

DATA REPOSITORY ITEM 1

HAMPDEN BEACH AGE FRAMEWORK

The Hampden Formation has a shallow northward dip. The section was measured horizontally, dip recorded and samples collected every 50 m and the slip on all the faults estimated (Table DR1) to determine the total stratigraphic thickness.

The base of AE7 (42.3 Ma) (Huber and Quillivré, 2006) was identified between previously collected samples J42/f489 and J42/f301 based on the Lowest Occurrence (LO) of *Subbotina angiporoides* (Morgans, unpublished data). The LO of *Globigerinatheka index*, which marks the base of the Bortonian (43 Ma) (Morgans, 2004), also occurs in sample J42/f301. This indicates that at least 700ka is absent at between these samples and thus 42.3 Ma is an oldest age for this stratigraphic level. A clear Highest Occurrence (HO) of *Acarinina bullbrooki* dated at 40.5Ma (Berggren et al., 1995) is seen in sample CB05HB226. The continued occurrence of *Turborotalia frontosa* to the top of the section (in sample CB05HB250) indicates that the top of the section is younger than the (HO) of this species, dated at 39.3 Ma (Berggren et al., 1995). The relative position of both sample sets and the calculated height for the CB samples are indicated on the Hampden Beach stratigraphic column (Fig. DR1).

Long period cyclicity is observed within the long section samples, this occurs in geochemical proxies and faunal assemblages on a wavelength of ~22 m (Fig. DR2). The ratio of the wavelengths between these long period cycles and the short period cycles discussed within the paper is ~1:20, a good match to the ratio of precessional cycles (19, 22 & 23 ka) to long period eccentricity cycles (405 ka) (Laskar et al., 2004). The 405 ka cycles are believed to be the most stable Milankovitch frequency throughout the Cenozoic (Laskar et al., 2004) and thus are suitable for use in developing an age model. To deposit the observed 22 m of

sediment in 405 ka requires a sedimentation rate of 54.9 m/Ma. A simple age framework was then constructed with this sedimentation rate, using the HO of *Acarinina bullbrooki* between Sample CB05HB226 and Sample CB05HB227 as a tie point at 40.5 Ma. This gives the age at the base of the Hampden Section as 42.1 Ma and at the top as 39.3 Ma, in good agreement with the biostratigraphic constraints (Fig. DR3).

Using the age framework discussed above gives a linear sedimentation rate through the section of 5.5 cm/ka, the high-resolution sample spacing of 5 cm through the studied section therefore equates to about 0.9 ka. The stratigraphic height of the base of the studied section is estimated to be 14.3 m (0.26 Ma) above the Porongan-Bortonian boundary. Therefore the studied section, which has a total stratigraphic thickness of 3.75 m, spans the approximate period 41.8 to 41.7 Ma. It must be noted that the errors on the dates of specific samples are large, consequently only the duration of the cycles and approximate age of the studied section are discussed.

The studied section comprises samples from two trenches, the base of the second trench was traced along the bedding from the top of the first (Fig. DR4). A 15 cm overlap was sampled and the results presented in Figure 3 through this overlap are the mean results for each pair of samples (CB05HB058 & 061, 059 & 062 and 060 & 063).

REFERENCES

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Figure DR1

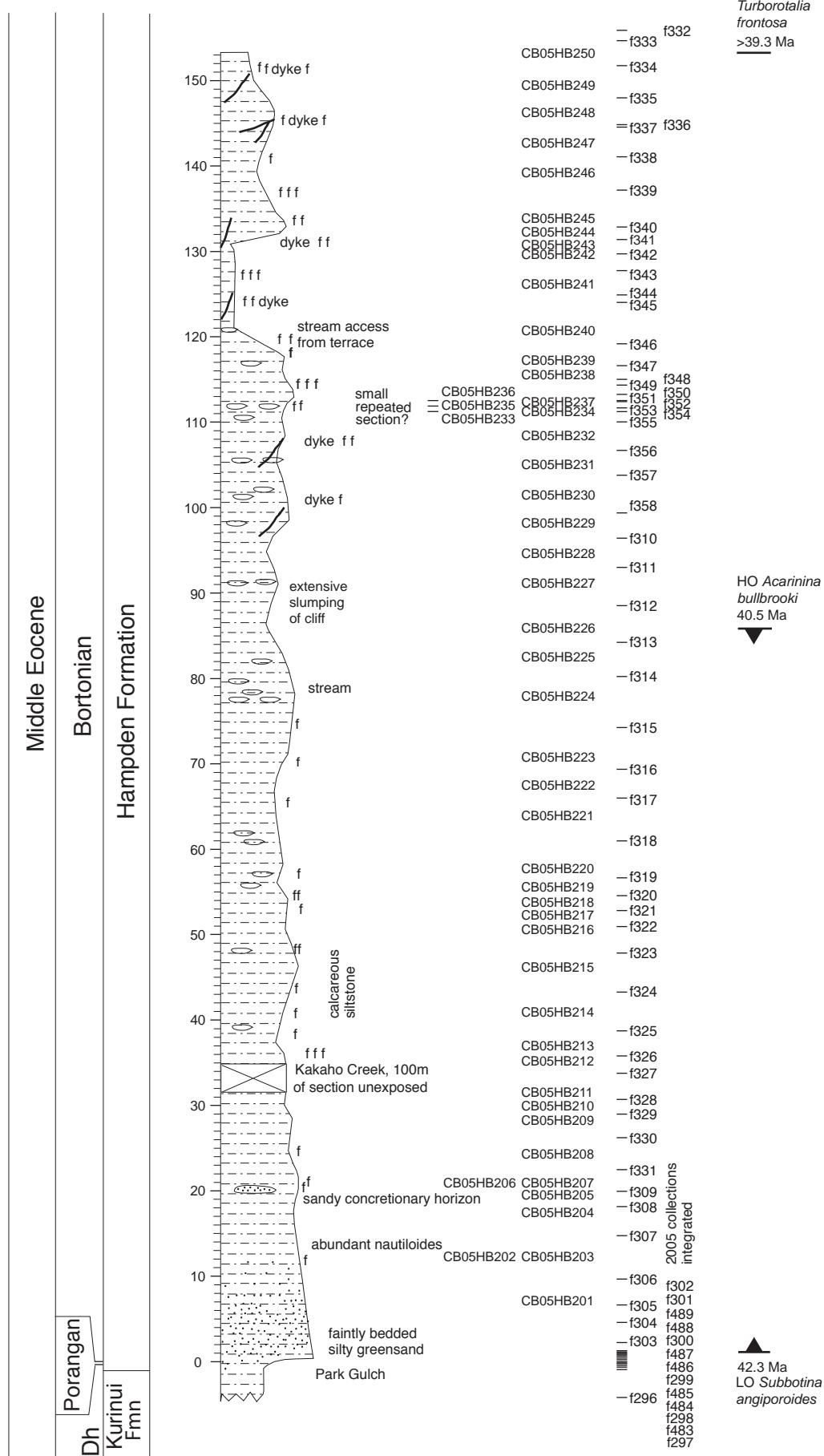


Figure DR1. Stratigraphic column of the Hampden Beach Formation showing biostratigraphic data and stratigraphic positions of samples. CB numbers are samples collected by Burgess for this study, "f" numbers are New Zealand fossil locality numbers of samples collected by Morgans. Thick black line marks the stratigraphic position of the high resolution studied section.

Figure DR2

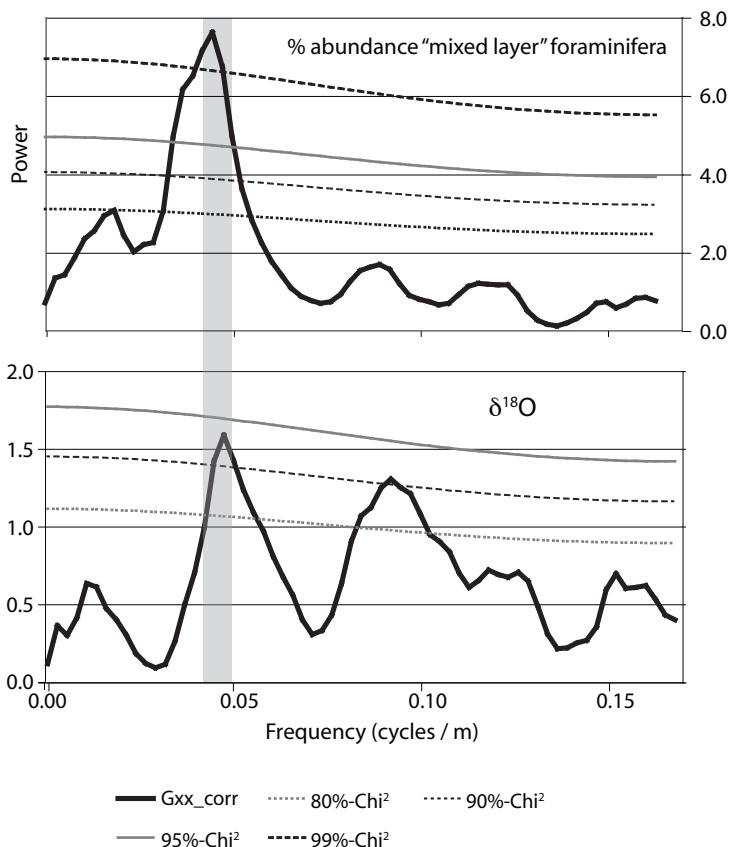


Figure DR2. Spectral analysis of long period cyclicity plotted with confidence intervals against a red noise background generated using REDFIT (Schulz and Mudelsee, 2002). Upper panel shows the % abundance of mixed layer foraminifera to sub-thermocline foraminifera and lower panel the $\delta^{18}\text{O}$ of planktonic foraminiferal carbonate. Grey band highlights the dominant cyclicity at approximately 0.045 cycle/m.

Figure DR3

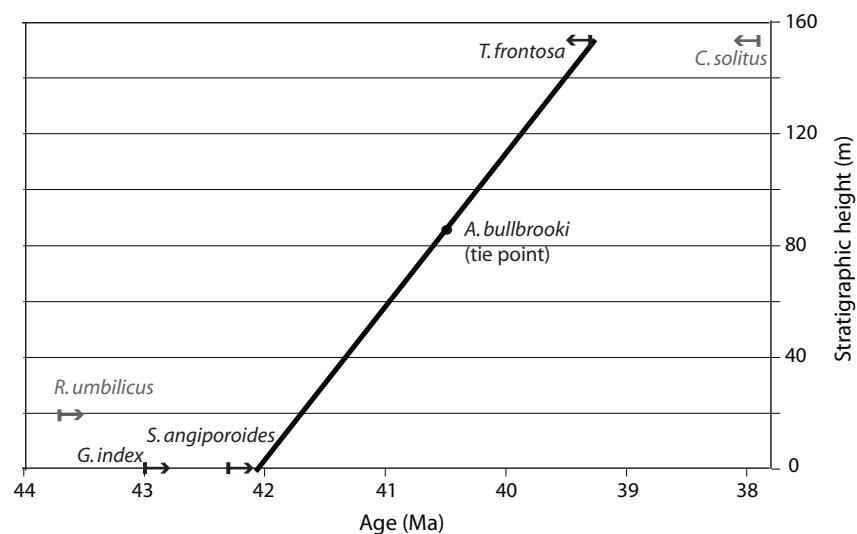


Figure DR3. Linear age-depth plot of the Hampden Formation using the cyclostratigraphic sedimentation rate of 54.87 m/Ma and the HO of *A. bullbrookii* at 40.5 Ma. The biostratigraphic data are shown as circles for a 'true' HO and lines with arrows where the LO or HO at Hampden is the top or base of the Formation and thus only provides a constraint. Foraminiferal data are shown in black and nannofossil data in grey.

Figure DR4



Figure DR4. Hampden Section, Hampden Beach, South Island, New Zealand (45°18'S 170°50'E). Samples were collected from the 3 m trench at the left of the photograph and a second site marked by the ladder at the right of the photograph.

DATA REPOSITORY ITEM 2

Figure DR5 - CALCAREOUS MICROFOSSIL PRESERVATION

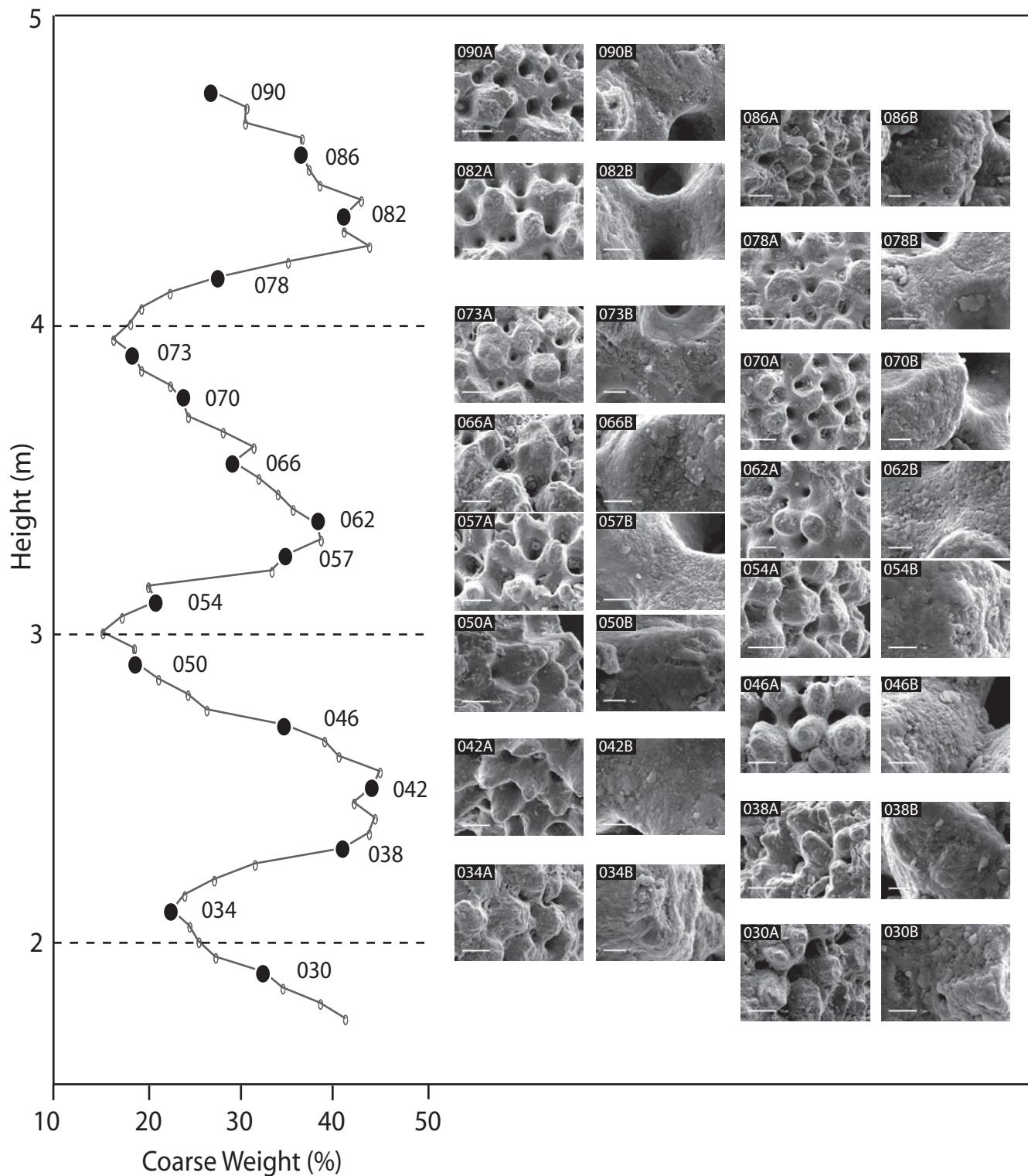


Figure DR5. High magnification scanning electron microscope photographs of typical specimens of foraminifera from the studied section. These show no systematic variability in preservation through the sedimentary cycles. Scale bar 10µm in 'A' images and 2µm in 'B' images

TABLE DR1

CB Sample No.	NZ Fossil locality No. ¹	Horizontal distance (m)	Dip (°N)	Stratigraphic height (m)	Stratigraphic height with estimated fault slip added (m)
CB05HB201	J42/f846	50	8	6.96	6.96
CB05HB202	J42/f847	100	6	12.19	12.19
CB05HB203	J42/f848	150	0	12.19	12.19
CB05HB204	J42/f849	200	6	17.41	17.41
CB05HB205	J42/f850	250	2	19.16	19.16
CB05HB206	J42/f851	300	2	20.90	20.90
CB05HB207	J42/f852	350	0	20.90	20.90
CB05HB208	J42/f853	400	4	24.39	24.39
CB05HB209	J42/f854	450	5	28.75	28.25
CB05HB210	J42/f855	500	2	30.49	29.99
CB05HB211	J42/f856	550	2	32.24	31.74
CB05HB212	J42/f857	600	4	35.72	35.22
CB05HB213	J42/f858	650	2	37.47	36.97
CB05HB214	J42/f859	700	4	40.96	40.96
CB05HB215	J42/f860	750	6	46.18	46.18
CB05HB216	J42/f861	800	6	51.41	50.41
CB05HB217	J42/f862	850	2	53.16	52.16
CB05HB218	J42/f863	900	2	54.90	53.90
CB05HB219	J42/f864	950	2	56.65	55.65
CB05HB220	J42/f865	1000	2	58.39	57.89
CB05HB221	N.A.	1050	7	64.48	63.98
CB05HB222	J42/f866	1100	4	67.97	67.47
CB05HB223	J42/f867	1150	4	71.46	70.96
CB05HB224	J42/f868	1200	8	78.42	77.92
CB05HB225	J42/f869	1250	4	81.91	82.41
CB05HB226	J42/f870	1300	4	85.39	85.89
CB05HB227	J42/f871	1350	6	90.62	91.12
CB05HB228	J42/f872	1400	4	94.11	94.61
CB05HB229	J42/f873	1450	4	97.60	98.10
CB05HB230	J42/f874	1500	4	101.08	101.58
CB05HB231	J42/f875	1550	4	104.57	105.07
CB05HB232	J42/f876	1600	4	108.06	108.56
CB05HB233	J42/f877	1650	3	110.68	111.18
CB05HB234	J42/f878	1700	0	110.68	111.18
CB05HB235	J42/f879	1750	0	110.68	111.98
CB05HB236	J42/f880	1800	4	114.16	112.46
CB05HB237	J42/f881	1850	2	115.91	112.21
CB05HB238	J42/f882	1900	4	119.40	115.70
CB05HB239	J42/f883	1950	4	122.88	117.18
CB05HB240	J42/f884	2000	4	126.37	120.67
CB05HB241	J42/f885	2050	4	129.86	126.16
CB05HB242	J42/f886	2100	4	133.35	129.65
CB05HB243	J42/f887	2150	1	134.22	130.52
CB05HB244	J42/f888	2200	2	135.97	132.27
CB05HB245	J42/f889	2250	2	137.71	134.01

CB05HB246	J42/f890	2300	6	142.94	139.24
CB05HB247	J42/f891	2350	4	146.42	142.72
CB05HB248	J42/f892	2400	4	149.91	146.21
CB05HB249	J42/f893	2450	4	153.40	149.70
CB05HB250	J42/f894	2500	4	156.89	153.19

*Geological Society of New Zealand Fossil Record File locality number. J42 refers to New Zealand Map Series (NZMS) 260, a 1:50,000 topographical map series.

†No sample collected.

Table DR1. Location of low resolution samples collected horizontally along Hampden Beach and their calculated stratigraphic height above the base of the section.

TABLE DR2

Height (m)	Coarse Weight (%)	Benthic Mg/Ca (mmol/mol)	Benthic Mg/Ca Temperature (°C)	Benthic d ¹⁸ O (‰)	Calculated d ¹⁸ Osw (‰)	Planktic d ¹⁸ O (‰)	Planktic d ¹⁸ O Temperature (°C)	TEX86	TEX-86 Temperature (°C)
1.45	34.4					-2.04	20.8		
1.50	33.7	2.53	12.0	-0.110	-1.01				
1.55	36.8	2.62	12.3	-0.053	-0.88	-1.48	18.3		
1.60	38.2			-0.234		-0.96	15.9		
1.65	40.9	2.18	10.6	-0.193	-1.40	-1.08	16.4		
1.70	43.7	2.32	11.2	-0.239	-1.32	-0.67	14.6		
1.75	41.4	2.04	10.0	-0.165	-1.50	-1.34	17.6		
1.80	38.7	2.65	12.4	-0.274	-1.07	-1.07	16.4		
1.85	34.6	2.57	12.1	-0.228	-1.09	-1.23	17.1		
1.90	32.6					-1.27	17.3	0.62	23.9
1.95	27.2			-0.239		-1.31	17.5		
2.00	25.4	2.66	12.5	-0.191	-0.99	-1.48	18.3		
2.05	24.4	2.44	11.7	-0.230	-1.20	-1.09	16.5		
2.10	22.5			-0.297		-1.01	16.2	0.63	24.5
2.15	23.8	2.47	11.8	-0.308	-1.25	-1.36	17.7		
2.20	27.1	2.22	10.8	-0.250	-1.42	-0.67	14.6		
2.25	31.5	2.60	12.2	-0.368	-1.21	-1.12	16.6		
2.30	41.2	2.49	11.9	-0.315	-1.24	-1.15	16.8	0.62	24.3
2.35	44.0	2.54	12.0	-0.360	-1.25	-1.39	17.9		
2.40	44.7	2.46	11.8	-0.360	-1.31	-1.18	16.9		
2.45	42.4	2.57	12.1	-0.377	-1.25	-1.22	17.1		
2.50	44.5	2.49	11.9	-0.375	-1.30	-1.49	18.3	0.63	24.7
2.55	45.2	2.54	12.1	-0.286	-1.17	-1.70	19.3		
2.60	40.7	2.62	12.3	-0.396	-1.22	-1.56	18.6		
2.65	39.1	2.55	12.1	-0.408	-1.29	-1.44	18.1		
2.70	34.9	2.53	12.0	-0.325	-1.22	-1.01	16.1		
2.75	26.3			-0.296		-1.23	17.1	0.61	23.4
2.80	24.2	2.78	12.9	-0.319	-1.03	-1.31	17.5		
2.85	21.0	2.57	12.2	-0.361	-1.22	-1.60	18.8		
2.90	18.6	2.54	12.1	-0.306	-1.19	-1.50	18.4		
2.95	18.3	2.57	12.1	-0.179	-1.05	-1.73	19.4	0.61	23.2
3.00	14.9	2.65	12.4	-0.227	-1.03	-1.04	16.3		
3.05	17.0	2.44	11.7	-0.211	-1.18	-1.83	19.8		
3.10	20.9	2.42	11.6	-0.319	-1.31	-1.38	17.8		
3.15	19.9	2.53	12.0	-0.314	-1.21	-1.54	18.5	0.61	23.5
3.20	33.4	2.64	12.4	-0.248	-1.06	-1.90	20.2		
3.25	35.0	2.75	12.8	-0.263	-0.99	-1.87	20.0		
3.30	38.8	2.72	12.7	-0.380	-1.13	-1.84	19.9		
3.35a	37.3	2.66	12.5	-0.383	-1.18	-1.83	19.9		
3.35b	39.5			-0.362		-1.61	18.8		
3.40a	34.8	2.42	11.6			-1.89	20.2		
3.40b	36.6	2.59	12.2	-0.363	-1.21	-1.78	19.6	0.63	24.5
3.45a	34.2	2.63	12.3	-0.471	-1.29	-1.54	18.6		
3.45b	33.9	2.66	12.5	-0.406	-1.20	-2.10	21.1		
3.50	31.9	2.41	11.6	-0.471	-1.46	-1.29	17.4		
3.55	29.2	2.63	12.4	-0.329	-1.15	-1.22	17.1		
3.60	31.4	2.80	12.9	-0.404	-1.10	-1.68	19.2	0.62	24.2
3.65	28.0	2.41	11.6	-0.345	-1.34	-1.16	16.8		
3.70	24.2	2.40	11.5	-0.317	-1.32				
3.75	23.7	2.58	12.2	-0.368	-1.22				
3.80	22.3	2.47	11.8	-0.323	-1.27	-1.35	17.7		
3.85	19.1	2.48	11.8	-0.366	-1.30	-1.09	16.5		
3.90	18.3	2.63	12.4	-0.322	-1.14	-1.70	19.3		
3.95	16.1	2.47	11.8	-0.373	-1.32	-1.15	16.8		
4.00	17.9	2.52	12.0	-0.377	-1.29	-1.44	18.1		
4.05	19.1	2.40	11.5	-0.286	-1.29	-1.32	17.6		
4.10	22.2	2.45	11.7	-0.275	-1.24	-1.50	18.3		
4.15	27.6	2.53	12.0	-0.322	-1.22	-1.60	18.8		
4.20	35.2	2.45	11.7	-0.328	-1.29			0.61	23.7
4.25	44.0	2.39	11.5	-0.363	-1.38	-1.61	18.9		
4.30	41.3	2.75	12.8	-0.356	-1.09	-1.75	19.5		
4.35	41.4	2.47	11.8	-0.425	-1.37	-1.75	19.5		
4.40	43.2	2.59	12.2	-0.422	-1.27	-1.84	19.9	0.62	23.9
4.45	38.6	2.53	12.0	-0.350	-1.25	-1.64	19.0		
4.50	37.4	2.67	12.5	-0.412	-1.20				
4.55	36.7	2.50	11.9	-0.345	-1.27	-1.33	17.6		
4.60	36.7	2.51	11.9	-0.448	-1.36	-1.23	17.1	0.61	23.5
4.65	30.5	2.57	12.2	-0.354	-1.22	-1.16	16.8		
4.70	30.6	2.73	12.7	-0.289	-1.03	-1.48	18.3		

4.75	26.9	2.70	12.6	-0.316	-1.08	-1.22	17.1		
4.80	26.9	2.69	12.6	-0.297	-1.07	-1.37	17.8	0.61	23.7
4.85	22.9	2.43	11.6	-0.148	-1.13	-1.21	17.0		
4.90	22.3	2.52	12.0	-0.257	-1.17	-1.42	18.0		
4.95	25.9	2.48	11.8	-0.221	-1.16	-0.98	16.0		
5.00	21.7	2.53	12.0	-0.254	-1.15	-1.31	17.5	0.60	23.1
5.05	23.1	2.51	11.9	-0.197	-1.11	-1.55	18.6		
5.10	18.8	2.63	12.4	-0.194	-1.01	-1.59	18.8		
5.15	22.8	2.99	13.5	-0.312	-0.87	-1.33	17.6		
5.20	20.3					-1.34	17.6	0.60	23.2

TABLE DR3

# Freq	Gxx_corr	80%-Chi2	90%-Chi2	95%-Chi2
0.000E+00	9.092E-03	1.380E-02	1.798E-02	2.198E-02
1.027E-01	1.154E-02	1.379E-02	1.798E-02	2.197E-02
2.055E-01	8.104E-03	1.377E-02	1.795E-02	2.195E-02
3.082E-01	5.830E-03	1.375E-02	1.792E-02	2.190E-02
4.110E-01	7.006E-03	1.371E-02	1.787E-02	2.184E-02
5.137E-01	9.061E-03	1.366E-02	1.781E-02	2.177E-02
6.164E-01	1.154E-02	1.361E-02	1.773E-02	2.168E-02
7.192E-01	1.540E-02	1.354E-02	1.765E-02	2.157E-02
8.219E-01	1.906E-02	1.346E-02	1.755E-02	2.145E-02
9.247E-01	2.148E-02	1.338E-02	1.744E-02	2.131E-02
1.027E+00	2.173E-02	1.328E-02	1.732E-02	2.116E-02
1.130E+00	1.956E-02	1.318E-02	1.718E-02	2.100E-02
1.233E+00	1.641E-02	1.307E-02	1.704E-02	2.083E-02
1.336E+00	1.276E-02	1.296E-02	1.689E-02	2.065E-02
1.438E+00	8.917E-03	1.284E-02	1.673E-02	2.045E-02
1.541E+00	6.626E-03	1.271E-02	1.656E-02	2.025E-02
1.644E+00	6.463E-03	1.257E-02	1.639E-02	2.003E-02
1.747E+00	6.614E-03	1.244E-02	1.621E-02	1.982E-02
1.849E+00	6.622E-03	1.229E-02	1.603E-02	1.959E-02
1.952E+00	7.314E-03	1.215E-02	1.584E-02	1.936E-02
2.055E+00	7.724E-03	1.200E-02	1.564E-02	1.912E-02
2.158E+00	7.079E-03	1.185E-02	1.545E-02	1.888E-02
2.260E+00	6.385E-03	1.170E-02	1.525E-02	1.864E-02
2.363E+00	6.004E-03	1.154E-02	1.504E-02	1.839E-02
2.466E+00	5.550E-03	1.139E-02	1.484E-02	1.814E-02
2.568E+00	5.240E-03	1.123E-02	1.464E-02	1.789E-02
2.671E+00	5.417E-03	1.107E-02	1.443E-02	1.764E-02
2.774E+00	5.874E-03	1.092E-02	1.423E-02	1.739E-02
2.877E+00	6.155E-03	1.076E-02	1.403E-02	1.714E-02
2.979E+00	6.193E-03	1.060E-02	1.382E-02	1.690E-02
3.082E+00	6.230E-03	1.045E-02	1.362E-02	1.665E-02
3.185E+00	6.247E-03	1.030E-02	1.342E-02	1.641E-02
3.288E+00	6.126E-03	1.015E-02	1.323E-02	1.617E-02
3.390E+00	6.004E-03	9.997E-03	1.303E-02	1.593E-02
3.493E+00	5.997E-03	9.850E-03	1.284E-02	1.569E-02
3.596E+00	5.875E-03	9.705E-03	1.265E-02	1.546E-02
3.699E+00	5.376E-03	9.562E-03	1.246E-02	1.524E-02
3.801E+00	4.819E-03	9.422E-03	1.228E-02	1.501E-02
3.904E+00	4.460E-03	9.285E-03	1.210E-02	1.479E-02
4.007E+00	4.082E-03	9.150E-03	1.193E-02	1.458E-02
4.110E+00	3.629E-03	9.018E-03	1.175E-02	1.437E-02
4.212E+00	3.325E-03	8.889E-03	1.159E-02	1.416E-02
4.315E+00	3.143E-03	8.763E-03	1.142E-02	1.396E-02
4.418E+00	2.928E-03	8.640E-03	1.126E-02	1.377E-02
4.521E+00	2.665E-03	8.520E-03	1.111E-02	1.357E-02
4.623E+00	2.300E-03	8.403E-03	1.095E-02	1.339E-02
4.726E+00	1.701E-03	8.289E-03	1.080E-02	1.321E-02
4.829E+00	9.263E-04	8.178E-03	1.066E-02	1.303E-02
4.932E+00	2.813E-04	8.071E-03	1.052E-02	1.286E-02
5.034E+00	1.031E-04	7.966E-03	1.038E-02	1.269E-02

5.137E+00	6.198E-04	7.865E-03	1.025E-02	1.253E-02
5.240E+00	1.823E-03	7.766E-03	1.012E-02	1.237E-02
5.342E+00	3.332E-03	7.671E-03	9.999E-03	1.222E-02
5.445E+00	4.632E-03	7.579E-03	9.879E-03	1.208E-02
5.548E+00	5.276E-03	7.490E-03	9.763E-03	1.193E-02
5.651E+00	5.067E-03	7.403E-03	9.650E-03	1.180E-02
5.753E+00	4.544E-03	7.320E-03	9.542E-03	1.166E-02
5.856E+00	4.350E-03	7.240E-03	9.437E-03	1.154E-02
5.959E+00	4.416E-03	7.162E-03	9.336E-03	1.141E-02
6.062E+00	4.622E-03	7.087E-03	9.238E-03	1.129E-02
6.164E+00	4.905E-03	7.015E-03	9.145E-03	1.118E-02
6.267E+00	4.994E-03	6.946E-03	9.055E-03	1.107E-02
6.370E+00	4.787E-03	6.880E-03	8.968E-03	1.096E-02
6.473E+00	4.377E-03	6.816E-03	8.885E-03	1.086E-02
6.575E+00	3.862E-03	6.755E-03	8.805E-03	1.076E-02
6.678E+00	3.453E-03	6.696E-03	8.729E-03	1.067E-02
6.781E+00	3.392E-03	6.640E-03	8.656E-03	1.058E-02
6.884E+00	3.738E-03	6.587E-03	8.586E-03	1.049E-02
6.986E+00	4.428E-03	6.536E-03	8.519E-03	1.041E-02
7.089E+00	5.560E-03	6.487E-03	8.456E-03	1.034E-02
7.192E+00	7.128E-03	6.441E-03	8.396E-03	1.026E-02
7.295E+00	8.629E-03	6.397E-03	8.339E-03	1.019E-02
7.397E+00	9.369E-03	6.356E-03	8.285E-03	1.013E-02
7.500E+00	8.905E-03	6.317E-03	8.234E-03	1.006E-02
7.603E+00	7.509E-03	6.280E-03	8.186E-03	1.001E-02
7.705E+00	5.692E-03	6.245E-03	8.141E-03	9.951E-03
7.808E+00	3.452E-03	6.213E-03	8.099E-03	9.899E-03
7.911E+00	1.415E-03	6.183E-03	8.059E-03	9.851E-03
8.014E+00	4.936E-04	6.155E-03	8.023E-03	9.807E-03
8.116E+00	6.230E-04	6.129E-03	7.989E-03	9.766E-03
8.219E+00	1.544E-03	6.105E-03	7.959E-03	9.728E-03
8.322E+00	2.742E-03	6.084E-03	7.930E-03	9.694E-03
8.425E+00	3.763E-03	6.064E-03	7.905E-03	9.663E-03
8.527E+00	4.688E-03	6.047E-03	7.883E-03	9.635E-03
8.630E+00	5.276E-03	6.032E-03	7.863E-03	9.611E-03
8.733E+00	5.168E-03	6.019E-03	7.845E-03	9.590E-03
8.836E+00	4.775E-03	6.008E-03	7.831E-03	9.572E-03
8.938E+00	4.742E-03	5.998E-03	7.819E-03	9.558E-03
9.041E+00	5.114E-03	5.991E-03	7.810E-03	9.546E-03
9.144E+00	5.317E-03	5.986E-03	7.803E-03	9.538E-03
9.247E+00	5.687E-03	5.983E-03	7.799E-03	9.533E-03
9.349E+00	6.560E-03	5.982E-03	7.798E-03	9.532E-03

Benthic oxygen isotope redfit analysis				
# Freq	Gxx_corr	80%-Chi2	90%-Chi2	95%-Chi2
0.000E+00	4.915E-03	2.460E-03	3.207E-03	3.920E-03
1.027E-01	4.122E-03	2.451E-03	3.195E-03	3.906E-03
2.055E-01	3.686E-03	2.425E-03	3.161E-03	3.864E-03
3.082E-01	2.919E-03	2.382E-03	3.105E-03	3.796E-03
4.110E-01	2.309E-03	2.325E-03	3.031E-03	3.704E-03
5.137E-01	2.115E-03	2.255E-03	2.940E-03	3.594E-03
6.164E-01	1.913E-03	2.176E-03	2.836E-03	3.467E-03

7.192E-01	1.922E-03	2.089E-03	2.723E-03	3.329E-03
8.219E-01	2.304E-03	1.997E-03	2.604E-03	3.183E-03
9.247E-01	2.472E-03	1.903E-03	2.481E-03	3.032E-03
1.027E+00	2.194E-03	1.808E-03	2.357E-03	2.880E-03
1.130E+00	1.759E-03	1.713E-03	2.233E-03	2.730E-03
1.233E+00	1.219E-03	1.621E-03	2.113E-03	2.583E-03
1.336E+00	6.561E-04	1.532E-03	1.997E-03	2.441E-03
1.438E+00	2.646E-04	1.446E-03	1.885E-03	2.304E-03
1.541E+00	1.004E-04	1.365E-03	1.779E-03	2.174E-03
1.644E+00	1.160E-04	1.287E-03	1.678E-03	2.051E-03
1.747E+00	2.085E-04	1.215E-03	1.583E-03	1.935E-03
1.849E+00	2.941E-04	1.146E-03	1.494E-03	1.827E-03
1.952E+00	3.395E-04	1.083E-03	1.411E-03	1.725E-03
2.055E+00	3.306E-04	1.023E-03	1.333E-03	1.630E-03
2.158E+00	2.947E-04	9.673E-04	1.261E-03	1.541E-03
2.260E+00	2.732E-04	9.154E-04	1.193E-03	1.459E-03
2.363E+00	2.591E-04	8.672E-04	1.130E-03	1.382E-03
2.466E+00	2.299E-04	8.224E-04	1.072E-03	1.310E-03
2.568E+00	1.886E-04	7.806E-04	1.018E-03	1.244E-03
2.671E+00	1.463E-04	7.418E-04	9.670E-04	1.182E-03
2.774E+00	1.065E-04	7.057E-04	9.199E-04	1.124E-03
2.877E+00	7.632E-05	6.721E-04	8.761E-04	1.071E-03
2.979E+00	6.256E-05	6.408E-04	8.353E-04	1.021E-03
3.082E+00	6.430E-05	6.117E-04	7.973E-04	9.746E-04
3.185E+00	7.382E-05	5.845E-04	7.619E-04	9.313E-04
3.288E+00	8.044E-05	5.591E-04	7.289E-04	8.909E-04
3.390E+00	8.630E-05	5.355E-04	6.980E-04	8.532E-04
3.493E+00	1.014E-04	5.134E-04	6.692E-04	8.180E-04
3.596E+00	1.303E-04	4.927E-04	6.422E-04	7.850E-04
3.699E+00	1.757E-04	4.733E-04	6.170E-04	7.542E-04
3.801E+00	2.307E-04	4.552E-04	5.934E-04	7.253E-04
3.904E+00	2.819E-04	4.382E-04	5.712E-04	6.982E-04
4.007E+00	3.264E-04	4.223E-04	5.505E-04	6.728E-04
4.110E+00	3.599E-04	4.073E-04	5.310E-04	6.490E-04
4.212E+00	3.644E-04	3.933E-04	5.126E-04	6.266E-04
4.315E+00	3.448E-04	3.801E-04	4.954E-04	6.056E-04
4.418E+00	3.372E-04	3.676E-04	4.792E-04	5.858E-04
4.521E+00	3.552E-04	3.559E-04	4.639E-04	5.671E-04
4.623E+00	3.680E-04	3.449E-04	4.496E-04	5.495E-04
4.726E+00	3.501E-04	3.345E-04	4.360E-04	5.330E-04
4.829E+00	3.110E-04	3.247E-04	4.232E-04	5.173E-04
4.932E+00	2.636E-04	3.154E-04	4.112E-04	5.026E-04
5.034E+00	2.138E-04	3.067E-04	3.998E-04	4.886E-04
5.137E+00	1.710E-04	2.984E-04	3.890E-04	4.755E-04
5.240E+00	1.507E-04	2.906E-04	3.788E-04	4.630E-04
5.342E+00	1.565E-04	2.832E-04	3.692E-04	4.512E-04
5.445E+00	1.751E-04	2.762E-04	3.600E-04	4.401E-04
5.548E+00	2.032E-04	2.696E-04	3.514E-04	4.295E-04
5.651E+00	2.375E-04	2.633E-04	3.432E-04	4.195E-04
5.753E+00	2.607E-04	2.574E-04	3.355E-04	4.100E-04
5.856E+00	2.686E-04	2.517E-04	3.281E-04	4.011E-04
5.959E+00	2.560E-04	2.464E-04	3.212E-04	3.926E-04
6.062E+00	2.095E-04	2.413E-04	3.146E-04	3.845E-04
6.164E+00	1.429E-04	2.365E-04	3.083E-04	3.768E-04

6.267E+00	8.134E-05	2.320E-04	3.024E-04	3.696E-04
6.370E+00	3.979E-05	2.276E-04	2.967E-04	3.627E-04
6.473E+00	2.777E-05	2.235E-04	2.914E-04	3.562E-04
6.575E+00	3.776E-05	2.197E-04	2.863E-04	3.500E-04
6.678E+00	5.415E-05	2.160E-04	2.815E-04	3.441E-04
6.781E+00	6.281E-05	2.125E-04	2.770E-04	3.386E-04
6.884E+00	5.536E-05	2.092E-04	2.727E-04	3.333E-04
6.986E+00	4.188E-05	2.061E-04	2.686E-04	3.283E-04
7.089E+00	3.616E-05	2.031E-04	2.647E-04	3.236E-04
7.192E+00	4.514E-05	2.003E-04	2.611E-04	3.191E-04
7.295E+00	7.200E-05	1.976E-04	2.576E-04	3.149E-04
7.397E+00	1.151E-04	1.951E-04	2.544E-04	3.109E-04
7.500E+00	1.686E-04	1.928E-04	2.513E-04	3.071E-04
7.603E+00	2.261E-04	1.905E-04	2.484E-04	3.036E-04
7.705E+00	2.860E-04	1.884E-04	2.456E-04	3.002E-04
7.808E+00	3.334E-04	1.865E-04	2.431E-04	2.971E-04
7.911E+00	3.439E-04	1.846E-04	2.406E-04	2.941E-04
8.014E+00	3.236E-04	1.829E-04	2.384E-04	2.914E-04
8.116E+00	2.902E-04	1.812E-04	2.363E-04	2.888E-04
8.219E+00	2.370E-04	1.797E-04	2.343E-04	2.864E-04
8.322E+00	1.661E-04	1.783E-04	2.324E-04	2.841E-04
8.425E+00	1.010E-04	1.770E-04	2.307E-04	2.820E-04
8.527E+00	5.751E-05	1.758E-04	2.292E-04	2.801E-04
8.630E+00	3.664E-05	1.747E-04	2.277E-04	2.784E-04
8.733E+00	3.434E-05	1.737E-04	2.264E-04	2.768E-04
8.836E+00	4.859E-05	1.728E-04	2.252E-04	2.753E-04
8.938E+00	6.825E-05	1.720E-04	2.242E-04	2.740E-04
9.041E+00	8.436E-05	1.712E-04	2.232E-04	2.728E-04
9.144E+00	1.056E-04	1.706E-04	2.224E-04	2.718E-04
9.247E+00	1.214E-04	1.700E-04	2.216E-04	2.709E-04
9.349E+00	1.149E-04	1.696E-04	2.210E-04	2.702E-04
9.452E+00	9.941E-05	1.692E-04	2.205E-04	2.696E-04
9.555E+00	7.560E-05	1.689E-04	2.202E-04	2.691E-04
9.658E+00	4.002E-05	1.687E-04	2.199E-04	2.688E-04
9.760E+00	2.623E-05	1.686E-04	2.197E-04	2.686E-04
9.863E+00	3.049E-05	1.685E-04	2.197E-04	2.685E-04

Coarse weight% redfit analysis					
# Freq	Gxx_corr	80%-Chi2	90%-Chi2	95%-Chi2	99%-Chi2
0.000E+00	1.373E-03	3.314E-02	4.320E-02	5.281E-02	7.414E-02
7.813E-02	1.639E-03	2.666E-02	3.475E-02	4.248E-02	5.964E-02
1.563E-01	1.152E-03	1.680E-02	2.190E-02	2.677E-02	3.759E-02
2.344E-01	8.868E-04	1.040E-02	1.355E-02	1.657E-02	2.326E-02
3.125E-01	6.920E-04	6.781E-03	8.839E-03	1.080E-02	1.517E-02
3.906E-01	4.915E-04	4.687E-03	6.109E-03	7.468E-03	1.048E-02
4.688E-01	3.397E-04	3.403E-03	4.436E-03	5.423E-03	7.613E-03
5.469E-01	2.495E-04	2.572E-03	3.353E-03	4.098E-03	5.754E-03
6.250E-01	2.832E-04	2.007E-03	2.616E-03	3.198E-03	4.490E-03
7.031E-01	5.061E-04	1.608E-03	2.096E-03	2.561E-03	3.596E-03
7.813E-01	8.988E-04	1.315E-03	1.715E-03	2.096E-03	2.943E-03
8.594E-01	1.438E-03	1.096E-03	1.428E-03	1.746E-03	2.451E-03
9.375E-01	2.064E-03	9.267E-04	1.208E-03	1.477E-03	2.073E-03
1.016E+00	2.543E-03	7.939E-04	1.035E-03	1.265E-03	1.776E-03

1.094E+00	2.673E-03	6.877E-04	8.964E-04	1.096E-03	1.538E-03
1.172E+00	2.495E-03	6.015E-04	7.841E-04	9.585E-04	1.346E-03
1.250E+00	2.096E-03	5.307E-04	6.917E-04	8.455E-04	1.187E-03
1.328E+00	1.553E-03	4.717E-04	6.149E-04	7.516E-04	1.055E-03
1.406E+00	1.027E-03	4.221E-04	5.503E-04	6.726E-04	9.443E-04
1.484E+00	6.298E-04	3.801E-04	4.954E-04	6.056E-04	8.502E-04
1.563E+00	3.770E-04	3.441E-04	4.485E-04	5.482E-04	7.696E-04
1.641E+00	2.529E-04	3.130E-04	4.080E-04	4.987E-04	7.002E-04
1.719E+00	2.065E-04	2.861E-04	3.729E-04	4.558E-04	6.399E-04
1.797E+00	1.892E-04	2.625E-04	3.422E-04	4.183E-04	5.872E-04
1.875E+00	1.824E-04	2.418E-04	3.152E-04	3.853E-04	5.409E-04
1.953E+00	1.724E-04	2.235E-04	2.914E-04	3.562E-04	5.000E-04
2.031E+00	1.534E-04	2.073E-04	2.702E-04	3.303E-04	4.637E-04
2.109E+00	1.306E-04	1.928E-04	2.514E-04	3.072E-04	4.314E-04
2.188E+00	1.052E-04	1.799E-04	2.345E-04	2.866E-04	4.024E-04
2.266E+00	7.601E-05	1.682E-04	2.193E-04	2.680E-04	3.763E-04
2.344E+00	4.717E-05	1.577E-04	2.056E-04	2.513E-04	3.528E-04
2.422E+00	2.455E-05	1.482E-04	1.932E-04	2.361E-04	3.315E-04
2.500E+00	1.081E-05	1.396E-04	1.819E-04	2.224E-04	3.122E-04
2.578E+00	5.044E-06	1.317E-04	1.717E-04	2.099E-04	2.946E-04
2.656E+00	6.457E-06	1.245E-04	1.623E-04	1.984E-04	2.785E-04
2.734E+00	1.397E-05	1.179E-04	1.537E-04	1.879E-04	2.638E-04
2.813E+00	2.462E-05	1.119E-04	1.459E-04	1.783E-04	2.503E-04
2.891E+00	3.525E-05	1.064E-04	1.386E-04	1.695E-04	2.379E-04
2.969E+00	4.324E-05	1.012E-04	1.320E-04	1.613E-04	2.264E-04
3.047E+00	4.630E-05	9.650E-05	1.258E-04	1.538E-04	2.159E-04
3.125E+00	4.396E-05	9.211E-05	1.201E-04	1.468E-04	2.061E-04
3.203E+00	3.914E-05	8.805E-05	1.148E-04	1.403E-04	1.970E-04
3.281E+00	3.464E-05	8.427E-05	1.099E-04	1.343E-04	1.885E-04
3.359E+00	2.997E-05	8.076E-05	1.053E-04	1.287E-04	1.807E-04
3.438E+00	2.421E-05	7.748E-05	1.010E-04	1.235E-04	1.733E-04
3.516E+00	1.828E-05	7.442E-05	9.701E-05	1.186E-04	1.665E-04
3.594E+00	1.301E-05	7.156E-05	9.328E-05	1.140E-04	1.601E-04
3.672E+00	8.330E-06	6.888E-05	8.979E-05	1.097E-04	1.541E-04
3.750E+00	4.672E-06	6.637E-05	8.651E-05	1.057E-04	1.485E-04
3.828E+00	2.555E-06	6.401E-05	8.344E-05	1.020E-04	1.432E-04
3.906E+00	1.797E-06	6.179E-05	8.055E-05	9.846E-05	1.382E-04
3.984E+00	1.968E-06	5.971E-05	7.783E-05	9.513E-05	1.336E-04
4.063E+00	2.658E-06	5.774E-05	7.527E-05	9.200E-05	1.292E-04
4.141E+00	3.438E-06	5.589E-05	7.285E-05	8.905E-05	1.250E-04
4.219E+00	4.015E-06	5.414E-05	7.057E-05	8.626E-05	1.211E-04
4.297E+00	4.460E-06	5.249E-05	6.842E-05	8.363E-05	1.174E-04
4.375E+00	4.950E-06	5.092E-05	6.638E-05	8.114E-05	1.139E-04
4.453E+00	5.517E-06	4.944E-05	6.445E-05	7.878E-05	1.106E-04
4.531E+00	6.111E-06	4.804E-05	6.262E-05	7.655E-05	1.075E-04
4.609E+00	6.612E-06	4.671E-05	6.089E-05	7.443E-05	1.045E-04
4.688E+00	6.900E-06	4.545E-05	5.925E-05	7.242E-05	1.017E-04
4.766E+00	6.936E-06	4.425E-05	5.768E-05	7.051E-05	9.899E-05
4.844E+00	6.873E-06	4.311E-05	5.620E-05	6.870E-05	9.644E-05
4.922E+00	7.037E-06	4.203E-05	5.479E-05	6.697E-05	9.402E-05
5.000E+00	7.602E-06	4.100E-05	5.345E-05	6.533E-05	9.172E-05
5.078E+00	8.795E-06	4.002E-05	5.217E-05	6.377E-05	8.952E-05
5.156E+00	1.059E-05	3.909E-05	5.095E-05	6.228E-05	8.743E-05
5.234E+00	1.185E-05	3.820E-05	4.979E-05	6.086E-05	8.544E-05

5.313E+00	1.134E-05	3.735E-05	4.868E-05	5.950E-05	8.354E-05
5.391E+00	9.064E-06	3.653E-05	4.762E-05	5.821E-05	8.173E-05
5.469E+00	5.804E-06	3.576E-05	4.662E-05	5.698E-05	8.000E-05
5.547E+00	2.738E-06	3.502E-05	4.565E-05	5.580E-05	7.834E-05
5.625E+00	1.182E-06	3.432E-05	4.473E-05	5.468E-05	7.676E-05
5.703E+00	1.553E-06	3.364E-05	4.385E-05	5.360E-05	7.525E-05
5.781E+00	3.118E-06	3.299E-05	4.301E-05	5.257E-05	7.381E-05
5.859E+00	4.833E-06	3.238E-05	4.220E-05	5.159E-05	7.243E-05
5.938E+00	5.969E-06	3.179E-05	4.143E-05	5.065E-05	7.110E-05
6.016E+00	6.359E-06	3.122E-05	4.070E-05	4.974E-05	6.984E-05
6.094E+00	6.350E-06	3.068E-05	3.999E-05	4.888E-05	6.863E-05
6.172E+00	6.401E-06	3.016E-05	3.931E-05	4.806E-05	6.747E-05
6.250E+00	6.572E-06	2.966E-05	3.867E-05	4.726E-05	6.636E-05
6.328E+00	6.721E-06	2.919E-05	3.805E-05	4.651E-05	6.529E-05
6.406E+00	6.810E-06	2.873E-05	3.745E-05	4.578E-05	6.427E-05
6.484E+00	6.572E-06	2.830E-05	3.688E-05	4.508E-05	6.330E-05
6.563E+00	5.854E-06	2.788E-05	3.634E-05	4.442E-05	6.236E-05
6.641E+00	5.089E-06	2.748E-05	3.582E-05	4.378E-05	6.146E-05
6.719E+00	4.576E-06	2.709E-05	3.531E-05	4.317E-05	6.060E-05
6.797E+00	4.358E-06	2.672E-05	3.483E-05	4.258E-05	5.978E-05
6.875E+00	4.591E-06	2.637E-05	3.437E-05	4.202E-05	5.899E-05
6.953E+00	5.026E-06	2.603E-05	3.393E-05	4.148E-05	5.823E-05
7.031E+00	5.387E-06	2.571E-05	3.351E-05	4.096E-05	5.750E-05
7.109E+00	5.857E-06	2.540E-05	3.310E-05	4.046E-05	5.681E-05
7.188E+00	6.605E-06	2.510E-05	3.272E-05	3.999E-05	5.614E-05
7.266E+00	8.151E-06	2.481E-05	3.235E-05	3.954E-05	5.551E-05
7.344E+00	1.104E-05	2.454E-05	3.199E-05	3.910E-05	5.490E-05
7.422E+00	1.461E-05	2.428E-05	3.165E-05	3.869E-05	5.431E-05
7.500E+00	1.772E-05	2.403E-05	3.132E-05	3.829E-05	5.375E-05
7.578E+00	1.966E-05	2.379E-05	3.101E-05	3.791E-05	5.322E-05
7.656E+00	1.966E-05	2.356E-05	3.072E-05	3.754E-05	5.271E-05
7.734E+00	1.758E-05	2.335E-05	3.043E-05	3.720E-05	5.222E-05
7.813E+00	1.444E-05	2.314E-05	3.016E-05	3.687E-05	5.176E-05
7.891E+00	1.076E-05	2.294E-05	2.990E-05	3.655E-05	5.131E-05
7.969E+00	6.905E-06	2.275E-05	2.966E-05	3.625E-05	5.089E-05
8.047E+00	3.951E-06	2.257E-05	2.942E-05	3.596E-05	5.049E-05
8.125E+00	2.336E-06	2.240E-05	2.920E-05	3.569E-05	5.011E-05
8.203E+00	1.873E-06	2.224E-05	2.899E-05	3.543E-05	4.974E-05
8.281E+00	2.405E-06	2.208E-05	2.879E-05	3.519E-05	4.940E-05
8.359E+00	3.542E-06	2.194E-05	2.860E-05	3.495E-05	4.907E-05
8.438E+00	4.908E-06	2.180E-05	2.842E-05	3.473E-05	4.876E-05
8.516E+00	6.032E-06	2.167E-05	2.825E-05	3.453E-05	4.847E-05
8.594E+00	6.357E-06	2.155E-05	2.809E-05	3.433E-05	4.820E-05
8.672E+00	5.732E-06	2.143E-05	2.794E-05	3.415E-05	4.794E-05
8.750E+00	4.310E-06	2.132E-05	2.780E-05	3.398E-05	4.770E-05
8.828E+00	2.457E-06	2.122E-05	2.767E-05	3.382E-05	4.748E-05
8.906E+00	8.982E-07	2.113E-05	2.754E-05	3.367E-05	4.727E-05
8.984E+00	3.015E-07	2.104E-05	2.743E-05	3.353E-05	4.707E-05
9.063E+00	7.911E-07	2.096E-05	2.733E-05	3.340E-05	4.690E-05
9.141E+00	1.899E-06	2.089E-05	2.723E-05	3.329E-05	4.673E-05
9.219E+00	3.051E-06	2.083E-05	2.715E-05	3.318E-05	4.659E-05
9.297E+00	3.819E-06	2.077E-05	2.707E-05	3.309E-05	4.645E-05
9.375E+00	3.818E-06	2.071E-05	2.700E-05	3.300E-05	4.633E-05
9.453E+00	3.441E-06	2.067E-05	2.694E-05	3.293E-05	4.623E-05

9.531E+00	3.430E-06	2.063E-05	2.689E-05	3.286E-05	4.614E-05
9.609E+00	3.654E-06	2.059E-05	2.684E-05	3.281E-05	4.606E-05
9.688E+00	4.283E-06	2.056E-05	2.680E-05	3.276E-05	4.600E-05
9.766E+00	5.700E-06	2.054E-05	2.678E-05	3.273E-05	4.595E-05
9.844E+00	6.798E-06	2.053E-05	2.676E-05	3.270E-05	4.592E-05
9.922E+00	7.226E-06	2.052E-05	2.674E-05	3.269E-05	4.589E-05
1.000E+01	8.359E-06	2.051E-05	2.674E-05	3.268E-05	4.589E-05

Table DR3. Data plotted in Figure 4