



Supplement of

Comparison of carbon and water fluxes and the drivers of ecosystem water use efficiency in a temperate rainforest and a peatland in southern South America

Jorge F. Perez-Quezada et al.

Correspondence to: Jorge F. Perez-Quezada (jorgepq@uchile.cl)

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Table S 1. Annual mean values of climatic variables recorded by Eddy Towers for the temperate rainforest (TRF) and anthropogenic peatland (AP) and average values for the study period (2015-2022).

Year	R_n W m ⁻² TRF; AP	Albedo fraction TRF; AP	U m s ⁻¹ TRF; AP	RH % TRF; AP	VPD kPa TRF; AP	SWC m ³ m ⁻³ TRF; AP	WTD m TRF; AP	Ts °C TRF; AP
2015	85.6; 67.8	0.14; 0.17	3.2; 1.6	83.0; 84.9*	0.25; 0.25	0.43; 0.37	0.33; 0.16	10.8; 11.2
2016	90.9; 70.9	0.13; 0.16	3.0; 1.4	82.8; 85.9	0.27; 0.25	0.43; 0.34	0.33; 0.16	10.8; 11.3
2017	83.2; 61.8	0.14; 0.17	3.3; 1.7	81.3; 84.7	0.27; 0.26	0.54; 0.46	0.16; 0.10	10.5; 11.4
2018	82.0; 63.3	0.14; 0.17	3.1; 1.6	83.6; 84.4	0.28; 0.33	0.42; 0.45	0.13; 0.11	10.1; 10.7
2019	82.0; 66.2	0.14; 0.18	3.1; 1.6	81.0; 83.5	0.28; 0.29	0.40; 0.44	0.18*; 0.15	10.2; 10.7
2020	87.6; 65.9	0.14; 0.18	3.2; 1.6	81.9; 85.3	0.27; 0.27	0.48; 0.45	0.23; 0.09	10.5; 10.8
2021	96.9; 76.4	0.14; 0.19	3.0; 1.5	82.1; 80.9	0.28; 0.32	0.43; 0.40	0.41*; 0.25*	10.6; 11.0
2022	80.0; 63.8	0.13; 0.17	3.1; 1.6	84.3; 76.7	0.23; 0.29	0.44; 0.39	-; 0.11	10.1; 10.4
Mean	86.1; 67.0	0.14; 0.17	3.1; 1.6	82.2; 78.9	0.27; 0.28	0.45; 0.41	0.25; 0.14	10.4; 11.0

R_n = net radiation; U = maximum wind speed in 30-minute data; RH = relative humidity; VPD = vapor pressure deficit; SWC = soil water content; WTD = water table depth; Ts = soil temperature. * Years that have several missing data, which long gaps could not be reliably filled by the MDS methodology, these years are not used to calculate the average and standard error of each variable.

Table S 2. Evapotranspiration in the forest (SDF) and peatland (SDP) using the High Relative Humidity Correction (HRHC) and the Bowen ratio correction (BRC).

Evapotranspiration [mm year ⁻¹]	SDF using HRHC	SDF using BRC	SDP using HRHC	SDP using BRC
2015	498	745	619	584
2016	587	820	615	598
2017	736	1122	697	738
2018	703	1089	794	763
2019	690	1071	701	651
2020	594	936	689	770
2021	492	721	629	670
2022	508	772	640	681
Mean ± SE	601 ± 35	910 ± 59	673 ± 21	682 ± 25

Table S 3. Partitioning of ET in the forest site (SDF) using the High Relative Humidity Correction (HRHC) and the Bowen ratio correction (BRC), associated with the partitioning methods proposed by Zhou et al. (2016) and Nelson et al. (2018).

T/ET [%]	Zhou (2016) using HRHC	Zhou (2016) using BRC	Nelson (2018) using HRHC	Nelson (2018) using BRC
2015	60.6	55.8	41.5	37.5
2016	52.1	49.0	44.3	38.5
2017	47.0	40.1	39.9	35.6
2018	49.3	42.6	40.3	36.6
2019	46.3	39.7	41.8	34.5
2020	51.6	45.2	40.5	34.3
2021	57.0	51.3	40.4	38.4
2022	49.7	44.3	37.3	36.2
2022	508	772	640	681
Mean ± SE	51.7 ± 1.7	46 ± 2.0	40.8 ± 0.7	36.5 ± 0.6

Table S 4. Partitioning of ET in the peatland site (SDP) using the High Relative Humidity Correction (HRHC) and the Bowen ratio correction (BRC), associated with the partitioning methods proposed by Zhou et al. (2016) and Nelson et al. (2018).

T/ET [%]	Zhou et al 2016 using HRHC	Zhou et al 2016 using BRC	Nelson 2018 using HRHC	Nelson 2018 using BRC
2015	51.6	48.2	43.5	37.5
2016	56.1	52.8	49.0	42.7
2017	54.1	47.5	48.1	37.8
2018	46.9	46.7	44.9	34.3
2019	51.5	51.2	47.3	35.7
2020	40.8	37.3	37.0	29.1
2021	57.1	52.6	52.4	41.2
2022	57.0	52.5	55.3	39.1
Mean ± SE	51.9 ± 2.0	48.6 ± 1.8	47.2 ± 2.0	37.2 ± 1.5

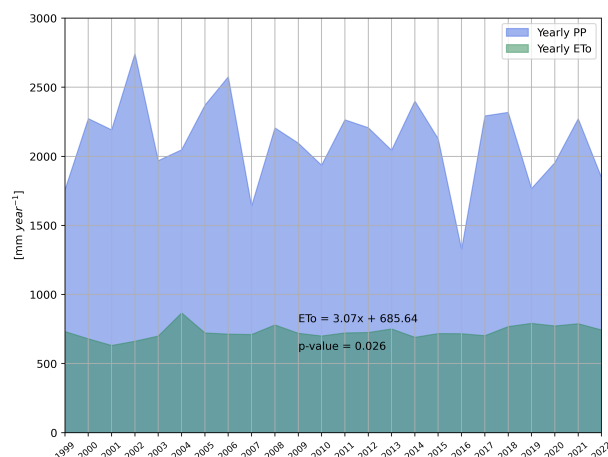


Figure S 1. Annual cumulative precipitation (PP) and Hargreaves potential evapotranspiration (ETo) measured at Senda Darwin meteorological station for the period 1999-2022. Significant increasing trend ($P=0.026$) for PET of about 3 mm per year, tested with Mann Kendall seasonal test.

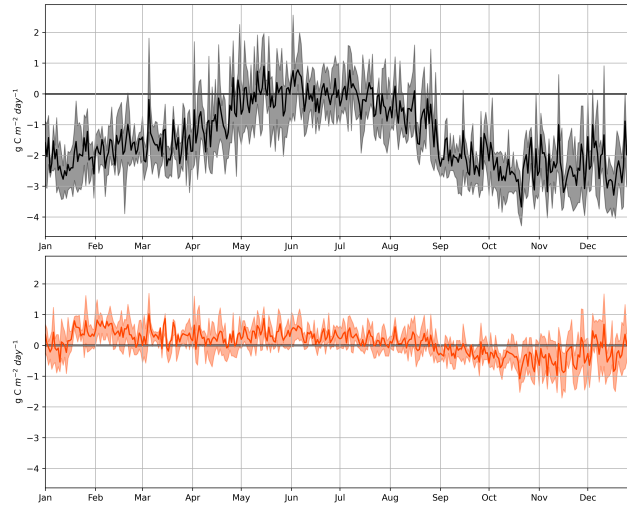


Figure S 2. Annual cycle of daily NEE at Senda Darwin Forest (black) and Senda Darwin Peatland (orange) for the period 2015-2022. The solid line indicates the daily mean, while the shadows show the daily values between percentiles 25 and 75.

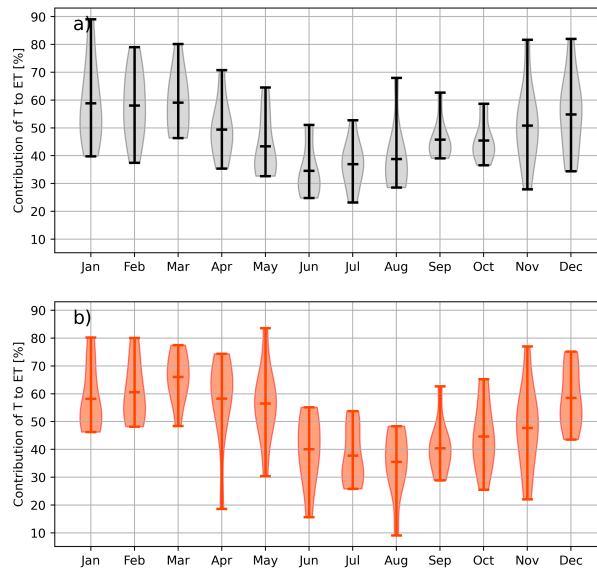


Figure S 3. Monthly contribution of transpiration to ET as a percentage in a) temperate rainforest and b) anthropogenic peatland, during the study period.