

Oceanography Branch CTD Data Report
CTD_REPORT_2016003HB

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DATE: March 28, 2017

Oceanography Branch CTD Data Report

CTD_REPORT_2016003HB

NOAA Fisheries Service
Northeast Fisheries Science Center
Woods Hole, MA 02543

HB 16-03
AMAPPS
Data Coverage: June 28 – August 24, 2016
Mid Atlantic Bight North, Georges Bank, off Shelf edge

This report presents a summary of surface and bottom temperature and salinity data collected during the Northeast Fisheries Science Center's HB1603 AMAPPS Survey aboard the NOAA FSV *Henry B Bigelow*.

Data was obtained with a Seabird Electronics SBE Model 19+ profiling CTD (s/n 4477) during bongo double oblique tows, vertical casts, and tow-yos with a VPR (visual plankton recorder) or a Neuston net. A Seabird Electronics SBE Model 9/11+ CTD (s/n 0832) was also used at a few select stations. Sea water samples were taken for the purpose of correcting conductivity. A SBE43 Dissolved Oxygen sensor was attached to the SBE 9/11+. The SBE 9/11+ also accommodates a Biospherical Instruments Inc. QSP2300 PAR (Photosynthetically Active Radiation) Sensor. A QSR2200 Surface PAR sensor was located on the flying bridge and relayed data in realtime to the 9/11+ deck unit. The PAR data obtained during the vertical profiling casts is included in the archived CTD data; the surface PAR data will be made available on request.

Data presented here have been audited, however, corrections and/or updates may be applied at a later time.

The most recent and complete station data can be found in an NODC formatted ASCII file at:
<ftp://ftp.nefsc.noaa.gov/pub/hydro/HB1603.dat>

This report may be viewed on the Oceanography Branch website at:

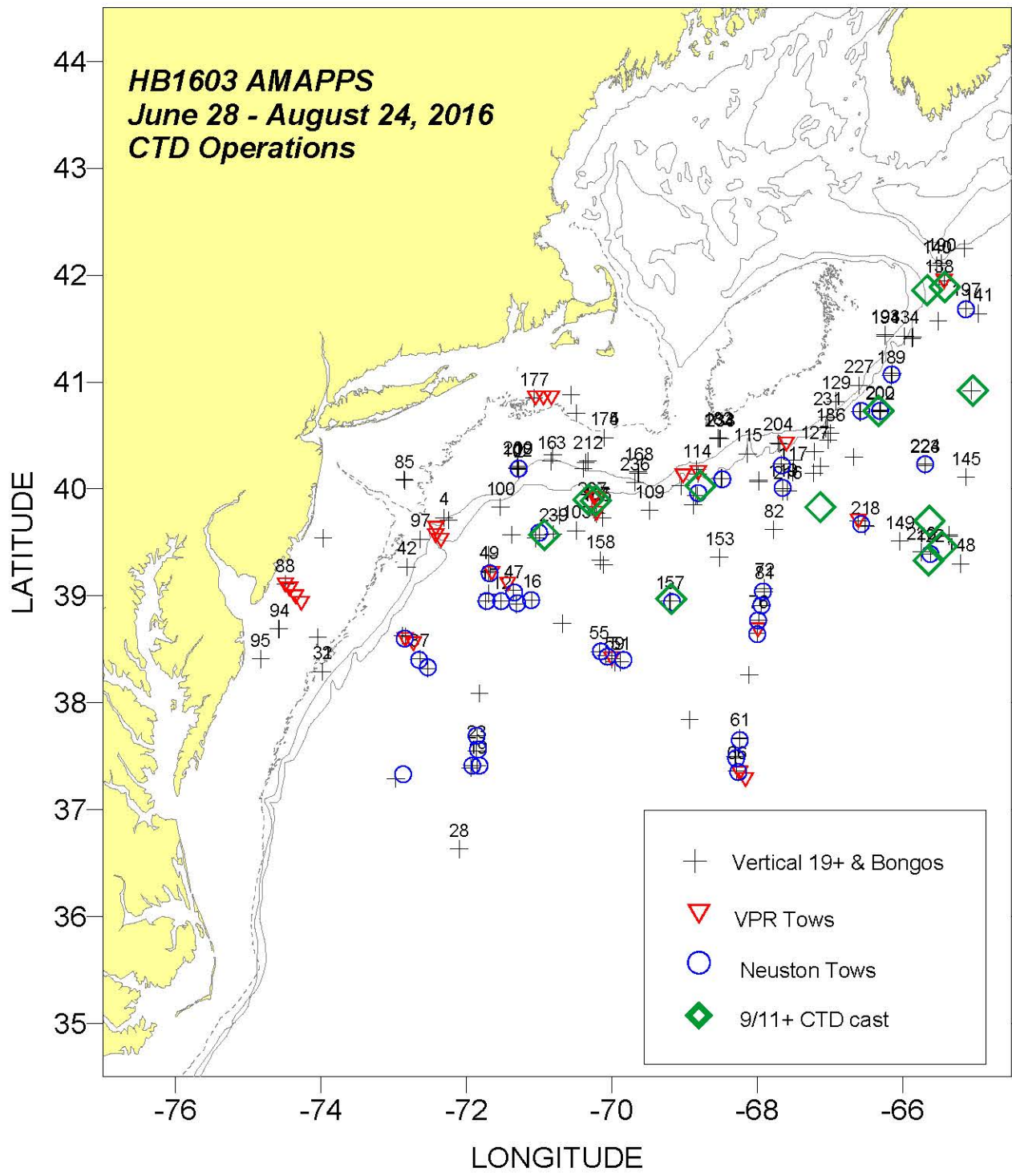
<http://www.nefsc.noaa.gov/HydroAtlas/>

choose: **2016 Cruises**

JUN_AMAPPS_HB1603

CTD_REPORT_2016003HB.pdf

Revised: March 28, 2017



**Areal average surface and bottom temperature/salinity and temperature/salinity anomalies for the
HB1603 AMAPPS Survey
June 28 - August 24, 20165**

CRUISE	CD	SURFACE						BOTTOM						Purpose	
		#obs	T/S	Anomaly	SDV1	SDV2	Flag	CD	#obs	T/S	Anomaly	SDV1	SDV2		Flag
Georges Bank															
hb1603	219	16	19.82	2.42	0.62	1.82	0	227	8	11.24	2.22	0.56	0.69	0	93
hb1603	219	16	32.87	-0.28	0.20	0.92	0	227	8	34.30	0.92	0.19	0.60	0	93
Northern Mid Atlantic Bight															
hb1603	207	27	21.68	2.01	0.33	1.24	0	208	21	11.49	1.65	0.41	0.94	0	93
hb1603	207	27	32.48	-0.26	0.14	0.38	0	208	21	34.18	0.07	0.13	0.36	0	93

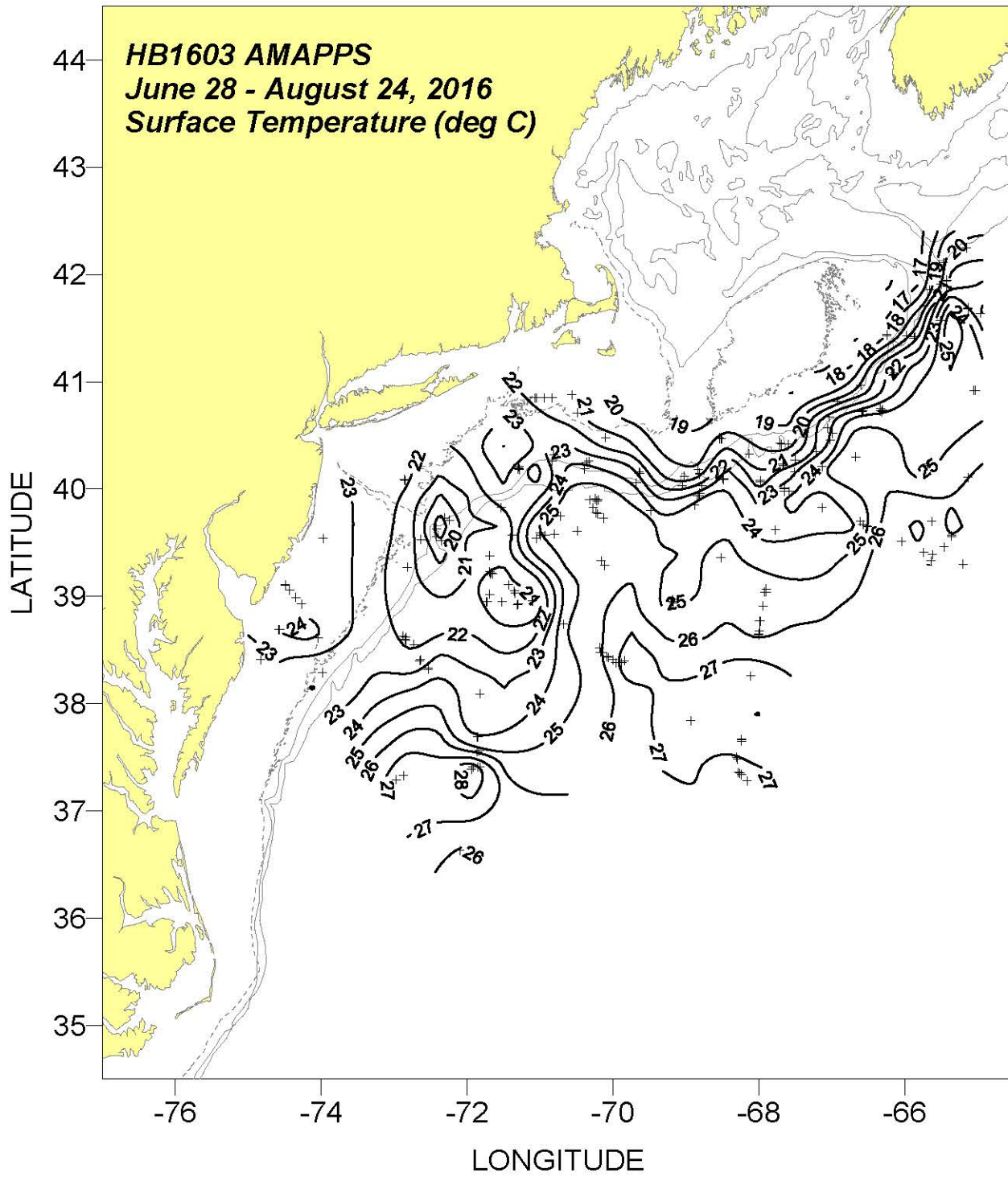
"CRUISE", the code name for a cruise: "CD", the calendar mid-date of all the stations within a region for a cruise:

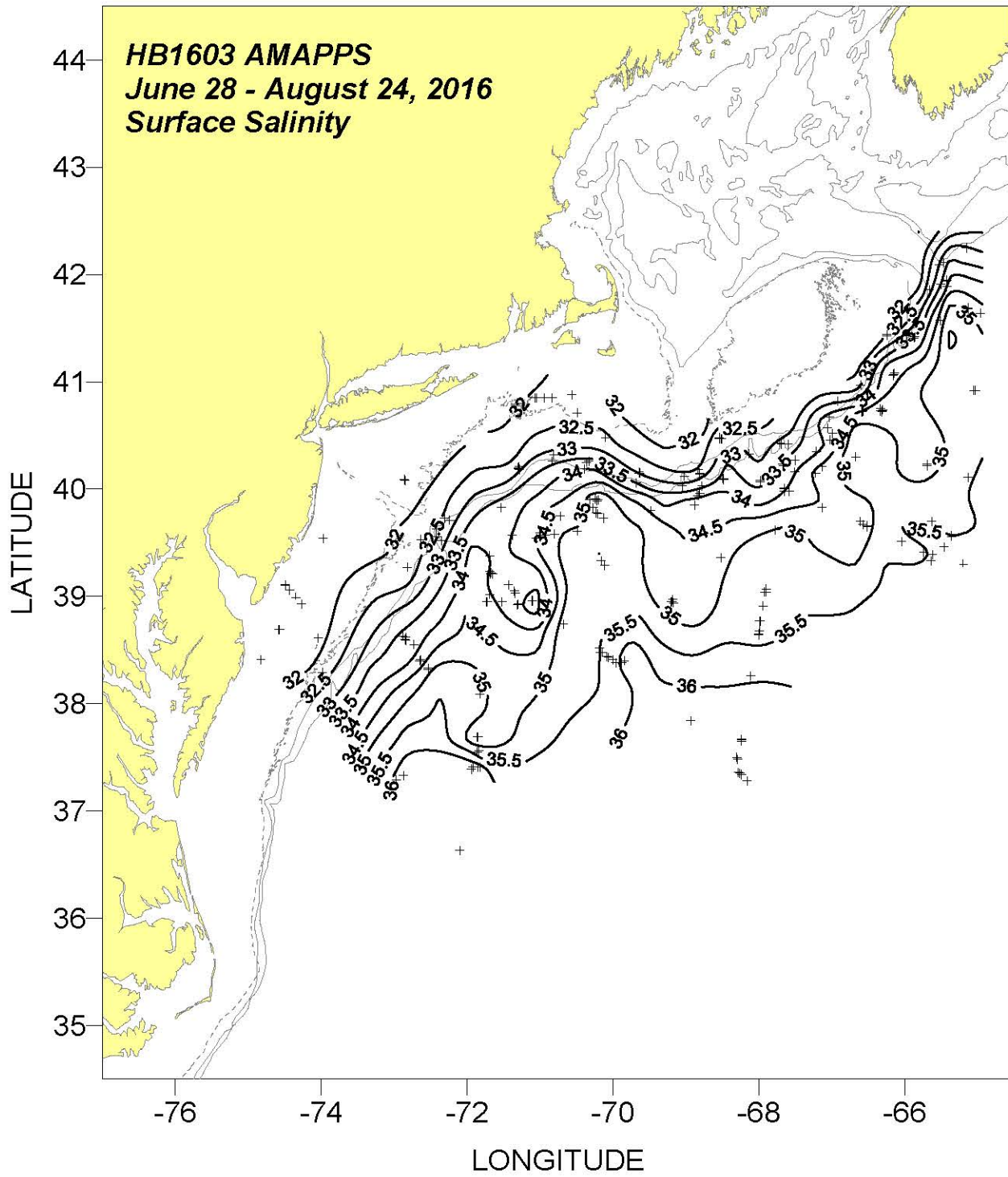
"#obs", the number of observations include in each average: "T/S", the areal average temp/salt: "Anomaly", the areal average temp/salt anomaly:

"SDV1", the standard deviation associated with the average temp/salt anomaly: "SDV2", the standard deviation of the individual anomalies from which the average anomaly was derived

"Flag", a value of "1" indicates that a true areal average could not be calculated due to poor station coverage. The areal averages listed were derived from a simple average of the observations within the region.

"Purpose", 2 digit code assigned by DMS to identify a unique NEFSC program survey.





HB1603 AMAPPS Survey
June 28 - August 24, 2016

Cast #	Sta #	Lat (deg N)	Long (deg W)	Day	Mo	Year	Time (GMT)	Btm Depth (m)	Sfc Temp (deg C)	Sfc Salt	Deepest	Deepest	Meters	Method
											Observed Temp (deg C)	Observed Salt	from Bottom	of Deployment
1	1	4011.6	7116.8	28	6	2016	7:07	97	17.98	32.68	11.23	33.00	75	B
2	2	4011.0	7117.0	28	6	2016	10:02	96	17.97	32.67	12.16	34.81	3	B
3	3	3934.0	7122.9	28	6	2016	16:06	204	19.03	32.91	11.15	35.42	1	B
4	4	3943.6	7218.9	28	6	2016	22:24	101	18.63	32.53	12.44	34.96	3	B
5	5	3937.5	7225.3	29	6	2016	1:53	381	18.59	32.54	12.60	35.09	276	O
6	6	3933.8	7225.2	29	6	2016	3:17	448	18.41	32.56	13.20	35.34	342	O
7	7	3931.3	7220.8	29	6	2016	5:04	602	19.03	32.77	13.62	35.57	497	O
8	8	3942.6	7214.7	29	6	2016	9:00	118	17.97	32.60	12.69	35.02	5	W
9	9	3856.9	7143.7	29	6	2016	23:14	2495	21.44	34.89	12.93	35.64	2291	B
10	9	3857.2	7143.5	29	6	2016	23:42	2495	21.11	34.88	17.52	35.21	2467	B
11	10	3856.8	7131.4	30	6	2016	1:03	2600	20.10	33.85	17.69	35.05	2578	B
12	10	3857.0	7131.2	30	6	2016	1:18	2600	20.12	33.80	12.54	35.59	2395	B
13	11	3855.4	7118.3	30	6	2016	2:53	2778	20.74	33.43	11.48	35.45	2556	B
14	11	3855.8	7117.9	30	6	2016	3:24	2851	20.79	33.43	12.97	33.93	2824	B
15	12	3857.6	7106.4	30	6	2016	4:38	2936	19.42	32.85	14.17	34.24	2915	B
16	12	3857.5	7105.9	30	6	2016	4:53	2932	19.50	32.88	11.31	35.44	2727	B
17	13	3901.3	7141.3	30	6	2016	8:58	2403	21.04	34.83	6.23	35.06	1894	W
18	14	3805.4	7149.4	30	6	2016	15:59	2978	23.64	35.13	9.99	35.28	2780	B
19	15	3724.3	7151.0	1	7	2016	0:23	3399	28.34	36.13	18.79	36.46	3195	B
20	15	3724.8	7149.3	1	7	2016	0:50	3419	28.32	36.13	28.37	36.40	3392	B
21	16	3724.5	7155.1	1	7	2016	2:12	3343	28.36	36.38	28.36	36.37	3321	B
22	16	3724.8	7154.3	1	7	2016	2:25	3351	28.32	36.28	15.94	36.07	3138	B
23	17	3732.9	7151.3	1	7	2016	3:52	3290	26.50	34.38	13.73	35.70	3077	B
24	17	3733.8	7150.7	1	7	2016	4:20	3284	24.57	33.90	26.83	36.32	3258	B
25	18	3741.3	7151.9	1	7	2016	5:38	3194	22.42	34.75	19.31	34.79	3173	B
26	18	3741.2	7151.1	1	7	2016	5:53	3202	22.63	34.63	12.58	35.60	2997	B
27	19	3723.5	7156.2	1	7	2016	9:05	3342	28.86	36.38	12.32	35.57	2984	W

HB1603 AMAPPS Survey
June 28 - August 24, 2016

Cast #	Sta #	Lat (deg N)	Long (deg W)	Day	Mo	Year	Time (GMT)	Btm Depth (m)	Sfc Temp (deg C)	Sfc Salt	Deepest	Deepest	Meters	Method
											Observed Temp (deg C)	Observed Salt	from Bottom	of Deployment
28	20	3638.0	7205.8	1	7	2016	15:54	3829	25.34	36.37	20.25	36.58	3626	B
29	21	3717.4	7258.3	1	7	2016	23:10	3046	27.93	36.32	18.81	36.53	2848	B
30	21	3719.6	7252.3	1	7	2016	23:57	3049	27.95	36.33	27.95	36.32	3024	B
31	22	3817.5	7359.1	2	7	2016	8:30	73	21.25	32.14	8.47	33.17	5	B
32	22	3817.2	7358.9	2	7	2016	8:43	73	19.50	32.21	8.49	33.20	27	W
33	23	3836.9	7250.3	2	7	2016	23:06	2162	21.98	33.82	12.28	35.56	1956	B
34	23	3836.1	7250.8	2	7	2016	23:34	2198	21.69	33.84	17.30	35.18	2172	B
35	24	3835.6	7250.1	3	7	2016	0:04	2217	21.35	33.55	14.67	35.88	2108	O
36	25	3833.0	7243.9	3	7	2016	2:03	2513	21.40	33.38	13.90	35.47	2449	O
37	26	3824.4	7238.7	3	7	2016	4:01	2752	21.75	33.62	11.62	35.48	2546	B
38	26	3823.9	7239.0	3	7	2016	4:25	2770	22.22	34.02	15.42	34.54	2743	B
39	27	3819.7	7231.6	3	7	2016	5:29	2925	24.05	35.26	19.51	35.28	2903	B
40	27	3819.3	7231.6	3	7	2016	5:42	2928	24.14	35.31	11.06	35.40	2723	B
41	28	3837.7	7252.5	3	7	2016	9:01	1963	21.79	33.84	6.19	35.06	1456	W
42	29	3916.3	7249.4	3	7	2016	16:00	83	21.19	32.03	10.50	34.15	8	B
43	30	3912.9	7140.2	4	7	2016	0:15	2383	21.16	33.87	12.53	35.59	2178	B
44	30	3912.7	7140.6	4	7	2016	0:39	2375	21.18	33.91	17.49	35.38	2348	B
45	31	3912.8	7138.9	4	7	2016	1:19	2446	20.89	33.81	14.30	35.61	2374	O
46	32	3906.3	7125.7	4	7	2016	3:17	2728	NaN	NaN	14.10	35.67	2626	O
47	33	3902.9	7120.8	4	7	2016	4:35	2808	20.65	33.29	11.33	35.44	2603	B
48	33	3901.9	7120.4	4	7	2016	5:05	2929	20.62	33.29	12.50	34.09	2904	B
49	34	3914.0	7141.3	4	7	2016	8:58	2333	20.22	33.52	5.65	35.04	1824	W
50	35	3844.4	7041.0	4	7	2016	15:57	3000	24.98	35.45	9.95	35.27	2802	B
51	36	3823.0	6952.5	4	7	2016	22:59	3529	28.05	36.40	13.89	35.71	3322	B
52	36	3823.8	6950.3	4	7	2016	23:26	3520	27.95	36.40	27.22	36.46	3494	B
53	37	3826.3	7004.9	5	7	2016	2:01	3419	27.57	36.03	12.90	35.63	3215	B
54	37	3826.1	7003.5	5	7	2016	2:29	3434	27.61	36.09	26.95	36.37	3407	B
55	38	3829.1	7010.1	5	7	2016	3:51	3326	25.64	35.48	12.35	35.57	3122	B

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Cast #	Sta #	Lat (deg N)	Long (deg W)	Day	Mo	Year	Time (GMT)	Btm Depth (m)	Sfc Temp (deg C)	Sfc Salt	Deepest	Deepest	Meters	Method
											Observed	Observed	from	of
											Temp (deg C)	Salt	Bottom	Deployment
56	38	3828.8	7009.2	5	7	2016	4:17	3338	24.95	34.85	25.49	36.31	3310	B
57	39	3831.5	7010.6	5	7	2016	5:21	3279	NaN	NaN	15.33	35.24	3196	O
58	40	3824.4	7000.2	5	7	2016	9:03	3484	27.06	36.24	6.92	35.09	3025	W
59	41	3822.8	6957.8	6	7	2016	9:00	3562	22.75	34.30	14.25	35.73	3435	W
60	42	3750.2	6855.9	6	7	2016	15:59	4124	27.65	36.40	19.76	36.58	3919	B
61	43	3740.1	6814.4	6	7	2016	22:57	4708	28.37	36.41	19.80	36.58	4501	B
62	43	3738.8	6814.6	6	7	2016	23:32	4719	28.35	36.41	27.14	36.40	4692	B
63	44	3730.0	6817.9	7	7	2016	0:41	4766	26.10	36.41	19.83	36.58	4562	B
64	44	3729.0	6817.4	7	7	2016	1:07	4774	25.58	36.32	25.14	36.31	4747	B
65	44	3728.8	6817.1	7	7	2016	1:20	4774	25.97	36.33	17.30	36.40	4261	V
66	45	3721.4	6816.6	7	7	2016	2:35	4831	26.68	36.32	19.86	36.58	4628	B
67	45	3720.8	6815.6	7	7	2016	3:00	4838	26.70	36.36	25.34	36.35	4810	B
68	46	3720.5	6814.7	7	7	2016	3:33	4842	26.40	36.37	20.57	36.59	4739	O
69	47	3716.9	6809.7	7	7	2016	4:59	4894	26.54	36.37	20.88	36.59	4792	O
70	48	3739.5	6814.6	7	7	2016	9:15	4713	28.17	36.37	19.85	36.59	4507	W
71	49	3815.4	6806.6	7	7	2016	15:50	4406	27.80	35.95	14.34	35.72	4204	B
72	50	3904.0	6754.2	7	7	2016	23:40	3629	25.62	35.31	13.74	35.77	3424	B
73	50	3902.6	6755.0	8	7	2016	0:10	3724	25.61	35.33	24.67	35.60	3703	B
74	51	3854.7	6756.5	8	7	2016	1:14	3793	25.56	35.53	24.66	35.97	3772	B
75	51	3854.3	6756.6	8	7	2016	1:25	3805	25.56	35.49	13.04	35.67	3599	B
76	52	3846.5	6758.7	8	7	2016	2:34	4053	25.67	35.22	12.50	35.59	3846	B
77	52	3846.1	6759.2	8	7	2016	2:56	4059	25.67	35.25	24.72	36.13	4032	B
78	53	3839.1	6800.2	8	7	2016	4:00	4170	25.85	35.24	11.85	35.50	3965	B
79	53	3838.4	6800.1	8	7	2016	4:25	4179	25.80	35.62	25.16	35.99	4152	B
80	54	3841.1	6759.5	8	7	2016	5:02	4154	25.66	35.28	14.99	35.71	4052	O
81	55	3902.6	6754.2	8	7	2016	8:58	3689	25.65	35.03	6.93	35.08	3180	W
82	56	3937.4	6746.1	8	7	2016	15:51	3000	23.13	35.54	12.19	35.54	2796	B
83	57	4025.5	6741.3	8	7	2016	23:37	220	20.23	33.21	11.71	35.42	49	B

HB1603 AMAPPS Survey
June 28 - August 24, 2016

Cast #	Sta #	Lat (deg N)	Long (deg W)	Day	Mo	Year	Time (GMT)	Btm Depth (m)	Sfc Temp (deg C)	Sfc Salt	Deepest	Deepest	Meters	Method
											Observed	Observed	from	of
											Temp (deg C)	Salt	Bottom	Deployment
84	58	4025.2	6736.2	9	7	2016	0:45	165	19.39	33.17	12.91	35.44	42	O
85	59	4004.8	7251.0	11	7	2016	9:02	53	22.31	31.58	7.67	32.74	3	B
86	59	4005.1	7251.4	11	7	2016	9:14	53	22.30	31.59	7.73	32.74	19	W
87	60	3932.6	7358.2	11	7	2016	15:58	26	23.63	31.81	11.52	32.46	6	B
88	61	3906.7	7429.5	11	7	2016	23:46	22	24.11	31.91	13.97	32.56	5	B
89	62	3906.0	7429.2	12	7	2016	0:21	22	23.28	30.61	22.68	32.16	12	O
90	63	3903.6	7425.7	12	7	2016	1:52	26	23.66	31.82	13.18	32.09	11	O
91	64	3859.4	7420.9	12	7	2016	4:01	34	23.82	31.59	16.90	32.11	19	O
92	65	3855.6	7415.9	12	7	2016	5:40	38	23.22	NaN	22.61	31.84	28	O
93	66	3841.4	7434.6	12	7	2016	9:04	33	24.15	31.99	12.88	32.67	4	B
94	66	3841.2	7434.2	12	7	2016	9:15	34	24.11	32.01	12.92	32.66	8	W
95	67	3824.9	7450.0	12	7	2016	15:53	22	22.45	31.42	16.13	32.09	6	B
96	68	3836.3	7402.5	12	7	2016	22:12	55	24.57	31.72	8.83	32.93	3	B
97	69	3932.0	7237.8	13	7	2016	8:27	83	21.25	32.59	9.40	33.66	3	B
98	69	3931.7	7237.5	13	7	2016	8:42	84	21.29	32.61	9.33	33.63	19	W
99	70	3922.8	7141.3	13	7	2016	15:54	2200	23.94	35.18	10.87	35.37	1996	B
100	71	3949.9	7131.7	13	7	2016	22:32	550	22.83	33.87	11.91	35.50	346	B
101	72	4012.1	7117.9	19	7	2016	9:01	96	23.04	32.26	13.87	35.39	3	B
102	72	4011.6	7118.2	19	7	2016	9:16	96	23.01	32.30	13.47	35.19	4	W
103	73	3936.4	7029.4	19	7	2016	16:01	2265	25.01	35.10	11.02	35.39	2048	B
104	74	4011.6	7023.1	19	7	2016	21:49	117	23.57	34.04	13.61	35.62	3	B
105	75	3946.0	7012.4	20	7	2016	3:40	1845	24.01	34.49	5.77	35.04	1337	V
106	76	3946.1	7012.6	20	7	2016	4:20	1712	23.91	34.32	14.14	35.43	1636	O
107	77	3954.5	7014.5	20	7	2016	5:58	1048	NaN	NaN	14.41	35.82	957	O
108	78	4015.0	7021.4	20	7	2016	8:56	102	22.35	33.45	12.92	35.12	7	W
109	79	3947.9	6929.0	20	7	2016	15:48	1780	25.26	35.09	11.57	35.46	1575	B
110	80	4008.3	6848.3	20	7	2016	22:53	183	20.27	32.42	11.64	35.42	9	B
111	81	4007.0	6901.2	21	7	2016	0:14	160	21.20	32.32	11.41	34.64	60	O

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											Observed Temp (deg C)	Observed Salt	from Bottom	of Deployment
112	82	4002.0	6902.7	21	7	2016	4:00	965	20.54	32.43	5.56	35.03	462	V
113	83	4009.2	6848.4	21	7	2016	6:56	162	19.89	32.51	15.51	34.59	131	O
114	84	4011.0	6849.5	21	7	2016	9:00	141	19.63	32.61	12.63	35.41	2	W
115	85	4019.9	6807.6	21	7	2016	15:47	951	19.78	33.05	9.61	35.24	749	B
116	86	4016.0	6729.9	21	7	2016	22:57	1384	21.90	33.92	11.68	35.48	1180	B
117	87	4009.8	6730.4	22	7	2016	5:47	1725	22.20	33.92	5.90	35.04	1217	V
118	88	4000.4	6739.2	22	7	2016	8:07	2832	22.11	33.70	17.83	35.09	2811	B
119	88	3959.8	6739.2	22	7	2016	8:24	2897	22.32	33.63	12.14	35.55	2691	B
120	88	3959.1	6739.1	22	7	2016	8:50	2989	22.32	33.65	15.04	35.71	2930	W
121	89	3941.8	6636.7	22	7	2016	15:47	4200	23.56	34.76	12.60	35.61	3996	B
122	90	3923.6	6537.3	22	7	2016	23:05	4437	27.41	36.11	15.08	36.00	4223	B
123	90	3923.6	6537.0	22	7	2016	23:33	4424	27.43	36.12	26.00	36.45	4398	B
124	91	3919.6	6538.6	23	7	2016	3:17	4424	27.42	36.10	4.84	35.02	3610	W
125	92	3942.1	6537.7	23	7	2016	9:08	4428	27.63	36.14	16.66	36.28	4325	V
126	93	4034.1	6703.3	24	7	2016	4:38	298	20.33	33.26	7.76	35.14	2	V
127	94	4021.1	6712.7	24	7	2016	8:14	1805	21.47	33.97	5.89	35.04	1301	V
128	95	4009.0	6713.0	24	7	2016	10:04	1800	22.29	34.13	12.22	35.54	1597	B
129	96	4049.4	6655.4	24	7	2016	15:45	101	16.43	32.53	12.60	34.94	11	B
130	97	4043.5	6619.9	25	7	2016	3:29	2432	21.42	34.12	4.75	35.00	1619	W
131	98	4044.9	6620.0	25	7	2016	6:58	2358	21.50	34.33	15.23	35.87	2281	O
132	99	4044.3	6618.1	25	7	2016	8:56	2500	21.28	34.06	12.26	35.55	2295	B
133	99	4043.7	6618.3	25	7	2016	9:21	2542	21.31	34.06	21.31	34.06	2530	W
134	100	4125.7	6558.4	25	7	2016	15:46	348	17.83	32.35	11.01	35.42	146	B
135	101	4157.1	6525.2	25	7	2016	22:55	1491	21.13	34.46	12.00	35.52	1288	B
136	102	4153.2	6525.2	26	7	2016	2:13	1736	20.55	33.89	5.41	35.03	1023	W
137	103	4156.1	6525.7	26	7	2016	6:29	1572	20.69	34.25	16.54	36.19	1491	O
138	104	4154.5	6529.8	26	7	2016	9:23	1482	20.67	34.03	11.69	35.48	1276	W
139	105	4151.5	6539.9	27	7	2016	2:33	939	17.73	32.27	5.09	35.01	230	W

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Cast #	Sta #	Lat (deg N)	Long (deg W)	Day	Mo	Year	Time (GMT)	Btm Depth (m)	Sfc Temp (deg C)	Sfc Salt	Deepest Observed Temp (deg C)	Deepest Observed Salt	Meters from Bottom	Method of Deployment
140	106	4205.2	6531.6	27	7	2016	8:45	658	18.62	32.71	5.74	35.03	150	V
141	107	4138.6	6457.9	27	7	2016	15:46	2726	21.94	34.70	13.30	35.60	2523	B
142	108	4055.2	6501.8	28	7	2016	1:38	3790	24.49	35.24	4.91	35.03	2970	W
143	109	4055.1	6503.0	28	7	2016	8:47	3731	24.26	35.11	7.21	35.10	3327	W
144	110	4055.4	6503.0	28	7	2016	9:15	3639	24.24	35.11	11.86	35.51	3436	B
145	111	4006.8	6507.6	28	7	2016	15:49	4600	26.55	35.62	13.25	35.70	4396	B
146	112	3927.5	6527.4	29	7	2016	3:26	2733	26.57	36.17	5.28	35.04	1923	W
147	113	3918.1	6512.3	29	7	2016	8:04	4846	26.78	35.85	14.85	35.97	4640	B
148	113	3918.2	6512.2	29	7	2016	8:33	4847	26.72	35.85	7.49	35.12	4340	W
149	2113	3930.5	6602.1	29	7	2016	15:47	4373	27.52	36.10	15.10	35.99	4171	B
150	114	3949.9	6707.8	30	7	2016	1:23	3221	23.48	34.50	5.61	35.06	2611	W
151	115	4004.3	6758.8	30	7	2016	8:59	2209	21.96	32.91	10.83	35.37	2003	B
152	115	4004.8	6758.9	30	7	2016	9:22	2212	21.40	33.21	8.56	35.15	1909	W
153	116	3921.6	6831.0	30	7	2016	15:44	3000	25.37	34.90	12.48	35.59	2797	B
154	117	3856.8	6911.1	30	7	2016	23:01	3278	24.73	34.45	11.58	35.47	3072	B
155	117	3856.6	6910.2	30	7	2016	23:32	3264	24.11	34.21	19.16	35.13	3243	B
156	118	3858.1	6910.6	31	7	2016	2:16	3231	24.41	34.42	4.77	35.02	2461	W
157	119	3856.7	6911.8	31	7	2016	8:59	3323	24.38	34.69	11.66	35.48	3117	W
158	120	3919.7	7009.8	31	7	2016	15:45	2671	25.57	35.62	16.62	36.34	2466	B
159	121	3934.3	7059.4	31	7	2016	22:45	2450	25.99	35.33	12.10	35.53	2245	B
160	121	3935.1	7059.9	31	7	2016	23:10	2423	25.98	35.32	22.69	35.55	2401	B
161	122	3934.0	7055.6	1	8	2016	1:58	2434	25.99	35.23	4.98	35.03	1725	W
162	123	3932.7	7102.8	1	8	2016	9:06	2452	26.05	34.84	16.09	35.60	2401	W
163	124	4015.5	7049.5	1	8	2016	15:52	123	24.20	33.90	13.77	35.63	10	B
164	125	3944.0	7007.6	1	8	2016	22:47	2058	26.14	35.12	12.56	35.60	1853	B
165	126	3953.3	7013.5	2	8	2016	2:59	1217	25.91	35.43	4.92	35.01	496	W
166	127	3953.8	7011.9	2	8	2016	4:23	818	25.85	35.43	13.88	35.38	737	O
167	128	3946.9	7013.6	2	8	2016	8:58	1977	25.56	35.24	13.93	35.67	1853	W

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Cast #	Sta #	Lat (deg N)	Long (deg W)	Day	Mo	Year	Time (GMT)	Btm Depth (m)	Sfc Temp (deg C)	Sfc Salt	Deepest Observed Temp (deg C)	Deepest Observed Salt	Meters from Bottom	Method of Deployment
168	129	4008.9	6938.0	2	8	2016	15:45	95	20.33	32.72	13.60	35.20	7	B
169	130	3956.6	6849.3	2	8	2016	22:57	1703	24.37	34.55	10.67	35.36	1498	B
170	130	3957.3	6848.8	2	8	2016	23:23	1652	24.48	34.67	20.89	35.30	1628	B
171	131	4001.7	6846.6	3	8	2016	2:04	1305	22.18	33.28	4.92	35.01	592	W
172	132	3956.3	6850.4	3	8	2016	8:58	1594	24.53	34.82	5.99	35.04	1092	W
173	2128	3954.2	7019.3	4	8	2016	1:17	610	25.52	35.33	5.36	35.03	1	W
174	2129	4028.5	7005.9	4	8	2016	9:00	70	20.55	32.48	9.62	33.10	4	B
175	2129	4028.8	7006.1	4	8	2016	9:11	69	20.51	32.52	9.63	33.07	14	W
176	2130	4042.3	7029.7	4	8	2016	15:41	56	20.99	32.61	10.25	32.88	5	B
177	2131	4050.9	7104.2	5	8	2016	0:09	60	21.99	32.04	9.39	32.83	3	B
178	2132	4051.0	7103.1	5	8	2016	1:09	60	21.39	32.16	9.47	32.80	3	O
179	133	4050.9	7056.2	5	8	2016	3:21	56	20.22	NaN	18.01	32.82	42	O
180	134	4051.1	7049.5	5	8	2016	4:43	55	20.50	NaN	10.07	32.72	16	O
181	135	4052.5	7033.3	10	8	2016	22:11	55	22.11	32.56	10.90	32.81	8	B
182	136	4028.6	6832.6	11	8	2016	9:04	92	20.04	32.36	11.79	34.53	8	B
183	137	4028.2	6832.6	11	8	2016	9:19	92	20.03	32.36	11.74	34.44	5	W
184	138	4013.9	6740.1	11	8	2016	15:51	1400	23.32	33.72	11.17	35.42	1206	B
185	138	4012.9	6739.4	11	8	2016	16:27	1400	23.32	33.70	15.35	34.10	1376	B
186	139	4031.0	6659.2	11	8	2016	22:19	644	23.94	34.75	12.29	35.56	441	B
187	140	4104.7	6608.3	12	8	2016	9:13	1300	24.09	35.04	12.83	35.62	1102	B
188	140	4104.1	6608.9	12	8	2016	9:41	1300	24.07	35.04	21.44	35.42	1277	B
189	140	4103.7	6609.3	12	8	2016	10:00	1300	24.00	35.09	11.92	35.50	1097	W
190	141	4206.7	6528.2	13	8	2016	8:40	390	20.34	33.73	10.42	35.33	184	B
191	141	4206.5	6528.0	13	8	2016	9:02	434	20.17	33.69	10.38	35.33	231	W
192	142	4134.4	6530.3	13	8	2016	15:48	2000	26.31	35.75	12.54	35.62	1795	B
193	143	4126.1	6614.3	13	8	2016	22:15	108	18.06	32.42	11.85	35.11	1	B
194	144	4125.8	6614.3	13	8	2016	22:57	91	17.80	32.46	9.70	33.67	4	W
195	145	4125.2	6551.9	14	8	2016	8:33	1400	20.21	33.29	12.67	35.61	1194	B

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Cast #	Sta #	Lat (deg N)	Long (deg W)	Day	Mo	Year	Time (GMT)	Btm Depth (m)	Sfc Temp (deg C)	Sfc Salt	Deepest	Deepest	Meters	Method
											Observed	Observed	from	of
											Temp (deg C)	Salt	Bottom	Deployment
196	147	4124.8	6552.2	14	8	2016	9:00	1400	20.11	33.25	8.86	35.17	1097	W
197	148	4141.3	6507.8	14	8	2016	15:43	2419	25.99	35.23	12.49	35.59	2218	B
198	149	4140.7	6507.9	14	8	2016	16:19	2437	25.69	35.14	25.69	35.13	2412	B
199	150	4214.9	6508.9	14	8	2016	20:47	656	20.08	32.44	11.05	35.40	451	B
200	151	4044.1	6618.8	15	8	2016	9:19	2392	24.58	34.83	12.47	35.59	2177	B
201	151	4043.5	6618.9	15	8	2016	9:45	2543	24.56	34.61	21.74	35.44	2518	B
202	152	4043.2	6618.5	15	8	2016	10:04	2543	24.62	34.87	13.11	35.66	2340	W
203	153	4027.5	6700.9	15	8	2016	15:45	1600	24.13	34.05	12.08	35.53	1398	B
204	154	4025.7	6742.6	15	8	2016	22:15	150	20.59	32.50	12.67	35.53	10	B
205	155	4009.2	6938.4	16	8	2016	8:32	99	22.64	32.61	11.86	34.39	6	B
206	155	4009.3	6938.1	16	8	2016	8:50	100	22.63	32.61	11.84	34.35	7	W
207	156	3949.8	7016.2	16	8	2016	15:48	1053	26.41	34.41	12.39	35.56	853	B
208	157	4019.4	7048.3	16	8	2016	21:01	110	24.47	32.68	12.65	34.73	5	B
209	158	4012.4	7117.2	18	8	2016	8:43	97	24.39	32.60	13.54	35.16	8	B
210	158	4012.3	7117.5	18	8	2016	8:57	98	24.39	32.62	13.54	35.16	9	W
211	159	3945.2	7043.5	18	8	2016	15:48	1985	26.40	34.48	13.13	35.67	1795	B
212	2159	4015.4	7019.5	18	8	2016	23:07	100	24.41	33.30	12.34	34.63	9	B
213	160	4005.9	6830.0	19	8	2016	8:46	907	24.11	33.82	12.19	35.53	708	B
214	2160	4005.8	6828.8	19	8	2016	9:16	1096	24.11	33.83	12.17	35.53	895	V
215	2160	4005.7	6828.7	19	8	2016	9:43	1125	24.12	33.82	18.11	34.19	1101	B
216	161	3959.0	6734.6	19	8	2016	15:47	2682	25.02	34.08	12.14	35.54	2477	B
217	162	3939.6	6631.1	19	8	2016	22:15	4197	25.70	34.16	12.70	35.62	3998	B
218	162	3939.1	6630.7	19	8	2016	22:40	4215	25.44	34.30	12.83	35.64	4011	W
219	163	3940.0	6634.1	20	8	2016	9:02	4107	25.09	34.27	21.36	34.58	4082	B
220	164	3924.7	6544.3	20	8	2016	16:01	4502	26.53	35.03	12.83	35.63	4302	B
221	165	3933.9	6521.9	20	8	2016	22:31	4696	25.43	35.10	13.28	35.71	4495	B
222	165	3933.7	6521.3	20	8	2016	22:56	4696	25.64	35.22	13.27	35.71	4493	W
223	166	4013.3	6541.1	21	8	2016	8:21	4001	23.85	34.43	13.74	35.71	3800	B

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Cast #	Sta #	Lat (deg N)	Long (deg W)	Day	Mo	Year	Time (GMT)	Btm Depth (m)	Sfc Temp (deg C)	Sfc Salt	Deepest	Deepest	Meters	Method
											Observed Temp (deg C)	Observed Salt	from Bottom	of Deployment
224	166	4013.9	6541.4	21	8	2016	8:44	3989	23.84	34.43	13.72	35.71	3786	W
225	166	4014.1	6541.6	21	8	2016	9:02	3980	23.81	34.42	21.09	35.50	3955	B
226	167	4018.2	6640.5	21	8	2016	15:50	2690	26.20	35.39	12.41	35.58	2491	B
227	168	4058.0	6635.8	21	8	2016	22:28	99	20.37	32.68	10.44	33.85	7	B
228	169	4043.1	6635.2	22	8	2016	8:45	1933	24.77	35.04	12.01	35.53	1732	B
229	170	4043.3	6634.5	22	8	2016	9:06	1806	24.80	35.06	12.27	35.56	1605	W
230	171	4043.6	6634.3	22	8	2016	9:24	1677	24.72	35.07	21.97	34.70	1652	B
231	172	4040.2	6701.9	22	8	2016	15:49	173	26.28	35.70	11.30	35.45	12	B
232	173	4012.6	6707.5	22	8	2016	23:17	2369	25.84	35.03	12.07	35.54	2165	B
233	174	4028.0	6830.7	23	8	2016	9:01	97	20.48	33.09	11.43	33.91	8	B
234	174	4028.1	6830.9	23	8	2016	9:16	96	20.47	33.12	11.39	33.90	5	W
235	175	3950.9	6852.7	23	8	2016	15:48	2009	23.77	33.56	11.14	35.41	1808	B
236	176	4003.7	6940.7	23	8	2016	22:27	113	23.39	33.60	12.85	35.04	4	B
237	177	3917.2	7006.9	24	8	2016	9:19	2713	25.71	34.85	12.11	35.54	2511	B
238	177	3917.5	7006.3	24	8	2016	9:41	271	25.71	34.86	12.35	35.57	69	W
239	178	3934.5	7048.1	24	8	2016	15:47	2479	26.47	35.39	13.64	35.74	2278	B

Deployment codes: B=bongo cast; W=water cast; V=vertical cast; and O=Other (VPR or neuston)

Casts in bold are from SBE9/11+ s/n 0832

