

SUPPLEMENTARY INFORMATION

TITLE: CO₂ and CH₄ fluxes are decoupled from organic carbon loss in drying reservoir sediments

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Supplement 1: Experimental setup.



Figure S1. Set up of sediment cores in the incubation chamber.

Supplement 2: Incubation sediment drying.

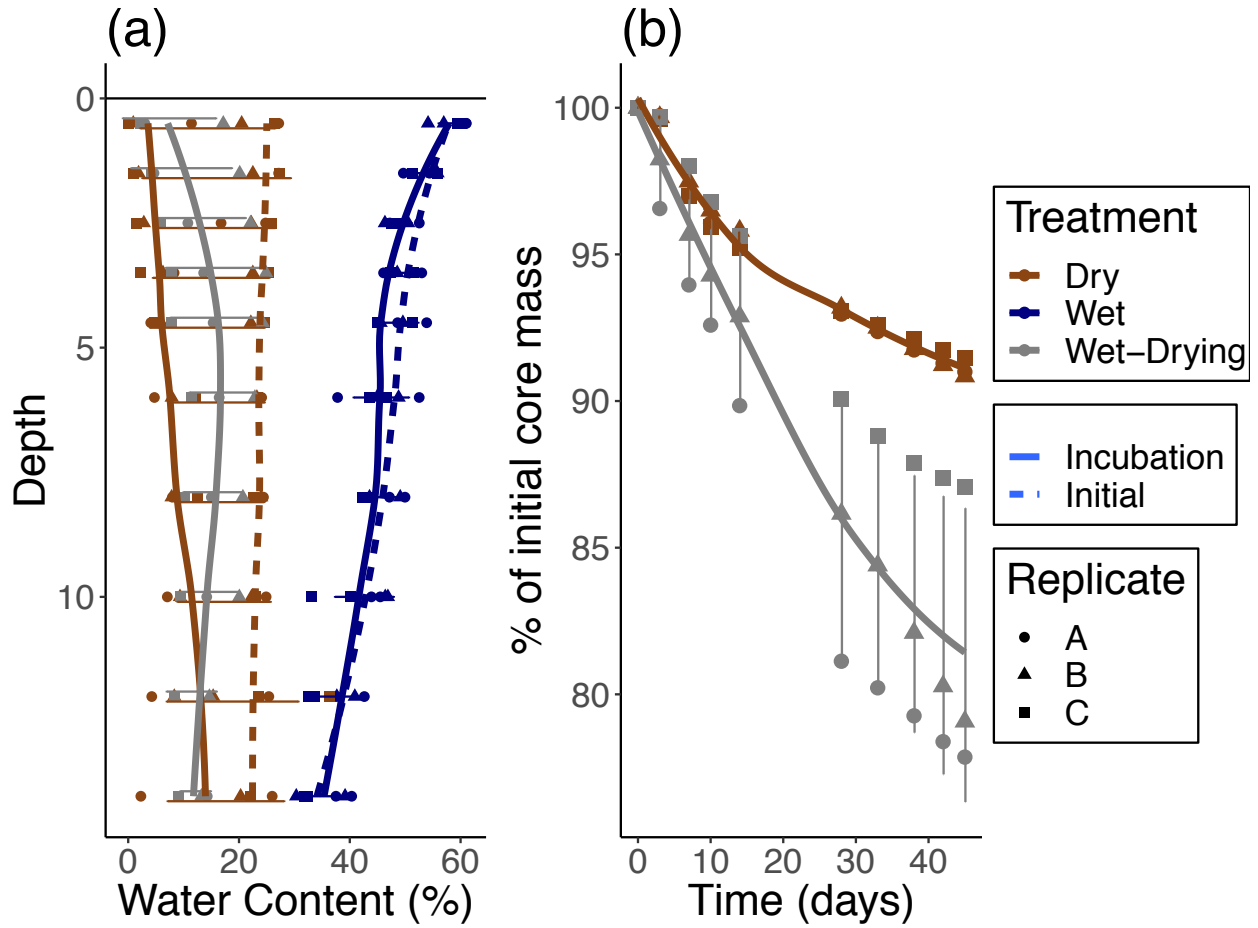


Figure S2. Incubation sediment drying as demonstrated by (a) sediment water content as a function of core depth for all initial and incubation cores and (b) decline in relative core mass over the course of the incubation for "Dry" and "Drying" incubation cores.

Supplement 3: Incubation methane fluxes.

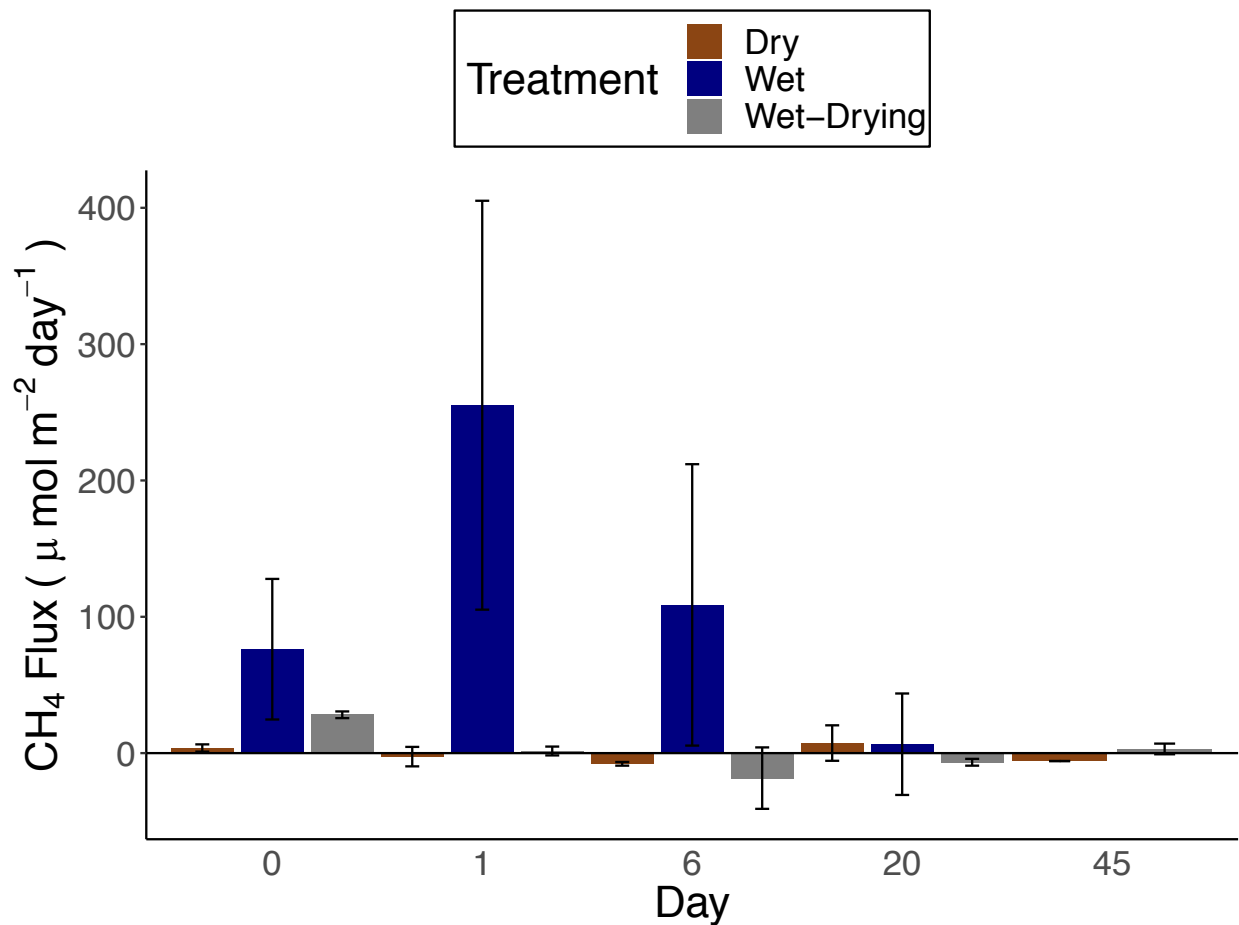


Figure S3. Sediment core methane fluxes as determined by gas chromatography at days 0, 1, 6, 20, and 45 for “Incubation: Dry”, “Incubation: Wet”, and “Incubation: Wet-Drying” incubation cores.

Supplement 4: Sediment mineralogy.

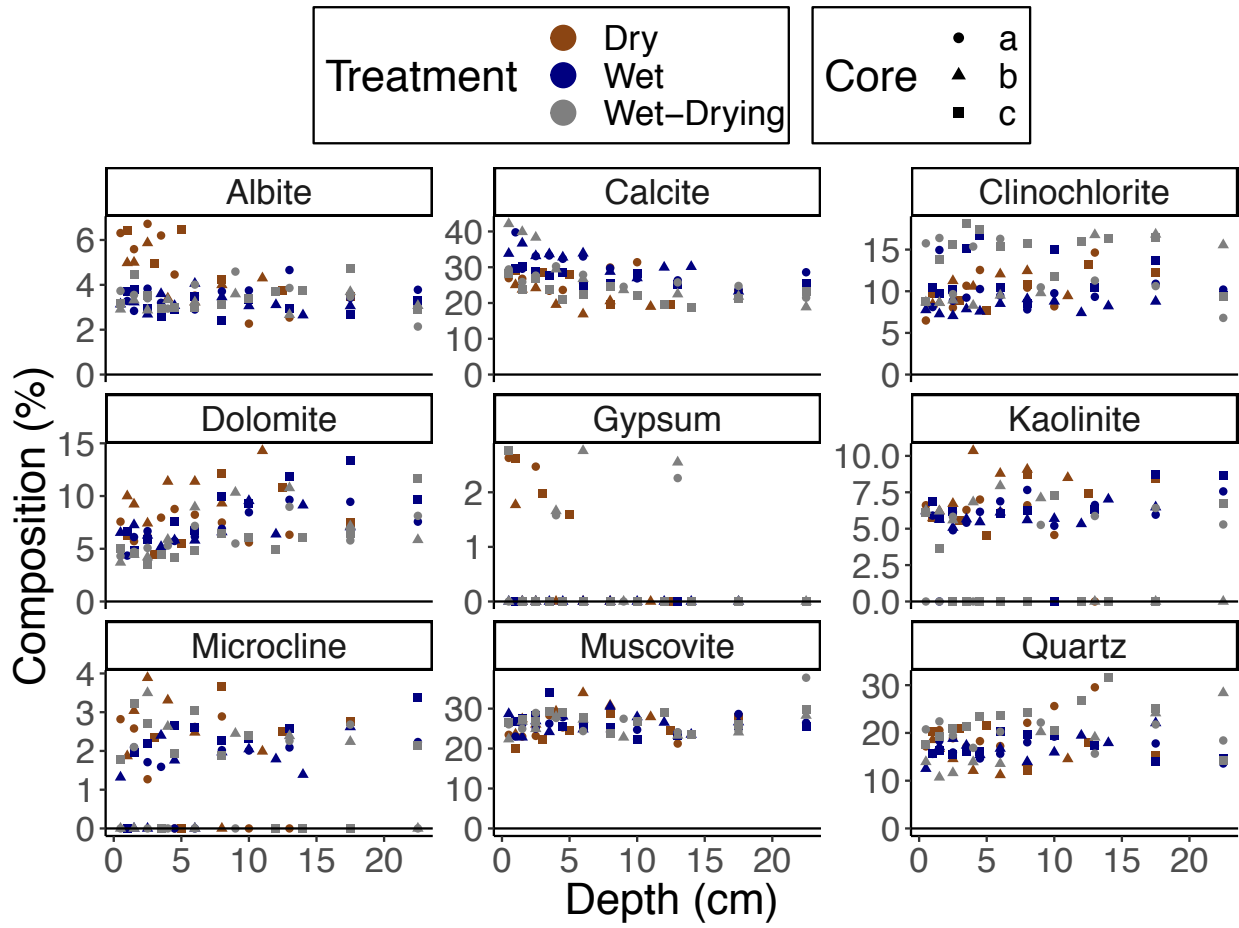


Figure S4. Mineralogy data by depth for “Incubation: Dry”, “Incubation: Wet”, and “Incubation: Wet-Drying” incubation cores.

Table S1

Emmission (mmol CO₂ m⁻² d⁻¹)

Exposed Sites

E1	397.0
E2	73.5
E3	38.159936
E4	55.35346649
E5	36.27349849

Submerged Sites

S1	353.0333063
S2	125.2055527
S3	83.38053813
S4	13.5823501
S5	12.18099652

Table S2

Comparison	p
Top	
Dry - Drying	0.0986
Dry - Exposed	0.9013
Dry - Submerged	0.539
Dry - Wet	0.6627
Drying - Exposed	0.4777
Drying- Submerged	0.0008
Drying - Wet	0.8691
Exposed Submerged	0.1085
Exposed - Wet	0.9834
Submerged - Wet	0.0471
Intermediate	
Dry - Drying	0.7699
Dry - Exposed	0.7834
Dry - Submerged	1
Dry - Wet	0.7814
Drying - Exposed	0.1485
Drying- Submerged	0.7211
Drying - Wet	1
Exposed Submerged	0.8272
Exposed - Wet	0.1552
Submerged - Wet	0.7335
Bottom	
Dry - Drying	0.2596
Dry - Exposed	0.2876
Dry - Submerged	0.3438
Dry - Wet	0.0336
Drying - Exposed	0.0002
Drying- Submerged	0.9997
Drying - Wet	0.8574
Exposed Submerged	0.0005
Exposed - Wet	<.0001
Submerged - Wet	0.7632

Incubation Treatment	Replicate	Day	Core Mass (% of initial mass)
Dry	A	0	100
Dry	B	0	100
Dry	C	0	100
Drying	A	0	100
Drying	B	0	100
Drying	C	0	100
Dry	A	3	99.730281
Dry	B	3	99.6794086
Dry	C	3	99.6270821
Drying	A	3	96.5640567
Drying	B	3	98.2402521
Drying	C	3	99.683225
Dry	A	7	97.0122789
Dry	B	7	97.4851758
Dry	C	7	96.9842621
Drying	A	7	93.9590696
Drying	B	7	95.6654917
Drying	C	7	98.017852
Dry	A	10	96.0649324
Dry	B	10	96.4946413
Dry	C	10	95.9393387
Drying	A	10	92.588808
Drying	B	10	94.2758953
Drying	C	10	96.7832541
Dry	A	14	95.3881374
Dry	B	14	95.8060887
Dry	C	14	95.2040501
Drying	A	14	89.842608
Drying	B	14	92.8876573
Drying	C	14	95.6257883
Dry	A	28	92.9664932
Dry	B	28	93.1838368
Dry	C	28	93.0720146
Drying	A	28	81.127858
Drying	B	28	86.1570122
Drying	C	28	90.067915
Dry	A	33	92.369615
Dry	B	33	92.5012054
Table S3			
Dry	C	33	92.5988986
Drying	A	33	80.2216829
Drying	B	33	84.3938684
Drying	C	33	88.8022703
Dry	A	38	91.7419355

Dry	B	38	91.7720502
Dry	C	38	92.1077017
Drying	A	38	79.2672542
Drying	B	38	82.0955331
Drying	C	38	87.8718347
Dry	A	42	91.2882414
Dry	B	42	91.2256067
Dry	C	42	91.7385507
Drying	A	42	78.3859156
Drying	B	42	80.2739801
Drying	C	42	87.3813913
Dry	A	45	90.9960458
Dry	B	45	90.8415737
Dry	C	45	91.4771315
Drying	A	45	77.8593832
Drying	B	45	79.0711574
Drying	C	45	87.0801397

Condition	Treatment	Replicate	Depth (cm)	Water Content (%)	
Initial	Wet	A	0.5	60.95211406	
Initial	Wet	A	1.5	54.38870566	
Initial	Wet	A	2.5	52.54778976	
Initial	Wet	A	3.5	52.99491865	
Initial	Wet	A	4.5	53.87996516	
Initial	Wet	A	6	52.53543389	
Initial	Wet	A	8	49.96278492	
Initial	Wet	A	10	45.50112464	
Initial	Wet	A	12	42.62622621	
Initial	Wet	A	14	40.34289772	
Initial	Wet	A	17.5	32.89750776	
Initial	Wet	A	22.5	30.10030197	
Initial	Wet	B	0.5	54.13276513	
Initial	Wet	B	1.5	55.83403185	
Initial	Wet	B	2.5	46.34352342	
Initial	Wet	B	3.5	48.5613623	
Initial	Wet	B	4.5	45.55691764	
Initial	Wet	B	6	44.90230029	
Initial	Wet	B	8	43.56012703	
Initial	Wet	B	10	46.88031376	
Initial	Wet	B	12	37.66232875	
Initial	Wet	B	14	30.33895452	
Initial	Wet	B	17.5	31.06479598	
Initial	Wet	B	22.5	32.54413076	
Initial	Wet	C	0.5	60.14715615	
Initial	Wet	C	1.5	55.84792181	
Initial	Wet	C	2.5	48.86098887	
Initial	Wet	C	3.5	51.4994594	
Initial	Wet	C	4.5	51.30287648	
Initial	Wet	C	6	46.59842497	
Initial	Wet	C	8	42.24866639	
Initial	Wet	C	10	40.16193752	
Initial	Wet	C	12	33.67475106	
Initial	Wet	C	14	32.29488144	
Initial	Wet	C	17.5	32.27805184	
Initial	Wet	C	22.5	20.59762395	
Initial	Dry	A	0.5	27.1767202	
Initial	Dry	A	1.5	27.15853797	
Initial	Dry	A	2.5	24.80010617	
Initial	Dry	A	3.5	25.32203017	
Initial	Dry	A	4.5	24.38898273	
Initial	Dry	A	6	24.08678542	
Initial	Dry	A	8	24.41305288	
Initial	Dry	A	10	24.89053501	

Initial	Dry	A	12	25.38267079
Initial	Dry	A	14	25.99057911
Initial	Dry	A	17.5	21.24830697
Initial	Dry	B	0.5	20.48328969
Initial	Dry	B	1.5	22.50579695
Initial	Dry	B	2.5	22.21563981
Initial	Dry	B	3.5	22.49192089
Initial	Dry	B	4.5	22.13978761
Initial	Dry	B	6	23.23395982
Initial	Dry	B	8	23.99514949
Initial	Dry	B	10	22.26985572
Initial	Dry	B	12	15.32979781
Initial	Dry	B	14	20.29673897
Initial	Dry	B	17.5	20.96877078
Initial	Dry	C	0.5	26.36408806
Initial	Dry	C	1.5	27.2849273
Initial	Dry	C	2.5	25.81972587
Initial	Dry	C	3.5	25.26817891
Initial	Dry	C	4.5	24.53217096
Initial	Dry	C	6	23.39613041
Initial	Dry	C	8	22.66806887
Initial	Dry	C	10	23.00496423
Initial	Dry	C	12	23.50467252
Incubation	Wet	A	0.5	61.03224962
Incubation	Wet	A	1.5	49.67136621
Incubation	Wet	A	2.5	47.22406964
Incubation	Wet	A	3.5	46.1021455
Incubation	Wet	A	4.5	48.63314905
Incubation	Wet	A	6	37.79381073
Incubation	Wet	A	8	47.16415182
Incubation	Wet	A	10	43.89707537
Incubation	Wet	A	12	37.57365468
Incubation	Wet	A	14	37.49717642
Incubation	Wet	A	17.5	34.38708839
Incubation	Wet	A	22.5	31.68519003
Incubation	Wet	B	0.5	56.97050938
Incubation	Wet	B	1.5	54.98001355
Incubation	Wet	B	2.5	50.52267117
Incubation	Wet	B	3.5	47.49125448
Incubation	Wet	B	4.5	49.58946957
Incubation	Wet	B	6	48.81040717
Incubation	Wet	B	8	49.1056993
Incubation	Wet	B	10	46.40294873
Incubation	Wet	B	12	40.91379448
Incubation	Wet	B	14	39.15371079

Incubation	Wet	B	17.5	31.64520241
Incubation	Wet	C	0.5	59.35662873
Incubation	Wet	C	1.5	51.28002146
Incubation	Wet	C	2.5	47.48995785
Incubation	Wet	C	3.5	47.30671436
Incubation	Wet	C	4.5	45.00507099
Incubation	Wet	C	6	43.55228963
Incubation	Wet	C	8	43.62658006
Incubation	Wet	C	10	33.00860946
Incubation	Wet	C	12	32.51355629
Incubation	Wet	C	14	31.74225409
Incubation	Wet	C	17.5	31.56017403
Incubation	Wet	C	22.5	30.91865699
Incubation	Dry	A	0.5	11.41939513
Incubation	Dry	A	2.5	16.76518001
Incubation	Dry	A	3.5	8.280871188
Incubation	Dry	A	4.5	4.068900041
Incubation	Dry	A	6	4.733416606
Incubation	Dry	A	8	7.982176507
Incubation	Dry	A	10	7.063461644
Incubation	Dry	A	12	4.252575552
Incubation	Dry	A	14	2.282010908
Incubation	Dry	B	0.5	0.909283787
Incubation	Dry	B	1.5	1.864013077
Incubation	Dry	B	2.5	2.822699206
Incubation	Dry	B	3.5	6.27279697
Incubation	Dry	B	4.5	5.945820523
Incubation	Dry	B	6	7.860150568
Incubation	Dry	B	8	7.838967165
Incubation	Dry	B	10	9.347800497
Incubation	Dry	B	12	8.317449316
Incubation	Dry	C	0.5	0
Incubation	Dry	C	1.5	1.01822625
Incubation	Dry	C	2.5	1.480629877
Incubation	Dry	C	3.5	2.235852192
Incubation	Dry	C	4.5	4.699283738
Incubation	Dry	C	6	12.20524478
Incubation	Dry	C	8	12.45577766
Incubation	Dry	C	12	36.31855733
Incubation	Dry	C	14	22.01702137
Incubation	Dry	C	17.5	14.74584134
Incubation	Wet-Drying	A	0.5	2.993904411
Incubation	Wet-Drying	A	1.5	4.649477276
Incubation	Wet-Drying	A	2.5	10.76698272
Incubation	Wet-Drying	A	3.5	13.62250948

Incubation	Wet-Drying	A	4.5	15.33522357
Incubation	Wet-Drying	A	6	16.42225914
Incubation	Wet-Drying	A	8	15.00769625
Incubation	Wet-Drying	A	10	14.17483357
Incubation	Wet-Drying	A	14	14.26428402
Incubation	Wet-Drying	A	17.5	13.71269504
Incubation	Wet-Drying	A	22.5	12.30017967
Incubation	Wet-Drying	B	0.5	17.16220604
Incubation	Wet-Drying	B	1.5	20.13137277
Incubation	Wet-Drying	B	2.5	22.08167821
Incubation	Wet-Drying	B	3.5	24.87079735
Incubation	Wet-Drying	B	4.5	24.27392654
Incubation	Wet-Drying	B	6	22.87017845
Incubation	Wet-Drying	B	8	20.70486276
Incubation	Wet-Drying	B	10	20.06591937
Incubation	Wet-Drying	B	12	14.65794904
Incubation	Wet-Drying	B	14	13.21132643
Incubation	Wet-Drying	B	17.5	12.8846954
Incubation	Wet-Drying	B	22.5	8.640066315
Incubation	Wet-Drying	C	0.5	2.215849844
Incubation	Wet-Drying	C	1.5	4.169361152
Incubation	Wet-Drying	C	2.5	5.880745115
Incubation	Wet-Drying	C	3.5	7.821598039
Incubation	Wet-Drying	C	4.5	7.900853476
Table S4				
Incubation	Wet-Drying	C	6	11.33964708
Incubation	Wet-Drying	C	8	10.13441853
Incubation	Wet-Drying	C	10	9.425599929
Incubation	Wet-Drying	C	12	8.278045412
Incubation	Wet-Drying	C	14	9.058079928
Incubation	Wet-Drying	C	17.5	16.32899363
Incubation	Wet-Drying	C	22.5	27.26717059

Treatment	Replicate	Day	CO2 Flux (mmol C m ⁻² day ⁻¹)
Dry	A	0	160.3210236
Dry	A	1	78.18041514
Dry	A	4	31.54517931
Dry	A	6	-11.95432922
Dry	A	7	-293.2845003
Dry	A	8	-237.9891709
Dry	A	11	-111.7721027
Dry	A	13	-168.3531142
Dry	A	17	-268.2688941
Dry	A	19	-270.7596768
Dry	A	24	-126.469094
Dry	A	28	-142.1537902
Dry	A	31	-82.71635874
Dry	A	33	-231.913059
Dry	A	35	-205.9814245
Dry	A	38	-300.7765948
Dry	A	39	-275.6449385
Dry	A	40	-226.023601
Dry	A	41	-253.0492657
Dry	A	42	-301.5490315
Dry	A	45	-198.6745231
Dry	B	0	231.8298247
Dry	B	1	1.315001868
Dry	B	4	62.33126432
Dry	B	6	-13.49740076
Dry	B	7	-230.8649876
Dry	B	8	-134.5772098
Dry	B	11	-150.9478713
Dry	B	13	-141.3509598
Dry	B	17	-142.2385958
Dry	B	19	-142.576622
Dry	B	24	-104.8595289
Dry	B	28	-117.6636963
Dry	B	31	-64.45430551
Dry	B	33	-149.2618553
Dry	B	35	-167.1647794
Dry	B	38	-250.0095624
Dry	B	39	-197.884299
Dry	B	40	-173.1260998
Dry	B	41	-192.1119624
Dry	B	42	-251.5513726
Dry	B	45	-161.2090767
Dry	C	0	84.56438683
Dry	C	1	41.33370738

Dry	C	4	162.0826702
Dry	C	6	38.52308547
Dry	C	7	-281.4499611
Dry	C	8	-134.5772098
Dry	C	11	-108.649292
Dry	C	13	-128.1422356
Dry	C	17	-174.9897456
Dry	C	19	-175.405604
Dry	C	24	-54.90955061
Dry	C	28	-139.556275
Dry	C	31	-28.22091705
Dry	C	33	-186.1379001
Dry	C	35	-176.5414593
Dry	C	38	-287.8610171
Dry	C	39	-223.2802726
Dry	C	40	-176.1732313
Dry	C	41	-177.2513226
Dry	C	42	-246.6189928
Dry	C	45	-169.136257
Wet-Drying	A	0	272.9988783
Wet-Drying	A	1	216.9134677
Wet-Drying	A	4	363.3485051
Wet-Drying	A	6	193.7170587
Wet-Drying	A	7	123.3466976
Wet-Drying	A	8	143.7497091
Wet-Drying	A	11	242.9269074
Wet-Drying	A	13	465.5229896
Wet-Drying	A	17	546.8216492
Wet-Drying	A	19	527.1063715
Wet-Drying	A	24	88.62826574
Wet-Drying	A	28	43.85646864
Wet-Drying	A	31	189.5626652
Wet-Drying	A	33	20.71140068
Wet-Drying	A	35	-40.12902909
Wet-Drying	A	38	-205.656874
Wet-Drying	A	39	-128.32751
Wet-Drying	A	40	-102.7891999
Wet-Drying	A	41	-124.917913
Wet-Drying	A	42	-167.8631278
Wet-Drying	A	45	-106.0199784
Wet-Drying	B	0	134.9784572
Wet-Drying	B	1	146.7684248
Wet-Drying	B	4	469.5746646
Wet-Drying	B	6	275.658454
Wet-Drying	B	7	211.0821423

Wet-Drying	B	8	205.4073202
Wet-Drying	B	11	193.7242479
Wet-Drying	B	13	171.6588176
Wet-Drying	B	17	164.373795
Wet-Drying	B	19	168.9615925
Wet-Drying	B	24	346.5217749
Wet-Drying	B	28	341.2247194
Wet-Drying	B	31	299.2941704
Wet-Drying	B	33	289.0146828
Wet-Drying	B	35	300.4400605
Wet-Drying	B	38	324.6149204
Wet-Drying	B	39	306.9020633
Wet-Drying	B	40	295.5209637
Wet-Drying	B	41	292.3067012
Wet-Drying	B	42	192.1457202
Wet-Drying	B	45	152.3887905
Wet-Drying	C	0	103.9346603
Wet-Drying	C	1	58.85521876
Wet-Drying	C	4	143.7307636
Wet-Drying	C	6	234.2300262
Wet-Drying	C	7	253.7294667
Wet-Drying	C	8	281.4257361
Wet-Drying	C	11	289.9526144
Wet-Drying	C	13	383.6799737
Wet-Drying	C	17	435.0373967
Wet-Drying	C	19	422.7155037
Wet-Drying	C	24	292.9158833
Wet-Drying	C	28	209.1204785
Wet-Drying	C	31	64.21499497
Wet-Drying	C	33	86.18940573
Wet-Drying	C	35	35.78239364
Wet-Drying	C	38	0.566364704
Wet-Drying	C	39	20.25337699
Wet-Drying	C	40	27.67110564
Table S5			
Wet-Drying	C	41	9.982322281
Wet-Drying	C	42	-16.01807725
Wet-Drying	C	45	16.20225646
Wet	A	0	145.8784346
Wet	A	1	112.9059117
Wet	A	5	52.75603664
Wet	A	19	70.44129892
Wet	A	45	33.30557868
Wet	B	0	78.93422148
Wet	B	1	149.8751041

Wet	B	5	104.3130724
Wet	B	19	91.92339717
Wet	B	45	66.61115737
Wet	C	0	254.7876769
Wet	C	1	124.8959201
Wet	C	5	61.54870941
Wet	C	19	64.44629475
Wet	C	45	23.09186789

Treatment	Replicate	Day	CH4 Flux (umol m ⁻² day ⁻¹)
Dry	A	0	1.088128988
Table S6			
Dry	C	0	6.423150918
Wet-Drying	A	0	31.2577113
Wet-Drying	B	0	29.82772191
Wet-Drying	C	0	23.28739247
Dry	A	1	-8.470671762
Dry	A	1	-12.66200308
Dry	B	1	-7.743690078
Dry	C	1	18.5732629
Wet-Drying	A	1	-3.653305607
Wet-Drying	B	1	0.800914502
Wet-Drying	C	1	7.498051754
Dry	A	6	-9.401800471
Dry	B	6	-8.987407678
Dry	C	6	-5.219540881
Wet-Drying	A	6	-63.31469982
Wet-Drying	B	6	6.66623287
Wet-Drying	C	6	1.608861368
Dry	B	20	20.38002957
Dry	C	20	-5.622496253
Wet-Drying	A	20	-4.800823275
Wet-Drying	B	20	-11.6534307
Wet-Drying	C	20	-3.66637865
Dry	A	45	-5.82542431
Wet-Drying	B	45	6.975219691
Wet-Drying	C	45	-0.857056184
Wet	A	0	-8.060927716
Wet	B	0	66.91324197
Wet	C	0	169.8032821
Wet	A	1	60.67062776
Wet	B	1	550.175928
Wet	C	1	154.723503
Wet	A	6	35.10335009
Wet	B	6	411.784916
Wet	C	6	-52.0286239
Wet	A	20	-37.9746871
Wet	B	20	80.4358265
Wet	C	20	-22.9016689
Wet	C	6	40.0069818

Table S7

	Unsterilized CO2 flux (ppm C second-1)	Sterilized CO2 flux (ppm C second-1)
Replicate 1	-0.007692308	-0.037288136
Replicate 2	-0.003076923	-0.0375
Replicate 3	-0.005	-0.039735099

Table S8

Treatment	Condition	Replicate	Depth	Organic Matter Content (% dw)
Dry	Initial	A	0.5	4.1388868
Dry	Initial	A	1.5	4.1517788
Dry	Initial	A	2.5	3.8427601
Dry	Initial	A	3.5	3.7172764
Dry	Initial	A	4.5	3.3840157
Dry	Initial	A	6	2.8211898
Dry	Initial	A	8	3.3137287
Dry	Initial	A	10	4.4129631
Dry	Initial	A	12	4.3094109
Dry	Initial	A	14	4.1317858
Dry	Initial	B	0.5	2.3293114
Dry	Initial	B	1.5	2.6919993
Dry	Initial	B	2.5	3.8836746
Dry	Initial	B	3.5	2.5653058
Dry	Initial	B	4.5	2.4979449
Dry	Initial	B	6	4.751794
Dry	Initial	B	8	4.4232636
Dry	Initial	B	10	4.9602638
Dry	Initial	B	12	2.8038755
Dry	Initial	B	14	4.1044202
Dry	Initial	C	0.5	3.7813795
Dry	Initial	C	1.5	3.5687702
Dry	Initial	C	2.5	2.9531333
Dry	Initial	C	3.5	3.8127908
Dry	Initial	C	4.5	3.7670892
Dry	Initial	C	6	4.0068898
Dry	Initial	C	8	4.6429378
Dry	Initial	C	10	4.8232929
Dry	Initial	C	12	4.9741554
Wet	Initial	A	0.5	5.6674442
Wet	Initial	A	1.5	5.1448868
Wet	Initial	A	2.5	4.5922357
Wet	Initial	A	3.5	4.0756715
Wet	Initial	A	4.5	4.9746
Wet	Initial	A	6	4.9534611
Wet	Initial	A	8	4.3490767
Wet	Initial	A	10	3.7399037
Wet	Initial	A	12	3.454912
Wet	Initial	A	14	3.6839271
Wet	Initial	B	0.5	5.2840206
Wet	Initial	B	2.5	4.5679416
Wet	Initial	B	3.5	4.8093607
Wet	Initial	B	4.5	4.6740326

Wet	Initial	B	6	4.1874469
Wet	Initial	B	8	3.5541392
Wet	Initial	B	10	1.1793144
Wet	Initial	B	12	1.5335263
Wet	Initial	B	14	1.6569996
Wet	Initial	C	0.5	3.7144671
Wet	Initial	C	1.5	3.399884
Wet	Initial	C	2.5	2.8157428
Wet	Initial	C	3.5	3.1221401
Wet	Initial	C	4.5	2.4544823
Wet	Initial	C	6	1.5680782
Wet	Initial	C	8	2.0088106
Wet	Initial	C	10	2.5014968
Wet	Initial	C	12	1.9986436
Wet	Initial	C	14	2.3384762
Wet-Drying	Incubation	A	0.5	2.9551802
Wet-Drying	Incubation	A	1.5	2.5044531
Wet-Drying	Incubation	A	2.5	2.0986822
Wet-Drying	Incubation	A	3.5	2.3018625
Wet-Drying	Incubation	A	4.5	3.602845
Wet-Drying	Incubation	A	6	3.5695393
Wet-Drying	Incubation	A	8	3.4400235
Wet-Drying	Incubation	A	10	3.3778621
Wet-Drying	Incubation	A	12	3.2925389
Wet-Drying	Incubation	A	14	2.9191851
Wet-Drying	Incubation	B	0.5	5.3107219
Wet-Drying	Incubation	B	1.5	4.3575072
Wet-Drying	Incubation	B	2.5	4.1227332
Wet-Drying	Incubation	B	3.5	3.959902
Wet-Drying	Incubation	B	4.5	3.9541933
Wet-Drying	Incubation	B	6	3.4102645
Wet-Drying	Incubation	B	8	3.7335886
Wet-Drying	Incubation	B	10	3.6687336
Wet-Drying	Incubation	B	12	2.2968708
Wet-Drying	Incubation	B	14	2.3701727
Wet-Drying	Incubation	C	0.5	2.2016207
Wet-Drying	Incubation	C	1.5	1.887996
Wet-Drying	Incubation	C	2.5	1.2719521
Wet-Drying	Incubation	C	3.5	1.5485458
Wet-Drying	Incubation	C	4.5	0.8517278
Wet-Drying	Incubation	C	6	1.0236963
Wet-Drying	Incubation	C	8	1.4963615
Wet-Drying	Incubation	C	10	1.5338777
Wet-Drying	Incubation	C	12	1.1147008
Wet-Drying	Incubation	C	14	0.7999472

Dry	Incubation	A	0.5	3.957561
Dry	Incubation	A	1.5	3.8447792
Dry	Incubation	A	2.5	3.5123569
Dry	Incubation	A	3.5	3.6033315
Dry	Incubation	A	4.5	3.0437621
Dry	Incubation	A	6	2.7601726
Dry	Incubation	A	8	3.7566883
Dry	Incubation	A	10	3.5266494
Dry	Incubation	A	12	1.5063101
Dry	Incubation	A	14	1.2149946
Dry	Incubation	B	0.5	3.5783975
Dry	Incubation	B	1.5	3.708371
Dry	Incubation	B	2.5	3.7571418
Dry	Incubation	B	3.5	3.5521283
Dry	Incubation	B	4.5	3.829996
Dry	Incubation	B	6	3.8950566
Dry	Incubation	B	8	3.8569935
Dry	Incubation	B	10	4.478265
Dry	Incubation	C	1.5	4.0659329
Dry	Incubation	C	2.5	3.9069382
Dry	Incubation	C	3.5	3.6840221
Dry	Incubation	C	4.5	3.8359075
Dry	Incubation	C	6	3.1221346
Dry	Incubation	C	8	2.9643198
Dry	Incubation	C	12	5.0823027
Dry	Incubation	C	14	4.2745305
Wet	Incubation	A	0.5	0.7963519
Wet	Incubation	A	4.5	3.2685216
Wet	Incubation	A	6	2.8934167
Wet	Incubation	A	8	3.0551721
Wet	Incubation	A	10	3.4091337
Wet	Incubation	A	12	2.3289651
Wet	Incubation	A	14	2.7017774
Wet	Incubation	B	0.5	3.5596725
Wet	Incubation	B	1.5	3.3280726
Wet	Incubation	B	2.5	2.8969632
Wet	Incubation	B	3.5	3.090027
Wet	Incubation	B	4.5	2.7601833
Wet	Incubation	B	6	2.3290941
Wet	Incubation	B	8	2.5617623
Wet	Incubation	B	10	0.6977325
Wet	Incubation	B	12	1.1021403
Wet	Incubation	B	14	0.77867
Wet	Incubation	C	0.5	3.5992651
Wet	Incubation	C	1.5	3.4378542

Wet	Incubation	C	2.5	3.0564505
Wet	Incubation	C	3.5	3.2131854
Wet	Incubation	C	4.5	3.1195766
Wet	Incubation	C	6	3.1409349
Wet	Incubation	C	8	2.758971
Wet	Incubation	C	10	2.2322415
Wet	Incubation	C	12	2.2364759
Wet	Incubation	C	14	2.0451524

Table S9

Treatment	Core	Alkalinity (uM HCO ₃ ⁻)
Dry	a	0.276
Dry	b	0.272
Dry	c	0.3
Wet	a	0.764
Wet	b	0.724
Wet	c	0.568
Wet-Drying	a	0.324
Wet-Drying	b	0.316
Wet-Drying	c	0.336
Initial Dry	a	0.452
Initial Dry	b	0.584
Initial Dry	c	0.212
Initial Wet	a	1.14
Initial Wet	b	1.432
Initial Wet	c	1.044

Table S10

Treatment	Replicate	Depth (cm)	Calcite (% dw)	Muscovite (% dw)	Gypsum (% dw)
Dry	a	0.5	26.95	23.44	2.63
Dry	a	1.5	26.78	23.01	0
Dry	a	2.5	27.1	23.18	2.47
Dry	a	3.5	23.42	28.34	0
Dry	a	4.5	23.65	25.29	0
Dry	a	6	25.55	26.26	0
Dry	a	8	29.93	24.19	0
Dry	a	10	31.4	22.35	0
Dry	a	13	25.69	21.25	0
Dry	b	1	25.07	23.57	1.77
Dry	b	1.5	23.81	27.39	0
Dry	b	2.5	24.21	26.07	0
Dry	b	4	19.55	29.33	0
Dry	b	6	16.89	33.95	0
Dry	b	8	20.58	30.83	0
Dry	b	11	19	27.93	0
Dry	c	1	28.96	20.05	2.62
Dry	c	3	28.58	22.39	1.97
Dry	c	5	28.1	24.47	1.59
Dry	c	8	19.45	28.83	0
Dry	c	12.5	19.7	24.52	0
Dry	c	17.5	22.52	27.77	0
Wet	a	1	39.76	23.01	0
Wet	a	1.5	29.57	26.09	0
Wet	a	2.5	33.11	25.02	0
Wet	a	3.5	33.28	26.24	0
Wet	a	4.5	32.36	27.85	0
Wet	a	6	33	25.97	0
Wet	a	8	29.69	24.16	0
Wet	a	10	26.88	24.72	0
Wet	a	13	26.34	24.01	0
Wet	a	17.5	23.82	28.66	0
Wet	a	22.5	28.6	26.46	0
Wet	b	0.5	33.82	28.7	0
Wet	b	1.5	36.69	22.83	0
Wet	b	2.5	33.18	26.91	0
Wet	b	3.5	33.7	24.19	0
Wet	b	4.5	32.79	28.09	0
Wet	b	6	33.92	24.85	0
Wet	b	8	28.79	30.54	0
Wet	b	10	27	27.91	0
Wet	b	12	29.96	26.54	0
Wet	b	14	30.15	23.53	0

Wet	b	17.5	23.27	26.64	0
Wet	c	1	29.74	26.81	0
Wet	c	1.5	30.32	27.49	0
Wet	c	2.5	28.84	28.24	0
Wet	c	3.5	27.69	33.93	0
Wet	c	4.5	28.52	25.51	0
Wet	c	6	24.75	25.6	0
Wet	c	8	25.49	25.34	0
Wet	c	10	28.2	22.19	0
Wet	c	13	25.29	23.2	0
Wet	c	17.5	21.82	25.71	0
Wet	c	22.5	25.36	25.63	0
Wet-Drying	a	0.5	29.39	26.06	0
Wet-Drying	a	1.5	25.87	24.96	0
Wet-Drying	a	2.5	27.66	28.92	0
Wet-Drying	a	4	30.26	27.67	1.58
Wet-Drying	a	6	27.89	24.38	0
Wet-Drying	a	9	24.54	27.46	0
Wet-Drying	a	13	25.76	24.08	2.26
Wet-Drying	a	17.5	24.77	24.48	0
Wet-Drying	a	22.5	21.49	37.74	0
Wet-Drying	b	0.5	42.13	22.37	0
Wet-Drying	b	1.5	39.9	26.8	0
Wet-Drying	b	2.5	38.34	24.95	0
Wet-Drying	b	4	29.46	28	1.66
Wet-Drying	b	6	26.77	27.3	2.76
Wet-Drying	b	9	23.67	22.81	0
Wet-Drying	b	13	22.49	23.29	2.55
Wet-Drying	b	17.5	21.83	24.1	0
Wet-Drying	b	22.5	18.86	28.28	0
Wet-Drying	c	0.5	28.2	26.42	2.76
Wet-Drying	c	1.5	23.71	27.33	0
Wet-Drying	c	2.5	26.94	26.68	0
Wet-Drying	c	3.5	23.85	29.3	0
Wet-Drying	c	4.5	20.93	29.06	0
Wet-Drying	c	6	22.25	27.82	0
Wet-Drying	c	8	24.56	23.86	0
Wet-Drying	c	10	22.06	26.69	0
Wet-Drying	c	12	19.53	29	0
Wet-Drying	c	14	18.7	23.53	0
Wet-Drying	c	17.5	21.26	26.07	0
Wet-Drying	c	22.5	23.27	29.77	0

Kaolinite (% dw)	Clinoclorite (% dw)	Quartz (% dw)	Microcline (% dw)	Albite (% dw)
6.61	6.49	17.18	2.82	6.31
5.98	9.76	20.58	2.58	5.59
6.14	8.03	18.89	1.27	6.72
6.29	10.66	17.14	0	6.2
7	12.55	18.28	0	4.46
6.16	10.4	17.25	2.62	3.52
6.61	10.43	22.12	2.89	-3.65
4.57	8.18	25.62	0	2.27
0	14.64	29.55	0	2.54
5.74	8.45	18.56	1.87	4.98
6.21	8.63	16.71	3.04	5
6.72	11.25	14.57	3.89	5.87
10.35	10.58	12.1	3.31	3.4
8.79	12.06	11.22	2.48	3.23
9.07	12.45	13.74	0	4
8.5	9.44	14.56	1.99	4.3
5.77	9.7	20.22	0	6.41
5.55	8.85	20.88	2.35	4.96
4.52	7.72	21.62	0	6.45
8.69	10.84	12.13	3.67	4.22
7.45	13.19	18.07	2.5	3.75
8.45	12.29	15.25	2.75	3.46
5.9	8.1	15.61	0	3.28
0	14.95	18.34	2.09	2.84
4.89	8.86	15.91	1.71	3.83
5.41	9.23	16.09	1.59	3.2
6.16	10.26	14.65	0	2.98
6.88	9.47	15.63	0	2.9
7.66	7.82	18.04	2.02	3.71
5.2	9.76	19.22	2.01	3.75
6.63	9.33	17.32	2.09	4.66
5.96	10.9	17.79	0	3.42
7.56	10.2	13.6	2.23	3.78
6.21	7.76	12.52	1.32	3.14
5.63	7.27	17.09	0	3.23
5.08	7.05	18.81	0	2.69
5.66	7.87	17.39	2.4	3.6
5.46	7.59	15.42	1.76	3.07
6.13	8.51	16.74	0	4.06
5.6	9.08	13.96	1.97	3.46
5.69	8.79	15.95	2.05	3.06
5.33	7.41	19.48	1.79	3.11
7.02	8.22	17.93	1.39	2.65

6.48	8.78	22.09	2.62	3.06
6.9	10.49	15.76	0	3.7
5.69	9.7	16.28	1.95	3.77
6.17	10.25	15.46	2.18	2.95
0	15.13	16.1	0	2.6
0	16.74	16.09	2.67	2.88
6.06	10.41	20.35	2.61	3.47
6.23	8.51	19.77	2.26	2.41
0	15.05	19.56	2.32	3.36
6.32	10.48	17.31	2.59	2.93
8.74	13.67	14.03	0	2.68
8.67	9.51	14.54	3.38	3.28
0	15.75	20.75	0	3.73
0	16.39	22.42	2.1	3.55
5.82	9.65	19.46	0	3.4
0	15.36	16.88	0	2.94
0	16.29	20.25	0	4.01
5.26	10.47	22.18	0	4.59
5.87	11.28	15.66	2.26	3.86
6.42	10.62	21.77	2.68	3.47
5.29	6.8	18.42	0	2.14
6.25	8.68	13.95	0	2.91
6.2	8.62	10.71	0	3.32
5.59	8.92	11.64	3.5	2.87
6.83	8.29	13.92	2.63	3.33
7.94	9.5	13.56	0	3.23
7.11	9.8	20.22	2.45	3.59
0	16.77	19.08	2.39	2.67
0	16.83	24.16	2.24	3.69
0	15.55	28.39	0	3.07
6.14	8.8	17.68	1.78	3.16
3.67	13.85	19.16	3.23	4.46
0	15.59	21.01	2.7	3.53
0	18.09	21.38	0	2.96
0	17.4	23.51	1.93	3
0	15.41	23.66	3.05	2.98
0	15.73	24.34	1.89	3.14
7.3	11.72	20.42	2.4	3.38
0	15.96	26.86	0	3.71
0	16.37	31.56	0	3.75
0	16.39	25.11	0	4.75
6.7	9.31	14.17	2.15	2.92

Dolomite (% dw)

7.57
5.72
6.2
7.95
8.77
8.23
7.49
5.6
6.33
10
9.22
7.42
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11.71