

**Table S1.** Precipitation and water table depth from September 1<sup>st</sup>, 2014 to June 30<sup>th</sup>, 2015.

Date	Rain (mm)	Water table depth (m from soil surface)			
		<i>Kdown</i>	<i>Kup</i>	<i>Gdown</i>	<i>Gup</i>
9/1/2014	0.5	-0.35	-0.91	-0.43	-0.59
9/2/2014	0	-0.36	-0.92	-0.43	-0.60
9/3/2014	0.5	-0.39	-0.92	-0.43	-0.60
9/4/2014	0	-0.42	-0.93	-0.43	-0.61
9/5/2014	0	-0.41	-0.94	-0.44	-0.62
9/6/2014	0	-0.43	-0.95	-0.44	-0.63
9/7/2014	0	-0.45	-0.96	-0.45	-0.64
9/8/2014	0	-0.50	-0.99	-0.47	-0.67
9/9/2014	0	-0.51	-1.01	-0.47	-0.69
9/10/2014	0	-0.52	-1.01	-0.47	-0.69
9/11/2014	0	-0.56	-1.03	-0.49	-0.71
9/12/2014	0	-0.58	-1.05	-0.51	-0.74
9/13/2014	0	-0.59	-1.07	-0.52	-0.76
9/14/2014	0	-0.59	-1.06	-0.51	-0.75
9/15/2014	0	-0.58	-1.08	-0.52	-0.77
9/16/2014	0.5	-0.56	-1.09	-0.52	-0.78
9/17/2014	0	-0.61	-1.10	-0.53	-0.79
9/18/2014	1.5	-0.57	-1.13	-0.55	-0.82
9/19/2014	0	-0.56	-1.16	-0.58	-0.85
9/20/2014	0	-0.57	-1.19	-0.61	-0.89
9/21/2014	0	-0.58	-1.22	-0.64	-0.91
9/22/2014	0	-0.58	-1.23	-0.65	-0.93
9/23/2014	0.5	-0.56	-1.22	-0.65	-0.93
9/24/2014	0	-0.55	-1.23	-0.66	-0.95
9/25/2014	0	-0.57	-1.27	-0.70	-0.98
9/26/2014	0	-0.58	-1.29	-0.71	-1.01
9/27/2014	0.5	-0.57	-1.29	-0.71	-1.02
9/28/2014	1	-0.57	-1.29	-0.72	-1.03
9/29/2014	1	-0.57	-1.33	-0.75	-1.07
9/30/2014	0	-0.57	-1.36	-0.76	-1.09
10/1/2014	0.5	-0.57	-1.37	-0.76	-1.10
10/2/2014	0	-0.56	-1.37	-0.76	-1.12
10/3/2014	0.5	-0.53	-1.36	-0.75	-1.11
10/4/2014	3.5	-0.52	-1.36	-0.75	-1.12
10/5/2014	0	-0.53	-1.39	-0.77	-1.14
10/6/2014	12	-0.48	-1.34	-0.71	-1.10
10/7/2014	5.5	-0.49	-1.37	-0.71	-1.12
10/8/2014	0.5	-0.47	-1.37	-0.70	-1.10
10/9/2014	2	-0.49	-1.41	-0.72	-1.12
10/10/2014	9.5	-0.48	-1.43	-0.73	-1.13
10/11/2014	2.5	-0.43	-1.40	-0.70	-1.10
10/12/2014	37	-0.23	-1.08	-0.41	-0.69
10/13/2014	0	-0.16	-0.71	-0.23	-0.33
10/14/2014	0.5	-0.19	-0.82	-0.34	-0.42
10/15/2014	6.5	-0.17	-0.75	-0.32	-0.40

Table S1. continued

Date	Rain (mm)	Water table depth (m from soil surface)			
		<i>Kdown</i>	<i>Kup</i>	<i>Gdown</i>	<i>Gup</i>
10/16/2014	9.5	-0.16	-0.67	-0.30	-0.37
10/17/2014	0	-0.11	-0.54	-0.26	-0.33
10/18/2014	1	-0.15	-0.68	-0.36	-0.43
10/19/2014	0.5	-0.17	-0.73	-0.39	-0.46
10/20/2014	2	-0.17	-0.74	-0.39	-0.47
10/21/2014	0	-0.18	-0.76	-0.40	-0.49
10/22/2014	0	-0.19	-0.80	-0.41	-0.49
10/23/2014	0	-0.18	-0.78	-0.39	-0.48
10/24/2014	0.5	-0.17	-0.77	-0.38	-0.48
10/25/2014	0	-0.18	-0.81	-0.40	-0.49
10/26/2014	0	-0.19	-0.81	-0.40	-0.49
10/27/2014	0.5	-0.18	-0.80	-0.39	-0.48
10/28/2014	0	-0.17	-0.80	-0.38	-0.48
10/29/2014	0.5	-0.17	-0.82	-0.39	-0.48
10/30/2014	0	-0.18	-0.83	-0.39	-0.48
10/31/2014	0.5	-0.17	-0.82	-0.39	-0.48
11/1/2014	1	-0.17	-0.83	-0.39	-0.48
11/2/2014	31.5	-0.13	-0.75	-0.32	-0.42
11/3/2014	11	0.01	-0.23	-0.08	-0.15
11/4/2014	0.5	-0.06	-0.27	-0.14	-0.28
11/5/2014	1	-0.08	-0.49	-0.26	-0.35
11/6/2014	14.5	-0.07	-0.47	-0.28	-0.34
11/7/2014	2.5	-0.01	-0.16	-0.11	-0.25
11/8/2014	19	0.01	-0.12	-0.07	-0.16
11/9/2014	0.5	0.01	-0.11	-0.05	-0.14
11/10/2014	4.5	-0.06	-0.29	-0.12	-0.28
11/11/2014	32.5	0.03	-0.10	-0.01	-0.08
11/12/2014	1	0.03	-0.08	0.02	-0.03
11/13/2014	6	0.03	-0.08	-0.01	-0.07
11/14/2014	7	0.03	-0.09	-0.04	-0.13
11/15/2014	3.5	0.03	-0.09	-0.03	-0.12
11/16/2014	0	0.03	-0.12	-0.05	-0.16
11/17/2014	0	0.00	-0.28	-0.09	-0.27
11/18/2014	0.5	-0.04	-0.38	-0.12	-0.31
11/19/2014	0.5	-0.06	-0.43	-0.15	-0.33
11/20/2014	0.5	-0.06	-0.45	-0.16	-0.34
11/21/2014	2	-0.06	-0.46	-0.17	-0.35
11/22/2014	5.5	-0.04	-0.41	-0.15	-0.32
11/23/2014	14	0.02	-0.13	-0.04	-0.12
11/24/2014	2	0.04	-0.10	-0.03	-0.08
11/25/2014	5	0.04	-0.12	-0.04	-0.14
11/26/2014	1	0.04	-0.15	-0.06	-0.20
11/27/2014	0	0.03	-0.22	-0.08	-0.25
11/28/2014	0	0.00	-0.34	-0.11	-0.30
11/29/2014	0	-0.04	-0.44	-0.15	-0.34
11/30/2014	0	-0.04	-0.47	-0.17	-0.36

Table S1. continued

Date	Rain (mm)	Water table depth (m from soil surface)			
		<i>Kdown</i>	<i>Kup</i>	<i>Gdown</i>	<i>Gup</i>
12/1/2014	0	-0.04	-0.49	-0.18	-0.37
12/2/2014	1	-0.04	-0.53	-0.20	-0.37
12/3/2014	2	-0.03	-0.49	-0.17	-0.33
12/4/2014	0.5	-0.03	-0.49	-0.17	-0.35
12/5/2014	1.5	-0.05	-0.55	-0.20	-0.36
12/6/2014	0.5	-0.05	-0.58	-0.21	-0.36
12/7/2014	1	-0.04	-0.55	-0.20	-0.35
12/8/2014	1.5	-0.04	-0.55	-0.21	-0.36
12/9/2014	1	-0.04	-0.56	-0.22	-0.36
12/10/2014	0	-0.05	-0.52	-0.20	-0.34
12/11/2014	3.5	-0.05	-0.52	-0.21	-0.36
12/12/2014	22.5	0.03	-0.23	-0.08	-0.18
12/13/2014	0.5	0.05	-0.10	0.02	-0.01
12/14/2014	1.5	0.04	-0.34	-0.07	-0.17
12/15/2014	5	0.04	-0.33	-0.09	-0.25
12/16/2014	0.5	0.04	-0.17	-0.07	-0.20
12/17/2014	0	0.04	-0.33	-0.10	-0.27
12/18/2014	0	0.03	-0.39	-0.13	-0.31
12/19/2014	1.5	0.03	-0.41	-0.14	-0.32
12/20/2014	0	0.00	-0.44	-0.15	-0.33
12/21/2014	0	-0.01	-0.45	-0.17	-0.35
12/22/2014	0.5	-0.02	-0.46	-0.18	-0.35
12/23/2014	0	-0.02	-0.47	-0.18	-0.36
12/24/2014	1	-0.02	-0.49	-0.19	-0.36
12/25/2014	0	-0.04	-0.53	-0.21	-0.36
12/26/2014	2.5	-0.02	-0.49	-0.19	-0.35
12/27/2014	4.5	0.02	-0.44	-0.16	-0.32
12/28/2014	0	0.01	-0.47	-0.16	-0.30
12/29/2014	0	-0.06	-0.54	-0.20	-0.35
12/30/2014	0	-0.06	-0.54	-0.22	-0.37
12/31/2014	0.5	-0.06	-0.54	-0.23	-0.37
1/1/2015	0	-0.06	-0.54	-0.23	-0.37
1/2/2015	0.5	-0.06	-0.55	-0.24	-0.37
1/3/2015	0.5	-0.03	-0.52	-0.22	-0.36
1/4/2015	0	-0.05	-0.55	-0.24	-0.36
1/5/2015	0	-0.04	-0.53	-0.24	-0.36
1/6/2015	1	-0.04	-0.55	-0.26	-0.37
1/7/2015	0	-0.05	-0.58	-0.28	-0.38
1/8/2015	10.5	0.00	-0.31	-0.15	-0.26
1/9/2015	0	0.03	-0.26	-0.10	-0.27
1/10/2015	2	0.03	-0.33	-0.12	-0.30
1/11/2015	0	0.02	-0.42	-0.16	-0.32
1/12/2015	7.5	0.03	-0.41	-0.16	-0.33
1/13/2015	5.5	0.04	-0.16	-0.05	-0.17
1/14/2015	18	0.04	-0.11	-0.05	-0.19
1/15/2015	13	0.05	-0.06	0.04	0.02

Table S1. continued

Date	Rain (mm)	Water table depth (m from soil surface)			
		<i>Kdown</i>	<i>Kup</i>	<i>Gdown</i>	<i>Gup</i>
1/16/2015	2	0.05	-0.08	0.02	-0.01
1/17/2015	4	0.04	-0.16	-0.03	-0.13
1/18/2015	8	0.05	-0.09	0.00	-0.06
1/19/2015	0	0.04	-0.11	-0.02	-0.10
1/20/2015	5	0.04	-0.20	-0.06	-0.18
1/21/2015	9.5	0.05	-0.08	0.00	-0.04
1/22/2015	0.5	0.04	-0.16	-0.03	-0.08
1/23/2015	0.5	0.03	-0.32	-0.08	-0.20
1/24/2015	0	0.03	-0.34	-0.10	-0.26
1/25/2015	0	0.03	-0.40	-0.12	-0.30
1/26/2015	0.5	0.03	-0.40	-0.12	-0.32
1/27/2015	0	0.02	-0.44	-0.13	-0.34
1/28/2015	1	0.03	-0.40	-0.12	-0.32
1/29/2015	14	0.04	-0.26	-0.06	-0.20
1/30/2015	5.5	0.04	-0.14	0.01	-0.01
1/31/2015	4.5	0.03	-0.21	-0.02	-0.08
2/1/2015	0	0.03	-0.26	-0.04	-0.13
2/2/2015	0	0.03	-0.35	-0.08	-0.22
2/3/2015	0	0.03	-0.40	-0.10	-0.28
2/4/2015	2	0.03	-0.46	-0.12	-0.32
2/5/2015	3	0.03	-0.44	-0.11	-0.31
2/6/2015	0	0.03	-0.43	-0.11	-0.31
2/7/2015	0	0.02	-0.50	-0.15	-0.35
2/8/2015	0	0.02	-0.53	-0.17	-0.36
2/9/2015	0	0.02	-0.53	-0.18	-0.37
2/10/2015	0	0.02	-0.54	-0.18	-0.37
2/11/2015	0.5	0.02	-0.55	-0.19	-0.37
2/12/2015	4.5	0.02	-0.57	-0.19	-0.38
2/13/2015	12.5	0.03	-0.35	-0.03	-0.15
2/14/2015	0.5	0.03	-0.21	0.01	-0.05
2/15/2015	0.5	0.02	-0.35	-0.06	-0.20
2/16/2015	8.5	0.03	-0.31	-0.04	-0.16
2/17/2015	0	0.02	-0.35	-0.06	-0.19
2/18/2015	0	0.02	-0.42	-0.10	-0.30
2/19/2015	4	0.02	-0.43	-0.11	-0.33
2/20/2015	6.5	0.03	-0.19	-0.01	-0.14
2/21/2015	2.5	0.02	-0.18	-0.01	-0.12
2/22/2015	4.5	0.03	-0.29	-0.03	-0.16
2/23/2015	2	0.03	-0.17	-0.01	-0.12
2/24/2015	1	0.02	-0.33	-0.06	-0.20
2/25/2015	0.5	0.02	-0.40	-0.08	-0.26
2/26/2015	2.5	0.02	-0.38	-0.08	-0.28
2/27/2015	0	0.02	-0.41	-0.10	-0.31
2/28/2015	2.5	0.03	-0.40	-0.10	-0.32
3/1/2015	0	0.02	-0.38	-0.09	-0.30
3/2/2015	1.5	0.02	-0.47	-0.12	-0.35

Table S1. continued

Date	Rain (mm)	Water table depth (m from soil surface)			
		<i>Kdown</i>	<i>Kup</i>	<i>Gdown</i>	<i>Gup</i>
3/3/2015	1	0.02	-0.50	-0.12	-0.35
3/4/2015	0.5	0.01	-0.55	-0.15	-0.38
3/5/2015	0	0.01	-0.56	-0.17	-0.39
3/6/2015	0.5	0.00	-0.56	-0.17	-0.39
3/7/2015	0	0.00	-0.57	-0.18	-0.39
3/8/2015	0	0.00	-0.60	-0.20	-0.40
3/9/2015	0.5	-0.01	-0.62	-0.21	-0.40
3/10/2015	2	-0.01	-0.63	-0.20	-0.40
3/11/2015	0.5	0.00	-0.61	-0.20	-0.39
3/12/2015	1.5	0.00	-0.61	-0.21	-0.40
3/13/2015	0.5	0.00	-0.62	-0.21	-0.39
3/14/2015	0.5	-0.01	-0.65	-0.24	-0.40
3/15/2015	0	-0.01	-0.64	-0.23	-0.40
3/16/2015	0	-0.01	-0.64	-0.24	-0.40
3/17/2015	0.5	-0.01	-0.66	-0.27	-0.41
3/18/2015	0	-0.04	-0.69	-0.29	-0.42
3/19/2015	0	-0.05	-0.69	-0.31	-0.42
3/20/2015	0	-0.03	-0.68	-0.30	-0.42
3/21/2015	0	-0.04	-0.70	-0.32	-0.43
3/22/2015	0	-0.06	-0.71	-0.33	-0.43
3/23/2015	0	-0.04	-0.70	-0.34	-0.43
3/24/2015	1.5	-0.03	-0.71	-0.34	-0.43
3/25/2015	1.5	-0.05	-0.72	-0.35	-0.43
3/26/2015	0.5	-0.04	-0.73	-0.34	-0.43
3/27/2015	2.5	-0.07	-0.76	-0.35	-0.44
3/28/2015	0	-0.06	-0.73	-0.32	-0.41
3/29/2015	4.5	-0.02	-0.70	-0.31	-0.40
3/30/2015	1	0.00	-0.69	-0.28	-0.37
3/31/2015	0	-0.03	-0.70	-0.33	-0.41
4/1/2015	0	-0.08	-0.72	-0.35	-0.43
4/2/2015	0	-0.07	-0.70	-0.35	-0.43
4/3/2015	3.5	-0.02	-0.69	-0.33	-0.42
4/4/2015	0	-0.04	-0.71	-0.34	-0.42
4/5/2015	0	-0.07	-0.73	-0.36	-0.44
4/6/2015	0	-0.09	-0.75	-0.37	-0.45
4/7/2015	0	-0.10	-0.76	-0.37	-0.46
4/8/2015	0	-0.11	-0.75	-0.37	-0.46
4/9/2015	0	-0.11	-0.75	-0.37	-0.46
4/10/2015	0.5	-0.10	-0.75	-0.37	-0.46
4/11/2015	0	-0.11	-0.78	-0.38	-0.48
4/12/2015	0.5	-0.11	-0.79	-0.38	-0.48
4/13/2015	0	-0.12	-0.79	-0.39	-0.48
4/14/2015	0	-0.12	-0.78	-0.38	-0.47
4/15/2015	0	-0.12	-0.76	-0.38	-0.47
4/16/2015	0	-0.11	-0.77	-0.39	-0.48
4/17/2015	22.5	-0.12	-0.80	-0.39	-0.49

Table S1. continued

Date	Rain (mm)	Water table depth (m from soil surface)			
		<i>Kdown</i>	<i>Kup</i>	<i>Gdown</i>	<i>Gup</i>
4/18/2015	0.5	0.00	-0.73	-0.24	-0.38
4/19/2015	0	-0.05	-0.68	-0.31	-0.43
4/20/2015	0.5	-0.08	-0.72	-0.36	-0.46
4/21/2015	0	-0.10	-0.73	-0.38	-0.47
4/22/2015	0	-0.11	-0.72	-0.37	-0.47
4/23/2015	0	-0.11	-0.73	-0.38	-0.47
4/24/2015	2.5	-0.11	-0.74	-0.37	-0.48
4/25/2015	3.5	-0.09	-0.74	-0.36	-0.48
4/26/2015	1.5	-0.08	-0.74	-0.36	-0.48
4/27/2015	0	-0.12	-0.77	-0.38	-0.49
4/28/2015	0.5	-0.14	-0.79	-0.39	-0.51
4/29/2015	23	-0.11	-0.78	-0.37	-0.50
4/30/2015	0.5	0.01	-0.55	-0.10	-0.24
5/1/2015	1	0.04	-0.21	0.00	-0.08
5/2/2015	19	0.04	-0.22	-0.01	-0.10
5/3/2015	1	0.04	-0.17	0.01	-0.07
5/4/2015	12.5	0.04	-0.32	-0.06	-0.25
5/5/2015	4.5	0.04	-0.27	-0.01	-0.13
5/6/2015	2	0.03	-0.40	-0.09	-0.29
5/7/2015	0.5	0.03	-0.47	-0.14	-0.37
5/8/2015	0.5	0.03	-0.52	-0.18	-0.40
5/9/2015	0	0.02	-0.59	-0.24	-0.43
5/10/2015	0	-0.01	-0.61	-0.27	-0.43
5/11/2015	0	-0.02	-0.63	-0.31	-0.45
5/12/2015	0.5	-0.04	-0.67	-0.33	-0.45
5/13/2015	1	-0.03	-0.67	-0.32	-0.45
5/14/2015	6	0.00	-0.67	-0.31	-0.45
5/15/2015	0	-0.03	-0.73	-0.32	-0.46
5/16/2015	0	-0.08	-0.73	-0.34	-0.46
5/17/2015	0	-0.11	-0.72	-0.35	-0.46
5/18/2015	1.5	-0.01	-0.68	-0.33	-0.45
5/19/2015	2	0.00	-0.72	-0.35	-0.46
5/20/2015	0.5	-0.05	-0.76	-0.37	-0.47
5/21/2015	0	-0.13	-0.78	-0.38	-0.48
5/22/2015	0	-0.14	-0.77	-0.37	-0.47
5/23/2015	0	-0.15	-0.76	-0.37	-0.47
5/24/2015	0	-0.17	-0.77	-0.37	-0.49
5/25/2015	0	-0.18	-0.78	-0.38	-0.50
5/26/2015	0.5	-0.19	-0.80	-0.39	-0.52
5/27/2015	0	-0.20	-0.80	-0.39	-0.52
5/28/2015	0	-0.19	-0.79	-0.38	-0.52
5/29/2015	0.5	-0.19	-0.80	-0.39	-0.53
5/30/2015	0.5	-0.19	-0.81	-0.39	-0.54
5/31/2015	2	-0.17	-0.82	-0.38	-0.54
6/1/2015	0	-0.18	-0.83	-0.39	-0.54
6/2/2015	1.5	-0.18	-0.83	-0.39	-0.55

Table S1. continued

Date	Rain (mm)	Water table depth (m from soil surface)			
		<i>Kdown</i>	<i>Kup</i>	<i>Gdown</i>	<i>Gup</i>
6/3/2015	0	-0.19	-0.86	-0.41	-0.57
6/4/2015	0	-0.21	-0.83	-0.41	-0.56
6/5/2015	0	-0.23	-0.85	-0.43	-0.58
6/6/2015	0	-0.25	-0.88	-0.46	-0.61
6/7/2015	0	-0.26	-0.87	-0.46	-0.62
6/8/2015	0	-0.29	-0.87	-0.47	-0.63
6/9/2015	0	-0.29	-0.87	-0.47	-0.65
6/10/2015	0	-0.28	-0.86	-0.47	-0.65
6/11/2015	4.5	-0.23	-0.86	-0.45	-0.66
6/12/2015	3.5	-0.22	-0.87	-0.44	-0.66
6/13/2015	0	-0.24	-0.88	-0.45	-0.67
6/14/2015	0	-0.26	-0.89	-0.47	-0.69
6/15/2015	0	-0.29	-0.92	-0.49	-0.72
6/16/2015	0	-0.32	-0.93	-0.52	-0.74
6/17/2015	0	-0.35	-0.92	-0.54	-0.75
6/18/2015	0	-0.34	-0.92	-0.54	-0.76
6/19/2015	0	-0.37	-0.93	-0.56	-0.78
6/20/2015	0	-0.39	-0.94	-0.58	-0.80
6/21/2015	0	-0.40	-0.94	-0.59	-0.81
6/22/2015	0	-0.40	-0.94	-0.59	-0.82
6/23/2015	0	-0.43	-0.96	-0.63	-0.86
6/24/2015	0	-0.47	-0.98	-0.66	-0.88
6/25/2015	0	-0.51	-0.99	-0.68	-0.91
6/26/2015	0	-0.51	-0.99	-0.68	-0.92
6/27/2015	0	-0.53	-1.01	-0.69	-0.93
6/28/2015	0	-0.56	-1.02	-0.70	-0.95
6/29/2015	0	-0.58	-1.03	-0.71	-0.97
6/30/2015	2.5	-0.61	-1.02	-0.71	-0.98

**Table S2.** DOC, DIC, Fe<sup>2+</sup>, F<sub>CO2</sub> (mean ± SD), WFPS and soil temperature data.

	DOC (mg/l)	DIC (mg/l)	Fe <sup>2+</sup> (mg/l)	F <sub>CO2</sub> ( $\mu\text{molC}/(\text{m}^2\cdot\text{s})$ )	WFPS (%)	Soil Temp (°C)
<b>Kdown</b>						
10/20/2014	15.78	5.45				
10/30/2014	14.55	5.87		2.59 ± 0.40	92.1	13.8
11/7/2014	19.76	7.86		1.11 ± 0.32	100.0	10.9
11/19/2014	15.37	9.65	1.11	0.75 ± 0.33	101.1	11.2
12/2/2014	12.69	9.23		0.47 ± 0.26	101.2	10.1
12/11/2014	<i>no soil solution</i>			0.57 ± 0.26	102.0	8.5
12/22/2014	18.66	12.60	1.66	0.64 ± 0.12	100.7	10.1
1/6/2015	13.08	15.38	2.92	0.44 ± 0.28	102.6	8.3
1/20/2015	16.73	14.82	6.57	0.37 ± 0.23	101.2	3.2
2/3/2015	10.73	12.52	6.54	0.19 ± 0.12	101.4	1.9
2/17/2015	11.34	11.36	5.33	0.24 ± 0.26	100.6	7.7
3/3/2015	10.08	12.12	2.31	0.28 ± 0.31	101.1	9.2
3/12/2015	<i>no soil solution</i>			0.25 ± 0.32	98.8	9.7
3/17/2015	12.54	14.75	2.61	0.25 ± 0.29	100.7	10.7
4/1/2015	17.31	23.58	3.27	0.52 ± 0.14	99.9	9.0
4/9/2015	24.63	33.90	6.28	0.80 ± 0.21	98.9	7.4
4/21/2015	<i>no soil solution</i>			1.65 ± 0.40	101.3	14.1
4/28/2015	35.59	44.12	9.62	2.33 ± 0.64	98.0	13.1
5/12/2015	37.50	41.71	15.47	0.93 ± 0.22	100.0	14.4
5/27/2015	33.88	50.55	14.95	3.69 ± 1.27	89.9	13.2
	DOC (mg/l)	DIC (mg/l)	Fe <sup>2+</sup> (mg/l)	F <sub>CO2</sub> ( $\mu\text{molC}/(\text{m}^2\cdot\text{s})$ )	WFPS (%)	Soil Temp (°C)
<b>Kup</b>						
10/20/2014	13.81	9.02		<i>Occurrence of maize - no data</i>		
10/30/2014	<i>no soil solution</i>			<i>Occurrence of maize - no data</i>		
11/7/2014	13.41	6.71		<i>Occurrence of maize - no data</i>		
11/19/2014	11.63	16.21	0.10	1.62 ± 0.14	77.6	10.8
12/2/2014	11.21	17.73		1.51 ± 0.08	72.9	9.3
12/11/2014	<i>no soil solution</i>			1.31 ± 0.62	89.7	8.3
12/22/2014	9.71	19.53	0.07	2.06 ± 1.21	77.6	10.4
1/6/2015	9.58	24.09	0.01	1.56 ± 0.32	85.4	8.5
1/20/2015	8.83	18.31	0.03	0.64 ± 0.19	92.6	1.5
2/3/2015	7.44	22.58	0.07	0.57 ± 0.11	85.5	0.8
2/17/2015	7.5	21.09	0.06	0.81 ± 0.29	85.6	7.8
3/3/2015	11.1	29.27	0.08	1.18 ± 0.54	97.0	9.4
3/12/2015	<i>no soil solution</i>			2.13 ± 0.73	86.4	11.5
3/17/2015	9.06	23.84	0.01	1.96 ± 0.95	83.4	13.2
4/1/2015	<i>no soil solution</i>			1.64 ± 1.12	82.1	10.7
4/9/2015	<i>no soil solution</i>			1.44 ± 0.11	70.7	10.2
4/21/2015	<i>no soil solution</i>			1.90 ± 0.34	71.5	17.2
4/28/2015	<i>no soil solution</i>			<i>Occurrence of maize - no data</i>		
5/12/2015	11.45	12.65	0.10	<i>Occurrence of maize - no data</i>		
5/27/2015	<i>no soil solution</i>			<i>Occurrence of maize - no data</i>		



Table S2. continued.

	DOC (mg/l)	DIC (mg/l)	Fe <sup>2+</sup> (mg/l)	F <sub>CO2</sub> ( $\mu\text{molC}/(\text{m}^2\cdot\text{s})$ )	WFPS (%)	Soil Temp (°C)
<b>Gdown</b>						
10/20/2014	24.28	5.26				
10/30/2014				4.79 ± 0.67	78.9	15.5
11/7/2014	29.67	5.8		2.00 ± 0.42	92.9	11.7
11/19/2014	33.38	12.41	0.54	1.91 ± 0.30	96.5	10.1
12/2/2014	26.29	6.84	0.25	2.82 ± 1.22	91.0	10.0
12/11/2014	<i>no soil solution</i>			1.46 ± 0.30	94.9	8.3
12/22/2014	31.31	15.34	0.55	1.78 ± 0.25	96.7	10.5
1/6/2015	28.36	18.23	0.22	1.82 ± 0.25	94.7	9.0
1/20/2015	25.88	16.01	0.47	0.82 ± 0.40	100.0	5.2
2/3/2015	26.01	25.75	0.41	0.79 ± 0.17	98.8	4.3
2/17/2015	25.3	15.66	0.81	0.67 ± 0.31	98.1	5.0
3/3/2015	28.39	25.3	0.38	1.16 ± 0.50	99.9	7.3
3/12/2015	<i>no soil solution</i>			2.48 ± 0.58	92.6	8.3
3/17/2015	25.74	19.16	0.61	3.06 ± 0.42	93.6	11.9
4/1/2015	<i>no soil solution</i>			5.32 ± 2.67	90.1	11.1
4/9/2015	<i>no soil solution</i>			5.53 ± 0.72	86.8	12.2
4/21/2015	<i>no soil solution</i>			4.43 ± 0.55	84.7	11.7
4/28/2015	24.61	7.29	0.39	3.57 ± 0.51	80.6	10.5
5/12/2015	35.19	12.87		5.16 ± 0.24	88.2	14.3
5/27/2015	<i>no soil solution</i>			4.08 ± 0.11	72.7	13.2
	DOC (mg/l)	DIC (mg/l)	Fe <sup>2+</sup> (mg/l)	F <sub>CO2</sub> ( $\mu\text{molC}/(\text{m}^2\cdot\text{s})$ )	WFPS (%)	Soil Temp (°C)
<b>Gup</b>						
10/20/2014	21.09	2.29				
10/30/2014	<i>no soil solution</i>			6.39 ± 1.47	74.2	15.1
11/7/2014	29.29	3.38		2.27 ± 0.47	92.3	11.6
11/19/2014	24.50	6.76	0.19	2.86 ± 1.21	88.4	10.0
12/2/2014	32.93	14.69	0.41	2.92 ± 1.19	92.1	9.5
12/11/2014	<i>no soil solution</i>			2.49 ± 0.85	86.7	7.6
12/22/2014	29.75	5.84	0.35	3.74 ± 1.15	91.1	10.6
1/6/2015	<i>no soil solution</i>			3.56 ± 3.21	91.2	9.0
1/20/2015	23.07	5.74	0.09	2.31 ± 1.59	92.6	4.9
2/3/2015	21.25	6.75	0.05	1.20 ± 0.46	95.1	4.2
2/17/2015	24.06	5.91	0.13	1.36 ± 0.47	92.7	4.8
3/3/2015	21.65	7.53	1.16	2.72 ± 0.32	94.5	7.6
3/12/2015	<i>no soil solution</i>			2.93 ± 0.82	89.8	8.4
3/17/2015	<i>no soil solution</i>			4.25 ± 1.22	91.1	11.7
4/1/2015	<i>no soil solution</i>			5.29 ± 1.72	88.7	11.6
4/9/2015	<i>no soil solution</i>			7.39 ± 0.66	85.8	12.7
4/21/2015	<i>no soil solution</i>			6.42 ± 1.18	83.0	11.5
4/28/2015	*		0.42	4.79 ± 1.02	78.5	10.5
5/12/2015	<i>no soil solution</i>			6.47 ± 1.97	82.4	14.1
5/27/2015	<i>no soil solution</i>			5.16 ± 0.70	70.4	13.4

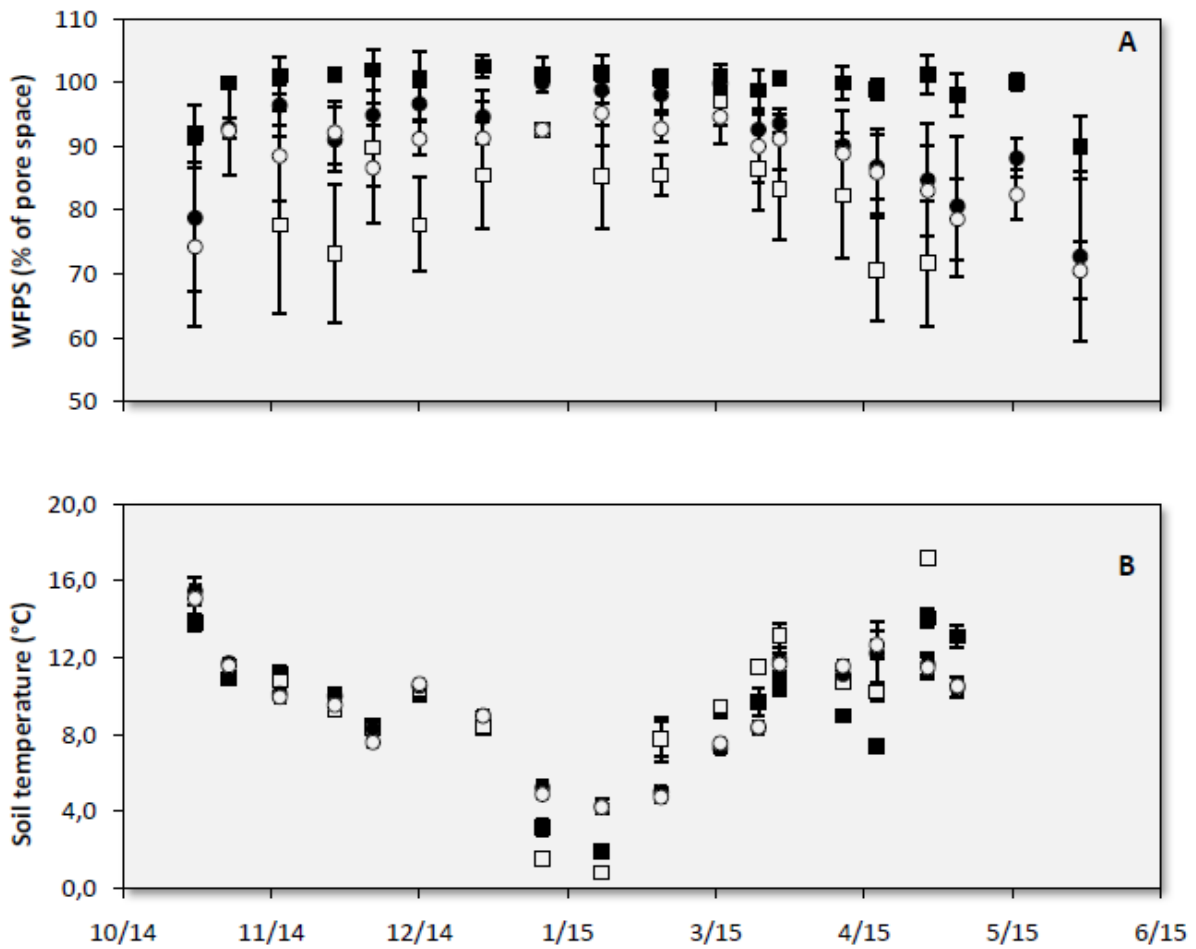
\* The soil solution volume was not high enough to be able to perform a DOC/DIC analysis

**Table S3.** Pearson's rank correlation coefficients and p-values (in brackets) calculated by the rcorr R functions. The correlations were investigated for each point and the catchment using the entire dataset.

<b>Kup</b>										
	DOC		DIC		Fe <sup>2+</sup>		F <sub>CO2</sub>		WFPS	Temp
<b>DOC</b>										
<b>DIC</b>	<b>-0.68 (0.0141)</b>									
<b>Fe<sup>2+</sup></b>	0.49 (0.1833)	-0.42 (0.2630)								
<b>F<sub>CO2</sub></b>	0.54 (0.1329)	-0.07 (0.8657)	-0.06 (0.8857)							
<b>WFPS</b>	-0.27 (0.4879)	<b>0.68 (0.0450)</b>	-0.22 (0.5926)	-0.46 (0.1011)						
<b>Temp</b>	0.56 (0.1207)	0.10 (0.8043)	0.01 (0.9815)	<b>0.84 (0.0002)</b>	-0.50 (0.0658)					
<b>Kdown (from October 20<sup>th</sup> to March 12<sup>th</sup>)</b>										
	DOC		DIC		Fe <sup>2+</sup>		F <sub>CO2</sub>		WFPS	Temp
<b>DOC</b>										
<b>DIC</b>	-0.24 (0.4843)									
<b>Fe<sup>2+</sup></b>	-0.27 (0.5521)	0.38 (0.4070)								
<b>F<sub>CO2</sub></b>	0.34 (0.3309)	<b>-0.75 (0.0120)</b>	<b>-0.76 (0.0477)</b>							
<b>WFPS</b>	-0.13 (0.7212)	<b>0.73 (0.0169)</b>	0.01 (0.9786)	<b>-0.87 (0.0002)</b>						
<b>Temp</b>	0.29 (0.4109)	<b>-0.71 (0.0215)</b>	<b>-0.93 (0.0020)</b>	<b>0.65 (0.0234)</b>	-0.55 (0.0652)					
<b>Kdown (from March 17<sup>th</sup> to May 27<sup>th</sup>)</b>										
	DOC		DIC		Fe <sup>2+</sup>		F <sub>CO2</sub>		WFPS	Temp
<b>DOC</b>										
<b>DIC</b>	<b>0.94 (0.0047)</b>									
<b>Fe<sup>2+</sup></b>	<b>0.92 (0.0097)</b>	<b>0.89 (0.0166)</b>								
<b>F<sub>CO2</sub></b>	<b>0.88 (0.0496)</b>	<b>0.93 (0.0232)</b>	<b>0.99 (0.0020)</b>							
<b>WFPS</b>	-0.45 (0.3755)	-0.69 (0.1258)	-0.58 (0.2286)	<b>-0.84 (0.0347)</b>						
<b>Temp</b>	0.72 (0.1083)	0.60 (0.2087)	0.79 (0.0640)	0.69 (0.1313)	-0.17 (0.7127)					
<b>Gup</b>										
	DOC		DIC		Fe <sup>2+</sup>		F <sub>CO2</sub>		WFPS	Temp
<b>DOC</b>										
<b>DIC</b>	0.52 (0.1525)									
<b>Fe<sup>2+</sup></b>	-0.03 (0.9485)	0.22 (0.6332)								
<b>F<sub>CO2</sub></b>	0.47 (0.2408)	0.40 (0.3284)	0.36 (0.3822)							
<b>WFPS</b>	-0.49 (0.2181)	0.09 (0.8391)	0.03 (0.9419)	<b>-0.69 (0.0012)</b>						
<b>Temp</b>	0.64 (0.0854)	0.11 (0.7867)	0.36 (0.3838)	<b>0.84 (0.0001)</b>	<b>-0.70 (0.0010)</b>					

Table S3. continued.

<b>Gdown</b>						
	<b>DOC</b>	<b>DIC</b>	<b>Fe<sup>2+</sup></b>	<b>F<sub>CO2</sub></b>	<b>WFPS</b>	<b>Temp</b>
<b>DOC</b>		0.01	0.01	0.38	-0.03	0.53
<b>DIC</b>	0.01 (0.9674)		0.07	-0.47	0.66	-0.55
<b>Fe<sup>2+</sup></b>	0.01 (0.9779)	0.07 (0.8532)		-0.29	0.26	-0.21
<b>F<sub>CO2</sub></b>	0.38 (0.2277)	-0.47 (0.1220)	-0.29 (0.4143)		-0.76	0.83
<b>WFPS</b>	-0.03 (0.9175)	<b>0.66 (0.0195)</b>	0.26 (0.4763)	<b>-0.76 (0.0002)</b>		-0.75
<b>Temp</b>	0.53 (0.0789)	-0.55 (0.0640)	-0.21 (0.5627)	<b>0.83 (0.0001)</b>	<b>-0.75 (0.0003)</b>	
<b>All sampling points</b>						
	<b>DOC</b>	<b>DIC</b>	<b>Fe<sup>2+</sup></b>	<b>F<sub>CO2</sub></b>	<b>WFPS</b>	<b>Temp</b>
<b>DOC</b>		0.18	0.35	0.54	0.16	0.32
<b>DIC</b>	0.18 (0.2127)		0.68	-0.05	0.04	0.18
<b>Fe<sup>2+</sup></b>	<b>0.35 (0.0307)</b>	<b>0.68 (0.0001)</b>		-0.06	0.34	0.30
<b>F<sub>CO2</sub></b>	<b>0.54 (0.0001)</b>	-0.05 (0.7649)	-0.06 (0.7234)		-0.56	0.55
<b>WFPS</b>	0.16 (0.2843)	0.04 (0.7955)	<b>0.34 (0.0371)</b>	<b>-0.56 (0.0001)</b>		-0.40
<b>Temp</b>	<b>0.32 (0.0346)</b>	0.18 (0.2454)	0.30 (0.0594)	<b>0.55 (0.0001)</b>	<b>-0.40 (0.0005)</b>	



**Figure S1.** Temporal WFPS variations (A) expressed as a percentage of pore space and (B) soil temperature expressed in °C at Kdown (black square), Kup (gray square), Gdown (black circle) and Gup (gray circle) during the 2014-2015 hydrological year. The uncertainties are the standard deviations of the three sampling replicates.

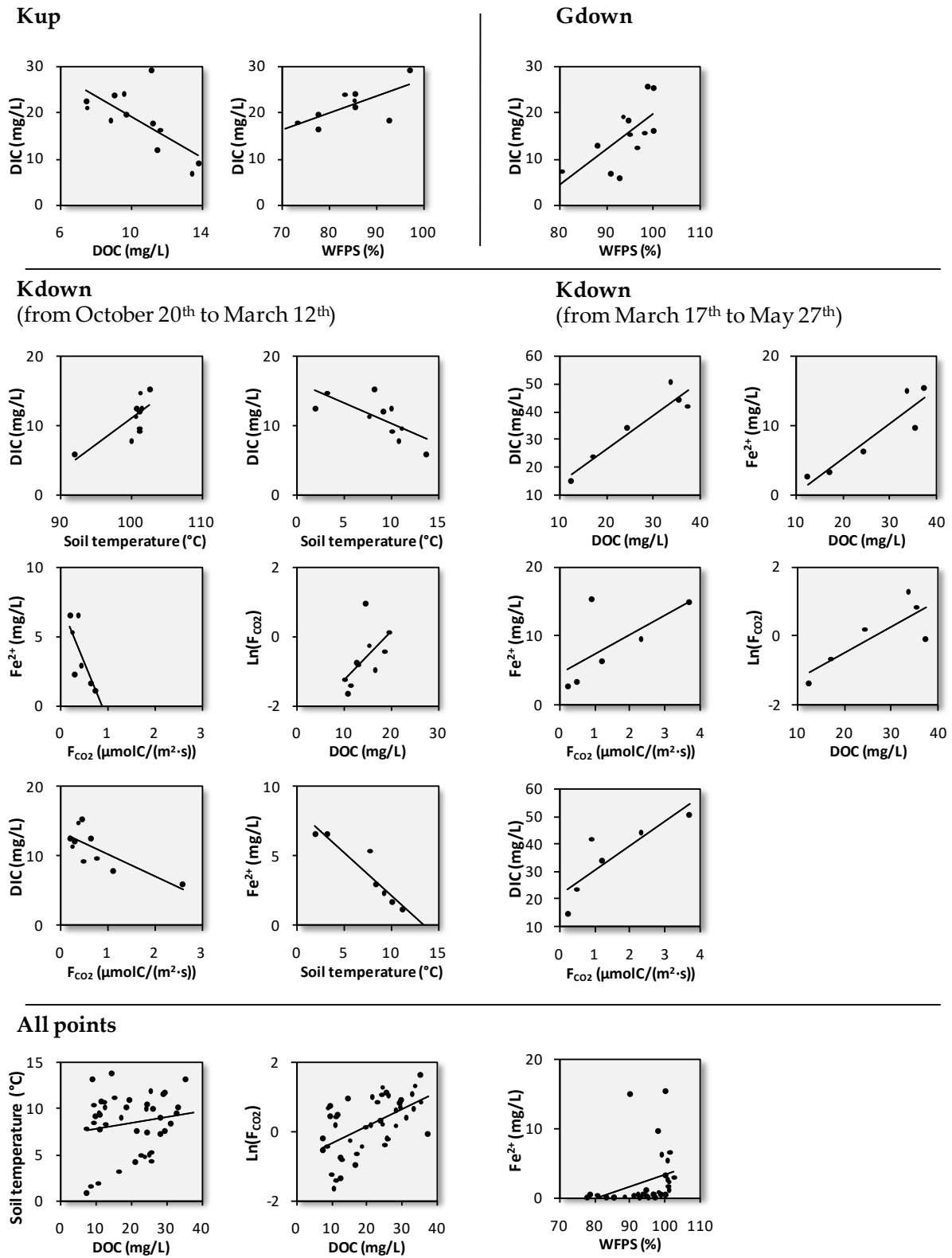


Figure S2. Graphic representation of the significant correlations between DIC, DOC, F<sub>CO2</sub>, Fe<sup>2+</sup>, WFPS and soil temperature highlighted in Table S3.