

Bimodal diel pattern in peatland ecosystem respiration rebuts uniform temperature response

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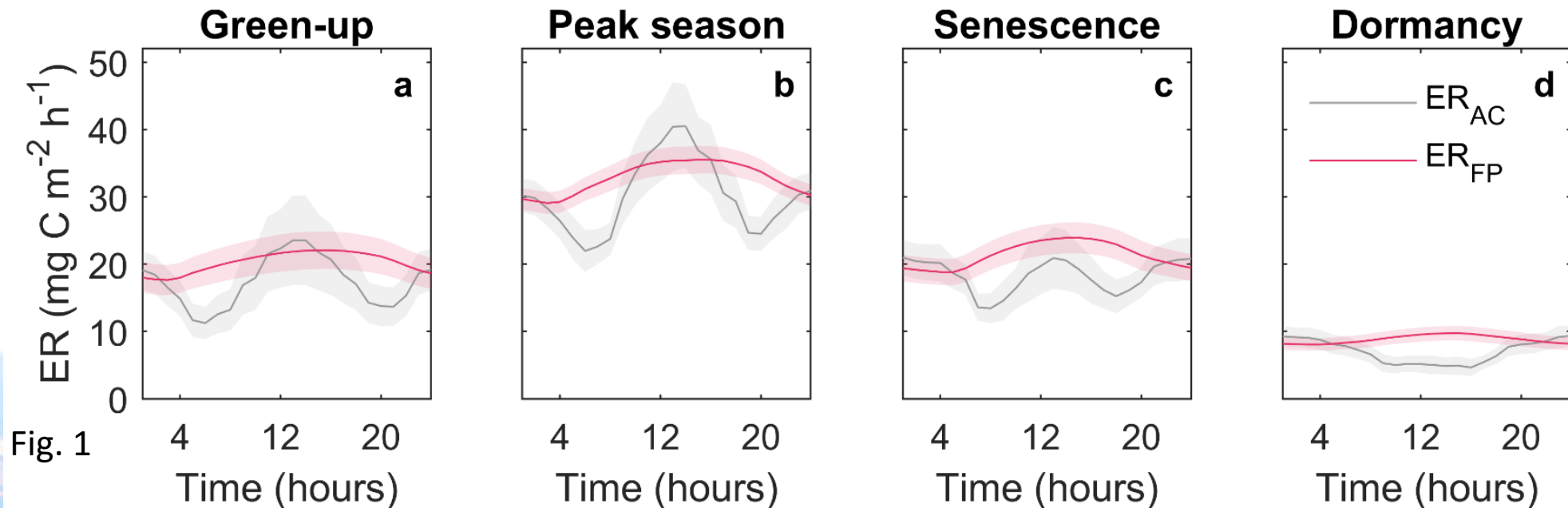
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Background & Study goal

Eddy covariance and manual chambers generate semi-continuous empirical data of ecosystem respiration (ER)
Periodic night- or daytime data are extrapolated to the daily scale *assuming* a uniform diel temperature response

Here, we test this assumption using hourly automated chamber data of ER and its component fluxes over 3 years

Results



Järveoja et al., in review

Diel ER patterns

Automated chamber measurements reveal a distinct *bimodal* diel pattern in ER (ER_{AC})

This contrast the *unimodal* diel ER pattern obtained from extrapolating nighttime data with the REdDyProc online flux partitioning tool (ER_{FP}) assuming a uniform diel temperature response

Results

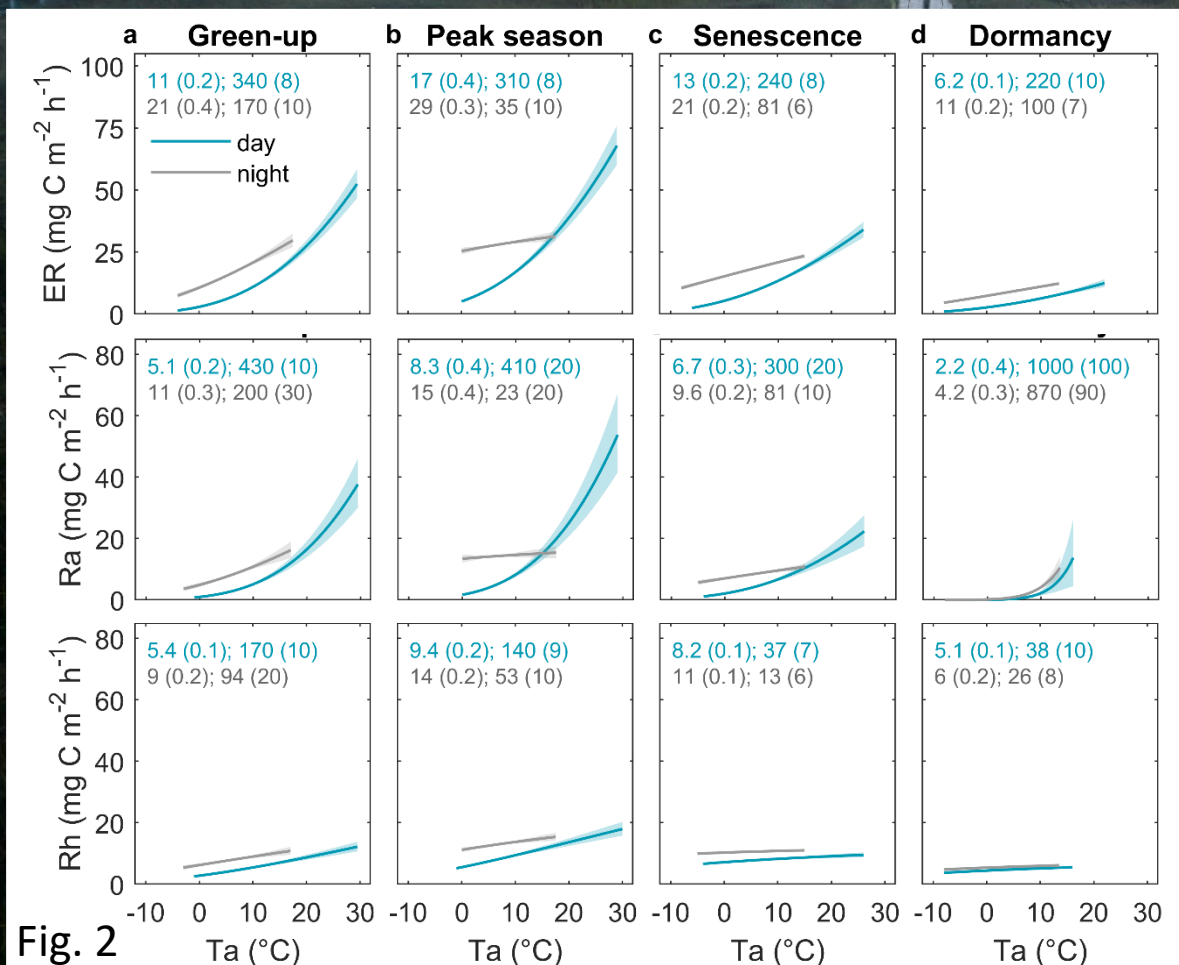


Fig. 2

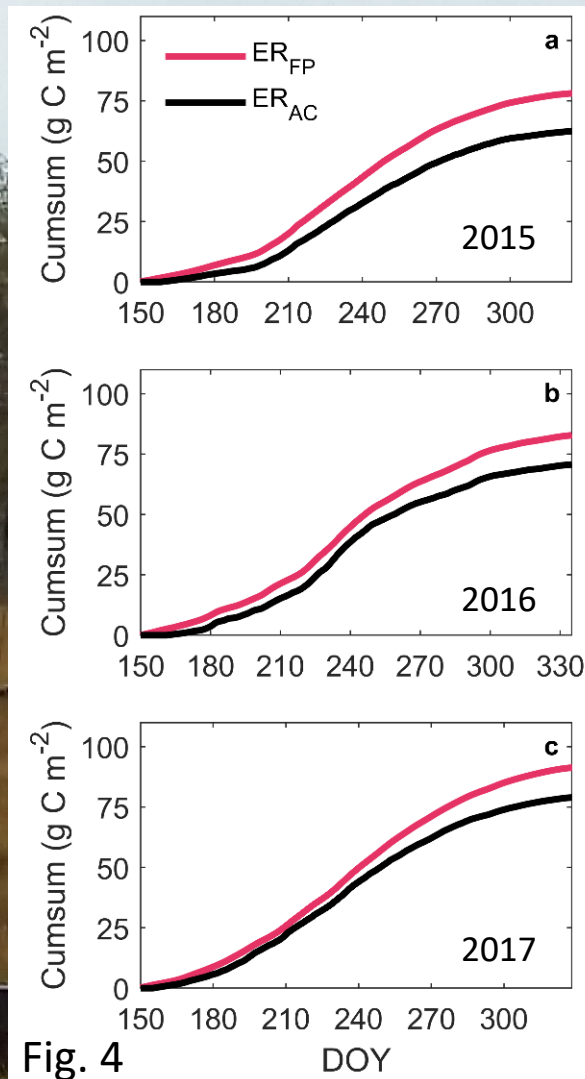
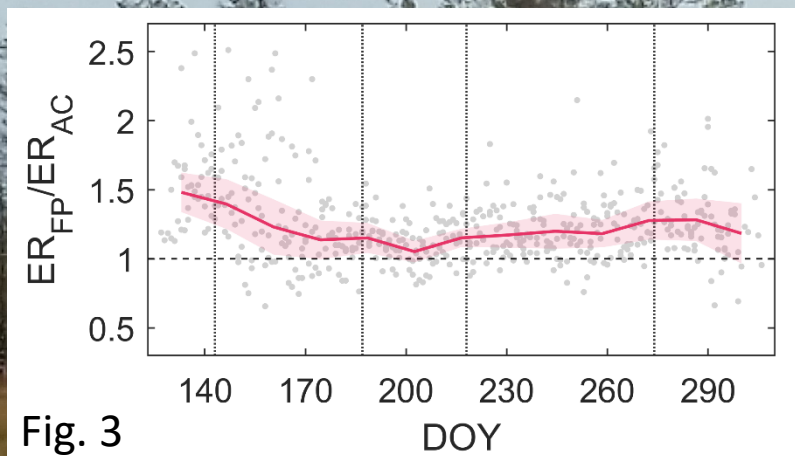
Values (SE) are the fitted parameters from eq.11 in Lloyd & Taylor (1994)

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Divergent diel temperature response
We find that the temperature response of ER and its autotrophic (Ra) and heterotrophic (Rh) component fluxes vary between day- and nighttime and across phenological phases

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Results



Bias in daily and growing season ER sums

Assuming a uniform temperature response results in a positive bias overestimating daily ER by up to ~2-fold (Fig. 3) and growing season ER by 16-23% (Fig. 4)