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Supplement of

Dynamic C and N stocks – key factors controlling the C gas exchange of maize in a heterogenous peatland

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Supplement Tables

Table S1. Overview of the cultivated grain maize varieties and the field operations (tillage, sowing, harvesting, etc.) conducted during the study period (05/2007–04/2011) by site.

Study year	Site	Maize variety	Date [dd/mm/yy]			
			Tillage/sowing	Harvesting	Mulching	Ploughing
2007/08 [†]	HS/AR	Nerissa	19/03/07	18/10/07	22/10/07	15/11/07
	GL	Nerissa	19/03/07	18/10/07	29/01/08	20/02/08
2008/09 [†]	HS/AR	Larc	29/04/08	14/10/08	21/10/08	15/11/08
	GL	Larc	29/04/08	14/10/08	15/01/09	20/04/09
2009/10 [†]	HS/AR	Logo	22/04/09	05/10/09	21/10/09	23/10/09
	GL	Logo	22/04/09	05/10/09	27/01/10	31/03/10
2010/11 [†]	HS/AR	DKC 3399	26/04/10	25/10/10	07/01/11	n.a. [‡]
	GL	DKC 3399	26/04/10	25/10/10	07/01/11	n.a. [‡]

[†] 2007/08: 01/05/07-30/04/08; 2008/09: 01/05/08-30/04/09; 2009/10: 01/05/09-30/04/10; 2010/11: 01/05/10-30/04/11

[‡] Data not available.

Table S2. Mean annual values (± 1 SD) of site-specific environmental control parameters: air and soil temperature, GWL, as well as SOC_{dyn} and N_{dyn} stocks by study year and average over the entire study

Site	Environmental control parameter	Study year				Study period
		2007/08	2008/09	2009/10	2010/11	2007/08-2010/11
AR	Biomass [kg DM m ⁻²]	1.86 (0.30)	2.18 (0.32)	1.95 (0.29)	1.57 (0.74)	1.89 (0.41)
	Air temperature [°C]	11.4 (8.8)	12.3 (7.5)	9.7 (8.4)	10.0 (8.2)	10.8 (8.1)
	Soil temperature [°C]	11.8 (6.7)	12.3 (6.7)	12.0 (7.9)	11.0 (8.0)	11.8 (7.4)
	GWL [m]	-1.2 (0.3)	-1.6 (0.2)	-1.5 (0.2)	-1.4 (0.3)	-1.4 (0.3)
	SOC _{dyn} (kg C m ⁻²)	8.0 (0.0)	8.0 (0.0)	8.0 (0.0)	8.0 (0.0)	8.0 (0.0)
	N _{dyn} (kg N m ⁻²)	0.7 (0.0)	0.7 (0.0)	0.7 (0.0)	0.7 (0.0)	0.7 (0.0)
GL	Biomass [kg DM m ⁻²]	0.57 n.a. [‡]	2.48 (0.24)	2.75 (0.43)	1.95 (0.19)	1.94 (0.29)
	Air temperature [°C]	10.8 (7.5)	9.7 (8.2)	8.9 (7.8)	10.8 (8.1)	10.0 (8.0)
	Soil temperature [°C]	12.0 (7.0)	10.9 (7.3)	9.9 (7.7)	11.3 (7.4)	11.0 (7.4)
	GWL [m]	-0.6 (0.2)	-0.9 (0.2)	-0.9 (0.3)	-0.6 (0.3)	-0.8 (0.3)
	SOC _{dyn} (kg C m ⁻²)	34.1 (5.6)	37.4 (0.5)	37.3 (0.6)	32.7 (8.1)	35.4 (5.3)
	N _{dyn} (kg N m ⁻²)	2.8 (0.5)	3.1 (0.1)	3.1 (0.1)	2.7 (0.7)	2.9 (0.5)
HS	Biomass [kg DM m ⁻²]	0.26 (0.10)	3.12 (0.39)	2.79 (0.35)	2.46 (0.15)	2.16 (0.24)
	Air temperature [°C]	11.4 (8.3)	11.1 (7.8)	9.1 (7.9)	8.7 (9.2)	10.1 (8.4)
	Soil temperature [°C]	12.3 (7.7)	11.6 (6.7)	10.6 (7.4)	9.1 (8.8)	10.9 (7.8)
	GWL [m]	-0.3 (0.3)	-0.7 (0.2)	-0.6 (0.2)	-0.5 (0.3)	-0.5 (0.3)
	SOC _{dyn} (kg C m ⁻²)	24.4 (19.8)	58.0 (16.3)	55.6 (18.5)	43.4 (22.1)	45.4 (23.5)
	N _{dyn} (kg N m ⁻²)	1.8 (1.3)	3.9 (0.8)	3.7 (1.0)	3.0 (1.3)	3.1 (1.4)

[‡] Data not available

Table S3. Model evaluation statistics for the site-specific R_{eco} and NEE models: mean absolute error (MAE), RMSE-observations standard deviation ratio (RSR), coefficient of determination (R^2), modified index of agreement (md), percent BIAS (PBIAS) and Nash-Sutcliffs model efficiency (NSE).

Model value	Statistical threshold	HS	GL	AR
R_{eco}	MAE [g CO ₂ -C m ⁻² y ⁻¹]	0.04	0.04	0.03
	RSR	0.37	0.42	0.41
	R^2	0.86	0.83	0.84
	md	0.87	0.83	0.88
	PBIAS [%]	-2.6	-5.5	-1.4
	NSE	0.86	0.83	0.84
NEE	MAE [g CO ₂ -C m ⁻² y ⁻¹]	0.19	0.12	0.12
	RSR	0.62	0.48	0.53
	R^2	0.65	0.78	0.73
	md	0.74	0.83	0.82
	PBIAS [%]	-16.5	-4.9	1.4
	NSE	0.61	0.77	0.72

Supplement Figures

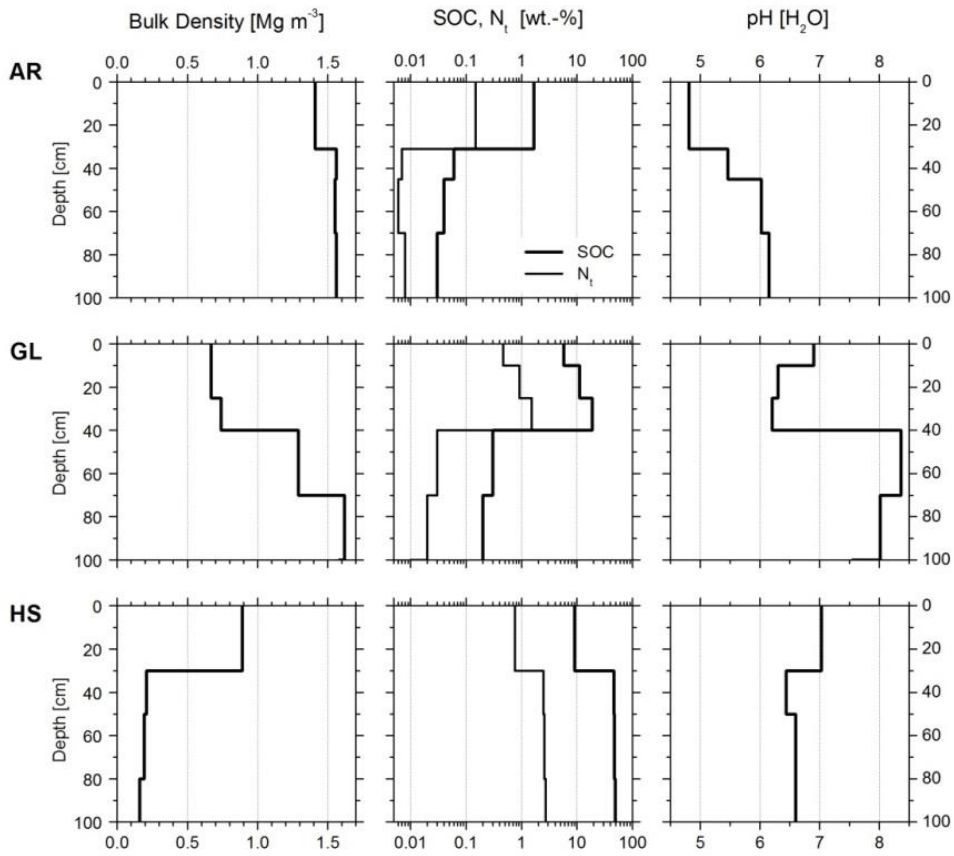


Figure S1. Site-specific depth profiles of bulk density, SOC and N_t concentration (weight %), and pH (in H_2O) up to a soil depth of 1 m.

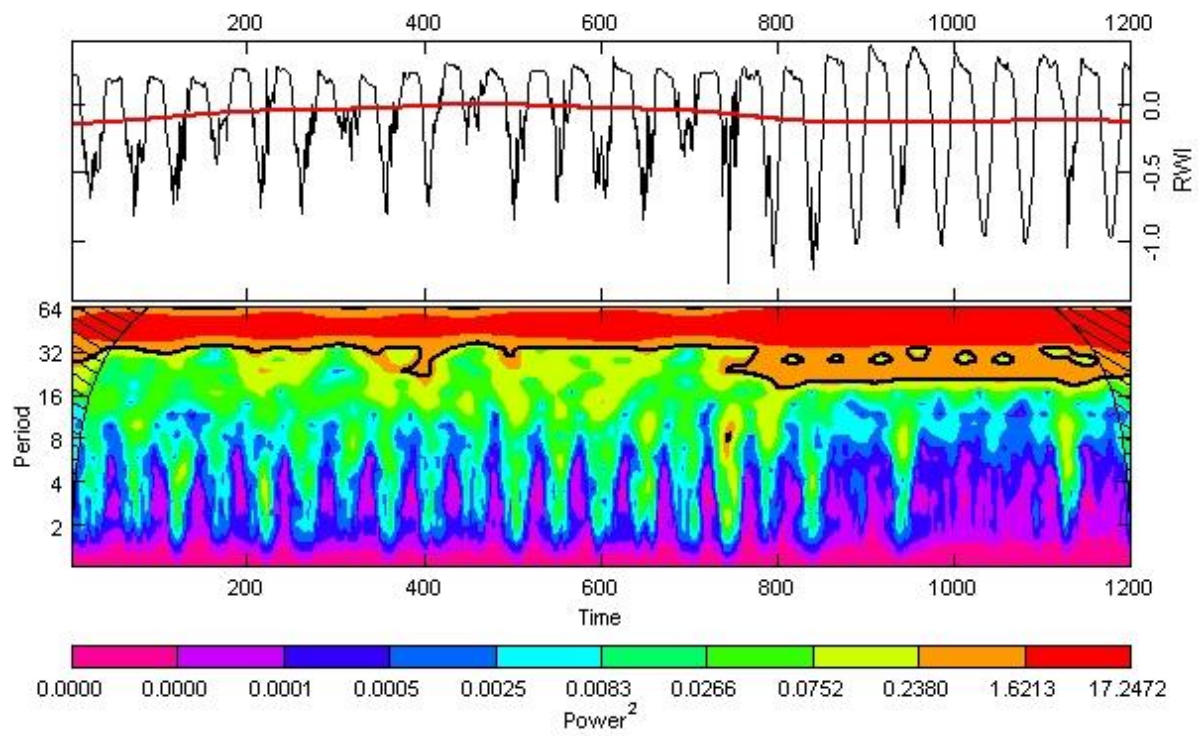


Figure S2. Annual signal of daily NEE data as detected by wavelet analysis.

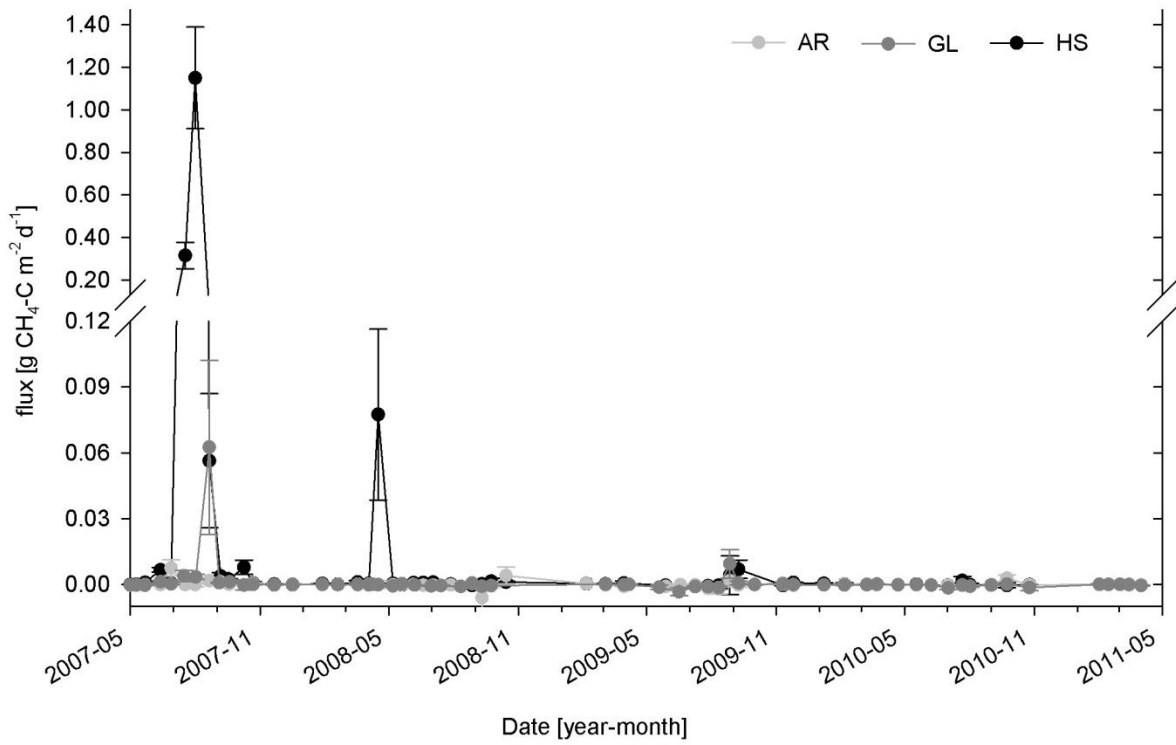


Figure S3. Measured average daily $\text{CH}_4\text{-C}$ fluxes (points) by site for the study period. Error bars indicate ± 1 SD ($n = 3$). Sites AR and GL measured until 01/04/2011; HS until 02/10/2010.