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Sea-Surface Temperatures in the Northwestern Atlantic in 1981

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Sea surface temperature (SST) data, principally collected from cooling water intakes of merchant ships, are reported in radio weather messages and log books transmitted to the U.S. Fleet Numerical Oceanography Center (FNOC) and the National Climatic Center for processing and archiving. The "real-time" reports of the data base provided by the radio messages are analyzed by FNOC and the Pacific Environmental Group of the National Marine Fisheries Service, which is co-located with FNOC. An elementary step in the analysis is the computation of average monthly temperatures and anomalies (from 1948-67 means) for each 1° x 1° square for which enough data have been reported each month. The average SST's, anomalies and number of observations are then printed in the 1° x 1° squares they characterize to produce a map such as the one shown in figure 1. To facilitate interpretation of the data, anomalies greater than +1°C or less than -1°C are shaded.

Monthly maps of SST anomalies in the northwestern Atlantic for 1981 show a continuation through May of the cold conditions which began in November 1980 (Ingham and McLain (MS 1981). The negative anomalies were most intense and persistent in the Middle Atlantic Bight, ranging to -4.0°C off the southern New Jersey coast in January. In June the negative anomalies were replaced by a positive pattern which persisted through October, when the pattern became negative again and remained so through December.

In the Gulf of Maine-Scotian Shelf area, however, the negative anomaly pattern began to break down in February and was replaced by a positive

anomaly pattern in April, which weakened in July but persisted in variable strength until October-December. During the last quarter of the year the anomaly pattern in this area was neither strongly positive nor strongly negative.

Pooled average SST anomalies for the entire area north of 35°N and west of 60°W (Table 1) were negative in all months except April-July, when they were weakly positive. The anomalies, either positive or negative, were considerably less than the standard deviations of the 1948-67 reference period in all months.

By determining the algebraic sum of the 12 monthly area mean anomalies we can obtain a rough index of how anomalous the sea surface temperature was for this area of northwest Atlantic for the year 1981. The resulting value, -3.53, is considerably "colder" than those for 1978, 1979, and 1980, which were -2.92, +0.70 and -1.85, respectively. Most of the negative anomalies responsible for this effect occurred south of 42°, however, so the Gulf of Maine and Scotian Shelf did not experience the "colder" year experienced on Georges Bank and in the Middle Atlantic Bight.

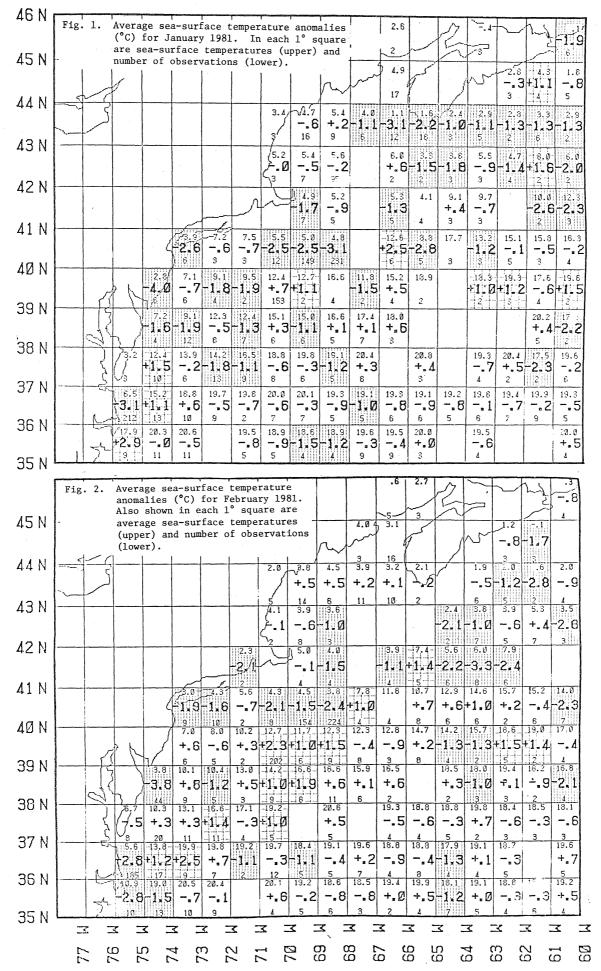
In order to characterize the spatial (SW to NE) and temporal gradients of SST anomalies during the course of 1981, monthly anomalies from 15 one-degree squares (Fig. 13) were plotted on a space-time grid (Fig. 14). The plot shows that the positive anomalies of April through July developed first at the northeastern end of the range, off southern Nova Scotia, and one or two months later in the Middle Atlantic Bight. The negative anomaly pattern of August-December developed first in the Georges Bank area and spread to the Middle Atlantic Bight two months later. Comparison with the plot for 1980 (Fig. 15) shows that the most apparent difference between the two years was this early development of a negative anomaly pattern, beginning in August around Georges Bank.

REFERENCE

INGHAM, M. C., and D. R. MCLAIN. MS 1981. Sea-surface temperatures in the northwestern Atlantic in 1980. NAFO SCR Doc. 81/VI/94.

Table 1. Monthly mean sea surface temperature anomalies (°C) from the 1948-1967 monthly means for 1981 in the northwestern Atlantic Ocean (35° - 46° N, 60° - 76° W).

Month	Number of 1° Squares	Area Mean Anomaly (°C)	Standard Deviation 1948-67
Jan	107	-0.69	1.26
Feb	113	-0.40	1.23
Mar	125	-0.16	1.49
Apr	124	+0.05	1.51
May	117	+0.02	1.22
Jun	122	+0.23	0.91
Jul	127	+0.05	0.89
Aug	132	-0.49	0.85
Sep	134	-0.19	0.89
0ct	125	-0.77	0.95
Nov	110	-0.51	0.90
Dec	115	-0.67	0.91
		$\Sigma = -3.53$	



45 N	Fig. 3.	Avera	ge se	a-sur	face	tempe	rature	anom	alies	-	3.6		1.1		- 1	7 .2	71.17
		(°C)	for M	arch	1981.	In	each l empera	l°squ	ıare		8	~~	(37)			2	+1.0
45 N		(uppe	r) an	d num	ber o	fobs	ervat	ions (lower). 	4.1	3.7	<u> </u>	1.4.	1.7	1.7	1.5
									r	ترر 3	11	3		∖ न ॄं∄	+.5	+.4	+.4
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A D Al							3/	13	8	15	4	Դ _ա 9 12	+.2	+.8 22	+,3	+ ₂ 5	+.5
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42 N							52	5	56	12	2	7	12	17	7	4	23
						<u> </u>	1	4.1 7	4.9 +.2	4.6 + . Ø	4.1 6	4.5 -1.1	5.7 -2 .1	8.2 7	7.€ -1.8	11.2 7	11.0
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38 N	1	<u></u>	7.	13.7	10	18	77	11	11	5	2	5	3	2	2		1 E
		-2.7		+1.7		^{20.3} + 4.3		20.9 +1.0	19.7 +.2	19.9 +.4		13.6 - 1.0	17.2 - 1.6		17.5 - 1.5	19.2 +.2	18.6
37 N		5.5	15 11.5	17.5	18 19.2	19.1	11	19.8	19.5	7 18.1	18.3	18.5	7 13.5	3 17.9	18.1	19.1	17.3
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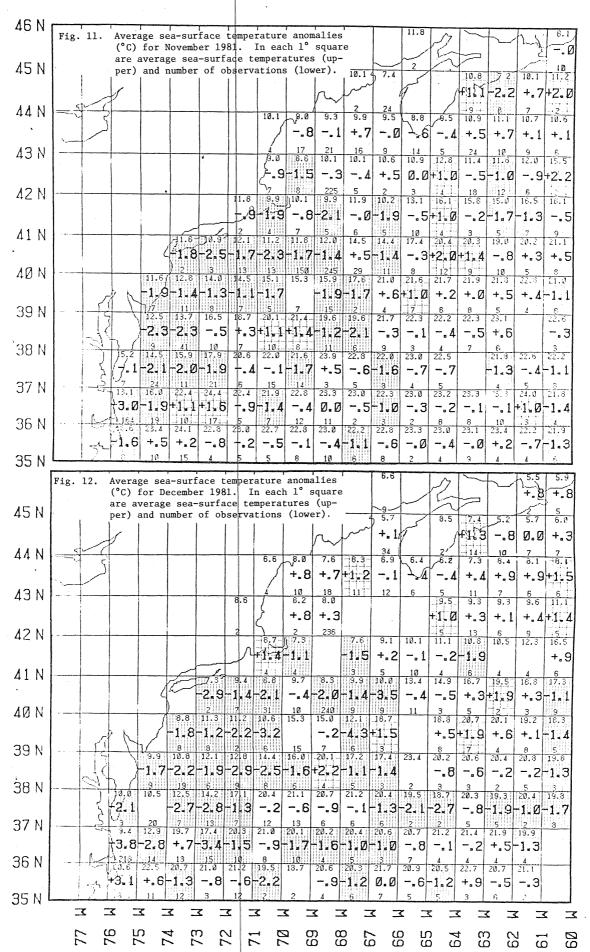
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F	Fig. 5.	Average (°C) f	or Ma	y 198	1. In	n each	ı 1°s	quare	are		7.5	8.0	رکرار		<u> </u>	1-1	+1 3
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38 N	(15.3	12.4	14.2	15.6	17.2	20.4	23.3	22.4	22.1	23.0			21.5	ed o Lodo	21.3	21.1
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F	Fig. 6.	Average	e sea	-surfa	ace te	empera	ture	anom-	•	12.8			2 راقار		<u></u>	1-1	8.5
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45 N 44 N 43 N 42 N	Fig. 6.	alies square atures	(°C) are (upp) (lowe	for Juaverager) air).	une 19ge seand num	15.2 15.2 16.5 +.2 7	In ea ace to f obs	ch 1° emper-erva-	12.6 +1.0 214 12.1 +.3 5 10.1 -3.3 19.3	2 9.6 34 12.1 10.3 10.3 11.7 6 11.7 8 21.0	+2.3 39 1 +2.1 -33 -7.7 -2.0 13 15.7 9 13 2.3	10.0 10.0 12.0 12.0 16.4 7.7 21.7	6.6 5 13 12.4 +1.4 8 13.8 5 13.5 9 7 22.3	10.4 +.8 7 11.6 1 9 13.7 20.2 +.4 3	11.7 9 11.7 +2.1 11.5 5 36 14.9 20.6	+.5 8 11.0 +1.2 50 12.1 +.4 9 15.0 2.3	10 7.6 7.6 7.6 11.1 11.1 12.6 12.6 17.2 17.2 19.7
45 N 44 N 43 N 42 N 41 N 40 N	Fig. 6.	alies square atures	(°C) are (upp) (lowe	for Juaverager) au er) au r).	une 19ge seand num	15.2 15.2 16.5 17.3 17.3	In ea ace to f obs	ch 1° emper erva- 13.1 2.2 13.1 191 19.8 12.5	12.6 +1.0 214 12.1 +-3 5 18.1 23.6 19.3 +-9	2 9.6 34 12.16 10.35 10.35 11.79 21.09	+2.3 16.1 +2.1 53 -7.7 -2.0 11 15.7 -1 15.7 -1 15.7 -1 13 -2.3 +2.3 +2.3	10.00 + 2 3 12.01 16.4.55 21.7 + 1	6.6 6.6 6.6 13 12.4 1.4 1.4 1.4 1.8 13.8 6.5 13.5 7.9 22.3 +.1	10.4 +.8 7 11.6 1 9 13.7 1.3 20.2 +.4 3	+1. I 9 11.7 +2. 1 11.5 5 36 14.9 20.6 +.0	+.5 8 11.0 +1.0 50 12.1 +.4 9 15.0 -2.3 19.4 -1.6	10. 1. 1. 2. 1. 2. 1. 3. 5. 1. 7. 2. 7. 2. 7. 2. 7. 2. 7. 2. 7. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3. 3.
45 N 44 N 43 N 42 N 41 N	Fig. 6.	alies square atures	(°C) are (upp) (lowe	for Juaverager) auerager) auerager).	une 19ge seand num -16.31 6 -13.7 +1.1 19.6	15.2.5 15.2.5 15.2.7 16.5 17.3 1.3 19.3	In ea ace t of obs 14.7 16.3 16.9 16.9 11.2 20.0 11.9	ch 1° emper erva- 13.1 2.0 3 13.13 19119.8 +2.523.7	12.6 +1.0 214 12.1 +.3 5 19.1 19.3 19.3 19.3 19.3	2 9.6 34 10.3	+2.3 16.1 +2.1 53 -7.7 -2.0 11 8.5 7.7 -1 13 15.7 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	10.02 10.02 12.15 16.45 21.7 21.7 21.7 21.7	6.6 6.6 5.13 13.6 6.6 6.6 7.13 13.6 6.6 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0	10.1 +.8 7 11.6 1 9 13.7 20.2 +.4 3 -23.7 +1.2 23.6	+1. I 9 11.7 +2. 1 11.5 -5 36 14.9 -1.5 -7 20.6 +.0 6 22.0 5	+.5 8 11.0 +1.2 50 12.1 +.4 9 15.0 2.3 -1.6 22.3 -1.6 3 -2.3 -1.6 3 -1.6	10. 12. 6 10. 12. 6 11. 12. 6 12. 6 12. 6 17. 2 19. 7 19. 7 20. 3 1. 6 7
45 N 44 N 43 N 42 N 41 N 40 N 39 N	Fig. 6.	alies square atures	(°C) are (upp) (lowe	(16.7) (1	16.3 - 1 6 13.7 19.6	15.2.5 15.2.5 15.2.7 16.5 17.3 1.3 19.3	In ea ace to f obs	ch 1° emper erva- 13.1 2.0 3 13.1 1-3 191 19.3 19.3	12.6 +1.0 214 12.1 +.3 5 19.1 19.3 19.3 19.3 19.3	2 9.6 34 12.1.6 10.3.5 6 7.0 10.3 1.0 9 21.0 9 23.3 21.8 8	+2.3 10.1 +2.1 -3.3 -7.7 -2.0 11 8.5.7 -1.3 15.7 -1.3 -2.3 +2.3 -2.3 -2.3 -3.5 -	10.02 10.02 12.15 16.45 21.7 21.7 21.7 21.7	6.6 6.6 7.5 13 13.8 13.8 5 13.5 7 7 22.3 + 1 5	10.4 +.8 7 11.6 1 9 13.7 -1.3 6 20.2 +.4 3 -23.7 +1.2	+1.1 9 11.7 +2.1 1.5 5 36 11.5 5 20.6 +.0 6 22.0 4	+.5 8 11.0 +1.2 50 12.1 +.4 9 15.0 2.3 -1.6 22.3 -1.6 3 -2.3 -1.6 3 -1.6	10 7.6 7.6 7.6 7.6 11.1 12.6 12.6 17.2 17.2 19.7 19.7 20.9 1.6 7
45 N 44 N 43 N 42 N 41 N 40 N	Fig. 6.	alies square atures tions	13.6 +1.7 12.5 +2.5 26.5	for June 16.7 (16.7) (1	16.3 - 1 6 13.7 + 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	15.2 15.2 16.5 + 2 7 17.3 + 6 10 19.3 - 17	In ea ace t f obs	13.1	12.6 +1.0 214 12.1 +.3 5 19.1 19.8 9 5 24.7 12.7	2 9.6 34 12.1 10.3 - 10.3 - 10.3	+2.3 16.1 +2.1 53 -7.7 -2.0 11 15.7 -19 15.7 -19 -22.3 +2.3 +2.3 +2.5 -2.5 -2.5	10.0 10.0 12.0 12.0 12.0 12.0 13.0 13.0 13.0 13.0 13.0 14.1 15.4 16.4 17.7 17.7 17.7 21.7 21.7 21.7 21.7 21.7 21.7 21.7 21.7 21.7 21.8	8.6 65 13 13.86 5 18.59 7 22.3 +.1 5 24.1 7 23.9	+1.5 10.4 +.8 7 11.6 1 9 13.7 -1.3 6 20.2 +.4 3 -23.7 +1.2 23.6 23.3	+1.1 9 11.7 +2.1 11.5 -5 36 -1.3 20.6 6 22.0 6 22.0 6 24.4 +.7 6 22.3	+.5 6 11.0 12.1 12.1 13.4 9 15.0 13.4 1	100 7.6 5.5 5 11.1 2 12.6 12.6 12.6 17.2 15.5 17.2 20 20.8 7 20.8 7 20.5 20.5 20.5
45 N 44 N 43 N 42 N 41 N 40 N 39 N 38 N	Fig. 6.	alies square atures tions	(°C) are (upp (lowe	for June 19 19 19 19 19 19 19 19 19 19 19 19 19	16.3 -13.7 +13.1 15.5 15.8	15.2 3 15.2 3 16.5 +.2 7 17.3 +.6 10 19.38 17	In ea ace to f obs 14.7 3 6.3 7 16.3	13.1	12.6 +1.0 214 12.1 +.3 5 19.1 19.3 19.3 19.3 19.3 19.3 7	2 9.6 34 12.1 10.3	+2.3 16.1 +2.1 -33 -7.7 2.3 -13 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -3.	5 0 2 12 15 16 4 5 21 7 21 7 21 8 6 6 2 24 8 6 6	8.6 65 13 13.86 5 18.59 7 22.3 90 3	10.4 +.8 7 11.6 1 9 13.7 -1.3 6 20.2 +.4 3 -23.7 +1.2 -23.6 -23.7 7	+1.1 9 11.7 +2.1 11.5 5 36 -1.5 1 20.6 +.0 6 22.0 4 4 5 4 5 4 5 5 5 5 5 5 5 5	+.50 11.0 12.1 1.50 15.0 15.0 15.0 15.0 15.0 2.3 19.1 22.3 1 22.5 -1.1 21.6 -1.2	11. i 12. i 13. i 14. 2 160. i 12. i 17. 2 19. 7 21. 7 23. 3 23. 3 23. 5 23. 5 23. 5 23. 5
45 N 44 N 43 N 42 N 41 N 40 N 39 N	Fig. 6.	alies square atures tions	(°C) are (upp) (lowe 13.5 +1.71 20.5 +2.1 20.5 +1.3 20.5	for June 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	16.8 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	15.2 15.2 15.2 15.2 16.5 17.3 19.3 19.3 19.3 19.3 19.3 19.3 19.3 19.3 19.3	In ea ace to fobs 14.7 3 16.8 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	ch 1° emper-erva- 13.1 3 191 13.1 3 191 19.3 5 6 23.7 4 1 7 6 4	12.6 +1.0 214 12.1 +.3 5 19.3 +.9 5 24.7 3	2 9.6 34 12.16 10.35 7.0 21.0 9.6 21.0 9.6 23.3 24.8 24.8 24.8	+2.3 33 16.1 +2.1 33 7.7 2.3 +2.3 +2.3 +2.3 +2.3 +2.3 5 22.5 -3 3 22.5 -3 3 4 2.3 -4 2.5 -3 3 -2.3 -4 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3	5 0 2 12.45 16.45 21.7 1 21.7 21.866 24.46	66 5 13 12.4 13.8 6 5 13.5 9 7 22.3 +.1 5 17.4 23.9 0 3 25.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1	10.4 +.8 7 11.6 1 9 13.7 -1.3 5 20.2 +.4 3 -23.7 +1.2 6 +.1 23.3 -9 7 23.8 +.2	+1.1 9 11.7 +2.1 1.5 -5 36 11.9 -1.5 -1.5 -2.0 6 -22.0 -4 5 -21.1 -22.3 -1.5 -21.3	+.5 6 11.0 12.1 12.1 13.4 9 15.0 13.4 14.4 9 15.0 13.4 13.4 13.4 13.4 13.4 13.4 13.4 13.6	+.8 10 7.6 7.6 7.6 15 5 11.1 12.61 5 17.2 19.7 -1.7 20 23.8 -1.6 7 23.20 5 23.5 +.0 3 22.4 8-1.0
45 N 44 N 43 N 42 N 41 N 40 N 39 N 38 N	Fig. 6.	alies square atures tions	(°C) are (upp) (lowe 13.6 +1.7 20.5 +1.7 20.5 +1.2 20.5 +1.2	for June 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	16.8 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	15.2 15.2 15.2 16.5 17.3 19.3 19.3 19.3 19.3 19.3 19.3 19.3 19	In ea ace to fobs 14.7 3 16.8 17 17 16.8 17 18 18 18 18 18 18 18 18 18 18 18 18 18	ch 1° emper-erva- 10.1 3 10.2 3 191 19.8 12.5 6 23.7 1.7 6 4	12.6 +1.0 214 12.1 +.3 5 19.3 19.3 19.3 19.3 19.3 19.3 19.3 19.3	2 9.6 34 12.16 10.35 11.09 21.09 21.09 23.32 46.32 24.88 25.2	+2.3 16.1 +2.1 -33 -7.7 -33 -7.7 -33 -13 -2.3 +2.3 +2.3 -2.5 -3 -3 -2.3 -3 -3 -2.3 -3 -3 -2.3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -	5 6 2 5 1 1 5 16 4 5 7 7 1 2 1 7 1 2 1 8 6 2 4 4 6 9	6.6 6 5 13 12.4 1 . 4 8 1 13.8 6 5 13.5 9 7 22.3 + . 1 5 24.1 1 7 23.9 0 3 25.8 1 25	10.4 +.8 7 11.6 1 9 13.7 1.3 5 20.2 +.4 3 -23.7 +1.2 6 +.1 23.3 9 7 23.6 4 23.8 4 22.6 23.6 4 23.6 23.6 23.6 23.6 23.6 23.6 23.6 23.6	+1.1 9 11.7 +2.1 1.5 36 11.9 1.5 7 20.6 6 22.0 6 22.0 6 22.1 1.5 21.1 21	+.5 6 11.0 12.1 12.1 13.4 9 15.0 13.4 14.4 9 15.0 13.4	+.8 10 7.6 7.6 7.6 15 5 11.1 12.61 5 17.2 19.7 -1.7 23.2 -23.3 -1.6 7 23.2 -1.6 3 22.4 8-1.0
45 N 44 N 43 N 42 N 41 N 40 N 39 N 38 N 37 N 36 N	Fig. 6.	alies square atures tions	(°C) are (upp) (lowe 13.6 +1.7 -20.5 +1.7 -20.5 +1.2 -21.2 -	for June 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	16.3 - 1 - 13 - 15 - 15 - 22.4 + 2.5 - 24.7 - 3	15.25 15.25 15.25 16.5 17.3 17.3 19.3 19.3 17.24.7 24.7 25.6 11.2	In ea ace to obs 14.7 14.7 13.3 16.0 11.9 11.9 11.9 12.0 13.9 14.0 15.0 16.0 16.0 17.0 18.0 19.0	ch 1° emper erva- 13.1 2.2 13.1 19.1 19.8 19.1 19.8 24.4 6 24.4 4	12.6 41.1 4 3 5 19.3 19.3 19.3 19.3 19.3 19.3 19.3 19.3	2 9,6 34 10,35 70 9 21,0 9 21,0 9 21,0 8 25,3 2 4 6 25,3 3 2 4 6 25,3 3 2 4 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 4 6 6 25,3 3 2 6 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7	10.1 10.1	5 62 51 45 7 7 1 9 W 56 46 9 15 16 17 7 21 + 2 21 17 3 1 4 6 9 15	66 5 13 12.4 13.8 6 5 13.5 9 7 22.3 +.1 5 17.4 23.9 0 3 25.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1	10.4 10.4 10.4 11.6 13.7 13.7 13.7 13.7 14.2 23.6 14.2 23.3 15.2 23.6 16.2 23.6 16.2 23.6 23.7 23.8 23.6	+1.1 9 11.7 +2.1 1.5 5 36 11.9 1.5 7 20.6 6 22.0 6 22.0 4 5 1 5 5 5 5 5 5 5 5	+1.6 11.0 12.1 12.1 12.1 13.1 13.4 13.4 13.4 13.4 13.6	+.8 10 7.65 5 11.1 12.61 5 17.2 1.3 5 19.7 23.8 -1.6 7 23.5 23.5 1.0 3 23.5 1.0 3 4.2 4.2
45 N 44 N 43 N 42 N 41 N 40 N 39 N 38 N 37 N		alies square atures tions	(°C) are (upp) (lowe) 13.6 +1.4 20.3 +1.4 20.5 +1.3 22.6 +1.2 26.0 +1.8 6	for June 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	16.3 - 1 - 13 - 15 - 15 - 15 - 15 - 15 - 15	15.2 15.2 15.2 17.3 17.3 17.3 19.3 19.3 19.3 19.3 19.3 19.3 19.3 19	In ea ace to fobs 14.7 3 16.8 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	ch 1° emper-erva- 13.1	12.6 +1.0 214 12.1 +-3 5 19.3 +-9 5 24.7 +2.7 +2.7 3 9 24.4 5	2 9.6 34 12.3 55 7 2 10.3 5 2 1.0 9 21.0 9 23.3 2 24.8 8 25.2 3 25.2 3 2	+2.3 10.1 +2.1 -3.3 -7.7 -2.0 11.3 15.7 -1.3 -2.3 +2.3 -2.5 -3.3 -2.5 -3.3 -3.5	5 62 8 1 12. 7 7 1 9.2 8 6 4 6 9.15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	6.6 6 5 13 12.4 1.4 6 13.8 6 5 13.5 9 7 22.3 +. 1 7 23.9 0 3 25.6 6 1.1 6	10.4 +.8 7 11.6 1 9 13.7 -1.3 6 20.2 +.4 3 -23.7 +1.2 6 +.1 23.3 -9 7 23.6 +.2 23.6 +.1 23.6 +.1 23.3 -9 23.7 23.7 23.6 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	+1.1 9 11.7 +2.1 1.5 36 11.9 -1.5 7 20.6 6 22.0 -1.5 6 22.1 5 24.4 +.7 6 22.3 23.2 5 3	+.5 6 11.0 12.1 1.2 1.3 1.3 1.4 2.3 2.3 2.1 3 2.1 3 2.1 3 2.1 3 2.1 3 2.3 3 2.3 3 2.3 3 3 2.3 3 3 3 3 4 4 5 6 6 7 8 8 8 8 8 8 8 8 8 8 8 8 8	+.8 10 7.65 5 11.1 12.61 5 17.2 1.3 5 19.7 23.8 -1.6 7 23.5 23.5 1.0 3 3 23.5
45 N 44 N 43 N 42 N 41 N 40 N 39 N 38 N 37 N 36 N		alies square atures tions	(°C) are (upp (lowe 13.6/ +1.7/ 120.5 +1.7/ 20.6, 3 21.6/ 120.5 +1.2/ 21.6/ 22.6/ 22.6/ 41.2/ 25.0/ 8	for June 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	16.3 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	15.2 5 15.2 5 15.2 5 17.3 17.3 17.3 17.3 17.3 17.3 17.3 17.3	In ea ace to fobs 14.7 3 6.3 7 16.3 7 16.3 9 24.8 3 7 23.7 5 5	ch 1° emper-erva- 13.1 0 3 19.1 19.3 19.3	12.6 +1.0 214 12.1 +.3 5 19.3 19.3 19.3 19.3 7 19.3 7 24.1 3 9 24.4 5	2 9.6 34 12.6 3.5 7.0 9 23.3 2 14.8 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8 25.4 8	+2.3 16.1 +2.1 33 17.7 2.3 +2.3 +2.3 +2.3 +2.3 +2.5 -3 22.5 -3 24.3 -3 24.3 -4 24.3 -4 24.5 -4 -4 -4 -4 -4 -4 -4 -4 -4 -4	7 5 6 2 6 4 6 9 5 1 1 1 1 5 16 17 7 1 9 2 3 1 8 6 4 6 9 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	6.6 6 6 13 12.4 8 13.8 6 5 13.5 7 22.3 9 14.1 7 123.9 9 25.8 14.1 1 6	+15 10 10.4 +.8 7 11.61 9 13.7 13.6 20.2 +.4 3 -23.7 +1.2 23.8 2.24 1.2 2 24.1 2.3 3 42 2 2 24.1 2.3 3 42 2 2 24.1 2.3 3 42 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	+1.1 9 11.7 +2.1 11.5 -5.3 -1.3 -1.5 -1.3 -1.5 -20.6 -2.0 -3.2 -3.2 -3.3 -3.2 -3.3 -3	11.0 1.1.0 1.1.1 1.1.0 1.1.1 1.1.0 1.1.1 1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1 1.1.1	+.8 10 7.6 7.6 7.6 15 5 11.1 12.61 5 17.2 19.7 -1.7 23.20 5 23.5 +.0 3 22.4 8-1.0 3 13.5 4.2 3

- Mr. C. C. C. C.

45 N ~								_		-						
46 N _F	ig. 7. Ave	rage se malies	a-surfa (°C) fo	ace te or Jul	mper y 19	ature 81.		•	13.2	12.2	13.0	17,0		~	\14.1 +1.3	13.4/
45 N		each l° -surfac)		3	7	~13	1			1.7	8
4011	and	l number ower).	-				10.4		12.0	11.2	12.4	15.0		-15.2 +1.3	14.0 2	13.4
44 N							1		51	67	6	2/	11	13	4	8
4411	7 5					16.3	1ŝ.8 3	13.9 1.3	.16.3. +2.7	11.9	-10.0 -1.0	/13.8 +.8	14.5	14.9	14.5	14.7
43 N						3/	10	12	4	55	2	13	7	51	65	6.2
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						18.8		17.0 +. A	16.5 +1.3		13.1	14.9	14.8 -1 Q	15.2 1 9	15.9 -1.3	16.2 -1 B
42 N						7.9	1	228	2 :	8	5	10	14	46	3	2
				20.9	20.00 غراد	20.6	ال.3 2 + . Ø	13.1 1+2.8	16.7 +2.3	13.7 -1.4	16.2 - 1.9	17.9 - 1.2	17.8 -2.1	16.9	21.2	21.6
41 N				2	15	3	::. 3	10	171	3	6	4	6	2	5	2
			421.3			1 + 1 . 5	5 +.5		18.4	17.9 -2,3	19.9 - 1.9	23.7 + .9	22.9 5	24.3 +.6	24.5 +_9	4
40 N		21.	9 23.4	22.9	23.0			236	23.0	23.0	7 -25.5	5 22.6	9 25.7	13 25.2	25.2	3 25.4
	1	V13			+ . {			+.3		5	+1.2	-2.2	+1.0	+.5	+.3	+.6
39 N	1131	23.4) 23.	24.5	22.9	23.8	23.8	23.4	25.8	25.7	26.4	25.6	25.4	25.9	26.8	25.8	26.0
, 20 11	16	1 6	3+1.1	7	Z	1 E	5-1.5	+.6	+.5	t],]	Ø	-₌3 ₅	+.1	+1,1	Ø	+.4
.38 N		26.3 24. 1.6 +.		25.1 3	26.6			27.1	27.1	26.4	26.8	26.1 2	25.2	26.7	26.3	24.5
37 N	1 5 0	14 14	12	15	3	14	14	5	6	11	4	6	2	+.6	+.4 5	6
0, 11		25.8 25. 1. 0 +.		27.0 +.7	27 7			26.9 +.4	26.7 +.5	25.9	25.6 3	24.0 -2.1	26.2 Ø	26.1 2	26.7	25.9
36 N		217 13 27.5 27.	3 27.8	27.1	1 26.7	9 26.8	12	26.1	7 25.3	4	12	26.8	4 25.3	9	5 26.1	9 23.5
		1.3 +.			- 1				-1.3	+.9		+.7	i		+.3	+2.6
35 N ^L						-] 4	3		4	2		2	
	a	verage s lies (°0) for	Augus	: 198	31. I	n eacl						{	~	117.4 +1.2	16.5/ +.2
45 N	- t	° square emperati						- 1	1		I~I	-				15
	Δ,					numbe	er of	+			الإزا	\sim				
	الم ا	bservati				numbe	er of	7	المسهر	į	13.3 ¥2.1		17.4 £14.6	۱6.8 2	17.2	17.2
44 N							• /	2	47	54	⊬2.1	_/	eri e	2	+.3	17.2
44 N							-17.6 +1.3+	17.3 1.6	47 15.9 1.7	54 12.2 +.6	# 2.1 3 -12.6 -1.3	∠16.9 +1.4	17.1 +.2	2 7 17.8 +.3	+.3 11 16.2 -1.6	17.2 +.1 8
44 N 43 N							17.6 +1.3+	17.3 1.6+	47 15.9 1.7	54 12.2 +.6 129	72.1 3 -12.6 14	/16.9 +1.4	17.1 + 2	2 7 17.8 +.3	+.3 11 16.2 -1.6	17.2 +.1 8 17.4 4 25
43 N							17.6 +1.3+ 19 19.3 +.7	17.3 1.6+ 13 13.5 +.9	47 15.9 1.7 9	12.2 +.6 129 15.7 +.6	12.6 14 16.6 +.7	/16.9 +1.4 -11 -18.6 +.5	17.1 +.2 17 18.7 4	2 7 17.8 +.3 10 17.9 -1.3	+.3 11 16.2 -1.6 20 20 20.1 +.2	17.2 +.1 8 17.4 4 25 19.8 9
				ower)	13.4	19.8	17.6 +1.8 +1.9 19.3 +.7 2	17.3 1.6+ 13 13.5 +.9 75	47 15.9 1.7 9 13.3 2.8 1	54 12.2 +.6 129	12.6 12.6 14 16.8 +.7 9	/16.9 +1.1 11.1 18.6 +.5 7	17.1 +.2 17 18.7 4 12	2 7 17.8 +.3 10 17.9 -1.3 5	+.3 11 16.2 -1.6 20 20 20.1 +.2 5	17.2 +.1 8 17.4 4 25 19.8 9 7
43 N 42 N			ons (1	ower)	(N):::	19.8	17.6 +1.8 +1.9 19.3 +.7 2	17.3 1.6+ 13 13.5 +.9 75	47 15.9 1.7 9 13.3 2.8	54 12.2 +.6 129 15.7 +.6 5	12.6 12.6 14 16.8 +.7 9	16.9 +1.4 11.5 18.6 +.5 7	17.1 17.1 18.7 4 12 20.0 2.2	2 7 17.8 +.3 10 17.9 -1.3 5	+.3 11 16.2 -1.6 20 20 20.1 +.2 6	17.2 +.1 8 17.4 4 25 19.8 9 7
43 N		bservati	22.2 1 3 (22.1)	ower)	18.4 (2) 1 22.7	19.8	17.6 +1.9+ 19.3 +.7 2 18.7 +.9	17.3.13.13.5.9.75.9.75.9.114.5	47 15.9 1.7 9 13.3 2.8 1 16.3 +.1 5 21.5	12.2 + 6 129 15.7 + 6 5 17.0 - 8 21	12.6 12.6 14 16.6 +.7 9 18.8 1.3 12 21.3	16.9 +1.4 11.5 7 17.5 17.5 13.5 24.9	17.1 +.2 17 18.7 4 12 20.0 25.2	17.8 +.3 10 17.9 -1.3 5 -2.0 6	+.3 11 16.2 -1.6 20 21.3 -2.3 -2.3	17.2 +.1 8 17.4 4 25 19.8 9 7 19.8 3.7 12
43 N 42 N 41 N	5	23	22.2 1 3 22.1 1 + 1	ower)		19.8	17.6 +1.9+ 19.3 +.7 2 18.7 +.9	17.3.13.13.5.9.75.9.75.9.114.5	47 15.9 1.7 8 13.3 2.8 1 16.3 +.1 5	12.2 + 6 129 15.7 + 6 5 17.0 - 8 21	12.6 14 16.8 +.7 9 18.8 12.8	16.9 +1.4 11.6 +.5 7 17.5 -3.5	17.1 +.2 17 18.7 4 12 20.0 25.2	17.8 +.3 10 17.9 -1.3 5	+.3 11 16.2 -1.6 20 20.1 +.2 6	17.2 +.1 8 17.4 4 25 19.8 9 7 19.8 3.7 12
43 N 42 N		23	22.2 1 3 22.4 1 9 4 23.1	24.2 -24.2 -2.1 -12 -22.8	18.4 12.7 19 22.7 19 22.7	19.8. 6 2 22.3 +.8 15	13.6 +1.3+ 19.3 +.7 2 18.7 +.9 1	17.3 1.6 13.5 13.5 75 15.9 14.5 235 23.9	47 15.9 1-7 8 13.3 2-8 1 16.3 +_1 5 21.5 +_7	54 12.2 +.6 129 15.7 +.6 5 17.0 8 21 19.25 21 22.8	12.6 14.6 16.8 +.7 9 18.8 1.2 21.3 21.3 24.6	16.9 +1.4 11. 18.6 +1.5 17.5 17.5 13.3 24.9 4 24.4	17.1 +.2 17 18.7 4 12 20.0 25.2 +.5 24.8	2 7 17.8 +.3 10 17.9 -1.3 5 20.7 -2.0 6 25.4 +.7 4	+.3 11 16.2 -1.6 20 21.1 +.2 6 21.3 -2.3 -4.3 25.5 +.4	17.2 +.1 8 17.4 4 25 19.8 9 7 19.8 3.7 12
43 N 42 N 41 N		23. — 1 21. — 1 / 7	22.2 1 3 22.4 1 9 4/ 23.1 45	-24.2 +2.1 -12 -22.8 8 24	18.4.7 2.7 1.22.7 +.8 19 22.7 9 9	19.8- 6 2 22.3 +.8 15 23.9 2 15	17.6. +1.9. +1.9. 19.3. +.7. 2. 18.7. 1.7. 18.0. 1.7. 1.7. 2.23.3.8	17.3 1.6 1.3 13.5 13.5 14.5 14.5 235 23.9 23.9 23.9	47 15.9 1.7 9 13.3 2.8 1 16.3 +.1 5 21.5 +.7 15 21.8	12.2 + 1.29 15.7 6 5 17.0 21 19.2 19.2 19.2 19.2 19.2 19.2 19.8 21 22 22 22 8	#2.1 12.6 14 16.8 +.7 9 18.8 21.3 21.3 24.6 1.2 24.6	11. 18.6 11. 18.6 17.5 17.5 17.5 13. 13 24.9 4 24.4 6	17.1 17.1 17.1 18.7 18.7 19.0 2.2 2.2 2.3 2.4 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8	2 7 17.8 +.3 10 17.9 -1.3 5 -20.7 -2.0 6 25.1 +.7 4 26.1 1 6	+.3 11 16.2 -1.6 20 20.1 +.2 6 21.3 -2.3 -4 25.5 +.4 1 25.9 -2	17.2 +.1 8 1 17.4 4 25 19.8 9 7 19.8 3.7 12 23.5 10 24.8 1.4
43 N 42 N 41 N 40 N		23. -1 1,1,21.	22.2 1 3 22.1 1 9 4/ 23.1 45 23 3 23.6 86	ower) -24.2 -24.2 -2.88824	18.4.10 22.77 19 22.79 9	19.8- -6 2 22.3 +.8 15 22 15 25.5 +.1	12.6. 11.9. 19.3. 19.3. 19.3. 19.3. 19.3. 11.7. 11.7. 12.2. 23.3. 8.2.9. 2.	17.3 6 + 13 18.5 9 1 14.5 9 23.9 3 24.7 5	47 15.9. 1.7. 8 13.3. 2.8 11.5. 16.3. +.1. 5. 21.5. 6	54 12.2 +.6 129 15.7 +.6 5 17.0 21 19.2 22.8 22.5 8 2.5 26.3 Ø	#2.1 12.6 13.3 14.6 16.8 +.7 9 18.8 1.2 21.3 1.3 21.3 24.6 1.2 24.6 1.3 24.6 1.3 26.1 8	11. 18.6.55 17.55 17.55	17.1 + 2 17 18.7 - 4 12 20.8 25.2 + 5 2 24.8 - 1.6 6.2 - 6	2 7 17.8 +.3 10 17.9 -1.3 5 20.7 -2.0 6 25.4 +.7 4 26.11 6	+.3 11 16.2 -1.6 20 20.1 +.2 5 21.3 -2.3 -2.3 -1 25.92 -11 27.2 +.7	17.2 +.1 8 17.4 4 25 19.8 9 7 19.8 3.7 12 13.5 10 24.8 1.4
43 N 42 N 41 N 40 N		23. -1. -1. -1. -1. -1. -1. -1. -1. -1. -1	22.2 1 3 22.4 1 9 4/ 23.1 24 23.6 86 21 5 24.6	ower) -24.2 -24.2 -21.2 -22.8 -8 -24	18.4. 2.7 19 22.7 22.7 2.9 9 24.5 6 14	19.8. 6 2 22.3 +-8 15 23.9 2 15 25.5	17.6. +1.9+19.3 +1.7-2 18.0 18.0 1.7-172 23.3 8 25.9 2-10	17.3 13.5 9 13.5 9 14.5 9 14.5 9 23.9 3 24.7.5	47 15.9. 1.7 9 13.3 2.8 1 16.3 +.1 5 21.5 +.7 15 21.8 5	54 12.2 + .6 129 15.7 + .6 5 17.0 8 21 19.2 5 5 8 22.8 5 6 3	#2.1 12.6 14 16.8 +.7 9 18.8 -1.3 21.3 21.3 21.6 12 21.3 21.6 12 21.3 21.6 12 21.5 12 21.5 12 21.5 12 21.5 12 21.5 12 21.5 12 21.5 12 21.5 12 21.5 12 21.5 13 21.5 14 21.5	17.5.5 17.5.5 17.5.5 17.5.5 17.5.6 18.6.9 19.13 24.9 24.4 1.6.8 9	17.1 + 2 17 18.7 - 4 12 20.8 2 - 2 2 2 4.8 13 16 10 10 10 10 10 10 10 10 10 10 10 10 10	2 7 17.8 +.3 10 17.9 -1.3 5 20.7 -2.0 6 25.4 +.7 4 26.11 6 25.7 -1.4 8	+.3 11 16.2 -1.6 20 21.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -2.3 -3.5 -2.7 -3.5	17.2 +.1 8 17.4 4 25 19.8 9 7 19.8 3.7 12 24.8 1.4 10 26.1 6 8
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43 N 42 N 41 N 40 N 39 N	21.4	23. — 1 21. — 1 23. — 26. 2 24. — 1 26. 2 24. — 1 25. 2 25.	22.2 1 3 1 4 23.1 4 23.1 23 3 23.6 8 -6 5 -1 2 1 2 2 1 2 2 2 3 2 2 3 2 2 2 3 2 2 3 2 2 3 2 3 2 3 2 3 3 3 4 5 5 5 5 5 6 6 7 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8	24.2 +2.1 -12 22.8 -8 24 22.9 -1.6 8 25.5 4 13 26.7	22.7 - 9 9 24.5 - 6 14 26.5 0.0 27.4	19.8- 2 22.3 + .8 15 23.92 15 25.5 + .1 4 27.0 16 226.2	17.6. +1.9. 19.3. +.7. 2. 18.0. 1.7. 1.7. 1.7. 2.3.3.3.8. 25.9. 2. 18.0. 26.9. 18.0. 26.9.	17.3 1.6 13.5 13.5 13.5 14.5 14.5 23.9 24.7 27.1 27.1 6 26.9	47 15.9 1.7 9 13.3 2.8 16.3 +.1 5 21.5 7 15 21.8 5 25.8 6 7 26.9 4 8	12.2 +.6 129 15.7 +.6 5 17.0 8 21 19.2 22.8 8 22.8 8 26.6 8 26.6 8 26.6 8	#2.1 12.6 14 16.8 +.7 9 18.8 1.3 21.9 21.9 24.6 1.2 24.6 1.2 25.0 25.0 26.5	11.6.6.9 11.6.6.9 11.6.6.9 17.5.5.7 17.5.5.3 13.24.9 1.6.8 26.9 9.6.9 9.6.9 9.6.9 9.6.9 9.6.9 9.6.9 9.6.9 9.6.9	17.1 + . 2 17 18.7 4 12 25.2 + . 5 2 26.2 6 10 12 25.5 4 25.5	2 7 17.8 +.3 10 17.9 -1.3 5 20.7 -2.0 6 25.4 +.7 4 26.11 6 25.7 1.4 8 26.9 +.1 7 26.5	+.3 11 16.2 -1.6 20 20.1 +.2 6 21.3 -2.3 -2.3 -2.3 -2.7 1 27.2 -2.4 3 -25.1	17.2 +.1 4 25 19.8 7 19.8 3.7 12 23.5 1.5 10 24.8 1.4 10 26.1 6 6 8 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9
43 N 42 N 41 N 40 N 39 N 38 N 37 N	24.4 -1.0 5 C 25.7 +.4	23. -1 21. 1, 23. -3 9 26.2 24. 11.3 -2 25.2 25.2 25.2 25.3 -2 194 5	22.2 1 3 22.4 1 9 4/ 23.1 23 3 23.6 86 21 56 51 2 26.7 93	-24.2 +2.2 +2.2 1 -12 22.8 -8 24 25.5 4 13 26.7 5 23	22.7 - 9 9 24.5 - 6 14 26.5 0.0 27.4	19.8 -6 22.3 +.8 15 23.9 2 15 25.5 +.1 4 27.0 16 26.2 11.3	17.6. +1.3+ 19.3 +.7 2 18.7 +.9- 18.0 1.7 17.2 23.3 8 25.9 2 10 26.9 8 18	17.3 1.6 13.5 13.5 13.5 14.5 14.5 23.9 23.9 24.7.5 27.1 26.9 26.9 14	47 15.9.11.7 16.3 16.3 16.3 15.5 21.5 21.5 21.8 5 25.8 7 7 26.9 8 25.7 1.7	12.2 +.6 129 15.7 +.6 5 17.0 8 21 13.2 22.8 8 26.6 8 26.6 8 26.6 8	#2.1 12.6 3 14 16.8 +.7 9 18.8 1.2 21.3 21.3 21.3 21.3 21.3 21.6 1.2 21.3 21.6 1.2 21.6 1.2 21.6 21.6 3 21.6	11.6.6.9 11.6.6.9 11.6.6.9 17.5.5.7 17.5.5.3 13.24.9 1.6.8 26.9 9.6.9 9.6.9 9.6.9 9.6.9 9.6.9 9.6.9 9.6.9 9.6.9	17.1 + 2 17 18.7 - 4 12 25.2 2 + .5 2 26.26 10 26.73 4 25.5 5 7 2	2 7 17.8 +.3 10 17.9 -1.3 5 20.7 -2.0 6 25.4 +.7 4 26.11 6 25.7 -1.4 8 26.9 +.1 7	+.3 11 16.2 -1.6 20 21.3 -2.3 -2.3 -2.3 -2.4 -2.4 -3.5 -2.4 -3.5 -2.4 -3.5 -2.4 -3.5 -2.4 -3.5 -2.4 -3.5 -2.4 -3.5 -2.4 -3.5 -2.4 -3.5 -2.4 -3.5 -2.4	17.2 +.1 8 17.4 4 25 19.8 9 7 19.8 3.7 12 24.8 1.0 24.8 1.0 24.8 1.0 25 1.0 24.8 1.0 25 10 25 26.1 26.1 26.1 26.1 26.1 26.1 26.1 26.1
43 N 42 N 41 N 40 N 39 N 38 N	21.4 -1.6 5 (25.7) +.4	23. -1 121. 17. 23. -26.2 24. 11.3 -26 25.2 25. -3 -3	22.2 1 3 22.6 1 4 23.1 4 23.1 23.6 21 5 24.6 59 11 2 26.7 9 23.4	22.8 -24 22.9 1.6 25.5 -4 26.7 -5 23 27.3	18.4. 22.7 19 22.7 9 9 22.7.6 14 26.5 26.5 27.4 19 27.4 1	19.8 2 22.3 +.8 15 23.9 2 15 25.5 +.1 4 27.0 +.0 16 28.2	17.6 +1.3 +1.7 2 19.3 +.7 2 18.0 1.7 -1.7 18.0 25.9 2 10 26.9 8 18	17.3 1.6 13.5 13.5 13.5 14.5 14.5 14.5 23.9 24.7 27.1 26.9 14 27.7	47 15.9 1.7 1.7 13.3 2.8 16.3 +.1 5 21.5 +.7 15 22.8 5 21.5 7 25.8 7 26.9 4 8 8 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	54 12.2 12.2 12.9 15.7 17.8 21 13.2 25.5 26.6 3 2.6 5 26.0 2 26.6 1 2 26.0 2 26.1 2 26	#2-1 -12.6 -14 16.8 +-7 9 18.8 -1.3 -21.3 -21.3 -21.3 -21.3 -21.3 -21.3 -21.3 -21.3 -21.3 -21.3 -21.3 -21.5 -21.3 -21.5	11.6.6.9 11.6.6.9 11.6.6.9 13.6.8 14.6.9 14.6.9 15.6.9 16.6.9 17.6.9 18.6.9 19.6.9	17.1 + 2 17 18.7 - 4 12 25.2 + 5 2 26.2 - 6 10 7 4 25.5 5 7 1.7	2 7 17.8 +.3 10 17.9 -1.3 5 20.7 -2.0 6 25.4 +.7 4 26.11 6 25.7 1.4 8 26.9 +.1 7 26.54	+.3 11 16.2 -1.6 20.1 +.2 5 21.3 -2.3 -2.3 -2.3 -2.5 1 27.2 +.7 5 24.5 -2.4 3 25.1 -39 4 26.4	17.2 +.1 4 2 19.8 9 19.8 3.7 19.8 3.7 19.8 1.4 10 26.1 5 8 1.9 27.7 +.8 4 25.8
43 N 42 N 41 N 40 N 39 N 38 N 37 N	24.4 -1.0 5 C 25.7 +.4	23. 23. 24. 26.2 24. 11.3 - 26.2 24. 11.3 - 25.2 25. 25.2 25. 26.9 27. 26.9 27. 26.9 27.	22.2 1 3 1 4 23.1 4 23.1 23 3 23.6 21 5 24.6 5 21 5 24.6 7 9 11 2 26.7 9 11 2 2 2 3 2 3 2 3 2 3 3 2 3 3 4 4 5 5 5 5 6 7 9 9 9 1 9 9 9 9 9 9 9 9 9 9 9 9 9	24.2 24.2 24.2 22.8 24.2 22.8 24.2 25.5 4 13.26.7 5 23.27.3 +.1	22.7 19 22.7 19 22.7 2.5 3 2.6 5 6 14 26.5 6 19 27.4 19 27.4 26.5 7 26.9 7 11	19.8- -6 22.3- +.8- 15 23.9- -2 15 25.5- +.1 4 27.0 +.0 16 27.5 +.1 7	17.6. 11.8 11.9 19.3 +.7 2 18.0 18.0 1.07 1.07 23.3 8 25.9 2 10 26.9 8 18	17.3 1.6 13.5 13.5 13.5 13.5 13.5 14.5 23.9 14.5 27.1 27.1 26.9 14 27.7 4 27.7 4	47 15.9.11.7 16.3 2.8 16.3 +.1 5 21.56 7 26.94 8 25.7 1.71 3	12.2 +.6 129 15.7 +.6 5 17.0 8 21 19.2 22.8 8 22.8 9 26.6 7 8 26.6 8 26.1 26.1 26.1 26.1 26.1 26.1 26.1	#2-1 -12.6 -14 -16.8 +-7 9 -18.8 -1.3 -21.	11.6.6.9 11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	17.1 + . 2 17 18.7 4 12 25.2 + . 5 2 26.7 6 10 26.7 3 4 25.5 5 6 2	2 7 17.8 +.3 10 17.9 -1.3 5 0.7 -2.0 6 25.4 +.7 4 26.11 6 25.7 1.4 8 26.9 +.1 7 26.54 3	+.3 11 16.2 -1.6 20 21.3 -2.3 -2.3 -2.3 -2.3 -2.4 -2.4 -2.4 -2.4 -2.4 -2.4 -2.4	17.2 +.1 17.4 4 -25 19.8 -7 19.8 3.7 12 23.5 1.0 24.8 1.4 10 25 10 24.8 1.4 10 25 10 24.8 1.4 10 25 10 26 10 27 10 27 10 27 10 27 10 27 10 27 10 27 10 27 10 27 10 27 10 10 10 10 10 10 10 10 10 10
43 N 42 N 41 N 40 N 39 N 38 N 37 N 36 N	21.4 -1.6 5 (25.7) +.4	231 -212123232425.2 2425.2 2526.9 2726.	22.2 1 3 22.1 4 23.1 4 23.1 4 23.1 5 24.6 59 11 2 26.7 9 23.4 0 +.5	24.2 -24.2 -2.4 -2.1 -12 -8 -8 -24 -22.9 1.6 -3 -3 -4 13 -3 -3 -3 -3 -12 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3	18.4. 18.4. 1.22.7 1.22.7 1.9 22.7 2.0.9 2.1.4 2.0.5 2.0.9 2.1.4 2.0.9 2.1.4 2.0.9 2.1.4 2.0.9 2.0	19.8- -6 2 22.3 +.8 15 23.9 -2 15 25.5 +.1 4 27.0 +.0 16 28.2 27.5 +.1 7	17.6. 11.3. 19.3. 19.3. 1.7. 18.0. 1.7. 1.7. 1.7. 1.7. 1.7. 23.3. 8. 25.9. 10. 26.9. 18.0. 7. 7. 7. 7. 7. 8. 25.9. 7. 7. 7. 7. 8. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7	17.3 1.5 13.5 13.5 13.5 13.5 13.5 13.5 13.	47 15.9 1.7 19 13.3 2.8 16.3 +.1 5 21.5 +.7 15 21.8 5 25.8 7 26.94 8 25.7 1.71 3	54 12.2 12.2 1.2 15.7 1.0 8 21 13.2 2.8 5 2.8 5 2.8 26.6 7 8 26.6 7 8 26.1 2 26.1 2 26.1 2 26.1 2 26.1 2 2 26.1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	#2.1 12.6 14 16.8 +.7 9 18.8 1.2 21.3 22.4 6 1.2 23.6 1.2 24.6 1.2 25.0 26.1 25.0 26.4 8 6	7 17.5.5 13 24.9 + 6 4 24.4.6 - 8 9 26.8 - 5 3 26.5 5 3	17.1 17.1 17.1 17.1 17.1 17.1 17.1 17.1	2 7 17.8 +.3 10 17.9 -1.3 5 20.7 -2.0 6 25.4 +.7 4 26.11 6 25.7 7 26.54 3	+.3 11 16.2 -1.6 20.1 +.2 5 21.3 -2.3 -2.3 -2.3 -2.4 -2.4 -3 -2.4 -3 -2.4 -3 -2.4 -3 -2.4 -3 -2.4 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3	17.2 +.1 4 9 19.8 9 19.8 3.7 19.8 3.7 19.8 1.0 24.8 1.0 25.0 1.9 27.7 +.8 4 25.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1

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В -	Fig. 9. A	verage	sea-suri	face temp	erature	1 1	14.0	13.8	1	^-			316	10.1
	а	nomalie	s (°C) 1	for Septe	ember				ار	ا رر			+1.5	16.4
45 N				l° square face temp	e are eratures—		1	_5_	~	2				6
	((upper)	and numl	ber of ob			13.2 12.70	10.6 2	المسر	15.6 + 1. 1	17. (1 4 (1) (1	-16.1 +.2	16.9	17.1
44.11		ions (l	ower).			My.	41	43	7 - [2,7	25	3		15
44 N =	च्ये री				18.4	15.7	14.3	13.1	_ز3.5 _.	/17.1	17.1	17.3	13.4	17.3
` -					16	7+1.7	+.9	+.9 127	6	+2.3	+1.1	** 1 ** 1 ** 1 **	+1.7	+.2
43 N -					16.9		13.9	16.9	16.3	17.1		10.7	20.0	11
					+.8	3+1.4	-1.1	+2.1	+.7	+.1	18.3	16.7 +.5	20.6 +2.2 _f +	2.9
42 N -					3	226	1	3	8	12	19	4		.3 .
				18.4 	15.6.∬15.1 5 -1-3-1. 3	17.2 3+1.3	16.7 +.7	16.8	17.4 -1.6	19.1 - 1.3	19.7 - 1.4	21.4		3
41 N -			ا سر	5	1 2	3	6	5	12	7	9	8	1	3
. 41 14			20.1	19.5			17.8	19.0	19.4	22.6	23.4			23.4
40.11			5	62	2-1.3: 8 129		-2, 1 - 9	-2.6	3	7 6	8	-1.0	-l.l	9
40 N -	23.0	22.2 18.		22.1 21.4	22.4 21.0	21.8	22.6	22.9 -1.6	22.9	23.6	24,9	23.1	24.1	25.1
00.11	البررا	, 1 2	770	+.56	8 - 2 3	-1.3 }	-1.3- 8	-1.6	-2.3	-1.5	6	-2.3 6	1.3	2 6
39 N -	114	20.Ž\ 21.	7 22.5	23.5 23.6		25.7	26.1	25.7	25.6	26.2	26.4			24.7
	14	-2.5	61	+.71	.H1.ØH1.3	3 +.2	1.0	+.5	2	+. 1	+.6	+.1	+.1	
38 N	1	31 y 18 22.6 22.	9 24.2	6 14	26.1 26.7	26.3	26.7	25.7	5 25.7	26.3	6 24.9	6 26.3	9 25.4	21.9
l	1 5	(7.5)	2 +.4	-1.7°6	-1 0.6	73	+.1	8	-1.Ø	2	-1.5	+.2	1.0	1.3
37 N		√16 21 22.7 24.		17 6 26.5 27.1	22 11 27.2 25.7	10 25.5	11 25.2	9 25.8	6 25.3	25.5	25.1	24.6	24.6	25.6
	+2.4	+ Q.I.	6 +.5	+.3 +.3	3 +.69	3 -1.1 -	1.4	4	1.2	8	-1.3	-1.9	1.6	7
36 N -	! 논의	\ 207 18		12 6 26.9 27.3	6 16 26.3 27.8	26.3	26 . 5	5 24.6	25.6	25.6	8 25.4	26.3	25.5	2 26.0
		25.3 25. Ø-1.	0+1.0	0 +.6	64 +.5	6	3	1.9	- 1 , 1	9			. 1	4
35 N L		13 14	6	5 8	7 1	8	9	3	3	8	3.	5	3	3
Fig	g. 10. Av	erage s	ea-surfa	ace tempe	rature ano	malies		9.0		^-	1		L	
1					. , , 0		- 1	3.0		الركر] _	\neg	111.	6 10.5/
- 1	(° ar	C) for (e avera	October ge sea-s	1981. I surface t	in each l° emperature	square	er)	_ 1	~				11.	7-1.7
5 N	ar	e avera	ge sea-s	surface t	in each l° cemperature is (lower).	square s (uppe		1	~		12.3	13.0		7-1.7
5 N	ar	e avera	ge sea-s	surface t	emperature	square s (uppe	ل المرازر المرازر	9.5			12.3	+.	1 12.1	7-1.7 3 13.2 5 +.5
	ar	e avera	ge sea-s	surface t	emperature ns (lower).	square es (uppe	11.3 122	9.5		1	16	5	12.1	7-1.7 3 13.2 5 +.5 8
	ar	e avera	ge sea-s	surface t	emperature is (lower).	square es (uppe	ل المرازر المرازر	9.5	J2.18	/12.2 2	16 12.9	5	12.1	7-1.7 3 13.2 5 +.5 8
5 N =	ar	e avera	ge sea-s	surface t	emperature is (lower).	square es (uppe	22	9.5 53			16 12.9	5	12.1	7-1.7 3 13.2 5 +.5 8 14.0 3 +.2
	ar	e avera	ge sea-s	surface t	11.7 11.3 14	square s (upper square)	22 11.8 +.9 7	9.5 53 11.3 +.2 24 12.7	13.0	2 10 13.4	16 12.9 4 12 14.5	13.4 17 14.9	1 12.0 1 10 1 15.0 3 11: 3 16.3	7-1.7 3 13.2 5 13.2 5 +.5 8 14.0 3 +.2 5 3 -17.9
4 N =	ar	e avera	ge sea-s	surface t	11.7 11.3 11.3 11.4	square s (upper s) 12.1 3+1.0 9 12.4 34	22 11.8 +.9	9.5 53 11.3 +.2 24 12.7	13.0	2 10 13.4	16 12.9 4 12	13.4 17 14.9	1 12.0 1 10 1 15.0 3 11: 3 16.3	7-1.7 3 13.2 5 +.5 8 14.0 3 +.2 5
4 N =	ar	e avera	ge sea-s	surface t servation	11.7 11.3 1.4 11.2 12.7 12.7 12.7	square ss (upper	11.3 22 11.8 +.9 7 12.1 3 5	1 9.5 53 11.3 +.2 24 12.7 +.0 5	13.0 - 2 6	2 10 13.4 1.4 11.4	12.9 A 12 14.5 A 10	13.4 13.4 17 14.9 18.5	1 12.0 1 10 1 15.0 3 + 1: 3 16.3 4 +.1	7-1.7 3-13.2 5-13.2 5-14.5 8-14.0 9-14.0 5-17.9 6+1.6 15.1 20.1
4 N =	ar	e avera	ge sea-s	surface t servation	11.7 11.3 1.4 11.2 12.7 12.7 12.7	square ss (upper	11.3 22 11.8 +.9 7 12.1 3 5	1 9.5 53 11.3 +.2 24 12.7 +.0 5	13.0 13.0 13.8 13.8 12.8	2 10 13.4 -1.4 11.4 -15.8 -1.8	12.9 A 12 14.5 A 10	13.4 13.4 17 14.9 18.5 18.5	1 12.0 1 12.0 10 15.0 3+1: 3 16.3 4 +.1	7-1.7 3-13.2 5-13.2 5-14.5 8-14.0 9-14.0 5-17.9 6+1.6 15.1 20.1
4 N	ar	e avera	ge sea-sr of obs	10.0 1 14.4 15.2 16.3	11.7 11.3 1.4 11.2 12.7 13.3 13.7 13.3	square s (upper land) 12.1. 3 12.4 3 4 235 7 13.3 7 1.2	11.3 22 11.8 +.9 7 12.1 3 5 14.1 0 11	1 9.5 53 11.3 +.2 24 12.7 +.0 5 13.2.2 15 16.2	13.0 13.0 6 13.8 13.8 13.2	2 10 13.4 1.1 15.8 15.8	12.9 4 12 14.5 4 16 17.2 17.2 18	13.4 17 14.9 4 18.5 21.5	1 12.1 1 0 1 15.1 3 + 1 3 16.3 4 + 1 11	7-1.7 3 13.2 5 +.5 8 14.0 9 +.2 5 -17.9 6+1.6 5 20.1 22 5 20.9
.4 N =	ar	re avera; d numbe	ge sea-r of obs	10.0 1 1.4 15.2 16.3	11.7 11.3 1.4 11.7 12.7 12.7 13.3 13.7 13.7	square ss (upper	11.3 22 11.8 +.9 7 12.1 3 5 14.1 0 11	1 9.5 53 11.3 +.2 24 12.7 +.5 13.2 15	13.8.8 1-6 13.8.8 22 22 13.8.8 13.8.8 13.8.8	2 10 13.4 -1.4 11.4 -15.8 -1.8	12.9 4 12 14.5 4 16 17.2 17.2 18	13. 4 17 14. 9 - 4 18. 5 19. 2 21. 5	12.0 1 12.0 1 15.1 3 14.1 1 16.3 1 16.3 1 1.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7-1.7 3 13.2 5 +.5 8 14.0 3 +.2 5 -17.9 6+1.6 15 20.1 22 5 20.9 3 -1.7
.4 N =	ar	e avera	ge sea-sr of obs	10.0 1 14.4 15.2 16.3 15.2 16.3 15.2 15.8 16.1	11.7 11.3 14 11.2 12.7 13.3 14 17.5 16.7	square s (upper s (up	11.3 22 11.8 +.9 7 12.1 3 5 14.1 0 11	1 9.5 53 11.3 2 12.7 2 2 2 2 2 12.7 2		2 10 13.4 -1.4 11 15.6 -1.8 20.1 -1.2	12.9 16 12.9 12 14.5 16 17.2 18 19.8 19.8 24.0	13.4 17 14.9 18.5 18.5 21.5 2	3 + 1: 10 15: 3 + 1: 3 + 1: 10 18: 4 + 1: 11 18: 5 22:33 6 6:	7-1.7 3 13.2 5 13.2 5 +.5 8 14.0 3 +.2 5 -17.9 6+1.6 15.1 20.1 20.1 20.1 20.1 20.3 3 -1.7 7 2 20.3
13 N — 11 N — 10 N —	ar	re avera; d numbe	16.0 16.0 16.9 16.9	10.0 10.0 1 1.1.1 15.2 16.3 1.5 2.4 15.8 16.1 2.5 3.5	11.7 11.3 11.7 11.3 11.7 11.7 11.7 11.7	square s (upper s (up	11.3 22 11.8 +.9 7 12.1 3 5 14.1 1 13.4 13.4 13.4 13.4 13.4 13.4 13.4 13.4 13.4	1 9.5 53 11.3 2 24 12.7 Ø 16.2 2 20.1 1 1 20.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	13.8 8 13	13.4 11.4 11.4 15.8 8 8 20.1 21.4 21.4 21.4 21.4 21.4 21.4 21.4	12.9 16 12.9 12 14.5	13.4 17 14.9 18.5 18.5 21.5 2.1.5 2.2.4.4 +.6	12.0 1 12.0 1 10 10 10 15.1 10 15.1 11 16.3 13 3 4 4 + 11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7-1.7 3 13.2 5 13.2 5 +.5 8 14.0 8 14.0 6 +1.6 6 +1.6 5 20.1 22 5 20.9 8 -1.7 77
13 N — 11 N — 10 N —	ar	re avera; d numbe	76.0 76.0 76.0 76.0 76.0 76.0 76.0 76.0	10.0 1 10.0 1 16.3 1.5 16.3 1.5 24 15.8 16.1 2.5 3.5	11.7 11.3 11.7 12.7 12.7 13.3 14 11.2 12.7 2 3 13.7 13.3 12.6 2.5 13.7 13.3 12.6 2.5 13.7 13.8 2.6 2.5 13.7 13.8 2.6 2.5 13.8 13.7 13.8 2.6 2.5 13.8 13.7 13.8 2.6 2.5 13.8 13.7 13.8 2.6 2.5 13.8 13.7 13.8 2.6 2.5 13.8 13.7 13.8 2.6 2.5 13.8 13.7 13.8 2.6 2.5 13.8 13.7 13.8 13.8 13.8 13.8 13.8 13.8 13.8 13.8	square ss (upper	11.3 22 11.8 +.9 7 12.1 3 5 14.1 3 5 14.1 3 5 14.1 3 5 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 13.4 3 3 3 3 3 3 3 3	1 9.5 53 11.3 2 12.7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	13.0 0 13	13.4 13.4 11.4 15.6 8 23.1 21.4 21.4 23.2	12.9 16 12.9 12 14.54 16 17.2 18 19.8 19.8 14.0 1.6 17.2 24.0 1.6 17.2 23.9	13.4 17 14.9 18.5 18.5 21.5 2.2 24.4 4	12.0 1 10 10 10 10 10 11 13 14 + 11 13 13 13 14 15 16 17 18 18 19 10 1	7-1.7 3 5 13.2 5 +.5 8 1 14.0 3 +.2 51.9 6+1.6 15.1 22 5 20.9 3 -1.7 7 7 7 2 24.2
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.4 N	17.57 17.57	13.0 15.2 2.5	76.0 16.0 16.9 16.9 18.5 12 20.6	10.0 10.0 1 11.4 15.2 16.3 15.2 16.3 15.8 16.1 2.5 3.5 10 17	11.7 11.3 11.7 11.3 11.7 11.3 11.2 12.7 12.7 13.3 13.7 13.3 13.7 13.7 13.7 13.7 13	square s (upper s (up	11.3 22 11.8 +.9 7 12.1 3 5 14.1 9 13.4 9 13.4 19.4 19.4 24.2 +.5 3 24.5	1 9.5 53 11.3 2 12.7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	13.62 13.62 13.83 15.22 18.23 18.33 24.12 9 24.8	2 10 13.4 -1.4 11.1 15.8 8 -1.8 20.1 21.4 21.4 21.4 21.4 21.4 21.4 21.4 21	12.9 16 12.9 12 14.54 16 17.2 18 19.8 19.8 14.0 1.6 17.2 24.0 1.6 17.2 23.9	13.4.1 13.4.2 17.1 14.9 18.5 18.5 2.1.5 2.2.5 2.2.4.4 18.5 2.2.5 2.3.4 2.3.5 2.3.6 2.3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6	12.1 10.1 10.1 10.1 11.1 10.2 11.1 10.2 10.3	7-1.7 3 13.2 5 13.2 5 +.5 8 14.8 9 +.2 5 6+1.6 15 20.1 2 20.1 2 20.9 8 3 17.9 6 23.5 7 - 7 7 7 2 24.2 5 6 6 6 6 7 - 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
.4 N	ar an	13.0 1 15.2 2 1.3 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8	718.0 718.0	10.0 1 10.0 1 11.4 1.7 6 15.2 16.3 1.5 - 3.3 1.5 - 3.3 1.5 - 3.3 1.7 2.1.0 18.7 2.1.0 18.7 2.1.0 18.7 2.1.0 18.7 2.1.0 18.7 2.1.0 18.7 2.1.0 18.7 2.1.0 18.7 2.1.0 18.7 2.1.0 18.7	11.7 11.3 11.7 11.3 3 14 11.7 12.7 12.7 12.7 12.7 13.3 13.7 13.3 13.7 13.7 13.7 13.7 13	square se (uppe se	11.3 22 11.8 +.9 7 12.1 3 5 14.1 3 13.4 3 19.4 19.4 19.4 19.4 19.4 19.4 19.4 19.4 19.4 19.5 10.5	1 9.5 53 11.3 2 24 12.7 20 12.	5 6 2 8 8 2 2 8 3 1 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	2 10 13.4 -1.4 15.8 -1.8 20.1 21.4 21.4 21.63	12.9 14.5 12.1 12.1 12.1 12.1 12.1 12.1 12.1 12	13.4. 13.4. 17. 14.9. 18.5. 18.5. 19. 21.5. 22.5. 24.4.4. 22.5. 21.5. 25. 26. 27. 28. 29. 21.5. 21.5. 21.5. 21.5. 21.5. 22.5. 23. 24. 25. 26. 27. 27. 27. 27. 27. 27. 27. 27	12.1 10.1 10.1 11.1 10.1 11.1 10.1 11.1 10.1	7-1.7 3 13.2 5 +.5 8 14.8 9 +.2 5 17.9 6+1.6 15.1 20.1 2 5 20.9 3 14.7 7 7 7 24.2 5 6 6 6 6 6 6 6 6 9 1.2
.4 N	17.57 17.57	13.0 15.2 2.5 1.1 1.3.9 17.8 17.8 17.8 17.8 17.8 17.8 17.8 17.8	7 16.0 1 16.9 - 8 - 6 12 20.6 11	10.0 10.0 1 11.4 1.7 6 15.2 16.3 1.5 24 15.8 16.1 2.5 3.6 17 21.0 18.7 8 14.1 2.1.0 21.1 18.7 8 14.1 2.1.0 21.1 18.7	11.7 11.3 11.7 11.3 3 11.7 11.3 11.7 11.3 11.7 11.3 11.7 11.3 11.7 11.3 11.7 11.3 11.7 11.3 11.7 11.3 11.7 11.3 11.7 11.3 11.3	square se (uppe se se se (uppe se	11.3 22 11.8 +.9 7 12.1 3 5 14.1 3 13.4 3 19.4 19.4 24.2 +.5 3 24.5 6 4	1 9.5 53 11.3 2.4 12.7 15 2.2 2.1	\$ 5 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 10 13.4 -1.4 15.8 8 -1.8 20.1 21.4 -1.9 23.2 21.4 24.63 3	12.9 14.5 12.1 12.1 12.1 12.1 12.1 12.1 12.1 12	13.4.4.5 13.4.4.7.1 14.9.2.1 4.18.5.2.2 21.5.2.2 24.4.4.6.2 22.5.3.6.2 23.6.6.2 1.2.3.6.2 1.2.3.6.2 1.2.3.6.2	12.1 10.1 10.1 11.1 10.1 11.1 11.1 11.1 11.1 11.1 12.2 13.6	7-1.7 3 13.2 5 +.5 8 14.8 9 +.2 5 6+1.6 15: 20.1 2 5 20.9 3 14.7 7 7 7 7 24.2 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
4 N =	17.57 17.57 14.	13.0 1 15.2 2 2 1 1 2 2 2 2 1	16.9 8 6 18.5 5 11 24.3 +1.4	10.0 10.0 1 14.4 1.7 6 15.2 16.3 1.5 - 3 1.5 - 3 1.5 24 1.5 8 16.1 2.1 9 18.7 2.1 0 18.7 2.	11.7 11.3 11.7 12.7 12.7 12.7 13.3 13.7 13.3 13.7 13.3 13.7 13.3 13.7 13.5 16.7 2.5 16.7 8 19.6 21.9 13.7 13.3 13.7	square se (uppe se se se (uppe se	11.3 22 11.8 +.9 7 12.1 3 5 14.1 9 13.4 9 14.1 19.4 1 24.2 +.5 3 24.5 6 4 24.3 4	1 9.5 53 11.3 2 24 12.7 Ø 16.2 20 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\$ 5 5 5 2 8 8 5 2 8 8 8 2 2 8 8 8 2 2 8 8 8 8	2 10 13.4 -1.4 15.8 15.8 20.1 21.4 -1.9 3 23.2 -1.2 4.6 -3 3 23.2 -1.1 1.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1	12.9 16 12.9 12 14.5 12 14.5 13 18 13.8 13.8 12.9 13.9 15 16 15 16 16 16 16 16 16 16 16 16 16 16 16 16	13.4.1.5 13.4.1.7.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	12.1 1 10 15.1 16.5 11 18.8 11 11 13 14 + 11 13 14 + 11 13 14 + 11 13 14 + 17 18 18 18 18 18 18 18 18 18 18	7-1.7 3 13.2 5 13.2 5 +.5 8 14.0 8 +.2 5 6 +1.6 15 20.1 22 5 20.9 7 7 7 7 21.2 9-1.2 4
4 N = 3 N = 10 N	17.57 17.57 12.21	13.0 1 15.2 2 2 2 1 1 2 2 2 2 1 1 2 2 2 2 1 1 2 2 2 2 1 1 2 2 2 2 1 1 2 2 2 2 1 1 2 2 2 2 2 1 1 2 2 2 2 2 2 1 1 2	16.9 8 6 18.5 5 11 24.3 +1.4	10.0 10.0 1 14.4 1.7 6 15.2 15.2 16.3 1.5 2.4 15.8 16.1 2.1.9 18.7 2.1.0 18.7 2.	11.7 11.3 11.7 11.7 12.7 12.7 12.7 13.3 14.1 12.7 12.7 12.7 13.3 13.7 13.7	square se (upper se	11.3 22 11.8 +.9 7 12.1 3 5 14.1 3 13.4 3 13.4 3 13.4 3 3 24.2 +.5 3 24.5 6 4 24.3 4 5	1 9.5 53 11.3 2 24 12.7 Ø 12.7 Ø 12.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\$ 5 5 5 2 8 8 2 13 8 9 1 1 N 5 1 1 2 N 2 1 1 2 N 2 1 1 2 N 2 1 2 N 2 1 1 2 N 2 N	2 10 13.4 -1.4 15.8 15.8 8 20.1 21.4 -1.9 3 23.2 -1.2 -3 3 23.2 -1.9	12.9 16 12.9 12 14.5 12 14.5 13 18 13.8 12 14.9 15 18 18 19 19 19 19 19 19 19 19 19 19 19 19 19	13.4.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	12.1 1 10.1 10.1 10.1 10.1 11.1 11.1 11.1 12.1 11.1 12.1 13.1 14.1 11.1 13.1 14.1 15.1 16.5	7-1.7 3 13.2 5 13.2 5 +.5 8 14.0 8 +.2 5 6 +1.6 15.2 20.1 22 5 20.9 3 -1.7 7 7 7 23.5 77 7 24.2 6 4 4
4 N = 3 N =	ar an an 17.57	13.0 13.0 11.5.2 2.2 2.3 2.2 13.3 1 24.0 3.1 24.	16.0 16.0 16.9 18.5 1.6 12.2 20.6 11.2 21.8 11.3 24.9 3.3 3.4 3.5 1.6 1.6 1.7 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	10.0 10.0 1 14.1 15.2 16.3 1.5 2.4 15.8 16.1 2.5 3.2 1.7 21.0 18.7 21.0 18.7 21.0 21.1 21.0 21.0	11.7 11.3 11.7 11.7 11.7 11.7 11.7 11.7	square se (upper se	22 11.8 +.9 7 12.1 3 5 14.1 3 13.4 2.3 13.4 2.3 24.2 +.5 3 24.5 6 4 24.3 6	1 9.5 53 11.3 2 12.7 Ø 12.7 Ø 12.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\$ 5 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 10 13.4 -1.4 11 15.8 8 20,11 21.4 -1.9 3 23.2 -1.9 21.53 3 23.2 -1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9	12.9 16 12.9 12 14.5 12 14.5 18 19.8 19.8 19.8 19.8 19.8 19.8 19.8 1	13.4. 13.4. 17. 14.9. -1.2. 9. 21.5. -2.3. 6. 22.5. 23.6. 23.7. -1.2. 3. 23.7. -1.2. 3. -1.2.	12.1 10.1	7-1.7 3 13.2 5 13.2 5 8 14.8 6 14.8 6 17.9 6 17.9 6 20.1 7 7 7 2 23.5 7 7 7 7 2 24.2 6 6 3 3.6 9 1.2 4 98
4 N = 3 N =	ar an an 17.57	13.0 1 15.2 2 2 2 1 1 2 2 3 1 1 24.0 1 2 3 1 24.0 1 2 3 1 2 4.0 1 2 3 1	16.9 16.9 16.9 18.5 12 20.6 11 21.4 8	10.0 10.0 1 14.4 1.7 6 15.2 16.3 1.5 24 15.8 16.1 2.5 3 1.7 21.0 18.7 21.0 18.7 21.0 18.7 21.0 18.7 21.0 18.7 21.0 18.7 21.0 18.7 21.0 21.0 21.0 21.0 21.0 21.0 21.0 21.0	11.7 11.3 14.4 11.7 12.7 12.7 13.3 14.4 11.7 13.6 12.7 12.7 13.5 16.7 16.7 16.7 16.7 16.8 19.6 21.5 16.8 19.6 25.6 25.6 25.6 25.6 25.6 25.6 25.6 25	square se (upper se	11.3 22 11.8 +.9 7 12.1 3 5 14.1 1 13.4 2 13.4 2 13.4 2 3 3 3 3 3 3 3 3	1 9.5 53 11.3 2 24 12.7 Ø 12.1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	\$ 5 5 5 2 8 8 8 2 2 8 8 8 2 2 8 8 8 8 2 2 8	2 10 13.4 -1.4 15.8 8 20.1 21.4 -1.9 3 23.2 -1.2 4.6 6 3 23.2 -1.9 5 23.5 -1.4	12.9 16 12.9 12 14.5 12 14.5 12 13.8 13.8 13.8 14.3 1 12.3 13.8 124.0 12.3 12.3 12.3 12.3 12.3 12.3 12.3 12.3	13.4. 17. 14.9. 18.5. 17. 14.9. 21.5. 2.5. 2.2.5. 2.3.6. 2.3.6. 2.3.6. 3.3.	12.0 10.0 10.1	7-1.7 3 13.2 5 13.2 5 +.5 8 14.0 6 +1.6 6 +1.6 72 5 20.1 22 5 77 7 2 24.2 6 6 3 23.6 9-1.2 4



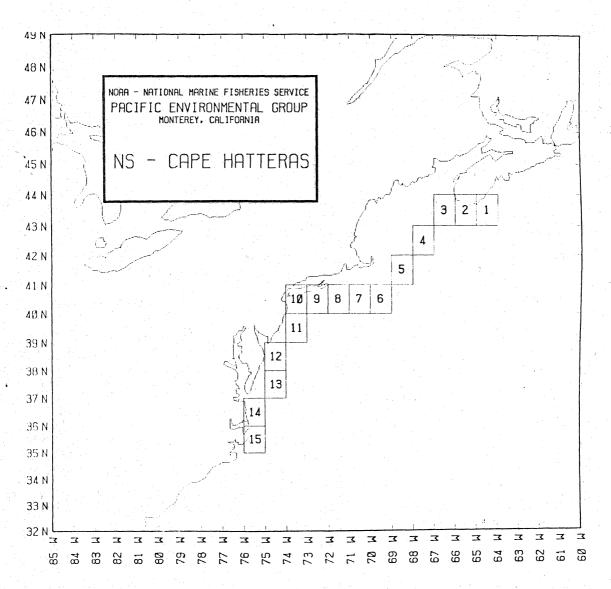


Figure 13. Location of one-degree squares of interest utilized in figures 14

4	\cap	1
-1	· 47	١,

1 43 N 64 H 7 7 -1.0 -1.1 0.2 1.5 0.65 0.8 1.4 2.324 2 43 N 65 H7 -2.22 0.9 2.33 -1.03 0.4 0.86 5 18 2 12 11 5 2 14 6 5 14 3 43 N 66 H -1.0 -3.1 0.14 3.5 1.8 2.1 1.7 0.6 0.9 0.20 11 12 10 10 55 29 33 55 129 127	
2 43 N 65 H =7 -2.22 Ø.9 = 2.33 -1 Ø3 Ø.4 Ø.86 E	4
3 -1.2 -3.1 0.14 3.5 1.8 2.1 1.7 0.6 0.9 0.20	
43 N 66 W 11 12 10 10 55 129 135 129 127 24 9	1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	-2.9
5 41 N 68 H = 2.69 -1.5 Ø.2 Ø.3 -1.7 Ø.3 2.8 -1.0 1.3 -1.2 -2.1 8 5 4 8 14 9 5 ip 1. 1 3 1.4 5	1.8
6 40 N 69 H	4
7 40 N 70 N =9 -2.5 -2.1 -1.282 1.2 1.5 0.8 -1.3 -2.6 -2.3	
8 40 N 71 W 5 3 277 2 1.2 51 7 9 0.2 1.0 0.823 -11.7	-1.4
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
40 N 73 W -2.6 -1.954 -2.153 0.15 -1.0 -1.8 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
39 N 73 H	-1.8
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
13 37 N 74 W	-2.Ø
14 36 N 75 W	-3.8 18
15 35 N 75 W 1.1 2.9 -2.8 -5.3 3.4 0.7 1.1 1.300 0.2 -1.6	

Figure 14. Space-time plot of sea-surface temperature anomalies (°C) for 1981. Also shown are the numbers of observations utilized (lower left corner of squares). Location of one-degree squares (1-15) shown in figure 13.

1980

	D	J	F	M	A	М	J	J	A	S	0	N	D
1 43 N 64 H	-1.5 i	3.4	2	2 7	Ø.5 2	2.6	2.1	- .8	Ø. 6	1.9		Ø.2 2	7 7
2 43 N 65 W							1.3 2					***************************************	
3 43 N 66 W	4	Ø.6	Ø		1.2	0.4	1.7 29	1.4	Ø.8 8	1.3 20	1.0	-2.6 8	-1.Ø
4 42 N 67 W	Ø	1.0	Ø.3 4	1.0	0.7	2.9 t	Ø.7 4	Ø.8 3	5 2	1.2	3 1		9
5 41 N 68 W	13 To A.						- . 8		100	į.		-1.3 2	-2.6 8
6 40 N 69 W	Ø.7	- .7 52	6	-1.2 8	Ø.2 155	1 179	-1.7 160	-2.6 168	-2.5 50	-1.6 43	Ø. 6	-3.1	-2.5 203
7 40 N 70 W	2.2.	1.0	1 6	-1.5 2	Ø.1 12	7	7 16	-2.1		1.5	Ø.9 6	1.5	9 6
8 40 N 71 W	-1.8 5	0.3	-1.8 7	-1.3 5	-1.8 LE	-1.5 -7	-1.7	1 12	3 1	1.1	0.4	1.0 3	7 5
9 40 N 72 W	Ø.6	6	-3.Ø	- . 5	-1.4 6	2.6	-2.6 7	ø . 2	-2.1 i	1.2	-2.4	 2	-3.Ø
1Ø 4Ø N 73 W	Ø.4 187	1.3	Ø.6 135	3 197	-1.0 187	- .7	9 189	4 221	7 60	196	2.8 174	-1.3 6	
11 39 N 73 W	0. 8	- . 2	- . 5	Ø.3	Ø.8	2.6	9 15	5	-1.9 4	Ø.7	-1.2 7	-1.3	3
12 38 N 74 W	1.Ø	5 13		-1.8 19	0.7	Ø.9	Ø.9 8	2	-1.0 3	1. 9	Ø.8	-1.1 6	-2.Ø 5
13 37 N 74 W			The state of the s			i.	Ø.4 21						
14 36 N 75 W	5	-1.1	-1.3	-1.1 ₁₅	-1.3	Ø.2 13	-1.0 17	Ø.4 18		- 2.2 -7	2.4	-2.5	-3.2 244
15 35 N 75 W	1.2	1.8	-4.7	-2.1	-1.3	1.9	1.5	1	1	1.5	-2.5	-3.Ø	1.1

Figure 15. Space-time plot of sea-surface temperature anomalies (°C) for 1980. Also shown are the numbers of observations utilized (lower left corner of squares). Location of one-degree squares (1-15) shown in figure 13.