CRUISE REPORT
C284

Scientific data collected aboard
SSV Corwith Cramer

Christiansted, St Croix, USVIs – Francis Bay, St John, USVIs – Samana Bay, Dominican Republic – Matthew Town, Great Inagua, Bahamas – Port Antonio, Jamaica – George Town, Grand Cayman – Stock Island, Florida Keys, USA

12 February – 22 March 2019

Delphine, Vuk, and Alle display in an impressive haul of *Sargassum*,
much to the delight of their Chief Scientist Jeff Schell.

Sea Education Association
Woods Hole, Massachusetts

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To obtain unpublished data, contact the Chief Scientist or the SEA Data Archivist:

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Table 1. C284 Ship's crew and student participants

Nautical Staff		
	Bill Burke (Beth Doxsee – shore)	Captain
	Allison Taylor	Chief Mate
	Rocky Bonner	2nd Mate
	Sarah Whitcher	3rd Mate
	Ava Stasiw	Sailing Intern
	Henry Cylkowski	Chief Engineer
	Cat Quinn	Steward
	Cody Schmeiding	Assistant Steward
Scientific Staff		
	Jeff Schell	Chief Scientist
	Helen Dufel	1st Scientist
	Emily Burke	2nd Scientist
	Courcelle Stark	3rd Scientist
Maritime Studies Staff		
	Craig Marin	Chief Historian
	Maria Jose (MJ) Fernandez	Teaching Assistant/Reef Specialist
Visiting Voyagers		
	Victoria Smith	Illustration and Journaling
	Sarah Weiss	NOAA Marine Mammal Acoustic Specialist
	Duby Joslin,	Voyager – SEA Overseer
	Jeremy Salesin	Voyager – SEA Overseer
	Everto Aguayo, SEA Alum	Voyager – SEA alumnus
Students		
	A Watch	
	Skylah Reis	Harvard University
	Natalie Bryce	University of Miami
	Andrew Foley	Lawrence University
	Allyssa Stevenson	American University
	Julia Grady	Colby College
	Jacob Cooper	University of Washington
	June Eikeland	Boston University
	B Watch	
	Allison Gaydeski	Northfield High School
	Jie (Jane) Sheng	University of Washington
	Mark Sheehan	Oberlin College
	Mica Hastings	Bard College
	Mariana Dominguez	Universidad de los Andes
	Lucas Stevens	Berklee College of Music
	Emily Scott	Boston University

C Watch

Alexandra (Alle) Brown-Law	Carleton College
Sasha (Vuk) Vukasovich	Reed College
Asia Milano	Richard Montgomery High School
Brison Grey	University of Washington
Emily Brooks	University of New Hampshire
Delphine Griffith	Sarah Lawrence College
Emma Saas	Whitman College

Data Description C284

The cruise track for C284 (Figure 1) departed from Christiansted, St Croix and concluded in Stock Island, FL USA 39 days later. During the nearly six-week voyage we had five port stops; the first in St John, USVIs; the second in Samana, Dominican Republic; the third in Matthew Town, Great Inagua, Bahamas; the fourth in Port Antonio, Jamaica; and finally George Town, Grand Cayman. We also conducted scientific sampling near Silver Bank, DR.

Our cruise track traversed several major oceanographic provinces (Figure 1): a) the seasonally cool, more saline waters of the Sargasso Sea, the b) dynamic, transitional waters of the Windward Passage, c), the warm, less saline waters of the Western Caribbean, and finally the d) the crossing of the Gulf Stream in the Florida Straits. In addition, shallow banks (Silver), near-coastal areas (St John), and inner waterways (Samana Bay) were surveyed.

We collected data with 120 individual deployments from 47 discrete geographic stations along our cruise track (Table 2). Comparison of the physical, chemical, and biologic features of these regions represented the major scientific theme of this Sea Semester.

1. Physical oceanographic studies focused on the distribution of surface and sub-surface (to 1200 m) water masses and the delineation of hydrographic boundaries. Specifically, North Atlantic sub-tropical mode water (18°C Water) and Antarctic Intermediate water.
2. Chemical oceanographic studies focused on the geographic and vertical distribution of nutrients (phosphate) and extracted chlorophyll-*a*. These chemical parameters were related to patterns in physical hydrography at various scales: nearshore to offshore transitions, ocean fronts and eddies associated with island passages and water column stratification.
3. Biological studies focused on the geographic distribution of charismatic megafauna (seabirds, sea turtles, flying fish, and marine mammals), several nektonic organisms (lantern fish – Family *Myctophidae*, and gelatinous organisms >2cm – i.e salps), meroplanktonic larvae including spiny lobster (phyllosoma) and eels (leptocephali), the floating macrophyte – *Sargassum* spp., the marine insect *Halobates*, and the density (mL/m2) and diversity (i.e. Shannon-Weiner index) of the aggregate zooplankton and phytoplankton communities. In addition, we characterized the sub-surface soundscape of the Caribbean, specifically we listened for: marine mammals, coral reef sounds, and ship noise.

Sea surface temperature, salinity, fluorescence (chlorophyll-*a* and CDOM) and transmissivity levels; along with barometric pressure, winds, bathymetry, and geographic position were recorded continuously along the cruise track. Large-scale hydrology is summarized with surface plots for temperature, salinity, and chlorophyll-*a* are presented (Figure 2a-c); additional data is available upon request.

Continuous recording of ocean current magnitude and direction from near surface to 600m occurred during the cruise using a hull-mounted acoustic doppler current profiler (ADCP). Regional examination of surface vectors indicates weak currents (< 500mm/s, or 1.0 knot)

throughout the Caribbean but for the Florida Current and near restricted island passages (Figure 3a-b); additional data available upon request.

Surface samples (n=43) of nutrients (phosphate), chlorophyll-*a*, and pH were collected in conjunction with all neuston net tows, coastal in-to-offshore transects, and coral reef surveys (Table 3).

Routinely we visually observed and enumerated marine mammals, seabirds, flying fish, sea turtles, *Sargassum* abundance, and floating plastic debris. These hourly observations occurred only during daylight hours 0700-1900 and lasted only six minutes. Periodically, opportunistic sightings were also recorded when notable megafauna or marine debris were present. These data are available upon request.

More detailed visual surveys of marine mammals, seabirds, and ship traffic were conducted to characterize and map marine animal behavior (MSV Surveys, n = 15, Table 4a-d). We successfully photographed a single humpback whale fluke in Samana Bay, DR and submitted photographs to the North Atlantic Humpback Whale Catalogue (NAHWC) for identification.

The density structure of the water column (maximum depth 956 m) was determined using a Seabird CTD with attached *in situ* chlorophyll-*a* fluorescence and dissolved oxygen sensors (13 stations, Table 5). Regional differences in vertical water column structure was observed based on T-S plots and profiles of temperature, salinity, density, and chlorophyll-*a* fluorescence (Figure 4a-f).

Surface plankton assemblages were sampled regularly with a neuston net (18 stations, 335 µm mesh, Table 6) while sub-surface plankton assemblages were sampled with a 1-meter diameter, circular net (1 station, 335 µm mesh, Table 7). These net deployments revealed the biogeographic patterns of zooplankton biovolume, along with the floating macrophyte *Sargassum* spp., marine debris and tar balls, the marine insect *Halobates*, eel (leptocephali) and spiny lobster (phyllosoma) larvae, and lantern fish (Myctophidae) in relation to numerous environmental parameters. Microscopic analysis determined general zooplankton diversity and taxonomic composition of each net tow (Table 8).

Discrete samples of *Sargassum* clumps and marine plastic debris were collected with a dip net (30 samples from 13 stations, 335 µm mesh, Table 9). Shrimp, crab, fish, and snail specimens were rinsed from collected samples. Abundance and diversity of associated biota were related to mass (g) and species form of *Sargassum* and geographic location. Four distinct morphological forms of *Sargassum* were recognized (*S. fluitans III, S. fluitans X, S. natans I*, and *S. natans VIII*) and clear differences in associated fauna were observed; even when different *Sargassum* forms were collected from the same station location.

Water clarity and light attenuation along our cruise track was also measured. We routinely deployed a secchi disc (10 stations, Table 10) to estimate depth of the 1% light level.

During five port stops we conducted visual surveys of coral reef habitats: 1) Cane Bay, St Croix. 2) Waterlemon Cay, St John. 3) Man O' War Bay, Great Inagua. 4) West Harbor-Port Antonio,

Jamaica. 5) Hamburger Reef, Grand Cayman. While snorkeling we recorded seafloor cover (coral, seagrass/algae, sand/rock), coral health (live, bleached, diseased), and fish and invertebrate abundance and diversity (Table 11a-c). In addition, numerous environmental conditions were measured: water chemistry (phosphate, chlorophyll-*a*, pH, and *E. coli* bacteria levels). In addition, a SoundTrap was deployed to record coral reef soundscapes at three sites (St John, Great Inagua, Jamaica) (Table 12).

In conjunction with most visual surveys, acoustic recordings below the sea surface were performed to characterize the soundscape of the marine environment (Hydrophone, n = 3 and SoundTrap, n = 9, Table 12). Various ship noise and marine mammal activity, including humpback whale songs, were recorded. Acoustic data and full recordings available upon request.

Additional CTD, CHIRP, ADCP and biological data not reported here are available on request through Sea Education Association (SEA) and the Chief Scientist. The information in this report is not intended to represent final interpretation of the data and should not be excerpted or cited without written permission from SEA.

As part of SEA's educational program, undergraduates conducted independent oceanographic research during the cruise. Projects explored regionally, relevant topics in the disciplines of physical, chemical, biological, and geological oceanography (Table 13). Student research efforts culminated in a written report and public presentation to the ship's company. These papers are available on request from SEA.

Jeffrey Schell, Professor of Oceanography – Chief Scientist, C284

Figure 1. Final cruise track for C284 based on hourly (local time) positions, including ports of call.

Table 2. Summary of oceanographic sampling stations for C284.

Station # (C284-)	Date (2019)	Time (local - 4 to -5 GMT)	Log (nm)	Lat (dec Deg N)	Lon (dec Deg W)	Location	Station Type
RS-000	13-Feb	1045	na	17.77	-64.81	St Croix - Cane Bay	RS
RS-001	16-Feb	1030	na	18.37	-64.72	East Caribbean, St. John, Waterlemon Cay	RS
RS-001	16-Feb	1055	na	18.37	-64.72	East Caribbean, St. John, Waterlemon Cay	ST
RS-001	16-Feb	1513	na	18.37	-64.75	East Caribbean, St. John, Francis Bay	RT
003	17-Feb	1024	90.6	18.37	-64.75	East Caribbean, St. John, Francis Bay	HP
003	17-Feb	1038	108.4	18.36	-64.75	Eastern Caribbean	SD
003	17-Feb	1056	108.4	18.36	-64.75	Eastern Caribbean	CTD
003	17-Feb	1024	108.4	18.36	-64.75	Eastern Caribbean	MSV
004	17-Feb	2029	138.9	18.52	-65.10	Eastern Caribbean	NT
005	18-Feb	1257	209.6	18.80	-66.09	Sargasso Sea, Puerto Rico, PR Trench	HP
005	18-Feb	1305	210.5	18.79	-66.10	Sargasso Sea, Puerto Rico, PR Trench	SD
005	18-Feb	1340	211.2	18.79	-66.11	Sargasso Sea, Puerto Rico, PR Trench	CTD
005	18-Feb	1446	213.1	18.77	-66.14	Sargasso Sea, Puerto Rico, PR Trench	NT
005	18-Feb	1343	211.2	18.79	-66.11	Sargasso Sea, Puerto Rico, PR Trench	MSV
006	19-Feb	0416	299.4	19.45	-67.40	Sargasso Sea	NT
007	19-Feb	1002	326.0	19.61	-67.81	Sargasso Sea	DN(A)
007	19-Feb	1010	326.3	19.61	-67.82	Sargasso Sea	DN(B)
008	19-Feb	1623	346.5	19.74	-68.08	Sargasso Sea	SD
008	19-Feb	1650	347.0	19.73	-68.08	Sargasso Sea	CTD
008	19-Feb	1723	347.4	19.73	-68.09	Sargasso Sea	HP
008	19-Feb	1815	349.0	19.70	-69.09	Sargasso Sea	NT
008	19-Feb	1723	347.4	68.09	-68.09	Sargasso Sea	MSV
009	20-Feb	0046	377.1	20.08	-68.22	Sargasso Sea	NT
010	20-Feb	0830	409.2	19.56	-68.25	Sargasso Sea	SD
010	20-Feb	0854	409.6	19.56	-68.26	Sargasso Sea	CTD
010	20-Feb	0901	409.7	19.56	-68.26	Sargasso Sea	HP
010	20-Feb	1030	411.6	19.53	-68.28	Sargasso Sea	NT
010	20-Feb	0915	409.7	19.56	-68.26	Sargasso Sea	MSV
011	21-Feb	0440	484.3	19.42	-68.91	Sargasso Sea: outside Samana Bay	NT
011	21-Feb	0527	484.3	19.40	-68.94	Sargasso Sea: outside Samana Bay	HP
012	23-Feb	0738	519.1	19.19	-69.33	Sargasso Sea: Inshore DR: Samana Bay	HP
012	23-Feb	0745	519.1	19.19	-69.33	Sargasso Sea: Inshore DR: Samana Bay	CTD
012	23-Feb	0745	519.1	19.19	-69.33	Sargasso Sea: Inshore DR: Samana Bay	MSV
013	25-Feb	1548	528.1	19.16	-69.21	Sargasso Sea: Inshore DR: Samana Bay	HP
013	25-Feb	1545	528.4	19.16	-69.21	Sargasso Sea: Inshore DR: Samana Bay	MSV
014	26-Feb	0358	591.6	19.87	-69.65	Sargasso Sea: Offshore DR	NT
014	26-Feb	1636	632.2	20.02	-69.94	Sargasso Sea: Offshore DR	HP

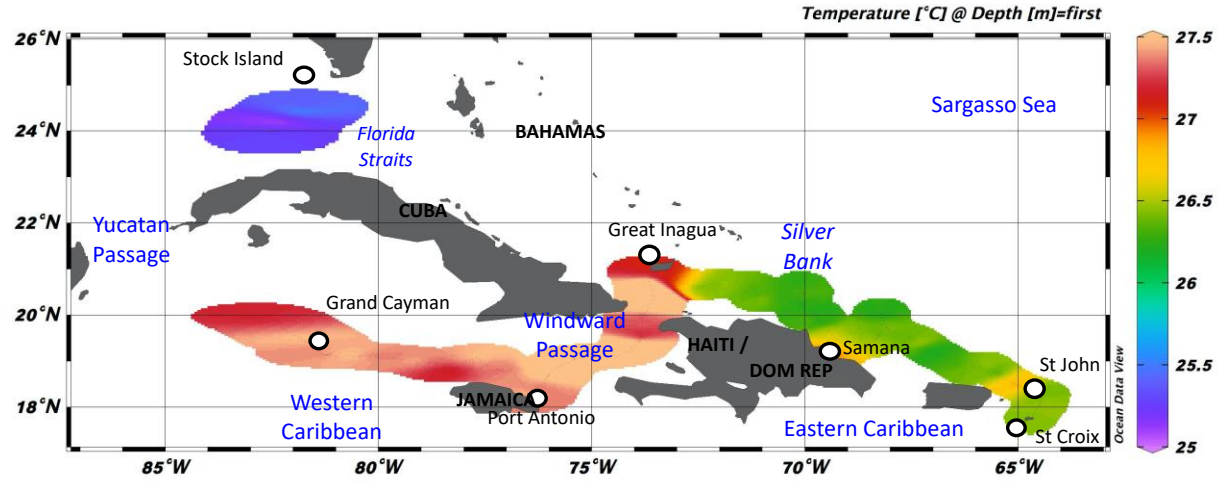
014	26-Feb	1638	632.2	20.02	-69.94	Sargasso Sea: Offshore DR	MSV
015	26-Feb	0935	611.4	20.07	-69.80	Sargasso Sea, DR Offshore	DN(A)
015	26-Feb	0948	612.3	20.06	-69.80	Sargasso Sea, DR Offshore	DN(B)
015	26-Feb	0957	na	20.05	-69.80	Sargasso Sea, DR Offshore	DN(C)
016	26-Feb	1540	630.9	20.02	-69.92	Sargasso Sea, DR Offshore	SD
016	26-Feb	1628	632.2	20.02	-69.93	Sargasso Sea, DR Offshore	CTD
017	26-Feb	2305	652.4	20.28	-70.06	Sargasso Sea, DR Offshore	MN
017	27-Feb	0028	655.2	20.24	-70.08	Sargasso Sea, DR Offshore	NT
018	27-Feb	1225	702.1	20.42	-70.04	Sargasso Sea: Silver Bank	HP
018	27-Feb	1230	702.1	20.42	-70.04	Sargasso Sea: Silver Bank	MSV
019	27-Feb	1414	710.0	20.50	-70.01	Sargasso Sea: Silver Bank	HP
019	27-Feb	1414	710.2	20.50	-70.01	Sargasso Sea: Silver Bank	MSV
020	27-Feb	1547	714.2	20.46	-70.02	Sargasso Sea: Silver Bank	HP
020	27-Feb	1552	714.4	20.46	-70.02	Sargasso Sea: Silver Bank	MSV
021	28-Feb	0856	803.3	20.64	-71.41	Sargasso Sea, DR, Offshore	DN(A)
021	28-Feb	1337	na	20.67	-71.93	Sargasso Sea, DR, Offshore	DN(B)
022	28-Feb	1315	830.5	20.66	-71.89	Sargasso Sea, DR, Offshore	DN
023	28-Feb	1615	847.9	20.67	-72.20	Sargasso Sea, DR, Offshore	DN(A)
023	28-Feb	1617	847.9	20.67	-72.20	Sargasso Sea, DR, Offshore	DN(B)
023	28-Feb	1624	848.0	20.67	-72.21	Sargasso Sea, DR, Offshore	DN(C)
024	28-Feb	1730	853.7	20.65	-72.30	Sargasso Sea, DR, Offshore	DN(A)
024	28-Feb	1744	853.4	1.64	-72.03	Sargasso Sea, DR, Offshore	DN(B)
RS-002	3-Mar	1030	na	21.09	-73.65	Man O' War Bay, Great Inagua	RS
RS-002	3-Mar	1146	na	21.09	-75.65	Man O' War Bay, Great Inagua	RT
RS-002	3-Mar	1018	na	21.09	-73.65	Man O' War Bay, Great Inagua	ST
025	4-Mar	0920	941.0	20.96	-73.68	Sargasso Sea: Great Inagua Inshore	CTD
026	4-Mar	1818	983.2	20.30	-73.58	Sargasso Sea, Great Inagua, Offshore	DN
027	4-Mar	2340	1008.0	19.94	-73.80	Windward Passage: Haiti, Offshore	NT
028	5-Mar	0912	1040.0	19.44	-73.88	Windward Passage: Haiti, Offshore	SD
028	5-Mar	0945	1040.0	19.44	-73.88	Windward Passage: Haiti, Offshore	CTD
028	5-Mar	0951	1040.0	19.44	-73.88	Windward Passage: Haiti, Offshore	HP
028	5-Mar	1125	1041.0	19.43	-73.87	Windward Passage: Haiti, Offshore	DN(A)
028	5-Mar	1132	1042.0	19.42	-73.87	Windward Passage: Haiti, Offshore	DN(B)
028	5-Mar	1147	1043.0	19.42	-73.88	Windward Passage: Haiti, Offshore	DN(C)
028	5-Mar	1000	1040.0	19.44	-73.88	Windward Passage, Haiti, Offshore	MSV
029	5-Mar	2303	1109.0	19.10	-74.91	Windward Passage: Haiti, Offshore	NT
030	6-Mar	0904	1138.0	19.06	-75.41	Windward Passage: Jamaica. Offshore	SD
030	6-Mar	0935	1138.0	19.06	-75.41	Windward Passage: Jamaica. Offshore	CTD
030	6-Mar	0948	1138.0	19.05	-75.41	Windward Passage: Jamaica, Offshore	HP
030	6-Mar	1111	1138.0	19.05	-75.40	Windward Passage: Jamaica, Offshore	DN(A)
030	6-Mar	1153	1139.0	19.04	-75.40	Windward Passage: Jamaica, Offshore	DN(B)
030	6-Mar	1215	1139.0	19.05	-75.40	Windward Passage: Jamaica, Offshore	DN(C)
030	6-Mar	0948	1138.0	19.05	-75.41	Windward Passage: Jamaica, Offshore	MSV

031	6-Mar	1713	1164.0	18.87	-75.81	Windward Passage: Jamaica, Offshore	DN(A)
031	6-Mar	1727	1165.0	18.86	-75.81	Windward Passage: Jamaica, Offshore	DN(B)
031	6-Mar	1731	1166.0	18.86	-75.84	Windward Passage: Jamaica, Offshore	DN(C)
032	6-Mar	2302	1181.0	18.69	-76.02	Windward Passage: Jamaica, Offshore	NT
RS-003	9-Mar	1444	na	18.19	-76.46	Navy Reef, Port Antonio, Jamaica	ST
RS-003	9-Mar	09:00	na	18.19	-76.46	Navy Reef, Port Antonio, Jamaica	RS
RS-003	9-Mar	0906	na	18.19	-76.46	Navy Reef, Port Antonio, Jamaica	RT
033	9-Mar	1746	1235.0	18.39	-76.56	Windward Passage: Jamaica, Offshore	DN(A)
034	10-Mar	0200	1270.0	18.81	-76.95	Windward Passage: Jamaica, Offshore	NT
035	10-Mar	0853	1303.0	18.93	-77.43	Windward Passage: Jamaica, Offshore	SD
035	10-Mar	0920	1303.0	18.93	-77.44	Windward Passage: Jamaica, Offshore	CTD
035	10-Mar	1055	1306.0	18.90	-77.45	Windward Passage: Jamaica, Offshore	NT
035	10-Mar	0924	1303.0	18.98	-78.79	Windward Passage: Jamaica, Offshore	MSV
036	11-Mar	0004	1360.0	18.86	-78.21	Western Caribbean: Caymans, Offshore	NT
037	11-Mar	0907	1399.0	18.98	-78.79	Western Caribbean: Caymans, Offshore	SD
037	11-Mar	0927	1399.0	18.98	-78.79	Western Caribbean: Caymans, Offshore	CTD
037	11-Mar	1059	1400.0	18.97	-78.81	Western Caribbean: Caymans, Offshore	NT
037	11-Mar	0938	1399.0	18.98	-78.79	Western Caribbean: Caymans, Offshore	MSV
038	11-Mar	1711	1427.0	19.02	-79.27	Western Caribbean: Caymans, Offshore	DN(A)
038	11-Mar	1726	1429.0	19.03	-79.30	Western Caribbean: Caymans, Offshore	DN(B)
038	11-Mar	1747	1430.0	19.03	-79.33	Western Caribbean: Caymans, Offshore	DN(C)
039	11-Mar	2255	1449.0	19.07	-79.64	Western Caribbean: Caymans, Offshore	NT
040	12-Mar	0910	1495.0	19.11	-80.42	Western Caribbean: Caymans, Offshore	SD
040	12-Mar	0940	1495.0	19.11	-80.43	Western Caribbean: Caymans, Offshore	CTD
040	12-Mar	1000	1495.0	19.11	-80.43	Western Caribbean: Caymans, Offshore	DN(A)
040	12-Mar	1116	1497.0	19.09	-80.45	Western Caribbean: Caymans, Offshore	NT
040	12-Mar	09:53	1495.0	19.11	-80.43	Western Caribbean: Caymans, Offshore	MSV
041	12-Mar	1755	1525.0	19.18	-80.92	Western Caribbean: Caymans, Offshore	DN(A)
041	12-Mar	1800	1525.0	19.19	-80.92	Western Caribbean: Caymans, Offshore	DN(B)
041	12-Mar	1805	1525.0	19.19	-80.93	Western Caribbean: Caymans, Offshore	DN(C)
RS-004	14-Mar	0945	na	19.30	-81.39	Hamburger Reef, Grand Cayman	RS
RS-004	14-Mar	1102	na	19.30	-81.39	Hamburger Reef, Grand Cayman	RT
042	15-Mar	0800	na	19.31	-81.39	Western Caribbean: Caymans, Inshore Shelf	CTD

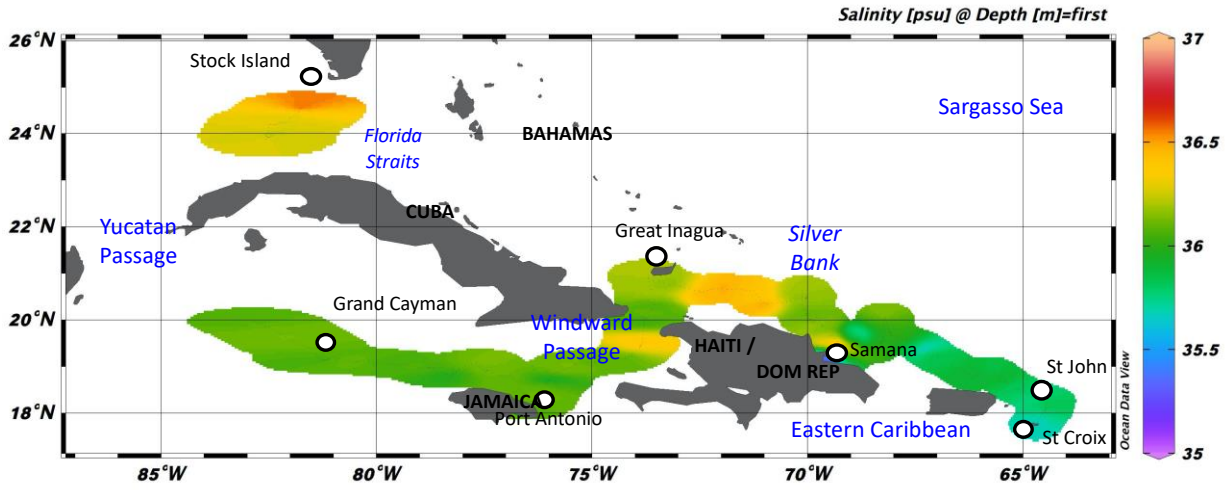
Duplicate station numbers indicate multiple oceanographic deployments that either occurred concurrently in the same location or were deployed sequentially in the same general location after the vessel was hove to. General Locations are categorized by traditional oceanic biomes or significant geologic feature. Abbreviations for oceanographic equipment deployed are: NT – Neuston Tow, MN – Meter Net tow, PN – Phytoplankton Net, DN – Dip Net, CTD – conductivity, temperature, and depth profilers, SG – Shipek Grab, and SD – Secchi Disc, RS – Reef Survey, RT – Reef Tow, HP – Hydrophone, ST – Soundtrap, MSV – Marine Mammal & Seabird, Vessel Survey.

Figure 2a-c. Surface water hydrography for C284.

a. Temperature (seawater flow thru system with in-line thermistor)



b. Salinity



c. Chlorophyll-*a* fluorescence.

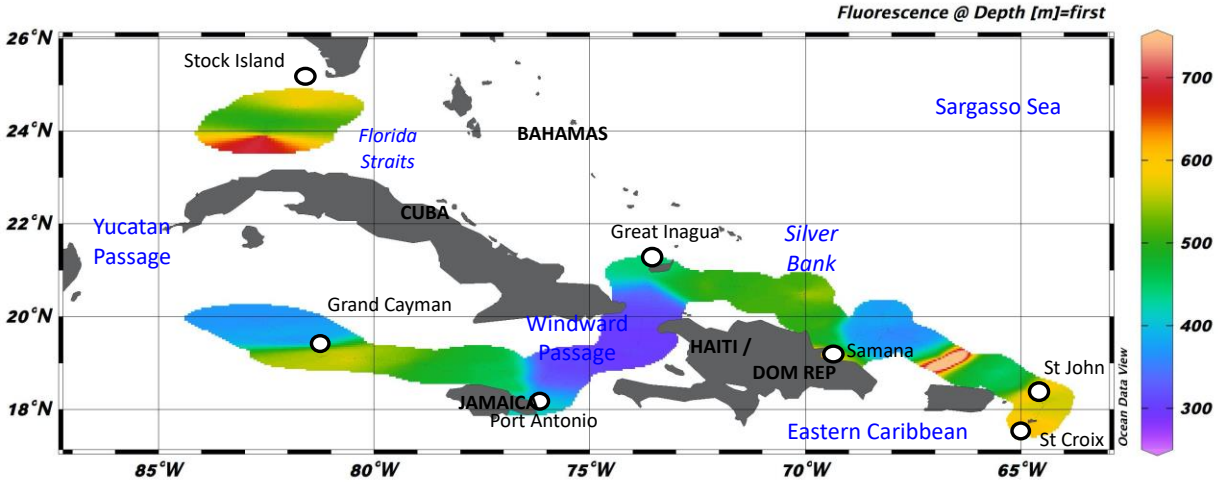


Figure 3a. Surface current vectors during C284 showing eastern and western Caribbean. Note 750 mm/s is equivalent to 1.5 knots. Currents were weak with the exception of mesoscale eddies near island passages (i.e. Windward Passage) and the Western Caribbean.

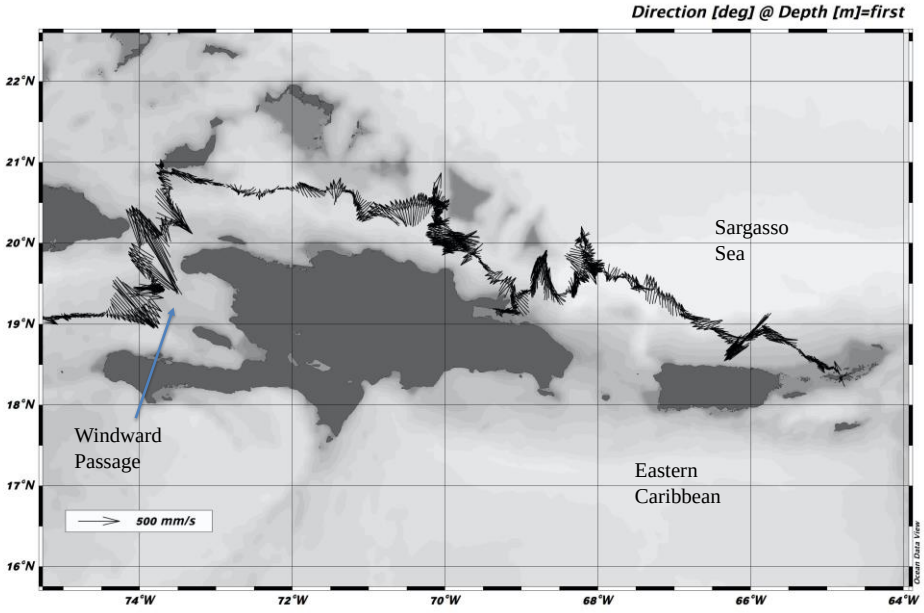


Figure 3b. Surface current vectors during C284 showing western Caribbean. Note 750 mm/s is equivalent to 1.5 knots. Currents were weak with the exception of mesoscale eddies near island passages (i.e. Windward Passage) and the Western Caribbean.

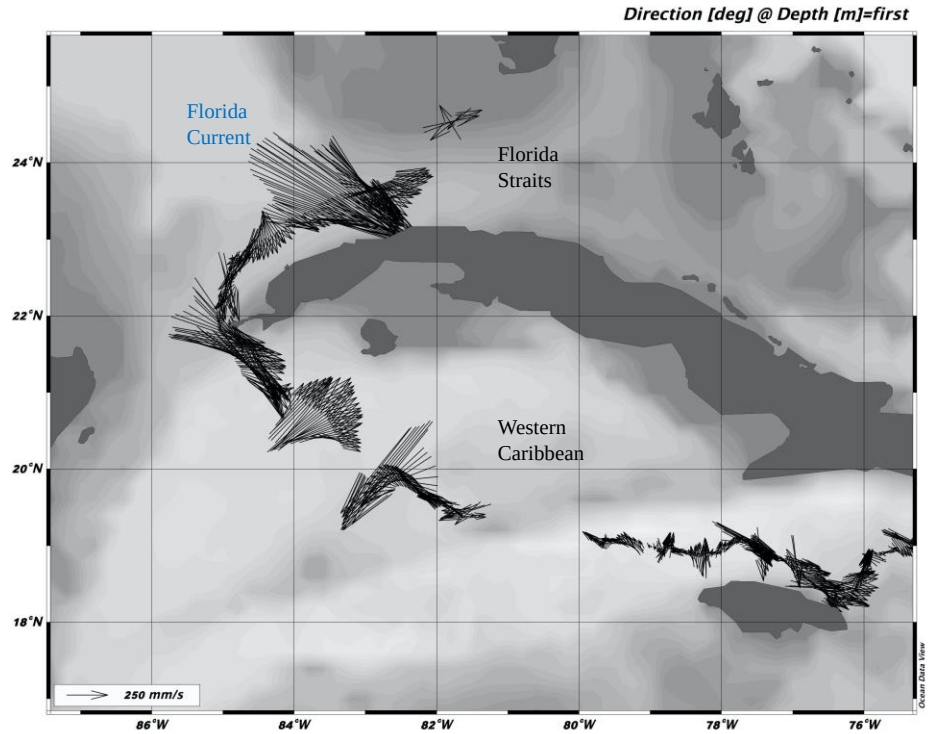


Table 3. Surface station location and surface sensor data for C284.

Station # (C284-)	Date (2019)	Time (local -4 to -5 GMT)	Log (nm)	Lat (dec Deg N)	Lon (dec Deg W)	Temp (°C)	Salinity (ppt)	chl-*a* Fluor (volts)
SS-001	14-Feb	2230	42.2	18.17	-64.43	26.4	35.90	559
SS-002	15-Feb	0424	73.8	18.17	-64.50	26.3	35.73	562
SS-003	15-Feb	1116	106.4	18.37	-64.75	26.3	35.73	752
SS-004	17-Feb	1113	108.4	18.37	-64.75	26.6	35.77	549
SS-005	17-Feb	1438	119.6	18.38	-64.85	26.8	35.80	535
SS-006	17-Feb	1723	128.6	18.46	-64.97	27.0	35.80	506
SS-007	17-Feb	2047	139.2	18.52	-65.11	26.8	35.90	433
SS-008	18-Feb	1448	213.1	18.77	-66.14	26.4	35.91	458
SS-009	19-Feb	0431	299.7	19.45	-67.40	26.5	35.70	361
SS-010	19-Feb	1830	349.0	19.70	-68.09	26.4	36.02	367
SS-011	20-Feb	0056	377.3	20.07	-68.21	26.3	36.23	366
SS-012	20-Feb	0925	410.1	19.55	-68.26	26.4	35.96	356
SS-013	21-Feb	0450	484.5	19.41	-68.92	26.5	36.20	371
SS-014	23-Feb	0745	519.3	19.19	-69.33	26.7	35.43	na
SS-015	23-Feb	1030	na	19.15	-69.84	na	na	na
SS-016	25-Feb	1552	528.1	19.16	-69.21	27.1	36.07	606
SS-017	25-Feb	1827	537.5	19.19	-69.11	26.7	36.45	503
SS-018	26-Feb	0413	592.3	19.86	-69.65	26.3	36.21	494
SS-019	26-Feb	1730	633.7	20.01	-69.97	26.3	36.16	497
SS-020	27-Feb	0035	655.3	20.24	-70.09	26.2	36.12	514
RS-000	13-Feb	1045	na	17.77	-64.81	na	na	na
RS-001	15-Feb	1030	na	18.37	-64.72	na	na	na
RS-002	3-Mar	1030	na	21.09	-73.65	na	na	na
SS-021	4-Mar	0935	941.0	20.96	-73.68	36.2	36.20	408
SS-022	4-Mar	1138	943.5	20.92	-73.70	28.1	36.19	367
SS-023	4-Mar	1237	948.5	20.86	-73.69	28.1	36.17	343
SS-024	5-Mar	0000	1009.0	19.93	-73.81	27.3	36.02	312
SS-025	5-Mar	1005	1040.0	19.44	-73.88	27.5	36.33	302
SS-026	5-Mar	2320	1109.0	19.09	-74.92	27.4	36.11	298
SS-027	6-Mar	1030	1138.0	19.05	-75.41	27.5	36.14	321
SS-028	6-Mar	2305	1181.0	18.69	-76.02	27.4	35.90	321
RS-003	9-Mar	1015	na	18.19	-76.46	27.0	36.13	na
SS-029	9-Mar	1405	1222.0	18.19	-76.45	27.6	35.97	478
SS-030	9-Mar	1455	1225.0	18.33	-76.47	27.5	36.12	451
SS-031	10-Mar	0220	1271.0	18.80	-76.96	27.3	36.10	467
SS-032	10-Mar	1010	1304.0	18.91	-77.44	27.5	36.13	445
SS-033	11-Mar	0016	na	18.86	-78.21	27.2	38.02	495
SS-034	11-Mar	1104	1400.0	18.97	-78.81	27.4	36.05	482
SS-035	11-Mar	2315	1449.0	19.06	-79.65	27.3	36.03	548
SS-036	12-Mar	1125	1497.0	19.09	-80.46	27.5	36.14	615
SS-037	13-Mar	0617	1552.0	19.18	-81.34	27.3	36.07	539

SS-038	13-Mar	0750	1558.0	19.25	-81.42	27.4	36.09	556
SS-039	13-Mar	1209	1565.0	19.31	-81.39	na	na	na

Table 3. Surface station location and surface sensor data for C284, continued.

Station # (C284-)	Chl-*a* (ug/l)	PO4 (uM)	pH	Fluoro (CDOM)	Tx (1 min Avg)
SS-001	0.048	bd	7.929	74.6	13944
SS-002	0.032	0.074	8.015	75.9	14342
SS-003	0.356	0.088	7.988	94.9	14152
SS-004	0.246	0.044	7.905	97.8	14068
SS-005	0.332	bd	na	99.8	14021
SS-006	0.176	0.024	na	95.5	14338
SS-007	0.069	bd	8.030	92.0	13868
SS-008	0.040	bd	8.049	85.4	14430
SS-009	0.104	bd	8.029	88.6	14104
SS-010	0.086	bd	8.066	75.3	14834
SS-011	0.043	bd	8.091	74.2	14655
SS-012	0.048	bd	8.030	74.9	14931
SS-013	0.066	bd	8.067	75.7	14762
SS-014	25.832	bd	7.942	0.9	4
SS-015	14.896	0.241	na	na	na
SS-016	4.196	bd	7.881	220.3	13998
SS-017	23.121	bd	8.094	17938.0	9561
SS-018	2.255	bd	8.076	75.4	13923
SS-019	5.966	0.010	8.071	73.8	14680
SS-020	3.896	3.859	8.107	75.2	14641
RS-000	0.325	0.454	na	na	na
RS-001	na	na	na	na	na
RS-002	4.467	na	na	na	na
SS-021	2.669	na	8.004	79.6	14834
SS-022	11.803	na	8.001	89.7	14802
SS-023	5.652	na	7.990	89.7	14826
SS-024	2.797	na	8.098	78.7	14772
SS-025	0.908	na	8.014	78.5	14797
SS-026	2.840	na	8.055	77.2	14723
SS-027	3.225	na	8.004	79.0	14687
SS-028	5.452	na	8.055	81.1	14601
RS-003	13.830	na	7.969	na	na
SS-029	9.077	na	8.050	95.4	12975
SS-030	6.437	na	8.041	91.9	14239
SS-031	2.797	na	8.033	78.7	13966
SS-032	2.455	na	8.020	78.7	14303
SS-033	8.406	na	8.041	81.9	14506
SS-034	1.656	na	8.029	80.1	14433

SS-035	0.699	na	8.055	80.0	14332
SS-036	5.580	na	8.008	79.0	14267
SS-037	1.269	na	8.059	79.1	14143
SS-038	0.552	na	8.035	79.2	14149
SS-039	9.577	na	7.963	na	na

Surface water samples were collected using a clean, seawater flow-thru system (intake ~ 1-3m depth) with in-line temperature, salinity and *in vivo* chlorophyll-*a*, fluorescence sensors. Discrete water samples were collected for phosphate (PO_4) analysis, measured by colorimetric analysis with an Ocean Optics Chem2000 digital spectrophotometer; and extracted chlorophyll-*a* (Chl-*a*) concentrations, measured with a Turner Designs Model 10-AU Fluorometer following methods outlined in Parsons, Maita and Lalli, *A Manual of Chemical and Biological Methods for Seawater Analysis*, Pergamon Press 1984. Chlorophyll-*a* samples were filtered through 0.45 µm filters. A blank space indicates that no sample was collected for that analysis while 'na' = data not available and 'bd' = below detectable levels.

Table 4a. Visual survey metadata for C284.

Station # (C284-)	Date (2019)	Start Time (local - 4 to -5 GMT)	General Locale	Temp (°C)	Salinity (ppt)	Chl-*a* Fluor (volts)	Water depth (m)	Marine Mammal Survey?	Seabird survey?	Vessel Activity survey?
003	17-Feb	1024	Eastern Caribbean	26.6	35.77	553.0	20	Y	Y	Y
005	18-Feb	1343	Sargasso Sea	26.4	35.91	462.8	2210	Y	Y	Y
008	19-Feb	1723	Sargasso Sea	26.4	36.05	381.0	7822	Y	Y	Y
010	20-Feb	0915	Sargasso Sea	26.4	35.95	357.9	7000	Y	Y	Y
012	23-Feb	0745	Sargasso Sea: Inshore DR: Samana Bay	___	____	____	15	Y	Y	Y
013	25-Feb	1545	Sargasso Sea: Inshore DR: Samana Bay	27.0	36.00	594.1	1044	Y	N	N
014	26-Feb	1638	Sargasso Sea: Offshore DR	26.3	36.12	498.0	___	Y	Y	Y
018	27-Feb	1230	Sargasso Sea: Silver Bank	26.4	36.20	544.0	___	Y	Y	Y
019	27-Feb	1414	Sargasso Sea: Silver Bank	26.4	36.17	570.1	___	Y	Y	Y
020	27-Feb	1552	Sargasso Sea: Silver Bank	26.3	36.12	642.2	___	Y	Y	Y
028	5-Mar	1000	Windward Passage, Haiti, Offshore	27.5	36.33	311.0	1108	Y	Y	Y
030	6-Mar	0948	Windward Passage: Jamaica, Offshore	27.5	36.10	321.1	__	Y	Y	Y
035	10-Mar	0924	Windward Passage: Jamaica, Offshore	27.4	36.13	454.0	__	Y	Y	Y
037	11-Mar	0938	Western Caribbean: Caymans Offshore	27.3	___	485.3	5500	Y	Y	Y
040	12-Mar	09:53	Western Caribbean: Caymans Offshore	27.4	36.13	580.3	__	Y	Y	Y

Table 4b. Marine Mammal Survey during C284. Behavior codes are: Bl = blow, Fd = fluke dive, Fs = fluke slap, Ps = pectoral fin slap, Ss – surface swimming, Br = breach,

Station # (C284-)	Mammals Total #	Mammals Unidentified #	Whale Unidentified #	Humpback Whale #	Other Whale Species (Record in Notes)#	Dolphin Unidentified #	Bottlenose Dolphin #	Common Dolphin #	Spotted Dolphin #	Spinner Dolphin #	Other Dolphin or Mammals # (Record species in Notes)	Marine Mammal Behavior Codes	Marine Mammal Behavior notes	Other notes
003	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
005	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
008	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
010	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
012	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
013	9	0	0	9	0	0	0	0	0	0	0	Bl(12) Ss(7), Fd (2), 1/2 Br(3)	Singing, making purring noises	N/A
014	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
018	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	Marine mammal sounds heard on hydrophone,

													none observed visually.
019	2	0	0	2	0	0	0	0	0	0	0	Br (2), Fs	N/A	N/A
020	9	0	0	9	0	0	0	0	0	0	0	Br, Bl	N/A	N/A
028	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
030	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
035	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
037	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.
040	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No marine mammals observed.

Table 4c. Seabird Survey during C284. Behavior codes are: Fs = foraging at sea surface, Fd = foraging dive, Fp = flight path with direction, Rs = roosting on ship, Rw = roosting on water.

Station # (C284-)	Birds Total # (If ID to species, record in comments)	Un-identified #	Gull #	Boobie #	Tropicbird #	Tern #	Petrel / Shearwater #	Black Skimmer #	Double-crested cormorant #	Brown Pelican #	Osprey #	Frigate Bird #	Bird Behavior Codes	Bird Behavior Notes	Other Notes
003	5	0	0	0	0	0	0	0	0	0	0	5	Flying	Approach bow of vessel from starboard to about 60m directly ahead, then fly away from ship one point off port bow.	
005	1	0	0	1	0	0	0	0	0	0	0	0	Flying	Flew from bow of vessel to port side and back towards bow	
008	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No birds observed
010	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No birds observed
012	17	17	0	0	0	0	0	0	0	0	0	0	Fd, Fs, Rw	N/A	
013	0	0	0	0	0	0	0	0	0	0	0	0	n/a	N/A	No birds observed
014	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No birds observed
018	14	14	0	0	0	0	0	0	0	0	0	0	Fd	N/A	
019	2	2	0	0	0	0	0	0	0	0	0	0	flying	N/A	N/A
020	0	0	0	0	0	0	0	0	0	0	0	0	n/a	n/a	
028	1	1	0	0	0	0	0	0	0	0	0	0	N/A	Flew close to vessel on port side	
030	0	0	0	0	0	0	0	0	0	0	0	0	N/A	N/A	No birds observed
035	1	0	1	0	0	0	0	0	0	0	0	0	Fp	Circled ship and roosted in water briefly	Laughing Gull
037	1	0	0	0	0	0	0	0	0	0	0	0	Flying, RS	Multiple visits, circling ship and roosting	Bird identified as Barn Swallow

Table 4d. Vessel Traffic Survey during C284. VA – vessels anchored, VM – vessels motoring.

Station # (C284-)	Vessels On AIS within 20nm of Cramer	Vessel Observation Codes	Vessel Acitivity Notes
003	About 25 small sailboats moored or anchored in Francis Bay. [Many more on AIS, not recorded.]	VA:25; VM:11	VM at 10:25, 10:33, 10:40, 10:46, 10:51, 10:53, 10:55, 11:00, 11:04, 11:05, 11:07
005	2	VM: 2	2 VM seen throughout entire survey, one off port quarter and one off starboard bow, both cargo vessels
008	0	N/A	None seen.
010	1	O: 1	One sailboat off the port bow
012	About 15 vessels motoring nearby	VM: 15	CC rescue boat was close to soundtrap. 08:00 whale watch boat activity. VM at 07:48, 07:55, 07:58, 07:59, 08:00, 08:06, 08:08, 08:09, 08:10
013	one vessel listed at 21.6 nm	n/a	No vessels observed
014	None.	N/A	No vessels observed
018	None.	N/A	No vessels observed
019	None.	N/A	No vessels observed
020	1 vessel (Nord I, 9.9nm away)	VM: 1	
028	None.	N/A	No vessels observed
030	None.	N/A	No vessels observed
035	None.	N/A	No vessels observed
037	1 (15nm)	N/A	No vessels observed visually

Table 5. CTD station data for C284. Physical characteristics of the water column were measured with a Seabird SEACAT Conductivity-Temperature-Depth Profiler Model SBE 19plus (unit # - 7705) and five attached sensors: dissolved oxygen (sensor # - 43-3328), chlorophyll-*a* fluorescence (sensor # - SCF-3149), PAR (sensor # - 70187), CDOM (sensor # - WSCD-1258ad), and transmissometer (sensor # - CST-779PR-ad). Vertical profile data available upon request.

Station # (C284-)	Date (2019)	Time (local -4 to -5 GMT)	Water Depth (m)	Cast Depth (m)	Locale
003	17-Feb	1056	18	15.0	Eastern Caribbean
005	18-Feb	1340	2210	545.5	Sargasso Sea
008	19-Feb	1650	7822	625.6	Sargasso Sea
010	20-Feb	0854	na	921.0	Sargasso Sea
012	23-Feb	0745	15	12.0	Sargasso Sea/Samana Bay
016	26-Feb	1628	na	856.0	Sargasso Sea
025	4-Mar	0920	10	1.0	Sargasso Sea: Great Inagua Inshore
028	5-Mar	0945	1108	881.2	Windward Passage: Offshore Haiti
030	6-Mar	0935	3128	230.0	Windward Passage: Offshore Jamaica
035	10-Mar	0920	na	906.0	Windward Passage: Jamaica, Offshore
037	11-Mar	0927	na	956.0	Western Caribbean: Caymans, Offshore
040	12-Mar	0940	na	926.0	Western Caribbean: Caymans, Offshore
042	15-Mar	0800	18	15.0	Western Caribbean: Caymans, Inshore Shelf

Figure 4a. CTD station locations for C284. Water column structure of temperature, salinity, dissolved oxygen and chlorophyll-*a* fluorescence was determined along the cruise track. Three geographic regions exhibited distinct water column structure: Sargasso Sea/Eastern Caribbean (red), Windward Passage (green), and Western Caribbean (blue). Shallow, near shore stations (< 50m) are indicated with an X and their vertical profiles are not shown in subsequent graphs but are available upon request. Corresponding CTD Stations listed in Table 5 are as follows: 003, 005, 008, 010, 016, and 025 are red, Station 028 is green, and Stations 035, 037, 040 and 042 are blue.

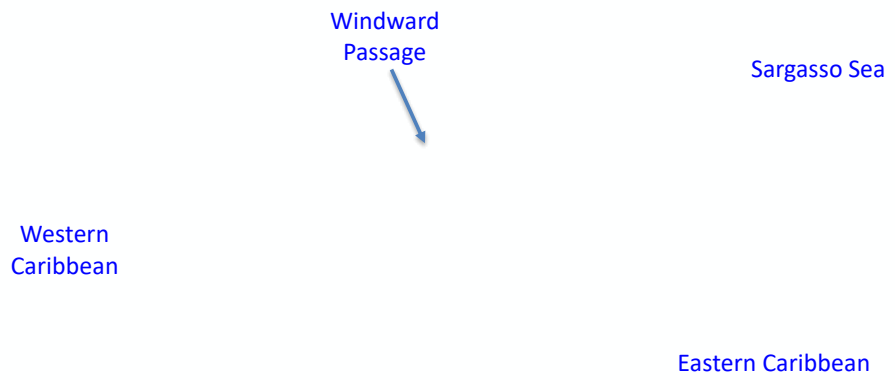


Figure 4b. T-S Plots for C284. Three geographic regions exhibited distinct water column structure: Sargasso Sea/Eastern Caribbean (red), Windward Passage (green), and Western Caribbean (blue).

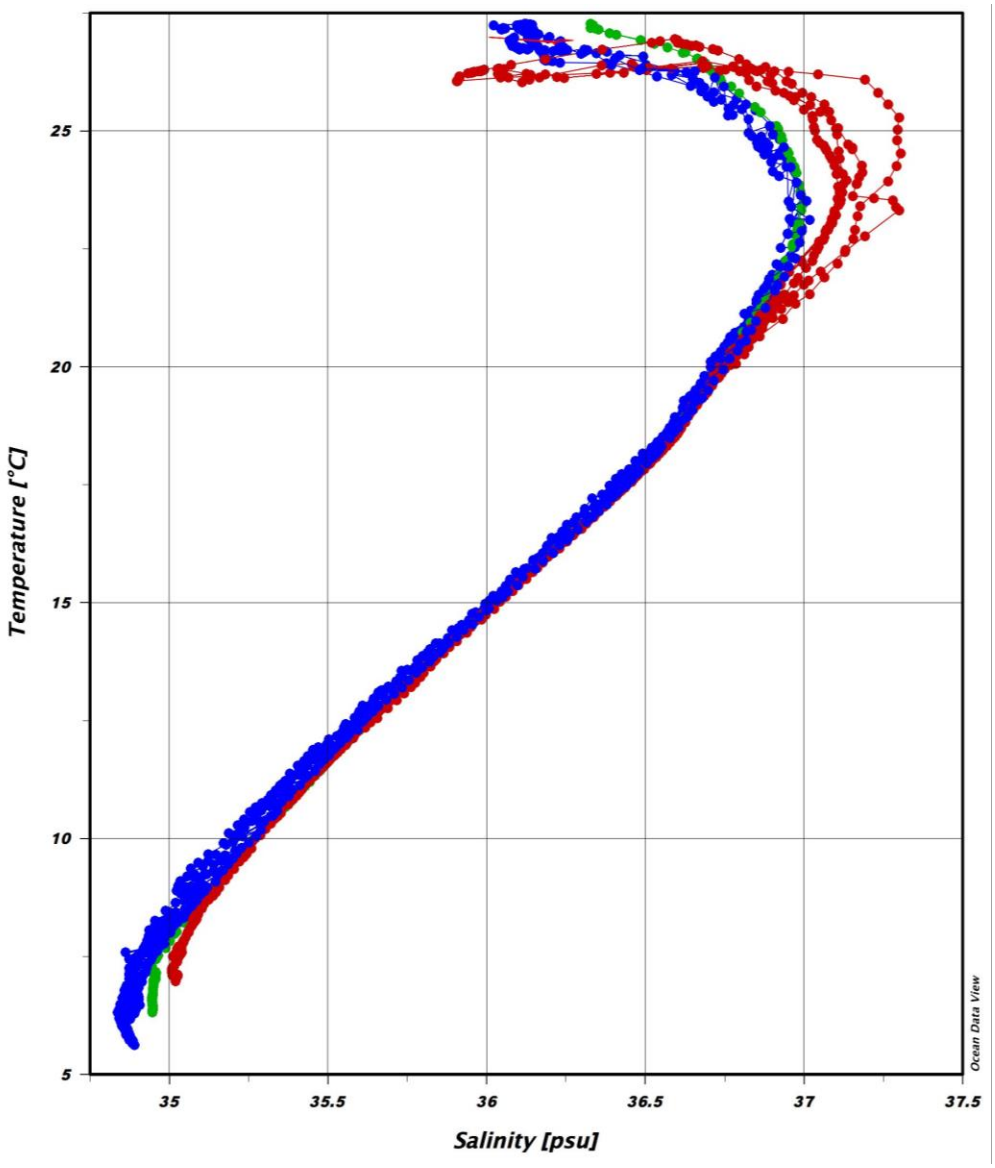


Figure 4c. Temperature profiles for C284. Three geographic regions exhibited distinct water column structure: Sargasso Sea/Eastern Caribbean (red), Windward Passage (green), and Western Caribbean (blue).

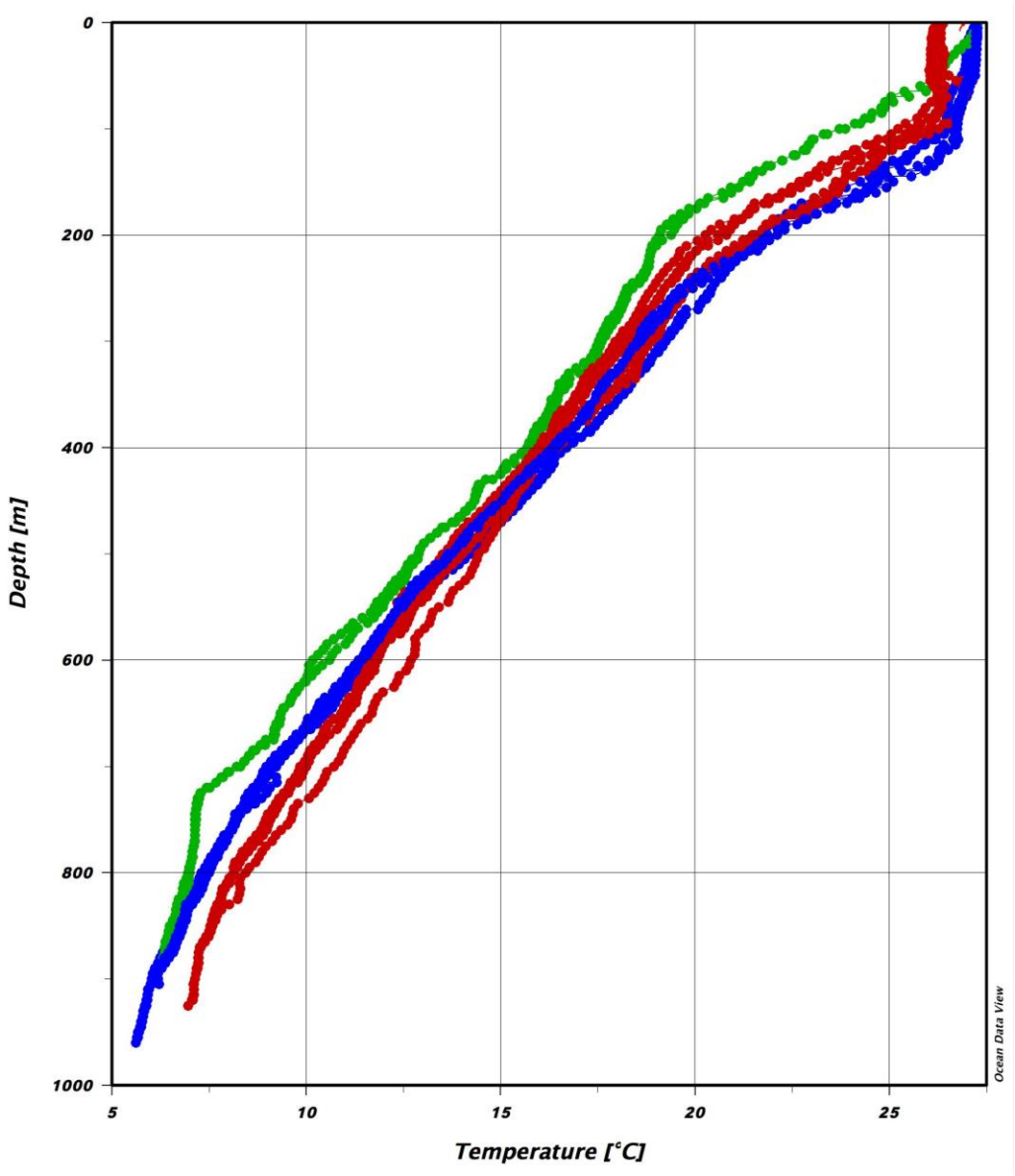


Figure 4d. Salinity profiles for C284. Three geographic regions exhibited distinct water column structure: Sargasso Sea/Eastern Caribbean (red), Windward Passage (green), and Western Caribbean (blue).

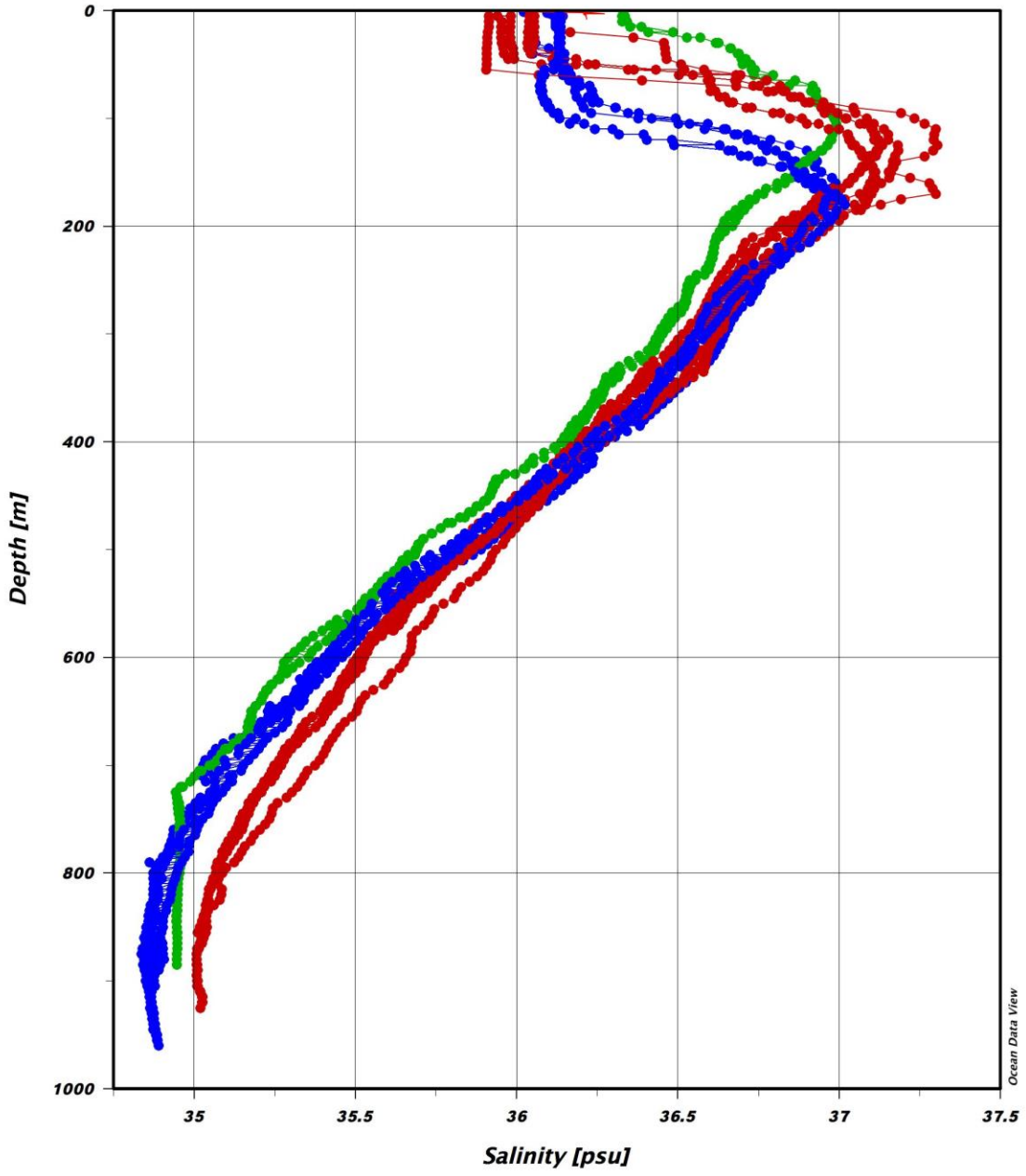


Figure 4e. Density profiles for C284. Three geographic regions exhibited distinct water column structure: Sargasso Sea/Eastern Caribbean (red), Windward Passage (green), and Western Caribbean (blue).

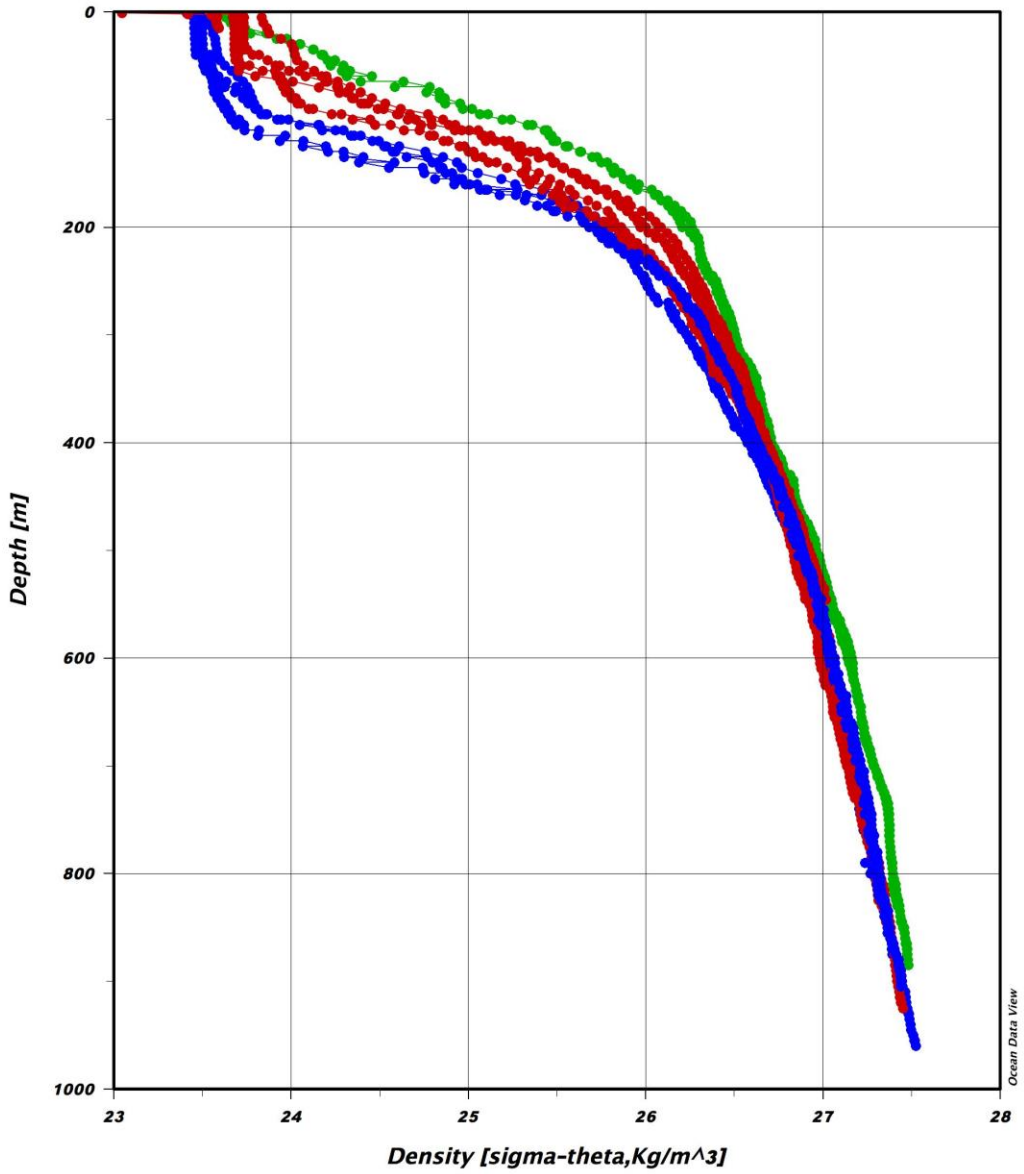


Figure 4f. Chlorophyll-*a* fluorescence profiles for C284. Four geographic regions exhibited distinct water column structure: Sargasso Sea/Greater Antilles (blue), Windward Passage (yellow), Western Caribbean (red), and Florida Straits (green).

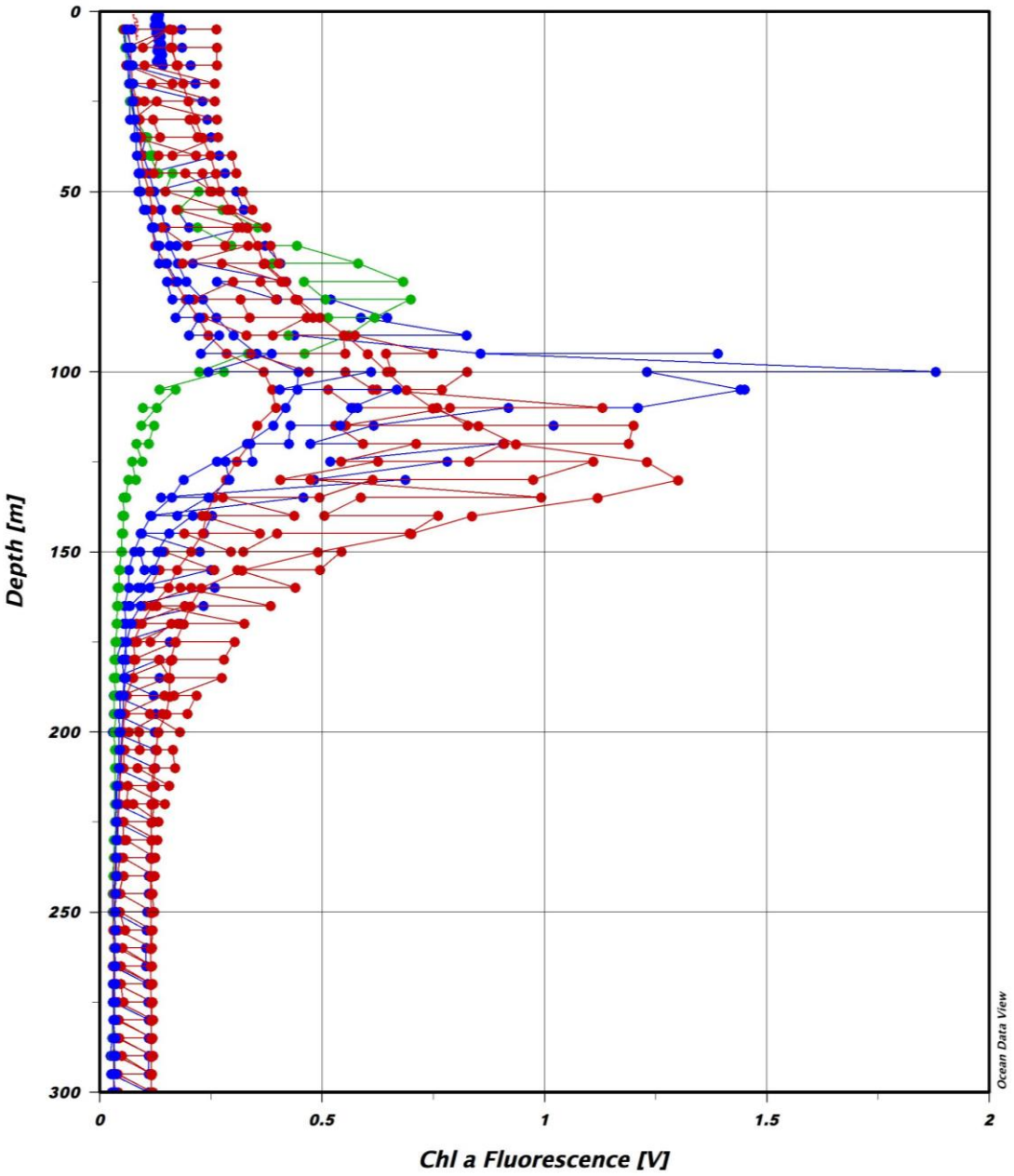


Table 6. Neuston station data for C284.

Station # (C284-)	Date (2019)	Time (local -4 to -5 GMT)	Moon Phase %	risen or set	Temp (°C)	Salinity (ppt)	Chl-*a* Fluor (volts)	Tow Area (m^2)	Zoop Biomass (ml)	Zoop Den (ml/m^2)	Locale
004	17-Feb	2029	98%	set	26.9	35.88	427.0	1935	47.0	0.0243	Eastern Caribbean
005	18-Feb	1446	99%	risen	26.4	35.91	457.8	2592	2.0	0.0008	Sargasso Sea, Puerto Rico, PR Trench
006	19-Feb	0416	100%	risen	26.5	35.67	372.8	1463	4.5	0.0031	Sargasso Sea
008	19-Feb	1815	99%	risen	26.4	36.02	370.6	2172	5.0	0.0023	Sargasso Sea
009	20-Feb	0046	99%	Set	26.3	36.23	376.4	2055	5.0	0.0024	Sargasso Sea
010	20-Feb	1030	95%	Risen	26.4	35.99	364.6	1951	1.7	0.0009	Sargasso Sea
011	21-Feb	0440	50%	Risen	26.6	36.30	373.2	2380	7.0	0.0029	Sargasso Sea: outside Samana Bay
014	26-Feb	0358	40%	Set	26.2	36.11	494.4	1888	6.3	0.0033	Sargasso Sea, DR Offshore
017	27-Feb	0028	4%	set	26.2	36.11	510.8	1736	6.0	0.0035	Sargasso Sea, DR Offshore
027	4-Mar	2340	1%	set	27.2	36.00	307.4	1666	10.5	0.0063	Windward Passage: Haiti, Offshore
029	5-Mar	2303	0%	set	27.6	36.11	305.3	2382	19.0	0.0080	Windward Passage: Haiti, Offshore
032	6-Mar	2302	14%	set	27.4	35.90	320.6	1237	20.0	0.0162	Windward Passage: Jamaica, Offshore
034	10-Mar	0200	14%	risen	27.3	36.10	465.9	1819	16.0	0.0088	Windward Passage: Jamaica, Offshore
035	10-Mar	1055	21%	set	27.4	36.13	446.1	1775	1.6	0.0009	Windward Passage: Jamaica, Offshore
036	11-Mar	0004	21%	risen	27.2	36.01	496.1	2089	8.0	0.0038	Windward Passage: Jamaica, Offshore
037	11-Mar	1059	21%	set	27.4	36.04	482.2	582	3.9	0.0067	Western Caribbean: Cayman Islands, Offshore
039	11-Mar	2255	30%	risen	27.3	36.03	558.4	2123	12.0	0.0057	Western Caribbean: Cayman Islands, Offshore
040	12-Mar	1116	na	na	27.5	36.14	626.5	990	8.0	0.0081	Western Caribbean: Cayman Islands, Offshore

Table 6 continued. Neuston station data for C284.

Station # (C284-)	Surface station #	Halo (#)	Lepto (#)	Phyllo (#)	Mycto (#)	Ceph (#)	Plastic Pellets (#)	Plastic Pieces (#)	Tar (#)	S. natans I (g)	S. natans II (g)	S. natans VIII (g)	S. fluitans III (g)	S. other (g)
004	SS-007	0	0	0	0	0	0	0	0	31	0	21	8	0
005	SS-008	0	0	0	0	0	0	0	0	9	0	25	15	266
006	SS-009	0	0	0	0	0	0	0	0	2	0	0	0	0
008	SS-010	0	0	0	0	0	0	0	0	340	0	20	260	45
009	SS-011	0	0	0	0	0	0	0	0	405	0	1085	925	0
010	SS-012	0	0	0	0	0	0	1	0	1	0	3	0	0
011	SS-013	0	0	0	1	0	0	0	0	330	0	40	260	0
014	SS-018	1	1	0	2	0	0	2	0	329	0	21	216	0
017	SS-020	0	0	0	5	0	0	0	0	7	0	0	3	0
027	SS-024	0	0	0	1	0	0	4	0	696	0	49	425	0
029	SS-026	27	0	0	5	0	0	4	0	900	0	28	600	29
032	SS-028	3	0	0	10	0	0	2	0	405	0	11	134	0
034	SS-031	1	0	1	0	0	0	1	0	1260	0	23	937	0
035	SS-032	0	0	0	0	0	0	0	0	82	0	0	96	0
036	SS-033	2	0	0	1	0	0	0	0	720	0	15	475	0
037	SS-034	0	0	0	0	0	0	0	0	460	0	36	420	0
039	SS-035	6	0	0	4	0	0	2	0	372	0	52	437	0
040	SS-036	3	0	0	0	0	0	1	0	255	0	330	980	0

Table 6 continued. Neuston station data for C284.

Station # (C284-)	Gelatinous >2cm (#)	Types of Gelatinous	Other Nekton >2cm (#)	Types of Nekton	Tow Description and other notes
004	0	na	5	juvenile fish (3, 2ml); crabs (2, 1ml)	Lots of sargassum, isopods very abundant, looks like piles of wild rice, several small juvenile fish, a small crab, mostly brown.
005	0	na	3	long silver fish (1, 0.02ml); small blue fish (1. 0.05); shrimp (1, 0.5)	Contained a large quantity of seagrass and sargassum. Mostly brown with a few blue copepods.
006	0	na	1	pipefish (1, 0.2ml)	Many clear gelatinous organisms. Brown, beige, purple debris. Crab smaller than 2cm.
008	0	na	5	crab (1, 2ml); shrimp (3, 0.4ml); small fish (1, 0.1ml)	Lots of sargassum, many tiny shrimp, one large crab. Brown.
009	0	na	15	Shrimp (13, 1ml) Crabs (2,~3ml)	There was a lot of sargassum and a couple of crabs
010	0	na	2	Crab (1, 0.5ml) ; Shrimp (1, 0.5)	Light biomass tow. Some small sargassum, crab, many shrimp, several blue copepods
011	0	na	7	silver and black fish (2, 0.3); long silvery fish with protruding jaw (1. 0.4); crabs (3, 2.5); shrimp (1, 0.2)	Not very gelatinous. Lots of larger organisms, not quite 2cm. Mainly natans I sargassum. A few (7) organisms larger than 2cm.
014	0	na	2	sargassum crab (1, 0.2ml); sargassum shrimp (1, 0.2ml)	Large amount of sargassum and some associated fauna.
017	0	na	1	pipefish (1,0.1ml)	Abundance of crab larvae and myctophids
027	0	na	23	sargassum crab(8, 2.5ml); trigger fish (2, 1.0 ml); long yellow fish with snout (2, 0.5 ml); flying fish (3,10ml); puffer fish (5, 1.5ml); shrimp (2, 0.5); little black fish (1, 0.2)	Diverse sample with many different types of nekton. Lots of sargassum and large pieces of plastic. And pieces of charcoal.
029	0	na	3	Pipefish (1, 5ml); flying fish (2, 3ml)	shrimp, small fish, flying fish, pipefish, and many organisms smaller than 2000um, as well as plastic (a whole spoon), charcoal, and wood; the tow had a general light brown and pink color with a little blue

032	5	na	40	Needlefish (1, 0.5); small silvery green fish (1, 0.9); shrimp (38, 3.8ml)	Lots of sargassum/plant material, lots of fish/other swimmers
034	0	na	0	Pipefish (1, 0.5)	So much sargassum, very small crabs and shrimp, one piece of styrofoam and one large fish.
035	0	na	1	crab (1, 1.0)	Comprised of sargassum fragments and clumps. Some sea grass as well. S. natans I and S. fluitans [III] found in relatively equal quantities. One big crab and some shrimp.
036	0	na	3	sargassum crabs (3, 1ml)	This tow contained lots of shrip, relatively dark / brown biomass, plenty of sargassum, 3 crabs and a myctophid
037	0	na	0	N/A	0.75cm-ish shrimp, lots of plant matter, worm tubes
039	2	siphonophore	8	flying fish (1, 0.5ml) puffer fish (1, 0.1 ml); shrimp (2, 0.3ml); crabs (3, 1.5 ml); polychaete (1, 0.1)	Many shrimp and several large creatures, plus a piece of charcoal
040	0	na	5	crabs (2, 1.5 ml); trigger fish (1, 1.5 ml); shrimps (2, 0.5ml)	Lots of shrimp <2cm, a lot of fluitans along with smaller amounts of natans I and VIII. Biomass is generally brown.

Tow area was calculated using distance in meters between successive (every minute) GPS positions. Net opening was 1.0 m wide by 0.5 m tall with a net mesh of 335 μm. Zooplankton density is recorded as wet volume displacement per tow area (ml/m^2). Eel larvae (leptocephali), spiny lobster larvae (phyllosoma), and Lantern fish (Family Myctophidae), were sorted from net contents and recorded as numbers caught per tow. Micronekton, gelatinous micronekton, and plant material was removed using a 1 cm mesh sieve and biomass (ml) or length (cm) was recorded. Floating plastic was also removed from net contents, sorted as pellets (none collected entire cruise) or pieces and recorded as numbers collected per tow. Floating tar was sorted from the nets contents and recorded present or absent (none collected entire cruise). Qualitative description of micronekton removed from the zooplankton biomass is provided, and when available biomass (ml) and length (cm) of specimens are recorded.

Table 7. Meter net station data for C284.

Station # (C284-)	Date (2019)	Time (local - 4 to -5 GMT)	Moon Phase %	risen or set	Temp (°C)	Salinity (ppt)	Chl-*a* Fluor (volts)	Tow Length (m)	Net Volume (m3)	Locale
017	26-Feb	2305	40%	Set	26.3	36.12	491.9	4323	3393.2	Sargasso Sea, DR Offshore

Station # (C284-)	Zoop Biomass (ml)	Zoop Den (ml/m3)	Lepto (#)	Phyllo (#)	Mycto (#)	Ceph (#)	Gelatinous >2cm (#)	Types of Gelatinous	Other Nekton >2cm (#)	Types of Nekton	Tow Description and other notes
017	41	0.012083	0	0	4	0	0	na	45	Large fish (1, 0.1ml) Shrimp (44, 2.4ml)	Many shrimp, some fish larvae with one clump of sargassum and rare fragments

Table 8. Zooplankton 100 count station data for C284.

Station # (C284-)	Date (2019)	Time (local -4 to -5 GMT)	Net Type	Cnidarian medu	Siphonophores	Ctenophores	Salp/Doliolids	Pteropods	Nudibranch	Heteropods	Other snails	Squid larvae	Polychaete	Chaetognaths	Copepods	Gammerids Amphipods	Hyperiid Amphipod	Megalopae	Zoea
004	17-Feb	2029	NT	0	1	0	1	0	0	2	7	0	0	0	2	51	0	0	0
005	18-Feb	1446	NT	1	0	0	0	0	0	0	75	0	2	0	5	2	0	0	0
006	19-Feb	0416	NT	1	18	0	0	4	0	0	7	0	0	2	59	0	3	0	0
008	19-Feb	1815	NT	0	3	0	1	5	0	8	13	0	0	1	51	1	1	1	0
009	20-Feb	0046	NT	1	1	0	1	0	0	2	39	0	0	1	50	0	0	0	0
010	20-Feb	1030	NT	0	26	0	0	0	0	0	12	0	0	0	49	0	1	0	0
011	21-Feb	0440	NT	0	7	0	0	2	0	0	2	0	0	0	56	1	1	0	1
014	26-Feb	0358	NT	0	5	0	0	7	0	0	19	0	0	1	48	1	4	1	0
017	27-Feb	0028	NT	0	12	0	0	5	0	0	7	0	1	0	60	5	0	4	0
027	4-Mar	2340	NT	0	10	0	0	2	0	0	16	0	4	0	47	6	4	0	0
029	5-Mar	2303	NT	0	4	0	0	1	0	0	3	0	1	1	77	1	2	0	1
032	6-Mar	2302	NT	0	0	0	0	0	0	0	5	0	0	1	88	0	3	0	2
034	10-Mar	0200	NT	0	0	0	0	0	0	0	14	0	0	0	80	0	2	0	0
035	10-Mar	1055	NT	0	0	0	0	0	0	0	7	0	4	0	72	1	0	0	0
036	11-Mar	0004	NT	0	0	0	0	0	0	0	4	0	0	1	90	1	2	0	0
037	11-Mar	1059	NT	0	4	0	0	1	0	0	5	0	2	1	62	0	0	0	0
039	11-Mar	2255	NT	0	2	0	0	2	0	0	1	0	0	0	81	8	2	0	0
040	12-Mar	1116	NT	0	0	0	0	1	0	0	9	0	2	0	37	0	0	0	0
017	26-Feb	2305	MN	0	2	0	1	7	0	0	2	0	0	3	73	0	1	0	0

Table 8 continued. Zooplankton 100 count station data for C284.

Station # (C284-)	Date (2019)	Time (local -4 to -5 GMT)	Net Type	Shrimp (larvae)	Lobster (larvae)	Mysids	Euphausids	Stomatopod (larv)	Ostracods	Cladocera	Isopods	Fish Larvae	Fish Eggs	Other	Other	Other	Total # of organisms	Shannon-Weiner Diversity Index
004	17-Feb	2029	NT	0	1	1	1	1	17	0	15	0	0	0	0	0	100	0.67
005	18-Feb	1446	NT	6	0	0	4	1	0	0	2	0	0	1	0	0	99	0.45
006	19-Feb	0416	NT	0	0	1	0	2	3	0	0	0	0	1	0	0	101	0.62
008	19-Feb	1815	NT	0	0	13	0	0	2	0	0	0	0	0	0	0	100	0.71
009	20-Feb	0046	NT	2	0	4	0	0	2	0	0	0	0	0	0	0	103	0.54
010	20-Feb	1030	NT	10	0	0	0	0	0	0	0	2	0	0	0	0	100	0.57
011	21-Feb	0440	NT	18	0	0	7	0	3	0	0	1	0	1	0	0	100	0.65
014	26-Feb	0358	NT	11	0	0	1	0	0	0	0	0	0	2	0	0	100	0.71
017	27-Feb	0028	NT	3	0	2	0	0	1	0	0	0	0	0	0	0	100	0.63
027	4-Mar	2340	NT	3	0	5	0	2	0	0	1	0	0	0	0	0	100	0.77
029	5-Mar	2303	NT	2	0	1	0	0	0	0	6	0	0	0	0	0	100	0.45
032	6-Mar	2302	NT	1	0	0	0	0	0	0	0	0	0	0	0	0	100	0.23
034	10-Mar	0200	NT	0	0	1	0	0	0	0	3	0	0	1	0	0	101	0.32
035	10-Mar	1055	NT	12	0	0	0	0	0	0	0	0	0	4	0	0	100	0.43
036	11-Mar	0004	NT	0	0	0	0	0	0	0	2	0	0	0	0	0	100	0.21
037	11-Mar	1059	NT	0	0	3	6	0	0	0	16	0	0	0	0	0	100	0.57
039	11-Mar	2255	NT	4	0	0	0	0	0	0	0	0	0	0	0	0	100	0.34
040	12-Mar	1116	NT	26	0	0	0	0	0	0	5	1	0	12	7	0	100	0.74
017	26-Feb	2305	MN	2	0	1	0	0	8	0	0	0	0	0	0	0	100	0.48

Table 9. Dip net station data for C284.

Station # (C284-)	Date (2019)	Time (local -4 to -5 GMT)	Location	Temp (°C)	Salinity (ppt)	Chl-*a* Fluor (volts)	Wind Dir deg true	Beaufort Force	Sea Height (ft)
007	19-Feb	1002	Sargasso Sea	26.3	36.05	358	70	5	8
007	19-Feb	1010	Sargasso Sea	26.3	36.09	353	73	5	5-6
015	26-Feb	0935	Sargasso Sea	26.1	36.20	493	98	5	5
015	26-Feb	0948	Sargasso Sea	26.1	36.03	496	103	5	5
015	26-Feb	0957	Sargasso Sea	26.1	36.03	517	101	4	5
021	28-Feb	0856	Sargasso Sea, DR, Offshore	26.4	36.42	499	124	6	6
021	28-Feb	1337	Sargasso Sea, DR, Offshore	26.5	35.59	491	130	6	6
022	28-Feb	1315	Sargasso Sea, DR, Offshore	26.5	35.59	491	130	6	6
023	28-Feb	1615	Sargasso Sea, DR, Offshore	26.4	36.50	503	120	5	6
023	28-Feb	1617	Sargasso Sea, DR, Offshore	26.4	36.50	503	120	5	6
023	28-Feb	1624	Sargasso Sea, DR, Offshore	26.4	36.47	504	101	5	6
024	28-Feb	1730	Sargasso Sea, DR, Offshore	26.5	36.42	535	96	5	4
024	28-Feb	1744	Sargasso Sea, DR, Offshore	26.5	36.40	527	106	5	3
026	4-Mar	1818	Sargasso Sea, Great Inagua, Offshore	28.1	36.02	315	44	1	2
028	5-Mar	1125	Windward Passage: Haiti, Offshore	27.8	36.33	290	215	2	0
028	5-Mar	1132	Windward Passage: Haiti, Offshore	27.9	36.33	286	120	2	0
028	5-Mar	1147	Windward Passage: Haiti, Offshore	28.0	36.31	299	140	2	0
030	6-Mar	1111	Windward Passage: Jamaica, Offshore	27.6	36.15	313	71	3	0
030	6-Mar	1153	Windward Passage: Jamaica, Offshore	27.6	36.14	305	42	3	0
030	6-Mar	1215	Windward Passage: Jamaica, Offshore	27.6	36.15	313	71	3	2
031	6-Mar	1713	Windward Passage: Jamaica, Offshore	28.6	36.13	304	127	1	1
031	6-Mar	1727	Windward Passage: Jamaica, Offshore	28.7	36.15	301	3	1	1
031	6-Mar	1731	Windward Passage: Jamaica, Offshore	28.6	36.14	304	3	1	1
033	9-Mar	1746	Windward Passage: Jamaica, Offshore	27.4	36.10	517	99	4	4
038	11-Mar	1711	W. Caribbean, Caymans, offshore	27.4	36.06	574	57	4	4
038	11-Mar	1726	W. Caribbean, Caymans, offshore	27.4	36.05	582	67	4	4
038	11-Mar	1747	W. Caribbean, Caymans, offshore	27.4	36.06	555	80	5	4
040	12-Mar	1000	W. Caribbean, Caymans, offshore	27.4	36.14	591	67	4	na

041	12-Mar	1755	W. Caribbean, Caymans, offshore	27.6	36.10	586	65	4	5
041	12-Mar	1800	W. Caribbean, Caymans, offshore	27.5	36.09	581	65	4	5
041	12-Mar	1805	W. Caribbean, Caymans, offshore	27.5	36.09	584	65	4	5

Table 9 continued. Dip net station data for C284.

Station # (C284-)	Replicate	Isolated/part of windrow?	Total # of clumps / fragments	Total Mass (g)	Largest clump: Species Largest clump / fragment	Largest clump: Mass Largest clump / fragment (g)	Growth Region %	Growth Color Code	Succession Region %	Succession Color Code	Decline Region %	Decline Color Code
007	A	Windrow	3	17	S.fluitans III	16	70	546/6	20	2.54 6/6	10	7.5YR 4/4
007	B	Windrow	5	18.6	S.fluitans III	7	50	5Y 6/6	25	7.5 YR 5/6	25	7.5 YR 4/4
015	A	Windrow	2	8.2	S.natans I	8	30	5y7/6	50	2.5y7/6	20	2.5yr3/6
015	B	Isolated	3	10.9	S.fluitans III	9	15	5y7/4	65	5y7/6	20	5yr4/6
015	C	Isolated	1	2.6	S.natans I	2.6	30	5y7/6	40	7.5yr6/8	30	5yr3/4
021	A	Isolated	4	36	S.fluitans III	35	5	5y7/8	80	2.5y7/6	15	7.5YR 4/4
021	B	Isolated	1	13	S.fluitans III	13	40	5y7/9	40	2.5y6/6	20	2.5YR3/4
022	A	Isolated	1	5.7	S.natans VIII	5.7	25	5y7/6	35	7.5yr6/6	40	2.5yr3/6
023	A	Isolated	1	2.8	S.natans VIII	2.8	15	5yr8/2	80	5YR8/4	5	5yr3/2
023	B	Isolated	1	4	S.fluitans III	4	40	5y7/4	60	7.5yr4/4	0	na
023	C	Windrow	2	5.7	S. natans I	4.5	65	5y8/4	20	7.5yr5/6	15	2.5yr3/6
024	A	Isolated	2	15.5	S. fluitans III	___	30	5Y 6/6	60	7.5YR 4/4	10	2.5YR 3/6
024	B	Isolated	1	2	S. natans VIII	2	20	5Y6/6	15	2.5Y6/6	65	2.5YR3/4
026	A	Isolated	13	65	S. fluitans III	30	25	5y6/8	65	7.5yr6/6	10	5yr3/2
028	A	Windrow	81	94.5	S. natans I	__	20	5y8/4	70	7.5yr6/8	10	5yr4/4
028	B	Windrow	19	48.5	S. natans I	17.5	15	2.5y6/2	75	2.5y5/6	10	5yr4/4
028	C	Windrow	177	159	S. natans I	___	0	na	5	7.5yr5/6	95	2.5yr3/4

030	A	Isolated	6	73	S. fluitans III	54	70	5y8/6	10	7.5yr6/4	20	10r3/2
030	B	Windrow	8	48	S. natans I	__	70	5y7/6	15	7.5yr6/6	15	5yr4/6
030	C	Isolated	6	91	S. fluitans III	__	35	5y6/6	25	7.5yr4/4	40	2.5y5/6
031	A	Isolated	17	71	S. natans I	14	70	5y6/6	25	7.5yr5/6	5	2.5yr3/4
031	B	Isolated	4	42	S. natans I	33	60	5y6/6	30	2.5yr4/6	10	2.5yr3/4
031	C	Isolated	4	64	S. fluitans III	59	20	2.5yr6/8	60	5yr5/8	20	5yr4/8
033	A	Isolated	3	4.5	S. fluitans III	2.5	25	5yr6/6	65	7.5yr5/6	10	10r3/4
038	A	Isolated	1	5.7	S. natans I	5.7	30	2.5y6/6	70	5yr5/6	0	na
038	B	Windrow	1	18	S. fluitans III	18	60	2.5y 6/6	35	5yr 5/6	5	10R3/2
038	C	Windrow	1	28	S. fluitans III	28	77	2.5y6/6	20	5yr6/7	3	5yr3/2
040	A	Windrow	2	37	S. natans VIII	36	15	5y6/6	15	2.5y6/6	60	7.5yr4/4
041	A	Windrow	2	14	S. natans I	13	20	5y7/4	65	7.5yr5/8	15	5yr3/4
041	B	Windrow	2	45	S. fluitans III	40	40	5y6/8	50	2.5y5/6	10	5r3/2
041	C	Windrow	2	30.5	S. natans VIII	15	30	5y6/6	30	2.5y6/8	40	2.5yr3/6

Table 9 continued. Dip net station data for C284.

		Largest clump						Entire dip net												
Station # (C284-)	**Replicate**	**% Hydroids**	**% Bryozoan**	**Worm Tubes #**	**Barnacles #**	**Anemones #**	**Other Epibiont?**	**Fish #**	**Crab #**	**Shrimp #**	**Snail #**	**Nudibranch #**	**Flatworms #**	**Polychaetes #**	**Isopods #**	**HYD sample?**	**Fauna Saved in EtOH?**	**Frond Saved in EtOH?**	**Photo?**	**DNA?**
007	A	5	80	123	0	0	0	0	0	20	2	0	0	0	2	N	Y	N	N	N
007	B	0	85	29	0	0	0	0	0	4	50	0	3	0	0	N	N	N	N	N
015	A	1	40	10	0	0	0	0	0	0	0	0	0	0	0	N	N	N	N	N
015	B	20	30	21	0	0	0	0	0	0	0	0	0	0	0	N	N	N	N	N
015	C	1	10	63	0	0	0	0	0	4	0	0	0	0	0	N	N	N	N	N
021	A	40	15	53	0	0	0	0	0	12	0	0	4	0	0	n	Y	N	N	N
021	B	1	50	25	0	0	0	0	0	3	10	0	5	0	0	n	Y	N	N	N
022	A	20	0	0	0	0	0	0	0	1	0	0	0	0	0	n	Y	N	N	N
023	A	30	60	65	0	0	0	0	0	1	0	0	0	0	0	N	Y	N	N	N

023	B	10	0	52	0	0	0	0	0	0	0	0	0	0	0	N	N	N	N	N
023	C	5	20	28	0	0	0	0	0	2	0	0	0	0	0	Y	Y	N	N	N
024	A	15	0	52	0	0	0	0	0	2	0	0	0	0	0	N	Y	N	N	N
024	B	10	0	19	19	0	0	0	0	1	0	0	0	0	0	N	N	N	N	N
026	A	5	80	91	0	0	0	0	1	21	4	0	1	3	1	N	N	N	N	N
028	A	0	60	21	0	0	0	0	0	32	2	0	1	2	3	N	Y	N	N	N
028	B	0	75	43	0	0	0	0	0	14	4	0	0	0	0	N	N	N	N	N
028	C	4	60	9	0	0	0	0	0	29	7	0	0	0	0	N	N	N	N	N
030	A	50	30	80	0	0	0	0	0	6	1	0	15	0	0	N	Y	N	N	N
030	B	5	70	17	0	0	0	0	0	1	0	0	0	0	0	N	N	N	N	N
030	C	8	65	40	0	0	0	0	1	6	0	0	0	1	0	N	Y	N	N	N
031	A	5	45	3	0	0	0	0	0	7	0	0	0	0	0	N	Y	N	N	N
031	B	0	10	17	0	0	0	0	0	3	0	0	0	0	0	N	Y	N	N	N
031	C	0	45	65	0	0	0	0	1	17	0	0	0	0	0	N	Y	N	N	N
033	A	2	20	11	0	0	0	0	3	2	0	0	0	0	0	N	N	N	N	N
038	A	3	30	0	0	0	0	0	0	1	0	0	0	1	0	N	Y	N	N	N
038	B	10	30	21	0	0	0	0	0	5	0	0	0	0	3	N	Y	N	N	N
038	C	30	2	143	0	0	0	0	0	13	0	0	0	0	6	N	Y	N	N	N
040	A	80	10	>100	0	0	0	0	0	1	4	0	16	0	0	N	Y	N	N	N
041	A	5	45	41	0	0	0	0	0	1	0	0	3	0	0	N	Y	N	N	N
041	B	10	0	0	0	0	0	0	0	12	1	0	0	0	0	N	Y	N	N	N
041	C	60	5	36	0	0	0	0	0	6	0	0	0	0	0	N	Y	N	N	N

Table 10. Secchi disc station data for C284.

Station # (C284-)	Date (2019)	Time (local -4 to -5 GMT)	General Locale	Temp (°C)	Salinity (ppt)	chl-*a* Fluor (volts)	CDOM Fluor (volts)	Xmiss (volts)	Water Depth (m)	Cloud Cover (%)	Wave ht (ft)	Wind Sp (BF)	Secchi Depth (m)	Calculated 1% Depth (m)
003	17-Feb	1038	Eastern Caribbean	26.5	35.77	533.0	98.2	14138	18	30%	1	2	12	32
005	18-Feb	1305	Eastern Caribbean	26.4	35.91	464.0	86.8	14397	2225	40%	5	5	34	90
008	19-Feb	1623	Sargasso Sea	26.4	36.04	381.0	85.8	14833	na	100%	6	6	23	62
010	20-Feb	0830	Sargasso Sea	26.3	36.00	360.0	74.6	14894	na	20%	6	5	27	72
016	26-Feb	1540	Sargasso Sea	26.3	36.10	495.8	74.5	14700	2432	15%	4	5	33	89
028	5-Mar	0912	Windward Passage: Haiti, Offshore	27.3	36.33	304.0	78.1	14787	1116	10%	1	2	37	99
030	6-Mar	0904	Windward Passage: Jamaica. Offshore	27.4	36.10	318.0	78.5	14704	3129	30%	1	2	33	89
035	10-Mar	0853	Western Caribbean: Caymans, Offshore	27.3	36.13	457.0	79.4	14217	na	65%	10	5	27	72
037	11-Mar	0907	Western Caribbean: Caymans, Offshore	27.3	36.04	484.0	81.2	14444	na	40%	5	5	30	81
040	12-Mar	0910	Western Caribbean: Caymans, Offshore	27.4	36.13	568.1	79.2	14249	na	50%	4	4	31	83

Table 11a-c. Reef survey data for C284. a. coral cover **b.** invertebrates, **c.** fish.

Station # (C284-)	STATION LOCATION:	DATE:	START TIME:	END TIME:	SEAFLOOR Mapping (%) Reef Patches (%)	Sea Grass & Algae (%)	Sandy Bottom (%)	REEF PATCH Mapping (average %) Hard Coral	Soft Coral or Sponge	Number Patches observed = 15 Seagrass & Algae	Exposed Rock& Sand
RS-000	St Croix - Cane Bay	13-Feb	1045	1115	40	10	50	65	20	0	15
RS-001	St John - Waterlemon Cay	16-Feb	1030	1130	60	10	30	48.6	36.3	0.33	14.6
RS-002	Great Inagua - Man O War Bay	3-Mar	1030	1130	70	10	20	67	26.3	0	6.66
RS-003	Jamaica - Navy Reef	9-Mar	0900	1100	40	45	15	50	27.6	10	12
RS-004	Grand Cayman - Hamburger Reef	14-Mar	0945	1045	60	15	15	78	11.8	4.7	5.29

Table 11b. Reef survey data for C284. b. invertebrates

Station # (C284-)	STATION LOCATION:	HARD CORAL (#) Elkhorn	Staghorn	Brain	Pillar	CORAL Bleaching (#) Elkhorn B (#)	Staghorn B (#)	Brain B (#)	Pillar B (#)	Elkhorn D CORAL Disease (#) (#)	Staghorn D (#)	Brain D (#)	Pillar D (#)
RS-000	St Croix - Cane Bay	0	2	56	0	0	0	0	0	0	0	0	0
RS-001	St John - Waterlemon Cay	0	0	48	5	0	0	0	0	0	0	0	0
RS-002	Great Inagua - Man O War Bay	0	0	41	0	0	0	9	0	0	0	0	0
RS-003	Jamaica - Navy Reef	23	2	12	0	0	1	2	0	0	0	0	0
RS-004	Grand Cayman - Hamburger Reef	0	5	7	0	0	1	0	0	0	0	0	0

Station # (C284-)	STATION LOCATION:	SOFT/ FIRE CORAL (#) Sea Fans	Sea Whips	Fire Coral	SPONGES (#) Tube Sponge	Vase Sponge	Barrel Sponge	Bowl Sponge	MOLLUSC (#) Squid	Conch	Flamingo Tongue
RS-000	St Croix - Cane Bay	40	118	68	0	8	51	1	0	0	0
RS-001	St John - Waterlemon Cay	82	75	89	45	21	4	3	0	0	5
RS-002	Great Inagua - Man O War Bay	206	51	122	2	7	3	0	0	0	1
RS-003	Jamaica - Navy Reef	0	3	39	2	0	0	0	0	3	0
RS-004	Grand Cayman - Hamburger Reef	90	183	16	1	0	0	1	0	0	1

Station # (C284-)	STATION LOCATION:	Long-Spined urchin ECHINO-DERMS (#)	Sea Egg Urchin	Pencil Urchin	Heart Urchin	Sea Cucmber ECHINO-DERMS (#)	Sea Stars	Brittle Star	Lobster/Crab CRUSTA-CEA (#)	Xmas Tree Worms WORMS (#)	Feather Duster worms	Carib Sea Anemone ANEMONES (#)	Corkscrew Anemone
RS-000	St Croix - Cane Bay	5	0	0	0	0	0	0	0	0	0	0	0
RS-001	St John - Waterlemon Cay	533	1	2	0	2	0	1	1	16	24	0	0
RS-002	Great Inagua - Man O War Bay	22	0	0	0	2	0	0	1	8	4	0	0
RS-003	Jamaica - Navy Reef	387	1	3	52	0	4	1	4	0	0	0	0
RS-004	Grand Cayman - Hamburger Reef	20	0	0	0	0	0	0	4	12	0	0	0

Table 11c. Reef survey data for C284. c. fish

Station # (C284-)	STATION LOCATION:	TERRITORIAL: Herb-Coralivore (#) Sergeant Major-Damselfish	Yellow-tail Damsel-fish	Blue Chromis	Brown Chromis	SCHOOLING: Herb-Coralivore (#) Blue Tang	Doctor-fish	Surgeonfish	ANGELFISH: Herb-Coralivore (#) Queen Angelfish	Rock Beauty Angelfish	French Angelfish	Black Durgon
RS-000	St Croix - Cane Bay	56	2	48	0	7	2	21	0	0	0	10
RS-001	St John - Waterlemon Cay	493	3	0	0	18	2	46	6	0	0	0
RS-002	Great Inagua - Man O War Bay	4	4	87	1	22	4	20	0	1	0	0
RS-003	Jamaica - Navy Reef	3	3	0	0	0	5	2	0	0	0	0
RS-004	Grand Cayman - Hamburger Reef	28	8	149	74	30	5	9	0	2	0	0

Station # (C284-)	STATION LOCATION:	PARROTFISH: Herb-Coralivore (#) Stoplight Parrotfish (Ini)	Queen Parrotfish (Ter)	Queen Parrotfish (Ini)	Queen Parrotfish (Ter)	WRASSES: Herb-Coralivore (#) Yellowhead Wrasse	Bluehead Wrasse	Clown Wrasse	BUTTERFLY FISH: planktivore (#) Banded	Four-Eye	Spotfin	Reef
RS-000	St Croix - Cane Bay	0	0	2	4	N/A	N/A	N/A	2	0	0	0
RS-001	St John - Waterlemon Cay	12	15	3	4	0	9	0	N/A	N/A	N/A	N/A
RS-002	Great Inagua - Man O War Bay	40	17	16	11	3	12	0	0	8	0	0
RS-003	Jamaica - Navy Reef					0	25	0	0	0	0	1
RS-004	Grand Cayman - Hamburger Reef	30	8	9	4	0	22	0	1	2	0	0

Station # (C284-)	STATION LOCATION:	CRUISING: Carnivores (#) Snappers	Barracuda	CRUISING: Carnivores (#) Grunts (Blue striped)	Jacks (Bar)	TERRITORIAL : Carnivores (#) Box fish (Trunk)	Squirrel-fish	Grouper (Red Hind)	Trumpetfish	TERRITORIAL : Carnivores (#) Lionfish	Eels
RS-000	St Croix - Cane Bay	0	0	1	0	1	3	0	0	0	0
RS-001	St John - Waterlemon Cay	1	2	54	18	4	4	1	1	0	0
RS-002	Great Inagua - Man O War Bay	0	0	4	2	0	8	5	0	0	0
RS-003	Jamaica - Navy Reef	0	0	0	2	1	10	0	3	1	0
RS-004	Grand Cayman - Hamburger Reef	0	0	1	3	0	15	0	1	0	0

Station # (C284-)	STATION LOCATION:	BENTHIC: Carnivores (#) Yellow Goatfish	Spotted Goatfish	SHARKS & RAYS (#) Southern Ray	Eagle Ray	Reef Shark	Nurse Shark	TURTLES (#) Green	Hawks-bill	Logger-head	NOTES
RS-000	St Croix - Cane Bay	0	1	2	0	0	0	1	0	0	1 dolphin
RS-001	St John - Waterlemon Cay	0	7	2	0	0	0	2	0	0	
RS-002	Great Inagua - Man O War Bay	20	2	0	0	0	0	0	0	0	2 sand dollars
RS-003	Jamaica - Navy Reef	0	0	0	0	0	0	0	0	0	10 sand dollars
RS-004	Grand Cayman - Hamburger Reef	1	0	1	0	0	0	0	0	0	

Table 12. Hydrophone station data for C284.

Station # (C284-)	Date (2019)	Start Time (local -4 to -5 GMT)	Recording Device	General Locale	Temp (°C)	Salinity (ppt)	Chl-*a* Fluor (volts)	Recording File name
RS-001	16-Feb	1055	Sound-Trap	East Caribbean, St.John, Waterlemon Cay				ST 1074044935.190215175143
003	17-Feb	1024	Hydro-phone	East Caribbean, St.John, Francis Bay	26.6	35.77	553.0	HB140334
005	18-Feb	1257	Hydro-phone	Sargasso Sea, Puerto Rico, PR Trench	26.4	35.91	453.0	HB140334 (Take 04, 05, 00, and 00)
008	19-Feb	1723	Hydro-phone	Sargasso Sea	26.4	36.04	348.0	HB 140338 (Take 00)
010	20-Feb	0901	Sound-Trap	Sargasso Sea	26.4	36.00	355.0	ST 1074044935.190220090308
011	21-Feb	0527	Sound-Trap	Sargasso Sea: outside Samana Bay	26.6	36.30	373.2	ST 1074044935. 190221053218
012	23-Feb	0738	Sound-Trap	Samana Bay	N/A	N/A	N/A	ST 1074044935. 190223074159
013	25-Feb	1548	Sound-Trap	Samana Bay	27.0	36.08	610.3	ST 1074044935.190225154611
014	26-Feb	1636	Sound-Trap	Sargasso Sea	26.3	36.12	498.0	ST 1074044935.190226163913
018	27-Feb	1225	Sound-Trap	Sargasso Sea: Silver Bank	26.4	36.20	544.0	ST 1074044935.190227122549
019	27-Feb	1414	Sound-Trap	Sargasso Sea: Silver Bank	26.4	36.17	491.0	ST 1074044935.190227150925
020	27-Feb	1547	Sound-Trap	Sargasso Sea: Silver Bank	26.3	36.14	647.0	ST 1074044935.190227163700
RS-002	4-Mar	1018	Sound-Trap	Great Inagua: Man O'War Bay	__	__	__	ST 1074044935.190303112128

028	5-Mar	0951	Sound-Trap	Windward Passage: Haiti, Offshore	27.5	36.33	311.0	ST 1074044935.190305105707
030	6-Mar	0948	Sound-Trap	Windward Passage: Jamaica, Offshore	27.5	36.14	322.1	ST 1074044935.190306105138
RS-003	7-Mar	1444	Sound-Trap	Jamaica: Navy Reef	__	___	__	ST 1074044935.190307151627

Table 13. Student research topics for C284.

Title	Author
Mobile Fauna of Caribbean Sargassum: A World of Its Own on the Open Ocean	Julia Grady and Alle Brown-Law
Determining how certain abiotic factors impact the organisms that are a part of coral reef systems and what conditions coral reefs thrive in	Asia Milano
Vegetarian vs. Meat Eating Fish: Which are Most Abundant In the Caribbean Coral Reefs	Brison Grey
Coastal Eutrophication	Emily Scott and Lucas Stevens
Sea Surface Temperature and Salinity Patterns, Ocean Currents, and Sub-surface Water Masses	Allyssa Stevenson & Emily Brooks
Zooplankton Diversity in the Caribbean Sea along the C-284 cruise track	Natalie Bryce and Delphine Griffith
Reef Soundscapes	Andrew Foley
Water Clarity Variability on Caribbean Reefs	Jacob Cooper
The silencing of the whales: understanding the effect of anthropogenic noise on humpback whale communication	Mariana Domínguez Morán
Sargass-yum?: Do marine mammals and seabirds go for the hottest seaweed in the North Atlantic?	Mark Sheehan
Meroplankton Distribution Along the C-284 Cruise Track	Mica Hastings, Skylah Reis, and Emma Saas
Whale Communication	June Helen Strøm Eikeland
The Relationship Between Coral and Sessile vs. Non- Sessile Invertebrates	Allison Gaydeski
Biogeographic Distribution of Dominant Sargassum Species in the Caribbean and Surrounding Seas	Vuk Vukasovich