

Biogeochemical and plant trait mechanisms drive enhanced methane emissions
in response to whole-ecosystem warming

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Supplement

Table S1. Calculated limit of detection (LOD_{flux}) of chamber flux system.

# of stacked chambers	LOD_{flux} ($\mu\text{mol CH}_4 \text{ m}^{-2} \text{ d}^{-1}$)
1	8.7
2	17.4
3	26.1
4	34.9

Table S2. Estimated annual CH₄ flux for each plot in 2017, 2108, and 2018.

Plot	Temperature Treatment	Plant Community	Replicate Transect	Estimated Annual CH ₄ Flux (mmol CH ₄ m ⁻² yr ⁻¹)			Mean (SE) Annual CH ₄ Flux (mmol CH ₄ m ⁻² yr ⁻¹)		
				2017	2018	2019	2017	2018	2019
310	Ambient	C ₃	1	59.9	125.5	83.7	58.4 (6.9)	161.4 (37.0)	80.4 (11.4)
320			2	69.6	235.4	98.3			
330			3	45.8	123.2	59.1			
311	+1.7 °C	C ₃	1	58.8	186.6	82.8	69.2 (21.8)	189.2 (23.0)	82.1 (6.5)
321			2	111.0	230.2	93.0			
331			3	37.8	150.9	70.6			
312	+3.4 °C	C ₃	1	87.5	160.5	113.6	82.6 (12.2)	178.8 (21.5)	90.7 (13.4)
322			2	100.9	221.7	67.2			
332			3	59.5	154.1	91.2			
313	+5.1 °C	C ₃	1	334.4	621.9	665.1	178.0 (78.2)	343.2 (140.0)	317.6 (174.5)
323			2	101.4	180.1	115.6			
333			3	98.3	227.6	172.1			
440	Ambient	C ₄	4	63.1	424.5	121.2	55.0 (6.9)	425.5 (88.6)	205.1 (45.2)
450			5	60.8	579.4	217.8			
460			6	41.2	272.4	276.3			
441	+1.7 °C	C ₄	4	37.6	298.4	154.9	61.7 (12.3)	370.9 (73.7)	417.6 (156.1)
451			5	69.7	518.3	695.0			
461			6	77.9	295.9	403.0			
442	+3.4 °C	C ₄	4	40.1	301.0	173.5	84.8 (24.5)	471.0 (96.9)	386.8 (127.6)
452			5	89.8	636.5	614.8			
462			6	124.5	475.3	371.9			
443	+5.1 °C	C ₄	4	84.3	288.8	127.7	157.8 (37.1)	879.3 (328.9)	469.9 (175.2)
453			5	185.2	1425.7	706.6			
463			6	203.8	923.3	575.5			



Figure S1. SMARTX plots in (a) the C₃ community (dominated by *Schoenoplectus americanus*) and (b) the C₄ community (dominated by *Spartina patens* and *Distichlis spicata*). Photos taken by G. Noyce.

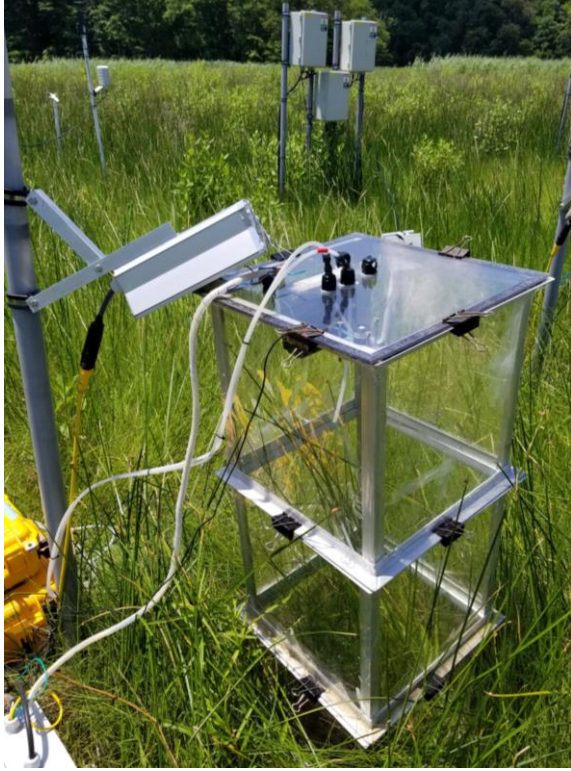


Figure S2. Stacked modular flux chambers. Photo taken by G. Noyce.

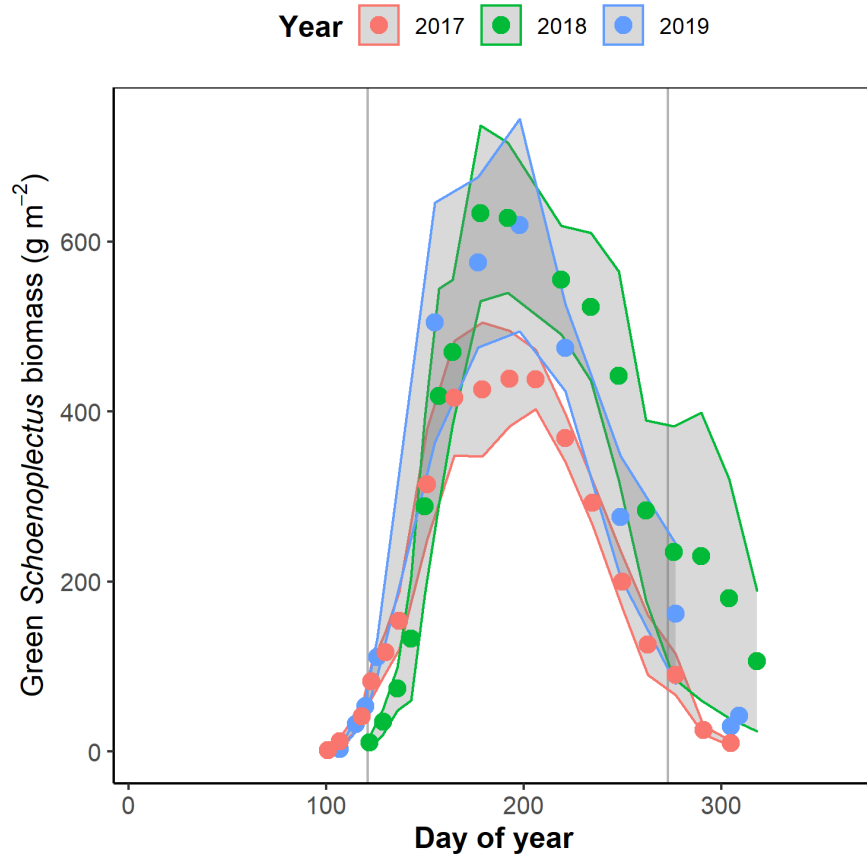


Figure S3. *Schoenoplectus* phenological data for 2017 – 2019 in ambient temperature plots. Points indicate means ($n = 3$) and shaded area indicates SE. The vertical lines indicate the ‘growing season’, e.g. May 1 through Sep 30.

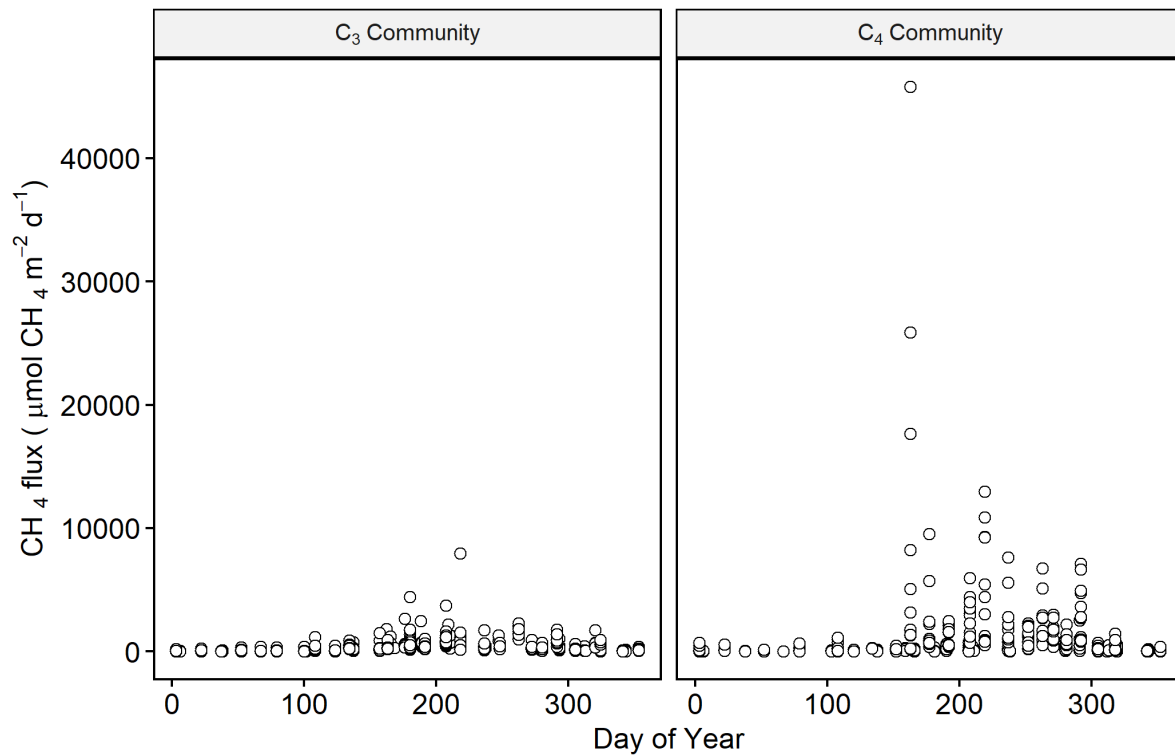


Figure S4. All raw flux data.

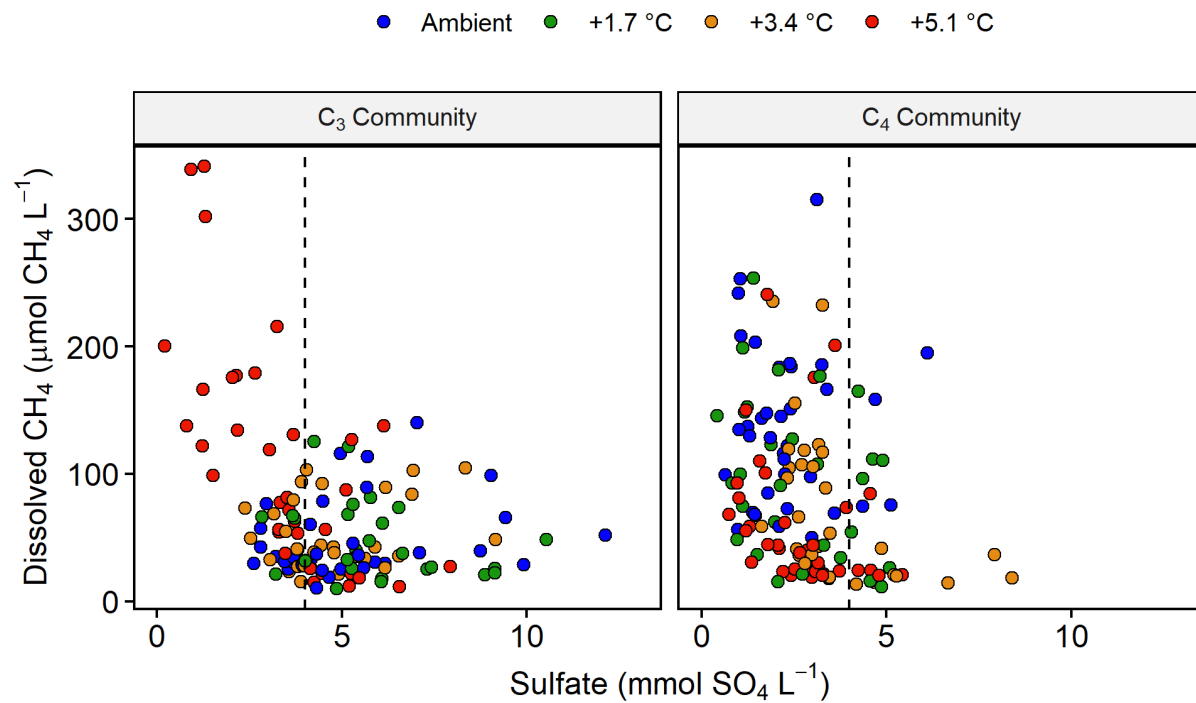


Figure S5. Mean concentrations of CH₄ and SO₄ for each plot and month that porewater was sampled. Colors indicate temperature treatment. The vertical dashed line indicates the 4 mm [SO₄] threshold below which methanogenesis is released from substrate competition.

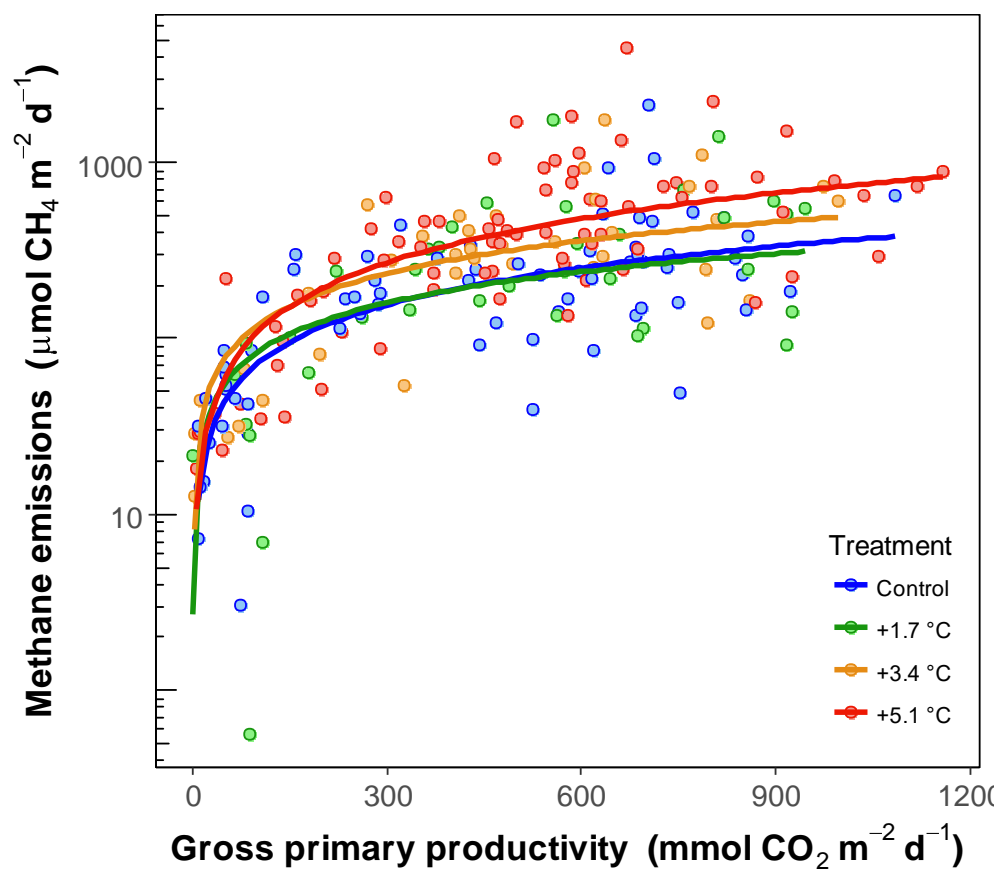


Figure S6. Methane emissions compared to gross primary productivity measured at the same time. CH_4 emissions were strongly correlated with GPP.