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Supplement of

Soil respiration across a permafrost transition zone: spatial structure and environmental correlates

James C. Stegen et al.

Correspondence to: James C. Stegen (james.stegen@pnnl.gov)

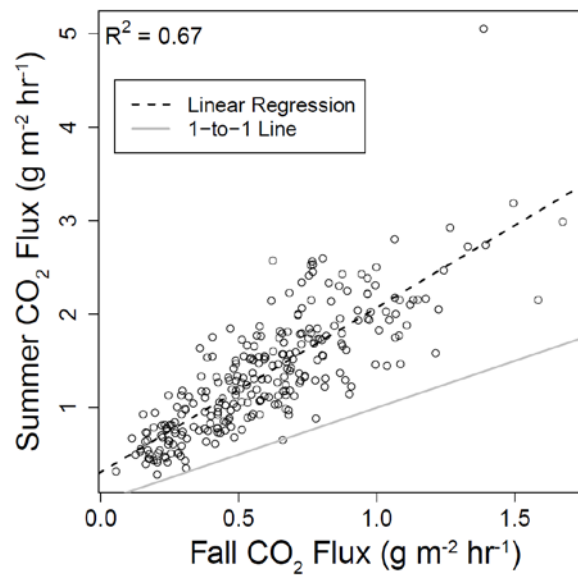
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Supplemental Table and Figures

Table S1. Soil respiration summary statistics, Matern variogram parameters, and sample sizes (n) for each season across the full, permafrost-free, and permafrost-associated spatial domains. Entries are identical to Table 1, with the addition of results from the analysis of Summer data using the reduced sampling scheme from the Fall.

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Variable	Mean	Variance	CV (%)	Nugget	Range	Sill	Kappa	n
Summer (full)	1.35	0.41	47.1	0.19	76	0.71	0.5	306
Reduced Summer (full)	1.36	0.41	47.0	0.19	3137	8	0.4	270
Fall (full)	0.60	0.09	49.8	0.01	7	0.07	0.2	270
Summer (permafrost-free)	1.65	0.39	37.9	0.22	133	0.94	0.3	156
Reduced Summer (permafrost-free)	1.66	0.39	37.6	0.22	1886	3.6	0.3	144
Summer (permafrost)	1.02	0.22	46.1	0.14	11	0.2	1.7	150
Reduced Summer (permafrost)	1.01	0.21	45.7	0.15	5.5	0.19	10	126
Fall (permafrost-free)	0.73	0.07	37.1	0.04	2.1	0.07	10	144
Fall (permafrost)	0.43	0.06	55.7	0	2.5	0.05	0.3	126



5 **Figure S1. Relationship between Summer and Fall soil respiration.** Each data point is from a given soil collar that was measured in both seasons. The linear regression and one-to-one lines are shown, and the strength of the relationship is indicated by the provided R².

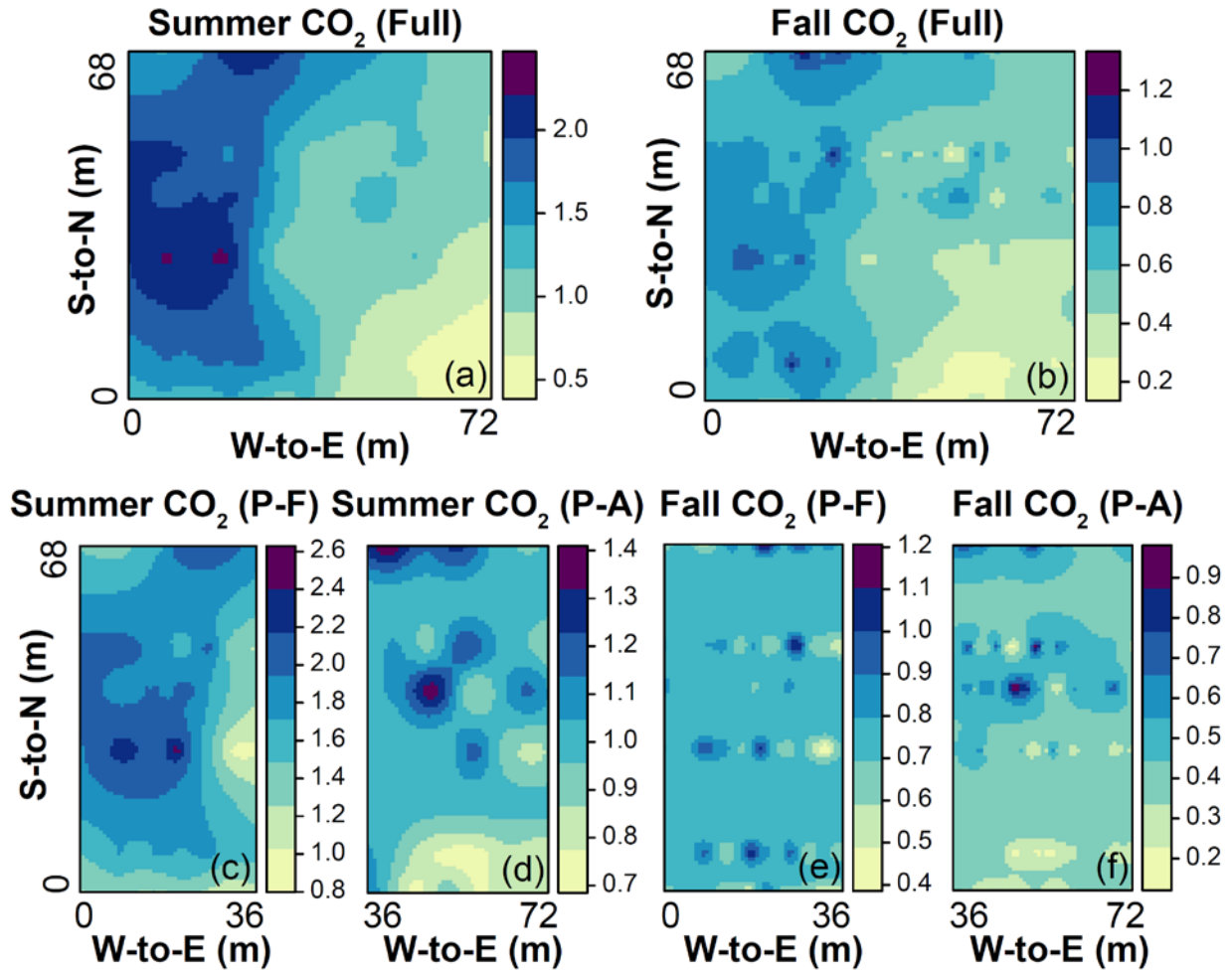


Figure S2. Interpolated soil respiration across seasons and spatial scales. Results presented for Fall are identical to Figure 5. The Summer results are based on the reduced sampling scheme used in the Fall. Each panel has its own color ramp, and in all panels the values are CO₂ flux rates (g m⁻² hr⁻¹). The vertical and horizontal axes in all panels indicate the South-to-North and West-to-East dimensions, respectively. The top panels show interpolations across full spatial domain and the bottom panels show interpolations within the permafrost-free (P-F) and permafrost-associated (P-A) domains. Stronger spatial structure in Summer is evident as is the non-linear decline in soil respiration near 36m, moving from West to East; these patterns are consistent with those generated using the full Summer dataset, as shown in Figure 5.

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