

TRANSPORT AND TRANSFORMATION OF NITRATE IN A DANISH RIPARIAN LOWLAND



Rasmus Jes Petersen¹, Christian Prinds¹,
Bo Vangsø Iversen¹, Charlotte Kjærgaard^{1,2},
Søren Jessen³ and Peter Engesgaard³.

TReNDS

Transport and Reduction of Nitrate in Danish Landscapes at various Scales

¹Dept. of Agroecology, Aarhus University

²SEGES

³Dept. of Geosciences, Copenhagen University



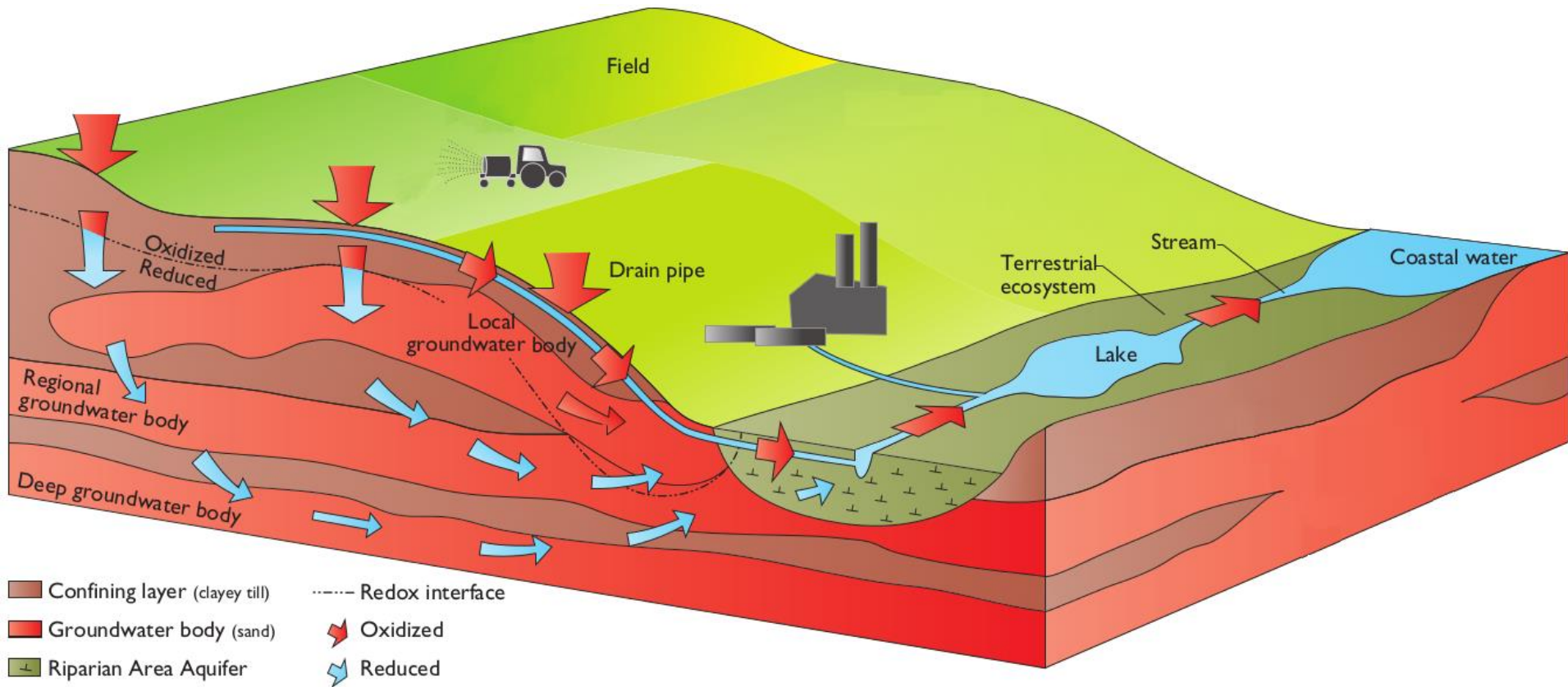
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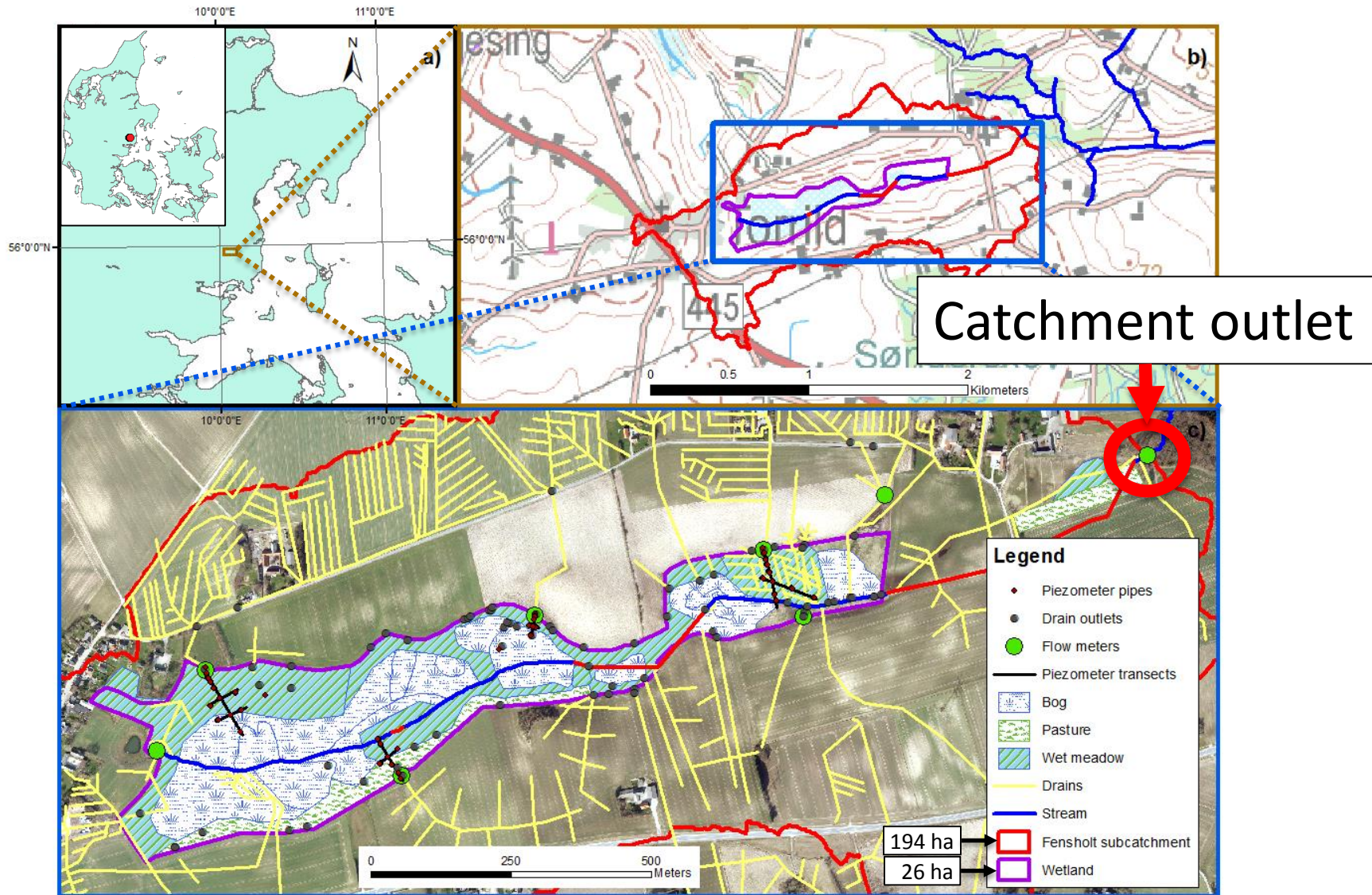
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Introduction

- Uniform nitrogen regulation \Rightarrow spatially differentiated regulation
- Identification of robust and vulnerable areas
- Influence of riparian lowlands?

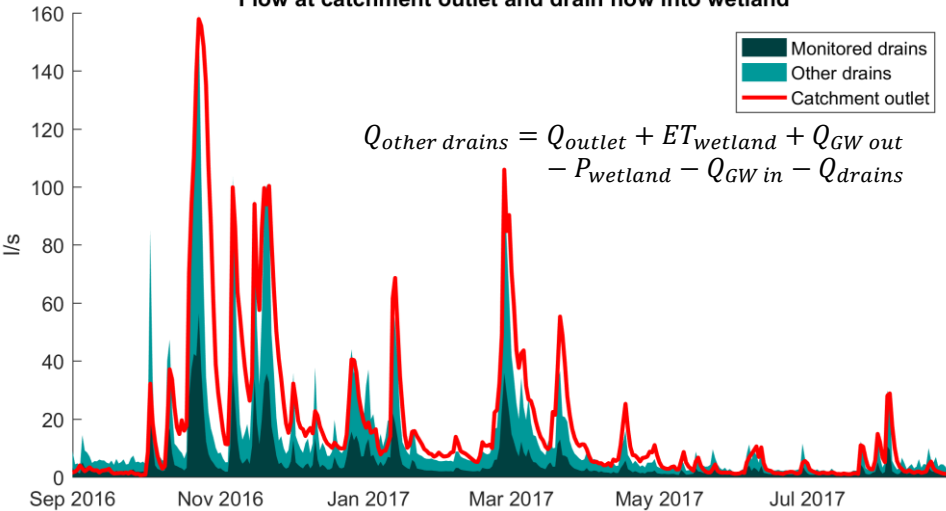


The Fensholt study site – a riparian lowland



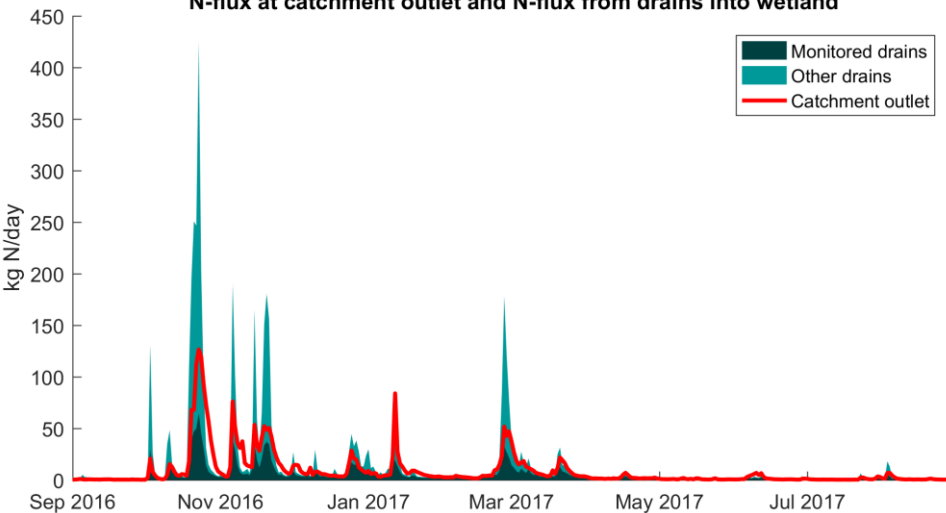
Results – catchment total

Flow at catchment outlet and drain flow into wetland



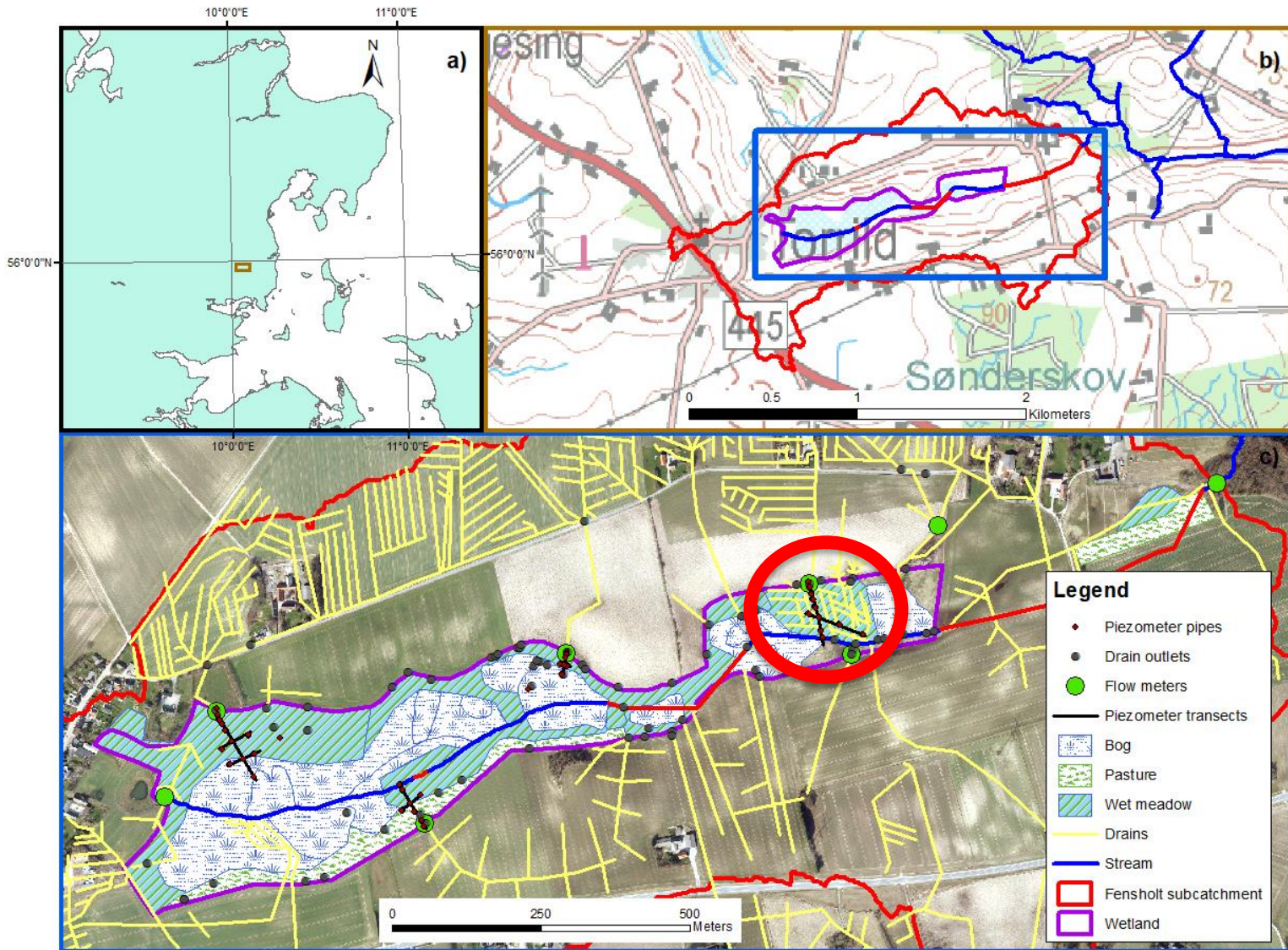
		Flow [1000 m ³ /yr]	N-flux [kg/yr]
Input to wetland	Unmonitored drains / other sources	295	3485
	Precipitation on wetland (atm. dep.)	225	356
	Monitored drains	161	1739
	Groundwater inflow in hillslope	30	194
Sum in		711	5774
Output from wetland	Catchment outlet	558	3093
	Evapotranspiration from wetland	144	0
	Seepage to deeper groundwater	9	0
	Sum out	711	3093

N-flux at catchment outlet and N-flux from drains into wetland

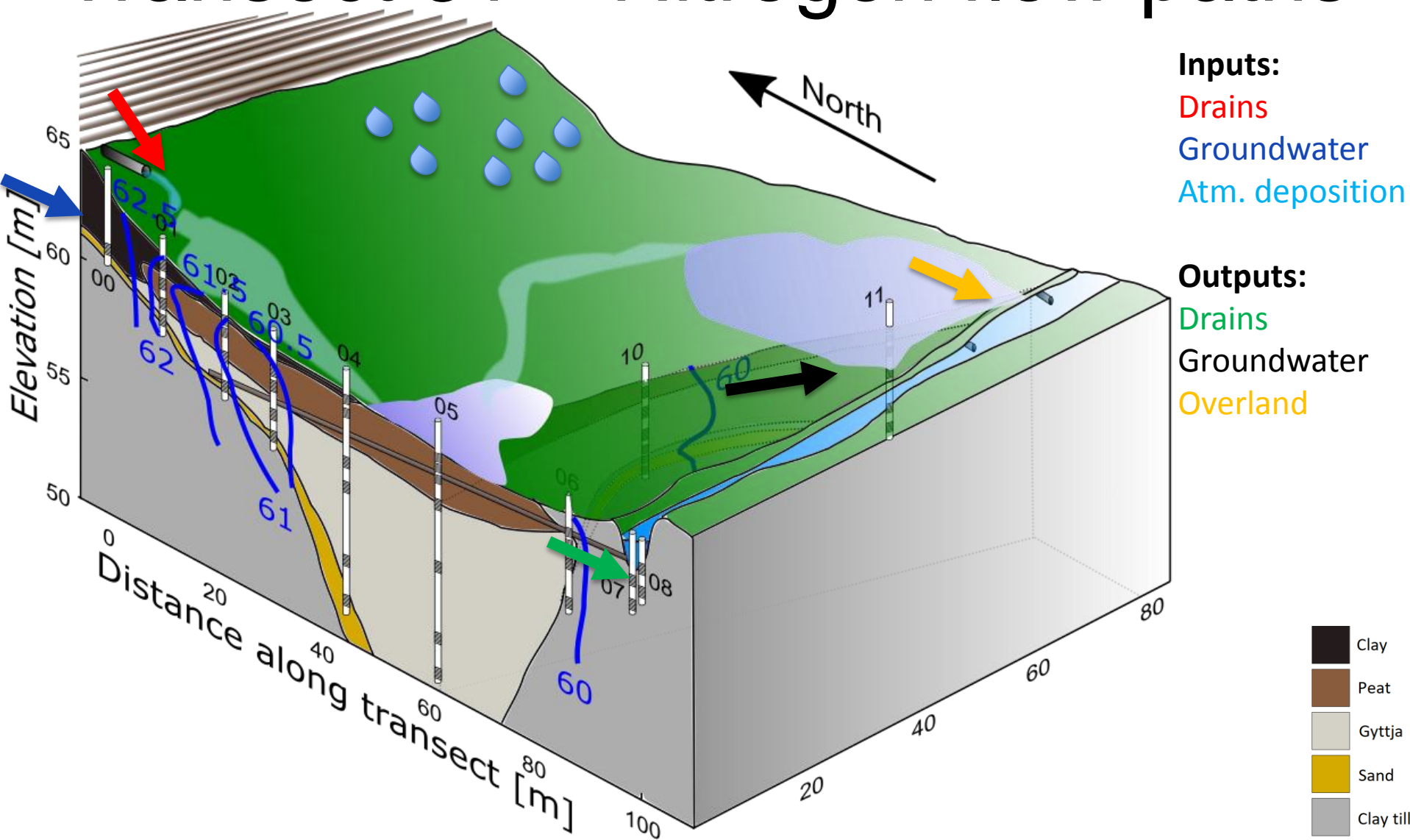


Nitrogen removal = 2682 kg/yr
 = **46 %**
 = 103 kg N/ha wetland/yr

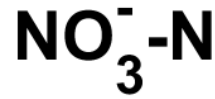
Fensholt transect 31



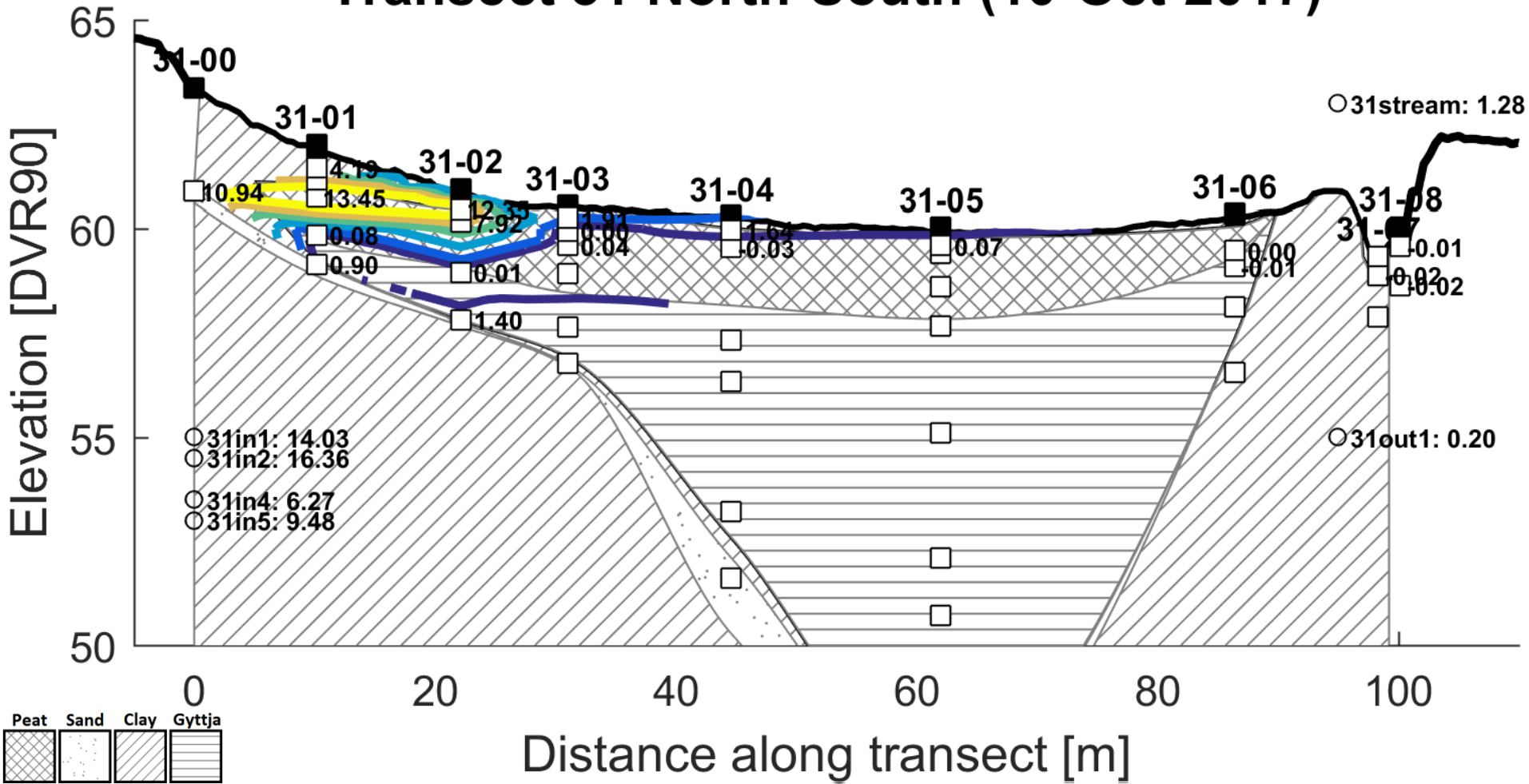
Transect 31 – Nitrogen flow paths



Transect 31 – Movement of nitrate



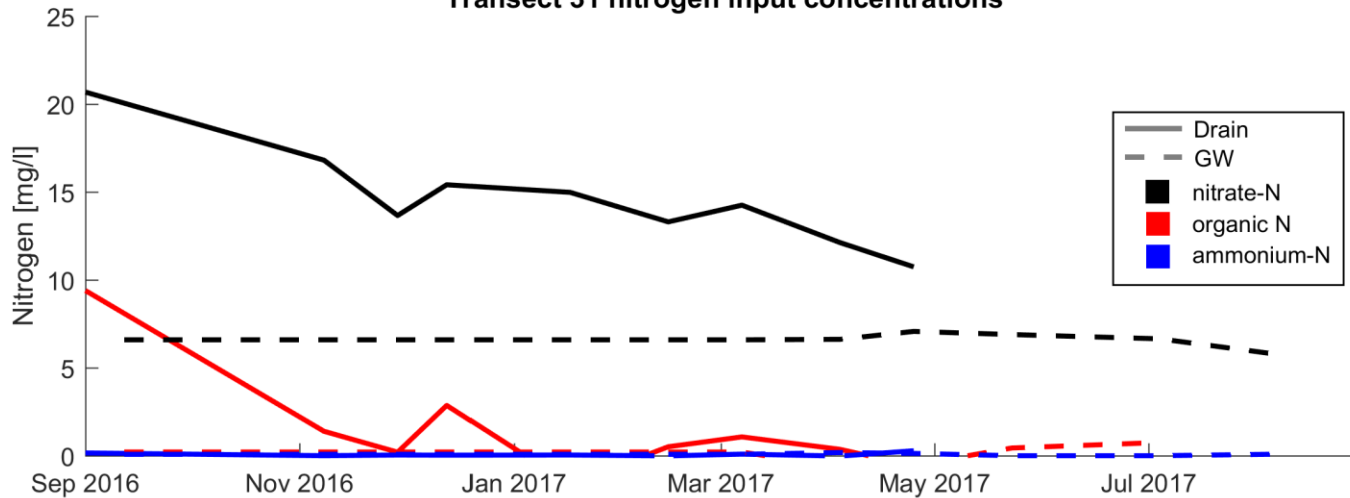
Transect 31 North-South (10-Oct-2017)



Transect 31 – Nitrogen transformation

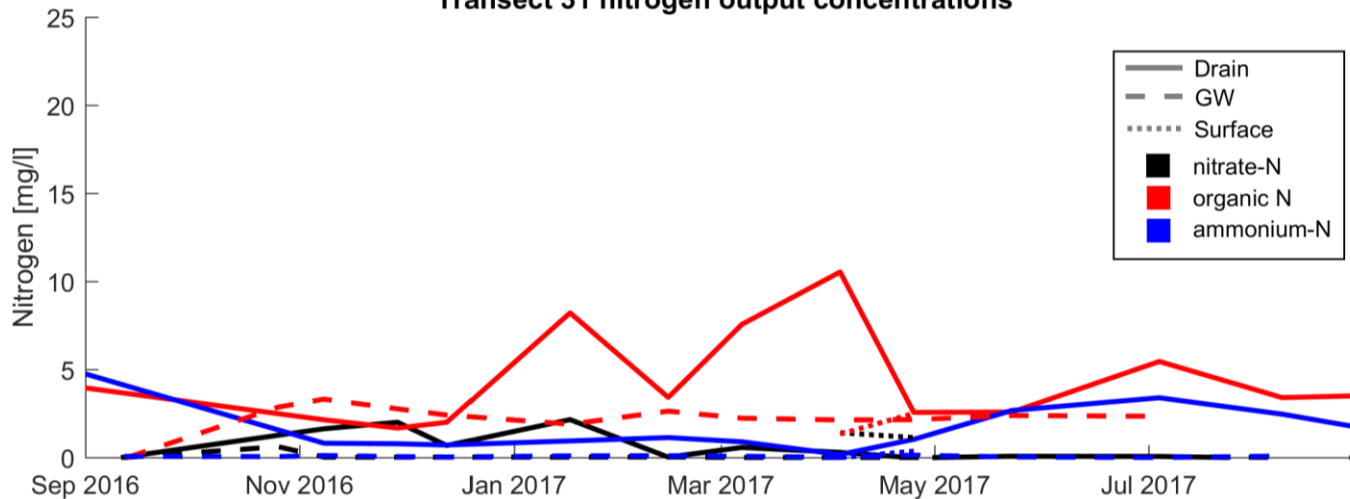
Transect 31 nitrogen input concentrations

In:

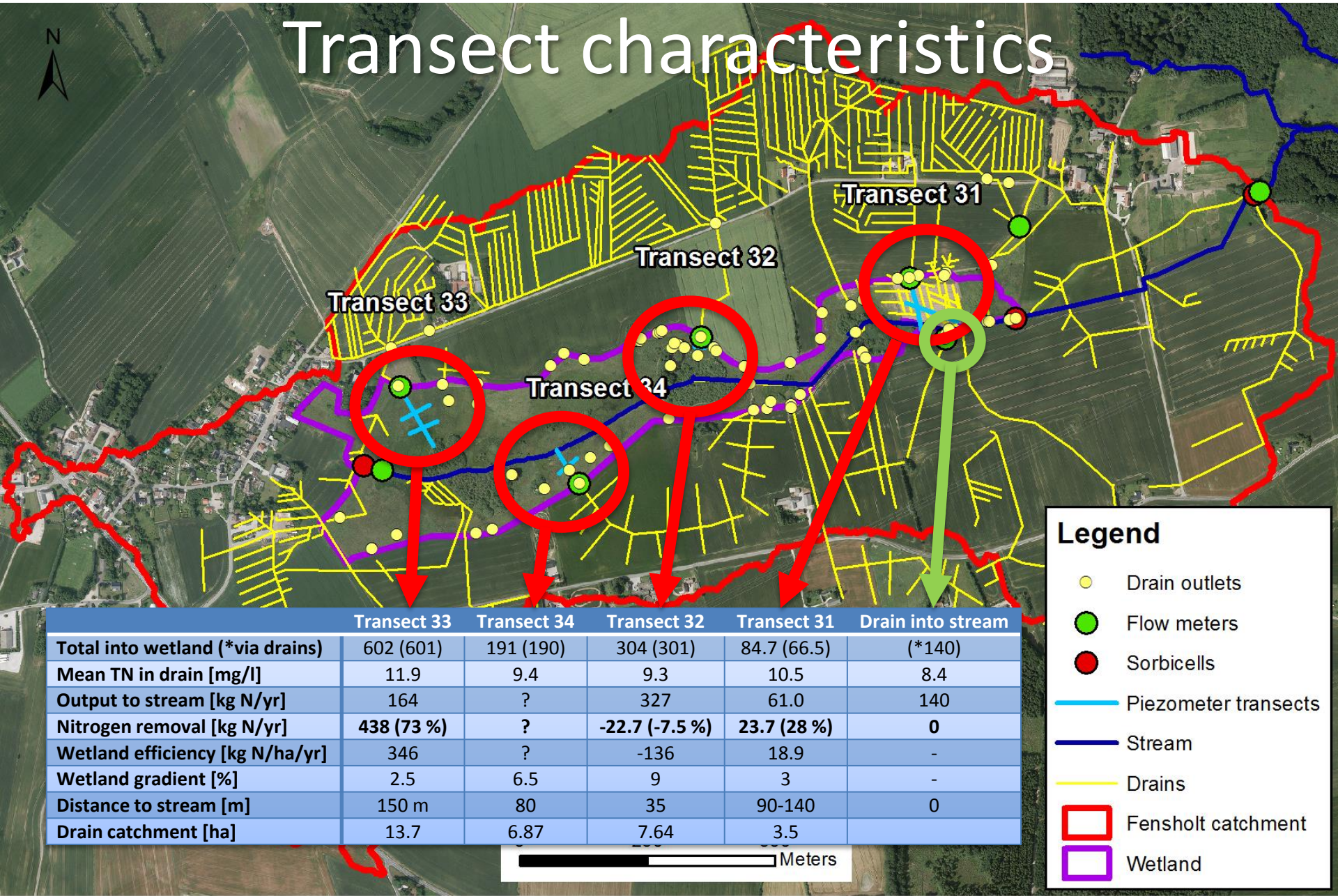


Transect 31 nitrogen output concentrations

Out:



Transect characteristics



	Transect 33	Transect 34	Transect 32	Transect 31	Drain into stream
Total into wetland (*via drains)	602 (601)	191 (190)	304 (301)	84.7 (66.5)	(*140)
Mean TN in drain [mg/l]	11.9	9.4	9.3	10.5	8.4
Output to stream [kg N/yr]	164	?	327	61.0	140
Nitrogen removal [kg N/yr]	438 (73 %)	?	-22.7 (-7.5 %)	23.7 (28 %)	0
Wetland efficiency [kg N/ha/yr]	346	?	-136	18.9	-
Wetland gradient [%]	2.5	6.5	9	3	-
Distance to stream [m]	150 m	80	35	90-140	0
Drain catchment [ha]	13.7	6.87	7.64	3.5	

Legend

- Drain outlets
- Flow meters
- Sorbicells
- Piezometer transects
- Stream
- Drains
- Fensholt catchment
- Wetland

Conclusions

- Riparian lowlands may be either sources or sinks for nitrogen
- Infiltration is essential for nitrate transformation
 - ➔ Controlling factors:
 - Distance from drain outlet to stream
 - Topographical gradient
 - Infiltration area
 - Hydraulic conductivity of peat
 - Hydraulic loading

Thank you

see more at trends.nitrat.dk



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