Oceans and Climate Branch CTD Data Report

HB 1901 Spring Bottom Trawl Survey

**For further information, contact Tamara Holzwarth-Davis
National Marine Fisheries Service, Northeast Fisheries Science
Center, Woods Hole, Massachusetts 02543-1097.**

DATE: January 14, 2020

Oceans and Climate Branch CTD Data Report

CTD_REPORT_2019001HB

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

HB 1901
Spring Bottom Trawl Survey
Data Coverage: March 10 – May 12, 2019
Mid Atlantic Bight, Georges Bank, Gulf of Maine

This report presents a summary of surface and bottom temperature and salinity data collected during the Northeast Fisheries Science Center's HB1901 Spring Bottom Trawl Survey aboard the NOAA FSV *Henry B Bigelow*. Data was obtained with a Sea-Bird Electronics SBE Model 19+ profiling CTD (s/n 4684) during double oblique bongo tows and on vertical casts with a SBE Model 9/11+ s/n 0832. Sea water samples were taken for the purpose of calibrating salinity values. An SBE43 Dissolved Oxygen sensor and a Biospherical Instruments Inc. QSP2300 PAR (Photosynthetically Active Radiation) sensor were attached to the SBE 9/11+. 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 SBE19+ was deployed on 105 double oblique bongo casts and 23 vertical/water sampling casts. The SBE9/11+ was used successfully on 252 stations.
Data presented here have been audited, however, corrections and/or updates may be applied at a later time.

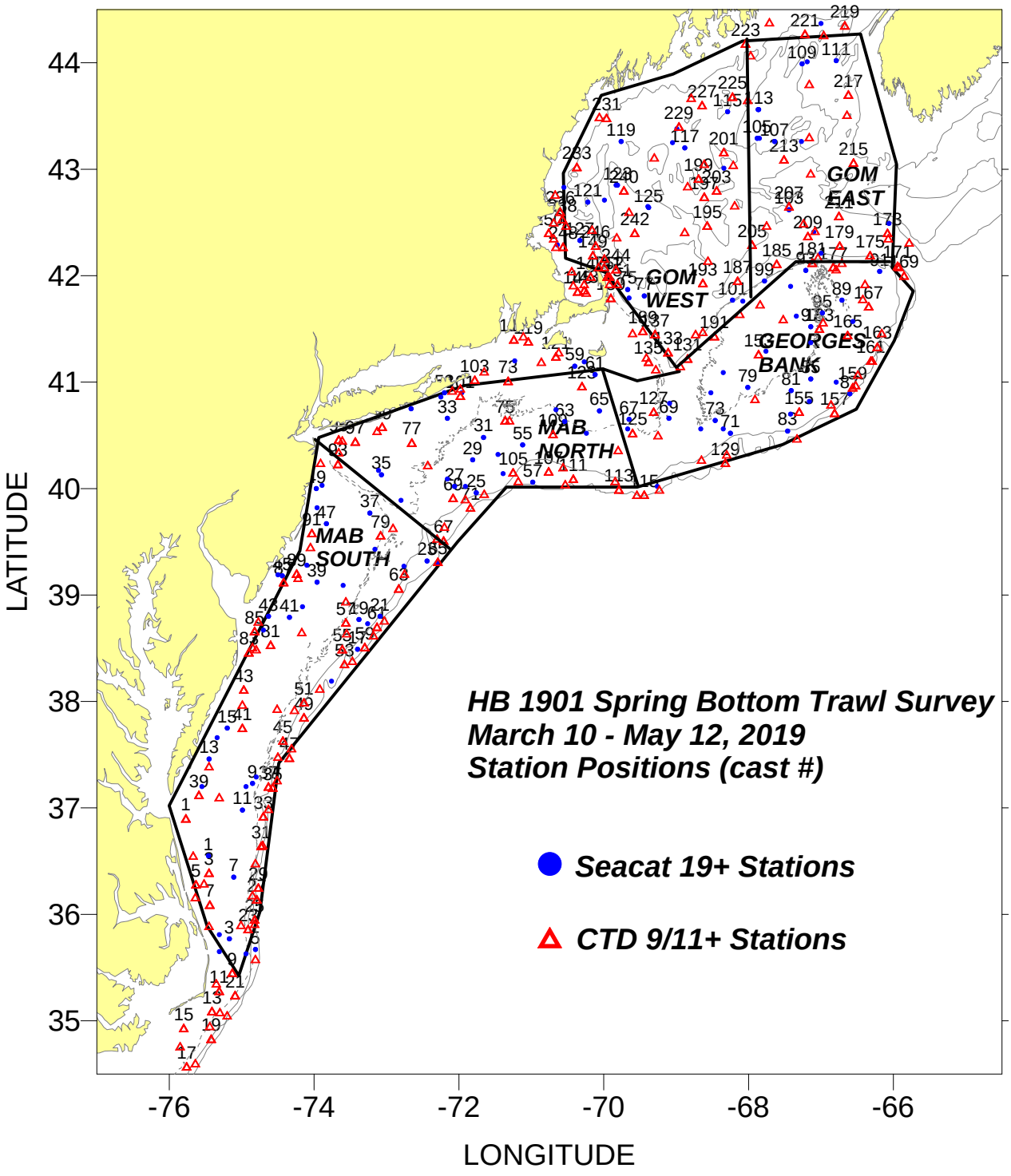
The most recent and complete station data can be found in an NODC formatted ASCII file and in a comma delimited file.

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

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

choose: **2019 Cruises**
MAR_TRAWL_HB1901
CTD_REPORT_2019001HB.pdf

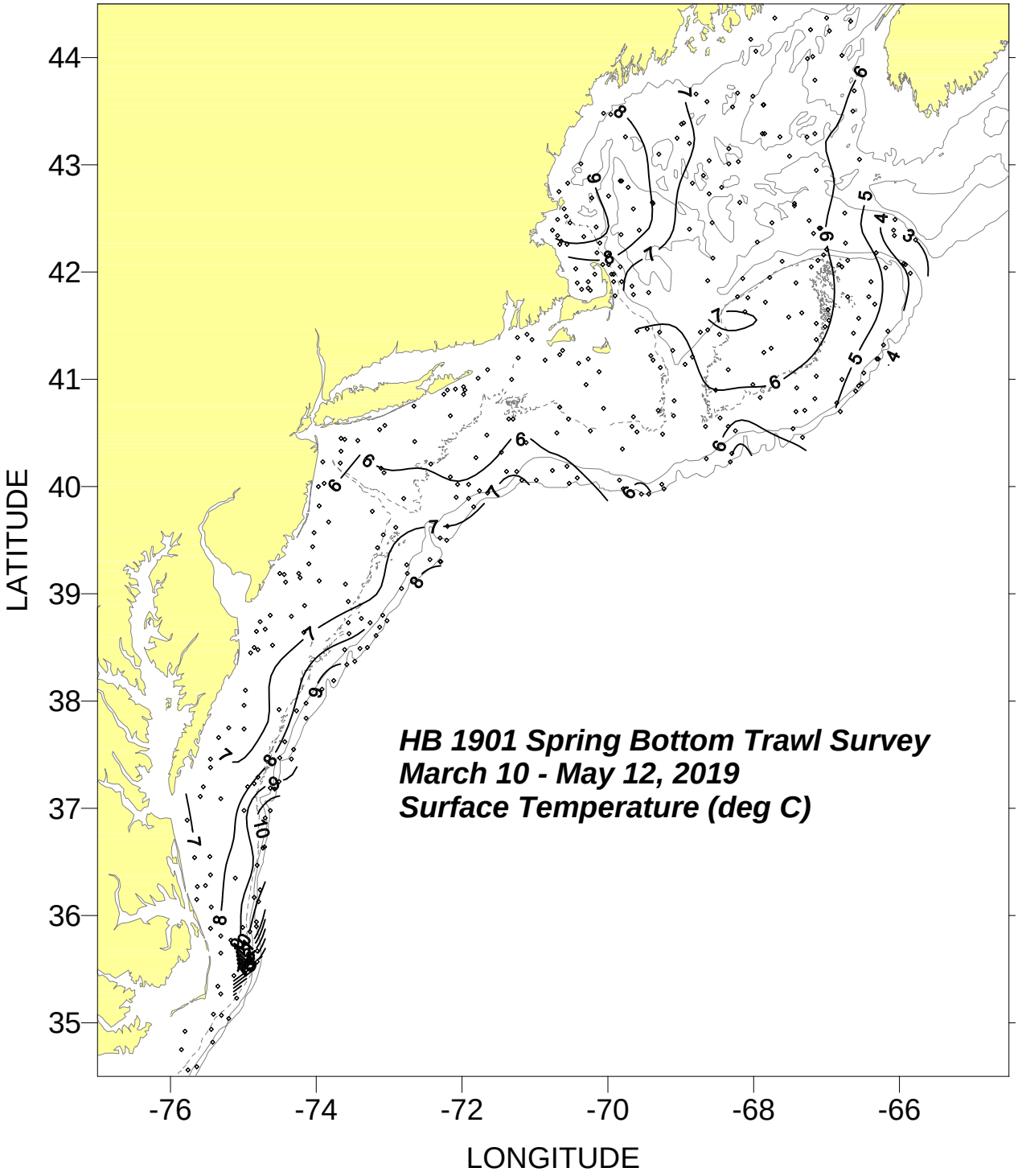
Revised: January 14, 2020

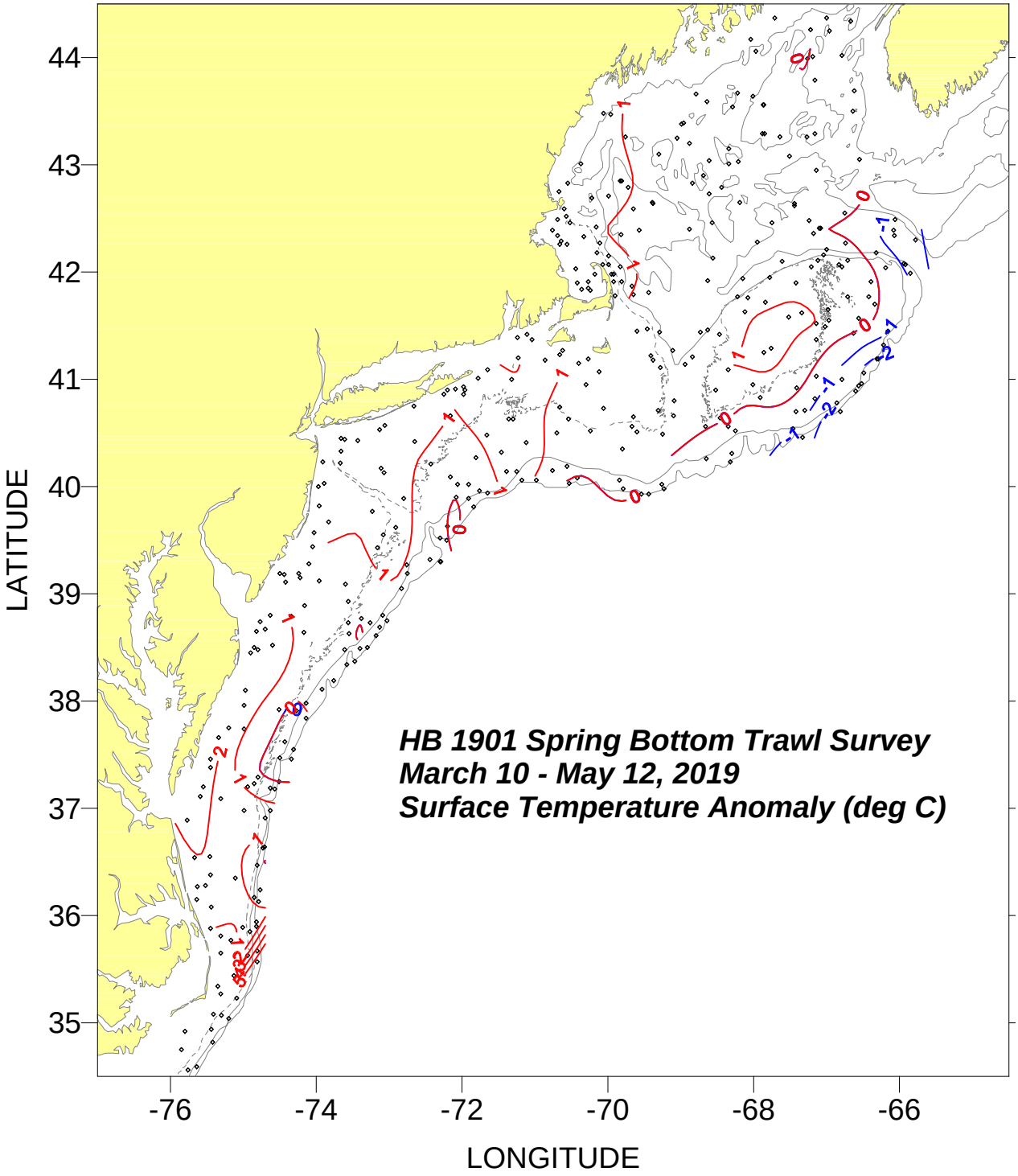

HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Station Positions (cast #)
Seacat 19+ Stations
CTD 9/11+ Stations
GOM WEST
GOM EAST
GEORGES BANK
MAB NORTH
MAB SOUTH
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66

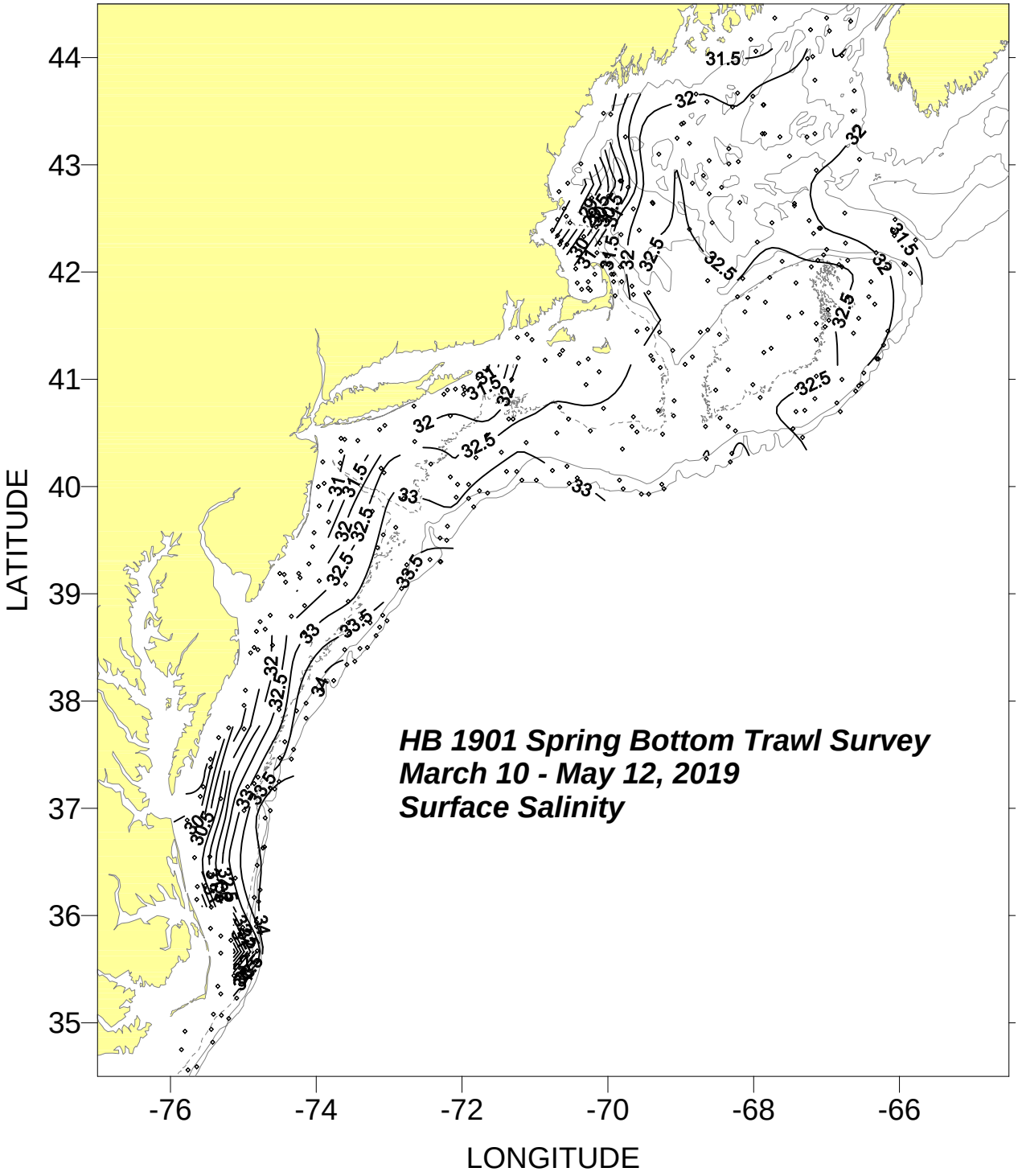
Areal average surface and bottom temperature/salinity and temperature/salinity anomalies for the HB1901 Spring Bottom Trawl Survey March 10 - May 12, 2019

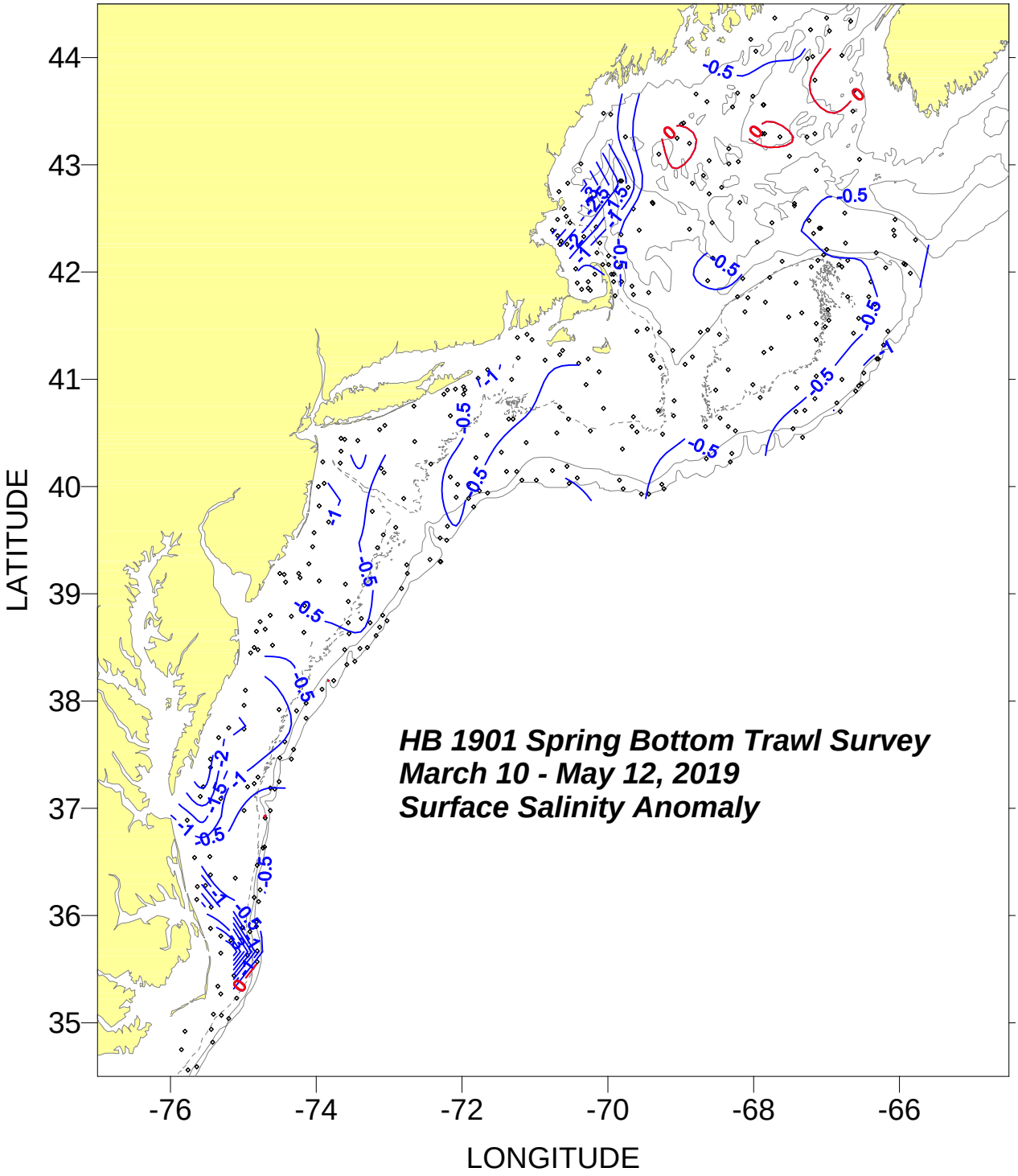
		SURFACE						BOTTOM						
CRUISE	CD	#obs	T/S	Anomaly	SDV1	SDV2	Flag	#obs	T/S	Anomaly	SDV1	SDV2	Flag	Purpose
						Western Gulf of Maine								
hb1901	124	61	7.12	0.68	0.14	0.51	0	59	6.75	1.52	0.12	0.63	0	10
hb1901	124	61	31.90	-0.51	0.06	0.79	0	59	33.40	0.04	0.04	0.29	0	10
						Eastern Gulf of Maine								
hb1901	123	36	6.06	0.14	0.15	0.69	0	33	8.50	1.66	0.20	0.75	0	10
hb1901	123	36	32.13	-0.31	0.08	0.34	0	33	34.23	0.16	0.06	0.36	0	10
						Georges Bank								
hb1901	109	54	5.81	0.05	0.20	1.34	0	54	6.73	0.63	0.20	1.10	0	10
hb1901	109	54	32.59	-0.41	0.06	0.37	0	54	33.11	-0.25	0.06	0.50	0	10
						MAB North								
hb1901	89	53	5.92	0.95	0.23	0.71	0	52	7.63	1.44	0.26	1.21	0	10
hb1901	89	53	32.41	-0.48	0.10	0.44	0	52	33.40	-0.22	0.09	0.40	0	10
						MAB South								
hb1901	79	96	7.48	0.94	0.19	1.02	0	91	8.17	1.42	0.24	1.35	0	10
hb1901	79	96	32.37	-0.77	0.11	0.89	0	91	33.37	-0.44	0.08	0.44	0	10

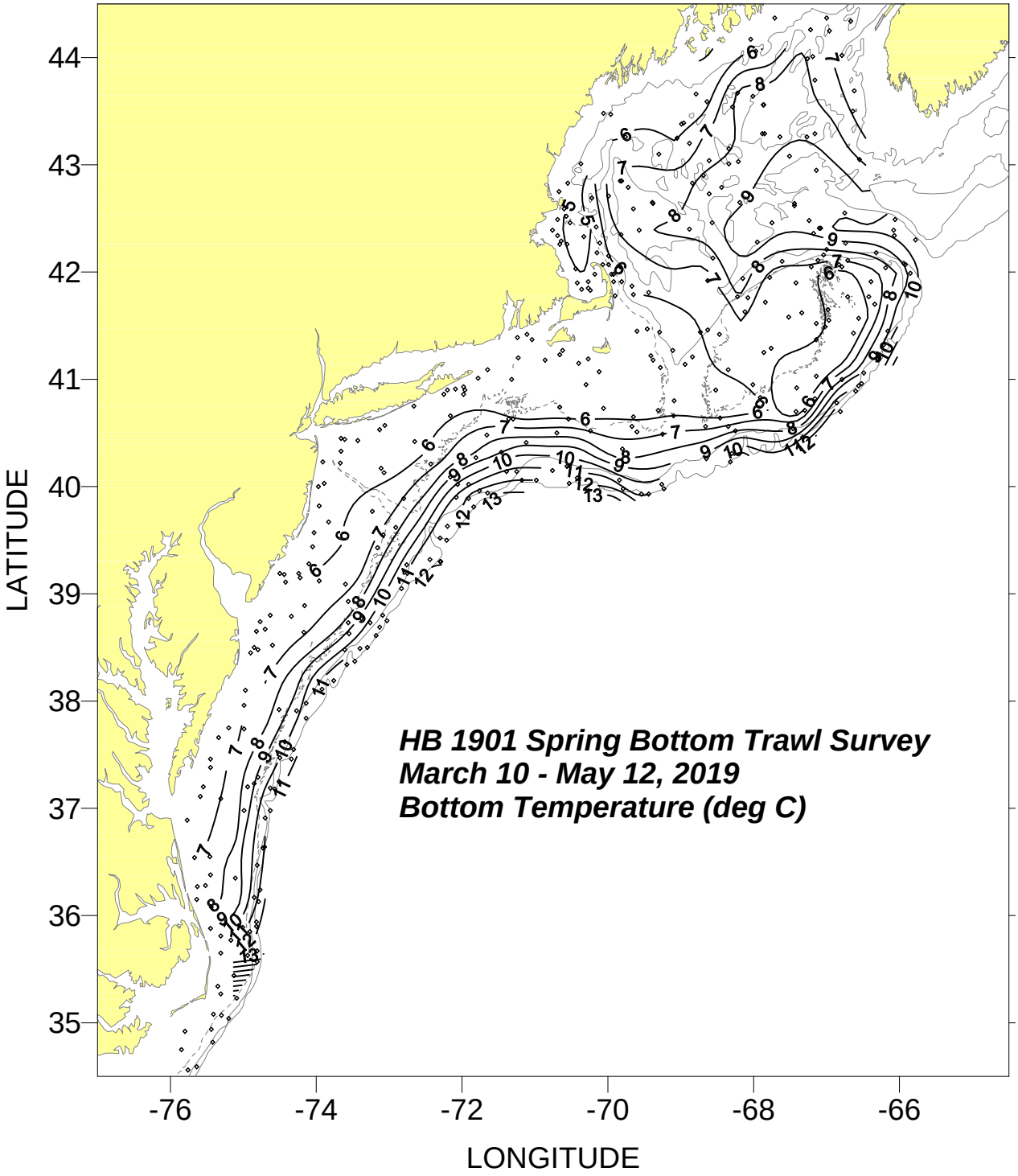
"CRUISE": the code name for a cruise; "CD": the calendar mid-date of all the stations within a region for a cruise;
"#obs": the number of observations include in each average; "T/S": the areal average temp/salt; "Anomaly": the areal average temp/salt anomaly;
"SDV1": the standard deviation associated 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 identifying the NEFSC program survey where 10 denotes a bottom trawl survey.

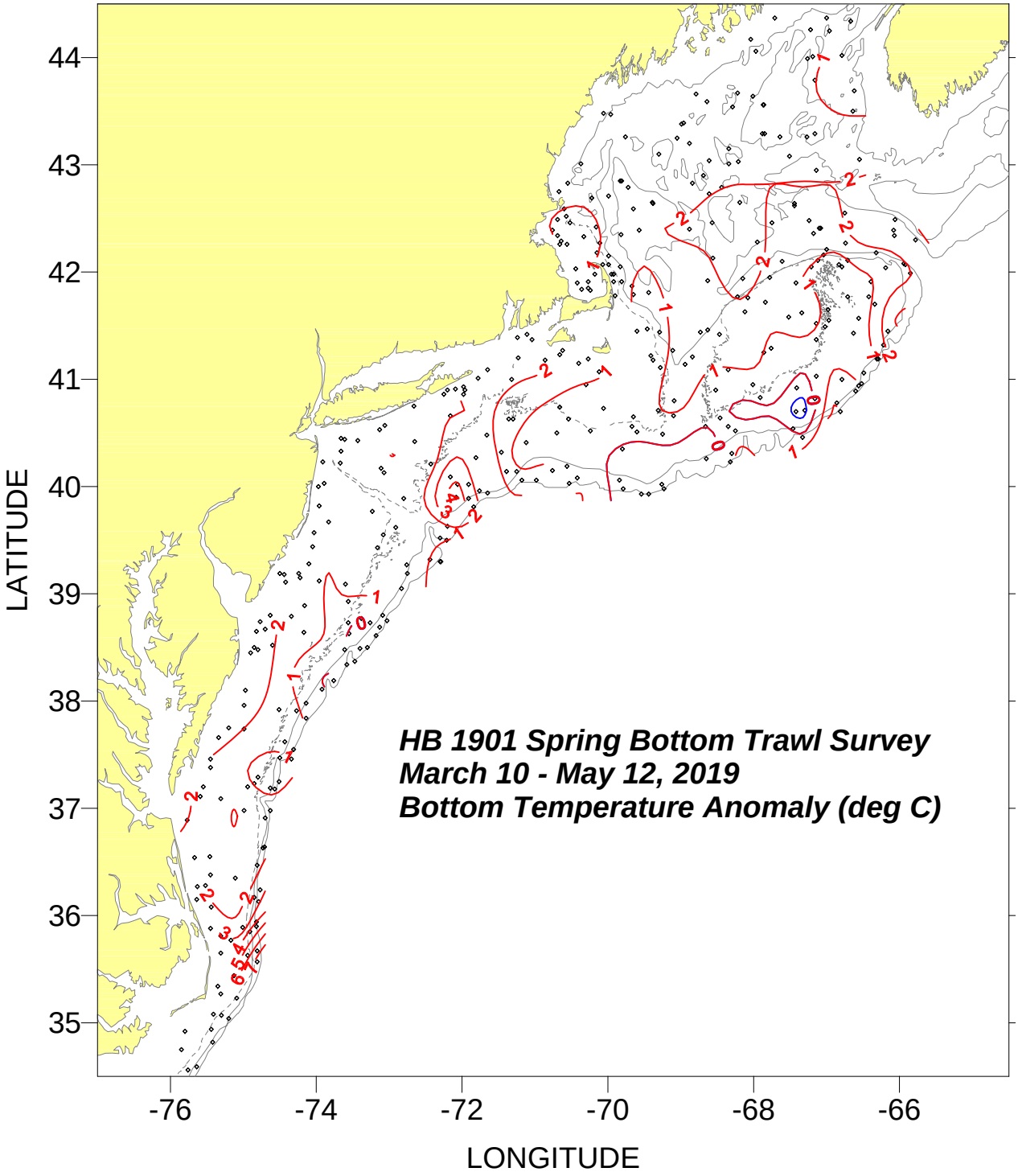

HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Surface Temperature (deg C)
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66

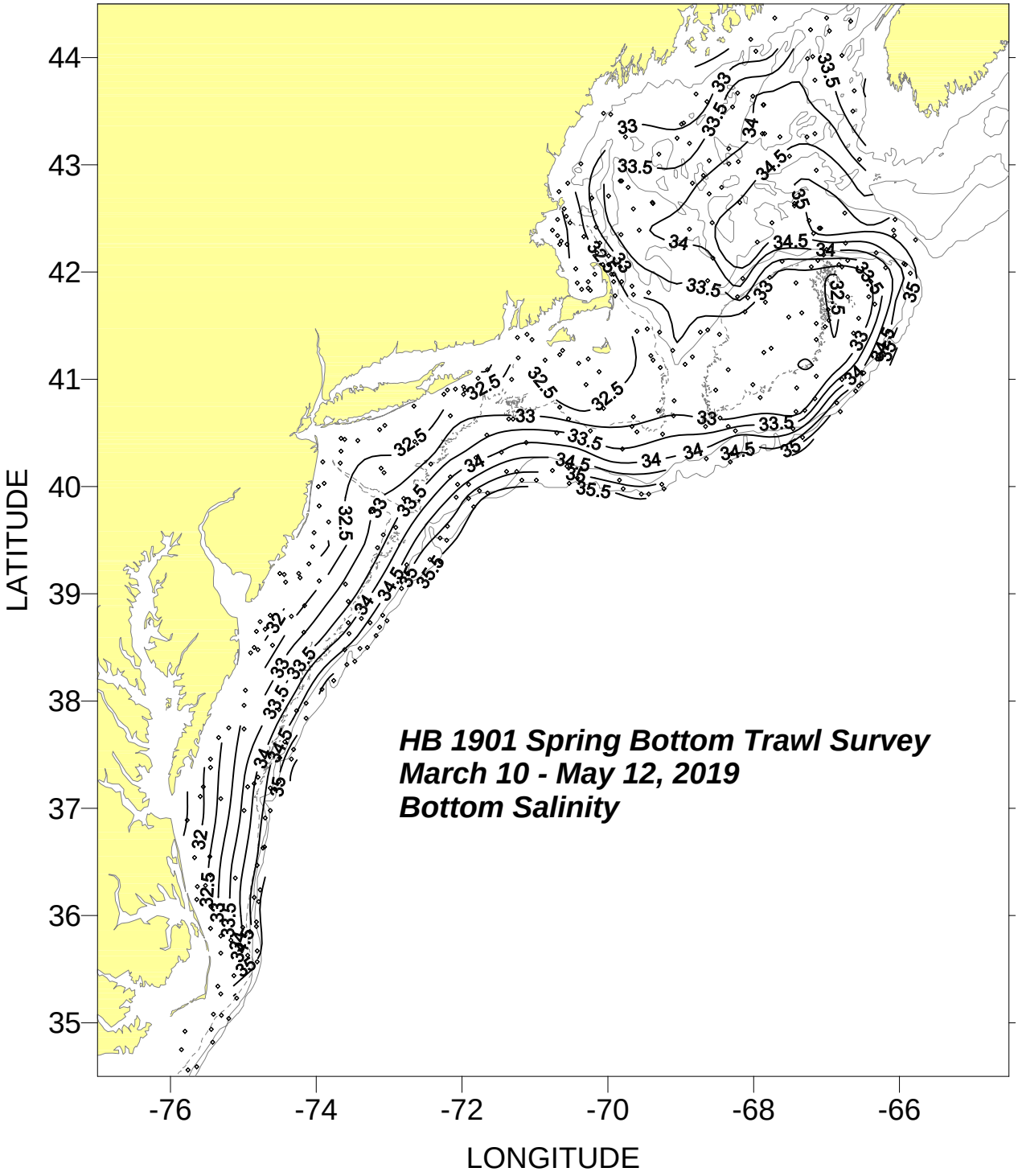

HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Surface Temperature Anomaly (deg C)
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66

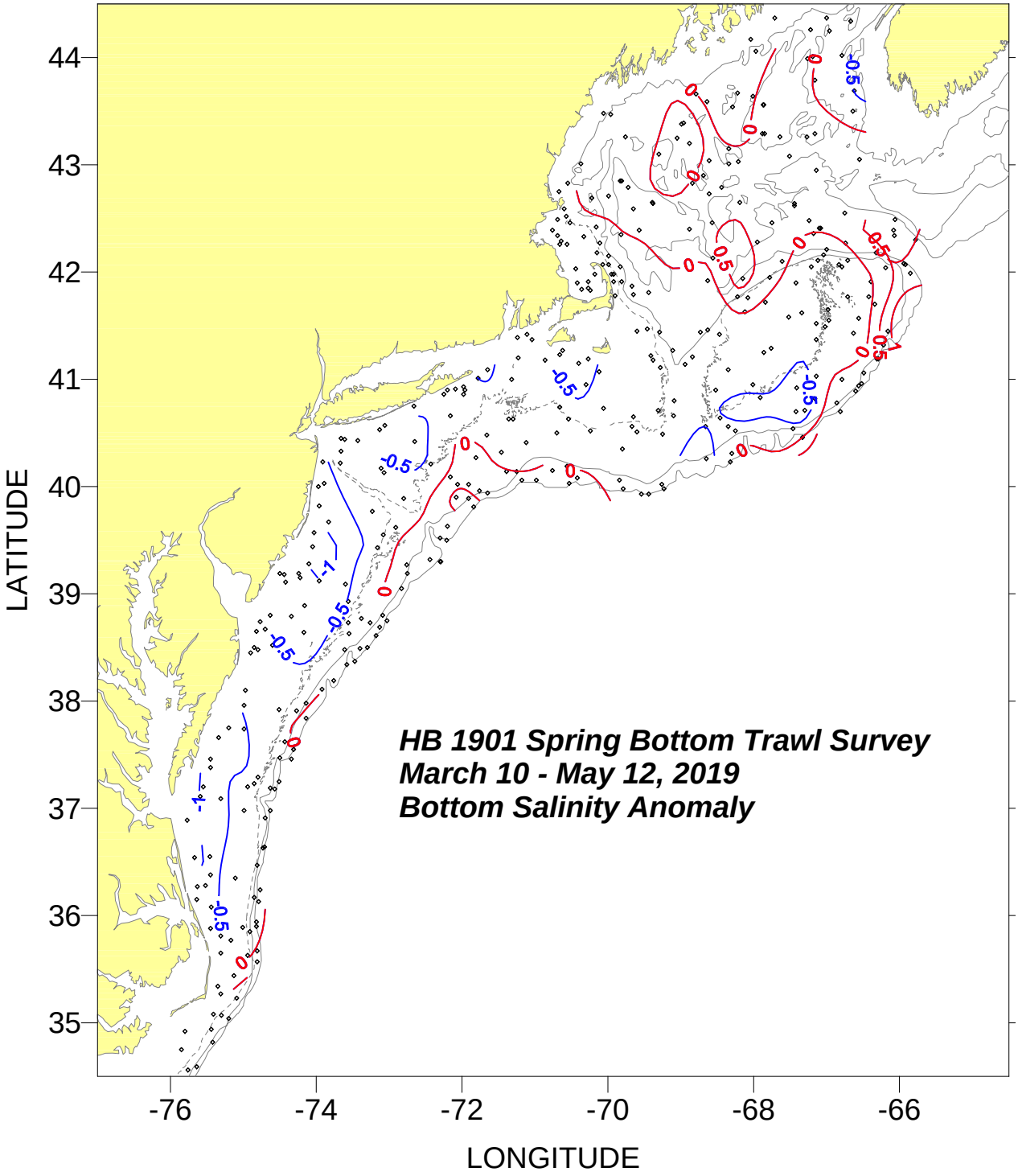

HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Surface Salinity
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66


HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Surface Salinity Anomaly
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66


HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Bottom Temperature (deg C)
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66


HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Bottom Temperature Anomaly (deg C)
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66


HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Bottom Salinity
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66


HB 1901 Spring Bottom Trawl Survey
March 10 - May 12, 2019
Bottom Salinity Anomaly
LATITUDE
LONGITUDE
44
43
42
41
40
39
38
37
36
35
-76
-74
-72
-70
-68
-66

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
1	**28390**	**3653.4**	**7546.2**	**10**	**3**	**2019**	**21:37**	**18**	**6.34**	**30.80**	**6.38**	**31.18**	**3**	**V**
2	**28293**	**3632.4**	**7540.3**	**11**	**3**	**2019**	**0:41**	**25**	**6.99**	**30.06**	**6.71**	**31.68**	**4**	**W**
1	28296	3632.9	7527.9	11	3	2019	3:14	28	7.39	31.85	7.25	32.55	9	B
3	**28158**	**3623.1**	**7526.8**	**11**	**3**	**2019**	**5:27**	**28**	**7.22**	**31.56**	**7.74**	**33.14**	**6**	**W**
4	**28440**	**3616.7**	**7530.9**	**11**	**3**	**2019**	**6:54**	**28**	**7.63**	**30.96**	**7.50**	**32.47**	**9**	**V**
5	**28176**	**3615.9**	**7537.8**	**11**	**3**	**2019**	**8:39**	**27**	**7.33**	**30.99**	**7.24**	**31.95**	**6**	**V**
6	**28199**	**3609.1**	**7538.5**	**11**	**3**	**2019**	**11:10**	**22**	**6.85**	**28.64**	**7.30**	**32.05**	**5**	**V**
7	**28512**	**3604.6**	**7526.7**	**11**	**3**	**2019**	**13:03**	**27**	**7.71**	**31.11**	**7.77**	**32.83**	**4**	**V**
8	**28418**	**3552.9**	**7527.1**	**11**	**3**	**2019**	**14:50**	**27**	**7.74**	**25.12**	**7.59**	**32.36**	**4**	**V**
2	28164	3548.5	7518.8	11	3	2019	16:25	34	8.72	24.32	8.32	33.25	3	B
3	28526	3546.3	7510.0	11	3	2019	18:00	39	8.70	30.60	8.62	33.48	3	B
4	28472	3539.1	7518.8	11	3	2019	20:53	26	9.53	25.76	7.68	32.26	4	B
9	**28261**	**3526.6**	**7507.5**	**12**	**3**	**2019**	**0:02**	**33**	**10.04**	**27.34**	**19.46**	**35.59**	**5**	**W**
10	**28198**	**3520.1**	**7520.9**	**12**	**3**	**2019**	**2:05**	**27**	**8.00**	**26.19**	**17.89**	**34.81**	**5**	**V**
11	**28269**	**3516.5**	**7518.8**	**12**	**3**	**2019**	**3:28**	**24**	**12.67**	**29.69**	**18.02**	**34.91**	**5**	**V**
12	**28166**	**3503.9**	**7517.9**	**12**	**3**	**2019**	**5:36**	**70**	**23.69**	**36.23**	**20.31**	**36.27**	**3**	**V**
13	**28685**	**3504.9**	**7524.3**	**12**	**3**	**2019**	**7:40**	**25**	**16.35**	**33.27**	**18.52**	**35.93**	**4**	**V**
14	**28389**	**3456.3**	**7526.4**	**12**	**3**	**2019**	**9:31**	**75**	**23.52**	**36.11**	**20.31**	**36.21**	**3**	**V**
15	**28609**	**3455.3**	**7547.9**	**12**	**3**	**2019**	**12:48**	**27**	**18.82**	**34.47**	**21.12**	**36.34**	**5**	**V**
16	**28378**	**3445.1**	**7551.0**	**12**	**3**	**2019**	**15:26**	**35**	**22.17**	**36.24**	**21.23**	**36.19**	**5**	**V**
17	**28240**	**3433.4**	**7545.3**	**12**	**3**	**2019**	**18:38**	**120**	**23.06**	**36.25**	**21.31**	**36.45**	**6**	**W**
18	**28335**	**3435.4**	**7538.7**	**12**	**3**	**2019**	**20:41**	**265**	**23.41**	**36.23**	**17.64**	**36.30**	**3**	**V**
19	**28292**	**3449.1**	**7525.3**	**13**	**3**	**2019**	**0:42**	**292**	**23.64**	**36.24**	**15.30**	**36.01**	**1**	**V**
20	**28447**	**3502.2**	**7511.9**	**13**	**3**	**2019**	**3:49**	**281**	**24.41**	**36.26**	**15.29**	**36.00**	**9**	**V**
21	**28379**	**3514.0**	**7505.1**	**13**	**3**	**2019**	**6:38**	**86**	**24.12**	**36.27**	**22.16**	**36.28**	**4**	**V**
22	**28416**	**3533.9**	**7448.9**	**13**	**3**	**2019**	**10:08**	**100**	**16.95**	**34.00**	**15.35**	**35.16**	**7**	**V**
5	28394	3540.4	7448.6	13	3	2019	12:06	159	12.80	31.76	11.61	34.64	9	B
6	28311	3538.0	7456.1	13	3	2019	14:09	53	9.44	29.37	16.17	34.63	9	W

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
23	**28484**	**3550.9**	**7454.8**	**13**	**3**	**2019**	**17:41**	**83**	**9.04**	**33.89**	**8.91**	**33.94**	**6**	**W**
24	**28224**	**3553.7**	**7500.3**	**13**	**3**	**2019**	**19:28**	**49**	**9.20**	**33.88**	**8.92**	**33.88**	**8**	**V**
25	**28459**	**3556.6**	**7449.0**	**13**	**3**	**2019**	**21:47**	**168**	**10.45**	**34.01**	**11.74**	**34.88**	**4**	**V**
26	**28206**	**3553.9**	**7449.0**	**13**	**3**	**2019**	**23:36**	**366**	**10.88**	**34.30**	**8.63**	**35.16**	**1**	**V**
27	**28453**	**3608.0**	**7447.4**	**14**	**3**	**2019**	**2:30**	**184**	**9.55**	**34.11**	**11.64**	**34.93**	**7**	**V**
28	**28291**	**3610.5**	**7451.0**	**14**	**3**	**2019**	**6:00**	**90**	**8.90**	**33.87**	**10.95**	**34.70**	**6**	**V**
29	**28439**	**3614.6**	**7446.4**	**14**	**3**	**2019**	**7:34**	**220**	**9.20**	**34.08**	**12.08**	**35.16**	**6**	**V**
30	**28263**	**3627.9**	**7448.6**	**14**	**3**	**2019**	**11:35**	**79**	**8.18**	**33.69**	**10.19**	**34.44**	**4**	**V**
7	28517	3621.1	7506.3	14	3	2019	14:10	38	8.71	33.67	8.53	33.71	7	B
31	**28533**	**3637.7**	**7444.0**	**14**	**3**	**2019**	**17:29**	**96**	**10.10**	**34.28**	**10.64**	**34.61**	**6**	**W**
32	**28279**	**3638.6**	**7442.8**	**14**	**3**	**2019**	**23:14**	**141**	**10.45**	**34.26**	**11.40**	**34.87**	**6**	**V**
33	**28345**	**3654.4**	**7442.0**	**15**	**3**	**2019**	**1:44**	**85**	**10.98**	**34.53**	**10.89**	**34.66**	**3**	**V**
34	**28496**	**3659.0**	**7437.5**	**15**	**3**	**2019**	**3:56**	**204**	**10.01**	**34.33**	**12.71**	**35.52**	**13**	**V**
35	**28396**	**3710.7**	**7434.1**	**15**	**3**	**2019**	**6:20**	**122**	**9.52**	**34.13**	**11.80**	**34.96**	**5**	**V**
36	**28446**	**3714.8**	**7430.7**	**15**	**3**	**2019**	**8:15**	**263**	**9.57**	**34.09**	**11.51**	**35.45**	**10**	**W**
37	**28433**	**3711.4**	**7437.9**	**15**	**3**	**2019**	**10:25**	**89**	**8.45**	**33.56**	**10.57**	**34.62**	**7**	**V**
8	28530	3717.2	7447.9	15	3	2019	12:53	54	8.01	33.41	8.37	33.87	8	B
9	28510	3713.8	7451.2	15	3	2019	14:15	49	7.52	33.16	8.36	33.86	8	B
10	28299	3711.9	7456.3	15	3	2019	15:50	44	7.65	32.88	7.93	33.67	4	W
11	28531	3658.8	7459.7	15	3	2019	18:35	43	8.01	33.10	7.61	33.48	4	B
38	**28663**	**3705.4**	**7518.5**	**15**	**3**	**2019**	**21:37**	**31**	**7.34**	**31.90**	**7.06**	**32.78**	**3**	**V**
39	**28500**	**3706.7**	**7535.4**	**15**	**3**	**2019**	**23:56**	**21**	**8.29**	**26.87**	**6.79**	**32.06**	**6**	**V**
12	28455	3711.9	7533.0	16	3	2019	2:07	26	8.30	26.93	6.94	32.26	4	B
40	**28313**	**3722.5**	**7527.0**	**16**	**3**	**2019**	**4:20**	**29**	**7.17**	**30.48**	**6.69**	**32.03**	**8**	**V**
13	28383	3727.6	7527.2	16	3	2019	5:56	22	7.13	30.48	6.41	31.92	5	B
14	28196	3739.3	7520.3	16	3	2019	8:15	19	6.55	30.57	6.24	32.27	6	B
15	28282	3745.0	7512.3	16	3	2019	9:57	28	6.38	30.31	6.71	32.88	5	W
41	**28289**	**3744.7**	**7459.7**	**16**	**3**	**2019**	**11:53**	**35**	**6.55**	**30.95**	**6.84**	**32.89**	**6**	**W**

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
42	**28253**	**3757.4**	**7459.5**	**16**	**3**	**2019**	**14:06**	**27**	**6.08**	**31.36**	**6.32**	**32.62**	**7**	**V**
43	**28504**	**3805.8**	**7458.5**	**16**	**3**	**2019**	**16:06**	**21**	**6.23**	**30.70**	**6.23**	**32.45**	**2**	**V**
44	**28190**	**3755.4**	**7430.4**	**16**	**3**	**2019**	**19:28**	**54**	**7.26**	**32.97**	**8.20**	**33.84**	**4**	**V**
45	**28340**	**3737.3**	**7425.7**	**16**	**3**	**2019**	**22:28**	**77**	**7.49**	**33.07**	**8.92**	**34.10**	**3**	**V**
46	**28412**	**3728.3**	**7430.2**	**17**	**3**	**2019**	**0:36**	**287**	**8.15**	**33.30**	**11.42**	**35.41**	**1**	**V**
47	**28513**	**3727.7**	**7420.2**	**17**	**3**	**2019**	**4:02**	**740**	**8.08**	**33.40**	**6.14**	**35.06**	**235**	**V**
48	**28275**	**3733.2**	**7418.4**	**17**	**3**	**2019**	**6:31**	**305**	**8.25**	**33.46**	**8.80**	**35.19**	**1**	**V**
49	**28366**	**3750.5**	**7408.5**	**17**	**3**	**2019**	**10:21**	**144**	**8.91**	**33.98**	**12.63**	**35.52**	**7**	**V**
50	**28351**	**3754.3**	**7416.1**	**17**	**3**	**2019**	**12:26**	**73**	**8.49**	**33.85**	**9.52**	**34.28**	**7**	**V**
51	**28346**	**3759.1**	**7408.2**	**17**	**3**	**2019**	**14:11**	**103**	**8.15**	**33.72**	**10.77**	**34.74**	**5**	**W**
16	28368	3811.5	7345.3	17	3	2019	18:20	120	9.98	34.39	12.21	35.29	2	B
53	**28338**	**3820.6**	**7334.5**	**17**	**3**	**2019**	**20:54**	**207**	**9.92**	**34.36**	**11.97**	**35.42**	**3**	**V**
54	**28480**	**3822.2**	**7328.3**	**17**	**3**	**2019**	**23:49**	**500**	**8.99**	**34.02**	**5.63**	**35.03**	**11**	**V**
17	28322	3829.6	7324.2	18	3	2019	2:24	109	8.01	33.73	11.60	35.00	2	B
55	**28451**	**3829.1**	**7336.6**	**18**	**3**	**2019**	**4:17**	**75**	**7.94**	**33.64**	**9.14**	**34.12**	**3**	**V**
56	**28478**	**3838.1**	**7332.9**	**18**	**3**	**2019**	**6:10**	**71**	**7.59**	**33.51**	**9.25**	**34.18**	**4**	**W**
57	**28162**	**3843.7**	**7333.7**	**18**	**3**	**2019**	**7:36**	**66**	**7.28**	**33.37**	**7.62**	**33.66**	**4**	**V**
58	**28186**	**3855.9**	**7333.5**	**18**	**3**	**2019**	**9:40**	**52**	**6.62**	**32.96**	**7.02**	**33.42**	**5**	**V**
18	28352	3905.2	7336.0	18	3	2019	11:39	48	6.18	32.72	6.73	33.34	5	B
19	28309	3846.0	7322.9	18	3	2019	14:21	74	7.37	33.48	8.65	34.03	7	B
20	28489	3844.1	7315.8	18	3	2019	16:28	83	7.68	33.58	9.28	34.23	7	B
59	**28400**	**3830.1**	**7317.9**	**18**	**3**	**2019**	**18:58**	**214**	**9.96**	**34.29**	**11.67**	**35.47**	**1**	**V**
60	**28363**	**3836.6**	**7310.7**	**18**	**3**	**2019**	**20:51**	**537**	**10.44**	**34.47**	**6.13**	**35.06**	**32**	**V**
61	**28167**	**3841.4**	**7307.7**	**18**	**3**	**2019**	**23:43**	**144**	**8.58**	**33.82**	**12.91**	**35.50**	**2**	**V**
62	**28231**	**3845.2**	**7301.7**	**19**	**3**	**2019**	**2:33**	**271**	**8.36**	**33.76**	**10.09**	**35.30**	**1**	**V**
21	28422	3847.9	7305.3	19	3	2019	4:45	91	7.23	33.43	9.96	34.43	8	B
63	**28393**	**3903.2**	**7249.6**	**19**	**3**	**2019**	**8:13**	**117**	**7.72**	**33.53**	**12.16**	**35.16**	**4**	**W**
64	**28380**	**3911.5**	**7244.8**	**19**	**3**	**2019**	**9:59**	**120**	**8.13**	**33.69**	**12.55**	**35.20**	**4**	**V**

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
22	28511	3916.0	7245.8	19	3	2019	11:44	96	7.54	33.51	11.24	34.82	7	B
23	28534	3918.9	7226.5	19	3	2019	14:01	142	7.85	33.65	13.05	35.43	5	W
24	28318	3918.2	7218.2	19	3	2019	15:52	253	7.59	33.54	11.31	35.46	48	B
65	**28318**	**3917.9**	**7217.5**	**19**	**3**	**2019**	**16:24**	**285**	**7.63**	**33.52**	**8.80**	**35.19**	**1**	**V**
66	**28415**	**3931.0**	**7218.0**	**19**	**3**	**2019**	**19:27**	**309**	**7.13**	**33.34**	**9.15**	**35.22**	**1**	**V**
67	**28467**	**3930.2**	**7212.6**	**19**	**3**	**2019**	**22:13**	**256**	**7.45**	**33.36**	**10.92**	**35.39**	**3**	**V**
68	**28225**	**3937.6**	**7211.8**	**20**	**3**	**2019**	**0:27**	**126**	**6.69**	**33.09**	**13.33**	**35.40**	**4**	**V**
69	**28262**	**3954.0**	**7205.0**	**20**	**3**	**2019**	**2:56**	**88**	**6.08**	**32.91**	**11.07**	**34.65**	**3**	**V**
70	**28169**	**3953.6**	**7154.7**	**20**	**3**	**2019**	**4:32**	**124**	**6.74**	**33.27**	**13.10**	**35.36**	**5**	**V**
71	**28184**	**3948.8**	**7150.7**	**20**	**3**	**2019**	**6:34**	**188**	**8.14**	**33.77**	**13.06**	**35.56**	**3**	**V**
72	**28445**	**3956.3**	**7139.1**	**20**	**3**	**2019**	**8:44**	**119**	**6.42**	**33.18**	**13.18**	**35.55**	**4**	**W**
25	28494	3957.4	7145.3	20	3	2019	10:33	108	6.36	33.21	12.49	35.15	6	B
26	28246	4001.2	7154.4	20	3	2019	12:13	85	6.04	33.01	10.77	34.58	7	B
27	28270	4001.2	7203.9	20	3	2019	13:37	82	5.75	32.69	7.63	33.61	6	W
28	28342	4005.3	7209.9	20	3	2019	14:57	72	5.89	32.33	8.24	33.79	6	B
29	28310	4016.3	7148.4	20	3	2019	17:32	75	6.14	32.83	8.98	33.97	5	B
30	28175	4019.2	7127.9	20	3	2019	19:57	83	5.47	32.62	6.81	33.34	4	W
31	28188	4028.5	7139.3	20	3	2019	21:56	77	5.22	32.57	7.36	33.52	4	B
32	28300	4112.0	7114.1	26	3	2019	18:10	49	5.31	32.15	5.46	32.62	9	B
73	**28370**	**4100.2**	**7119.2**	**26**	**3**	**2019**	**20:36**	**48**	**5.54**	**31.71**	**6.17**	**33.05**	**7**	**V**
74	**28356**	**4037.9**	**7117.9**	**27**	**3**	**2019**	**0:48**	**62**	**5.19**	**32.36**	**4.70**	**32.74**	**4**	**V**
75	**28244**	**4037.5**	**7121.3**	**27**	**3**	**2019**	**2:31**	**65**	**5.17**	**32.38**	**4.75**	**32.78**	**4**	**W**
33	28449	4039.6	7209.9	27	3	2019	6:58	48	5.31	32.01	5.83	32.84	6	B
76	**28179**	**4012.5**	**7226.0**	**27**	**3**	**2019**	**10:27**	**62**	**5.97**	**32.76**	**6.41**	**33.01**	**3**	**V**
77	**28405**	**4025.4**	**7239.2**	**27**	**3**	**2019**	**12:51**	**46**	**5.56**	**32.47**	**5.62**	**32.54**	**7**	**W**
34	28519	4010.2	7306.8	27	3	2019	16:10	45	5.67	32.51	5.65	32.65	3	B
35	28424	4007.6	7304.0	27	3	2019	17:47	46	6.15	32.87	6.00	32.89	5	B
36	28398	3953.3	7247.9	27	3	2019	20:30	55	6.67	33.10	6.54	33.17	4	B

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
37	28250	3946.0	7313.9	27	3	2019	23:46	45	6.31	32.85	6.51	33.12	4	B
78	**28221**	**3937.0**	**7254.7**	**28**	**3**	**2019**	**2:48**	**64**	**6.75**	**33.14**	**7.58**	**33.52**	**3**	**W**
79	**28197**	**3933.1**	**7304.9**	**28**	**3**	**2019**	**4:30**	**50**	**7.01**	**33.28**	**6.94**	**33.28**	**7**	**V**
38	28375	3926.1	7309.9	28	3	2019	5:57	58	6.54	33.13	6.55	33.13	8	B
39	28442	3907.1	7357.8	28	3	2019	10:17	40	5.94	32.19	6.07	32.33	5	W
40	28420	3853.6	7409.4	28	3	2019	12:39	34	6.28	32.51	6.29	32.55	5	B
41	28204	3847.4	7420.3	28	3	2019	14:30	40	6.29	32.39	6.12	32.43	8	B
80	**28497**	**3838.4**	**7410.1**	**28**	**3**	**2019**	**17:04**	**48**	**6.80**	**32.95**	**6.76**	**32.98**	**4**	**W**
81	**28505**	**3831.1**	**7436.0**	**28**	**3**	**2019**	**20:06**	**31**	**7.03**	**32.22**	**6.23**	**32.24**	**18**	**V**
82	**28201**	**3828.8**	**7448.0**	**28**	**3**	**2019**	**22:12**	**25**	**6.93**	**31.27**	**6.45**	**31.81**	**3**	**V**
83	**28208**	**3826.9**	**7453.9**	**28**	**3**	**2019**	**23:28**	**15**	**7.35**	**29.10**	**6.59**	**31.43**	**4**	**V**
84	**28493**	**3830.0**	**7451.0**	**29**	**3**	**2019**	**0:36**	**22**	**7.20**	**31.25**	**6.43**	**31.43**	**3**	**V**
85	**28170**	**3839.1**	**7449.4**	**29**	**3**	**2019**	**2:21**	**26**	**6.88**	**30.42**	**6.36**	**31.55**	**3**	**V**
42	28336	3840.1	7442.1	29	3	2019	4:11	21	6.34	31.83	6.32	31.83	6	B
86	**28507**	**3844.6**	**7445.9**	**29**	**3**	**2019**	**5:30**	**20**	**6.53**	**31.22**	**6.56**	**31.28**	**4**	**V**
43	28452	3847.9	7437.6	29	3	2019	7:23	19	6.40	31.42	6.12	31.76	7	B
44	28334	3911.3	7429.9	29	3	2019	10:15	19	6.46	31.08	6.12	31.29	5	W
45	28529	3910.8	7426.1	29	3	2019	11:18	20	6.38	31.26	6.00	31.72	4	B
87	**28202**	**3906.7**	**7425.4**	**29**	**3**	**2019**	**12:32**	**24**	**6.26**	**31.56**	**6.09**	**31.84**	**5**	**V**
88	**28485**	**3908.8**	**7413.3**	**29**	**3**	**2019**	**13:57**	**23**	**6.18**	**31.72**	**6.02**	**31.74**	**6**	**V**
89	**28392**	**3911.6**	**7414.6**	**29**	**3**	**2019**	**14:58**	**22**	**6.18**	**31.65**	**6.15**	**31.65**	**7**	**V**
46	28278	3916.8	7405.9	29	3	2019	16:30	30	6.22	31.40	5.90	31.83	2	B
90	**28528**	**3926.5**	**7402.8**	**29**	**3**	**2019**	**18:30**	**25**	**6.60**	**30.97**	**5.79**	**31.40**	**5**	**W**
91	**28457**	**3934.4**	**7401.8**	**29**	**3**	**2019**	**20:16**	**24**	**6.68**	**30.85**	**5.69**	**31.32**	**2**	**V**
47	28397	3940.0	7349.8	29	3	2019	21:53	30	5.88	31.45	5.63	31.84	2	B
48	28178	3949.4	7357.5	29	3	2019	23:45	21	6.13	30.22	5.56	31.68	3	W
49	28305	4000.0	7358.5	30	3	2019	1:27	22	6.20	30.64	5.60	31.86	3	B
50	28194	4001.9	7353.1	30	3	2019	2:48	25	6.05	30.59	5.83	32.51	3	B

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
92	**28222**	**4014.0**	**7354.9**	**30**	**3**	**2019**	**4:57**	**22**	**5.84**	**31.16**	**5.51**	**32.03**	**8**	**V**
93	**28181**	**4013.2**	**7340.3**	**30**	**3**	**2019**	**6:51**	**36**	**6.11**	**30.82**	**5.58**	**32.52**	**5**	**V**
94	**28185**	**4019.5**	**7339.8**	**30**	**3**	**2019**	**8:36**	**26**	**6.12**	**30.31**	**5.42**	**32.04**	**5**	**W**
95	**28372**	**4026.8**	**7339.6**	**30**	**3**	**2019**	**10:06**	**24**	**5.94**	**29.96**	**5.53**	**32.19**	**5**	**V**
96	**28382**	**4026.4**	**7336.4**	**30**	**3**	**2019**	**11:07**	**25**	**6.26**	**29.54**	**5.45**	**32.07**	**4**	**V**
97	**28168**	**4025.7**	**7326.0**	**30**	**3**	**2019**	**12:31**	**27**	**6.08**	**30.77**	**5.49**	**32.32**	**4**	**V**
98	**28430**	**4032.0**	**7307.6**	**30**	**3**	**2019**	**14:26**	**28**	**5.51**	**31.45**	**4.82**	**31.76**	**4**	**V**
99	**28355**	**4033.9**	**7303.5**	**30**	**3**	**2019**	**15:28**	**27**	**5.36**	**31.43**	**4.82**	**31.94**	**4**	**V**
51	28307	4044.8	7239.6	30	3	2019	17:51	26	6.06	31.54	5.52	31.84	4	B
52	28218	4051.4	7215.1	30	3	2019	20:18	29	6.22	31.16	5.23	32.08	2	W
53	28219	4054.1	7211.9	30	3	2019	21:47	23	5.95	31.01	5.39	31.75	2	B
100	**28301**	**4054.5**	**7205.2**	**30**	**3**	**2019**	**23:00**	**29**	**5.76**	**31.52**	**5.23**	**31.90**	**5**	**V**
101	**28495**	**4051.4**	**7158.8**	**31**	**3**	**2019**	**0:46**	**39**	**5.59**	**31.74**	**5.58**	**32.56**	**3**	**V**
54	28343	4054.0	7157.7	31	3	2019	2:22	34	5.93	30.61	5.34	32.24	4	B
102	**28358**	**4055.9**	**7158.7**	**31**	**3**	**2019**	**3:42**	**29**	**5.77**	**30.77**	**5.41**	**31.72**	**5**	**V**
103	**28385**	**4100.7**	**7146.7**	**31**	**3**	**2019**	**5:18**	**28**	**5.56**	**30.20**	**5.84**	**31.86**	**5**	**V**
104	**28163**	**4105.5**	**7139.0**	**31**	**3**	**2019**	**6:38**	**35**	**5.69**	**30.38**	**5.64**	**31.93**	**4**	**W**
55	28357	4024.3	7107.3	31	3	2019	11:55	86	6.72	33.22	8.78	33.99	7	B
56	28249	4008.6	7123.4	31	3	2019	15:14	90	5.51	32.59	12.21	35.10	8	B
105	**28388**	**4008.5**	**7115.0**	**31**	**3**	**2019**	**16:45**	**115**	**7.24**	**33.23**	**12.91**	**35.36**	**3**	**V**
106	**28272**	**4003.6**	**7111.0**	**31**	**3**	**2019**	**18:33**	**199**	**8.20**	**33.53**	**12.51**	**35.50**	**3**	**W**
57	28508	4003.5	7058.6	31	3	2019	21:46	208	6.39	33.01	12.46	35.58	7	B
107	**28328**	**4008.9**	**7045.6**	**1**	**4**	**2019**	**2:20**	**130**	**6.55**	**33.04**	**12.82**	**35.30**	**2**	**V**
108	**28285**	**4011.6**	**7033.9**	**1**	**4**	**2019**	**4:13**	**120**	**6.38**	**33.03**	**11.82**	**35.00**	**7**	**V**
109	**28460**	**4029.8**	**7042.3**	**1**	**4**	**2019**	**12:52**	**75**	**4.64**	**32.50**	**4.81**	**32.88**	**6**	**V**
110	**28407**	**4001.6**	**7031.9**	**1**	**4**	**2019**	**22:34**	**234**	**6.08**	**33.02**	**11.39**	**35.44**	**1**	**W**
111	**28403**	**4004.8**	**7025.4**	**2**	**4**	**2019**	**1:05**	**168**	**5.86**	**32.95**	**13.24**	**35.58**	**4**	**V**
112	**28315**	**4003.4**	**6950.6**	**2**	**4**	**2019**	**5:12**	**131**	**5.72**	**32.91**	**12.98**	**35.56**	**3**	**W**

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
113	**28165**	**3959.0**	**6947.3**	**2**	**4**	**2019**	**7:30**	**142**	**5.94**	**32.94**	**12.94**	**35.55**	**5**	**V**
114	**28259**	**3955.9**	**6932.6**	**2**	**4**	**2019**	**9:51**	**235**	**6.09**	**32.92**	**11.40**	**35.44**	**3**	**V**
115	**28256**	**3956.0**	**6926.4**	**2**	**4**	**2019**	**12:02**	**228**	**5.89**	**32.90**	**10.57**	**35.35**	**1**	**V**
116	**28360**	**3959.0**	**6914.1**	**2**	**4**	**2019**	**15:08**	**267**	**6.02**	**32.71**	**10.54**	**35.34**	**1**	**V**
58	28434	4001.3	6915.8	2	4	2019	17:02	134	5.84	32.71	12.83	35.59	6	B
117	**28787**	**4123.6**	**7114.6**	**4**	**4**	**2019**	**2:43**	**28**	**5.66**	**31.66**	**5.36**	**32.26**	**3**	**V**
118	**28160**	**4125.0**	**7106.8**	**4**	**4**	**2019**	**4:19**	**22**	**5.58**	**31.68**	**5.58**	**31.70**	**6**	**V**
119	**28359**	**4122.3**	**7102.1**	**4**	**4**	**2019**	**7:02**	**22**	**5.64**	**31.63**	**5.63**	**31.67**	**5**	**V**
120	**28518**	**4111.0**	**7051.9**	**4**	**4**	**2019**	**9:50**	**26**	**5.55**	**31.98**	**5.56**	**31.98**	**7**	**V**
121	**28538**	**4114.0**	**7039.7**	**4**	**4**	**2019**	**14:23**	**29**	**5.44**	**31.99**	**5.41**	**31.99**	**6**	**V**
122	**28284**	**4116.3**	**7037.4**	**4**	**4**	**2019**	**16:12**	**27**	**5.45**	**31.88**	**5.43**	**31.88**	**3**	**V**
59	28229	4108.9	7023.8	4	4	2019	18:40	35	5.36	32.06	5.31	32.07	3	B
60	28273	4111.5	7015.9	4	4	2019	21:00	28	5.46	32.00	5.45	32.00	5	B
61	28465	4104.2	7007.1	4	4	2019	22:46	25	5.49	32.27	5.50	32.27	1	W
123	**28281**	**4056.9**	**7017.7**	**5**	**4**	**2019**	**1:00**	**40**	**5.05**	**32.09**	**5.04**	**32.09**	**7**	**W**
62	28386	4044.4	7039.7	11	4	2019	21:00	61	5.96	32.64	5.11	32.66	8	B
63	28288	4038.1	7032.2	11	4	2019	23:12	62	6.03	32.77	5.43	32.77	11	B
64	28159	4030.9	7014.6	12	4	2019	2:19	65	5.95	32.77	5.57	32.77	8	B
65	28330	4043.9	7003.6	12	4	2019	5:14	40	5.80	32.45	5.70	32.57	9	B
124	**28471**	**4021.1**	**6948.2**	**12**	**4**	**2019**	**8:53**	**78**	**6.03**	**32.80**	**5.57**	**32.86**	**3**	**W**
66	28234	4033.7	6940.4	12	4	2019	11:33	66	5.90	32.85	5.70	32.84	6	B
67	28233	4039.0	6939.0	12	4	2019	13:10	53	5.72	32.78	5.66	32.79	8	B
125	**28438**	**4030.7**	**6936.2**	**12**	**4**	**2019**	**15:04**	**68**	**5.84**	**32.83**	**5.62**	**32.84**	**3**	**V**
126	**28303**	**4029.3**	**6915.2**	**12**	**4**	**2019**	**18:39**	**74**	**6.03**	**32.82**	**5.79**	**32.84**	**8**	**V**
127	**28304**	**4042.5**	**6918.9**	**12**	**4**	**2019**	**21:55**	**47**	**5.59**	**32.79**	**5.57**	**32.78**	**8**	**W**
68	28217	4048.2	6905.6	12	4	2019	23:51	70	5.66	32.89	5.64	32.89	8	B
69	28364	4039.5	6906.2	13	4	2019	2:06	81	5.75	32.90	5.72	32.90	8	W
70	28223	4033.5	6839.6	13	4	2019	5:15	68	5.84	32.65	5.47	32.73	4	B

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
128	**28429**	**4015.4**	**6839.0**	**13**	**4**	**2019**	**7:46**	**113**	**5.32**	**32.41**	**9.63**	**34.42**	**3**	**V**
129	**28367**	**4014.1**	**6819.1**	**13**	**4**	**2019**	**11:03**	**232**	**7.72**	**33.26**	**11.42**	**35.44**	**3**	**W**
130	**28399**	**4018.6**	**6817.8**	**13**	**4**	**2019**	**12:45**	**150**	**8.04**	**33.34**	**12.77**	**35.54**	**4**	**V**
71	28488	4031.0	6814.8	13	4	2019	15:19	100	5.38	32.50	5.50	32.78	8	B
72	28448	4033.4	6821.2	13	4	2019	17:06	94	5.83	32.56	5.37	32.62	7	B
73	28377	4038.4	6827.8	13	4	2019	19:39	69	5.73	32.66	5.45	32.67	6	W
74	28280	4054.1	6831.1	13	4	2019	22:09	48	5.74	32.84	5.75	32.84	8	B
131	**28332**	**4112.7**	**6850.5**	**14**	**4**	**2019**	**2:01**	**94**	**6.03**	**32.96**	**5.60**	**32.94**	**8**	**V**
132	**28257**	**4108.7**	**6856.3**	**14**	**4**	**2019**	**3:51**	**101**	**5.86**	**32.88**	**5.66**	**32.95**	**4**	**V**
133	**28294**	**4116.1**	**6906.3**	**14**	**4**	**2019**	**6:12**	**149**	**5.41**	**32.71**	**5.44**	**33.01**	**3**	**V**
134	**28258**	**4106.9**	**6916.6**	**14**	**4**	**2019**	**10:14**	**56**	**5.33**	**32.74**	**5.34**	**32.74**	**4**	**W**
135	**28521**	**4110.6**	**6923.0**	**14**	**4**	**2019**	**13:25**	**49**	**5.28**	**32.64**	**5.24**	**32.64**	**5**	**V**
136	**28521**	**4113.1**	**6924.7**	**14**	**4**	**2019**	**21:40**	**47**	**5.33**	**32.62**	**5.32**	**32.62**	**6**	**V**
137	**28423**	**4126.6**	**6917.1**	**15**	**4**	**2019**	**0:27**	**95**	**5.47**	**32.49**	**5.19**	**32.80**	**8**	**V**
138	**28515**	**4127.2**	**6936.1**	**15**	**4**	**2019**	**4:48**	**29**	**5.15**	**NaN**	**5.09**	**32.56**	**3**	**V**
139	**28426**	**4146.8**	**6953.9**	**15**	**4**	**2019**	**11:54**	**23**	**5.79**	**32.51**	**4.98**	**32.91**	**4**	**W**
140	**28347**	**4154.4**	**6955.5**	**15**	**4**	**2019**	**18:24**	**28**	**6.27**	**32.32**	**5.34**	**32.68**	**7**	**V**
141	**28547**	**4158.5**	**6957.1**	**16**	**4**	**2019**	**2:37**	**32**	**5.72**	**32.13**	**4.79**	**32.86**	**7**	**V**
142	**28287**	**4154.6**	**7016.4**	**16**	**4**	**2019**	**12:19**	**35**	**5.48**	**32.03**	**4.78**	**32.53**	**4**	**V**
143	**28361**	**4151.2**	**7016.1**	**16**	**4**	**2019**	**14:04**	**29**	**5.56**	**32.09**	**5.54**	**32.00**	**3**	**V**
144	**28349**	**4149.5**	**7014.4**	**16**	**4**	**2019**	**15:30**	**20**	**6.02**	**32.02**	**5.84**	**32.04**	**5**	**W**
145	**28290**	**4150.4**	**7021.9**	**16**	**4**	**2019**	**16:56**	**28**	**5.86**	**31.97**	**5.65**	**32.07**	**6**	**V**
146	**28268**	**4153.9**	**7025.0**	**16**	**4**	**2019**	**18:08**	**34**	**6.21**	**31.96**	**5.78**	**32.13**	**7**	**V**
147	**28411**	**4159.0**	**7010.9**	**16**	**4**	**2019**	**20:11**	**31**	**7.68**	**31.99**	**5.96**	**32.65**	**6**	**V**
148	**28248**	**4204.1**	**7004.3**	**16**	**4**	**2019**	**23:09**	**23**	**5.72**	**32.16**	**5.24**	**32.36**	**6**	**V**
149	**28207**	**4210.9**	**7009.1**	**17**	**4**	**2019**	**0:43**	**43**	**5.02**	**32.28**	**4.75**	**32.34**	**8**	**V**
150	**28235**	**4204.4**	**6959.7**	**17**	**4**	**2019**	**2:36**	**61**	**5.02**	**32.23**	**4.90**	**32.23**	**6**	**W**

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
151	**28492**	**4154.6**	**6948.3**	**17**	**4**	**2019**	**5:54**	**98**	**5.00**	**32.37**	**4.82**	**32.55**	**3**	**V**
75	28195	4152.2	6940.4	17	4	2019	8:49	160	5.42	32.64	5.57	33.03	8	B
76	28456	4147.5	6939.1	17	4	2019	11:29	152	5.37	32.65	5.49	33.04	4	B
77	28327	4148.5	6926.2	17	4	2019	14:28	183	5.68	32.69	5.83	33.19	4	B
78	28520	4105.6	6821.0	17	4	2019	22:29	48	6.29	32.89	6.30	32.89	6	B
79	28477	4057.2	6800.5	18	4	2019	3:58	50	6.06	32.78	6.13	32.81	6	B
152	**28381**	**4050.0**	**6754.9**	**18**	**4**	**2019**	**5:37**	**66**	**5.69**	**32.58**	**5.66**	**32.58**	**3**	**V**
153	**28402**	**4114.9**	**6751.8**	**18**	**4**	**2019**	**9:36**	**33**	**6.54**	**32.89**	**6.55**	**32.88**	**6**	**V**
80	28509	4117.6	6745.3	18	4	2019	11:40	39	6.44	32.87	6.45	32.88	6	B
81	28369	4055.5	6724.5	18	4	2019	15:48	78	5.77	32.46	5.24	32.46	7	B
82	28245	4042.2	6725.5	18	4	2019	18:07	93	5.62	32.44	5.21	32.64	6	W
83	28337	4032.5	6727.7	18	4	2019	20:17	121	5.37	32.31	7.82	33.72	9	B
154	**28384**	**4027.3**	**6719.8**	**19**	**4**	**2019**	**0:41**	**230**	**6.20**	**32.56**	**12.12**	**35.52**	**2**	**W**
155	**28401**	**4042.4**	**6718.0**	**19**	**4**	**2019**	**3:40**	**99**	**5.27**	**32.39**	**5.99**	**33.01**	**7**	**V**
84	28239	4049.2	6709.5	19	4	2019	6:01	93	5.33	32.42	5.01	32.50	4	B
85	28437	4101.8	6708.2	19	4	2019	9:00	68	5.36	32.44	5.35	32.44	5	B
156	**28525**	**4046.9**	**6651.6**	**19**	**4**	**2019**	**12:03**	**112**	**4.92**	**32.23**	**10.54**	**34.67**	**8**	**V**
157	**28469**	**4042.1**	**6648.8**	**19**	**4**	**2019**	**15:24**	**261**	**4.93**	**32.17**	**12.74**	**35.57**	**3**	**W**
86	28230	4100.0	6647.6	19	4	2019	19:02	76	5.54	32.61	5.80	32.95	5	B
87	28373	4053.4	6635.8	19	4	2019	22:08	208	4.22	32.01	11.13	35.32	8	B
158	**28432**	**4057.8**	**6631.3**	**20**	**4**	**2019**	**1:07**	**157**	**4.65**	**32.06**	**10.88**	**35.28**	**5**	**V**
159	**28171**	**4056.3**	**6633.7**	**20**	**4**	**2019**	**3:41**	**144**	**4.87**	**32.12**	**10.72**	**34.90**	**5**	**W**
160	**28210**	**4103.7**	**6629.7**	**20**	**4**	**2019**	**5:57**	**100**	**4.44**	**31.99**	**8.69**	**34.19**	**4**	**V**
161	**28408**	**4111.4**	**6618.4**	**20**	**4**	**2019**	**8:39**	**151**	**4.12**	**31.88**	**10.12**	**34.62**	**7**	**V**
162	**28344**	**4111.4**	**6617.6**	**20**	**4**	**2019**	**10:36**	**177**	**4.24**	**31.96**	**11.34**	**35.18**	**5**	**V**
163	**28419**	**4119.4**	**6613.5**	**20**	**4**	**2019**	**13:38**	**134**	**4.04**	**31.87**	**10.27**	**34.85**	**5**	**V**
164	**28387**	**4126.9**	**6609.6**	**20**	**4**	**2019**	**16:01**	**116**	**4.47**	**31.97**	**9.77**	**34.92**	**4**	**V**
165	**28532**	**4125.6**	**6637.5**	**20**	**4**	**2019**	**19:52**	**82**	**5.77**	**32.45**	**5.29**	**32.58**	**3**	**V**

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
88	28326	4134.1	6633.5	20	4	2019	22:32	82	5.59	32.49	5.35	32.52	9	B
89	28474	4146.1	6642.4	21	4	2019	1:02	66	5.80	32.62	5.80	32.62	7	B
166	**28286**	**4146.4**	**6625.0**	**21**	**4**	**2019**	**3:50**	**80**	**5.36**	**32.53**	**5.37**	**32.54**	**7**	**V**
167	**28486**	**4141.9**	**6620.7**	**21**	**4**	**2019**	**6:00**	**84**	**5.28**	**32.57**	**5.27**	**32.57**	**6**	**W**
168	**28441**	**4154.8**	**6623.1**	**21**	**4**	**2019**	**9:15**	**82**	**5.63**	**32.48**	**5.62**	**32.57**	**8**	**V**
169	**28473**	**4159.2**	**6550.8**	**21**	**4**	**2019**	**16:27**	**189**	**3.50**	**31.53**	**9.98**	**35.18**	**2**	**V**
170	**28177**	**4204.3**	**6555.0**	**21**	**4**	**2019**	**17:39**	**228**	**3.03**	**31.48**	**8.77**	**35.19**	**5**	**V**
171	**28177**	**4204.8**	**6556.7**	**21**	**4**	**2019**	**22:02**	**205**	**5.04**	**32.08**	**9.66**	**35.22**	**5**	**V**
172	**28325**	**4218.2**	**6546.5**	**22**	**4**	**2019**	**1:10**	**210**	**2.73**	**31.34**	**11.14**	**35.27**	**3**	**V**
90	28491	4229.3	6603.7	22	4	2019	5:30	214	4.08	31.74	10.48	35.18	2	B
173	**28516**	**4223.7**	**6604.6**	**22**	**4**	**2019**	**9:06**	**254**	**2.89**	**31.43**	**10.53**	**35.23**	**7**	**V**
174	**28237**	**4220.4**	**6604.0**	**22**	**4**	**2019**	**11:43**	**258**	**2.71**	**31.31**	**10.64**	**35.25**	**1**	**V**
91	28464	4202.7	6611.3	22	4	2019	15:40	92	4.64	31.83	6.17	33.09	4	B
175	**28321**	**4211.0**	**6619.4**	**22**	**4**	**2019**	**18:37**	**195**	**5.29**	**32.07**	**10.33**	**35.03**	**7**	**W**
176	**28173**	**4206.8**	**6642.6**	**22**	**4**	**2019**	**23:43**	**73**	**5.03**	**32.09**	**6.10**	**33.00**	**4**	**V**
177	**28431**	**4204.1**	**6650.0**	**23**	**4**	**2019**	**1:30**	**68**	**5.91**	**32.63**	**5.92**	**32.78**	**7**	**V**
178	**28431**	**4202.8**	**6647.5**	**23**	**4**	**2019**	**9:02**	**72**	**5.77**	**32.60**	**5.74**	**32.59**	**5**	**V**
179	**28466**	**4216.4**	**6644.2**	**23**	**4**	**2019**	**11:36**	**273**	**4.50**	**31.83**	**9.52**	**35.12**	**3**	**V**
92	28192	4212.5	6700.1	23	4	2019	14:06	199	5.84	32.25	9.51	34.87	2	B
180	**28260**	**4209.7**	**6702.2**	**23**	**4**	**2019**	**16:06**	**93**	**5.76**	**32.34**	**6.05**	**32.88**	**3**	**V**
181	**28306**	**4206.5**	**6707.4**	**23**	**4**	**2019**	**17:58**	**60**	**NaN**	**NaN**	**5.98**	**32.63**	**6**	**V**
93	28180	4202.9	6712.4	23	4	2019	19:43	50	6.15	32.62	6.10	32.62	7	B
94	28462	4153.8	6725.1	23	4	2019	22:05	56	6.62	32.78	6.58	32.77	8	W
95	28227	4139.1	6658.7	24	4	2019	1:02	63	6.10	32.59	6.12	32.59	5	B
182	**28354**	**4132.9**	**6658.3**	**24**	**4**	**2019**	**3:13**	**64**	**5.92**	**32.46**	**5.92**	**32.46**	**6**	**V**
183	**28450**	**4129.1**	**6701.0**	**24**	**4**	**2019**	**5:22**	**65**	**6.12**	**32.53**	**6.18**	**32.56**	**7**	**V**
96	28421	4122.3	6708.3	24	4	2019	7:42	57	6.57	32.74	6.56	32.73	4	B
97	28211	4131.1	6708.7	24	4	2019	9:53	54	6.52	32.73	6.52	32.73	4	B

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
98	28461	4137.2	6720.4	24	4	2019	12:00	53	6.77	32.82	6.78	32.82	5	B
184	**28242**	**4134.7**	**6731.1**	**24**	**4**	**2019**	**14:20**	**45**	**6.91**	**32.80**	**6.90**	**32.80**	**7**	**W**
185	**28498**	**4206.0**	**6736.4**	**24**	**4**	**2019**	**18:01**	**174**	**5.75**	**32.39**	**7.40**	**33.74**	**3**	**V**
99	28266	4156.9	6747.0	24	4	2019	21:11	57	6.63	32.84	6.60	32.86	5	B
186	**28479**	**4143.1**	**6750.1**	**24**	**4**	**2019**	**23:36**	**30**	**6.88**	**32.85**	**6.89**	**32.85**	**7**	**V**
187	**28522**	**4156.1**	**6808.9**	**25**	**4**	**2019**	**2:29**	**203**	**6.13**	**32.45**	**9.07**	**34.60**	**4**	**V**
100	28295	4145.6	6805.0	25	4	2019	5:16	40	6.79	32.88	6.78	32.88	4	B
101	28191	4146.4	6813.5	25	4	2019	6:48	76	6.80	32.85	6.47	32.89	5	B
188	**28277**	**4137.9**	**6807.3**	**25**	**4**	**2019**	**10:10**	**34**	**7.28**	**32.83**	**7.28**	**32.83**	**4**	**V**
189	**28847**	**4128.3**	**6927.8**	**2**	**5**	**2019**	**5:26**	**43**	**6.47**	**32.24**	**5.80**	**32.35**	**5**	**W**
190	**28216**	**4126.1**	**6844.0**	**2**	**5**	**2019**	**12:07**	**128**	**7.25**	**32.70**	**5.68**	**32.96**	**3**	**V**
191	**28203**	**4125.4**	**6828.0**	**2**	**5**	**2019**	**14:52**	**79**	**7.00**	**32.81**	**6.93**	**32.81**	**4**	**V**
192	**28333**	**4127.9**	**6837.7**	**2**	**5**	**2019**	**16:45**	**99**	**6.86**	**32.75**	**6.17**	**32.83**	**3**	**V**
193	**28371**	**4155.4**	**6837.7**	**2**	**5**	**2019**	**20:36**	**167**	**6.93**	**32.55**	**6.84**	**33.54**	**2**	**V**
194	**28482**	**4207.6**	**6833.8**	**3**	**5**	**2019**	**0:38**	**186**	**6.57**	**32.45**	**6.74**	**33.44**	**2**	**V**
195	**28255**	**4227.8**	**6834.2**	**3**	**5**	**2019**	**4:40**	**201**	**6.60**	**32.47**	**8.99**	**34.60**	**6**	**W**
196	**28316**	**4223.8**	**6852.7**	**3**	**5**	**2019**	**7:12**	**209**	**6.38**	**32.43**	**8.80**	**34.45**	**1**	**V**
197	**28226**	**4244.0**	**6836.9**	**3**	**5**	**2019**	**11:41**	**178**	**6.04**	**32.39**	**8.59**	**34.22**	**4**	**V**
198	**28302**	**4249.9**	**6850.5**	**3**	**5**	**2019**	**15:09**	**180**	**6.22**	**32.44**	**7.58**	**33.76**	**5**	**V**
199	**28443**	**4254.1**	**6841.5**	**3**	**5**	**2019**	**17:30**	**199**	**6.60**	**32.37**	**8.22**	**34.07**	**3**	**V**
200	**28409**	**4302.2**	**6836.4**	**3**	**5**	**2019**	**19:45**	**187**	**6.58**	**32.36**	**7.86**	**33.84**	**3**	**V**
201	**28251**	**4308.8**	**6820.5**	**3**	**5**	**2019**	**23:18**	**201**	**6.29**	**32.32**	**7.90**	**33.81**	**3**	**W**
202	**28254**	**4301.6**	**6812.9**	**4**	**5**	**2019**	**4:41**	**201**	**6.17**	**32.35**	**7.61**	**33.79**	**3**	**V**
102	28501	4300.9	6820.7	4	5	2019	6:47	181	6.12	32.36	7.81	33.91	6	B
203	**28161**	**4247.6**	**6826.2**	**4**	**5**	**2019**	**9:37**	**195**	**6.65**	**32.39**	**8.38**	**34.12**	**1**	**V**
204	**28247**	**4239.0**	**6811.3**	**4**	**5**	**2019**	**12:51**	**188**	**6.56**	**32.35**	**9.35**	**34.71**	**1**	**V**
205	**28243**	**4216.6**	**6757.1**	**4**	**5**	**2019**	**16:16**	**207**	**6.89**	**32.36**	**9.65**	**35.07**	**4**	**V**
206	**28410**	**4227.9**	**6745.0**	**4**	**5**	**2019**	**19:25**	**214**	**6.85**	**32.30**	**9.79**	**35.06**	**3**	**W**

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
103	28395	4237.3	6726.3	4	5	2019	22:37	240	6.39	32.00	10.04	35.12	37	B
207	**28395**	**4238.4**	**6726.7**	**4**	**5**	**2019**	**23:14**	**226**	**6.30**	**31.98**	**9.77**	**35.12**	**2**	**V**
208	**28428**	**4228.7**	**6714.6**	**5**	**5**	**2019**	**2:21**	**338**	**6.54**	**32.09**	**9.54**	**35.17**	**1**	**V**
209	**28468**	**4221.4**	**6710.6**	**5**	**5**	**2019**	**4:57**	**316**	**6.33**	**32.17**	**9.56**	**35.16**	**3**	**V**
104	28353	4224.3	6706.1	5	5	2019	6:40	363	6.75	32.18	9.79	35.20	162	B
210	**28353**	**4224.7**	**6704.9**	**5**	**5**	**2019**	**7:11**	**363**	**6.75**	**32.13**	**9.44**	**35.15**	**1**	**V**
211	**28174**	**4232.9**	**6644.8**	**5**	**5**	**2019**	**10:14**	**246**	**5.98**	**31.76**	**10.41**	**35.22**	**2**	**V**
212	**28271**	**4257.2**	**6708.4**	**5**	**5**	**2019**	**14:05**	**245**	**6.11**	**32.00**	**9.84**	**35.10**	**4**	**V**
213	**28362**	**4304.5**	**6730.8**	**5**	**5**	**2019**	**18:18**	**214**	**6.89**	**32.39**	**8.90**	**34.42**	**2**	**V**
105	28348	4317.4	6752.6	5	5	2019	21:36	220	7.43	32.41	9.14	34.30	20	B
106	28348	4317.6	6751.0	5	5	2019	22:15	226	6.67	32.42	9.03	34.27	7	W
107	28274	4315.8	6738.6	6	5	2019	1:32	235	6.88	32.43	8.21	34.03	6	V
108	28341	4315.4	6716.4	6	5	2019	4:06	219	6.03	32.31	9.05	34.46	8	B
214	**28404**	**4317.3**	**6709.6**	**6**	**5**	**2019**	**6:39**	**235**	**6.15**	**32.30**	**9.32**	**34.59**	**3**	**W**
215	**28527**	**4303.3**	**6632.9**	**6**	**5**	**2019**	**12:01**	**128**	**5.13**	**31.75**	**6.93**	**33.33**	**8**	**V**
216	**28487**	**4330.1**	**6638.6**	**6**	**5**	**2019**	**16:43**	**114**	**5.98**	**32.22**	**7.01**	**33.44**	**6**	**V**
217	**28214**	**4341.4**	**6637.3**	**6**	**5**	**2019**	**20:39**	**108**	**5.83**	**32.19**	**5.93**	**32.79**	**5**	**V**
218	**28228**	**4347.6**	**6709.7**	**7**	**5**	**2019**	**0:01**	**176**	**6.50**	**32.41**	**8.00**	**33.86**	**3**	**W**
109	28475	4359.2	6715.7	7	5	2019	3:03	179	6.54	31.95	8.25	34.02	5	B
110	28209	4400.7	6711.6	7	5	2019	5:05	157	6.43	31.79	8.15	33.96	5	W
111	28283	4401.4	6647.2	7	5	2019	10:04	95	6.72	32.64	6.45	33.13	8	B
219	**28265**	**4420.3**	**6640.3**	**7**	**5**	**2019**	**13:08**	**191**	**6.46**	**32.59**	**6.74**	**33.24**	**4**	**V**
220	**28427**	**4415.0**	**6657.8**	**7**	**5**	**2019**	**17:21**	**175**	**6.85**	**32.52**	**6.70**	**33.25**	**6**	**V**
112	28215	4422.4	6659.8	7	5	2019	19:55	129	6.06	32.26	6.74	33.21	9	B
221	**28241**	**4415.4**	**6713.4**	**7**	**5**	**2019**	**22:13**	**187**	**5.98**	**32.24**	**8.09**	**33.82**	**3**	**V**
222	**28391**	**4422.1**	**6742.8**	**8**	**5**	**2019**	**2:00**	**57**	**5.81**	**31.09**	**4.68**	**31.57**	**7**	**V**
223	**28236**	**4410.5**	**6802.5**	**8**	**5**	**2019**	**4:46**	**89**	**5.94**	**31.26**	**4.91**	**32.22**	**3**	**V**
224	**28577**	**4403.5**	**6758.4**	**8**	**5**	**2019**	**7:43**	**119**	**5.94**	**31.37**	**5.66**	**32.73**	**5**	**V**

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
225	**28413**	**4340.0**	**6813.0**	**8**	**5**	**2019**	**12:49**	**190**	**6.54**	**31.81**	**8.18**	**33.87**	**5**	**V**
226	**28454**	**4338.6**	**6800.4**	**8**	**5**	**2019**	**15:04**	**203**	**6.88**	**32.25**	**8.80**	**34.12**	**9**	**V**
113	28267	4333.6	6751.5	8	5	2019	17:55	247	6.93	32.40	9.14	34.31	43	B
114	28267	4333.7	6752.1	8	5	2019	18:24	252	6.80	32.40	9.15	34.31	6	V
115	28212	4332.6	6817.1	8	5	2019	22:01	188	7.19	32.34	7.79	33.74	14	B
227	**28417**	**4335.3**	**6838.3**	**9**	**5**	**2019**	**1:41**	**134**	**6.39**	**32.11**	**5.50**	**32.84**	**1**	**V**
228	**28514**	**4339.5**	**6847.6**	**9**	**5**	**2019**	**4:38**	**124**	**6.82**	**31.89**	**5.31**	**32.73**	**3**	**V**
229	**28365**	**4323.3**	**6857.6**	**9**	**5**	**2019**	**7:49**	**134**	**7.17**	**32.22**	**5.88**	**33.00**	**4**	**V**
116	28499	4322.5	6859.3	9	5	2019	9:48	150	7.19	32.24	6.05	33.09	3	B
117	28252	4311.9	6852.7	9	5	2019	12:42	183	6.95	32.31	7.16	33.54	6	V
118	28189	4314.9	6903.2	9	5	2019	14:49	144	7.52	32.45	5.89	33.06	4	B
230	**28238**	**4305.9**	**6918.1**	**9**	**5**	**2019**	**18:00**	**206**	**7.65**	**32.48**	**6.69**	**33.30**	**4**	**W**
119	28470	4315.4	6945.6	9	5	2019	22:04	116	8.37	32.00	5.80	33.01	7	B
231	**28523**	**4328.0**	**6957.4**	**10**	**5**	**2019**	**1:53**	**132**	**8.05**	**30.91**	**6.02**	**33.06**	**5**	**V**
232	**28320**	**4328.7**	**7003.9**	**10**	**5**	**2019**	**3:58**	**111**	**7.98**	**29.19**	**4.86**	**32.57**	**5**	**V**
233	**28213**	**4300.4**	**7022.2**	**10**	**5**	**2019**	**8:04**	**132**	**8.79**	**28.87**	**5.29**	**32.84**	**7**	**V**
120	28220	4249.7	7032.7	10	5	2019	14:47	114	9.99	26.14	4.47	32.65	6	B
235	**28483**	**4245.0**	**7040.3**	**10**	**5**	**2019**	**17:32**	**41**	**8.74**	**25.42**	**4.42**	**32.09**	**7**	**V**
236	**28319**	**4235.1**	**7036.0**	**10**	**5**	**2019**	**19:51**	**50**	**9.41**	**28.64**	**4.61**	**32.10**	**8**	**V**
237	**28376**	**4229.4**	**7041.3**	**10**	**5**	**2019**	**22:13**	**61**	**9.36**	**28.52**	**4.37**	**32.26**	**6**	**V**
238	**28172**	**4231.1**	**7034.0**	**10**	**5**	**2019**	**23:49**	**67**	**9.57**	**28.42**	**4.36**	**32.29**	**8**	**V**
239	**28200**	**4227.7**	**7031.1**	**11**	**5**	**2019**	**2:47**	**59**	**9.76**	**28.25**	**4.32**	**32.35**	**7**	**V**
121	28182	4241.3	7013.5	11	5	2019	5:58	86	9.08	27.82	4.65	32.63	6	B
122	28193	4242.6	6959.4	11	5	2019	8:31	195	8.81	29.94	7.44	33.71	1	V
123	28436	4251.1	6948.9	11	5	2019	10:59	202	8.17	29.92	7.63	33.81	1	B
124	28436	4251.0	6949.9	11	5	2019	11:27	260	8.18	29.93	7.94	34.02	2	V
240	**28463**	**4247.4**	**6943.1**	**11**	**5**	**2019**	**13:27**	**252**	**7.96**	**30.99**	**7.92**	**33.96**	**2**	**V**
241	**28323**	**4235.4**	**6939.0**	**11**	**5**	**2019**	**16:06**	**261**	**8.28**	**32.20**	**7.92**	**33.95**	**3**	**V**

HB1901 Spring Bottom Trawl Survey
Mar 10 - May 12, 2019

Cast #	Site ID #	Lat (DDMM.M)	Long (DDMM.M)	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
125	28314	4238.5	6922.9	11	5	2019	18:41	234	8.47	32.50	7.24	33.66	31	B
126	28314	4239.1	6923.3	11	5	2019	19:07	235	8.60	32.51	7.61	33.82	6	V
242	**28506**	**4223.7**	**6934.4**	**11**	**5**	**2019**	**22:03**	**237**	**8.30**	**32.32**	**7.99**	**33.98**	**5**	**V**
243	**28276**	**4221.1**	**6949.2**	**12**	**5**	**2019**	**0:19**	**251**	**8.60**	**31.76**	**7.91**	**33.95**	**4**	**V**
244	**28183**	**4202.9**	**6949.6**	**12**	**5**	**2019**	**3:54**	**159**	**8.61**	**31.77**	**6.28**	**33.22**	**5**	**V**
245	**28297**	**4208.8**	**6959.3**	**12**	**5**	**2019**	**5:42**	**110**	**9.24**	**31.39**	**5.12**	**32.71**	**5**	**V**
246	**28324**	**4216.1**	**7006.3**	**12**	**5**	**2019**	**7:34**	**106**	**8.68**	**31.55**	**5.19**	**32.76**	**6**	**V**
247	**28317**	**4225.2**	**7009.5**	**12**	**5**	**2019**	**9:24**	**83**	**8.39**	**31.29**	**4.57**	**32.48**	**2**	**V**
127	28374	4219.7	7019.8	12	5	2019	11:37	58	9.85	29.79	4.18	32.41	8	B
248	**28406**	**4215.3**	**7033.8**	**12**	**5**	**2019**	**13:50**	**51**	**10.40**	**28.42**	**4.56**	**32.13**	**3**	**V**
249	**28435**	**4220.3**	**7041.2**	**12**	**5**	**2019**	**15:35**	**45**	**9.01**	**29.09**	**4.84**	**31.96**	**7**	**V**
250	**28425**	**4223.2**	**7045.8**	**12**	**5**	**2019**	**17:18**	**32**	**9.66**	**27.26**	**5.72**	**31.50**	**7**	**V**
128	28476	4217.6	7038.4	12	5	2019	20:27	50	10.21	28.34	4.48	32.24	6	B
251	**28502**	**4215.4**	**7039.4**	**12**	**5**	**2019**	**22:35**	**31**	**9.88**	**27.58**	**4.99**	**31.88**	**6**	**V**
252	**28547**	**4159.0**	**6955.4**	**13**	**5**	**2019**	**4:54**	**46**	**8.99**	**31.00**	**6.42**	**32.04**	**5**	**W**
253	**28298**	**4201.8**	**7026.1**	**13**	**5**	**2019**	**13:52**	**51**	**8.74**	**30.19**	**4.66**	**32.14**	**6**	**V**

Deployment codes: B=bongo cast; W=water cast; and V=vertical cast

Records in bold are collected with an SBE911+ CTD