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Fractal behavior of soil water storage at multiple depths

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Tables

Table S.1. Standard deviation and coefficient of variation of soil water storage at different depths (20 cm increment) over the whole measurement period.

	0-20 cm		20-40 cm		40-60 cm		60-80 cm		80-100 cm		100-120 cm		120-140 cm	
	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)
Jul 17 2007	2.43	43	1.55	28	1.20	21	1.16	20	1.09	19	1.16	19	1.15	19
Aug 7 2007	2.05	42	1.44	29	1.17	22	1.14	21	1.06	19	0.97	17	0.87	15
Sept 1 2007	1.58	30	1.25	25	1.11	21	0.98	18	0.98	18	0.96	17	0.86	15
Oct 12 2007	1.13	23	1.05	21	1.00	19	0.94	18	0.94	17	0.91	16	0.81	14
May 2 2008	1.73	28	1.08	18	0.96	17	0.97	17	0.93	17	1.02	18	0.92	16
May 31 2008	1.62	31	1.00	18	0.90	16	0.81	15	0.84	15	0.87	15	0.83	14
Jun 21 2008	1.16	25	0.96	18	0.88	16	0.84	15	0.85	15	0.86	15	0.80	14
July 16 2008	0.81	20	0.94	20	0.95	19	0.91	17	0.88	16	0.87	16	0.76	14
Aug 23 2008	0.43	13	0.70	17	0.86	19	0.92	19	0.92	18	0.93	17	0.84	16
Sept 17 2008	0.45	13	0.67	16	0.83	18	0.90	18	0.91	18	0.93	18	0.86	16
Oct 22 2008	0.50	10	0.70	16	0.84	18	0.88	18	0.90	18	0.91	18	0.93	18
April 20 2009	1.97	30	1.39	24	1.44	26	1.27	23	1.11	21	1.16	21	1.28	23
May 7 2009	1.44	24	0.97	17	1.06	19	1.01	19	0.96	18	1.04	19	0.99	18
May 27 2009	1.28	24	0.86	16	0.95	18	0.93	17	0.92	17	0.98	18	0.94	17
July 21 2009	0.82	18	0.90	19	0.93	19	1.23	23	0.90	17	0.92	17	0.84	16
Aug 27 2009	0.61	12	0.67	13	0.89	18	0.94	19	0.91	18	0.93	18	0.87	16
Oct 27 2009	0.52	10	0.71	14	0.86	18	0.91	19	0.90	18	0.92	18	0.88	17
April 6 2010	1.57	24	1.14	21	1.16	22	1.22	23	1.05	20	1.14	21	1.12	21
May 19 2010	1.61	27	0.95	16	0.80	13	0.80	13	0.77	13	0.93	16	0.91	16
June 14 2010	1.92	29	1.18	19	0.93	15	0.90	14	0.81	13	0.90	14	0.84	13
Sept 28, 2010	1.81	29	1.14	18	0.88	15	0.93	15	0.90	15	0.94	15	0.97	16
May 13, 2011	2.09	29	1.19	18	1.05	16	0.94	15	0.95	15	1.04	16	1.11	17
Jun 6, 2011	2.13	30	1.33	20	1.09	17	0.96	15	0.93	14	1.07	17	1.11	17
Jun 29, 2011	2.12	30	1.29	19	1.07	16	0.95	14	0.90	14	1.01	16	1.13	17
Sept 29, 2011	1.55	30	1.05	19	0.91	16	0.78	13	0.80	13	0.90	15	0.88	14

*Stdev.- standard deviation; CV- coefficient of variation

Table S.2. Maximum, minimum, and average of soil water storage with increasing depth over the whole measurement period.

	0-20 cm			0-40 cm			0-60 cm			0-80 cm			0-100 cm			0-120 cm			0-140 cm		
	Maximum (cm)	Minimum (cm)	Average (cm)	Maximum (cm)	Minimum (cm)	Average (cm)	Maximum (cm)	Minimum (cm)	Average (cm)	Maximum (cm)	Minimum (cm)	Average (cm)	Maximum (cm)	Minimum (cm)	Average (cm)	Maximum (cm)	Minimum (cm)	Average (cm)	Maximum (cm)	Minimum (cm)	Average (cm)
Jul 17 2007	13.96	3.25	5.65	23.92	6.39	11.28	32.23	9.35	17.01	40.08	12.87	22.91	49.36	16.45	28.79	58.72	20.41	34.84	68.08	23.95	40.98
Aug 7 2007	13.96	3.05	4.90	23.25	5.85	9.94	30.87	8.57	15.16	39.32	11.32	20.63	45.89	14.30	26.21	52.00	17.60	31.82	58.11	20.85	37.49
Sept 1 2007	13.96	2.26	5.29	23.25	6.72	10.38	30.11	9.29	15.60	35.70	12.04	20.98	42.57	15.01	26.50	50.64	18.21	32.14	58.72	21.44	37.86
Oct 12 2007	8.30	3.40	5.04	15.07	6.67	10.06	21.80	9.25	15.25	28.54	12.06	20.61	36.93	15.14	26.09	44.85	18.42	31.69	53.40	21.67	37.37
May 2 2008	13.96	4.49	6.28	23.40	9.23	12.31	31.25	13.14	18.10	39.85	16.60	23.85	49.36	19.51	29.50	58.72	22.85	35.20	68.08	26.97	40.95
May 31 2008	13.96	3.30	5.21	23.25	5.40	10.72	30.11	10.20	16.26	35.70	14.17	21.85	42.57	17.38	27.48	50.64	20.60	33.19	58.72	23.85	38.98
Jun 21 2008	8.77	3.06	4.70	15.98	6.73	9.95	22.57	9.70	15.33	29.00	12.47	20.84	35.83	15.58	26.45	43.56	18.86	32.15	52.04	22.09	37.92
July 16 2008	7.07	2.78	4.03	13.60	6.07	8.80	20.30	8.86	13.90	26.99	11.42	19.21	33.27	14.33	24.64	39.87	17.49	30.20	46.20	20.65	35.83
Aug 23 2008	4.96	2.44	3.40	9.97	5.36	7.52	15.82	7.73	12.10	21.88	10.09	17.00	27.78	12.94	22.12	34.31	15.98	27.42	40.78	18.97	32.84
Sept 17 2008	4.64	2.66	3.51	10.22	5.49	7.57	16.00	7.98	12.12	22.08	10.44	16.97	28.34	13.23	22.02	34.98	16.28	27.27	41.65	19.31	32.64
Oct 22 2008	6.11	3.83	4.96	11.69	7.25	9.33	17.59	10.05	13.86	23.59	12.52	18.66	29.48	15.23	23.65	36.06	18.23	28.83	42.76	21.20	34.11
April 20 2009	13.96	4.73	6.67	23.92	8.56	12.51	32.23	12.05	18.13	40.08	15.31	23.61	49.36	18.44	28.99	58.72	21.63	34.48	68.53	25.11	40.14
May 7 2009	13.96	4.45	5.97	23.25	8.71	11.67	30.11	11.97	17.16	35.70	15.18	22.51	43.55	18.36	27.87	53.36	21.37	33.30	62.26	25.47	38.80
May 27 2009	12.60	3.67	5.43	20.75	7.67	10.95	28.83	11.10	16.35	35.55	14.34	21.71	42.57	17.55	27.10	50.64	20.54	32.61	59.09	24.58	38.13
July 21 2009	6.92	3.16	4.56	13.79	6.35	9.39	19.92	9.58	14.39	26.30	12.53	19.62	32.80	15.89	24.87	39.36	19.06	30.21	46.25	23.37	35.63
Aug 27 2009	6.64	3.42	5.01	13.09	7.32	10.08	19.02	10.39	15.00	25.35	13.27	20.02	31.82	16.76	25.18	38.38	20.16	30.44	45.16	23.91	35.77
Oct 27 2009	6.65	3.89	5.30	12.98	7.82	10.19	18.73	10.81	14.99	24.92	13.49	19.90	31.26	16.70	24.96	37.57	20.11	30.12	44.25	23.44	35.41
April 6 2010	13.96	4.67	6.47	23.25	8.55	11.99	31.02	11.98	17.30	39.85	15.42	22.65	49.36	18.75	27.89	58.72	21.89	33.22	68.08	25.89	38.64
May 19 2010	13.96	4.08	6.04	23.25	8.84	11.98	30.19	13.30	17.91	38.79	18.53	23.84	47.40	22.15	29.74	55.62	26.35	35.65	63.85	31.23	41.51
June 14 2010	13.96	4.38	6.54	23.92	9.19	12.86	32.23	13.83	19.17	40.08	19.08	25.46	49.36	22.94	31.68	58.72	27.55	37.93	68.08	32.76	44.12
Sept 28, 2010	13.96	4.51	6.33	23.92	9.37	12.49	32.23	13.57	18.57	40.08	17.48	24.70	49.36	22.16	30.82	58.72	27.52	36.97	68.50	31.70	43.17
May 13, 2011	13.96	4.82	7.12	23.92	10.04	13.73	32.23	15.07	20.22	40.08	20.18	26.62	49.36	25.12	32.96	58.72	29.75	39.28	68.50	35.06	45.72
Jun 6, 2011	13.96	4.31	7.05	23.92	9.53	13.64	32.23	14.75	20.16	40.08	19.80	26.60	49.36	24.64	33.00	58.72	29.21	39.39	68.50	34.13	45.90
Jun 29, 2011	13.96	4.93	7.16	23.92	10.20	13.89	32.23	15.32	20.54	40.68	20.08	27.11	49.36	25.02	33.59	58.72	30.02	40.05	68.50	35.26	46.61
Sept 29, 2011	12.60	3.11	5.25	20.75	6.75	10.75	28.83	9.64	16.43	35.55	13.83	22.25	42.57	18.89	28.14	50.64	23.74	34.16	59.08	28.48	40.21

Table S.3. Standard deviation and coefficient of variation of soil water storage with increasing depth over the whole measurement period.

	0-20 cm		0-40 cm		0-60 cm		0-80 cm		0-100 cm		0-120 cm		0-140 cm	
	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)	Stdev. (cm)	CV (%)
Jul 17 2007	2.43	43	3.89	34	4.99	29	6.02	26	6.96	24	7.94	23	8.86	22
Aug 7 2007	2.05	42	3.38	34	4.42	29	5.42	26	6.31	24	6.94	22	7.50	20
Sept 1 2007	1.58	30	2.73	26	3.73	24	4.54	22	5.38	20	6.18	19	6.89	18
Oct 12 2007	1.13	23	2.11	21	3.05	20	3.91	19	4.73	18	5.51	17	6.18	17
May 2 2008	1.73	28	2.72	22	3.54	20	4.36	18	5.14	17	6.00	17	6.76	17
May 31 2008	1.62	31	2.51	23	3.26	20	3.90	18	4.59	17	5.29	16	5.97	15
Jun 21 2008	1.16	25	2.04	21	2.81	18	3.56	17	4.29	16	5.02	16	5.69	15
July 16 2008	0.81	20	1.68	19	2.55	18	3.37	18	4.12	17	4.83	16	5.45	15
Aug 23 2008	0.43	13	1.07	14	1.85	15	2.65	16	3.42	15	4.17	15	4.82	15
Sept 17 2008	0.45	13	1.07	14	1.81	15	2.60	15	3.36	15	4.11	15	4.79	15
Oct 22 2008	0.50	10	1.10	12	1.85	13	2.61	14	3.35	14	4.08	14	4.74	14
April 20 2009	1.97	30	3.23	26	4.44	25	5.57	24	6.50	22	7.49	22	8.65	22
May 7 2009	1.44	24	2.34	20	3.21	19	4.04	18	4.84	17	5.71	17	6.53	17
May 27 2009	1.28	24	2.06	19	2.92	18	3.72	17	4.52	17	5.37	16	6.12	16
July 21 2009	0.82	18	1.67	18	2.51	17	3.38	17	4.16	17	4.92	16	5.56	16
Aug 27 2009	0.61	12	1.21	12	2.02	13	2.86	14	3.65	14	4.42	15	5.10	14
Oct 27 2009	0.52	10	1.14	11	1.90	13	2.72	14	3.49	14	4.24	14	4.92	14
April 6 2010	1.57	24	2.60	22	3.53	20	4.51	20	5.40	19	6.37	19	7.31	19
May 19 2010	1.61	27	2.46	21	3.13	17	3.74	16	4.39	15	5.16	14	5.91	14
June 14 2010	1.92	29	3.00	23	3.79	20	4.53	18	5.18	16	5.93	16	6.62	15
Sept 28, 2010	1.81	29	2.88	23	3.62	20	4.38	18	5.12	17	5.92	16	6.80	16
May 13, 2011	2.09	29	3.15	23	4.05	20	4.84	18	5.65	17	6.44	16	7.50	16
Jun 6, 2011	2.13	30	3.32	24	4.28	21	5.05	19	5.82	18	6.63	17	7.67	17
Jun 29, 2011	2.12	30	3.28	24	4.20	20	4.99	18	5.72	17	6.45	16	7.52	16
Sept 29, 2011	1.55	30	2.53	24	3.37	20	4.03	18	4.68	17	5.42	16	6.15	15

*Stdev.- standard deviation; CV- coefficient of variation

Table S.4. Slope for single fit and segmented fit of the $\tau(q)$ curve of soil water storage at different depths (20 cm increment) over the whole measurement period.

	0-20 cm			20-40 cm			40-60 cm			60-80 cm			80-100 cm			100-120 cm			120-140 cm		
	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$
Jul 17 2007	0.97	1.09	0.83	1.00	1.08	0.91	1.02	1.09	0.95	1.01	1.06	0.95	1.01	1.07	0.96	1.00	1.05	0.95	1.00	1.04	0.95
Aug 7 2007	0.96	1.08	0.80	1.00	1.08	0.91	1.02	1.10	0.95	1.01	1.08	0.94	1.02	1.08	0.97	1.01	1.06	0.97	1.01	1.04	0.98
Sept 1 2007	0.96	1.06	0.83	1.00	1.07	0.93	1.02	1.09	0.96	1.02	1.08	0.97	1.02	1.08	0.97	1.02	1.06	0.97	1.01	1.04	0.98
Oct 12 2007	1.00	1.05	0.93	1.01	1.07	0.96	1.02	1.09	0.97	1.02	1.07	0.97	1.02	1.07	0.97	1.01	1.06	0.98	1.01	1.04	0.98
May 2 2008	0.97	1.04	0.87	0.99	1.03	0.94	1.00	1.05	0.96	1.01	1.07	0.96	1.01	1.06	0.96	1.00	1.05	0.94	0.99	1.03	0.94
May 31 2008	0.96	1.06	0.82	1.02	1.09	0.95	1.02	1.09	0.97	1.01	1.05	0.98	1.01	1.06	0.98	1.01	1.05	0.98	1.01	1.04	0.98
Jun 21 2008	0.99	1.06	0.92	1.01	1.05	0.96	1.01	1.06	0.98	1.01	1.06	0.98	1.02	1.06	0.98	1.01	1.05	0.98	1.01	1.04	0.98
July 16 2008	0.99	1.04	0.93	1.01	1.05	0.96	1.02	1.07	0.97	1.02	1.08	0.97	1.02	1.07	0.98	1.01	1.05	0.98	1.01	1.04	0.98
Aug 23 2008	1.00	1.02	0.98	1.00	1.04	0.97	1.02	1.07	0.97	1.02	1.09	0.97	1.02	1.07	0.97	1.01	1.06	0.97	1.01	1.04	0.98
Sept 17 2008	1.00	1.02	0.98	1.00	1.04	0.97	1.01	1.07	0.97	1.02	1.09	0.97	1.02	1.07	0.97	1.01	1.06	0.97	1.01	1.04	0.98
Oct 22 2008	1.00	1.01	0.99	1.00	1.03	0.97	1.01	1.07	0.97	1.02	1.08	0.97	1.02	1.07	0.91	1.01	1.06	0.97	1.01	1.05	0.98
April 20 2009	0.97	1.04	0.88	1.00	1.06	0.92	1.00	1.07	0.93	1.01	1.08	0.94	1.01	1.07	0.94	1.00	1.05	0.93	0.99	1.05	0.93
May 7 2009	0.96	1.03	0.86	1.00	1.04	0.95	1.01	1.06	0.97	1.01	1.07	0.96	1.01	1.07	0.97	1.00	1.05	0.94	1.00	1.04	0.95
May 27 2009	0.97	1.05	0.87	1.00	1.04	0.96	1.01	1.05	0.97	1.02	1.06	0.97	1.02	1.07	0.97	1.01	1.06	0.96	1.00	1.04	0.96
July 21 2009	1.00	1.04	0.96	1.01	1.05	0.97	1.02	1.07	0.97	1.01	1.08	0.93	1.02	1.06	0.97	1.01	1.06	0.97	1.01	1.04	0.98
Aug 27 2009	1.00	1.02	0.98	1.00	1.03	0.98	1.01	1.06	0.97	1.02	1.08	0.97	1.02	1.07	0.97	1.01	1.06	0.97	1.01	1.04	0.98
Oct 27 2009	1.00	1.01	0.99	1.00	1.03	0.98	1.02	1.07	0.97	1.02	1.08	0.97	1.02	1.06	0.97	1.01	1.06	0.97	1.01	1.04	0.98
April 6 2010	0.97	1.03	0.88	0.99	1.04	0.93	1.00	1.06	0.95	1.01	1.08	0.94	1.00	1.06	0.94	0.99	1.06	0.92	0.99	1.05	0.92
May 19 2010	0.97	1.03	0.86	0.99	1.02	0.95	1.00	1.02	0.97	1.00	1.03	0.98	1.00	1.02	0.98	1.00	1.03	0.96	1.00	1.03	0.96
June 14 2010	0.97	1.04	0.88	0.99	1.03	0.93	1.00	1.03	0.97	1.00	1.03	0.97	1.00	1.03	0.97	1.00	1.03	0.96	0.99	1.02	0.96
Sept 28, 2010	0.97	1.04	0.87	0.99	1.03	0.93	1.00	1.04	0.97	1.00	1.04	0.97	1.00	1.03	0.97	1.00	1.03	0.96	1.00	1.03	0.96
May 13, 2011	0.98	1.05	0.89	0.99	1.03	0.94	1.00	1.03	0.96	1.00	1.03	0.97	1.00	1.03	0.97	1.00	1.03	0.95	1.00	1.03	0.95
Jun 6, 2011	0.98	1.05	0.89	0.99	1.04	0.94	1.00	1.04	0.96	1.00	1.03	0.97	1.00	1.03	0.97	1.00	1.03	0.96	1.00	1.03	0.96
Jun 29, 2011	0.98	1.05	0.89	0.99	1.03	0.94	1.00	1.03	0.96	1.00	1.03	0.97	1.00	1.03	0.97	1.00	1.03	0.96	1.00	1.03	0.95
Sept 29, 2011	0.98	1.08	0.86	1.01	1.05	0.96	1.01	1.06	0.97	1.00	1.03	0.98	1.00	1.03	0.98	1.00	1.03	0.97	1.00	1.02	0.96

Table S.5. Slope for single fit and segmented fit of the $\tau(q)$ curve of soil water storage with increasing depth over the whole measurement period.

	0-20 cm			0-40 cm			0-60 cm			0-80 cm			0-100 cm			0-120 cm			0-140 cm		
	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$	$-15 \le q \le 15$	$-15 \le q \le 0$	$0 \le q \le 15$
Jul 17 2007	0.97	1.09	0.83	0.99	1.08	0.88	1.00	1.08	0.90	1.00	1.08	0.92	1.00	1.07	0.93	1.00	1.07	0.93	1.00	1.06	0.94
Aug 7 2007	0.96	1.08	0.80	0.98	1.08	0.86	0.99	1.08	0.89	1.00	1.08	0.91	1.00	1.07	0.93	1.01	1.07	0.94	1.01	1.06	0.95
Sept 1 2007	0.96	1.06	0.83	0.98	1.06	0.87	0.99	1.07	0.91	1.00	1.07	0.93	1.01	1.07	0.95	1.01	1.06	0.95	1.01	1.06	0.96
Oct 12 2007	1.00	1.05	0.93	1.00	1.06	0.95	1.01	1.06	0.96	1.01	1.06	0.96	1.01	1.06	0.97	1.01	1.06	0.97	1.01	1.06	0.97
May 2 2008	0.97	1.04	0.87	0.98	1.03	0.91	0.99	1.03	0.93	0.99	1.04	0.94	1.00	1.04	0.94	1.00	1.04	0.94	1.00	1.04	0.95
May 31 2008	0.96	1.06	0.82	0.98	1.06	0.88	0.99	1.05	0.92	1.00	1.04	0.94	1.00	1.04	0.96	1.00	1.04	0.96	1.00	1.04	0.97
Jun 21 2008	0.99	1.06	0.92	1.00	1.05	0.95	1.00	1.05	0.96	1.01	1.05	0.97	1.01	1.05	0.97	1.01	1.05	0.97	1.01	1.05	0.97
July 16 2008	0.90	1.06	0.92	1.00	1.05	0.95	1.00	1.05	0.96	1.01	1.05	0.97	1.01	1.05	0.97	1.01	1.05	0.97	1.01	1.05	0.97
Aug 23 2008	1.00	1.02	0.98	1.00	1.03	0.98	1.01	1.04	0.97	1.01	1.05	0.98	1.01	1.05	0.98	1.01	1.05	0.98	1.01	1.05	0.98
Sept 17 2008	1.00	1.02	0.98	1.00	1.03	0.98	1.01	1.04	0.97	1.01	1.05	0.98	1.01	1.05	0.98	1.01	1.05	0.98	1.01	1.05	0.98
Oct 22 2008	1.00	1.01	0.99	1.00	1.02	0.98	1.00	1.03	0.98	1.01	1.04	0.98	1.01	1.04	0.98	1.01	1.04	0.98	1.01	1.04	0.98
April 20 2009	0.97	1.04	0.88	0.98	1.04	0.91	0.99	1.05	0.92	0.99	1.05	0.93	1.00	1.05	0.93	1.00	1.05	0.93	1.00	1.05	0.93
May 7 2009	0.96	1.03	0.86	0.98	1.03	0.91	0.99	1.04	0.93	1.00	1.04	0.95	1.00	1.04	0.95	1.00	1.04	0.95	1.00	1.04	0.95
May 27 2009	0.97	1.05	0.87	0.99	1.04	0.92	0.99	1.04	0.94	1.00	1.04	0.95	1.00	1.05	0.96	1.00	1.04	0.96	1.03	1.04	0.96
July 21 2009	1.00	1.04	0.96	1.00	1.04	0.96	1.01	1.05	0.97	1.01	1.05	0.97	1.01	1.05	0.97	1.01	1.05	0.97	1.01	1.05	0.98
Aug 27 2009	1.00	1.02	0.98	1.00	1.02	0.98	1.01	1.03	0.98	1.01	1.04	0.98	1.09	1.04	0.98	1.01	1.04	0.98	1.01	1.04	0.98
Oct 27 2009	1.00	1.01	0.99	1.00	1.02	0.98	1.00	1.03	0.98	1.01	1.04	0.98	1.01	1.04	0.98	1.01	1.04	0.98	1.01	1.04	0.98
April 6 2010	0.97	1.03	0.88	0.98	1.03	0.91	0.99	1.04	0.92	0.99	1.04	0.93	0.99	1.04	0.93	0.99	1.04	0.93	0.99	1.04	0.93
May 19 2010	0.97	1.03	0.86	0.98	1.03	0.91	0.99	1.03	0.94	0.99	1.02	0.96	1.00	1.02	0.96	1.00	1.02	0.96	1.00	1.02	0.97
June 14 2010	0.97	1.04	0.88	0.98	1.03	0.91	0.99	1.03	0.93	0.99	1.03	0.95	1.00	1.03	0.96	1.00	1.03	0.96	1.00	1.03	0.96
Sept 28, 2010	0.97	1.04	0.87	0.98	1.03	0.91	0.99	1.03	0.93	0.99	1.03	0.94	1.00	1.03	0.95	1.00	1.03	0.95	1.00	1.03	0.95
May 13, 2011	0.98	1.05	0.89	0.99	1.04	0.92	0.99	1.03	0.94	0.99	1.03	0.95	1.00	1.03	0.95	1.00	1.03	0.96	1.00	1.03	0.96
Jun 6, 2011	0.98	1.05	0.89	0.99	1.04	0.92	0.99	1.04	0.94	1.00	1.03	0.95	1.00	1.03	0.96	1.00	1.03	0.96	1.00	1.03	0.96
Jun 29, 2011	0.98	1.05	0.89	0.99	1.04	0.92	0.99	1.04	0.94	1.00	1.03	0.95	1.00	1.03	0.96	1.00	1.03	0.96	1.00	1.03	0.96
Sept 29, 2011	0.98	1.08	0.86	1.00	1.06	0.92	1.00	1.06	0.94	1.00	1.05	0.95	1.00	1.04	0.96	1.00	1.04	0.97	1.00	1.03	0.97

Table S.6. Sum of squared residuals between $\tau(q)$ curves and the UM model for soil water storage at different depths (20 cm increment) over the whole measurement period.

	0-20 cm	20-40 cm	40-60 cm	60-80 cm	80-100 cm	100-120 cm	120-140 cm
Jul 17 2007	57.86	22.25	15.28	9.43	9.60	7.87	6.02
Aug 7 2007	68.45	23.18	18.00	15.45	10.56	6.08	3.35
Sept 1 2007	47.34	16.80	16.28	10.19	9.63	6.95	3.51
Oct 12 2007	9.96	9.58	14.28	8.89	8.53	6.00	2.79
May 2 2008	27.74	6.17	4.98	8.80	8.50	8.86	6.16
May 31 2008	50.49	15.82	12.37	4.35	5.85	4.49	2.75
Jun 21 2008	14.12	5.64	6.51	5.77	6.37	4.57	2.47
July 16 2008	8.25	6.37	9.16	10.53	7.28	5.05	2.47
Aug 23 2008	1.30	3.85	9.04	12.72	8.35	5.98	3.31
Sept 17 2008	1.46	3.31	7.96	11.97	8.03	6.06	3.44
Oct 22 2008	0.52	2.67	7.86	10.35	8.08	5.79	4.57
April 20 2009	22.76	14.06	16.16	14.56	12.00	11.79	10.49
May 7 2009	27.79	5.71	7.49	8.73	7.92	8.95	5.28
May 27 2009	24.57	3.88	6.02	7.36	7.77	6.81	4.57
July 21 2009	5.19	5.66	8.39	15.55	7.23	5.55	2.85
Aug 27 2009	1.38	1.55	7.38	10.56	7.85	5.95	3.34
Oct 27 2009	0.42	2.09	7.88	10.50	7.49	5.81	3.55
April 6 2010	20.79	9.61	8.93	14.20	11.24	13.56	10.81
May 19 2010	27.18	3.99	1.87	1.74	1.59	3.59	3.62
June 14 2010	24.63	7.29	2.50	2.38	1.96	3.15	2.81
Sept 28, 2010	26.66	7.97	3.21	4.04	3.24	4.01	3.93
May 13, 2011	21.78	6.30	3.57	2.44	2.78	4.44	4.39
Jun 6, 2011	22.00	7.46	4.85	2.24	2.62	4.40	4.00
Jun 29, 2011	21.92	6.46	4.23	2.90	2.12	3.24	4.26
Sept 29, 2011	35.51	7.16	6.82	1.99	1.83	2.46	2.75

Table S.7. Sum of squared residuals between $\tau(q)$ curves and the UM model for soil water storage with increasing depth over the whole measurement period.

	0-20 cm	0-40 cm	0-60 cm	0-80 cm	0-100 cm	0-120 cm	0-140 cm
Jul 17 2007	57.87	36.45	24.80	18.86	15.35	13.15	11.43
Aug 7 2007	68.45	38.49	27.09	21.13	16.70	12.25	9.39
Sept 1 2007	47.34	27.41	19.10	13.47	11.02	9.40	7.89
Oct 12 2007	9.96	8.59	8.64	8.21	7.64	7.00	6.04
May 2 2008	27.74	14.11	9.31	7.71	6.86	6.71	6.30
May 31 2008	50.49	23.35	12.78	7.38	5.65	4.81	4.13
Jun 21 2008	14.12	8.08	6.31	5.48	4.90	4.54	4.03
July 16 2008	14.12	8.08	6.31	5.48	4.90	4.54	4.03
Aug 23 2008	1.30	2.20	3.34	4.55	4.89	4.72	4.19
Sept 17 2008	1.46	2.05	3.04	4.11	4.48	4.40	3.95
Oct 22 2008	0.52	0.95	1.74	2.50	3.00	3.13	2.89
April 20 2009	22.76	15.83	13.15	11.87	10.65	10.15	9.92
May 7 2009	27.79	13.43	8.86	6.68	5.96	5.74	5.47
May 27 2009	24.58	10.51	7.71	6.09	5.47	5.23	4.86
July 21 2009	5.19	4.80	5.20	5.79	5.59	5.15	4.42
Aug 27 2009	1.38	1.20	2.16	3.12	3.52	3.36	3.29
Oct 27 2009	0.42	0.78	1.60	2.47	2.96	3.11	2.95
April 6 2010	20.79	13.58	10.36	9.03	8.67	8.87	8.77
May 19 2010	27.18	11.50	5.95	3.46	2.66	2.51	2.40
June 14 2010	24.63	12.98	7.58	5.33	4.05	3.61	3.27
Sept 28, 2010	26.66	14.32	8.61	6.29	5.01	4.54	4.37
May 13, 2011	21.78	11.08	6.95	5.10	4.23	3.79	3.80
Jun 6, 2011	22.00	11.44	7.59	5.49	-4.46	4.00	3.95
Jun 29, 2011	21.92	11.41	7.52	5.55	4.41	3.77	3.77
Sept 29, 2011	35.51	16.12	10.83	6.71	4.60	3.71	3.22

Table S.8. The width of the multifractal spectrum (α_{max}-α_{min} value) for soil water storage at different depths (20 cm increment) over the whole measurement period.

	0-20 cm	20-40 cm	40-60 cm	60-80 cm	80-100 cm	100-120 cm	120-140 cm
Jul 17 2007	0.23	0.15	0.14	0.19	0.20	0.20	0.18
Aug 7 2007	0.32	0.23	0.23	0.24	0.17	0.14	0.12
Sept 1 2007	0.31	0.22	0.20	0.16	0.16	0.14	0.12
Oct 12 2007	0.16	0.15	0.19	0.15	0.16	0.14	0.11
May 2 2008	0.23	0.15	0.14	0.19	0.20	0.20	0.18
May 31 2008	0.31	0.25	0.19	0.11	0.14	0.12	0.11
Jun 21 2008	0.19	0.13	0.14	0.13	0.14	0.12	0.10
July 16 2008	0.16	0.12	0.16	0.16	0.14	0.13	0.10
Aug 23 2008	0.07	0.11	0.16	0.18	0.15	0.13	0.11
Sept 17 2008	0.08	0.10	0.15	0.18	0.14	0.13	0.11
Oct 22 2008	0.05	0.09	0.15	0.17	0.14	0.13	0.12
April 20 2009	0.20	0.21	0.21	0.20	0.21	0.21	0.18
May 7 2009	0.23	0.15	0.14	0.17	0.16	0.20	0.15
May 27 2009	0.25	0.13	0.14	0.13	0.15	0.17	0.14
July 21 2009	0.13	0.12	0.15	0.24	0.13	0.13	0.10
Aug 27 2009	0.08	0.07	0.14	0.16	0.14	0.13	0.11
Oct 27 2009	0.05	0.08	0.15	0.16	0.13	0.13	0.11
April 6 2010	0.21	0.17	0.16	0.20	0.21	0.22	0.20
May 19 2010	0.24	0.12	0.10	0.09	0.08	0.13	0.14
June 14 2010	0.21	0.15	0.10	0.10	0.10	0.13	0.13
Sept 28, 2010	0.22	0.16	0.12	0.13	0.12	0.14	0.13
May 13, 2011	0.20	0.14	0.12	0.09	0.11	0.14	0.12
Jun 6, 2011	0.21	0.15	0.14	0.10	0.11	0.14	0.11
Jun 29, 2011	0.21	0.14	0.13	0.12	0.10	0.13	0.12
Sept 29, 2011	0.29	0.14	0.16	0.08	0.09	0.10	0.11

Table S.9. The width of the multifractal spectrum (α_{max}-α_{min} value) for soil water storage with increasing depth over the whole measurement period.

	0-20 cm	0-40 cm	0-60 cm	0-80 cm	0-100 cm	0-120 cm	0-140 cm
Jul 17 2007	0.31	0.26	0.24	0.22	0.20	0.19	0.19
Aug 7 2007	0.32	0.27	0.26	0.24	0.22	0.19	0.17
Sept 1 2007	0.31	0.26	0.24	0.22	0.20	0.18	0.16
Oct 12 2007	0.16	0.15	0.16	0.15	0.15	0.14	0.14
May 2 2008	0.23	0.18	0.16	0.16	0.17	0.17	0.17
May 31 2008	0.31	0.26	0.21	0.17	0.15	0.14	0.13
Jun 21 2008	0.19	0.15	0.14	0.13	0.12	0.12	0.12
July 16 2008	0.19	0.15	0.14	0.13	0.12	0.12	0.12
Aug 23 2008	0.07	0.09	0.10	0.12	0.12	0.12	0.12
Sept 17 2008	0.08	0.08	0.10	0.12	0.12	0.12	0.11
Oct 22 2008	0.05	0.06	0.08	0.09	0.10	0.10	0.10
April 20 2009	0.20	0.19	0.18	0.18	0.17	0.17	0.17
May 7 2009	0.23	0.19	0.17	0.16	0.15	0.15	0.15
May 27 2009	0.25	0.19	0.17	0.16	0.15	0.14	0.14
July 21 2009	0.13	0.12	0.12	0.13	0.12	0.12	0.11
Aug 27 2009	0.08	0.07	0.09	0.10	0.11	0.10	0.10
Oct 27 2009	0.05	0.06	0.08	0.09	0.10	0.10	0.10
April 6 2010	0.21	0.18	0.17	0.17	0.17	0.18	0.18
May 19 2010	0.24	0.18	0.14	0.12	0.10	0.10	0.10
June 14 2010	0.21	0.17	0.14	0.13	0.12	0.12	0.12
Sept 28, 2010	0.22	0.17	0.15	0.14	0.13	0.13	0.13
May 13, 2011	0.20	0.16	0.13	0.12	0.11	0.11	0.11
Jun 6, 2011	0.21	0.16	0.14	0.12	0.11	0.11	0.11
Jun 29, 2011	0.21	0.16	0.14	0.13	0.12	0.11	0.11
Sept 29, 2011	0.29	0.22	0.20	0.16	0.13	0.11	0.11

Table S.10. The information dimension (D_1) and the correlation dimension (D_2) for soil water storage at different depths (20 cm increment) over the whole measurement period.

	0-20 cm		20-40 cm		40-60 cm		60-80 cm		80-100 cm		100-120 cm		120-140 cm	
	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
Jul 17 2007	0.982	0.961	0.992	0.983	0.995	0.990	0.996	0.992	0.996	0.993	0.996	0.993	0.996	0.993
Aug 7 2007	0.983	0.963	0.991	0.982	0.994	0.989	0.995	0.991	0.996	0.993	0.997	0.994	0.998	0.996
Sept 1 2007	0.992	0.981	0.993	0.987	0.995	0.990	0.996	0.993	0.997	0.993	0.997	0.994	0.998	0.996
Oct 12 2007	0.995	0.989	0.995	0.990	0.996	0.992	0.997	0.993	0.997	0.994	0.997	0.995	0.998	0.996
May 2 2008	0.993	0.983	0.997	0.993	0.997	0.994	0.997	0.994	0.997	0.994	0.997	0.994	0.998	0.995
May 31 2008	0.991	0.979	0.996	0.993	0.997	0.995	0.998	0.996	0.998	0.995	0.998	0.996	0.998	0.996
Jun 21 2008	0.994	0.987	0.996	0.993	0.997	0.994	0.997	0.995	0.997	0.995	0.998	0.996	0.998	0.996
July 16 2008	0.996	0.991	0.996	0.992	0.996	0.993	0.997	0.994	0.997	0.995	0.997	0.995	0.998	0.997
Aug 23 2008	0.998	0.997	0.997	0.994	0.996	0.993	0.996	0.993	0.996	0.993	0.997	0.994	0.998	0.996
Sept 17 2008	0.998	0.997	0.997	0.995	0.996	0.993	0.996	0.993	0.996	0.993	0.997	0.994	0.998	0.995
Oct 22 2008	0.999	0.998	0.997	0.995	0.996	0.993	0.996	0.993	0.996	0.993	0.997	0.994	0.997	0.995
April 20 2009	0.992	0.982	0.995	0.989	0.993	0.987	0.994	0.989	0.996	0.991	0.996	0.991	0.995	0.990
May 7 2009	0.995	0.987	0.997	0.994	0.996	0.992	0.996	0.993	0.997	0.994	0.997	0.993	0.997	0.994
May 27 2009	0.995	0.988	0.997	0.995	0.997	0.993	0.997	0.994	0.997	0.994	0.997	0.994	0.997	0.995
July 21 2009	0.997	0.993	0.996	0.993	0.996	0.993	0.996	0.991	0.997	0.994	0.997	0.994	0.998	0.996
Aug 27 2009	0.999	0.997	0.998	0.997	0.996	0.993	0.996	0.993	0.997	0.993	0.997	0.994	0.998	0.995
Oct 27 2009	0.999	0.998	0.998	0.996	0.996	0.993	0.996	0.993	0.997	0.993	0.997	0.994	0.998	0.995
April 6 2010	0.995	0.988	0.996	0.993	0.995	0.991	0.995	0.989	0.996	0.993	0.996	0.991	0.996	0.992
May 19 2010	0.994	0.986	0.998	0.995	0.998	0.997	0.998	0.997	0.998	0.997	0.998	0.996	0.998	0.996
June 14 2010	0.992	0.982	0.997	0.993	0.998	0.996	0.998	0.996	0.998	0.997	0.998	0.996	0.998	0.997
Sept 28, 2010	0.992	0.982	0.996	0.992	0.998	0.996	0.997	0.995	0.998	0.996	0.998	0.995	0.998	0.995
May 13, 2011	0.991	0.981	0.997	0.993	0.997	0.995	0.998	0.995	0.998	0.995	0.997	0.995	0.997	0.994
Jun 6, 2011	0.991	0.981	0.996	0.991	0.997	0.994	0.998	0.996	0.998	0.996	0.997	0.995	0.997	0.994
Jun 29, 2011	0.991	0.981	0.996	0.992	0.997	0.994	0.998	0.996	0.998	0.996	0.998	0.996	0.997	0.994
Sept 29, 2011	0.991	0.981	0.996	0.992	0.997	0.994	0.998	0.996	0.998	0.996	0.998	0.996	0.998	0.996

Table S.11. The information dimension (D_1) and the correlation dimension (D_2) for soil water storage with increasing depth over the whole measurement period.

	0-20 cm		0-40 cm		0-60 cm		0-80 cm		0-100 cm		0-120 cm		0-140 cm	
	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
Jul 17 2007	0.982	0.961	0.988	0.974	0.991	0.981	0.992	0.985	0.993	0.987	0.994	0.988	0.995	0.989
Aug 7 2007	0.983	0.963	0.988	0.975	0.991	0.981	0.992	0.985	0.993	0.987	0.995	0.989	0.995	0.991
Sept 1 2007	0.992	0.981	0.993	0.985	0.994	0.987	0.995	0.989	0.995	0.991	0.996	0.992	0.996	0.993
Oct 12 2007	0.995	0.989	0.995	0.99	0.995	0.991	0.996	0.992	0.996	0.993	0.997	0.993	0.997	0.994
May 2 2008	0.993	0.983	0.995	0.989	0.996	0.992	0.996	0.993	0.997	0.993	0.997	0.994	0.997	0.994
May 31 2008	0.991	0.979	0.994	0.988	0.996	0.991	0.996	0.993	0.997	0.994	0.997	0.994	0.997	0.995
Jun 21 2008	0.994	0.987	0.995	0.991	0.996	0.993	0.997	0.993	0.997	0.994	0.997	0.995	0.997	0.995
July 16 2008	0.996	0.991	0.996	0.992	0.996	0.993	0.996	0.993	0.997	0.994	0.997	0.994	0.997	0.995
Aug 23 2008	0.998	0.997	0.998	0.996	0.997	0.995	0.997	0.995	0.997	0.995	0.997	0.995	0.998	0.995
Sept 17 2008	0.998	0.997	0.998	0.996	0.998	0.995	0.997	0.995	0.997	0.995	0.997	0.995	0.998	0.995
Oct 22 2008	0.999	0.998	0.999	0.997	0.998	0.996	0.998	0.996	0.998	0.996	0.998	0.996	0.998	0.996
April 20 2009	0.992	0.982	0.994	0.986	0.994	0.987	0.994	0.988	0.995	0.989	0.995	0.99	0.995	0.99
May 7 2009	0.995	0.987	0.996	0.991	0.996	0.992	0.997	0.993	0.997	0.993	0.997	0.994	0.997	0.994
May 27 2009	0.995	0.988	0.996	0.992	0.997	0.993	0.997	0.993	0.997	0.994	0.997	0.994	0.997	0.994
July 21 2009	0.997	0.993	0.997	0.993	0.997	0.993	0.997	0.994	0.997	0.994	0.997	0.994	0.997	0.995
Aug 27 2009	0.999	0.997	0.999	0.997	0.998	0.996	0.998	0.996	0.998	0.995	0.998	0.995	0.998	0.996
Oct 27 2009	0.999	0.998	0.999	0.998	0.998	0.997	0.998	0.996	0.998	0.996	0.998	0.996	0.998	0.996
April 6 2010	0.995	0.988	0.996	0.99	0.996	0.991	0.996	0.992	0.996	0.992	0.996	0.992	0.996	0.992
May 19 2010	0.994	0.986	0.996	0.992	0.997	0.994	0.998	0.995	0.998	0.996	0.998	0.996	0.998	0.996
June 14 2010	0.992	0.982	0.995	0.988	0.996	0.992	0.997	0.993	0.997	0.994	0.997	0.995	0.998	0.995
Sept 28, 2010	0.992	0.982	0.995	0.988	0.996	0.991	0.997	0.993	0.997	0.994	0.997	0.994	0.997	0.994
May 13, 2011	0.991	0.981	0.995	0.988	0.996	0.991	0.996	0.993	0.997	0.994	0.997	0.994	0.997	0.994
Jun 6, 2011	0.991	0.981	0.994	0.987	0.995	0.99	0.996	0.982	0.997	0.993	0.997	0.994	0.997	0.994
Jun 29, 2011	0.991	0.981	0.994	0.988	0.996	0.991	0.996	0.992	0.997	0.994	0.997	0.994	0.997	0.994
Sept 29, 2011	0.991	0.981	0.994	0.988	0.995	0.99	0.996	0.993	0.997	0.994	0.997	0.994	0.997	0.994

Figures

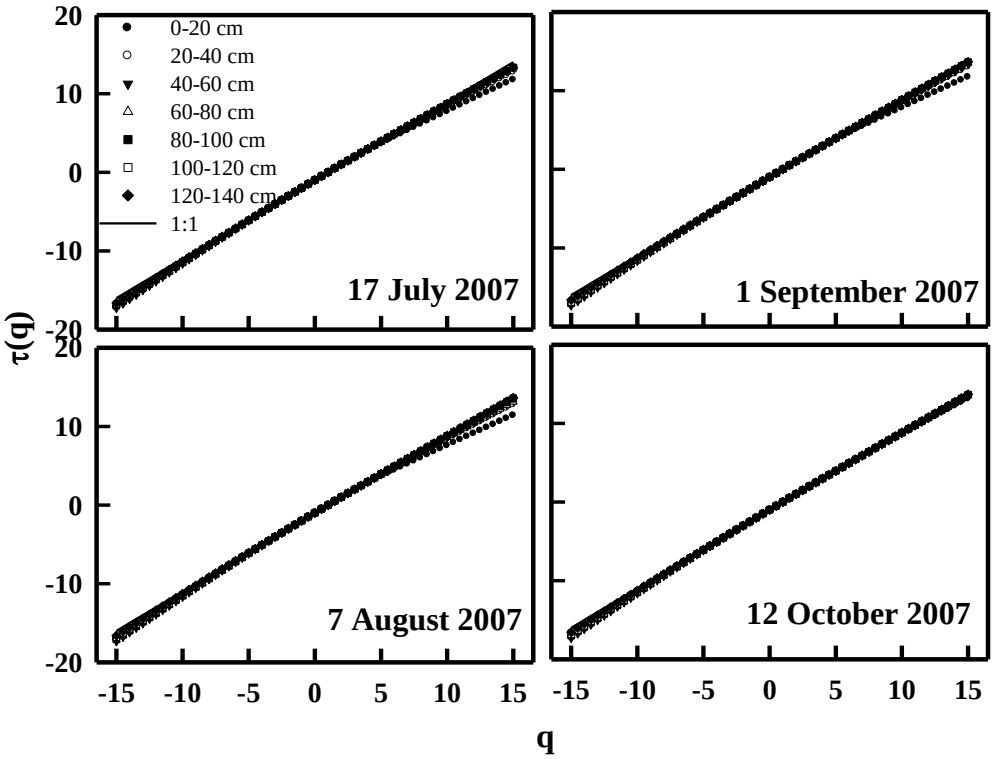

Fig. S.1. Mass exponents for soil water storage spatial series measured at each 20 cm soil layer down to 140 cm in 2007 for a range of q (-15 to 15 at 0.5 increments). The solid line is a linear reference created following the UM model of Schertzer and Lovejoy (1987) passing through (q = 0).

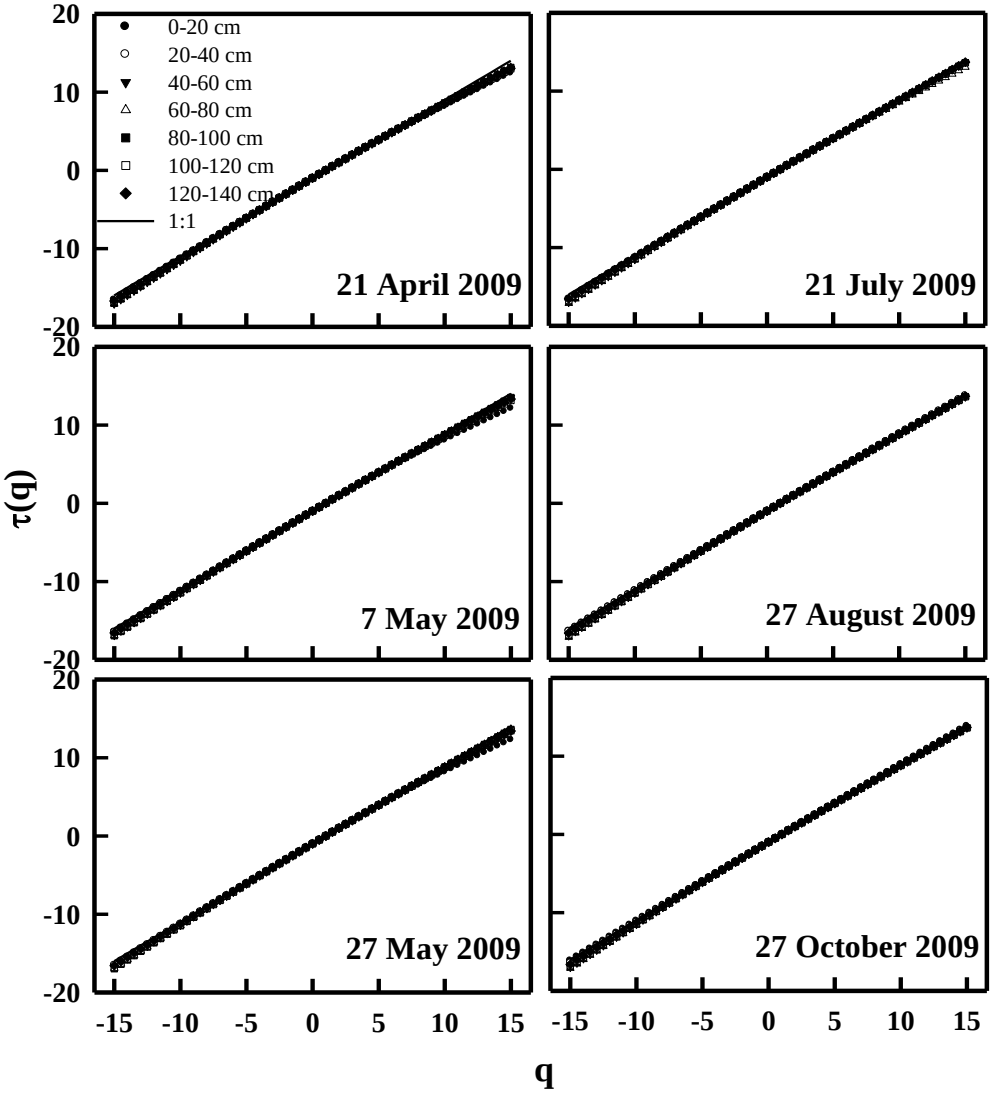

Fig. S.2. Mass exponents for soil water storage spatial series measured at each 20 cm soil layer down to 140 cm in 2009 for a range of q (-15 to 15 at 0.5 increments). The solid line is a linear reference created following the UM model of Schertzer and Lovejoy (1987) passing through (q = 0).

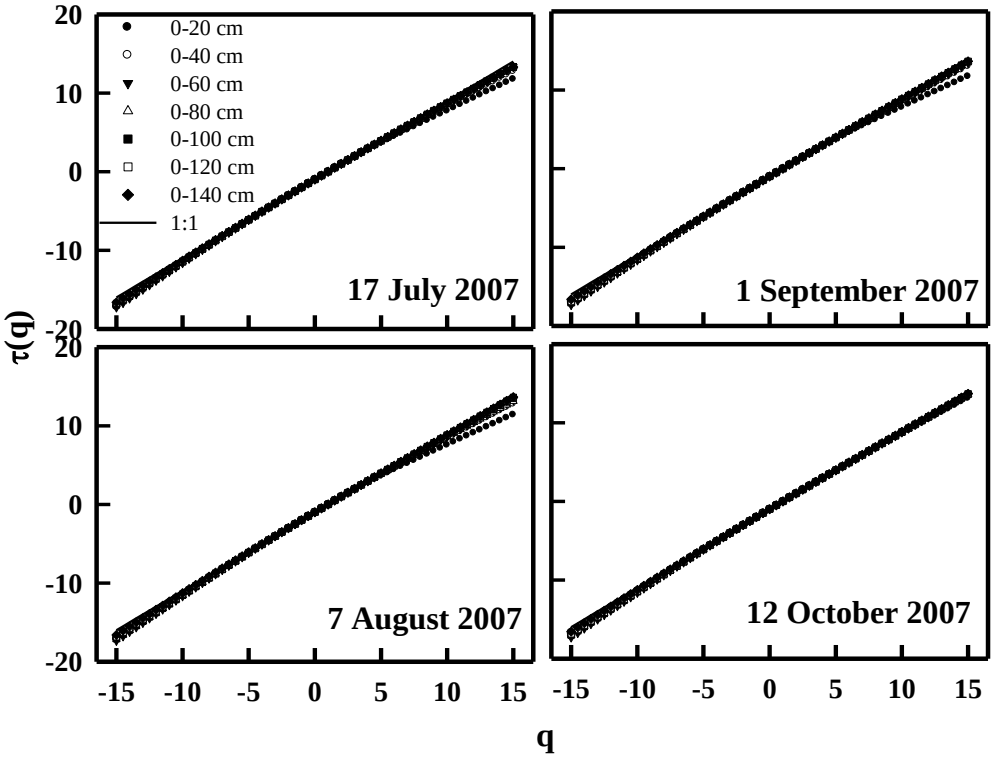

Fig. S.3. Mass exponents for soil water storage spatial from surface to different soil layers (cumulative storage) at 20 cm increment down to 140 cm in 2007 for a range of q (-15 to 15 at 0.5 increments). The solid line is a linear reference created following the UM model of Schertzer and Lovejoy (1987) passing through (q = 0).

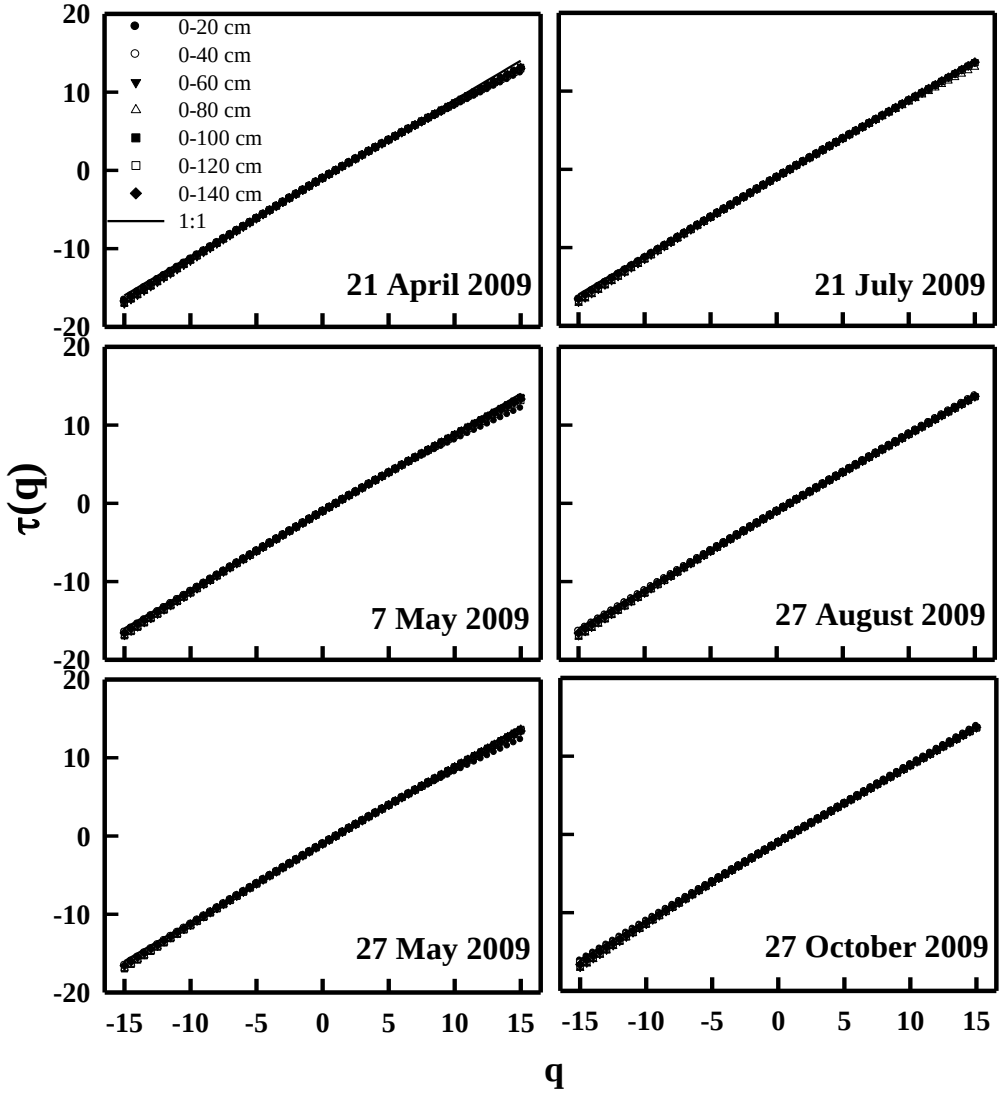

Fig. S.4. Mass exponents for soil water storage spatial from surface to different soil layers (cumulative storage) at 20 cm increment down to 140 cm in 2009 for a range of q (-15 to 15 at 0.5 increments). The solid line is a linear reference created following the UM model of Schertzer and Lovejoy (1987) passing through (q = 0).

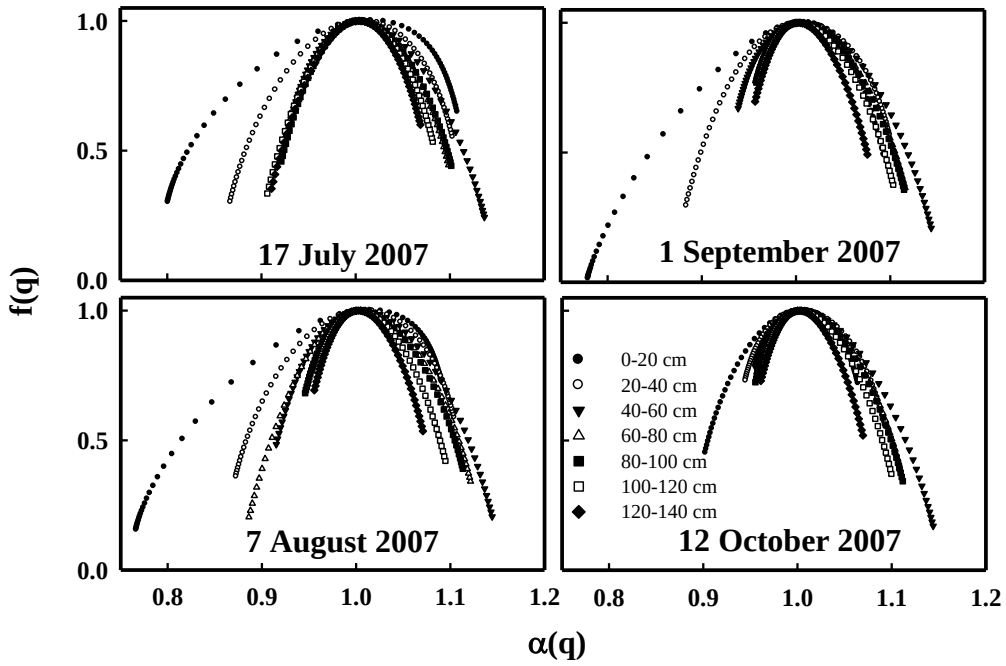

Fig. S.5. Multifractal spectra of soil water storage spatial series measured at each 20 cm soil layer down to 140 cm in 2007 for a range of q (-15 to 15 at 0.5 increments).

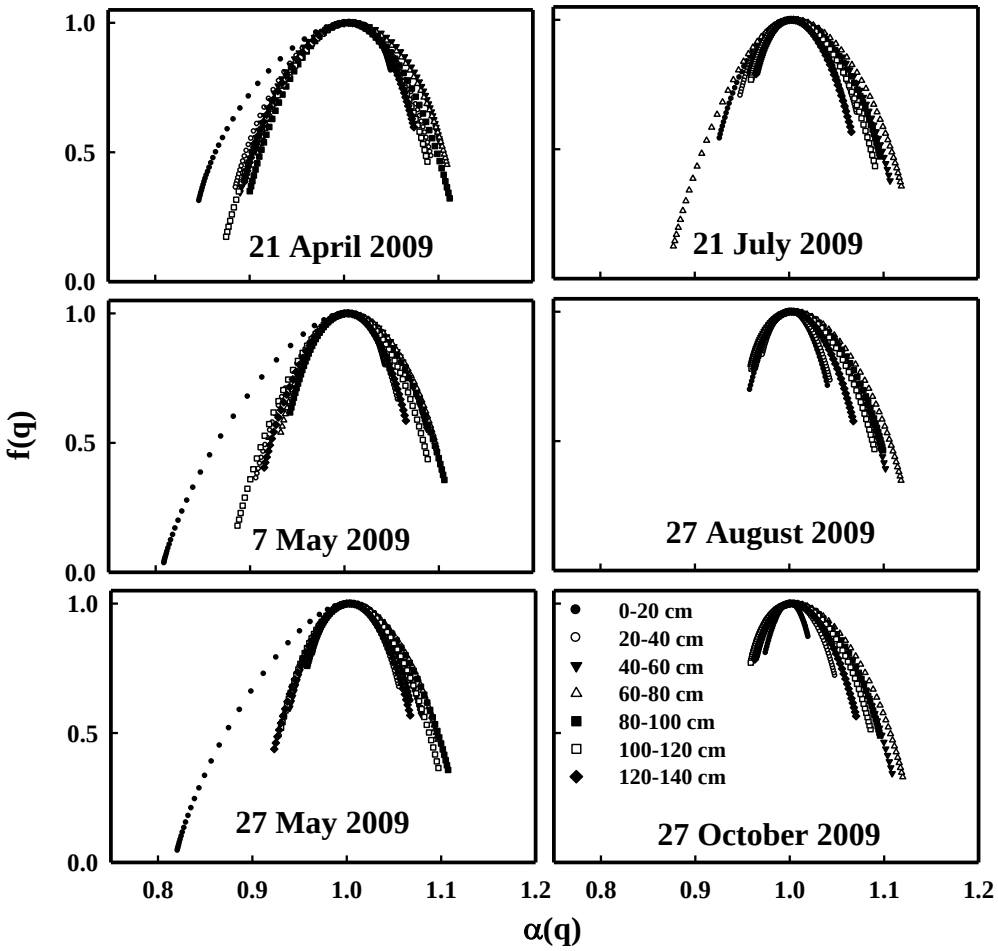

Fig. S.6. Multifractal spectra of soil water storage spatial series measured at each 20 cm soil layer down to 140 cm in 2009 for a range of q (-15 to 15 at 0.5 increments).

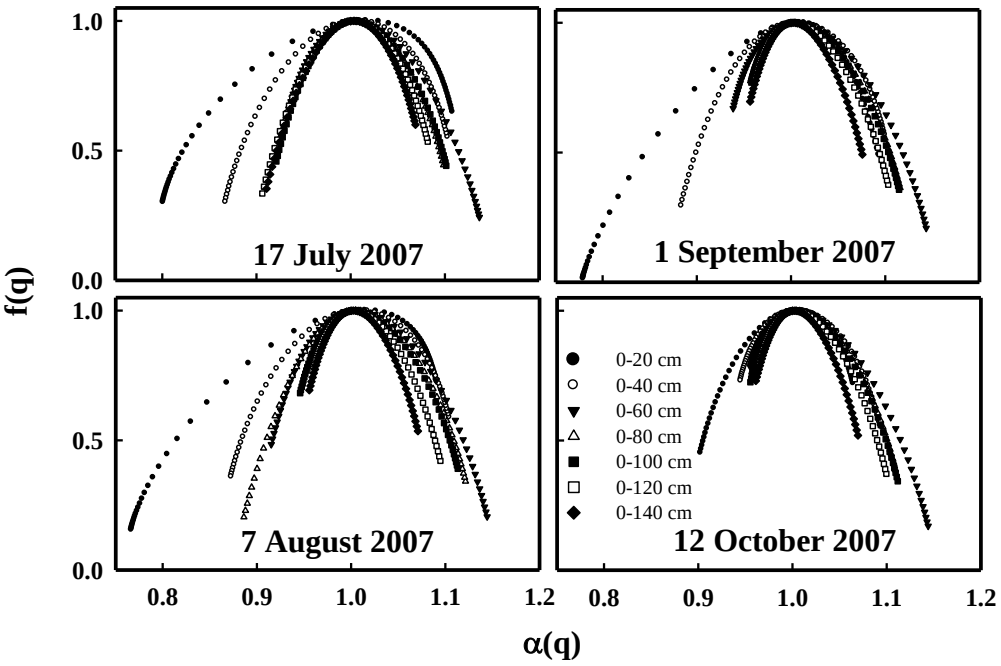

Fig. S.7. Multifractal spectra of soil water storage spatial series from surface to different soil layers (cumulative storage) at 20 cm increment down to 140 cm in 2007 for a range of q (-15 to 15 at 0.5 increments).

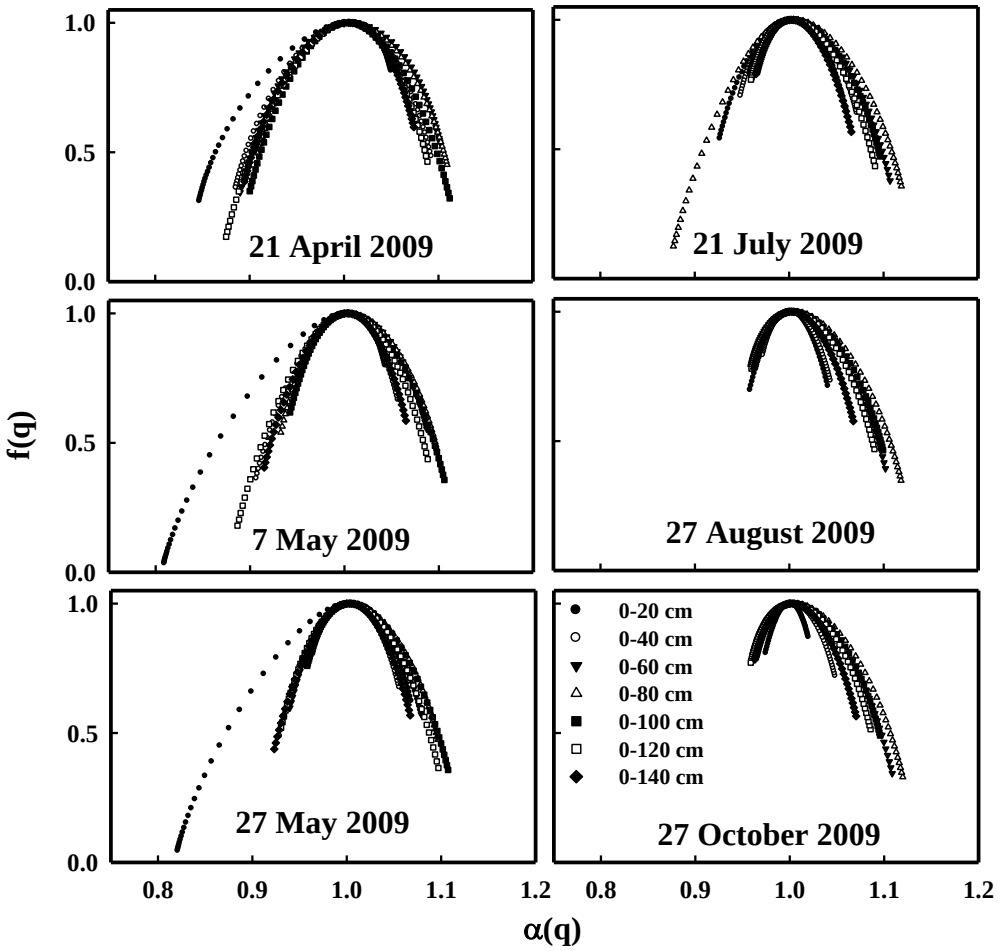

Fig. S.8. Multifractal spectra of soil water storage spatial series from surface to different soil layers (cumulative storage) at 20 cm increment down to 140 cm in 2009 for a range of q (-15 to 15 at 0.5 increments).

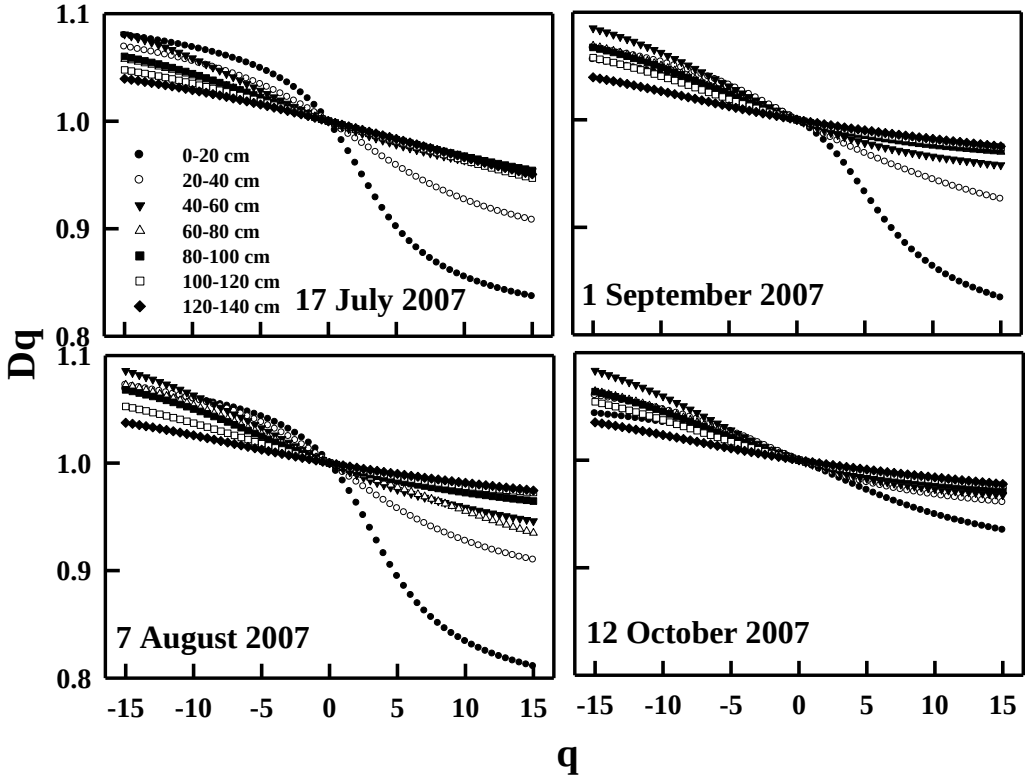

Fig. S.9. Generalized dimension spectra of soil water storage spatial series measured at each 20 cm soil layer down to 140 cm in 2007 for a range of q (-15 to 15 at 0.5 increments).

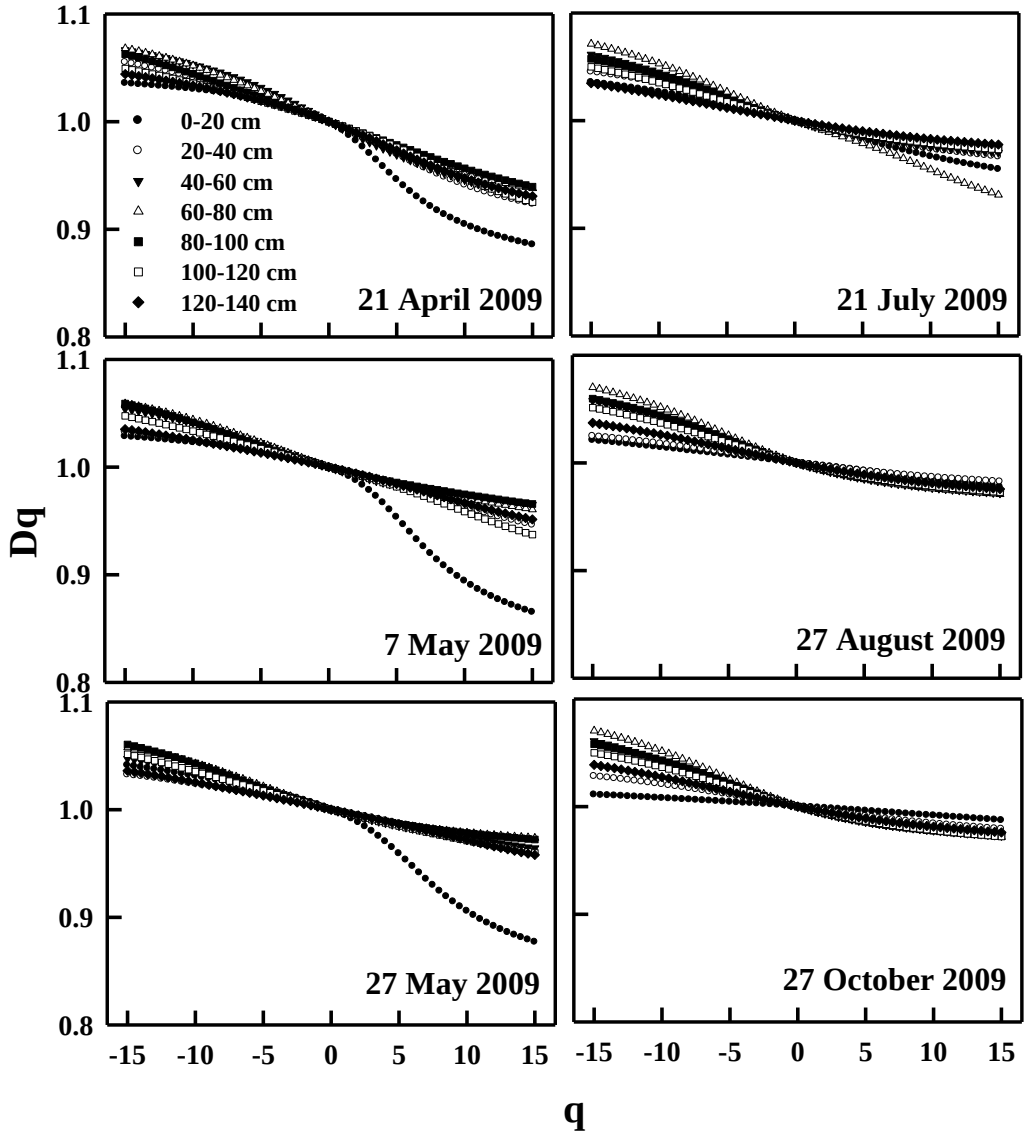

Fig. S.10. Generalized dimension spectra of soil water storage spatial series measured at each 20 cm soil layer down to 140 cm in 2009 for a range of q (-15 to 15 at 0.5 increments).

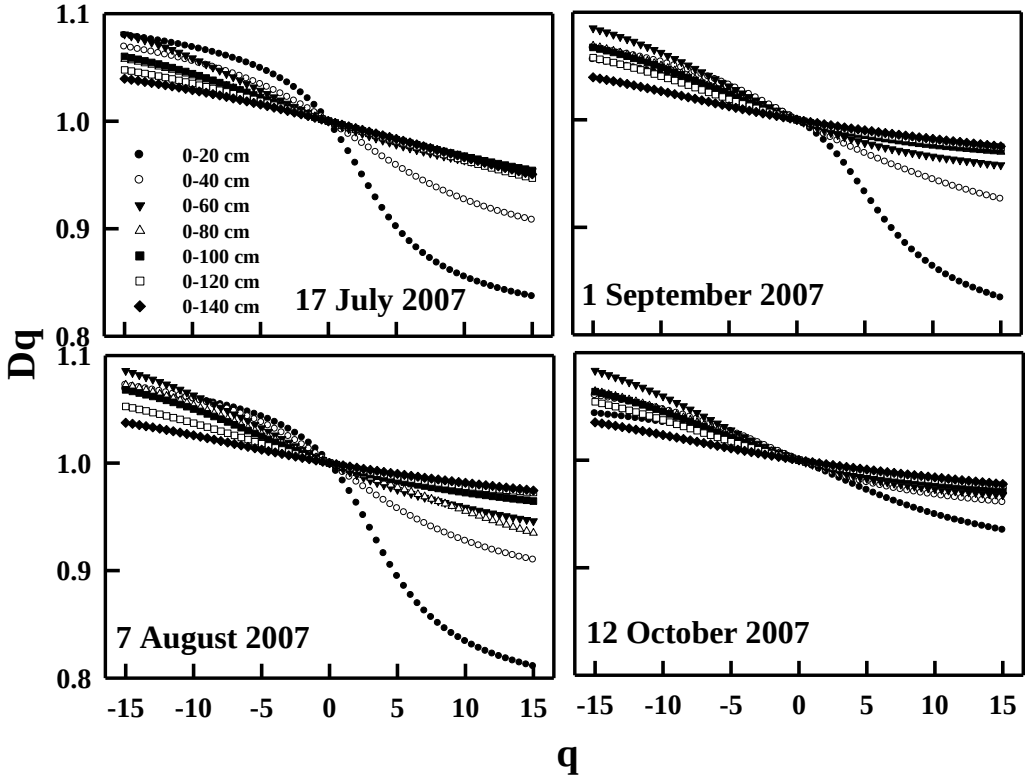

Fig. S.11. Generalized dimension spectra of soil water storage spatial series from surface to different soil layers (cumulative storage) at 20 cm increment down to 140 cm in 2007 for a range of q (-15 to 15 at 0.5 increments).

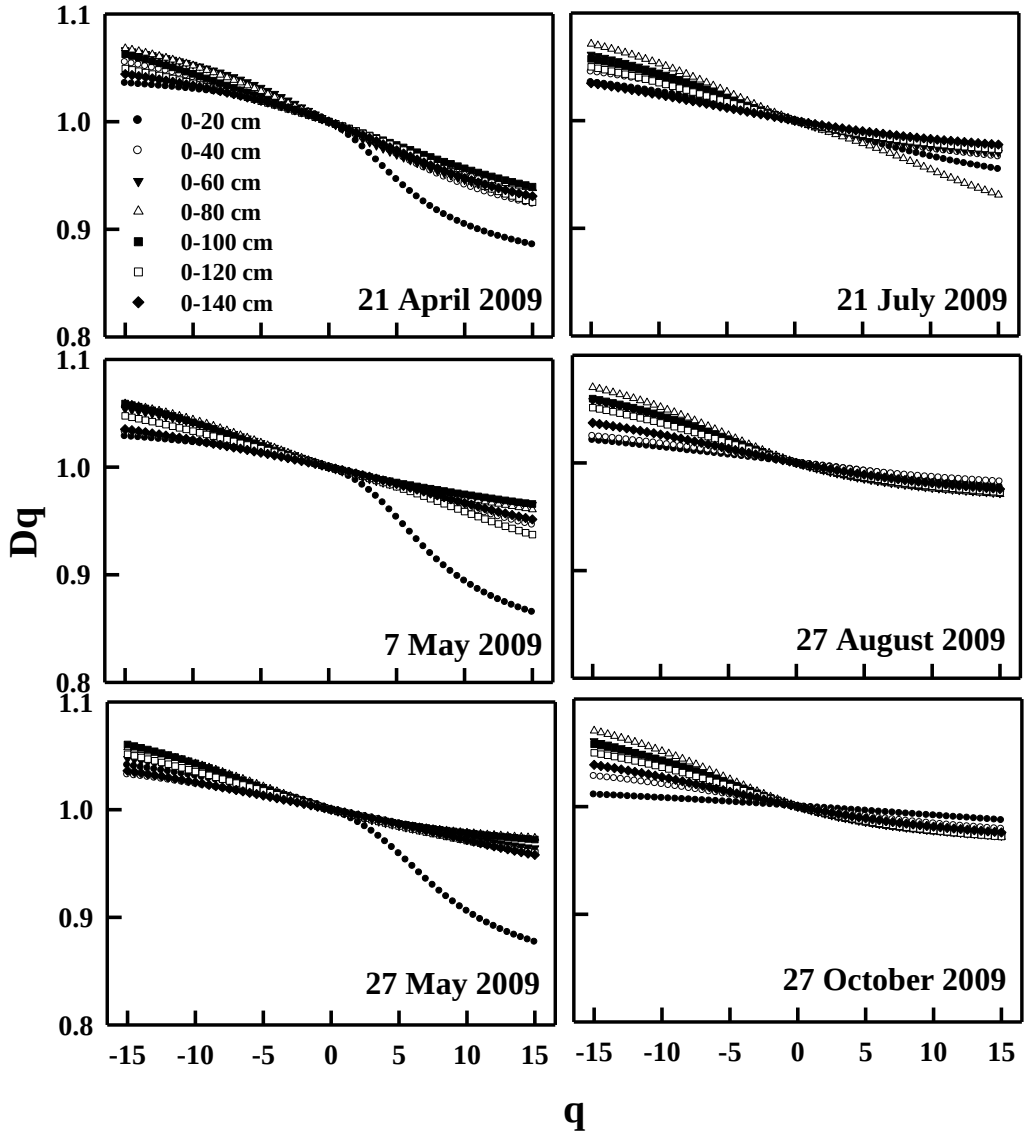

Fig. S.12. Generalized dimension spectra of soil water storage spatial series from surface to different soil layers (cumulative storage) at 20 cm increment down to 140 cm in 2009 for a range of q (-15 to 15 at 0.5 increments).