

CRUISE REPORT

S275: SUSTAINABILITY IN POLYNESIAN ISLAND CULTURES AND ECOSYSTEMS

Scientific Activities Undertaken Aboard the SSV Robert C. Seamans

PAGO PAGO, AMERICAN SAMOA – NEIAFU, TONGA – NUKU’ALOFA, TONGA
– SUVA, FIJI – AUCKLAND, NEW ZEALAND

28 SEPTEMBER – 6 NOVEMBER, 2017



Sea Education Association, Woods Hole, Massachusetts

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To obtain unpublished data, contact the SEA Data Archivist:

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Table 1: S275 Ship's Company, *SSV Robert C. Seamans*

Faculty	
Jay Amster	Captain
Jeff Wescott	Chief Anthropologist
Benjamin Harden	Chief Scientist
Crew	
Alison Taylor	Chief Mate
Rebecca Jackson	2nd Mate
Tristan Feldman	3rd Mate
Brittany Mauer	1st Assistant Scientist
Erin Adams	2nd Assistant Scientist
Erin Houlihan	3rd Assistant Scientist
Edward Flemming	Chief Engineer
Michael Rigney	Assistant Engineer
Sabrina Hutchinson	Steward
Christian Letourneau	Steward-in-training
Observers	
Yumi Asagi (Tonga)	Pago Pago – Suva
Vani Koroisamanunu (Fiji)	Nuku’alofa – Auckland
Students	
Mary Elizabeth Benton	Sewanee: The University of the South
Nikkol Blair	Colorado College
Graeme Brown	Colby College
Claire Caputi	Colby College
Amanda Carreau	University of Massachusetts, Amherst
Hannah Chiu	Pitzer College
Alison Derevensky	Macaulay Honors at CUNY Brooklyn College
Anna Gaskill	Wellesley College
Amy Green	Boston University
Katharine Hall	Sewanee: The University of the South
Katherine Hodge	University of Chicago
Arya Jemal	Swarthmore College
Joshua Jolly	University of Denver
Kellen McAuliffe	Colgate University
Faith McKenna	University of Denver
Henry Oliva	Colby College
Flannery Raabe	Oberlin College
Alessandra Rella	Franklin and Marshall College
Noah Robiner	Carleton College
Sierra Schmitz	American University
Sarah Towne	Cornell University

Data Description

This report summarizes the science activities aboard the *SSV Robert C. Seamans* during the Sea Education Association's Fall 2017 semester "Sustainability in Polynesian Island Cultures and Ecosystems" (SPICE), cruise S275. This cruise departed Pago Pago, in American Samoa on 28th September 2017 and concluded in Auckland on 6th November 2017. En route, the Seamans had port calls in Neiafu in the Vava'u island group of Tonga (4–7 Oct), in Nuku'alofa the Tongan Capital in the southern Tongatapu island group (11–14th Oct), and in Suva, Fiji (19–23 Oct). On the leg between American Samoa and the Vava'u, we crossed the international date line. The 1st October was skipped and our clocks went from midnight at the end of the 30th September to midnight at the end of the 1st October.

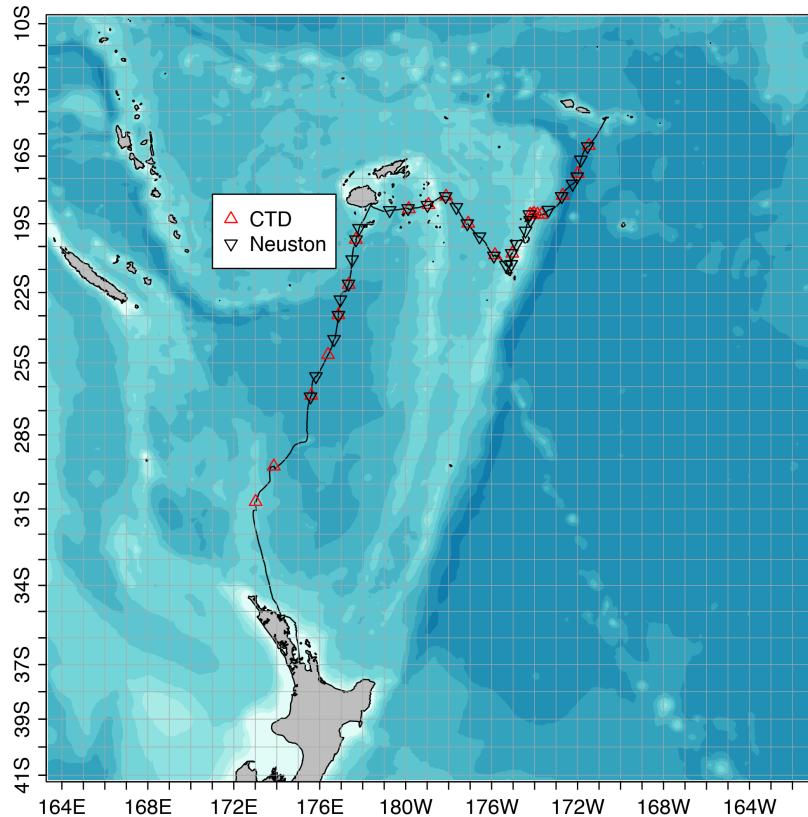


Figure 1: The S275 cruise track from hourly GPS data. Overlaid are the locations of the CTD/Hydrocast and Neuston Stations.

The cruise track spanned a range of oceanographic environments. We transited from the tropics in American Samoa to the temperate mid-latitudes around New Zealand's North Island, crossing the western side of the south Pacific Gyre en route. We also had the opportunity to sample across the transition from near-shore to open ocean as we transited through the Tongan and Fijian region.

The 21 students of S275 were all active and responsible for data collection in the lab. Although this particular semester program is science-lite in its focus, students all undertook small research projects pertaining to the ocean data collected. In addition to investigations of physical, chemical and biological properties along the whole cruise track, the two additional key topics of investigation were the Island Mass Effect and Ocean Soundscapes.

To accomplish our science goals our sampling plan included:

- A standard SEA portfolio of noon CTD casts, twice-daily Neuston tows, and continuous measurements from ADCP, Chirp and flow-through system;
- Surface and subsurface samples for extracted chlorophyll-a, Nitrate, Phosphate and pH. This included high-resolution surface stations approaching and/or leaving port to probe run-off. We also conducted hydrocasts upstream and downstream of islands to investigate island upwelling.
- Noon hydrophone deployments (outlined below).
- Day-time, hourly 6-minute observations of fauna and debris.
- Occasional midnight CTD casts.
- Occasional midnight Meter-Net tows to approximately 200 m.
- Occasional RBR-CTD towed deployments (outlined below).
- Filtering for Microplastics from water samples.

The winds for this cruise were predominantly from an easterly direction (Figure 8) and presented little in the way of obstruction to our movement along the cruise track. The easterlies were maintained all the way to New Zealand. In the previous year (S269), the winds had been from a more south-easterly direction before transitioning to westerlies south of 30°S. As a result, the cruise track heading southward from Fiji this year was much more direct. S269's cruise track tended more westward before returning eastward to New Zealand. For the second half of the long passage to New Zealand, the winds were sustained strong with large seas. As a result, we undertook limited sampling south of 30°S, instead opting to make the most of the winds in moving us towards our destination.

This summary of the data is not meant to be exhaustive; lengthy data sets from, for example, ADCP, CTDs, or CHIRP, have not been included in their entirety. All data is available and can be requested from the SEA data archivist.

– Ben Harden, Chief Scientist, S275

Hydrophone Deployments

Part of our standard sampling during this cruise was noon hydrophone deployments. This was motivated partly by our proximity to humpback whale breeding grounds in Tonga and partly by a desire from SEA faculty to expand our capabilities in this area given our relatively quiet vessels.

The hydrophone was streamed from the port-side of the quarter deck while the Seamans was hove-to. Our standard protocol was to make 30-minute recordings on a TASCAM audio recorder. However, some deployments varied in length. During the hydrophone deployment we undertook visual surveys of ships and marine mammals.

Two notable deployments were stations 16 and 38 on the 8 Oct and 27 Oct respectively.

During station 16 we were in the shallow breeding grounds of humpback whales in Tonga. During the recording (which was approximately 1hr20m long) we saw numerous whales displaying a range of behaviours. This recording is our best record of humpback whale song along our cruise track.

During station 38 we conducted an experiment into the soundscape of the Seamans itself. We systematically secured machinery aboard the ship to isolate the sounds that each produced. This included a short period (approximately 30 seconds) of black-shop when all engineering equipment was secured. The meta data for this experiment is recorded in the SEA Archive.

RBR-CTD towed deployments

We experimented with deploying the RBR-CTD on a towable wing during this cruise. This was deployed from the BT winch on the starboard quarter and was towed in a saw-tooth configuration while the ship was in transit. The goal of this deployment was to investigate small-scale structures in the vertical and horizontal around island regions that could be indicative of eddy shedding or localized upwelling.

We deployed four times, once in the open ocean between American Samoa and Tonga, twice around the island group of Vava'u (one upstream, one downstream) and once south of Vava'u as we moved from the shallow shelf region (approx. 100m) to the deep ocean. An example is presented in Figure 4.

The salinity data from these casts is suspect in comparison with Seabird CTD data at nearby casts (Figure 4). This is not necessarily surprising. The RBR module is an older model made before the company moved to improve the flow through the induction cell. The flow over the towable wing might also be mixing and trapping water pockets thereby also creating issues with the data collected. The data below is presented as-is and should be considered not quality controlled.

Additional Data Notes

- One event file was maintained for the duration of the cruise (ELG 002)
- The author suspects that the ADCP data exported by the onboard system and recorded in the ODV text files in our archive is probably not accurate. There are occasions when the current direction appears correlated to the ships heading and so can't be considered physical. This needs further investigation and is the reason why no ADCP data is shown in this report. As of writing, this ADCP data in the SEA archive should be not used without consideration of this quality issue.
- Please request the end of cruise report for full technical details of ship science operations.

Figures

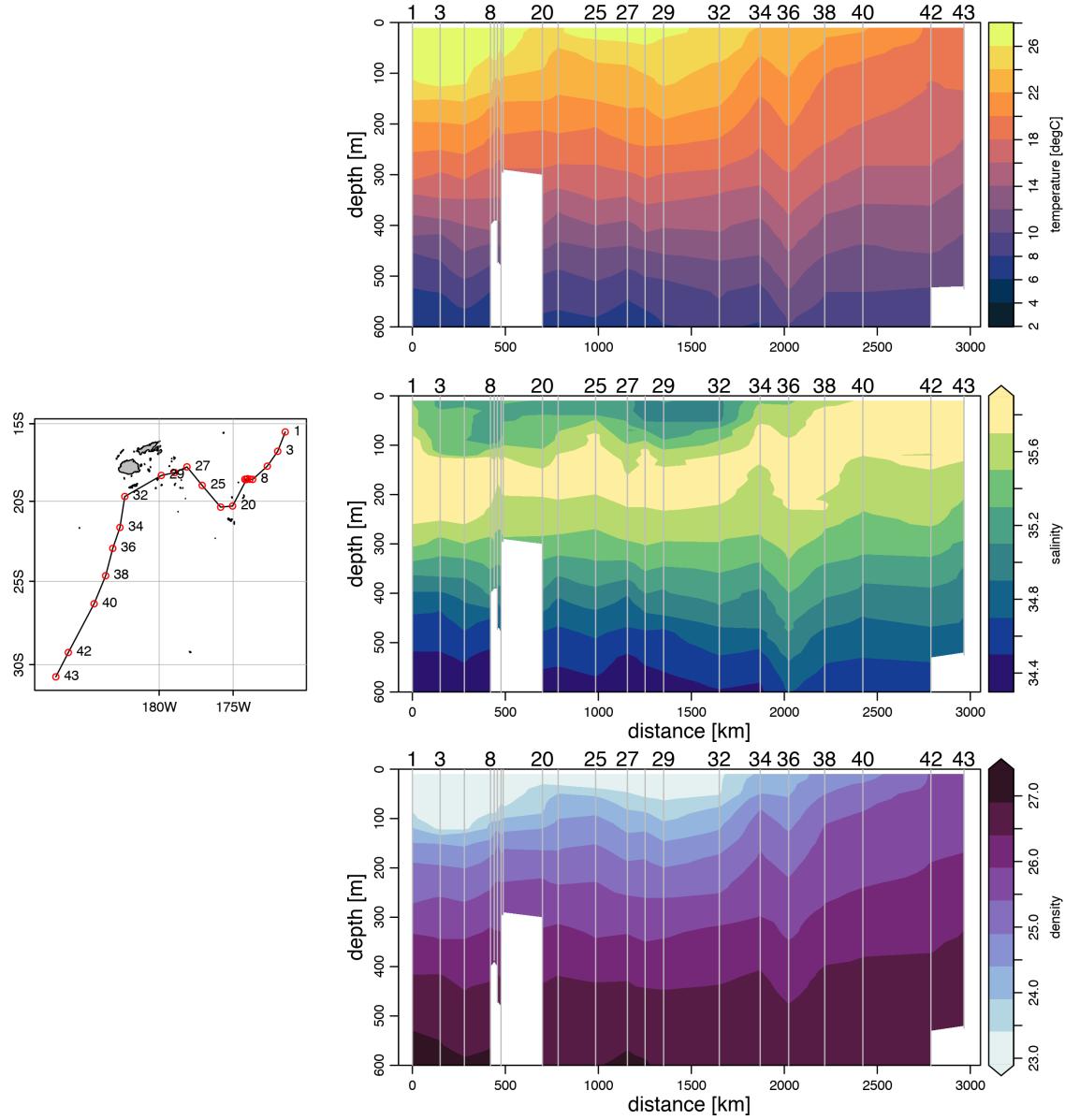


Figure 2: CTD Section running along the S275 cruise track - left: map of stations; top right: temperature; middle right: Salinity; bottom right: Potential Density. Select station numbers are shown with red circles in left panel. All profile locations are shown with gray lines in panels on right with select stations numbered. See Tables 3 and 4 for full cast details. Concentrated casts around Vava'u in northern Tonga were an attempt to investigate the Island Mass Effect around the island.

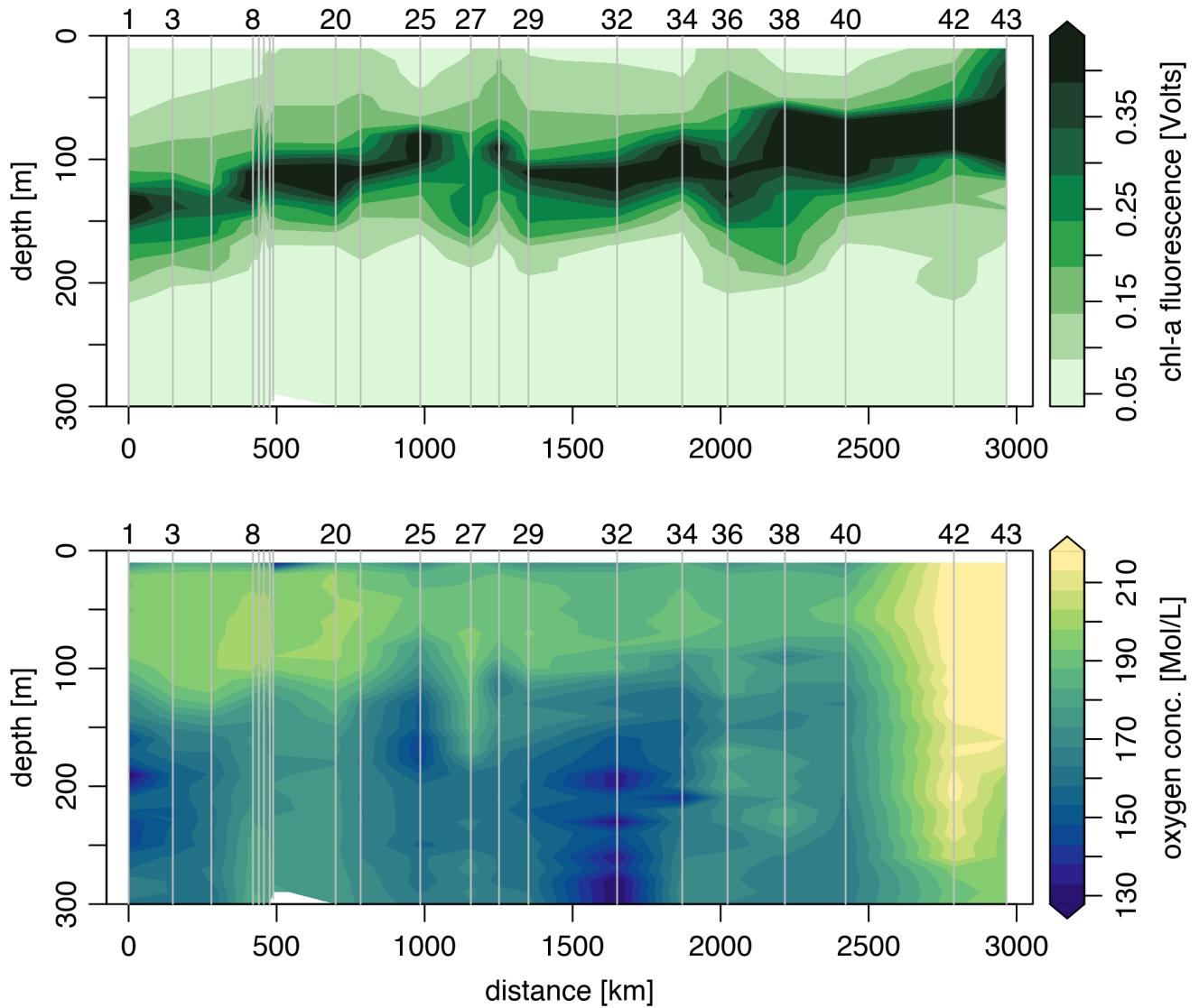


Figure 3: As Figure 2 but for auxiliary CTD data running along the S275 cruise track. Top: Chlorophyll-a Fluorometer. Bottom: Oxygen Concentration.

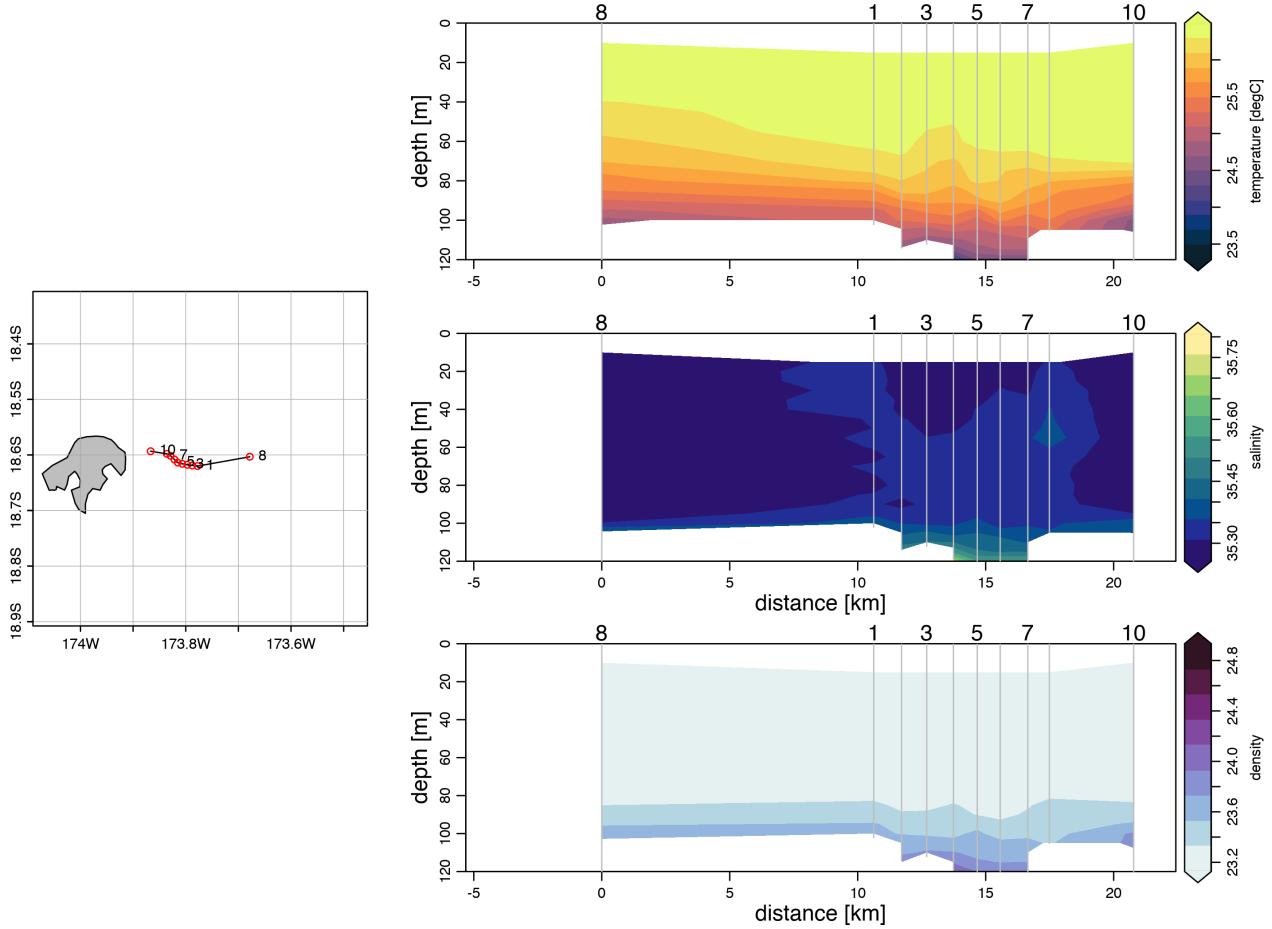


Figure 4: Example of one Tow-Yo deployment using an RBR CTD towed from the BT winch upstream of Vava'u in northern Tonga. Panels as Figure 2. CTD stations 8 and 10 (Seabird CTDs) were undertaken at either end of the RBR tow period and are appended to the record for the sake of this figure. Only the downcast of the RBR deployment were used for this plot (of which there were 8). As can be seen, the Seabird CTD data doesn't necessarily match well with that of the RBR. There were three more deployments of the RBR in this manner.

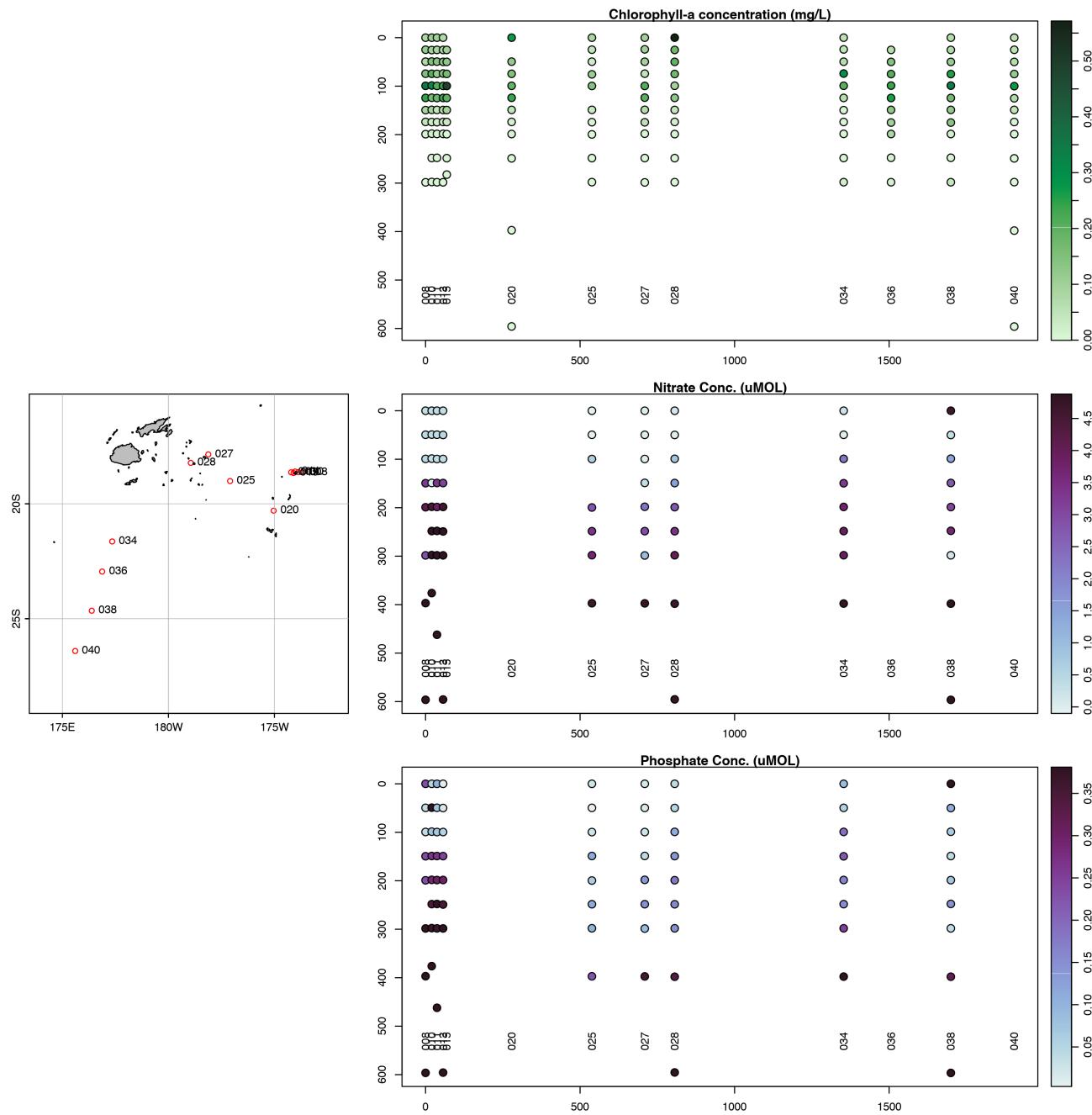


Figure 5: Hydrocast data from the complete S275 cruise track. Left: Map of all hydrocast locations. Top right: Extracted Chlorophyll-a (0.45um filter; mg/L); middle right: Nitrate Concentration (uMOL), bottom right: Phosphate Concentration (uMOL). Concentrated sampling around Vava'u in northern Tonga was an attempt to detect signatures of upwelling due to the Island Mass Effect.

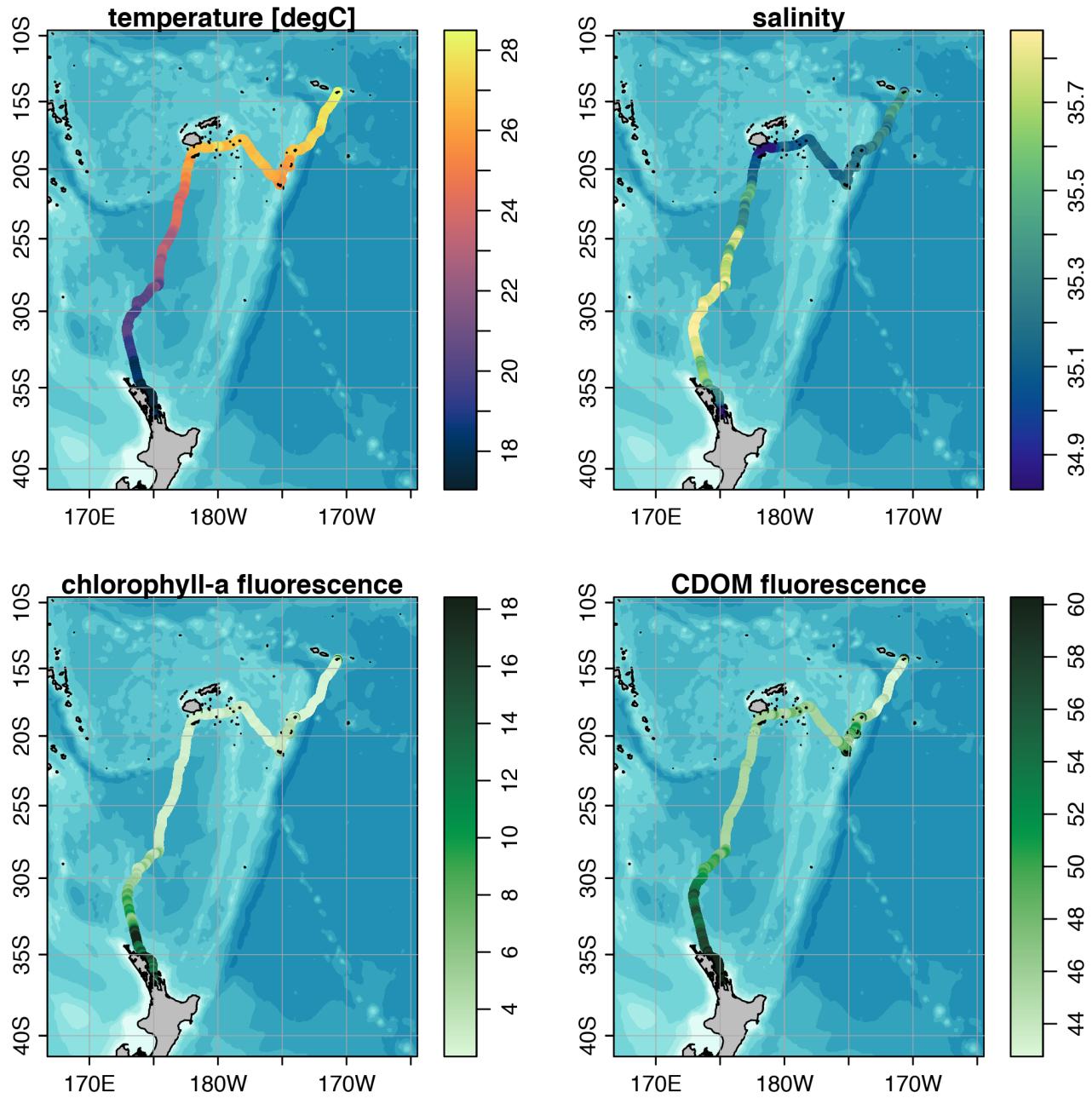


Figure 6: Underway flow-through data from the S275 cruise track. From top left: Surface water temperature ($^{\circ}\text{C}$), salinity, chlorophyll fluorescence (volts) and CDOM fluorescence (volts) as measured by flow through system sensors.

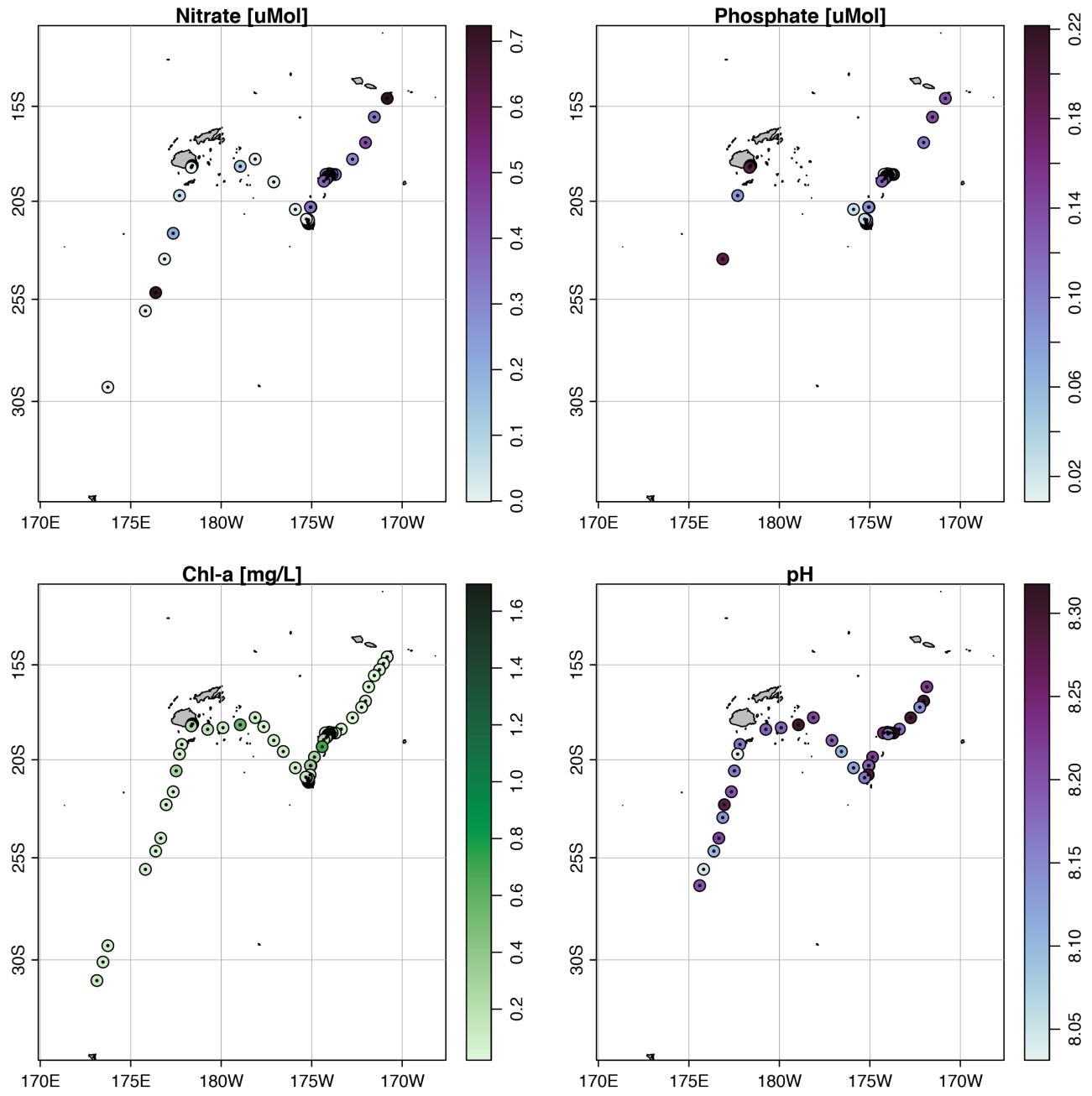


Figure 7: Surface Station data from along S275 cruise track. From top left: Surface water nitrate concentration (uM), phosphate concentration (uM), chlorophyll concentration (0.45um filter; mg/L), and pH as measured by laboratory analyses on discrete surface station water samples. See Table 5 for full station details.

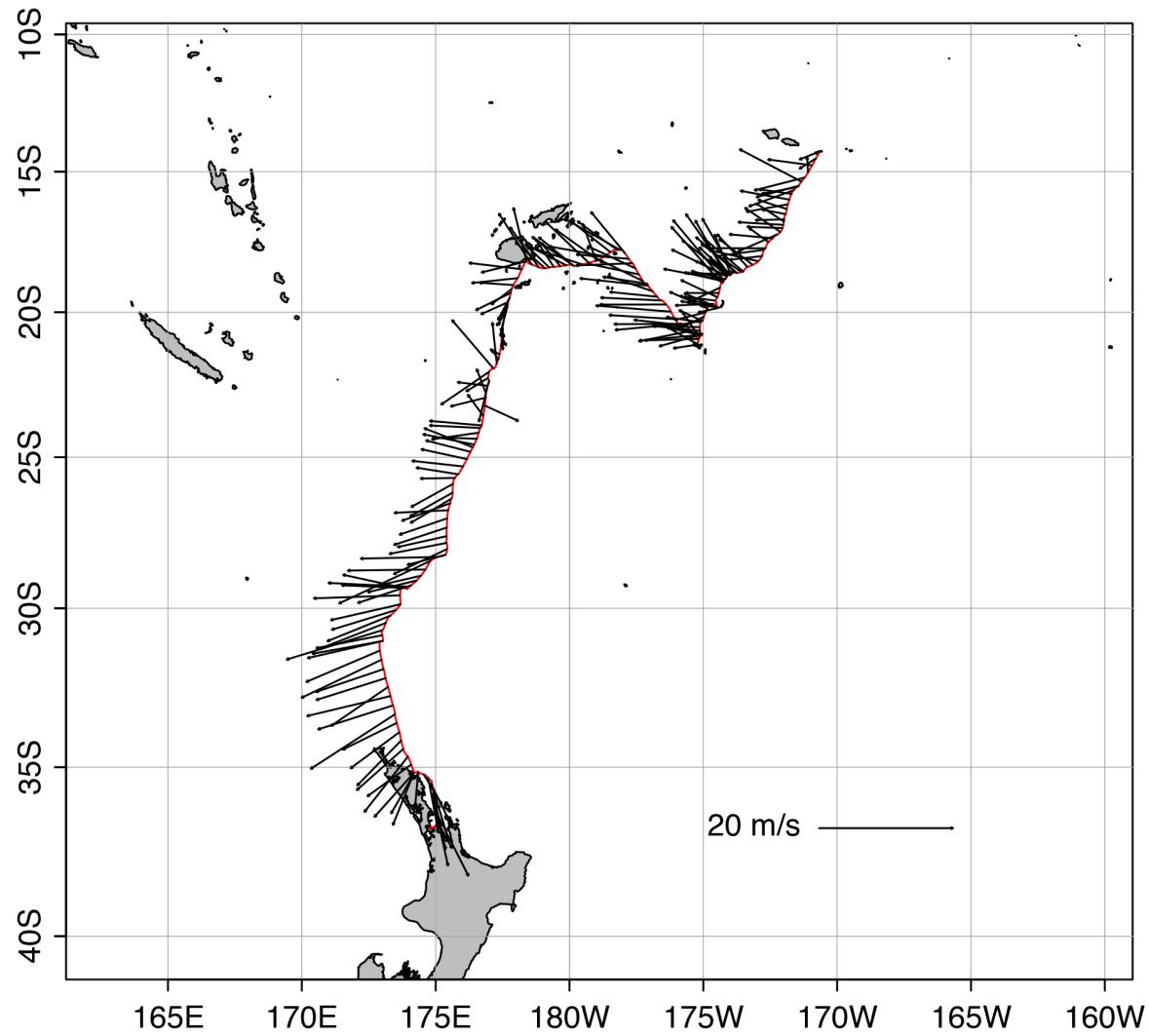


Figure 8: Wind speed and direction for the S275 cruise track, as measured by the ship's anemometer. Lines indicate direction that the winds are flowing towards.

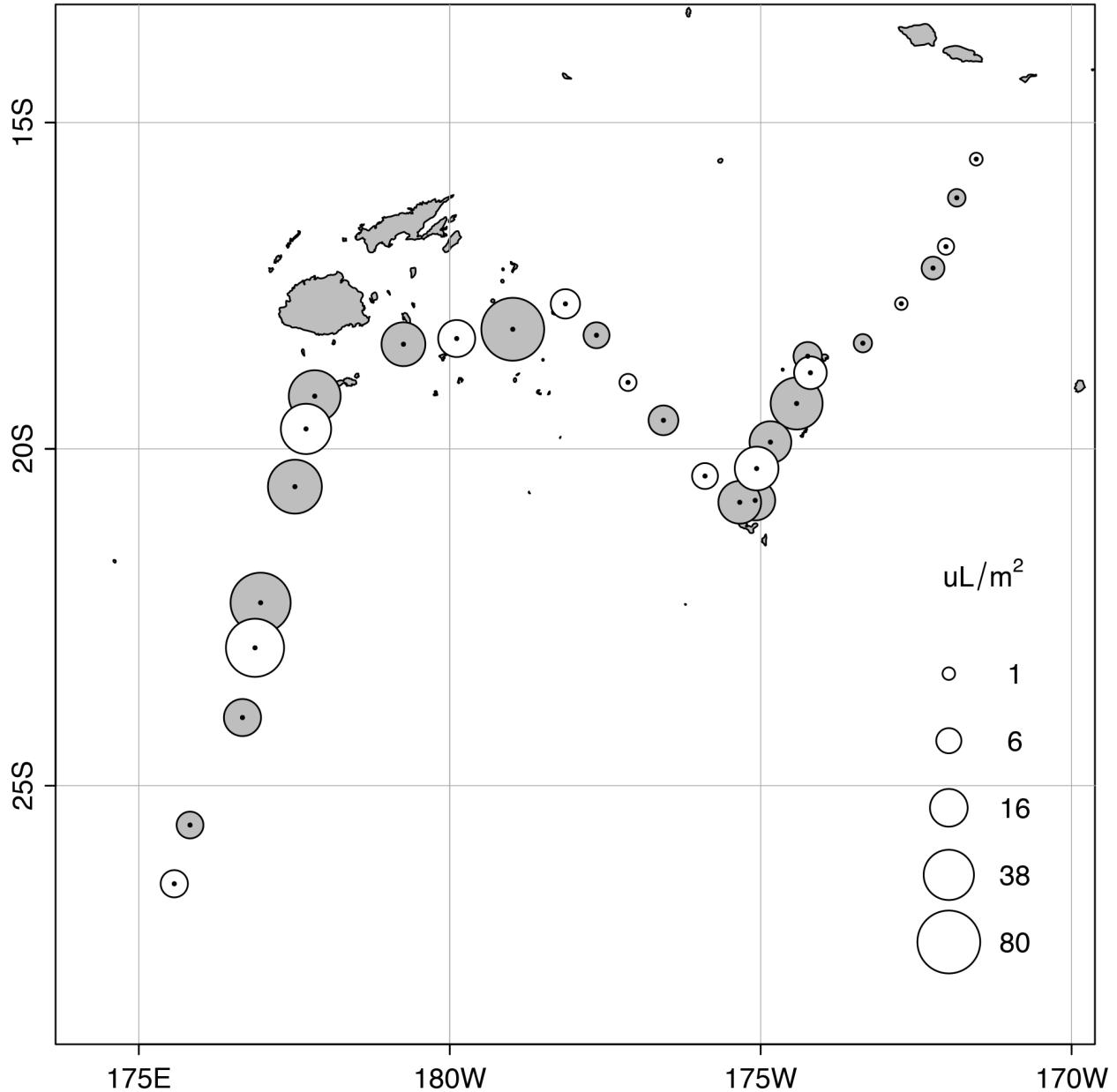


Figure 9: Total zooplankton biomass ($\mu\text{L}/\text{m}^2$) for neuston tows on cruise S275. Grey circles are night time tows and white are for day time.

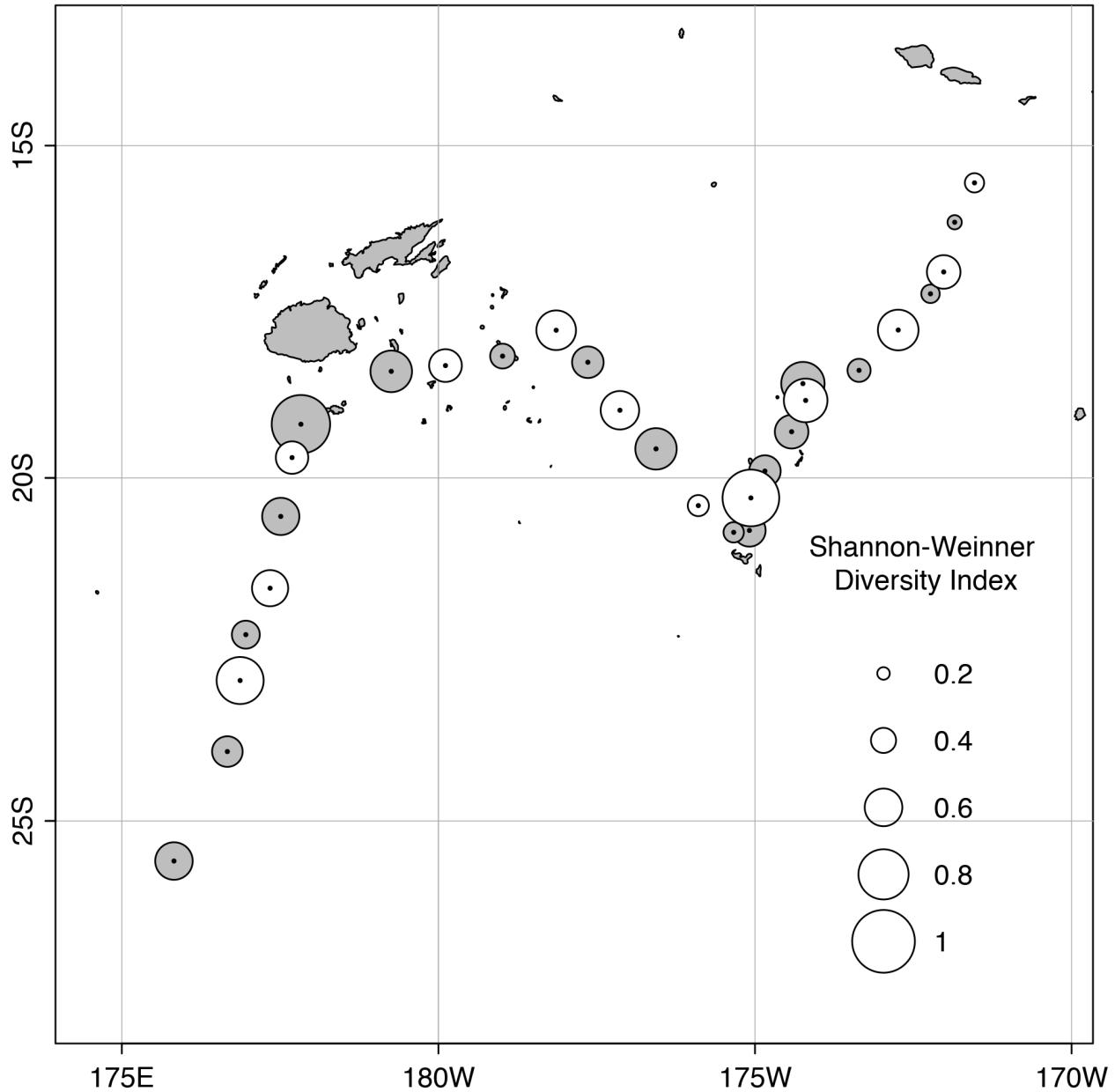


Figure 10: Total zooplankton biodiversity (Shannon-Wiener Index) for neuston tows on cruise S275 . Data is computed from standard SEA 100 count methodology. Grey circles are night time tows and white are for day time.

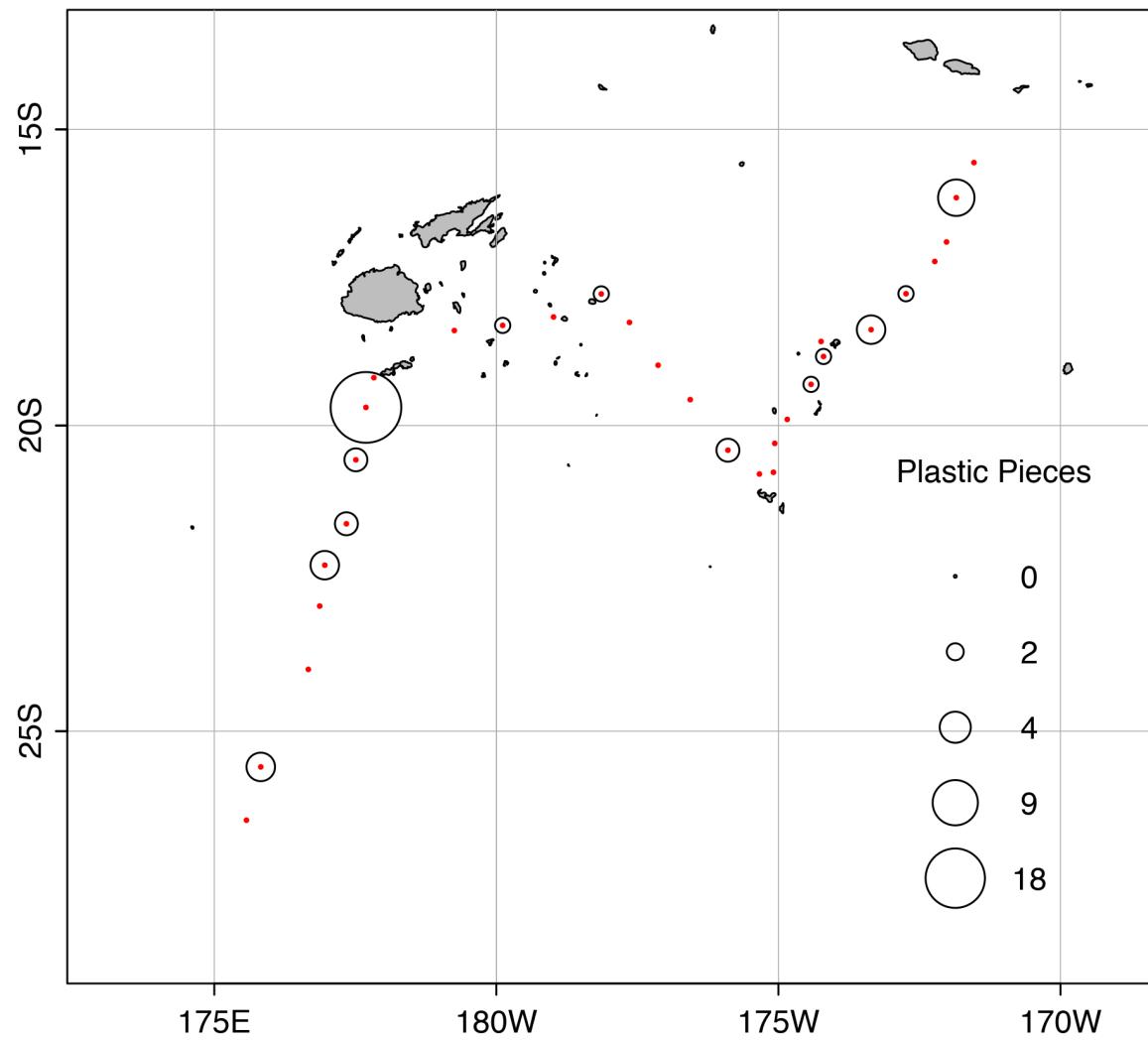


Figure 11: Total number of plastic pieces found in neuston tows on cruise S275.

Tables

Table 2: Summary of oceanographic sampling stations for SEA
Cruise S275. [43 Stations]

Station	Date	Time	Longitude	Latitude	NT	MN	PN	HC	CTD	RBR	HP	SS	General Locale
S275-001	2017-09-29	10:22	171°28.6'W	15°33.2'S	X			X		X		4	South of American Samoa
S275-002	2017-09-29	23:48	171°50.8'W	16°9.9'S	X							5	South of American Samoa
S275-003	2017-09-30	11:02	171°59.1'W	16°47.6'S				X			X		South of American Samoa
S275-004	2017-09-30	15:56	172°1.2'W	16°55.0'S	X					X		6	South of American Samoa
S275-005	2017-09-30	23:21	172°13.7'W	17°14.8'S	X							7	South of American Samoa
S275-006	2017-10-02	09:39	172°41.4'W	17°45.3'S	X			X			X	8	South of American Samoa
S275-007	2017-10-02	23:59	173°21.4'W	18°23.8'S	X							9	South of American Samoa
S275-008	2017-10-03	07:30	173°40.7'W	18°36.2'S				X				10	South of American Samoa
S275-009	2017-10-03	09:41	173°50.0'W	18°35.9'S						X			South of American Samoa
S275-010	2017-10-03	11:31	173°52.0'W	18°35.6'S				X				11	South of American Samoa
S275-011	2017-10-03	15:30	174°1.5'W	18°33.8'S				X				12	Tonga Ridge North
S275-012	2017-10-03	18:11	174°8.9'W	18°35.2'S						X			Tonga Ridge North
S275-013	2017-10-03	20:03	174°12.5'W	18°35.9'S				X				13	Tonga Ridge Hapai
S275-014	2017-10-03	23:34	174°14.6'W	18°35.7'S	X							14	Tonga Ridge Hapai
S275-015	2017-10-07	12:01	174°6.0'W	18°37.7'S				X					Tonga Ridge Hapai
S275-016	2017-10-08	11:54	174°10.2'W	18°50.1'S						X			Tonga Ridge Hapai
S275-017	2017-10-08	13:39	174°12.0'W	18°50.8'S	X							22	Tonga Ridge Hapai
S275-018	2017-10-08	16:22	174°16.8'W	18°59.5'S						X			Tonga Ridge Hapai
S275-019	2017-10-09	23:36	174°51.3'W	19°51.3'S	X							25	Tonga Ridge Hapai
S275-020	2017-10-10	09:58	175°2.2'W	20°18.2'S	X			X				026, 027	Tonga Ridge Hapai
S275-021	2017-10-10	23:36	175°5.3'W	20°46.6'S	X							28	Tonga Ridge Hapai
S275-022	2017-10-14	23:35	175°20.2'W	20°48.3'S	X			X				42	Tonga Ridge Hapai
S275-023	2017-10-15	09:38	175°50.5'W	20°22.4'S	X					X		43	Tonga Ridge Hapai
S275-024	2017-10-15	23:26	176°33.8'W	19°34.1'S	X							45	Lau Basin
S275-025	2017-10-16	10:12	177°5.4'W	18°59.4'S	X			X			X	46	Lau Basin
S275-026	2017-10-16	23:37	177°38.4'W	18°16.5'S	X							47	Lau Basin
S275-027	2017-10-17	09:22	178°7.2'W	17°47.9'S	X	X		X				48	Lau Basin
S275-028	2017-10-17	21:59	178°56.7'W	18°10.6'S	X			X				50	Lau Basin
S275-029	2017-10-18	09:45	179°57.2'W	18°21.2'S	X			X			X	51	Lau Ridge
S275-030	2017-10-18	23:31	179°15.3'W	18°24.7'S	X							52	East of Vitu Levu
S275-031	2017-10-23	23:47	177°49.3'E	19°12.2'S	X							61	South of Vitu Levu
S275-032	2017-10-24	09:37	177°40.7'E	19°41.8'S	X			X			X	62	South of Vitu Levu
S275-033	2017-10-24	22:06	177°30.1'E	20°34.7'S	X	X						63	South of Vitu Levu
S275-034	2017-10-25	09:56	177°21.0'E	21°39.5'S	X			X			X	64	Northern Subtropical Gyre
S275-035	2017-10-25	23:29	176°57.5'E	22°18.4'S	X							65	Northern Subtropical Gyre

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Station	Date	Time	Longitude	Latitude	NT	MN	PN	HC	CTD	RBR	HP	SS	General Locale
S275-036	2017-10-26	10:03	176°52.5'E	22°58.2'S	X			X				66	Northern Subtropical Gyre
S275-037	2017-10-26	22:05	176°47.1'E	22°59.2'S	X	X						67	Northern Subtropical Gyre
S275-038	2017-10-27	10:39	176°23.1'E	24°39.5'S	X				X		X	68	Northern Subtropical Gyre
S275-039	2017-10-27	23:29	175°49.4'E	25°34.3'S	X							69	Northern Subtropical Gyre
S275-040	2017-10-28	10:02	175°36.3'E	26°22.2'S	X				X		X	70	Northern Subtropical Gyre
S275-041	2017-10-29	10:42	175°29.0'E	28°14.1'S				X					Central Subtropical Gyre
S275-042	2017-10-30	09:32	173°51.8'E	29°17.1'S					X			71	Central Subtropical Gyre
S275-043	2017-10-31	08:31	173°0.1'E	30°42.7'S					X				Southern Subtropical Gyre

Notes: abbreviations for oceanographic equipment deployments are: NT – neuston tow; MN – 1-meter or 2-meter net (oblique tow); PN – phytoplankton net; HC – hydrocast with 12 Niskin bottles, CTD and optical instrumentation; CTD – free CTD with no water samples; RBR - RBR type free CTD with no water samples, SG – shipek grab, HP - Hydrophone, SS - Surface Station.

Table 3: Hydrocast station data for SEA Cruise S275. Locations as in Table 2

Station	Date	Time (local)	Bottle	Bottle Depth [m]	NO3 [uM]	PO4 [uM]	Chl-a [mg/L]	Temperature [degC]	Salinity
S275-008-HC	2017-10-03	07:30	13	0	0.33	0.23	0.083	26.9	35.26
S275-008-HC	2017-10-03	07:30	12	25			0.117	26.3	35.19
S275-008-HC	2017-10-03	07:30	11	50	0.40	0.04	0.077	26.2	35.18
S275-008-HC	2017-10-03	07:30	10	74			0.150	25.9	35.19
S275-008-HC	2017-10-03	07:30	9	99	0.43	0.04	0.361	24.6	35.40
S275-008-HC	2017-10-03	07:30	8	124			0.245	24.2	35.75
S275-008-HC	2017-10-03	07:30	7	149	3.27	0.24	0.089	22.6	35.83
S275-008-HC	2017-10-03	07:30	6	174			0.045	21.8	35.82
S275-008-HC	2017-10-03	07:30	5	199	4.12	0.23	0.010	20.7	35.74
S275-008-HC	2017-10-03	07:30	4	DNF				19.3	35.66
S275-008-HC	2017-10-03	07:30	3	298	2.88	0.39	0.002	17.2	35.44
S275-008-HC	2017-10-03	07:30	2	397	13.47	0.71		13.9	35.10
S275-008-HC	2017-10-03	07:30	1	596	31.14	1.66		7.0	34.37
S275-010-HC	2017-10-03	11:31	13	0	0.32	0.05	0.108	27.0	35.27
S275-010-HC	2017-10-03	11:31	12	26			0.097	26.7	35.25
S275-010-HC	2017-10-03	11:31	11	49	0.34	0.55	0.151	26.4	35.21
S275-010-HC	2017-10-03	11:31	10	74			0.205	26.0	35.22
S275-010-HC	2017-10-03	11:31	9	99	0.26	0.07	0.311	24.6	35.45
S275-010-HC	2017-10-03	11:31	8	124			0.169	22.9	35.76
S275-010-HC	2017-10-03	11:31	7	149	0.00	0.27	0.091	22.4	35.77
S275-010-HC	2017-10-03	11:31	6	174			0.025	21.1	35.77
S275-010-HC	2017-10-03	11:31	5	198	4.50	0.29	0.015	20.4	35.70
S275-010-HC	2017-10-03	11:31	4	248	5.48	0.35	0.004	18.6	35.59
S275-010-HC	2017-10-03	11:31	3	298	5.44	0.37	0.004	17.4	35.48
S275-010-HC	2017-10-03	11:31	2	375				14.9	35.15
S275-010-HC	2017-10-03	11:31	1	376	10.72	0.70		14.9	35.15
S275-011-HC	2017-10-03	15:30	13	0	0.37	0.10	0.103	26.9	35.22
S275-011-HC	2017-10-03	15:30	12	25			0.088	26.6	35.20
S275-011-HC	2017-10-03	15:30	11	49	0.34	0.07	0.133	26.3	35.20
S275-011-HC	2017-10-03	15:30	10	75			0.113	25.8	35.26
S275-011-HC	2017-10-03	15:30	9	99	0.33	0.07	0.208	24.8	35.33
S275-011-HC	2017-10-03	15:30	8	125			0.180	23.2	35.76
S275-011-HC	2017-10-03	15:30	7	149	3.31	0.27	0.042	21.3	35.77
S275-011-HC	2017-10-03	15:30	6	174			0.016	20.5	35.71
S275-011-HC	2017-10-03	15:30	5	199	3.83	0.30	0.010	20.1	35.68
S275-011-HC	2017-10-03	15:30	4	248	5.58	0.39	0.004	18.3	35.55

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Station	Date	Time (local)	Bottle	Bottle Depth [m]	NO3 [uM]	PO4 [uM]	Chl-a [mg/L]	Temperature [degC]	Salinity
S275-011-HC	2017-10-03	15:30	3	298	5.79	0.37	0.005	17.0	35.40
S275-011-HC	2017-10-03	15:30	2	398				13.2	35.00
S275-011-HC	2017-10-03	15:30	1	462	20.53	1.28		10.1	34.65
S275-013-HC	2017-10-03	20:03	13	0	0.34	0.01	0.076	27.0	35.25
S275-013-HC	2017-10-03	20:03	12	25			0.082	26.7	35.25
S275-013-HC	2017-10-03	20:03	11	50	0.43	0.02	0.136	25.8	35.18
S275-013-HC	2017-10-03	20:03	10	74			0.134	24.9	35.26
S275-013-HC	2017-10-03	20:03	9	99	0.38	0.05	0.242	24.5	35.44
S275-013-HC	2017-10-03	20:03	8	124			0.236	23.7	35.69
S275-013-HC	2017-10-03	20:03	7	149	3.12	0.25	0.068	22.4	35.84
S275-013-HC	2017-10-03	20:03	6	174			0.027	21.5	35.78
S275-013-HC	2017-10-03	20:03	5	198	4.59	0.30	0.011	20.2	35.71
S275-013-HC	2017-10-03	20:03	4	249	6.02	0.35		18.6	35.56
S275-013-HC	2017-10-03	20:03	3	298	6.60	0.52	0.002	16.8	35.39
S275-013-HC	2017-10-03	20:03	2	396				13.7	35.08
S275-013-HC	2017-10-03	20:03	1	596	26.86	2.36		6.8	34.37
S275-015-HC	2017-10-07	12:01	12	25			0.098	26.6	35.19
S275-015-HC	2017-10-07	12:01	11	50			0.132	26.5	35.27
S275-015-HC	2017-10-07	12:01	10	75			0.163	25.8	35.38
S275-015-HC	2017-10-07	12:01	9	100			0.492	24.3	35.54
S275-015-HC	2017-10-07	12:01	8	124			0.203	23.4	35.72
S275-015-HC	2017-10-07	12:01	7	149			0.096	22.3	35.78
S275-015-HC	2017-10-07	12:01	6	174			0.032	21.3	35.78
S275-015-HC	2017-10-07	12:01	5	199			0.002	20.7	35.72
S275-015-HC	2017-10-07	12:01	4	249			0.008	19.1	35.60
S275-015-HC	2017-10-07	12:01	3	283			0.007	18.0	35.51
S275-015-HC	2017-10-07	12:01	2	284				18.0	35.51
S275-015-HC	2017-10-07	12:01	1	285				17.9	35.50
S275-020-HC	2017-10-10	09:58	13	0			0.271	26.0	35.19
S275-020-HC	2017-10-10	09:58	12	25				25.4	35.21
S275-020-HC	2017-10-10	09:58	11	49			0.119	24.3	35.35
S275-020-HC	2017-10-10	09:58	10	75			0.144	24.2	35.38
S275-020-HC	2017-10-10	09:58	9	99			0.190	23.3	35.53
S275-020-HC	2017-10-10	09:58	8	124			0.239	22.7	35.61
S275-020-HC	2017-10-10	09:58	7	149			0.049	21.7	35.76
S275-020-HC	2017-10-10	09:58	6	174			0.012	21.0	35.74
S275-020-HC	2017-10-10	09:58	5	199			0.011	20.5	35.72
S275-020-HC	2017-10-10	09:58	4	249			0.004	19.2	35.63
S275-020-HC	2017-10-10	09:58	3	298				17.7	35.48

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Station	Date	Time (local)	Bottle	Bottle Depth [m]	NO3 [uM]	PO4 [uM]	Chl-a [mg/L]	Temperature [degC]	Salinity
S275-020-HC	2017-10-10	09:58	2	397			0.001	14.2	35.10
S275-020-HC	2017-10-10	09:58	1	596			0.002	7.5	34.44
S275-025-HC	2017-10-16	10:12	13	0	-0.12	0.03	0.082	26.8	35.17
S275-025-HC	2017-10-16	10:12	12	25			0.047	26.5	35.19
S275-025-HC	2017-10-16	10:12	11	50	-0.08	-0.01	0.027	24.7	35.48
S275-025-HC	2017-10-16	10:12	10	76			0.106	24.0	35.76
S275-025-HC	2017-10-16	10:12	9	100	0.62	0.03	0.146	23.0	35.74
S275-025-HC	2017-10-16	10:12	8	124				22.5	35.87
S275-025-HC	2017-10-16	10:12	7	149		0.11	0.034	22.3	35.95
S275-025-HC	2017-10-16	10:12	6	174			0.011	21.3	35.89
S275-025-HC	2017-10-16	10:12	5	200	2.78	0.06	0.002	20.1	35.76
S275-025-HC	2017-10-16	10:12	4	248	3.38	0.11	0.001	18.6	35.55
S275-025-HC	2017-10-16	10:12	3	298	3.67	0.10	0.001	17.3	35.41
S275-025-HC	2017-10-16	10:12	2	397	4.64	0.23		14.1	35.08
S275-025-HC	2017-10-16	10:12	1	595				7.5	34.45
S275-027-HC	2017-10-17	09:22	13	0	0.00	0.02	0.099	26.9	35.13
S275-027-HC	2017-10-17	09:22	12	24			0.100	26.6	35.13
S275-027-HC	2017-10-17	09:22	11	50	0.00	0.02	0.097	25.5	35.24
S275-027-HC	2017-10-17	09:22	10	74			0.047	24.3	35.30
S275-027-HC	2017-10-17	09:22	9	100	-0.07	0.03	0.212	23.7	35.50
S275-027-HC	2017-10-17	09:22	8	124			0.203	23.1	35.61
S275-027-HC	2017-10-17	09:22	7	149	0.37	0.04	0.068	22.4	35.70
S275-027-HC	2017-10-17	09:22	6	175			0.054	21.9	35.76
S275-027-HC	2017-10-17	09:22	5	198	2.30	0.14	0.007	21.2	35.77
S275-027-HC	2017-10-17	09:22	4	248	2.93	0.15	0.003	19.7	35.67
S275-027-HC	2017-10-17	09:22	3	299	1.03	0.08	0.003	17.7	35.49
S275-027-HC	2017-10-17	09:22	2	397	4.75	0.36		13.4	34.95
S275-027-HC	2017-10-17	09:22	1	596				6.9	34.39
S275-028-HC	2017-10-17	21:59	13	0	0.11	0.04	0.571	27.0	35.08
S275-028-HC	2017-10-17	21:59	12	25			0.176	26.6	35.06
S275-028-HC	2017-10-17	21:59	11	50	-0.01	0.05	0.193	26.1	35.05
S275-028-HC	2017-10-17	21:59	10	75			0.174	24.7	35.31
S275-028-HC	2017-10-17	21:59	9	99	0.79	0.11	0.095	24.1	35.64
S275-028-HC	2017-10-17	21:59	8	124			0.128	23.3	35.74
S275-028-HC	2017-10-17	21:59	7	149	1.55	0.14	0.045	22.4	35.76
S275-028-HC	2017-10-17	21:59	6	174			0.023	21.7	35.79
S275-028-HC	2017-10-17	21:59	5	199	2.77	0.18	0.006	21.3	35.78
S275-028-HC	2017-10-17	21:59	4	248	3.40	0.16	0.003	19.5	35.64
S275-028-HC	2017-10-17	21:59	3	298	4.00	0.15	0.002	18.3	35.54

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Station	Date	Time (local)	Bottle	Bottle Depth [m]	NO3 [uM]	PO4 [uM]	Chl-a [mg/L]	Temperature [degC]	Salinity
S275-028-HC	2017-10-17	21:59	2	398	4.70	0.34		14.3	35.08
S275-028-HC	2017-10-17	21:59	1	595	4.72	1.46		7.2	34.43
S275-034-HC	2017-10-25	09:56	13	0	0.21	0.09	0.053		
S275-034-HC	2017-10-25	09:56	12	24			0.048	23.4	35.78
S275-034-HC	2017-10-25	09:56	11	50	-0.02	0.05	0.064	22.4	35.76
S275-034-HC	2017-10-25	09:56	10	74			0.295	21.6	35.75
S275-034-HC	2017-10-25	09:56	9	99	2.25	0.19	0.204	20.8	35.74
S275-034-HC	2017-10-25	09:56	8	124			0.062	20.3	35.67
S275-034-HC	2017-10-25	09:56	7	150	3.30	0.22	0.011	19.6	35.64
S275-034-HC	2017-10-25	09:56	6	174			0.007	19.1	35.60
S275-034-HC	2017-10-25	09:56	5	198	3.76	0.16	0.006	18.6	35.59
S275-034-HC	2017-10-25	09:56	4	248	3.91	0.15	0.007	17.7	35.55
S275-034-HC	2017-10-25	09:56	3	298	3.92	0.25	0.022	16.6	35.45
S275-034-HC	2017-10-25	09:56	2	398	4.78	1.47		13.2	35.04
S275-034-HC	2017-10-25	09:56	1	596				7.9	34.49
S275-036-HC	2017-10-26	10:03	13	0				23.9	35.41
S275-036-HC	2017-10-26	10:03	12	25			0.068	22.4	35.69
S275-036-HC	2017-10-26	10:03	11	50			0.142	21.9	35.80
S275-036-HC	2017-10-26	10:03	10	75			0.206	20.9	35.81
S275-036-HC	2017-10-26	10:03	9	99			0.241	20.1	35.76
S275-036-HC	2017-10-26	10:03	8	124			0.261	19.6	35.76
S275-036-HC	2017-10-26	10:03	7	149			0.127	19.2	35.74
S275-036-HC	2017-10-26	10:03	6	175			0.100	19.0	35.74
S275-036-HC	2017-10-26	10:03	5	199			0.083	18.4	35.69
S275-036-HC	2017-10-26	10:03	4	248			0.014	17.7	35.63
S275-036-HC	2017-10-26	10:03	3	298			0.014	16.2	35.45
S275-036-HC	2017-10-26	10:03	2	398				13.5	35.17
S275-036-HC	2017-10-26	10:03	1	596				8.7	34.59
S275-038-HC	2017-10-27	10:39	13	0	4.63	1.35	0.064	22.8	35.69
S275-038-HC	2017-10-27	10:39	12	25			0.075	22.4	35.69
S275-038-HC	2017-10-27	10:39	11	50	0.32	0.11	0.116	21.9	35.80
S275-038-HC	2017-10-27	10:39	10	75			0.253	20.9	35.81
S275-038-HC	2017-10-27	10:39	9	99	1.43	0.06	0.337	20.1	35.76
S275-038-HC	2017-10-27	10:39	8	124			0.169	19.6	35.76
S275-038-HC	2017-10-27	10:39	7	149	2.75	0.04	0.123	19.2	35.74
S275-038-HC	2017-10-27	10:39	6	175			0.137	19.0	35.74
S275-038-HC	2017-10-27	10:39	5	199	3.04	0.07	0.020	18.4	35.69
S275-038-HC	2017-10-27	10:39	4	248	3.64	0.14	0.007	17.7	35.63
S275-038-HC	2017-10-27	10:39	3	298	0.15	0.04	0.040	16.2	35.45

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Station	Date	Time (local)	Bottle	Bottle Depth [m]	NO3 [uM]	PO4 [uM]	Chl-a [mg/L]	Temperature [degC]	Salinity
S275-038-HC	2017-10-27	10:39	2	398	4.90	0.32		13.5	35.17
S275-038-HC	2017-10-27	10:39	1	596	4.95	0.48		8.7	34.59
S275-040_HC	2017-10-28	10:02	13	0			0.055		
S275-040_HC	2017-10-28	10:02	12	25			0.058	21.4	35.81
S275-040_HC	2017-10-28	10:02	11	50			0.068	20.9	35.80
S275-040_HC	2017-10-28	10:02	10	75			0.116	19.9	35.76
S275-040_HC	2017-10-28	10:02	9	100			0.272	19.2	35.73
S275-040_HC	2017-10-28	10:02	8	125			0.073	18.8	35.70
S275-040_HC	2017-10-28	10:02	7	149			0.046	18.4	35.66
S275-040_HC	2017-10-28	10:02	6	174			0.010	18.1	35.63
S275-040_HC	2017-10-28	10:02	5	199			0.004	17.6	35.58
S275-040_HC	2017-10-28	10:02	4	249			0.002	16.5	35.43
S275-040_HC	2017-10-28	10:02	3	298			0.001	15.7	35.37
S275-040_HC	2017-10-28	10:02	2	398			0.002	13.1	35.08
S275-040_HC	2017-10-28	10:02	1	596			0.002	8.7	34.59

Notes: all hydrocasts gathered data from a SeaBird 19PlusV2 CTD (S/N 4043) and three auxiliary instruments (Seapoint Chlorophyll fluorometer (S/N SCF-3149), SeaBird Dissolved Oxygen sensor (model 43; S/N 1518), and Biospherical Instruments/SeaBird PAR sensor (S/N 4179). Extracted chlorophyll-a samples were filtered through 0.45 μm filters and measured with a Turner Designs Model 10-AU fluorometer. Seawater pH was determined using m-cresol purple indicator dye and spectrophotometry. Nutrients (PO4 and NO3) were assessed with colorimetric spectrophotometry. A blank space indicates that no sample was collected for that analysis. DNF indicates a bottle that Did Not Fire.

Table 4: CTD station data for SEA Cruise S275. Locations as in
Table 2

Station	Date	Time (local)	Surf. Temperature [degC]	Surf. Salinity	Surf. Chl-a Fluoro [Volts]	Cast Depth [m]
S275-001-CTD	2017-09-29	10:22	27.8	35.47	2.70	838
S275-003-CTD	2017-09-30	11:02	28.0	35.25	2.44	988
S275-004-RBR	2017-09-30	17:53	27.9	35.15	2.68	120
S275-006-CTD	2017-10-02	09:39	27.4	35.26	2.47	867
S275-009-RBR	2017-10-03	09:41	26.8	35.21	2.49	135
S275-012-RBR	2017-10-03	18:11	26.9	35.20	2.83	86
S275-018-RBR	2017-10-08	16:22	27.4	35.24	3.21	145
S275-023-CTD	2017-10-15	09:38	26.2	35.11	3.38	870
S275-029-CTD	2017-10-18	09:45	26.9	35.10	3.16	908
S275-032-CTD	2017-10-24	09:37	25.7	35.05	3.60	985
S275-042-CTD	2017-10-30	09:32	20.0	35.78	3.79	1931
S275-043-CTD	2017-10-31	08:31	20.2	35.85	6.80	525

Table 5: Surface station data for SEA Cruise S275

Station	Date	Time (local)	Longitude	Latitude	Temperature [degC]	Salinity	Chl-a	NO3	PO4	pH
SS-001	2017-09-28	18:41	170°49.6' W	14°34.6' S	28.6	35.42	0.044	0.727	0.135	
SS-002	2017-09-28	22:52	171°1.9' W	14°55.8' S	28.5	35.37	0.046			
SS-003	2017-09-29	03:50	171°15.2' W	15°15.7' S	28.1	35.31	0.057			
SS-004	2017-09-29	12:48	171°32.4' W	15°34.4' S	27.9	35.50	0.010	0.356	0.142	
SS-005	2017-09-30	00:00	171°51.0' W	16°10.4' S	27.8	35.48	0.042			8.226
SS-006	2017-09-30	16:11	172°1.5' W	16°55.5' S	27.9	35.16	0.063	0.445	0.113	8.303
SS-007	2017-09-30	23:41	172°14.4' W	17°15.0' S	27.2	35.34	0.027			8.143
SS-008	2017-10-02	12:09	172°44.6' W	17°48.2' S	27.5	35.27	0.015	0.294		8.298
SS-009	2017-10-03	00:16	173°22.0' W	18°24.2' S	27.3	35.33	0.044			8.180
SS-010	2017-10-03	08:02	173°41.5' W	18°36.3' S	26.9	35.26	0.083	0.318	0.231	8.333
SS-011	2017-10-03	11:40	173°52.1' W	18°35.6' S	27.0	35.27	0.108	0.322	0.049	8.316
SS-012	2017-10-03	15:44	174°1.6' W	18°33.7' S	26.9	35.22	0.103	0.414	0.100	8.199
SS-013	2017-10-03	20:33	174°12.8' W	18°35.8' S	27.0	35.25	0.076	0.342	0.009	8.243
SS-014	2017-10-03	23:58	174°14.9' W	18°36.0' S	27.1	35.34	0.023			8.254
SS-015	2017-10-07	15:53	173°59.3' W	18°39.3' S	27.5	34.98	0.431	0.057	0.049	8.169
SS-016	2017-10-07	16:17	174°0.6' W	18°39.4' S	27.3	35.04	0.133	0.335	0.714	
SS-017	2017-10-07	16:28	174°1.7' W	18°40.2' S	27.4	35.08	0.167	0.404	0.034	
SS-018	2017-10-08	07:36	174°3.5' W	18°40.6' S	27.0	35.22	0.046	0.359	0.085	
SS-019	2017-10-08	08:01	174°6.0' W	18°41.5' S	26.9	35.24	0.081	0.353	0.150	
SS-020	2017-10-08	08:24	174°7.0' W	18°43.2' S	27.0	35.27	0.140	0.363	0.110	
SS-021	2017-10-08	10:43	174°8.5' W	18°47.2' S	27.1	35.21	0.160	0.339	0.095	
SS-022	2017-10-08	13:20	174°11.7' W	18°50.4' S	27.2	35.20	0.175	0.394	0.140	
SS-023	2017-10-08	18:35	174°19.8' W	18°57.4' S	27.3	35.24	0.237	0.394	0.125	
SS-024	2017-10-08	23:49	174°25.3' W	19°19.2' S	26.3	35.18	0.696			
SS-025	2017-10-09	23:56	174°50.9' W	19°51.7' S	25.9	35.17	0.250			8.223
SS-026	2017-10-10	10:31	175°2.6' W	20°18.1' S	26.0	35.19	0.271	0.411	0.059	8.052
SS-027	2017-10-10	12:25	175°4.3' W	20°18.2' S	26.3	35.18	0.320	0.342	0.090	8.188
SS-028	2017-10-10	23:51	175°5.3' W	20°46.8' S	25.7	35.24	0.118			8.296
SS-029	2017-10-13	09:42	175°11.8' W	21°7.8' S			0.128	0.717	0.120	
SS-030	2017-10-13	09:00	175°10.4' W	21°9.5' S			2.036	0.203	0.139	
SS-031	2017-10-13	09:30	175°9.9' W	21°9.3' S			1.706	0.123	0.119	
SS-032	2017-10-13	10:00	175°9.8' W	21°9.6' S			2.378	0.223	0.158	
SS-033	2017-10-14	18:07	175°11.8' W	21°7.8' S	26.0	35.34	0.223	0.054	0.116	
SS-034	2017-10-14	18:49	175°12.6' W	21°6.4' S	25.8	35.32	0.140	0.000	0.103	
SS-035	2017-10-14	18:59	175°13.0' W	21°3.5' S	25.7	35.35	0.171	0.000	0.054	
SS-036	2017-10-14	19:22	175°13.0' W	21°3.5' S	25.7	35.28	0.234	0.000	0.038	
SS-037	2017-10-14	19:46	175°13.0' W	21°3.5' S	25.4	35.35	0.237	0.169	0.009	

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Station	Date	Time (local)	Longitude	Latitude	Temperature [degC]	Salinity	Chl-a	NO3	PO4	pH
SS-038	2017-10-14	20:14	175°11.5' W	21°1.9' S	25.3	35.30	0.146	0.000	0.000	
SS-039	2017-10-14	20:46	175°10.4' W	20°59.8' S	25.6	35.16	0.199	0.000	0.022	
SS-040	2017-10-14	21:12	175°10.5' W	20°57.4' S	25.9	35.15	0.201	0.000	0.077	
SS-041	2017-10-14	21:42	175°17.4' W	20°55.6' S	26.0	35.13	0.131	0.000	0.025	8.166
SS-042	2017-10-14	23:39	175°19.3' W	20°53.8' S	25.7	35.20	0.132			
SS-043	2017-10-15	12:16	175°54.1' W	20°25.2' S	26.4	35.12	0.078	0.000	0.025	8.122
SS-044	2017-10-15	18:27	176°13.8' W	19°56.2' S	26.6	35.13				
SS-045	2017-10-15	23:42	176°34.2' W	19°34.2' S	26.9	35.10	0.085			8.108
SS-046	2017-10-16	10:23	177°5.7' W	18°59.6' S	26.7	35.20	0.082	0.000		8.191
SS-047	2017-10-17	00:02	177°39.1' W	18°16.5' S	26.8	35.17	0.055			
SS-048	2017-10-17	09:33	178°7.4' W	17°47.9' S	26.9	35.13	0.099	0.004		8.215
SS-049	2017-10-17	10:47	178°8.7' W	17°47.8' S	26.9	35.13				
SS-050	2017-10-17	22:10	178°56.9' W	18°10.5' S	27.0	35.08	0.571	0.114		8.301
SS-051	2017-10-18	12:15	179°54.1' W	18°19.6' S	27.0	35.09	0.097			8.182
SS-052	2017-10-18	23:40	179°15.1' E	18°24.9' S	27.0	35.06	0.158			8.187
SS-053	2017-10-23	08:57	178°25.5' E	18°7.9' S			1.350			0.074
SS-054	2017-10-23	10:10	178°24.3' E	18°7.9' S	26.0	33.04	1.156	0.000	0.129	
SS-055	2017-10-23	10:15	178°23.9' E	18°8.3' S	26.1	33.03	0.829	0.000	0.139	
SS-056	2017-10-23	10:21	178°23.6' E	18°9.1' S	26.0	32.85	1.207	0.000	0.100	
SS-057	2017-10-23	10:29	178°23.2' E	18°10.1' S	26.2	33.51	0.986	0.000	0.071	
SS-058	2017-10-23	10:39	178°22.5' E	18°11.0' S	26.3	34.40	0.355	0.000	0.132	
SS-059	2017-10-23	10:50	178°21.9' E	18°12.0' S	26.5	34.67	0.269	0.000	0.139	
SS-060	2017-10-23	11:18	178°20.8' E	18°14.0' S	26.5	34.61	0.245	0.001	0.190	
SS-061	2017-10-23	23:53	177°49.3' E	19°12.2' S	26.3	34.90	0.071			8.168
SS-062	2017-10-24	12:31	177°41.8' E	19°42.2' S	25.9	35.05	0.078	0.062	0.087	7.715
SS-063	2017-10-24	23:03	177°30.7' E	20°34.5' S	25.6	35.16	0.291			8.162
SS-064	2017-10-25	10:25	177°20.9' E	21°39.1' S	24.9	35.42	0.053	0.212		8.200
SS-065	2017-10-25	23:43	176°57.5' E	22°18.8' S	23.7	35.53	0.087			8.279
SS-066	2017-10-26	10:34	176°52.3' E	22°58.1' S	23.9	35.41		0.000	0.190	8.137
SS-067	2017-10-26	23:18	176°39.5' E	24°0.8' S	24.1	35.27	0.084			8.215
SS-068	2017-10-27	11:13	176°22.8' E	24°39.8' S	22.8	35.69	0.064	4.629		8.099
SS-069	2017-10-28	23:45	175°48.7' E	25°34.6' S	22.8	35.70	0.060	0.001		8.045
SS-070	2017-10-28	10:30	175°35.8' E	26°22.9' S	22.4	35.70				8.198
SS-071	2017-10-30	13:22	173°44.2' E	29°18.9' S	20.1	35.70	0.078	0.000		
SS-072	2017-10-30	23:40	173°28.1' E	30°6.0' S	19.6	35.80	0.088			
SS-073	2017-10-31	12:17	173°7.9' E	30°58.9' S	19.6	35.80	0.103			

Notes: extracted chlorophyll-a samples were filtered through 0.45 μm filters and measured with a Turner Designs Model 10-AU fluorometer. Seawater pH was determined using m-cresol purple indicator dye and spectrophotometry. Nutrients (PO4 and NO3) were assessed with colorimetric spectrophotometry.

Table 6: Neuston tow hydrographic data for SEA Cruise S275.
Locations as in Table 2

Station	Date	Time (local)	Moon Phase [% full]	Temperature [degC]	Salinity	Chl-a Fluoroescence [Volts]	Tow Area [m ²]	Zooplankton Biovolume [mL]	Zooplankton Density [uL/m ²]
S275-001-NT	2017-09-29	12:34	63	27.9	35.50	2.43	2439	2.0	0.82
S275-002-NT	2017-09-29	23:48	63	27.8	35.50	2.69	2260	5.5	2.43
S275-004-NT	2017-09-30	15:56	72	27.9	35.15	2.59	1526	3.0	1.97
S275-005-NT	2017-09-30	23:21	72	27.2	35.34	2.56	1992	9.5	4.77
S275-006-NT	2017-10-02	11:50	88	27.5	35.27	2.35	2147	1.6	0.75
S275-007-NT	2017-10-02	23:59	88	27.3	35.30	2.66	2218	6.0	2.71
S275-014-NT	2017-10-03	23:34	94	27.1	35.34	2.57	984	8.0	8.13
S275-017-NT	2017-10-08	13:39	90	27.2	35.20	3.07	1701	19.5	11.46
S275-018-NT	2017-10-08	23:36	90	26.4	35.20	4.12	1597	67.0	41.96
S275-019-NT	2017-10-09	23:36	82	25.9	35.17	4.25	1593	35.0	21.97
S275-020-NT	2017-10-10	12:10	73	26.3	35.20	3.47	1883	47.0	24.96
S275-021-NT	2017-10-10	23:36	73	25.8	35.20	3.34	1256	24.5	19.51
S275-022-NT	2017-10-14	23:35	29	25.7	35.20	3.46	1712	40.0	23.37
S275-023-NT	2017-10-15	11:58	23	26.4	35.10	2.98	2008	13.0	6.47
S275-024-NT	2017-10-15	23:26	19	26.9	35.09	3.10	2141	19.5	9.11
S275-025-NT	2017-10-16	12:11	12	26.9	35.20	2.61	1565	3.5	2.24
S275-026-NT	2017-10-16	23:37	12	26.8	35.16	2.73	1444	9.4	6.51
S275-027-NT	2017-10-17	10:37	6	26.9	35.13	3.11	1481	13.0	8.78
S275-028-NT	2017-10-17	23:29	6	26.9	35.06	4.10	1697	136.0	80.15
S275-029-NT	2017-10-18	11:52	2	26.9	35.10	2.84	1516	24.0	15.83
S275-030-NT	2017-10-18	23:31	2	27.0	35.06	3.04	1550	39.0	25.15
S275-031-NT	2017-10-23	23:47	13	26.3	34.90	2.84	1492	62.0	41.56
S275-032-NT	2017-10-24	12:20	20	25.9	35.05	2.65	1928	73.0	37.86
S275-033-NT	2017-10-24	22:58	20	25.6	35.15	2.92	2142	101.0	47.15
S275-034-NT	2017-10-25	11:58	28	24.9	35.40	2.72	1199		
S275-035-NT	2017-10-25	23:29	28	23.8	35.50	3.14	1610	110.0	68.34
S275-036-NT	2017-10-26	11:17	37	23.9	35.38	3.14	1925	117.0	60.78
S275-037-NT	2017-10-26	22:56	37	24.3	35.27	3.06	1883	30.0	15.93
S275-038-NT	2017-10-27	11:47	46	22.8	35.69	2.72	1776	13.0	7.32
S275-039-NT	2017-10-27	23:29	46	22.7	35.70	2.95	2269	16.0	7.05
S275-040-NT	2017-10-27	11:58	56	22.1	35.70	2.80	2466	63.0	25.55

Notes: tow area calculated using distance (meters) between successive minutes' GPS positions. Neuston net opening 1.0m wide by 0.5m tall, with a 333 μ m mesh net. Zooplankton density recorded as wet volume displacement per tow area (mL/m^2).

Table 7: Neuston tow biological data for SEA Cruise S275. Locations as in Table 2

Station	Phyl [#]	Lept [#]	Halo [#]	Myct [#]	Plastic Pellets [#]	Plastic Pieces [#]	Tar [#]	Nekton > 2cm [mL]	Gelatinous > 2cm [mL]
S275-001-NT	0	0	0	0	0	0	0	0.0	0.0
S275-002-NT	0	0	2	4	0	5	0		
S275-004-NT	0	0	0	0	0	0	0	0.0	0.0
S275-005-NT	0	0	0	0	0	0	0	0.0	0.0
S275-006-NT	0	0	0	0	0	1	0	0.0	4.0
S275-007-NT	0	0	1	0	0	3	0	0.0	1.0
S275-014-NT	0	0	0	0	0	0	0	0.0	0.0
S275-017-NT	0	0	0	0	0	1	0	0.0	0.0
S275-018-NT	0	0	0	3	0	1	0	3.1	0.0
S275-019-NT	0	0	4	2	0	0	0	0.3	0.9
S275-020-NT	0	0	0	0	0	0	0	0.0	0.0
S275-021-NT	0	0	0	1	0	0	0	0.1	0.0
S275-022-NT	0	0	3	31	0	0	0	2.0	5.0
S275-023-NT	0	0	0	0	0	2	0	0.0	0.0
S275-024-NT	0	0	0	8	0	0	0	0.8	4.2
S275-025-NT	0	0	0	0	0	0	0	0.0	0.0
S275-026-NT	0	0	0	9	0	0	0	1.5	1.2
S275-027-NT	0	0	0	0	0	1	0	0.0	0.5
S275-028-NT	0	0	0	2	0	0	0	1.3	0.0
S275-029-NT	0	0	1	0	1	0	0	0.0	0.0
S275-030-NT	0	1	3	9	0	0	0	3.2	15.0
S275-031-NT	0	0	0	10	0	0	0	4.0	2.0
S275-032-NT	0	0	0	0	0	32	0	0.1	1.7
S275-033-NT	0	0	8	13	0	2	0	1.4	6.2
S275-034-NT	0	0	8	0	0	2	0	0.0	0.0
S275-035-NT	0	0	128	46	0	3	0	7.8	30.0
S275-036-NT	0	0	0	0	0	0	0	0.5	1.0
S275-037-NT	1	0	119	7	0	0	0	3.0	6.6
S275-038-NT	0	0	3	0	0	3	0	0.1	0.0
S275-039-NT	4	0	11	15	0	0	0	6.2	5.4
S275-040-NT	0	0	3	0	0	0	0	2.7	9.0

Notes: Eel larvae (leptocephali - lept), spiny lobster larvae (phyllosoma - phyl), marine water striders (halobates - halo) and Lantern fish (myctophids - myct) sorted from net contents and counted. Micronekton and gelatinous micronekton removed using a 333 μm mesh sieve; biovolume (ml) recorded. Qualitative descriptions of micronekton removed from zooplankton biomass are available. Floating plastic and tar removed from net contents, sorted and recorded as numbers collected per tow.

Table 8: Zooplankton 100 count data for SEA Cruise S275 (part 1). Locations as in Table 2

Station	Date	Time [local]	Cnid	Siph	Cten	Pter	Nud	Other Snail	Poly	Chaet	Cop	Gam	Hyp	Crab Larv.
S275-002-NT	2017-09-29	23:48	0	0	0	3	0	0	0	0	87	3	2	1
S275-004-NT	2017-09-30	15:56	0	0	0	2	0	5	0	0	88	0	3	0
S275-005-NT	2017-09-30	23:21	0	0	0	1	0	2	0	7	66	11	8	4
S275-006-NT	2017-10-02	11:50	1	0	0	1	0	3	0	0	72	4	0	0
S275-007-NT	2017-10-02	23:59	0	0	0	3	0	2	0	0	33	7	3	1
S275-014-NT	2017-10-03	23:34	0	0	0	0	0	0	0	0	75	0	7	1
S275-017-NT	2017-10-08	13:39	0	0	0	2	0	1	0	0	19	4	1	0
S275-018-NT	2017-10-08	23:36	0	2	0	1	0	0	0	0	53	0	11	9
S275-019-NT	2017-10-09	23:36	0	1	0	3	0	0	0	0	70	3	3	7
S275-020-NT	2017-10-10	12:10	0	0	0	7	0	7	0	2	72	0	0	4
S275-021-NT	2017-10-10	23:36	3	0	0	1	0	0	1	1	39	8	8	6
S275-022-NT	2017-10-14	23:35	0	1	0	2	0	3	0	0	58	0	1	0
S275-023-NT	2017-10-15	11:58	0	0	0	25	0	0	0	0	71	0	0	0
S275-024-NT	2017-10-15	23:26	0	0	0	1	0	0	0	0	81	6	1	2
S275-025-NT	2017-10-16	12:11	6	2	0	6	0	32	0	0	44	2	2	0
S275-026-NT	2017-10-16	23:37	0	2	0	1	0	8	0	1	66	0	1	6
S275-027-NT	2017-10-17	10:37	0	0	0	5	0	38	0	1	50	2	1	1
S275-028-NT	2017-10-17	23:29	0	1	0	0	0	0	0	0	59	12	3	7
S275-029-NT	2017-10-18	11:52	0	0	0	0	0	12	0	0	71	0	0	1
S275-030-NT	2017-10-18	23:31	0	0	0	3	0	4	0	0	69	1	1	1
S275-031-NT	2017-10-23	23:47	0	0	0	0	0	0	0	0	52	6	1	15
S275-032-NT	2017-10-24	12:20	0	6	17	0	0	1	0	0	32	1	4	3
S275-033-NT	2017-10-24	22:58	0	0	0	4	0	2	0	0	74	0	2	1
S275-034-NT	2017-10-25	11:58	0	10	3	3	0	1	0	0	65	1	2	0
S275-035-NT	2017-10-25	23:29	0	0	0	4	0	0	0	0	55	0	3	0
S275-036-NT	2017-10-26	11:17	0	0	0	2	0	0	0	0	41	0	0	0
S275-037-NT	2017-10-26	22:56	1	1	0	2	0	2	0	0	48	3	9	0
S275-038-NT	2017-10-27	11:47	0	0	0	1	0	3	0	0	48	4	0	0
S275-039-NT	2017-10-27	23:29	0	0	0	0	0	0	0	0	93	0	0	0
S275-040-NT	2017-10-27	11:58	0	1	0	2	0	4	4	22	59	3	2	0

Notes: abbreviations for zooplankton categories: Cnid – cnidarian medusa; Siph – siphonophore bracts and floats; Cten – ctenophores; Pter – pteropods; Nud - nudibranchs; Other Snail – pelagic snails; Ceph – cephalopods; Poly – polychaetes; Chaet – chaetognaths; Cop – copepods; Gam Amp – gammarid amphipods; Hyp Amp – hyperiid amphipods; Crab (larv) – Crab zoea and megalops.

Table 9: Zooplankton 100 count data for SEA Cruise S275 (part 2). Locations as in Table 2

Station	Date	Time [local]	Shr Larv.	Lob Larv.	Mys	Euph	Stom Larv.	Ostr	Iso	Salp	Fish Larv.	Fish Eggs	Other	Shannon-Weiner Diversity Index
S275-002-NT	2017-09-29	23:48	0	0	0	5	0	1	0	0	1	0	0	0.31
S275-004-NT	2017-09-30	15:56	0	0	0	0	0	0	0	0	2	0	0	0.23
S275-005-NT	2017-09-30	23:21	0	0	0	0	0	0	0	1	0	0	0	0.54
S275-006-NT	2017-10-02	11:50	0	0	0	0	0	0	0	0	3	0	1	0.29
S275-007-NT	2017-10-02	23:59	0	0	4	7	0	0	0	0	0	0	0	0.65
S275-014-NT	2017-10-03	23:34	0	0	0	14	0	0	0	0	0	0	3	0.37
S275-017-NT	2017-10-08	13:39	1	0	1	0	0	0	0	0	1	1	2	0.69
S275-018-NT	2017-10-08	23:36	0		9	8	0	2	2	0	0	0	3	0.70
S275-019-NT	2017-10-09	23:36	0	0	7	2	1	2	0	0	0	1	0	0.54
S275-020-NT	2017-10-10	12:10	1	0	1	0	0	0	0	0	4	0	2	0.50
S275-021-NT	2017-10-10	23:36	3	0	0	0	1	15	7	0	0	4	3	0.90
S275-022-NT	2017-10-14	23:35	0	0	22	0	0	0	0	0	0	0	13	0.52
S275-023-NT	2017-10-15	11:58	0	0	0	0	0	0	0	0	2	2	0	0.32
S275-024-NT	2017-10-15	23:26	0	0	7	0	0	2	0	0	0	0	0	0.34
S275-025-NT	2017-10-16	12:11	0	0	0	0	0	1	0	0	4	1	0	0.66
S275-026-NT	2017-10-16	23:37	0	0	0	9	0	0	0	1	1	0	7	0.61
S275-027-NT	2017-10-17	10:37	0	0	0	0	0	2	0	0	0	0	0	0.50
S275-028-NT	2017-10-17	23:29	1	0	3	9	0	0	3	0	0	0	0	0.63
S275-029-NT	2017-10-18	11:52	0	0	1	0	0	0	0	0	0	0	15	0.40
S275-030-NT	2017-10-18	23:31	0	0	3	13	0	0	0	2	0	0	2	0.52
S275-031-NT	2017-10-23	23:47	5	0	11	1	0	0	0	0	1	0	8	0.66
S275-032-NT	2017-10-24	12:20	0	0	5	0	0	1	0	11	1	0	18	0.93
S275-033-NT	2017-10-24	22:58	1	0	3	3	0	2	0	3	0	0	4	0.52
S275-034-NT	2017-10-25	11:58	0	0	5	0	0	0	0	2	2	0	6	0.59
S275-035-NT	2017-10-25	23:29	1	0	11	1	0	0	0	23	0	0	2	0.58
S275-036-NT	2017-10-26	11:17	0	0	0	0	0	7	1	49	0	0	0	0.45
S275-037-NT	2017-10-26	22:56	0	0	19	9	0	0	0	4	2	0	2	0.75
S275-038-NT	2017-10-27	11:47	0	0	0	2	0	0	0	41	0	1	0	0.49
S275-039-NT	2017-10-27	23:29	6	0	0	0	0	1	0	0	0	0	0	0.12
S275-040-NT	2017-10-27	11:58	1	0	0	0	0	0	0	2	0	0	1	0.60

Notes: abbreviations for zooplankton categories: Shr Larv., – shrimp larval stage; Lob Larv. – lobster larval stage; Mys – mysids; Euph – euphausiids; Stom Larv. – stomatopod larval stage; Ost – ostracods; Clad – cladocerans; Iso – isopods; Salp – salps and doliolids; Fish Larv. - larval fish; Other - Other categories not listed individually in Tables 8 or 9.