



HOKKAIDO UNIVERSITY

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**THE "OSHO RO MARU" CRUISE 225
TO WEST OF THE TSUGARU STRAIT**

IN FEBRUARY 2011

1. Cruise Itinerary

Cruise 225

Departure from Hakodate	Feb.	21	2011
Start hydrographic research (OS11001)		21	
Start drift gillnet research		22	
Finish drift gillnet research		23	
Finish hydrographic research (OS11027)		24	
Return to Hakodate		25	

Total coverage 565.6 miles

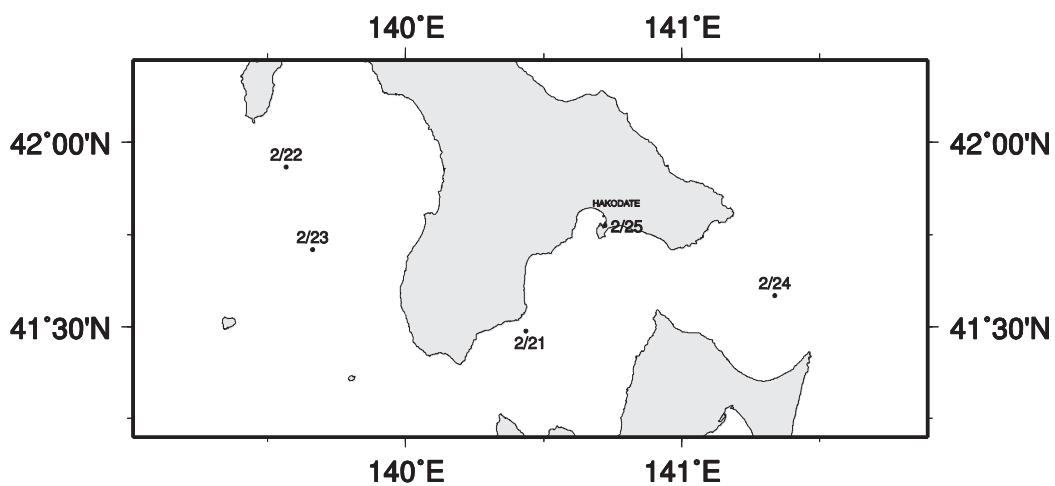


Figure 1. Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew:	Chief Officer	Associate Professor	Yoshihiko Kamei
	First Officer	Associate Professor	Keiichiro Sakaoka
	Second Officer	Instructor	Naoki Hoshi
	Third Officer	Technical official	Takuzo Abe
	Science Officer	Technical official	Keiri Imai
	Chief Engineer	Instructor	Jyunichi Kimura
	And 24 men		

Cruise 225

Research Staff:	Associate Professor	(Laboratory of Satellite Oceanography)	Toru Hirawake
	Instructor	(Field Science Center for Northern Biosphere, Hokkaido University)	Yoko Mitani
	Associate Professor	(Graduate School of Environmental Science)	Yutaka Watanabe
	Researcher	(National Museum of Nature and Science)	Manami Makara
	Veterinarian	(Toba Aquarium)	Masahiko Kasamatsu
	Researcher	(Japan Agency for Marine-Earth Science and Technology)	Yoshiyuki Tanaka
	Technical assistant	(Japan Agency for Marine-Earth Science and Technology)	Hideki Yamamoto
	Technical assistant	(Marine Work Japan)	Satoshi Ozawa

Graduate Students	10 persons
Under Graduate Students	6 persons
	Total 55 persons

3. Items of Research

Hydrographic observations:	Fig. 2, Table 1, 2
Biological research for fur seal caught by drift gillnet:	Fig. 3, Table 3
Water sampling by CTD/RMS and underwater tug plane:	

4. Data on Temperature, Salinity and Computed Dynamic Depth Anomaly

Hydrographic work on deck and the data processing were made by the deck officers, science officer, crews, research staff and cadets of the “*Oshoromaru*”. Temperature and salinity were measured by CTD (Seabird SBE-9Plus and SBE-19Plus). Dynamic computations were made using a desk-top computer aboard the “*Oshoromaru*”.

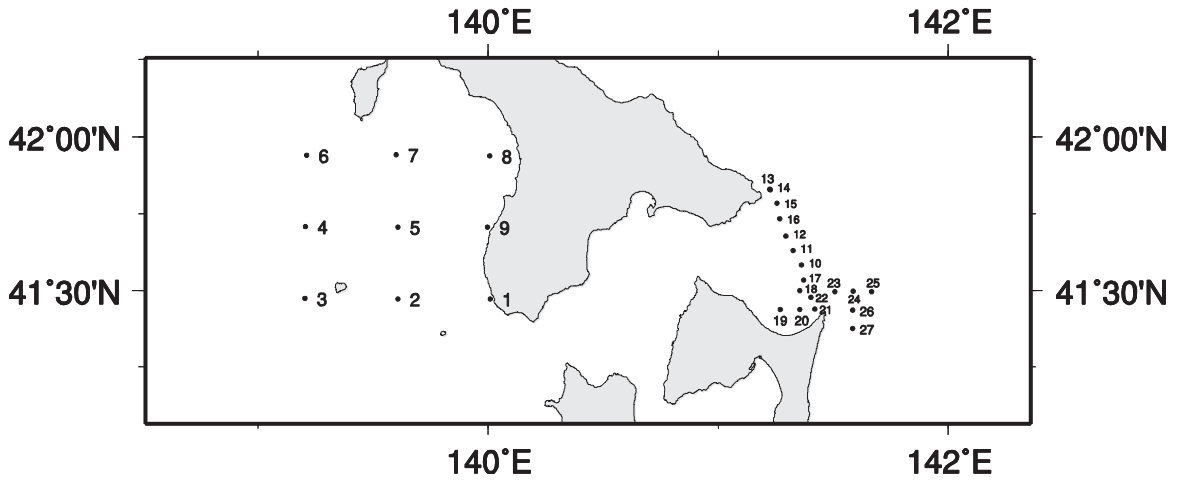


Figure 2. Oceanographic stations

Table 1. List of Oceanographic Station

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS11001	41-28.5N	144-00.2E	2/21	0534	9	82	3	17	8.6	bc	19Plus-4636
OS11002	41-28.6N	139-36.1E	2/21	0731	9	1257	3	20	20	bc	19Plus-4636
OS11003	41-28.7N	139-12.0E	2/21	1045	9	1135	-	-	8.6	bc	19Plus-4636
OS11004	41-42.7N	139-12.1E	2/21	1216	9	1950	-	-	8.5	bc	19Plus-4636
OS11005	41-42.6N	139-36.2E	2/21	1400	9	800	-	-	7.1	bc	19Plus-4636
OS11006	41-56.7N	139-12.3E	2/21	1619	9	3010	-	-	7.6	bc	19Plus-4636
OS11007	41-56.8N	139-35.7E	2/21	1812	9	515	-	-	7.6	bc	19Plus-4636
OS11008	41-56.5N	140-00.2E	2/21	2130	9	911	-	-	8.3	bc	19Plus-4636
OS11009	41-42.6N	139-59.6E	2/22	0433	9	80	4	16	8.9	bc	19Plus-4636
OS11010	41-35.2N	141-21.4E	2/23	1757	9	327	-	-	8.9	-	9Plus-0769
OS11011	41-38.1N	141-19.3E	2/23	1855	9	215	-	-	8.4	-	9Plus-0769
OS11012	41-40.9N	141-17.4E	2/23	1954	9	226	-	-	8.2	-	9Plus-0769
OS11013	41-49.9N	141-13.3E	2/23	2152	9	187	-	-	2.5	-	9Plus-0769
OS11014	41-49.9N	141-13.1E	2/23	2306	9	185	-	9	1.8	-	9Plus-0769
OS11015	41-47.3N	141-15.0E	2/24	0014	9	208	5	8.2	2.4	bc	9Plus-0769
OS11016	41-44.2N	141-15.7E	2/24	0107	9	222	4	12	2.9	bc	9Plus-0769
OS11017	41-32.3N	141-21.9E	2/24	0323	9	220	3	22	8.8	bc	9Plus-0769
OS11018	41-30.2N	141-20.9E	2/24	0504	9	258	3	23	9.3	bc	9Plus-0769
OS11019	41-26.5N	141-15.8E	2/24	0619	9	230	3	22	9.1	bc	9Plus-0769
OS11020	41-26.5N	141-20.9E	2/24	0718	9	82	3	20	9.2	bc	9Plus-0769
OS11021	41-26.5N	141-24.9E	2/24	0757	9	66	3	19	9.2	c	9Plus-0769
OS11022	41-28.9N	141-23.8E	2/24	0836	9	37	-	-	9.1	c	9Plus-0769
OS11023	41-30.0N	141-30.1E	2/24	0925	9	82	-	-	8.9	-	19Plus-4636
OS11024	41-30.0N	141-34.9E	2/24	1002	9	60	-	-	9.0	-	19Plus-4636
OS11025	41-29.9E	141-39.7E	2/24	1041	9	111	-	-	8.9	-	19Plus-4636
OS11026	41-26.4N	141-34.8E	2/24	1149	9	325	-	-	8.9	-	19Plus-4636
OS11027	41-22.8N	141-34.8E	2/24	1234	9	467	-	-	8.7	-	19Plus-4636

(*) : Fixed position by Global Positioning System

Table 2. Oceanographic data

Station OS11001 Latitude 41-28.5 N Longitude 140-00.2 E Depth(m) 82				Station OS11002 Latitude 41-28.6 N Longitude 139-36.1 E Depth(m) 1257				Station OS11003 Latitude 41-28.7 N Longitude 139-12.0 E Depth(m) 1135				Station OS11004 Latitude 41-42.7 N Longitude 139-12.1 E Depth(m) 1950			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	8.164	33.924	26.404	5	9.402	33.880	26.176	5	9.404	33.893	26.186	5	9.062	33.899	26.246
10	8.143	33.925	26.408	10	9.391	33.881	26.179	10	9.400	33.893	26.187	10	9.056	33.897	26.246
20	8.098	33.939	26.426	20	9.369	33.880	26.183	20	9.408	33.893	26.186	20	9.049	33.927	26.269
30	8.052	33.946	26.439	30	9.319	33.878	26.188	30	9.411	33.893	26.185	30	8.827	33.950	26.323
40	7.996	33.949	26.449	40	9.314	33.877	26.189	40	9.410	33.893	26.185	40	8.688	33.954	26.348
50	7.895	33.947	26.462	50	9.312	33.878	26.189	50	9.408	33.893	26.186	50	8.381	33.965	26.403
				75	9.313	33.879	26.190	75	9.255	33.927	26.236	75	7.100	34.008	26.622
				100	9.314	33.893	26.201	100	7.886	34.020	26.517	100	5.451	34.023	26.847
				125	8.638	33.990	26.383	125	6.537	34.019	26.708	125	4.050	34.008	26.992
				150	7.432	34.036	26.598	150	6.073	34.018	26.761	150	2.696	34.014	27.124
				175	5.913	34.004	26.771	175	5.541	34.007	26.824	175	2.403	34.021	27.155

Station OS11005 Latitude 41-42.6 N Longitude 139-36.2 E Depth(m) 800				Station OS11006 Latitude 41-56.7 N Longitude 139-12.3 E Depth(m) 3010				Station OS11007 Latitude 41-56.8 N Longitude 139-35.7 E Depth(m) 515				Station OS11008 Latitude 41-56.5 N Longitude 140-00.2 E Depth(m) 911			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	7.063	33.978	26.605	5	7.557	33.976	26.534	5	7.397	33.946	26.533	5	8.496	33.917	26.349
10	7.038	33.977	26.607	10	7.554	33.978	26.536	10	7.396	33.945	26.533	10	8.503	33.917	26.348
20	6.773	33.971	26.637	20	7.558	33.978	26.535	20	7.091	33.939	26.570	20	8.502	33.917	26.348
30	6.647	33.978	26.661	30	7.403	33.980	26.558	30	6.979	33.948	26.592	30	8.499	33.918	26.349
40	6.409	33.988	26.700	40	6.919	33.982	26.626	40	6.665	33.983	26.661	40	8.439	33.925	26.364
50	5.910	34.014	26.784	50	6.222	33.989	26.724	50	6.164	34.004	26.743	50	8.232	33.966	26.427
75	4.509	34.013	26.946	75	4.685	33.990	26.907	75	5.210	34.017	26.871	75	7.820	33.984	26.501
100	3.453	34.032	27.070	100	3.526	34.025	27.057	100	4.354	34.031	26.978	100	6.685	34.003	26.674
125	2.969	34.043	27.122	125	3.034	34.047	27.121	125	3.839	34.040	27.038	125	5.505	34.022	26.840
150	2.174	34.063	27.206	150	2.472	34.067	27.186	150	3.121	34.057	27.121	150	4.307	34.025	26.978
175	1.778	34.070	27.243	175	1.900	34.061	27.226	175	2.568	34.063	27.174	175	3.532	34.036	27.064
				200	1.587	34.069	27.257	200	2.067	34.068	27.219	200	2.802	34.061	27.153

Station OS11009 Latitude 41-42.6 N Longitude 139-59.6 E Depth(m) 80				Station OS11010 Latitude 41-35.2 N Longitude 141-21.4 E Depth(m) 327				Station OS11011 Latitude 41-38.1 N Longitude 141-19.3 E Depth(m) 215				Station OS11012 Latitude 41-40.9 N Longitude 141-17.4 E Depth(m) 226			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	8.579	33.917	26.331	5	8.812	33.897	26.284	5	8.296	33.890	26.358	5	8.155	33.864	26.359
10	8.470	33.933	26.365	10	8.773	33.897	26.290	10	8.293	33.890	26.358	10	8.157	33.864	26.358
20	8.328	33.939	26.392	20	8.620	33.882	26.303	20	8.304	33.888	26.355	20	8.007	33.841	26.363
30	8.191	33.925	26.401	30	8.546	33.880	26.312	30	8.275	33.884	26.356	30	7.921	33.832	26.368
40	8.189	33.930	26.405	40	8.447	33.872	26.321	40	8.184	33.872	26.361	40	7.871	33.824	26.369
50	8.211	33.946	26.414	50	8.344	33.861	26.328	50	8.154	33.869	26.362	50	7.774	33.812	26.374
75	8.101	33.952	26.436	75	7.971	33.815	26.347	75	7.105	33.742	26.413	75	7.460	33.764	26.381
				100	7.484	33.744	26.362	100	6.017	33.612	26.454	100	7.343	33.747	26.384
				125	6.964	33.691	26.392	125	5.611	33.570	26.470	125	6.505	33.619	26.397
				150	7.057	33.733	26.413	150	4.577	33.466	26.506	150	5.367	33.449	26.403
				175	5.819	33.542	26.423	175	4.451	33.458	26.513	175	4.974	33.394	26.405
				200	5.288	33.480	26.437					200	4.827	33.382	26.412
				250	4.951	33.455	26.456								
				300	4.182	33.463	26.545								

Station OS11013 Latitude 41-49.9 N Longitude 141-13.3 E Depth(m) 187				Station OS11014 Latitude 41-49.9 N Longitude 141-13.1 E Depth(m) 185				Station OS11015 Latitude 41-47.3 N Longitude 141-15.0 E Depth(m) 208				Station OS11016 Latitude 41-44.2 N Longitude 141-15.7 E Depth(m) 222			
Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T	Press.	Temp.	Sal.	SIG-T
5	1.675	32.811	26.242	5	1.697	32.811	26.240	5	1.592	32.796	26.235	5	2.332	32.920	26.280
10	1.719	32.817	26.243	10	1.668	32.812	26.243	10	1.582	32.796	26.236	10	2.276	32.922	26.286
20	1.947	32.865	26.265	20	1.804	32.834	26.251	20	1.606	32.802	26.239	20	2.331	32.934	26.292
30	2.404	32.956	26.303	30	2.033	32.883	26.274	30	1.740	32.820	26.244	30	2.459	32.965	26.306
40	2.568	33.009	26.332	40	2.438	32.965	26.308	40	1.902	32.855	26.261	40	2.683	33.013	26.326
50	2.653	33.034	26.345	50	2.639	33.020	26.336	50	2.312	32.943	26.300	50	2.795	33.037	26.336
75	2.800	33.062	26.355	75	2.772	33.049	26.347	75	3.353	33.148	26.375	75	2.966	33.078	26.354
100	3.018	33.126	26.388	100	3.030	33.122	26.384	100	5.954	33.590	26.444	100	3.415	33.157	26.377
125	3.112	33.176	26.419	125	3.106	33.173	26.417	125	5.062	33.455	26.444	125	4.228	33.319	26.426
150	3.143	33.197	26.433	150	3.149	33.190	26.427	150	4.651	33.405	26.449	150	3.121	33.228	26.460
								175	4.868	33.476	26.482	175	3.076	33.291	26.514
												200	2.876	33.306	26.543

Station	OS11017		
Latitude	41-32.3 N		
Longitude	141-21.9 E		
Depth(m)	258		
Press.	Temp.	Sal.	SIG-T
5	8.745	33.913	26.307
10	8.718	33.914	26.312
20	8.577	33.919	26.338
30	8.592	33.918	26.335
40	8.602	33.917	26.332
50	8.601	33.918	26.334
75	8.598	33.915	26.331
100	8.621	33.917	26.329
125	8.604	33.917	26.332
150	8.604	33.918	26.333
175	8.566	33.919	26.340
200	8.429	33.917	26.359

Station	OS11018		
Latitude	41-30.2 N		
Longitude	141-20.9 E		
Depth(m)	230		
Press.	Temp.	Sal.	SIG-T
5	8.907	33.909	26.278
10	8.872	33.908	26.284
20	8.748	33.912	26.306
30	8.741	33.913	26.307
40	8.735	33.914	26.309
50	8.731	33.914	26.310
75	8.726	33.915	26.311
100	8.698	33.914	26.315
125	8.607	33.913	26.328
150	8.582	33.914	26.333
175	8.556	33.917	26.340
200	8.476	33.908	26.345

Station	OS11019		
Latitude	41-26.5 N		
Longitude	141-15.8 E		
Depth(m)	82		
Press.	Temp.	Sal.	SIG-T
5	8.804	33.918	26.301
10	8.833	33.917	26.297
20	8.721	33.915	26.313
30	8.687	33.915	26.318
40	8.657	33.914	26.322
50	8.621	33.913	26.326

Station	OS11020		
Latitude	41-26.5 N		
Longitude	141-20.9 E		
Depth(m)	66		
Press.	Temp.	Sal.	SIG-T
5	8.876	33.916	26.289
10	8.778	33.914	26.303
20	8.751	33.916	26.308
30	8.734	33.916	26.311
40	8.709	33.917	26.316

Station	OS11021		
Latitude	41-26.5 N		
Longitude	141-24.9 E		
Depth(m)	37		
Press.	Temp.	Sal.	SIG-T
5	8.762	33.917	26.308
10	8.743	33.916	26.310
20	8.617	33.914	26.328
30	8.604	33.914	26.329

Station	OS11022		
Latitude	41-28.9 N		
Longitude	141-23.8 E		
Depth(m)	82		
Press.	Temp.	Sal.	SIG-T
5	8.807	33.909	26.295
10	8.771	33.909	26.300
20	8.725	33.913	26.310
30	8.706	33.915	26.315
40	8.698	33.917	26.318
50	8.678	33.918	26.321

Station	OS11023		
Latitude	41-30.0 N		
Longitude	141-30.1 E		
Depth(m)	60		
Press.	Temp.	Sal.	SIG-T
5	8.784	33.910	26.298
10	8.777	33.905	26.295
20	8.740	33.911	26.306
30	8.717	33.912	26.310
40	8.703	33.912	26.312

Station	OS11024		
Latitude	41-30.0 N		
Longitude	141-34.9 E		
Depth(m)	111		
Press.	Temp.	Sal.	SIG-T
5	8.814	33.916	26.298
10	8.815	33.916	26.298
20	8.815	33.916	26.298
30	8.816	33.916	26.298
40	8.817	33.915	26.297
50	8.820	33.915	26.297
75	8.669	33.916	26.321

Station	OS11025		
Latitude	41-29.9 E		
Longitude	141-39.7 E		
Depth(m)	610		
Press.	Temp.	Sal.	SIG-T
5	8.712	33.884	26.290
10	8.699	33.884	26.291
20	8.572	33.833	26.267
30	7.735	33.775	26.348
40	7.693	33.783	26.364
50	7.493	33.759	26.373
75	7.513	33.760	26.370
100	7.326	33.723	26.366
125	6.920	33.681	26.391
150	6.168	33.568	26.400
175	5.729	33.511	26.411
200	5.641	33.496	26.407
250	3.161	33.201	26.432
300	3.623	33.424	26.575
400	2.492	33.510	26.739
500	2.826	33.710	26.871

Station	OS11026		
Latitude	41-26.4 N		
Longitude	141-34.8 E		
Depth(m)	325		
Press.	Temp.	Sal.	SIG-T
5	8.661	33.911	26.319
10	8.660	33.912	26.319
20	8.663	33.911	26.318
30	8.663	33.911	26.318
40	8.664	33.911	26.318
50	8.665	33.911	26.318
75	8.660	33.910	26.318
100	8.642	33.906	26.318
125	8.635	33.908	26.320
150	8.605	33.904	26.322
175	8.333	33.872	26.338
200	7.115	33.688	26.359
250	6.763	33.668	26.402

Station	OS11027		
Latitude	41-22.8 N		
Longitude	141-34.8 E		
Depth(m)	467		
Press.	Temp.	Sal.	SIG-T
5	8.618	33.905	26.321
10	8.618	33.906	26.321
20	8.631	33.908	26.321
30	8.629	33.908	26.321
40	8.633	33.909	26.321
50	8.629	33.908	26.321
75	8.627	33.908	26.322
100	8.623	33.907	26.322
125	8.616	33.902	26.318
150	8.643	33.909	26.320
175	8.645	33.909	26.320
200	8.646	33.908	26.318
250	7.040	33.699	26.388
300	6.415	33.652	26.434

5. Drift Gillnet Research

Biological research for fur seal caught by drift gillnet were conducted. Although five gillnet researches were performed during this cruise, there were no catch of fur seal.

The operations were supervised by the captain, and were conducted by deck officers, crews and research staff.

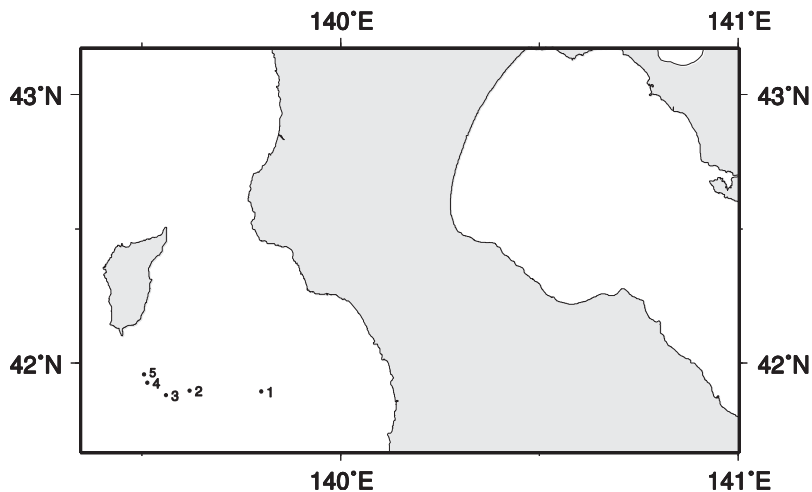


Figure 3. Locations of drift gillnet research

Table 3. Data on drift gillnet research

No. of research	Date and Time (S.M.T.)				Position		Wr	Wind	S.T. (°C)
	Net set		Net haul		Lat.(N)	Long. (E)			
1	22-Feb	0815-0819	22-Feb	0848-0855	41-56.9	139-47.9	c	ESE-2	8.6
2	22-Feb	0955-0958	22-Feb	1028-1040	41-57.0	139-37.1	c	East-1	8.7
3	22-Feb	1106-1110	22-Feb	1216-1222	41-56.5	139-33.5	bc	ESE-3	8.8
4	22-Feb	1515-1518	22-Feb	1612-1617	41-57.9	139-30.7	bc	ESE-2	8.3
5	23-Feb	0647-0650	23-Feb	0755-0800	41-58.8	139-30.2	bc	East-5	7.9

Wr.: Weather (bc:25-75% clouded, c: 75-99% clouded) S.T. : Surface temperature

