

IS- OG BESEJLINGSFORHOLDENE I DE DANSKE FARVANDE

I VINTEREN 1989-90

ICE AND NAVIGATIONAL CONDITIONS
IN DANISH WATERS DURING THE WINTER
1989-90



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Oplysningerne til denne beretning om is- og besejlingsforholdene i de danske farvande i vinteren 1989-90 er indsamlet og bearbejdet som i tidligere år.

Almindelig oversigt

Luftens middeltemperatur og antallet af frostdøgn i efterårs- og vintermånederne var for hele landet, ifølge oplysninger modtaget fra Meteorologisk Institut, som følger:

November	+4,5 mod normalt +5,0 - afv. -0,5 antal døgn med frost 12,4 mod normalt 6,0 - afv. +6,4
December	+2,6 mod normalt +2,3 - afv. +0,3 antal døgn med frost 13,9 mod normalt 14,0 - afv. -0,1
Januar	+4,1 mod normalt 0,0 - afv. +4,1 antal døgn med frost 5,0 mod normalt 21,0 - afv. -16,0
Februar	+5,4 mod normalt -0,3 - afv. +5,7 antal døgn med frost 2,6 mod normalt 19,0 - afv. -16,4
Marts	+6,0 mod normalt +1,7 - afv. +4,3 antal døgn med frost 6,5 mod normalt 19,0 - afv. -12,5

Landsmiddeltemperaturen var i efteråret 1989 for oktober lidt over (ca. +1,4) og for november måneder lidt under normalen (ca. -0,5) for årstiden. I første halvdel af december var middeltemperaturen lidt under (0 - -2) og i sidste halvdel lidt over (+2 - +4) normalen for årstiden. I januar steg temperaturen til 4-5 grader over det normale og holdt sig her resten af vintersæsonen.

Overfladevandets temperatur var i første del af december såvel lidt under som lidt over normalen for årstiden, for fra midten af december at holde sig lidt over normalen. Fra midten af januar og resten af vintersæsonen holdt søvandets temperatur 3-4 grader over normalen.

Enkelte dage med forholdsvis lave temperaturer i december forårsagede kortvarige, ringe isdannelse enkelte steder i de indre danske farvande. Der observeredes således begyndende

isdannelser i Ringkøbing fjord den 16-17/12, ligeledes i Isefjorden (Frederikssund) og i Limfjorden ud for Løgstør, i Ringkøbing fjord igen den 5-8/1-90.

Første ismelding modtoges fra Sverige den 8/12-89 og fra Finland den 11/12-89, med restriktioner for skibsfarten hhv. den 18. og 16/12.

Sidste ismelding fra Sverige modtoges den 25/5 og fra Finland den 24/5-90, hvilke dage begge lande afsluttede isbrydningen.

De på efterfølgende sider viste tabeller angiver specialoplysninger om temperaturer og isforhold ved særlige observationssteder m.v.

Således viser:

Tabel 1: Luftens middeltemperatur og afvigelser fra normalen fra seks vidt adskilte steder i landet.

Tabel 2: Vinterens frostdøgn. Middeltallet for vinterens kuldesum er beregnet til -10,2 mod middelvinterens godt 100.

Tabel 3: Grafisk oversigt over middeltal af kuldesummer for vintrene fra 1906-07 til dato.

Tabel 4: Forholdene ved observationssteder, hvorfra isforekomster er rapporteret.

Tabel 5: Sammenligning mellem forskellige vintre.

Tabel 6: Statisbrydernes virksomhed gennem de sidste 25 år.

Tabel 7: Skematisk oversigt over is- og besejlingsforholdene på strækningen Skagen-Gedser henholdsvis gennem Storebælt og gennem Øresund, endvidere løbene til Fredericia, Kalundborg og Stignæs samt Limfjorden og Esbjerg i perioden 1929/30 til 1989/90.

Tabel 8: Kurver over overfladevandets gennemsnitstemperatur i gennemsejlingsfarvandede, normaltemperaturen og luftens gennemsnitstemperatur.

ICE AND NAVIGATIONAL CONDITIONS IN DANISH WATERS DURING THE WINTER 1989-90

Information for this report about ice and navigational conditions in Danish waters during the recent winter has been obtained and prepared in the same manner as in previous years.

General survey

According to information from the Danish Meteorological Institute the mean air temperatures and amount of days with frost for the whole country in the winter months of 1989-90 (given in centigrade) were as follows:

November	+4.5 normal +5.0 (div. -0.5) Days with frost 12.4, normal 6.0 (div. +6.4)
December	+2.6 normal +2.3 (div. +0.3) Days with frost 13.9, normal 14.0 (div. -0.1)
January	+4.1 normal 0.0 (div. +4.1) Days with frost 5.0, normal 21.0 (div. -16.0)
February	+5.4, normal -0.3 (div. +5.7) Days with frost 2.6, normal 19.0 (afv. -16.4)
March	+6.0 normal +1.7 (div. +4.3) Days with frost 6.5, normal 19.0 (div. -12.5)

The mean air temperature in the autumn 1989 was for October a little above (+1.4) and for November a little below (-0.5) normal.

In the first part of December the mean air temperature was a little below (0 to -2.0) and in the last part of the month a little above (+2 to +4) normal.

In January 1990 the temperature rose to 4 to 5 degrees above normal, and stayed there for the rest of the winter period.

The sea surface temperature was in the first part of December slightly below as well as slightly above normal. From the middle of December the temperature remained a little above normal.

From the middle of January and the rest of the winter period the sea surface temperature kept 3 to 4 degrees above normal.

A few days with rather low temperatures in December caused a short period with insignificant ice formations a few places in the inner Danish waters. Beginning ice formation were thus reported the 16-17/12 in Ringkøbing Fjord, in Isefjorden (Frederikssund) and in Limfjorden outside Løgstør, and again in Ringkøbing Fjord the 5-8/1 1990.

The first ice report from Sweden was received 8/12-89 and from Finland 11/12-89, with restrictions for navigation respectively 18 and 16/12. The last ice reports from Sweden was received 25/5 and from Finland 24/5-90. At the same time the icebreaking service terminated.

The tables on the following pages contain detailed information about temperatures and ice conditions at selected ice observation stations as follows:

Table 1: Mean air temperatures and variations from the normal at 6 widely separated places in the country.

Table 2: Days with frost during the winter. The mean amount of cold has been calculated at -10.2 against the mean amount of a normal winter of just above 100.

Table 3: Graphic summary of mean amounts of cold for the winters 1906-07 to date.

Table 4: Conditions at stations from where reports of ice formations have been submitted.

Table 5: A comparison between winters.

Table 6: The activity of the government icebreakers over a period of 25 years.

Table 7: Information in tabular form of ice and navigational conditions from the Skaw to Gedser through the Great Belt and The Sound respectively, and in the approaches to Fredericia, Kalundborg, Stignæs and Esbjerg, and also through Limfjorden in the period from 1929/30 to 1989/90.

Table 8: Graphic curves showing the average temperature of surface water in main through passages, the normal temperature and average air temperature.

Tab. 1.

Luftens middeltemperatur samt afvigelserne fra normalen i vinteren 1989-90
Mean temperature of the air and variations from normal during the winter 1989-90

Måned Month	Middeltemp./afv. Mean temp./var.	Fornæs	Fanø	Læsø	København	Næsgård	Hammerodde*
November	middeltemp. afvigelse	5,7 0,0	5,0 -0,7	5,6 +0,4	5,2 -0,2	4,8 -0,5	6,3 -0,6
December	middeltemp. afvigelse	2,9 0,0	3,6 +0,7	2,7 +0,2	2,9 +0,4	3,0 +0,7	4,1 +1,2
Januar	middeltemp. afvigelse	4,3 +3,7	4,8 +4,3	4,5 +4,6	4,5 +4,4	4,2 +4,2	4,4 +3,9
Februar	middeltemp. afvigelse	5,6 +5,5	5,9 +5,9	5,7 +6,4	6,1 +6,2	5,8 +6,0	5,8 +5,8
Marts	middeltemp. afvigelse	6,1 +4,3	7,0 +5,4	6,4 +5,0	6,8 +4,9	6,6 +4,7	6,0 +4,7

*) Normaler fra Sandvig.

Tab. 2. **Kuldedøgn i vinteren 1989-90**
Days with frost during the winter 1989-90

Sted Place	Frosdøgn og frosperioder Dates and periods with frost		Samlet kuldesum Amount of cold		
Fornes	25/11	1-2/12	16/12	-10,0	
	1	14-16/12	1		
	-1,4	3	-2,8		
Fane	20/11	24-25/11	30/11-1/12	3-4/1	-11,3
	1	28/11	31/12	2	
	-0,3	1	1	-0,2	
Læse	24/11	9/12	13-16/12		-17,5
	1	11/12	4		
	-1,9	1	-4,1		
Landbohøjsk.	24-25/11	1-2/12	14-16/12	2/1	-14,7
	2	9/12	3	1	
	-4,8	1	-2,7	-0,1	
Næsgård	24-25/11	9/12	30/12	4/1	-7,2
	2	15/12	1	1	
	-4,4	1	-0,6	-0,6	
Hammerødde	25/11	4/1			-0,2
	1				
	-0,1				

N.B.: a = datoer for perioder med frost
dates for periods with frost

b= antal dage hvor middelttemperaturen har været under 0°
number of days with mean temperature below 0°

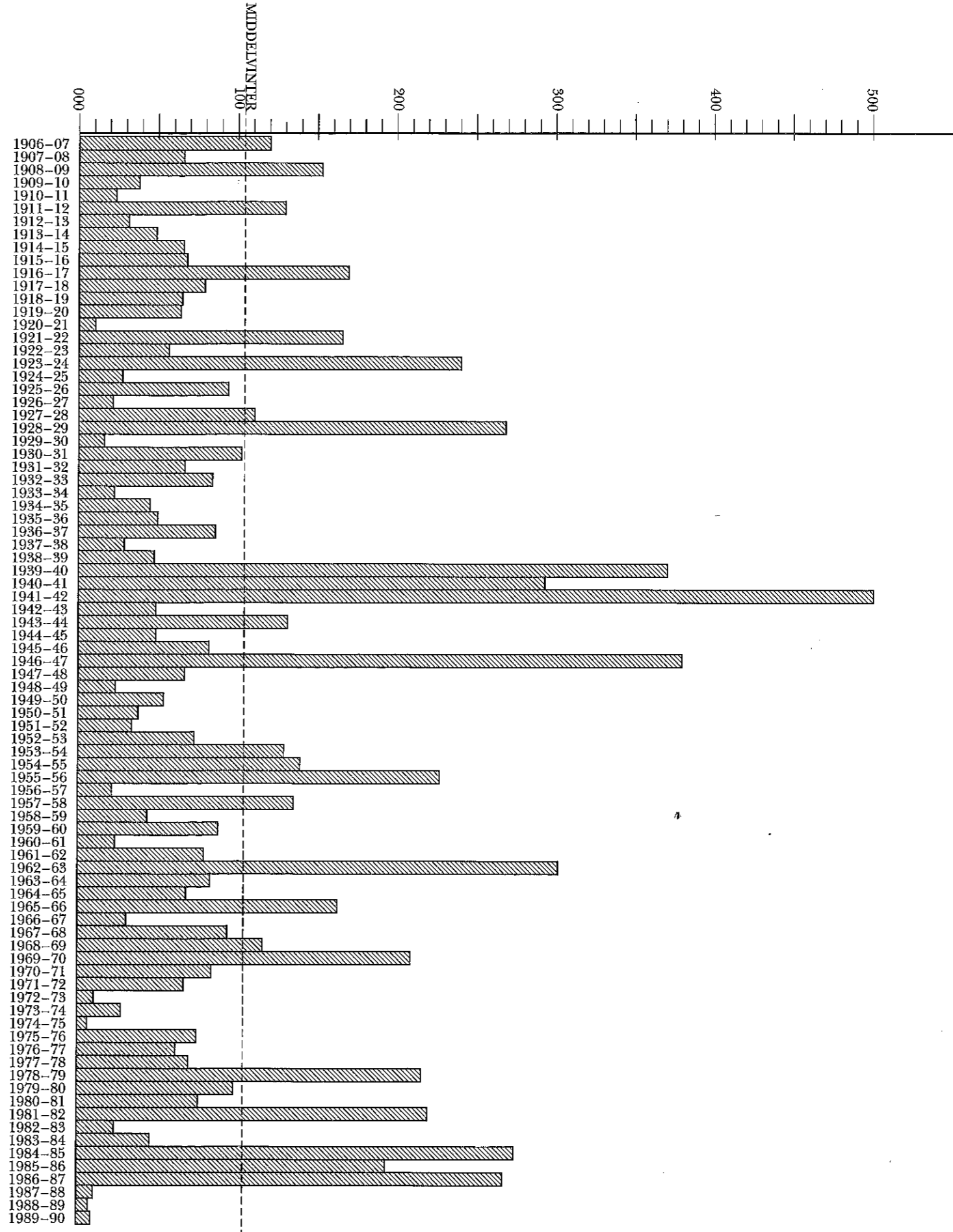
c = kuldesum = summen af frosperiodens daglige middeltemperatur
amount of cold = sum of daily mean temperatures in the period with frost

Middeltal
Means amount

-10,2

Tab. 3.

Grafisk oversigt over middeltal af kuldesummer for vintrene 1906-07 til 1989-90
Graphic summary of mean amounts of cold for the winters 1906-07 to 1989-90



Sammenligning mellem
Comparison between

Tab. 5.

Gennemsnitligt antal dage med is for: Average number of days with ice in:	1906 -07	1907 -08	1908 -09	1909 -10	1910 -11	1911 -12	1912 -13	1913 -14	1914 -15	1915 -16	1916 -17	1917 -18	1918 -19	1919 -20	1920 -21
Åbne farvande Open waters	6.6	0.2	18.6	0.1	0.0	17.7	0.3	0.1	0.0	0.1	21.4	1.2	0.7	0.0	0.0
Havne ved åbent farvand Harbours at open waters	17.4	2.9	28.4	2.2	0.5	20.4	3.2	2.1	0.5	2.7	33.5	6.1	4.4	2.7	0.0
Tildels lukkede farvande Partly closed waters	24.2	6.7	41.0	2.1	0.2	35.1	6.2	4.6	2.7	3.7	50.7	9.1	8.5	6.9	0.1
Havne ved lukkede farvande Harbours in closed waters	52.8	25.5	69.2	14.2	9.6	49.1	18.4	15.0	16.9	18.1	71.6	34.3	28.6	24.8	1.5
Lukkede farvande Closed waters	57.9	32.2	66.3	20.7	5.6	52.9	19.1	16.6	19.3	22.1	78.5	48.1	31.1	41.0	4.1
Alle stationer All stations	30.3	10.1	38.8	5.7	2.4	31.5	7.4	6.0	6.1	7.3	44.9	15.3	11.6	11.9	0.9
Middeltal af kuldesum for stat. i tab. 2 Mean amount of cold for stations in tab. 2	121.1	65.8	151.6	37.9	23.9	128.6	31.9	49.2	66.3	68.2	169.5	79.4	65.2	64.3	11.3

1942 -43	1943 -44	1944 -45	1945 -46	1946 -47	1947 -48	1948 -49	1949 -50	1950 -51	1951 -52	1952 -53	1953 -54	1954 -55	1955 -56	1956 -57	1957 -58	1958 -59	1959 -60	1960 -61	1961 -62
0.0	0.0	1.0	0.3	65.0	0.6	0.0	0.2	0.0	0.1	1.9	13.6	9.0	29.6	0.1	5.5	0.2	1.8	0.0	0.0
3.3	0.0	2.0	2.2	70.0	0.8	0.0	2.9	1.3	0.5	4.3	25.1	13.4	29.8	0.2	9.5	0.3	5.0	1.4	0.4
2.1	0.0	3.4	1.4	78.0	2.8	0.0	2.8	1.9	0.6	4.6	32.0	18.6	37.7	0.2	7.2	1.3	7.7	1.3	2.1
11.9	1.3	16.7	15.3	85.6	15.1	0.5	11.7	11.0	4.7	16.3	45.5	42.3	48.0	2.2	28.8	9.2	24.1	7.4	13.6
14.6	1.5	20.7	17.8	97.3	20.4	1.5	15.2	16.3	6.1	21.5	52.0	51.8	56.8	3.5	44.9	12.5	36.2	11.3	21.1
7.1	0.7	9.8	8.2	82.0	9.1	0.5	7.2	7.0	2.7	10.7	35.7	30.2	42.7	1.4	21.1	5.6	17.2	4.9	8.7
49.4	131.1	49.5	82.5	378.0	67.0	(23.8)	53.7	38.4	34.4	72.9	129.3	139.2	226.0	22.4	135.1	43.9	87.6	23.9	78.9

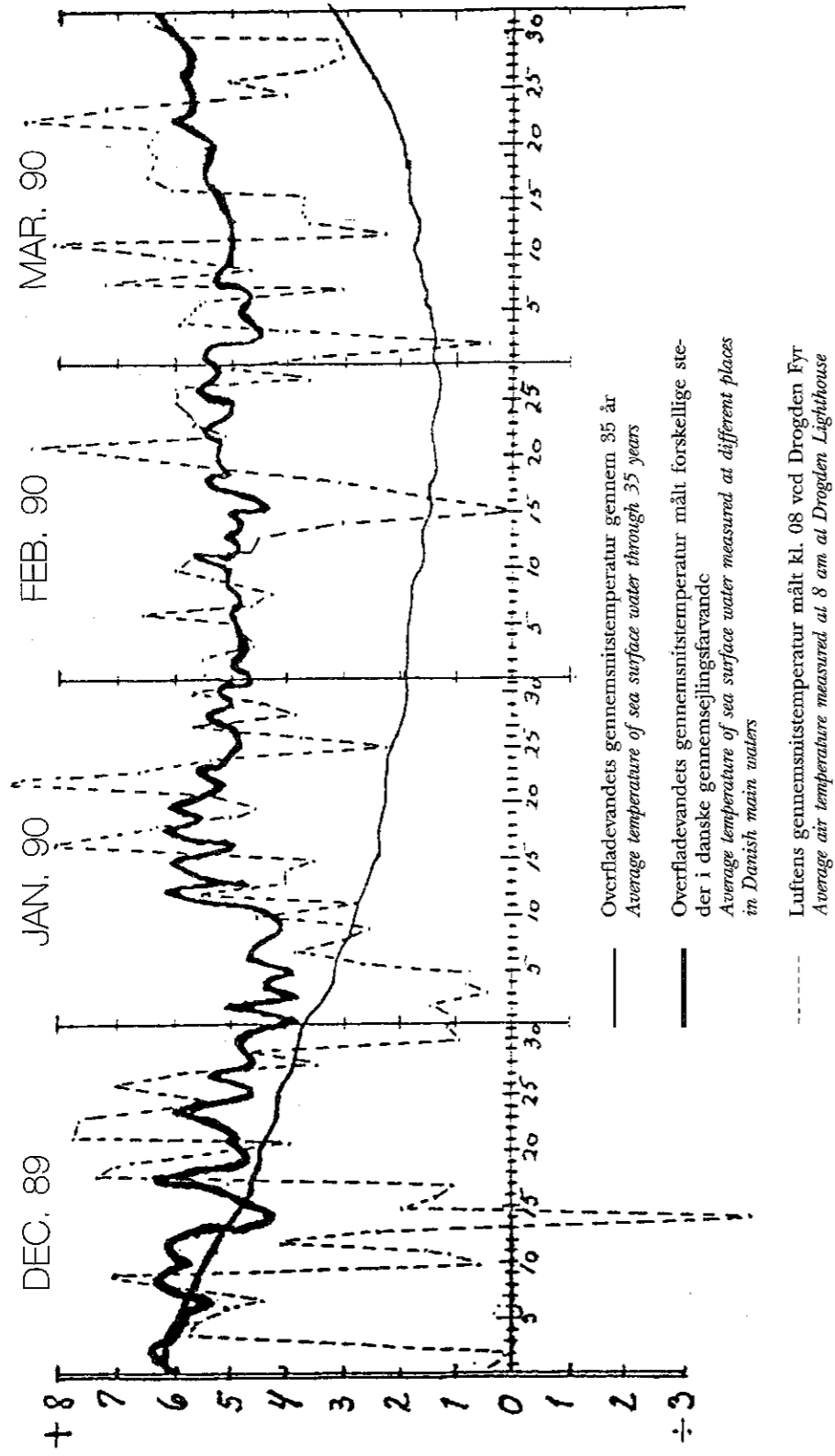
1983 -84	1984 -85	1985 -86	1986 -87	1987 -88	1988 -89	1989 -90													
0.3	47.0	31.6	49.3	0.0	0.0	0.0													
0.0	46.1	27.3	50.7	0.2	0.0	0.0													
1.0	65.6	42.3	64.7	0.0	0.0	0.0													
7.3	71.3	52.9	72.7	0.3	0.0	0.2													
7.0	79.7	59.3	79.8	0.0	0.2	0.3													
3.5	64.8	45.4	65.6	0.1	0.0	0.1													
48.8	273.4	193.3	266.3	11.0	8.0	10.2													

de forskellige vintre
the various winters

1921 -22	1922 -23	1923 -24	1924 -25	1925 -26	1926 -27	1927 -28	1928 -29	1929 -30	1930 -31	1931 -32	1932 -33	1933 -34	1934 -35	1935 -36	1936 -37	1937 -38	1938 -39	1939 -40	1940 -41	1941 -42
30.6	2.5	40.3	0.0	0.4	0.0	7.0	48.4	0.2	1.0	0.3	1.3	0.0	0.0	0.5	8.5	0.0	0.3	56.5	47.1	71.1
34.4	10.1	51.2	0.2	5.8	0.0	17.8	49.3	0.0	4.1	1.3	5.1	0.3	0.0	2.7	17.7	0.0	1.3	61.6	58.2	72.5
37.5	8.2	71.3	0.0	10.7	0.3	19.9	61.2	0.7	8.3	2.1	7.6	0.7	0.8	3.0	21.2	0.7	3.2	74.7	60.5	82.4
52.7	20.5	97.6	1.3	36.9	6.3	47.6	79.5	7.0	27.1	12.7	21.5	6.5	7.9	15.5	33.4	7.0	14.2	84.1	74.3	85.7
52.9	23.8	111.3	2.0	53.2	4.3	57.5	87.1	8.5	37.1	15.2	26.8	9.5	11.0	22.6	43.9	9.4	20.1	97.3	84.7	93.6
39.4	11.0	68.0	0.5	16.9	1.7	25.4	62.3	2.9	12.9	6.3	12.2	3.4	4.0	9.6	26.4	3.8	8.6	78.5	67.3	83.6
165.4	57.5	238.8	27.9	94.4	21.8	110.3	266.7	16.6	101.8	67.1	84.0	23.2	44.6	49.7	86.3	28.7	47.5	368.5	290.7	497.5

1962 -63	1963 -64	1964 -65	1965 -66	1966 -67	1967 -68	1968 -69	1969 -70	1970 -71	1971 -72	1972 -73	1973 -74	1974 -75	1975 -76	1976 -77	1977 -78	1978 -79	1979 -80	1980 -81	1981 -82	1982 -83
60.0	0.0	1.8	16.9	0.0	1.0	4.8	29.4	1.6	5.8	0.0	0.0	0.0	0.8	1.4	2.1	36.5	4.4	0.7	26.1	0.3
63.6	1.2	3.2	24.3	0.0	2.3	13.8	42.1	4.2	12.3	0.0	0.0	0.0	0.5	2.8	3.8	49.7	6.6	0.8	31.7	0.0
79.8	2.9	6.4	23.6	0.3	4.2	9.6	53.7	5.0	16.7	0.2	0.2	0.0	3.6	6.8	7.2	62.8	12.3	2.0	45.5	0.7
85.7	21.0	16.1	41.9	3.6	17.7	39.1	76.3	17.3	32.0	3.0	2.0	0.8	13.8	18.9	15.6	74.6	33.0	9.5	67.6	5.0
98.6	27.4	21.0	53.5	5.7	23.5	53.3	95.3	22.3	33.7	3.8	3.2	1.0	17.3	26.0	18.0	83.3	42.9	10.7	77.3	4.0
81.7	12.4	11.3	34.4	1.9	11.7	26.9	65.2	11.7	24.0	1.7	1.3	3.4	7.8	12.0	10.0	61.4	21.3	5.2	53.5	2.3
300.3	82.9	67.9	163.0	31.5	94.1	116.2	208.4	83.9	66.6	10.6	27.8	7.2	75.0	62.4	70.3	215.2	97.7	75.6	218.7	23.9

Overfladevandets gennemsnitstemperatur i gennemsejlingsfarvande
Average temperature of surface water in main through passages



Tab. 8.

