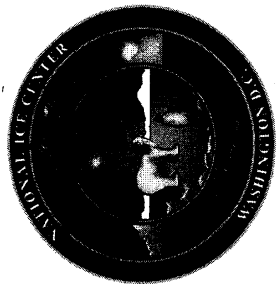
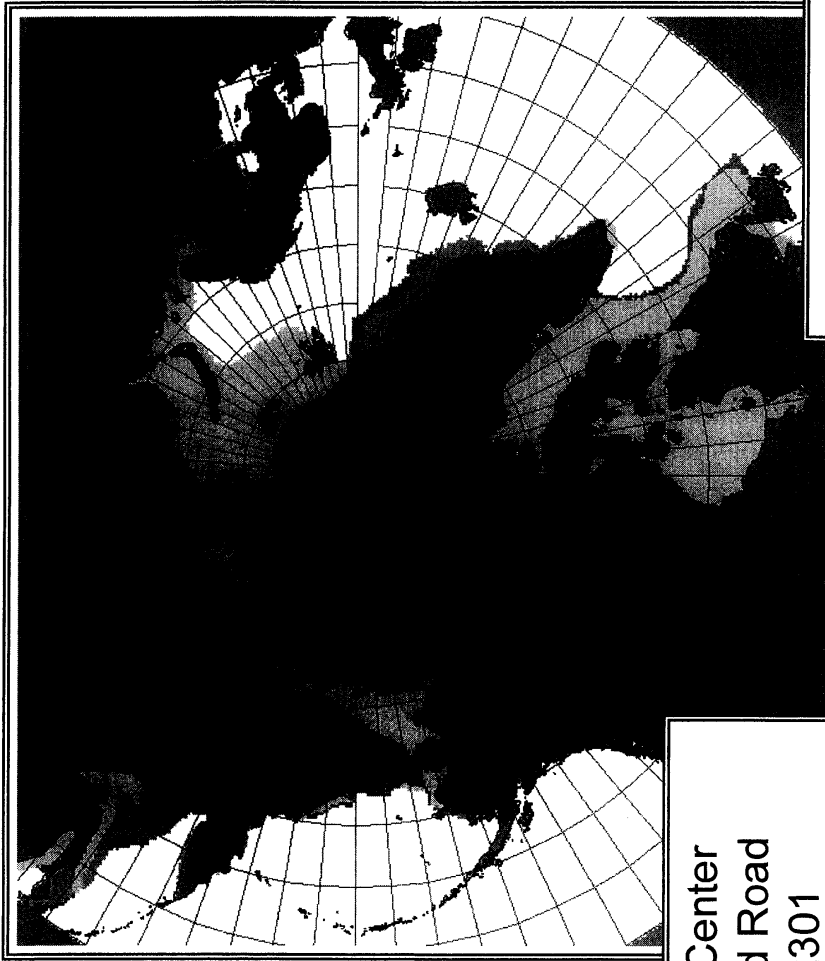




National Ice Center
Arctic Sea Ice Atlas
1996



19990722 020



<http://www.natice.noaa.gov>

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PREFACE

The National Ice Center (NIC), under sponsorship of the United States Navy, the United States Coast Guard, and the National Oceanic and Atmospheric Administration (NOAA), provides sea ice analyses encompassing the "Arctic" and the "Antarctic". These analyses continue the data set established under our previous name, the Joint Ice Center. These atlases continue the near real-time integration of remotely sensed data and point observations and differ only in that the Arctic and Antarctic are split into two separate publications per hemisphere per year.

This publication is the "Arctic Sea Ice Atlas" published in hard copy format by the NIC. The atlas contains weekly charts depicting the sea ice extent and coverage in the Northern Hemisphere from the first week of January through the last week of December 1996. Future annual atlases will be available in a digital format on CD-ROM through the National Snow and Ice Data Center (<http://www/nsidc.colorado.edu>). NSIDC is the official archive center for the NIC.

The NIC uses a wide variety of data sources in the production of sea ice analyses. Table 1 lists the data sources used to produce the Arctic weekly ice analyses contained in this publication. The line types used in the analyses provide metadata information with regard to sensor type. Solid lines depict boundaries derived from: point observations, Defense Meteorological Satellite Program Operational Line Scan (DMSP OLS) and NOAA Advanced Very High Resolution Radiometer (AVHRR) data. Dash-dash-dotted lines depict boundaries derived from DMSP Special Sensor Microwave Imager (SSM/I), and dashed lines depict boundaries derived from forecast models and climatology.

Please direct questions or comments to the NIC Liaison Branch, at phone number (301) 457-5303 extension 311 or 303, facsimile number (301)457-5300, or electronic mail address: liaison@natice.noaa.gov

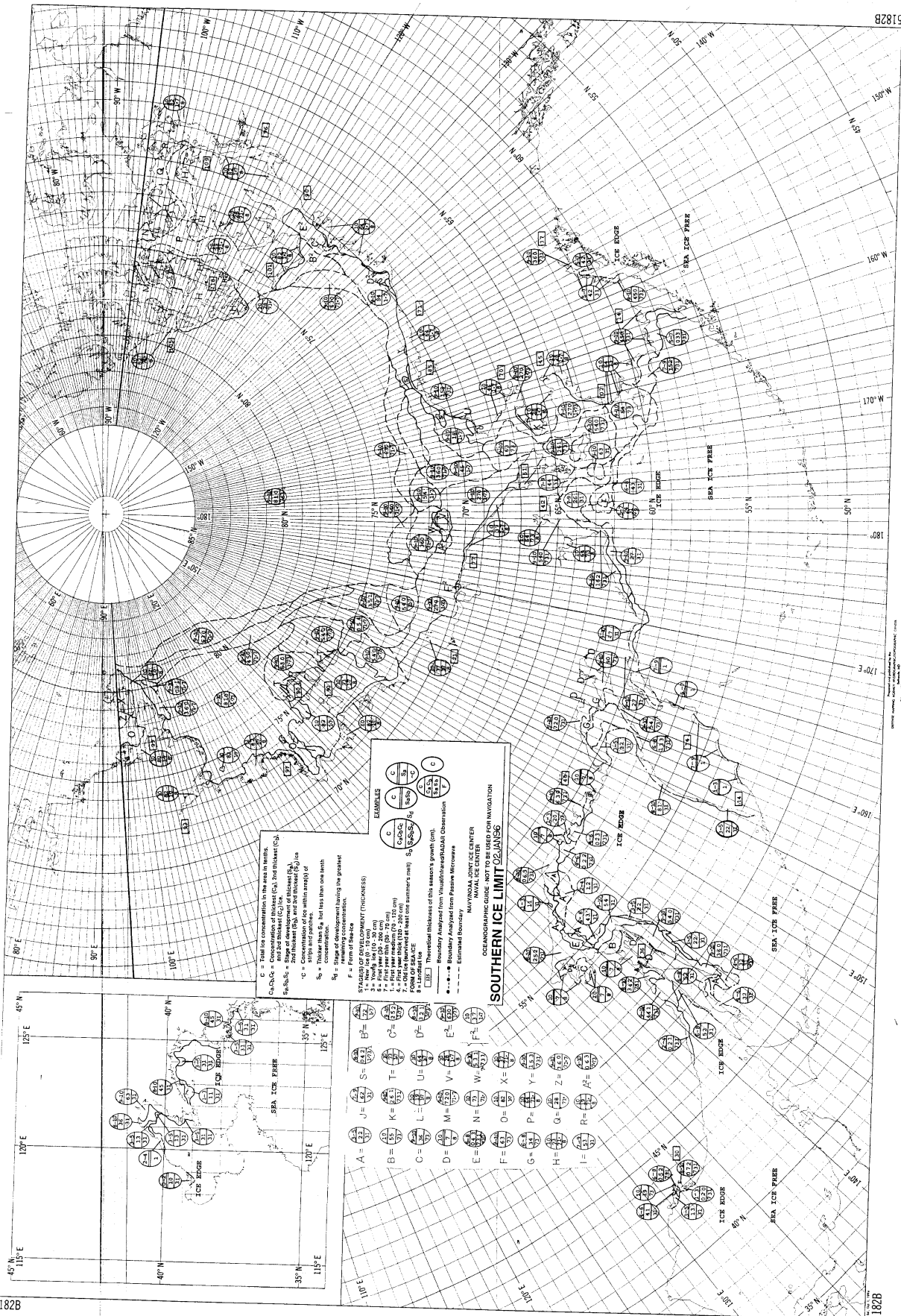
From	To	Sensor Platform	Sensor and Type	Spectral Region	Resolution	Coverage
01-96	12-96	DMSP F-10, 11, 12, 13	OLS Fine: VIS IR SSM/I	0.4 to 1.1 μm 10.2 to 12.8 μm 19.35 and 37GHz	0.55 km 25 km	3,012km 3,012km
01-96	12-96	NOAA 12, 14	AVHRR: HRPT/LAC VIS NIR IR	0.58 to 0.68 μm 0.72 to 1.10 μm 3.55 to 3.93 μm	1.1km at nadir; 2.5km at swath edge	4,000km
01-96	12-96	RADARSAT	AMI SAR	C- Band (5.3 Ghz)	100km	500km

TABLE 1. 1996 Arctic Satellite Data Sources

Abbreviations and Acronyms:

AMI- Active Microwave Sensor
 AVHRR- Advanced Very High Resolution Radiometer
 cm- centimeter
 ERS- Earth Remote Sensing Satellite
 GHz- GigaHertz
 HRPT- High Resolution Picture transmission
 IR- Infrared
 km- kilometer
 LAC- Local Area Coverage
 NIR- Near Infrared
 OLS- Operational Linescan System
 RADARSAT- Radar Satellite
 SAR- Synthetic Aperture Radar
 SSM/I- Special Sensor Microwave Imager
 μm - micrometer
 VIS- Visible
 RADARSAT- Radar Satellite
 SAR- Synthetic Aperture Radar

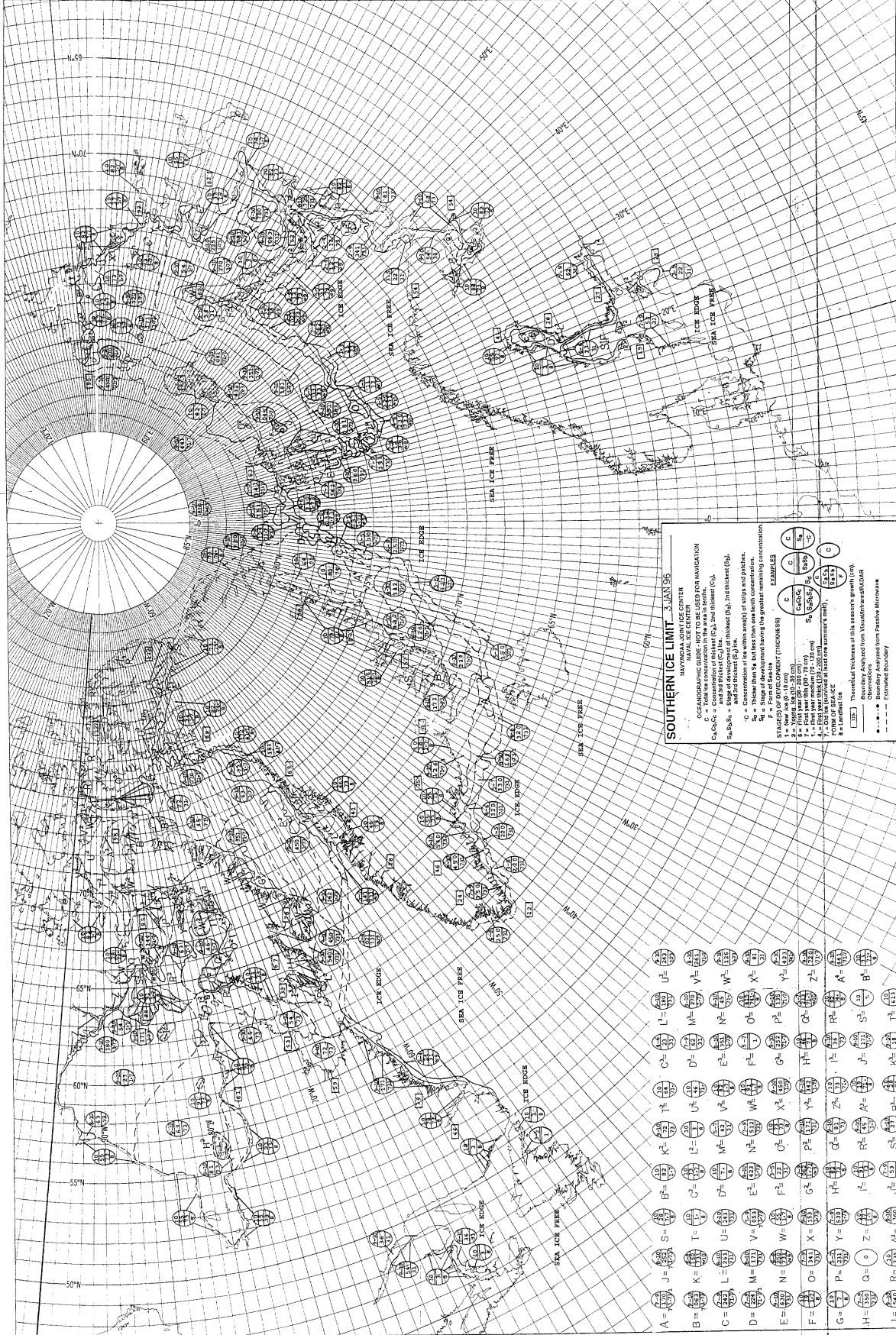
Prepared under the authority of Commander, Naval Oceanography Command,
 Stennis Space Center, MS 39529-5000



C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of the 1st, 2nd and 3rd thickness (C₁, C₂, C₃) in tenths.
 S₁S₂S₃ = Thickness (S₁, S₂, S₃) in tenths.
 C = Concentration of ice within a group of 100 tenths.
 S₁ = Thickest thin ice, but less than one tenth concentration.
 S₂ = Second thickest thin ice.
 F = Form of Sea-ice
 1 = Field of development (thickness)
 2 = Young ice (10-20 cm)
 3 = First year thin (20-75 cm)
 4 = First year thick (75-200 cm)
 5 = First year thick (200-250 cm)
 6 = First year thick (250-300 cm)
 7 = First year thick (300-350 cm)
 8 = First year thick (350-400 cm)
 9 = First year thick (400-450 cm)
 10 = First year thick (450-500 cm)
 11 = First year thick (500-550 cm)
 12 = First year thick (550-600 cm)
 13 = First year thick (600-650 cm)
 14 = First year thick (650-700 cm)
 15 = First year thick (700-750 cm)
 16 = First year thick (750-800 cm)
 17 = First year thick (800-850 cm)
 18 = First year thick (850-900 cm)
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 196 = First year thick (9750-9800 cm)
 197 = First year thick (9800-9850 cm)
 198 = First year thick (9850-9900 cm)
 199 = First year thick (9900-9950 cm)
 200 = First year thick (9950-10000 cm)

SOUTHERN ICE LIMIT 02 JAN 56

MINIMUM ICE CENTER
 OCEANOGRAPHIC CODE, NOT TO BE USED FOR NAVIGATION



SOUTHERN ICE LIMIT - 3 JAN 95

NVAL ICE CENTER

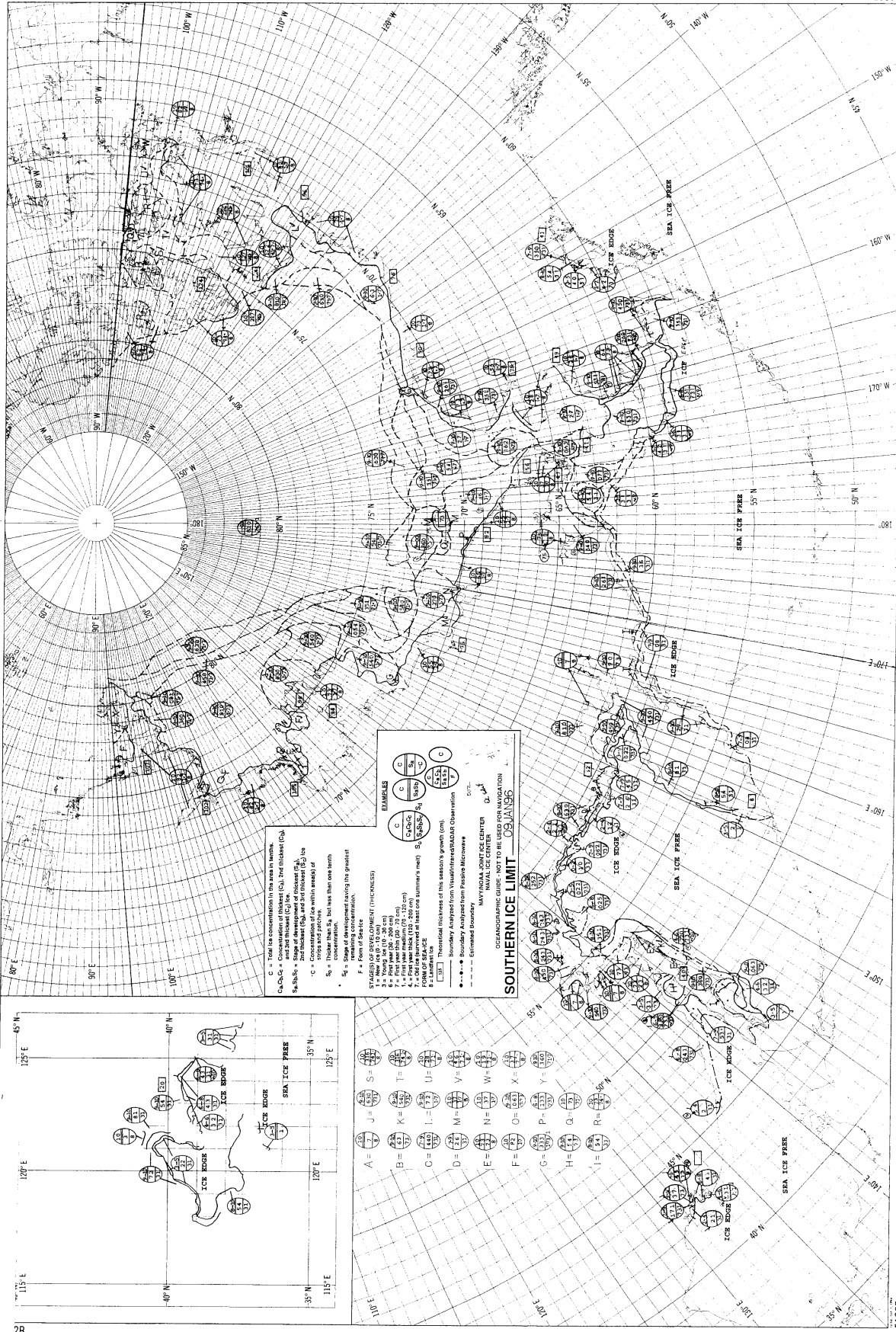
OCEANOGRAPHIC DATA - NOT TO BE USED FOR NAVIGATION

C = Concentration of ice
 C₁, C₂, C₃ = Concentration of floes (C₁ 30% floes, C₂ 20% floes, C₃ 10% floes)
 S₁, S₂, S₃ = Stage of development having the greatest remaining concentration
 P = Form of floes
 P₁ = New ice (0-15 cm)
 P₂ = Young ice (15-200 cm)
 P₃ = First-year ice (200-300 cm)
 P₄ = Second-year ice (300-600 cm)
 P₅ = Third-year ice (600-900 cm)
 P₆ = Fourth-year ice (900-1200 cm)
 P₇ = Ice of unknown age (1200+ cm)

Examples:
 C₁P₁C₁ = 30% floes, new ice
 C₂P₂C₂ = 20% floes, young ice
 S₁P₃S₁ = 10% floes, first-year ice
 S₂P₄S₂ = 20% floes, second-year ice

ICE BOUNDARY: Boundary thickness of the ice zone, generally by observations
 ICE BOUNDARY: Boundary thickness from passive microwave observations
 ICE BOUNDARY: Estimated boundary

A = $\frac{100}{100}$	J = $\frac{200}{100}$	S = $\frac{300}{100}$	B = $\frac{400}{100}$	T = $\frac{500}{100}$	I = $\frac{600}{100}$	K = $\frac{700}{100}$	U = $\frac{800}{100}$	L = $\frac{900}{100}$	V = $\frac{1000}{100}$	M = $\frac{1100}{100}$	W = $\frac{1200}{100}$	N = $\frac{1300}{100}$	X = $\frac{1400}{100}$	E = $\frac{1500}{100}$	Y = $\frac{1600}{100}$	D = $\frac{1700}{100}$	G = $\frac{1800}{100}$	F = $\frac{1900}{100}$	H = $\frac{2000}{100}$	C = $\frac{2100}{100}$	P = $\frac{2200}{100}$	O = $\frac{2300}{100}$	R = $\frac{2400}{100}$	V = $\frac{2500}{100}$	P = $\frac{2600}{100}$	G = $\frac{2700}{100}$	H = $\frac{2800}{100}$	C = $\frac{2900}{100}$	P = $\frac{3000}{100}$	O = $\frac{3100}{100}$	R = $\frac{3200}{100}$	V = $\frac{3300}{100}$	P = $\frac{3400}{100}$	G = $\frac{3500}{100}$	H = $\frac{3600}{100}$	C = $\frac{3700}{100}$	P = $\frac{3800}{100}$	O = $\frac{3900}{100}$	R = $\frac{4000}{100}$	V = $\frac{4100}{100}$	P = $\frac{4200}{100}$	G = $\frac{4300}{100}$	H = $\frac{4400}{100}$	C = $\frac{4500}{100}$	P = $\frac{4600}{100}$	O = $\frac{4700}{100}$	R = $\frac{4800}{100}$	V = $\frac{4900}{100}$	P = $\frac{5000}{100}$	G = $\frac{5100}{100}$	H = $\frac{5200}{100}$	C = $\frac{5300}{100}$	P = $\frac{5400}{100}$	O = $\frac{5500}{100}$	R = $\frac{5600}{100}$	V = $\frac{5700}{100}$	P = $\frac{5800}{100}$	G = $\frac{5900}{100}$	H = $\frac{6000}{100}$	C = $\frac{6100}{100}$	P = $\frac{6200}{100}$	O = $\frac{6300}{100}$	R = $\frac{6400}{100}$	V = $\frac{6500}{100}$	P = $\frac{6600}{100}$	G = $\frac{6700}{100}$	H = $\frac{6800}{100}$	C = $\frac{6900}{100}$	P = $\frac{7000}{100}$	O = $\frac{7100}{100}$	R = $\frac{7200}{100}$	V = $\frac{7300}{100}$	P = $\frac{7400}{100}$	G = $\frac{7500}{100}$	H = $\frac{7600}{100}$	C = $\frac{7700}{100}$	P = $\frac{7800}{100}$	O = $\frac{7900}{100}$	R = $\frac{8000}{100}$	V = $\frac{8100}{100}$	P = $\frac{8200}{100}$	G = $\frac{8300}{100}$	H = $\frac{8400}{100}$	C = $\frac{8500}{100}$	P = $\frac{8600}{100}$	O = $\frac{8700}{100}$	R = $\frac{8800}{100}$	V = $\frac{8900}{100}$	P = $\frac{9000}{100}$	G = $\frac{9100}{100}$	H = $\frac{9200}{100}$	C = $\frac{9300}{100}$	P = $\frac{9400}{100}$	O = $\frac{9500}{100}$	R = $\frac{9600}{100}$	V = $\frac{9700}{100}$	P = $\frac{9800}{100}$	G = $\frac{9900}{100}$	H = $\frac{10000}{100}$
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SOUTHERN ICE LIMIT 09 JAN 1966

NAVY OCEANOGRAPHIC CENTER
 NAVAL ICE CENTER
 OCEANOGRAPHIC CHART - NOT TO BE USED FOR NAVIGATION

EXAMPLES

C	C	C	C
100	100	100	100
100	100	100	100
100	100	100	100

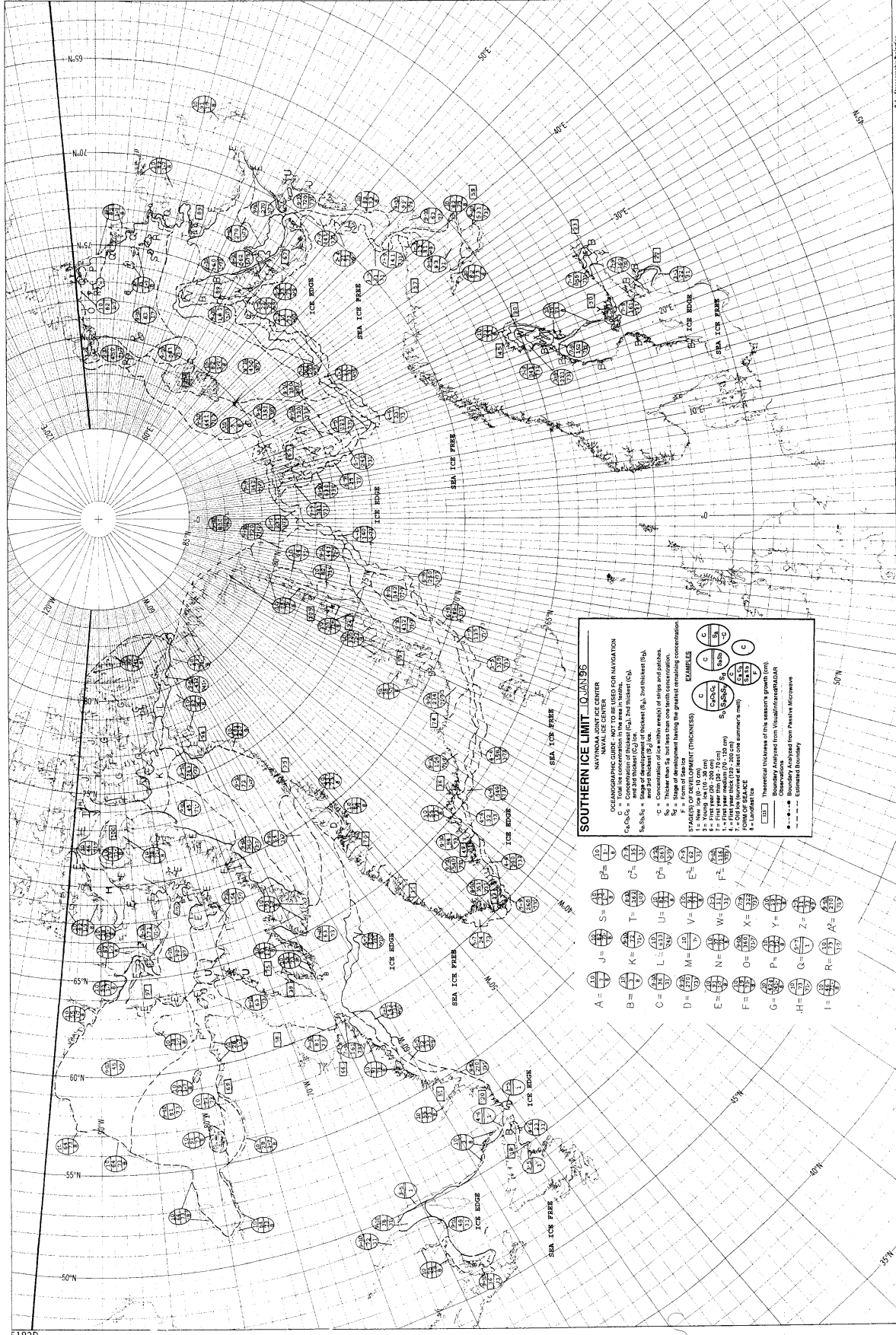
Legend:

- C = Total ice concentration in the area in tenths.
- C₁C₂C₃C₄ = Concentration of thickest (C₁), 2nd thickest (C₂), 3rd thickest (C₃), and 4th thickest (C₄) ice.
- S₁S₂S₃S₄ = Shape of thickest (S₁), 2nd thickest (S₂), 3rd thickest (S₃), and 4th thickest (S₄) ice.
- C = Concentration of ice within areas of stress and protrusion.
- S₁ = Thicker than S₂, but less than one sixth of S₂.
- S₂ = Shape of thickest having the greatest remaining concentration.
- F = Form of ice.
- 1 = New ice (0 - 10 cm).
- 2 = Thin ice (10 - 20 cm).
- 3 = First year ice (20 - 200 cm).
- 4 = First year maximum (20 - 250 cm).
- 5 = Old ice (more than one summer's melt).
- 6 = Old ice (more than two summers' melt).
- 7 = Old ice (more than three summers' melt).
- 8 = Old ice (more than four summers' melt).
- 9 = Old ice (more than five summers' melt).
- 10 = Old ice (more than six summers' melt).
- 11 = Old ice (more than seven summers' melt).
- 12 = Old ice (more than eight summers' melt).
- 13 = Old ice (more than nine summers' melt).
- 14 = Old ice (more than ten summers' melt).
- 15 = Old ice (more than eleven summers' melt).
- 16 = Old ice (more than twelve summers' melt).
- 17 = Old ice (more than thirteen summers' melt).
- 18 = Old ice (more than fourteen summers' melt).
- 19 = Old ice (more than fifteen summers' melt).
- 20 = Old ice (more than sixteen summers' melt).
- 21 = Old ice (more than seventeen summers' melt).
- 22 = Old ice (more than eighteen summers' melt).
- 23 = Old ice (more than nineteen summers' melt).
- 24 = Old ice (more than twenty summers' melt).
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- 64 = Old ice (more than sixty summers' melt).
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- 71 = Old ice (more than sixty-seven summers' melt).
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- 74 = Old ice (more than seventy summers' melt).
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- 76 = Old ice (more than seventy-two summers' melt).
- 77 = Old ice (more than seventy-three summers' melt).
- 78 = Old ice (more than seventy-four summers' melt).
- 79 = Old ice (more than seventy-five summers' melt).
- 80 = Old ice (more than seventy-six summers' melt).
- 81 = Old ice (more than seventy-seven summers' melt).
- 82 = Old ice (more than seventy-eight summers' melt).
- 83 = Old ice (more than seventy-nine summers' melt).
- 84 = Old ice (more than eighty summers' melt).
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- 86 = Old ice (more than eighty-two summers' melt).
- 87 = Old ice (more than eighty-three summers' melt).
- 88 = Old ice (more than eighty-four summers' melt).
- 89 = Old ice (more than eighty-five summers' melt).
- 90 = Old ice (more than eighty-six summers' melt).
- 91 = Old ice (more than eighty-seven summers' melt).
- 92 = Old ice (more than eighty-eight summers' melt).
- 93 = Old ice (more than eighty-nine summers' melt).
- 94 = Old ice (more than ninety summers' melt).
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- 96 = Old ice (more than ninety-two summers' melt).
- 97 = Old ice (more than ninety-three summers' melt).
- 98 = Old ice (more than ninety-four summers' melt).
- 99 = Old ice (more than ninety-five summers' melt).
- 00 = Old ice (more than ninety-six summers' melt).
- 01 = Old ice (more than ninety-seven summers' melt).
- 02 = Old ice (more than ninety-eight summers' melt).
- 03 = Old ice (more than ninety-nine summers' melt).
- 04 = Old ice (more than one hundred summers' melt).

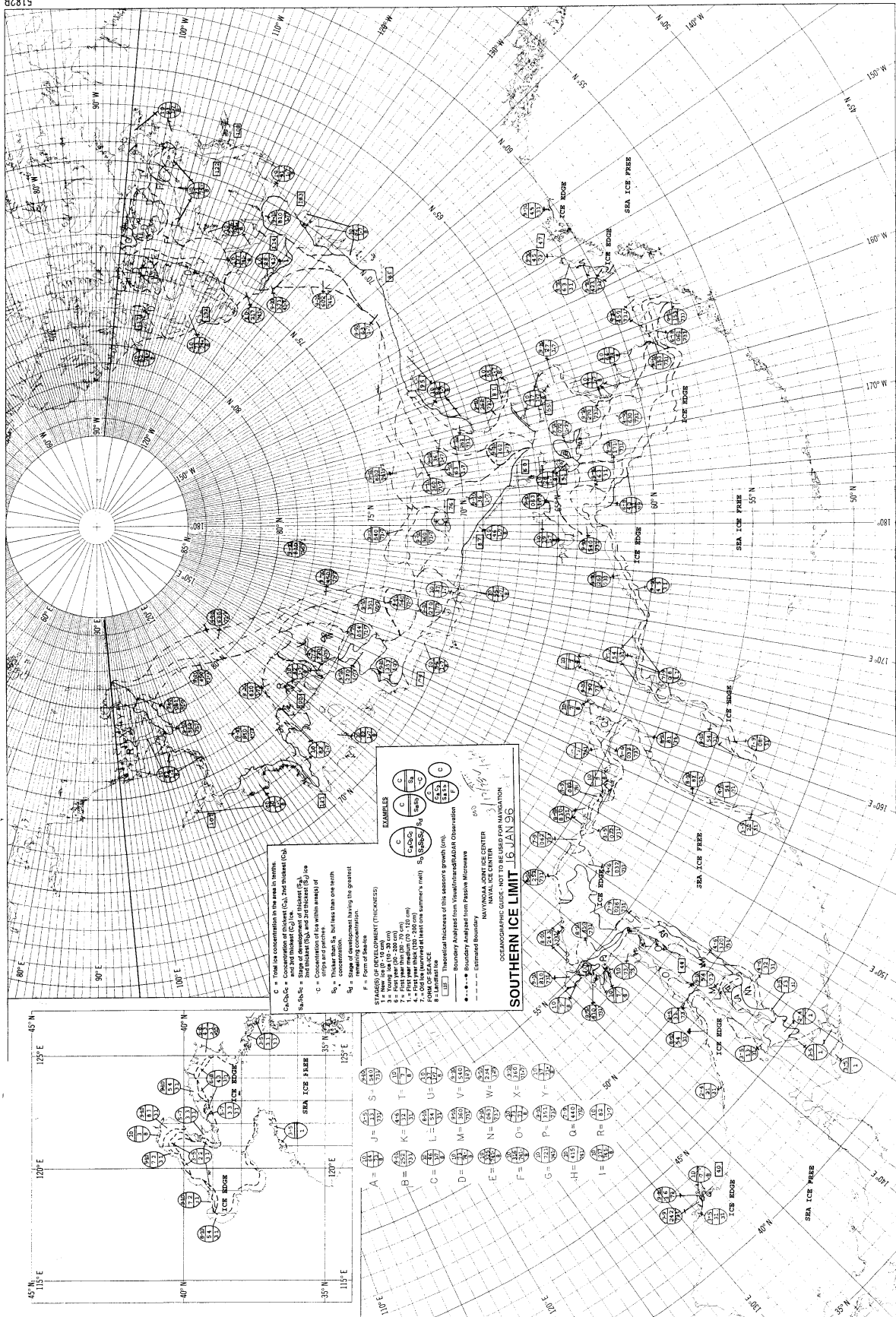
Legend:

- Theoretical thickness of this season's growth form.
- Boundary Analyzed from Visual/Infrared/RADAR Observation
- Estimated Boundary
- Glimmed Boundary

PHOTO COURTESY OF THE U.S. NAVY OCEANOGRAPHIC CENTER
 1966 JAN 09
 51828B



SOUTHERN ICE LIMIT (0.01-1.95)
 NAVAL ICE CENTER
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
 C₁ C₂ C₃ = Concentration of thickest ice, 2nd thickest (C₂) and 3rd thickest (C₃)
 S₁ S₂ S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂) and 3rd thickest (S₃) ice
 S₁ - Thicker than S₂, but less than one-half concentration
 S₂ - Stage of development having the greatest remaining concentration
STAGES OF DEVELOPMENT (THICKNESS)
 1 = New (up to 10 cm)
 2 = First year (10 - 200 cm)
 3 = First year medium (70 - 170 cm)
 4 = First year (up to 300 cm)
 5 = Multiyear ice
 6 = Ice of last year
 7 = Ice of previous years
 8 = Ice of several years
 9 = Ice of many years
EXAMPLES
 C₁ C₂ C₃ S₁ S₂ S₃
 1 1 1 1 1 1
 2 2 2 2 2 2
 3 3 3 3 3 3
 4 4 4 4 4 4
 5 5 5 5 5 5
 6 6 6 6 6 6
 7 7 7 7 7 7
 8 8 8 8 8 8
 9 9 9 9 9 9
 10 10 10 10 10 10
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C = Total ice concentration in the area to which
 1st and 2nd thickness (C1, and thickness (C2)
 and 3rd thickness (C3) are applied.
 S1, S2, S3 = 1st, 2nd and 3rd thickness (S1, S2, S3).
 C = Concentration of ice within areas of
 1st, 2nd and 3rd thickness (C1, C2, C3).
 S₁ = Thicker than S₂, but has less ice
 concentration.
 S₂ = Thicker than S₃, but has less ice
 concentration.
 S₃ = Thinner than S₂, but has less ice
 concentration.

EXAMPLES

C	1	2	3
C ₁ C ₂ C ₃	1/10	2/10	3/10
S ₁ S ₂ S ₃	1/10	2/10	3/10

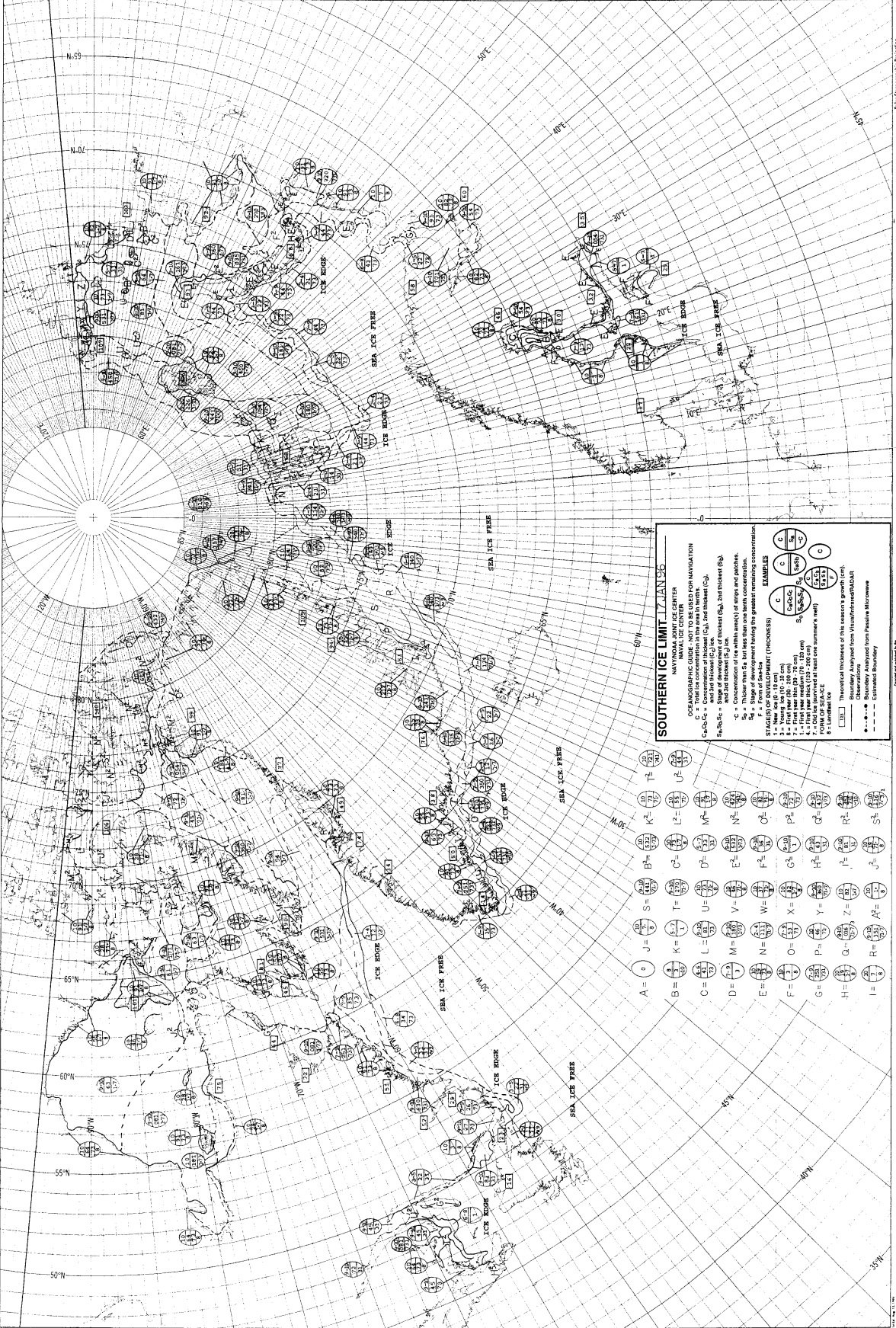
F = Form of Sea Ice
 S₁ = First ice (100-200 cm)
 S₂ = Second ice (100-200 cm)
 S₃ = Third ice (100-200 cm)
 S₄ = Fourth ice (100-200 cm)
 S₅ = Fifth ice (100-200 cm)
 S₆ = Sixth ice (100-200 cm)
 S₇ = Seventh ice (100-200 cm)
 S₈ = Eighth ice (100-200 cm)
 S₉ = Ninth ice (100-200 cm)
 S₁₀ = Tenth ice (100-200 cm)
 S₁₁ = Eleventh ice (100-200 cm)
 S₁₂ = Twelfth ice (100-200 cm)
 S₁₃ = Thirteenth ice (100-200 cm)
 S₁₄ = Fourteenth ice (100-200 cm)
 S₁₅ = Fifteenth ice (100-200 cm)
 S₁₆ = Sixteenth ice (100-200 cm)
 S₁₇ = Seventeenth ice (100-200 cm)
 S₁₈ = Eighteenth ice (100-200 cm)
 S₁₉ = Nineteenth ice (100-200 cm)
 S₂₀ = Twentieth ice (100-200 cm)

SOUTHERN ICE LIMIT 15 JAN 56

OCEANOGRAPHIC GUIDE, NOT TO BE USED FOR NAVIGATION

NAVY/USNA, ONY ICE CENTER
 NAVAL ICE CENTER

Boundary Analyzed from Visual/RADAR Observation
 Estimated Boundary



PAUL STANLEY, UNITED STATES NAVY

SOUTHERN ICE LIMIT 17 JAN 95
 NAVAL ICE CENTER

ICE LIMITS ARE NOT TO BE USED FOR NAVIGATION

STAGES OF DEVELOPMENT (THICKNESS)

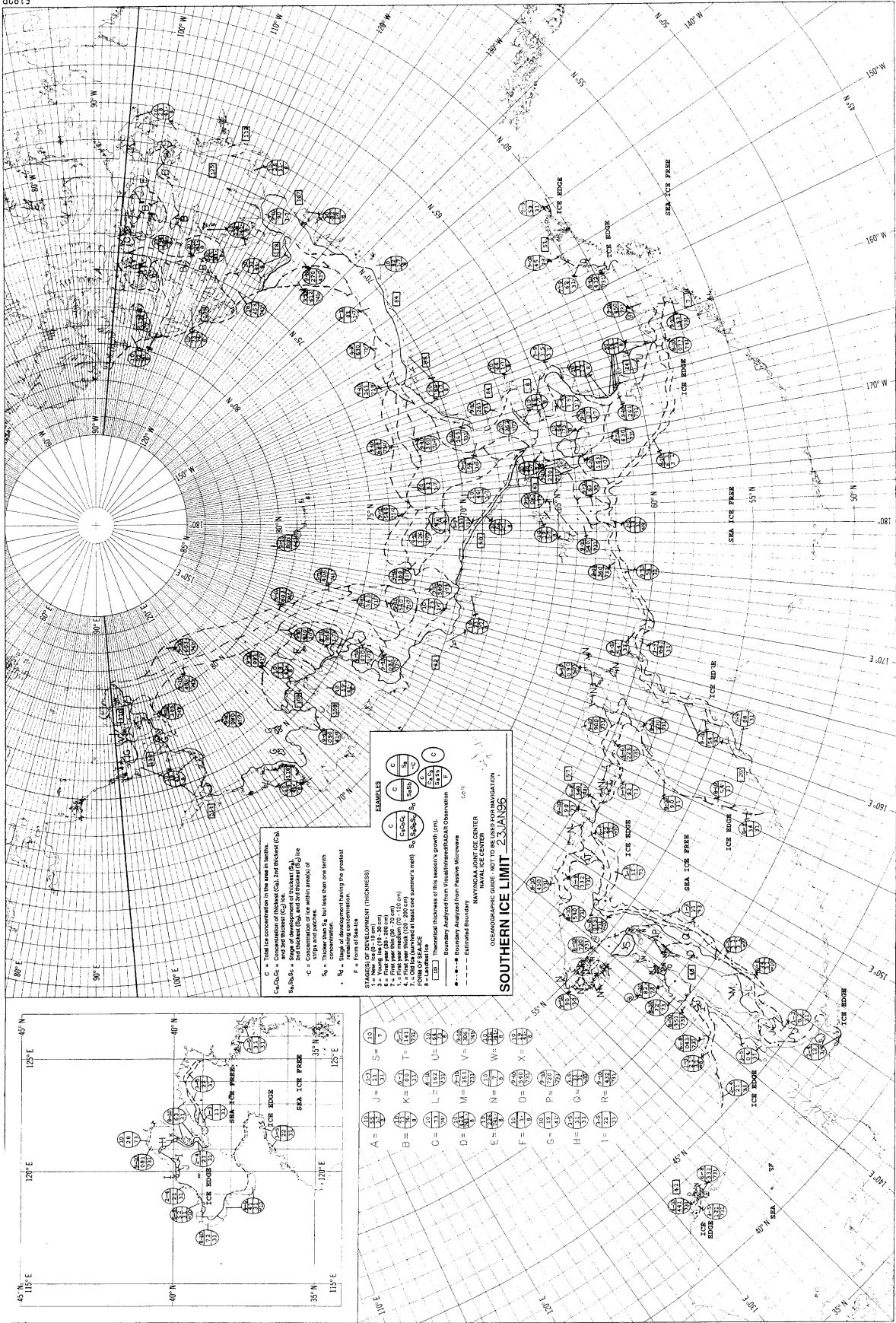
1 = First year medium (75-125 cm)
 2 = Old ice (formed at least one summer's melt)
 3 = Winter ice (10-35 cm)
 4 = First year medium (75-125 cm)
 5 = First year medium (75-125 cm)
 6 = Old ice (formed at least one summer's melt)
 7 = Old ice (formed at least one summer's melt)
 8 = Icefast ice

EXAMPLES

100% C = 100% C
 50% C 50% C = 50% C 50% C
 25% C 25% C 50% C = 25% C 25% C 50% C
 25% C 25% C 50% C 50% C = 25% C 25% C 50% C 50% C

LEGEND

--- Theoretical thickness of this season's growth (cm)
 --- Boundary Analyzed from Visual/Infrared/RADAR
 --- Unlimited Boundary



EXAMPLES

C	10	20	30
C	10	20	30
C	10	20	30
C	10	20	30
C	10	20	30
C	10	20	30
C	10	20	30
C	10	20	30
C	10	20	30
C	10	20	30

EXPLANATION

C = Total ice concentration in the area in north.
 C-10-C-20 = Concentration of thickest (C₁) and thickest (C₂) ice masses (C₁) and (C₂).
 S₁-S₂-S₃ = Second thickest (S₂) and third thickest (S₃) ice masses.
 C = Concentration of ice within limits of S₁ and S₂.
 S₁ = Thicker than S₂, but less than one tenth concentration.
 S₂ = Thicker than S₃, but less than one tenth concentration.
 S₃ = Thicker than S₄, but less than one tenth concentration.
 F = Form of icebergs.

ICEBERG DATA (THICKNESS)

1 = No. (0 = 15 cm)
 2 = No. (0 = 20 cm)
 3 = No. (0 = 25 cm)
 4 = No. (0 = 30 cm)
 5 = No. (0 = 35 cm)
 6 = No. (0 = 40 cm)
 7 = No. (0 = 45 cm)
 8 = No. (0 = 50 cm)
 9 = No. (0 = 55 cm)
 10 = No. (0 = 60 cm)

FORM OF SEA ICE

1 = Thin
 2 = Medium
 3 = Thick
 4 = Very Thick
 5 = Iceberg
 6 = Iceberg
 7 = Iceberg
 8 = Iceberg
 9 = Iceberg
 10 = Iceberg
 11 = Iceberg
 12 = Iceberg
 13 = Iceberg
 14 = Iceberg
 15 = Iceberg
 16 = Iceberg
 17 = Iceberg
 18 = Iceberg
 19 = Iceberg
 20 = Iceberg

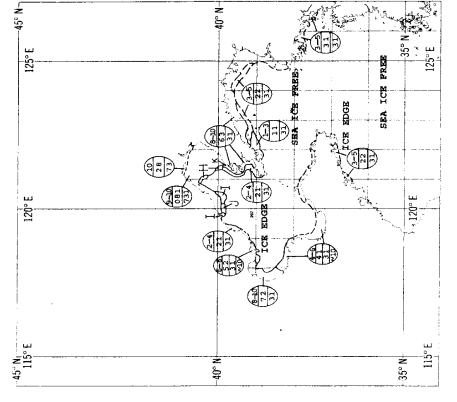
BOUNDARIES

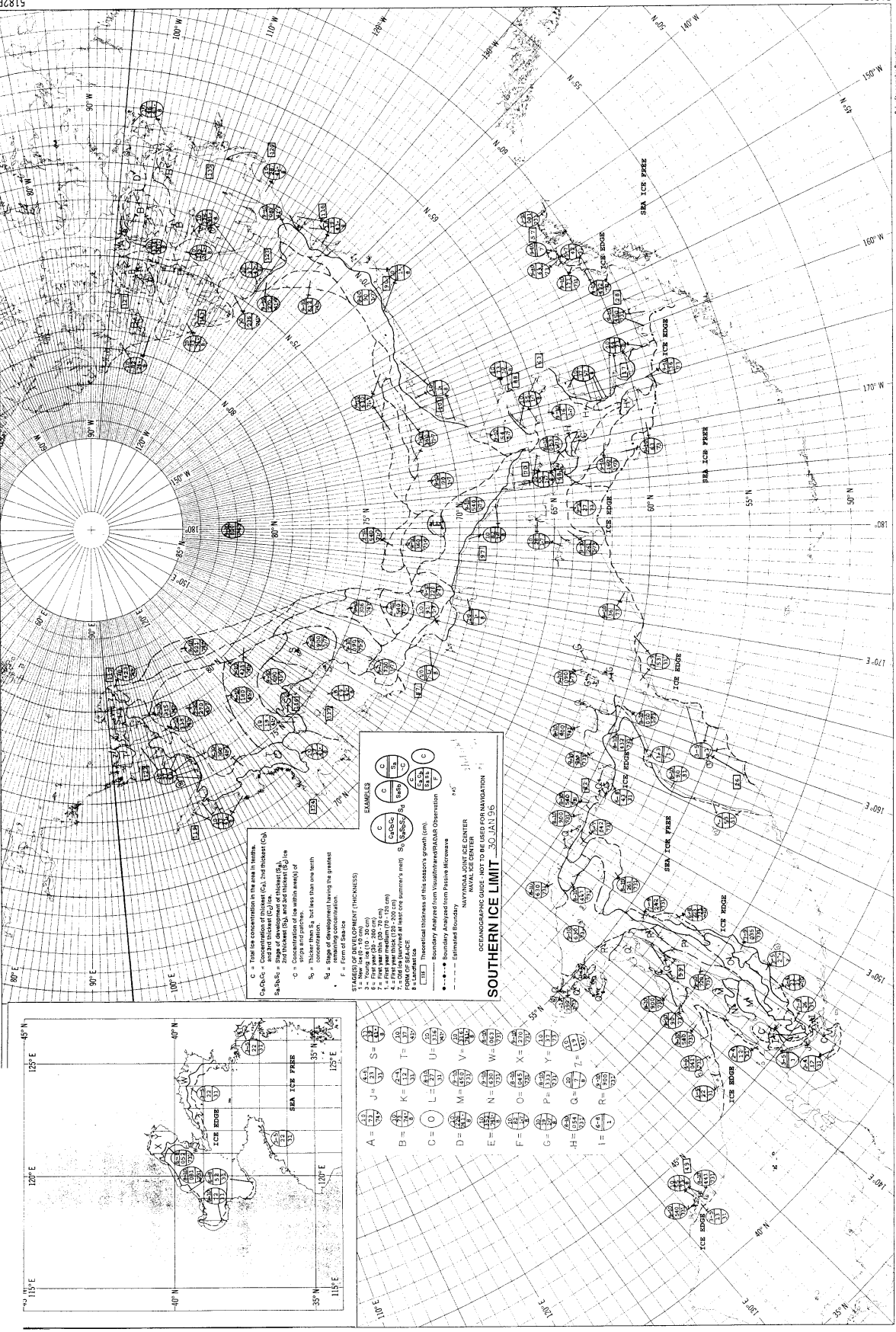
••••• Boundary Analyzed from Passive Microwave
 - - - - - Estimated Boundary

**NAVY NAVAL CENTER
 NAVAL ICE CENTER**

OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

SOUTHERN ICE LIMIT 23 JAN 66





C = Total ice concentration in the area in tenths.
Ca, Cb, Cc = ... and 3rd thickest (Ca, Cb, Cc) ...
Ca, Cb, Cc = Stages of development of thickest (Ca, Cb, Cc) ...
C = Concentration of ice within area(s) of ...
S₀ = ...
S₁ = Stage of development having the greatest ...
S₂ = Form of ice size

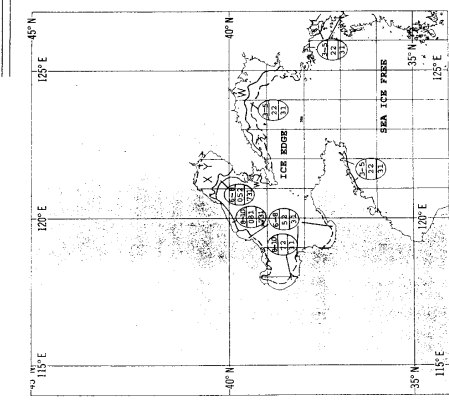
STAGES OF DEVELOPMENT (THICKNESS)
 1 = ...
 2 = ...
 3 = ...
 4 = ...
 5 = ...
 6 = ...
 7 = ...
 8 = ...
 9 = ...
 10 = ...
 11 = ...
 12 = ...
 13 = ...
 14 = ...
 15 = ...

EXAMPLES

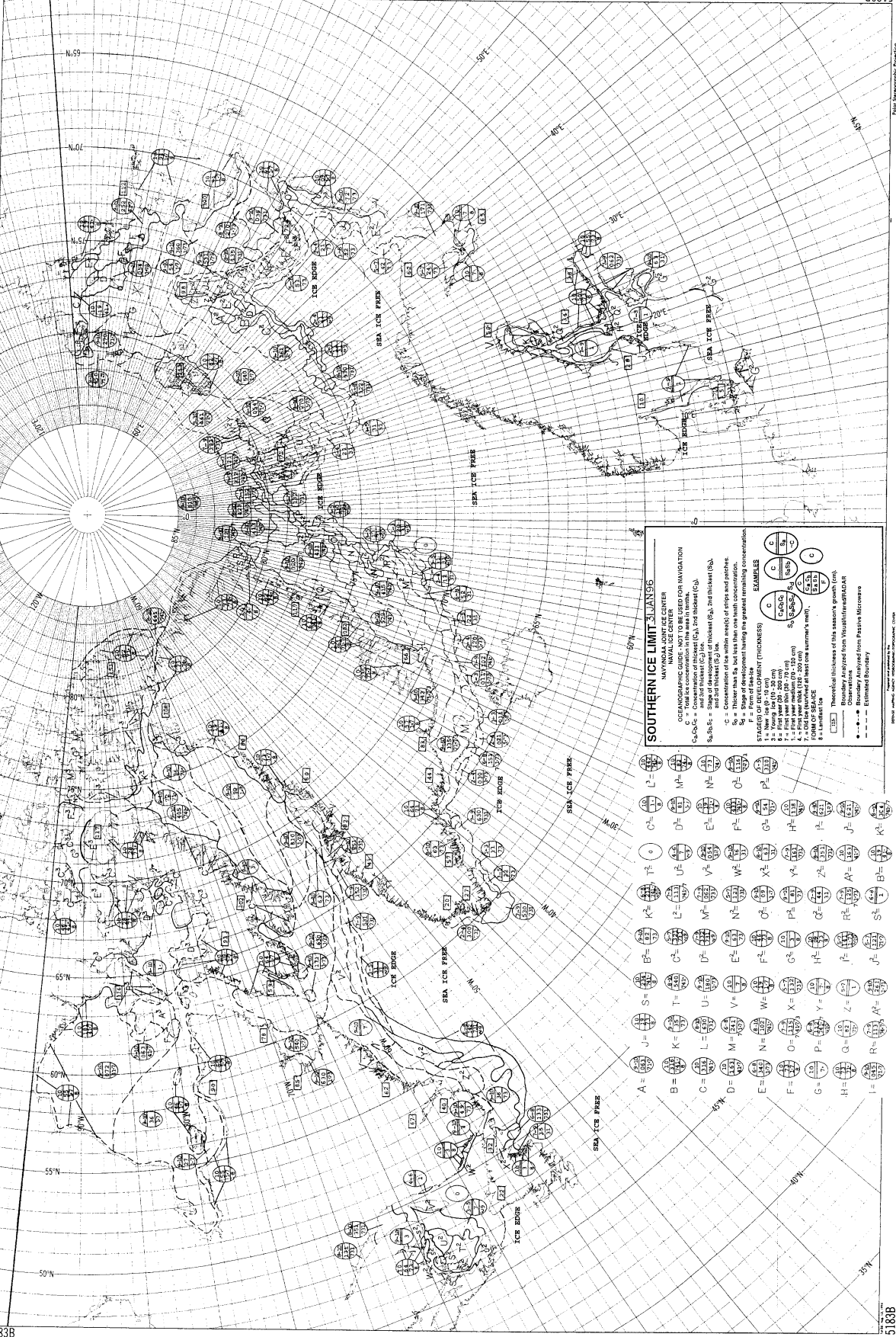
LEGEND
 --- Boundary analyzed from Visual/Infrared/ARDA Observation
 --- Estimated Boundary from Positive Microwave
 --- Estimated Boundary from Sea Ice Navigation
 --- Estimated Boundary from Sea Ice Navigation

SOUTHERN ICE LIMIT

OCTAGONAL CENTER
 NAVY/CENTRAL ICE CENTER



A = $\frac{12}{12}$	J = $\frac{12}{12}$	S = $\frac{12}{12}$
B = $\frac{12}{12}$	K = $\frac{12}{12}$	T = $\frac{12}{12}$
C = $\frac{12}{12}$	L = $\frac{12}{12}$	U = $\frac{12}{12}$
D = $\frac{12}{12}$	M = $\frac{12}{12}$	V = $\frac{12}{12}$
E = $\frac{12}{12}$	N = $\frac{12}{12}$	W = $\frac{12}{12}$
F = $\frac{12}{12}$	O = $\frac{12}{12}$	X = $\frac{12}{12}$
G = $\frac{12}{12}$	P = $\frac{12}{12}$	Y = $\frac{12}{12}$
H = $\frac{12}{12}$	Q = $\frac{12}{12}$	Z = $\frac{12}{12}$
I = $\frac{12}{12}$	R = $\frac{12}{12}$	



SOUTHERN ICE LIMIT DATA 1956
 NAVY NAVAL ICE CENTER

OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
 C₁, C₂, C₃ = Concentration of floelets (C₁), and floelets (C₂)
 S₁, S₂, S₃ = Stage of floelets (S₁), and floelets (S₂)
 and stage of floelets (S₃)

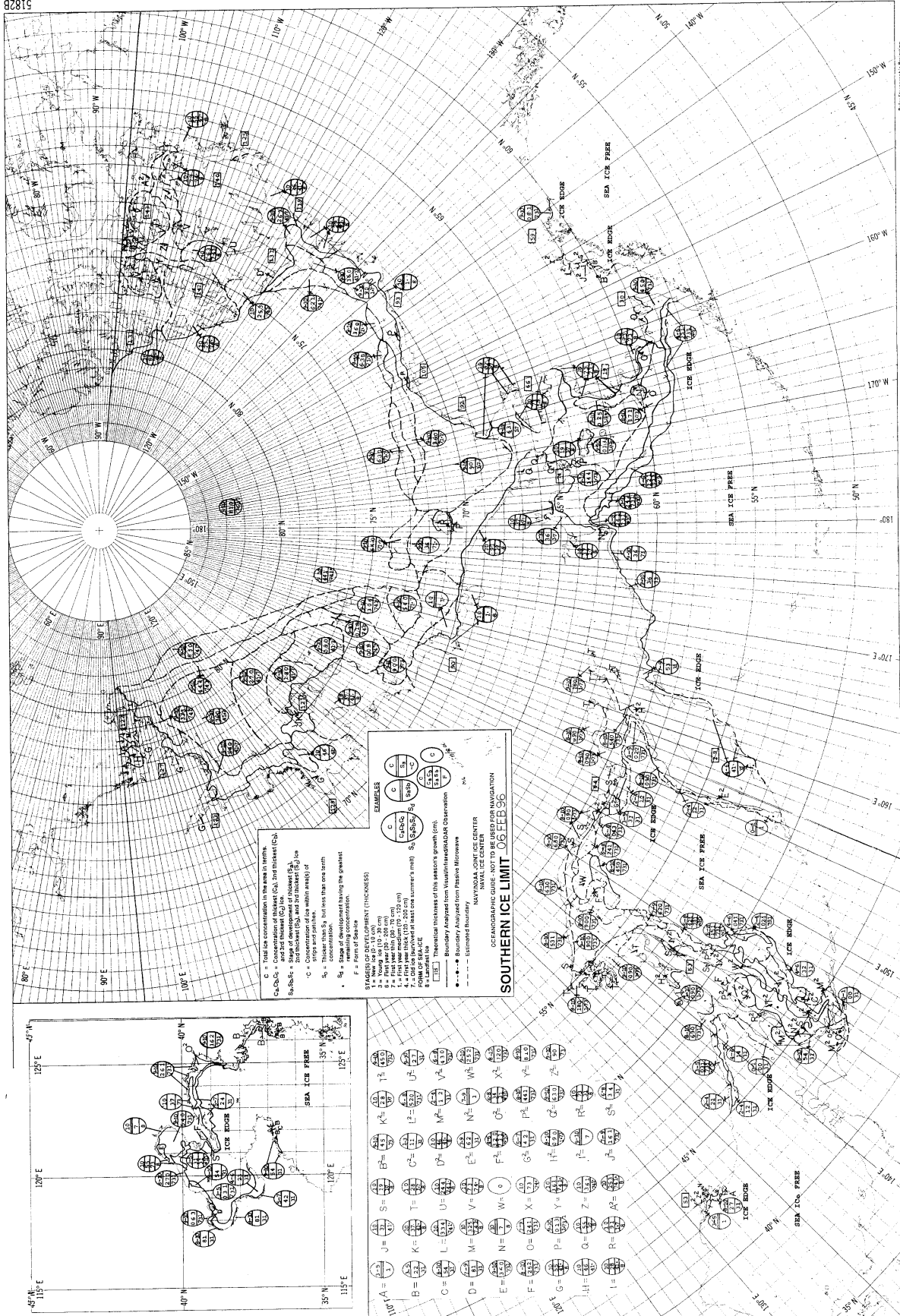
C = Concentration of ice within range of ships and planes.
 S = Stage of development having the greatest remaining concentration.

EXAMPLES

1 = New (0-15 cm)
 2 = First year (16-20 cm)
 3 = First year (21-25 cm)
 4 = First year (26-30 cm)
 5 = First year (31-35 cm)
 6 = First year (36-40 cm)
 7 = Old (ice removed at last summer's melt)

FORM OF SEALS
 1. Thickness (thickness of this season's seal only)
 2. Boundary Abstract from Historical Records
 3. Observations
 4. Boundary Abstract from Passive Records
 5. Estimated Boundary

A = $\frac{A}{100}$	J = $\frac{J}{100}$	S = $\frac{S}{100}$	T = $\frac{T}{100}$	U = $\frac{U}{100}$	V = $\frac{V}{100}$	W = $\frac{W}{100}$	X = $\frac{X}{100}$	Y = $\frac{Y}{100}$	Z = $\frac{Z}{100}$	AA = $\frac{AA}{100}$	AB = $\frac{AB}{100}$	AC = $\frac{AC}{100}$	AD = $\frac{AD}{100}$	AE = $\frac{AE}{100}$	AF = $\frac{AF}{100}$	AG = $\frac{AG}{100}$	AH = $\frac{AH}{100}$	AI = $\frac{AI}{100}$	AJ = $\frac{AJ}{100}$	AK = $\frac{AK}{100}$	AL = $\frac{AL}{100}$	AM = $\frac{AM}{100}$	AN = $\frac{AN}{100}$	AO = $\frac{AO}{100}$	AP = $\frac{AP}{100}$	AQ = $\frac{AQ}{100}$	AR = $\frac{AR}{100}$	AS = $\frac{AS}{100}$	AT = $\frac{AT}{100}$	AU = $\frac{AU}{100}$	AV = $\frac{AV}{100}$	AW = $\frac{AW}{100}$	AX = $\frac{AX}{100}$	AY = $\frac{AY}{100}$	AZ = $\frac{AZ}{100}$	BA = $\frac{BA}{100}$	BB = $\frac{BB}{100}$	BC = $\frac{BC}{100}$	BD = $\frac{BD}{100}$	BE = $\frac{BE}{100}$	BF = $\frac{BF}{100}$	BG = $\frac{BG}{100}$	BH = $\frac{BH}{100}$	BI = $\frac{BI}{100}$	BJ = $\frac{BJ}{100}$	BK = $\frac{BK}{100}$	BL = $\frac{BL}{100}$	BM = $\frac{BM}{100}$	BN = $\frac{BN}{100}$	BO = $\frac{BO}{100}$	BP = $\frac{BP}{100}$	BQ = $\frac{BQ}{100}$	BR = $\frac{BR}{100}$	BS = $\frac{BS}{100}$	BT = $\frac{BT}{100}$	BU = $\frac{BU}{100}$	BV = $\frac{BV}{100}$	BW = $\frac{BW}{100}$	BX = $\frac{BX}{100}$	BY = $\frac{BY}{100}$	BZ = $\frac{BZ}{100}$	CA = $\frac{CA}{100}$	CB = $\frac{CB}{100}$	CC = $\frac{CC}{100}$	CD = $\frac{CD}{100}$	CE = $\frac{CE}{100}$	CF = $\frac{CF}{100}$	CG = $\frac{CG}{100}$	CH = $\frac{CH}{100}$	CI = $\frac{CI}{100}$	CJ = $\frac{CJ}{100}$	CK = $\frac{CK}{100}$	CL = $\frac{CL}{100}$	CM = $\frac{CM}{100}$	CN = $\frac{CN}{100}$	CO = $\frac{CO}{100}$	CP = $\frac{CP}{100}$	CQ = $\frac{CQ}{100}$	CR = $\frac{CR}{100}$	CS = $\frac{CS}{100}$	CT = $\frac{CT}{100}$	CU = $\frac{CU}{100}$	CV = $\frac{CV}{100}$	CW = $\frac{CW}{100}$	CX = $\frac{CX}{100}$	CY = $\frac{CY}{100}$	CZ = $\frac{CZ}{100}$	DA = $\frac{DA}{100}$	DB = $\frac{DB}{100}$	DC = $\frac{DC}{100}$	DD = $\frac{DD}{100}$	DE = $\frac{DE}{100}$	DF = $\frac{DF}{100}$	DG = $\frac{DG}{100}$	DH = $\frac{DH}{100}$	DI = $\frac{DI}{100}$	DJ = $\frac{DJ}{100}$	DK = $\frac{DK}{100}$	DL = $\frac{DL}{100}$	DM = $\frac{DM}{100}$	DN = $\frac{DN}{100}$	DO = $\frac{DO}{100}$	DP = $\frac{DP}{100}$	DQ = $\frac{DQ}{100}$	DR = $\frac{DR}{100}$	DS = $\frac{DS}{100}$	DT = $\frac{DT}{100}$	DU = $\frac{DU}{100}$	DV = $\frac{DV}{100}$	DW = $\frac{DW}{100}$	DX = $\frac{DX}{100}$	DY = $\frac{DY}{100}$	DZ = $\frac{DZ}{100}$	EA = $\frac{EA}{100}$	EB = $\frac{EB}{100}$	EC = $\frac{EC}{100}$	ED = $\frac{ED}{100}$	EE = $\frac{EE}{100}$	EF = $\frac{EF}{100}$	EG = $\frac{EG}{100}$	EH = $\frac{EH}{100}$	EI = $\frac{EI}{100}$	EJ = $\frac{EJ}{100}$	EK = $\frac{EK}{100}$	EL = $\frac{EL}{100}$	EM = $\frac{EM}{100}$	EN = $\frac{EN}{100}$	EO = $\frac{EO}{100}$	EP = $\frac{EP}{100}$	EQ = $\frac{EQ}{100}$	ER = $\frac{ER}{100}$	ES = $\frac{ES}{100}$	ET = $\frac{ET}{100}$	EU = $\frac{EU}{100}$	EV = $\frac{EV}{100}$	EW = $\frac{EW}{100}$	EX = $\frac{EX}{100}$	EY = $\frac{EY}{100}$	EZ = $\frac{EZ}{100}$	FA = $\frac{FA}{100}$	FB = $\frac{FB}{100}$	FC = $\frac{FC}{100}$	FD = $\frac{FD}{100}$	FE = $\frac{FE}{100}$	FF = $\frac{FF}{100}$	FG = $\frac{FG}{100}$	FH = $\frac{FH}{100}$	FI = $\frac{FI}{100}$	FJ = $\frac{FJ}{100}$	FK = $\frac{FK}{100}$	FL = $\frac{FL}{100}$	FM = $\frac{FM}{100}$	FN = $\frac{FN}{100}$	FO = $\frac{FO}{100}$	FP = $\frac{FP}{100}$	FQ = $\frac{FQ}{100}$	FR = $\frac{FR}{100}$	FS = $\frac{FS}{100}$	FT = $\frac{FT}{100}$	FU = $\frac{FU}{100}$	FV = $\frac{FV}{100}$	FW = $\frac{FW}{100}$	FX = $\frac{FX}{100}$	FY = $\frac{FY}{100}$	FZ = $\frac{FZ}{100}$	GA = $\frac{GA}{100}$	GB = $\frac{GB}{100}$	GC = $\frac{GC}{100}$	GD = $\frac{GD}{100}$	GE = $\frac{GE}{100}$	GF = $\frac{GF}{100}$	GG = $\frac{GG}{100}$	GH = $\frac{GH}{100}$	GI = $\frac{GI}{100}$	GJ = $\frac{GJ}{100}$	GK = $\frac{GK}{100}$	GL = $\frac{GL}{100}$	GM = $\frac{GM}{100}$	GN = $\frac{GN}{100}$	GO = $\frac{GO}{100}$	GP = $\frac{GP}{100}$	GQ = $\frac{GQ}{100}$	GR = $\frac{GR}{100}$	GS = $\frac{GS}{100}$	GT = $\frac{GT}{100}$	GU = $\frac{GU}{100}$	GV = $\frac{GV}{100}$	GW = $\frac{GW}{100}$	GX = $\frac{GX}{100}$	GY = $\frac{GY}{100}$	GZ = $\frac{GZ}{100}$	HA = $\frac{HA}{100}$	HB = $\frac{HB}{100}$	HC = $\frac{HC}{100}$	HD = $\frac{HD}{100}$	HE = $\frac{HE}{100}$	HF = $\frac{HF}{100}$	HG = $\frac{HG}{100}$	HH = $\frac{HH}{100}$	HI = $\frac{HI}{100}$	HJ = $\frac{HJ}{100}$	HK = $\frac{HK}{100}$	HL = $\frac{HL}{100}$	HM = $\frac{HM}{100}$	HN = $\frac{HN}{100}$	HO = $\frac{HO}{100}$	HP = $\frac{HP}{100}$	HQ = $\frac{HQ}{100}$	HR = $\frac{HR}{100}$	HS = $\frac{HS}{100}$	HT = $\frac{HT}{100}$	HU = $\frac{HU}{100}$	HV = $\frac{HV}{100}$	HW = $\frac{HW}{100}$	HX = $\frac{HX}{100}$	HY = $\frac{HY}{100}$	HZ = $\frac{HZ}{100}$	IA = $\frac{IA}{100}$	IB = $\frac{IB}{100}$	IC = $\frac{IC}{100}$	ID = $\frac{ID}{100}$	IE = $\frac{IE}{100}$	IF = $\frac{IF}{100}$	IG = $\frac{IG}{100}$	IH = $\frac{IH}{100}$	II = $\frac{II}{100}$	IJ = $\frac{IJ}{100}$	IK = $\frac{IK}{100}$	IL = $\frac{IL}{100}$	IM = $\frac{IM}{100}$	IN = $\frac{IN}{100}$	IO = $\frac{IO}{100}$	IP = $\frac{IP}{100}$	IQ = $\frac{IQ}{100}$	IR = $\frac{IR}{100}$	IS = $\frac{IS}{100}$	IT = $\frac{IT}{100}$	IU = $\frac{IU}{100}$	IV = $\frac{IV}{100}$	IW = $\frac{IW}{100}$	IX = $\frac{IX}{100}$	IY = $\frac{IY}{100}$	IZ = $\frac{IZ}{100}$	JA = $\frac{JA}{100}$	JB = $\frac{JB}{100}$	JC = $\frac{JC}{100}$	JD = $\frac{JD}{100}$	JE = $\frac{JE}{100}$	JF = $\frac{JF}{100}$	JG = $\frac{JG}{100}$	JH = $\frac{JH}{100}$	JI = $\frac{JI}{100}$	IJ = $\frac{IJ}{100}$	JK = $\frac{JK}{100}$	JL = $\frac{JL}{100}$	JM = $\frac{JM}{100}$	JN = $\frac{JN}{100}$	JO = $\frac{JO}{100}$	JP = $\frac{JP}{100}$	JQ = $\frac{JQ}{100}$	JR = $\frac{JR}{100}$	JS = $\frac{JS}{100}$	JT = $\frac{JT}{100}$	JU = $\frac{JU}{100}$	JV = $\frac{JV}{100}$	JW = $\frac{JW}{100}$	JX = $\frac{JX}{100}$	JY = $\frac{JY}{100}$	JZ = $\frac{JZ}{100}$	KA = $\frac{KA}{100}$	KB = $\frac{KB}{100}$	KC = $\frac{KC}{100}$	KD = $\frac{KD}{100}$	KE = $\frac{KE}{100}$	KF = $\frac{KF}{100}$	KG = $\frac{KG}{100}$	KH = $\frac{KH}{100}$	KI = $\frac{KI}{100}$	KJ = $\frac{KJ}{100}$	KK = $\frac{KK}{100}$	KL = $\frac{KL}{100}$	KM = $\frac{KM}{100}$	KN = $\frac{KN}{100}$	KO = $\frac{KO}{100}$	KP = $\frac{KP}{100}$	KQ = $\frac{KQ}{100}$	KR = $\frac{KR}{100}$	KS = $\frac{KS}{100}$	KT = $\frac{KT}{100}$	KU = $\frac{KU}{100}$	KV = $\frac{KV}{100}$	KW = $\frac{KW}{100}$	KX = $\frac{KX}{100}$	KY = $\frac{KY}{100}$	KZ = $\frac{KZ}{100}$	LA = $\frac{LA}{100}$	LB = $\frac{LB}{100}$	LC = $\frac{LC}{100}$	LD = $\frac{LD}{100}$	LE = $\frac{LE}{100}$	LF = $\frac{LF}{100}$	LG = $\frac{LG}{100}$	LH = $\frac{LH}{100}$	LI = $\frac{LI}{100}$	LJ = $\frac{LJ}{100}$	LK = $\frac{LK}{100}$	LL = $\frac{LL}{100}$	LM = $\frac{LM}{100}$	LN = $\frac{LN}{100}$	LO = $\frac{LO}{100}$	LP = $\frac{LP}{100}$	LQ = $\frac{LQ}{100}$	LR = $\frac{LR}{100}$	LS = $\frac{LS}{100}$	LT = $\frac{LT}{100}$	LU = $\frac{LU}{100}$	LV = $\frac{LV}{100}$	LW = $\frac{LW}{100}$	LX = $\frac{LX}{100}$	LY = $\frac{LY}{100}$	LZ = $\frac{LZ}{100}$	MA = $\frac{MA}{100}$	MB = $\frac{MB}{100}$	MC = $\frac{MC}{100}$	MD = $\frac{MD}{100}$	ME = $\frac{ME}{100}$	MF = $\frac{MF}{100}$	MG = $\frac{MG}{100}$	MH = $\frac{MH}{100}$	MI = $\frac{MI}{100}$	MJ = $\frac{MJ}{100}$	MK = $\frac{MK}{100}$	ML = $\frac{ML}{100}$	MM = $\frac{MM}{100}$	MN = $\frac{MN}{100}$	MO = $\frac{MO}{100}$	MP = $\frac{MP}{100}$	MQ = $\frac{MQ}{100}$	MR = $\frac{MR}{100}$	MS = $\frac{MS}{100}$	MT = $\frac{MT}{100}$	MU = $\frac{MU}{100}$	MV = $\frac{MV}{100}$	MW = $\frac{MW}{100}$	MX = $\frac{MX}{100}$	MY = $\frac{MY}{100}$	MZ = $\frac{MZ}{100}$	NA = $\frac{NA}{100}$	NB = $\frac{NB}{100}$	NC = $\frac{NC}{100}$	ND = $\frac{ND}{100}$	NE = $\frac{NE}{100}$	NF = $\frac{NF}{100}$	NG = $\frac{NG}{100}$	NH = $\frac{NH}{100}$	NI = $\frac{NI}{100}$	NJ = $\frac{NJ}{100}$	NK = $\frac{NK}{100}$	NL = $\frac{NL}{100}$	NM = $\frac{NM}{100}$	NN = $\frac{NN}{100}$	NO = $\frac{NO}{100}$	NP = $\frac{NP}{100}$	NQ = $\frac{NQ}{100}$	NR = $\frac{NR}{100}$	NS = $\frac{NS}{100}$	NT = $\frac{NT}{100}$	NU = $\frac{NU}{100}$	NV = $\frac{NV}{100}$	NW = $\frac{NW}{100}$	NX = $\frac{NX}{100}$	NY = $\frac{NY}{100}$	NZ = $\frac{NZ}{100}$	OA = $\frac{OA}{100}$	OB = $\frac{OB}{100}$	OC = $\frac{OC}{100}$	OD = $\frac{OD}{100}$	OE = $\frac{OE}{100}$	OF = $\frac{OF}{100}$	OG = $\frac{OG}{100}$	OH = $\frac{OH}{100}$	OI = $\frac{OI}{100}$	OJ = $\frac{OJ}{100}$	OK = $\frac{OK}{100}$	OL = $\frac{OL}{100}$	OM = $\frac{OM}{100}$	ON = $\frac{ON}{100}$	OO = $\frac{OO}{100}$	OP = $\frac{OP}{100}$	OQ = $\frac{OQ}{100}$	OR = $\frac{OR}{100}$	OS = $\frac{OS}{100}$	OT = $\frac{OT}{100}$	OU = $\frac{OU}{100}$	OV = $\frac{OV}{100}$	OW = $\frac{OW}{100}$	OX = $\frac{OX}{100}$	OY = $\frac{OY}{100}$	OZ = $\frac{OZ}{100}$	PA = $\frac{PA}{100}$	PB = $\frac{PB}{100}$	PC = $\frac{PC}{100}$	PD = $\frac{PD}{100}$	PE = $\frac{PE}{100}$	PF = $\frac{PF}{100}$	PG = $\frac{PG}{100}$	PH = $\frac{PH}{100}$	PI = $\frac{PI}{100}$	PJ = $\frac{PJ}{100}$	PK = $\frac{PK}{100}$	PL = $\frac{PL}{100}$	PM = $\frac{PM}{100}$	PN = $\frac{PN}{100}$	PO = $\frac{PO}{100}$	PP = $\frac{PP}{100}$	PN = $\frac{PN}{100}$	PQ = $\frac{PQ}{100}$	PR = $\frac{PR}{100}$	PS = $\frac{PS}{100}$	PT = $\frac{PT}{100}$	PU = $\frac{PU}{100}$	PV = $\frac{PV}{100}$	PW = $\frac{PW}{100}$	PX = $\frac{PX}{100}$	PY = $\frac{PY}{100}$	PZ = $\frac{PZ}{100}$	QA = $\frac{QA}{100}$	QB = $\frac{QB}{100}$	QC = $\frac{QC}{100}$	QD = $\frac{QD}{100}$	QE = $\frac{QE}{100}$	QF = $\frac{QF}{100}$	QG = $\frac{QG}{100}$	QH = $\frac{QH}{100}$	QI = $\frac{QI}{100}$	QJ = $\frac{QJ}{100}$	QK = $\frac{QK}{100}$	QL = $\frac{QL}{100}$	QM = $\frac{QM}{100}$	QN = $\frac{QN}{100}$	QO = $\frac{QO}{100}$	QP = $\frac{QP}{100}$	QQ = $\frac{QQ}{100}$	QN = $\frac{QN}{100}$	QR = $\frac{QR}{100}$	QS = $\frac{QS}{100}$	QT = $\frac{QT}{100}$	QU = $\frac{QU}{100}$	QV = $\frac{QV}{100}$	QW = $\frac{QW}{100}$	QX = $\frac{QX}{100}$	QY = $\frac{QY}{100}$	QZ = $\frac{QZ}{100}$	RA = $\frac{RA}{100}$	RB = $\frac{RB}{100}$	RC = $\frac{RC}{100}$	RD = $\frac{RD}{100}$	RE = $\frac{RE}{100}$	RF = $\frac{RF}{100}$	RG = $\frac{RG}{100}$	RH = $\frac{RH}{100}$	RI = $\frac{RI}{100}$	RJ = $\frac{RJ}{100}$	RK = $\frac{RK}{100}$	RL = $\frac{RL}{100}$	RM = $\frac{RM}{100}$	RN = $\frac{RN}{100}$	RO = $\frac{RO}{100}$	RP = $\frac{RP}{100}$	RQ = $\frac{RQ}{100}$	RR = $\frac{RR}{100}$	RS = $\frac{RS}{100}$	RT = $\frac{RT}{100}$	RU = $\frac{RU}{100}$	RV = $\frac{RV}{100}$	RW = $\frac{RW}{100}$	RX = $\frac{RX}{100}$	RY = $\frac{RY}{100}$	RZ = $\frac{RZ}{100}$	SA = $\frac{SA}{100}$	SB = $\frac{SB}{100}$	SC = $\frac{SC}{100}$	SD = $\frac{SD}{100}$	SE = $\frac{SE}{100}$	SF = $\frac{SF}{100}$	SG = $\frac{SG}{100}$	SH = $\frac{SH}{100}$	SI = $\frac{SI}{100}$	SJ = $\frac{SJ}{100}$	SK = $\frac{SK}{100}$	SL = $\frac{SL}{100}$	SM = $\frac{SM}{100}$	SN = $\frac{SN}{100}$	SO = $\frac{SO}{100}$	SP = $\frac{SP}{100}$	SQ = $\frac{SQ}{100}$	SR = $\frac{SR}{100}$	SS = $\frac{SS}{100}$	SN = $\frac{SN}{100}$	ST = $\frac{ST}{100}$	SU = $\frac{SU}{100}$	SV = $\frac{SV}{100}$	SW = $\frac{SW}{100}$	SX = $\frac{SX}{100}$	SY = $\frac{SY}{100}$	SZ = $\frac{SZ}{100}$	TA = $\frac{TA}{100}$	TB = $\frac{TB}{100}$	TC = $\frac{TC}{100}$	TD = $\frac{TD}{100}$	TE = $\frac{TE}{100}$	TF = $\frac{TF}{100}$	TG = $\frac{TG}{100}$	TH = $\frac{TH}{100}$	TI = $\frac{TI}{100}$	TJ = $\frac{TJ}{100}$	TK = $\frac{TK}{100}$	TL = $\frac{TL}{100}$	TM = $\frac{TM}{100}$	TN = $\frac{TN}{100}$	TO = $\frac{TO}{100}$	TP = $\frac{TP}{100}$	TQ = $\frac{TQ}{100}$	TR = $\frac{TR}{100}$	TS = $\frac{TS}{100}$	TT = $\frac{TT}{100}$	TU = $\frac{TU}{100}$	TV = $\frac{TV}{100}$	TW = $\frac{TW}{100}$	TX = $\frac{TX}{100}$	TY = $\frac{TY}{100}$	TZ = $\frac{TZ}{100}$	UA = $\frac{UA}{100}$	UB = $\frac{UB}{100}$	UC = $\frac{UC}{100}$	UD = $\frac{UD}{100}$	UE = $\frac{UE}{100}$	UF = $\frac{UF}{100}$	UG = $\frac{UG}{100}$	UH = $\frac{UH}{100}$	UI = $\frac{UI}{100}$	UJ = $\frac{UJ}{100}$	UK = $\frac{UK}{100}$	UL = $\frac{UL}{100}$	UM = $\frac{UM}{100}$	UN = $\frac{UN}{100}$	UO = $\frac{UO}{100}$	UP = $\frac{UP}{100}$	UQ = $\frac{UQ}{100}$	UR = $\frac{UR}{100}$	US = $\frac{US}{100}$	UT = $\frac{UT}{100}$	UU = $\frac{UU}{100}$	UN = $\frac{UN}{100}$	UV = $\frac{UV}{100}$	UW = $\frac{UW}{100}$	UX = $\frac{UX}{100}$	UY = $\frac{UY}{100}$	UZ = $\frac{UZ}{100}$	VA = $\frac{VA}{100}$	VB = $\frac{VB}{100}$	VC = $\frac{VC}{100}$	VD = $\frac{VD}{100}$	VE = $\frac{VE}{100}$	VF = $\frac{VF}{100}$	VG = $\frac{VG}{100}$	VH = $\frac{VH}{100}$	VI = $\frac{VI}{100}$	VJ = $\frac{VJ}{100}$	VK = $\frac{VK}{100}$	VL = $\frac{VL}{100}$	VM = $\frac{VM}{100}$	VN = $\frac{VN}{100}$	VO = $\frac{VO}{100}$	VP = $\frac{VP}{100}$	VQ = $\frac{VQ}{100}$	VR = $\frac{VR}{100}$	VS = $\frac{VS}{100}$	VT = $\frac{VT}{100}$	VU = $\frac{VU}{100}$	VV = \frac
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SOUTHERN ICE LIMIT 06 FEB 96

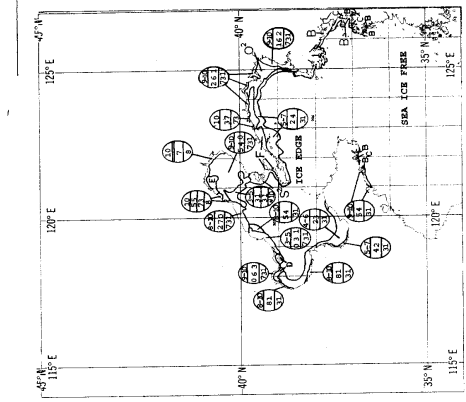
NAVY NAVAL CENTER
NAVAL ICE CENTER
ICE CENTER

GCT FAO NAUTICAL GUIDE - NOT TO BE USED FOR NAVIGATION

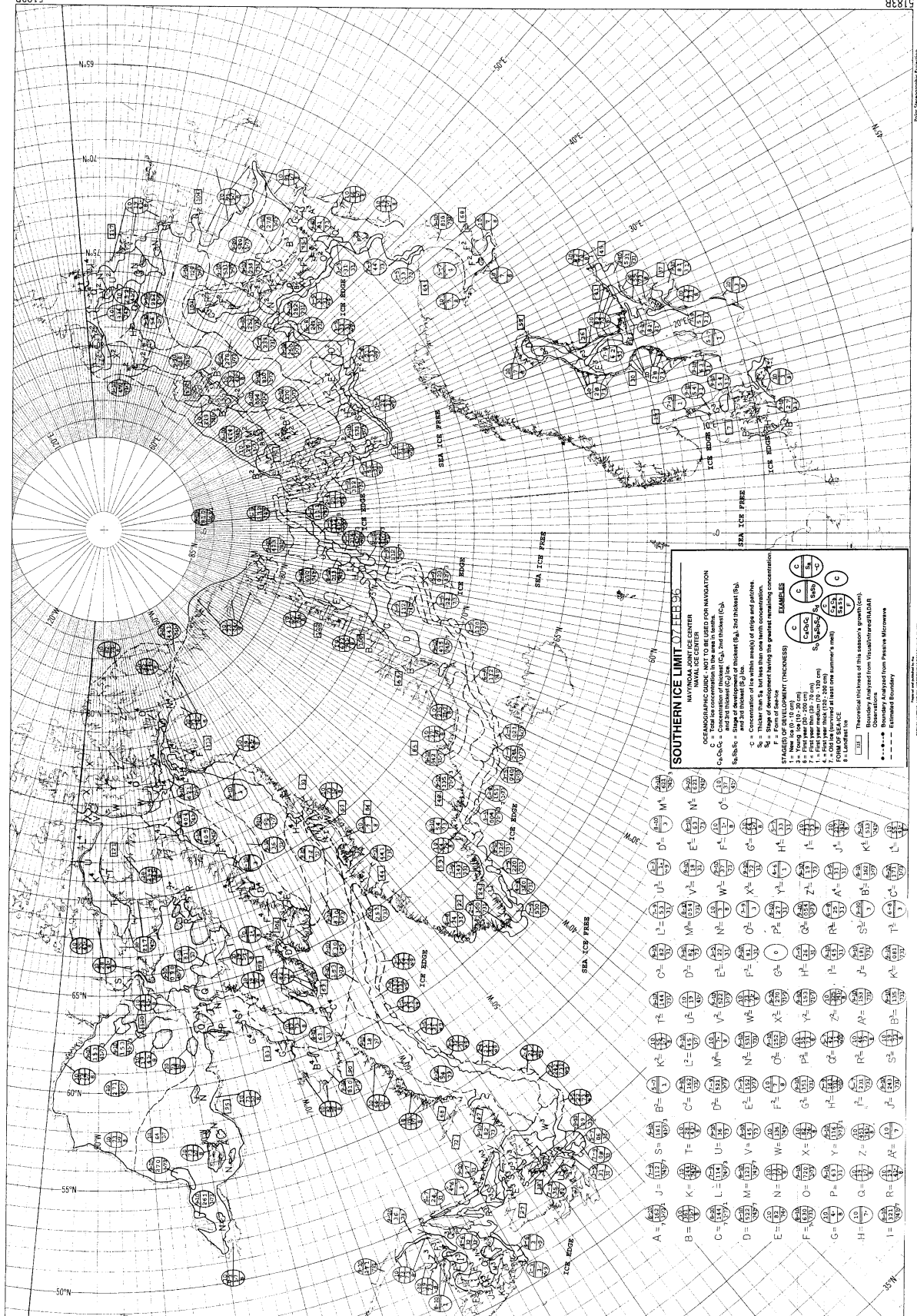
EXAMPLES

1	2	3	4	5	6	7	8	9	10

C = Total ice concentration in the area in tenths.
 C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice in the area.
 S₁, S₂, S₃ = Thickness (S₁) and 2nd thickest (S₂) and 3rd thickest (S₃) ice in the area.
 C = Concentration of ice within area(s) of interest.
 S₁ = Thickness (S₁), but less than one tenth concentration.
 S₂ = Thickness (S₂), but less than one tenth concentration.
 F = Firm of Icebergs.
 F₁ = Firm of Icebergs.
 F₂ = Firm of Icebergs.
 F₃ = Firm of Icebergs.
 F₄ = Firm of Icebergs.
 F₅ = Firm of Icebergs.
 F₆ = Firm of Icebergs.
 F₇ = Firm of Icebergs.
 F₈ = Firm of Icebergs.
 F₉ = Firm of Icebergs.
 F₁₀ = Firm of Icebergs.



A =	B =	C =	D =	E =	F =	G =	H =	I =	J =	K =	L =	M =	N =	O =	P =	Q =	R =	S =	T =	U =	V =	W =	X =	Y =	Z =	AA =	AB =	AC =	AD =	AE =	AF =	AG =	AH =	AI =	AJ =	AK =	AL =	AM =	AN =	AO =	AP =	AQ =	AR =	AS =	AT =	AU =	AV =	AW =	AX =	AY =	AZ =
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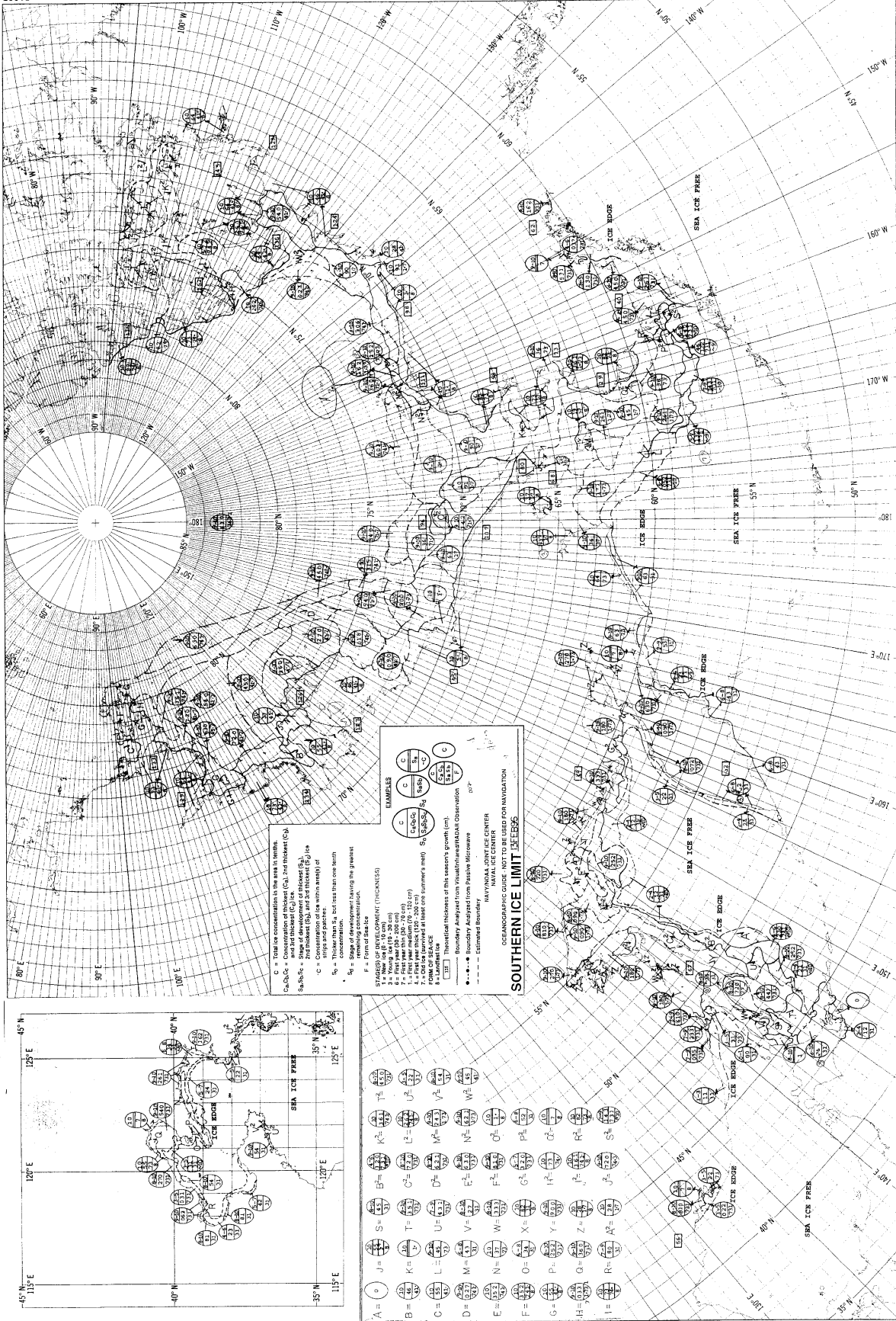
SOUTHERN ICE LIMIT, 1975

NAVY/Joint ICE CENTER
 NAVAL ICE CENTER
 OCEANOGRAPHIC OFFICE FOR NAVIGATION
 NAVAL OCEANOGRAPHIC OFFICE FOR NAVIGATION
 U.S. NAVY

C = Total ice concentration in the area in tenths.
 Ca, D, Cc = 10, 20, and 30 tenths (10%, 20% and 30% ice).
 S, H, B, R, C = Stage of development of sheaves (S), and thickest (H),
 and ice thickness (B), and ice concentration (C).
 S₁ = Thicker than S, but less than one tenth concentration.
 S₂ = Concentration of ice within area (H) of stage and pattern.
 F = Form of sheave.
 P = Form of sheave.

STAGES OF DEVELOPMENT (THICKNESS)

C = Theoretical thickness of this season's growth (cm).
 1 = Young ice (10 - 20 cm)
 2 = First year ice (20 - 25 cm)
 3 = First year ice (25 - 30 cm)
 4 = First year ice (30 - 35 cm)
 5 = First year ice (35 - 40 cm)
 6 = First year ice (40 - 45 cm)
 7 = First year ice (45 - 50 cm)
 8 = First year ice (50 - 55 cm)
 9 = First year ice (55 - 60 cm)
 10 = First year ice (60 - 65 cm)
 11 = First year ice (65 - 70 cm)
 12 = First year ice (70 - 75 cm)
 13 = First year ice (75 - 80 cm)
 14 = First year ice (80 - 85 cm)
 15 = First year ice (85 - 90 cm)
 16 = First year ice (90 - 95 cm)
 17 = First year ice (95 - 100 cm)
 18 = First year ice (100 - 105 cm)
 19 = First year ice (105 - 110 cm)
 20 = First year ice (110 - 115 cm)
 21 = First year ice (115 - 120 cm)
 22 = First year ice (120 - 125 cm)
 23 = First year ice (125 - 130 cm)
 24 = First year ice (130 - 135 cm)
 25 = First year ice (135 - 140 cm)
 26 = First year ice (140 - 145 cm)
 27 = First year ice (145 - 150 cm)
 28 = First year ice (150 - 155 cm)
 29 = First year ice (155 - 160 cm)
 30 = First year ice (160 - 165 cm)
 31 = First year ice (165 - 170 cm)
 32 = First year ice (170 - 175 cm)
 33 = First year ice (175 - 180 cm)
 34 = First year ice (180 - 185 cm)
 35 = First year ice (185 - 190 cm)
 36 = First year ice (190 - 195 cm)
 37 = First year ice (195 - 200 cm)
 38 = First year ice (200 - 205 cm)
 39 = First year ice (205 - 210 cm)
 40 = First year ice (210 - 215 cm)
 41 = First year ice (215 - 220 cm)
 42 = First year ice (220 - 225 cm)
 43 = First year ice (225 - 230 cm)
 44 = First year ice (230 - 235 cm)
 45 = First year ice (235 - 240 cm)
 46 = First year ice (240 - 245 cm)
 47 = First year ice (245 - 250 cm)
 48 = First year ice (250 - 255 cm)
 49 = First year ice (255 - 260 cm)
 50 = First year ice (260 - 265 cm)
 51 = First year ice (265 - 270 cm)
 52 = First year ice (270 - 275 cm)
 53 = First year ice (275 - 280 cm)
 54 = First year ice (280 - 285 cm)
 55 = First year ice (285 - 290 cm)
 56 = First year ice (290 - 295 cm)
 57 = First year ice (295 - 300 cm)
 58 = First year ice (300 - 305 cm)
 59 = First year ice (305 - 310 cm)
 60 = First year ice (310 - 315 cm)
 61 = First year ice (315 - 320 cm)
 62 = First year ice (320 - 325 cm)
 63 = First year ice (325 - 330 cm)
 64 = First year ice (330 - 335 cm)
 65 = First year ice (335 - 340 cm)
 66 = First year ice (340 - 345 cm)
 67 = First year ice (345 - 350 cm)
 68 = First year ice (350 - 355 cm)
 69 = First year ice (355 - 360 cm)
 70 = First year ice (360 - 365 cm)
 71 = First year ice (365 - 370 cm)
 72 = First year ice (370 - 375 cm)
 73 = First year ice (375 - 380 cm)
 74 = First year ice (380 - 385 cm)
 75 = First year ice (385 - 390 cm)
 76 = First year ice (390 - 395 cm)
 77 = First year ice (395 - 400 cm)
 78 = First year ice (400 - 405 cm)
 79 = First year ice (405 - 410 cm)
 80 = First year ice (410 - 415 cm)
 81 = First year ice (415 - 420 cm)
 82 = First year ice (420 - 425 cm)
 83 = First year ice (425 - 430 cm)
 84 = First year ice (430 - 435 cm)
 85 = First year ice (435 - 440 cm)
 86 = First year ice (440 - 445 cm)
 87 = First year ice (445 - 450 cm)
 88 = First year ice (450 - 455 cm)
 89 = First year ice (455 - 460 cm)
 90 = First year ice (460 - 465 cm)
 91 = First year ice (465 - 470 cm)
 92 = First year ice (470 - 475 cm)
 93 = First year ice (475 - 480 cm)
 94 = First year ice (480 - 485 cm)
 95 = First year ice (485 - 490 cm)
 96 = First year ice (490 - 495 cm)
 97 = First year ice (495 - 500 cm)
 98 = First year ice (500 - 505 cm)
 99 = First year ice (505 - 510 cm)
 100 = First year ice (510 - 515 cm)



STAGES OF DEVELOPMENT (THICKNESS)

C = Total ice concentration in the area in tenths.
 C₁C₂C₃C₄ = Concentration of ice in tenths.
 S₁S₂S₃S₄ = Stage of development of ice in tenths.
 C = Concentration of ice in tenths.
 S = Stage of development of ice in tenths.
 S₁ = Concentration of ice in tenths.
 S₂ = Concentration of ice in tenths.
 S₃ = Concentration of ice in tenths.
 S₄ = Concentration of ice in tenths.

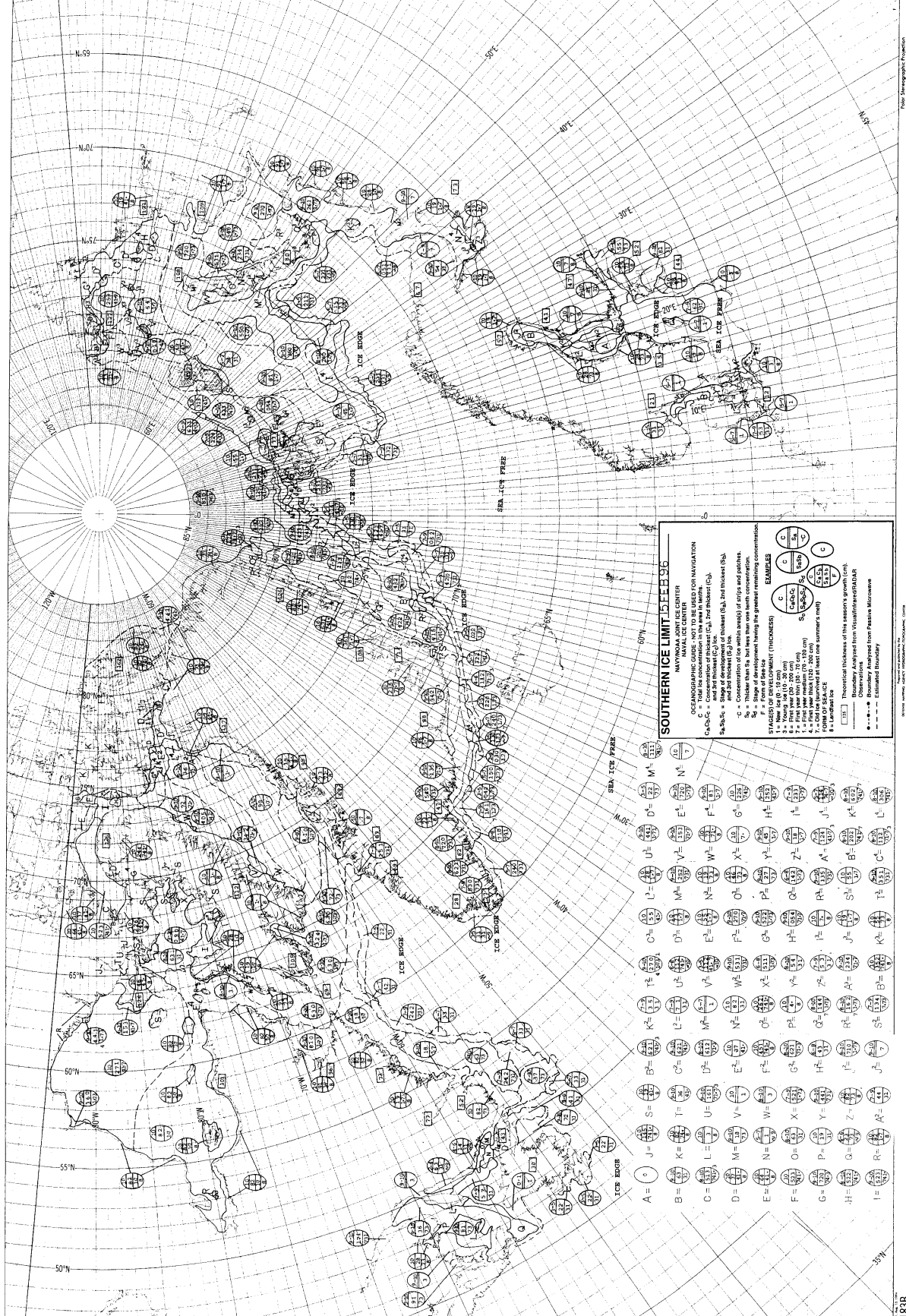
CHRONOLOGICAL ORDER NOT TO BE USED FOR NAVIGATION

NAVYAL JOINT ICE CENTER
 NAVYAL ICE CENTER

SOUTHERN ICE LIMIT DATA

--- Boundary Analyzed from Visual/Aerial Observation
 --- Estimated Boundary from Passive Microwave

A = 0	J = 1/100	S = 1/100	B = 2/100	K = 2/100	T = 2/100	C = 3/100	L = 3/100	M = 3/100	N = 3/100	O = 3/100	P = 3/100	Q = 3/100	R = 3/100	S = 3/100
B = 2/100	K = 2/100	T = 2/100	C = 3/100	L = 3/100	M = 3/100	N = 3/100	O = 3/100	P = 3/100	Q = 3/100	R = 3/100	S = 3/100	T = 3/100	U = 3/100	V = 3/100
C = 3/100	L = 3/100	M = 3/100	N = 3/100	O = 3/100	P = 3/100	Q = 3/100	R = 3/100	S = 3/100	T = 3/100	U = 3/100	V = 3/100	W = 3/100	X = 3/100	Y = 3/100
D = 4/100	M = 4/100	N = 4/100	O = 4/100	P = 4/100	Q = 4/100	R = 4/100	S = 4/100	T = 4/100	U = 4/100	V = 4/100	W = 4/100	X = 4/100	Y = 4/100	Z = 4/100
E = 5/100	N = 5/100	O = 5/100	P = 5/100	Q = 5/100	R = 5/100	S = 5/100	T = 5/100	U = 5/100	V = 5/100	W = 5/100	X = 5/100	Y = 5/100	Z = 5/100	A = 5/100
F = 6/100	O = 6/100	P = 6/100	Q = 6/100	R = 6/100	S = 6/100	T = 6/100	U = 6/100	V = 6/100	W = 6/100	X = 6/100	Y = 6/100	Z = 6/100	A = 6/100	B = 6/100
G = 7/100	P = 7/100	Q = 7/100	R = 7/100	S = 7/100	T = 7/100	U = 7/100	V = 7/100	W = 7/100	X = 7/100	Y = 7/100	Z = 7/100	A = 7/100	B = 7/100	C = 7/100
H = 8/100	Q = 8/100	R = 8/100	S = 8/100	T = 8/100	U = 8/100	V = 8/100	W = 8/100	X = 8/100	Y = 8/100	Z = 8/100	A = 8/100	B = 8/100	C = 8/100	D = 8/100
I = 9/100	R = 9/100	S = 9/100	T = 9/100	U = 9/100	V = 9/100	W = 9/100	X = 9/100	Y = 9/100	Z = 9/100	A = 9/100	B = 9/100	C = 9/100	D = 9/100	E = 9/100



SOUTHERN ICE LIMIT, FEB 30
 NAVY/NOAA JOINT CENTER
 NAVAL ICE CENTER

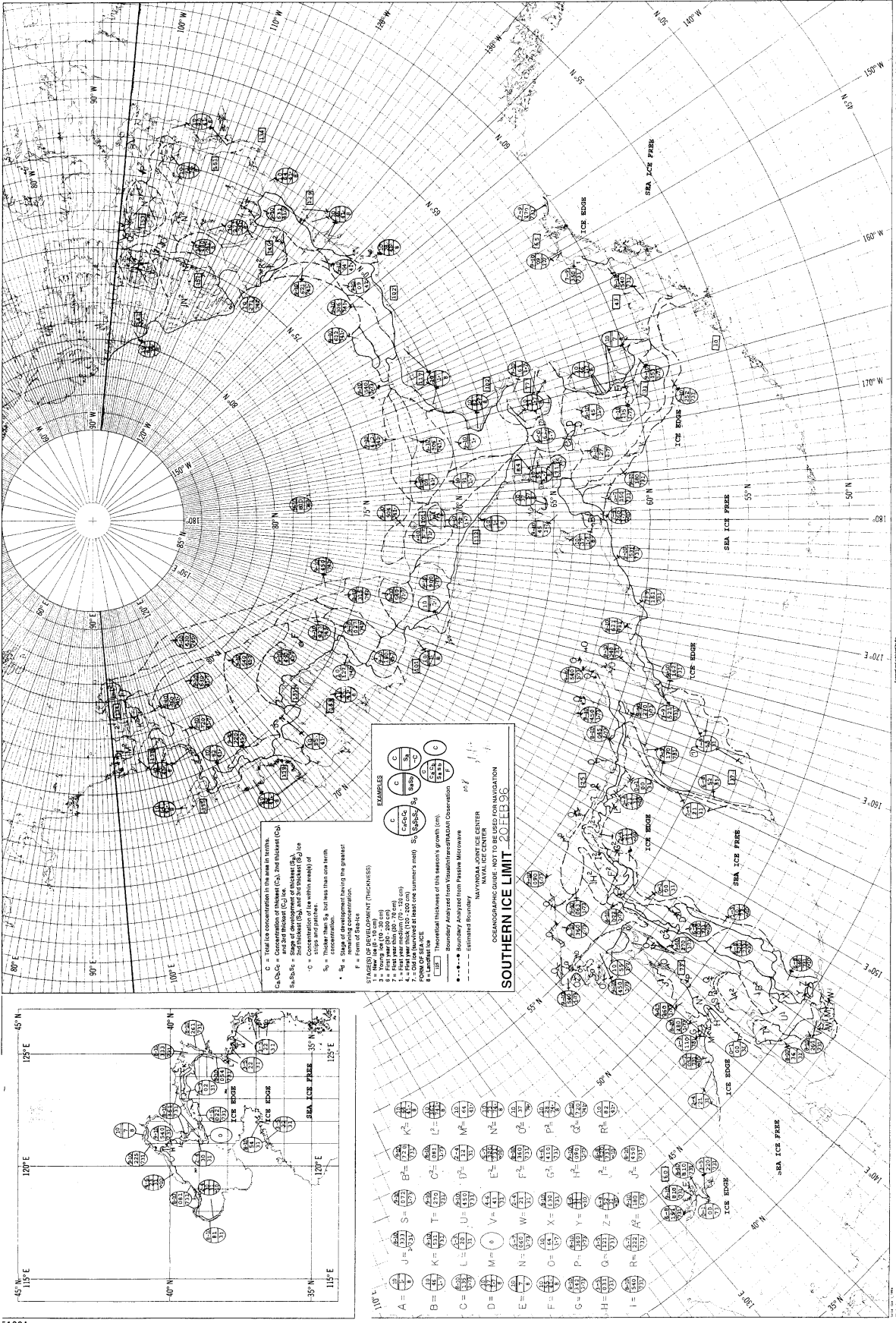
ICE CHARACTERISTICS: NAVAL ICE CENTER
 C = Total ice concentration in the near 10 knots.
 C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and thickest (C₃).
 S₁S₂S₃S₄ = Slope of development of thickest (S₁), 2nd thickest (S₂), and thickest (S₃).
 S₄ = Concentration of ice within area of steepest slope.
 S₄ = Thicker than S₃, but less than one fourth concentration.
 S₄ = Slope of development having the greatest remaining concentration.

STAGES OF DEVELOPMENT (THICKNESS)
 S₁ = Stage of development having the greatest remaining concentration.
 1 = None (0-10 cm)
 2 = First year (10-20 cm)
 3 = First year (20-30 cm)
 4 = First year (30-40 cm)
 5 = Old ice (40-50 cm)
 6 = Old ice (50-60 cm)
 7 = Old ice (60-70 cm)
 8 = Landfast ice

EXAMPLES

C	C	C	C	C	C	C	C	C	C
1	2	3	4	5	6	7	8	1	2
1	2	3	4	5	6	7	8	1	2
1	2	3	4	5	6	7	8	1	2

131: Theoretical thickness of this season's growth (cm).
 ---: Boundary Analyzed from Visual/Passive Microwave
 - - - - -: Boundary Analyzed from Passive Microwave
 - - - - -: Estimated Boundary



C = Total ice concentration in the area in tenths.
 C₁C₂C₃C₄ = (C₁), (C₂), (C₃), (C₄)
 S₁S₂S₃S₄ = Stages of development of thickness (S₁) ice
 in tenths and patches.
 T = Concentration of ice within area(s) of
 concentration. (T) is less than one tenth.
 S₁ = Stage of development having the greatest
 concentration.
 S₂ = Stage of development having the greatest
 thickness.
 S₃ = Stage of development having the greatest
 thickness.
 S₄ = Stage of development having the greatest
 thickness.

EXAMPLES

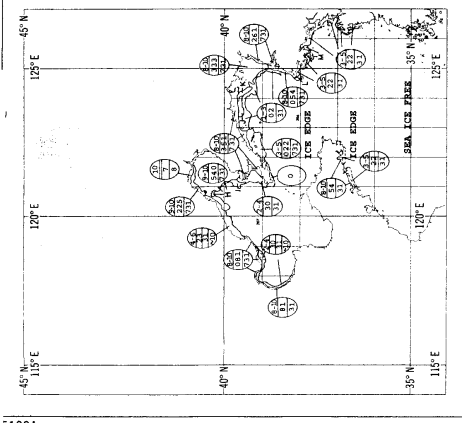
C	C	C	C
100	100	100	100
100	100	100	100
100	100	100	100

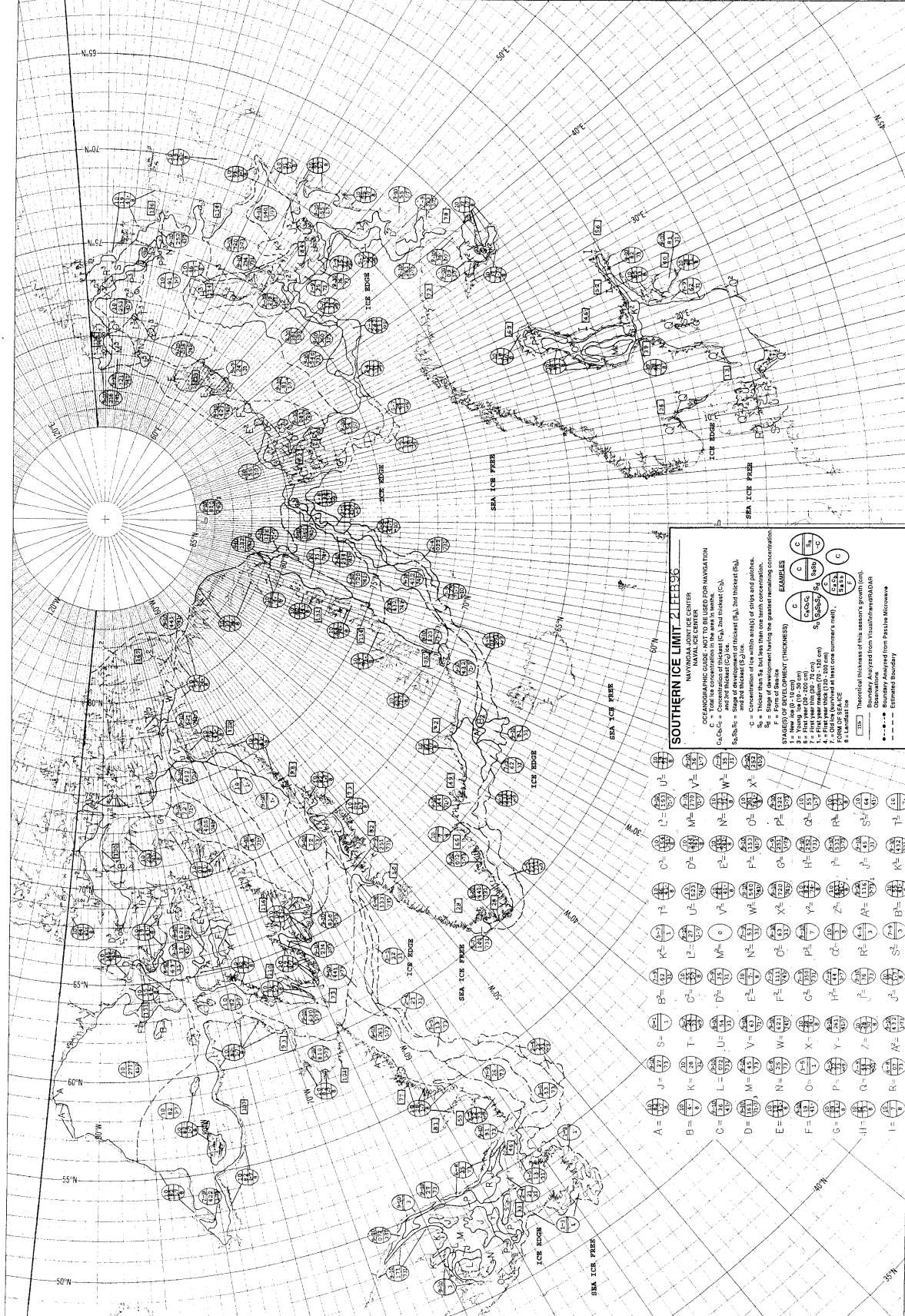
STAGES OF DEVELOPMENT (THICKNESS)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1/16	1/8	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	6
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260

SOUTHERN ICE LIMIT - 20 FEB 1966

OCEANOGRAPHIC CENTER
 NAVAL ICE CENTER
 NAVY JOINT ICE CENTER
 NAVY JOINT ICE CENTER
 NAVY JOINT ICE CENTER





SOUTHERN ICE LIMIT 21 FEB 56

NAVYAL ICE CENTER

CELESTIAL COORDS - NOT TO BE USED FOR NAVIGATION

C_1, C_2, C_3 = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃)

S_1, S_2, S_3 = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃)

T_1, T_2, T_3 = Thickness (T₁) has been used of strips and patches.

R_1, R_2, R_3 = Stage of development having the greatest remaining concentration

STAGES OF DEVELOPMENT (THICKNESS)

1 = New ice (0 - 15 cm)
 2 = First year (15 - 100 cm)
 3 = First year medium (100 - 200 cm)
 4 = First year old (200 - 300 cm)
 5 = Old ice (300 - 400 cm)
 6 = Old ice (400 - 500 cm)
 7 = Old ice (500 - 600 cm)
 8 = Old ice (600 - 700 cm)
 9 = Old ice (700 - 800 cm)
 10 = Old ice (800 - 900 cm)
 11 = Old ice (900 - 1000 cm)

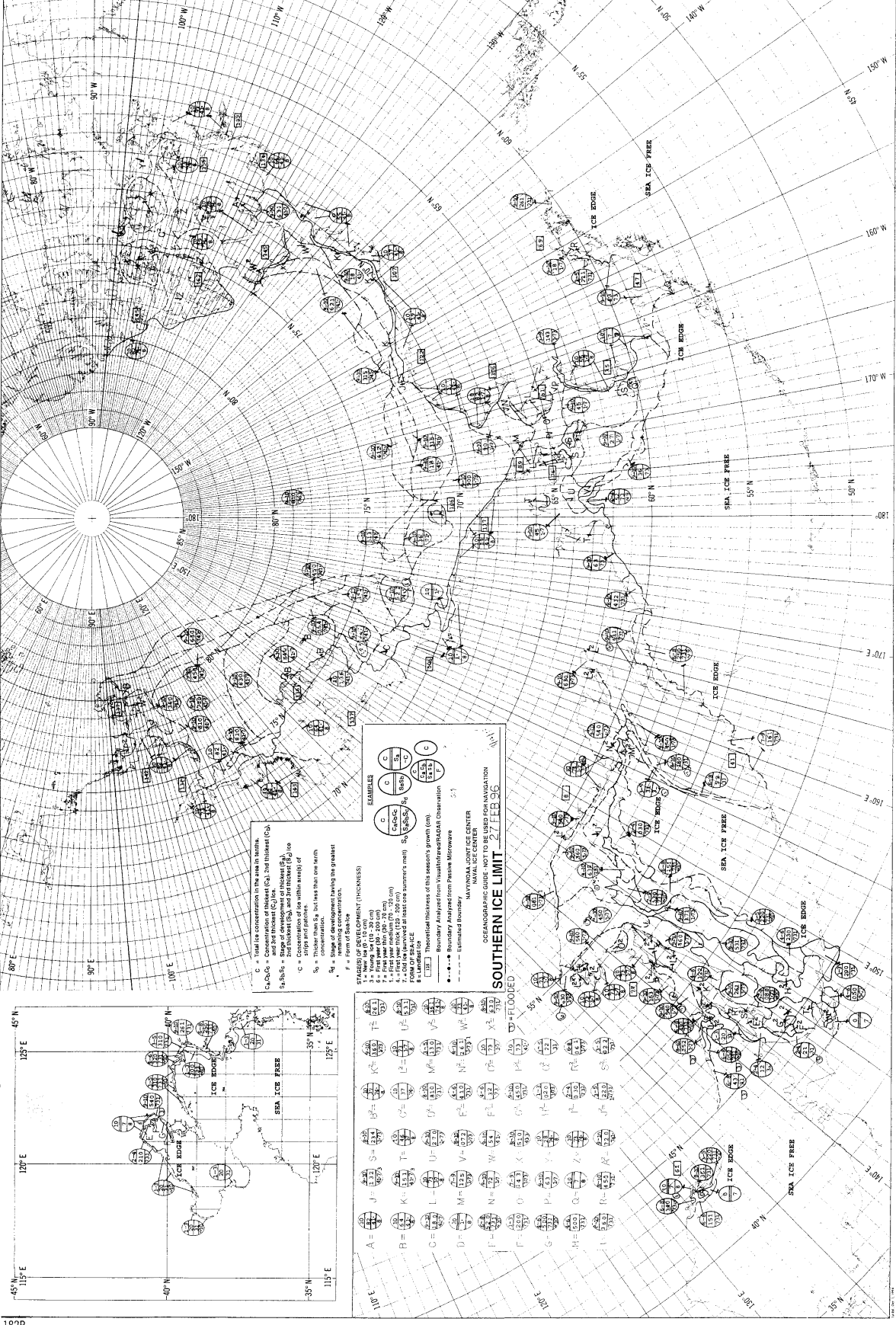
POINT OF SPREAD

1 = Theoretical thickness of the season's growth
 2 = Boundary Analyzed from Visual/Range/RADAR
 3 = Boundary Analyzed from Relative Microwave
 4 = Observations
 5 = Estimated Boundary

A = $\frac{1}{10}$	B = $\frac{2}{10}$	C = $\frac{3}{10}$	D = $\frac{4}{10}$	E = $\frac{5}{10}$	F = $\frac{6}{10}$	G = $\frac{7}{10}$	H = $\frac{8}{10}$	I = $\frac{9}{10}$	J = $\frac{10}{10}$	K = $\frac{11}{10}$	L = $\frac{12}{10}$	M = $\frac{13}{10}$	N = $\frac{14}{10}$	O = $\frac{15}{10}$	P = $\frac{16}{10}$	Q = $\frac{17}{10}$	R = $\frac{18}{10}$	S = $\frac{19}{10}$	T = $\frac{20}{10}$	U = $\frac{21}{10}$	V = $\frac{22}{10}$	W = $\frac{23}{10}$	X = $\frac{24}{10}$	Y = $\frac{25}{10}$	Z = $\frac{26}{10}$
A = $\frac{1}{10}$	B = $\frac{2}{10}$	C = $\frac{3}{10}$	D = $\frac{4}{10}$	E = $\frac{5}{10}$	F = $\frac{6}{10}$	G = $\frac{7}{10}$	H = $\frac{8}{10}$	I = $\frac{9}{10}$	J = $\frac{10}{10}$	K = $\frac{11}{10}$	L = $\frac{12}{10}$	M = $\frac{13}{10}$	N = $\frac{14}{10}$	O = $\frac{15}{10}$	P = $\frac{16}{10}$	Q = $\frac{17}{10}$	R = $\frac{18}{10}$	S = $\frac{19}{10}$	T = $\frac{20}{10}$	U = $\frac{21}{10}$	V = $\frac{22}{10}$	W = $\frac{23}{10}$	X = $\frac{24}{10}$	Y = $\frac{25}{10}$	Z = $\frac{26}{10}$

Plotting Information, Edition 1-1956

NAVYAL ICE CENTER



Plotting Information
1001 (1/83)

NOAA Nautical Chart
NO. 1616
SOUTHERN OCEAN
1983

C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and thickest (C₃) ice.
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and thickest (S₃) ice.
 C = 0 = 0/100 and 0/1000
 C = 1 = 10/100 and 100/1000
 C = 2 = 20/100 and 200/1000
 C = 3 = 30/100 and 300/1000
 C = 4 = 40/100 and 400/1000
 C = 5 = 50/100 and 500/1000
 C = 6 = 60/100 and 600/1000
 C = 7 = 70/100 and 700/1000
 C = 8 = 80/100 and 800/1000
 C = 9 = 90/100 and 900/1000
 C = 10 = 100/100 and 1000/1000

S₁ = Thicker than S₂, but less than one with remaining concentration.
 S₂ = Stage of development having the greatest remaining concentration.
 S₃ = Form of development (THICKNESS)
 1 = New ice (0-10 cm)
 2 = First year ice (10-200 cm)
 3 = Second year ice (200-300 cm)
 4 = Third year ice (300-500 cm)
 5 = Old ice (500 cm and over)

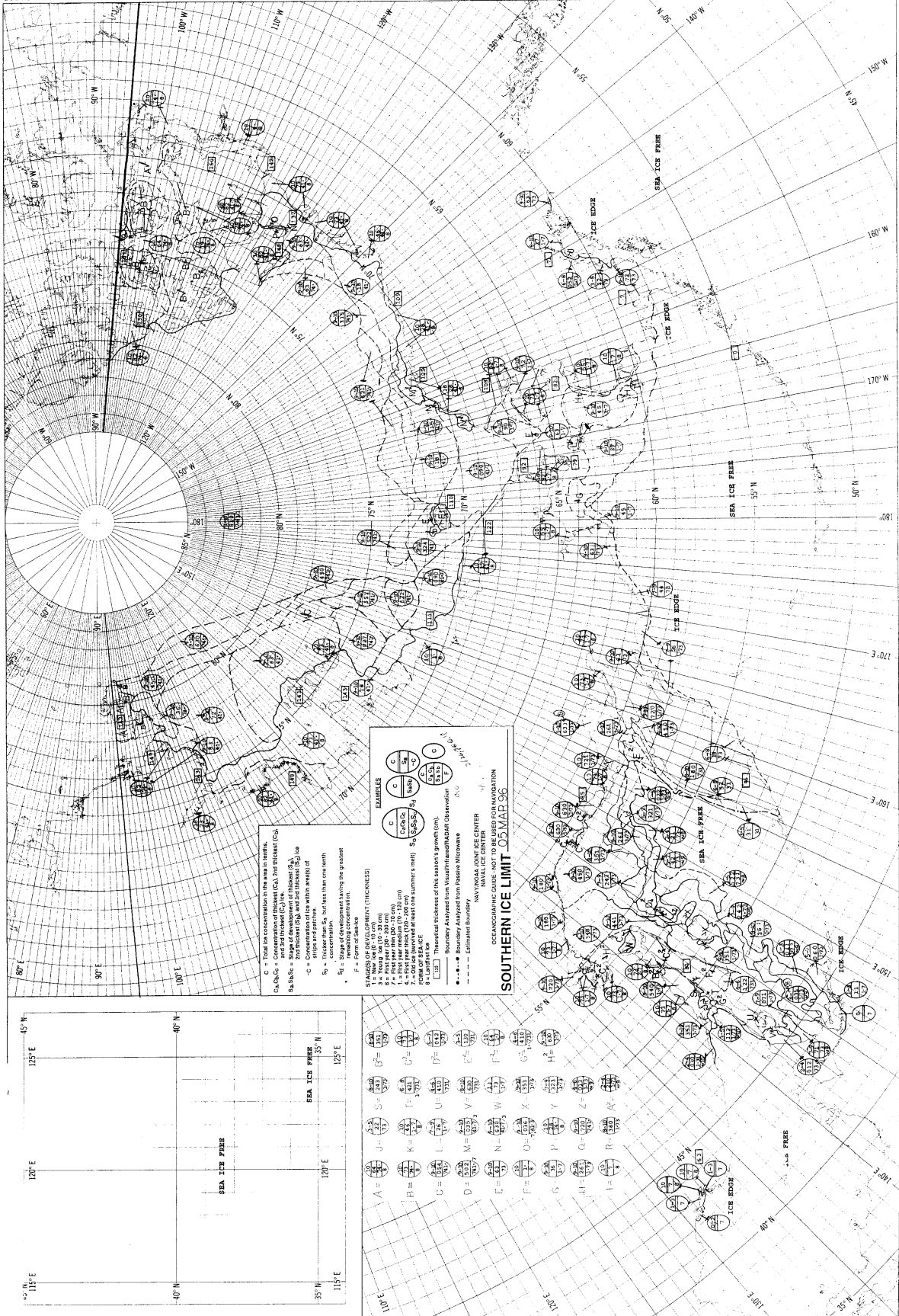
ICE BOUNDARY
 - - - - - Boundary Analyzed from Visual/Air/Radar Observation
 - - - - - Estimated Boundary
 * * * * * NAVYAL ICE CENTER
 * * * * * NATIONAL ICE CENTER

SOUTHERN ICE LIMIT
27 FEB 96

ICE FLOODED

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Examples:
 C₁C₂C₃S₁S₂S₃ = 1000/1000/1000/1/2/3
 C₁C₂C₃S₁S₂S₃ = 1000/1000/1000/1/2/3
 C₁C₂C₃S₁S₂S₃ = 1000/1000/1000/1/2/3



C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of thickest (C₁), the thickest (C₂)
 and the next thickest (C₃) ice.
 S₁S₂S₃S₄ = Stage of development of thickest (S₁) ice.
 Z = Thickness (Z₁) and of thickest (Z₂) ice
 in strips and patches.
 S₁ = Thinner than S₂, but less than one sixth
 of S₂.
 S₂ = Stage of development having the greatest
 remaining concentration.
 S₃ = S₂ + S₁.
 S₄ = S₃ + S₂.

EXAMPLES

C	C ₁ C ₂ C ₃	S ₁ S ₂ S ₃ S ₄	Z ₁ Z ₂
10	10000	1234	1000
10	10000	1234	1000
10	10000	1234	1000

STAGES OF DEVELOPMENT (THICKNESS)

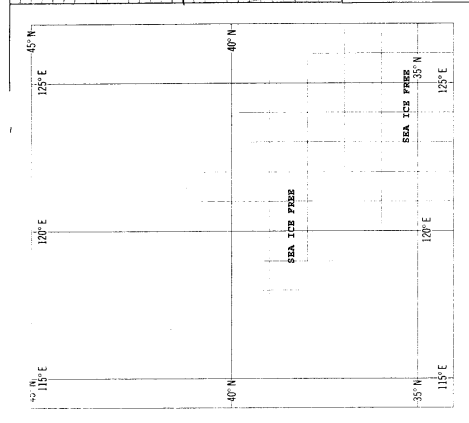
1 = New ice (0-10 cm)
 2 = Young ice (10-20 cm)
 3 = First year (20-200 cm)
 4 = First year (200-300 cm)
 5 = First year (300-350 cm)
 6 = First year (350-400 cm)
 7 = Old ice (400-500 cm)
 8 = Old ice (500-600 cm)
 9 = Old ice (600-700 cm)
 10 = Old ice (700-800 cm)

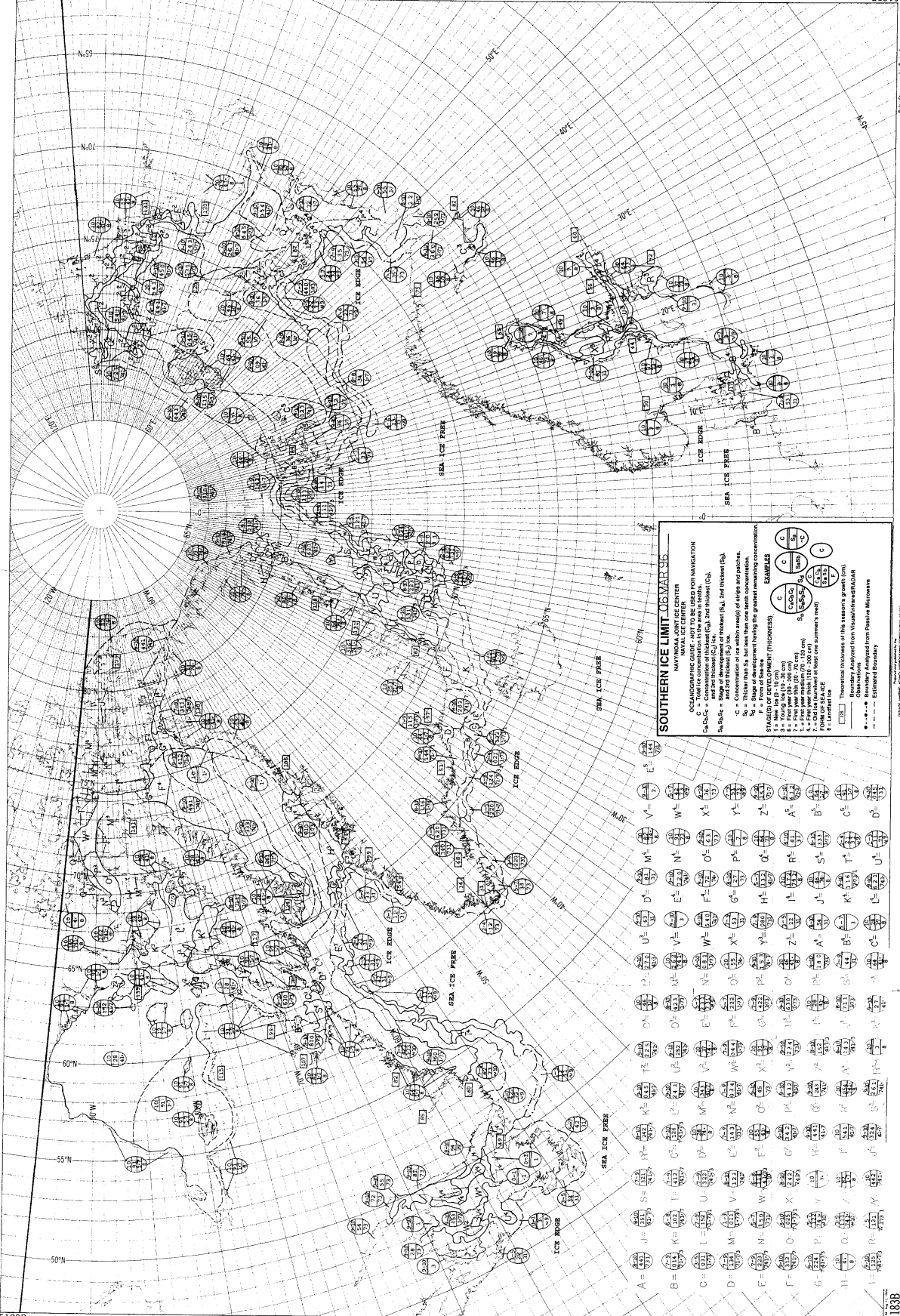
FORM OF SEA ICE

1 = Theoretical thickness of this season's growth (cm).
 2 = Boundary Analyzed from Visual and Radar Observation.
 3 = Boundary Analyzed from Passive Microwave Observation.
 4 = Estimated Boundary.

NATIONAL ICE CENTER
NAVAL ICE CENTER

OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT - 05 MAR 56





SOUTHERN ICE LIMIT, 06 MAR 53

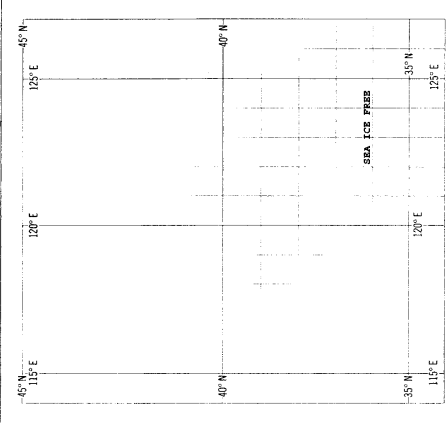
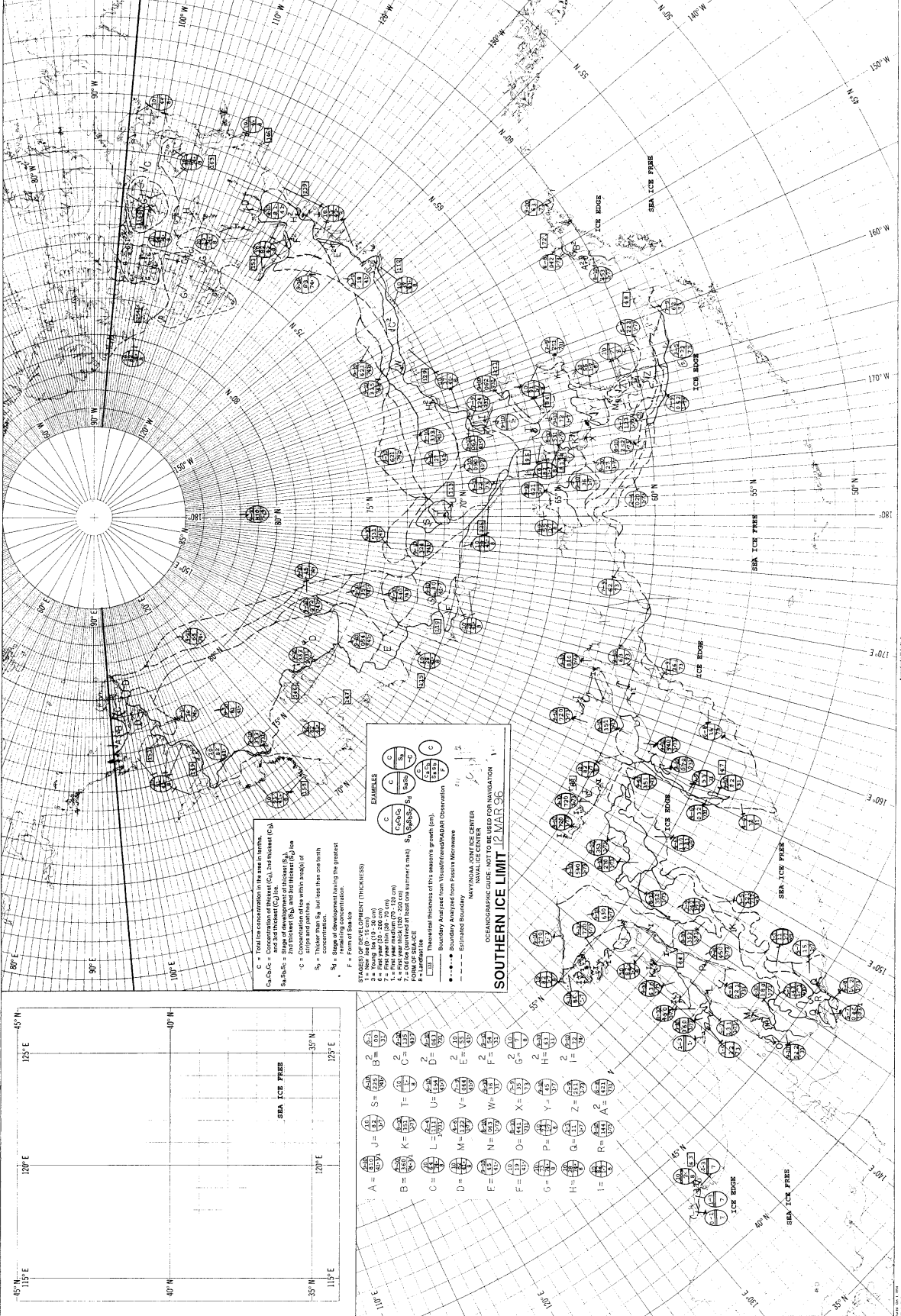
NAVY/Joint ICE CENTER
NAVY ICE CENTER
OCCUPANCY/NAVIGATION

C = Total ice concentration in the area in tenths.
 S, L, D, T, E, F = Sea ice thickness (S, L, D, T, E, F) in feet.
 S, L, D, T, E, F = Sea ice thickness (S, L, D, T, E, F) in feet.

Stages of Development (Thickness)
 1 = Young ice (10 - 30 cm)
 2 = First year ice (30 - 75 cm)
 3 = First year ice (75 - 100 cm)
 4 = First year ice (100 - 200 cm)
 5 = First year ice (200 - 300 cm)
 6 = First year ice (300 - 400 cm)
 7 = First year ice (400 - 500 cm)
 8 = First year ice (500 - 600 cm)
 9 = First year ice (600 - 700 cm)
 10 = First year ice (700 - 800 cm)
 11 = First year ice (800 - 900 cm)
 12 = First year ice (900 - 1000 cm)
 13 = Landfast ice

Thematic thicknesses of this season's growth (cm)
 1 - 100
 2 - 200
 3 - 300
 4 - 400
 5 - 500
 6 - 600
 7 - 700
 8 - 800
 9 - 900
 10 - 1000

Observations based from Visual/Infra-Red
 Observations
 Estimated boundary



EXAMPLES

C	C	C	C
100	100	100	100
100	100	100	100
100	100	100	100

STAGES OF DEVELOPMENT (THICKNESS)

- C = Total ice concentration in the area in tenths.
- Ca, Cbc, Cc = Stage of development of ice sheet (Ca, thin; Cbc, medium; Cc, thick).
- Sa, Sbc, Sc = Stage of development of ice sheet (Sa, thin; Sbc, medium; Sc, thick).
- C = Concentration of ice within each of the strips and patches.
- S = Stage of development of ice sheet (S, thin; Sb, medium; Sc, thick).
- Sa = Stage of development of ice sheet (Sa, thin; Sb, medium; Sc, thick).
- F = Form of ice.

SEASONS

- 1 = First year maximum (70 - 100 cm)
- 2 = First year minimum (30 - 70 cm)
- 3 = First year maximum (100 - 150 cm)
- 4 = First year minimum (50 - 100 cm)
- 5 = First year maximum (150 - 200 cm)
- 6 = First year minimum (100 - 150 cm)
- 7 = Old ice (formed at least one summer's age)
- 8 = Old ice (formed at least two summer's age)
- 9 = Landfast ice
- 10 = Theoretical thickness of this season's growth (cm)

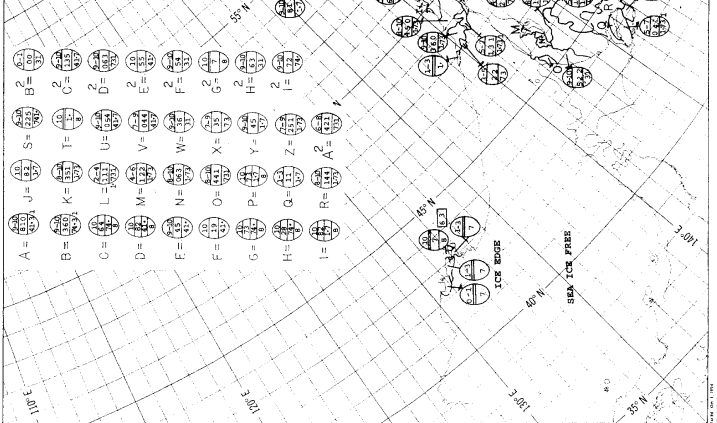
SYMBOLS

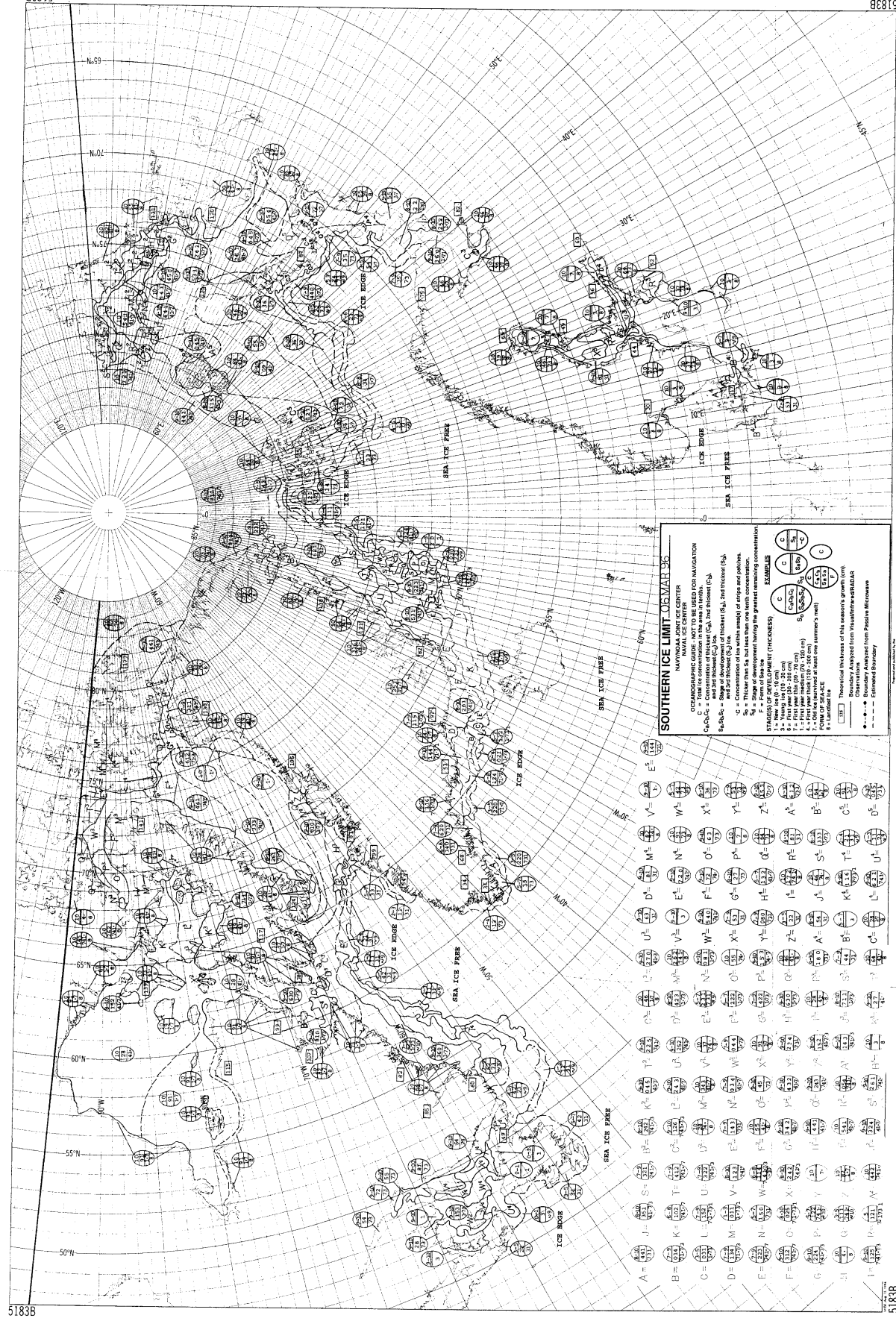
- = Boundary Analyzed from Visual/Passive Microwave
- = Boundary Analyzed from Visual/Passive Microwave Observation
- = Boundary Analyzed from Visual/Passive Microwave
- = Boundary Analyzed from Visual/Passive Microwave
- = Boundary Analyzed from Visual/Passive Microwave

ORGANIZATIONS AND INSTITUTIONS INVOLVED IN THIS CALCULATION

NAVY AND NAVAL OCEANOGRAPHIC CENTER
 NAVAL ICE CENTER
 NAVY AND NAVAL OCEANOGRAPHIC CENTER
 NAVY AND NAVAL OCEANOGRAPHIC CENTER

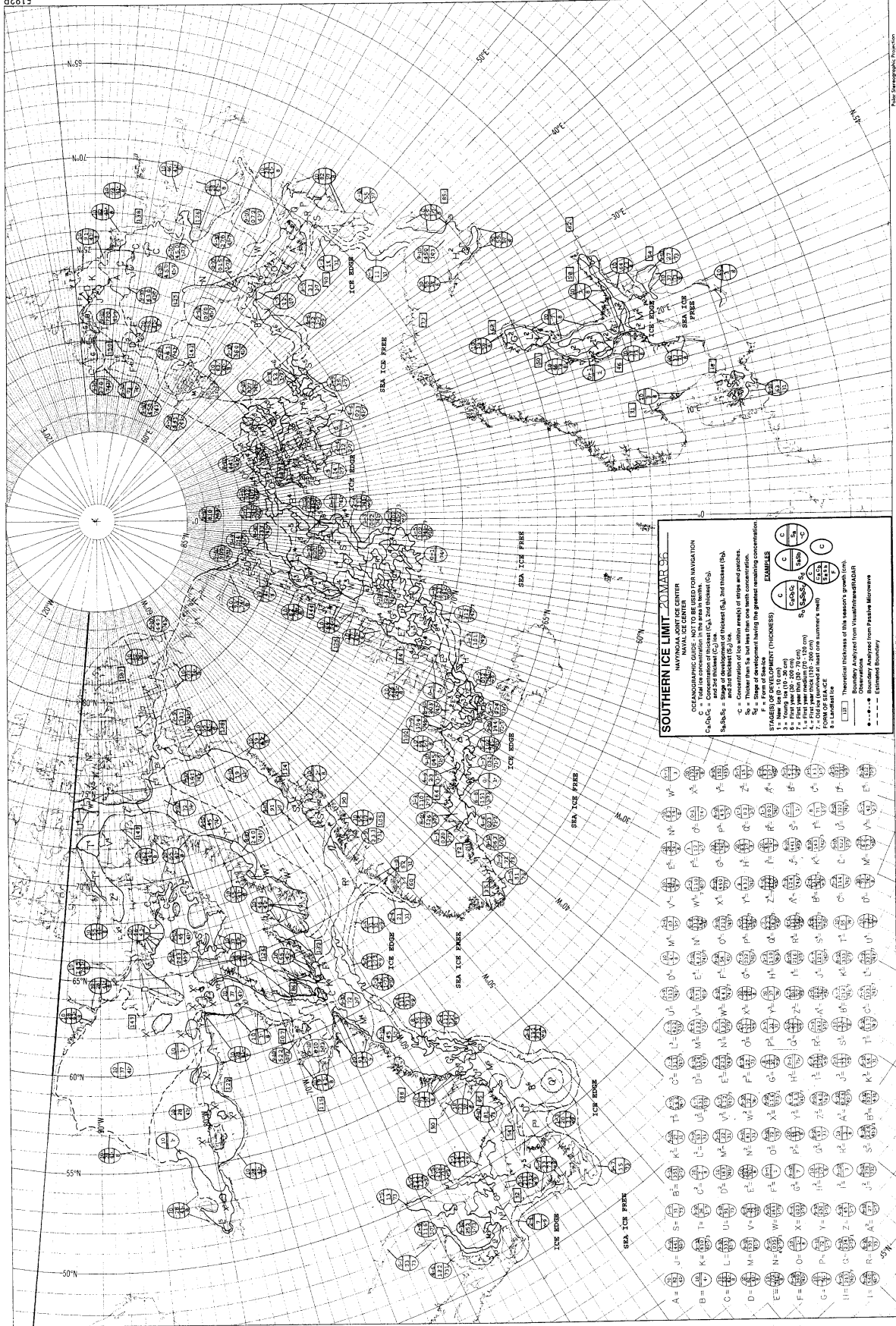
SOUTHERN ICE LIMIT 12 MAR 50





SOUTHERN ICE LIMIT (CG MAR 58)
 NAVAL ICE CENTER
 ICE STAGES
 C = Total ice concentration in the area is thick
 C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), 3rd thickest (C₃)
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), 3rd thickest (S₃)
 S₁ = Thicker than S₂, but less than one with concentration
 S₂ = Concentration of (1) within area) of one and another.
 S₃ = Stage of development having the greatest remaining concentration
STAGES OF DEVELOPMENT (THICKNESS)
 1 = Young ice (10-25 cm)
 2 = First year ice (25-100 cm)
 3 = First year ice (100-200 cm)
 4 = First year ice (200-300 cm)
 5 = Old ice (300-500 cm)
 6 = Old ice (500-1000 cm)
 7 = Old ice (1000-2000 cm)
 8 = Old ice (2000-5000 cm)
 9 = Landfast ice

A = 1/10	B = 2/10	C = 3/10	D = 4/10	E = 5/10	F = 6/10	G = 7/10	H = 8/10	I = 9/10	J = 10/10	K = 11/10	L = 12/10	M = 13/10	N = 14/10	O = 15/10	P = 16/10	Q = 17/10	R = 18/10	S = 19/10	T = 20/10	U = 21/10	V = 22/10	W = 23/10	X = 24/10	Y = 25/10	Z = 26/10	A = 27/10	B = 28/10	C = 29/10	D = 30/10	E = 31/10	F = 32/10	G = 33/10	H = 34/10	I = 35/10	J = 36/10	K = 37/10	L = 38/10	M = 39/10	N = 40/10	O = 41/10	P = 42/10	Q = 43/10	R = 44/10	S = 45/10	T = 46/10	U = 47/10	V = 48/10	W = 49/10	X = 50/10	Y = 51/10	Z = 52/10	A = 53/10	B = 54/10	C = 55/10	D = 56/10	E = 57/10	F = 58/10	G = 59/10	H = 60/10	I = 61/10	J = 62/10	K = 63/10	L = 64/10	M = 65/10	N = 66/10	O = 67/10	P = 68/10	Q = 69/10	R = 70/10	S = 71/10	T = 72/10	U = 73/10	V = 74/10	W = 75/10	X = 76/10	Y = 77/10	Z = 78/10	A = 79/10	B = 80/10	C = 81/10	D = 82/10	E = 83/10	F = 84/10	G = 85/10	H = 86/10	I = 87/10	J = 88/10	K = 89/10	L = 90/10	M = 91/10	N = 92/10	O = 93/10	P = 94/10	Q = 95/10	R = 96/10	S = 97/10	T = 98/10	U = 99/10	V = 100/10
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SOUTHERN ICE LIMIT - 20 MAR 56

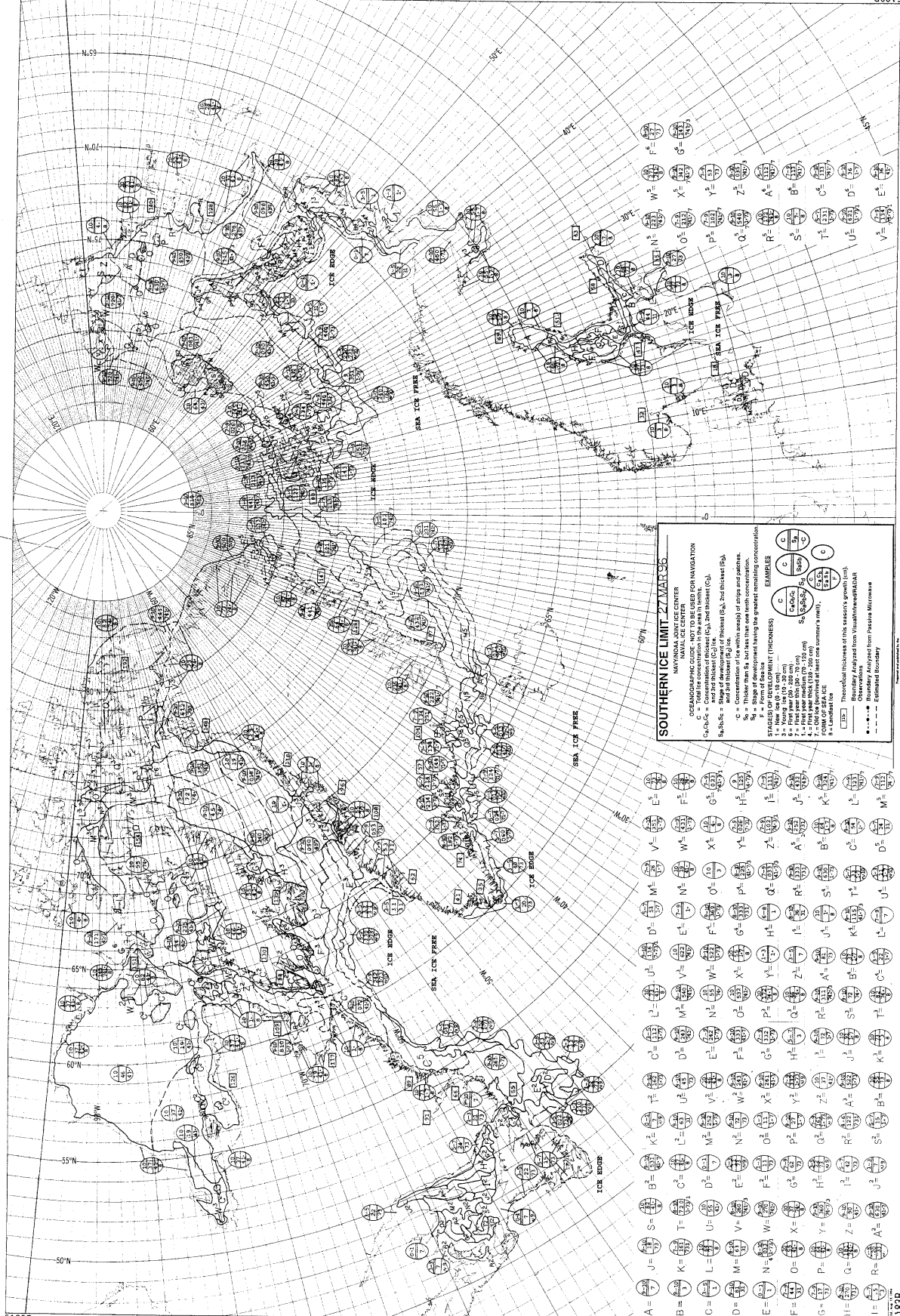
NAVY/NAVY JOINT ICE CENTER
NAVAL ICE CENTER

CONCENTRATIONS:
C = Total ice concentration in the area in percent.
C₁, C₂ = Concentration of thickets (C₁) and thicket (C₂).
%₁, %₂, %₃ = Stage of development of thicket (%₁), 2nd thicket (%₂), and 3rd thicket (%₃).
%₄ = Concentration of ice within reaches of straits and passages.
%₅ = Thicker than %₄, but less than one tenth concentration.

STAGES OF DEVELOPMENT (THICKNESS):
S = Stage of development bearing the greatest remaining concentration.
S₁ = Young ice (10 - 30 cm)
S₂ = First year ice (30 - 70 cm)
S₃ = First year ice (70 - 100 cm)
S₄ = First year ice (100 - 150 cm)
S₅ = First year ice (150 - 200 cm)
S₆ = First year ice (200 - 250 cm)
S₇ = First year ice (250 - 300 cm)
S₈ = First year ice (300 - 350 cm)
S₉ = First year ice (350 - 400 cm)
S₁₀ = First year ice (400 - 450 cm)
S₁₁ = First year ice (450 - 500 cm)
S₁₂ = First year ice (500 - 550 cm)
S₁₃ = First year ice (550 - 600 cm)
S₁₄ = First year ice (600 - 650 cm)
S₁₅ = First year ice (650 - 700 cm)
S₁₆ = First year ice (700 - 750 cm)
S₁₇ = First year ice (750 - 800 cm)
S₁₈ = First year ice (800 - 850 cm)
S₁₉ = First year ice (850 - 900 cm)
S₂₀ = First year ice (900 - 950 cm)
S₂₁ = First year ice (950 - 1000 cm)
S₂₂ = First year ice (1000 - 1050 cm)
S₂₃ = First year ice (1050 - 1100 cm)
S₂₄ = First year ice (1100 - 1150 cm)
S₂₅ = First year ice (1150 - 1200 cm)
S₂₆ = First year ice (1200 - 1250 cm)
S₂₇ = First year ice (1250 - 1300 cm)
S₂₈ = First year ice (1300 - 1350 cm)
S₂₉ = First year ice (1350 - 1400 cm)
S₃₀ = First year ice (1400 - 1450 cm)
S₃₁ = First year ice (1450 - 1500 cm)
S₃₂ = First year ice (1500 - 1550 cm)
S₃₃ = First year ice (1550 - 1600 cm)
S₃₄ = First year ice (1600 - 1650 cm)
S₃₅ = First year ice (1650 - 1700 cm)
S₃₆ = First year ice (1700 - 1750 cm)
S₃₇ = First year ice (1750 - 1800 cm)
S₃₈ = First year ice (1800 - 1850 cm)
S₃₉ = First year ice (1850 - 1900 cm)
S₄₀ = First year ice (1900 - 1950 cm)
S₄₁ = First year ice (1950 - 2000 cm)
S₄₂ = First year ice (2000 - 2050 cm)
S₄₃ = First year ice (2050 - 2100 cm)
S₄₄ = First year ice (2100 - 2150 cm)
S₄₅ = First year ice (2150 - 2200 cm)
S₄₆ = First year ice (2200 - 2250 cm)
S₄₇ = First year ice (2250 - 2300 cm)
S₄₈ = First year ice (2300 - 2350 cm)
S₄₉ = First year ice (2350 - 2400 cm)
S₅₀ = First year ice (2400 - 2450 cm)
S₅₁ = First year ice (2450 - 2500 cm)
S₅₂ = First year ice (2500 - 2550 cm)
S₅₃ = First year ice (2550 - 2600 cm)
S₅₄ = First year ice (2600 - 2650 cm)
S₅₅ = First year ice (2650 - 2700 cm)
S₅₆ = First year ice (2700 - 2750 cm)
S₅₇ = First year ice (2750 - 2800 cm)
S₅₈ = First year ice (2800 - 2850 cm)
S₅₉ = First year ice (2850 - 2900 cm)
S₆₀ = First year ice (2900 - 2950 cm)
S₆₁ = First year ice (2950 - 3000 cm)
S₆₂ = First year ice (3000 - 3050 cm)
S₆₃ = First year ice (3050 - 3100 cm)
S₆₄ = First year ice (3100 - 3150 cm)
S₆₅ = First year ice (3150 - 3200 cm)
S₆₆ = First year ice (3200 - 3250 cm)
S₆₇ = First year ice (3250 - 3300 cm)
S₆₈ = First year ice (3300 - 3350 cm)
S₆₉ = First year ice (3350 - 3400 cm)
S₇₀ = First year ice (3400 - 3450 cm)
S₇₁ = First year ice (3450 - 3500 cm)
S₇₂ = First year ice (3500 - 3550 cm)
S₇₃ = First year ice (3550 - 3600 cm)
S₇₄ = First year ice (3600 - 3650 cm)
S₇₅ = First year ice (3650 - 3700 cm)
S₇₆ = First year ice (3700 - 3750 cm)
S₇₇ = First year ice (3750 - 3800 cm)
S₇₈ = First year ice (3800 - 3850 cm)
S₇₉ = First year ice (3850 - 3900 cm)
S₈₀ = First year ice (3900 - 3950 cm)
S₈₁ = First year ice (3950 - 4000 cm)
S₈₂ = First year ice (4000 - 4050 cm)
S₈₃ = First year ice (4050 - 4100 cm)
S₈₄ = First year ice (4100 - 4150 cm)
S₈₅ = First year ice (4150 - 4200 cm)
S₈₆ = First year ice (4200 - 4250 cm)
S₈₇ = First year ice (4250 - 4300 cm)
S₈₈ = First year ice (4300 - 4350 cm)
S₈₉ = First year ice (4350 - 4400 cm)
S₉₀ = First year ice (4400 - 4450 cm)
S₉₁ = First year ice (4450 - 4500 cm)
S₉₂ = First year ice (4500 - 4550 cm)
S₉₃ = First year ice (4550 - 4600 cm)
S₉₄ = First year ice (4600 - 4650 cm)
S₉₅ = First year ice (4650 - 4700 cm)
S₉₆ = First year ice (4700 - 4750 cm)
S₉₇ = First year ice (4750 - 4800 cm)
S₉₈ = First year ice (4800 - 4850 cm)
S₉₉ = First year ice (4850 - 4900 cm)
S₁₀₀ = First year ice (4900 - 4950 cm)

EXAMPLES:
C
C₁C₂C₃
%₁%₂%₃%₄%₅
S₁S₂S₃S₄S₅S₆S₇S₈S₉S₁₀S₁₁S₁₂S₁₃S₁₄S₁₅S₁₆S₁₇S₁₈S₁₉S₂₀S₂₁S₂₂S₂₃S₂₄S₂₅S₂₆S₂₇S₂₈S₂₉S₃₀S₃₁S₃₂S₃₃S₃₄S₃₅S₃₆S₃₇S₃₈S₃₉S₄₀S₄₁S₄₂S₄₃S₄₄S₄₅S₄₆S₄₇S₄₈S₄₉S₅₀S₅₁S₅₂S₅₃S₅₄S₅₅S₅₆S₅₇S₅₈S₅₉S₆₀S₆₁S₆₂S₆₃S₆₄S₆₅S₆₆S₆₇S₆₈S₆₉S₇₀S₇₁S₇₂S₇₃S₇₄S₇₅S₇₆S₇₇S₇₈S₇₉S₈₀S₈₁S₈₂S₈₃S₈₄S₈₅S₈₆S₈₇S₈₈S₈₉S₉₀S₉₁S₉₂S₉₃S₉₄S₉₅S₉₆S₉₇S₉₈S₉₉S₁₀₀

BOUNDARIES:
- - - - - Boundary Analyzed from Visual Observations
- - - - - Boundary Analyzed from Passive Microwave
- - - - - Estimated Boundary



SOUTHERN ICE LIMIT - 27 MAR 56

NAVY/Joint ICE CENTER
 NAVAL ICE CENTER FOR NAVIGATION
 C = Total ice concentration in the area in tenths.
 C₀, C₁₀, C₂₀ = Range of development of thickness (B₁), 2nd thickest (B₂), and 3rd thickest (C₃) ice.
 B₁, B₂, C₃ = Range of development of thickness (B₁), 2nd thickest (B₂), and 3rd thickest (C₃) ice.
 C₀ = Concentration of ice within (width) of strips and patches.
 S₀ = Thicker than 16, but less than one tenth concentration.
 F = Form of Sea Ice

STAGES OF DEVELOPMENT (THICKNESS)

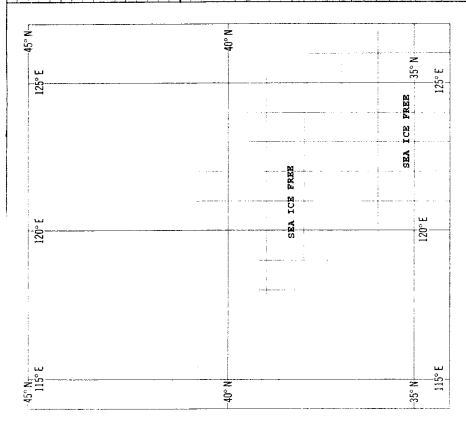
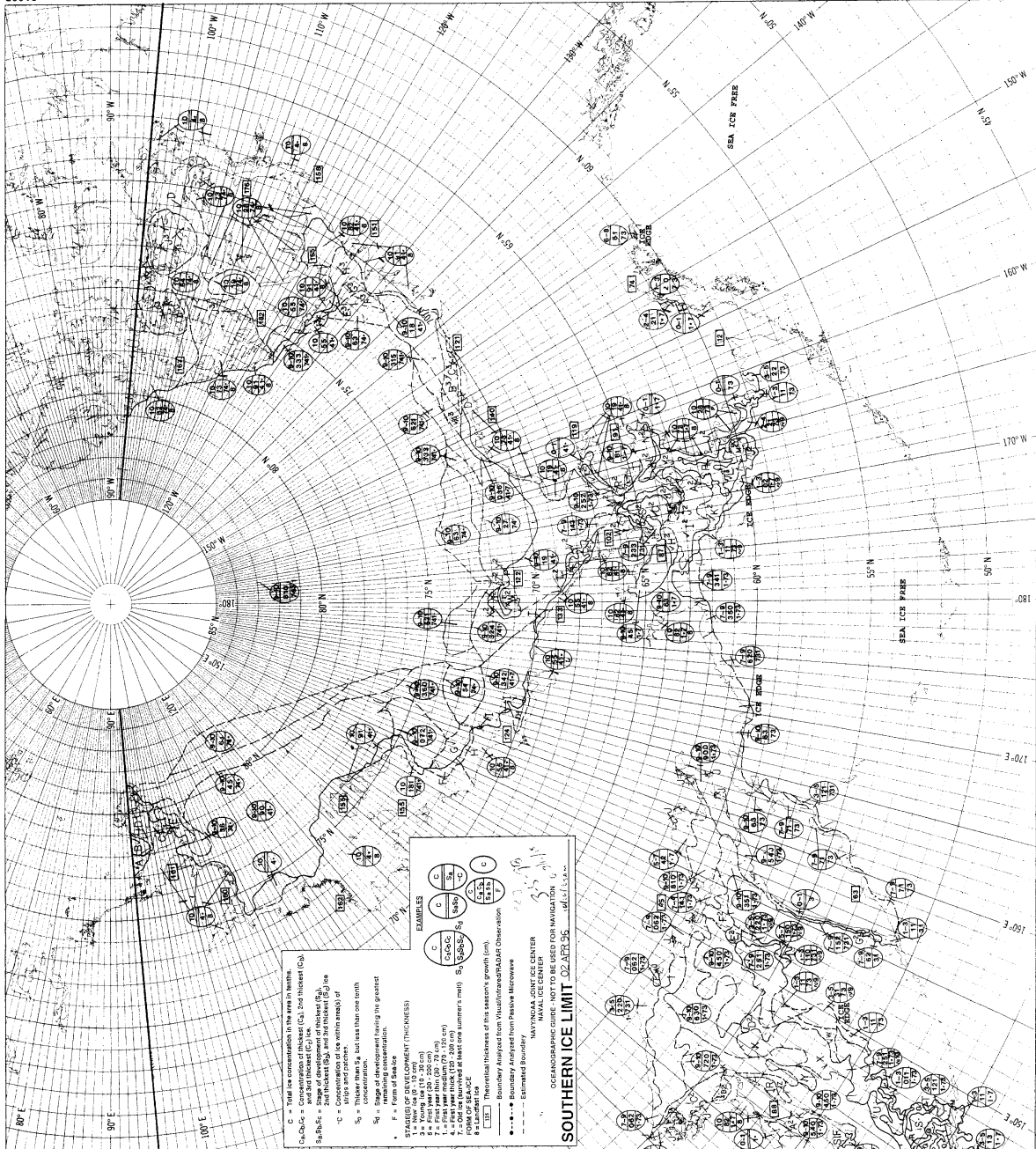
1 = Young ice (10 - 30 cm)
 2 = First year ice (30 - 70 cm)
 3 = First year ice (70 - 100 cm)
 4 = First year ice (100 - 150 cm)
 5 = First year ice (150 - 200 cm)
 6 = First year ice (200 - 300 cm)
 7 = First year ice (300 - 400 cm)
 8 = First year ice (400 - 500 cm)
 9 = Landfast ice

EXAMPLES

C	C	C	C
10/10	10/10	10/10	10/10
10/10	10/10	10/10	10/10
10/10	10/10	10/10	10/10

- - - - - Theoretical thickness of this season's growth (cm).
 - - - - - Boundary Analyzed from Visual/Infrared
 - - - - - Estimated Boundary
 - - - - - Landfast Ice

- A =
- B =
- C =
- D =
- E =
- F =
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- J =
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- IA =
- IB =
- IC =
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- IE =
- IF =
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- IL =
- IM =
- IN =
- IO =
- IP =
- IQ =
- IR =
- IS =
- IT =
- IU =
- IV =
- IW =
- IX =
- IY =
- IZ =



EXAMPLES

$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$
$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$

STAGES OF DEVELOPMENT (THICKNESS)

1 = New (0-15 cm)
 2 = First year (15-30 cm)
 3 = Second year (30-50 cm)
 4 = First year maximum (50-75 cm)
 5 = Second year maximum (75-100 cm)
 6 = Old (100 cm or more)

FORM OF SEA ICE

1 = Thin
 2 = Medium
 3 = Thick

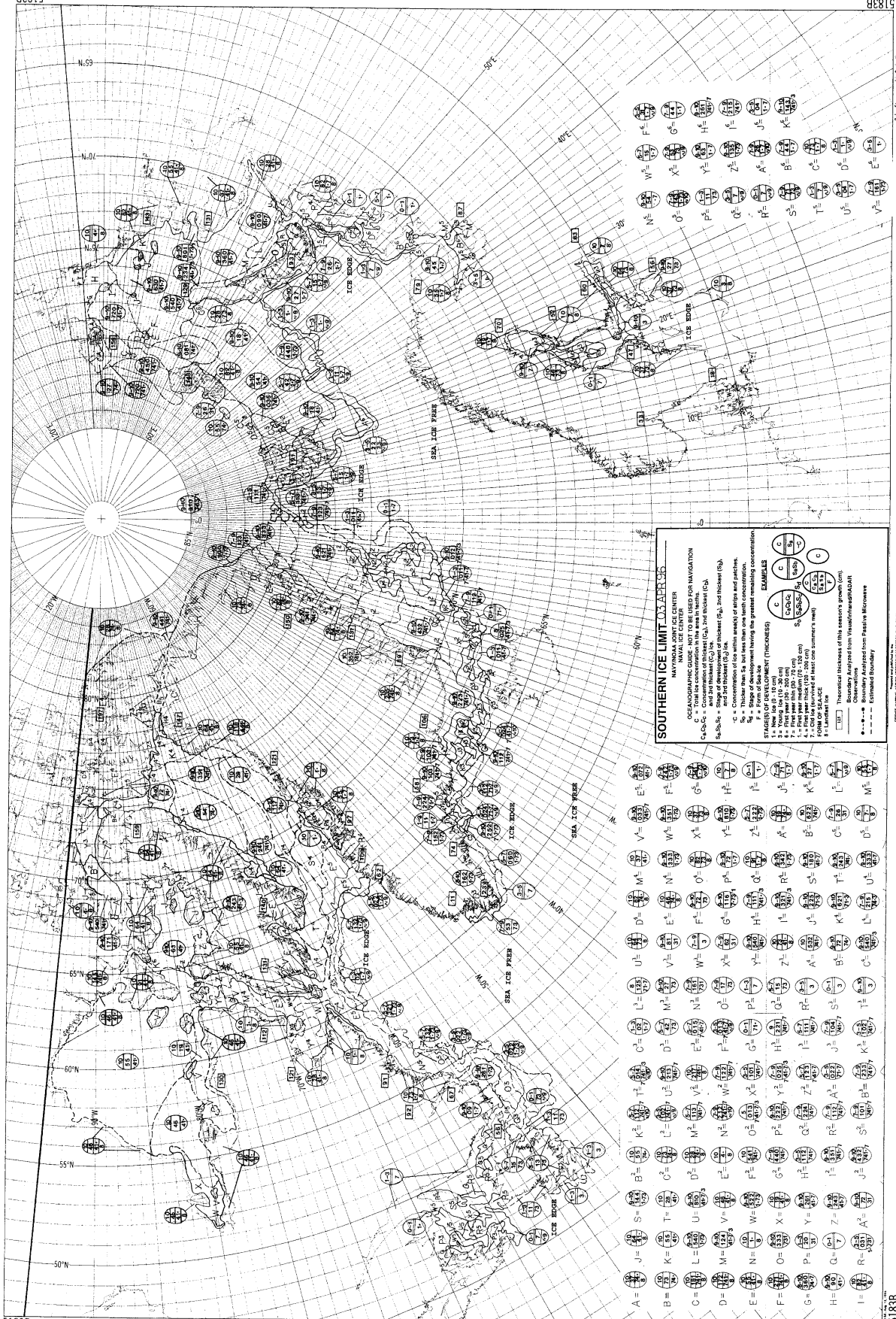
BOUNDARY ANALYSIS FROM MICROWAVE OBSERVATION

••••• Boundary Analyzed from Microwave
 - - - - - Estimated boundary

NAVY/Joint ICE CENTER
NAVAL ICE CENTER

SOUTHERN ICE LIMIT 02 APR 55

OCEANOGRAPHIC CHART NOT TO BE USED FOR NAVIGATION



SOUTHERN ICE LIMIT DATA

NAVY/Joint ICE CENTER
 NAVAL ICE CENTER

ICE DEVELOPMENT STAGES

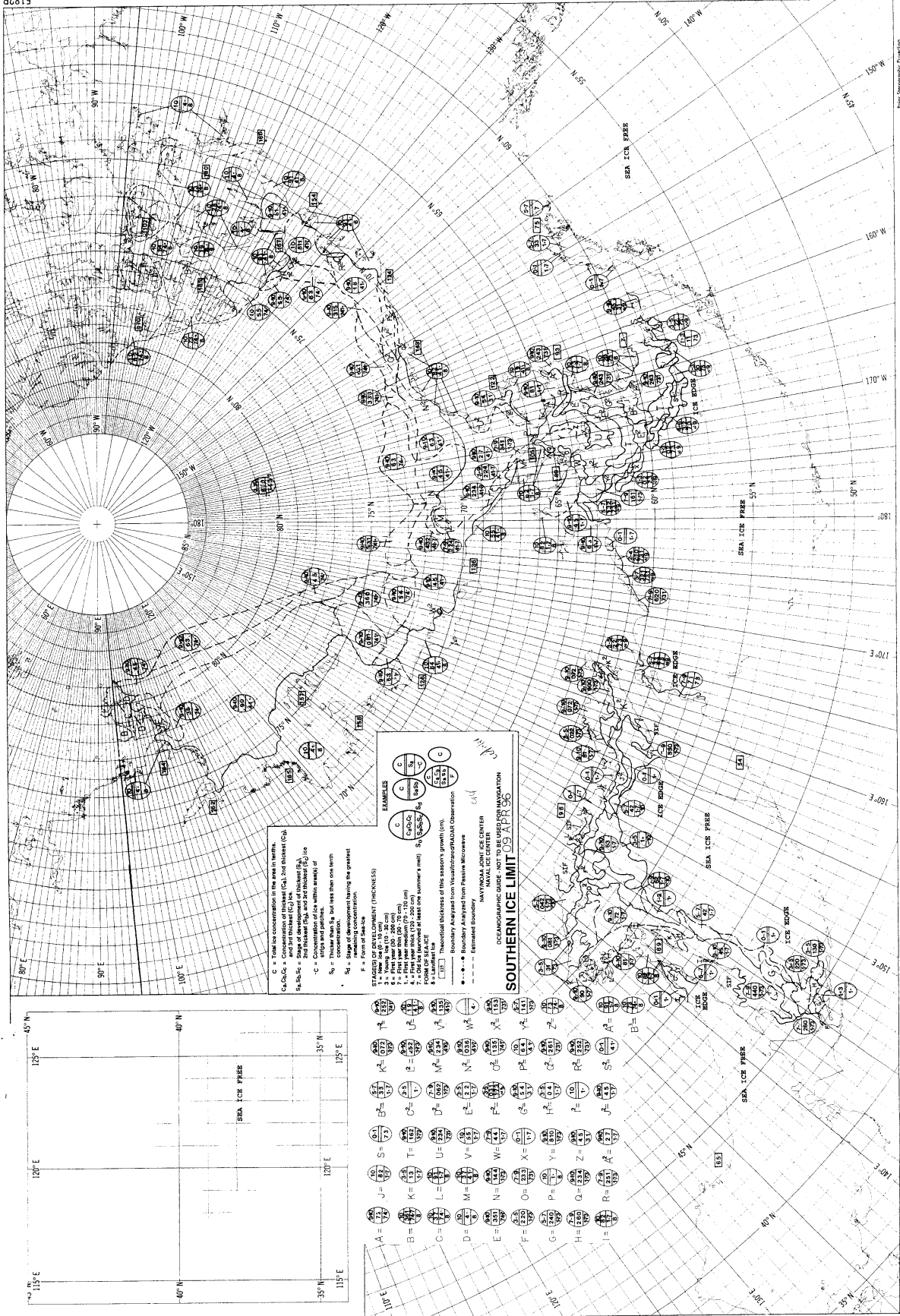
C = Total ice concentration in the area in tenths.
 1 = 10% and 2nd thickness (C₂), 2nd thickness (C₂).
 2 = 20% and 3rd thickness (C₃), 3rd thickness (C₃).
 3 = Young ice (15 - 20 cm).
 4 = First year thin (20 - 70 cm).
 5 = First year thick (70 - 100 cm).
 6 = First year thick (100 - 200 cm).
 7 = First year thick (200 - 400 cm).
 8 = First year thick (400 - 700 cm).
 9 = First year thick (700 - 1000 cm).
 0 = Landfast ice.

ICE THICKNESS

1 = Thicker than 50, but less than one with concentration.
 2 = Concentration of ice within areas of areas and patches.
 3 = Thinner than 50, but less than one with concentration.
 4 = Ice concentration having the greater remaining concentration.

ICE BOUNDS

1 = Boundary analyzed from Visual/IR/MSAT/DAI.
 2 = Boundary analyzed from Passive Microwave.
 3 = Estimated boundary.



C = Total ice concentration in the area in percent.
 C₁C₂C₃ = Concentration of thickness (C₁), 2nd thickest (C₂),
 3rd thickest (C₃).
 S₁S₂S₃ = Stage of development of thickest (S₁),
 2nd thickest (S₂), and thickest (S₃) ice
 strips and patches.
 S₁ = Thinner than S₂, but less than one tenth
 of S₂ in concentration.
 S₂ = Stage of development having the greatest
 opening concentration.
 S₃ = Opening concentration.

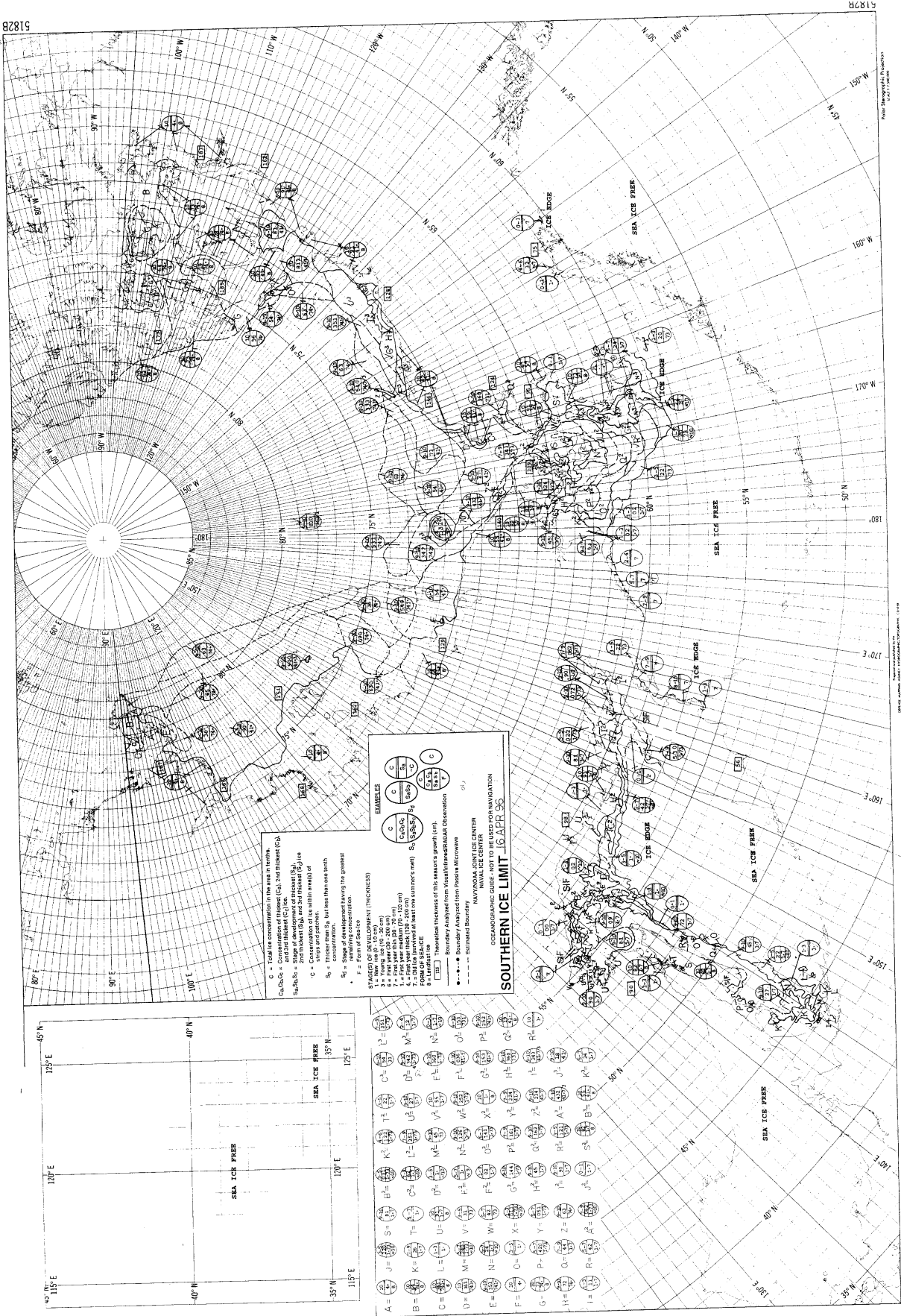
STAGED BY DEVELOPMENT (THICKNESS)
 1 = None (0 to 10 cm)
 2 = First year (10 to 200 cm)
 3 = First year medium (70 to 150 cm)
 4 = First year medium (70 to 150 cm)
 5 = Old ice (more than one summer's melt)
 6 = Old ice (more than one summer's melt)
 7 = Old ice (more than one summer's melt)
 8 = Landfast ice

Boundary Analyzed from Visual and RADARSAT Observation
 - - - - - Estimated Boundary
 MANTANNA JOHN ICE CENTER
 NAVAL ICE CENTER
 CIRCUMPOLAR NAVIGATOR FOR AMBASSADOR

SOUTHERN ICE LIMIT 09 APR 96

A = $\frac{01}{01}$	B = $\frac{02}{02}$	C = $\frac{03}{03}$	D = $\frac{04}{04}$	E = $\frac{05}{05}$	F = $\frac{06}{06}$	G = $\frac{07}{07}$	H = $\frac{08}{08}$	I = $\frac{09}{09}$	J = $\frac{10}{10}$	K = $\frac{11}{11}$	L = $\frac{12}{12}$	M = $\frac{13}{13}$	N = $\frac{14}{14}$	O = $\frac{15}{15}$	P = $\frac{16}{16}$	Q = $\frac{17}{17}$	R = $\frac{18}{18}$	S = $\frac{19}{19}$	T = $\frac{20}{20}$	U = $\frac{21}{21}$	V = $\frac{22}{22}$	W = $\frac{23}{23}$	X = $\frac{24}{24}$	Y = $\frac{25}{25}$	Z = $\frac{26}{26}$
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 Distribution Statement (DS) (When Approved)
 Form 1041 Rev. 11-80



C = Total ice concentration in sea ice breaks
 C₁C₂C₃ = Concentration of thickest (C₁), medium (C₂), and thinnest (C₃) ice
 S₁S₂S₃ = Stage of development (S₁ = first year thin ice, S₂ = first year thick ice, S₃ = second year ice)
 C = Concentration of ice within areas of thin ice breaks, and first year thin ice concentration.
 S₁ = Stage of development having the greatest concentration.
 F = Form of Sea Ice

EXAMPLES

C	C	C
C ₁ C ₂ C ₃	C ₁ C ₂ C ₃	C ₁ C ₂ C ₃
S ₁ S ₂ S ₃	S ₁ S ₂ S ₃	S ₁ S ₂ S ₃

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = Young ice (10-30 cm)
- 2 = First year thin ice (30-70 cm)
- 3 = First year thick ice (70-100 cm)
- 4 = First year thick ice (100-200 cm)
- 5 = Second year ice (100-200 cm)
- 6 = Landfast ice
- 7 = Ice free
- 8 = Ice free

Legend:

- Boundary
- Standard Boundary
- Antarctic Peninsula
- Antarctic Peninsula

ANTARCTIC PENINSULA

SOUTHERN ICE LIMIT 16 APR 56

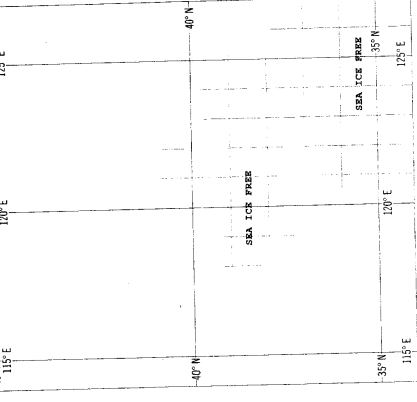
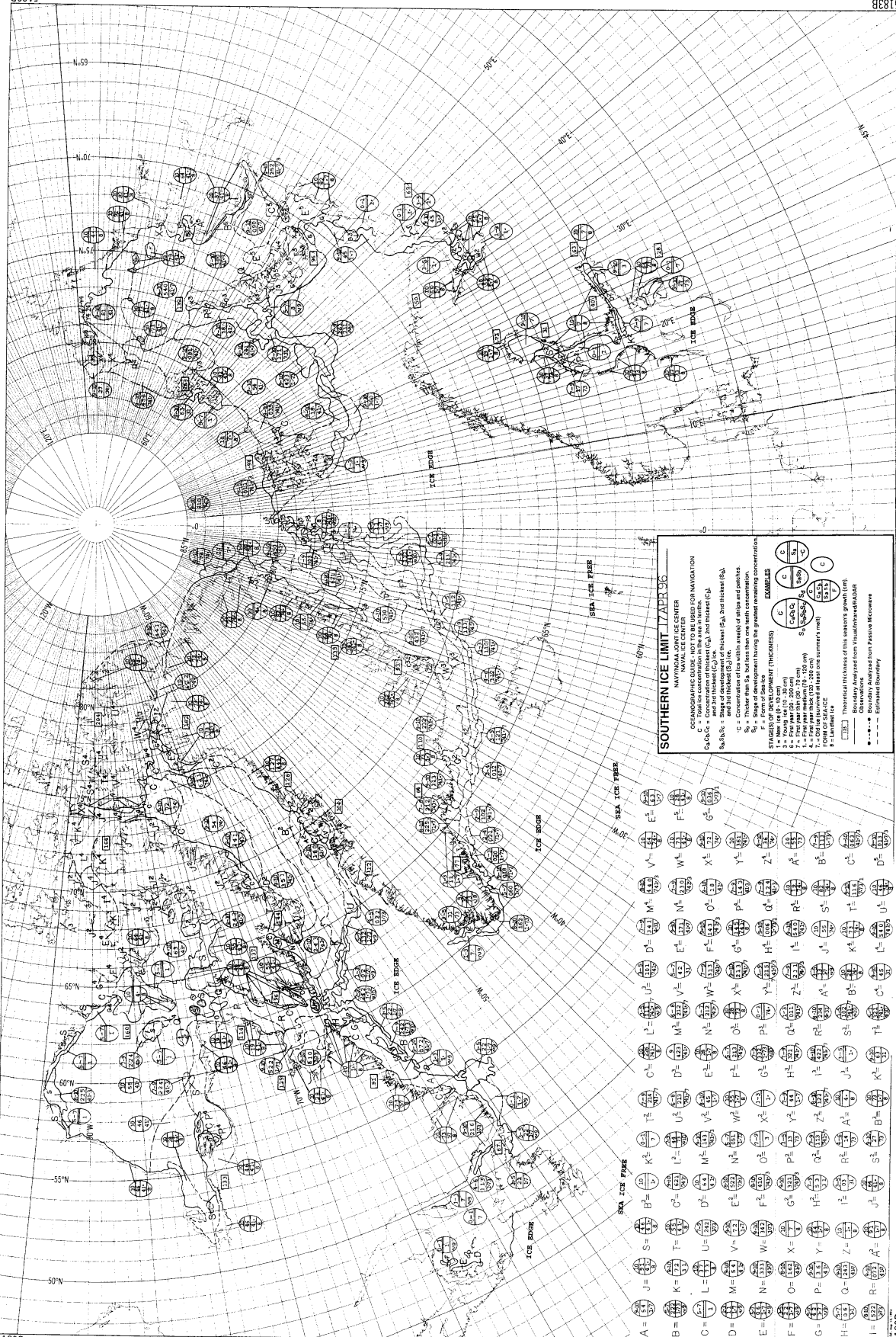
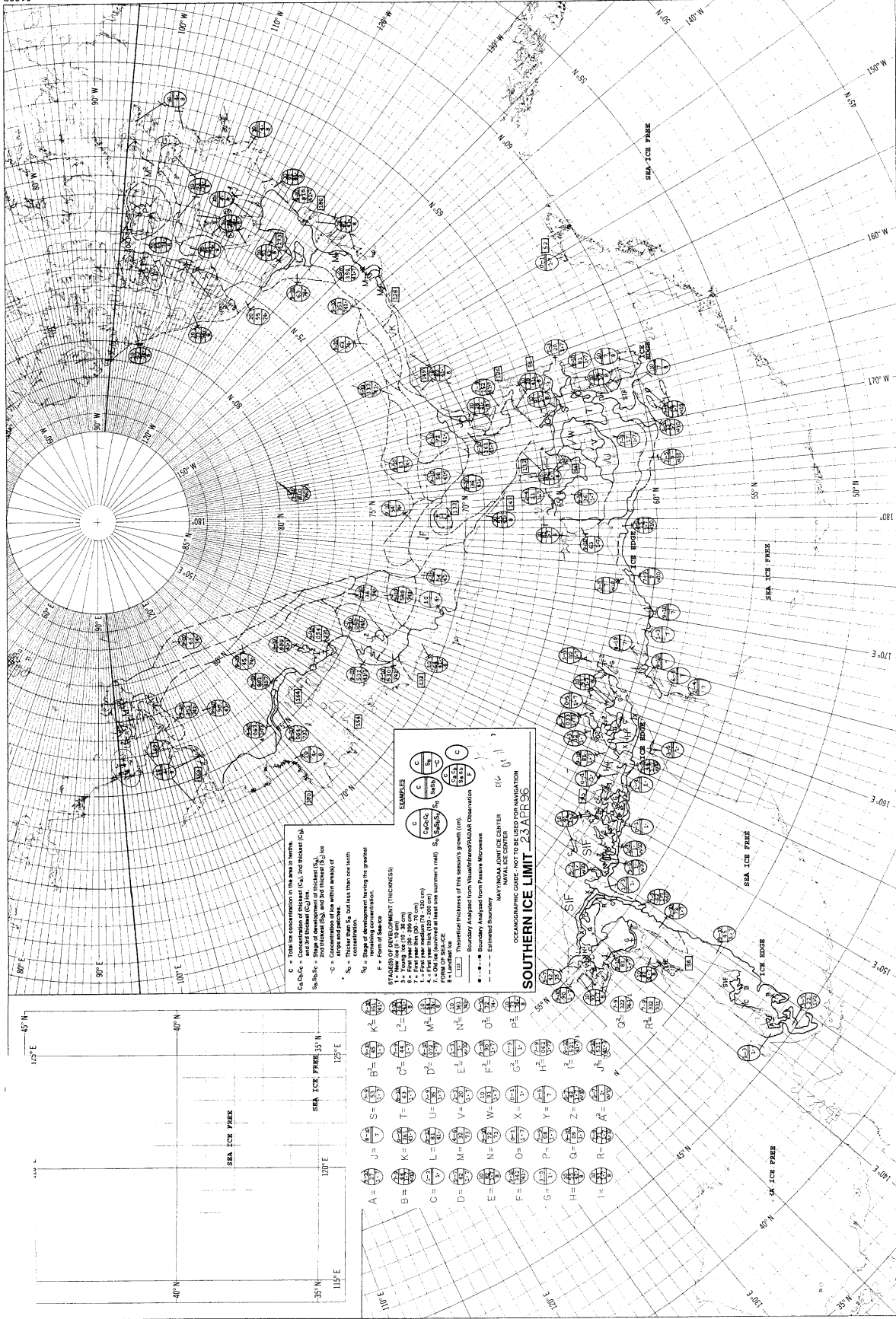


Photo Enlargement, Projection
Scale 1:100,000



SOUTHERN ICE LIMIT TABLE
 NAVY NAVAL ICE CENTER
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
 C₁, C₂, C₃ = Concentration of thickest (C₁) and thickest (C₂) and 3rd thickest (C₃) ice.
 S₁, S₂, S₃ = Stage of development (S₁ = lowest (S₁), 2nd highest (S₂), and 3rd highest (S₃)).
 C = Concentration of ice with areas of irregularities.
 S = Stage of development having the greatest remaining concentration.
 1 = New ice (0-10 cm)
 2 = First year ice (10-20 cm)
 3 = First year medium (20-100 cm)
 4 = First year medium (100-150 cm)
 5 = Old ice (more than 150 cm summer's end)
 FORM OF SURFACE
 1 = Thin
 2 = Moderate
 3 = Thick
 4 = Very thick
 5 = Boundary analyzed from Visual/Infrared/RADAR
 Observations
 ● = Observed
 ○ = Estimated Boundary

A =	1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	10/10	11/10	12/10	13/10	14/10	15/10	16/10	17/10	18/10	19/10	20/10
B =	1/20	2/20	3/20	4/20	5/20	6/20	7/20	8/20	9/20	10/20	11/20	12/20	13/20	14/20	15/20	16/20	17/20	18/20	19/20	20/20
C =	1/30	2/30	3/30	4/30	5/30	6/30	7/30	8/30	9/30	10/30	11/30	12/30	13/30	14/30	15/30	16/30	17/30	18/30	19/30	20/30
D =	1/40	2/40	3/40	4/40	5/40	6/40	7/40	8/40	9/40	10/40	11/40	12/40	13/40	14/40	15/40	16/40	17/40	18/40	19/40	20/40
E =	1/50	2/50	3/50	4/50	5/50	6/50	7/50	8/50	9/50	10/50	11/50	12/50	13/50	14/50	15/50	16/50	17/50	18/50	19/50	20/50
F =	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
G =	1/70	2/70	3/70	4/70	5/70	6/70	7/70	8/70	9/70	10/70	11/70	12/70	13/70	14/70	15/70	16/70	17/70	18/70	19/70	20/70
H =	1/80	2/80	3/80	4/80	5/80	6/80	7/80	8/80	9/80	10/80	11/80	12/80	13/80	14/80	15/80	16/80	17/80	18/80	19/80	20/80
I =	1/90	2/90	3/90	4/90	5/90	6/90	7/90	8/90	9/90	10/90	11/90	12/90	13/90	14/90	15/90	16/90	17/90	18/90	19/90	20/90



EXAMPLES

$\frac{C_1}{C_2} \frac{S_1}{S_2} \frac{G_1}{G_2}$

$\frac{C_1}{C_2} \frac{S_1}{S_2}$

$\frac{C_1}{C_2} \frac{G_1}{G_2}$

$\frac{S_1}{S_2} \frac{G_1}{G_2}$

$\frac{C_1}{C_2}$

$\frac{S_1}{S_2}$

$\frac{G_1}{G_2}$

$\frac{C_1}{C_2} \frac{S_1}{S_2} \frac{G_1}{G_2}$

$\frac{C_1}{C_2} \frac{S_1}{S_2}$

$\frac{C_1}{C_2} \frac{G_1}{G_2}$

$\frac{S_1}{S_2} \frac{G_1}{G_2}$

$\frac{C_1}{C_2}$

$\frac{S_1}{S_2}$

$\frac{G_1}{G_2}$

LEGEND

$\frac{C_1}{C_2} \frac{S_1}{S_2} \frac{G_1}{G_2}$ - Total ice concentration in the area at term.

$\frac{C_1}{C_2} \frac{S_1}{S_2}$ - Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.

$\frac{S_1}{S_2}$ - 2nd thickest (S₁) and 3rd thickest (S₂) ice.

$\frac{G_1}{G_2}$ - 2nd thickest (G₁) and 3rd thickest (G₂) ice.

$\frac{C_1}{C_2} \frac{S_1}{S_2} \frac{G_1}{G_2}$ - Concentration, thickness, and growth rate within areas of interest.

$\frac{C_1}{C_2} \frac{S_1}{S_2}$ - Thickness (S₁) and less than one month concentration.

$\frac{S_1}{S_2}$ - Thickness (S₁) and less than one month concentration.

$\frac{G_1}{G_2}$ - Growth rate (G₁) and less than one month concentration.

$\frac{C_1}{C_2} \frac{S_1}{S_2} \frac{G_1}{G_2}$ - Form of Ice.

EXAMPLES

1. New ice 10-15 cm

2. First year medium (70-120 cm)

3. Second year medium (120-180 cm)

4. Old ice medium (180-200 cm)

5. Old ice thin (200-250 cm)

6. Old ice thick (250-300 cm)

FORM OF ICE

1. 1st year medium (70-120 cm)

2. 2nd year medium (120-180 cm)

3. 3rd year medium (180-200 cm)

4. 4th year medium (200-250 cm)

5. 5th year medium (250-300 cm)

6. 6th year medium (300-350 cm)

7. 7th year medium (350-400 cm)

8. 8th year medium (400-450 cm)

9. 9th year medium (450-500 cm)

10. 10th year medium (500-550 cm)

11. 11th year medium (550-600 cm)

12. 12th year medium (600-650 cm)

13. 13th year medium (650-700 cm)

14. 14th year medium (700-750 cm)

15. 15th year medium (750-800 cm)

16. 16th year medium (800-850 cm)

17. 17th year medium (850-900 cm)

18. 18th year medium (900-950 cm)

19. 19th year medium (950-1000 cm)

20. 20th year medium (1000-1050 cm)

21. 21st year medium (1050-1100 cm)

22. 22nd year medium (1100-1150 cm)

23. 23rd year medium (1150-1200 cm)

24. 24th year medium (1200-1250 cm)

25. 25th year medium (1250-1300 cm)

26. 26th year medium (1300-1350 cm)

27. 27th year medium (1350-1400 cm)

28. 28th year medium (1400-1450 cm)

29. 29th year medium (1450-1500 cm)

30. 30th year medium (1500-1550 cm)

31. 31st year medium (1550-1600 cm)

32. 32nd year medium (1600-1650 cm)

33. 33rd year medium (1650-1700 cm)

34. 34th year medium (1700-1750 cm)

35. 35th year medium (1750-1800 cm)

36. 36th year medium (1800-1850 cm)

37. 37th year medium (1850-1900 cm)

38. 38th year medium (1900-1950 cm)

39. 39th year medium (1950-2000 cm)

40. 40th year medium (2000-2050 cm)

41. 41st year medium (2050-2100 cm)

42. 42nd year medium (2100-2150 cm)

43. 43rd year medium (2150-2200 cm)

44. 44th year medium (2200-2250 cm)

45. 45th year medium (2250-2300 cm)

46. 46th year medium (2300-2350 cm)

47. 47th year medium (2350-2400 cm)

48. 48th year medium (2400-2450 cm)

49. 49th year medium (2450-2500 cm)

50. 50th year medium (2500-2550 cm)

51. 51st year medium (2550-2600 cm)

52. 52nd year medium (2600-2650 cm)

53. 53rd year medium (2650-2700 cm)

54. 54th year medium (2700-2750 cm)

55. 55th year medium (2750-2800 cm)

56. 56th year medium (2800-2850 cm)

57. 57th year medium (2850-2900 cm)

58. 58th year medium (2900-2950 cm)

59. 59th year medium (2950-3000 cm)

60. 60th year medium (3000-3050 cm)

61. 61st year medium (3050-3100 cm)

62. 62nd year medium (3100-3150 cm)

63. 63rd year medium (3150-3200 cm)

64. 64th year medium (3200-3250 cm)

65. 65th year medium (3250-3300 cm)

66. 66th year medium (3300-3350 cm)

67. 67th year medium (3350-3400 cm)

68. 68th year medium (3400-3450 cm)

69. 69th year medium (3450-3500 cm)

70. 70th year medium (3500-3550 cm)

71. 71st year medium (3550-3600 cm)

72. 72nd year medium (3600-3650 cm)

73. 73rd year medium (3650-3700 cm)

74. 74th year medium (3700-3750 cm)

75. 75th year medium (3750-3800 cm)

76. 76th year medium (3800-3850 cm)

77. 77th year medium (3850-3900 cm)

78. 78th year medium (3900-3950 cm)

79. 79th year medium (3950-4000 cm)

80. 80th year medium (4000-4050 cm)

81. 81st year medium (4050-4100 cm)

82. 82nd year medium (4100-4150 cm)

83. 83rd year medium (4150-4200 cm)

84. 84th year medium (4200-4250 cm)

85. 85th year medium (4250-4300 cm)

86. 86th year medium (4300-4350 cm)

87. 87th year medium (4350-4400 cm)

88. 88th year medium (4400-4450 cm)

89. 89th year medium (4450-4500 cm)

90. 90th year medium (4500-4550 cm)

91. 91st year medium (4550-4600 cm)

92. 92nd year medium (4600-4650 cm)

93. 93rd year medium (4650-4700 cm)

94. 94th year medium (4700-4750 cm)

95. 95th year medium (4750-4800 cm)

96. 96th year medium (4800-4850 cm)

97. 97th year medium (4850-4900 cm)

98. 98th year medium (4900-4950 cm)

99. 99th year medium (4950-5000 cm)

100. 100th year medium (5000-5050 cm)

LEGEND

$\frac{C_1}{C_2} \frac{S_1}{S_2} \frac{G_1}{G_2}$ - Boundary Analyzed from Visual/REP/STAN Observation

$\frac{C_1}{C_2} \frac{S_1}{S_2} \frac{G_1}{G_2}$ - Boundary Analyzed from Passive Microwave

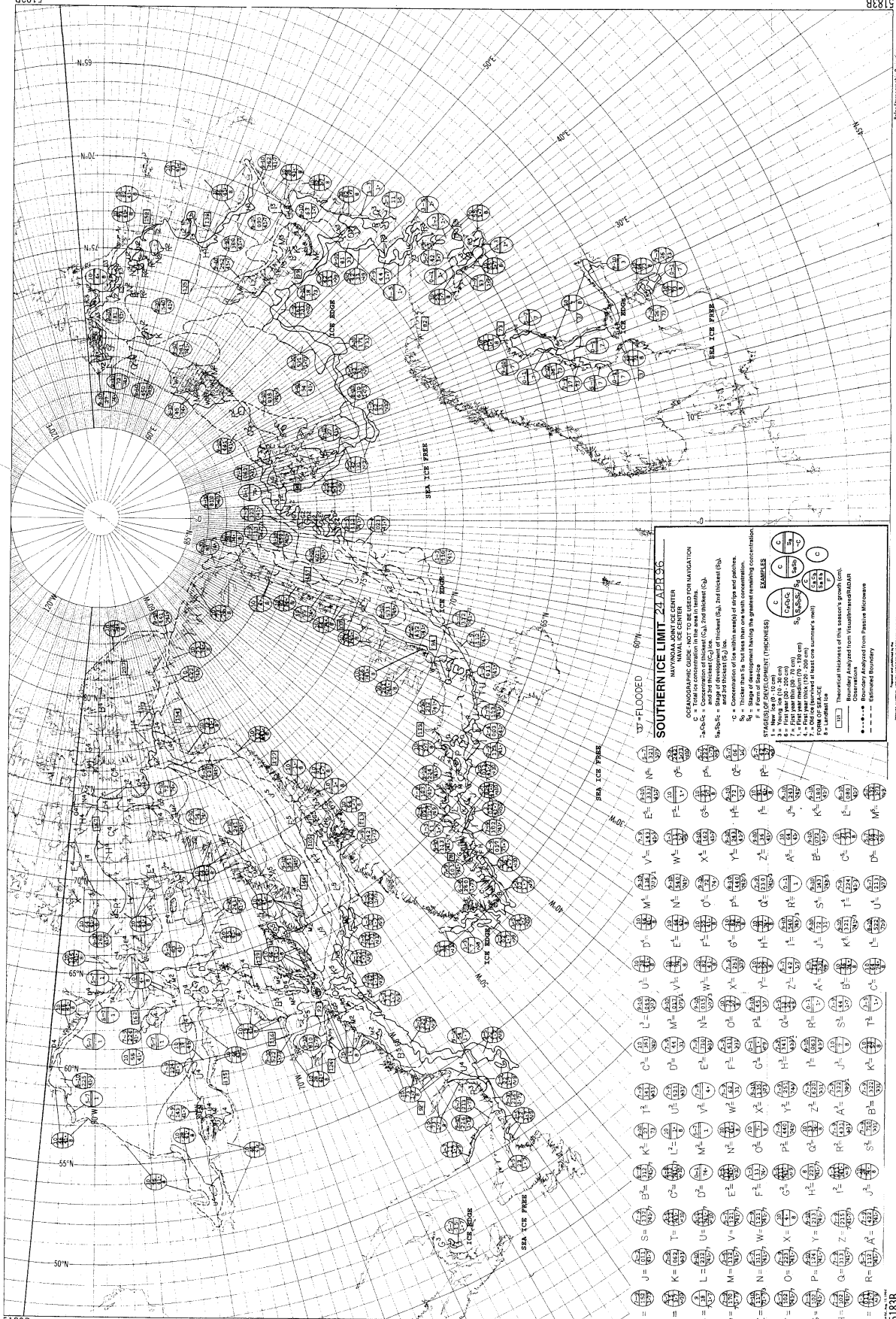
--- - Estimated Boundary

ANTARCTIC ICE CENTER

NAVY ICE CENTER

OCEANOGRAPHIC CHIEF, NOT TO BE USED FOR NAVIGATION

SOUTHERN ICE LIMIT - 23 APR 96



SOUTHERN ICE LIMIT 21 APR 56

NAVY JOINT ICE CENTER
OCEANOGRAPHIC GUIDANCE FOR NAVIGATION

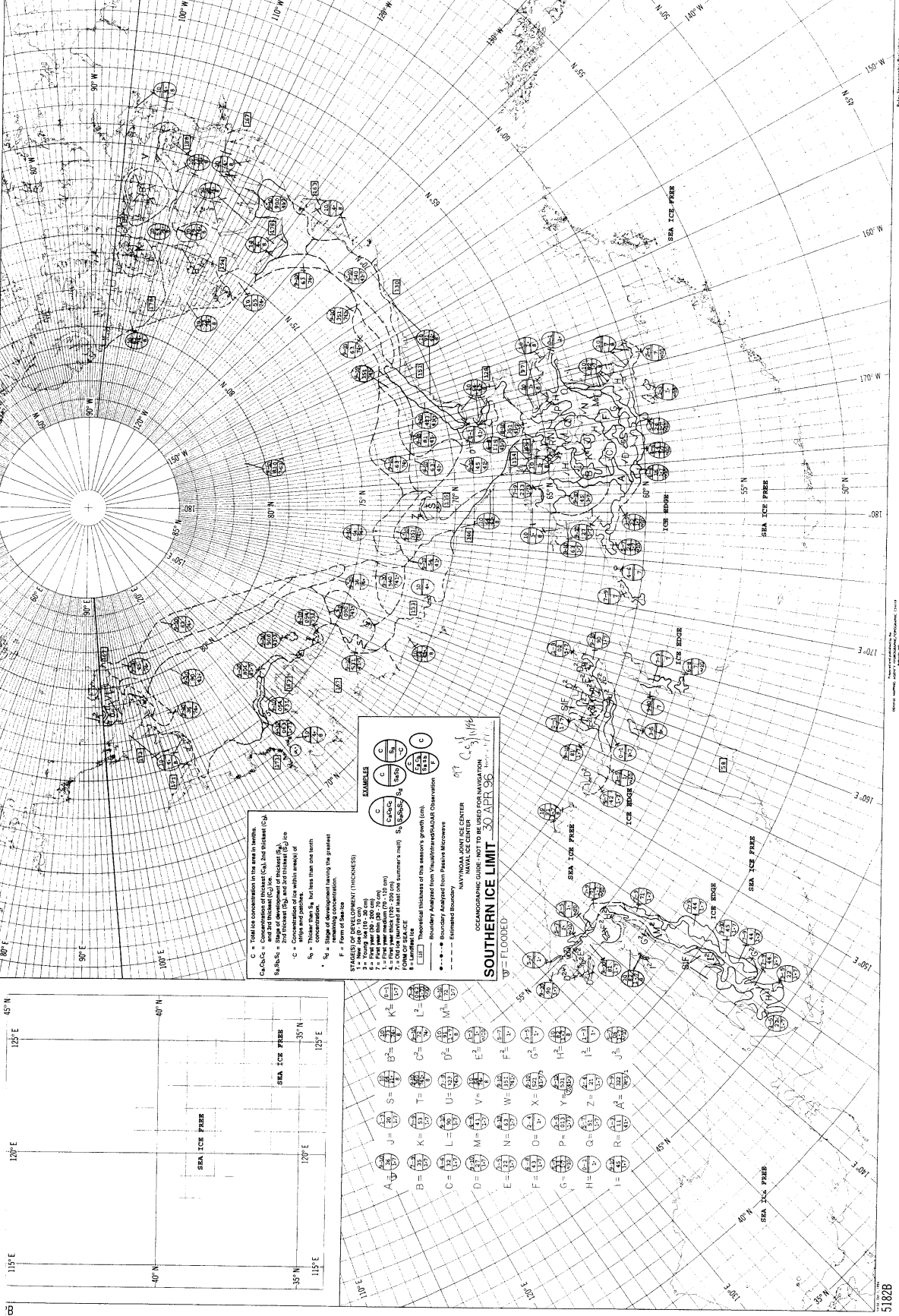
C = Total ice concentration in the area in tenths.
SeaBis = 100 minus the sum of the percentages of open water and icebergs (C, Y, Z) (thickets (S), S₁, S₂, S₃).

Stages of development (thickness (S), and thickets (S))
S₁ = Thicker than S₂, but less than one sixth concentration.
S₂ = Thicker than S₃, but less than one sixth concentration.
S₃ = Form of ice

STAGES OF DEVELOPMENT (THICKNESS)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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FORM OF ICE
1 = Landfast ice
2 = Fast ice
3 = Young ice (0-30 cm)
4 = First year thin (30-75 cm)
5 = First year thick (75-200 cm)
6 = First year ice (200-300 cm)
7 = First year ice (300-500 cm)
8 = First year ice (500-1000 cm)
9 = First year ice (1000-2000 cm)
10 = First year ice (2000-3000 cm)
11 = First year ice (3000-5000 cm)
12 = First year ice (5000-10000 cm)
13 = First year ice (10000-20000 cm)
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100 = First year ice (50000000000000000000000000-100000000000000000000000000 cm)



Map: Geographic Projection: Mercator

Scale: 1:100,000,000

C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Stage of development of ice (C₁, the thickest; C₂, the next thickest; C₃, the next thinnest).
 C₁C₂C₃S = Stage of development of ice (C₁, the thickest; C₂, the next thickest; C₃, the next thinnest) and ice strip and pattern.
 C₁C₂C₃ = Concentration of ice within areas of ice strip and pattern.
 No = No ice.
 S = Ice strip, for less than one tenth concentration.
 F = Form of ice top.
 Fig. = Stage of development during the greatest concentration.

EXAMPLES

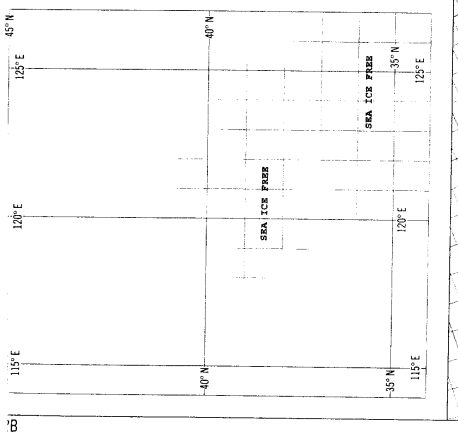
C	C	C
C ₁ C ₂ C ₃	C ₁ C ₂ C ₃	C ₁ C ₂ C ₃
C ₁ C ₂ C ₃ S	C ₁ C ₂ C ₃ S	C ₁ C ₂ C ₃ S
C ₁ C ₂ C ₃ S	C ₁ C ₂ C ₃ S	C ₁ C ₂ C ₃ S

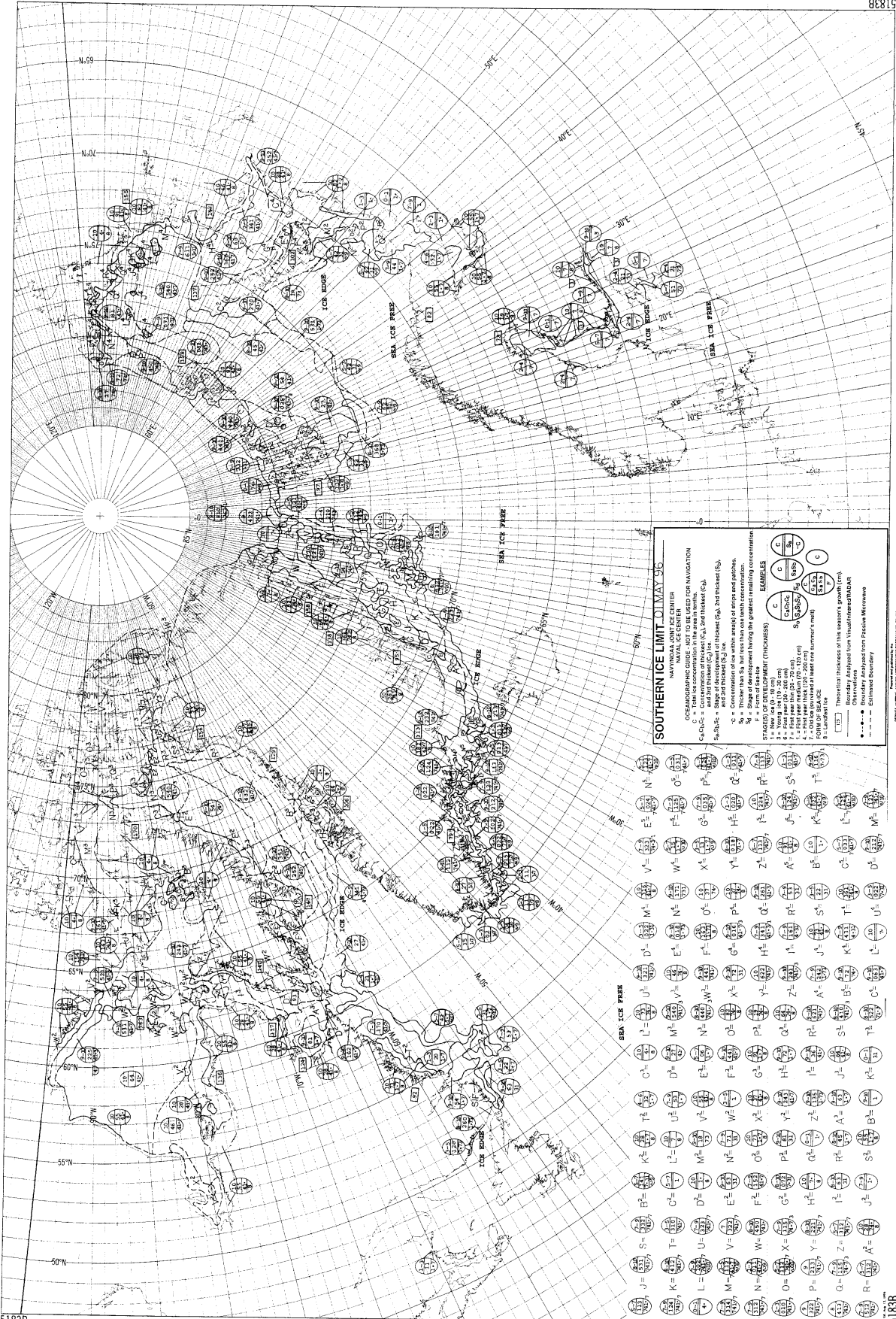
STAGES OF DEVELOPMENT (THICKNESS)

1 = Young ice (15-30 cm)
 2 = First year ice (30-70 cm)
 3 = First year ice (70-100 cm)
 4 = First year ice (100-150 cm)
 5 = First year ice (150-200 cm)
 6 = First year ice (200-300 cm)
 7 = First year ice (300-400 cm)
 8 = First year ice (400-500 cm)
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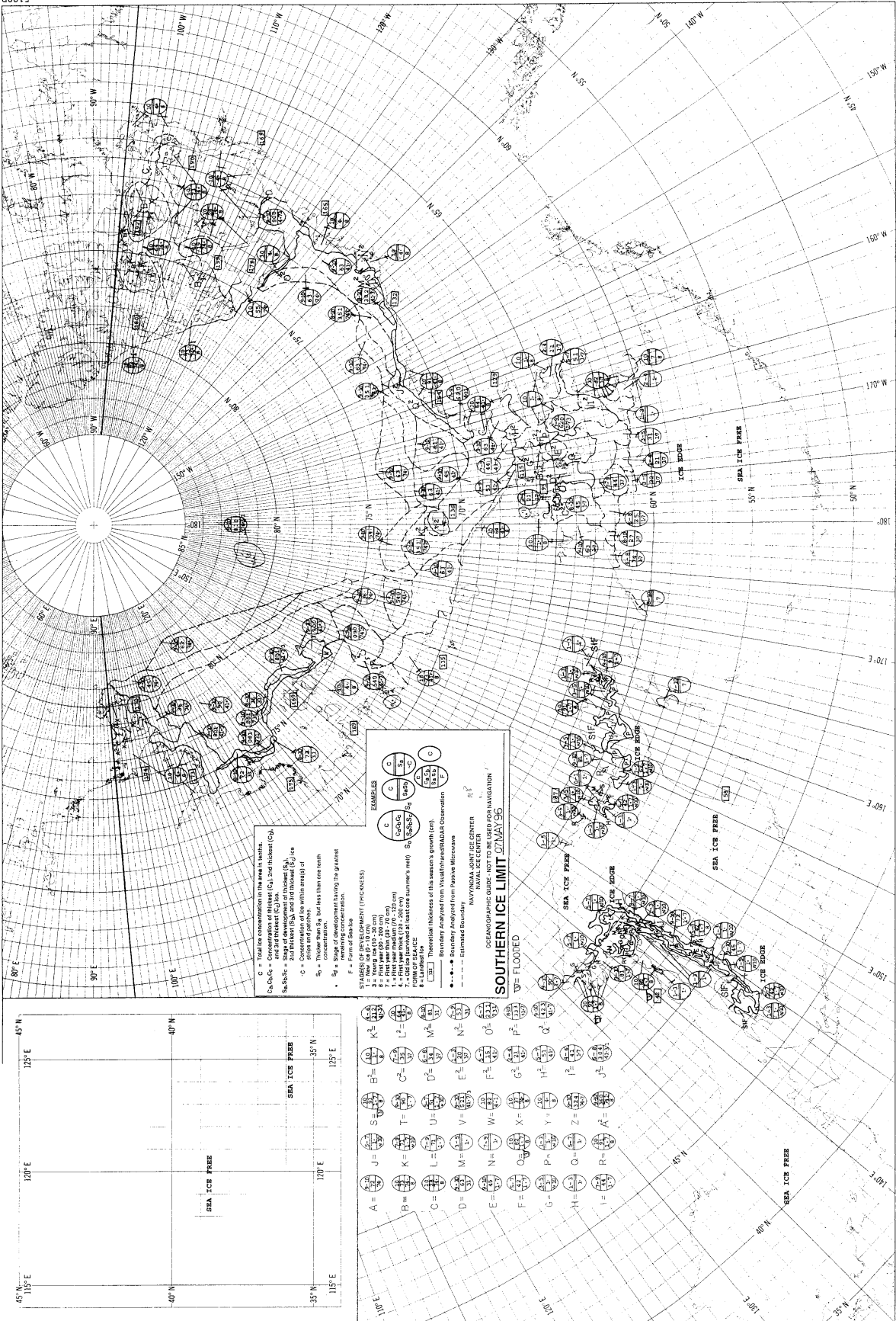
SOUTHERN ICE LIMIT 30 APR 95

W = FLOODED





SOUTHERN ICE LIMIT - MAY 30
 NAVY/NOA JOINT ICE CENTER
 OCEANOGRAPHIC CODE - NOT TO BE USED FOR NAVIGATION
 C = Total ice concentration in the area in tenths.
 S = Sea ice thickness (S) and thickness (S).
 S = Thicker than 50, but less than 50 with concentration.
 C = Concentration of ice within area of rings and patches.
 S = Sea ice thickness (S) and thickness (S).
 S = Form of sea ice.
 OF PHASES OF DEVELOPMENT (THICKNESS)
 1 = Young (40-70 cm)
 2 = First year (70-100 cm)
 3 = First year (100-150 cm)
 4 = First year (150-200 cm)
 5 = First year (200-250 cm)
 6 = First year (250-300 cm)
 7 = First year (300-350 cm)
 8 = Landfast ice
 FORM OF SEA ICE
 1 - Thin
 2 - Medium
 3 - Thick
 4 - Very thick
 5 - Iceberg
 6 - Ice island
 7 - Ice cake
 8 - Ice patch
 9 - Ice field
 10 - Ice drift
 11 - Ice belt
 12 - Ice barrier
 13 - Ice wall
 14 - Ice shelf
 15 - Ice ridge
 16 - Ice lead
 17 - Ice lane
 18 - Ice street
 19 - Ice alley
 20 - Ice passage
 21 - Ice channel
 22 - Ice strait
 23 - Ice narrows
 24 - Ice gap
 25 - Ice break
 26 - Ice edge
 27 - Ice front
 28 - Ice back
 29 - Ice side
 30 - Ice end
 31 - Ice corner
 32 - Ice point
 33 - Ice line
 34 - Ice area
 35 - Ice zone
 36 - Ice region
 37 - Ice sector
 38 - Ice quarter
 39 - Ice part
 40 - Ice piece
 41 - Ice fragment
 42 - Ice remnant
 43 - Ice debris
 44 - Ice rubble
 45 - Ice wreckage
 46 - Ice debris field
 47 - Ice debris zone
 48 - Ice debris area
 49 - Ice debris region
 50 - Ice debris sector
 51 - Ice debris quarter
 52 - Ice debris part
 53 - Ice debris piece
 54 - Ice debris fragment
 55 - Ice debris remnant
 56 - Ice debris debris
 57 - Ice debris rubble
 58 - Ice debris wreckage
 59 - Ice debris debris field
 60 - Ice debris debris zone
 61 - Ice debris debris area
 62 - Ice debris debris region
 63 - Ice debris debris sector
 64 - Ice debris debris quarter
 65 - Ice debris debris part
 66 - Ice debris debris piece
 67 - Ice debris debris fragment
 68 - Ice debris debris remnant
 69 - Ice debris debris debris
 70 - Ice debris debris rubble
 71 - Ice debris debris wreckage
 72 - Ice debris debris debris field
 73 - Ice debris debris debris zone
 74 - Ice debris debris debris area
 75 - Ice debris debris debris region
 76 - Ice debris debris debris sector
 77 - Ice debris debris debris quarter
 78 - Ice debris debris debris part
 79 - Ice debris debris debris piece
 80 - Ice debris debris debris fragment
 81 - Ice debris debris debris remnant
 82 - Ice debris debris debris debris
 83 - Ice debris debris debris rubble
 84 - Ice debris debris debris wreckage
 85 - Ice debris debris debris debris field
 86 - Ice debris debris debris debris zone
 87 - Ice debris debris debris debris area
 88 - Ice debris debris debris debris region
 89 - Ice debris debris debris debris sector
 90 - Ice debris debris debris debris quarter
 91 - Ice debris debris debris debris part
 92 - Ice debris debris debris debris piece
 93 - Ice debris debris debris debris fragment
 94 - Ice debris debris debris debris remnant
 95 - Ice debris debris debris debris debris
 96 - Ice debris debris debris debris rubble
 97 - Ice debris debris debris debris wreckage
 98 - Ice debris debris debris debris debris field
 99 - Ice debris debris debris debris debris zone
 100 - Ice debris debris debris debris debris area



C = Total ice concentration in the area in percent
 C₁C₂C₃ = Concentration of thickness (C₁), 2nd thickness (C₂), and 3rd thickness (C₃) in %
 S₁S₂S₃ = 1st thickness (S₁), 2nd thickness (S₂), and 3rd thickness (S₃) in cm
 C = Concentration of ice within range(s) of S₁ - S₃
 S₁ = Thicker than S₂, but less than one tenth concentration, or thicker than S₃ but less than one tenth concentration.
 S₂ = Same as S₁ but with the greatest remaining concentration.
 F = Form of floe(s)
 1 = Main (0 - 10 cm)
 2 = Primary (10 - 200 cm)
 3 = Primary (200 - 700 cm)
 4 = Primary (700 - 1000 cm)
 5 = Primary (1000 - 2000 cm)
 6 = Primary (2000 - 3000 cm)
 7 = Primary (3000 - 5000 cm)
 8 = Primary (5000 - 10000 cm)
 9 = Primary (10000 - 20000 cm)
 0 = Primary (20000 - 50000 cm)
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EXAMPLES

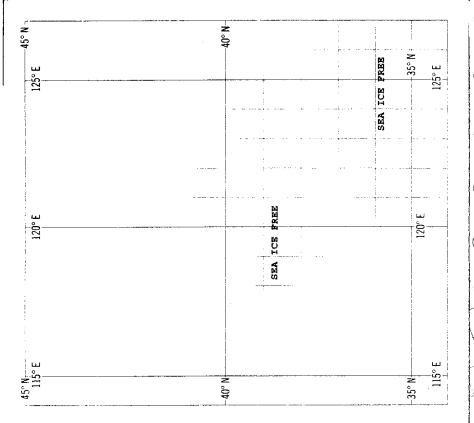
C	C	C
S	S	S
F	F	F

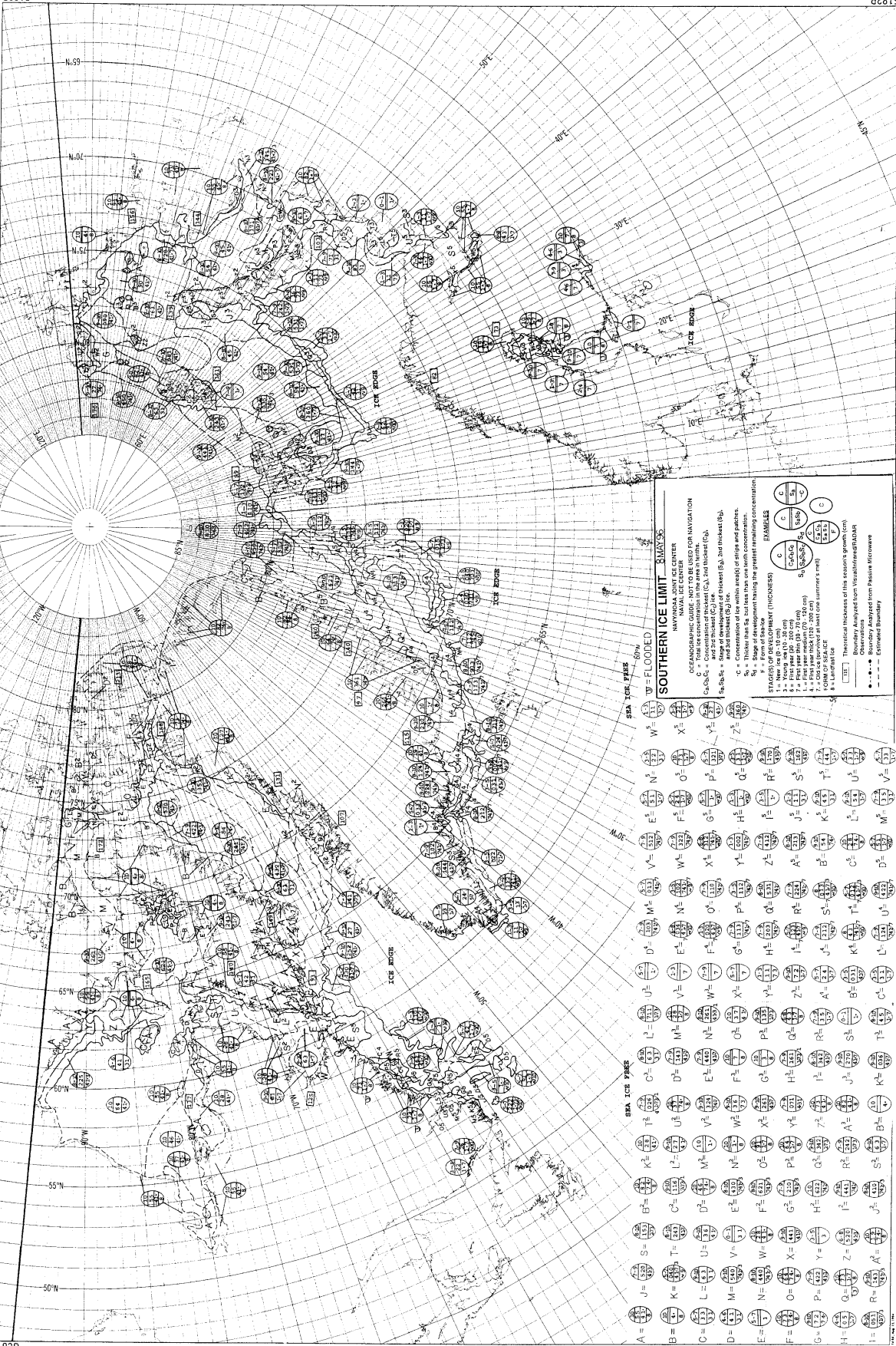
LEGEND

- Boundary Analyzed from Visual and RADARSAT Observation
- Estimated Boundary
- Estimated Boundary

SOUTHERN ICE LIMIT 07MAY95

ICE EDGE
SEA ICE FREE





SOUTHERN ICE LIMIT - MAY 2005
 NAVAL ICE CENTER

DEMOGRAPHIC CHART - NOT TO BE USED FOR NAVIGATION
 C = Concentration of ice (in percent) (S, 2nd bucket) (S),
 T = Thickness (in cm) (S, 3rd bucket) (S),
 S = Stage of development (S, 4th bucket) (S)

EXAMPLES

C	T	S
0-100	0-100	0-100
0-100	0-100	0-100
0-100	0-100	0-100
0-100	0-100	0-100

STATION TYPES

- New site (0-10 cm)
- First year (0-100 cm)
- First year (100-200 cm)
- Second year (100-200 cm)

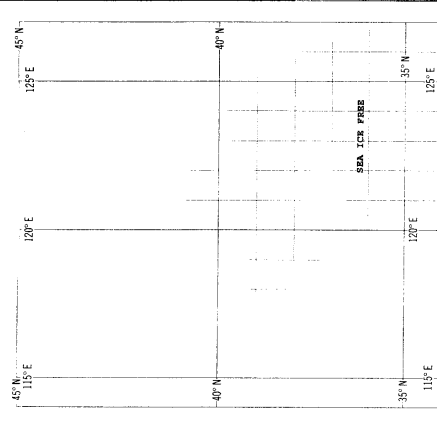
FORM OF ICE

- 1-100
- 100-200
- 200-300
- 300-400
- 400-500
- 500-600
- 600-700
- 700-800
- 800-900
- 900-1000

Legend for symbols:

- Theoretical thickness of this season's growth
- Boundary Analyzed from Visual/Satellite Data
- Observations
- Analyzed from Future Reconnaissance
- Estimated Boundary

NAVAL ICE CENTER
 1100 North State Street
 Suite 2000
 San Diego, CA 92161
 TEL: 619-552-1500
 FAX: 619-552-1501
 WWW: www.navalicecenter.org



SOUTHERN ICE LIMIT - 15 MAY 95

NAVY AND NAVAL CENTER
NAVAL ICE CENTER

BOUNDARY ANALYZED FROM PASTICE MICROWAVE OBSERVATION

●---● Boundary
--- Estimated Boundary

EXAMPLES

$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$
$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$

FORM OF SEA-ICE

1. $\frac{C}{100}$ - Thin (10-15 cm)
 2. $\frac{C}{100}$ - First year (15-100 cm)
 3. $\frac{C}{100}$ - Multi-year (100-200 cm)
 4. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 5. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 6. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 7. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 8. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 9. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 10. $\frac{C}{100}$ - Ice with snow (100-200 cm)

CONCENTRATION (PERCENT THICKNESS)

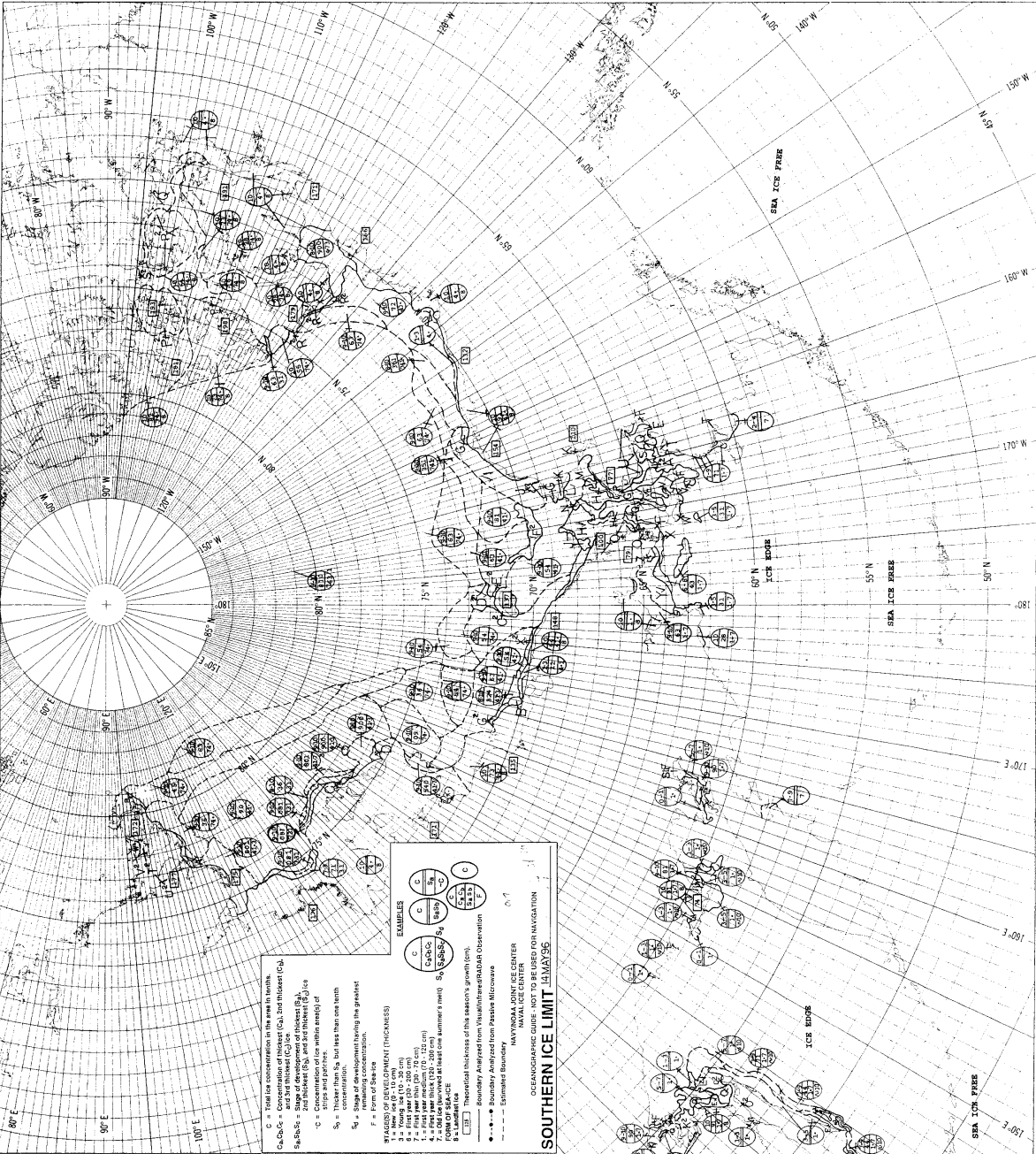
1. $\frac{C}{100}$ - Thin (10-15 cm)
 2. $\frac{C}{100}$ - First year (15-100 cm)
 3. $\frac{C}{100}$ - Multi-year (100-200 cm)
 4. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 5. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 6. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 7. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 8. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 9. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 10. $\frac{C}{100}$ - Ice with snow (100-200 cm)

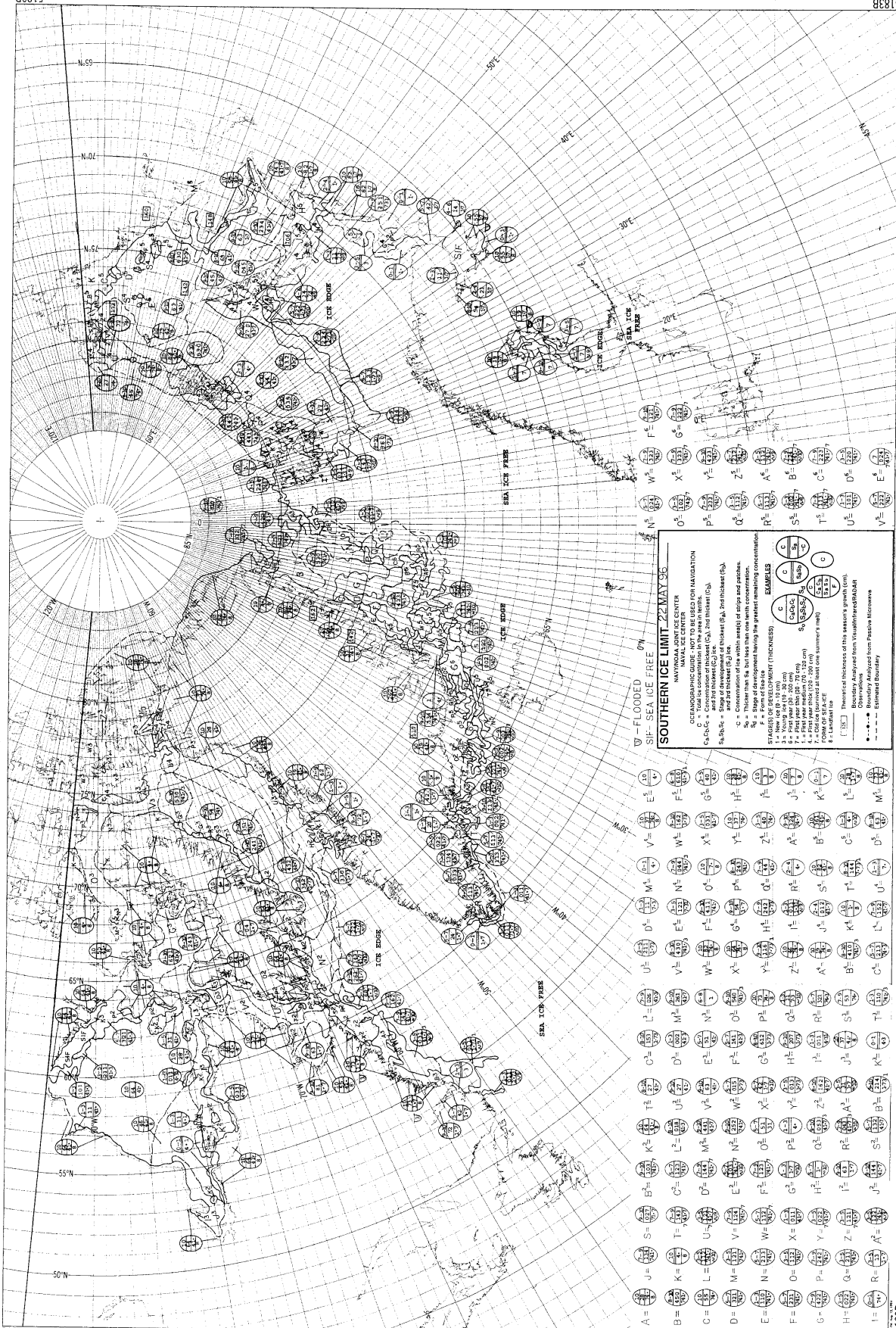
FORM OF SEA-ICE

1. $\frac{C}{100}$ - Thin (10-15 cm)
 2. $\frac{C}{100}$ - First year (15-100 cm)
 3. $\frac{C}{100}$ - Multi-year (100-200 cm)
 4. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 5. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 6. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 7. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 8. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 9. $\frac{C}{100}$ - Ice with snow (100-200 cm)
 10. $\frac{C}{100}$ - Ice with snow (100-200 cm)

A = $\frac{A}{100}$	B = $\frac{B}{100}$	C = $\frac{C}{100}$	D = $\frac{D}{100}$	E = $\frac{E}{100}$	F = $\frac{F}{100}$	G = $\frac{G}{100}$	H = $\frac{H}{100}$	I = $\frac{I}{100}$	J = $\frac{J}{100}$	K = $\frac{K}{100}$	L = $\frac{L}{100}$	M = $\frac{M}{100}$	N = $\frac{N}{100}$	O = $\frac{O}{100}$	P = $\frac{P}{100}$	Q = $\frac{Q}{100}$	R = $\frac{R}{100}$	S = $\frac{S}{100}$	T = $\frac{T}{100}$	U = $\frac{U}{100}$	V = $\frac{V}{100}$	W = $\frac{W}{100}$	X = $\frac{X}{100}$	Y = $\frac{Y}{100}$	Z = $\frac{Z}{100}$	A = $\frac{A}{100}$
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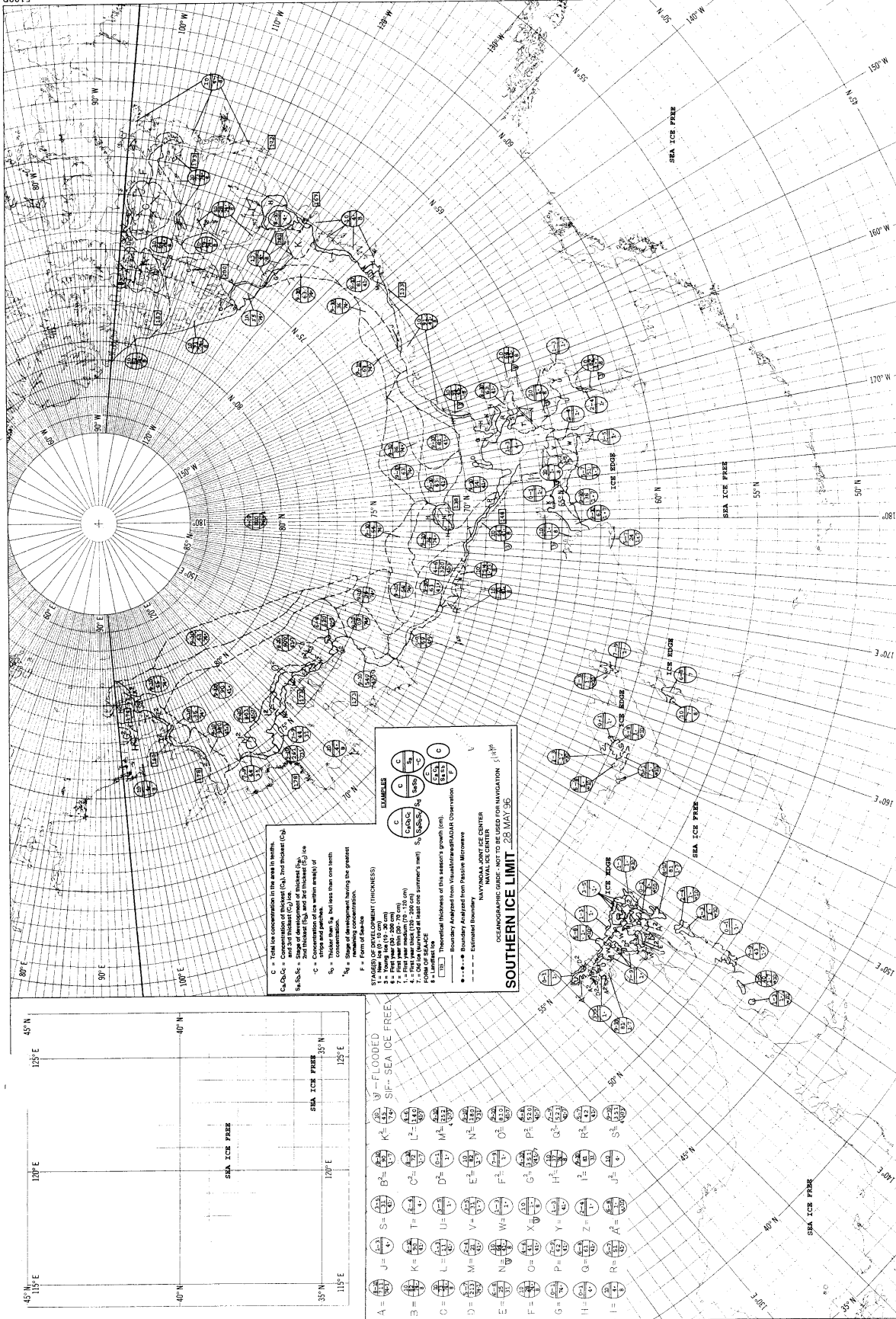
∇ = FLOODED
 ∇ = ROTTEN
 SF = SEA ICE FREE



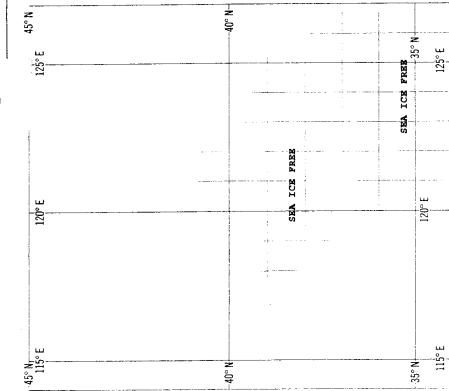


▽ - FLOODED
 SIF - SEA ICE FREE ON
 SOUTHERN ICE LIMIT 22 MAY 56
 NAVY NAVAL ICE CENTER
 OCEANOGRAPHIC - NOT TO BE USED FOR NAVIGATION
 C - Concentration of thickest (S₁) and thickest (S₂)
 S₁, S₂ - Stage of development of thickest (S₁) and thickest (S₂)
 S₁, S₂ - Stage of development of thickest (S₁) and thickest (S₂)
 S₁ - Thicker than S₂, and has less than one week concentration
 S₂ - Stage of development having the greatest remaining concentration
 STAGES OF DEVELOPMENT (THICKNESS)
 1 - New ice (0-10 cm)
 2 - First year (10-100 cm)
 3 - First year (100-150 cm)
 4 - First year (150-200 cm)
 5 - Old ice (more than 200 cm)
 6 - Old ice (more than 200 cm)
 7 - Old ice (more than 200 cm)
 8 - Landfast ice

STAGES OF DEVELOPMENT (THICKNESS)	ICE ZONES
1 - New ice (0-10 cm)	A =
2 - First year (10-100 cm)	B =
3 - First year (100-150 cm)	C =
4 - First year (150-200 cm)	D =
5 - Old ice (more than 200 cm)	E =
6 - Old ice (more than 200 cm)	F =
7 - Old ice (more than 200 cm)	G =
8 - Landfast ice	H =
	I =
	J =
	K =
	L =
	M =
	N =
	O =
	P =
	Q =
	R =
	S =
	T =
	U =
	V =
	W =
	X =
	Y =
	Z =
	A ¹ =
	B ¹ =
	C ¹ =
	D ¹ =
	E ¹ =
	F ¹ =
	G ¹ =
	H ¹ =
	I ¹ =
	J ¹ =
	K ¹ =
	L ¹ =
	M ¹ =
	N ¹ =
	O ¹ =
	P ¹ =
	Q ¹ =
	R ¹ =
	S ¹ =
	T ¹ =
	U ¹ =
	V ¹ =
	W ¹ =
	X ¹ =
	Y ¹ =
	Z ¹ =
	A ² =
	B ² =
	C ² =
	D ² =
	E ² =
	F ² =
	G ² =
	H ² =
	I ² =
	J ² =
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	M ² =
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	P ² =
	Q ² =
	R ² =
	S ² =
	T ² =
	U ² =
	V ² =
	W ² =
	X ² =
	Y ² =
	Z ² =
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	B ³ =
	C ³ =
	D ³ =
	E ³ =
	F ³ =
	G ³ =
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	I ³ =
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	Q ³ =
	R ³ =
	S ³ =
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	U ³ =
	V ³ =
	W ³ =
	X ³ =
	Y ³ =
	Z ³ =

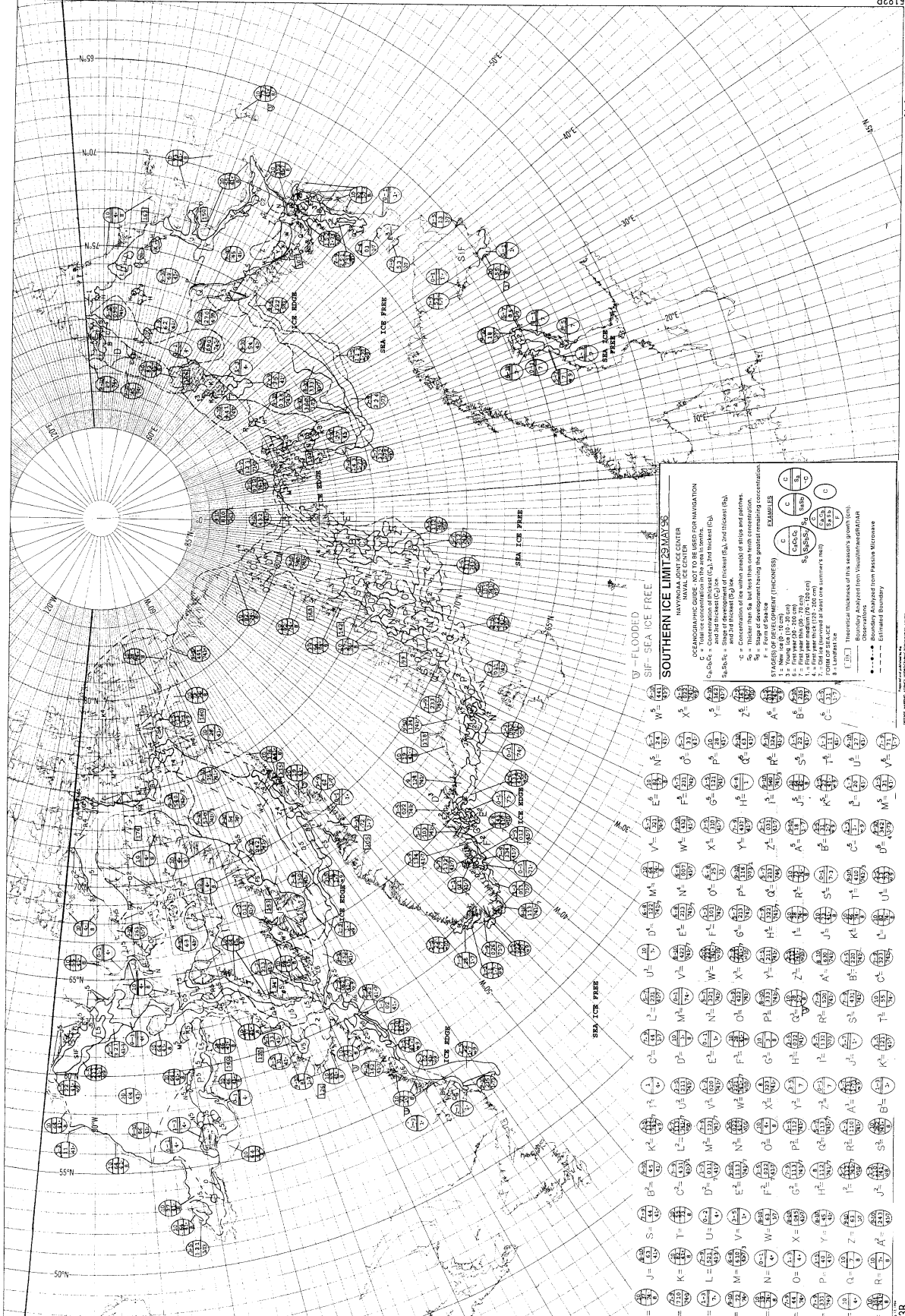


C = Total ice concentration in the area in health.
 C₁, C₂, C₃ = Concentration of classes (C₁), 1st thickness (C₂), and 2nd thickness (C₃).
 S₁, S₂, S₃ = Stage of development or thickness (S₁), 1st thickness (S₂), and 2nd thickness (S₃).
 C = Current and past ice.
 S₁ = Thinner than S₂, but less than one month old.
 S₂ = Stage of development having the greatest thickness.
 S₃ = Thickest ice.
 F = Form of floe.
 STAGES OF DEVELOPMENT (THICKNESS)
 S₁ = New ice (10 - 30 cm)
 S₂ = First year ice (30 - 70 cm)
 S₃ = First year ice medium (70 - 100 cm)
 S₄ = First year ice old (100 - 150 cm)
 S₅ = First year ice (150 - 200 cm)
 S₆ = Old ice (200 cm or more)
 S₇ = Old ice (survived at least one summer's melt)
 S₈ = Landfast ice
 S₉ = Landfast ice
 S₁₀ = Theoretical thickness of this season's growth (cm).
 --- Boundary Analyzed from Visual/Instrumental Observation
 --- Estimated Boundary from Passive Instruments
 NAVY/Joint Ice Center
 NAVAL ICE CENTER FOR NAVIGATION 11/96
 ICE LANGRANGING CODE FOR NAVIGATION
 SOUTHERN ICE LIMIT 28 MAY 96



V - FLOODED
 SIF - SEA ICE FREE

A = $\frac{C_1}{C_2}$	B = $\frac{C_1}{C_2}$	C = $\frac{C_1}{C_2}$	D = $\frac{C_1}{C_2}$	E = $\frac{C_1}{C_2}$	F = $\frac{C_1}{C_2}$	G = $\frac{C_1}{C_2}$	H = $\frac{C_1}{C_2}$	I = $\frac{C_1}{C_2}$	J = $\frac{C_1}{C_2}$
K = $\frac{C_1}{C_2}$	L = $\frac{C_1}{C_2}$	M = $\frac{C_1}{C_2}$	N = $\frac{C_1}{C_2}$	O = $\frac{C_1}{C_2}$	P = $\frac{C_1}{C_2}$	Q = $\frac{C_1}{C_2}$	R = $\frac{C_1}{C_2}$	S = $\frac{C_1}{C_2}$	T = $\frac{C_1}{C_2}$
U = $\frac{C_1}{C_2}$	V = $\frac{C_1}{C_2}$	W = $\frac{C_1}{C_2}$	X = $\frac{C_1}{C_2}$	Y = $\frac{C_1}{C_2}$	Z = $\frac{C_1}{C_2}$	AA = $\frac{C_1}{C_2}$	AB = $\frac{C_1}{C_2}$	AC = $\frac{C_1}{C_2}$	AD = $\frac{C_1}{C_2}$
AE = $\frac{C_1}{C_2}$	AF = $\frac{C_1}{C_2}$	AG = $\frac{C_1}{C_2}$	AH = $\frac{C_1}{C_2}$	AI = $\frac{C_1}{C_2}$	AJ = $\frac{C_1}{C_2}$	AK = $\frac{C_1}{C_2}$	AL = $\frac{C_1}{C_2}$	AM = $\frac{C_1}{C_2}$	AN = $\frac{C_1}{C_2}$



SOUTHERN ICE LIMIT 23 MAY 56

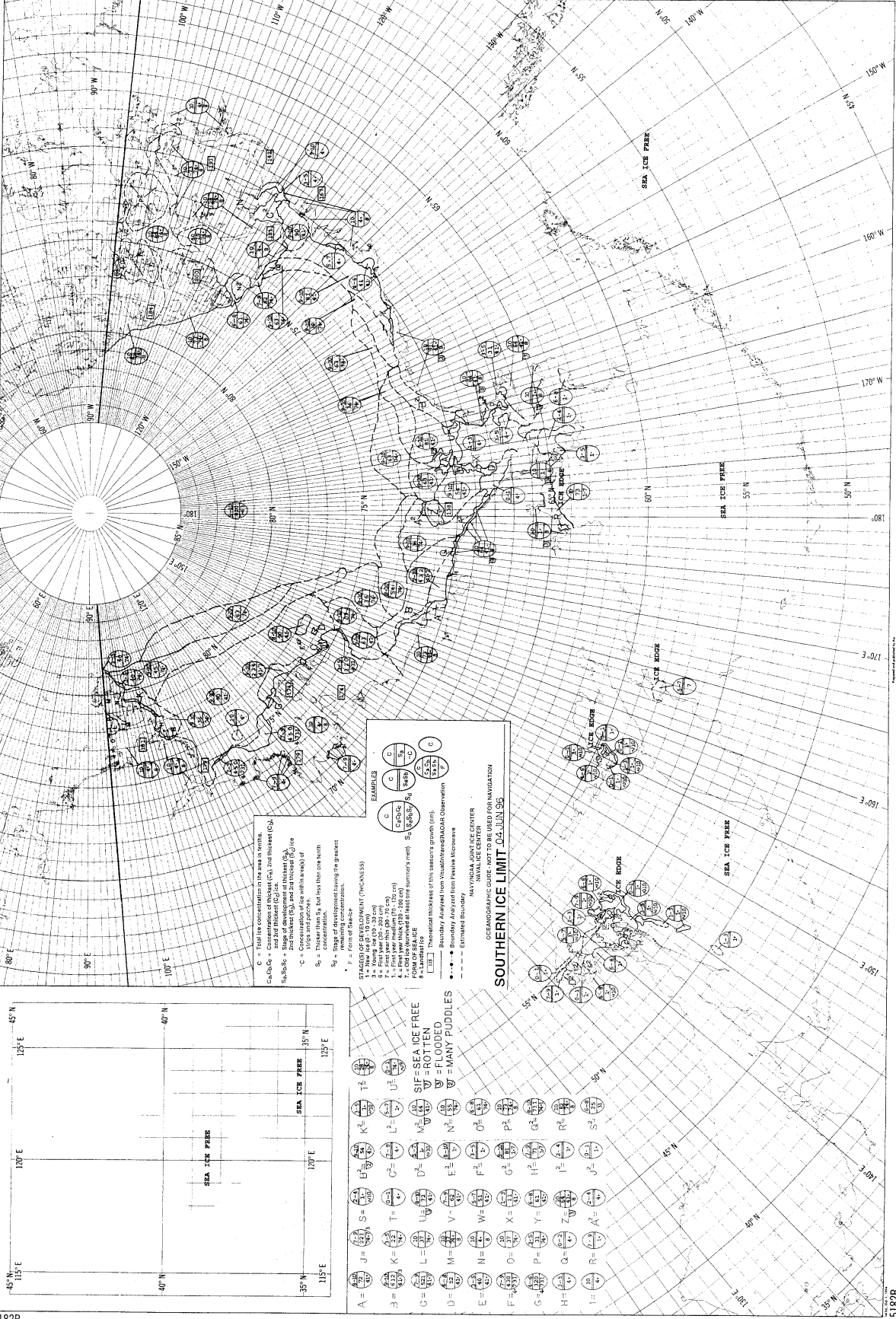
NAVY/NOAA JOINT CENTER
 OCEANOGRAPHIC GUIDE (NOT TO BE USED FOR NAVIGATION)

C = Total ice concentration in the area in percent.
 C₁ = Ice concentration in the area in percent.
 C₂ = Ice concentration in the area in percent.
 C₃ = Ice concentration in the area in percent.
 C₄ = Ice concentration in the area in percent.
 C₅ = Ice concentration in the area in percent.
 C₆ = Ice concentration in the area in percent.
 C₇ = Ice concentration in the area in percent.
 C₈ = Ice concentration in the area in percent.
 C₉ = Ice concentration in the area in percent.
 C₁₀ = Ice concentration in the area in percent.
 C₁₁ = Ice concentration in the area in percent.
 C₁₂ = Ice concentration in the area in percent.
 C₁₃ = Ice concentration in the area in percent.
 C₁₄ = Ice concentration in the area in percent.
 C₁₅ = Ice concentration in the area in percent.
 C₁₆ = Ice concentration in the area in percent.
 C₁₇ = Ice concentration in the area in percent.
 C₁₈ = Ice concentration in the area in percent.
 C₁₉ = Ice concentration in the area in percent.
 C₂₀ = Ice concentration in the area in percent.

FILED SHEET 1000

NAVY/NOAA JOINT CENTER

5183B



EXAMPLES

C	100	100	100	100	100
S	100	100	100	100	100
S ₁	100	100	100	100	100
S ₂	100	100	100	100	100

KEY

C = Total ice concentration in the area in percent.
 C₁, C₂, C₃ = Concentration of thickest (C₁) and thickest (C₂) and thickest (C₃) ice.
 S = State of atmospheric conditions (S₁ = 100%, S₂ = 90%, S₃ = 80%, S₄ = 70%, S₅ = 60%, S₆ = 50%).
 S₁ = Thicker than S₂, but has less ice than S₂.
 S₂ = Thicker than S₃, but has less ice than S₃.
 S₃ = Thicker than S₄, but has less ice than S₄.
 S₄ = Thicker than S₅, but has less ice than S₅.
 S₅ = Thicker than S₆, but has less ice than S₆.
 S₆ = Thicker than S₁, but has less ice than S₁.

FORM OF ICE

T = Thin ice (100 cm or less)
 I = First year thin (100-175 cm)
 L = First year medium (175-225 cm)
 M = First year thick (225-275 cm)
 H = First year thick (275-325 cm)
 F = First year thick (325-375 cm)
 P = First year thick (375-425 cm)
 G = First year thick (425-475 cm)
 H = First year thick (475-525 cm)
 I = First year thick (525-575 cm)
 J = First year thick (575-625 cm)
 K = First year thick (625-675 cm)
 L = First year thick (675-725 cm)
 M = First year thick (725-775 cm)
 N = First year thick (775-825 cm)
 O = First year thick (825-875 cm)
 P = First year thick (875-925 cm)
 Q = First year thick (925-975 cm)
 R = First year thick (975-1025 cm)
 S = First year thick (1025-1075 cm)

POINT OF SPACE

1 = Point of space (100-150 cm)
 2 = Point of space (150-200 cm)
 3 = Point of space (200-250 cm)
 4 = Point of space (250-300 cm)
 5 = Point of space (300-350 cm)
 6 = Point of space (350-400 cm)
 7 = Point of space (400-450 cm)
 8 = Point of space (450-500 cm)
 9 = Point of space (500-550 cm)
 0 = Point of space (550-600 cm)
 1 = Point of space (600-650 cm)
 2 = Point of space (650-700 cm)
 3 = Point of space (700-750 cm)
 4 = Point of space (750-800 cm)
 5 = Point of space (800-850 cm)
 6 = Point of space (850-900 cm)
 7 = Point of space (900-950 cm)
 8 = Point of space (950-1000 cm)
 9 = Point of space (1000-1050 cm)
 0 = Point of space (1050-1100 cm)

BOUNDARY ANALYSIS FROM SATELLITE MICROWAVE OBSERVATION

---●--- = Boundary Analyzed from Satellite Microwave Observation
 ---●--- = Estimated Boundary

SOUTHERN ICE LIMIT 04 JUN 95

NEW YORK, NEW YORK CENTER
 NAVAL ICE CENTER

GEORGIAN GLOBE, NOT TO BE USED FOR NAVIGATION

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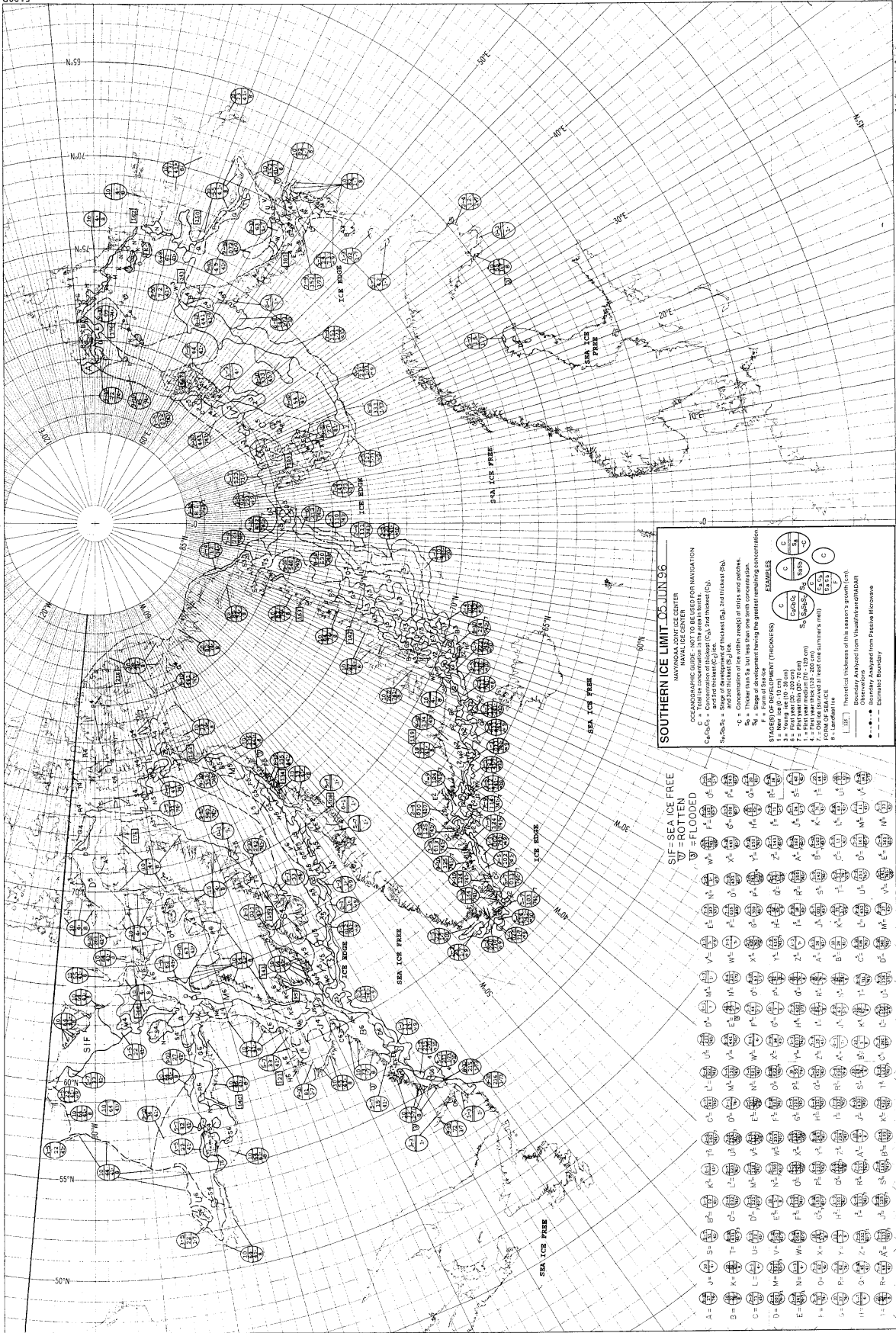
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SOUTHERN ICE LIMIT 05 JUN 96

NATIONAL ICE CENTER
 NATIONAL CENTER FOR ENVIRONMENTAL INFORMATION

CONCENTRATIONS
 C = Total ice concentration in the area in tenths.
 C₁-C₉ = Concentrations of first (C₁) and thickest (C₉) ice.
 N₁, N₂, N₃ = Stages of development of thickest (C₉) and thickest (C₁) ice.
 S₁ = Thicker than S₂, but less than one unit concentration.
 S₂ = Stage of development having the greatest remaining concentration.

STAGES OF DEVELOPMENT (THICKNESS)
 S₁ - Thicker than S₂, but less than one unit concentration.
 S₂ - Stage of development having the greatest remaining concentration.
 S₃ - Young ice (17-30 cm)
 S₄ - First year ice (30-100 cm)
 S₅ - First year ice (100-200 cm)
 S₆ - Old ice (formed at least one summer's melt)
 S₇ - Landfast ice

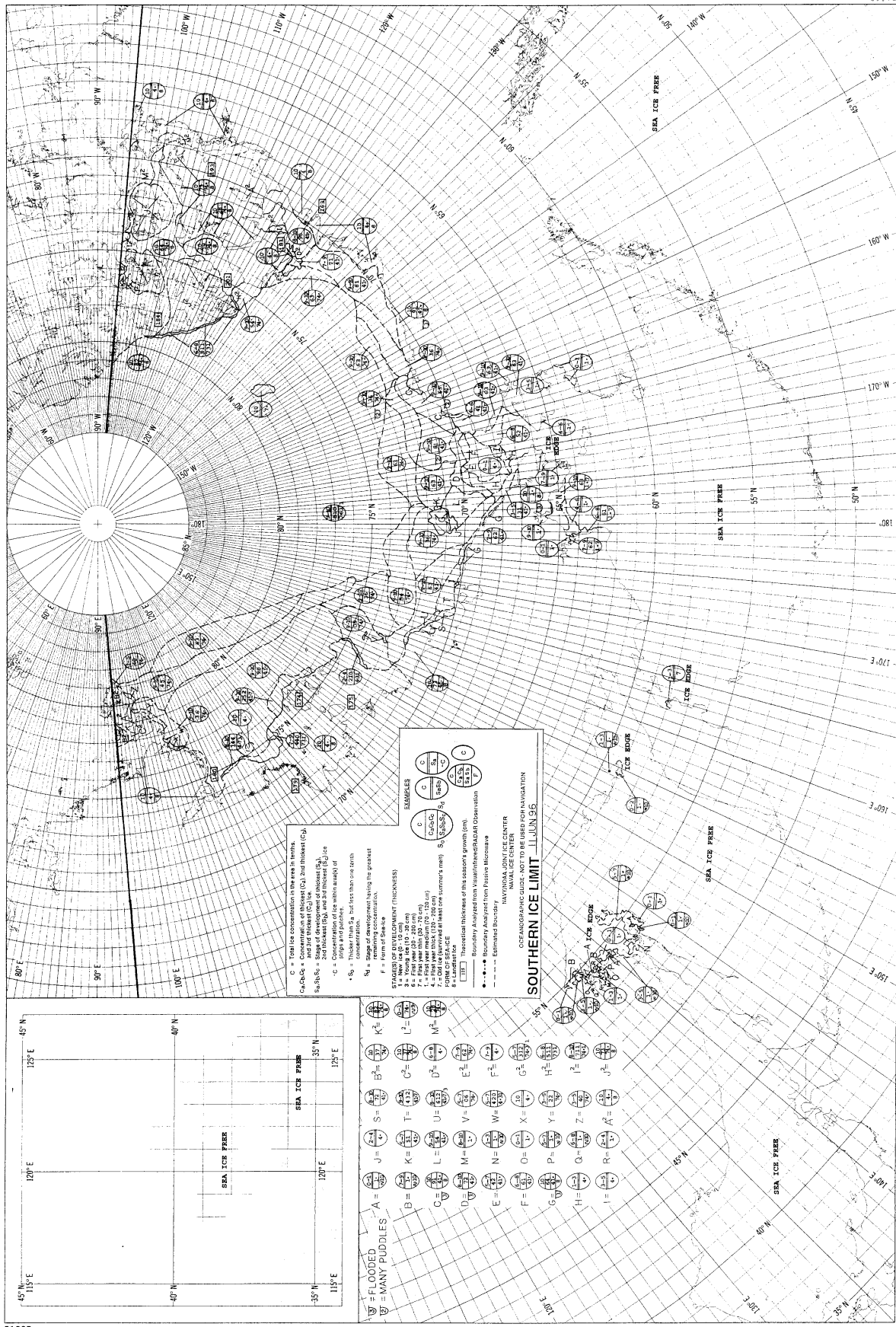
EXAMPLES

C	1	2	3	4	5	6	7	8	9
N	1	2	3	4	5	6	7	8	9
S	1	2	3	4	5	6	7	8	9

LEGEND
 --- Boundary Inferred from Visual Interferometer
 - - - - - Boundary Inferred from Passive Microwave
 - - - - - Estimated Boundary

SIF = SEA ICE FREE
▽ = FLOODEN

A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
B	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
E	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
F	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
G	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
H	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
I	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100



C = Total ice concentration in the area in terms of concentration of thickest (Ca) and thickest (Cb).
 CaCbCa = Concentration of thickest (Ca) and thickest (Cb).
 S₁S₂S₃S₄ = Stage of development of thickest (Ca), 200 thickest (Cb), and thickest (Ca), 200 thickest (Cb), and thickest (Ca) in terms of thickness.
 C = 0 - 100% of area covered by ice.

* S₁ = Thicker than S₂ and less than one sixth of S₃.
 S₂ = Stage of development having the greatest remaining concentration.
 S₃ = New ice (0 - 100 cm).
 S₄ = First year ice (100 - 200 cm).
 S₅ = Second year ice (200 - 300 cm).
 S₆ = First year ice (300 - 400 cm).
 S₇ = Old ice (formed at least one summer melt).
 S₈ = Old ice (formed at least two summers melt).
 S₉ = Old ice (formed at least three summers melt).

STAGES OF DEVELOPMENT (THICKNESS)
 0 = New ice (0 - 100 cm)
 1 = First year ice (100 - 200 cm)
 2 = Second year ice (200 - 300 cm)
 3 = First year ice (300 - 400 cm)
 4 = Old ice (formed at least one summer melt)
 5 = Old ice (formed at least two summers melt)
 6 = Old ice (formed at least three summers melt)

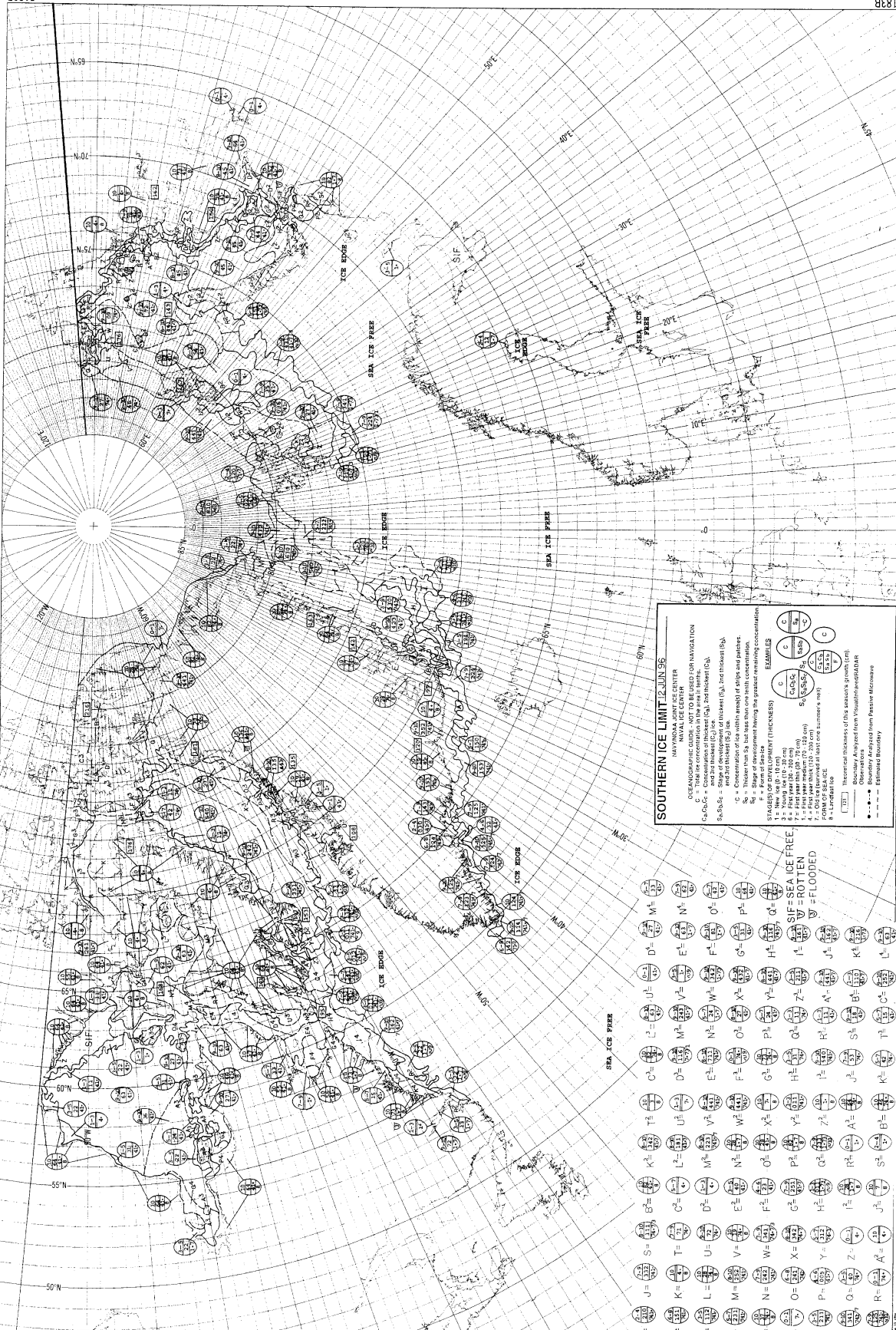
THEORETICAL THICKNESS OF THIS SEASON'S GROWTH (cm).
 Boundary Analyzed from Visual/Infrared/RADAR Observation
 Estimated Boundary

SOUTHERN ICE LIMIT - 11 JUN 55

INTERNATIONAL JOINT ICE CENTER
 NAVAL ICE CENTER
 CHANGING GUIDE - NOT TO BE USED FOR NAVIGATION

A = $\frac{100}{100}$	B = $\frac{100}{100}$	C = $\frac{100}{100}$	D = $\frac{100}{100}$	E = $\frac{100}{100}$	F = $\frac{100}{100}$	G = $\frac{100}{100}$	H = $\frac{100}{100}$	I = $\frac{100}{100}$	J = $\frac{100}{100}$
K = $\frac{100}{100}$	L = $\frac{100}{100}$	M = $\frac{100}{100}$	N = $\frac{100}{100}$	O = $\frac{100}{100}$	P = $\frac{100}{100}$	Q = $\frac{100}{100}$	R = $\frac{100}{100}$	S = $\frac{100}{100}$	T = $\frac{100}{100}$
U = $\frac{100}{100}$	V = $\frac{100}{100}$	W = $\frac{100}{100}$	X = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A' = $\frac{100}{100}$	B' = $\frac{100}{100}$	C' = $\frac{100}{100}$	D' = $\frac{100}{100}$
E' = $\frac{100}{100}$	F' = $\frac{100}{100}$	G' = $\frac{100}{100}$	H' = $\frac{100}{100}$	I' = $\frac{100}{100}$	J' = $\frac{100}{100}$	K' = $\frac{100}{100}$	L' = $\frac{100}{100}$	M' = $\frac{100}{100}$	N' = $\frac{100}{100}$
O' = $\frac{100}{100}$	P' = $\frac{100}{100}$	Q' = $\frac{100}{100}$	R' = $\frac{100}{100}$	S' = $\frac{100}{100}$	T' = $\frac{100}{100}$	U' = $\frac{100}{100}$	V' = $\frac{100}{100}$	W' = $\frac{100}{100}$	X' = $\frac{100}{100}$
Y' = $\frac{100}{100}$	Z' = $\frac{100}{100}$	A'' = $\frac{100}{100}$	B'' = $\frac{100}{100}$	C'' = $\frac{100}{100}$	D'' = $\frac{100}{100}$	E'' = $\frac{100}{100}$	F'' = $\frac{100}{100}$	G'' = $\frac{100}{100}$	H'' = $\frac{100}{100}$
I'' = $\frac{100}{100}$	J'' = $\frac{100}{100}$	K'' = $\frac{100}{100}$	L'' = $\frac{100}{100}$	M'' = $\frac{100}{100}$	N'' = $\frac{100}{100}$	O'' = $\frac{100}{100}$	P'' = $\frac{100}{100}$	Q'' = $\frac{100}{100}$	R'' = $\frac{100}{100}$
S'' = $\frac{100}{100}$	T'' = $\frac{100}{100}$	U'' = $\frac{100}{100}$	V'' = $\frac{100}{100}$	W'' = $\frac{100}{100}$	X'' = $\frac{100}{100}$	Y'' = $\frac{100}{100}$	Z'' = $\frac{100}{100}$	A''' = $\frac{100}{100}$	B''' = $\frac{100}{100}$
C''' = $\frac{100}{100}$	D''' = $\frac{100}{100}$	E''' = $\frac{100}{100}$	F''' = $\frac{100}{100}$	G''' = $\frac{100}{100}$	H''' = $\frac{100}{100}$	I''' = $\frac{100}{100}$	J''' = $\frac{100}{100}$	K''' = $\frac{100}{100}$	L''' = $\frac{100}{100}$
M''' = $\frac{100}{100}$	N''' = $\frac{100}{100}$	O''' = $\frac{100}{100}$	P''' = $\frac{100}{100}$	Q''' = $\frac{100}{100}$	R''' = $\frac{100}{100}$	S''' = $\frac{100}{100}$	T''' = $\frac{100}{100}$	U''' = $\frac{100}{100}$	V''' = $\frac{100}{100}$
W''' = $\frac{100}{100}$	X''' = $\frac{100}{100}$	Y''' = $\frac{100}{100}$	Z''' = $\frac{100}{100}$	A'''' = $\frac{100}{100}$	B'''' = $\frac{100}{100}$	C'''' = $\frac{100}{100}$	D'''' = $\frac{100}{100}$	E'''' = $\frac{100}{100}$	F'''' = $\frac{100}{100}$
G'''' = $\frac{100}{100}$	H'''' = $\frac{100}{100}$	I'''' = $\frac{100}{100}$	J'''' = $\frac{100}{100}$	K'''' = $\frac{100}{100}$	L'''' = $\frac{100}{100}$	M'''' = $\frac{100}{100}$	N'''' = $\frac{100}{100}$	O'''' = $\frac{100}{100}$	P'''' = $\frac{100}{100}$
Q'''' = $\frac{100}{100}$	R'''' = $\frac{100}{100}$	S'''' = $\frac{100}{100}$	T'''' = $\frac{100}{100}$	U'''' = $\frac{100}{100}$	V'''' = $\frac{100}{100}$	W'''' = $\frac{100}{100}$	X'''' = $\frac{100}{100}$	Y'''' = $\frac{100}{100}$	Z'''' = $\frac{100}{100}$

⊖ = FLOODED
 ⊕ = MANY PUDDLES



SOUTHERN ICE LIMIT 12 JUN 56

NAVY ICE CENTER
NAVAL ICE CENTER

OBSERVATIONS - NOT TO BE USED FOR NAVIGATION

S₁ S₂ C₁ C₂ = Concentration of thicket (C₁ for thicket (C₂))
 S₁ S₂ S₃ S₄ = Stage of development (S₁, 2nd thickest (S₂), 3rd thickest (S₃), and 4th thickest (S₄)) ice

S₁ = Thickness of ice within range of slope and pattern.
 S₂ = Thickness of ice within range of greatest remaining concentration

STAGES OF DEVELOPMENT

1 = New ice (0 - 10 cm)
 2 = First year (10 - 200 cm)
 3 = First year medium (70 - 120 cm)
 4 = First year (200 - 300 cm)
 5 = Old ice (300 - 500 cm)
 6 = Old ice (500 - 700 cm)
 7 = Old ice (700 - 1000 cm)

EXAMPLES

S ₁ S ₂ C ₁ C ₂	S ₁ S ₂ C ₁ C ₂	S ₁ S ₂ C ₁ C ₂
1 2 3 4	1 2 3 4	1 2 3 4
5 6 7 8	5 6 7 8	5 6 7 8

100 = Theoretical thickness of the ice edge (in centimeters)
 1000 = Boundary Analyzed from Visual Observations
 1000 = Boundary Analyzed from Passive Microwave Observations
 --- = Estimated Boundary

SEA ICE FREE

A =	B =	C =	D =	E =	F =	G =	H =	I =	J =	K =	L =	M =	N =	O =	P =	Q =	R =	S =	T =	U =	V =	W =	X =	Y =	Z =
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SEA ICE FREE

A =	B =	C =	D =	E =	F =	G =	H =	I =	J =	K =	L =	M =	N =	O =	P =	Q =	R =	S =	T =	U =	V =	W =	X =	Y =	Z =
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SIF = SEA ICE FREE

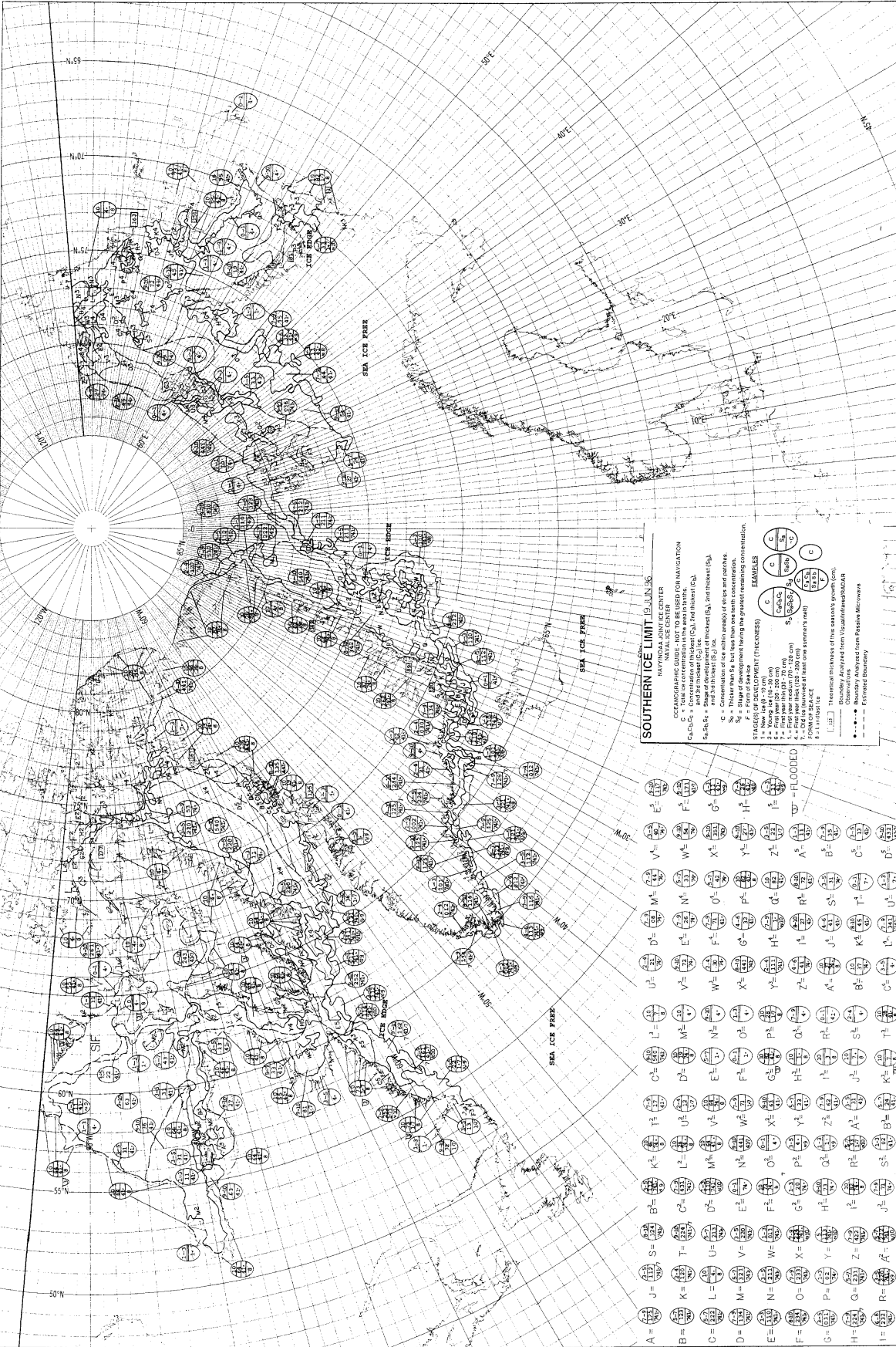
A =	B =	C =	D =	E =	F =	G =	H =	I =	J =	K =	L =	M =	N =	O =	P =	Q =	R =	S =	T =	U =	V =	W =	X =	Y =	Z =
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O = ROTTEN

A =	B =	C =	D =	E =	F =	G =	H =	I =	J =	K =	L =	M =	N =	O =	P =	Q =	R =	S =	T =	U =	V =	W =	X =	Y =	Z =
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∅ = FLOODED

A =	B =	C =	D =	E =	F =	G =	H =	I =	J =	K =	L =	M =	N =	O =	P =	Q =	R =	S =	T =	U =	V =	W =	X =	Y =	Z =
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SOUTHERN ICE LIMIT BOUNDARY
 ANTARCTIC PENINSULA
 NAVAL ICE CENTER

ICE PERK - NOT TO BE USED FOR NAVIGATION
 C₁, C₂, C₃ = Concentrations of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
 C = Thicker than (C) but not as thick as (C) in areas of strips and patches.
 S₁ = Stage of development having the greatest remaining concentration.
 S₂ = Stage of development having the next greatest remaining concentration.
 S₃ = Stage of development having the next greatest remaining concentration.

STAGES OF DEVELOPMENT (THICKNESS)
 1 = New (40-10 cm)
 2 = First year (10-200 cm)
 3 = First year (200-100 cm)
 4 = First year (100-20 cm)
 5 = Old (100-20 cm)
 6 = Old (20-10 cm)
 7 = Old (10-20 cm)
 8 = Old (20-10 cm)
 9 = Old (10-20 cm)
 10 = Old (20-10 cm)

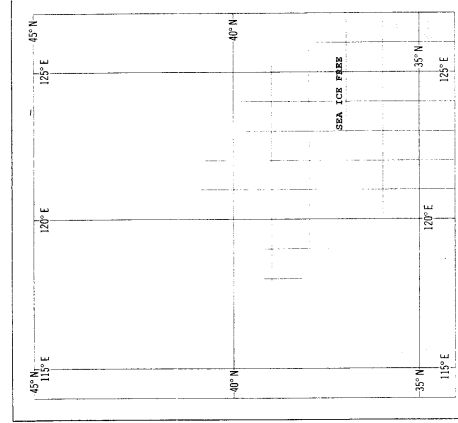
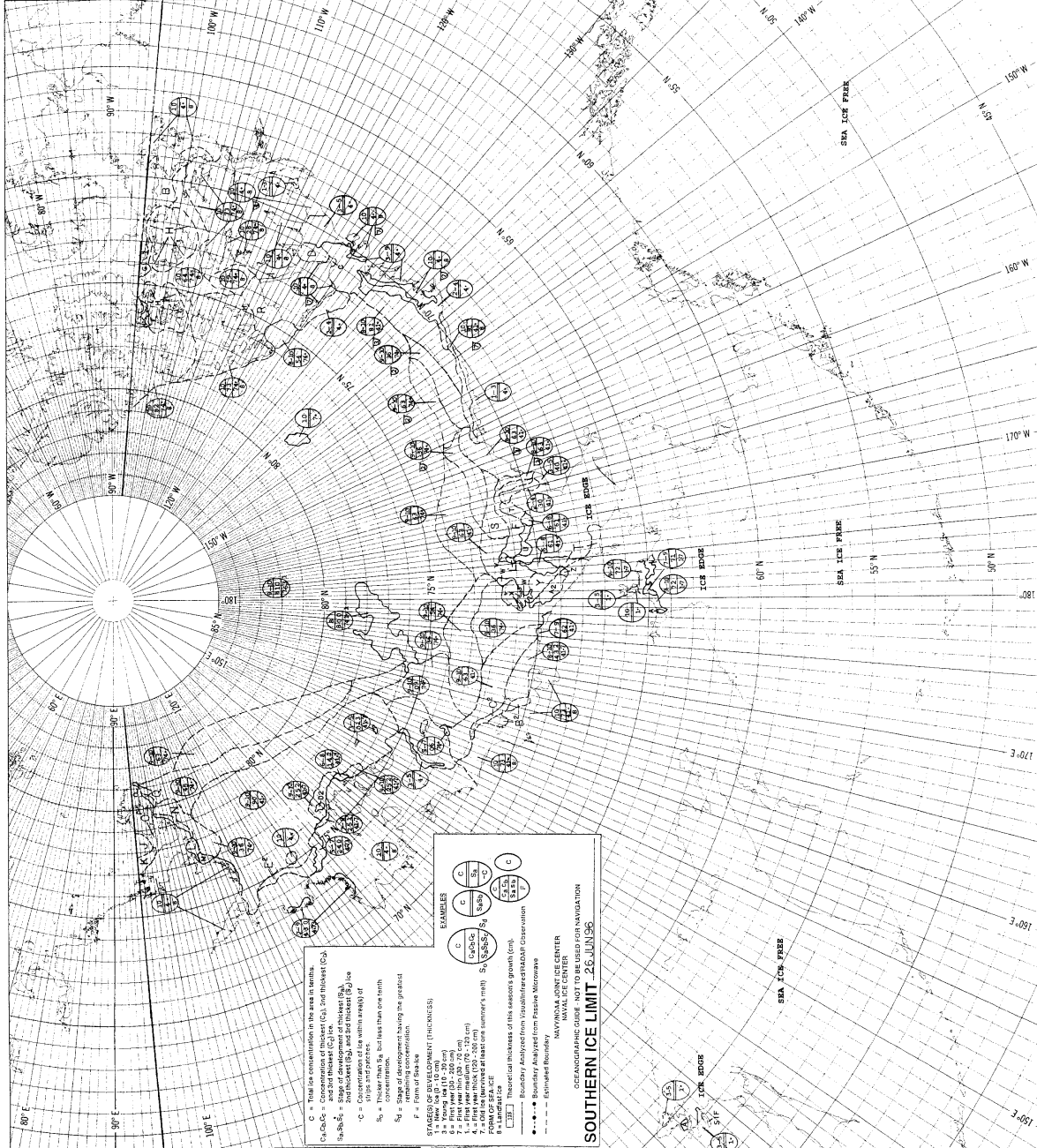
EXAMPLES

--	--	--	--	--	--	--	--	--	--	--	--	--	--

BOUNDARY TYPES
 - - - - - Boundary Analyzed from Visual Observations
 - - - - - Boundary Analyzed from Repeat Microwave
 - - - - - Estimated Boundary

ICE TYPES

A =	B =	C =	D =	E =	F =	G =	H =	I =	J =	K =	L =	M =	N =	O =	P =	Q =	R =	S =	T =	U =	V =	W =	X =	Y =	Z =	AA =	AB =	AC =	AD =	AE =	AF =	AG =	AH =	AI =	AJ =	AK =	AL =	AM =	AN =	AO =	AP =	AQ =	AR =	AS =	AT =	AU =	AV =	AW =	AX =	AY =	AZ =	BA =	BB =	BC =	BD =	BE =	BF =	BG =	BH =	BI =	BJ =	BK =	BL =	BM =	BN =	BO =	BP =	BQ =	BR =	BS =	BT =	BU =	BV =	BW =	BX =	BY =	BZ =	CA =	CB =	CC =	CD =	CE =	CF =	CG =	CH =	CI =	CJ =	CK =	CL =	CM =	CN =	CO =	CP =	CQ =	CR =	CS =	CT =	CU =	CV =	CW =	CX =	CY =	CZ =	DA =	DB =	DC =	DD =	DE =	DF =	DG =	DH =	DI =	DJ =	DK =	DL =	DM =	DN =	DO =	DP =	DQ =	DR =	DS =	DT =	DU =	DV =	DW =	DX =	DY =	DZ =	EA =	EB =	EC =	ED =	EE =	EF =	EG =	EH =	EI =	EJ =	EK =	EL =	EM =	EN =	EO =	EP =	EQ =	ER =	ES =	ET =	EU =	EV =	EW =	EX =	EY =	EZ =	FA =	FB =	FC =	FD =	FE =	FF =	FG =	FH =	FI =	FJ =	FK =	FL =	FM =	FN =	FO =	FP =	FQ =	FR =	FS =	FT =	FU =	FV =	FW =	FX =	FY =	FZ =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GA =	GB =	GC =
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STAGES OF DEVELOPMENT (THICKNESSES)

1 = New ice (0 - 10 cm)
 2 = First year (10 - 20 cm)
 3 = First year medium (20 - 25 cm)
 4 = First year (25 - 30 cm)
 5 = First year maximum (30 - 40 cm)
 6 = First year (40 - 50 cm)
 7 = First year maximum (50 - 75 cm)
 8 = First year maximum (75 - 125 cm)
 9 = First year maximum (125 - 150 cm)
 10 = First year maximum (150 - 200 cm)

BOUNDARY OF SEA ICE

— Theoretical thickness of this season's growth (cm).
 — Boundary analyzed from Visible Infrared Radiometer Observation
 — Estimated boundary

EXAMPLES

BOUNDARY OF SEA ICE

— Theoretical thickness of this season's growth (cm).
 — Boundary analyzed from Visible Infrared Radiometer Observation
 — Estimated boundary

BOUNDARY OF SEA ICE

— Theoretical thickness of this season's growth (cm).
 — Boundary analyzed from Visible Infrared Radiometer Observation
 — Estimated boundary

BOUNDARY OF SEA ICE

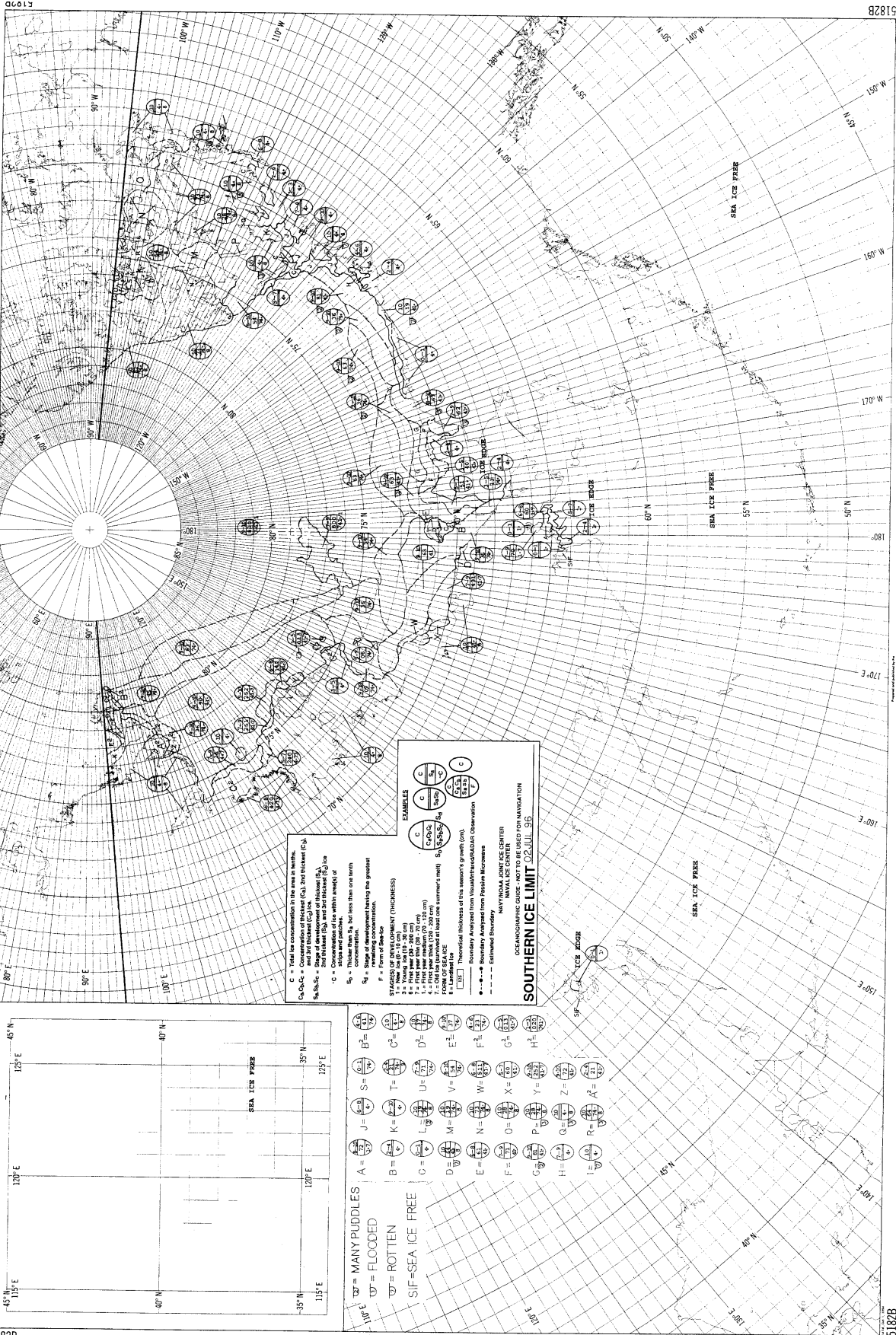
— Theoretical thickness of this season's growth (cm).
 — Boundary analyzed from Visible Infrared Radiometer Observation
 — Estimated boundary

SOUTHERN ICE LIMIT 25 JUN 96

ICE CENTER
 ICE CENTER
 ICE CENTER

BOUNDARY OF SEA ICE

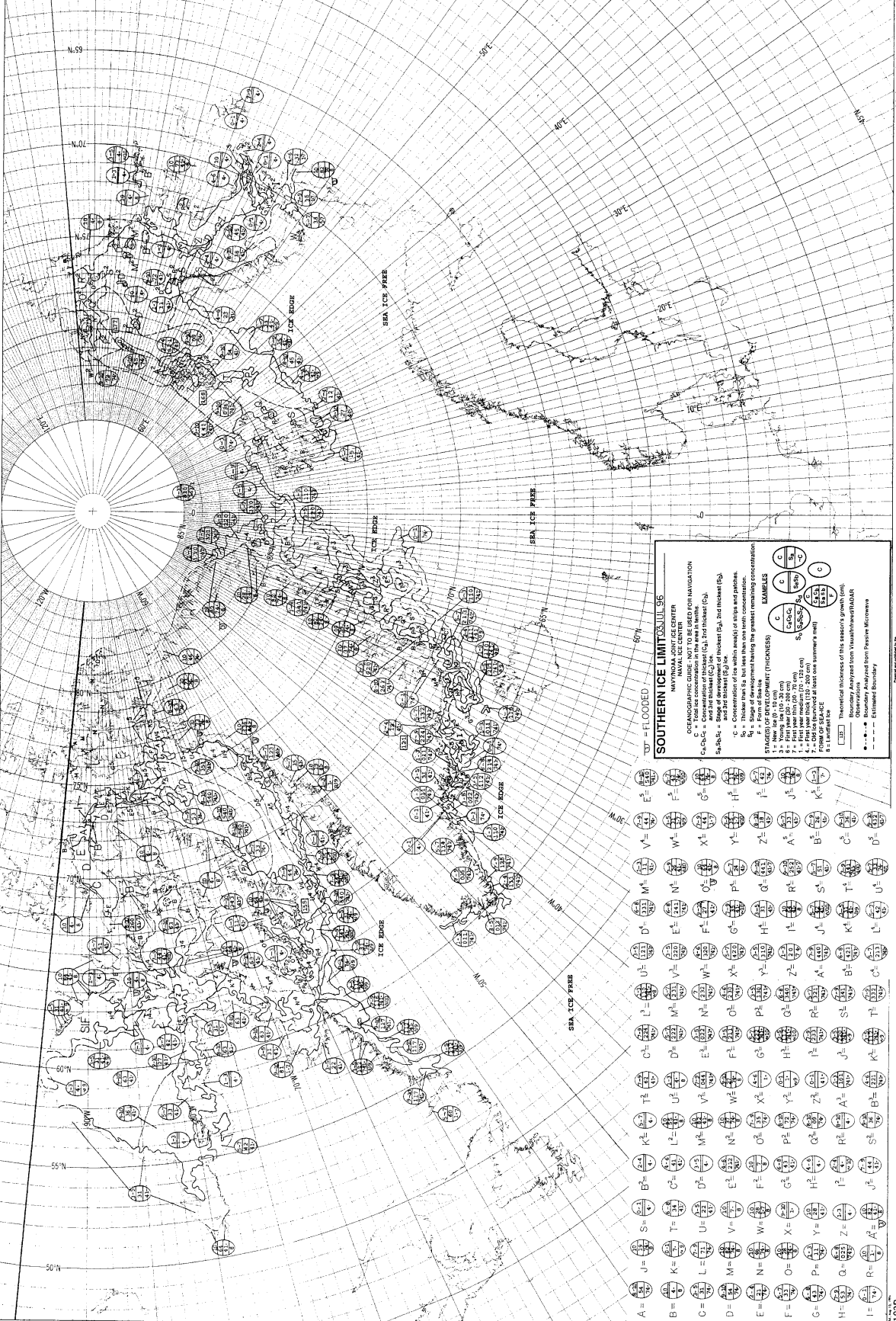
— Theoretical thickness of this season's growth (cm).
 — Boundary analyzed from Visible Infrared Radiometer Observation
 — Estimated boundary



C = Total ice concentration in the area shown.
 C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 S₁, S₂, S₃ = 2nd thickest (S₂), and 3rd thickest (S₃) ice concentration of ice within area(s) of interest.
 S₀ = Thicker than S₁, but less than one tenth concentration.
 S₄ = remaining concentration.
 F = Form of Ice-edge
 F₁ = Form of Ice-edge
 F₂ = Form of Ice-edge
 F₃ = Form of Ice-edge
 F₄ = Form of Ice-edge
 F₅ = Form of Ice-edge
 F₆ = Form of Ice-edge
 F₇ = Form of Ice-edge
 F₈ = Form of Ice-edge
 F₉ = Form of Ice-edge
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 F₉₈ = Form of Ice-edge
 F₉₉ = Form of Ice-edge
 F₁₀₀ = Form of Ice-edge

EXAMPLES
 C₁C₂C₃S₁S₂S₃F₁
 C₁C₂C₃S₁S₂S₃F₂
 C₁C₂C₃S₁S₂S₃F₃
 C₁C₂C₃S₁S₂S₃F₄
 C₁C₂C₃S₁S₂S₃F₅
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 C₁C₂C₃S₁S₂S₃F₁₂
 C₁C₂C₃S₁S₂S₃F₁₃
 C₁C₂C₃S₁S₂S₃F₁₄
 C₁C₂C₃S₁S₂S₃F₁₅
 C₁C₂C₃S₁S₂S₃F₁₆
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 C₁C₂C₃S₁S₂S₃F₉₉
 C₁C₂C₃S₁S₂S₃F₁₀₀

SOUTHERN ICE LIMIT 92 JUL 95
 NAVY/NOAA JOINT ICE CENTER
 NAVAL ICT CENTER
 DECEMBER 1995
 THIS PRODUCT IS NOT TO BE USED FOR NAVIGATION
 NAVY/NOAA JOINT ICE CENTER
 NAVAL ICT CENTER
 DECEMBER 1995
 THIS PRODUCT IS NOT TO BE USED FOR NAVIGATION



SOUTHERN ICE LIMITS JUL 95

NAVY/NOAA JOINT CENTER
NAVAL ICE CENTER

CONCENTRATIONS: 10% FOR NAVIGATION
 C = Total ice concentration in the area in frame.
 C₁-C₂-C₃ = Concentrations of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃).
 S₁-S₂-S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃).
 S₁ = Stage of development having the greatest remaining concentration.
 S₂ = Thicker than S₁, but less than one month concentration.
 S₃ = Stage of development having the greatest remaining concentration.

STAGES OF DEVELOPMENT (THICKNESS)

1 = First year (thickness 100-125 cm)
 2 = First year (thickness 125-150 cm)
 3 = Young (1st 10-20 cm)
 4 = First year (10-20 cm)
 5 = First year (10-20 cm)
 6 = Old (thickness at least one summer melt)
 7 = Old (thickness at least one summer melt)
 8 = Landfast ice

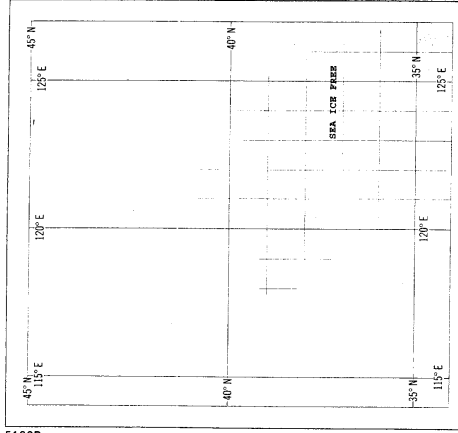
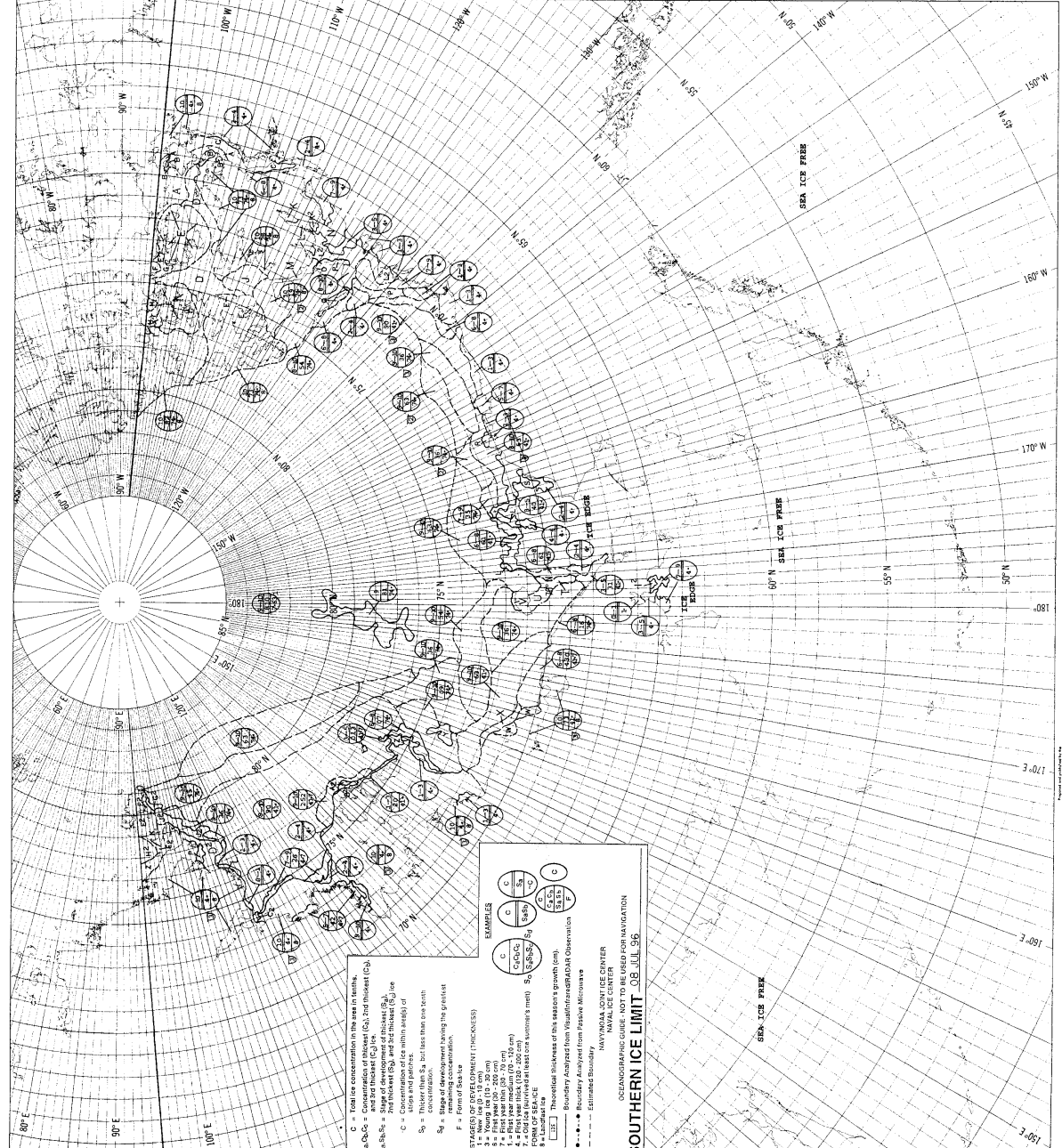
EXAMPLES

C	C	C	C	C	C	C	C	C	C
100	100	100	100	100	100	100	100	100	100
100	100	100	100	100	100	100	100	100	100
100	100	100	100	100	100	100	100	100	100
100	100	100	100	100	100	100	100	100	100

BOUNDARIES

— = Theoretical thickness of this season's growth (cm)
 - - - = Boundary Analyzed from Visual/Microwave
 - - - = Boundary Analyzed from Passive Microwave
 - - - = Estimated Boundary

A =	B =	C =	D =	E =	F =	G =	H =	I =	J =	K =	L =	M =	N =	O =	P =	Q =	R =	S =	T =	U =	V =	W =	X =	Y =	Z =	AA =	AB =	AC =	AD =	AE =	AF =	AG =	AH =	AI =	AJ =	AK =	AL =	AM =	AN =	AO =	AP =	AQ =	AR =	AS =	AT =	AU =	AV =	AW =	AX =	AY =	AZ =	BA =	BB =	BC =	BD =	BE =	BF =	BG =	BH =	BI =	BJ =	BK =	BL =	BM =	BN =	BO =	BP =	BQ =	BR =	BS =	BT =	BU =	BV =	BW =	BX =	BY =	BZ =	CA =	CB =	CC =	CD =	CE =	CF =	CG =	CH =	CI =	CJ =	CK =	CL =	CM =	CN =	CO =	CP =	CQ =	CR =	CS =	CT =	CU =	CV =	CW =	CX =	CY =	CZ =	DA =	DB =	DC =	DD =	DE =	DF =	DG =	DH =	DI =	DJ =	DK =	DL =	DM =	DN =	DO =	DP =	DQ =	DR =	DS =	DT =	DU =	DV =	DW =	DX =	DY =	DZ =	EA =	EB =	EC =	ED =	EE =	EF =	EG =	EH =	EI =	EJ =	EK =	EL =	EM =	EN =	EO =	EP =	EQ =	ER =	ES =	ET =	EU =	EV =	EW =	EX =	EY =	EZ =	FA =	FB =	FC =	FD =	FE =	FF =	FG =	FH =	FI =	FJ =	FK =	FL =	FM =	FN =	FO =	FP =	FQ =	FR =	FS =	FT =	FU =	FV =	FW =	FX =	FY =	FZ =	GA =	GB =	GC =	GD =	GE =	GF =	GG =	GH =	GI =	GJ =	GK =	GL =	GM =	GN =	GO =	GP =	GQ =	GR =	GS =	GT =	GU =	GV =	GW =	GX =	GY =	GZ =	HA =	HB =	HC =	HD =	HE =	HF =	HG =	HH =	HI =	HJ =	HK =	HL =	HM =	HN =	HO =	HP =	HQ =	HR =	HS =	HT =	HU =	HV =	HW =	HX =	HY =	HZ =	IA =	IB =	IC =	ID =	IE =	IF =	IG =	IH =	II =	IJ =	IK =	IL =	IM =	IN =	IO =	IP =	IQ =	IR =	IS =	IT =	IU =	IV =	IW =	IX =	IY =	IZ =
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EXAMPLES

$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$
$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$

STAGES OF DEVELOPMENT (THICKNESS)

1 = First year ice (10-20 cm)
 2 = First year medium (20-30 cm)
 3 = First year old (30-40 cm)
 4 = First year old (40-50 cm)
 5 = Old ice (50-60 cm)
 6 = Old ice (60-70 cm)
 7 = Old ice (70-80 cm)
 8 = Landfast ice

CONCENTRATION

0 = Concentration of ice more than 80%
 1 = Concentration of ice more than 70%
 2 = Concentration of ice more than 60%
 3 = Concentration of ice more than 50%
 4 = Concentration of ice more than 40%
 5 = Concentration of ice more than 30%
 6 = Concentration of ice more than 20%
 7 = Concentration of ice more than 10%
 8 = Concentration of ice more than 5%

BOUNDARY ANALYSIS FROM VISUAL/REMOTELY SENSITIVE OBSERVATION

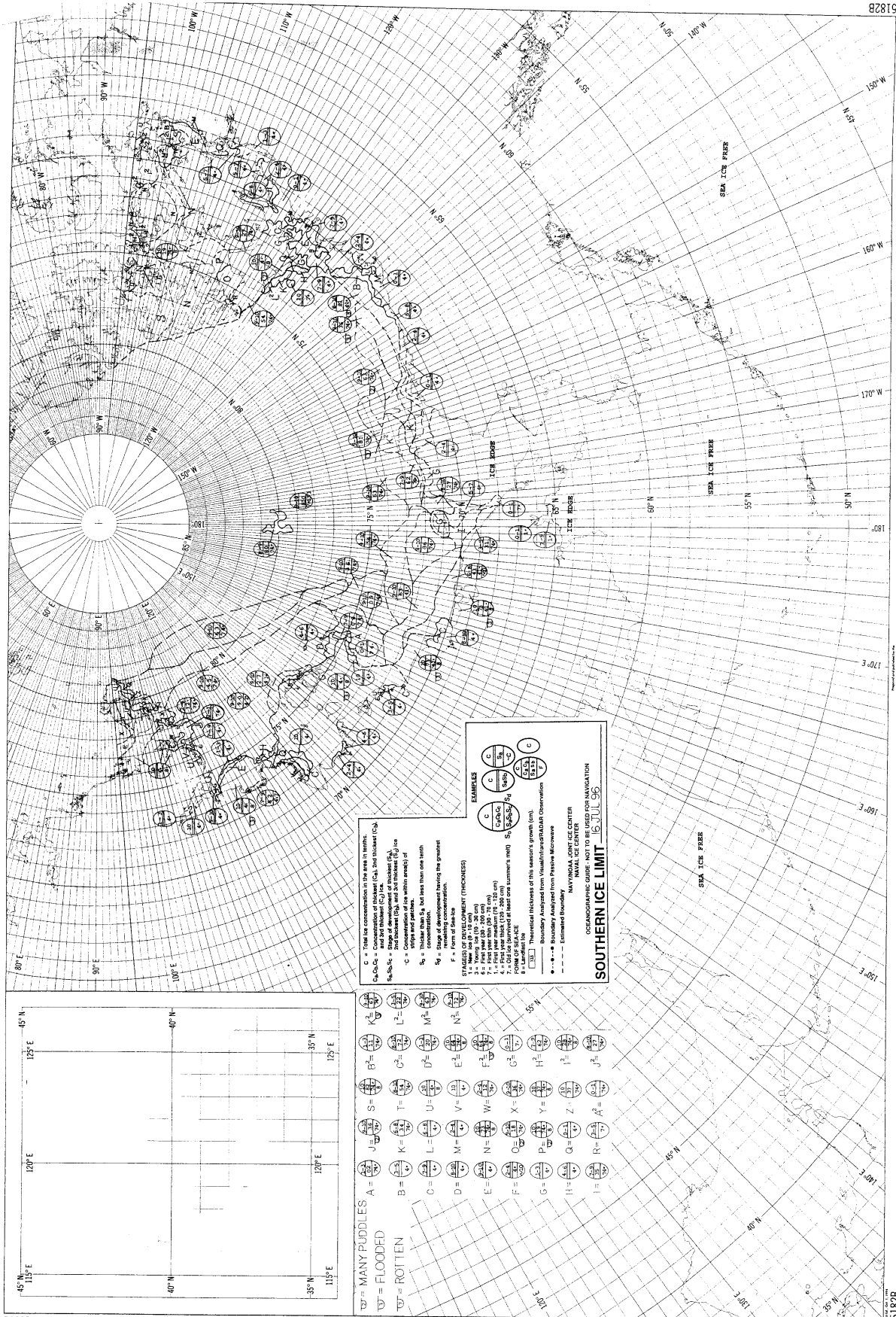
--- Estimated boundary from Visual Observation
 --- Estimated boundary from Passive Microwave

NAVY/NOAA JOINT ICE CENTER
NAVAL ICE CENTER
SOUTHERN ICE LIMIT 30 JUL 35

MANY PUDDLES: $\frac{A}{100}$ $\frac{B}{100}$ $\frac{C}{100}$ $\frac{D}{100}$ $\frac{E}{100}$ $\frac{F}{100}$ $\frac{G}{100}$ $\frac{H}{100}$ $\frac{I}{100}$ $\frac{J}{100}$ $\frac{K}{100}$ $\frac{L}{100}$ $\frac{M}{100}$ $\frac{N}{100}$ $\frac{O}{100}$ $\frac{P}{100}$ $\frac{Q}{100}$ $\frac{R}{100}$ $\frac{S}{100}$ $\frac{T}{100}$ $\frac{U}{100}$ $\frac{V}{100}$ $\frac{W}{100}$ $\frac{X}{100}$ $\frac{Y}{100}$ $\frac{Z}{100}$ $\frac{A}{100}$

FLOODED: $\frac{A}{100}$ $\frac{B}{100}$ $\frac{C}{100}$ $\frac{D}{100}$ $\frac{E}{100}$ $\frac{F}{100}$ $\frac{G}{100}$ $\frac{H}{100}$ $\frac{I}{100}$ $\frac{J}{100}$ $\frac{K}{100}$ $\frac{L}{100}$ $\frac{M}{100}$ $\frac{N}{100}$ $\frac{O}{100}$ $\frac{P}{100}$ $\frac{Q}{100}$ $\frac{R}{100}$ $\frac{S}{100}$ $\frac{T}{100}$ $\frac{U}{100}$ $\frac{V}{100}$ $\frac{W}{100}$ $\frac{X}{100}$ $\frac{Y}{100}$ $\frac{Z}{100}$ $\frac{A}{100}$

ROTTEN: $\frac{A}{100}$ $\frac{B}{100}$ $\frac{C}{100}$ $\frac{D}{100}$ $\frac{E}{100}$ $\frac{F}{100}$ $\frac{G}{100}$ $\frac{H}{100}$ $\frac{I}{100}$ $\frac{J}{100}$ $\frac{K}{100}$ $\frac{L}{100}$ $\frac{M}{100}$ $\frac{N}{100}$ $\frac{O}{100}$ $\frac{P}{100}$ $\frac{Q}{100}$ $\frac{R}{100}$ $\frac{S}{100}$ $\frac{T}{100}$ $\frac{U}{100}$ $\frac{V}{100}$ $\frac{W}{100}$ $\frac{X}{100}$ $\frac{Y}{100}$ $\frac{Z}{100}$ $\frac{A}{100}$



☉ = MANY PUDDLES
☉ = FLOODED
☉ = ROTTEN

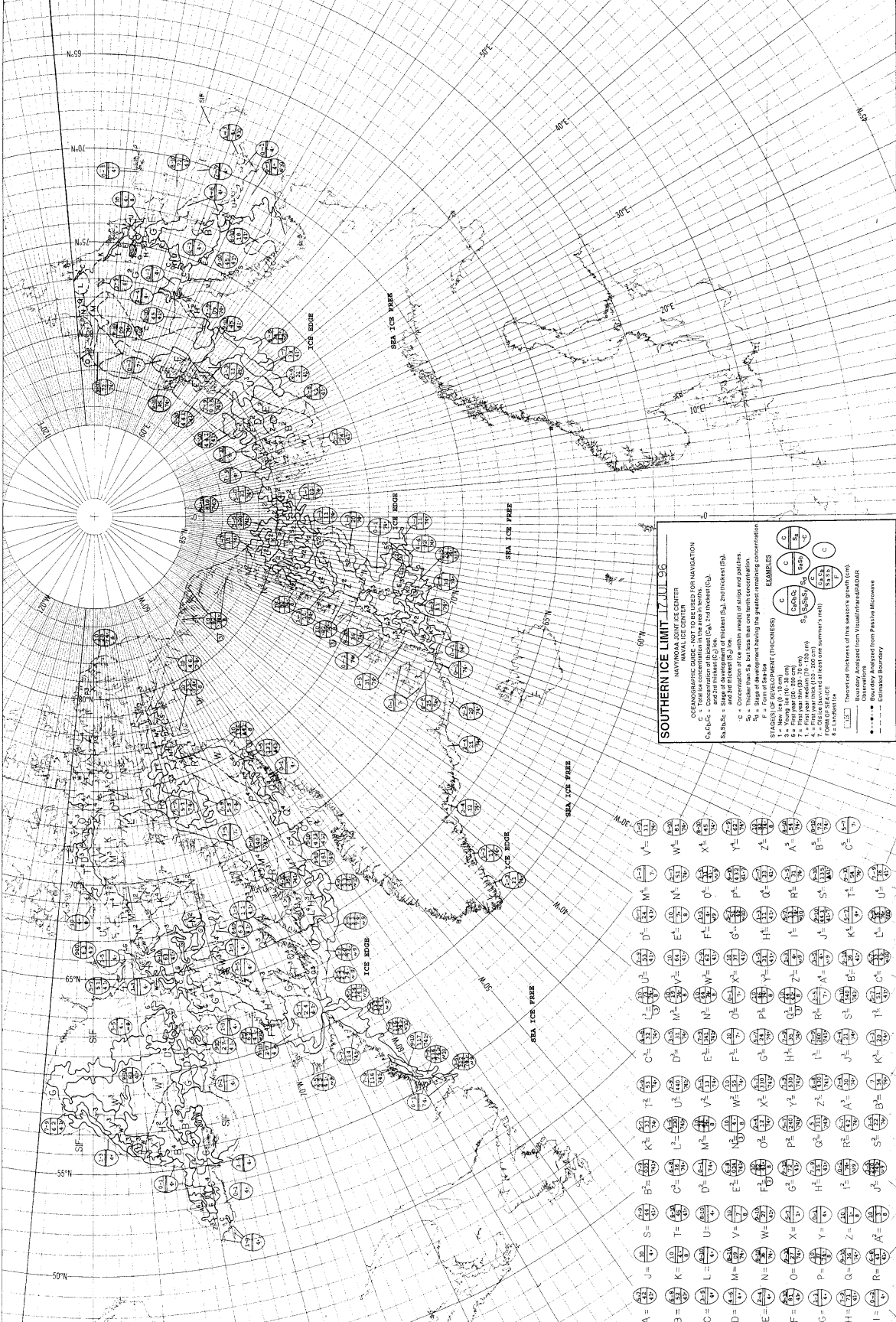
C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of ice (C₁, C₂, and C₃) in tenths.
S₁S₂S₃ = Stage of development of ice (S₁, S₂, and S₃) in tenths.
C = Concentration of ice within areas of single wind patches.
S₁ = Concentration of ice within areas of single wind patches.
S₂ = Stage of development having the greatest concentration.
F = Form of sea ice.

STAGES OF DEVELOPMENT (THICKNESS)
S₁ = New ice (10-20 cm)
S₂ = Young ice (20-70 cm)
S₃ = First year ice (70-200 cm)
S₄ = Second year ice (200-300 cm)
S₅ = Old ice (thawed at least one summer's work)
S₆ = Ice that has melted
S₇ = Landfast ice

— Theoretical thickness of this season's growth (cm).
— Boundary Assayzed from Visual/Aircraft Observation.
— Boundary Assayzed from Satellite Measurement.
--- Estimated Boundary.

OCEANOGRAPHIC CENTER, NOT TO BE USED FOR NAVIGATION
MAY/NOVEMBER 1996
SOUTHERN ICE LIMIT 16 JUL 96

A = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	B = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	C = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	D = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	E = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	F = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	G = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	H = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	I = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	J = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	K = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	L = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	M = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	N = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	O = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	P = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	Q = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	R = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	S = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	T = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	U = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	V = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	W = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	X = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	Y = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	Z = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$	A = $\frac{10}{10} \frac{10}{10} \frac{10}{10}$
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SOUTHERN ICE LIMIT - JUL 30
 NAVY CENTER
 NAVAL ICE CENTER

OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Concentration of bulked ice, 2nd thickest (C)
 T = Thickness (T) in feet
 F = Form of floe
 S = Shape of development having the greatest remaining concentration

EXAMPLES

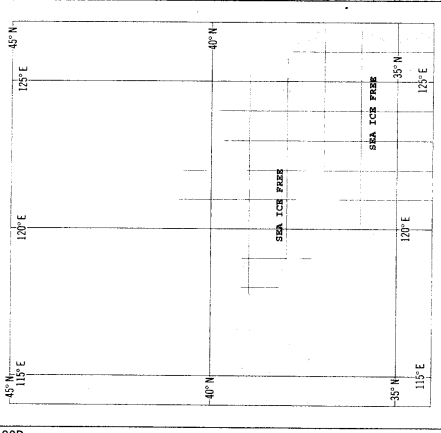
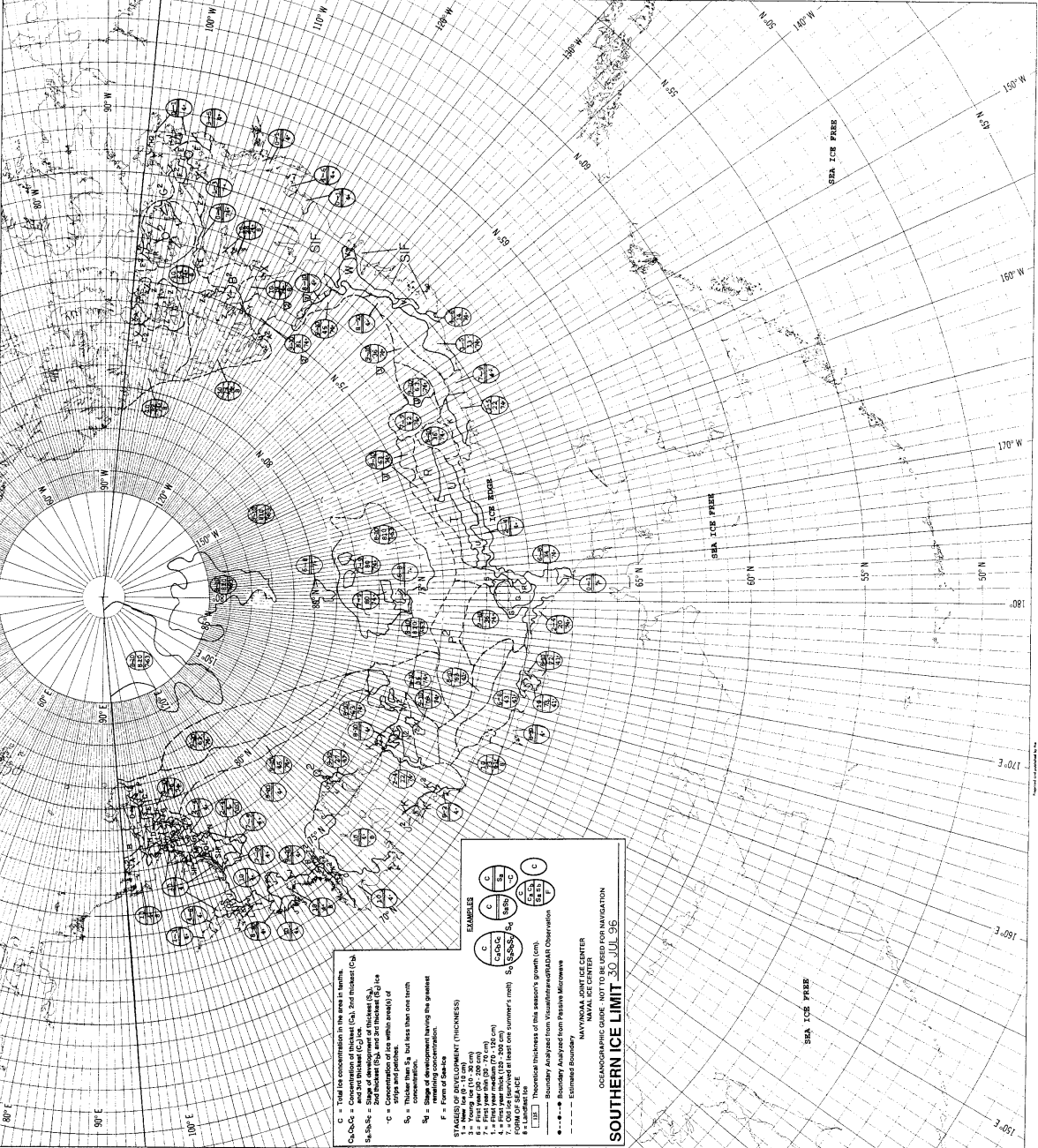
1 = New ice (0-10 cm)	C ₁ C ₂ C ₃ C ₄ C ₅ C ₆ C ₇ C ₈ C ₉ C ₁₀ C ₁₁ C ₁₂ C ₁₃ C ₁₄ C ₁₅ C ₁₆ C ₁₇ C ₁₈ C ₁₉ C ₂₀ C ₂₁ C ₂₂ C ₂₃ C ₂₄ C ₂₅ C ₂₆ C ₂₇ C ₂₈ C ₂₉ C ₃₀ C ₃₁ C ₃₂ C ₃₃ C ₃₄ C ₃₅ C ₃₆ C ₃₇ C ₃₈ C ₃₉ C ₄₀ C ₄₁ C ₄₂ C ₄₃ C ₄₄ C ₄₅ C ₄₆ C ₄₇ C ₄₈ C ₄₉ C ₅₀ C ₅₁ C ₅₂ C ₅₃ C ₅₄ C ₅₅ C ₅₆ C ₅₇ C ₅₈ C ₅₉ C ₆₀ C ₆₁ C ₆₂ C ₆₃ C ₆₄ C ₆₅ C ₆₆ C ₆₇ C ₆₈ C ₆₉ C ₇₀ C ₇₁ C ₇₂ C ₇₃ C ₇₄ C ₇₅ C ₇₆ C ₇₇ C ₇₈ C ₇₉ C ₈₀ C ₈₁ C ₈₂ C ₈₃ C ₈₄ C ₈₅ C ₈₆ C ₈₇ C ₈₈ C ₈₉ C ₉₀ C ₉₁ C ₉₂ C ₉₃ C ₉₄ C ₉₅ C ₉₆ C ₉₇ C ₉₈ C ₉₉ C ₁₀₀
2 = First year ice (10-100 cm)	
3 = Second year ice (100-200 cm)	
4 = Third year ice (200-300 cm)	
5 = Fourth year ice (300-400 cm)	
6 = Fifth year ice (400-500 cm)	
7 = Sixth year ice (500-600 cm)	
8 = Seventh year ice (600-700 cm)	
9 = Eighth year ice (700-800 cm)	
10 = Ninth year ice (800-900 cm)	
11 = Tenth year ice (900-1000 cm)	

KEY

- Ice thickness of this season's growth
- • • • • Boundary determined from Visual and Radar Observations
- — — — — Estimated Boundary

NAVAL OPERATIONS DIVISION

NAVY CENTER NAVAL ICE CENTER



EXAMPLES

$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$
$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$	$\frac{C}{100}$

STAGES OF DEVELOPMENT (THICKNESS)

1 = New ice (0 - 10 cm)
 2 = First year ice (10 - 20 cm)
 3 = First year ice (20 - 100 cm)
 4 = First year ice (100 - 150 cm)
 5 = First year ice (150 - 200 cm)
 6 = First year ice (200 - 300 cm)
 7 = Old ice (formed in last one summer or more)
 8 = Multiyear ice

SEASONS

1 = Winter
 2 = Spring
 3 = Summer
 4 = Autumn

ICE CHARACTERISTICS

1 = Thin
 2 = Medium
 3 = Thick

ICE TYPES

1 = Edge
 2 = Interior
 3 = Lead
 4 = Bay
 5 = Strait
 6 = Inlet
 7 = Fjord
 8 = Sound
 9 = Narrows
 10 = Channel
 11 = Trench
 12 = Shoal
 13 = Bank
 14 = Shelf
 15 = Slope
 16 = Rise
 17 = Fall
 18 = Drop
 19 = Rise
 20 = Fall

ICE LIMITS

1 = Mean
 2 = Maximum
 3 = Minimum

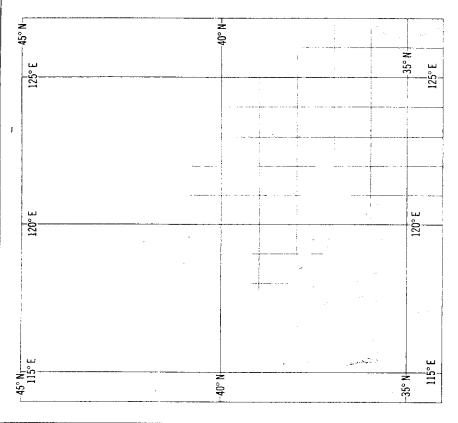
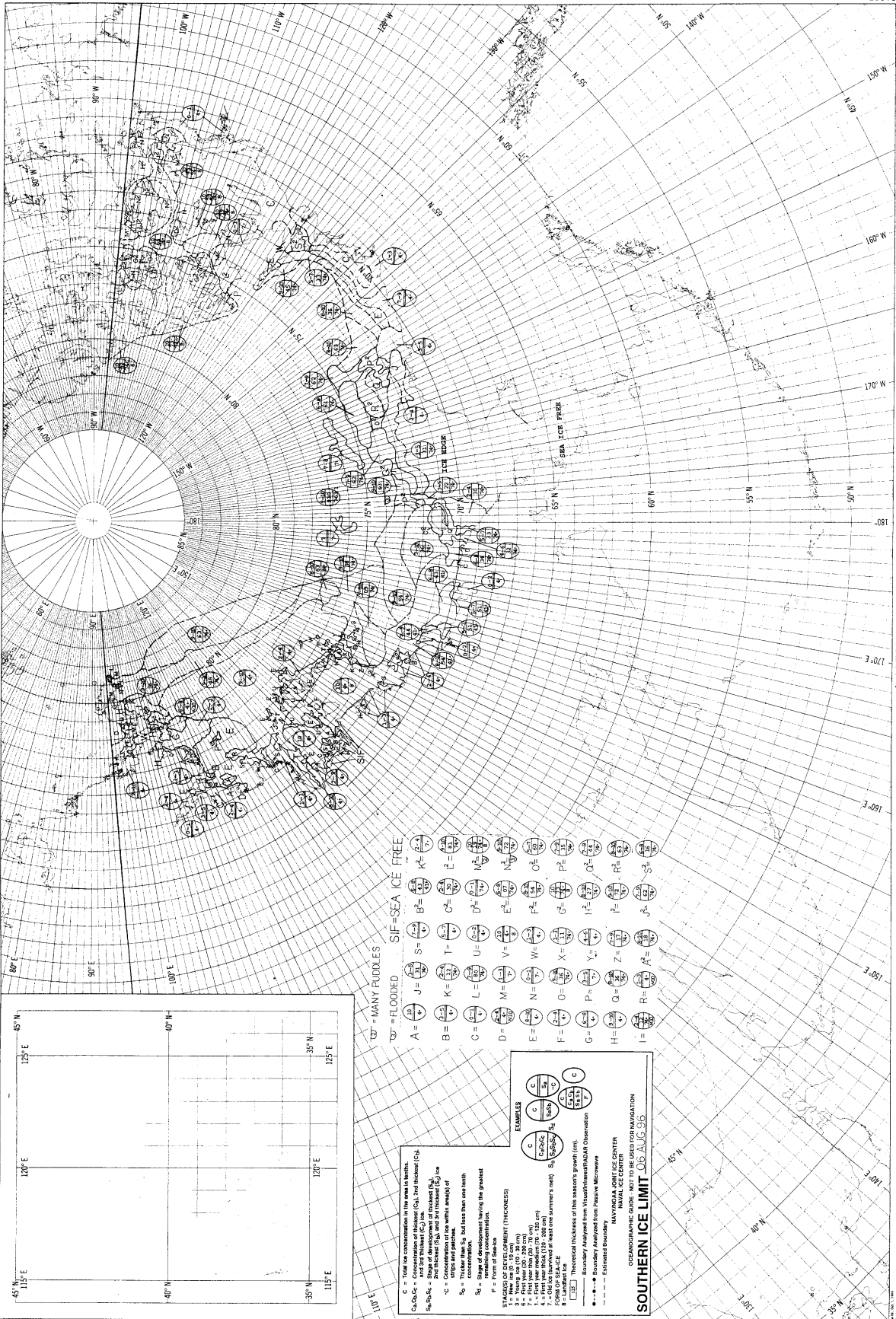
ICE TYPES

1 = Edge
 2 = Interior
 3 = Lead
 4 = Bay
 5 = Strait
 6 = Inlet
 7 = Fjord
 8 = Sound
 9 = Narrows
 10 = Channel
 11 = Trench
 12 = Shoal
 13 = Bank
 14 = Shelf
 15 = Slope
 16 = Rise
 17 = Fall
 18 = Drop
 19 = Rise
 20 = Fall

ICE TYPES

1 = Edge
 2 = Interior
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NAVY OPERATIONAL INFORMATION REPORT
 REPORT NUMBER: OI-100-100-100-100
 DATE: 10/10/10



100° = MANY PUDDLES

100° = FLOODED

SIF-SEA ICE FREE

A = $\frac{100}{100}$	J = $\frac{100}{100}$	S = $\frac{100}{100}$	K = $\frac{100}{100}$	L = $\frac{100}{100}$	M = $\frac{100}{100}$	N = $\frac{100}{100}$	O = $\frac{100}{100}$	P = $\frac{100}{100}$	Q = $\frac{100}{100}$	R = $\frac{100}{100}$	S = $\frac{100}{100}$	T = $\frac{100}{100}$	U = $\frac{100}{100}$	V = $\frac{100}{100}$	W = $\frac{100}{100}$	X = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	B = $\frac{100}{100}$	C = $\frac{100}{100}$	D = $\frac{100}{100}$	E = $\frac{100}{100}$	F = $\frac{100}{100}$	G = $\frac{100}{100}$	H = $\frac{100}{100}$	I = $\frac{100}{100}$
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EXAMPLES

$\frac{C}{C} \frac{C}{C} \frac{C}{C}$ $\frac{C}{C} \frac{C}{C} \frac{C}{C}$ $\frac{C}{C} \frac{C}{C} \frac{C}{C}$ $\frac{C}{C} \frac{C}{C} \frac{C}{C}$

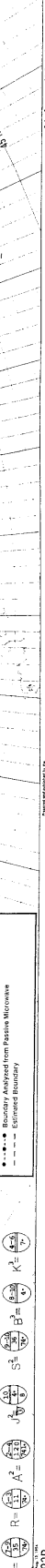
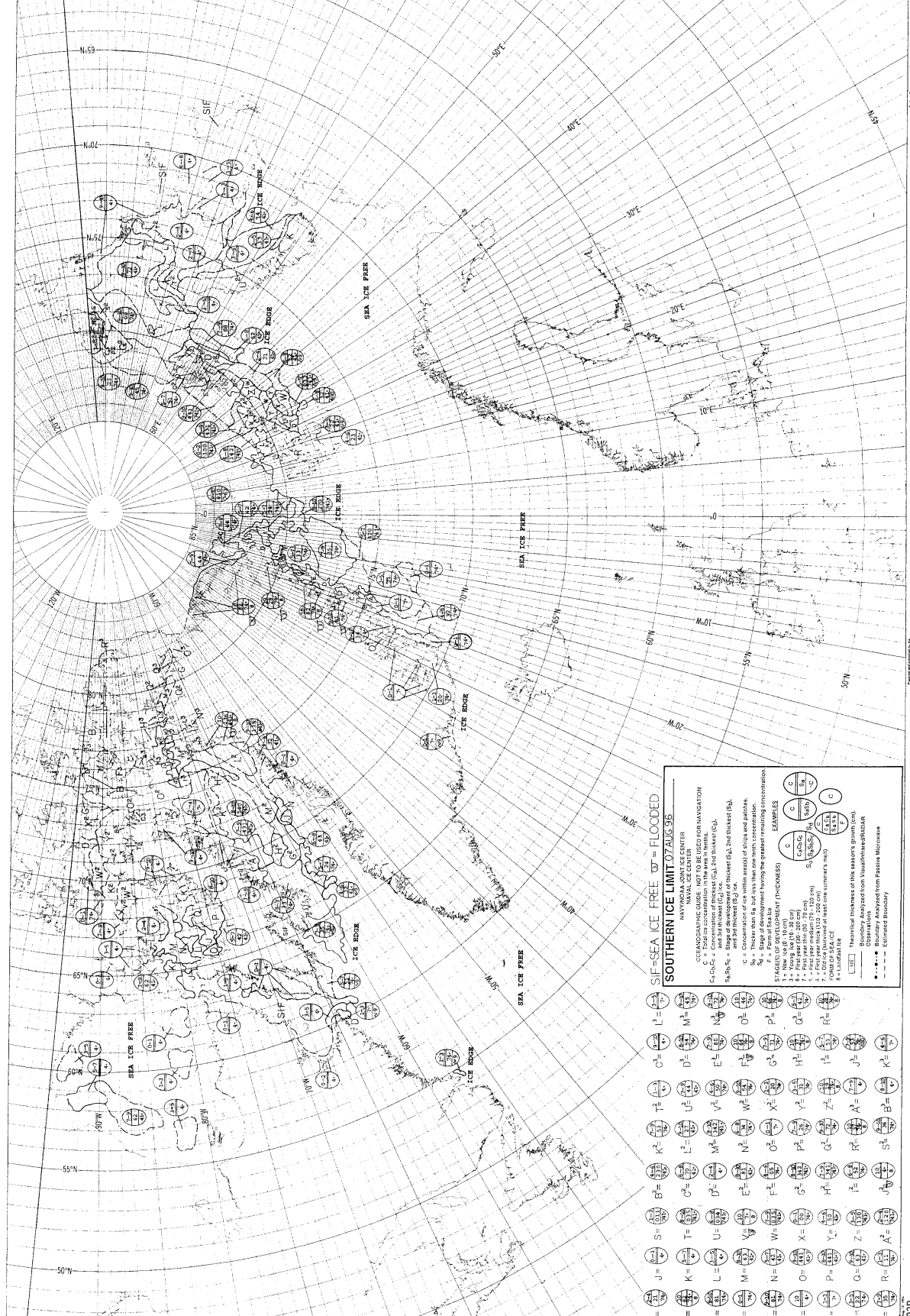
LEGEND

- C = Total ice concentration in the area in tenths.
- C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂) and thickest (C₃) ice.
- S₁S₂S₃ = Shape of dome, and 3rd thickest (S₃) and thickest (S₁) ice within annulus of strips and patches.
- S₁ = Thicker than S₂, but less than one tenth remaining concentration.
- F = Form of floe.
- STAGES OF ICE THICKNESS
- 1 = New ice (0 - 10 cm)
- 2 = First year (10 - 20 cm)
- 3 = First year (20 - 30 cm)
- 4 = First year (30 - 40 cm)
- 5 = First year (40 - 50 cm)
- 6 = First year (50 - 75 cm)
- 7 = Old ice (formed at least one summer's age)
- S₁S₂S₃S₄ = Stages of SEA ICE
- 100 = Theoretical thickness of this season's growth (cm)
- 1000 = Estimated boundary from Visual/Infrared Observation
- = Boundary Analyzed from Passive Microwave
- = Estimated Boundary

NAVINDCMIA, JONIC ICE CENTER, NAVAL ICE CENTER

SOUTHERN ICE LIMIT 06 AUG 95

OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION



SIF=SEA ICE FRONT OF FLOODED SOUTHERN ICE LIMIT 07AUG59

ICE EDGE
SEA ICE FRONT

ICE THICKNESS

STAGES OF DEVELOPMENT (THICKNESS)

EXAMPLES

1 = New (100-150m)
2 = 1st year (150-200cm)
3 = 2nd year (200-300cm)
4 = 3rd year (300-400cm)
5 = 4th year (400-500cm)
6 = 5th year (500-600cm)
7 = 6th year (600-700cm)

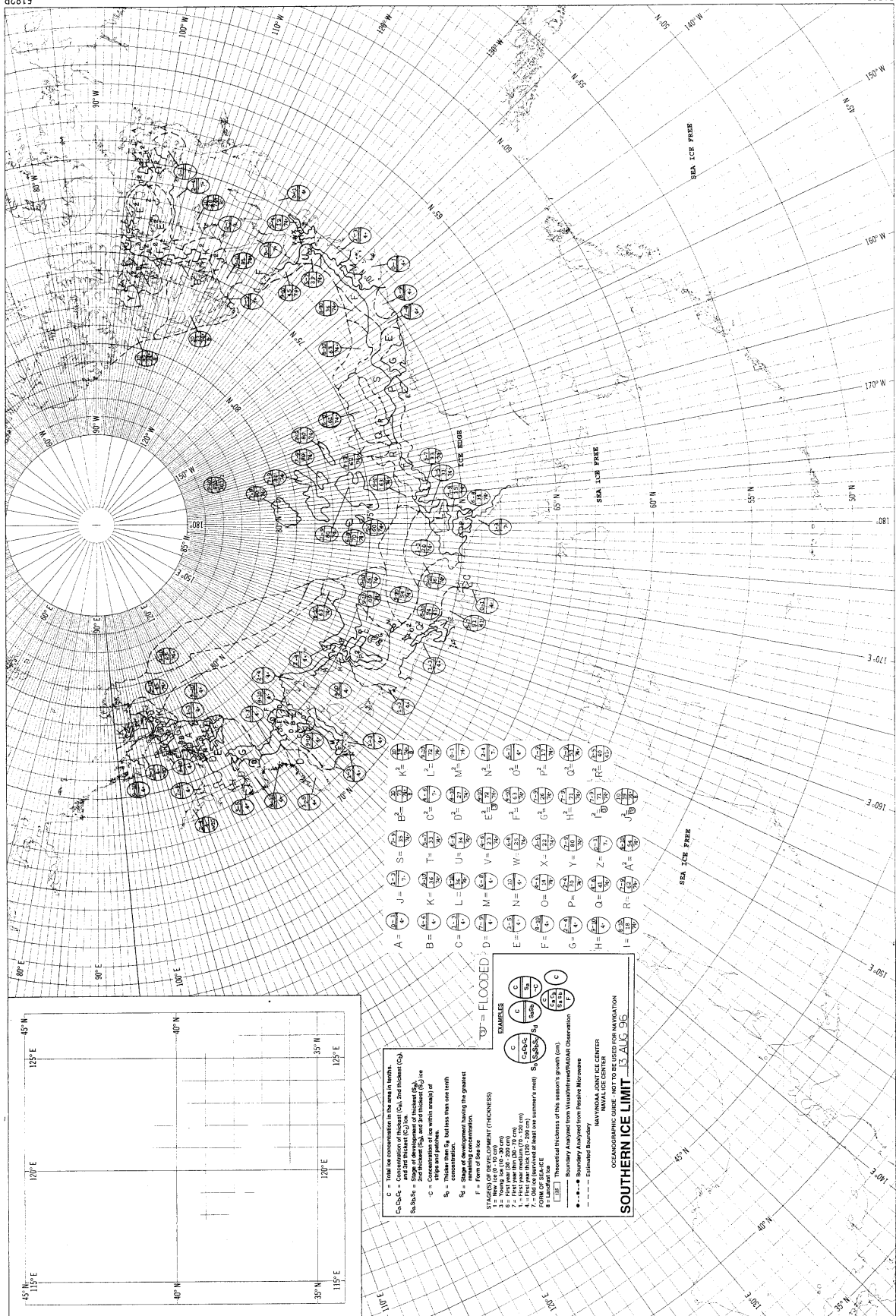
ICE THICKNESS OF THIS SEASON'S GROWTH

Boundary Analyzed from Visual/Infrared/SAR

Observation

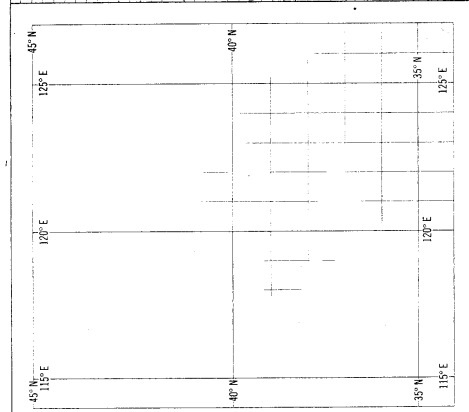
Estimated Boundary

A = $\frac{A}{1}$	B = $\frac{B}{1}$	C = $\frac{C}{1}$	D = $\frac{D}{1}$	E = $\frac{E}{1}$	F = $\frac{F}{1}$	G = $\frac{G}{1}$	H = $\frac{H}{1}$	I = $\frac{I}{1}$	J = $\frac{J}{1}$	K = $\frac{K}{1}$	L = $\frac{L}{1}$
M = $\frac{M}{1}$	N = $\frac{N}{1}$	O = $\frac{O}{1}$	P = $\frac{P}{1}$	Q = $\frac{Q}{1}$	R = $\frac{R}{1}$	S = $\frac{S}{1}$	T = $\frac{T}{1}$	U = $\frac{U}{1}$	V = $\frac{V}{1}$	W = $\frac{W}{1}$	X = $\frac{X}{1}$
Y = $\frac{Y}{1}$	Z = $\frac{Z}{1}$	1 = $\frac{1}{1}$	2 = $\frac{2}{1}$	3 = $\frac{3}{1}$	4 = $\frac{4}{1}$	5 = $\frac{5}{1}$	6 = $\frac{6}{1}$	7 = $\frac{7}{1}$	8 = $\frac{8}{1}$	9 = $\frac{9}{1}$	0 = $\frac{0}{1}$



Plotting Machine Projection
Scale 1:500,000

Vertical Datum: Mean Sea Level
Horizontal Datum: Greenwich Mean Time



A = $\frac{1}{2}$	B = $\frac{1}{4}$	C = $\frac{1}{8}$	D = $\frac{1}{16}$	E = $\frac{1}{32}$	F = $\frac{1}{64}$	G = $\frac{1}{128}$	H = $\frac{1}{256}$	I = $\frac{1}{512}$	J = $\frac{1}{1024}$	K = $\frac{1}{2048}$	L = $\frac{1}{4096}$	M = $\frac{1}{8192}$	N = $\frac{1}{16384}$	O = $\frac{1}{32768}$	P = $\frac{1}{65536}$	Q = $\frac{1}{131072}$	R = $\frac{1}{262144}$	S = $\frac{1}{524288}$	T = $\frac{1}{1048576}$	U = $\frac{1}{2097152}$	V = $\frac{1}{4194304}$	W = $\frac{1}{8388608}$	X = $\frac{1}{16777216}$	Y = $\frac{1}{33554432}$	Z = $\frac{1}{67108864}$	A = $\frac{1}{134217728}$
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EXAMPLES

$\frac{1}{8}$ $\frac{1}{16}$ $\frac{1}{32}$ $\frac{1}{64}$ $\frac{1}{128}$ $\frac{1}{256}$ $\frac{1}{512}$ $\frac{1}{1024}$ $\frac{1}{2048}$ $\frac{1}{4096}$ $\frac{1}{8192}$ $\frac{1}{16384}$ $\frac{1}{32768}$ $\frac{1}{65536}$ $\frac{1}{131072}$ $\frac{1}{262144}$ $\frac{1}{524288}$ $\frac{1}{1048576}$ $\frac{1}{2097152}$ $\frac{1}{4194304}$ $\frac{1}{8388608}$ $\frac{1}{16777216}$ $\frac{1}{33554432}$ $\frac{1}{67108864}$ $\frac{1}{134217728}$

LEGEND

- Boundary Analyzed from Visual/Infrared Observation
- Estimated Boundary
- • • • • MAYNARD POINT ICE CENTER
- ○ ○ ○ ○ NYAL ICE CENTER

SOUTHERN ICE LIMIT IS AUG 96

ICE CONCENTRATION

- C = Total ice concentration in the area of frame.
- C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂) and 3rd thickest (C₃) ice.
- S₁S₂S₃ = Size of thickest (S₁), 2nd thickest (S₂) and 3rd thickest (S₃) ice.
- C = Ice concentration with areas of dense and pack ice.
- S₁ = Thicker than S₂, but less than one sixth concentration.
- S₂ = Thicker than S₃, but less than one sixth concentration.
- S₃ = remaining concentration.
- F = Form of ice.

FORM OF ICE

- 1 = New ice (0 - 10 cm) (THICKNESS)
- 2 = First year (10 - 200 cm)
- 3 = Second year (20 - 200 cm)
- 4 = Third year (20 - 200 cm)
- 5 = Fourth year (20 - 200 cm)
- 6 = Old (200+ cm) (at least one summer's melt)
- S₁ = 100% (at least one summer's melt)
- S₂ = 50% (at least one summer's melt)
- S₃ = 25% (at least one summer's melt)

FORM OF ICE

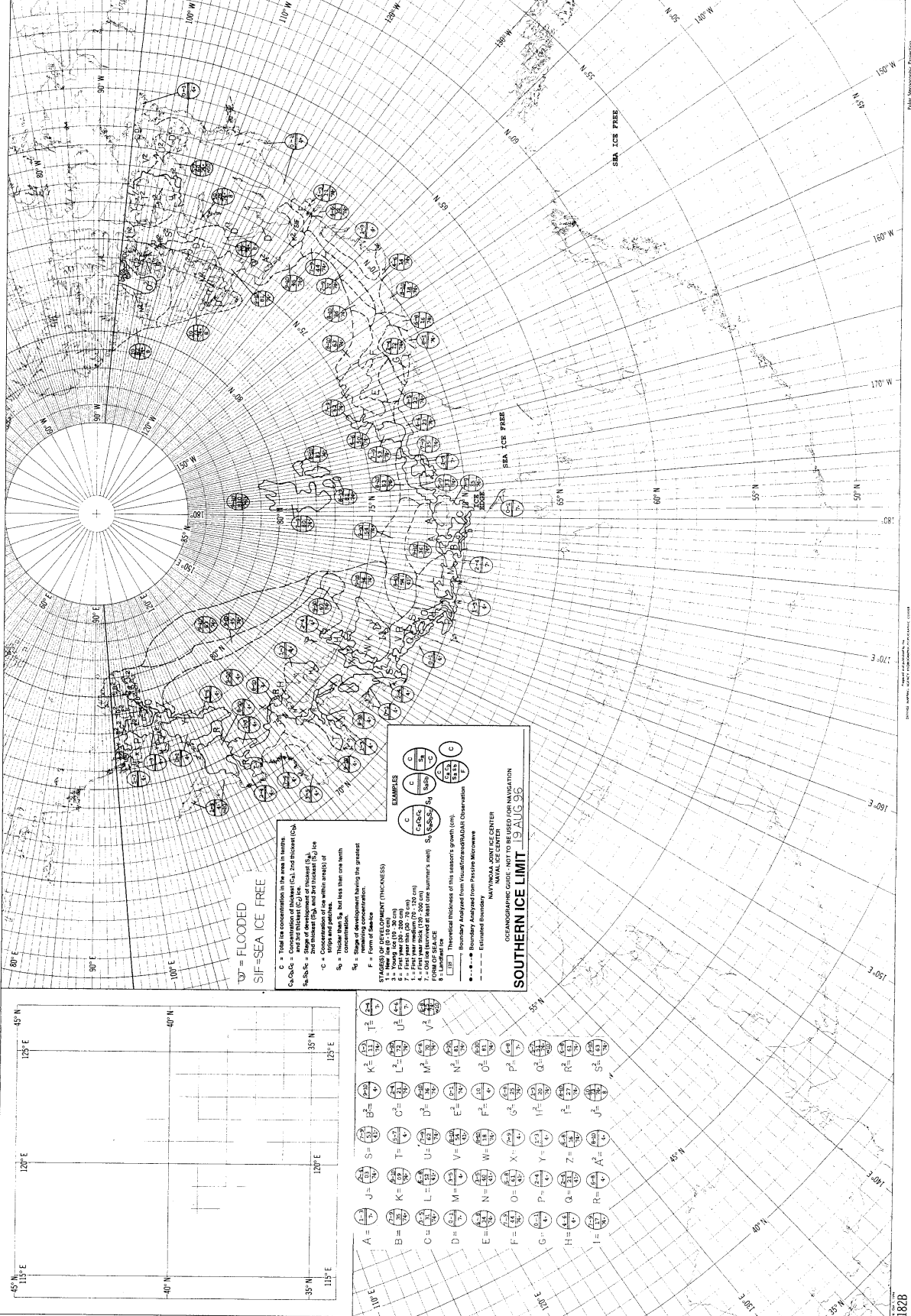
- 1 = New ice (0 - 10 cm) (THICKNESS)
- 2 = First year (10 - 200 cm)
- 3 = Second year (20 - 200 cm)
- 4 = Third year (20 - 200 cm)
- 5 = Fourth year (20 - 200 cm)
- 6 = Old (200+ cm) (at least one summer's melt)
- S₁ = 100% (at least one summer's melt)
- S₂ = 50% (at least one summer's melt)
- S₃ = 25% (at least one summer's melt)

ICE CONCENTRATION

- C = Total ice concentration in the area of frame.
- C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂) and 3rd thickest (C₃) ice.
- S₁S₂S₃ = Size of thickest (S₁), 2nd thickest (S₂) and 3rd thickest (S₃) ice.
- C = Ice concentration with areas of dense and pack ice.
- S₁ = Thicker than S₂, but less than one sixth concentration.
- S₂ = Thicker than S₃, but less than one sixth concentration.
- S₃ = remaining concentration.
- F = Form of ice.

FORM OF ICE

- 1 = New ice (0 - 10 cm) (THICKNESS)
- 2 = First year (10 - 200 cm)
- 3 = Second year (20 - 200 cm)
- 4 = Third year (20 - 200 cm)
- 5 = Fourth year (20 - 200 cm)
- 6 = Old (200+ cm) (at least one summer's melt)
- S₁ = 100% (at least one summer's melt)
- S₂ = 50% (at least one summer's melt)
- S₃ = 25% (at least one summer's melt)



10° = FLOODED
SIF = SEA ICE FREE

C = Total ice concentration in the area in terms of thickness (C₁, C₂, C₃)
 C₁C₂C₃ = Concentration of thickest ice, 2nd thickest (C₂) and thickest (C₃)
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
 C = Ice concentration in terms of area (C₁)
 S = Stage and patches

S₁ = Thickest ice, but less than one with
 S₂ = Stage of development having the greatest amount of concentration
 S₃ = Stage of development having the least amount of concentration

STAGES OF DEVELOPMENT (THICKNESS)

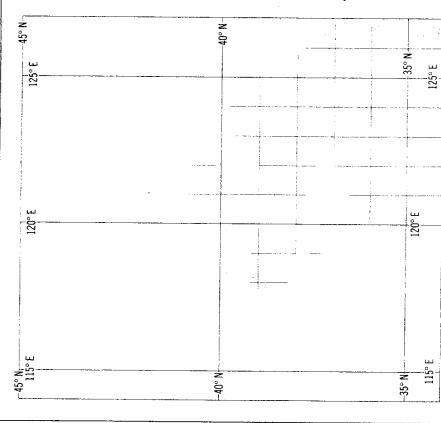
F = First year (0 - 100 cm)
 1 = First year (10 - 200 cm)
 2 = First year (20 - 300 cm)
 3 = First year (30 - 400 cm)
 4 = First year medium (70 - 100 cm)
 5 = Old ice (formed at least one summer, melt)
 6 = Old ice (formed at least one summer, melt)
 7 = Landfast ice

[C] = Theoretical thickness of this season's growth (cm)
 [S] = Boundary analyzed from VISUAL/INSTRUMENTAL Observation
 [---] = Estimated boundary
 [---] = Boundary analyzed from Passive Microwaves

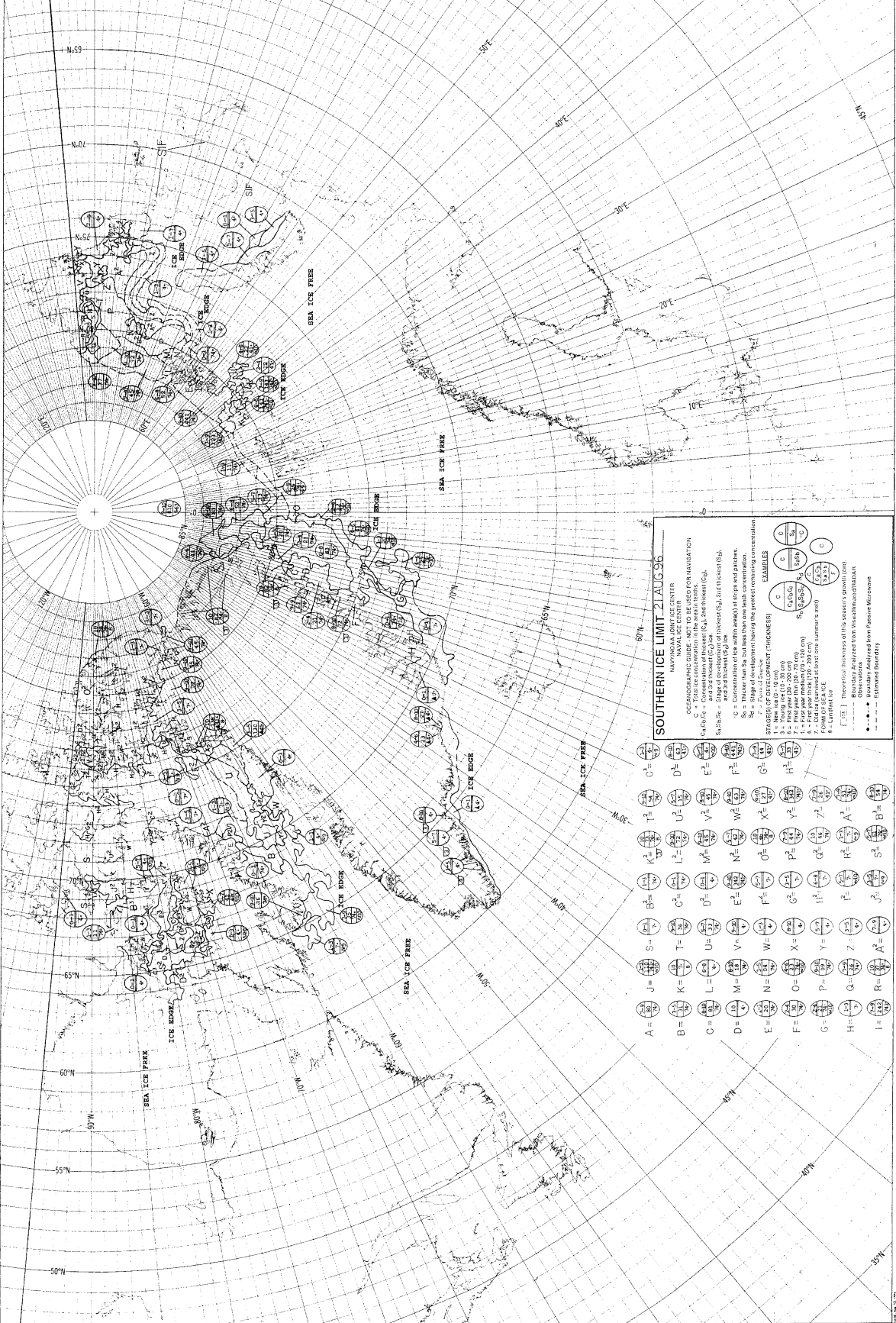
OCEANOGRAPHIC DATA CENTER
 NAVAL ICE CENTER
 NAVY/NOAA JOINT CENTER
 SOUTHERN ICE LIMIT 1949-50

EXAMPLES

C	C	C	C
100	100	100	100
100	100	100	100
100	100	100	100



A = $\frac{100}{100}$	J = $\frac{100}{100}$	S = $\frac{100}{100}$	T = $\frac{100}{100}$	U = $\frac{100}{100}$	V = $\frac{100}{100}$	W = $\frac{100}{100}$	X = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$
B = $\frac{100}{100}$	K = $\frac{100}{100}$	T = $\frac{100}{100}$	U = $\frac{100}{100}$	V = $\frac{100}{100}$	W = $\frac{100}{100}$	X = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$
C = $\frac{100}{100}$	L = $\frac{100}{100}$	U = $\frac{100}{100}$	V = $\frac{100}{100}$	W = $\frac{100}{100}$	X = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$
D = $\frac{100}{100}$	M = $\frac{100}{100}$	V = $\frac{100}{100}$	W = $\frac{100}{100}$	X = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$
E = $\frac{100}{100}$	N = $\frac{100}{100}$	W = $\frac{100}{100}$	X = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$
F = $\frac{100}{100}$	O = $\frac{100}{100}$	X = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$
G = $\frac{100}{100}$	P = $\frac{100}{100}$	Y = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$
H = $\frac{100}{100}$	Q = $\frac{100}{100}$	Z = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$
I = $\frac{100}{100}$	R = $\frac{100}{100}$	A = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$	S = $\frac{100}{100}$



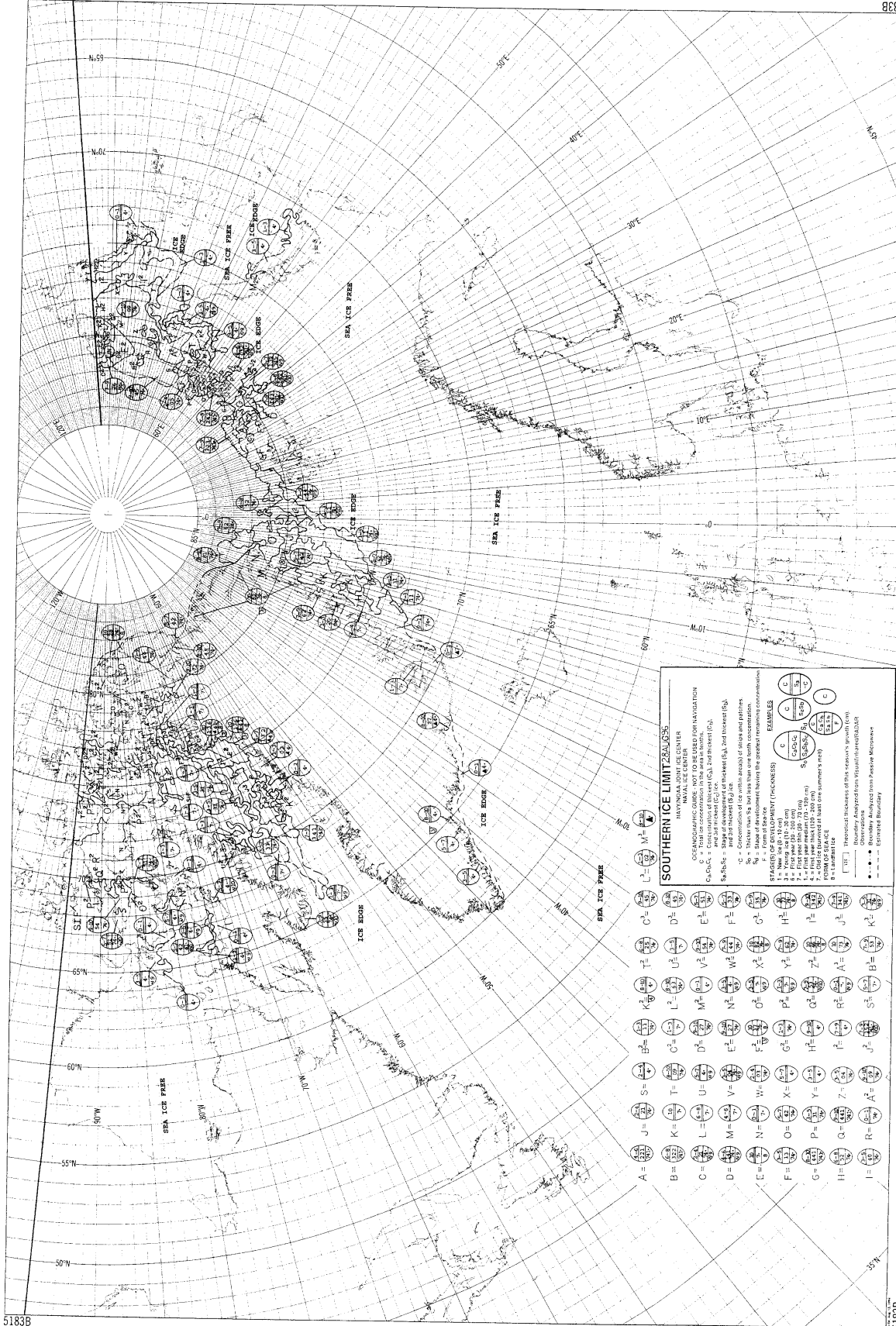
SOUTHERN ICE LIMIT 21 AUG 56
 NAVAL ICE CENTER

ICE SYMBOLS:
 C = Concentration of ice
 S = Stage of development of ice
 T = Thickness of ice
 A = Age of ice

EXAMPLES:
 A-1, B-2, C-3, D-4, E-5, F-6, G-7, H-8, I-9, J-10, K-11, L-12, M-13, N-14, O-15, P-16, Q-17, R-18, S-19, T-20, U-21, V-22, W-23, X-24, Y-25, Z-26, AA-27, AB-28, AC-29, AD-30, AE-31, AF-32, AG-33, AH-34, AI-35, AJ-36, AK-37, AL-38, AM-39, AN-40, AO-41, AP-42, AQ-43, AR-44, AS-45, AT-46, AU-47, AV-48, AW-49, AX-50, AY-51, AZ-52, BA-53, BB-54, BC-55, BD-56, BE-57, BF-58, BG-59, BH-60, BI-61, BJ-62, BK-63, BL-64, BM-65, BN-66, BO-67, BP-68, BQ-69, BR-70, BS-71, BT-72, BU-73, BV-74, BW-75, BX-76, BY-77, BZ-78, CA-79, CB-80, CC-81, CD-82, CE-83, CF-84, CG-85, CH-86, CI-87, CJ-88, CK-89, CL-90, CM-91, CN-92, CO-93, CP-94, CQ-95, CR-96, CS-97, CT-98, CU-99, CV-100, CW-101, CX-102, CY-103, CZ-104, DA-105, DB-106, DC-107, DD-108, DE-109, DF-110, DG-111, DH-112, DI-113, DJ-114, DK-115, DL-116, DM-117, DN-118, DO-119, DP-120, DQ-121, DR-122, DS-123, DT-124, DU-125, DV-126, DW-127, DX-128, DY-129, DZ-130, EA-131, EB-132, EC-133, ED-134, EE-135, EF-136, EG-137, EH-138, EI-139, EJ-140, EK-141, EL-142, EM-143, EN-144, EO-145, EP-146, EQ-147, ER-148, ES-149, ET-150, EU-151, EV-152, EW-153, EX-154, EY-155, EZ-156, FA-157, FB-158, FC-159, FD-160, FE-161, FF-162, FG-163, FH-164, FI-165, FJ-166, FK-167, FL-168, FM-169, FN-170, FO-171, FP-172, FQ-173, FR-174, FS-175, FT-176, FU-177, FV-178, FW-179, FX-180, FY-181, FZ-182, GA-183, GB-184, GC-185, GD-186, GE-187, GF-188, GG-189, GH-190, GI-191, GJ-192, GK-193, GL-194, GM-195, GN-196, GO-197, GP-198, GQ-199, GR-200, GS-201, GT-202, GU-203, GV-204, GW-205, GX-206, GY-207, GZ-208, HA-209, HB-210, HC-211, HD-212, HE-213, HF-214, HG-215, HH-216, HI-217, HJ-218, HK-219, HL-220, HM-221, HN-222, HO-223, HP-224, HQ-225, HR-226, HS-227, HT-228, HU-229, HV-230, HW-231, HX-232, HY-233, HZ-234, IA-235, IB-236, IC-237, ID-238, IE-239, IF-240, IG-241, IH-242, II-243, IJ-244, IK-245, IL-246, IM-247, IN-248, IO-249, IP-250, IQ-251, IR-252, IS-253, IT-254, IU-255, IV-256, IW-257, IX-258, IY-259, IZ-260, JA-261, JB-262, JC-263, JD-264, JE-265, JF-266, JG-267, JH-268, JI-269, JJ-270, JK-271, JL-272, JM-273, JN-274, JO-275, JP-276, JQ-277, JR-278, JS-279, JT-280, JU-281, JV-282, JW-283, JX-284, JY-285, JZ-286, KA-287, KB-288, KC-289, KD-290, KE-291, KF-292, KG-293, KH-294, KI-295, KJ-296, KK-297, KL-298, KM-299, KN-300, KO-301, KP-302, KQ-303, KR-304, KS-305, KT-306, KU-307, KV-308, KW-309, KX-310, KY-311, KZ-312, LA-313, LB-314, LC-315, LD-316, LE-317, LF-318, LG-319, LH-320, LI-321, LJ-322, LK-323, LL-324, LM-325, LN-326, LO-327, LP-328, LQ-329, LR-330, LS-331, LT-332, LU-333, LV-334, LW-335, LX-336, LY-337, LZ-338, MA-339, MB-340, MC-341, MD-342, ME-343, MF-344, MG-345, MH-346, MI-347, MJ-348, MK-349, ML-350, MM-351, MN-352, MO-353, MP-354, MQ-355, MR-356, MS-357, MT-358, MU-359, MV-360, MW-361, MX-362, MY-363, MZ-364, NA-365, NB-366, NC-367, ND-368, NE-369, NF-370, NG-371, NH-372, NI-373, NJ-374, NK-375, NL-376, NM-377, NO-378, NP-379, NQ-380, NR-381, NS-382, NT-383, NU-384, NV-385, NW-386, NX-387, NY-388, NZ-389, OA-390, OB-391, OC-392, OD-393, OE-394, OF-395, OG-396, OH-397, OI-398, OJ-399, OK-400, OL-401, OM-402, ON-403, OO-404, OP-405, OQ-406, OR-407, OS-408, OT-409, OU-410, OV-411, OW-412, OX-413, OY-414, OZ-415, PA-416, PB-417, PC-418, PD-419, PE-420, PF-421, PG-422, PH-423, PI-424, PJ-425, PK-426, PL-427, PM-428, PN-429, PO-430, PP-431, PQ-432, PR-433, PS-434, PT-435, PU-436, PV-437, PW-438, PX-439, PY-440, PZ-441, QA-442, QB-443, QC-444, QD-445, QE-446, QF-447, QG-448, QH-449, QI-450, QJ-451, QK-452, QL-453, QM-454, QN-455, QO-456, QP-457, QQ-458, QR-459, QS-460, QT-461, QU-462, QV-463, QW-464, QX-465, QY-466, QZ-467, RA-468, RB-469, RC-470, RD-471, RE-472, RF-473, RG-474, RH-475, RI-476, RJ-477, RK-478, RL-479, RM-480, RN-481, RO-482, RP-483, RQ-484, RR-485, RS-486, RT-487, RU-488, RV-489, RW-490, RX-491, RY-492, RZ-493, SA-494, SB-495, SC-496, SD-497, SE-498, SF-499, SG-500, SH-501, SI-502, SJ-503, SK-504, SL-505, SM-506, SN-507, SO-508, SP-509, SQ-510, SR-511, SS-512, ST-513, SU-514, SV-515, SW-516, 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XW-642, XX-643, XY-644, XZ-645, YA-646, YB-647, YC-648, YD-649, YE-650, YF-651, YG-652, YH-653, YI-654, YJ-655, YK-656, YL-657, YM-658, YN-659, YO-660, YP-661, YQ-662, YR-663, YS-664, YT-665, YU-666, YV-667, YW-668, YX-669, YZ-670, ZA-671, ZB-672, ZC-673, ZD-674, ZE-675, ZF-676, ZG-677, ZH-678, ZI-679, ZJ-680, ZK-681, ZL-682, ZM-683, ZN-684, ZO-685, ZP-686, ZQ-687, ZR-688, ZS-689, ZT-690, ZU-691, ZV-692, ZW-693, ZX-694, ZY-695, ZZ-696

NAVAL ICE CENTER
 1957-1958

**Refer to 1996 Special Arctic
Supplement for this Chart**



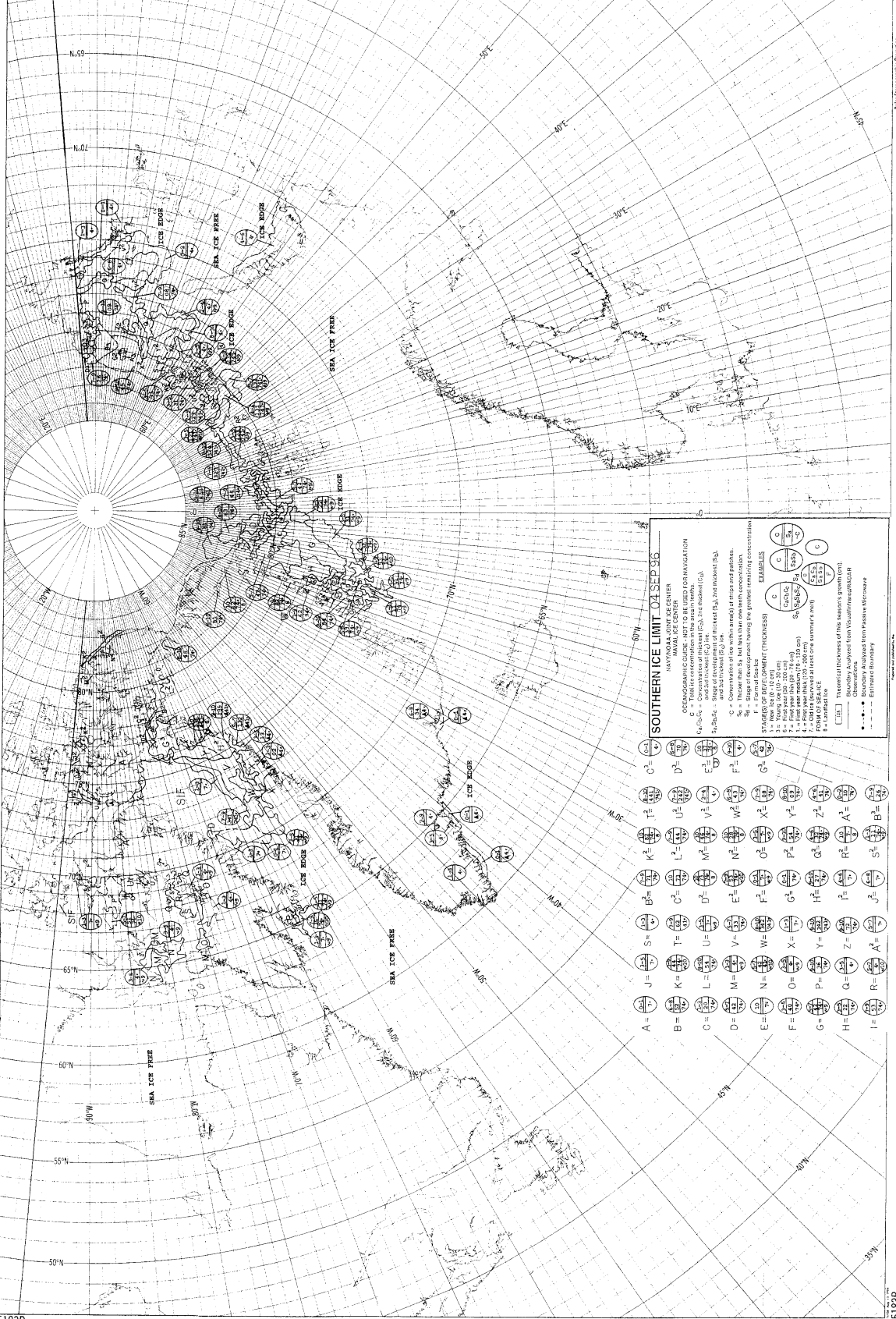
SOUTHERN ICE LIMIT 25035
 HAVING A POINT ICE CENTER
 OBSERVATIONS NOT TO BE USED FOR ASSASSINATION

C = Total ice concentration in the area in tenths
 C₁ = Ice concentration in the area in tenths
 C₂ = Ice concentration in the area in tenths
 C₃ = Ice concentration in the area in tenths

Subscripts = 1 = Ice thickness (m), 2 = Ice thickness (m), 3 = Ice thickness (m)

Examples:
 1 - 100 (100-120) 100
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 3 - 100 (100-120) 100
 4 - 100 (100-120) 100
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**Refer to 1996 Special Arctic
Supplement for this Chart**



SOUTHERN ICE LIMIT 04 SEP 56

NAVY/Joint Ice Center
NAVAL ICE CENTER

CONCENTRATIONS OF ICE IN THE ARCTIC OCEAN
 C = Total concentration in the area marked
 C₁, C₂, C₃ = Concentrations of ice in the 1st, 2nd and 3rd stages
 S, S₁, S₂, S₃ = Stages of development of ice in the 1st, 2nd and 3rd stages
 S₁, S₂, S₃ = Concentrations of ice in the 1st, 2nd and 3rd stages

STAGES OF DEVELOPMENT (THICKNESS)
 1 = New ice (10-15 cm)
 2 = First year ice (15-30 cm)
 3 = First year ice (30-70 cm)
 4 = First year ice (70-100 cm)
 5 = First year ice (100-150 cm)
 6 = First year ice (150-200 cm)
 7 = First year ice (200-300 cm)
 8 = Landfast ice

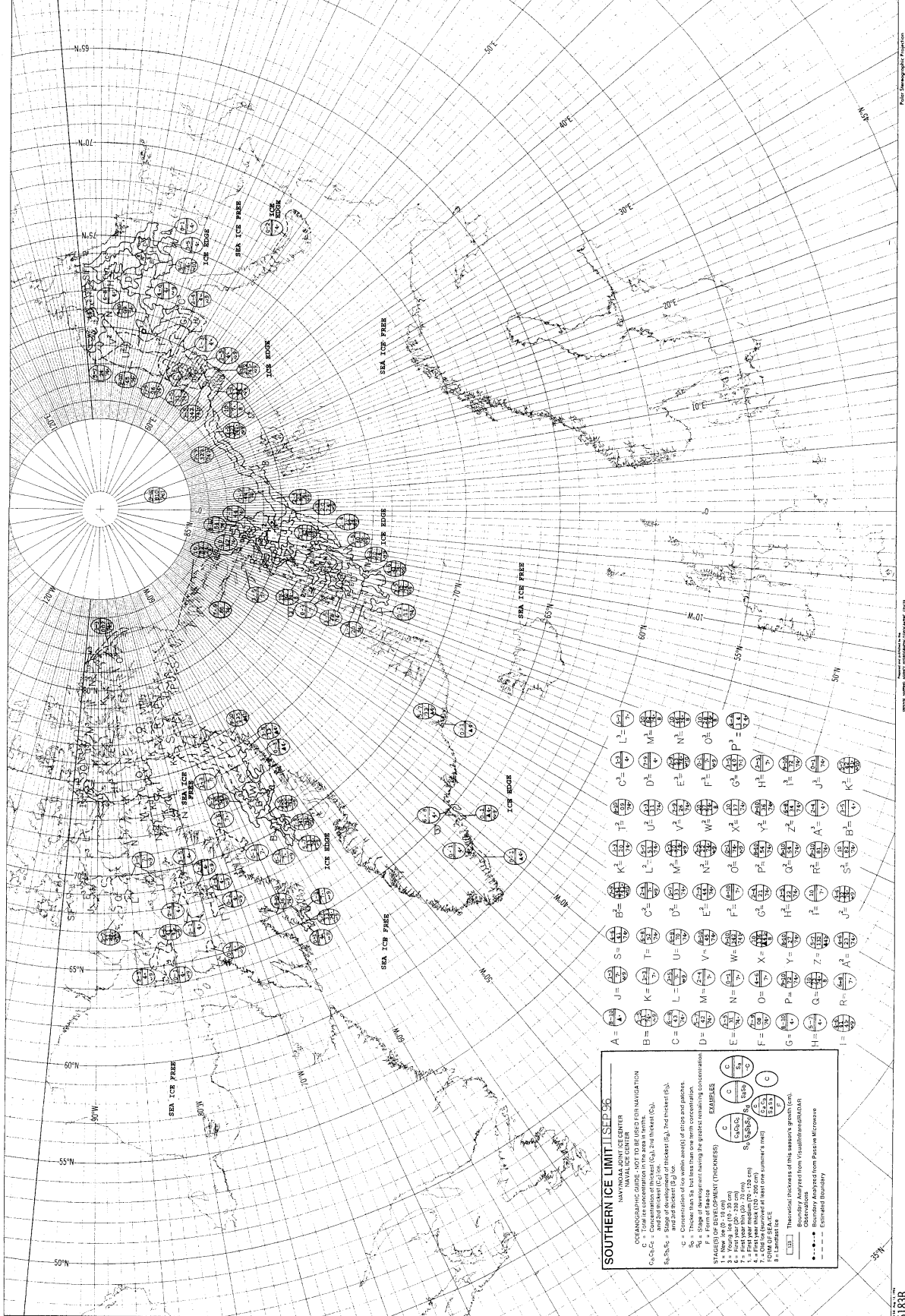
EMBLEMS
 S = Stage of development having the greatest remaining concentration
 S₁ = Stage of development having the greatest remaining concentration
 S₂ = Stage of development having the greatest remaining concentration
 S₃ = Stage of development having the greatest remaining concentration

THEORETICAL THICKNESS OF THE SEASON'S GROWTH (cm)
 1 = 10
 2 = 20
 3 = 30
 4 = 40
 5 = 50
 6 = 60
 7 = 70
 8 = 80
 9 = 90
 10 = 100

ICE TYPES
 1 = Ice
 2 = Ice
 3 = Ice
 4 = Ice
 5 = Ice
 6 = Ice
 7 = Ice
 8 = Ice
 9 = Ice
 10 = Ice

BOUNDARY
 - - - - - Estimated boundary
 - - - - - Boundary Analyzed from Passive Electronic Observations

**Refer to 1996 Special Arctic
Supplement for this Chart**



SOUTHERN ICE LIMIT (SIP) 30

NAVY/NOAA JOINT ICE CENTER
NAVAL ICE CENTER

SYMBOLS:
 C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of first (C₁), second (C₂), and third (C₃) ice thicknesses.
 S₁S₂S₃ = Stage of development of thickest (S₁), first thickest (S₂), and second thickest (S₃) ice.
 C = Concentration of ice within several of stages and patterns.
 P = Stage of development having the greatest remaining concentration.
 T = Thicker than 30, but less than one tenth concentration.

STAGES OF DEVELOPMENT (THICKNESS)

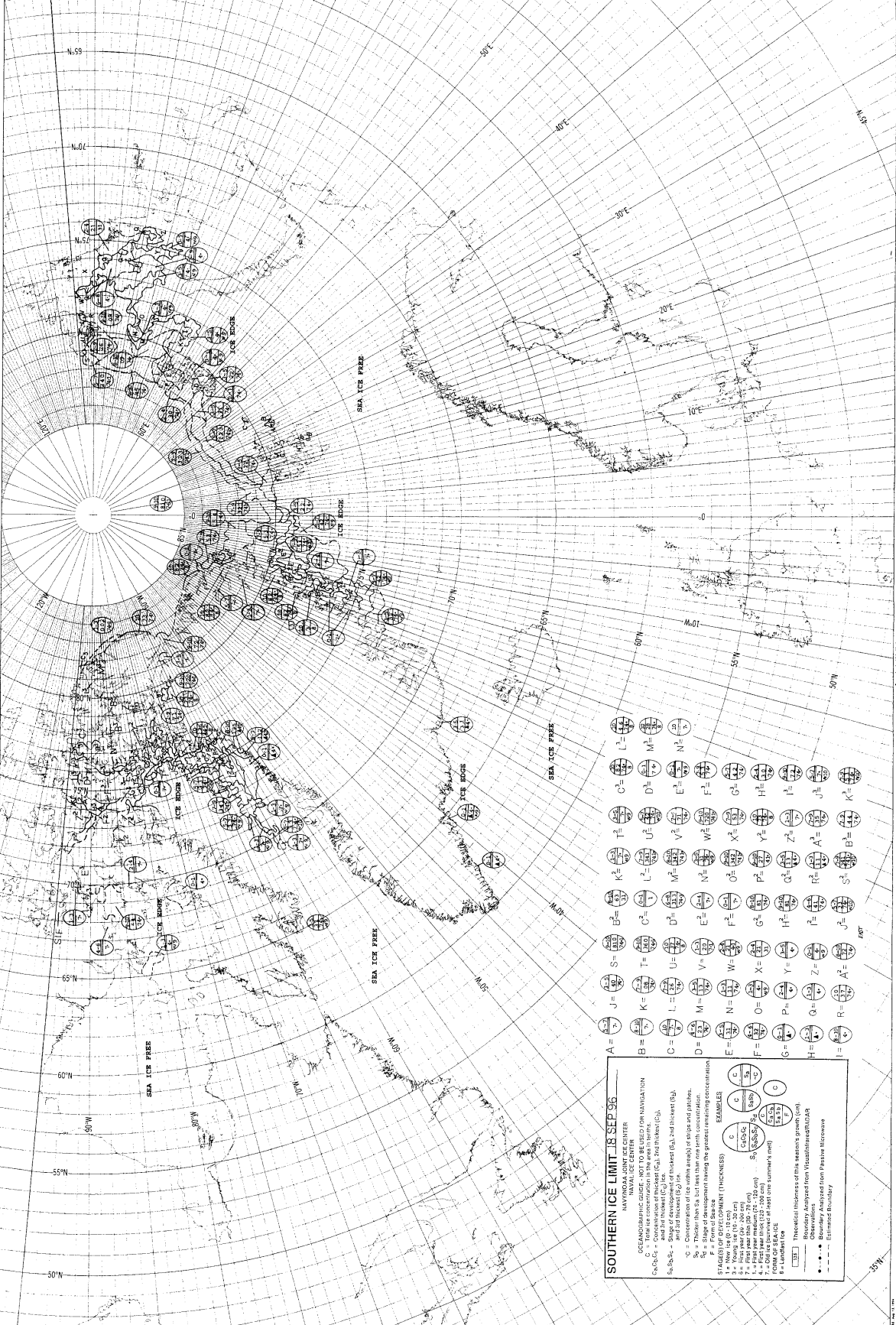
EXAMPLES: $\frac{C}{S_1 S_2 S_3}$, $\frac{C}{S_1 S_2}$, $\frac{C}{S_1 S_3}$, $\frac{C}{S_2 S_3}$, $\frac{C}{S_1}$, $\frac{C}{S_2}$, $\frac{C}{S_3}$, $\frac{C}{S_1 S_2 S_3}$

1 = First year maximum (20-100 cm)
 2 = Second year maximum (100-200 cm)
 3 = Third year maximum (200-300 cm)
 4 = First year minimum (10-20 cm)
 5 = Second year minimum (20-30 cm)
 6 = Third year minimum (30-40 cm)
 7 = Observed maximum at least one summer's span
 8 = Estimated maximum
 9 = Landfast ice

BOUNDARIES:
 ———— Boundary Analyzed from Visual Observations
 - - - - - Boundary Analyzed from Radar Microwave
 - - - - - Estimated Boundary

- A = $\frac{A}{1}$
- B = $\frac{B}{1}$
- C = $\frac{C}{1}$
- D = $\frac{D}{1}$
- E = $\frac{E}{1}$
- F = $\frac{F}{1}$
- G = $\frac{G}{1}$
- H = $\frac{H}{1}$
- I = $\frac{I}{1}$
- J = $\frac{J}{1}$
- K = $\frac{K}{1}$
- L = $\frac{L}{1}$
- M = $\frac{M}{1}$
- N = $\frac{N}{1}$
- O = $\frac{O}{1}$
- P = $\frac{P}{1}$
- Q = $\frac{Q}{1}$
- R = $\frac{R}{1}$
- S = $\frac{S}{1}$
- T = $\frac{T}{1}$
- U = $\frac{U}{1}$
- V = $\frac{V}{1}$
- W = $\frac{W}{1}$
- X = $\frac{X}{1}$
- Y = $\frac{Y}{1}$
- Z = $\frac{Z}{1}$
- A² = $\frac{A^2}{1}$
- B² = $\frac{B^2}{1}$
- C² = $\frac{C^2}{1}$
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- E² = $\frac{E^2}{1}$
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- H² = $\frac{H^2}{1}$
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- J² = $\frac{J^2}{1}$
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- L² = $\frac{L^2}{1}$
- M² = $\frac{M^2}{1}$
- N² = $\frac{N^2}{1}$
- O² = $\frac{O^2}{1}$
- P² = $\frac{P^2}{1}$
- Q² = $\frac{Q^2}{1}$
- R² = $\frac{R^2}{1}$
- S² = $\frac{S^2}{1}$
- T² = $\frac{T^2}{1}$
- U² = $\frac{U^2}{1}$
- V² = $\frac{V^2}{1}$
- W² = $\frac{W^2}{1}$
- X² = $\frac{X^2}{1}$
- Y² = $\frac{Y^2}{1}$
- Z² = $\frac{Z^2}{1}$
- A³ = $\frac{A^3}{1}$
- B³ = $\frac{B^3}{1}$
- C³ = $\frac{C^3}{1}$
- D³ = $\frac{D^3}{1}$
- E³ = $\frac{E^3}{1}$
- F³ = $\frac{F^3}{1}$
- G³ = $\frac{G^3}{1}$
- H³ = $\frac{H^3}{1}$
- I³ = $\frac{I^3}{1}$
- J³ = $\frac{J^3}{1}$
- K³ = $\frac{K^3}{1}$
- L³ = $\frac{L^3}{1}$
- M³ = $\frac{M^3}{1}$
- N³ = $\frac{N^3}{1}$
- O³ = $\frac{O^3}{1}$
- P³ = $\frac{P^3}{1}$

**Refer to 1996 Special Arctic
Supplement for this Chart**



SOUTHERN ICE LIMIT 18 SEP 56
 NAVAL ICE CENTER

ICE STAGE: NOT TO BE USED FOR NAVIGATION
 C = Thickness of ice (cm)
 C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
 C = Thicker than S₁ but less than open water
 S₁ = Stage of development having the greatest remaining concentration

STAGES OF DEVELOPMENT (THICKNESS)

1 = New ice (0-15 cm)	4 = 4th year (200-300 cm)
2 = 2nd year (15-20 cm)	5 = 5th year (300-400 cm)
3 = 3rd year (20-25 cm)	6 = 6th year (400-500 cm)
4 = 4th year (25-30 cm)	7 = Old ice (over 500 cm)

BOUNDARY OF SEA ICE

— Theoretical thickness of this season, based on
 Boundary assigned from Visual/IR/MSR
 Observations
 ••••• Lead from Passive Microwave
 - - - - - Estimated Boundary

A = $\frac{A}{A}$	B = $\frac{B}{B}$	C = $\frac{C}{C}$	D = $\frac{D}{D}$	E = $\frac{E}{E}$	F = $\frac{F}{F}$	G = $\frac{G}{G}$	H = $\frac{H}{H}$	I = $\frac{I}{I}$	J = $\frac{J}{J}$	K = $\frac{K}{K}$	L = $\frac{L}{L}$	M = $\frac{M}{M}$	N = $\frac{N}{N}$	O = $\frac{O}{O}$	P = $\frac{P}{P}$	Q = $\frac{Q}{Q}$	R = $\frac{R}{R}$	S = $\frac{S}{S}$	T = $\frac{T}{T}$	U = $\frac{U}{U}$	V = $\frac{V}{V}$	W = $\frac{W}{W}$	X = $\frac{X}{X}$	Y = $\frac{Y}{Y}$	Z = $\frac{Z}{Z}$	A ¹ = $\frac{A^1}{A^1}$	B ² = $\frac{B^2}{B^2}$	C ³ = $\frac{C^3}{C^3}$	D ⁴ = $\frac{D^4}{D^4}$	E ⁵ = $\frac{E^5}{E^5}$	F ⁶ = $\frac{F^6}{F^6}$	G ⁷ = $\frac{G^7}{G^7}$	H ⁸ = $\frac{H^8}{H^8}$	I ⁹ = $\frac{I^9}{I^9}$	J ¹⁰ = $\frac{J^{10}}{J^{10}}$	K ¹¹ = $\frac{K^{11}}{K^{11}}$	L ¹² = $\frac{L^{12}}{L^{12}}$	M ¹³ = $\frac{M^{13}}{M^{13}}$	N ¹⁴ = $\frac{N^{14}}{N^{14}}$	O ¹⁵ = $\frac{O^{15}}{O^{15}}$	P ¹⁶ = $\frac{P^{16}}{P^{16}}$	Q ¹⁷ = $\frac{Q^{17}}{Q^{17}}$	R ¹⁸ = $\frac{R^{18}}{R^{18}}$	S ¹⁹ = $\frac{S^{19}}{S^{19}}$	T ²⁰ = $\frac{T^{20}}{T^{20}}$	U ²¹ = $\frac{U^{21}}{U^{21}}$	V ²² = $\frac{V^{22}}{V^{22}}$	W ²³ = $\frac{W^{23}}{W^{23}}$	X ²⁴ = $\frac{X^{24}}{X^{24}}$	Y ²⁵ = $\frac{Y^{25}}{Y^{25}}$	Z ²⁶ = $\frac{Z^{26}}{Z^{26}}$	A ²⁷ = $\frac{A^{27}}{A^{27}}$	B ²⁸ = $\frac{B^{28}}{B^{28}}$	C ²⁹ = $\frac{C^{29}}{C^{29}}$	D ³⁰ = $\frac{D^{30}}{D^{30}}$	E ³¹ = $\frac{E^{31}}{E^{31}}$	F ³² = $\frac{F^{32}}{F^{32}}$	G ³³ = $\frac{G^{33}}{G^{33}}$	H ³⁴ = $\frac{H^{34}}{H^{34}}$	I ³⁵ = $\frac{I^{35}}{I^{35}}$	J ³⁶ = $\frac{J^{36}}{J^{36}}$	K ³⁷ = $\frac{K^{37}}{K^{37}}$	L ³⁸ = $\frac{L^{38}}{L^{38}}$	M ³⁹ = $\frac{M^{39}}{M^{39}}$	N ⁴⁰ = $\frac{N^{40}}{N^{40}}$	O ⁴¹ = $\frac{O^{41}}{O^{41}}$	P ⁴² = $\frac{P^{42}}{P^{42}}$	Q ⁴³ = $\frac{Q^{43}}{Q^{43}}$	R ⁴⁴ = $\frac{R^{44}}{R^{44}}$	S ⁴⁵ = $\frac{S^{45}}{S^{45}}$	T ⁴⁶ = $\frac{T^{46}}{T^{46}}$	U ⁴⁷ = $\frac{U^{47}}{U^{47}}$	V ⁴⁸ = $\frac{V^{48}}{V^{48}}$	W ⁴⁹ = $\frac{W^{49}}{W^{49}}$	X ⁵⁰ = $\frac{X^{50}}{X^{50}}$	Y ⁵¹ = $\frac{Y^{51}}{Y^{51}}$	Z ⁵² = $\frac{Z^{52}}{Z^{52}}$	A ⁵³ = $\frac{A^{53}}{A^{53}}$	B ⁵⁴ = $\frac{B^{54}}{B^{54}}$	C ⁵⁵ = $\frac{C^{55}}{C^{55}}$	D ⁵⁶ = $\frac{D^{56}}{D^{56}}$	E ⁵⁷ = $\frac{E^{57}}{E^{57}}$	F ⁵⁸ = $\frac{F^{58}}{F^{58}}$	G ⁵⁹ = $\frac{G^{59}}{G^{59}}$	H ⁶⁰ = $\frac{H^{60}}{H^{60}}$	I ⁶¹ = $\frac{I^{61}}{I^{61}}$	J ⁶² = $\frac{J^{62}}{J^{62}}$	K ⁶³ = $\frac{K^{63}}{K^{63}}$	L ⁶⁴ = $\frac{L^{64}}{L^{64}}$	M ⁶⁵ = $\frac{M^{65}}{M^{65}}$	N ⁶⁶ = $\frac{N^{66}}{N^{66}}$	O ⁶⁷ = $\frac{O^{67}}{O^{67}}$	P ⁶⁸ = $\frac{P^{68}}{P^{68}}$	Q ⁶⁹ = $\frac{Q^{69}}{Q^{69}}$	R ⁷⁰ = $\frac{R^{70}}{R^{70}}$	S ⁷¹ = $\frac{S^{71}}{S^{71}}$	T ⁷² = $\frac{T^{72}}{T^{72}}$	U ⁷³ = $\frac{U^{73}}{U^{73}}$	V ⁷⁴ = $\frac{V^{74}}{V^{74}}$	W ⁷⁵ = $\frac{W^{75}}{W^{75}}$	X ⁷⁶ = $\frac{X^{76}}{X^{76}}$	Y ⁷⁷ = $\frac{Y^{77}}{Y^{77}}$	Z ⁷⁸ = $\frac{Z^{78}}{Z^{78}}$	A ⁷⁹ = $\frac{A^{79}}{A^{79}}$	B ⁸⁰ = $\frac{B^{80}}{B^{80}}$	C ⁸¹ = $\frac{C^{81}}{C^{81}}$	D ⁸² = $\frac{D^{82}}{D^{82}}$	E ⁸³ = $\frac{E^{83}}{E^{83}}$	F ⁸⁴ = $\frac{F^{84}}{F^{84}}$	G ⁸⁵ = $\frac{G^{85}}{G^{85}}$	H ⁸⁶ = $\frac{H^{86}}{H^{86}}$	I ⁸⁷ = $\frac{I^{87}}{I^{87}}$	J ⁸⁸ = $\frac{J^{88}}{J^{88}}$	K ⁸⁹ = $\frac{K^{89}}{K^{89}}$	L ⁹⁰ = $\frac{L^{90}}{L^{90}}$	M ⁹¹ = $\frac{M^{91}}{M^{91}}$	N ⁹² = $\frac{N^{92}}{N^{92}}$	O ⁹³ = $\frac{O^{93}}{O^{93}}$	P ⁹⁴ = $\frac{P^{94}}{P^{94}}$	Q ⁹⁵ = $\frac{Q^{95}}{Q^{95}}$	R ⁹⁶ = $\frac{R^{96}}{R^{96}}$	S ⁹⁷ = $\frac{S^{97}}{S^{97}}$	T ⁹⁸ = $\frac{T^{98}}{T^{98}}$	U ⁹⁹ = $\frac{U^{99}}{U^{99}}$	V ¹⁰⁰ = $\frac{V^{100}}{V^{100}}$
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**Refer to 1996 Special Arctic
Supplement for this Chart**

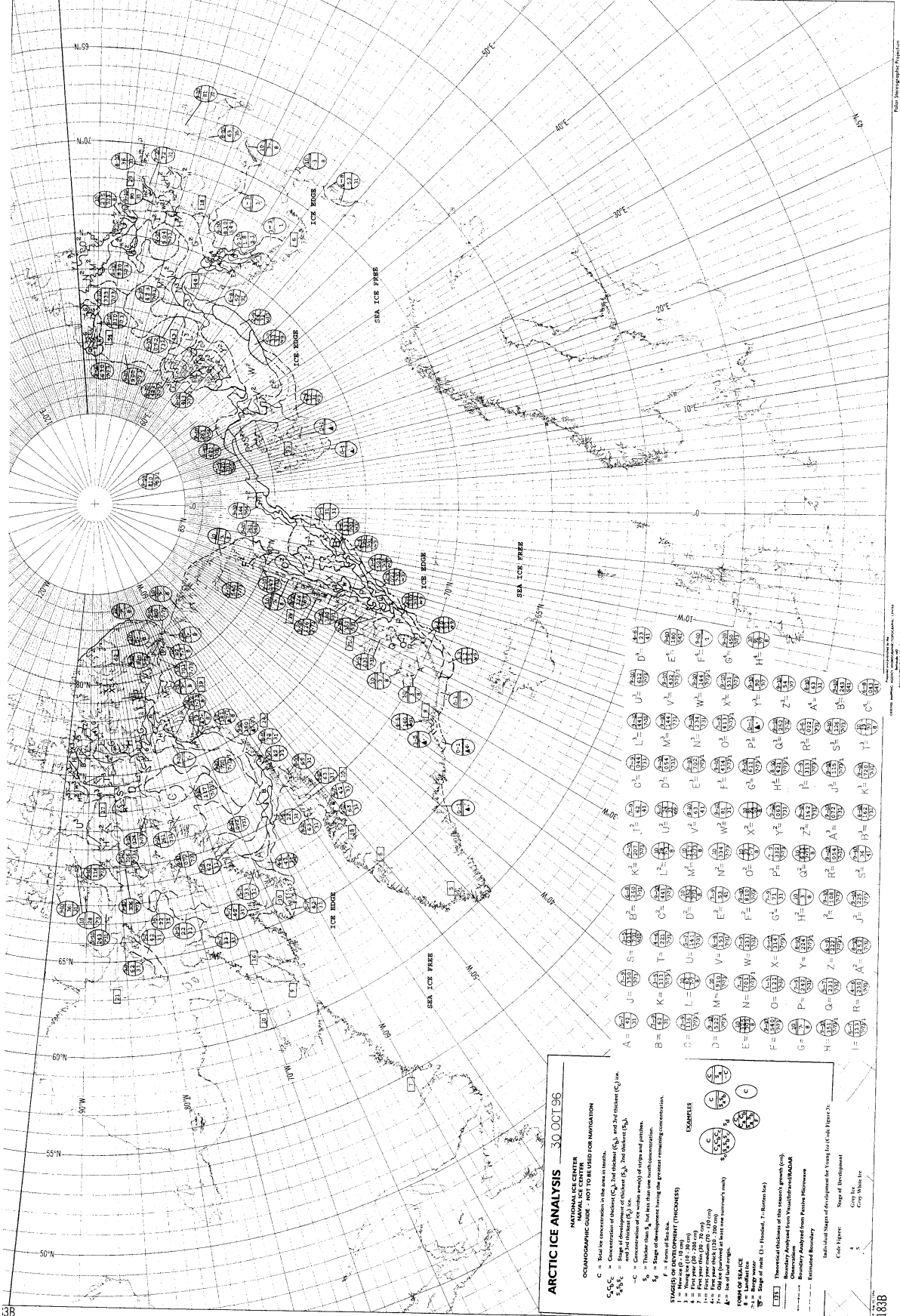
**Refer to 1996 Special Arctic
Supplement for this Chart**

**Refer to 1996 Special Arctic
Supplement for this Chart**

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ARCTIC ICE ANALYSIS 30 OCT 96

NATIONAL ICE CENTER
NAVAL ICE CENTER
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in tenths.
 C₁, C₂, C₃ = Concentrations of ice thickness (C₁) and thickness (C₂) and thickness (C₃) in tenths.
 S₁, S₂, S₃ = Stages of development (S₁) and thickness (S₂) and thickness (S₃) in tenths.
 C = Concentration of ice within area(s) of origin and patches.
 S₁ = Stage of development, tenths, using the greater remaining concentration.
 F = Form of ice.
 F = Form of ice.

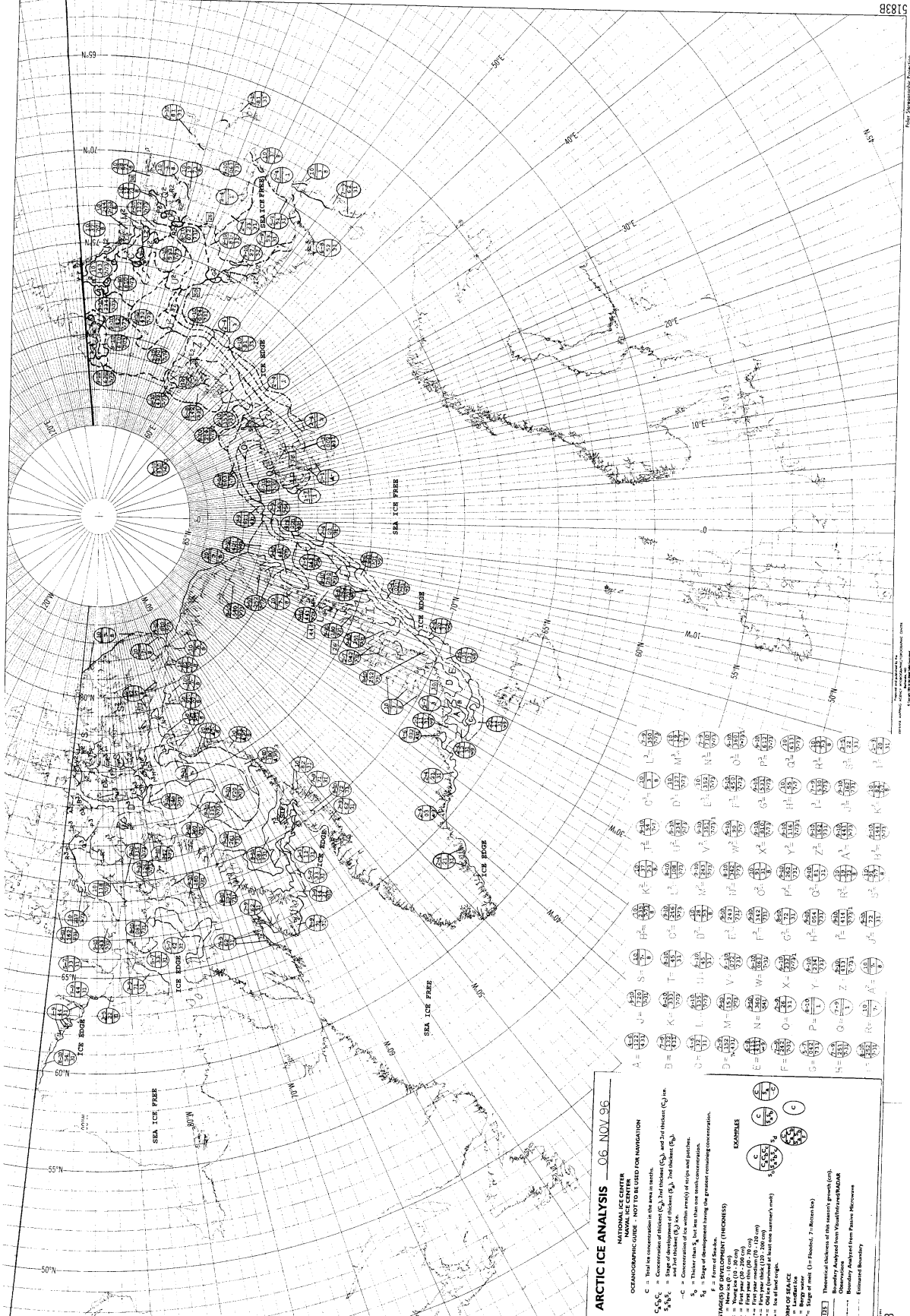
RANGES OF DEVELOPMENT (THICKNESS)
 1 = Young ice (0 - 20 cm)
 2 = First year ice (20 - 25 cm)
 3 = First year ice (25 - 30 cm)
 4 = First year ice (30 - 35 cm)
 5 = First year ice (35 - 40 cm)
 A = Ice of unknown or less than one summer's melt

FORMS OF ICE
 A = Landfast ice
 B = Edge of melt (3 = floes, 1 = Berms (ice))
 C = Theoretical thickness of ice, assuming growth (cm).
 D = Boundary Analyzed from Visual Observations
 E = Estimated Boundary
 F = Estimated Boundary

Individual Stages of Development for Young Ice (C₁ & S₁)
 Cook Open: Stage of Development
 Cook Melt: Stage of Development
 Cook Water for

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	IJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	IJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	IJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	IJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	IJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	IJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	IJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	IJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	IJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	IJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	XG	XH	XI	IJ	XK	XL	XM	XN	XO	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI	IJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	IJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	IJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	IJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	IJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	IJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	IJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	IJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	IJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	IJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	IJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	IJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	IJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	IJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	IJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	XG	XH	XI	IJ	XK	XL	XM	XN	XO	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI	IJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	IJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	IJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	IJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	IJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	KL	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	IJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	IJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	IJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	IJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	IJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	IJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	IJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	IJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	IJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	IJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	XG	XH	XI	IJ	XK	XL	XM	XN	XO	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI	IJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	IJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	Z
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Refer to 1996 Special Arctic
Supplement for this Chart



ARCTIC ICE ANALYSIS 06. NOV. 96

NATIONAL ICE CENTER
SYMBOLIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in tenths
C₁C₂C₃ = Concentration of thickness (C₁), 2nd thickness (C₂), and 3rd thickness (C₃) in tenths
S₁S₂S₃ = Stages of development of thickness (S₁), 2nd thickness (S₂), and 3rd thickness (S₃) in tenths
 - **C** = Concentration of ice within area(s) of ship and patches
S₁ = Thicker than S₂ but less than one tenth concentration
S₂ = Stage of development being the greatest remaining concentration

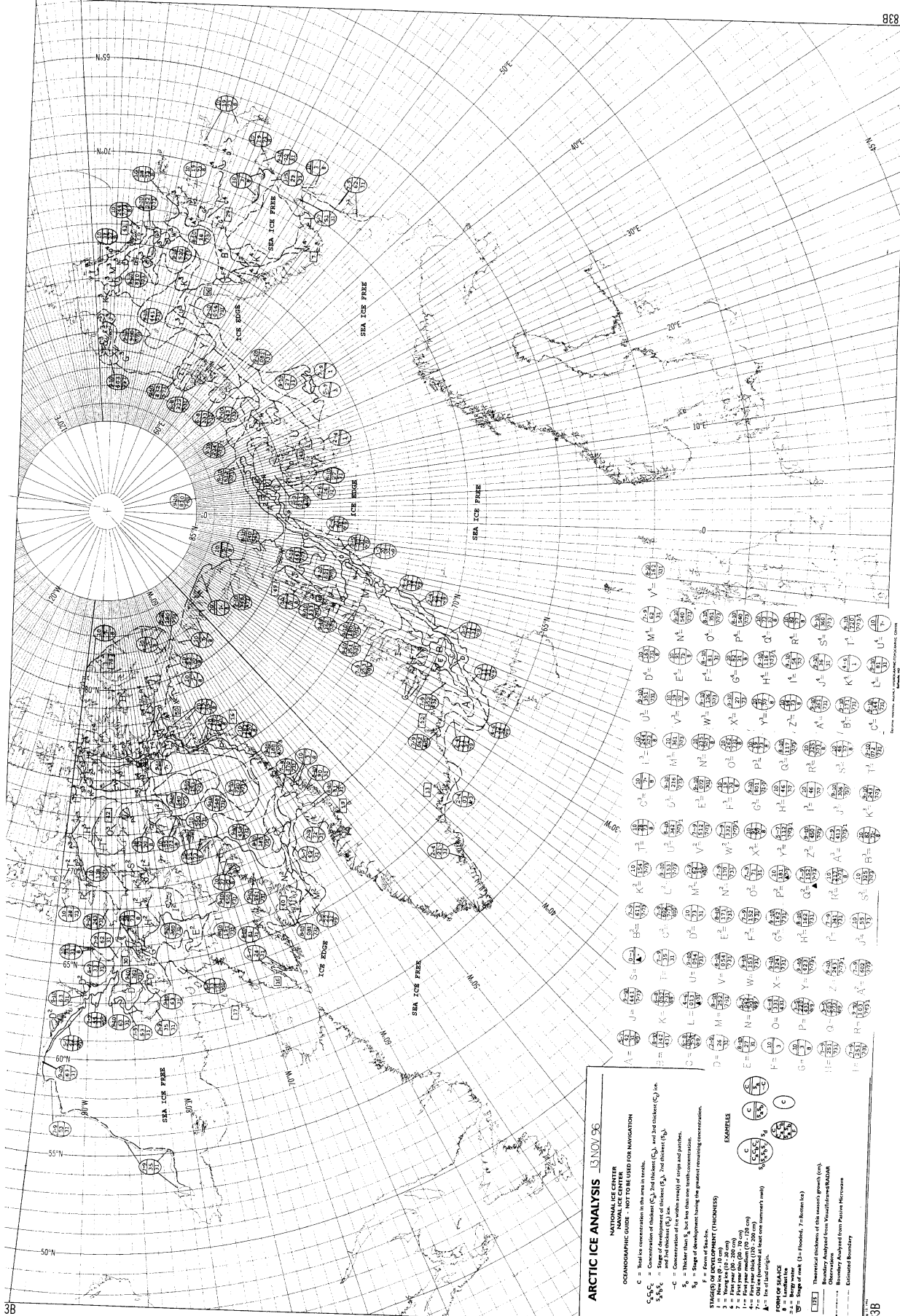
STAGES OF DEVELOPMENT (THICKNESS)

1 = None (0 - 100 cm)
2 = None (10 - 200 cm)
3 = First year maximum (20 - 100 cm)
4 = First year maximum (20 - 100 cm)
5 = Old ice (formed at least one summer's melt)
A = Ice at least 1 year
B = Ice at least 2 years
C = Ice at least 3 years
D = Ice at least 4 years
E = Ice at least 5 years
F = Ice at least 6 years
G = Ice at least 7 years
H = Ice at least 8 years
I = Ice at least 9 years
J = Ice at least 10 years
K = Ice at least 11 years
L = Ice at least 12 years
M = Ice at least 13 years
N = Ice at least 14 years
O = Ice at least 15 years
P = Ice at least 16 years
Q = Ice at least 17 years
R = Ice at least 18 years
S = Ice at least 19 years
T = Ice at least 20 years
U = Ice at least 21 years
V = Ice at least 22 years
W = Ice at least 23 years
X = Ice at least 24 years
Y = Ice at least 25 years
Z = Ice at least 26 years
AA = Ice at least 27 years
AB = Ice at least 28 years
AC = Ice at least 29 years
AD = Ice at least 30 years
AE = Ice at least 31 years
AF = Ice at least 32 years
AG = Ice at least 33 years
AH = Ice at least 34 years
AI = Ice at least 35 years
AJ = Ice at least 36 years
AK = Ice at least 37 years
AL = Ice at least 38 years
AM = Ice at least 39 years
AN = Ice at least 40 years
AO = Ice at least 41 years
AP = Ice at least 42 years
AQ = Ice at least 43 years
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BG = Ice at least 59 years
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BI = Ice at least 61 years
BJ = Ice at least 62 years
BK = Ice at least 63 years
BL = Ice at least 64 years
BM = Ice at least 65 years
BN = Ice at least 66 years
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BP = Ice at least 68 years
BQ = Ice at least 69 years
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BV = Ice at least 74 years
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BZ = Ice at least 78 years
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CB = Ice at least 80 years
CC = Ice at least 81 years
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CE = Ice at least 83 years
CF = Ice at least 84 years
CG = Ice at least 85 years
CH = Ice at least 86 years
CI = Ice at least 87 years
CJ = Ice at least 88 years
CK = Ice at least 89 years
CL = Ice at least 90 years
CM = Ice at least 91 years
CN = Ice at least 92 years
CO = Ice at least 93 years
CP = Ice at least 94 years
CQ = Ice at least 95 years
CR = Ice at least 96 years
CS = Ice at least 97 years
CT = Ice at least 98 years
CU = Ice at least 99 years
CV = Ice at least 100 years
CW = Ice at least 101 years
CX = Ice at least 102 years
CY = Ice at least 103 years
CZ = Ice at least 104 years
DA = Ice at least 105 years
DB = Ice at least 106 years
DC = Ice at least 107 years
DD = Ice at least 108 years
DE = Ice at least 109 years
DF = Ice at least 110 years
DF = Ice at least 111 years
DF = Ice at least 112 years
DF = Ice at least 113 years
DF = Ice at least 114 years
DF = Ice at least 115 years
DF = Ice at least 116 years
DF = Ice at least 117 years
DF = Ice at least 118 years
DF = Ice at least 119 years
DF = Ice at least 120 years

Examples:
 C = 100, S₁ = 100, S₂ = 100, S₃ = 100
 C = 100, S₁ = 100, S₂ = 100, S₃ = 100
 C = 100, S₁ = 100, S₂ = 100, S₃ = 100
 C = 100, S₁ = 100, S₂ = 100, S₃ = 100

Legend:
 [Symbol] = Numerical thickness of the season's growth (cm)
 [Symbol] = Numerical thickness from 1st summer's growth
 [Symbol] = Observations
 [Symbol] = Analyzed from Passive Microwave
 [Symbol] = Estimated Boundary

**Refer to 1996 Special Arctic
Supplement for this Chart**



ARCTIC ICE ANALYSIS 13 NOV 95

NAVY CENTER FOR NAVAL ICE CENTER

OSMOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Best ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) in e.
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) in e.
 -C = Concentration of ice within 500m of ships and parties.
 S_g = Thicker than S_g, but less than one tenth concentration.
 S_g = Stage of development having the greatest remaining concentration.

STAGES OF DEVELOPMENT (THICKNESS)

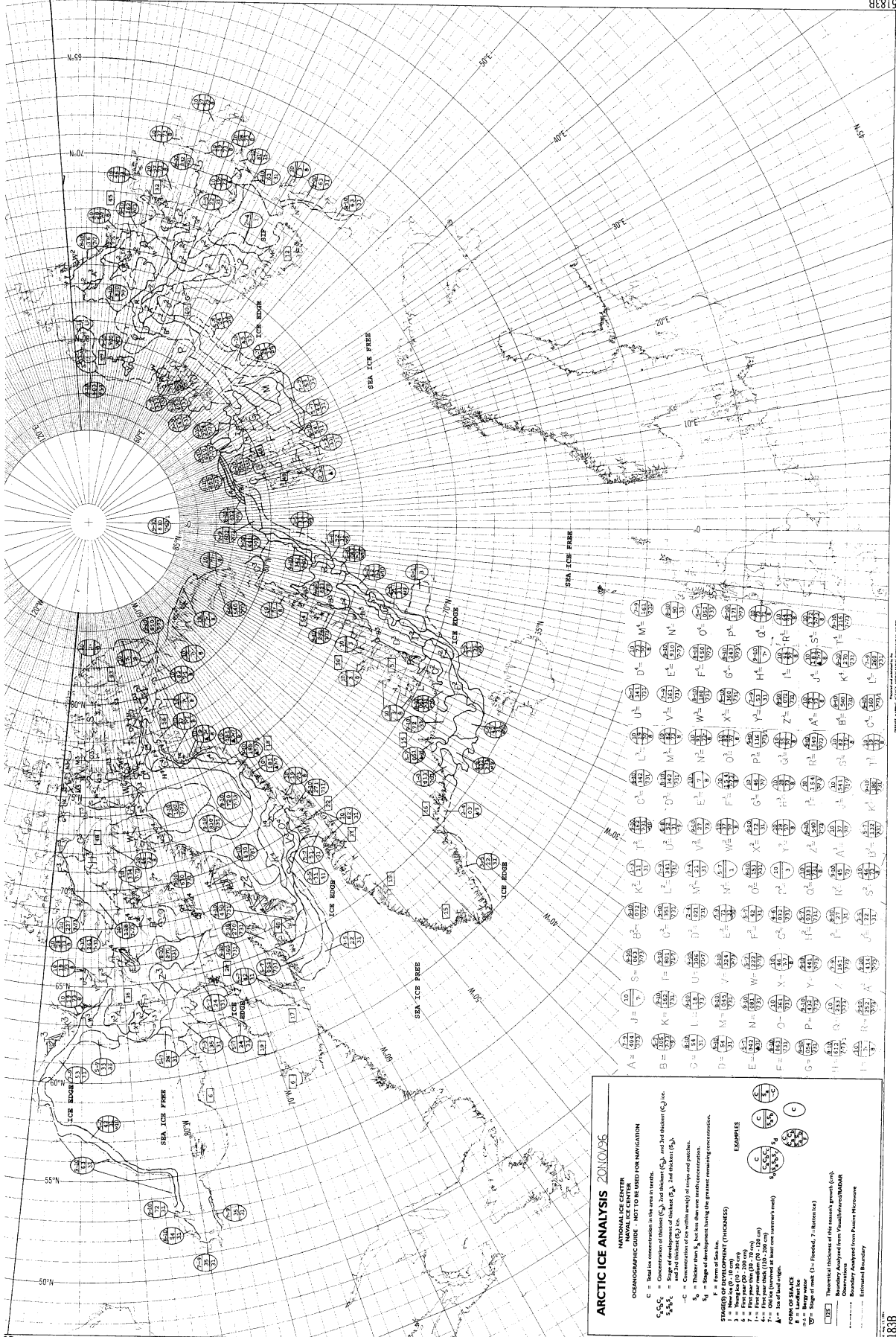
1 = New ice (0-10 cm)
 2 = First year ice (10-200 cm)
 3 = First year medium (20-75 cm)
 4 = Old ice (formed 1st, 2nd, 3rd summer's work)
 A = Ice of land origin.

FORM OF ICE

1 = Heavy water
 2 = Light water
 3 = Stage of ice (1 = Floes, 2 = Buttons, 3 = Berms)

ICE = Theoretical thickness of this season's growth (cm)
 Boundary Analyzed from Visual Observations
 Boundary Analyzed from Passive Microwave
 --- --- --- Estimated Boundary

**Refer to 1996 Special Arctic
Supplement for this Chart**



ARCTIC ICE ANALYSIS ZONOPSIS

NATIONAL ICE CENTER
NAVAL ICE CENTER
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in units.
 $C_1 C_2 C_3$ = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 $S_1 S_2 S_3$ = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 -C = Concentration of ice within area(s) of strips and patches.
 S_p = Thicker than S_p , but less than one month concentration.
 S_q = Stage of development using the greatest remaining concentration.

STAGES OF DEVELOPMENT (THICKNESS)

1 = None (0 to 20 cm)
 2 = Very thin (20 to 30 cm)
 3 = Thin (30 to 40 cm)
 4 = Fairly good medium (40 to 50 cm)
 5 = Good (50 to 60 cm)
 6 = Fairly good (60 to 70 cm)
 7 = Old ice (formed at least one summer's end)
 A = Ice of last origin.

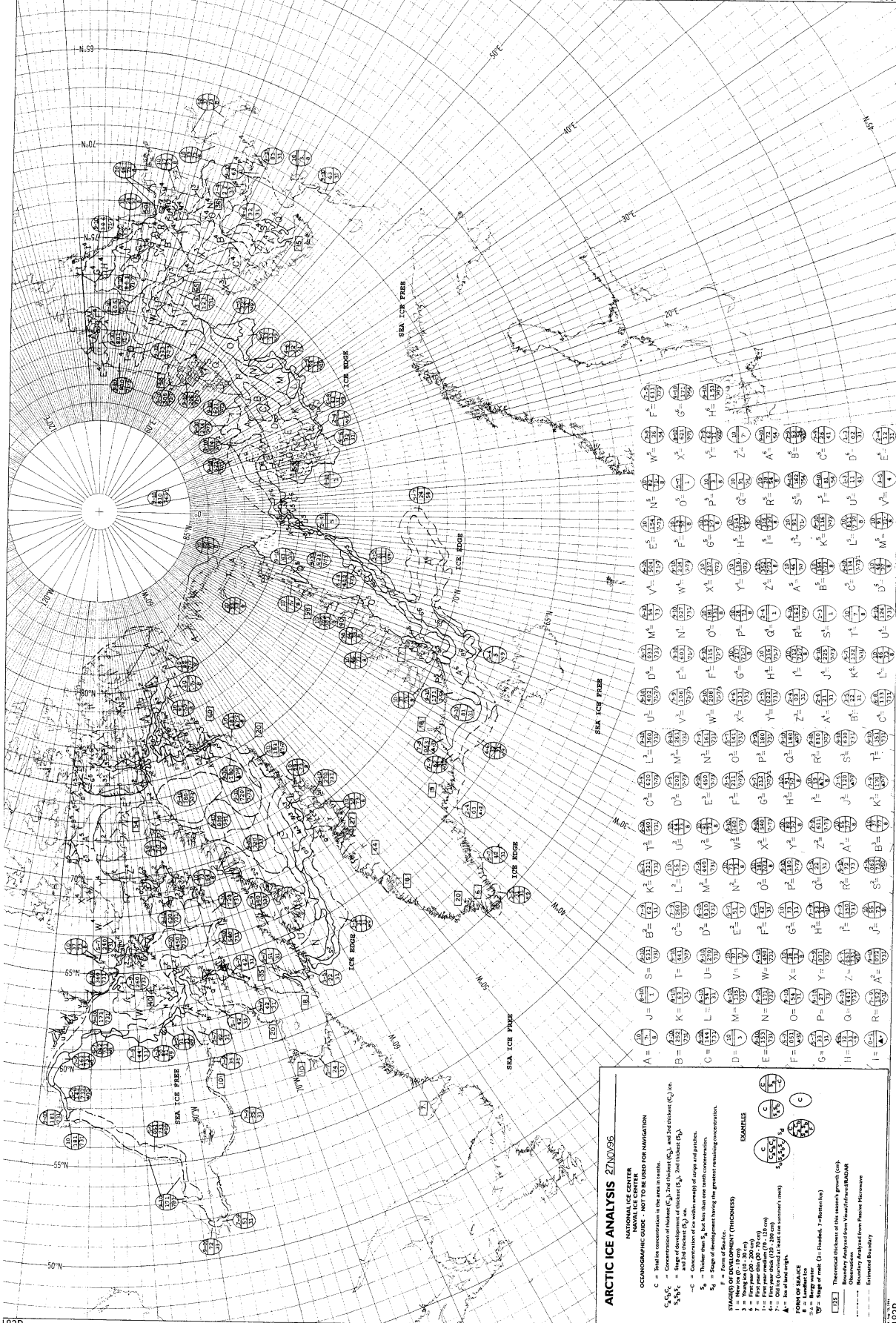
CODES OF GRADE

0 = Heavy water
 1 = Stage of melt (1 = floored; 2 = broken ice)
 2 = Theoretical thickness of ice season's growth (cm).
 3 = Boundary Analyzed from Visual/Infra-Red (VIR) Observations
 4 = Boundary Analyzed from Passive Microwave
 5 = Estimated Boundary

EXAMPLES

$\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$ $\frac{C}{S_1 S_2 S_3}$

**Refer to 1996 Special Arctic
Supplement for this Chart**



ARCTIC ICE ANALYSIS ZND095

NATIONAL ICE CENTER
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in tenths.
 S₁S₂S₃ = Concentration of thickets (S₁, S₂, S₃), and ice thickness (C) in tenths.
 S₁S₂S₃C = Stage of development of thicket (S₁, S₂, S₃) and ice thickness (C) in tenths.
 -C = Concentration of ice in tenths.
 S₁ = Thicket stage S₁, but has no way of being and patches.
 S₂ = Stage of development being the greatest remaining concentration.
 F = Form of ice.
 1 = New ice (0-10 centimeters) (THICKNESS)
 2 = Young ice (10-30 cm)
 3 = First year thin (30-70 cm)
 4 = First year thick (70-100 cm)
 5 = First year thick (100-200 cm)
 6 = Ice of unknown age (at least one summer's melt)
 7 = Ice of unknown age (at least one summer's melt)

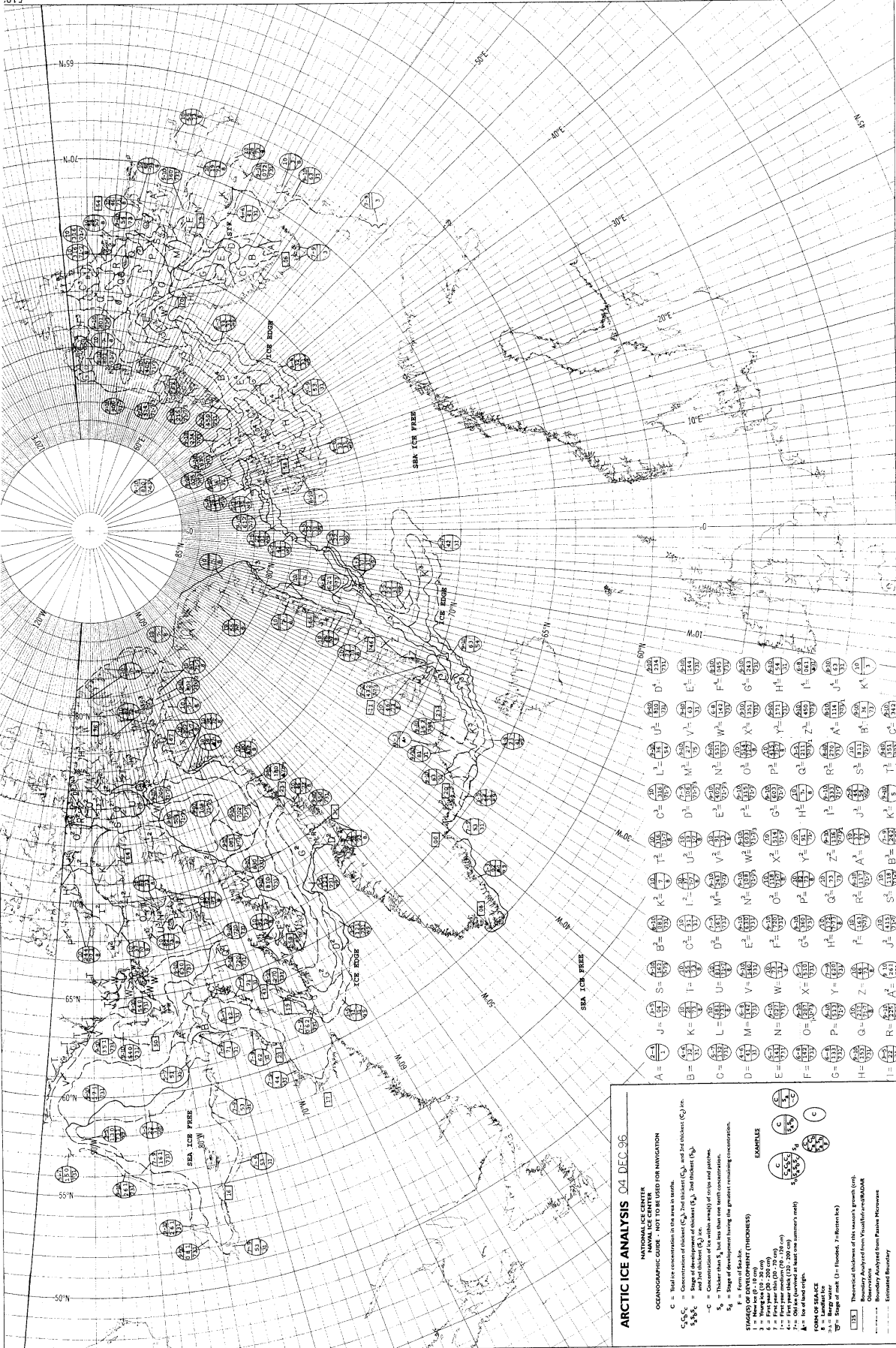
FORM OF ICE
 B = Landfast
 W = Winddrift
 T = Stage of melt (1 = Freshly, 7 = Broken Ice)

THICKNESS
 [Symbol] = Thickness of ice of the thickest growth only.
 [Symbol] = Boundary Analyzed from Visual Observations
 [Symbol] = Boundary Analyzed from Passive Microwave Observations
 [Symbol] = Estimated Boundary

EXAMPLES

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 NATIONAL ICE CENTER
 1000 EAST 17TH AVENUE
 DENVER, COLORADO 80202
 PHONE: 303-442-1000
 FAX: 303-442-1001
 WWW: WWW.NIC.NMFS.NOAA.GOV

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Supplement for this Chart**



ARCTIC ICE ANALYSIS 04 DEC 96

NATIONAL ICE CENTER
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CEMENOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in parts.
 C₁C₂C₃ = Concentration of distinct C₁, 2nd thickest C₂, and 3rd thickest C₃ in.
 S₁S₂S₃ = Thickness of distinct S₁, 2nd thickest S₂, and 3rd thickest S₃ in feet.
 -C = Concentration of ice within area(s) of ice and patch.
 S₁ = Thicker than S₂ but less than one tenth concentration.
 S₂ = Stage of development during the greatest remaining concentration.

STAGES OF DEVELOPMENT (THICKNESS)

1 = New ice (0-30 cm)
 2 = First year ice (30-200 cm)
 3 = First year ice (200-250 cm)
 4 = First year ice (250-300 cm)
 5 = First year ice (300-350 cm)
 6 = First year ice (350-400 cm)
 7 = Old ice (400+ cm) (at least one anniversary melt)
 A = Ice of land origin.

FORM OF SPACE

1 = Range water
 2 = Stage of melt (1 = floe-like, 2 = broken floe)
 3 = Stage of melt (3 = broken, 4 = broken)

EXAMPLES

1. 1/10
 2. 1/10
 3. 1/10
 4. 1/10
 5. 1/10
 6. 1/10
 7. 1/10
 A = 1/10
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 6 = 1/10
 7 = 1/10
 A = 1/10

FORM OF SPACE

1 = Range water
 2 = Stage of melt (1 = floe-like, 2 = broken floe)
 3 = Stage of melt (3 = broken, 4 = broken)

EXAMPLES

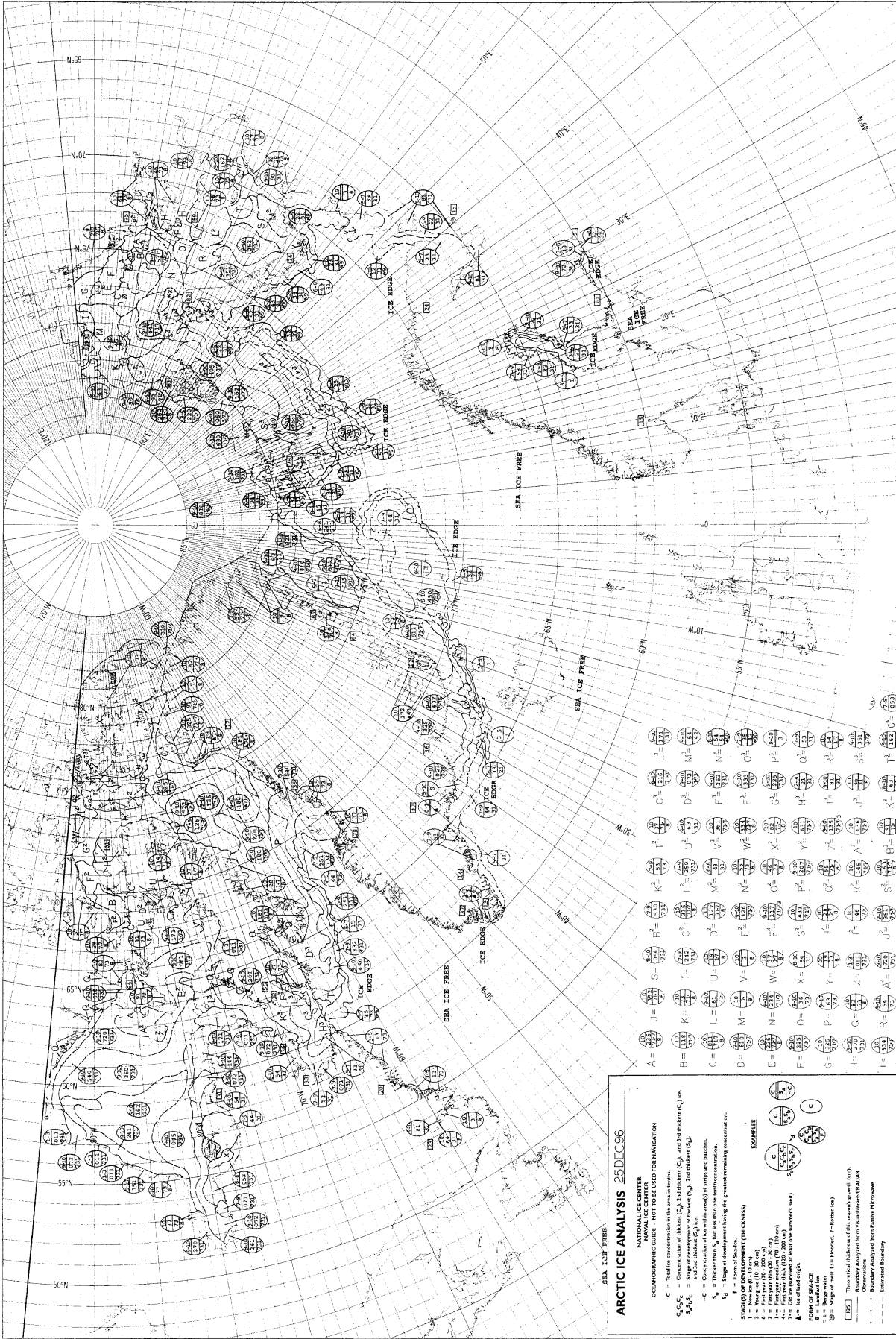
1. 1/10
 2. 1/10
 3. 1/10
 4. 1/10
 5. 1/10
 6. 1/10
 7. 1/10
 A = 1/10
 1 = 1/10
 2 = 1/10
 3 = 1/10
 4 = 1/10
 5 = 1/10
 6 = 1/10
 7 = 1/10
 A = 1/10
 1 = 1/10
 2 = 1/10
 3 = 1/10
 4 = 1/10
 5 = 1/10
 6 = 1/10
 7 = 1/10
 A = 1/10

Boundary Analyzed from Visual and RADAR
 Estimated Boundary

**Refer to 1996 Special Arctic
Supplement for this Chart**

**Refer to 1996 Special Arctic
Supplement for this Chart**

**Refer to 1996 Special Arctic
Supplement for this Chart**



ARCTIC ICE ANALYSIS 25 DEC 96

NATIONAL ICE CENTER
 OCEANOGRAPHIC CODE - NOT TO BE USED FOR NAVIGATION

C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of thickest (C₁), and thickest (C₂), and 2nd thickest (C₃) ice.
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
 T = Thickness (in tenths) of single ice patches.
 S₁ = Thicker than S₂, but less than one semi-concentration.
 S₂ = Stage of development having the greatest remaining concentration.

FORM OF SEA ICE
 F = Form of Sea Ice.
 1 = Thick ice (10 - 30 cm)
 2 = Young ice (10 - 30 cm)
 3 = First year thin (0 - 20 cm)
 4 = First year thin (20 - 30 cm)
 5 = First year thin (30 - 50 cm)
 6 = First year thin (50 - 100 cm)
 7 = First year thin (100 - 200 cm)
 8 = First year thin (200 - 300 cm)
 9 = First year thin (300 - 400 cm)
 A = Ice at danger.

FORM OF SEA ICE
 B = Landfast ice
 C = Ice at danger

BOUNDARY AND OTHER FEATURES
 [Symbol] = Theoretical thickness of the nearby growth (cm)
 [Symbol] = Boundary Area (km) from Visual/Infrared/RADAR Observations
 [Symbol] = Estimated Boundary

A	J	S	B	K	L	M	N	O	P	Q	R	S	T	C ₁
B	K	L	M	N	O	P	Q	R	S	T	C ₁	C ₂	C ₃	C ₄
C	L	M	N	O	P	Q	R	S	T	C ₁	C ₂	C ₃	C ₄	C ₅
D	M	N	O	P	Q	R	S	T	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆
E	N	O	P	Q	R	S	T	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇
F	O	P	Q	R	S	T	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈
G	P	Q	R	S	T	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈	C ₉
H	Q	R	S	T	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈	C ₉	C ₁₀
I	R	S	T	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	C ₈	C ₉	C ₁₀	C ₁₁