

Nitrogen response of natural phytoplankton communities: a new indicator based on photosynthetic efficiency F_v/F_m

Emily Ann Saeck*, Katherine Rosemary O'Brien, Michele Astrid Burford

*Corresponding author: e.saeck@griffith.edu.au

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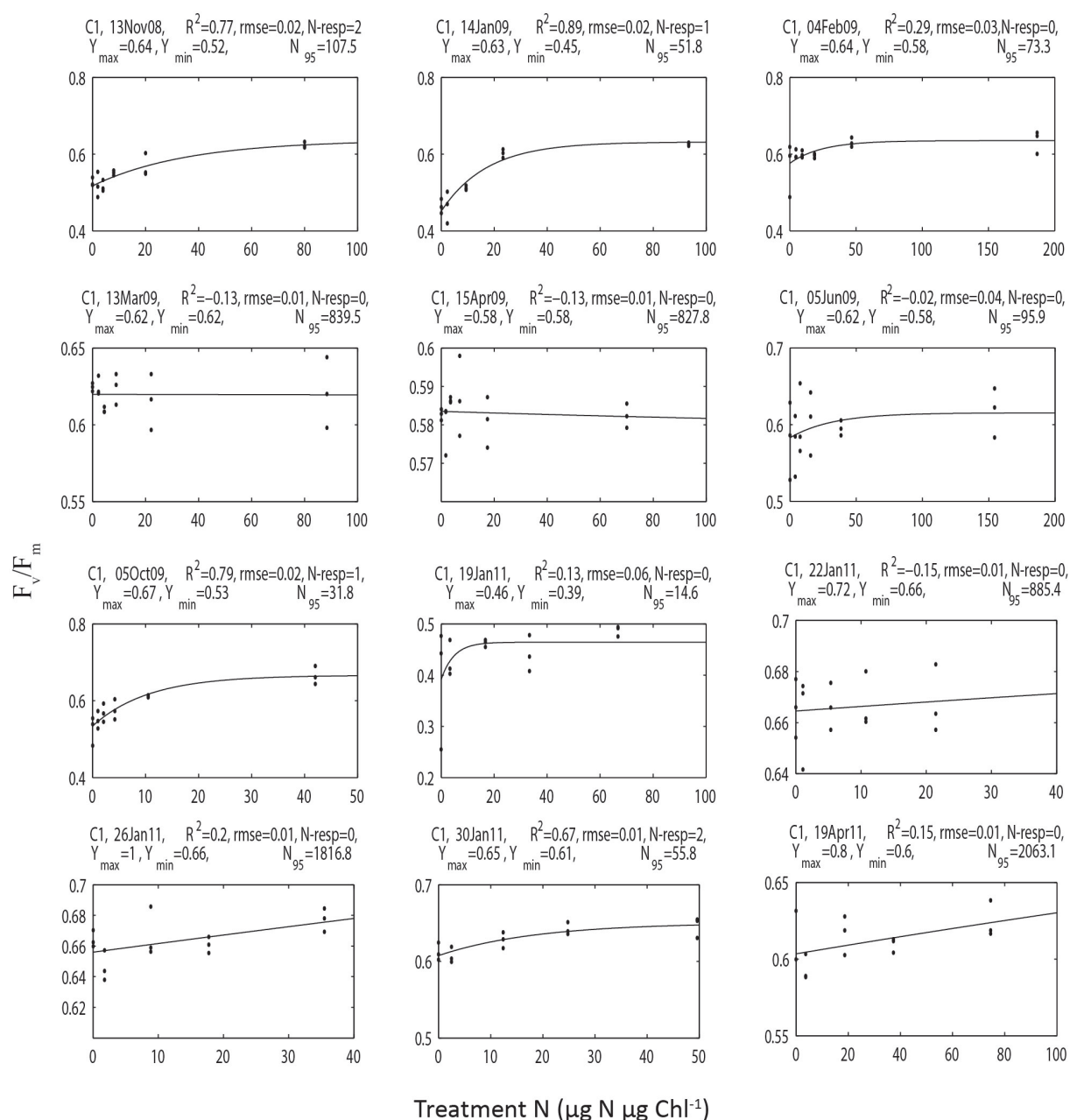


Fig. S1. F_v/F_m response curves and model results for all 52 cases. Plots show raw yield data (circles) from each bioassay and modelled data (line). The R^2 and N_{95} values for each fitted curve are also shown. The classification used for the Moreton Bay study is shown as the N -resp value, where 0 = not N -responsive, 1 = N -responsive, 2 = False negative (excluded from the spatial analysis).

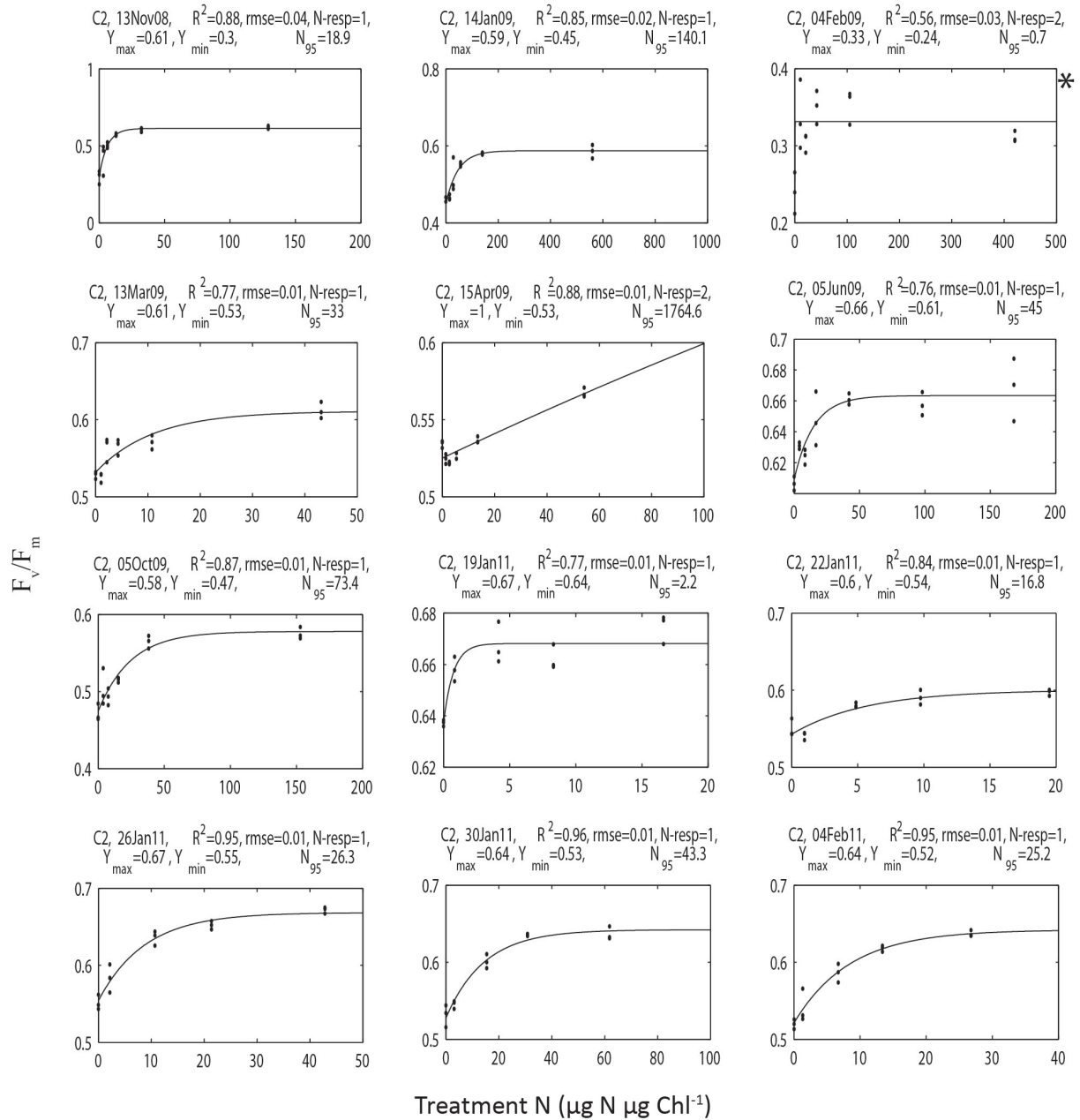


Fig. S1 (continued)

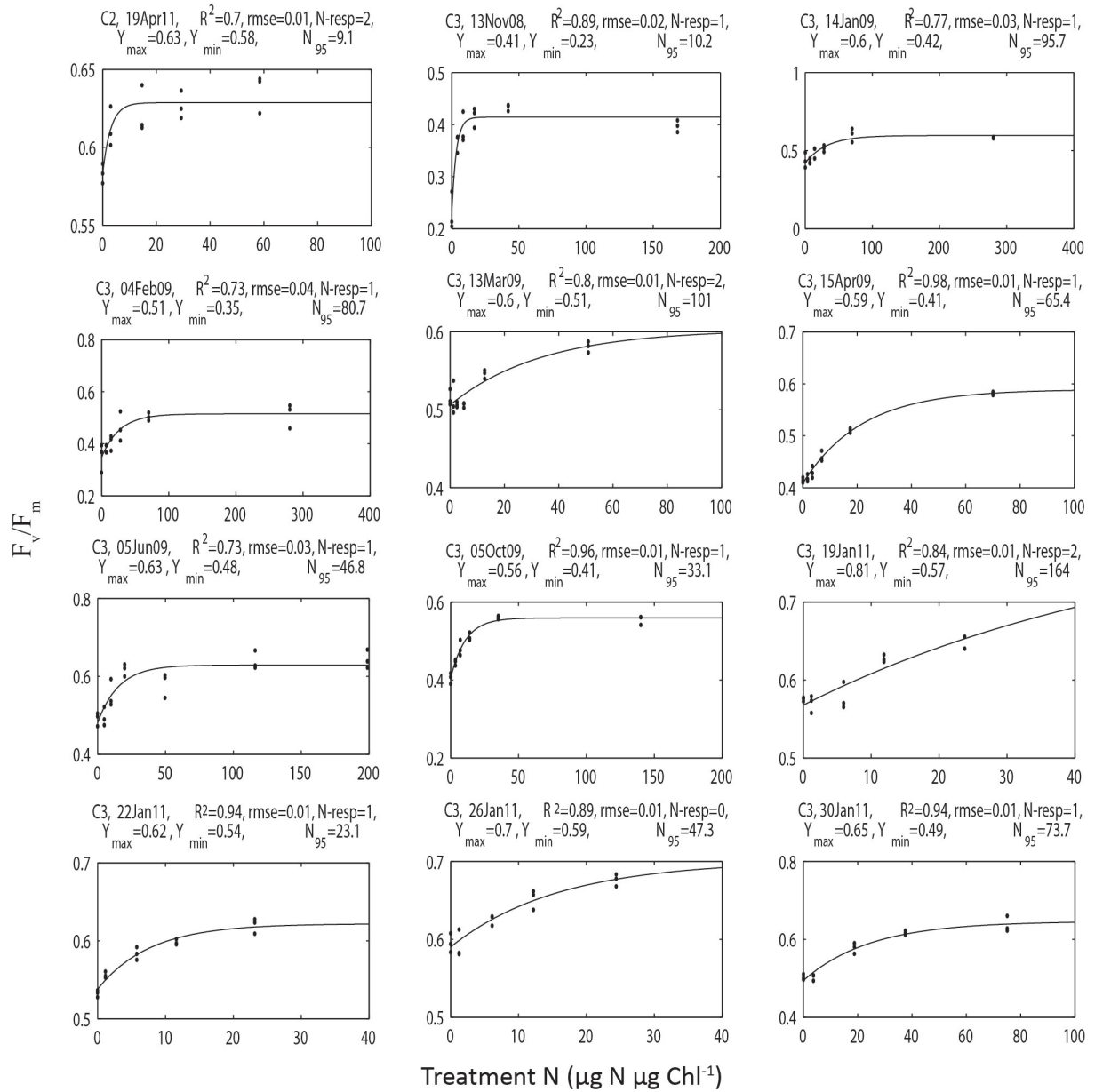


Fig. S1 (continued)

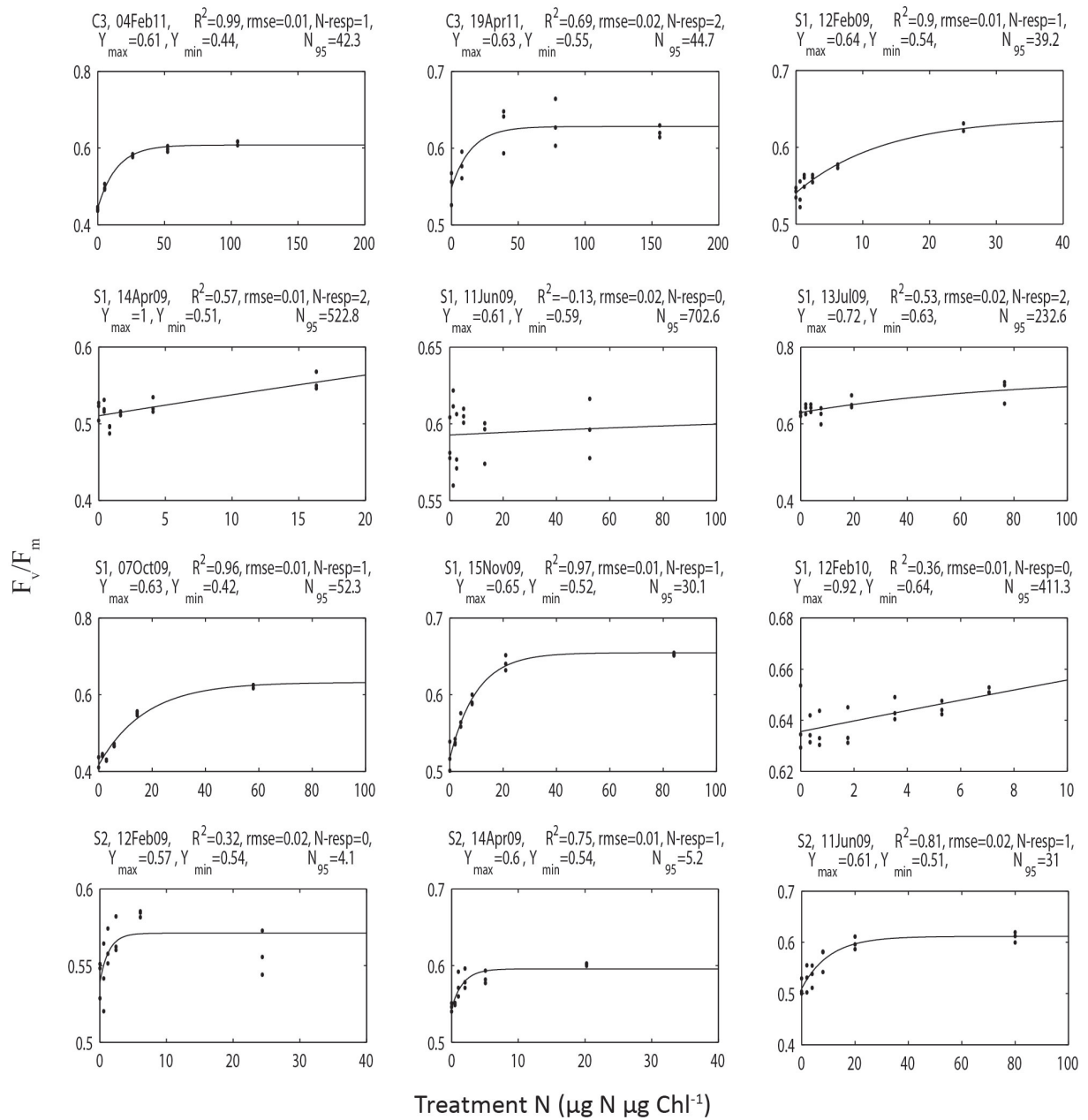


Fig. S1 (continued)

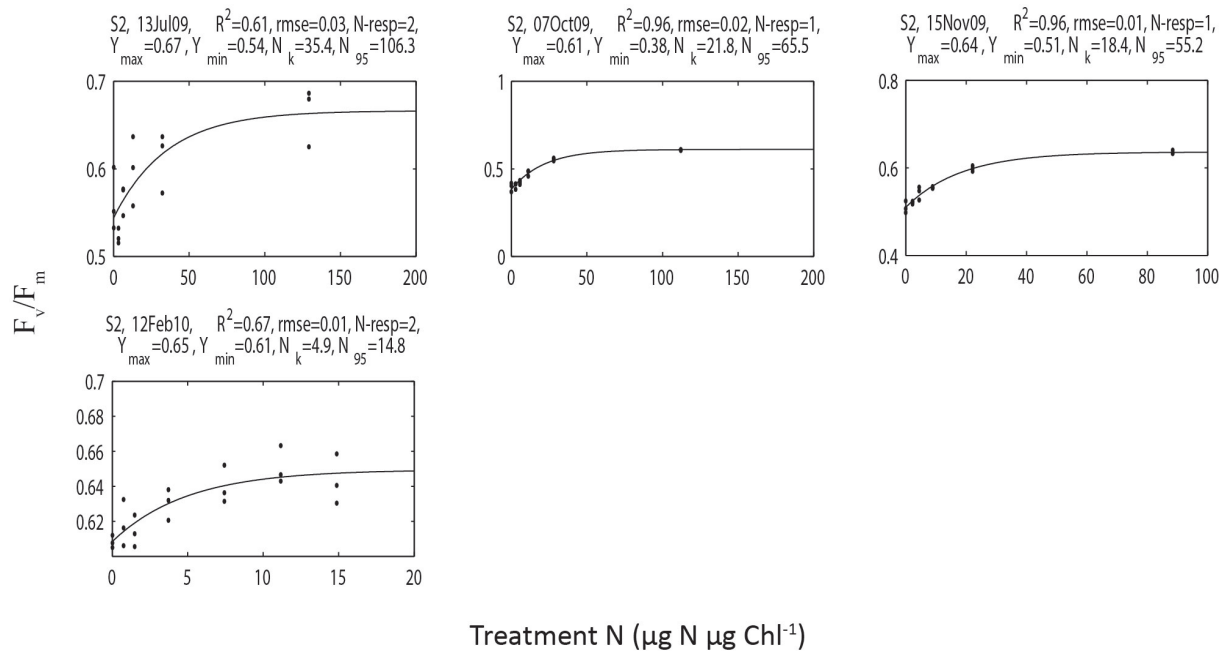


Fig. S1 (continued)

Table S1: N_{95} values used in the Moreton Bay analysis (assigned), the ANOVA results and asymptotic model output associated with all samples in this study. *Classification used for the Moreton Bay study, where 0 = not N-responsive, 1 = N-responsive, 2 = False negative (excluded from the spatial analysis).

Station	Date	Classification*	N_{95} (assigned)	Water quality		ANOVA		Asymptotic model output														
				DIN ($\mu\text{mol L}^{-1}$)	Chl a ($\mu\text{g L}^{-1}$)	ANOVA classification (limited p<.01)	P	Asymptotic model classification	$ Y_{\text{max}} > Y_{\text{min}} $	$ N_{95} > 0$	N_{95} ($\mu\text{g N } \mu\text{g Chl}^{-1}$)			Y_{max}		Y_{min}		R^2	df			
											N_{95}	95% CI lower	95% CI upper	Y_{max}	95% CI lower	95% CI upper	Y_{min}			95% CI lower	95% CI upper	
C1	13-Nov-08	2	n	0.07	2.1	N-responsive	.000	not N-responsive	✓	x	107.5	-17.4	232.5	0.64	0.58	0.69	0.52	0.50	0.53	0.80	15	
	14-Jan-09	1	51.8	0.07	1.8	N-responsive	.000	N-responsive	✓	✓	51.8	24.6	79.1	0.63	0.60	0.66	0.45	0.43	0.48	0.91	12	
	4-Feb-09	0	0.0	1.50	0.9	not N-responsive	.191	not N-responsive	✓	x	73.3	-65.1	211.8	0.64	0.60	0.67	0.58	0.55	0.61	0.37	15	
	13-Mar-09	0	0.0	6.50	1.9	not N-responsive	.653	not N-responsive	x	x	839.5	-1.5E+06	1.5E+06	0.62	-1.31	2.55	0.62	0.61	0.63	0.00	15	
	15-Apr-09	0	0.0	19.78	2.4	not N-responsive	.587	not N-responsive	x	x	827.8	-2.2E+05	2.2E+05	0.58	-0.81	1.97	0.58	0.58	0.59	0.01	15	
	5-Jun-09	0	0.0	5.14	1.1	not N-responsive	.793	not N-responsive	✓	x	95.9	-323.5	515.2	0.62	0.57	0.66	0.58	0.55	0.62	0.10	15	
	5-Oct-09	1	31.8	0.07	4.0	N-responsive	.000	N-responsive	✓	✓	31.8	7.9	55.7	0.67	0.63	0.70	0.53	0.51	0.55	0.82	15	
	19-Jan-11	0	0.0	12.96	2.5	not N-responsive	.385	not N-responsive	✓	x	14.6	-32.8	62.0	0.46	0.42	0.51	0.39	0.32	0.46	0.25	12	
	22-Jan-11	0	0.0	15.71	7.8	not N-responsive	.987	not N-responsive	x	x	885.4	-4.2E+05	4.2E+05	0.72	-23.92	25.35	0.66	0.65	0.68	0.02	12	
	26-Jan-11	0	0.0	18.92	4.7	not N-responsive	.036	not N-responsive	x	x	1.8E+03	-2.0E+05	2.1E+05	1.00	-36.71	38.71	0.66	0.64	0.67	0.31	12	
	30-Jan-11	2	n	6.03	3.4	N-responsive	.004	not N-responsive	✓	x	55.8	-22.4	134.1	0.65	0.63	0.67	0.61	0.60	0.62	0.72	12	
	19-Apr-11	0	0.0	8.66	2.3	not N-responsive	.096	not N-responsive	x	x	2.1E+03	-1.4E+05	1.4E+05	0.80	-11.78	13.39	0.60	0.59	0.62	0.27	12	
	C2	13-Nov-08	1	18.9	0.07	1.3	N-responsive	.000	N-responsive	✓	✓	18.9	10.6	27.1	0.61	0.58	0.65	0.30	0.25	0.35	0.90	15
		14-Jan-09	1	140.1	0.07	0.3	N-responsive	.000	N-responsive	✓	✓	140.1	65.5	214.6	0.59	0.57	0.61	0.45	0.43	0.47	0.87	15
4-Feb-09		2	n	0.07	0.4	N-responsive	.001	not N-responsive	✓	x	0.7	0.0	0.0	0.33	0.31	0.35	0.24	0.20	0.28	0.61	15	
13-Mar-09		1	33.0	0.50	3.9	N-responsive	.000	N-responsive	✓	✓	33.0	6.9	59.1	0.61	0.59	0.63	0.53	0.52	0.54	0.80	15	
15-Apr-09		2	n	1.64	3.1	N-responsive	.000	not N-responsive	x	x	1.8E+03	-3.7E+04	4.1E+04	1.00	-9.00	11.00	0.53	0.52	0.53	0.89	15	
5-Jun-09		1	45.0	1.36	1.0	N-responsive	.000	N-responsive	✓	✓	45.0	14.8	75.1	0.66	0.65	0.67	0.61	0.60	0.62	0.79	18	
5-Oct-09		1	73.4	0.07	1.1	N-responsive	.000	N-responsive	✓	✓	73.4	35.1	111.7	0.58	0.56	0.60	0.47	0.46	0.49	0.89	15	
19-Jan-11		1	2.2	4.28	10.1	N-responsive	.000	N-responsive	✓	✓	2.2	0.4	4.1	0.67	0.66	0.67	0.64	0.63	0.65	0.81	12	
22-Jan-11		1	16.8	1.00	8.6	N-responsive	.000	N-responsive	✓	✓	16.8	3.0	30.6	0.60	0.58	0.62	0.54	0.53	0.55	0.86	12	
26-Jan-11		1	26.3	1.11	3.9	N-responsive	.000	N-responsive	✓	✓	26.3	15.1	37.4	0.67	0.66	0.68	0.55	0.54	0.57	0.96	12	
30-Jan-11		1	43.3	2.21	2.7	N-responsive	.000	N-responsive	✓	✓	43.3	26.9	59.7	0.64	0.63	0.66	0.53	0.52	0.54	0.96	12	
4-Feb-11		1	25.2	1.25	6.3	N-responsive	.000	N-responsive	✓	✓	25.2	13.9	36.5	0.64	0.62	0.66	0.52	0.51	0.53	0.96	12	
19-Apr-11		2	n	0.64	2.9	N-responsive	.002	not N-responsive	✓	x	9.1	-0.1	18.3	0.63	0.62	0.64	0.58	0.57	0.60	0.74	12	
C3		13-Nov-08	1	10.2	0.07	1.0	N-responsive	.000	N-responsive	✓	✓	10.2	5.4	15.0	0.41	0.40	0.43	0.23	0.20	0.26	0.90	15
	14-Jan-09	1	95.7	0.07	0.6	N-responsive	.000	N-responsive	✓	✓	95.7	26.8	164.6	0.60	0.56	0.64	0.42	0.38	0.46	0.80	15	
	4-Feb-09	1	80.7	0.36	0.6	N-responsive	.002	N-responsive	✓	✓	80.7	17.2	144.3	0.51	0.48	0.55	0.35	0.31	0.39	0.76	15	
	13-Mar-09	2	n	0.57	3.3	N-responsive	.000	not N-responsive	✓	x	101.0	-55.6	257.6	0.60	0.53	0.68	0.51	0.50	0.52	0.83	15	
	15-Apr-09	1	65.4	0.29	2.4	N-responsive	.000	N-responsive	✓	✓	65.4	51.5	79.2	0.59	0.58	0.60	0.41	0.40	0.42	0.99	15	
	5-Jun-09	1	46.8	0.07	0.8	N-responsive	.000	N-responsive	✓	✓	46.8	13.5	80.2	0.63	0.60	0.65	0.48	0.44	0.52	0.76	18	
	5-Oct-09	1	33.1	0.07	1.2	N-responsive	.000	N-responsive	✓	✓	33.1	24.2	42.1	0.56	0.55	0.57	0.41	0.39	0.42	0.96	15	
	19-Jan-11	2	n	2.14	7.1	N-responsive	.000	not N-responsive	x	x	164.0	-516.2	844.2	0.81	0.00	1.62	0.57	0.55	0.58	0.86	12	
	22-Jan-11	1	23.1	1.25	7.3	N-responsive	.000	N-responsive	✓	✓	23.1	11.9	34.3	0.62	0.61	0.64	0.54	0.53	0.55	0.95	12	
	26-Jan-11	2	n	1.11	6.9	N-responsive	.000	not N-responsive	✓	x	47.3	-1.3	96.0	0.70	0.64	0.76	0.59	0.58	0.60	0.90	12	
	30-Jan-11	1	73.7	1.29	2.2	N-responsive	.000	N-responsive	✓	✓	73.7	38.9	108.4	0.65	0.62	0.67	0.49	0.48	0.51	0.95	12	
	4-Feb-11	1	42.3	1.78	1.6	N-responsive	.000	N-responsive	✓	✓	42.3	33.8	50.9	0.61	0.60	0.61	0.44	0.43	0.45	0.99	12	
	19-Apr-11	2	n	0.36	1.1	N-responsive	.005	not N-responsive	✓	x	44.7	-10.2	99.5	0.63	0.61	0.65	0.55	0.52	0.57	0.73	12	
	S1	12-Feb-09	1	39.2	0.43	6.7	N-responsive	.000	N-responsive	✓	✓	39.2	7.5	71.0	0.64	0.61	0.67	0.54	0.53	0.55	0.90	15
14-Apr-09		2	n	11.85	10.3	N-responsive	.000	not N-responsive	x	x	522.8	-2.5E+04	2.6E+04	1.00	-21.93	23.93	0.51	0.50	0.52	0.57	15	
11-Jun-09		0	0.0	7.52	3.2	not N-responsive	.803	not N-responsive	x	x	702.6	-2.2E+05	2.2E+05	0.61	-4.99	6.21	0.59	0.58	0.61	-0.13	15	
13-Jul-09		2	n	1.78	2.2	N-responsive	.008	not N-responsive	x	x	232.6	-799.1	1264.4	0.72	0.47	0.97	0.63	0.61	0.64	0.53	15	
7-Oct-09		1	52.3	0.07	2.9	N-responsive	.000	N-responsive	✓	✓	52.3	35.5	69.1	0.63	0.61	0.66	0.42	0.40	0.43	0.96	15	
15-Nov-09		1	30.1	0.29	2.0	N-responsive	.000	N-responsive	✓	✓	30.1	22.5	37.8	0.65	0.64	0.67	0.52	0.51	0.53	0.97	15	
12-Feb-10	0	0.0	6.96	23.8	not N-responsive	.097	not N-responsive	x	x	411.3	-3.5E+04	3.6E+04	0.92	-23.39	25.23	0.64	0.63	0.64	0.36	18		
S2	12-Feb-09	0	0.0	0.64	6.9	not N-responsive	.023	not N-responsive	✓	x	4.1	-2.4	10.7	0.57	0.56	0.59	0.54	0.52	0.56	0.40	15	
	14-Apr-09	1	5.2	4.57	8.3	N-responsive	.000	N-responsive	✓	✓	5.2	1.4	9.0	0.60	0.58	0.61	0.54	0.53	0.56	0.78	15	
	11-Jun-09	1	31.0	0.50	2.1	N-responsive	.000	N-responsive	✓	✓	31.0	11.2	50.8	0.61	0.59	0.63	0.51	0.49	0.53	0.84	15	
	13-Jul-09	2	n	0.07	1.3	N-responsive	.002	not N-responsive	✓	x	106.3	-20.5	233.2	0.67	0.62	0.72	0.54	0.51	0.57	0.65	15	
	7-Oct-09	1	65.5	0.07	1.5	N-responsive	.000	N-responsive	✓	✓	65.5	46.9	84.2	0.61	0.59	0.63	0.38	0.37	0.40	0.96	15	
	15-Nov-09	1	55.2	0.29	1.9	N-responsive	.000	N-responsive	✓	✓	55.2	40.2	70.1	0.64	0.62	0.65	0.51	0.50	0.52	0.97	15	
	12-Feb-10	2	n	7.60	11.3	N-responsive	.001	not N-responsive	✓	x	14.8	-2.7	32.3	0.65	0.63	0.67	0.61	0.60	0.62	0.70	18	