Leiber-Sauheitl et al.: Supplement

Fig. S1: PAR correction for site $C_{med}$, $W_{low}$, $C_{low}$, $W_{low}$ and $C_{low}$, $W_{high}$ at a distance of 50 metres from the tree line. Dashed line = 1:1 line, continuous line = correction function $PAR = \alpha \times PAR_{station}^\beta$.

Fig. S2: Time series of water table levels at each site (June 1, 2011 to June 1, 2012).

Fig. S3: Reco flux model (A) and GPP flux model (B) of an exemplary measurement campaign (02 May 2012) showing measured data as dots and fits as lines.

Fig. S4A: Plots of measured Reco fluxes vs. modeled Reco fluxes of all measurement campaigns seperated by site (1 June 2011 to 1 June 2012).

Fig. S4B: Plots of measured NEE fluxes vs. modeled NEE fluxes of all measurement campaigns seperated by site (1 June 2011 to 1 June 2012).

Fig. S5: Example of a flux measurement where the non-linear fit severely overestimates the flux. N$_2$O concentrations were close to ambient and (by chance) the second to fourth concentration were almost identical and the first concentration was lower by 20 ppb (which is within typical measurement error). Robust linear fit equaled linear fit with flux = 13 $\mu$g N m$^{-2}$ h$^{-1}$, $p = 0.2$, AIC=-24. Shaded area depicts confidence band of the linear fit. HMR fit resulted in flux = 96 $\mu$g N m$^{-2}$ h$^{-1}$, $p = 2E-5$, AIC=-59. Since the HMR flux estimate is more than four times the robust linear flux estimate, we used the latter.

Fig. S6: Annual time lines of CH$_4$ (A) and N$_2$O (B) (mean ± standard error of the replicates; June 1, 2011 to June 1, 2012).
Table S1: Linear mixed-effects model of $R_{eco}$ vs. Water table.

Linear mixed-effects model fit by REML

Data: Dat

<table>
<thead>
<tr>
<th></th>
<th>AIC</th>
<th>BIC</th>
<th>loglik</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>475.256</td>
<td>496.8599</td>
<td>-229.628</td>
</tr>
</tbody>
</table>

Random effects:

- Formula: ~WTpeat | site
- Structure: General positive-definite, Log-Cholesky parametrization
- (Intercept) 2.256385 (Intr)
- WTpeatTRUE 2.409026 -0.896
- Residual 1.748395

Fixed effects: Reco ~ WT * WTpeat

<table>
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<th>Std.Error</th>
<th>DF</th>
<th>t-value</th>
<th>p-value</th>
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<td>-0.180163</td>
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<td>-5.428574</td>
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<tr>
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<td>0.5413</td>
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<tr>
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<td>4.246360</td>
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<td>0.699270</td>
<td>0.4859</td>
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</table>

Correlation:

- (Intr) WT - WTTRUE
- WT - 0.787
- WTpeatTRUE -0.922 -0.733
- WT:WTpeatTRUE -0.628 -0.796 0.752

Standardized Within-Group Residuals:

<table>
<thead>
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<th></th>
<th>Min</th>
<th>Q1</th>
<th>Med</th>
<th>Q3</th>
<th>Max</th>
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<tbody>
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<td>0.612438896</td>
<td>2.697319770</td>
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</table>

Number of Observations: 114
Number of Groups: 6
Fig. S3

Fig. S4A
Fig. S4B
Fig. S5

Fig. S6A
Fig. S6B

N2O flux [µg N2O-N m⁻² h⁻¹]