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Supplement of

Sediment phosphorus speciation and mobility under dynamic redox conditions

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Time, days	pH	Temp, oC	Eh (SHE), mV	Nitrogen sparging (% of 30 mL min-1)	Air sparging (% of 30 mL min-1)	Dissolved O2 (% saturation)	Colorimetric methods (UV-vis spectrometer)			Total	
							Sulfide, uM	SRP, uM	Al		Ca
10.93	7.69	25	415.3	0	100	103.3	0.0	2.6	0.9	5572.5	0.1
11.12	7.21	25	278.34	100	0	0	0.0	3.3	1.6	5826.1	0.4
11.83	7.25	25	243.52	100	0	-0.1	0.0	2.9	1.1	5705.5	0.1
14.97	7.34	25	19.91	100	0	-0.1	0.0	3.4	1.9	5589.1	1.1
17.94	7.39	25	-81.7	99.99	0	-0.1	1.0	15.3	0.9	5414.4	23.7
18.12	7.44	25	356.3	0	100	94.3	0.0	1.4	1.0	5298.0	0.1
18.83	7.63	25	405.5	0	100	104.1	0.0	2.3	1.1	5302.2	0.2
22.04	7.67	25	441.29	0	100	105	0.0	3.2	1.5	5381.2	0.1
24.94	7.69	25	451.6	0	100	106.4	0.0	3.2	1.3	5539.2	0.1
25.12	7.18	25	291.12	100	0	0	0.0	4.6	1.4	5767.9	0.2
25.83	7.23	25	77.04	100	0	-0.1	0.0	3.1	1.1	5867.7	0.1
28.97	7.34	25	-96.87	100	0	-0.1	0.3	19.9	1.0	6276.2	43.8
31.94	7.42	25	-166.07	100	0	-0.1	2.2	47.2	0.3	6171.3	71.9
32.12	7.49	25	335.09	0	100	96.5	0.0	0.8	1.9	5697.2	0.2
32.83	7.72	25	416.96	0	100	103.5	0.0	1.3	1.1	5700.0	0.6
35.97	7.69	25	452.89	0	100	105.7	0.0	2.6	1.1	5718.0	0.1
38.94	7.69	25	467.72	0	100	106.1	0.0	3.5	0.5	5792.9	0.0
39.12	7.22	25	227.47	100	0	0	0.0	4.8	0.8	6000.8	0.2
39.84	7.26	25	-43.79	100	0	-0.1	0.5	7.8	0.6	6108.9	6.4
42.98	7.43	24.9	-174.31	100	0	-0.1	1.0	49.0	0.5	6200.4	71.7
45.91	7.48	25	-208.64	100	0	-0.1	1.6	26.5	0.7	6104.8	55.7
46.05	7.49	25	291.03	0	100	97.1	0.0	0.9	0.6	5713.9	0.2
46.76	7.68	25	377.25	0	100	105.3	0.0	0.9	0.5	5709.7	0.1
49.90	7.64	25	429.85	0	100	105.3	0.0	1.6	1.2	5834.5	0.1
52.87	7.68	25	450.43	0	100	104.7	0.0	2.3	0.5	6025.7	0.1
53.05	7.21	25	272.9	100	0	0.6	0.0	5.7	0.8	6208.7	0.2
53.76	7.25	25	-24.65	100	0	-0.1	0.3	9.3	0.5	6300.2	5.2
56.90	7.44	25	-194.62	100	0	-0.1	1.0	51.8	0.9	6578.8	77.8
59.87	7.53	25	-231.92	100	0	-0.1	0.9	44.3	0.6	6612.1	73.2
59.87	7.71	25	296.47	0	100	92.6	0.0	1.0	1.4	6208.7	0.2
60.77	7.95	25	366.51	0	100	103.1	0.0	0.9	0.2	6233.7	0.1
63.91	7.97	25	419.35	0	100	104.2	0.0	1.9	1.0	6395.9	0.1
66.87	7.78	25	447.54	0	100	104.3	0.0	2.2	1.5	6454.1	0.0
67.05	7.18	25	257.01	100	0	0.1	0.0	9.3	1.3	6670.3	0.3
67.79	7.32	25	-94.38	100	0	-0.1	1.7	27.8	0.7	6869.9	23.3
70.91	7.51	25	-226.04	100	0	-0.1	3.8	36.7	1.5	7032.1	51.8
74.04	7.6	25	-247.17	100	0	-0.1	6.0	49.7	0.7	6953.1	65.6

al aqueous Concentration, uM (from ICP-OES analysis)							Fe:P	% TDP as SRP	DOC, mM (Shimadzu)
K	Mg	Mn	Na	P	Si	S			
239.4	1094.4	0.0	1601.4	3.7	77.4	5535.6	0.0	70.7	1.53
436.5	1172.6	0.4	1651.5	4.7	109.0	5312.1	0.1	69.5	8.44
393.9	1158.9	2.0	1602.2	4.4	112.2	5473.3	0.0	66.7	5.37
378.3	1172.6	40.8	1595.6	4.9	127.0	5426.5	0.2	68.6	6.45
374.4	1145.2	37.2	1534.0	15.6	179.5	5514.8	1.5	97.8	6.72
394.1	1094.4	0.2	1601.4	3.0	100.2	5738.3	0.0	46.0	3.41
370.4	1068.4	0.1	1610.0	3.5	82.8	5837.1	0.0	67.0	2.76
383.4	1064.9	0.0	1623.2	3.9	87.9	5941.1	0.0	82.1	1.46
393.9	1083.5	0.0	1606.5	4.2	97.1	5993.0	0.0	76.9	1.46
631.7	1156.1	0.4	1667.4	5.7	130.4	6164.6	0.0	81.1	9.56
612.1	1197.3	20.4	1666.0	4.4	146.0	6173.4	0.0	71.0	9.50
599.1	1305.5	48.3	1713.7	21.7	221.9	5972.2	2.0	91.3	13.38
621.1	1372.1	42.9	1691.3	49.1	255.1	5961.8	1.5	95.9	8.29
627.5	1368.9	36.7	1662.3	2.6	121.9	6138.6	0.1	29.5	1.96
641.1	1367.3	18.3	1692.1	2.8	112.1	6221.7	0.2	46.9	1.77
607.0	1147.2	0.0	1693.5	3.4	91.8	6346.5	0.0	76.7	1.52
615.1	1160.9	0.0	1689.2	3.9	99.8	6544.0	0.0	91.5	1.53
1062.7	1235.7	3.0	1752.2	6.4	137.6	6486.8	0.0	74.9	36.60
986.8	1304.9	44.7	1733.4	9.3	188.0	6284.1	0.7	83.0	14.41
951.4	1400.3	40.0	1718.9	54.8	271.4	5935.9	1.3	89.4	18.49
929.3	1407.1	35.5	1708.0	29.6	265.5	6190.5	1.9	89.3	17.57
996.2	1263.8	19.5	1710.2	3.2	132.5	6367.3	0.1	29.0	2.33
926.3	1178.1	0.3	1733.4	2.5	81.7	6616.8	0.1	36.0	2.00
912.7	1154.8	0.0	1717.4	3.0	87.5	6835.1	0.0	54.3	2.23
931.0	1171.2	0.0	1739.2	3.0	94.8	6944.2	0.0	76.2	2.07
1411.0	1258.3	3.1	1797.2	6.4	133.6	6933.8	0.0	89.2	29.39
1370.5	1342.7	42.4	1807.3	9.5	180.8	6803.9	0.5	98.2	9.51
1330.8	1461.3	40.8	1840.7	50.5	276.1	6512.8	1.5	102.7	10.28
1366.2	1495.6	35.9	1896.5	37.6	268.8	6762.3	1.9	117.7	12.81
1442.9	1353.6	15.7	1899.4	2.7	133.1	7178.1	0.1	37.7	2.54
1399.0	1281.6	0.2	1924.0	2.4	86.0	7464.0	0.1	38.4	2.37
1426.7	1274.1	0.0	1948.0	2.9	85.2	7568.0	0.0	64.7	2.11
1412.3	1257.6	0.0	1966.8	3.0	91.6	7853.8	0.0	74.1	1.97
2141.6	1367.3	7.0	2006.7	9.4	138.7	7749.9	0.0	99.1	94.42
2103.2	1501.7	42.4	2074.1	26.0	226.8	7178.1	0.9	106.6	23.45
2039.3	1555.9	35.5	2048.7	37.0	273.1	6679.1	1.4	99.2	12.44
2075.1	1562.8	30.2	2108.2	61.1	275.0	6783.1	1.1	81.4	13.32

Time, days	0.5M HCl extract, uM, Fe2+/Fetotal (Ferrozine method)			Thermogravimetric Analysis		Total extraction (ASPILA method), umol g-1							MgCl2 extract								
	Fe2+, extractable umol g-1	Fe total, extractable umol g-1	Fe2+:Fe(tot)	% C	% CaCO3	Al	Ca	Fe	Mn	P	S	Si	Al	Ca	Fe	Mn	P	S	Si	Al	Ca
10.93	42	120	0.35	3.1	23.6	265.7	2043.7	262.5	12.7	56.5	66.8	174.2	0.2	549.9	0.1	1.6	10.0	14.5	31.6	1.6	36.1
11.12	48	111	0.43	3.2	23.5	257.5	2030.7	259.8	13.0	56.8	66.9	170.4	0.4	469.8	0.1	1.5	9.2	13.1	28.6	1.4	38.0
11.83	51	109	0.46	3.1	23.9																
14.97	81	130	0.63	3.0	23.2																
17.94	105	136	0.77	3.2	23.9	282.5	2073.9	260.8	12.0	57.1	69.5	189.6	-0.1	467.3	0.1	3.0	10.3	13.8	30.2	1.4	39.0
18.12	58	125	0.47	3.1	24.0																
18.83	49	117	0.42	3.2	23.4																
22.04	42	120	0.35	2.9	24.5																
24.94	41	111	0.37	3.0	24.4	254.6	2109.4	253.4	12.7	58.7	64.6	174.4	0.0	460.5	0.1	1.5	9.6	12.4	28.8	1.1	44.5
25.12	45	109	0.41	3.2	24.4	250.8	2139.4	245.1	12.6	57.5	64.1	181.8	0.0	448.5	0.0	1.6	9.7	18.3	24.0	1.1	31.5
25.83	51	115	0.45	3.0	24.5																
28.97	80	118	0.67	2.9	24.8																
31.94	111	136	0.81	2.8	25.0	229.4	2183.2	219.9	11.7	55.8	62.1	162.7	0.4	436.3	0.1	2.7	10.0	13.0	25.0	1.2	29.7
32.12	63	122	0.52	2.9	24.7																
32.83	60	119	0.51	2.7	25.1																
35.97	50	126	0.40	2.7	25.1																
38.94	41	113	0.36	2.9	24.5	226.6	2138.2	234.0	12.2	58.4	64.2	147.6	0.3	430.6	0.1	1.3	9.4	11.3	23.4	1.4	33.0
39.12	45	108	0.42	3.1	24.2								0.0	433.1	0.0	1.9	9.8	11.6	21.3	0.8	47.3
39.84	54	118	0.46	2.7	25.5																
42.98	92	124	0.74	2.9	24.8																
45.91	113	143	0.79	3.1	24.5	237.8	2119.7	226.4	11.6	56.6	65.3	157.9	0.1	426.2	0.1	2.8	10.7	14.0	22.8	1.2	41.0
46.05	65	123	0.53	2.8	24.7																
46.76	54	119	0.45	2.9	24.3																
49.90	44	114	0.39	3.3	23.2																
52.87	41	105	0.39	3.0	24.3	248.0	2100.5	237.5	12.3	58.0	65.3	164.6	0.0	435.6	0.1	1.3	9.4	12.4	25.8	1.0	42.3
53.05	47	113	0.41	3.2	24.1								-0.2	425.5	0.0	1.7	10.1	13.2	23.2	1.2	41.3
53.76	61	119	0.52	3.0	24.0																
56.90	82	105	0.78	3.1	24.5																
59.87	92	105	0.88	3.2	24.1	248.2	2070.3	236.1	11.9	57.0	66.8	211.1	0.1	423.7	0.0	2.8	10.4	17.2	23.4	1.0	49.5
59.87	49	90	0.54	2.9	24.5																
60.77	42	88	0.48	3.0	24.4																
63.91	35	85	0.41	2.7	25.0																
66.87	36	93	0.39	2.9	24.7	237.7	2130.5	233.4	12.2	56.1	62.6	194.5	-0.1	448.4	0.0	1.3	9.6	14.4	26.4	1.2	41.3
67.05	43	90	0.48	3.0	24.9	227.1	2139.9	228.8	12.1	56.6	64.7	178.3	0.0	442.2	0.1	2.4	9.9	14.8	23.4	0.8	39.1
67.79	64	99	0.65	3.0	24.2																
70.91	77	92	0.84	2.9	24.6																
74.04	100	106	0.95	2.8	25.3	222.5	2179.4	211.3	11.5	53.5	66.1	189.3	0.1	432.6	0.1	2.7	10.3	18.9	24.3	1.0	44.3

NaHCO3 extract					CDB extract							Acetate extract							HCl extract							Ash + HCl extract						
Fe	Mn	P	S	Si	Al	Ca	Fe	Mn	P	S	Si	Al	Ca	Fe	Mn	P	S	Si	Al	Ca	Fe	Mn	P	S	Si	Al	Ca	Fe	Mn	P	S	Si
25.5	2.4	19.0	9.6	12.9	10.5	717.2	80.3	0.3	10.7	662.0	42.7	11.8	527.5	25.7	0.5	9.5	14.6	10.7	90.5	53.0	75.6	0.0	7.6	0.0	107.9	220.4	3.3	95.2	1.0	4.3	41.4	63.6
22.0	2.1	16.5	###	12.1	9.1	695.1	74.4	0.2	10.7	436.0	39.7	10.8	486.9	24.2	0.5	9.2	14.9	9.7	83.2	49.7	70.5	0.0	6.8	0.3	99.8	202.3	2.8	82.3	0.9	3.9	33.8	57.8
19.9	1.1	17.6	9.1	12.7	10.2	729.4	83.2	0.3	11.8	423.7	40.9	12.0	523.4	26.9	0.5	9.7	12.6	11.2	89.9	55.0	73.7	0.0	7.0	0.4	106.8	210.6	2.8	95.9	0.9	4.0	31.1	62.9
19.6	2.4	17.0	9.0	12.5	9.5	700.3	81.7	0.2	13.7	465.2	40.0	10.7	572.7	25.2	0.6	9.1	15.6	9.9	86.1	48.5	73.8	0.0	7.5	0.3	100.1	206.6	3.1	97.5	0.8	4.0	28.9	58.1
18.5	2.1	14.6	8.2	12.3	8.5	714.8	79.4	0.2	13.7	411.7	38.9	10.4	588.6	26.7	0.6	9.8	12.0	10.3	87.4	63.3	74.2	0.0	7.7	0.6	100.9	211.4	3.1	109.2	0.8	4.0	29.9	56.6
19.2	0.9	16.8	8.5	12.6	7.5	735.4	72.5	0.2	13.1	337.9	36.2	9.5	577.3	25.8	0.6	9.5	10.7	9.2	81.3	58.6	71.1	0.0	7.6	0.5	94.5	194.3	2.7	107.5	0.7	3.3	26.0	51.5
18.2	2.0	15.0	8.1	12.5	8.3	671.6	83.5	0.2	16.9	461.7	38.9	9.9	678.6	25.8	0.6	9.4	12.4	9.5	84.5	64.5	73.6	0.0	8.3	0.5	97.6	204.2	2.9	109.4	0.7	3.9	25.0	55.8
17.8	1.6	13.8	9.0	12.4	7.8	722.5	78.0	0.2	16.6	418.7	37.4	9.7	571.6	25.2	0.6	9.3	11.2	9.2	82.2	59.6	71.4	0.0	8.0	0.9	96.0	202.4	28.5	106.2	0.7	3.8	25.5	50.6
19.6	0.9	15.0	8.6	12.0	8.2	696.4	78.8	0.2	14.4	568.1	39.1	10.3	592.3	27.0	0.6	9.5	12.7	10.0	86.9	62.0	74.0	0.0	7.8	0.9	100.9	207.6	3.0	108.1	0.7	3.8	26.2	54.9
20.5	2.0	15.2	8.5	13.4	9.3	689.8	88.1	0.2	18.3	701.4	42.2	10.8	584.2	26.2	0.6	9.9	13.2	10.3	90.0	62.3	75.8	0.0	8.2	0.7	104.7	219.5	3.1	115.9	0.7	4.6	28.9	56.0
19.0	1.7	13.5	7.5	13.4	9.6	690.9	91.4	0.2	19.6	638.5	42.6	11.3	570.0	26.8	0.5	9.8	13.6	10.4	90.2	63.9	75.6	0.0	7.8	1.3	105.1	215.9	3.3	121.0	0.8	4.8	91.0	56.3
23.7	1.0	16.9	8.6	11.3	7.6	686.6	73.1	0.2	14.7	530.7	37.7	10.6	568.6	26.7	0.6	9.6	9.5	9.7	84.7	64.1	72.5	0.0	7.8	1.1	99.2	202.0	2.9	115.6	0.7	3.9	28.6	50.7
21.4	2.0	15.6	7.7	12.3	8.2	728.3	77.6	0.2	15.2	478.3	39.5	10.6	576.6	27.2	0.6	9.7	10.5	10.2	84.8	65.9	72.6	0.0	8.0	1.1	100.1	204.8	3.5	104.3	0.7	4.1	26.8	51.0
20.4	1.2	14.4	8.0	11.7	7.8	689.9	76.0	0.2	16.7	622.1	38.7	9.3	620.2	24.6	0.6	9.0	13.2	8.8	83.4	68.7	73.4	0.0	8.3	1.7	99.6	204.3	3.2	112.2	0.7	4.1	26.7	48.9
22.1	0.9	15.6	9.0	11.1	7.3	709.3	66.2	0.2	12.2	400.5	36.1	9.4	617.7	27.0	0.6	9.3	10.5	9.7	81.0	69.4	71.5	0.0	7.8	1.6	96.7	192.0	4.1	110.2	0.7	3.6	26.8	44.9

Totals (sum of sequential extracts)						
Al	Ca	Fe	Mn	P	S	Si
334.9	1887.0	302.4	5.7	61.0	742.1	269.4
307.2	1742.4	273.4	5.2	56.3	508.4	247.7
323.9	1817.0	299.7	5.8	60.4	490.6	264.7
313.9	1829.7	297.9	5.4	60.9	531.4	249.4
318.7	1849.7	308.0	5.3	59.4	480.7	243.1
294.3	1840.0	296.3	5.2	60.4	396.6	229.1
308.5	1881.2	310.6	4.9	62.9	519.0	237.6
302.9	1862.6	298.7	5.0	61.2	477.0	226.9
314.3	1820.9	307.6	5.2	61.0	630.5	239.8
330.7	1817.3	326.5	4.8	65.6	765.2	252.3
328.1	1794.9	333.8	4.9	65.7	765.1	251.0
306.1	1795.4	311.5	5.3	63.3	595.7	232.0
309.4	1864.1	303.1	4.8	62.2	538.8	239.6
305.6	1863.3	306.6	5.1	62.5	686.5	231.1
290.9	1877.4	297.0	5.0	58.8	467.3	222.8