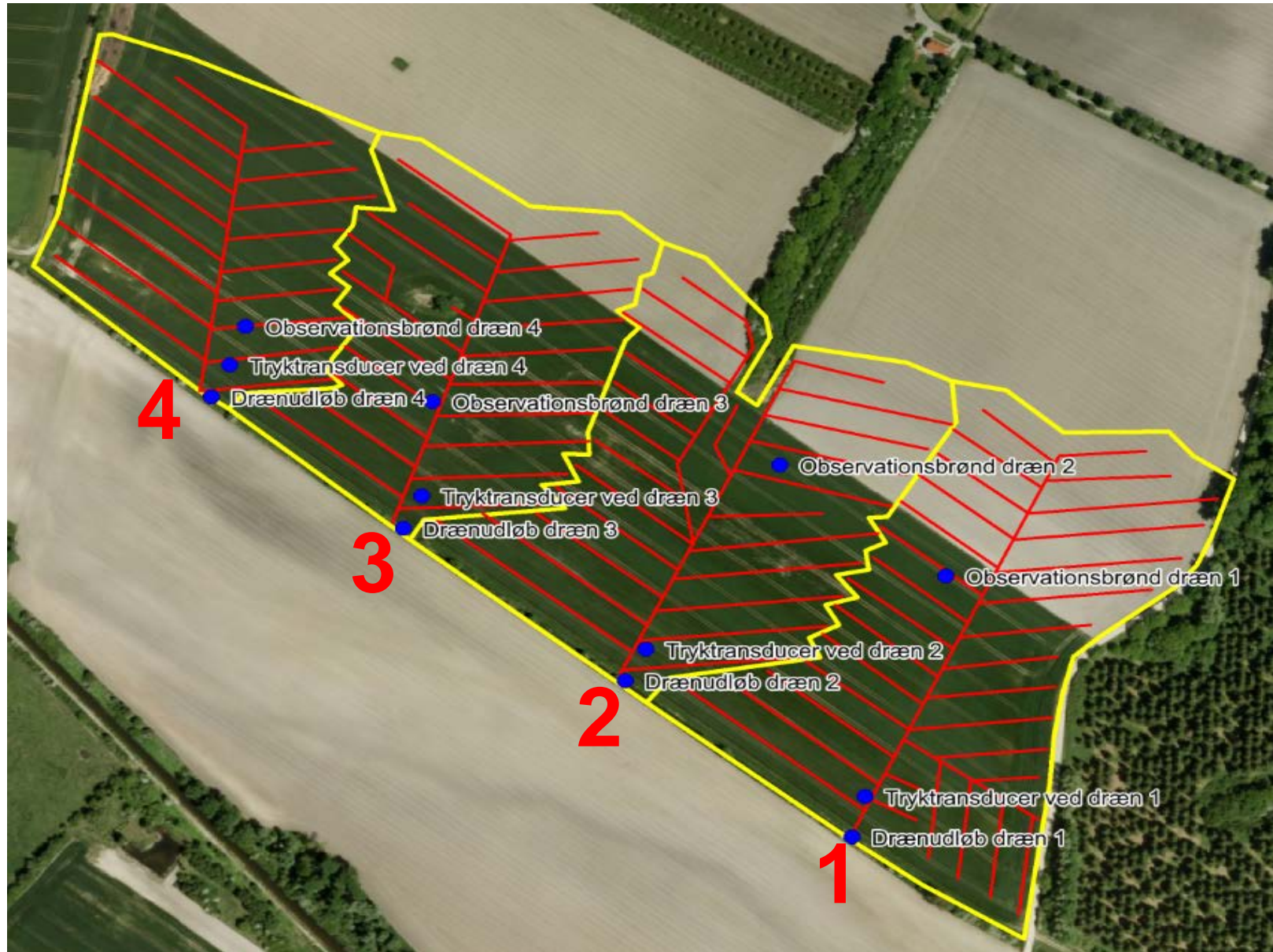


Control well

Measuring well



Drainage system at Hofmansgave

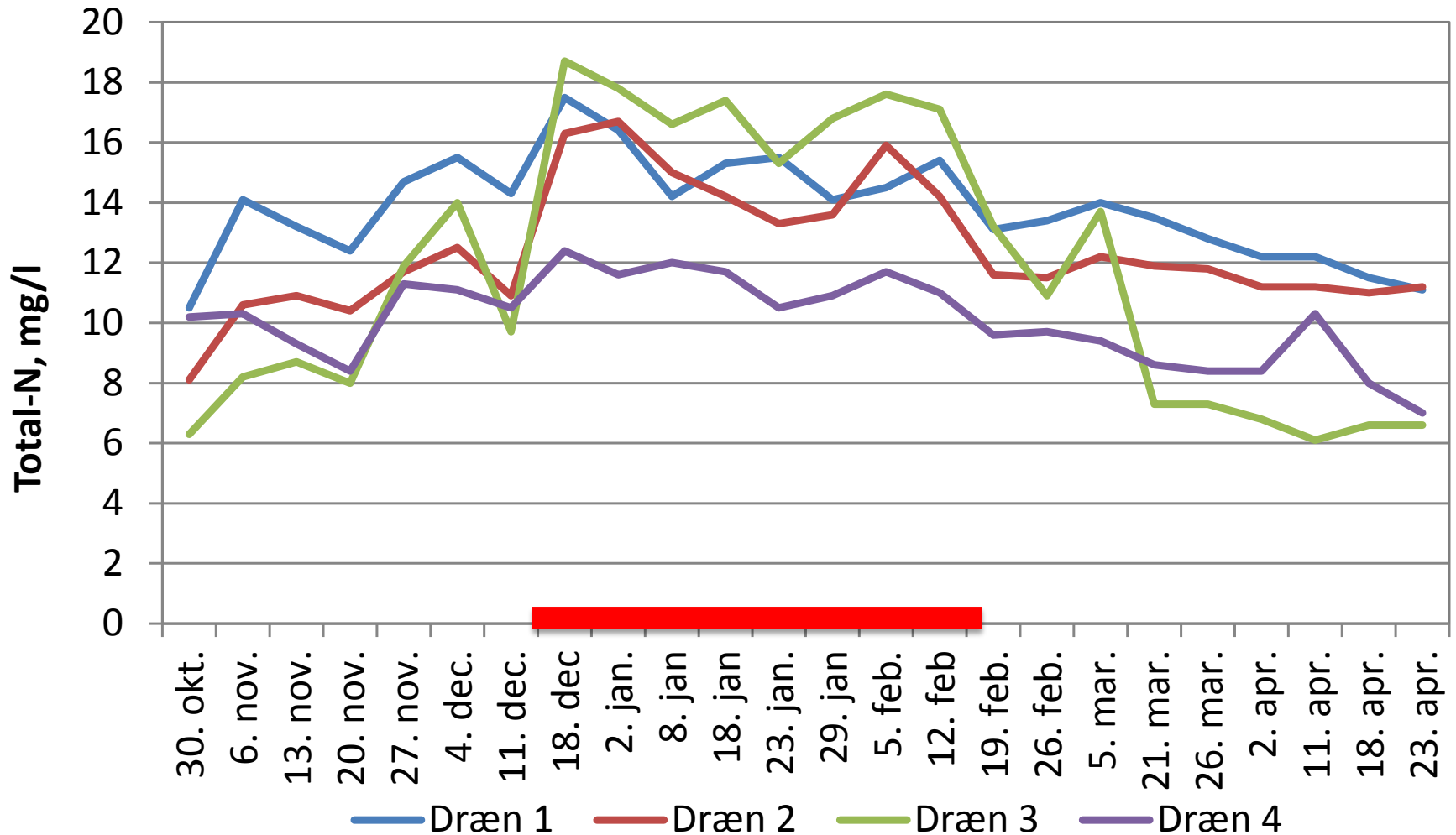


Discharge of drainage water and rainfall, mm/d

2012-13

2012-13

Nitrogen in drainage water at Hofmansgave 2012-13 (reference year), mg N/l (total-N)



Outlet of nitrogen from drain 1-4 at Hofmangave 2012-13 (reference year)

	Ha	Run-off, mm	Total-N mg/l	Kg N per ha
Drain 1	6,2	213	15,0	32
Drain 2	5,4	241	13,3	28
Drain 3	4,2	288	14,9	31
Drain 4	3,8	282	10,6	22

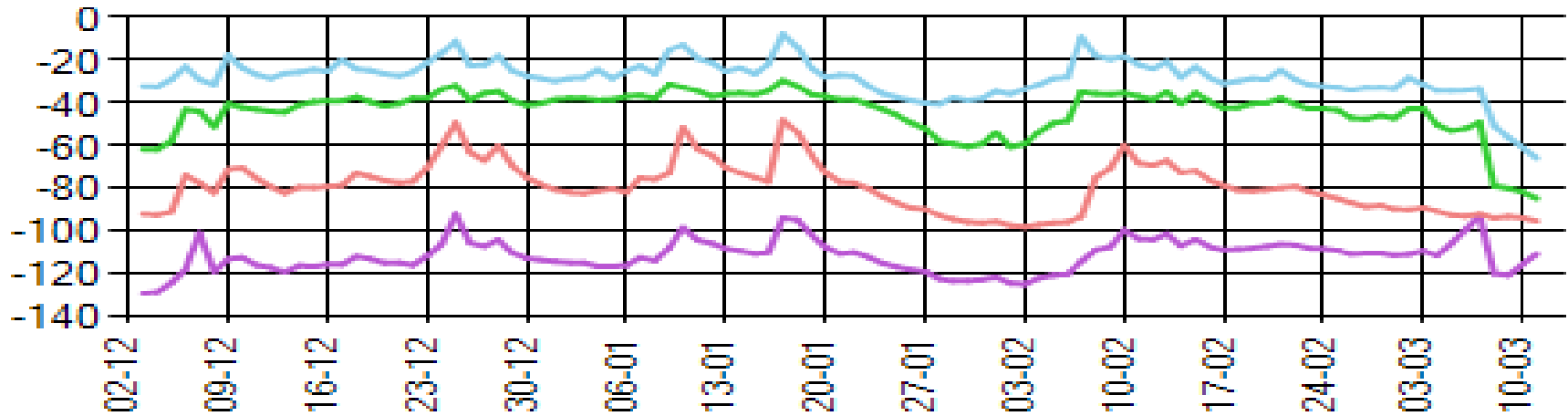
Percolation: 210 mm in 2012-13

Water level regulated in 2013-14

- Winterwheat sown 25 september 2013
- Water level regulated to 60 cm below soil surface 1 November 2013 at drain 1 and 2.
When drain discharge started.
- Normal drainage at drain 3 and 4.
- Normal drainage again from 7 March 2014 at drain 1 and 2.
- No damage can be seen on the wheat crop so far
 - Yield will be measured with GPS on the combiner (yield map)

Water level – 25 m from control well, cm below surface

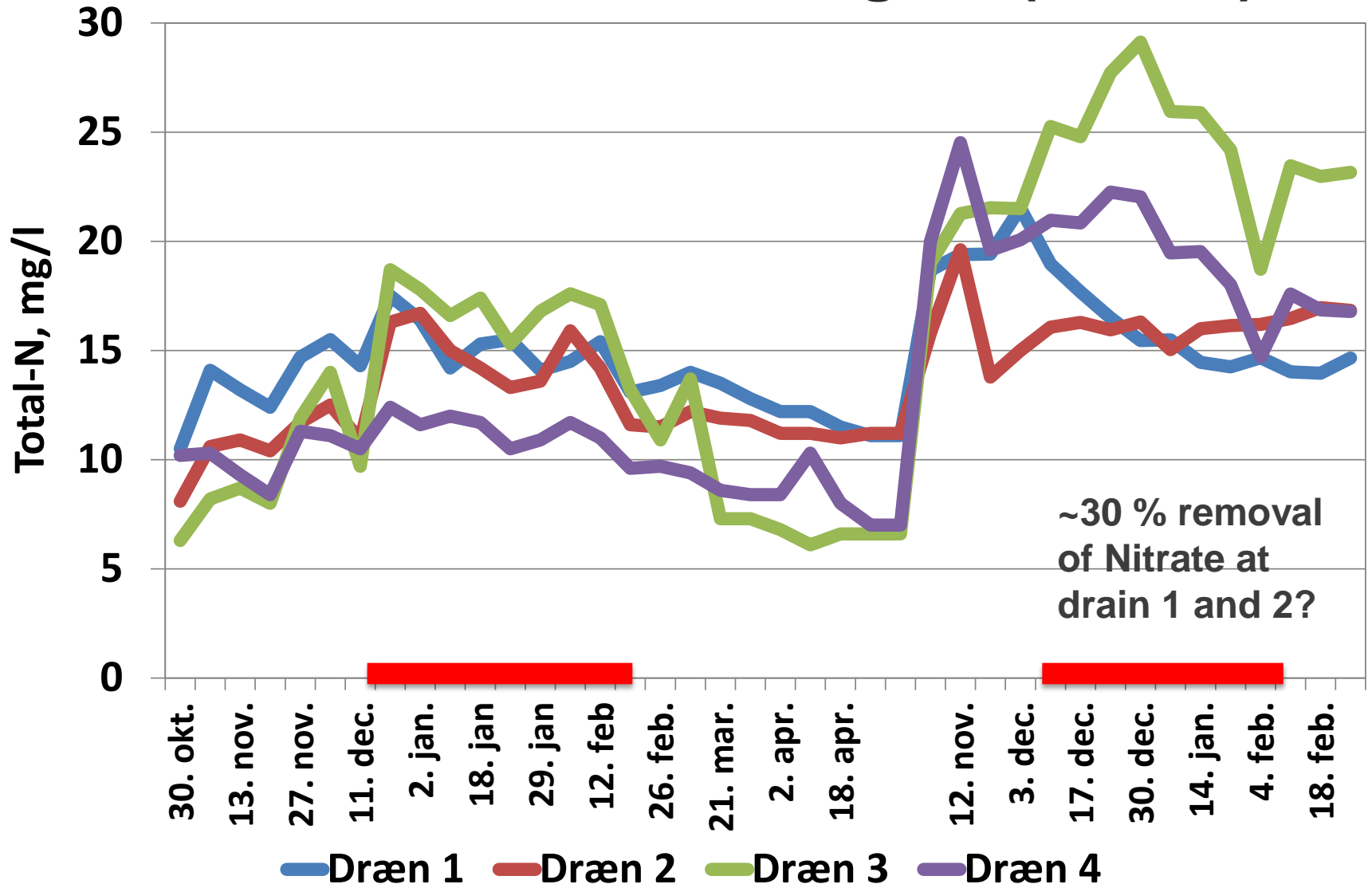
2012-13



2013-14

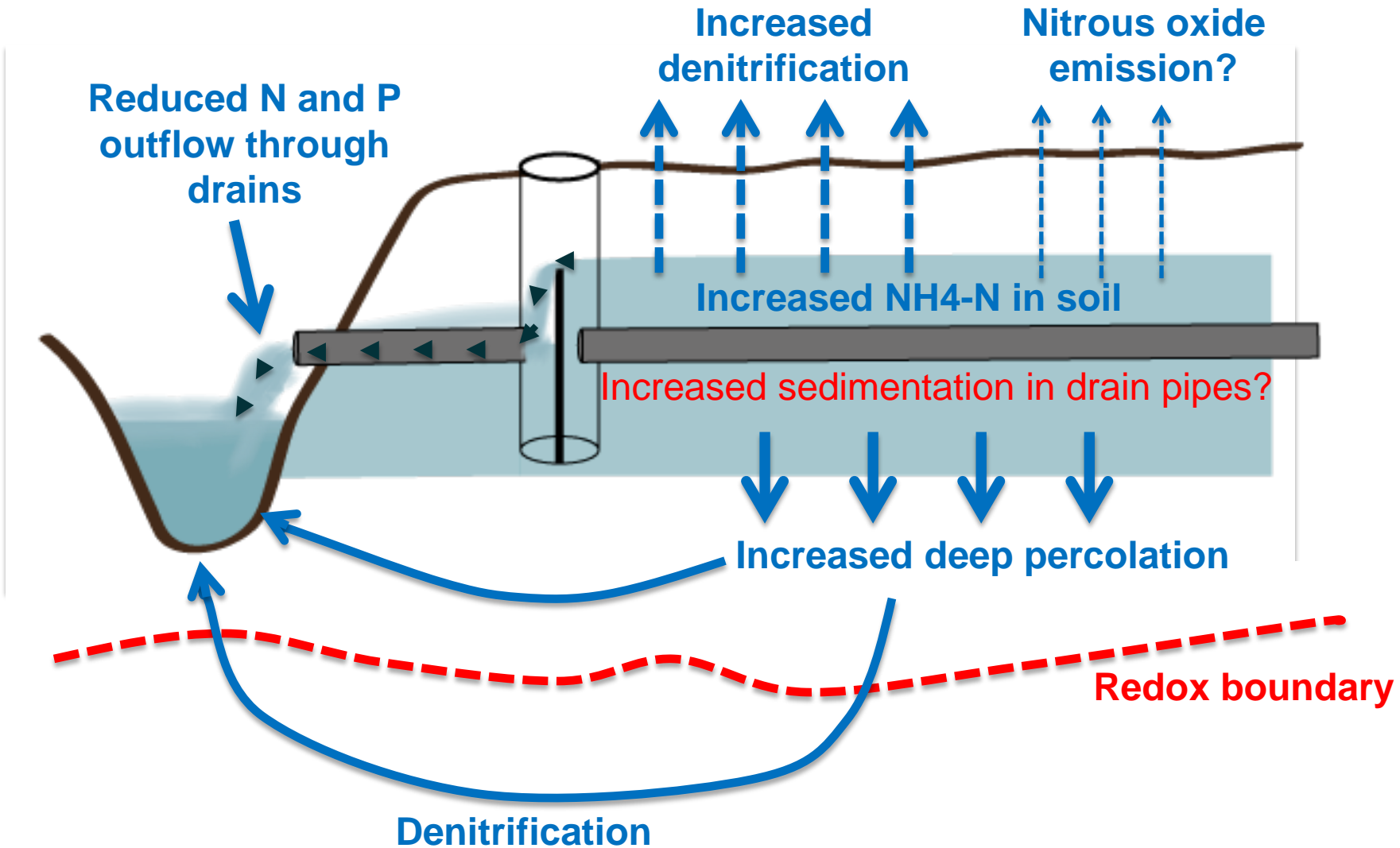
— Draen 1 — Draen 2 — Draen 3 — Draen 4

Nitrogen in drainage water at Hofmansgave 2012-13 and 2013-14, mg N/l (total-N)



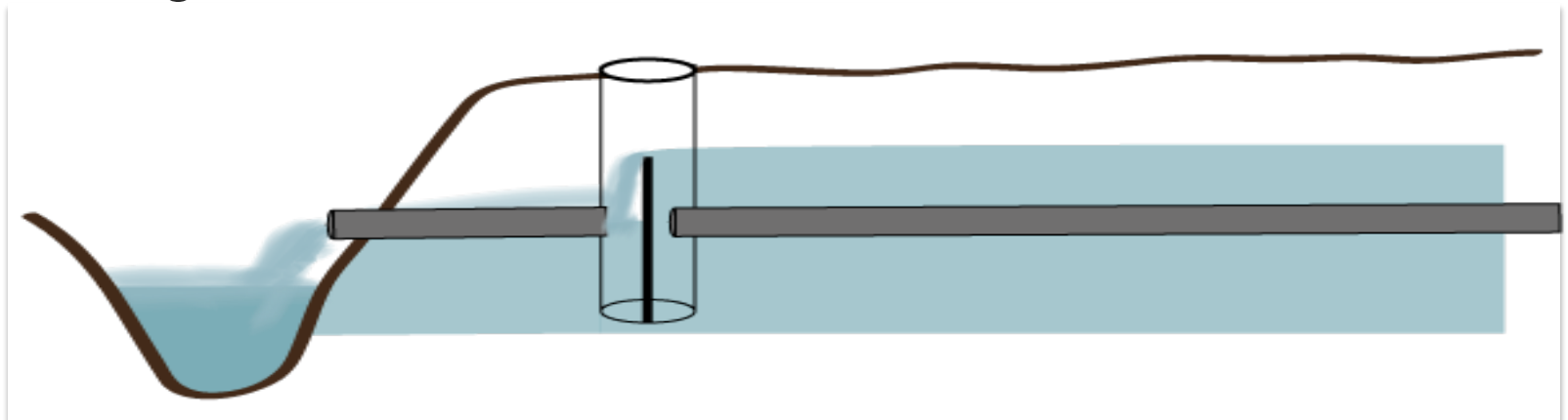
Effects of controlled drainage

Water level is raised during autumn and winter



Implementation of controlled drainage (CD) in Denmark

- CD is hopefully a recognized measure in 2016
- Maybe 10 % of the agricultural area is suitable for CD
- CD is probably not profitable for the farmer by itself
- Maybe CD is profitable as an alternative to compulsory catch crops and reduced N quotas
- CD will probably often be combined with constructed wetlands and riparian buffer zones in order to optimize nitrogen removal





Thank you for your attention!

Project homepage:

www.vfl.dk/hofmansgave

or

www.vfl.dk/kontrolleretdraening

The Hofmansgave demonstration site is partly funded by BALTIC COMPASS

