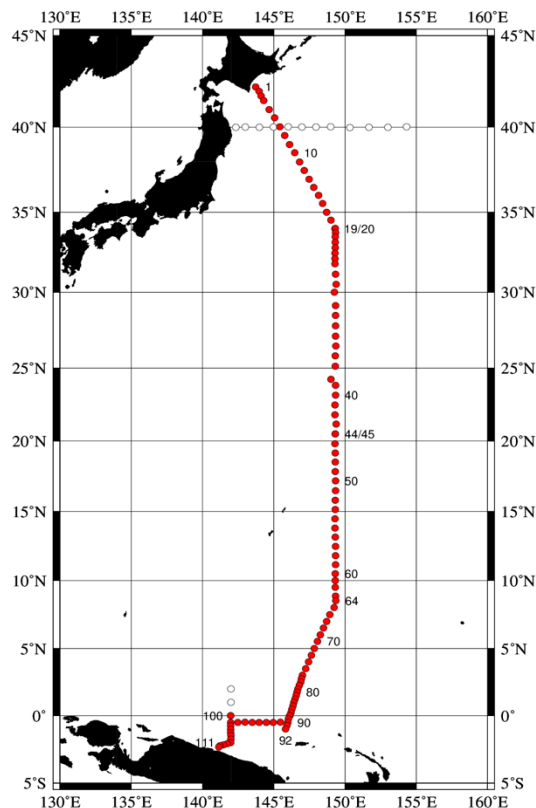


CRUISE REPORT: P10

(Updated SEP 2018)

Highlights



Cruise Summary Information

Section Designation	P10
Expedition designation (ExpoCodes)	49UP20140609
Chief Scientists	Kazuhiro NEMOTO Takahiro SEGAWA
Dates	2014 JUN 06 - 2014 SEP 16
Ship	<i>Ryofu Maru</i>
Ports of call	Tokyo, Japan; Pohnpei, Micronesia
Geographic Boundaries	42° 15.12' N 141° 8.48' E 149° 26.84' E 2° 20.34' S
Stations	111
Floats and drifters deployed	5 floats and 2 drifters deployed
Moorings deployed or recovered	0

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Links to Select Topics

Shaded sections are not relevant to this cruise or were not available when this report was compiled.

Cruise Summary Information	Hydrographic Measurements
Description of Scientific Program	CTD Data:
Geographic Boundaries	Acquisition
Cruise Track (Figure)	Processing
Description of Stations	Calibration
Description of Parameters Sampled	Temperature Pressure
Bottle Depth Distributions (Figure)	Salinities Oxygens
Floats and Drifters Deployed	Bottle Data
Moorings Deployed or Recovered	Salinity
	Oxygen
Principal Investigators	Nutrients
Cruise Participants	Carbon System Parameters
	CFCs
Problems and Goals Not Achieved	Helium / Tritium
Other Incidents of Note	Radiocarbon
Underway Data Information	Lowered Acoustic Doppler Current Profiler (LADCP)
Acoustic Doppler Current Profiler (ADCP)	References
Navigation Bathymetry	
Thermosalinograph	
XBT and/or XCTD	
Meteorological Observations	
Atmospheric Chemistry Data	
Underway pCO₂	
Data Processing Notes	Acknowledgments

A. Cruise narrative

1. Highlights

Cruise designation: RF14-05, RF14-06 and RF14-07 (WHP-P10 revisit)

a. EXPOCODE: 49UP20140609

b. Chief scientist: RF14-05 Kazuhiro NEMOTO (k-nemoto@met.kishou.go.jp)

RF14-06 Kazuhiro NEMOTO (k-nemoto@met.kishou.go.jp)

RF14-07 Takahiro SEGAWA (tsegawa@met.kishou.go.jp)

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Global Environment and Marine Department

Japan Meteorological Agency (JMA)

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c. Ship name: R/V Ryofu Maru

d. Ports of call: RF14-05 : Tokyo–Tokyo

RF14-06 : Tokyo–Tokyo

RF14-07 Leg 1: Tokyo–Pohnpei

Leg 2: Pohnpei–Tokyo

e. Cruise dates: RF14-05 : 9 June 2014–29 June 2014

RF14-06 : 3 July 2014–21 July 2014

RF14-07 Leg 1: 28 July 2014–19 August 2014

Leg 2: 23 August 2014–16 September 2014

f. Floats and drifters deployed: RF14-05: 3 floats and 1 drifter

RF14-07: 2 floats and 1 drifter

2. Cruise Summary Information

RF14-05, RF14-06 and RF14-07 cruises were carried out during the period from June 9 to September 16, 2014. The observation line along approximately 149°E meridian was observed by Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Japan in 2005, 2011 and 2012. These cruises were carried out as ‘WHP-P10’, which is a part of WOCE (World Ocean Circulation Experiment) Hydrographic Programme, CLIVAR (Climate Variability and Predictability Project) and GO-SHIP (Global Ocean Ship-based Hydrographic Investigations Program).

The stations from Stn.1 (34°00’N, 149°18’E; RF5113) to Stn.18 (42°15’N, 143°44’E; RF5130) for RF14-05 cruise, from Stn.20 (34°02’N, 149°20’E; RF5145) to Stn.44 (20°30’N, 149°20’E; RF5169) for RF14-06 cruise and from Stn.45 (20°30’N, 149°20’E; RF5171) to Stn.111 (2°20’S, 141°09’E; RF5236) for RF14-07 cruise had been designed.

A total of 111 stations was occupied using a Sea-Bird Electronics (SBE) 36 position carousel equipped with 10-liter Niskin water sample bottles, a CTD system (SBE911plus) equipped with SBE35 deep ocean standards thermometer, JFE Advantech oxygen sensor (RINKO III), Teledyne Benthos altimeter (PSA-916D), and Teledyne RD Instruments L-ADCP (300kHz). Cruise track and station location are shown in [Figure 1](#).

At each station, full-depth CTDO₂ (temperature, conductivity (salinity) and dissolved oxygen) profile and up to 36 water samples were taken and analyzed. Water samples were obtained from 10 dbar to approximately 10 m above the bottom. In addition, surface water was sampled using a stainless steel bucket at each station. Sampling layer is designed as so-called staggered mesh as shown in [Table 1](#) (*Swift, 2010*). The bottle depth diagram is shown in [Figure 2](#).

Water samples were analyzed for salinity, dissolved oxygen, nutrients, dissolved inorganic carbon (DIC), total alkalinity (TA), pH, CFC-11, CFC-12 and phytopigment (chlorophyll-a and phaeopigments). Underway measurements of partial pressure of carbon dioxide (*p*CO₂), temperature, salinity, chlorophyll-a, subsurface current, bathymetry and meteorological parameters were conducted along the cruise track.

RF14-05

RF14-05 cruise was carried out during the period from June 9 to June 29, 2014. Before the observation at the first station, all watch standers were drilled in the method of sample drawing and CTD operations near Izu-Oshima (34°42’N, 139°50’E). The cruise started from Stn.19 (34°00’N, 149°18’E; RF5113) on June 12 and sailed northward to Stn.1 (42°15’N, 143°44’E; RF5130) on June 18. We skipped the Stn.7 (40°02’N, 145°26’E; RF5135) that was

cross 40°N. After observation of Stn.1, we observed twelve stations at the 40°N section. Stn.7 was done while observing along 40°N on June 19. RF14-05 cruise consisted of 19 stations at the WHP-P10 section.

Three Argo floats and one drifting ocean data buoy were deployed along the cruise track. The information of deployed the float and the buoy are listed in [Table 2a](#).

RF14-06

RF14-06 cruise was carried out during the period from July 3 to July 16, 2014. Before the observation at the first station, all watch standers were drilled in the method of sample drawing and CTD operations at the point (34°27'N, 142°59'E). The hydrographic cast of CTDO₂ was started at the first station (Stn.20 (34°02'N, 149°20'E; RF5145)) that was the same location of Stn.19 on July 5, and sailed southward to Stn.44 (20°30'N, 149°20'E; RF5169) at July 13. After observed Stn.44 she sailed toward Tokyo. RF14-06 cruise consisted of 25 stations.

RF14-07

RF14-07 cruise was carried out during the period from July 28 to September 16, 2014. Before the observation at the first station, all watch standers were drilled in the method of sample drawing and CTD operations at the point (34°44'N, 139°50'E). The hydrographic cast of CTDO₂ was started at the first station (Stn.45 (20°30'N, 149°20'E; RF5171)) that was the same station of Stn.44 on August 1. Leg 1 consisted of 43 stations from Stn.45 to Stn.87 (0°01'S, 146°09'E; RF5213). Stn.87 was finished on July 23. She called for Pohnpei (Federated States of Micronesia) on August 19 (Leg 1). She left Pohnpei on August 23, 2014. The hydrographic cast of CTDO₂ was restarted at the station (Stn.88 (0°01'N, 146°08'E; RF5214)) that was the same station of Stn.87 on August 26. We sailed westward to Stn.101 (0°30'S, 142°00'E; RF5226) at August 30 and turned southward to Stn.111 (2°20'S, 141°09'E; RF5236) Stn.111 was finished on September 1. After observation of Stn.111 she sailed northward, we observed Stn.100 (0°00', 142°00'E; RF5237) on September 2, and observed other two stations (1°N and 2°N, 142°E). She arrived at Tokyo (Japan) on September 16, 2014 (Leg 2). Leg 2 consisted of 24 stations from Stn.88 to Stn.111 at the WHP-P10 section.

Two Argo floats and one drifting ocean data buoy were deployed along the cruise track. The information of deployed the float and the buoy are listed in [Table 2b](#).

Location data of stations is shown in [Table 3](#).

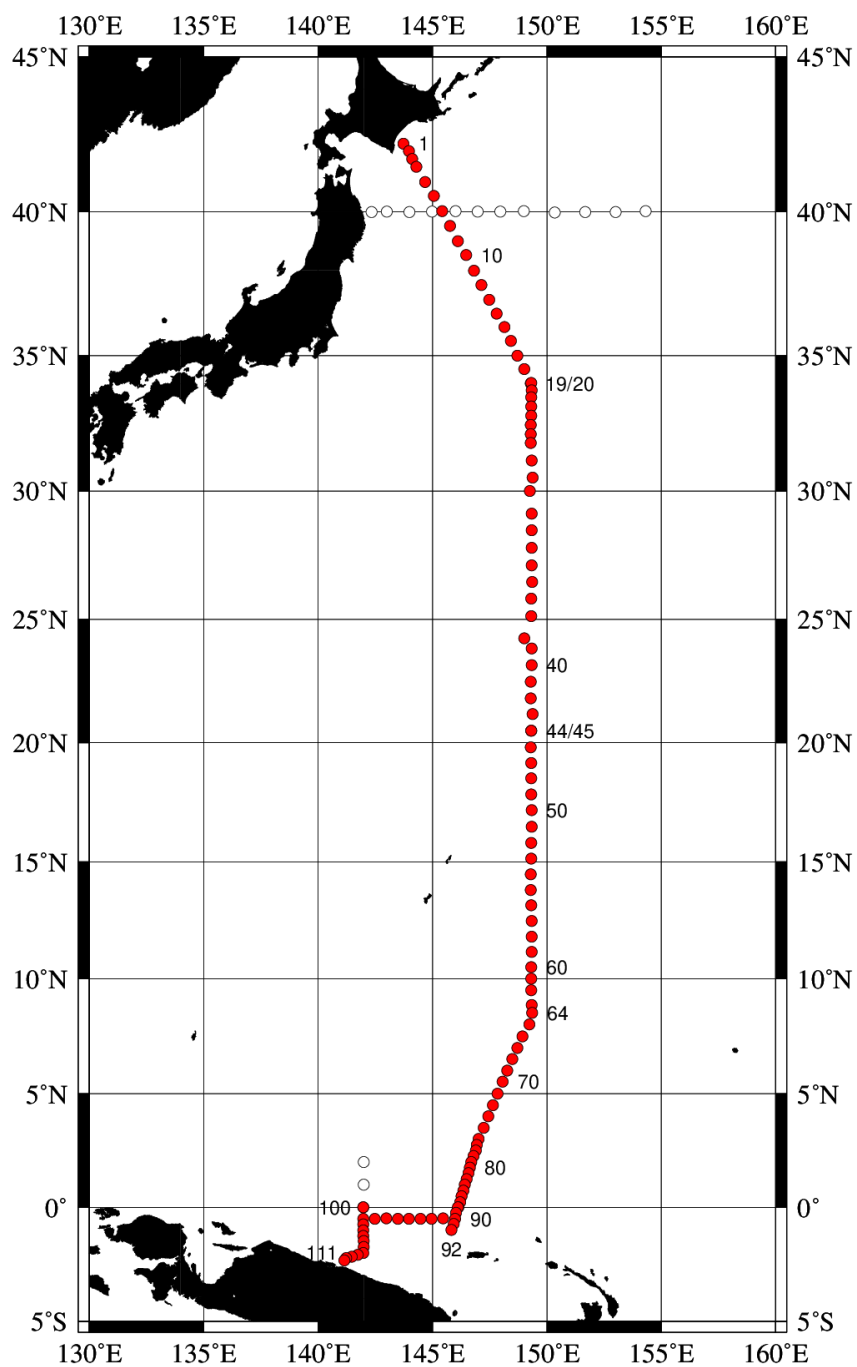


Figure 1: Cruise track of RF14-05, RF14-06 and RF14-07. Red closed circles indicate the observation stations at the WHP-P10 section. Open circles indicate the CTD stations of other section.

Bottle Depth Diagram along P10

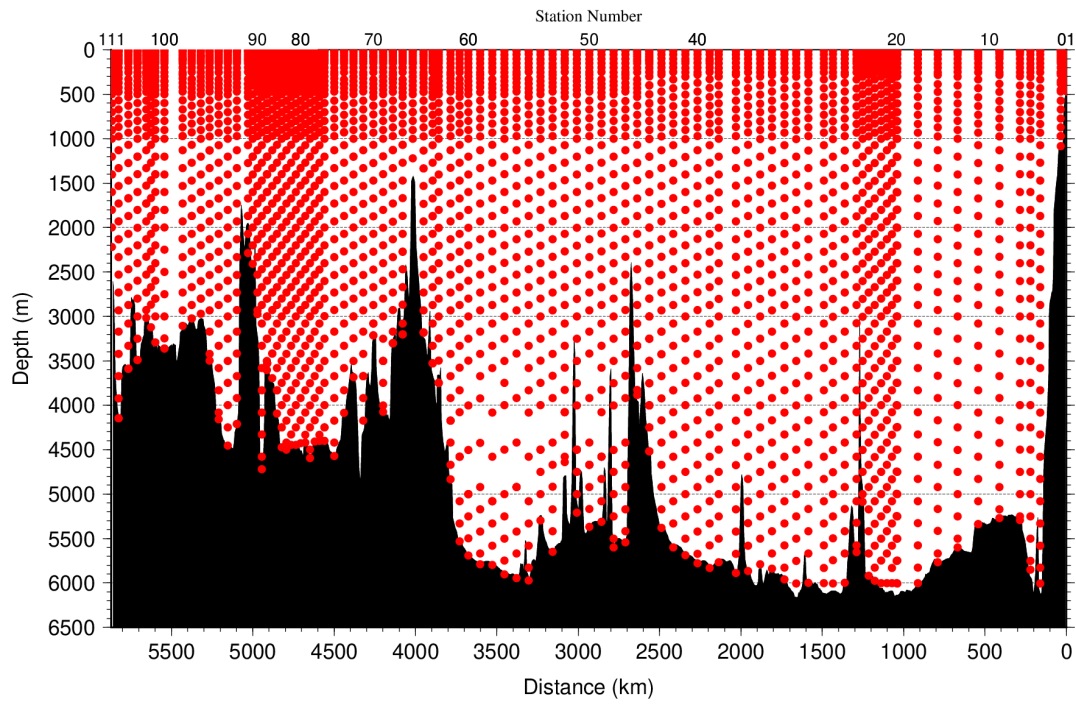


Figure 2: The bottle depth diagram for WHP-P10 revisit.

Table 1a: The scheme of sampling layer in meters (RF14-05).

<i>Bottle count</i>	<i>scheme1</i>	<i>scheme2</i>	<i>scheme3</i>	<i>Bottle count</i>	<i>scheme1</i>	<i>scheme2</i>	<i>scheme3</i>
1	10	10	10	37	5000	5080	4920
2	25	25	25	38	5250	5330	5170
3	50	50	50	39	5500	5580	5420
4	75	75	75	40	5750	5830	5670
5	100	100	100	41	6000	6000	6000
6	125	125	125				
7	150	150	150				
8	200	200	200				
9	250	250	250				
10	300	330	280				
11	350	350	350				
12	400	430	380				
13	450	450	450				
14	500	530	470				
15	600	630	570				
16	700	730	670				
17	800	830	770				
18	900	930	870				
19	1000	1070	970				
20	1200	1270	1130				
21	1400	1470	1330				
22	1600	1670	1530				
23	1800	1870	1730				
24	2000	2070	1930				
25	2200	2270	2130				
26	2400	2470	2330				
27	2600	2670	2530				
28	2800	2870	2730				
29	3000	3080	2930				
30	3250	3330	3170				
31	3500	3580	3420				
32	3750	3830	3670				
33	4000	4080	3920				
34	4250	4330	4170				
35	4500	4580	4420				
36	4750	4830	4670				

Table 1b: The scheme of sampling layer in meters (RF14-06 and RF14-07).

<i>Bottle count</i>	North of 20°N (Stn.20–Stn.45)			South of 20°N (Stn.46–Stn.111)		
	<i>scheme1</i>	<i>scheme2</i>	<i>scheme3</i>	<i>scheme4</i>	<i>scheme5</i>	<i>scheme6</i>
<i>1</i>	10	10	10	10	10	10
<i>2</i>	25	25	25	25	25	25
<i>3</i>	50	50	50	50	50	50
<i>4</i>	75	75	75	75	75	75
<i>5</i>	100	100	100	100	100	100
<i>6</i>	125	125	125	125	125	125
<i>7</i>	150	150	150	150	150	150
<i>8</i>	200	200	200	200	200	200
<i>9</i>	250	250	250	250	250	250
<i>10</i>	300	330	280	300	330	280
<i>11</i>	400	430	370	350	380	320
<i>12</i>	500	530	470	400	430	370
<i>13</i>	600	630	570	450	480	420
<i>14</i>	700	730	670	500	530	470
<i>15</i>	800	830	770	600	630	570
<i>16</i>	900	930	870	700	730	670
<i>17</i>	1000	1070	970	800	830	770
<i>18</i>	1200	1270	1130	900	930	870
<i>19</i>	1400	1470	1330	1000	1070	970
<i>20</i>	1600	1670	1530	1200	1270	1130
<i>21</i>	1800	1870	1730	1400	1470	1330
<i>22</i>	2000	2070	1930	1600	1670	1530
<i>23</i>	2200	2270	2130	1800	1870	1730
<i>24</i>	2400	2470	2330	2000	2070	1930
<i>25</i>	2600	2670	2530	2200	2270	2130
<i>26</i>	2800	2870	2730	2400	2470	2330
<i>27</i>	3000	3080	2930	2600	2670	2530
<i>28</i>	3250	3330	3170	2800	2870	2730
<i>29</i>	3500	3580	3420	3000	3080	2930
<i>30</i>	3750	3830	3670	3250	3330	3170
<i>31</i>	4000	4080	3920	3500	3580	3420
<i>32</i>	4250	4330	4170	3750	3830	3670
<i>33</i>	4500	4580	4420	4000	4080	3920
<i>34</i>	4750	4830	4670	4250	4330	4170
<i>35</i>	5000	5080	4920	4500	4580	4420

Table 1b: Continue.

<i>Bottle count</i>	North of 20°N (Stn.20–Stn.45)			South of 20°N (Stn.46–Stn.111)		
	<i>scheme1</i>	<i>scheme2</i>	<i>scheme3</i>	<i>scheme4</i>	<i>scheme5</i>	<i>scheme6</i>
<i>36</i>	5250	5330	5170	4750	4830	4670
<i>37</i>	5500	5580	5420	5000	5080	4920
<i>38</i>	5750	5830	5670	5250	5330	5170
<i>39</i>	6000	6000	6000	5500	5580	5420
<i>40</i>				5750	5830	5670
<i>41</i>				6000	6000	6000

Table 2a: Information of deployed floats and buoy at RF14-05.

<i>Float WMO number</i>	<i>Date and Time (UTC) of Deployment</i>	<i>Position of deployment</i>		<i>PI</i>	
		<i>Latitude</i>	<i>Longitude</i>		
2902517	2014 June 16 02:47	40-01.63 N	144-59.61 E	JMA	APEX
2902516	2014 June 19 04:23	40-01.04 N	145-25.52 E	JMA	APEX
2902522	2014 June 22 00:19	40-02.74 N	154-19.92 E	JAMSTEC	Navis

<i>Buoy WMO number</i>	<i>Date and Time (UTC) of Deployment</i>	<i>Position of deployment</i>		<i>PI</i>	
		<i>Latitude</i>	<i>Longitude</i>		
21638	2014 June 15 23:40	39-29.37 N	145-47.08 E	JMA	YTSS-2100

APEX: Teledyne Webb Research (USA)

Navis: Sea-Bird Scientific (USA)

YTSS-2100: JVC KENWOOD Co., Japan

Table 2b: Information of deployed floats and buoy at RF14-07.

<i>Float WMO number</i>	<i>Date and Time (UTC) of Deployment</i>	<i>Position of deployment</i>		<i>PI</i>	
		<i>Latitude</i>	<i>Longitude</i>		
2902523	2014 July 30 08:00	27-31.02 N	147-09.21 E	JAMSTEC	Navis
2902524	2014 July 31 00:30	24-00.96 N	148-14.62 E	JAMSTEC	Navis

<i>Buoy WMO number</i>	<i>Date and Time (UTC) of Deployment</i>	<i>Position of deployment</i>		<i>PI</i>	
		<i>Latitude</i>	<i>Longitude</i>		
21597	2014 Sep. 10 03:17	29-50.35 N	140-08.58 E	JMA	YTSS-2100

Navis: Sea-Bird Scientific (USA)

YTSS-2100: JVC KENWOOD Co., Japan

Table 3a: Station data of RF14-05 cruises. The ‘RF’ column indicates the JMA station identification number.

<i>Leg</i>	<i>Station</i>		<i>Position</i>	
	<i>Stn.</i>	<i>RF</i>	<i>Latitude</i>	<i>Longitude</i>
1	1	5130	42-15.03 N	143-44.19 E
1	2	5129	42-00.03 N	143-58.51 E
1	3	5128	41-45.02 N	144-07.93 E
1	4	5127	41-29.69 N	144-18.26 E
1	5	5126	40-59.64 N	144-41.77 E
1	6	5125	40-32.29 N	145-03.42 E
1	7	5135	40-01.67 N	145-25.68 E
1	8	5124	39-31.98 N	145-46.44 E
1	9	5123	39-00.87 N	146-06.67 E
1	10	5122	38-32.20 N	146-28.81 E
1	11	5121	37-59.37 N	146-49.48 E
1	12	5120	37-30.99 N	147-08.86 E
1	13	5119	36-59.01 N	147-29.97 E
1	14	5118	36-29.52 N	147-48.70 E
1	15	5117	36-01.89 N	148-09.81 E
1	16	5116	35-31.74 N	148-25.42 E
1	17	5115	35-00.94 N	148-42.14 E
1	18	5114	34-31.15 N	149-01.67 E
1	19	5113	34-00.14 N	149-17.68 E

Table 3b: Station data of RF14-06 cruises. The ‘RF’ column indicates the JMA station identification number.

<i>EXPOCODE</i>	<i>Leg</i>	<i>Station</i>		<i>Position</i>	
sub number		<i>Stn.</i>	<i>RF</i>	<i>Latitude</i>	<i>Longitude</i>
2	1	20	5145	34-01.66 N	149-19.74 E
2	1	21	5146	33-45.70 N	149-20.62 E
2	1	22	5147	33-29.03 N	149-19.89 E
2	1	23	5148	33-09.33 N	149-19.34 E
2	1	24	5149	32-49.02 N	149-19.83 E
2	1	25	5150	32-28.04 N	149-18.40 E
2	1	26	5151	32-08.21 N	149-17.57 E
2	1	27	5152	31-48.44 N	149-18.67 E
2	1	28	5153	31-09.38 N	149-20.39 E
2	1	29	5154	30-30.07 N	149-22.62 E
2	1	30	5155	30-00.27 N	149-15.18 E
2	1	31	5156	29-08.74 N	149-20.68 E
2	1	32	5157	28-29.22 N	149-20.52 E
2	1	33	5158	27-49.37 N	149-20.47 E
2	1	34	5159	27-08.57 N	149-20.13 E
2	1	35	5160	26-29.33 N	149-21.17 E
2	1	36	5161	25-49.11 N	149-19.49 E
2	1	37	5162	25-08.81 N	149-19.59 E
2	1	38	5163	24-14.83 N	149-00.98 E
2	1	39	5164	23-50.37 N	149-20.25 E
2	1	40	5165	23-10.17 N	149-20.10 E
2	1	41	5166	22-29.45 N	149-18.48 E
2	1	42	5167	21-49.24 N	149-17.72 E
2	1	43	5168	21-10.82 N	149-22.51 E
2	1	44	5169	20-30.37 N	149-19.65 E

Table 3c: Station data of RF14-07 cruises. The ‘RF’ column indicates the JMA station identification number.

<i>EXPOCODE</i>	<i>Leg</i>	<i>Station</i>		<i>Position</i>	
sub number		<i>Stn.</i>	<i>RF</i>	<i>Latitude</i>	<i>Longitude</i>
3	1	45	5171	20-30.10 N	149-19.69 E
3	1	46	5172	19-49.89 N	149-18.45 E
3	1	47	5173	19-10.43 N	149-19.32 E
3	1	48	5174	18-31.70 N	149-19.34 E
3	1	49	5175	17-51.28 N	149-19.77 E
3	1	50	5176	17-11.64 N	149-20.19 E
3	1	51	5177	16-30.13 N	149-20.46 E
3	1	52	5178	15-49.22 N	149-19.84 E
3	1	53	5179	15-09.66 N	149-19.25 E
3	1	54	5180	14-29.44 N	149-18.83 E
3	1	55	5181	13-49.67 N	149-18.58 E
3	1	56	5182	13-10.15 N	149-19.59 E
3	1	57	5183	12-29.53 N	149-20.33 E
3	1	58	5184	11-49.48 N	149-20.40 E
3	1	59	5185	11-09.20 N	149-20.46 E
3	1	60	5186	10-30.02 N	149-19.58 E
3	1	61	5187	10-00.72 N	149-19.33 E
3	1	62	5188	9-30.62 N	149-19.92 E
3	1	63	5189	8-51.10 N	149-20.91 E
3	1	64	5190	8-31.36 N	149-21.27 E
3	1	65	5191	8-01.84 N	149-14.63 E
3	1	66	5192	7-30.74 N	148-56.56 E
3	1	67	5193	7-00.56 N	148-42.74 E
3	1	68	5194	6-30.91 N	148-29.30 E
3	1	69	5195	6-00.53 N	148-16.54 E
3	1	70	5196	5-31.03 N	148-04.85 E
3	1	71	5197	4-59.79 N	147-51.09 E
3	1	72	5198	4-29.87 N	147-38.95 E
3	1	73	5199	4-00.49 N	147-26.65 E
3	1	74	5200	3-30.67 N	147-14.39 E
3	1	75	5201	3-00.93 N	147-01.28 E
3	1	76	5202	2-45.81 N	146-56.21 E
3	1	77	5203	2-30.55 N	146-53.13 E
3	1	78	5204	2-15.59 N	146-47.45 E

Table 3c: continue.

<i>EXPOCODE</i>	<i>Leg</i>	<i>Station</i>		<i>Position</i>	
sub number		<i>Stn.</i>	<i>RF</i>	<i>Latitude</i>	<i>Longitude</i>
3	1	79	5205	2-00.31 N	146-42.47 E
3	1	80	5206	1-45.29 N	146-38.34 E
3	1	81	5207	1-30.57 N	146-34.26 E
3	1	82	5208	1-15.10 N	146-29.19 E
3	1	83	5209	1-00.30 N	146-25.47 E
3	1	84	5210	0-44.88 N	146-21.41 E
3	1	85	5211	0-30.18 N	146-16.15 E
3	1	86	5212	0-14.61 N	146-12.88 E
3	1	87	5213	0-00.72 S	146-08.78 E
4	2	88	5214	0-00.50 N	146-07.86 E
4	2	89	5215	0-14.93 S	146-02.90 E
4	2	90	5216	0-30.02 S	145-59.21 E
4	2	91	5217	0-44.96 S	145-55.30 E
4	2	92	5218	0-59.91 S	145-50.38 E
4	2	93	5219	0-29.85 S	145-28.77 E
4	2	94	5220	0-30.12 S	144-58.78 E
4	2	95	5221	0-30.37 S	144-28.85 E
4	2	96	5222	0-30.67 S	143-58.64 E
4	2	97	5223	0-30.24 S	143-29.52 E
4	2	98	5224	0-29.81 S	142-59.15 E
4	2	99	5225	0-30.76 S	142-29.23 E
4	2	100	5237	0-00.00 N	141-59.81 E
4	2	101	5226	0-30.38 S	141-59.69 E
4	2	102	5227	0-45.35 S	141-59.35 E
4	2	103	5228	1-00.25 S	141-59.90 E
4	2	104	5229	1-15.58 S	141-59.89 E
4	2	105	5230	1-29.96 S	142-00.33 E
4	2	106	5231	1-44.56 S	142-00.04 E
4	2	107	5232	2-00.23 S	141-59.58 E
4	2	108	5233	2-05.05 S	141-44.59 E
4	2	109	5234	2-10.14 S	141-28.66 E
4	2	110	5235	2-14.98 S	141-14.04 E
4	2	111	5236	2-20.34 S	141-09.17 E

List of Principal Investigators for all Measurements

The principal investigator (PI) and the person in charge responsible for major parameters measured on the cruise are listed in Table 4a (RF14-05), Table 4b (RF14-06) and [Table 4c](#) (RF14-07).

Table 4a: List of principal investigators and the persons in charge on the ship for RF14-05.

Item	Principal Investigator (PI)	Person in charge on the ship
<u>Hydrography</u>		
CTDO ₂ / LADCP	Toshiya NAKANO	Keizo SHUTTA
Salinity	Toshiya NAKANO	Keizo SHUTTA
Dissolve oxygen	Toshiya NAKANO	Takahiro KITAGAWA
Nutrients	Toshiya NAKANO	Takahiro KITAGAWA
Phytopigment	Toshiya NAKANO	Naoshi KUBO
DIC	Toshiya NAKANO	Shu SAITO
Total Alkalinity	Toshiya NAKANO	Shu SAITO
pH	Toshiya NAKANO	Shu SAITO
CFCs	Toshiya NAKANO	Shu SAITO
<u>Underway</u>		
Meteorology	Toshiya NAKANO	Kazuhiro NEMOTO
Thermo-Salinograph	Toshiya NAKANO	Shu SAITO
<i>p</i> CO ₂	Toshiya NAKANO	Shu SAITO
Chlorophyll-a	Toshiya NAKANO	Naoshi KUBO
ADCP	Toshiya NAKANO	Keizo SHUTTA
Bathymetry	Toshiya NAKANO	Keizo SHUTTA
<u>Float and Buoy</u>		
Argo float (JMA)	Kazuhiro NEMOTO	Keizo SHUTTA
Argo float (JAMSTEC)	Shigeki HOSODA	Keizo SHUTTA
Buoy (JMA)	Kazuhiro NEMOTO	Keizo SHUTTA

Table 4b: List of principal investigators and the persons in charge on the ship for RF14-06.

Item	Principal Investigator (PI)	Person in charge on the ship
<u>Hydrography</u>		
CTDO ₂ / LADCP	Toshiya NAKANO	Keizo SHUTTA
Salinity	Toshiya NAKANO	Keizo SHUTTA
Dissolve oxygen	Toshiya NAKANO	Sonoki IWANO
Nutrients	Toshiya NAKANO	Takahiro KITAGAWA

Phytopigment	Toshiya NAKANO	Sonoki IWANO
DIC	Toshiya NAKANO	Kazutaka ENYO
Total Alkalinity	Toshiya NAKANO	Kazutaka ENYO
pH	Toshiya NAKANO	Kazutaka ENYO
CFCs	Toshiya NAKANO	Akira WADA

Underway

Meteorology	Toshiya NAKANO	Kazuhiro NEMOTO
Thermo-Salinograph	Toshiya NAKANO	Kazutaka ENYO
pCO ₂	Toshiya NAKANO	Kazutaka ENYO
Chlorophyll-a	Toshiya NAKANO	Sonoki IWANO
ADCP	Toshiya NAKANO	Keizo SHUTTA
Bathymetry	Toshiya NAKANO	Keizo SHUTTA

Table 4c: List of principal investigators and the persons in charge on the ship for RF14-07.

Item	Principal Investigator (PI)	Person in charge on the ship
<u>Hydrography</u>		
CTDO ₂ / LADCP	Toshiya NAKANO	Keizo SHUTTA
Salinity	Toshiya NAKANO	Keizo SHUTTA
Dissolve oxygen	Toshiya NAKANO	Sonoki IWANO
Nutrients	Toshiya NAKANO	Hiroyuki FUJIWARA
Phytopigment	Toshiya NAKANO	Sonoki IWANO
DIC	Toshiya NAKANO	Shu SAITO
Total Alkalinity	Toshiya NAKANO	Shu SAITO
pH	Toshiya NAKANO	Shu SAITO
CFCs	Toshiya NAKANO	Kazutaka ENYO
<u>Underway</u>		
Meteorology	Toshiya NAKANO	Takahiro SEGAWA
Thermo-Salinograph	Toshiya NAKANO	Shu SAITO
pCO ₂	Toshiya NAKANO	Shu SAITO
Chlorophyll-a	Toshiya NAKANO	Sonoki IWANO
ADCP	Toshiya NAKANO	Keizo SHUTTA
Bathymetry	Toshiya NAKANO	Keizo SHUTTA
<u>Float and Buoy</u>		
Argo float (JAMSTEC)	Shigeki HOSODA	Keizo SHUTTA
Buoy (JMA)	Kazuhiro NEMOTO	Keizo SHUTTA

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Reference

Swift, J. H. (2010): Reference-quality water sample data: Notes on acquisition, record keeping, and evaluation. *IOCCP Report No.14, ICPO Pub. 134, 2010 ver.1*

CCHDO Data Processing Notes

- **File Online Carolina Berys**

[A_cruise_narrative_2014_P10_20180511.doc \(download\)](#) #6276e

Date: 2018-06-08

Current Status: unprocessed

- **File Online Carolina Berys**

[ct1.zip \(download\)](#) #61d6c

Date: 2018-06-08

Current Status: unprocessed

- **File Online Carolina Berys**

[p10_hy1.csv \(download\)](#) #c79c1

Date: 2018-06-08

Current Status: unprocessed

- **File Online Carolina Berys**

[p10su.txt \(download\)](#) #58af6

Date: 2018-06-08

Current Status: unprocessed

- **File Submission Toshiya NAKANO**

[p10su.txt \(download\)](#) #58af6

Date: 2018-05-12

Current Status: unprocessed

Notes

Ship Name: Ryofu Maru (Japan Meteorological Agency)

Section: P10 (RF14-05, RF14-06 and RF14-07)

Cruise date:

RF14-05 : 9 June 2014-29 June 2014

RF14-06 : 3 July 2014-21 July 2014

RF14-07 : 28 July 2014-16 September 2014

- **File Submission Toshiya NAKANO**

[p10_hy1.csv \(download\)](#) #c79c1

Date: 2018-05-12

Current Status: unprocessed

Notes

Ship Name: Ryofu Maru (Japan Meteorological Agency)

Section: P10 (RF14-05, RF14-06 and RF14-07)

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RF14-06 : 3 July 2014-21 July 2014

RF14-07 : 28 July 2014-16 September 2014

- **File Submission Toshiya NAKANO**

[ct1.zip \(download\)](#) #61d6c

Date: 2018-05-12

Current Status: unprocessed

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RF14-07 : 28 July 2014-16 September 2014

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