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Response of hydrology and CO_2 flux to experimentally altered rainfall frequency in a temperate poor fen, southern Ontario, Canada

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Table S1: Mean values of set-point diurnal meteorological conditions in growth chamber and the study site (May-September 2015).

Location	Diurnal Phase	Air temperature (°C)	Relative Humidity (%)	Vapour Pressure Deficit	PAR (µmol $m^{-2}s^{-1}$)	Number of hours in each diurnal phase
Chamber	Day	19.2	69	0.69	300	15
	Night	12.1	90	0.14	0	9
Field	Day	19.1	69.7	0.67	635	15
	Night	12.1	93.8	0.09	0	9

Table S2: Precipitation characteristics of treatments in the growth chamber and the study site (May-September 2015).

Location	Treatment	Frequency	# of dry days between events	Amount per event (mm)	% of days with rain
Chamber	HiFreq-Lab	3x/ week	1-2	2.3	42
	MedFreq-Lab	1x/ week	6	6.9	14
	LowFreq-Lab	0.5x/ week	13	13.8	7
Field	Ambient	3(±2)x/ week	2(±2)	6 (±9)	38
	HiFreq	3x/ week	1(±1)	5 (±2)	42
	MedFreq	1x/ week	6(±1)	13(±6)	14
	LowFreq	0.5x/ week	13(±1)	29(±8)	7

Table S3: Mean (standard deviation) values of hydrological variables for each precipitation treatment within each vegetation community during the field experiment (May-September 2015). Different letters indicate significant differences ($p < 0.05$) between precipitation treatments within each water table and vegetation treatment. No letters indicate no significant differences.

Vegetation Community	Rainfall Treatment	VMC (%)	WT (cm)
Moss	HiFreq	75(6)a	-17(6)a
	MedFreq	75(7)a	-12(6)b
	LowFreq	71(8)b	-13(6)ab
Shrub	HiFreq	50(3)a	-18(6)
	MedFreq	26(3)b	-18(6)
	LowFreq	30(4)c	-16(6)
Sedge	HiFreq	27(2)a	-21(6)a
	MedFreq	82(6)b	-11(6)b
	LowFreq	68(11)c	-13(6)b

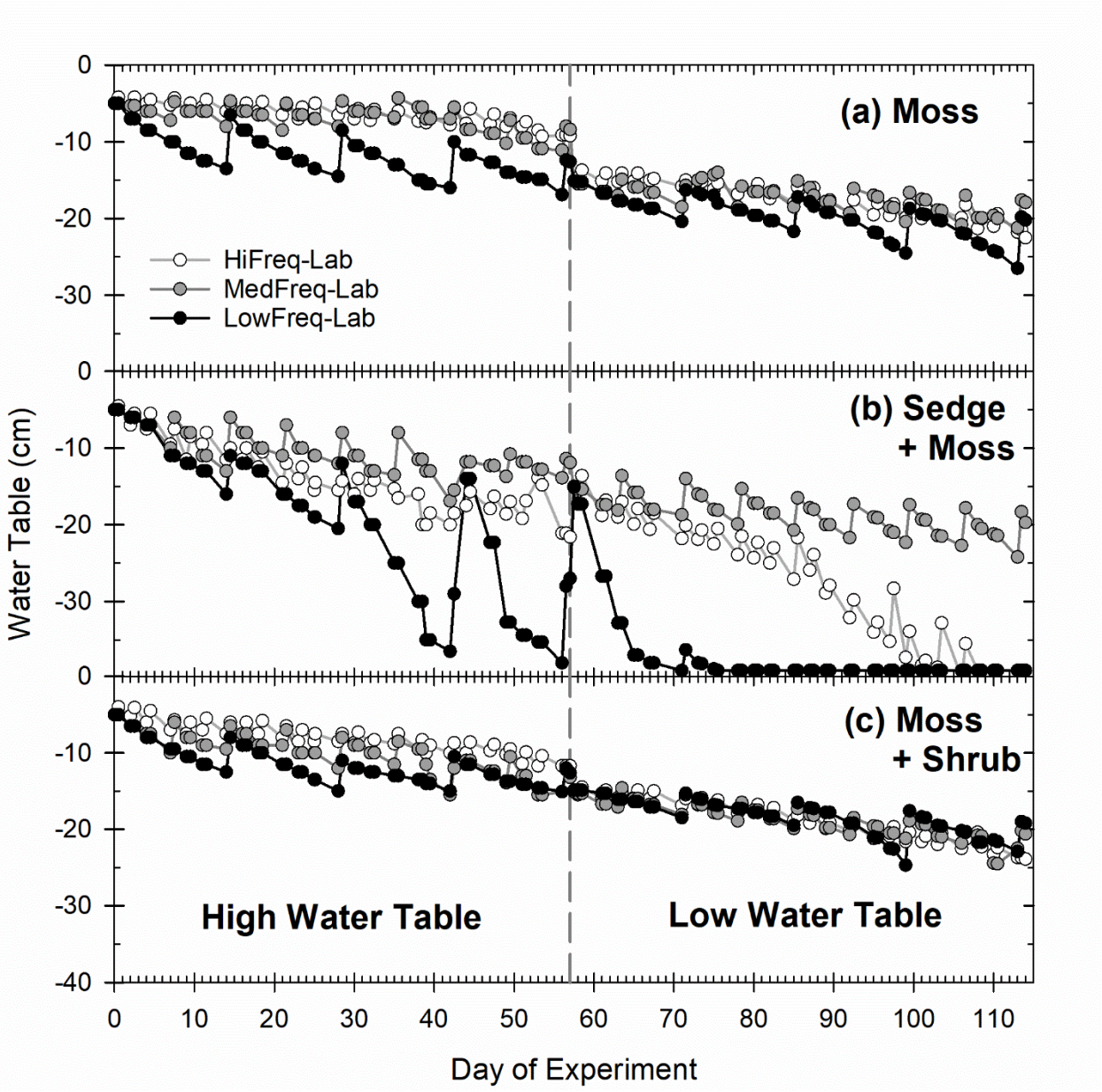

Figure S1: Water table fluctuation between rainfall frequency treatments in (a) Moss, (b) Sedge + Moss, and (c) Moss + Shrub monoliths.

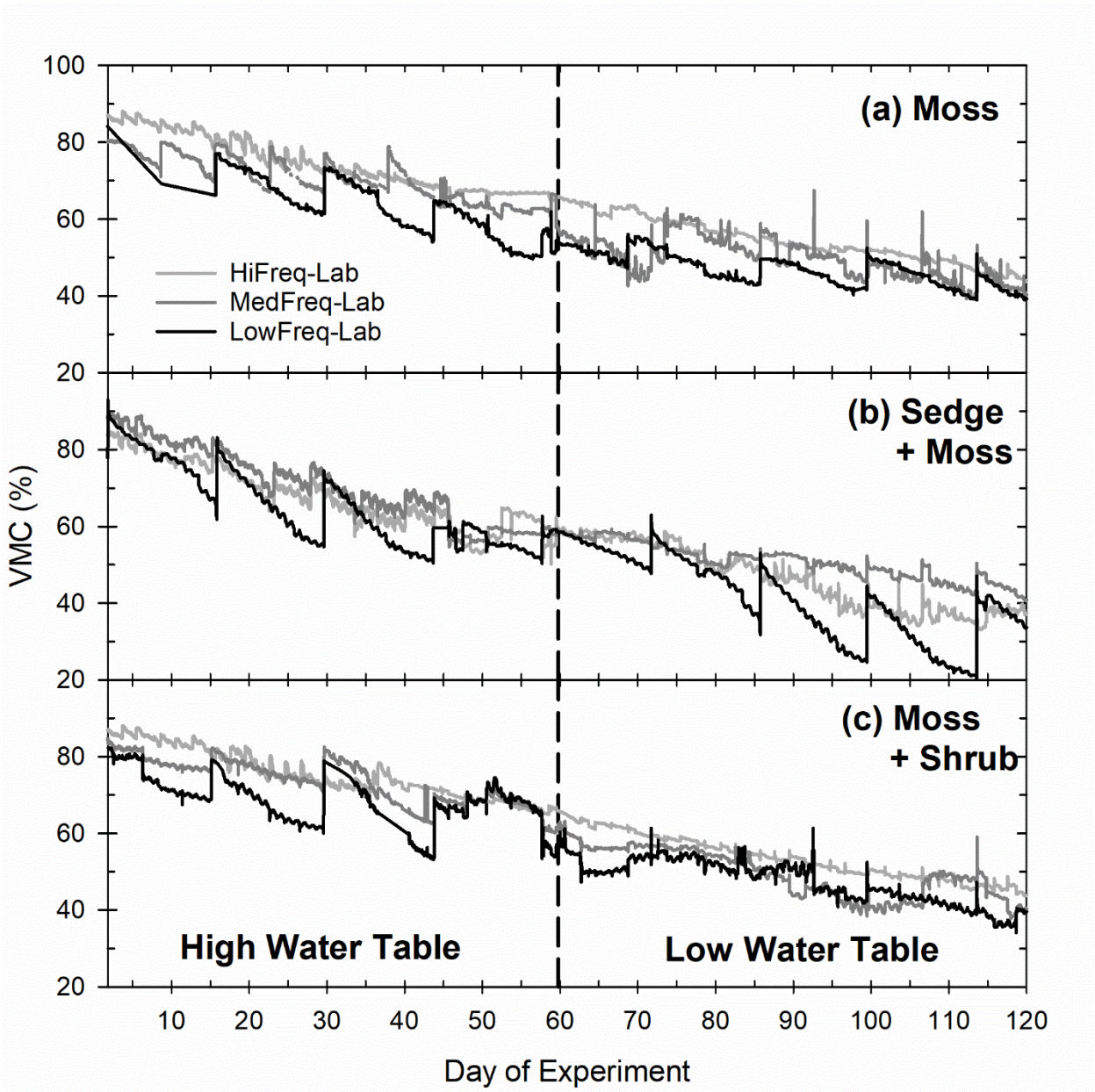

Figure S2: Near-surface volumetric moisture content fluctuation between rainfall frequency treatments in (a) Moss, (b) Sedge + Moss, and (c) Moss + Shrub monoliths.

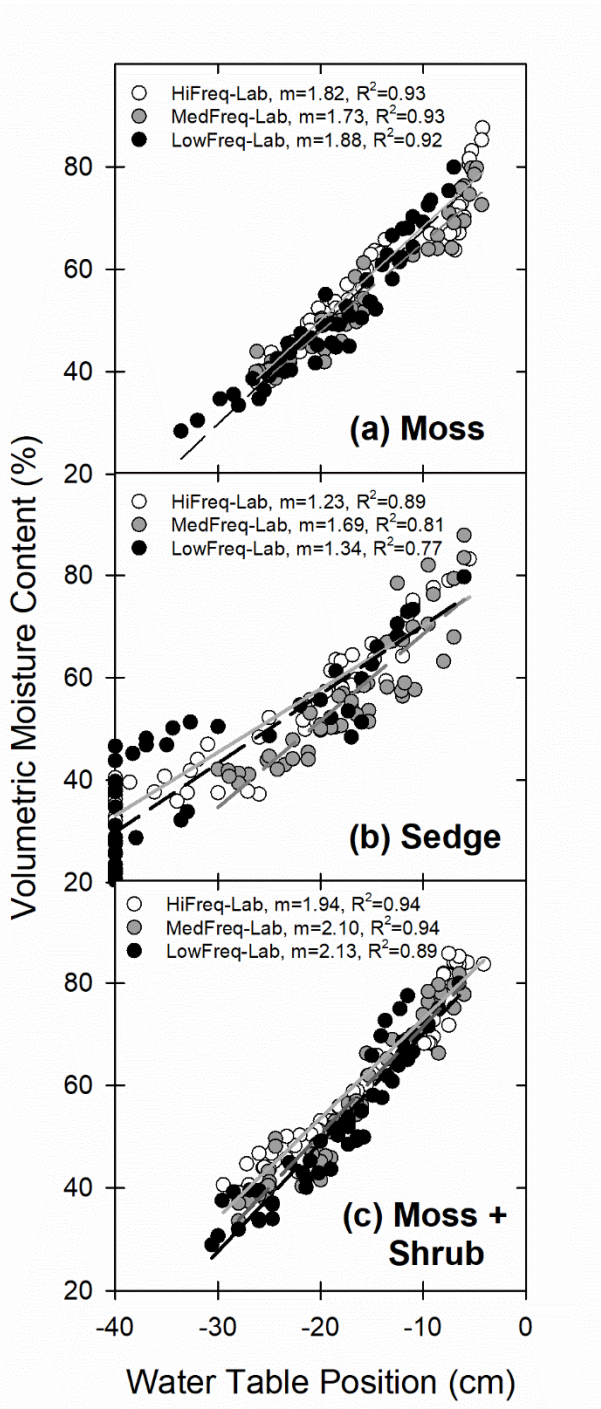

Figure S3: Relationship between daily average VMC and WT depth for (a) Moss, (b) Sedge + Moss, and (c) Moss + Shrub communities. Slopes and correlation coefficients (R^2) of the regressions for each precipitation treatment are shown. All correlations were significant ($p < 0.001$).

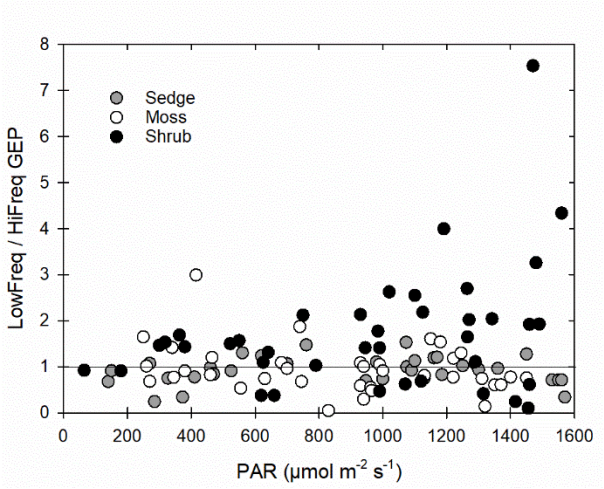

Figure S4: Ratios of GEP of plots receiving the low-frequency treatment to plots receiving the high-frequency treatment at the same PAR values. Different symbols indicate measurements taken in the Moss, Sedge, and Shrub vegetation communities at the field site during May-September 2015. The horizontal line indicates equal GEP between frequency treatments at the given PAR value.

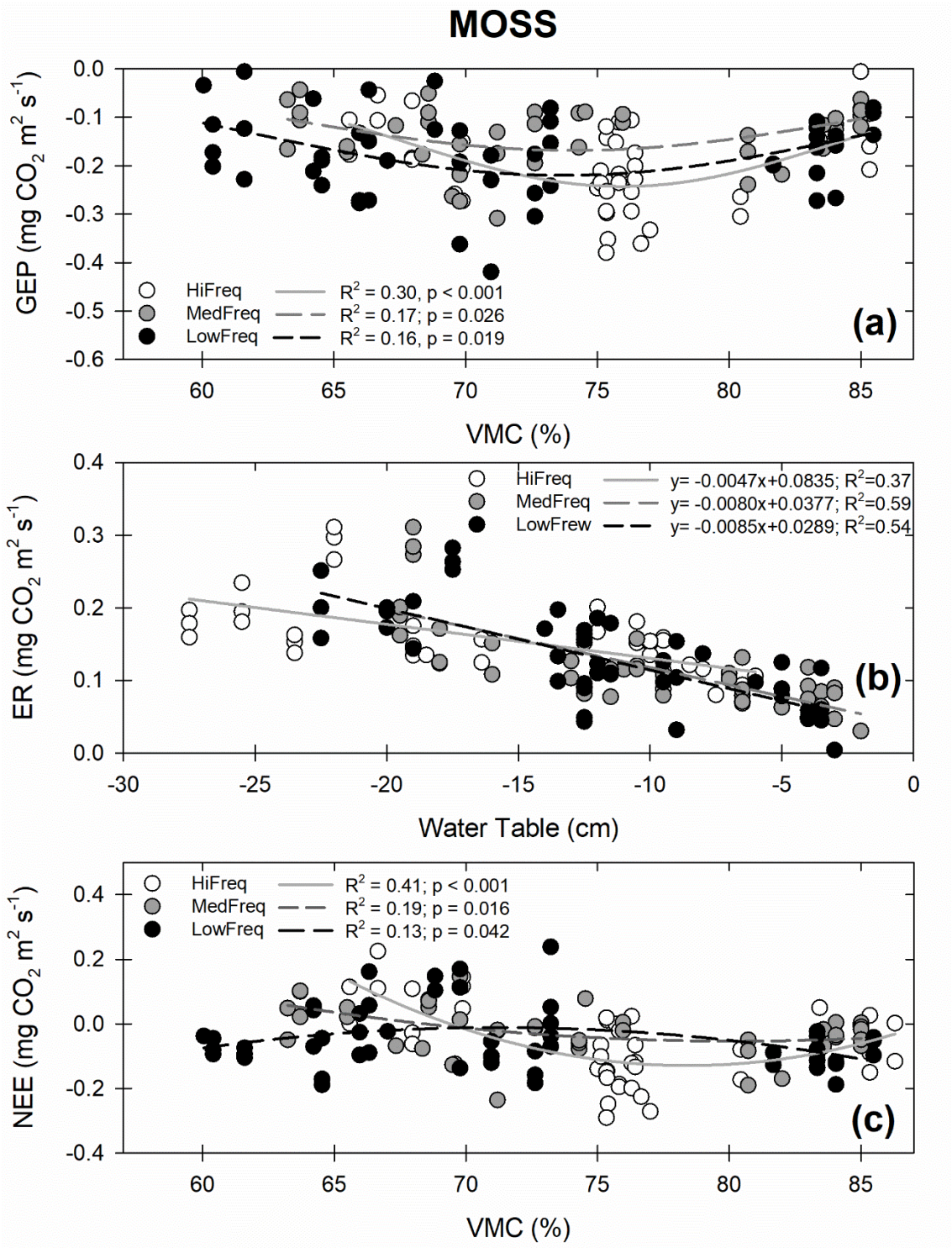

Figure S5: Hydrologic controls on CO_2 exchange in *S. capillifolium*-dominated field plots, depicting relationships in (a) GEP, (b) ER, and (c) NEE between rainfall frequency treatments. Relationships in (a) and (c) are unimodal with indicated correlation coefficients and significance. Relationships in (b) are linear and are indicated with correlation coefficients. All regressions in (b) were significant at $p < 0.001$.