

TableTable 1. Physical and chemical properties (**Mean \pm SD**) of soils at various sites within each transect

Transect	Zone	Sample number	SMC		Soil C:N	TOC (g·kg ⁻¹)	BIO (g)	ρ_b	pH	EC (μ s/cm)	SSM (%)
			SMC10-V	SMC20-V							
T1	Riparian	12	12.16 \pm 7.55	12.88 \pm 12.05	12.46 \pm 0.91	30.16 \pm 6.54	14.67 \pm 5.44	1.28 \pm 0.07	7.25 \pm 0.62	154.71 \pm 23.70	47.77 \pm 7.04
	Hillslope	6	2.72 \pm 0.91	5.05 \pm 3.09	11.41 \pm 0.09	10.77 \pm 4.72	6.70 \pm 1.48	1.45 \pm 0.03	7.22 \pm 0.40	82.02 \pm 16.37	31.02 \pm 1.32
T2	Riparian	12	26.75 \pm 19.52	12.19 \pm 7.82	11.70 \pm 1.14	19.96 \pm 5.71	24.76 \pm 9.65	1.23 \pm 0.05	8.95 \pm 0.45	303.88 \pm 102.16	51.21 \pm 6.49
	Hillslope	9	5.85 \pm 4.82	3.03 \pm 1.43	9.77 \pm 0.88	14.87 \pm 11.21	6.10 \pm 3.19	1.38 \pm 0.13	8.10 \pm 0.55	162.97 \pm 128.18	35.09 \pm 6.75
T3	Riparian	12	28.04 \pm 22.95	14.53 \pm 8.98	15.80 \pm 4.16	22.40 \pm 9.69	6.37 \pm 2.95	1.35 \pm 0.19	9.50 \pm 0.67	1233.20 \pm 829.83	47.56 \pm 11.65
	L3	3	116.37 \pm 56.91	113.36 \pm 23.17	16.8 \pm 0.58	36.1 \pm 1.84	107.75 \pm 16.94	0.592 \pm 0.02	8.5 \pm 0.17	403 \pm 57.21	>100
T4	Riparian	12	5.42 \pm 3.34	4.07 \pm 4.31	12.52 \pm 2.06	9.96 \pm 1.25	11.97 \pm 4.50	1.30 \pm 0.08	8.84 \pm 0.22	461.72 \pm 314.27	44.08 \pm 7.07
	Hillslope	6	3.35 \pm 2.06	4.27 \pm 1.94	9.97 \pm 0.50	9.65 \pm 1.05	7.84 \pm 2.48	1.30 \pm 0.09	8.23 \pm 0.14	118.5 \pm 8.25	39.43 \pm 5.55
T5	Dry lake bed	12	17.47 \pm 15.08	14.49 \pm 13.28	63.74 \pm 12.93	31.41 \pm 6.55	5.48 \pm 2.35	1.16 \pm 0.10	9.88 \pm 0.18	7320.87 \pm 4300.03	58.47 \pm 7.16
	Lake shore	9	2.64 \pm 1.48	2.82 \pm 1.27	15.92 \pm 4.71	6.35 \pm 1.16	0	1.33 \pm 0.09	9.41 \pm 0.7	281.82 \pm 162.73	37.52 \pm 5.34

Note: Soil C:N - soil carbon-nitrogen ratio; TOC - total soil organic carbon; BIO - aboveground biomass; ρ_b - soil bulk density; pH - soil pH; EC - soil electrical conductivity; SMC10-V - average soil volumetric moisture content for the 0–10 cm soil depth in wet season and in dry season; SMC20-V - average soil volumetric moisture content for the 10–20 cm soil depth in wet season and in dry season; SSM - saturated soil moisture.

Table 2. soil particle composition of soils at various sites within each transect

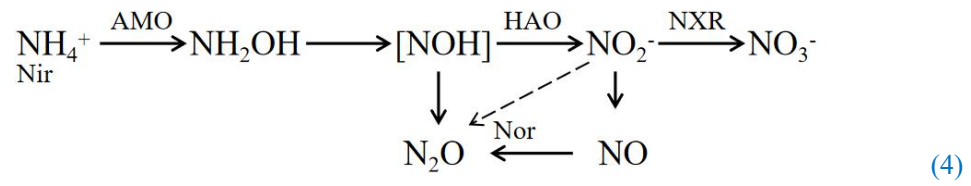
Transect	Zone	soil particle composition		
		Clay % (<0.002 mm)	Silt % (0.02~0.002 mm)	Sand % (2.0 ~0.02 mm)
T1	Riparian	2.5	2.7	94.8
	Hillslope	9.6	6.1	85.3
T2	Riparian	5.5	5.8	90.7
	Hillslope	10.8	8.6	80.6
T3	Riparian	4.1	1.1	94.8
T4	Riparian	11.4	1.5	87.1
	Hillslope	12.7	5.9	81.4
T5	Lake shore	5.1	2.1	92.8
	Dry lake bed	46.1	4.8	49.1

Table 5. GHG emission fluxes (Mean \pm SD) of riparian wetlands and grasslands

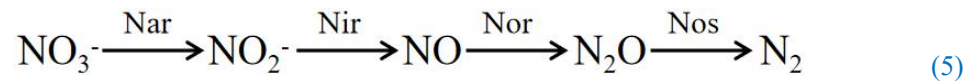
Sample plot		GHG emissions in August ($\text{mg}\cdot\text{m}^{-2}\cdot\text{h}^{-1}$)			GHG emissions in October ($\text{mg}\cdot\text{m}^{-2}\cdot\text{h}^{-1}$)			Reference
		CO ₂	CH ₄	N ₂ O	CO ₂	CH ₄	N ₂ O	
Wetlands of upstream transects (T1, T2, and T3)	n=13	1606.28 \pm 697.78	1.417 \pm 3.41	0.031 \pm 0.03	182.35 \pm 88.26	0.272 \pm 0.49	0.002 \pm 0.005	
Wetlands of downstream transects (T4 and T5)	n=7	1144.15 \pm 666.50	-0.215 \pm 0.45	-0.037 \pm 0.05	98.13 \pm 15.11	-0.015 \pm 0.05	0.001 \pm 0.01	This study
Hillslope grasslands of all transects	n=7	1071.54 \pm 225.39	-0.300 \pm 0.40	0.003 \pm 0.03	77.68 \pm 25.32	-0.048 \pm 0.03	-0.002 \pm 0.005	
Meadow grassland		166.39 \pm 45.89	-0.038 \pm 0.009	0.002 \pm 0.001	-	-	-	
Typical grassland		240.32 \pm 87.56	-0.042 \pm 0.025	0.037 \pm 0.034	-	-	-	Guo et al., 2017
Desert grassland		107.59 \pm 54.10	-0.036 \pm 0.015	0.003 \pm 0.001	-	-	-	
Typical grassland		520.25 \pm 59.07	-0.102 \pm 0.012	0.007 \pm 0.001	88.34 \pm 9.84	-0.099 \pm 0.003	0.005 \pm 0.001	Zhang, 2019
Typical grassland		232.42 \pm 18.90	-0.090 \pm 0.005	0.004 \pm 0.001	-	-	-	Chao, 2019
Typical grassland		265.23 \pm 31.43	-0.185 \pm 0.018	0.005 \pm 0.001	189.41 \pm 28.96	-0.092 \pm 0.012	0.004 \pm 0.001	
Meadow grassland		553.85	-0.163	0.003	47.73	-0.019	0.011	Geng, 2004
Typical grassland		308.60	-0.105	0.002	70.25	-0.029	0.007	

Formula

Nitrification:



Denitrification:



The enzymes involved in the formula include Ammonia monooxygenase (AMO), Hydroxylamine oxidase (HAO), Nitrite REDOX enzyme (HAO), nitrate reductase (Nar), nitrite reductase (Nir), Nitric oxide reductase (Nor) and Nitrous oxide reductase (Nos).