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*Supplement of*

## **The greenhouse gas balance of a drained fen peatland is mainly controlled by land-use rather than soil organic carbon content**

**T. Eickenscheidt et al.**

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**Table S1** Model parameters of the A1C<sub>medium</sub> site.

Site	Date	$R_{\text{eco}}$				GPP										$R_{\text{eco}}$ without model parameter									
		Std. Error		95% Confidence Limits		$n$	model based on	$\alpha$	Std. Error		95% Confidence Limits		$n$	lower GPP <sub>2000</sub>	upper GPP <sub>2000</sub>	$n$	daily mean $R_{\text{eco}}$ [ $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ]	Std. Error	95% Confidence Limits						
		$R_{\text{ref}}$	$E_0$	$R_{\text{ref}}$	$E_0$				lower $R_{\text{ref}}$	upper $R_{\text{ref}}$	lower $E_0$	upper $E_0$							$\alpha$	GPP <sub>2000</sub>	lower $\alpha$	upper $\alpha$	lower $R_{\text{eco}}$	upper $R_{\text{eco}}$	$n$
A1C <sub>medium</sub>	2010-02-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.78	0.18	0.44	1.11	9			
A1C <sub>medium</sub>	2010-02-25	-	-	-	-	-	-	-	-	-	-0.01	-6.91	0.00	0.15	-0.01	-0.01	-7.22	-6.61	36	0.92	0.12	0.69	1.15	15	
A1C <sub>medium</sub>	2010-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.11	0.09	0.95	1.28	9		
A1C <sub>medium</sub>	2010-03-24	3.43	138.31	0.06	7.64	3.32	3.55	122.73	153.89	33	$T_{\text{air}}$	-0.01	-10.44	0.00	0.25	-0.01	-0.01	-10.94	-9.93	55	-	-	-	-	-
A1C <sub>medium</sub>	2010-04-07	7.99	119.04	0.26	19.17	7.43	8.55	78.41	159.67	18	$ST_2$	-0.02	-21.89	0.00	0.73	-0.02	-0.01	-23.37	-20.42	44	-	-	-	-	-
A1C <sub>medium</sub>	2010-04-28	9.62	103.31	0.40	17.69	8.77	10.47	65.60	141.02	17	$ST_2$	-0.03	-28.78	0.00	1.00	-0.03	-0.02	-30.84	-26.73	26	-	-	-	-	-
A1C <sub>medium</sub>	2010-05-23	6.73	231.96	0.71	35.92	5.27	8.19	157.65	306.26	25	$ST_2$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1C <sub>medium</sub>	2010-06-10	-	-	-	-	-	-	-	-	-	-	-0.01	-11.00	0.00	0.54	-0.01	-0.01	-12.11	-9.89	27	9.15	0.27	8.63	9.67	17
A1C <sub>medium</sub>	2010-07-02	12.59	110.77	1.24	23.54	10.02	15.16	61.82	159.72	23	$T_{\text{air}}$	-0.03	-29.42	0.01	1.78	-0.04	-0.02	-33.03	-25.81	36	-	-	-	-	-
A1C <sub>medium</sub>	2010-07-22	11.34	218.93	0.64	23.03	10.03	12.65	171.89	265.97	32	$T_{\text{air}}$	-0.06	-67.47	0.01	1.68	-0.07	-0.05	-70.94	-64.01	27	-	-	-	-	-
A1C <sub>medium</sub>	2010-08-21	7.43	143.40	0.54	16.74	6.28	8.58	107.90	178.89	18	$T_{\text{air}}$	-0.04	-42.18	0.01	1.27	-0.05	-0.03	-44.83	-39.53	22	-	-	-	-	-
A1C <sub>medium</sub>	2010-09-12	6.28	135.16	0.48	21.87	5.25	7.31	88.27	182.06	16	$T_{\text{air}}$	-0.01	-33.80	0.00	1.92	-0.02	-0.01	-37.80	-29.80	22	-	-	-	-	-
A1C <sub>medium</sub>	2010-10-04	4.62	202.38	0.18	14.43	4.23	5.01	171.21	233.55	15	$T_{\text{air}}$	-0.05	-20.85	0.01	1.44	-0.07	-0.02	-23.98	-17.72	14	-	-	-	-	-
A1C <sub>medium</sub>	2010-10-13	6.10	175.57	0.54	46.50	4.83	7.37	65.62	285.52	9	$T_{\text{air}}$	-0.01	-13.33	0.00	7.28	-0.02	0.00	-32.05	5.39	7	-	-	-	-	-
A1C <sub>medium</sub>	2010-10-29	4.70	104.79	0.36	36.38	3.93	5.47	26.77	182.81	16	$T_{\text{air}}$	-0.01	-18.61	0.00	4.97	-0.01	0.00	-29.14	-8.08	18	-	-	-	-	-
A1C <sub>medium</sub>	2010-12-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.20	0.06	0.09	0.31	9	
A1C <sub>medium</sub>	2011-01-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.82	0.14	0.56	1.09	9	
A1C <sub>medium</sub>	2011-01-27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.75	0.02	0.72	0.79	9	
A1C <sub>medium</sub>	2011-02-07	1.28	151.19	0.09	41.66	1.09	1.48	61.20	241.19	15	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1C <sub>medium</sub>	2011-03-08	1.07	32.45	0.04	10.60	0.99	1.15	10.09	54.81	19	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1C <sub>medium</sub>	2011-03-29	4.16	196.91	0.18	25.69	3.78	4.53	142.93	250.89	20	$T_{\text{air}}$	-0.01	-14.78	0.00	1.31	-0.01	0.00	-17.53	-12.04	22	-	-	-	-	-
A1C <sub>medium</sub>	2011-04-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.92	0.19	7.91	9.94	23	
A1C <sub>medium</sub>	2011-05-06	5.90	79.18	0.24	15.44	5.39	6.41	47.06	111.29	23	$T_{\text{air}}$	-0.01	-8.27	0.00	0.55	-0.02	-0.01	-9.39	-7.15	36	-	-	-	-	-
A1C <sub>medium</sub>	2011-05-25	14.57	76.98	1.02	19.05	12.41	16.72	36.59	117.36	18	$ST_2$	-0.03	-34.06	0.01	1.44	-0.04	-0.02	-36.99	-31.12	32	-	-	-	-	-
A1C <sub>medium</sub>	2011-06-28	14.88	124.68	1.12	19.41	12.56	17.20	84.43	164.93	24	$T_{\text{air}}$	-0.16	-52.10	0.02	0.84	-0.20	-0.12	-53.81	-50.39	30	-	-	-	-	-
A1C <sub>medium</sub>	2011-08-02	10.82	133.18	0.67	18.45	9.41	12.23	94.26	172.10	19	$T_{\text{air}}$	-0.15	-29.02	0.03	0.79	-0.21	-0.08	-30.64	-27.40	30	-	-	-	-	-
A1C <sub>medium</sub>	2011-08-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.22	0.20	13.32	15.11	19	
A1C <sub>medium</sub>	2011-09-24	7.30	177.34	0.30	20.51	6.66	7.94	133.64	221.05	17	$T_{\text{air}}$	-0.02	-28.26	0.00	2.35	-0.03	-0.02	-33.25	-23.28	18	-	-	-	-	-
A1C <sub>medium</sub>	2011-10-16	9.69	207.95	0.37	22.25	8.90	10.49	160.52	255.38	17	$ST_2$	-0.03	-33.29	0.00	1.48	-0.03	-0.02	-36.37	-30.20	23	-	-	-	-	-
A1C <sub>medium</sub>	2011-12-15	2.42	168.70	0.20	31.97	1.95	2.89	93.11	244.28	9	$T_{\text{air}}$	-0.04	-16.40	0.00	3.16	-0.05	-0.03	-24.13	-8.66	8	-	-	-	-	-
A1C <sub>medium</sub>	2012-01-12	4.53	302.37	0.55	59.54	3.28	5.78	167.69	437.06	11	$T_{\text{air}}$	-0.02	-21.94	0.01	7.93	-0.03	-0.01	-39.21	-4.66	14	-	-	-	-	-

**Table S2** Model parameters of the A1C<sub>high</sub> site.

Site	Date	<i>R<sub>eco</sub></i>									<i>GPP</i>									<i>R<sub>eco</sub></i> without model					
		<i>R<sub>ref</sub></i>		Std. Error		95% Confidence Limits				<i>n</i>	<i>model based on</i>	<i>α</i>		Std. Error		95% Confidence Limits				<i>n</i>	daily mean <i>R<sub>eco</sub></i> [μmol CO <sub>2</sub> m <sup>-2</sup> s <sup>-1</sup> ]	Std. Error	95% Confidence Limits		<i>n</i>
		<i>R<sub>ref</sub></i>	<i>E<sub>0</sub></i>	<i>R<sub>ref</sub></i>	<i>E<sub>0</sub></i>	lower <i>R<sub>ref</sub></i>	upper <i>R<sub>ref</sub></i>	lower <i>E<sub>0</sub></i>	upper <i>E<sub>0</sub></i>			<i>α</i>	<i>GPP<sub>2000</sub></i>	<i>α</i>	<i>GPP<sub>2000</sub></i>	lower <i>α</i>	upper <i>α</i>	lower <i>GPP<sub>2000</sub></i>	upper <i>GPP<sub>2000</sub></i>				lower <i>R<sub>eco</sub></i>	upper <i>R<sub>eco</sub></i>	
A1C <sub>high</sub>	2010-02-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.14	0.05	0.56	9	
A1C <sub>high</sub>	2010-02-25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.04	0.07	0.23	9	
A1C <sub>high</sub>	2010-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.07	0.09	0.90	1.25	9	
A1C <sub>high</sub>	2010-03-24	2.49	76.95	0.07	13.88	2.34	2.64	48.53	105.38	30	<i>T<sub>air</sub></i>	0.00	-2.46	0.00	0.12	-0.01	0.00	-2.71	-2.21	44	-	-	-	-	-
A1C <sub>high</sub>	2010-04-06	4.59	81.94	0.20	23.27	4.16	5.02	32.85	131.03	20	<i>T<sub>air</sub></i>	0.00	-3.57	0.00	0.18	-0.01	0.00	-3.94	-3.19	30	-	-	-	-	-
A1C <sub>high</sub>	2010-04-28	5.84	155.65	0.34	33.27	5.11	6.57	84.29	227.01	16	<i>ST<sub>5</sub></i>	-0.01	-8.94	0.00	0.51	-0.01	0.00	-10.00	-7.89	24	-	-	-	-	-
A1C <sub>high</sub>	2010-05-23	2.95	106.80	0.23	27.68	2.45	3.45	47.82	165.79	17	<i>T<sub>air</sub></i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1C <sub>high</sub>	2010-06-10	1.39	404.93	0.19	36.87	0.98	1.79	327.15	482.70	19	<i>ST<sub>2</sub></i>	-0.01	-9.42	0.00	0.30	-0.01	-0.01	-10.04	-8.80	29	-	-	-	-	-
A1C <sub>high</sub>	2010-07-02	23.46	42.87	1.83	21.10	19.33	27.59	4.86	90.60	11	<i>T<sub>air</sub></i>	-0.02	-17.50	0.01	1.43	-0.03	0.00	-20.50	-14.50	20	-	-	-	-	-
A1C <sub>high</sub>	2010-07-21	12.61	88.94	1.14	21.86	10.20	15.02	42.83	135.05	19	<i>T<sub>air</sub></i>	-0.04	-37.67	0.01	1.76	-0.05	-0.02	-41.28	-34.06	30	-	-	-	-	-
A1C <sub>high</sub>	2010-08-21	6.66	146.95	0.47	18.09	5.65	7.67	107.88	186.02	15	<i>T<sub>air</sub></i>	-0.04	-24.30	0.01	1.27	-0.05	-0.02	-26.99	-21.60	18	-	-	-	-	-
A1C <sub>high</sub>	2010-09-12	5.73	81.71	0.33	17.09	5.01	6.44	44.79	118.63	15	<i>T<sub>air</sub></i>	-0.01	-20.57	0.00	1.09	-0.02	-0.01	-22.80	-18.34	30	-	-	-	-	-
A1C <sub>high</sub>	2010-10-04	4.54	203.09	0.39	36.90	3.67	5.40	120.88	285.29	12	<i>T<sub>air</sub></i>	-0.03	-20.40	0.01	1.25	-0.05	-0.02	-23.12	-17.69	14	-	-	-	-	-
A1C <sub>high</sub>	2010-10-13	14.00	577.38	2.83	138.77	7.48	20.51	257.36	897.39	10	<i>ST<sub>2</sub></i>	-0.02	-15.84	0.01	8.05	-0.04	0.00	-33.23	1.56	15	-	-	-	-	-
A1C <sub>high</sub>	2010-10-29	2.76	87.44	0.07	12.46	2.60	2.92	60.30	114.59	14	<i>T<sub>air</sub></i>	-0.01	-10.84	0.00	3.14	-0.01	0.00	-17.57	-4.10	16	-	-	-	-	-
A1C <sub>high</sub>	2010-12-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.03	0.03	0.12	9	
A1C <sub>high</sub>	2011-01-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.85	0.33	1.23	2.47	9	
A1C <sub>high</sub>	2011-01-27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.47	0.06	0.42	0.52	9	
A1C <sub>high</sub>	2011-02-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.20	0.09	1.03	1.37	15	
A1C <sub>high</sub>	2011-03-08	1.20	64.75	0.04	13.73	1.11	1.29	35.10	94.41	15	<i>T<sub>air</sub></i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A1C <sub>high</sub>	2011-03-29	3.06	250.34	0.19	35.10	2.65	3.47	175.52	325.16	17	<i>T<sub>air</sub></i>	-0.01	-10.48	0.00	0.46	-0.01	-0.01	-11.45	-9.51	21	-	-	-	-	-
A1C <sub>high</sub>	2011-04-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.98	0.11	2.76	3.20	24	
A1C <sub>high</sub>	2011-05-06	4.33	167.57	0.18	20.60	3.96	4.70	124.11	211.03	19	<i>ST<sub>5</sub></i>	-0.01	-5.85	0.00	0.27	-0.01	0.00	-6.39	-5.31	42	-	-	-	-	-
A1C <sub>high</sub>	2011-05-25	12.13	68.75	0.46	11.91	11.08	13.17	41.81	95.69	11	<i>T<sub>air</sub></i>	-0.08	-33.08	0.01	0.71	-0.10	-0.06	-34.53	-31.62	31	-	-	-	-	-
A1C <sub>high</sub>	2011-06-28	13.41	150.82	0.49	10.04	12.37	14.45	129.64	171.99	19	<i>T<sub>air</sub></i>	-0.10	-41.08	0.01	0.82	-0.12	-0.07	-42.80	-39.37	23	-	-	-	-	-
A1C <sub>high</sub>	2011-08-02	6.49	96.67	0.34	13.66	5.77	7.21	67.98	125.36	20	<i>T<sub>air</sub></i>	-0.01	-7.74	0.00	0.26	-0.02	-0.01	-8.28	-7.21	22	-	-	-	-	-
A1C <sub>high</sub>	2011-08-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.69	0.10	10.86	12.52	17	
A1C <sub>high</sub>	2011-09-24	4.43	137.92	0.27	28.27	3.85	5.01	77.29	198.55	16	<i>T<sub>air</sub></i>	-0.03	-17.13	0.00	0.71	-0.04	-0.02	-18.64	-15.63	19	-	-	-	-	-
A1C <sub>high</sub>	2011-10-16	5.71	86.06	0.14	12.31	5.42	6.00	59.82	112.29	17	<i>T<sub>air</sub></i>	-0.01	-14.30	0.00	0.89	-0.02	-0.01	-16.16	-12.43	21	-	-	-	-	-
A1C <sub>high</sub>	2011-12-15	-	-	-	-	-	-	-	-	-	-	-0.03	-12.11	0.00	2.21	-0.03	-0.02	-17.78	-6.43	11	0.41	0.05	0.32	0.49	9
A1C <sub>high</sub>	2012-01-12	1.03	301.93	0.11	68.91	0.79	1.27	153.06	450.81	15	<i>T<sub>air</sub></i>	-0.01	-11.43	0.00	3.50	-0.01	0.00	-18.86	-4.01	18	-	-	-	-	-

**Table S3** Model parameters of the A2C<sub>medium</sub> site.

Site	Date	$R_{\text{ECO}}$										$GPP$										$R_{\text{ECO}}$ without model				
		$R_{\text{ref}}$		$E_0$		Std. Error		95% Confidence Limits				$n$	$\alpha$	$GPP_{2000}$	Std. Error		95% Confidence Limits				$n$	daily mean $R_{\text{ECO}}$ ( $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ )	Std. Error	95% Confidence Limits		$n$
		$R_{\text{ref}}$	$E_0$	$R_{\text{ref}}$	$E_0$	lower $R_{\text{ref}}$	upper $R_{\text{ref}}$	lower $E_0$	upper $E_0$	lower $\alpha$	upper $\alpha$				lower $GPP_{2000}$	upper $GPP_{2000}$	lower $R_{\text{ECO}}$	upper $R_{\text{ECO}}$								
A2C <sub>medium</sub>	2010-02-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.78	0.18	0.44	1.11	9
A2C <sub>medium</sub>	2010-02-25	-	-	-	-	-	-	-	-	-	-	-0.01	-6.91	0.00	0.15	-0.01	-0.01	-7.22	-6.61	36	-	0.92	0.12	0.69	1.15	15
A2C <sub>medium</sub>	2010-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.11	0.09	0.95	1.28	9
A2C <sub>medium</sub>	2010-03-24	3.43	138.31	0.06	7.64	3.32	3.55	122.73	153.89	33	$T_{\text{air}}$	-0.01	-10.44	0.00	0.25	-0.01	-0.01	-10.94	-9.93	55	-	-	-	-	-	-
A2C <sub>medium</sub>	2010-04-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.48	0.55	4.44	6.53	15
A2C <sub>medium</sub>	2010-04-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.53	0.30	3.96	5.09	19
A2C <sub>medium</sub>	2010-04-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.68	0.33	7.04	8.32	18
A2C <sub>medium</sub>	2010-05-23	4.94	239.51	0.27	18.32	4.39	5.49	201.62	277.40	25	$T_{\text{air}}$	-0.06	-24.05	0.00	0.25	-0.07	-0.05	-24.57	-23.54	38	-	-	-	-	-	-
A2C <sub>medium</sub>	2010-06-10	12.65	48.50	0.72	13.26	11.10	14.21	20.06	76.95	16	$T_{\text{air}}$	-0.08	-34.35	0.02	1.44	-0.12	-0.04	-37.31	-31.38	26	-	-	-	-	-	-
A2C <sub>medium</sub>	2010-07-02	15.39	105.33	1.14	15.77	13.00	17.78	72.21	138.45	20	$T_{\text{air}}$	-0.15	-47.21	0.03	1.56	-0.20	-0.09	-50.37	-44.04	36	-	-	-	-	-	-
A2C <sub>medium</sub>	2010-07-22	13.58	328.79	2.34	71.82	8.48	18.68	172.29	485.28	14	$ST_2$	-0.08	-54.20	0.01	1.64	-0.10	-0.05	-57.70	-50.70	17	-	-	-	-	-	-
A2C <sub>medium</sub>	2010-08-21	9.82	55.31	0.90	22.33	7.92	11.72	7.98	102.65	18	$T_{\text{air}}$	-0.02	-12.72	0.00	0.40	-0.03	-0.01	-13.57	-11.87	20	-	-	-	-	-	-
A2C <sub>medium</sub>	2010-09-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.13	0.40	5.37	6.90	16
A2C <sub>medium</sub>	2010-10-04	3.35	114.22	0.23	26.44	2.86	3.84	56.61	171.84	14	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2C <sub>medium</sub>	2010-10-29	3.51	109.14	0.10	14.11	3.29	3.72	79.07	139.21	17	$T_{\text{air}}$	-0.01	-9.40	0.00	1.31	-0.01	0.00	-12.31	-6.48	12	-	-	-	-	-	-
A2C <sub>medium</sub>	2010-12-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	0.01	0.15	0.19	9
A2C <sub>medium</sub>	2011-01-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.70	0.16	0.40	1.00	9
A2C <sub>medium</sub>	2011-01-27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.02	0.04	0.95	1.09	9
A2C <sub>medium</sub>	2011-02-07	1.27	119.11	0.09	39.12	1.07	1.47	34.59	203.63	15	$T_{\text{air}}$	0.00	-1.50	0.00	0.67	0.00	0.00	-2.87	-0.13	34	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-03-08	1.63	110.71	0.05	13.91	1.34	1.75	47.28	163.19	19	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-03-29	4.30	237.53	0.17	24.85	3.94	4.66	185.33	289.74	20	$T_{\text{air}}$	-0.01	-15.21	0.00	1.28	-0.01	-0.01	-17.85	-12.57	26	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-04-20	17.78	81.14	2.43	44.53	12.71	22.84	-11.75	174.02	22	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-05-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.39	0.07	3.08	3.70	23
A2C <sub>medium</sub>	2011-05-25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.06	0.15	5.70	6.41	22
A2C <sub>medium</sub>	2011-06-28	9.05	151.48	0.74	20.79	7.51	10.58	108.36	194.59	24	$T_{\text{air}}$	-0.06	-50.00	0.01	1.61	-0.08	-0.04	-53.29	-46.71	30	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-08-02	9.67	215.74	1.08	31.17	7.40	11.93	150.50	280.99	21	$T_{\text{air}}$	-0.14	-79.49	0.03	3.32	-0.21	-0.07	-86.28	-72.69	30	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-08-24	15.56	116.88	1.89	30.61	11.58	19.55	52.29	181.46	19	$T_{\text{air}}$	-0.12	-85.43	0.02	4.04	-0.17	-0.08	-93.67	-77.19	33	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-09-24	4.95	218.83	0.18	17.84	4.56	5.33	180.82	256.85	17	$T_{\text{air}}$	-0.01	-26.59	0.00	3.01	-0.02	-0.01	-32.89	-20.30	21	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-10-16	2.65	136.11	0.05	14.55	2.54	2.76	105.41	166.81	19	$T_{\text{air}}$	-0.01	-7.35	0.00	0.80	-0.02	0.00	-9.02	-5.68	23	-	-	-	-	-	-
A2C <sub>medium</sub>	2011-12-15	1.91	202.88	0.18	39.64	1.47	2.35	109.14	296.62	9	$T_{\text{air}}$	-0.01	-4.35	0.00	1.50	-0.02	-0.01	-8.02	-0.68	8	-	-	-	-	-	-
A2C <sub>medium</sub>	2012-01-12	2.35	256.47	0.22	44.32	1.84	2.85	156.21	356.73	11	$T_{\text{air}}$	-0.01	-6.71	0.00	0.47	-0.01	-0.01	-7.75	-5.68	14	-	-	-	-	-	-

**Table S4** Model parameters of the A2C<sub>high</sub> site.

Site	Date	$R_{\text{eco}}$				$GPP$							$R_{\text{eco}}$ without model													
		Std. Error		95% Confidence Limits		$n$	$model$ <i>based on</i>	Std. Error		95% Confidence Limits		$n$	daily mean $R_{\text{eco}}$ [ $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ]	Std. Error		95% Confidence Limits		$n$								
		$R_{\text{ref}}$	$E_0$	$R_{\text{ref}}$	$E_0$			lower $R_{\text{ref}}$	upper $R_{\text{ref}}$	lower $E_0$	upper $E_0$			$\alpha$	$GPP_{2000}$	$\alpha$	$GPP_{2000}$		lower $\alpha$	upper $\alpha$	lower $GPP_{2000}$	upper $GPP_{2000}$	$R_{\text{eco}}$	lower $R_{\text{eco}}$	upper $R_{\text{eco}}$	
A2C <sub>high</sub>	2010-02-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.14	0.05	0.56	9	
A2C <sub>high</sub>	2010-02-25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.15	0.04	0.07	0.23	9
A2C <sub>high</sub>	2010-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.07	0.09	0.90	1.25	9
A2C <sub>high</sub>	2010-03-24	2.49	76.95	0.07	13.88	2.34	2.64	48.53	105.38	30	$T_{\text{air}}$	0.00	-2.46	0.00	0.12	-0.01	0.00	-2.71	-2.21	44	-	-	-	-	-	
A2C <sub>high</sub>	2010-04-06	7.03	144.14	0.56	52.92	5.85	8.21	32.50	255.78	19	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2C <sub>high</sub>	2010-04-28	8.78	113.36	0.83	33.95	6.97	10.60	39.39	187.32	14	$T_{\text{air}}$	-0.01	-8.95	0.00	0.61	-0.02	-0.01	-10.24	-7.65	17	-	-	-	-	-	
A2C <sub>high</sub>	2010-05-23	2.42	397.23	0.39	46.67	1.60	3.24	300.17	494.29	23	$T_{\text{air}}$	-0.04	-22.39	0.00	0.34	-0.04	-0.03	-23.08	-21.70	30	-	-	-	-	-	
A2C <sub>high</sub>	2010-06-10	3.81	480.26	0.51	35.58	2.73	4.89	405.19	555.33	19	$ST_2$	-0.07	-31.57	0.01	0.75	-0.09	-0.05	-33.11	-30.02	28	-	-	-	-	-	
A2C <sub>high</sub>	2010-07-02	13.84	278.17	2.24	51.41	9.14	18.55	170.16	386.19	20	$ST_2$	-0.08	-42.19	0.01	1.45	-0.11	-0.05	-45.15	-39.23	32	-	-	-	-	-	
A2C <sub>high</sub>	2010-07-21	20.09	61.88	1.20	14.67	17.55	22.64	30.77	92.99	18	$T_{\text{air}}$	-0.01	-19.72	0.00	1.97	-0.02	-0.01	-23.79	-15.64	25	-	-	-	-	-	
A2C <sub>high</sub>	2010-08-21	-	-	-	-	-	-	-	-	-	-	-0.09	-23.80	0.04	2.05	-0.18	0.01	-28.44	-19.16	11	18.05	1.07	16.19	19.92	14	
A2C <sub>high</sub>	2010-09-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.17	0.68	8.88	11.46	14	
A2C <sub>high</sub>	2010-10-04	4.94	277.42	0.90	77.83	2.96	6.91	106.12	448.72	13	$T_{\text{air}}$	-0.02	-19.00	0.00	1.64	-0.03	-0.01	22.56	-15.43	14	-	-	-	-	-	
A2C <sub>high</sub>	2010-10-13	7.38	87.46	0.69	41.44	5.76	9.01	10.52	185.44	9	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2C <sub>high</sub>	2010-10-29	5.12	127.75	0.25	26.17	4.57	5.67	70.73	184.78	14	$T_{\text{air}}$	-0.01	-30.81	0.00	11.22	-0.02	-0.01	-55.04	-6.58	15	-	-	-	-	-	
A2C <sub>high</sub>	2010-12-13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.01	0.01	0.06	9	
A2C <sub>high</sub>	2011-01-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.42	0.53	1.45	3.40	9	
A2C <sub>high</sub>	2011-01-27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.96	0.47	1.65	2.26	9	
A2C <sub>high</sub>	2011-02-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.55	0.07	1.43	1.68	15	
A2C <sub>high</sub>	2011-03-08	2.62	114.38	0.13	17.76	2.34	2.90	75.68	153.08	14	$T_{\text{air}}$	0.00	-0.70	0.00	0.11	0.00	0.00	-0.95	-0.45	13	-	-	-	-	-	
A2C <sub>high</sub>	2011-03-29	4.63	234.03	0.38	44.50	3.82	5.43	139.69	328.37	18	$T_{\text{air}}$	-0.02	-15.01	0.00	0.70	-0.02	-0.01	-16.46	-13.56	23	-	-	-	-	-	
A2C <sub>high</sub>	2011-04-20	8.78	94.88	0.40	14.88	7.96	9.61	64.18	125.58	26	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2C <sub>high</sub>	2011-05-06	4.69	69.13	0.17	13.36	4.34	5.05	40.94	97.32	19	$T_{\text{air}}$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A2C <sub>high</sub>	2011-05-25	6.91	84.23	0.18	9.25	6.53	7.30	64.61	103.85	18	$T_{\text{air}}$	0.00	-1.25	0.00	0.14	-0.01	0.00	-1.54	-0.97	31	-	-	-	-	-	
A2C <sub>high</sub>	2011-06-28	9.92	155.21	0.57	15.63	8.71	11.13	122.24	188.18	19	$T_{\text{air}}$	-0.04	-39.75	0.01	1.17	-0.06	-0.03	-33.97	-42.21	20	-	-	-	-	-	
A2C <sub>high</sub>	2011-08-02	8.32	177.09	1.21	35.68	5.77	10.86	102.13	252.04	20	$T_{\text{air}}$	-0.11	-69.31	0.03	2.86	-0.17	-0.05	-75.28	-63.34	22	-	-	-	-	-	
A2C <sub>high</sub>	2011-08-24	17.70	120.30	2.27	29.64	12.80	22.59	56.27	184.33	15	$T_{\text{air}}$	-0.10	-97.68	0.03	7.84	-0.16	-0.05	-113.87	-81.50	26	-	-	-	-	-	
A2C <sub>high</sub>	2011-09-24	4.90	203.68	0.45	39.86	3.94	5.85	118.71	288.64	17	$T_{\text{air}}$	-0.02	-23.07	0.00	2.18	-0.03	-0.01	-27.68	-18.47	19	-	-	-	-	-	
A2C <sub>high</sub>	2011-10-16	3.47	108.54	0.10	17.64	3.26	3.67	71.31	145.76	18	$T_{\text{air}}$	-0.01	-9.84	0.00	0.93	-0.01	-0.01	-11.78	-7.90	22	-	-	-	-	-	
A2C <sub>high</sub>	2011-12-15	3.50	98.86	0.36	41.42	2.66	4.35	0.92	196.81	9	$T_{\text{air}}$	-0.03	-3.51	0.01	0.75	-0.06	0.00	-5.44	-1.58	9	-	-	-	-	-	
A2C <sub>high</sub>	2012-01-12	1.80	144.11	0.11	29.54	1.55	2.05	80.29	207.93	15	$T_{\text{air}}$	-0.01	-8.57	0.00	2.28	-0.01	0.00	-13.40	-3.74	18	-	-	-	-	-	

**Table S5** Model parameters of the G1C<sub>medium</sub> site.

Site	Date	$R_{\text{ECO}}$				GPP							$R_{\text{ECO}}$ without model												
		Std. Error		95% Confidence Limits		$n$	<i>model based on</i>	Std. Error		95% Confidence Limits		$n$	daily mean $R_{\text{ECO}}$ [ $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ]	Std. Error	95% Confidence Limits		$n$								
		$R_{\text{ref}}$	$E_0$	lower $R_{\text{ref}}$	upper $R_{\text{ref}}$			lower $E_0$	upper $E_0$	$\alpha$	$GPP_{2000}$				lower $\alpha$	upper $\alpha$		lower $GPP_{2000}$	upper $GPP_{2000}$	lower $R_{\text{ECO}}$	upper $R_{\text{ECO}}$				
G1C <sub>medium</sub>	2010-02-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.59	0.06	1.48	1.70	9	
G1C <sub>medium</sub>	2010-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.49	0.03	1.44	1.54	9
G1C <sub>medium</sub>	2010-03-24	5.56	51.60	0.13	10.16	5.26	5.86	27.59	75.62	9	$T_{\text{air}}$	-0.01	-17.44	0.00	3.41	-0.02	-0.01	-24.86	-10.02	14	-	-	-	-	-
G1C <sub>medium</sub>	2010-04-06	6.96	445.87	0.35	76.92	6.19	7.72	279.70	612.04	15	$ST_2$	-0.01	-36.01	0.00	5.56	-0.01	0.00	-47.61	-24.41	22	-	-	-	-	-
G1C <sub>medium</sub>	2010-04-28	15.08	181.18	0.90	33.49	13.16	16.99	109.80	252.56	17	$ST_2$	-0.05	-43.75	0.00	1.19	-0.06	-0.04	-46.26	-41.24	20	-	-	-	-	-
G1C <sub>medium</sub>	2010-05-24	10.99	301.17	0.51	29.03	9.92	12.06	239.63	362.70	18	$ST_2$	-0.07	-47.56	0.00	0.56	-0.08	-0.06	-48.73	-46.38	22	-	-	-	-	-
G1C <sub>medium</sub>	2010-06-09	11.29	154.84	1.05	26.62	9.10	13.48	99.13	210.56	21	$ST_2$	-0.07	-31.18	0.01	0.79	-0.09	-0.05	-32.81	-29.56	28	-	-	-	-	-
G1C <sub>medium</sub>	2010-07-07	5.76	467.71	1.28	74.30	3.05	8.47	310.95	624.47	19	$ST_5$	-0.04	-31.64	0.01	1.37	-0.06	-0.02	-34.51	-28.77	21	-	-	-	-	-
G1C <sub>medium</sub>	2010-07-21	15.52	275.53	2.15	41.54	10.99	20.05	188.26	362.80	20	$ST_2$	-0.05	-36.69	0.02	2.80	-0.08	-0.02	-42.45	-30.93	27	-	-	-	-	-
G1C <sub>medium</sub>	2010-08-22	15.85	72.27	0.52	7.49	14.73	16.97	56.20	88.34	16	$T_{\text{air}}$	-0.09	-43.62	0.01	1.23	-0.12	-0.06	-46.19	-41.04	21	-	-	-	-	-
G1C <sub>medium</sub>	2010-09-11	9.99	146.57	0.40	14.49	9.14	10.84	116.01	177.13	19	$T_{\text{air}}$	-0.10	-40.60	0.01	0.70	-0.12	-0.08	-42.05	-39.15	26	-	-	-	-	-
G1C <sub>medium</sub>	2010-10-29	7.76	135.15	0.44	33.85	6.81	8.70	62.02	208.28	15	$T_{\text{air}}$	-0.02	-39.42	0.00	7.00	-0.03	-0.01	-54.27	-24.57	18	-	-	-	-	-
G1C <sub>medium</sub>	2010-12-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.05	0.06	0.94	1.17	9
G1C <sub>medium</sub>	2011-01-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.47	0.61	3.35	5.59	9
G1C <sub>medium</sub>	2011-01-27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.15	0.12	1.94	2.37	9
G1C <sub>medium</sub>	2011-02-07	2.45	88.93	0.11	22.55	2.20	2.69	39.80	138.06	14	$T_{\text{air}}$	0.00	-1.86	0.00	0.95	-0.01	0.00	-4.30	0.57	7	-	-	-	-	-
G1C <sub>medium</sub>	2011-03-09	6.23	275.39	1.00	52.83	4.13	8.34	164.39	386.38	20	$ST_2$	0.00	-4.13	0.00	0.32	-0.01	0.00	-4.80	-3.46	23	-	-	-	-	-
G1C <sub>medium</sub>	2011-03-29	7.86	273.58	0.32	36.32	7.19	8.53	196.94	350.21	19	$ST_2$	-0.02	-20.96	0.00	0.71	-0.02	-0.02	-22.42	-19.50	28	-	-	-	-	-
G1C <sub>medium</sub>	2011-04-20	12.07	108.27	0.54	16.87	10.95	13.19	72.97	143.58	21	$T_{\text{air}}$	-0.04	-31.53	0.01	1.33	-0.06	-0.03	-34.26	-28.80	30	-	-	-	-	-
G1C <sub>medium</sub>	2011-05-10	17.04	139.74	0.59	14.65	15.81	18.28	109.08	170.39	21	$ST_2$	-0.04	-37.61	0.01	1.32	-0.05	-0.03	-40.31	-34.91	31	-	-	-	-	-
G1C <sub>medium</sub>	2011-06-21	7.30	428.58	1.09	89.72	4.64	9.96	209.05	648.11	12	$ST_{10}$	-0.08	-45.56	0.01	1.71	-0.11	-0.06	-49.22	-41.90	16	-	-	-	-	-
G1C <sub>medium</sub>	2011-06-28	15.68	132.75	1.68	27.44	12.17	19.19	75.31	190.19	21	$T_{\text{air}}$	-0.08	-45.52	0.01	0.98	-0.10	-0.06	-47.53	-43.51	30	-	-	-	-	-
G1C <sub>medium</sub>	2011-07-26	13.64	100.63	0.63	14.36	12.35	14.93	70.98	130.27	26	$T_{\text{air}}$	-0.09	-41.98	0.01	0.91	-0.11	-0.07	-43.82	-40.14	35	-	-	-	-	-
G1C <sub>medium</sub>	2011-08-17	15.17	77.85	0.57	10.18	13.97	16.38	56.36	99.34	19	$T_{\text{air}}$	-0.08	-42.61	0.01	0.93	-0.10	-0.06	-44.51	-40.71	29	-	-	-	-	-
G1C <sub>medium</sub>	2011-09-16	13.34	52.50	0.30	7.79	12.70	13.98	35.99	69.01	18	$T_{\text{air}}$	-0.03	-11.37	0.01	1.05	-0.05	0.00	-13.55	-9.19	22	-	-	-	-	-
G1C <sub>medium</sub>	2011-10-16	9.60	177.01	0.20	19.33	9.17	10.02	136.22	217.80	19	$ST_2$	-0.03	-40.11	0.00	2.74	-0.04	-0.02	-45.83	-34.39	22	-	-	-	-	-
G1C <sub>medium</sub>	2011-12-15	-	-	-	-	-	-	-	-	-	-	-0.07	-10.65	0.03	3.29	-0.15	0.01	-18.71	-2.58	8	4.19	0.31	3.61	4.77	9
G1C <sub>medium</sub>	2012-01-12	10.80	447.23	2.23	73.24	5.95	15.66	287.65	606.81	14	$ST_2$	-0.02	-15.99	0.01	8.09	-0.03	0.00	-33.63	1.64	14	-	-	-	-	-

**Table S6** Model parameters of the G1C<sub>high</sub> site.

Site	Date	$R_{\text{eco}}$		$GPP$								$R_{\text{eco}}$ without model													
		Std. Error		95% Confidence Limits				$n$	$model$ based on	Std. Error		95% Confidence Limits		$n$	daily mean $R_{\text{eco}}$ [ $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ]	Std. Error	95% Confidence Limits		$n$						
		$R_{\text{ref}}$	$E_0$	$R_{\text{ref}}$	$E_0$	lower $R_{\text{ref}}$	upper $R_{\text{ref}}$			lower $E_0$	upper $E_0$	$\alpha$	$GPP_{2000}$				$\alpha$	$GPP_{2000}$		lower $\alpha$	upper $\alpha$	lower $GPP_{2000}$	upper $GPP_{2000}$	lower $R_{\text{eco}}$	upper $R_{\text{eco}}$
G1C <sub>high</sub>	2010-02-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.26	0.88	1.02	1.50	6	
G1C <sub>high</sub>	2010-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.21	0.09	1.05	1.38	9	
G1C <sub>high</sub>	2010-03-24	4.87	40.00	0.20	13.63	4.45	5.28	10.95	69.06	17	$T_{\text{air}}$	-0.02	-8.91	0.01	0.47	-0.03	-0.01	-9.88	-7.94	27	-	-	-	-	-
G1C <sub>high</sub>	2010-04-06	7.75	110.35	0.61	38.27	6.46	9.05	28.78	191.92	17	$T_{\text{air}}$	-0.02	-25.30	0.00	1.27	-0.02	-0.01	-27.94	-22.65	22	-	-	-	-	-
G1C <sub>high</sub>	2010-04-28	11.39	63.78	0.53	16.12	10.26	12.53	29.20	98.36	16	$T_{\text{air}}$	-0.03	-36.67	0.01	1.48	-0.04	-0.02	-39.79	-33.55	20	-	-	-	-	-
G1C <sub>high</sub>	2010-05-24	8.94	351.02	0.72	52.71	7.36	10.51	235.00	467.04	13	$ST_2$	-0.04	-51.43	0.00	1.31	-0.05	-0.03	-54.17	-48.68	20	-	-	-	-	-
G1C <sub>high</sub>	2010-06-09	15.58	91.65	1.92	33.23	11.54	19.61	21.83	161.48	20	$T_{\text{air}}$	-0.10	-36.43	0.01	0.66	-0.12	-0.08	-37.78	-35.08	27	-	-	-	-	-
G1C <sub>high</sub>	2010-07-07	15.79	85.17	0.99	20.65	13.65	17.93	40.56	129.78	15	$T_{\text{air}}$	-0.06	-39.26	0.01	0.98	-0.07	-0.04	-41.32	-37.20	21	-	-	-	-	-
G1C <sub>high</sub>	2010-07-21	16.78	107.93	1.38	18.93	13.69	19.86	65.75	150.10	12	$T_{\text{air}}$	-0.07	-38.41	0.01	1.40	-0.09	-0.04	-41.43	-35.39	15	-	-	-	-	-
G1C <sub>high</sub>	2010-08-22	20.25	58.29	1.73	19.61	16.57	23.94	16.49	100.09	17	$T_{\text{air}}$	-0.08	-46.19	0.01	1.45	-0.11	-0.06	-49.20	-43.18	23	-	-	-	-	-
G1C <sub>high</sub>	2010-09-11	13.45	116.83	0.54	14.92	12.29	14.60	85.04	148.63	17	$T_{\text{air}}$	-0.10	-39.34	0.01	0.55	-0.11	-0.08	-40.47	-38.22	29	-	-	-	-	-
G1C <sub>high</sub>	2010-10-29	6.24	111.28	0.19	14.32	5.83	6.64	80.34	142.21	15	$T_{\text{air}}$	-0.02	-36.79	0.00	4.99	-0.03	-0.02	-47.56	-26.02	15	-	-	-	-	-
G1C <sub>high</sub>	2010-12-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.45	0.46	1.60	3.30	9	
G1C <sub>high</sub>	2011-01-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.13	0.45	1.35	2.91	9	
G1C <sub>high</sub>	2011-01-27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.16	0.18	1.82	2.50	9	
G1C <sub>high</sub>	2011-02-07	2.23	113.41	0.14	32.98	1.93	2.52	43.49	183.34	18	$T_{\text{air}}$	0.00	-5.11	0.00	0.73	0.00	0.00	-6.68	-3.54	15	-	-	-	-	-
G1C <sub>high</sub>	2011-03-08	2.45	82.00	0.16	21.30	2.10	2.80	36.61	127.40	17	$T_{\text{air}}$	0.00	-4.85	0.00	0.59	0.00	0.00	-6.10	-3.61	19	-	-	-	-	-
G1C <sub>high</sub>	2011-03-29	8.98	159.99	0.42	25.77	8.10	9.86	105.61	214.37	19	$T_{\text{air}}$	-0.03	-25.07	0.00	0.85	-0.04	-0.02	-26.83	-23.31	24	-	-	-	-	-
G1C <sub>high</sub>	2011-04-20	12.36	339.75	0.72	53.59	10.83	13.88	227.16	452.35	20	$ST_2$	-0.04	-40.50	0.00	1.27	-0.05	-0.03	-43.11	-37.89	27	-	-	-	-	-
G1C <sub>high</sub>	2011-05-10	15.68	112.87	1.13	21.06	13.32	18.05	68.94	156.80	22	$T_{\text{air}}$	-0.10	-51.21	0.01	0.80	-0.11	-0.08	-52.85	-49.58	29	-	-	-	-	-
G1C <sub>high</sub>	2011-06-21	7.49	416.41	1.63	91.65	3.87	11.12	212.20	620.62	12	$ST_2$	-0.07	-48.31	0.01	1.71	-0.09	-0.06	-51.96	-44.66	17	-	-	-	-	-
G1C <sub>high</sub>	2011-06-28	17.60	83.62	0.88	12.42	15.78	19.41	57.86	109.39	24	$T_{\text{air}}$	-0.13	-43.58	0.02	0.78	-0.16	-0.10	-45.18	-41.99	32	-	-	-	-	-
G1C <sub>high</sub>	2011-07-26	9.48	355.18	0.68	39.94	8.05	10.90	271.57	438.78	21	$ST_2$	-0.09	-43.69	0.01	0.79	-0.11	-0.08	-45.29	-42.08	35	-	-	-	-	-
G1C <sub>high</sub>	2011-08-18	11.24	219.60	1.16	34.20	8.80	13.68	147.74	291.46	20	$ST_2$	-0.09	-42.79	0.01	0.68	-0.11	-0.07	-44.19	-41.39	28	-	-	-	-	-
G1C <sub>high</sub>	2011-09-16	7.45	285.14	0.49	48.61	6.42	8.48	183.02	387.26	20	$ST_5$	-0.01	-9.15	0.01	1.06	-0.03	0.00	-11.35	-6.95	24	-	-	-	-	-
G1C <sub>high</sub>	2011-10-16	8.24	437.52	0.60	113.76	6.85	9.62	175.19	699.84	10	$ST_5$	-0.03	-27.09	0.00	1.05	-0.03	-0.02	-29.37	-24.81	14	-	-	-	-	-
G1C <sub>high</sub>	2011-12-15	-	-	-	-	-	-	-	-	-	-	-0.06	-15.15	0.01	3.28	-0.08	-0.04	22.91	-7.39	9	2.98	0.31	2.40	3.55	9
G1C <sub>high</sub>	2012-01-12	13.31	525.53	3.73	127.91	5.18	21.45	246.82	804.23	14	$ST_2$	-0.03	-23.67	0.00	1.76	-0.03	-0.02	-27.51	-19.82	14	-	-	-	-	-

**Table S7** Model parameters of the G2C<sub>medium</sub> site.

Site	Date	$R_{\text{ECCO}}$				GPP							$R_{\text{ECCO}}$ without model												
		Std. Error		95% Confidence Limits		$n$	<i>model based on</i>	Std. Error		95% Confidence Limits		$n$	daily mean $R_{\text{ECCO}}$ [ $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ]	Std. Error $R_{\text{ECCO}}$	95% Confidence Limits		$n$								
		$R_{\text{ref}}$	$E_0$	lower $R_{\text{ref}}$	upper $R_{\text{ref}}$			lower $E_0$	upper $E_0$	$\alpha$	GPP <sub>2000</sub>				lower $\alpha$	upper $\alpha$		lower GPP <sub>2000</sub>	upper GPP <sub>2000</sub>	lower $R_{\text{ECCO}}$	upper $R_{\text{ECCO}}$				
G2C <sub>medium</sub>	2010-02-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.53	0.09	1.36	1.71	6	
G2C <sub>medium</sub>	2010-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.14	0.16	1.85	2.43	9	
G2C <sub>medium</sub>	2010-03-24	5.65	72.15	0.12	11.65	5.36	5.94	44.61	99.69	9	$T_{\text{air}}$	-0.01	-16.82	0.00	3.81	-0.01	-0.01	-25.06	-8.58	15	-	-	-	-	-
G2C <sub>medium</sub>	2010-04-06	7.19	419.60	0.26	47.88	6.63	7.74	318.09	521.11	18	$ST_2$	-0.01	-34.75	0.00	4.77	-0.01	0.00	-44.69	-24.80	22	-	-	-	-	-
G2C <sub>medium</sub>	2010-04-28	11.73	191.24	0.95	28.69	9.71	13.74	130.09	252.39	17	$T_{\text{air}}$	-0.04	-45.59	0.01	3.03	-0.05	-0.02	-51.99	-39.20	19	-	-	-	-	-
G2C <sub>medium</sub>	2010-05-24	13.14	93.72	0.52	11.74	12.03	14.25	68.84	118.61	18	$T_{\text{air}}$	-0.08	-52.31	0.01	1.03	-0.10	-0.07	-54.44	-50.17	22	-	-	-	-	-
G2C <sub>medium</sub>	2010-06-09	11.75	109.05	1.14	25.24	9.31	14.18	54.91	163.19	16	$T_{\text{air}}$	-0.07	-26.29	0.01	0.79	-0.09	-0.04	-27.93	-24.66	25	-	-	-	-	-
G2C <sub>medium</sub>	2010-07-07	-	-	-	-	-	-	-	-	-	-	-0.14	-31.20	0.04	1.30	-0.22	-0.06	-33.93	-28.46	20	20.37	0.86	18.72	22.01	18
G2C <sub>medium</sub>	2010-07-21	19.26	112.06	1.64	21.33	14.99	23.53	56.20	167.93	20	$T_{\text{air}}$	-0.05	-32.41	0.02	4.16	-0.09	0.00	-41.02	-23.80	25	-	-	-	-	-
G2C <sub>medium</sub>	2010-08-22	11.75	273.86	1.02	37.89	9.59	13.91	193.53	354.19	18	$ST_5$	-0.10	-42.30	0.01	0.80	-0.12	-0.08	-43.97	-40.63	21	-	-	-	-	-
G2C <sub>medium</sub>	2010-09-11	10.70	106.79	0.41	14.14	9.84	11.57	76.96	136.63	19	$T_{\text{air}}$	-0.12	-39.73	0.01	0.52	-0.14	-0.10	-40.81	-38.64	26	-	-	-	-	-
G2C <sub>medium</sub>	2010-10-29	8.51	222.39	0.48	40.84	7.48	9.55	134.17	310.61	15	$ST_2$	-0.03	-42.97	0.00	5.23	-0.03	-0.02	-54.01	-31.94	19	-	-	-	-	-
G2C <sub>medium</sub>	2010-12-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.44	0.12	1.22	1.66	9	
G2C <sub>medium</sub>	2011-01-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.26	0.40	2.52	4.01	9	
G2C <sub>medium</sub>	2011-01-27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.30	0.09	2.14	2.46	9	
G2C <sub>medium</sub>	2011-02-07	2.31	29.03	0.05	9.46	2.20	2.42	8.20	49.86	13	$T_{\text{air}}$	0.00	-3.29	0.00	2.12	-0.01	0.00	-7.88	1.29	15	-	-	-	-	-
G2C <sub>medium</sub>	2011-03-09	9.46	387.53	2.50	87.27	4.16	14.76	202.53	572.54	18	$ST_2$	0.00	-3.58	0.00	0.69	-0.01	0.00	-5.02	-2.14	23	-	-	-	-	-
G2C <sub>medium</sub>	2011-03-29	7.33	265.06	0.18	21.50	6.96	7.71	220.06	310.05	21	$ST_2$	-0.02	-25.22	0.00	0.89	-0.03	-0.02	-27.04	-23.40	28	-	-	-	-	-
G2C <sub>medium</sub>	2011-04-20	11.59	171.79	0.39	19.77	10.78	12.40	130.55	213.03	22	$ST_2$	-0.04	-42.66	0.00	1.46	-0.05	-0.03	-45.65	-39.66	29	-	-	-	-	-
G2C <sub>medium</sub>	2011-05-10	17.16	73.71	0.67	11.51	15.78	18.54	49.90	97.53	25	$T_{\text{air}}$	-0.08	-45.86	0.01	1.39	-0.11	-0.06	-48.71	-43.00	31	-	-	-	-	-
G2C <sub>medium</sub>	2011-06-21	11.94	216.47	0.91	29.21	9.95	13.93	152.83	280.10	14	$ST_2$	-0.10	-62.80	0.01	2.04	-0.12	-0.07	-67.21	-58.40	15	-	-	-	-	-
G2C <sub>medium</sub>	2011-06-28	17.53	95.90	0.82	12.36	15.83	19.22	70.26	121.53	24	$T_{\text{air}}$	-0.13	-48.98	0.01	0.91	-0.16	-0.10	-50.84	-47.12	32	-	-	-	-	-
G2C <sub>medium</sub>	2011-07-26	9.43	340.97	0.56	28.40	8.28	10.58	282.35	399.59	26	$ST_2$	-0.11	-41.73	0.01	0.69	-0.13	-0.09	-43.14	-40.31	35	-	-	-	-	-
G2C <sub>medium</sub>	2011-08-17	14.31	126.80	1.45	29.90	11.27	17.35	63.99	189.61	20	$ST_2$	-0.10	-47.49	0.01	0.57	-0.12	-0.09	-48.66	-46.31	26	-	-	-	-	-
G2C <sub>medium</sub>	2011-09-16	13.49	102.46	0.44	10.71	12.57	14.40	79.96	124.96	20	$T_{\text{air}}$	-0.01	-14.22	0.00	1.23	-0.02	-0.01	-16.79	-11.65	22	-	-	-	-	-
G2C <sub>medium</sub>	2011-10-16	10.69	71.95	0.13	6.59	10.41	10.97	58.04	85.86	19	$T_{\text{air}}$	-0.05	-38.23	0.01	1.73	-0.07	-0.04	-41.83	-34.62	22	-	-	-	-	-
G2C <sub>medium</sub>	2011-12-15	-	-	-	-	-	-	-	-	-	-	-0.08	-10.96	0.03	2.57	-0.14	-0.01	-17.26	-4.67	8	4.15	0.42	3.36	4.93	9
G2C <sub>medium</sub>	2012-01-12	3.97	153.98	0.67	64.04	2.33	5.62	-2.72	310.67	8	$T_{\text{air}}$	-0.03	-14.57	0.00	1.33	-0.03	-0.02	-18.80	-10.33	5	-	-	-	-	-



**Table S8** Model parameters of the G2C<sub>high</sub> site.

Site	Date	$R_{\text{Eco}}$				$GPP$											$R_{\text{Eco}}$ without model								
		Std. Error		95% Confidence Limits		$\alpha$	Std. Error		95% Confidence Limits		$n$	$\alpha$	Std. Error		95% Confidence Limits		daily mean $R_{\text{Eco}}$ [ $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ]	Std. Error	95% Confidence Limits		$n$				
		$R_{\text{net}}$	$E_0$	lower $R_{\text{net}}$	upper $R_{\text{net}}$		lower $E_0$	upper $E_0$	$GPP_{2000}$	$GPP_{2000}$			lower $\alpha$	upper $\alpha$	lower $GPP_{2000}$	upper $GPP_{2000}$			lower $R_{\text{Eco}}$	upper $R_{\text{Eco}}$					
G2C <sub>high</sub>	2010-02-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.14	0.06	1.03	1.26	6
G2C <sub>high</sub>	2010-03-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.05	0.12	1.84	2.27	9
G2C <sub>high</sub>	2010-03-24	-	-	-	-	-	-	-	-	-	-0.03	-10.99	0.01	0.63	-0.05	-0.01	-12.29	-9.69	27	6.73	0.28	6.19	7.27	21	
G2C <sub>high</sub>	2010-04-06	7.75	110.35	0.61	38.27	6.46	9.05	28.78	191.92	17	$T_{\text{air}}$	-0.02	-25.30	0.00	1.27	-0.02	-0.01	-27.94	-22.65	22	-	-	-	-	-
G2C <sub>high</sub>	2010-04-28	10.72	133.27	0.45	25.92	9.74	11.69	77.69	188.85	16	$ST_2$	-0.02	-38.83	0.00	1.90	-0.03	-0.01	-42.86	-34.80	18	-	-	-	-	-
G2C <sub>high</sub>	2010-05-24	8.93	182.53	0.98	28.95	6.75	11.11	118.03	247.04	12	$T_{\text{air}}$	-0.05	-39.66	0.00	0.98	-0.06	-0.04	-41.73	-37.60	20	-	-	-	-	-
G2C <sub>high</sub>	2010-06-09	12.92	165.80	2.65	66.35	7.34	18.50	26.40	305.20	20	$ST_2$	-0.09	-38.11	0.01	1.15	-0.12	-0.06	-40.49	-35.74	25	-	-	-	-	-
G2C <sub>high</sub>	2010-07-07	-	-	-	-	-	-	-	-	-	-	-0.09	-29.82	0.01	0.55	-0.11	-0.07	-30.99	-28.66	18	16.00	0.56	14.89	17.10	15
G2C <sub>high</sub>	2010-07-21	9.76	232.70	1.90	63.17	5.47	14.06	89.79	375.61	11	$ST_2$	-0.06	-30.86	0.01	0.93	-0.07	-0.04	-32.79	-28.93	25	-	-	-	-	-
G2C <sub>high</sub>	2010-08-22	10.06	404.98	3.24	144.78	3.15	16.97	96.40	713.57	17	$ST_2$	-0.09	-51.92	0.01	1.60	-0.12	-0.07	-55.24	-48.59	23	-	-	-	-	-
G2C <sub>high</sub>	2010-09-11	10.09	325.19	1.06	61.72	7.86	12.32	194.98	455.41	19	$ST_2$	-0.10	-36.65	0.01	1.01	-0.13	-0.07	-38.72	-34.57	29	-	-	-	-	-
G2C <sub>high</sub>	2010-10-29	6.32	125.94	0.22	17.65	5.84	6.80	87.82	164.06	15	$T_{\text{air}}$	-0.03	-38.30	0.00	4.25	-0.03	-0.02	-47.49	-29.11	15	-	-	-	-	-
G2C <sub>high</sub>	2010-12-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.99	0.20	0.63	1.36	9
G2C <sub>high</sub>	2011-01-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.89	0.50	1.97	3.81	9
G2C <sub>high</sub>	2011-01-27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.39	0.59	4.31	6.48	9
G2C <sub>high</sub>	2011-02-07	2.67	111.98	0.15	31.07	2.35	2.99	46.11	177.85	18	$T_{\text{air}}$	-0.01	-5.60	0.00	0.85	-0.01	0.00	-7.37	-3.83	23	-	-	-	-	-
G2C <sub>high</sub>	2011-03-08	2.58	67.33	0.23	25.69	2.07	3.09	11.84	122.82	15	$T_{\text{air}}$	-0.01	-5.60	0.00	0.85	-0.01	0.00	-7.37	-3.83	23	-	-	-	-	-
G2C <sub>high</sub>	2011-03-29	9.00	162.98	0.37	24.02	8.22	9.79	111.79	214.16	17	$T_{\text{air}}$	-0.04	-27.65	0.01	1.53	-0.05	-0.02	-30.82	-24.48	24	-	-	-	-	-
G2C <sub>high</sub>	2011-04-20	12.16	273.72	0.54	41.96	11.00	13.33	183.07	364.37	15	$ST_2$	-0.04	-40.82	0.01	1.66	-0.05	-0.03	-44.28	-37.37	23	-	-	-	-	-
G2C <sub>high</sub>	2011-05-10	12.93	196.63	0.76	25.47	11.33	14.54	142.88	250.38	19	$ST_2$	-0.08	-48.03	0.01	0.95	-0.09	-0.06	-49.98	-46.08	27	-	-	-	-	-
G2C <sub>high</sub>	2011-06-21	14.10	120.68	1.37	28.61	11.09	17.10	57.70	183.65	13	$T_{\text{air}}$	-0.09	-67.43	0.01	2.65	-0.12	-0.07	-73.07	-61.79	17	-	-	-	-	-
G2C <sub>high</sub>	2011-06-28	16.82	115.08	1.18	17.50	14.36	19.28	78.69	151.47	23	$T_{\text{air}}$	-0.11	-52.91	0.01	0.93	-0.14	-0.09	-54.81	-51.01	31	-	-	-	-	-
G2C <sub>high</sub>	2011-07-26	9.20	460.15	0.98	57.13	7.16	11.25	340.58	579.71	21	$ST_2$	-0.10	-53.96	0.01	0.86	-0.12	-0.09	-55.72	-52.21	36	-	-	-	-	-
G2C <sub>high</sub>	2011-08-18	17.83	78.70	1.54	21.46	14.56	21.10	33.20	124.19	18	$T_{\text{air}}$	-0.10	-49.63	0.01	1.08	-0.12	-0.07	-51.85	-47.41	27	-	-	-	-	-
G2C <sub>high</sub>	2011-09-16	8.55	345.34	0.55	47.23	7.39	9.70	245.21	445.46	18	$ST_5$	-0.01	-14.66	0.00	1.41	-0.02	-0.01	-17.59	-11.74	23	-	-	-	-	-
G2C <sub>high</sub>	2011-10-16	7.96	145.79	0.29	38.84	7.33	8.59	61.16	230.42	14	$ST_2$	-0.03	-33.96	0.00	1.67	-0.04	-0.03	-37.49	-30.43	19	-	-	-	-	-
G2C <sub>high</sub>	2011-12-15	-	-	-	-	-	-	-	-	-	-	-0.06	-20.27	0.01	3.78	-0.07	-0.04	-29.20	-11.35	9	3.40	0.15	3.12	3.68	9
G2C <sub>high</sub>	2012-01-12	7.19	248.93	1.31	76.03	4.30	10.08	81.58	416.28	13	$T_{\text{air}}$	-0.03	-18.45	0.00	1.58	-0.04	-0.02	-21.89	-15.00	14	-	-	-	-	-