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Agricultural peatlands: towards a greenhouse gas sink – a synthesis of a Dutch landscape study

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Supplement S1. Emission estimates and gapfilling methods per greenhouse gas and per site.

SITE	GHG	METHOD	ESTIMATION OF EMISSIONS	REF.	ABBREVIATIONS
Ou, St, Ho	CO_2	Eddy covariance Ecosystem Respiration (Lloyd Tailor equation fitted on night time data) Net Day time ecosystem flux (Michaelis-Menten equation)	Annual NEE_{CO2} =GPP-R_e Annual NEE is calculated from 30 minute night fluxes $R_e = R_{10} \exp^{E_0((1/283.15-T_0)-1/(T-T_0)}$ R_{10} and E_0 are fitted from30 minutes average night time per month or shorter when required. $F_c = \frac{\alpha.\mathrm{PPFD}.\beta}{\alpha.\mathrm{PPFD}+\beta} + \chi$	1, 2, 3	NEE= net ecosystem exchange GPP= gross primary production R_e = ecosystem respiration R_{10}= respiration at 10 °C T_0= fixed T at 227.13 K E_0= activation energy F_c= ecosystem flux PPFD= Photosynthetic photon flux density α, β and χ are parameters
Ou, St,	CO_2	Dark chamber	Annual R_e is calculated from a regression given by $R_e = R_{10} \exp^{E_0((1/283.15-T_0)-1/(T-T_0)}$	4	
Ou	CH_4	Eddy covariance	$\mathrm{NEE}_{\mathrm{CH4}} = \sum_{i=1}^{N} F_{\mathrm{CH4}_i} T_{av}$ with F_{CH4} 30 minute measured eddy covariance flux or the gap filled flux given by $F_{\mathrm{CH}_4} = \exp^{a+bT+cU}$ *a*, *b* and *c* are factors in the regression	5	NEE_{CH4}= annual emissions of CH_4 F_{CH4}= 30 minute flux of CH_4 T_{av} = averaging time T= 30 minute soil temperature U –=30 minute wind velocity
Ou, St, Ho	CH_4	Dark chamber	$\mathrm{NEE}_{\mathrm{CH4}} = \sum_{i=1}^{N} F_{\mathrm{CH4}_i} T_{\mathrm{av}}$ with $F_{\mathrm{CH}_4} = \exp^{a+bT}$ a and b are factors in the regression and are different per site and per landform The factors a and b are given per site per landform in Schrier-Uijl et al 2009.	6,1	
Ou	N_2O	Eddy covariance	$\mathrm{NEE}_{\mathrm{N_2O}} = E_{\mathrm{EC}} + E_{\mathrm{l}} + E_{\mathrm{d}}$ with $E_{\mathrm{EC}} = E_{\mathrm{bgnd}} + E_{\mathrm{fert}}$	5	NEE_{N2O}= annual emissions of N_2O E_{EC} = emission measured by eddy covariance E_l = indirect emission due to leaching and run-off E_d = indirect emission due to deposition E_{bgnd} = background emission E_{fert} = direct emission due to fertilizing events
St	N_2O	Literature		7	
Ho	N_2O	Literature		7	

1 Hendriks et al (2007), 2 Veenendaal et al. (2007), 3 Falge et al. (2001), 4 Schrier-Uijl et al. (2010b), 5 Kroon et al. (2010), 6 Schrier-Uijl et al. (2010a), 7 Velthof et al. (2007).