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Water temperature off Newfoundland and Labrador in 1982

by

V. V. Burmakin
Polar Research Institute of Marine Fisheires and Oceanography (PINRO)
6 Knipovich Street, Murmansk, 183763, USSR

Abstract

The paper deals with water temperature anomalies on standard sections in NAFO Subareas 2 and 3 in May, July and November in 1982. Positive temperature anomalies were dominant over the eastern and southern slopes of the Grand Bank in May, whereas negative anomalies occurred on section 8-A in July and November. Extremely low anomalies, close to those registered in unusually "cold" 1972, were observed in the 0 - 50 m layer of the Coastal and Offshore Jets of the Labrador Current. Anomalies in the core of the Labrador Current in the 50 - 200 m layer and in the 200 - 500 m layer in the frontal zone were moderately cold.

Materials and Methods

In 1982 hydrological observations on standard sections off Newfoundland and Labrador were made in April - July during 25-th trip of FRV "Suloy" and in November during 26 trip of this ship.

Mean temperature and its anomalies were calculated by parts of sections, suggested by A.A. Elizarov (1962) and V.V. Burmakin (1972, 1976).

Results

Water temperature in the 0 - 200 m layer over the eastern slope of the Grand Bank (sections 3-A, 4-A, 7-A) was close to the long-term mean in May (anomalies -0,2, -0,3°) and over the south-west

slope (section 1-A) was 1,1° above norm (Table 1). In July and November negative anomalies were dominant in the abovementioned layer over the Shelf and in particular over the slope off southern Labrador (section 8-A, parts AB and C).

Water temperature in the 200 - 500 m as well as in the 0 - 200 m layers on the slopes of the Grand Bank was close to a normal one (Table 2) in May. In July and November negative anomalies were found over the Shelf (- 0,64°) and over the slope (- 0,37°) off Southern Labrador.

A detailed examination of temperature changes in the 0-50, 50-200, 200-500 m layers on section 8-A in November (from a 19 year series of observations: 1964 - 1982) showed a considerable cooling of the surface layer (0 - 50 m): in the cold component of the Labrador Current over the Shelf down to -0,88° and in the Atlantic component over the slope down to -1,84° (Table 3). The core of the Labrador Current (50 - 200 m layer) was moderately cold in the Coastal and Main Branches and extermely cold - in the Atlantic Branch (C).

Over the entire period of observations made in November 1964 - 1982 the last year is mostly close to a hydrologically very cold 1972 in the 0 - 50 m layer and to moderately cold 1974 and 1976 in the 50 - 200 m layer of the Coastal and Main Branches of the Labrador Current. Over the entire period of observations maximum negative anomalies were found in the 0 - 50, 50 - 200 m layers of the Atlantic component and insignificant negative anomalies - in the 200 - 500 m layer (See National Report for NAFO - June 1983, Table 22).

Water temperature in the Labrador Current on the whole was close to "cold" years' level in the 0 - 50 m layer and to "moderately cold" years' level in the 50 - 200 m and 200 - 500 m layers.

Conclusions

In May 1982 water temperature in the 0 - 200 m and 200 - 500 m layers over the eastern slope of the Grand Bank was close to

the long-term mean. In July and November negative anomalies were dominant over the Shelf and slope off Southern Labrador.

Data available by early November 1982 indicate that water temperature on section across Hamilton Inlet Bank was significantly below in the 0 - 50 m layer and slightly below - in the 50 - 200 and 200 - 500 m layers as compared to the long-term '64 - '82 mean.

References

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Table 1. Temperature anomalies in the 0-200 m layer in 1982.

Section	Date	May	July	November
8-A (A)	4 November			-0,43
8-A (B)	5 November			-0,44
8-A(C)	5 November			-I,39
8-A(A)	6 July		0,03	
8-A(B)	6 July		-0,63	
8-A(C)	6 July		-0,73	
7-A	26 May	-0,20		
4-A	I7 May	0,30		
3-A	I8 May	0,I0		
I-A	23 May	I,I0		

Table 2. Temperature anomalies in the 200-500 m layer in 1982.

Section	Date	May	July	November
8-A (B)	5 November			-0,64
8-A (C)	5 November			-0,37
8-A (B)	6 July		-0,26	
8-A (C)	6 July		-0,I9	
7-A	26 May	0,00		
4-A	I7 May	0,30		
3-A	I8 May	-0,30		
I-A	23 May	0,00		

Table 3. Mean temperature (t) and its anomalies (Δ) compared to the long-term mean for the 1964-1982 period on section B - A across Labrador on 4-5 November 1982.

Parts of section 8-A	Layers, m							
	0-50		50-200		0-200		200-500	
	t	Δ	t	Δ	t	Δ	t	Δ
A	0,46	-0,84	-0,09	-0,27	0,08	-0,43	-	-
B	0,48	-0,85	0,94	-0,28	0,82	-0,44	I,36	-0,64
C	I,83	-I,84	2,36	-I,2I	2,23	-I,39	3,58	-0,37
AB	0,44	-0,88	0,42	-0,20	0,44	-0,38	-	-
ABC	0,8I	-I,04	0,94	-0,35	0,9I	-0,53	-	-