

Supplementary material

Nitrogen removal by tropical floodplain wetlands through denitrification

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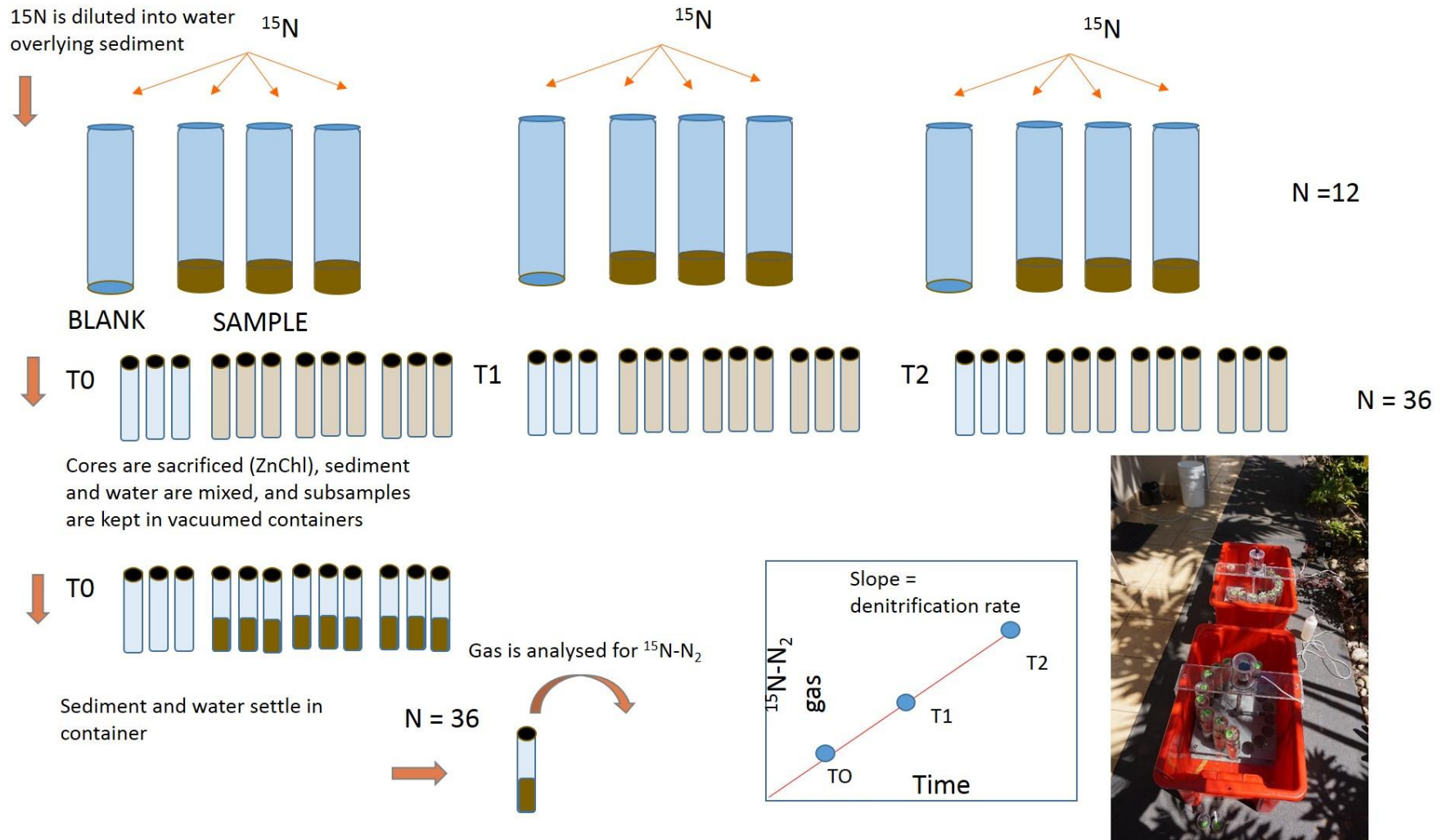


Fig. S1. Denitrification experiment design based on Steingruber *et al.* (2001).

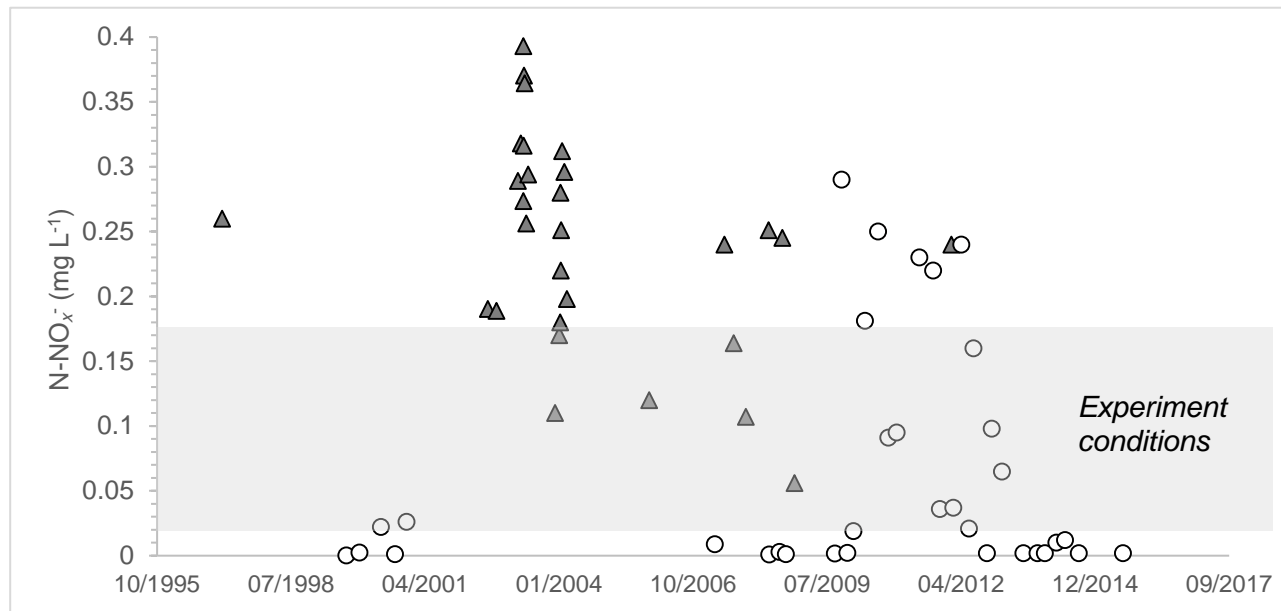


Fig. S2. Concentrations of N-NO_x^- in the Tully (grey triangles) and Herbert (white circles) rivers from 1995 to 2017. Shaded area represents the range of concentrations used in our experiments, which are similar to natural conditions. Data are from the Water Monitoring Information Portal, Queensland Government, Australia (see <https://water-monitoring.information.qld.gov.au/>, accessed September 2018)

Table S1. Correlation among independent variables using Spearman's correlation coefficient (r_s), with P -values in parentheses

Significant correlations are shown in bold. Temp, temperature; EC, water electrical conductivity

	NO _x ⁻ -N (EXP)	NO _x ⁻ -N	NH ₄ ⁺ -N	PO ₄ -P	Temp	pH
NO _x ⁻ -N	0.63 (0.05)					
NH ₄ ⁺ -N	-0.10 (0.78)	-0.27 (0.44)				
PO ₄ -P	0.02 (0.96)	0.15 (0.69)	-0.22 (0.55)			
Temp	0.14 (0.69)	0.24 (0.50)	-0.27 (0.46)	0.24 (0.51)		
pH	0.16 (0.68)	0.55 (0.13)	-0.29 (0.44)	0.59 (0.10)	-0.15 (0.70)	
EC	-0.17 (0.66)	-0.55 (0.12)	0.47 (0.20)	-0.72 (0.03)	-0.03 (0.93)	-0.88 (0.00)

Table S2. Best-fit model for predicting denitrification from water NO_x⁻-N concentrations in wetlands at the time of sampling

	Estimated	s.e.	t	P -value
(Intercept)	2.948	0.783	3.765	0.006**
log(NO _x ⁻ -N)	0.355	0.179	1.99	0.082
Adjusted R^2	0.246			
F -statistics	3.94 on 1 and 8 d.f.			
P -value	0.082			

Table S3. Denitrification rates in tropical wetlands (mg m⁻² h⁻¹), including estuarine (mangroves), lacustrine (lakes) and artificial wetlands (reservoirs)

Wetland type	Methodology	Denitrification	Reference
Tropical mangroves, Malaysia	Acetylene reduction in sediment	0.23–6.6	Alongi <i>et al.</i> 2004
Tropical mangroves, Mexico	Potential denitrification in sediment with isotope pairing	0.03–0.13	Rivera-Monroy <i>et al.</i> 1995
Tropical small rivers, Puerto Rico	<i>In situ</i> denitrification with ¹⁵ N tracing	0.30–9.6	Potter <i>et al.</i> 2010
Tropical lake, Kenya	Acetylene reduction in sediment	0.72	Viner 1982
Subtropical lake, China	Unamended and potential denitrification with acetylene reduction in sediment	0.033–0.65	Yao <i>et al.</i> 2016
Subtropical reservoir, Brazil	Acetylene reduction in water	0.22	Abe <i>et al.</i> 2003
Floodplain wetlands, Australia	Potential denitrification in sediment with isotope pairing	1.1–9.7	This study

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