



Supplement of

Temperature dependence of the contribution of soil water content to soil respiration in a monsoon influenced temperate deciduous forest

Dongmin Seo et al.

Correspondence to: Jaeseok Lee (jaeseok@konkuk.ac.kr)

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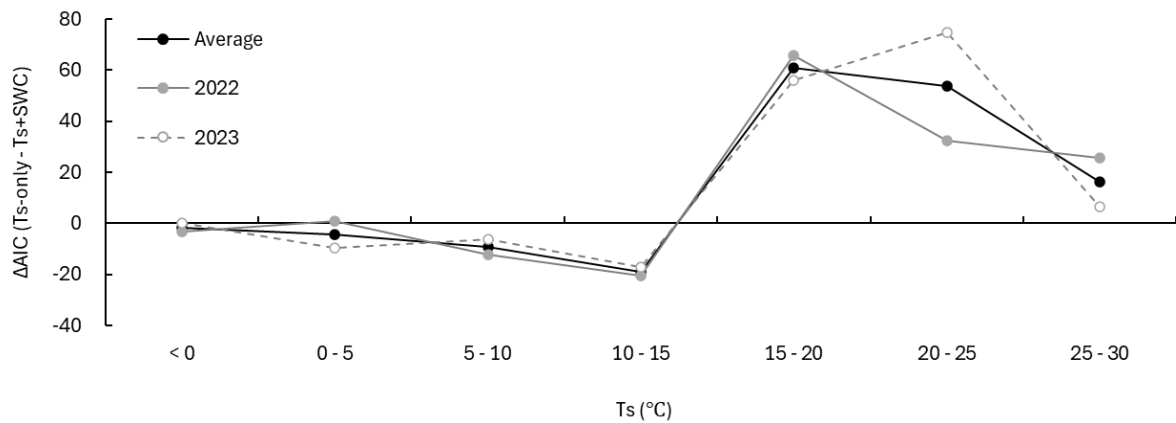


Figure S1: SMC related model fit improvement (ΔAIC) by Ts bin. The effect of including SMC was quantified as the difference in AIC between the Ts-only model and the Ts + SMC model (ΔAIC). Positive ΔAIC values indicate improved model fit when SMC is included. The gray solid line indicates 2022, the gray dashed line indicates 2023, and the black solid line indicates the mean across both years.

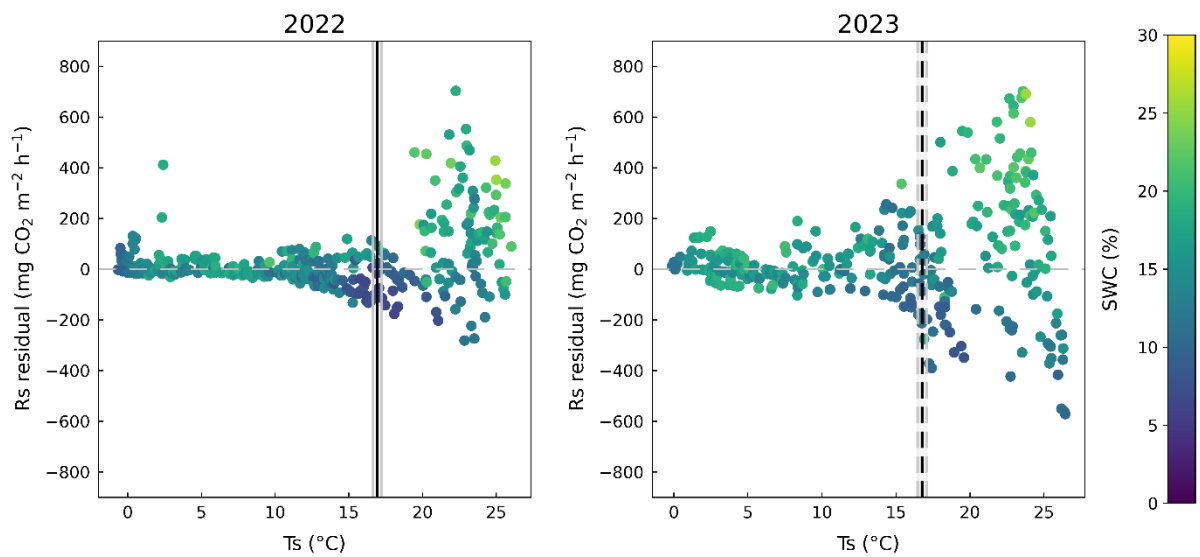


Figure S2: Relationship between Ts and residuals of Rs in 2022 and 2023. Residuals were calculated as observed Rs minus Rs predicted by the Ts only model. Points are colored by SWC. Vertical lines indicate the estimated breakpoint in the Rs response to Ts for each year, and the horizontal line indicates zero residual.

Table S1: Model comparison using AIC to determine the optimal number of temperature breakpoints in the relationship between Rs and Ts and to evaluate goodness of fit across candidate models.

Year	Model	Breakpoint	k	AIC
2022	Exponential	0	2	3469.96
	segmented regression(1 breakpoints)	1	4	3449.61
	segmented regression(2 breakpoints)	2	6	3457.95
2023	Exponential	0	2	3562.32
	segmented regression(1 breakpoints)	1	4	3449.92
	segmented regression(2 breakpoints)	2	6	3512.06

Table S2: Segment specific regression statistics for the relationship between soil temperature and soil respiration below and above the breakpoint in 2022 and 2023. Ts range, slope of the Ts–Rs fit, R², p-value, and mean SWC are shown for each segment.

Year	Section	Ts range	Slope of Ts–Rs fit	R²	p-value	Mean SWC (%)
2022	Below breakpoint	Ts < 16.94	10.88	0.65	< 0.0001	13.58
2023	Below breakpoint	Ts < 16.77	30.27	0.77	< 0.0001	15.27
2022	Above breakpoint	Ts ≥ 16.94	127.91	0.66	< 0.0001	15.22
2023	Above breakpoint	Ts ≥ 16.77	190.00	0.68	< 0.0001	16.18