Regional Operations Centre
Canadian Coast Guard – Pacific

PACIFIC REGION CCG VESSEL -POST CRUISE REPORT

NAME OF SHIP/PLATFORM: **LAURIER**

DATE: **FROM:** **8 July 2005** **TO:** **21 July 2005**

SCIENCE CRUISE NUMBER: **2005-05** **SHIP'S PATROL NUMBER:**

CHIEF SCIENTIST[S]: **Bon van Hardenberg / Jackie Grebmeier**

AREAS OF OPERATION: **Gulf of Alaska, Bering & Chukchi Seas**

INTRODUCTION/ PROGRAM BACKGROUND:

This component of the Joint Western Arctic Climate Studies (JWACS) is a continuation of the multi-disciplinary collaboration between Dr. Eddy Carmack (Institute of Ocean Sciences, DFO/IOS), Dr. Jackie M. Grebmeier & Dr. Lee W. Cooper (University of Tennessee, Marine Ecology Group). Since 1998, annual oceanographic sampling has been done aboard the Canadian Coast Guard ship "Sir Wilfrid Laurier" in July during transit to its Canadian Arctic mission. Hydrographic and benthic sampling is repeated at selected sites in the Gulf of Alaska, the Bering Sea, and biologically active regions north and south of the Bering Strait. Associated research during this leg involves Dr. Jack DiTullio (University of Charleston) to investigate dimethyl-sulfoniopropionate (DMSP) and sulphur cycling that produce trace gases involved in global climate change; and Dr. Jim Overland (Pacific Marine Environmental Laboratory) and Dr. Terry Whitledge (University of Alaska Fairbanks), who look at water mass structure and nutrient cycling. In addition, this year Dr. Rebecca Woodgate (University of Washington /Applied Physics Lab) recovered and deployed moorings in & near Bering Strait to monitor the flow and water properties exchanged between the North Pacific and the Arctic Ocean.

CRUISE OBJECTIVES:

The following summary outlines the overall science fieldwork tasks:
1. cross-shelf hydrographic transects off Kodiak (10 stns) and Unimak Pass (9 stns),
2. a section onto the Bering Sea shelf south of area A (6 stations),
3. sampling at 5 benthic sites south of St. Lawrence in a "hot spot" region (A),
4. recovery and deployment of 2 oceanographic moorings near SLIP1 & 2 stations
5. sampling at 4 benthic stations in the NE Bering Sea (B)
6. a section of 13 CTD stations across eastern Bering Strait (C) (U.S. waters only),
7. recovery & deployment of 3 instrumented moorings near Bering Strait
8. sampling at 7 benthic stations in the SE Chukchi Sea (D) ,
9. profile data at sections near mooring A3, and off Cape Lisburne and Poit Hope,
10. sampling at 4 CTD stations during transit to Barrow, and sediment grabs at the head of Barrow Canyon.

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DAYS LOST DUE TO WEATHER: none

RESULTS: In spite of some periods of strong winds around Bering Strait, all science objectives were successfully completed.

RADIOISOTOPE USE: not applicable

PROBLEMS [SCIENTIFIC GEAR AND OPERATIONS]:

Pallet jack for the CTD/rosette failed but was repaired (insufficient hydraulic fluid). Science sounder was not operating for a while until loose connection was repaired. After several dozen casts, the NMEA option in the CTD deck unit caused conflicts with the CTD data stream and was disabled for the remaining stations. The water sampler pylon sometimes triggered several bottles randomly. It was returned to the factory for repair: a circuit board was replaced, as were the latch activators.

SUCCESSES [SCIENTIFIC]:

Excellent data were obtained in this ongoing study. The additional mooring deployments and CTD transects did increase the work load, but will provide further detail into the dynamics of the areas studied.

PROBLEMS [SHIP'S EQUIPMENT/ OPERATIONS/PLATFORM SUITABILITY]:

The limited availability of UPS power in the main lab still needs to be resolved. The current setup could lead to loss of data or spoiled samples when regular power is interrupted or fails. The upgrade with bench space and seats in the former radio room has greatly improved the available work space for science instrumentation away from the main chemical / wet-lab area.

SUCCESSES [SHIP]:

Easy and frequent email access for communication with labs and offices on shore was highly appreciated, as was the excellent provision of transfers at sea of science gear and samples to and from other vessels for transport to the west-coast labs.

DELAYS [OTHER THAN WEATHER]: none

SAFETY CONCERNS:

HAZARDOUS OCCURRENCES: none

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EVENT LOG: TO BE UPDATED WITH 2005 STNS !!!!

Cast #	Station	Date (UTC)	start time (UTC)	Lat Deg N	Lat Min	Lon Deg W	Lon Min	Water Depth (m)	Task
	Kodiak	05/07/08							Embark science
1	**KD-1**	05/07/09	18:12	57	31.870	152	1.375	68	CTD/R
2	**KD-2**	05/07/09	18:55	57	30.273	151	56.893	100	CTD/R
3	**KD-3**	05/07/09	19:35	57	28.386	151	50.992	75	CTD/R
4	**KD-4**	05/07/09	20:22	57	25.872	151	42.588	67	CTD
5	**KD-5**	05/07/09	21:12	57	23.216	151	33.514	70	CTD/R
6	**KD-6**	05/07/09	22:04	57	20.570	151	24.710	141	CTD/R
7	**KD-7**	05/07/09	22:58	57	17.900	151	16.252	147	CTD/R
8	**KD-8**	05/07/10	00:05	57	14.012	151	3.152	126	CTD/R
9	**KD-9**	05/07/10	01:15	57	9.682	150	50.186	885	CTD/R
10	**UN-8**	05/07/11	21:01	53	38.357	163	47.955	1750	CTD/R
11	**UN-7**	05/07/11	22:36	53	44.011	163	55.850	1340	CTD/R
12	**UN-6**	05/07/11	23:50	53	48.459	164	3.719	90	CTD/R
13	**UN-5**	05/07/12	00:48	53	53.061	164	11.717	80	CTD/R
14	**UN-4**	05/07/12	01:45	53	57.475	164	19.851	109	CTD/R
15	**UN-3**	05/07/12	02:43	54	2.443	164	27.892	101	CTD/R
16	**UN-2**	05/07/12	03:38	54	6.802	164	35.712	87	CTD/R
17	**UN-1**	05/07/12	04:29	54	11.289	164	43.752	69	CTD/R
18	**BS-1**	05/07/13	11:25	56	18.746	172	49.436	1700	CTD/R
19	**BS-2**	05/07/13	12:53	56	25.130	172	47.626	1400	CTD/R
20	**BS-3**	05/07/13	13:54	56	28.577	172	46.806	790	CTD/R
21	**BS-4**	05/07/13	15:02	56	32.751	172	45.348	240	CTD/R
22	**BS-5**	05/07/13	15:56	56	38.764	172	43.846	133	CTD/R
23	**BS-6**	05/07/14	07:42	59	19.226	173	29.956	109	CTD/R
24	**SLIP-1**	05/07/15	00:22	62	0.833	175	3.364	80	CTD/R +sediment
25	**SLIP-2**	05/07/15	02:49	62	3.017	175	12.313	83	CTD/R +sediment
26	**SLIP-3**	05/07/15	07:00	62	23.606	174	34.224	73	CTD/R +sediment
27	**04STL-1B**	05/07/15	13:26	62	11.474	174	51.742	79	CTD/R & mooring
28	**05BS-8A**	05/07/15	15:26	62	11.687	174	39.856	75	CTD/R & mooring
29	**SLIP-5**	05/07/15	19:32	62	33.822	173	33.256	66	CTD/R +sediment
30	**SLIP-4**	05/07/15	23:16	63	1.728	173	27.460	73	CTD/R +sediment
31	**BCS-6**	05/07/16	07:48	64	1.973	171	49.951	53	CTD/R
32	**UT-BS5**	05/07/16	14:10	64	39.994	169	55.347	48	CTD/R +sediment
33	**UT-BS2**	05/07/16	17:30	64	40.935	169	5.986	45	CTD/R +sediment
34	**UT-BS4**	05/07/16	21:18	64	57.534	169	53.112	49	CTD/R +sediment
35	**UT-BS1**	05/07/17	00:36	64	59.507	169	8.132	49	CTD/R +sediment
36	**BRS-0**	7/172005	06:57	65	43.425	168	57.449	40	CTD
37	**BRS-1**	05/07/17	07:22	65	42.989	168	53.943	49	CTD/R
38	**BRS-1a**	05/07/17	07:57	65	42.572	168	50.343	51	CTD
39	**BRS-1b**	05/07/17	08:23	65	42.262	168	46.659	53	CTD
40	**BRS-2**	05/07/17	08:43	65	42.012	168	42.977	52	CTD/R

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Cast #	Station	Date (UTC)	start time (UTC)	Lat Deg N	Lat Min	Lon Deg W	Lon Min	Water Depth (m)	Task
41	**BRS-2a**	05/07/17	09:15	65	41.426	168	38.659	53	CTD
42	**BRS-3**	05/07/17	09:41	65	40.933	168	34.039	53	CTD/R
43	**BRS-3a**	05/07/17	10:31	65	40.422	168	28.893	55	CTD
44	**BRS-4**	05/07/17	10:56	65	40.127	168	24.068	53	CTD/R
45	**BRS-4a**	05/07/17	11:29	65	39.695	168	20.192	50	CTD/R
46	**BRS-4b**	05/07/17	11:51	65	39.412	168	16.363	46	CTD/R
47	**BRS-5**	05/07/17	12:11	65	39.113	168	12.990	41	CTD/R
48	**BRS-5a**	05/07/17	12:49	65	38.937	168	10.184	23	CTD/R
49	**A4**	05/07/17	14:58	65	44.683	168	15.976	49	CTD & mooring
50	**A2**	05/07/17	17:44	65	46.731	168	34.680	57	CTD/R & mooring
51	**A3**	05/07/18	01:54	66	19.509	168	57.764	58	CTD & mooring
52	**a3-2**	05/07/18	02:41	66	21.390	168	48.365	57	CTD
53	**a3-2a**	05/07/18	03:08	66	22.073	168	43.917	49	CTD/R
54	**a3-3**	05/07/18	03:35	66	22.975	168	39.669	58	CTD
55	**a3-4**	05/07/18	04:16	66	24.377	168	29.975	55	CTD
56	**a3-5**	05/07/18	04:57	66	26.100	168	18.544	48	CTD/R
57	**a3-6**	05/07/18	05:42	66	28.146	168	6.200	29	CTD
58	**a3-7**	05/07/18	06:15	66	29.721	167	56.911	24	CTD
59	**a3-8**	05/07/18	07:03	66	31.788	167	42.704	25	CTD/R
60	**a3-9**	05/07/18	08:00	66	34.737	167	25.316	30	CTD
61	**a3-10**	05/07/18	08:51	66	37.418	167	9.234	33	CTD
62	**a3-11**	05/07/18	09:45	66	40.022	166	51.466	34	CTD
63	**UTN-1**	05/07/18	13:50	66	42.501	168	23.895	35	CTD/R +sediment
64	**UTN-2**	05/07/18	17:30	67	3.019	168	43.885	47	CTD/R +sediment
65	**UTN-3**	05/07/18	20:28	67	20.061	169	0.003	50	CTD/R +sediment
66	**UTN-4**	05/07/18	22:28	67	30.065	168	54.604	50	CTD/R +sediment
67	**UTN-5**	05/07/19	00:32	67	40.222	168	57.465	51	CTD/R +sediment
68	**UTN-6**	05/07/19	02:58	67	44.169	168	26.298	50	CTD/R +sediment
69	**UTN-7**	05/07/19	05:53	67	59.944	168	56.009	58	CTD/R +sediment
70	**ph-1**	05/07/19	07:42	68	2.617	168	39.487	60	CTD
71	**ph-2**	05/07/19	08:38	68	5.208	168	21.617	60	CTD
72	**ph-3**	05/07/19	09:29	68	7.806	168	5.837	55	CTD
73	**ph-4**	05/07/19	10:21	68	10.412	167	49.043	54	CTD/R
74	**ph-5**	05/07/19	11:12	68	13.000	167	32.263	49	CTD
75	**ph-6**	05/07/19	12:02	68	15.587	167	15.434	46	CTD
76	**ph-7**	05/07/19	12:59	68	17.626	166	59.587	37	CTD/R
77	**ph-8**	05/07/19	13:21	68	18.291	166	55.895	34	CTD
78	**cpl-0**	05/07/19	17:41	68	53.116	166	15.542	16	CTD
79	**cpl-1**	05/07/19	18:03	68	54.200	166	19.878	28	CTD
80	**cpl-2**	05/07/19	18:27	68	55.869	166	26.226	34	CTD
81	**cpl-3**	05/07/19	19:04	68	58.521	166	37.895	40	CTD
82	**cpl-4**	05/07/19	19:46	69	1.518	166	51.105	45	CTD/R
83	**cpl-5**	05/07/19	21:14	69	5.918	167	11.882	49	CTD
84	**cpl-6**	05/07/19	22:41	69	12.950	167	42.075	51	CTD

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85	**BD-6**	05/07/20	03:14	69	11.851	166	8.996	31	CTD/R
86	**CKS-1**	05/07/20	20:01	70	37.021	161	5.709	34	CTD
87	**BD-7**	05/07/21	02:56	71	9.556	158	24.085	49	CTD
88	**BC2**	05/07/21	13:59	71	24.791	157	29.247	128	CTD/R +sediment
	Barrow								Disembark

SUMMARY/FINAL COMMENTS:

The members of the science team wish to extend their thanks to the Captain and the ship's officers and crew for their hospitality and their able and willing assistance above and beyond their duties in making this mission a success. The ship is an excellent platform for science programs, and we appreciate the extensive efforts that have been made to modify and improve the vessel for science tasks.