

CSS DAWSON CRUISE 88-042

DEC 3-DEC 10, 1988

G. L. BUGDEN

Department of Fisheries and Oceans
Physical and Chemical Sciences Branch
Scotia-Fundy Region
Bedford Institute of Oceanography
Dartmouth, N.S. B2Y 4A2
Canada

Cruise Particulars

Cruise Number: 88-042
Vessel: CSS Dawson
Dates: December 3-10, 1988
Area: Gulf of St. Lawrence
Responsible Agency: Dept. of Fisheries and Oceans
Physical and Chemical Sciences
Scotia-Fundy Region

Senior Scientist: G. L. Bugden (PCS)

Scientific Personnel: R. R. Lively (PCS)
E. A. T. Verge (PCS)
P. d'Entremont (PCS)
R. Pattipas (PCS)

Purpose

1. Obtain temperature-salinity soundings from 35 stations in the Gulf of St. Lawrence for preparation of seasonal ice outlook by the Ice Climatology Branch of the Atmospheric Environment Service.
2. Acquire dissolved oxygen and nutrient data from these 35 stations in aid of ongoing climatological studies.

Operations and Nature of Data Gathered

CTD-Rosette

Temperature and salinity profiles were obtained at all stations using a Guildline Digital CTD. Data were logged, processed and displayed using a MicroVax II computer system. A rosette sampler was used with the CTD to collect water samples at several depths at each station for dissolved oxygen and nutrient analysis. Nutrient samples were frozen for later analysis. Oxygen samples were processed on board. It had been hoped to try out the new automated oxygen analysis system, but it was unavailable. One rosette bottle was fitted with a pair of reversing thermometers for CTD temperature calibration. Salinity samples for calibration were also drawn from this bottle. One salinity sample was analyzed on board using a Guildline Autosol Salinometer and a duplicate salinity sample was retained for analysis upon return to EIO.

All 35 intended stations were occupied as little time was lost to weather or ship related problems. However, some problems were encountered with both the CTD probe and the data logging computer. Both hardware and software problems were encountered with the computer. The hardware problems were later traced to some confusion with the cables at the back of the unit.

The end result of this confusion was to slow the operation of the machine down as it was attempting to communicate with a non-existent device and generating errors. The data quality was in no way impaired by this fault, but some frustration was created by the slow response of the machine. A few small bugs were found in the 'Bottle System' thermometer correction program and future users are warned to check their results against the old manual tables. The problem with the CTD probe was slightly more serious.

The temperature channel performed well and appeared to be accurate when compared to the reversing thermometers. The thermometers used on this cruise had had ice point determinations done last year and as they compared well with each other and the CTD some confidence in our measurement of this parameter was felt. (Note that these ice points are not included in the standard calibration set for these thermometers which is used to produce both the manual tables and the MicroVax II 'Bottle System' files. They were determined by B. Carson after my complaints following the Ice Forecast Cruise last year and were applied manually. As the change in the ice points from the last time these thermometers were calibrated to the most recent calibration was as much as 0.05°C these corrections must be considered.)

The salinity (conductivity) channel unfortunately did not behave nearly as well. An apparent offset of approximately -0.08‰ between the CTD results and the Autosal salinometer values was found to exist. The standard deviation of this offset over about 35 values was 0.03‰ giving some indication that the probe calibration was not stable. This is presently under investigation. It is apparent that some more formal method of checking the calibration and operation of the CTD probes during the field season must be instituted. As several previous operators of this particular probe did not work up their in-situ calibrations during their cruises there was no indication that problems might exist. This is the rule rather than the exception and leaves open the possibility of happily sailing about collecting garbage data at great expense when the indications to prevent this are readily available. This problem must be followed up.

Temperature and salinity profiles were collected at each station and a decimated data set (after suitable corrections) was sent to Ice Central immediately after the cruise. The following table shows the number and type of discrete samples collected at each station as well as other relevant information. The cruise track is indicated on the attached chart.

As in previous years the skill and co-operation of the officers and crew of the CSS Dawson was an important factor in the success of this cruise.

STATION #	LATITUDE (N)	LONGITUDE (W)	DEPTH M	DATE	GMT	OXYGEN	NUTRIENTS
1	46°55.1	60°10.8	84	88-12-04	1735	3	3
2	47°04.9	60°01.5	291	88-12-04	1901	7	7
3	47°14.9	59°51.1	450	88-12-04	2103	9	9
4	47°25.5	59°35.7	478	88-12-04	2313	9	9
5	47°34.9	59°20.0	243	88-12-05	0152	4	4
6	47°59.9	59°29.4	155	88-12-05	0627	4	4
7	48°08.8	60°06.6	470	88-12-05	1142	9	9
8	48°21.5	60°39.0	450	88-12-05	1648	9	9
9	48°35.9	61°11.0	400	88-12-05	2029	8	8
10	48°55.0	61°39.9	168	88-12-06	0046	4	4
11	49°07.1	60°00.1	264	88-12-06	0740	6	6
12	49°19.5	58°31.2	63	88-12-06	1356	2	2
13	49°34.6	58°51.0	152	88-12-06	1615	4	4
14	49°50.0	59°25.0	260	88-12-06	1915	6	6
15	50°05.0	59°55.0	128	88-12-06	2155	4	4
16	49°44.7	61°49.1	265	88-12-07	0653	6	6
17	50°02.4	64°04.4	114	88-12-07	1508	3	3
18	50°01.5	66°18.9	139	88-12-08	0051	4	4
19	49°48.0	63°18.4	305	88-12-08	0244	7	7
20	49°34.2	66°18.7	330	88-12-08	0605	8	8
21	49°24.5	66°18.6	326	88-12-08	0851	8	8
22	49°14.5	66°18.3	213	88-12-08	1050	5	5
23	49°25.6	65°36.3	340	88-12-08	1530	8	8
24	49°12.3	64°49.0	122	88-12-08	1856	3	3
25	49°18.0	64°43.4	369	88-12-08	2002	8	8
26	49°24.0	64°39.8	379	88-12-08	2132	8	8
27	49°30.5	64°29.3	302	88-12-08	2306	7	7
28	49°39.0	64°24.8	190	88-12-09	0034	5	5
29	49°09.8	63°52.7	385	88-12-09	0411	8	8
30	48°56.3	63°04.0	392	88-12-09	0807	8	8
31	48°42.5	62°19.0	387	88-12-09	1157	8	8
32	48°19.4	63°09.6	55	88-12-09	1624	2	2
33	47°49.4	62°49.1	72	88-12-09	1931	2	2
34	47°09.4	63°09.6	62	88-12-09	2333	2	2
35	46°46.6	62°02.9	66	88-12-09	0402	2	2

CTD station locations, depths and times along with number of discrete samples collected for cruise 88-042

88-042

