

S1 Table: Time series of measured water temperature, salinity and carbonate chemistry parameters taken from Point B from 2007-2012, used to validate hindcast modeling of pH.

Date	Salinity	Temperature (°C)	C _T (μmol kg ⁻¹)	A _T (μmol kg ⁻¹)	Ω aragonite
09/01/07	38.16	15.46	2248.5	2561.4	3.32
16/01/07	38.21	15.45	2252.5	2564.8	3.31
23/01/07	38.24	15.42	2252.7	2565.8	3.32
30/01/07	38.18	14.95	2253	2560.6	3.26
06/02/07	38.17	14.75	2257.3	2563	3.24
13/02/07	NA	NA	NA	NA	NA
20/02/07	38.1	14.27	2253.1	2555.9	3.20
27/02/07	NA	NA	NA	NA	NA
06/03/07	NA	NA	NA	NA	NA
13/03/07	NA	NA	NA	NA	NA
20/03/07	38.03	14.24	2254.8	2554.7	3.18
27/03/07	NA	NA	NA	NA	NA
03/04/07	38.08	14.1	2252.7	2553.4	3.18
10/04/07	NA	NA	NA	NA	NA
17/04/07	38.01	15.77	2235.9	2541.6	3.24
24/04/07	37.87	18.04	2227.9	2537.3	3.32
02/05/07	37.72	18.4	2215.7	2529.8	3.38
09/05/07	37.33	18.82	2190	2497.6	3.32
15/05/07	37.57	20	2196.6	2510.5	3.40
22/05/07	37.47	20.45	2190.1	2510.3	3.47
30/05/07	37.82	17.1	2217.7	2528.9	3.32
05/06/07	37.71	20.23	2201.8	2517.4	3.42
12/06/07	37.56	21.49	2195.9	2512.4	3.46
19/06/07	37.61	21.69	2198.7	2519.3	3.50
27/06/07	37.75	19.73	2205	2523.1	3.44
03/07/07	37.77	22.71	2200.2	2524.6	3.56
10/07/07	37.81	22.1	2204.4	2522.4	3.48
17/07/07	37.88	22.9	2203.1	2524.5	3.53
24/07/07	37.95	22.59	2207.4	2534.8	3.58
31/07/07	37.95	24.8	2201.7	2535	3.69
07/08/07	37.89	25.1	2204.6	2539.3	3.71
14/08/07	37.97	23.45	2206.2	2542.5	3.69
22/08/07	38.07	23.45	2212.5	2549.3	3.69
28/08/07	38	24.09	2207	2544.6	3.72
04/09/07	38.06	NA	2210.9	2544.3	NA
18/09/07	38.18	22.81	2216	2552.6	3.67
25/09/07	38.17	22.03	2213.1	2556.8	3.73
02/10/07	38.14	21.25	2207.7	2549	3.69
09/10/07	38.14	21.33	2204.3	2548.8	3.72
16/10/07	38.13	20.72	2209.5	2548.4	3.66

23/10/07	38.1	19.17	2207.8	2546.3	3.62
30/10/07	38.09	20.72	2216.1	2545.9	3.57
06/11/07	38.06	19.18	2213.2	2545	3.56
13/11/07	38.07	17.64	2218.1	2544.8	3.48
22/11/07	38	16.63	2198.6	2516.9	3.37
27/11/07	38.12	16.3	2228.1	2546.4	3.38
04/12/07	NA	NA	NA	NA	NA
11/12/07	NA	NA	NA	NA	NA
18/12/07	38.1	15.78	2240	2551.8	3.31
25/12/07	NA	NA	NA	NA	NA
04/01/08	38.1	NA	2273	2556.4	NA
08/01/08	38	NA	2248.7	2551	NA
18/01/08	37.98	13.74	2244.1	2545.5	3.18
22/01/08	37.97	13.73	2243.4	2547	3.20
29/01/08	38.04	13.77	2248.1	2549.9	3.19
05/02/08	38.03	13.62	2245	2546.6	3.18
12/02/08	38.04	13.58	2245.1	2548.2	3.19
19/02/08	38.11	13.45	2250.3	2550.3	3.16
26/02/08	38.09	13.49	2248.9	2553.2	3.21
03/03/08	38.09	13.73	2255.4	2553.3	3.15
12/03/08	38.04	13.39	2254.3	2547.7	3.10
18/03/08	38.09	13.66	2256.1	2550.7	3.11
26/03/08	38.08	13.49	2258.8	2553	3.11
01/04/08	38.07	13.69	2256.8	2553.8	3.14
08/04/08	38.04	13.71	2257.7	2554.7	3.14
15/04/08	37.89	13.81	2250.8	2546.4	3.13
23/04/08	37.9	14.35	2250.6	2546.8	3.14
28/04/08	37.69	16.18	2247.1	2550.6	3.25
06/05/08	37.64	16.89	2249.1	2552.6	3.27
13/05/08	37.94	17.24	2245.2	2548.6	3.26
20/05/08	37.8	18.03	2238.8	2539	3.24
28/05/08	37.78	18.42	2246.3	2536.2	3.15
03/06/08	37.61	19.97	2228.4	2538.3	3.37
10/06/08	37.58	20.94	2219.1	2538.5	3.48
17/06/08	37.81	21.01	2226.5	2530.1	3.32
23/06/08	37.7	22.68	2211.8	2518.7	3.38
01/07/08	37.67	25.24	2214.3	2533.7	3.57
08/07/08	37.77	24.47	2215.8	2539.7	3.60
16/07/08	37.92	22.25	2232.6	2535.3	3.33
22/07/08	37.75	23.72	2224.6	2549.9	3.60
28/07/08	38.16	23.31	2221.3	2552.4	3.63
05/08/08	38.17	25.86	2210.1	2556.4	3.83
12/08/08	NA	NA	NA	NA	NA
19/08/08	38.12	23.95	2220.1	2555.9	3.69
26/08/08	NA	NA	NA	NA	NA
02/09/08	38.26	25.23	2236.6	2539.7	3.39

10/09/08	38.25	22.77	2223.2	2564.1	3.72
16/09/08	NA	NA	NA	NA	NA
22/09/08	38.32	22.53	2225.1	2570.2	3.75
29/09/08	38.36	21.59	2243.1	2574.9	3.61
07/10/08	38.28	19.68	2224.5	2565.4	3.66
14/10/08	38.3	20.29	2225.2	2567.4	3.68
21/10/08	38.36	21.64	2230.4	2569.3	3.67
28/10/08	38.36	21.64	2218.4	2569.2	3.79
06/11/08	38.12	18.95	2215.9	2555.1	3.63
10/11/08	38	18.67	2228.3	2558	3.54
20/11/08	38.12	18.45	2228.9	2558	3.52
25/11/08	38.09	17.96	2225	2556.9	3.54
02/12/08	38.07	16.69	2224.2	2547.5	3.43
09/12/08	38.06	16.26	2232.9	2552	3.39
17/12/08	37.44	15.21	2232.3	2539.3	3.27
22/12/08	37.62	15.21	2240.6	2548.2	3.28
30/12/08	NA	NA	NA	NA	NA
06/01/09	38.04	14.57	2243.2	2556.5	3.31
14/01/09	38.06	14.36	2256.2	2561.1	3.23
22/01/09	38.04	14.15	2254.2	2556	3.19
27/01/09	38.02	13.94	2252.1	2554.5	3.20
03/02/09	37.99	13.87	2247.7	2555	3.24
10/02/09	37.51	13.12	2250.8	2555.3	3.22
17/02/09	37.96	13.65	2245.8	2551.6	3.23
24/02/09	37.9	13.48	2249.1	2549.9	3.18
03/03/09	37.92	13.59	2242.7	2542	3.16
10/03/09	37.99	13.71	2251	2552.1	3.18
17/03/09	37.95333333	14.1	2247.8	2551.5	3.21
23/03/09	38.01	13.97	2248.4	2554.4	3.23
31/03/09	38	13.8	2265.9	2547.2	2.99
07/04/09	37.59	15.15	2237.8	2542.8	3.25
14/04/09	NA	NA	NA	NA	NA
21/04/09	NA	NA	NA	NA	NA
28/04/09	NA	NA	NA	NA	NA
05/05/09	37.34	16.71	2231.7	2534	3.25
12/05/09	37.09	17.63	2235.8	2540.6	3.30
19/05/09	37.42	19.89	2228	2535.3	3.35
26/05/09	36.84	22.09	2232.2	2541	3.44
02/06/09	37.54	20.86	2230.7	2532.4	3.31
09/06/09	37.6	18.27	2241.7	2535	3.18
16/06/09	37.63	22.84	2216.2	2521.5	3.37
23/06/09	37.75	22.76	2221.5	2534.5	3.45
30/06/09	37.81	23.26	2225.3	2541	3.49
07/07/09	37.64	24.90666667	2224.5	2542	3.55
13/07/09	37.82	24.15	2218.8	2533.9	3.50
21/07/09	37.8	22.71	2214.6	2532.6	3.50

28/07/09	NA	NA	NA	NA	NA
04/08/09	38	23.79	2216.4	2539.8	3.57
11/08/09	37.99	24.6	2226	2544.5	3.54
18/08/09	NA	NA	NA	NA	NA
25/08/09	38.03	26.84	2228.6	2554.1	3.66
01/09/09	38.11	26.84	2224.5	2555	3.71
08/09/09	38.2	24.22	NA	2540.8	NA
15/09/09	NA	NA	NA	NA	NA
22/09/09	NA	NA	NA	NA	NA
29/09/09	NA	NA	NA	NA	NA
06/10/09	NA	NA	NA	NA	NA
13/10/09	NA	NA	NA	NA	NA
20/10/09	NA	NA	NA	NA	NA
29/10/09	38.1	21.15	2211.6	2553.7	3.70
05/11/09	37.985	18.97	2214.3	2548.5	3.58
10/11/09	38.02	18.66	2217.7	2549.8	3.55
17/11/09	37.98	18.11	2208.8	2542.2	3.56
24/11/09	37.99	17.59	2219.9	2539.3	3.41
01/12/09	37.9	17.05	2224.1	2538.6	3.36
08/12/09	37.92	16.74	2227.1	2546	3.40
15/12/09	37.97	15.99	2229	2547.6	3.38
22/12/09	37.86	14.51	2230.3	2538.2	3.26
29/12/09	NA	NA	NA	NA	NA
05/01/10	37.85	14.21	2240.3	2543.9	3.21
12/01/10	37.88	14	2246.5	2541.8	3.13
19/01/10	37.87	13.63	2250.3	2547	3.14
25/01/10	37.72	13.07	2246.6	2532.2	3.02
02/02/10	37.94	13.22	2255.2	2546.2	3.08
11/02/10	37.92	13.2	2251.4	2543.9	3.09
16/02/10	37.96	13.2	2254.4	2546.5	3.09
23/02/10	NA	NA	NA	NA	NA
02/03/10	NA	NA	NA	NA	NA
09/03/10	37.5	12.51	2249.7	2542.1	3.09
16/03/10	37.86	13	2254	2545.4	3.08
23/03/10	37.86	13.27	2253.7	2542.2	3.05
30/03/10	37.84	13.82	2246.8	2542	3.13
06/04/10	37.72	13.94	2245.7	2544.3	3.17
13/04/10	37.74	13.86	2252.2	2538.4	3.04
20/04/10	37.79	14.78	2240.3	2541.4	3.20
27/04/10	37.78	15.16	2232.1	2540.5	3.27
04/05/10	NA	NA	NA	NA	NA
11/05/10	37.7	16.39	2234.7	2539.8	3.26
18/05/10	37.63	16.66	2218.4	2538.9	3.42
25/05/10	37.49	18.06	2230.4	2545	3.39
01/06/10	NA	NA	NA	NA	NA
08/06/10	37.46	21.47	2216	2542.9	3.58

15/06/10	37.65	21.38	2219	2539.9	3.51
23/06/10	37.52	21.83	2218.3	2540.5	3.54
29/06/10	37.26	23.56	2216.5	2539	3.58
06/07/10	37.62	24.75	2217.2	2545	3.65
13/07/10	37.47	24.62	2213	2545.9	3.71
20/07/10	38	25	2220.1	2558.8	3.76
27/07/10	38.01	25.33	2219.7	2559.1	3.77
03/08/10	37.98	25.35	2226	2563.7	3.76
10/08/10	NA	NA	NA	NA	NA
17/08/10	37.91	21.21	2224.1	2552.3	3.57
24/08/10	37.97	24.58	2212.9	2554.6	3.78
31/08/10	38.06	23.92	2224.3	2558.3	3.68
07/09/10	NA	NA	NA	NA	NA
14/09/10	38.02	22.97	2216.3	2557.2	3.73
21/09/10	38.02	22.33	2226.3	2558.9	3.64
28/09/10	38.15	22.24	2220.6	2564.7	3.74
07/10/10	38.11	20.84	2222.6	2563.5	3.69
12/10/10	38.14	19.79	2229.6	2566.9	3.63
19/10/10	NA	NA	NA	NA	NA
26/10/10	NA	NA	NA	NA	NA
03/11/10	36.9	18.05	2225.2	2549.1	3.51
09/11/10	38.03	18.32	2240.5	2567.5	3.51
17/11/10	38	17.82	2234.8	2561.3	3.49
23/11/10	37.62	17.08	2242.9	2560.3	3.41
30/11/10	38	15	2244.8	2559.3	3.33
08/12/10	38	14.5	2242.2	2554.6	3.30
14/12/10	38	14	2239.2	2563.5	3.41
21/12/10	37.81	14.67	2245.9	2559.6	3.33
28/12/10	37.43	13.88	2248.7	2551.1	3.22
04/01/11	37.75	14.09	2242.8	2544.5	3.20
11/01/11	37.62	13.6	2249	2548.3	3.17
18/01/11	37.46	13.3	2247.1	2550.4	3.21
25/01/11	37.85	13.34	2259.8	2550.3	3.08
01/02/11	37.99	13.425	2262.9	2554.6	3.09
08/02/11	37.96	13.26	2256.7	2554.1	3.14
15/02/11	37.7	13.38	2239.7	2533.2	3.11
22/02/11	37.88	13.1	2255.1	2546.4	3.08
01/03/11	38.05	13.38	2259.6	2554.3	3.11
08/03/11	NA	NA	NA	NA	NA
15/03/11	38.02	13.12	2257.4	2553.3	3.12
22/03/11	37.23	13.72	2258.7	2551.9	3.13
29/03/11	37.41	13.65	2239.2	2544.8	3.24
05/04/11	37.3	14.99	2251	2552.8	3.23
12/04/11	NA	NA	NA	NA	NA
19/04/11	37.64	15.72	2240	2555.8	3.37
26/04/11	37.79	15.57	2247.2	2555.6	3.29

03/05/11	37.78	16.64	2248.1	2557.9	3.32
10/05/11	37.81	17.83	2244.9	2559.6	3.39
17/05/11	37.72	18.31	2253	2561	3.33
24/05/11	37.89	19.53	2238.9	2557.2	3.45
31/05/11	37.92	19.93	2237	2555.2	3.45
07/06/11	37.78	20.38	2235	2543.4	3.36
14/06/11	37.95	21.2	2232.3	2548.7	3.45
21/06/11	37.89	21.51	2234.8	2549.1	3.44
28/06/11	NA	NA	NA	NA	NA
05/07/11	37.84	24.5	2227	2544.3	3.53
12/07/11	37.98	25.27	2221.4	2545.5	3.61
19/07/11	38.01	20.26	2227.2	2546.2	3.46
26/07/11	38.03	23.58	2217.5	2547.9	3.64
02/08/11	37.99	23.82	2222.5	2545.6	3.57
09/08/11	38.03	21.72	2223.1	2543.7	3.50
16/08/11	38.11	24.18	2202.3	2552.3	3.84
23/08/11	38.11	25.91	2236.7	2541.9	3.43
30/08/11	38.19	24.46	2230.5	2557.5	3.62
06/09/11	38.25	24.48	2227.4	2554.5	3.61
13/09/11	38.25	25.15	2223.9	2556	3.68
20/09/11	NA	NA	NA	NA	NA
27/09/11	38.21	22.81	2222.9	2555.1	3.63
04/10/11	38.23	22.9	2226.3	2558.5	3.63
11/10/11	38.2	21.2	2292.1	2561.8	3.01
18/10/11	38.18	20	2225.8	2560.2	3.60
26/10/11	38.18	19.12	2227.5	2549.4	3.46
02/11/11	38.23	19.39	2229.4	2555.8	3.51
10/11/11	37.85	18.45	2230	2552.2	3.46
15/11/11	NA	NA	NA	NA	NA
22/11/11	38.13	18.12	2227.4	2553.2	3.48
29/11/11	38.08	17.81	2229.3	2554.6	3.47
06/12/11	38.09	17.55	2231.8	2553.9	3.44
13/12/11	38.1	17.28	2234.7	2554.9	3.42
19/12/11	38.08	15.34	2246.6	2554.7	3.27
27/12/11	NA	NA	NA	NA	NA
03/01/12	38.09	15.07	2244.9	2553.7	3.27
10/01/12	38.09	15.11	2266	2560.4	3.14
17/01/12	38.1	14.8	2247.4	2553.2	3.24
24/01/12	NA	NA	NA	NA	NA
31/01/12	38.09	14.37	2251.5	2552.3	3.18
07/02/12	NA	NA	NA	NA	NA
14/02/12	38.21	13.15	2280.8	2565.2	3.01
21/02/12	38.15	13.4	2266.3	2560	3.10
28/02/12	38.17	13.48	2266.8	2562.1	3.12
06/03/12	38.12	13.39	2260.8	2558.1	3.14
13/03/12	38.14	13.47	2265	2560.6	3.12

20/03/12	38.15	13.47	2263.7	2563.2	3.16
27/03/12	38.14	14.28	2262.3	2560.9	3.16
03/04/12	38.13	15.24	2256	2561.8	3.25
10/04/12	38.16	14.55	2265	2560.4	3.14
17/04/12	38.03	14.79	2252.8	2567.3	3.33
25/04/12	38.09	13.79	2273.9	2566.9	3.11
02/05/12	NA	NA	NA	NA	NA
09/05/12	37.63	16.74	2256.9	2555.9	3.22
15/05/12	38.02	17.45	2256.5	2562.2	3.29
22/05/12	37.99	16.7	2257.4	2561.3	3.26
29/05/12	37.94	18.98	2255.3	2561.9	3.32
05/06/12	37.76	20.66	2250.1	2551.9	3.31
13/06/12	38.12	16.19	2251.4	2559.6	3.29
19/06/12	37.97	23.22	2244	2563.8	3.53
26/06/12	37.99	23.84	2236.2	2560.9	3.59
03/07/12	37.97	25.58	2251.3	2571.7	3.59
10/07/12	38.16	26.11	2238.1	2567.6	3.69
17/07/12	38.12	21.93	2249.8	2565	3.46
24/07/12	38.21	23.03	2240	2565	3.57
31/07/12	38.23	23.3	2246.4	2569.8	3.56
07/08/12	38.31	25.27	2261.7	2568.6	3.44
14/08/12	NA	NA	NA	NA	NA
21/08/12	38.37	26.74	2249.3	2576	3.67
28/08/12	38.35	25.88	2242.7	2580	3.76
05/09/12	38.39	24.26	2247.1	2577.2	3.65
11/09/12	38.35	24.02	2250.6	2566.2	3.49
18/09/12	38.38	23.04	2239.1	2576.1	3.69
25/09/12	38.35	22.31	2239.4	2574	3.65
02/10/12	38.23	21.85	2231.1	2565.6	3.64
09/10/12	38.32	22.02	2231.1	2572.3	3.71
16/10/12	38.22	21.47	2224.4	2561.7	3.72
23/10/12	38.28	20.78	2235.1	2570.1	3.62
30/10/12	38.24	20.02	2242.9	2572.5	3.56
06/11/12	38.1	19	2240.8	2557.3	3.41
13/11/12	38.02	18.05	2234	2546.9	3.45
20/11/12	38.08	17.46	2243.4	2564.9	3.44
27/11/12	38.12	17.47	2245.7	2564.7	4.24
05/12/12	38.11	16.92	2237.5	2559.3	3.43
11/12/12	38.12	16.32	2228.4	2544.7	3.36
18/12/12	38.09	15.81	2246.4	2558.5	3.32
28/12/12	38	15	2255	2560.8	3.29

Supplementary Figures

