5.15 CTD profiling

(1) Personnel

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(2) Objective

Investigation of oceanic structure and water sampling.

(3) Parameters

Temperature (Primary and Secondary)
Conductivity (Primary and Secondary)
Pressure
Dissolved Oxygen (Primary and Secondary SBE43)
Dissolved Oxygen voltage (RINKO III)
Fluorescence
Photosynthetically Active Radiation

(4) Instruments and Methods

CTD/Carousel Water Sampling System, which is a 36-position Carousel Water Sampler (CWS) with Sea-Bird Electronics, Inc. CTD (SBE9plus), was used during this cruise. 12-liter sample Bottles were used for sampling seawater. The sensors attached on the CTD were temperature (primary and secondary), conductivity (primary and secondary), pressure, dissolved oxygen (primary and secondary), RINKO III (dissolved oxygen sensor), fluorescence, photosynthetically active radiation. Salinity was calculated by measured values of pressure, conductivity and temperature. The CTD/CWS was deployed from starboard on working deck.

Specifications of the sensors are listed below.

CTD: SBE911plus CTD system
Under water unit:
SBE9plus (S/N: 09P21746-0575, Sea-Bird Electronics, Inc.)
Pressure sensor: Digiquartz pressure sensor (S/N: 79492)
Calibrated Date: 10-Jul-2020
Carousel water sampler:
SBE32 (S/N: 3227443-0391, Sea-Bird Electronics, Inc.)

Temperature sensors:
Primary: SBE03-04/F (S/N: 031464, Sea-Bird Electronics, Inc.)
Calibrated Date: 01-Jun-2019

Secondary: SBE03-04/F (S/N: 03P2453, Sea-Bird Electronics, Inc.)
Calibrated Date: 27-Feb-2019

Conductivity sensors:
Primary: SBE04C (S/N: 041203, Sea-Bird Electronics, Inc.)
Calibrated Date: 04-Oct-2019
Secondary: SBE04C (S/N: 041206, Sea-Bird Electronics, Inc.)
Calibrated Date: 25-Jun-2019

Dissolved oxygen sensor:
Primary: SBE43 (S/N:432211, Sea-Bird Electronics, Inc.)
Calibrated Date: 19-Jun-2019
Secondary: SBE43 (S/N: 430949, Sea-Bird Electronics, Inc.)
Calibrated Date: 20 Oct. 2018

Dissolved oxygen voltage
RINKO III, (S/N: 0278(163010BA), JFE Advantech Co., Ltd.)
Calibrated Date: 12-Jun-2020

Fluorescence:
Chlorophyll Fluorometer (S/N: 3618, Seapoint Sensors, Inc.)
Gain setting: 10X, 0-15 ug/l
Calibrated Date: None
Offset: 0.000

Photosynthetically Active Radiation:
PAR sensor (S/N: 1025, Satlantic Inc.)
Calibrated Date: 06 Jul. 2015

Submersible Pump:
Primary: SBE5T (S/N: 054595, Sea-Bird Electronics, Inc.)
Secondary: SBE5T (S/N: 053293, Sea-Bird Electronics, Inc.)

Deck unit: SBE11plus (S/N 11P54451-0872, Sea-Bird Electronics, Inc.)

Configuration file: MR20E01A.xmlcon
C01M001 – STNM175

MR20E01B.xmlcon
STNM176 –STNM229

MR20E01C.xmlcon
C04M010

The CTD raw data were acquired on real time using the Seasave-Win32 (ver.7.26.7) provided by Sea-Bird Electronics, Inc. and stored on the hard disk of the personal computer. Seawater was sampled during the up

cast by sending fire commands from the personal computer.

The bottle was fired after waiting from the stop for more than 30 seconds below thermocline to stabilize. For depths where vertical gradient of water properties was expected to be large, the bottle was exceptionally fired after waiting 60 seconds from the stop to enhance the exchange of water between inside and outside of the bottle. 223 casts of CTD measurements were conducted (Table 5.15-1).

Data processing procedures and used utilities of SBE Data Processing-Win32 (ver.7.26.7.129) and SEASOFT were as follows:

(The process in order)

DATCNV: Convert the binary raw data to engineering unit data. DATCNV also extracts bottle information where scans were marked with the bottle confirm bit during acquisition. The duration was set to 3 seconds, and the offset was set to 0.0 seconds.

TCORP (original module): Corrected the pressure sensitivity of the temperature (SBE3) sensor.
S/N 031464 : 7.75293156e-009 (degC/dbar)
S/N 03P2453 : 3.1274e-007 (degC/dbar)

BOTTLESUM: Create a summary of the bottle data. The data were averaged over 3 seconds.

ALIGNCTD: Convert the time-sequence of sensor outputs into the pressure sequence to ensure that all calculations were made using measurements from the same parcel of water. Dissolved oxygen data are systematically delayed with respect to depth mainly because of the long time constant of the dissolved oxygen sensor and of an additional delay from the transit time of water in the pumped pluming line. This delay was compensated by 6 seconds advancing to dissolved oxygen sensor (primary and secondary SBE43) output and 1 second advancing to dissolved oxygen voltage (RINKO III) relative to the temperature data.

WILDEDIT: Mark extreme outliers in the data files. The first pass of WILDEDIT obtained the accurate estimate of the true standard deviation of the data. The data were read in blocks of 1000 scans. Data greater than 10 standard deviations were flagged. The second pass computed a standard deviation over the same 1000 scans excluding the flagged values. Values greater than 20 standard deviations were marked bad. This process was applied to pressure, depth, temperature, conductivity, dissolved oxygen (SBE43) output.

CELLTM: Remove conductivity cell thermal mass effects from the measured conductivity. Typical values used were thermal anomaly amplitude alpha = 0.03 and the time constant 1/beta = 7.0.

FILTER: Perform a low pass filter on pressure and depth data with a time constant of 0.15 second. In order to produce zero phase lag (no time shift) the filter runs forward first then backward

WFILTER: Perform a median filter to remove spikes in the fluorescence data. A median value was determined by 49 scans of the window.

SECTIONU (original module of SECTION): Select a time span of data based on scan number in order to reduce a file size. The minimum number was set to be the starting time when the CTD package was beneath the sea-surface after activation of the pump. The maximum number of was set to be the end time when the package came up from the surface.

LOOPEDIT: Mark scans where the CTD was moving less than the minimum velocity of 0.0 m/s (traveling backwards due to ship roll).

DERIVE: Compute dissolved oxygen (SBE43).

BINAVG: Average the data into 1-dbar pressure bins and 1-sec time bins.

BOTTOMCUT (original module): Deletes discontinuous scan bottom data, when it's created by BINAVG.

DERIVE: Compute salinity, potential temperature, and density (sigma-theta).

SPLIT: Separate the data from the input .cnv file into down cast and up cast files.

(5) Station list

During this cruise, 223 casts of CTD observation were carried out. Date, time and locations of the CTD casts are listed in Table 5.15-1.

(6) Preliminary Results

During this cruise, 223 casts of CTD observation were carried out on buoy observation, ARGO float observation and fixed station observation. Date, time and locations of the CTD casts are listed in Table 5.15.1.

The time series contours of primary temperature, salinity, fluorescence and photosynthetically active radiation with pressure are shown in Figure. 5.15.1. Vertical profile (down cast) of primary temperature, salinity and dissolved oxygen with pressure are shown in the appendix.

During this cruise, we judged noise, spike or shift in the data of some casts.

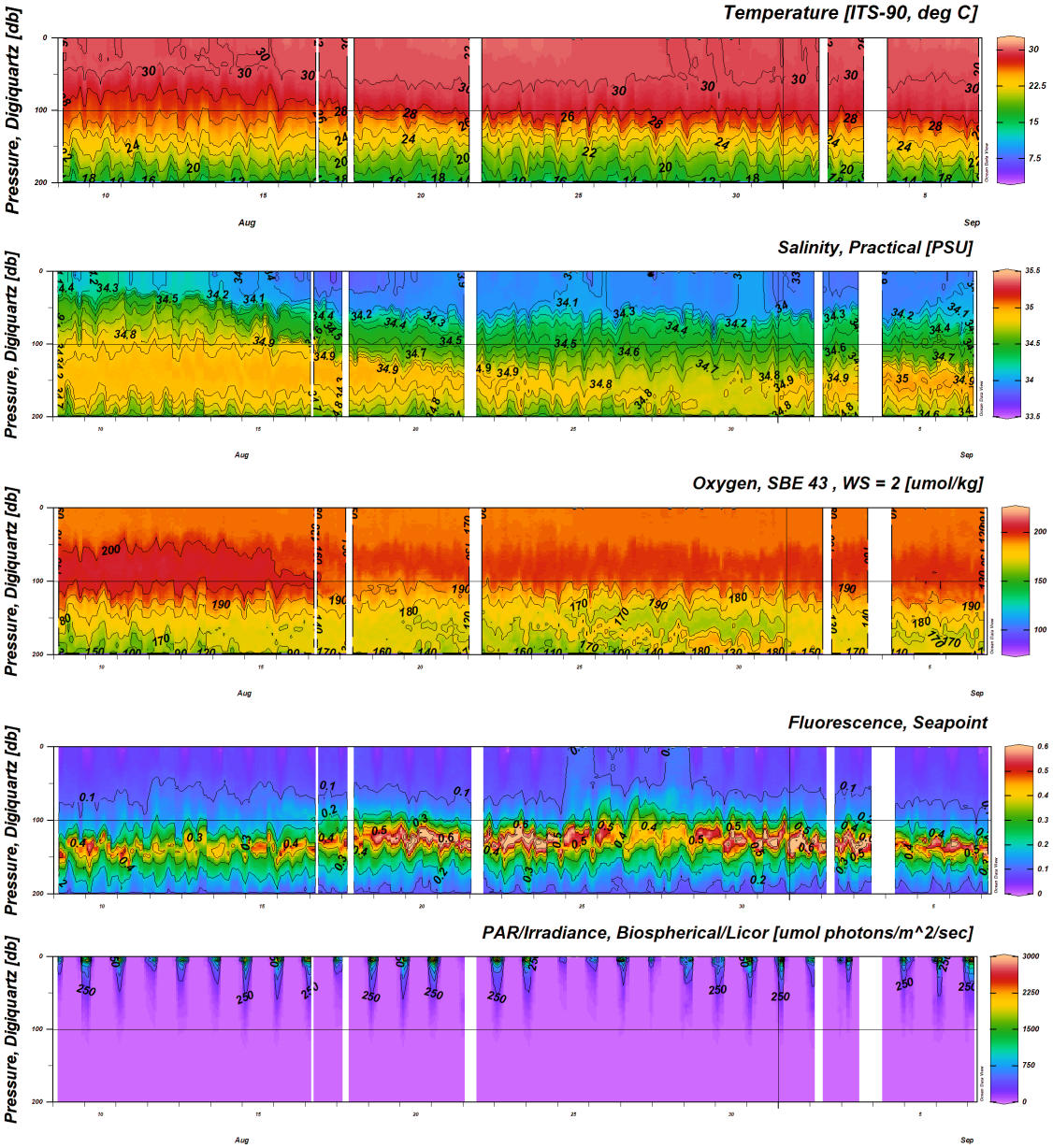


Figure 5.15-1 the time series contours (temperature, salinity oxygen and fluorescence and photosynthetically active radiation) in fixed point measurement (STNM001 ~ STNM229).

(7)Data archive

These data obtained in this cruise will be submitted to the Data Management Group of JAMSTEC, and will be opened to the public via “Data Research System for Whole Cruise Information in JAMSTEC (DARWIN)” in JAMSTEC web site.

<http://www.godac.jamstec.go.jp/darwin/e>

Table 5.15.1 MR20-E01 CTD cast table

Stnnbr	Castno	Date(UTC)	Time(UTC)		BottomPosition		Depth (m)	Wire Out (m)	HT Above Bottom (m)	Max Depth (m)	Max Pressure (dbar)	CTD Filename	Remark
		(mmddyy)	Start	End	Latitude	Longitude							
C01	1	080420	04:27	05:13	21-00.09N	135-00.08E	5810.0	999.1	-	1001.3	1010.0	C01M001	ARGO
C02	1	080420	21:28	22:09	18-00.01N	134-59.69E	5215.0	1000.4	-	1000.5	1009.0	C02M001	ARGO
C03	1	080520	15:36	16:17	15-00.09N	134-59.82E	4497.0	999.3	-	1001.7	1010.0	C03M001	ARGO
C04	1	080720	06:13	06:40	11-40.86N	134-57.74E	4353.0	500.6	-	501.5	505.0	C04M001	m-TRITON Dep.
STN	1	080920	06:19	06:43	12-00.01N	135-00.03E	4612.0	497.6	-	500.5	504.0	STNM001	
STN	2	080920	09:20	09:44	12-00.47N	134-59.65E	4620.0	499.3	-	502.5	506.0	STNM002	
STN	3	080920	12:19	12:42	11-59.30N	135-00.07E	4621.0	498.2	-	500.5	504.0	STNM003	
STN	4	080920	15:20	15:43	12-01.04N	135-01.11E	4572.0	501.5	-	503.5	507.0	STNM004	
STN	5	080920	18:23	18:46	12-00.20N	135-00.02E	4611.0	499.3	-	500.5	504.0	STNM005	
STN	6	080920	21:19	21:43	11-59.22N	135-00.22E	4615.0	497.8	-	501.5	505.0	STNM006	
STN	7	081020	00:18	01:14	12-00.01N	135-01.21E	4430.0	1001.3	-	1002.8	1011.0	STNM007	
STN	8	081020	03:16	03:41	12-00.29N	135-00.94E	4542.0	505.0	-	500.5	504.0	STNM008	
STN	9	081020	06:16	06:39	11-59.66N	135-00.47E	4575.0	499.6	-	500.5	504.0	STNM009	
STN	10	081020	09:16	09:42	11-59.67N	135-00.04E	4612.0	498.5	-	501.5	505.0	STNM010	
STN	11	081020	12:17	12:40	11-59.92N	134-59.45E	4620.0	499.6	-	501.5	505.0	STNM011	
STN	12	081020	15:17	15:41	12-00.22N	134-59.79E	4617.0	500.6	-	502.5	506.0	STNM012	
STN	13	081020	18:18	18:41	12-00.15N	134-59.80E	4619.0	499.1	-	501.5	505.0	STNM013	
STN	14	081020	21:18	21:41	11-59.93N	135-00.05E	4612.0	499.8	-	502.5	506.0	STNM014	
STN	15	081120	00:16	01:15	12-00.17N	134-59.75E	4617.0	999.8	-	1000.8	1009.0	STNM015	
STN	16	081120	03:15	03:38	11-59.61N	134-59.97E	4612.0	498.5	-	500.5	504.0	STNM016	
STN	17	081120	06:16	06:39	12-00.52N	134-59.82E	4619.0	502.6	-	500.5	504.0	STNM017	
STN	18	081120	09:16	09:39	12-00.86N	134-59.41E	4599.0	498.7	-	500.5	504.0	STNM018	
STN	19	081120	12:17	12:39	11-59.08N	134-59.88E	4625.0	499.4	-	502.5	506.0	STNM019	
STN	20	081120	15:18	15:42	11-59.92N	134-59.52E	4624.0	502.2	-	503.5	507.0	STNM020	
STN	21	081120	18:19	18:43	12-00.01N	134-59.94E	4616.0	504.8	-	502.5	506.0	STNM021	
STN	22	081120	21:17	21:40	11-59.49N	135-00.21E	4600.0	500.4	-	502.5	506.0	STNM022	
STN	23	081220	00:17	01:17	12-00.08N	135-00.05E	4608.0	1000.0	-	1000.8	1009.0	STNM023	
STN	24	081220	03:14	03:37	12-00.14N	135-00.12E	4605.0	499.1	-	500.5	504.0	STNM024	
STN	25	081220	06:15	06:38	11-59.97N	135-00.06E	4603.0	500.4	-	500.5	504.0	STNM025	
STN	26	081220	09:15	09:37	12-00.11N	135-00.23E	4594.0	500.4	-	502.5	506.0	STNM026	
STN	27	081220	12:17	12:40	12-00.13N	135-00.05E	4612.0	500.2	-	502.5	506.0	STNM027	

STN	28	081220	15:17	15:41	11-59.59N	134-59.13E	4617.0	501.3	-	501.5	505.0	STNM028	
STN	29	081220	18:17	18:41	12-00.12N	134-59.80E	4625.0	500.2	-	500.5	504.0	STNM029	
STN	30	081220	21:18	21:41	11-59.71N	134-59.96E	4614.0	500.9	-	501.5	505.0	STNM030	
STN	31	081320	00:16	01:13	11-59.94N	134-59.85E	4619.0	999.3	-	1000.8	1009.0	STNM031	
STN	32	081320	03:22	03:49	11-59.74N	134-59.76E	4616.0	500.2	-	500.5	504.0	STNM032	
STN	33	081320	06:16	06:40	12-00.08N	135-00.05E	4609.0	497.4	-	500.5	504.0	STNM033	
STN	34	081320	09:19	09:42	11-59.87N	134-59.66E	4617.0	497.4	-	501.5	505.0	STNM034	
STN	35	081320	12:17	12:41	12-00.33N	135-00.00E	4613.0	499.1	-	502.5	506.0	STNM035	
STN	36	081320	15:17	15:42	12-00.30N	134-59.98E	4615.0	497.6	-	500.5	504.0	STNM036	
STN	37	081320	18:19	18:42	12-00.06N	135-00.25E	4602.0	500.6	-	502.5	506.0	STNM037	
STN	38	081320	21:17	21:43	11-59.72N	134-59.65E	4619.0	500.4	-	500.5	504.0	STNM038	
STN	39	081420	00:15	01:11	11-59.98N	134-59.50E	4619.0	1003.9	-	1001.8	1010.0	STNM039	
STN	40	081420	03:14	03:37	12-00.38N	135-00.20E	4610.0	499.4	-	500.5	504.0	STNM040	
STN	41	081420	06:14	06:37	11-59.95N	134-59.80E	4618.0	500.0	-	501.5	505.0	STNM041	
STN	42	081420	09:17	09:39	12-00.01N	135-00.01E	4614.0	499.8	-	501.5	505.0	STNM042	
STN	43	081420	12:19	12:41	12-00.27N	134-59.90E	4615.0	500.9	-	503.5	507.0	STNM043	
STN	44	081420	15:18	15:41	12-00.34N	134-59.72E	4626.0	502.6	-	502.5	506.0	STNM044	
STN	45	081420	18:18	18:42	12-00.05N	135-00.10E	4612.0	502.0	-	503.5	507.0	STNM045	
STN	46	081420	21:19	21:42	11-59.80N	135-00.16E	4601.0	497.8	-	500.5	504.0	STNM046	
STN	47	081520	00:15	01:13	11-59.97N	135-00.05E	4612.0	999.6	-	1000.8	1009.0	STNM047	
STN	48	081520	03:14	03:36	12-00.00N	135-00.08E	4610.0	500.4	-	502.5	506.0	STNM048	
STN	49	081520	06:14	06:38	12-00.02N	135-00.10E	4612.0	498.5	-	500.5	504.0	STNM049	
STN	50	081520	09:17	09:40	11-59.84N	134-59.93E	4611.0	499.1	-	500.5	504.0	STNM050	
STN	51	081520	12:17	12:39	11-59.85N	134-59.80E	4620.0	499.8	-	501.5	505.0	STNM051	
STN	52	081520	15:17	15:41	12-00.04N	134-59.63E	4619.0	499.4	-	500.5	504.0	STNM052	
STN	53	081520	18:17	18:40	12-00.13N	134-59.74E	4620.0	499.4	-	500.5	504.0	STNM053	
STN	54	081520	21:16	21:40	12-00.24N	134-59.98E	4617.0	498.5	-	500.5	504.0	STNM054	
STN	55	081620	00:15	01:13	12-00.01N	135-00.10E	4605.0	1000.9	-	1000.8	1009.0	STNM055	
STN	56	081620	03:13	03:35	11-59.98N	134-59.84E	4614.0	500.2	-	502.5	506.0	STNM056	
STN	57	081620	06:14	06:38	12-00.17N	135-00.16E	4609.0	500.6	-	500.5	504.0	STNM057	
STN	58	081620	09:17	09:40	12-00.04N	134-59.92E	4615.0	496.7	-	500.5	504.0	STNM058	
STN	59	081620	12:19	12:43	12-00.09N	134-59.84E	4618.0	499.4	-	500.5	504.0	STNM059	
STN	60	081620	15:17	15:41	12-00.10N	134-59.76E	4623.0	499.3	-	501.5	505.0	STNM060	
STN	61	081620	18:16	18:40	12-00.16N	134-59.79E	4619.0	496.1	-	500.5	504.0	STNM061	
STN	62	081620	21:16	21:40	11-59.32N	135-00.16E	4623.0	500.4	-	501.5	505.0	STNM062	
STN	63	081720	00:15	01:15	11-59.61N	135-00.09E	4613.0	1000.4	-	1000.8	1009.0	STNM063	

STN	64	081720	03:14	03:37	12-00.02N	135-00.07E	4613.0	500.0	-	501.5	505.0	STNM064	
STN	66	081720	09:13	09:36	12-00.09N	135-00.00E	4611.0	499.3	-	501.5	505.0	STNM066	
STN	67	081720	12:18	12:40	11-58.80N	135-00.82E	4490.0	499.6	-	500.5	504.0	STNM067	
STN	68	081720	15:16	15:40	12-00.02N	135-00.07E	4610.0	497.4	-	500.5	504.0	STNM068	
STN	69	081720	18:16	18:40	12-00.04N	134-59.96E	4612.0	500.9	-	501.5	505.0	STNM069	
STN	70	081720	21:15	21:38	12-00.07N	134-59.88E	4614.0	498.7	-	501.5	505.0	STNM070	
STN	71	081820	00:15	01:10	11-59.94N	134-59.75E	4616.0	1002.2	-	1002.8	1011.0	STNM071	
STN	72	081820	03:15	03:39	12-00.07N	134-59.91E	4614.0	497.4	-	500.5	504.0	STNM072	
STN	74	081820	12:17	12:40	12-00.09N	135-00.04E	4613.0	499.6	-	501.5	505.0	STNM074	
STN	75	081820	15:15	15:39	11-59.95N	134-59.90E	4616.0	499.6	-	501.5	505.0	STNM075	
STN	76	081820	18:16	18:40	12-00.09N	135-00.03E	4613.0	500.6	-	501.5	505.0	STNM076	
STN	77	081820	21:16	21:40	12-00.06N	135-00.05E	4613.0	500.7	-	501.5	505.0	STNM077	
STN	78	081920	00:15	01:11	12-00.08N	135-00.38E	4595.0	1001.7	-	1000.8	1009.0	STNM078	
STN	79	081920	03:15	03:38	11-59.92N	135-00.02E	4610.0	499.1	-	500.5	504.0	STNM079	
STN	80	081920	06:15	06:39	11-59.97N	135-00.05E	4614.0	500.0	-	500.5	504.0	STNM080	
STN	81	081920	09:14	09:40	12-00.19N	134-59.88E	4622.0	498.7	-	500.5	504.0	STNM081	
STN	82	081920	12:17	12:40	12-00.02N	134-59.99E	4617.0	499.3	-	501.5	505.0	STNM082	
STN	83	081920	15:17	15:40	11-59.97N	134-59.87E	4615.0	500.4	-	500.5	504.0	STNM083	
STN	84	081920	18:16	18:40	12-00.07N	134-59.93E	4614.0	499.6	-	500.5	504.0	STNM084	
STN	85	081920	21:17	21:40	12-00.02N	134-59.97E	4614.0	500.0	-	501.5	505.0	STNM085	
STN	86	082020	00:16	01:12	11-59.99N	135-00.04E	4610.0	1001.7	-	1000.8	1009.0	STNM086	
STN	87	082020	03:15	03:37	11-59.95N	135-00.05E	4609.0	498.5	-	500.5	504.0	STNM087	
STN	88	082020	06:15	06:38	12-00.00N	134-59.99E	4617.0	499.1	-	500.5	504.0	STNM088	
STN	89	082020	09:15	09:38	12-00.10N	135-00.06E	4613.0	499.1	-	500.5	504.0	STNM089	
STN	90	082020	12:16	12:43	11-59.61N	134-59.88E	4620.0	498.5	-	500.5	504.0	STNM090	
STN	91	082020	15:17	15:40	12-00.19N	134-59.80E	4616.0	499.8	-	500.5	504.0	STNM091	
STN	92	082020	18:16	18:39	12-00.11N	134-59.84E	4620.0	500.9	-	501.5	505.0	STNM092	
STN	93	082020	21:15	21:38	11-59.94N	134-59.95E	4612.0	500.2	-	500.5	504.0	STNM093	
STN	94	082120	00:14	01:11	11-58.95N	134-59.97E	4627.0	1001.3	-	1000.8	1009.0	STNM094	
STN	95	082120	03:15	03:38	11-59.92N	135-00.01E	4614.0	499.1	-	500.5	504.0	STNM095	
STN	96	082120	06:15	06:37	11-59.91N	134-59.73E	4619.0	499.1	-	500.5	504.0	STNM096	
STN	97	082120	09:17	09:41	12-00.28N	134-59.88E	4617.0	499.8	-	501.5	505.0	STNM097	
STN	98	082120	12:15	12:38	12-00.09N	134-59.67E	4621.0	501.3	-	502.5	506.0	STNM098	
STN	99	082120	15:15	15:39	12-00.05N	134-59.82E	4616.0	498.3	-	500.5	504.0	STNM099	
STN	100	082120	18:15	18:39	11-59.99N	134-59.81E	4615.0	500.7	-	502.5	506.0	STNM100	
STN	101	082120	21:15	21:39	11-59.91N	134-59.75E	4621.0	500.0	-	501.5	505.0	STNM101	

STN	102	082220	00:15	01:11	11-59.82N	134-59.97E	4616.0	1002.4	-	1000.8	1009.0	STNM102	
STN	105	082220	12:17	12:39	12-00.12N	134-59.79E	4622.0	500.6	-	502.5	506.0	STNM105	
STN	106	082220	15:15	15:39	11-59.93N	134-59.72E	4626.0	500.2	-	500.5	504.0	STNM106	
STN	107	082220	18:15	18:42	12-00.06N	134-59.91E	4611.0	500.9	-	501.5	505.0	STNM107	
STN	108	082220	21:14	21:38	12-00.00N	135-00.08E	4612.0	499.4	-	501.5	505.0	STNM108	
STN	109	082320	00:14	01:09	11-59.97N	134-59.79E	4628.0	1010.5	-	1000.8	1009.0	STNM109	
STN	110	082320	03:14	03:40	11-59.89N	134-59.97E	4611.0	500.4	-	502.5	506.0	STNM110	
STN	111	082320	06:14	06:38	11-59.92N	134-59.77E	4620.0	502.2	-	500.5	504.0	STNM111	
STN	112	082320	09:15	09:38	12-00.09N	134-59.59E	4618.0	499.6	-	501.5	505.0	STNM112	
STN	113	082320	12:15	12:38	11-59.95N	134-59.84E	4615.0	498.7	-	500.5	504.0	STNM113	
STN	114	082320	15:14	15:37	12-00.02N	134-59.78E	4622.0	500.6	-	500.5	504.0	STNM114	
STN	115	082320	18:14	18:38	11-59.81N	134-59.79E	4620.0	501.3	-	501.5	505.0	STNM115	
STN	116	082320	21:17	21:40	12-00.04N	134-59.96E	4613.0	499.4	-	501.5	505.0	STNM116	
STN	117	082420	00:15	01:11	12-00.13N	134-59.87E	4615.0	1000.6	-	999.8	1008.0	STNM117	
STN	118	082420	03:13	03:35	12-00.01N	134-59.58E	4620.0	497.4	-	499.5	503.0	STNM118	
STN	119	082420	06:15	06:38	11-59.79N	134-59.53E	4619.0	500.2	-	500.5	504.0	STNM119	
STN	120	082420	09:14	09:37	12-00.27N	134-59.53E	4620.0	500.4	-	500.5	504.0	STNM120	
STN	121	082420	12:16	12:38	11-59.82N	134-59.98E	4613.0	500.2	-	502.5	506.0	STNM121	
STN	122	082420	15:14	15:37	12-00.34N	134-59.91E	4618.0	499.8	-	500.5	504.0	STNM122	
STN	123	082420	18:17	18:40	11-59.93N	134-59.61E	4618.0	499.6	-	500.5	504.0	STNM123	
STN	124	082420	21:17	21:41	12-00.23N	134-59.98E	4613.0	500.0	-	500.5	504.0	STNM124	
STN	125	082520	00:15	01:12	12-00.12N	134-59.91E	4618.0	1004.8	-	1000.8	1009.0	STNM125	
STN	126	082520	03:14	03:36	12-00.02N	134-59.84E	4616.0	499.1	-	500.5	504.0	STNM126	
STN	127	082520	06:14	06:36	11-59.88N	134-59.83E	4615.0	500.0	-	500.5	504.0	STNM127	
STN	128	082520	09:21	09:44	12-01.20N	134-59.78E	4623.0	498.3	-	501.5	505.0	STNM128	
STN	129	082520	12:15	12:37	12-00.90N	134-59.71E	4628.0	499.3	-	502.5	506.0	STNM129	
STN	130	082520	15:15	15:38	12-00.34N	134-59.93E	4618.0	500.0	-	502.5	506.0	STNM130	
STN	131	082520	18:18	18:41	12-00.23N	134-59.93E	4617.0	499.4	-	500.5	504.0	STNM131	
STN	132	082520	21:16	21:41	11-59.68N	135-00.57E	4577.0	499.6	-	502.5	506.0	STNM132	
STN	133	082620	00:15	01:11	12-00.00N	134-59.88E	4617.0	1002.6	-	1000.8	1009.0	STNM133	
STN	134	082620	03:14	03:37	11-59.99N	134-59.66E	4620.0	498.9	-	500.5	504.0	STNM134	
STN	135	082620	06:14	06:37	11-59.75N	134-59.80E	4618.0	500.4	-	502.5	506.0	STNM135	
STN	136	082620	09:13	09:36	11-59.89N	134-59.22E	4620.0	497.1	-	500.5	504.0	STNM136	
STN	137	082620	12:14	12:37	12-00.01N	135-00.02E	4612.0	497.6	-	500.5	504.0	STNM137	
STN	138	082620	15:14	15:38	12-00.26N	135-00.13E	4613.0	499.8	-	501.5	505.0	STNM138	
STN	139	082620	18:17	18:40	12-00.51N	134-59.79E	4622.0	499.3	-	500.5	504.0	STNM139	

STN	140	082620	21:16	21:39	12-00.13N	135-00.12E	4608.0	500.7	-	501.5	505.0	STNM140	
STN	141	082720	00:14	01:10	11-59.97N	135-00.09E	4613.0	999.4	-	1000.8	1009.0	STNM141	
STN	142	082720	03:15	03:37	12-00.10N	134-59.99E	4614.0	495.6	-	500.5	504.0	STNM142	
STN	143	082720	06:14	06:36	11-59.92N	135-00.10E	4608.0	497.4	-	500.5	504.0	STNM143	
STN	144	082720	09:13	09:36	11-59.98N	135-00.02E	4611.0	497.2	-	501.5	505.0	STNM144	
STN	145	082720	12:14	12:37	12-00.03N	134-59.76E	4618.0	499.1	-	501.5	505.0	STNM145	
STN	146	082720	15:14	15:37	12-00.22N	135-00.08E	4614.0	498.2	-	500.5	504.0	STNM146	
STN	147	082720	18:17	18:41	12-00.11N	135-00.01E	4614.0	499.8	-	500.5	504.0	STNM147	
STN	148	082720	21:15	21:38	11-59.94N	135-00.02E	4607.0	499.6	-	501.5	505.0	STNM148	
STN	149	082820	00:15	01:10	11-59.97N	134-59.88E	4620.0	1000.4	-	1000.8	1009.0	STNM149	
STN	150	082820	03:15	03:38	11-59.54N	135-00.01E	4623.0	503.7	-	500.5	504.0	STNM150	
STN	151	082820	06:13	06:36	11-59.82N	135-00.04E	4604.0	497.8	-	500.5	504.0	STNM151	
STN	152	082820	09:13	09:35	12-00.02N	134-59.57E	4621.0	497.4	-	501.5	505.0	STNM152	
STN	153	082820	12:14	12:36	11-59.75N	134-58.44E	4602.0	498.5	-	500.5	504.0	STNM153	
STN	154	082820	15:14	15:38	11-59.30N	134-59.05E	4613.0	499.4	-	501.5	505.0	STNM154	
STN	155	082820	18:17	18:40	12-00.60N	135-00.98E	4562.0	496.7	-	500.5	504.0	STNM155	
STN	156	082820	21:14	21:38	11-59.92N	135-00.14E	4602.0	498.7	-	502.5	506.0	STNM156	
STN	157	082920	00:15	01:10	11-59.97N	135-00.04E	4611.0	999.8	-	1001.8	1010.0	STNM157	
STN	158	082920	03:14	03:36	11-59.98N	134-59.88E	4617.0	497.8	-	502.5	506.0	STNM158	
STN	159	082920	06:15	06:37	11-59.99N	135-00.07E	4611.0	496.3	-	500.5	504.0	STNM159	
STN	160	082920	09:13	09:37	12-00.15N	135-00.00E	4612.0	497.4	-	501.5	505.0	STNM160	
STN	161	082920	12:14	12:37	12-00.00N	135-00.05E	4607.0	498.3	-	501.5	505.0	STNM161	
STN	162	082920	15:14	15:38	12-00.10N	135-00.02E	4615.0	497.6	-	501.5	505.0	STNM162	
STN	163	082920	18:17	18:41	12-00.26N	135-00.14E	4612.0	499.6	-	502.5	506.0	STNM163	
STN	164	082920	21:15	21:41	12-00.00N	135-00.05E	4615.0	497.4	-	500.5	504.0	STNM164	
STN	165	083020	00:15	01:11	12-00.00N	135-00.13E	4609.0	999.1	-	1000.8	1009.0	STNM165	
STN	166	083020	03:17	03:39	12-00.01N	135-00.19E	4597.0	496.3	-	500.5	504.0	STNM166	
STN	167	083020	06:15	06:39	11-59.89N	135-00.06E	4609.0	496.0	-	500.5	504.0	STNM167	
STN	168	083020	09:14	09:37	11-59.90N	135-00.09E	4608.0	496.1	-	501.5	505.0	STNM168	
STN	169	083020	12:14	12:38	11-59.57N	135-00.06E	4613.0	496.9	-	500.5	504.0	STNM169	
STN	170	083020	15:14	15:38	12-00.29N	134-59.95E	4616.0	497.4	-	501.5	505.0	STNM170	
STN	171	083020	18:17	18:41	12-00.02N	134-59.93E	4618.0	496.9	-	500.5	504.0	STNM171	
STN	172	083020	21:15	21:37	12-00.07N	135-00.15E	4605.0	498.5	-	501.5	505.0	STNM172	
STN	173	083120	00:16	01:17	12-00.05N	134-59.89E	4615.0	1000.4	-	1001.8	1010.0	STNM173	
STN	174	083120	03:14	03:37	12-00.00N	134-59.90E	4613.0	497.1	-	500.5	504.0	STNM174	
STN	175	083120	06:15	06:38	11-59.99N	135-00.16E	4600.0	496.0	-	500.5	504.0	STNM175	

STN	176	083120	09:13	09:36	12-00.29N	134-59.93E	4618.0	498.5	-	501.5	505.0	STNM176	
STN	177	083120	12:15	12:38	12-00.23N	134-59.76E	4621.0	496.3	-	500.5	504.0	STNM177	
STN	178	083120	15:14	15:37	12-00.30N	134-59.83E	4622.0	498.9	-	501.5	505.0	STNM178	
STN	179	083120	18:18	18:41	12-00.40N	134-59.72E	4621.0	500.0	-	500.5	504.0	STNM179	
STN	180	083120	21:15	21:38	12-00.13N	135-00.05E	4613.0	499.4	-	501.5	505.0	STNM180	
STN	181	090120	00:16	01:13	11-59.75N	134-59.18E	4617.0	999.6	-	1000.8	1009.0	STNM181	
STN	182	090120	03:15	03:38	12-00.11N	135-00.12E	4613.0	499.3	-	500.5	504.0	STNM182	
STN	183	090120	06:14	06:36	12-00.20N	135-00.18E	4609.0	498.5	-	500.5	504.0	STNM183	
STN	184	090120	09:14	09:36	12-00.24N	135-00.24E	4604.0	499.4	-	501.5	505.0	STNM184	
STN	185	090120	12:15	12:38	12-00.26N	135-00.07E	4612.0	499.6	-	500.5	504.0	STNM185	
STN	186	090120	15:14	15:37	12-00.10N	134-59.94E	4616.0	500.0	-	500.5	504.0	STNM186	
STN	187	090120	18:17	18:39	12-00.06N	134-59.86E	4619.0	497.1	-	500.5	504.0	STNM187	
STN	188	090120	21:15	21:38	12-00.06N	134-59.92E	4622.0	502.8	-	502.5	506.0	STNM188	
STN	189	090220	00:14	01:10	12-00.00N	135-00.08E	4608.0	999.6	-	1000.8	1009.0	STNM189	
STN	190	090220	03:14	03:36	11-59.52N	134-58.50E	4598.0	497.8	-	500.5	504.0	STNM190	
STN	192	090220	12:15	12:37	12-00.15N	134-59.94E	4613.0	498.9	-	500.5	504.0	STNM192	
STN	193	090220	15:14	15:37	12-00.05N	134-59.82E	4615.0	500.9	-	500.5	504.0	STNM193	
STN	194	090220	18:17	18:40	12-00.05N	134-59.65E	4628.0	499.6	-	500.5	504.0	STNM194	
STN	195	090220	21:15	21:38	11-59.90N	134-59.46E	4621.0	500.2	-	500.5	504.0	STNM195	
STN	196	090320	00:16	01:12	12-00.04N	134-59.87E	4614.0	1000.2	-	1000.8	1009.0	STNM196	
STN	197	090320	03:14	03:36	11-59.99N	135-00.03E	4612.0	499.4	-	500.5	504.0	STNM197	
STN	198	090320	06:13	06:35	11-59.97N	135-00.10E	4608.0	498.9	-	500.5	504.0	STNM198	
STN	199	090320	09:14	09:36	11-59.90N	135-00.02E	4621.0	497.6	-	501.5	505.0	STNM199	
STN	200	090320	12:15	12:37	12-00.12N	135-00.11E	4609.0	498.5	-	501.5	505.0	STNM200	
STN	207	090420	09:14	09:37	12-00.04N	135-00.15E	4601.0	499.6	-	502.5	506.0	STNM207	
STN	208	090420	12:14	12:37	12-00.20N	135-00.39E	4595.0	499.1	-	501.5	505.0	STNM208	
STN	209	090420	15:16	15:39	12-00.08N	135-00.02E	4615.0	499.3	-	501.5	505.0	STNM209	
STN	210	090420	18:17	18:40	12-00.07N	134-59.90E	4616.0	499.8	-	501.5	505.0	STNM210	
STN	211	090420	21:15	21:39	11-59.89N	135-00.09E	4600.0	502.0	-	502.5	506.0	STNM211	
STN	212	090520	00:14	01:10	11-59.89N	134-59.78E	4620.0	1001.3	-	1001.8	1010.0	STNM212	
STN	213	090520	03:14	03:36	11-59.98N	134-59.89E	4615.0	498.7	-	500.5	504.0	STNM213	
STN	214	090520	06:13	06:36	12-00.03N	134-59.79E	4622.0	498.9	-	500.5	504.0	STNM214	
STN	215	090520	09:13	09:36	12-00.15N	134-59.91E	4614.0	498.0	-	500.5	504.0	STNM215	
STN	216	090520	12:14	12:37	12-00.02N	134-59.97E	4614.0	499.8	-	502.5	506.0	STNM216	
STN	217	090520	15:14	15:36	12-00.06N	134-59.94E	4616.0	498.3	-	501.5	505.0	STNM217	
STN	218	090520	18:16	18:39	11-59.90N	134-59.94E	4611.0	499.1	-	500.5	504.0	STNM218	

STN	219	090520	21:15	21:38	11-59.95N	134-59.97E	4611.0	500.6	-	502.5	506.0	STNM219	
STN	220	090620	00:14	01:10	11-59.74N	134-59.81E	4619.0	1000.0	-	1000.8	1009.0	STNM220	
STN	221	090620	03:13	03:37	11-59.67N	134-58.75E	4606.0	499.8	-	500.5	504.0	STNM221	
STN	222	090620	06:16	06:38	11-59.85N	134-58.63E	4607.0	497.1	-	500.5	504.0	STNM222	
STN	223	090620	09:13	09:35	12-00.04N	135-00.03E	4617.0	498.0	-	502.5	506.0	STNM223	
STN	224	090620	12:15	12:39	12-00.10N	134-59.86E	4615.0	498.9	-	500.5	504.0	STNM224	
STN	225	090620	15:15	15:37	12-00.05N	134-59.91E	4621.0	500.4	-	501.5	505.0	STNM225	
STN	226	090620	18:18	18:40	11-59.98N	135-00.00E	4611.0	499.4	-	500.5	504.0	STNM226	
STN	227	090620	21:16	21:40	11-59.90N	135-00.02E	4608.0	499.4	-	502.5	506.0	STNM227	
STN	228	090720	00:15	01:11	12-00.10N	135-00.00E	4611.0	1001.1	-	1000.8	1009.0	STNM228	
STN	229	090720	03:15	03:38	11-58.61N	134-59.51E	4631.0	500.9	-	500.5	504.0	STNM229	
C04	10	090720	21:08	21:31	11-37.68N	134-55.96E	4099.0	501.1	-	502.5	506.0	C04M010	m-TRITON Rec.