

**EASTERN—WESTERN
ARCTIC SEA ICE ANALYSES
1991**

**PREPARED BY
NAVAL POLAR OCEANOGRAPHY CENTER
SUITLAND, MD**

**PREPARED UNDER AUTHORITY OF
COMMANDER, NAVAL OCEANOGRAPHY COMMAND
STENNIS SPACE CENTER, MS 39529-5000**

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FOREWORD

The U.S. Navy has a long and eventful history of polar exploration from Robert E. Peary in the Arctic to Richard E. Byrd in the Antarctic. In recent years the strategic importance and expanded research pursuits in these areas have resulted in greater national and international requirements for environmental information. Since 1976, the National Oceanic and Atmospheric Administration (NOAA) and the Navy have worked together at the Joint Ice Center (JIC) in Suitland, Maryland. By combining the Navy's experience in observing and recording sea ice data, and NOAA's expertise in satellite data collection and interpretation, the JIC has been able to keep pace with that demand in both polar regions.

This publication is the 18th edition of the Arctic sea ice atlases prepared by the JIC. The atlas contains weekly charts depicting Northern Hemisphere and Great Lakes ice conditions and extent. The significant use of high resolution satellite imagery, combined with valuable ice reconnaissance data from various sources, has greatly improved the accuracy of these analyses.

The purpose of this atlas is to provide the user with reliable weekly hemispheric ice analyses. Both Navy and NOAA personnel with considerable experience in sea ice analysis prepare the analyses. The following procedures have been developed to ensure the quality of the final products:

- a. Conventional shore station, ship and aerial ice reconnaissance observations are plotted and evaluated.
- b. Satellite data from different sensors is compared and analyzed for ice information content. Table I, located on the inside back cover, summarizes satellite data availability for 1991.
- c. A final product results from a. and b. However, where insufficient data is available, an estimated boundary will be depicted. Meteorological data and computer generated ice drift vectors are utilized to determine the estimated ice edge position.

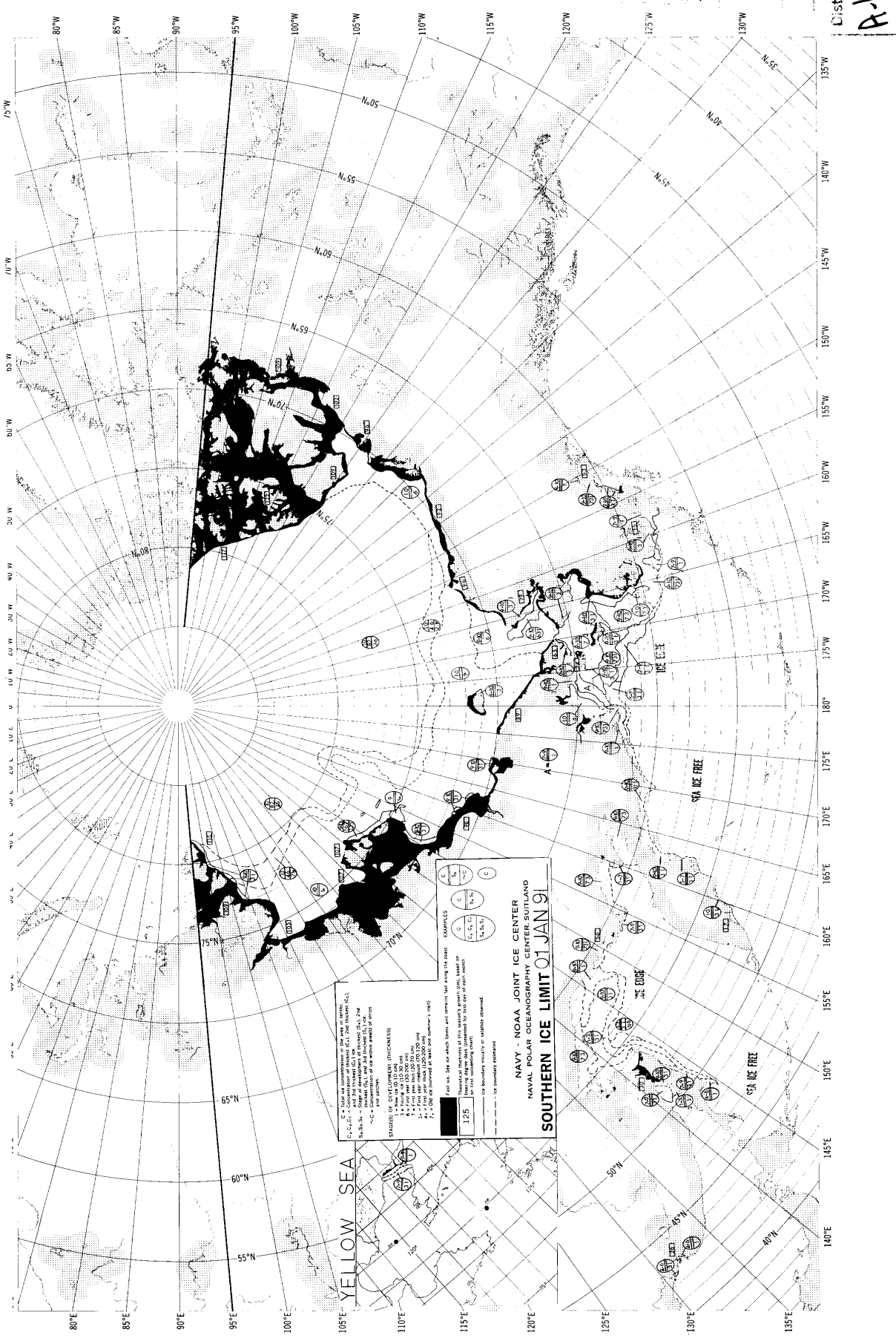
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D-51
A-1

YELLOW SEA

105°E 100°E 95°E 90°E 85°E 80°E

55°N 60°N 65°N 70°N

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 01 JAN 91

125°E 120°E 115°E 110°E 105°E 100°E 95°E 90°E 85°E 80°E

130°W 125°W 120°W 115°W 110°W 105°W 100°W 95°W 90°W 85°W 80°W

EXAMPLES

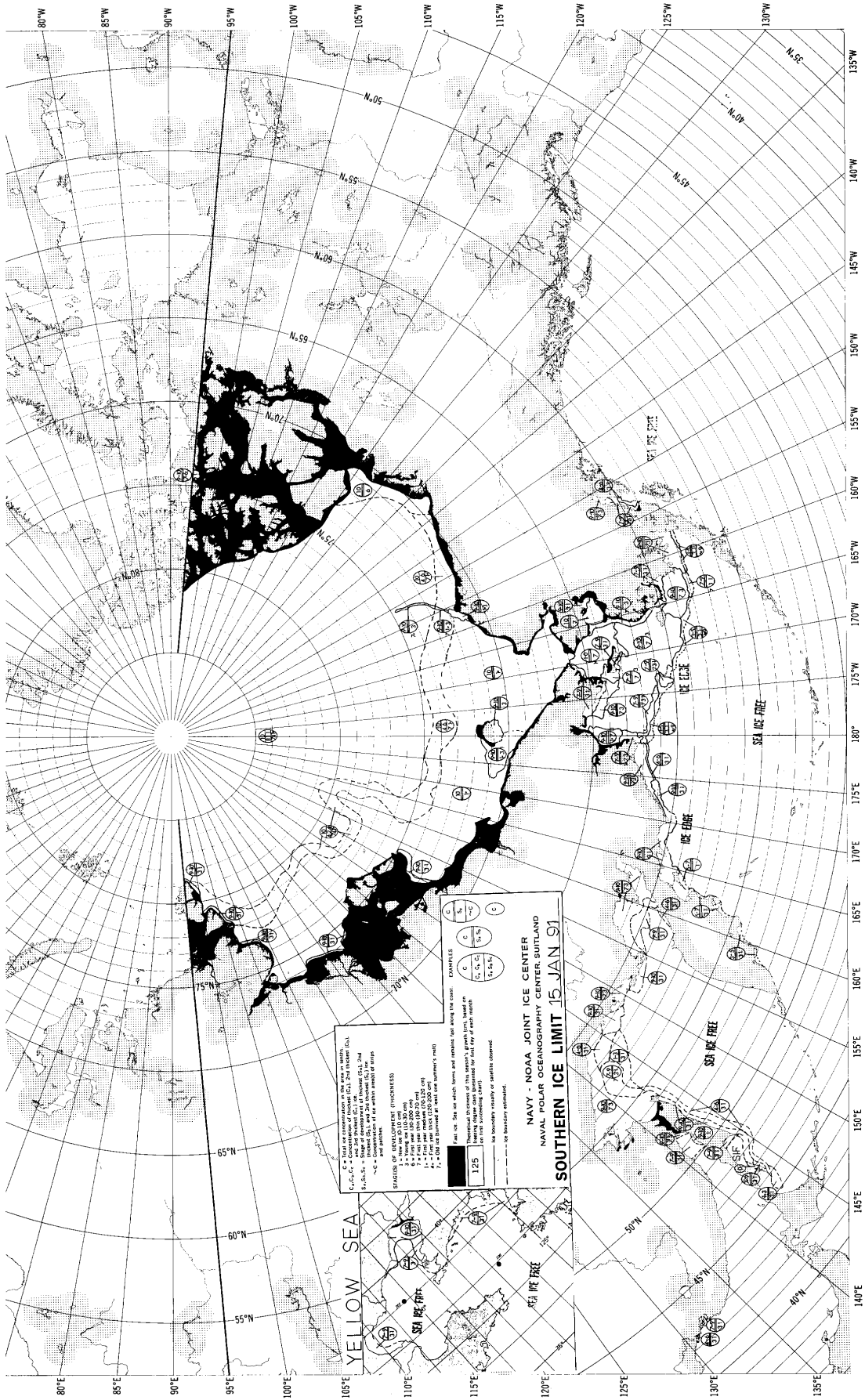
(A)	(B)	(C)
10	10	10
10	10	10
10	10	10

STAGES OF DEVELOPMENT (THICKNESS)

- 1 - First year thin (20-30 cm)
- 2 - First year thick (30-50 cm)
- 3 - First year medium (50-75 cm)
- 4 - First year heavy (75-100 cm)
- 5 - First year very heavy (100-150 cm)
- 6 - Second year thin (20-30 cm)
- 7 - Second year medium (50-75 cm)
- 8 - Second year thick (75-100 cm)
- 9 - Second year heavy (100-150 cm)
- 10 - Second year very heavy (150-200 cm)
- 11 - Third year thin (20-30 cm)
- 12 - Third year medium (50-75 cm)
- 13 - Third year thick (75-100 cm)
- 14 - Third year heavy (100-150 cm)
- 15 - Third year very heavy (150-200 cm)

LEGEND

- Ice boundary (country or regular pattern)
- - - Ice boundary (estimated)



C = Total ice concentration in this area as shown by the symbols
 C₁, C₂, C₃ = one, two, three, etc., in the area shown by the symbols
 S, M, L, H = Small, Medium, Large, Heavy, etc., in the area shown by the symbols
 * = Ice thickness at each grid location
 ** = Ice thickness at each grid location's center
 *** = Ice thickness at each grid location's edge

SYMBOLS OF DEVELOPMENT (THICKNESS)
 1 = 1000 ft (300 m)
 2 = 1500 ft (450 m)
 3 = 2000 ft (600 m)
 4 = 2500 ft (750 m)
 5 = 3000 ft (900 m)
 6 = 3500 ft (1050 m)
 7 = 4000 ft (1200 m)
 8 = 4500 ft (1350 m)
 9 = 5000 ft (1500 m)

125
 Thermal thickness of this season's growth based on
 the mean temperature of the ice and the water
 in contact with the ice during the season

- - - - - Ice boundary estimated
 - - - - - Ice boundary estimated

125
 Thermal thickness of this season's growth based on
 the mean temperature of the ice and the water
 in contact with the ice during the season

- - - - - Ice boundary estimated
 - - - - - Ice boundary estimated

- - - - - Ice boundary estimated
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125
 Thermal thickness of this season's growth based on
 the mean temperature of the ice and the water
 in contact with the ice during the season

- - - - - Ice boundary estimated
 - - - - - Ice boundary estimated

- - - - - Ice boundary estimated
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NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTCLAND
SOUTHERN ICE LIMIT 15 JAN 91

125
 Thermal thickness of this season's growth based on
 the mean temperature of the ice and the water
 in contact with the ice during the season

- - - - - Ice boundary estimated
 - - - - - Ice boundary estimated

- - - - - Ice boundary estimated
 - - - - - Ice boundary estimated

- - - - - Ice boundary estimated
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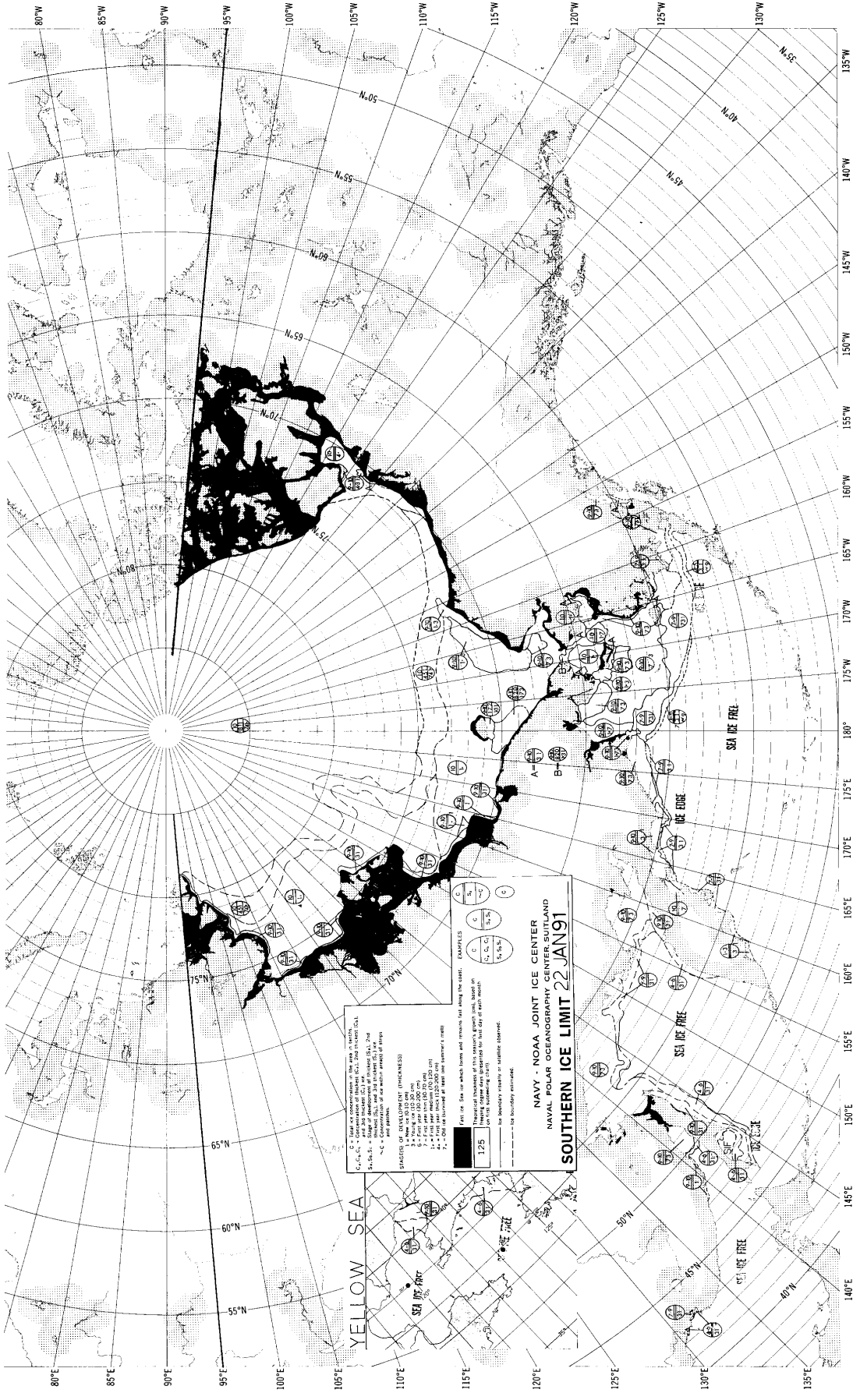
- - - - - Ice boundary estimated
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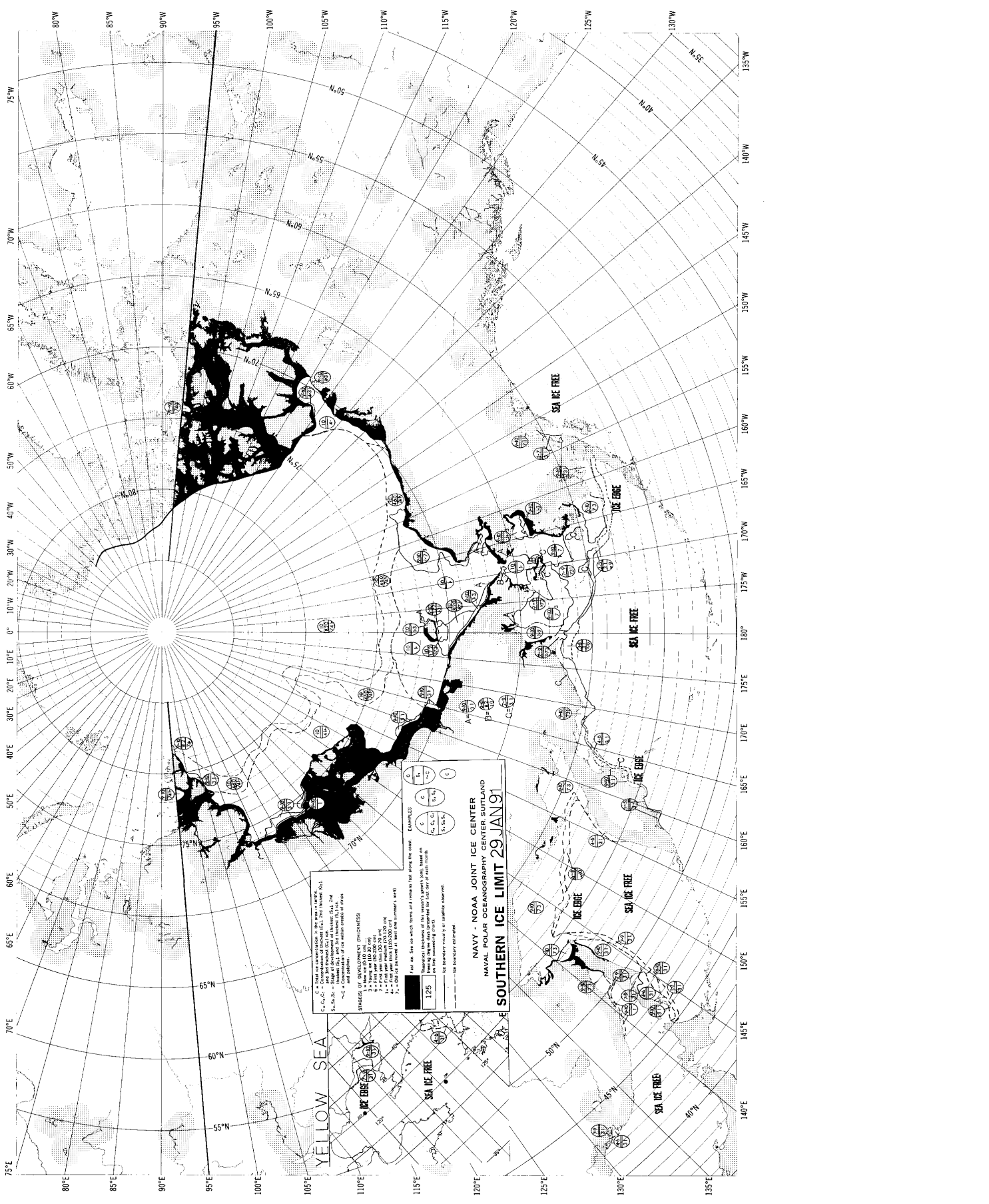
- - - - - Ice boundary estimated
 - - - - - Ice boundary estimated



0 - 100% ice concentration of the area in north.
 0-4, 4-8, 8-12, 12-16, 16-20, 20-24, 24-28, 28-32, 32-36, 36-40, 40-44, 44-48, 48-52, 52-56, 56-60, 60-64, 64-68, 68-72, 72-76, 76-80, 80-84, 84-88, 88-92, 92-96, 96-100
 125 - thickness of ice in meters (411.5 ft)
 150 - thickness of ice in meters (492.1 ft)
 175 - thickness of ice in meters (574.1 ft)
 200 - thickness of ice in meters (656.2 ft)
 225 - thickness of ice in meters (738.2 ft)
 250 - thickness of ice in meters (820.3 ft)
 275 - thickness of ice in meters (902.4 ft)
 300 - thickness of ice in meters (984.4 ft)
 325 - thickness of ice in meters (1066.5 ft)
 350 - thickness of ice in meters (1148.6 ft)
 375 - thickness of ice in meters (1230.6 ft)
 400 - thickness of ice in meters (1312.7 ft)
 425 - thickness of ice in meters (1394.7 ft)
 450 - thickness of ice in meters (1476.8 ft)
 475 - thickness of ice in meters (1558.9 ft)
 500 - thickness of ice in meters (1640.9 ft)
 525 - thickness of ice in meters (1723.0 ft)
 550 - thickness of ice in meters (1805.1 ft)
 575 - thickness of ice in meters (1887.1 ft)
 600 - thickness of ice in meters (1969.2 ft)
 625 - thickness of ice in meters (2051.3 ft)
 650 - thickness of ice in meters (2133.3 ft)
 675 - thickness of ice in meters (2215.4 ft)
 700 - thickness of ice in meters (2297.4 ft)
 725 - thickness of ice in meters (2379.5 ft)
 750 - thickness of ice in meters (2461.6 ft)

STAGES OF DEVELOPMENT (THICKNESS)
 1 - 1st year ice (150-200 cm)
 2 - 2nd year ice (200-250 cm)
 3 - 3rd year ice (250-300 cm)
 4 - 4th year ice (300-350 cm)
 5 - 5th year ice (350-400 cm)
 6 - 6th year ice (400-450 cm)
 7 - 7th year ice (450-500 cm)
 8 - 8th year ice (500-550 cm)
 9 - 9th year ice (550-600 cm)
 10 - 10th year ice (600-650 cm)
 11 - 11th year ice (650-700 cm)
 12 - 12th year ice (700-750 cm)
 13 - 13th year ice (750-800 cm)
 14 - 14th year ice (800-850 cm)
 15 - 15th year ice (850-900 cm)
 16 - 16th year ice (900-950 cm)
 17 - 17th year ice (950-1000 cm)
 18 - 18th year ice (1000-1050 cm)
 19 - 19th year ice (1050-1100 cm)
 20 - 20th year ice (1100-1150 cm)
 21 - 21st year ice (1150-1200 cm)
 22 - 22nd year ice (1200-1250 cm)
 23 - 23rd year ice (1250-1300 cm)
 24 - 24th year ice (1300-1350 cm)
 25 - 25th year ice (1350-1400 cm)
 26 - 26th year ice (1400-1450 cm)
 27 - 27th year ice (1450-1500 cm)
 28 - 28th year ice (1500-1550 cm)
 29 - 29th year ice (1550-1600 cm)
 30 - 30th year ice (1600-1650 cm)
 31 - 31st year ice (1650-1700 cm)
 32 - 32nd year ice (1700-1750 cm)
 33 - 33rd year ice (1750-1800 cm)
 34 - 34th year ice (1800-1850 cm)
 35 - 35th year ice (1850-1900 cm)
 36 - 36th year ice (1900-1950 cm)
 37 - 37th year ice (1950-2000 cm)
 38 - 38th year ice (2000-2050 cm)
 39 - 39th year ice (2050-2100 cm)
 40 - 40th year ice (2100-2150 cm)
 41 - 41st year ice (2150-2200 cm)
 42 - 42nd year ice (2200-2250 cm)
 43 - 43rd year ice (2250-2300 cm)
 44 - 44th year ice (2300-2350 cm)
 45 - 45th year ice (2350-2400 cm)
 46 - 46th year ice (2400-2450 cm)
 47 - 47th year ice (2450-2500 cm)
 48 - 48th year ice (2500-2550 cm)
 49 - 49th year ice (2550-2600 cm)
 50 - 50th year ice (2600-2650 cm)
 51 - 51st year ice (2650-2700 cm)
 52 - 52nd year ice (2700-2750 cm)
 53 - 53rd year ice (2750-2800 cm)
 54 - 54th year ice (2800-2850 cm)
 55 - 55th year ice (2850-2900 cm)
 56 - 56th year ice (2900-2950 cm)
 57 - 57th year ice (2950-3000 cm)
 58 - 58th year ice (3000-3050 cm)
 59 - 59th year ice (3050-3100 cm)
 60 - 60th year ice (3100-3150 cm)
 61 - 61st year ice (3150-3200 cm)
 62 - 62nd year ice (3200-3250 cm)
 63 - 63rd year ice (3250-3300 cm)
 64 - 64th year ice (3300-3350 cm)
 65 - 65th year ice (3350-3400 cm)
 66 - 66th year ice (3400-3450 cm)
 67 - 67th year ice (3450-3500 cm)
 68 - 68th year ice (3500-3550 cm)
 69 - 69th year ice (3550-3600 cm)
 70 - 70th year ice (3600-3650 cm)
 71 - 71st year ice (3650-3700 cm)
 72 - 72nd year ice (3700-3750 cm)
 73 - 73rd year ice (3750-3800 cm)
 74 - 74th year ice (3800-3850 cm)
 75 - 75th year ice (3850-3900 cm)
 76 - 76th year ice (3900-3950 cm)
 77 - 77th year ice (3950-4000 cm)
 78 - 78th year ice (4000-4050 cm)
 79 - 79th year ice (4050-4100 cm)
 80 - 80th year ice (4100-4150 cm)
 81 - 81st year ice (4150-4200 cm)
 82 - 82nd year ice (4200-4250 cm)
 83 - 83rd year ice (4250-4300 cm)
 84 - 84th year ice (4300-4350 cm)
 85 - 85th year ice (4350-4400 cm)
 86 - 86th year ice (4400-4450 cm)
 87 - 87th year ice (4450-4500 cm)
 88 - 88th year ice (4500-4550 cm)
 89 - 89th year ice (4550-4600 cm)
 90 - 90th year ice (4600-4650 cm)
 91 - 91st year ice (4650-4700 cm)
 92 - 92nd year ice (4700-4750 cm)
 93 - 93rd year ice (4750-4800 cm)
 94 - 94th year ice (4800-4850 cm)
 95 - 95th year ice (4850-4900 cm)
 96 - 96th year ice (4900-4950 cm)
 97 - 97th year ice (4950-5000 cm)
 98 - 98th year ice (5000-5050 cm)
 99 - 99th year ice (5050-5100 cm)
 100 - 100th year ice (5100-5150 cm)

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER-SUITLAND
SOUTHERN ICE LIMIT 22 JAN 91

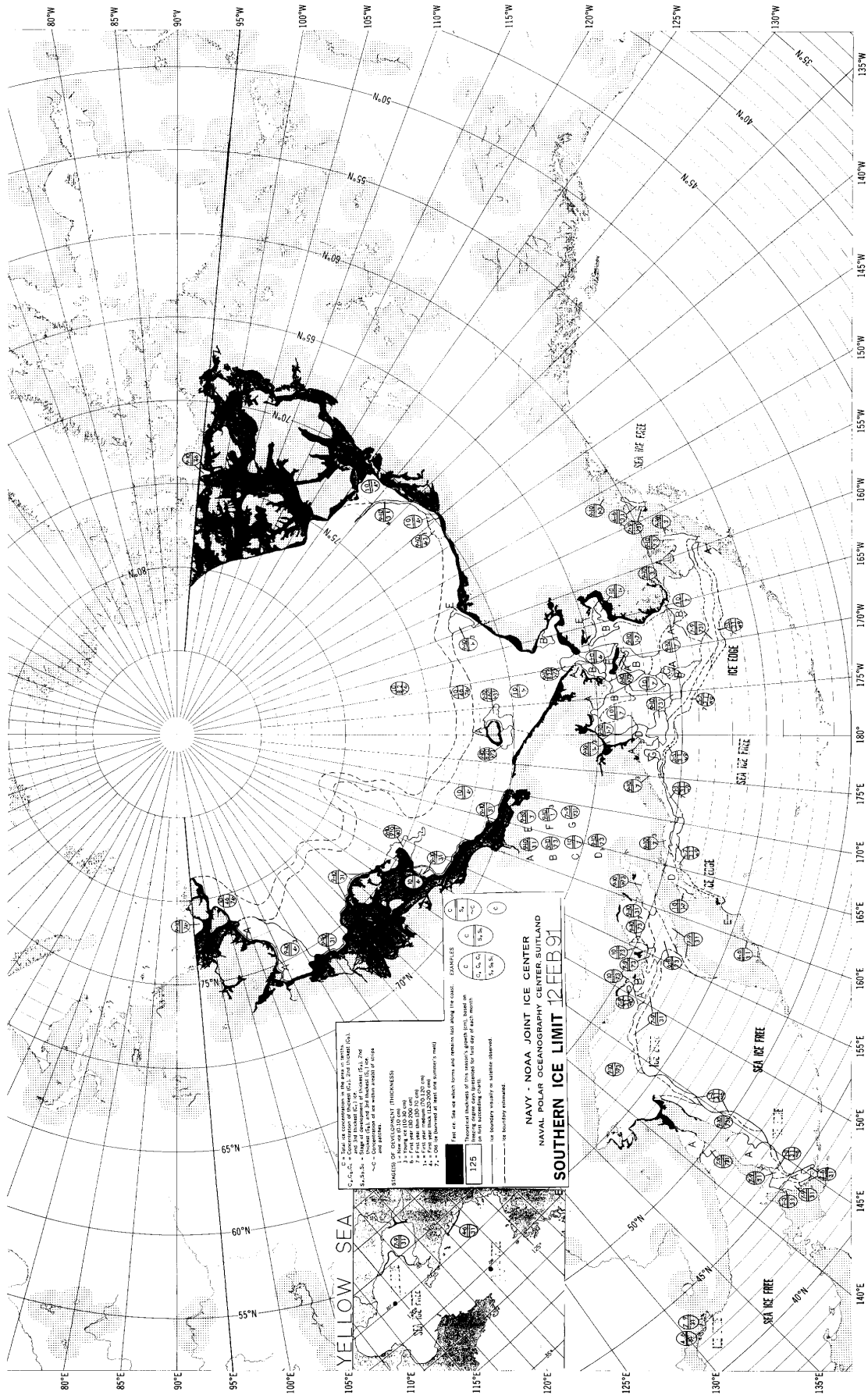


* Data from the National Oceanic and Atmospheric Administration (NOAA) Arctic Data Center (ADC) and the Naval Oceanography Center (NOC).
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 * Data from the National Oceanic and Atmospheric Administration (NOAA) Arctic Data Center (ADC) and the Naval Oceanography Center (NOC).
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NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUI TLAND
SOUTHERN ICE LIMIT 29 JAN 91

125
 100
 75
 50
 25
 0

See note on which forms and volumes that apply to the chart.
 * Data from the National Oceanic and Atmospheric Administration (NOAA) Arctic Data Center (ADC) and the Naval Oceanography Center (NOC).
 * Data from the National Oceanic and Atmospheric Administration (NOAA) Arctic Data Center (ADC) and the Naval Oceanography Center (NOC).
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YELLOW SEA

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER-SUITLAND
SOUTHERN ICE LIMIT 12 FEB 91

FRAMES (In Chart 125 only) (THICKNESS)
 1 - 1/2 ft (15 cm) or more
 2 - 1 ft (30 cm)
 3 - 6 in (15 cm)
 4 - 3 in (7.5 cm)
 5 - 1 1/2 in (3.75 cm)
 6 - 1 in (2.5 cm)
 7 - 3/4 in (1.875 cm)
 8 - 1/2 in (1.25 cm)
 9 - 3/8 in (0.9375 cm)
 10 - 1/4 in (0.625 cm)
 11 - 1/8 in (0.3125 cm)
 12 - 1/16 in (0.15625 cm)
 13 - 1/32 in (0.078125 cm)
 14 - 1/64 in (0.0390625 cm)

FRAMES (In Chart 125 only) (THICKNESS)
 1 - 1/2 ft (15 cm) or more
 2 - 1 ft (30 cm)
 3 - 6 in (15 cm)
 4 - 3 in (7.5 cm)
 5 - 1 1/2 in (3.75 cm)
 6 - 1 in (2.5 cm)
 7 - 3/4 in (1.875 cm)
 8 - 1/2 in (1.25 cm)
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 12 - 1/16 in (0.15625 cm)
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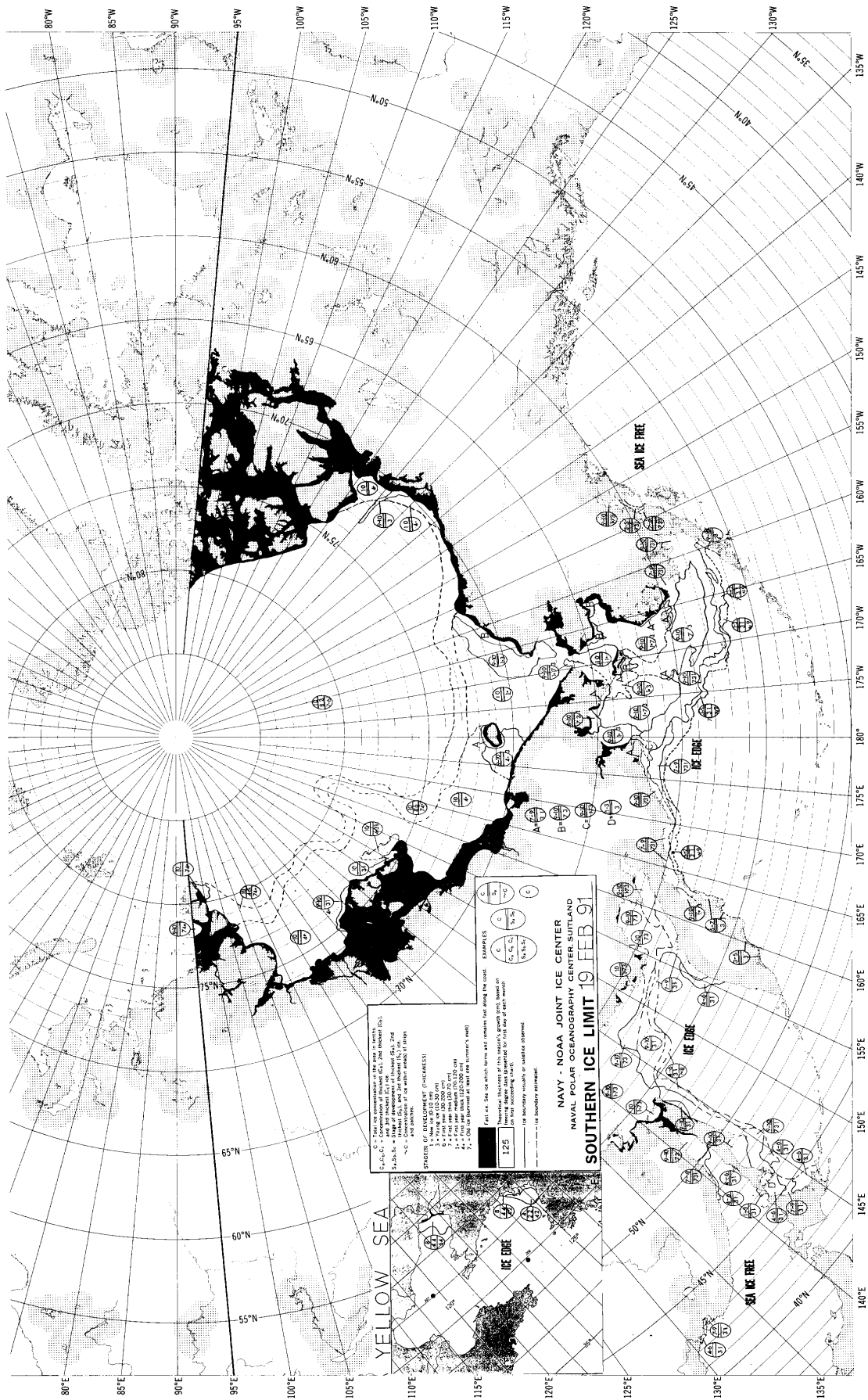
FRAMES (In Chart 125 only) (THICKNESS)
 1 - 1/2 ft (15 cm) or more
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 6 - 1 in (2.5 cm)
 7 - 3/4 in (1.875 cm)
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FRAMES (In Chart 125 only) (THICKNESS)
 1 - 1/2 ft (15 cm) or more
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 4 - 3 in (7.5 cm)
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 7 - 3/4 in (1.875 cm)
 8 - 1/2 in (1.25 cm)
 9 - 3/8 in (0.9375 cm)
 10 - 1/4 in (0.625 cm)
 11 - 1/8 in (0.3125 cm)
 12 - 1/16 in (0.15625 cm)
 13 - 1/32 in (0.078125 cm)
 14 - 1/64 in (0.0390625 cm)

FRAMES	FRAMES	FRAMES
1	2	3
4	5	6
7	8	9
10	11	12
13	14	15

FRAMES (In Chart 125 only) (THICKNESS)
 1 - 1/2 ft (15 cm) or more
 2 - 1 ft (30 cm)
 3 - 6 in (15 cm)
 4 - 3 in (7.5 cm)
 5 - 1 1/2 in (3.75 cm)
 6 - 1 in (2.5 cm)
 7 - 3/4 in (1.875 cm)
 8 - 1/2 in (1.25 cm)
 9 - 3/8 in (0.9375 cm)
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FRAMES (In Chart 125 only) (THICKNESS)
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 11 - 1/8 in (0.3125 cm)
 12 - 1/16 in (0.15625 cm)
 13 - 1/32 in (0.078125 cm)
 14 - 1/64 in (0.0390625 cm)



C = Total ice concentration in 10% grid squares
 C₁ - C₅ = Ice concentration in 10% grid squares
 and 100 meters (100 m) grid squares
 C₁ - C₅ = Ice concentration in 10% grid squares
 and 100 meters (100 m) grid squares
 C₁ - C₅ = Ice concentration in 10% grid squares
 and 100 meters (100 m) grid squares

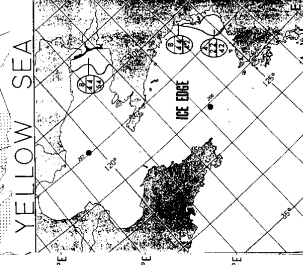
STAGES OF DEVELOPMENT (THICKNESS)
 1 = Young ice (10-30 cm)
 2 = Thin ice (30-70 cm)
 3 = Medium ice (70-150 cm)
 4 = Thick ice (150-300 cm)
 5 = Very thick ice (300-600 cm)
 6 = Icebergs (600 cm and over)

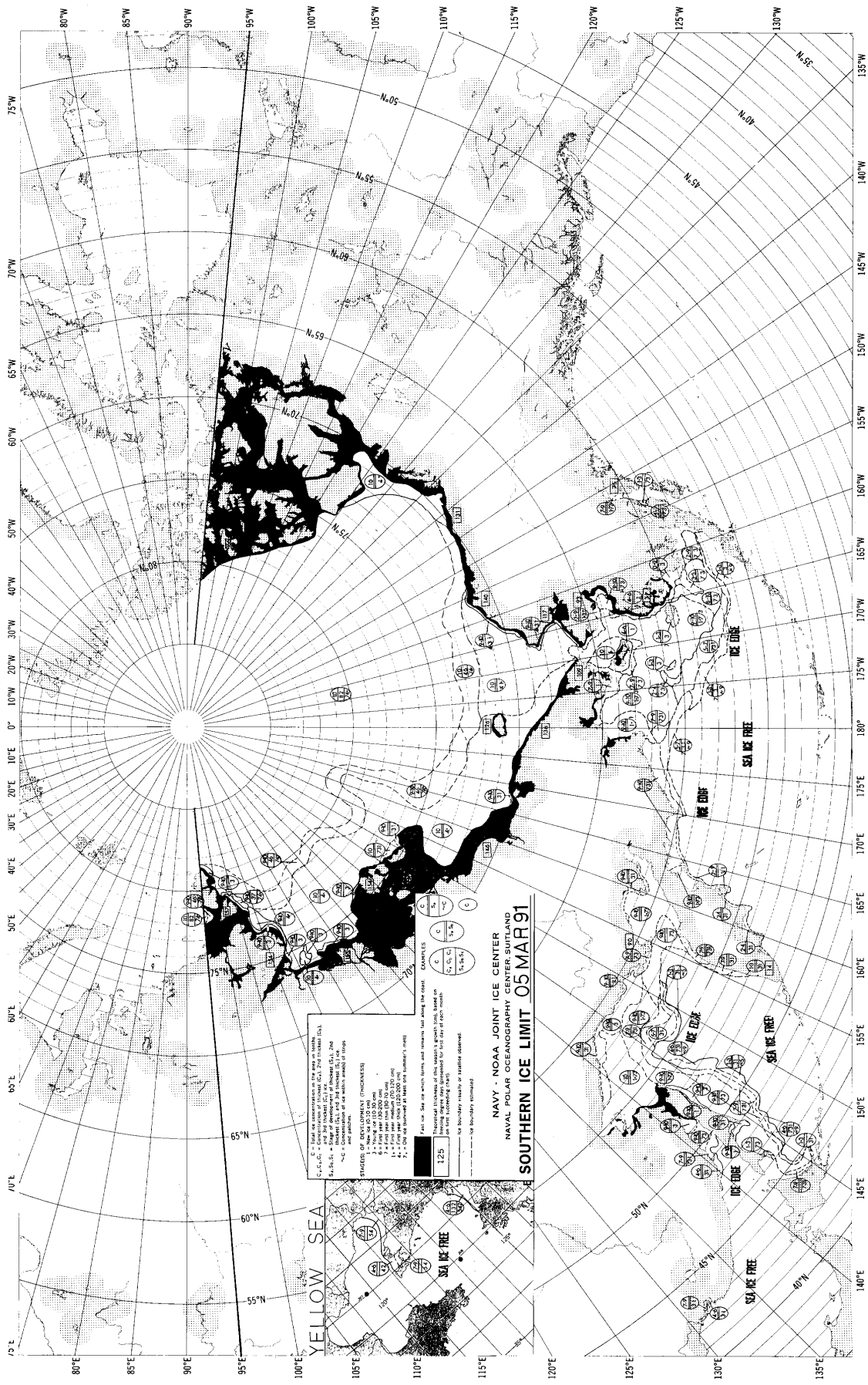
EXAMPLES

C	C ₁	C ₂	C ₃	C ₄	C ₅
100%	100%	100%	100%	100%	100%
100%	100%	100%	100%	100%	100%
100%	100%	100%	100%	100%	100%

125 = Maximum thickness of the season's growth from summer
 on for the 100 m grid square
 125 = Maximum thickness of the season's growth from summer
 on for the 100 m grid square
 125 = Maximum thickness of the season's growth from summer
 on for the 100 m grid square

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTTLAND
SOUTHERN ICE LIMIT 19 FEB 91





C = 100% ice concentration in the area of interest.
 C.C.L.C. = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 S.C.L.C. = Degree of concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).

STAGES OF DEVELOPMENT (THICKNESS)
 1 - New ice (0-15 cm)
 2 - First year (15-30 cm)
 3 - First year (30-50 cm)
 4 - First year (50-100 cm)
 5 - First year (100-150 cm)
 6 - First year (150-200 cm)
 7 - Old ice (200 cm or more)

See the Sea Ice Manual for details on the symbols used along the coast.
 C.C.L.C. = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 S.C.L.C. = Degree of concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
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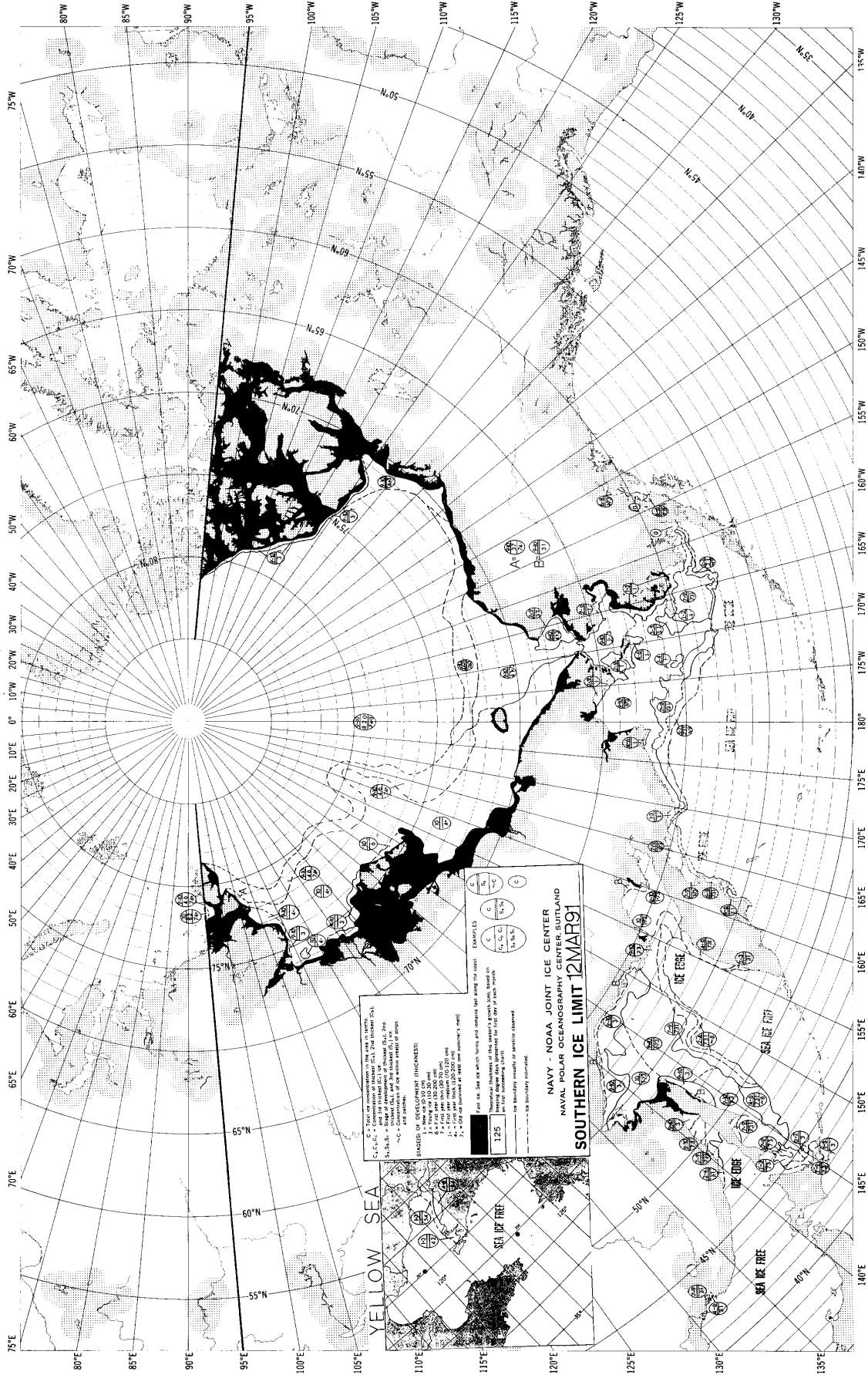
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 4 - First year (50-100 cm)
 5 - First year (100-150 cm)
 6 - First year (150-200 cm)
 7 - Old ice (200 cm or more)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER-SUITLAND
SOUTHERN ICE LIMIT 05 MAR 91

See the Sea Ice Manual for details on the symbols used along the coast.
 C.C.L.C. = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 S.C.L.C. = Degree of concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).

See the Sea Ice Manual for details on the symbols used along the coast.
 C.C.L.C. = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 S.C.L.C. = Degree of concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).

See the Sea Ice Manual for details on the symbols used along the coast.
 C.C.L.C. = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 S.C.L.C. = Degree of concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).
 *C = Concentration of Ice Limit (C.I.L.), 20% to 100% (I.S.).



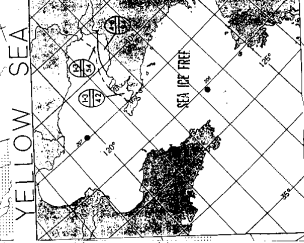
STAGES OF DEVELOPMENT (THICKNESS):

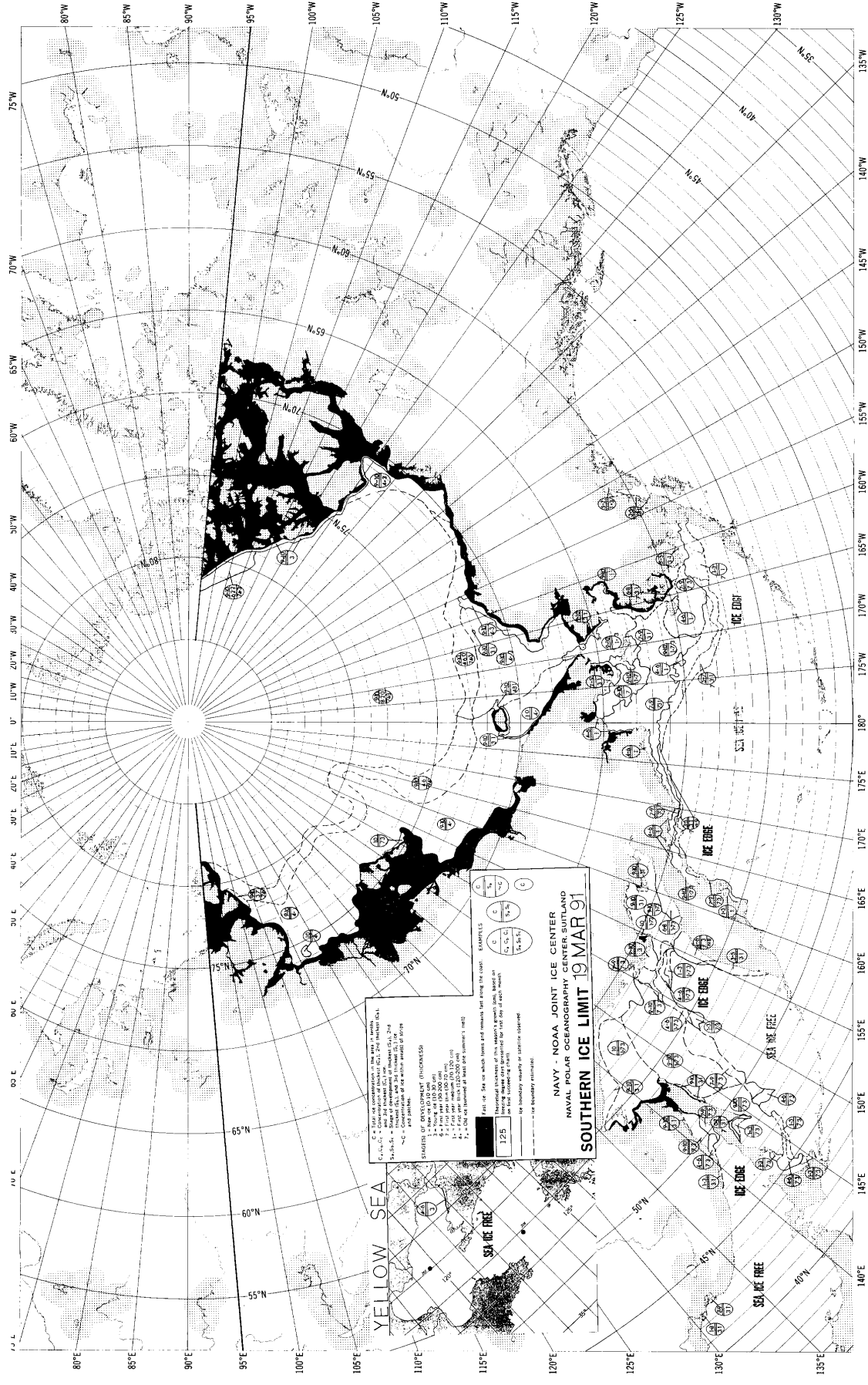
- 1 = New ice (0-150 cm)
- 2 = Young ice (150-300 cm)
- 3 = First year ice (300-1,000 cm)
- 4 = First year ice (1,000-2,000 cm)
- 5 = First year ice (>2,000 cm)
- 6 = Multi-year ice (>2,000 cm)

ICE TYPES:

- A = Thin ice (0-150 cm)
- B = Thin ice (150-300 cm)
- C = Thin ice (300-1,000 cm)
- D = Thin ice (1,000-2,000 cm)
- E = Thin ice (>2,000 cm)
- F = Multi-year ice (>2,000 cm)
- G = Multi-year ice (>2,000 cm)
- H = Multi-year ice (>2,000 cm)
- I = Multi-year ice (>2,000 cm)
- J = Multi-year ice (>2,000 cm)
- K = Multi-year ice (>2,000 cm)
- L = Multi-year ice (>2,000 cm)
- M = Multi-year ice (>2,000 cm)
- N = Multi-year ice (>2,000 cm)
- O = Multi-year ice (>2,000 cm)
- P = Multi-year ice (>2,000 cm)
- Q = Multi-year ice (>2,000 cm)
- R = Multi-year ice (>2,000 cm)
- S = Multi-year ice (>2,000 cm)
- T = Multi-year ice (>2,000 cm)
- U = Multi-year ice (>2,000 cm)
- V = Multi-year ice (>2,000 cm)
- W = Multi-year ice (>2,000 cm)
- X = Multi-year ice (>2,000 cm)
- Y = Multi-year ice (>2,000 cm)
- Z = Multi-year ice (>2,000 cm)

**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND
SOUTHERN ICE LIMIT 12 MAR 91**



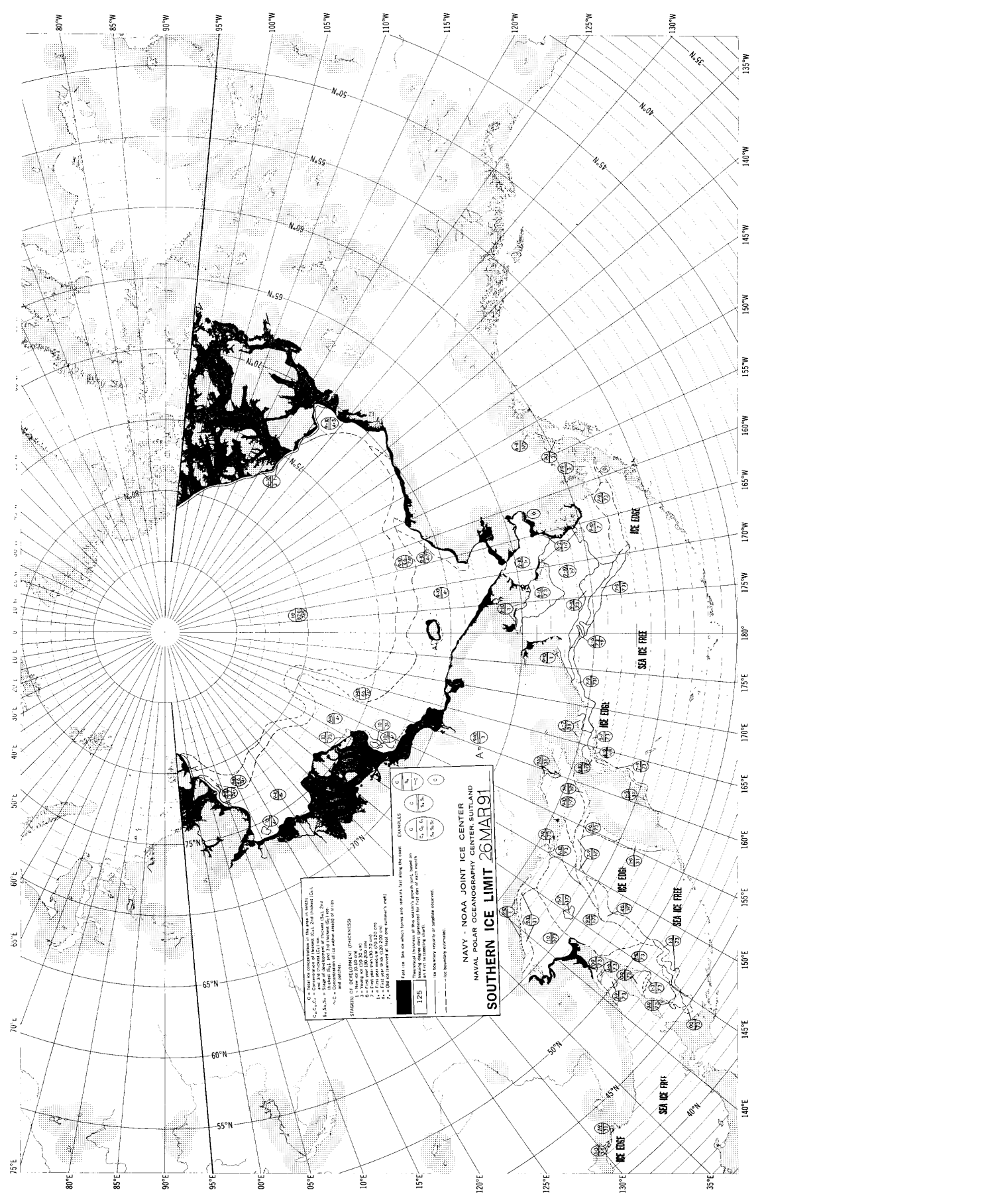


- = 1000 m depth contour of the area in months
 - = 2000 m depth contour of the area in months
 - = 3000 m depth contour of the area in months
 - = 4000 m depth contour of the area in months
 - = 5000 m depth contour of the area in months
 - = 6000 m depth contour of the area in months
 - = 7000 m depth contour of the area in months
 - = 8000 m depth contour of the area in months
 - = 9000 m depth contour of the area in months
 - = 10000 m depth contour of the area in months

CHARACTER OF DEVELOPMENT (THICKNESS)
 1 = None (0-100 mm)
 2 = Thin (100-200 mm)
 3 = Medium (200-500 mm)
 4 = Thick (500-1000 mm)
 5 = Very Thick (1000-2000 mm)
 6 = Ice (2000 mm or more)
 7 = Ice (2000 mm or more) (Summer - 1 meter)

EXAMPLES
 (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) (jj) (jk) (jl) (jm) (jn) (jo) (jp) (jq) (jr) (js) (jt) (ju) (jv) (jw) (jx) (jy) (jz) (ka) (kb) (kc) (kd) (ke) (kf) (kg) (kh) (ki) (kj) (kk) (kl) (km) (kn) (ko) (kp) (kq) (kr) (ks) (kt) (ku) (kv) (kw) (kx) (ky) (kz) (la) (lb) (lc) (ld) (le) (lf) (lg) (lh) (li) (lj) (lk) (ll) (lm) (ln) (lo) (lp) (lq) (lr) (ls) (lt) (lu) (lv) (lw) (lx) (ly) (lz) (ma) (mb) (mc) (md) (me) (mf) (mg) (mh) (mi) (mj) (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) (nj) (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) (pj) (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) (qj) (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) (rj) (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) (sj) (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) (tj) (tk) (tl) (tm) (tn) (to) (tp) (tq) (tr) (ts) (tt) (tu) (tv) (tw) (tx) (ty) (tz) (ua) (ub) (uc) (ud) (ue) (uf) (ug) (uh) (ui) (uj) (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) (vj) (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) (wj) (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) (xj) (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) (yj) (yk) (yl) (ym) (yn) (yo) (yp) (yq) (yr) (ys) (yt) (yu) (yv) (yw) (yx) (yy) (yz) (za) (zb) (zc) (zd) (ze) (zf) (zg) (zh) (zi) (zj) (zk) (zl) (zm) (zn) (zo) (zp) (zq) (zr) (zs) (zt) (zu) (zv) (zw) (zx) (zy) (zz)

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SOUTHERN ICE LIMIT 19 MAR 91



C, L, S, M, H, W, C, O, P, S, I, N, S, E, A, I, C, E, S, I, M, I, T, I, O, N, S, A, R, E, S, H, O, W, N, I, N, T, H, I, S, M, A, P.
 C, L, S, M, H, W, C, O, P, S, I, N, S, E, A, I, C, E, S, I, M, I, T, I, O, N, S, A, R, E, S, H, O, W, N, I, N, T, H, I, S, M, A, P.
 C, L, S, M, H, W, C, O, P, S, I, N, S, E, A, I, C, E, S, I, M, I, T, I, O, N, S, A, R, E, S, H, O, W, N, I, N, T, H, I, S, M, A, P.
 C, L, S, M, H, W, C, O, P, S, I, N, S, E, A, I, C, E, S, I, M, I, T, I, O, N, S, A, R, E, S, H, O, W, N, I, N, T, H, I, S, M, A, P.

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NAVAL POLAR OCEANOGRAPHY CENTER, SRI LAND
SOUTHERN ICE LIMIT 26 MAR 91

125
 100
 75
 50
 25
 0

1:100,000
 1:500,000
 1:1,000,000
 1:2,000,000
 1:5,000,000
 1:10,000,000
 1:20,000,000
 1:50,000,000
 1:100,000,000
 1:200,000,000
 1:500,000,000
 1:1,000,000,000

SYMBOLS OF DEVELOPMENT (ENCASED)

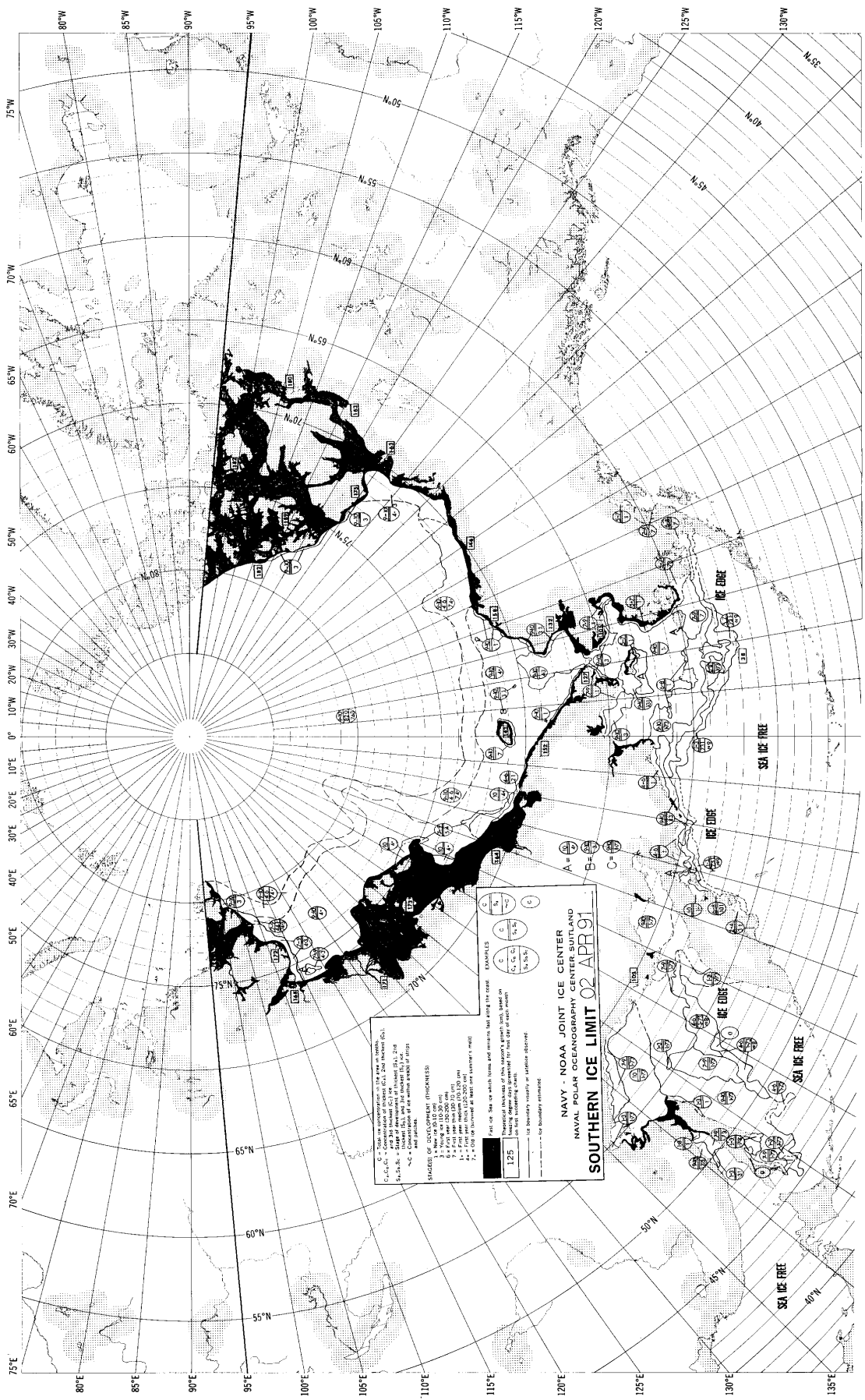
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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1.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



NAVY - NOAA JOINT ICE CENTER
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SOUTHERN ICE LIMIT 02 APR 91

EXAMPLES

LEGEND

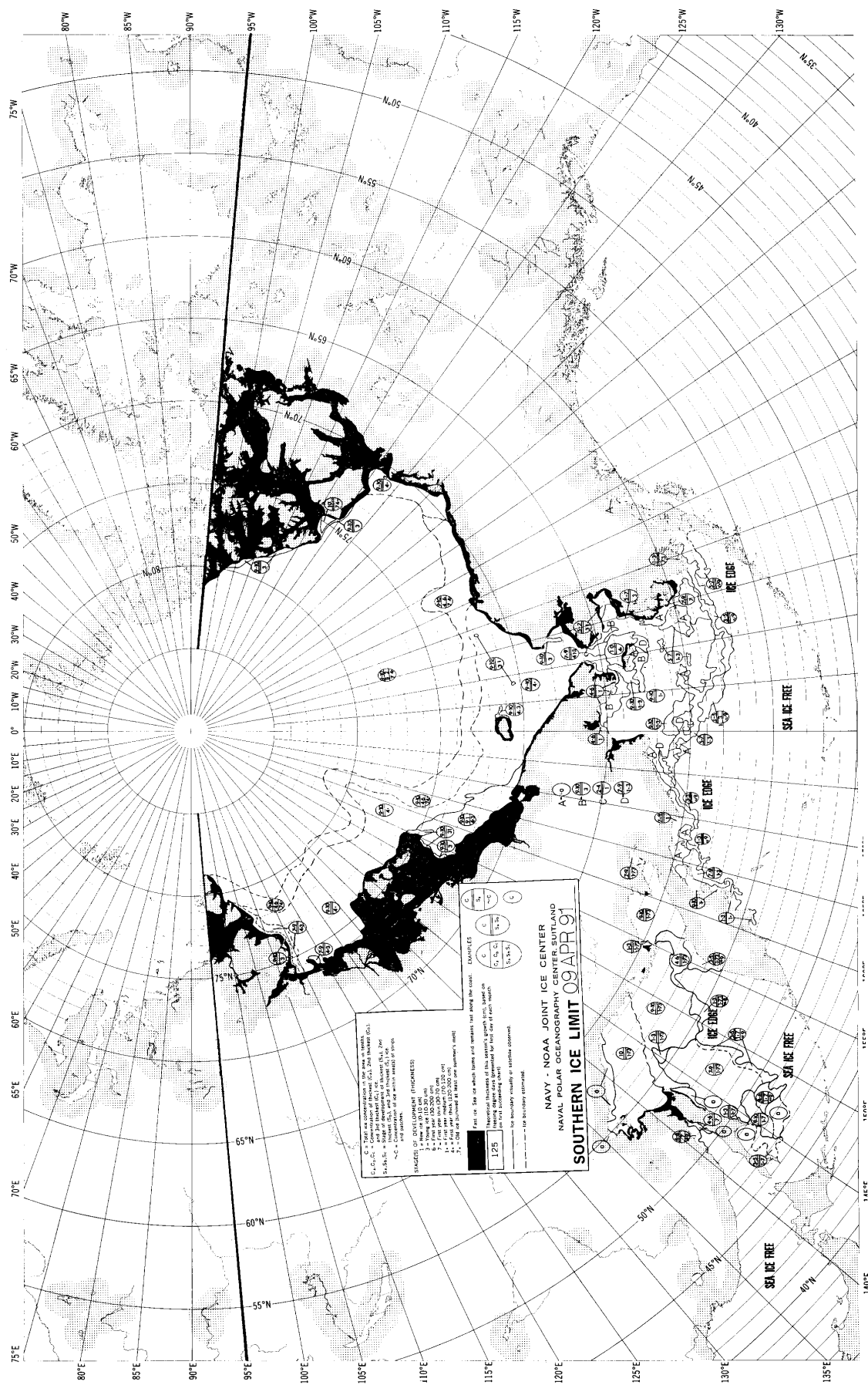
- Thick ice concentration in the area of study.
- Concentration of thickness (C.T.) and fracture (C.F.).
- State of development of the ice sheet (S.D.).
- State of development of the ice sheet (S.D.).
- Concentration of ice within areas of stress.
- Concentration of ice within areas of stress.

SCALE OF ICE DEVELOPMENT (THICKNESS)

- A - None or 0-10 cm
- B - 10-20 cm
- C - 20-30 cm
- D - 30-40 cm
- E - 40-50 cm
- F - 50-60 cm
- G - 60-70 cm
- H - 70-80 cm
- I - 80-90 cm
- J - 90-100 cm
- K - 100-110 cm
- L - 110-120 cm
- M - 120-130 cm
- N - 130-140 cm
- O - 140-150 cm
- P - 150-160 cm
- Q - 160-170 cm
- R - 170-180 cm
- S - 180-190 cm
- T - 190-200 cm
- U - 200-210 cm
- V - 210-220 cm
- W - 220-230 cm
- X - 230-240 cm
- Y - 240-250 cm
- Z - 250-260 cm
- AA - 260-270 cm
- AB - 270-280 cm
- AC - 280-290 cm
- AD - 290-300 cm
- AE - 300-310 cm
- AF - 310-320 cm
- AG - 320-330 cm
- AH - 330-340 cm
- AI - 340-350 cm
- AJ - 350-360 cm
- AK - 360-370 cm
- AL - 370-380 cm
- AM - 380-390 cm
- AN - 390-400 cm
- AO - 400-410 cm
- AP - 410-420 cm
- AQ - 420-430 cm
- AR - 430-440 cm
- AS - 440-450 cm
- AT - 450-460 cm
- AU - 460-470 cm
- AV - 470-480 cm
- AW - 480-490 cm
- AX - 490-500 cm
- AY - 500-510 cm
- AZ - 510-520 cm
- BA - 520-530 cm
- BB - 530-540 cm
- BC - 540-550 cm
- BD - 550-560 cm
- BE - 560-570 cm
- BF - 570-580 cm
- BG - 580-590 cm
- BH - 590-600 cm
- BI - 600-610 cm
- BJ - 610-620 cm
- BK - 620-630 cm
- BL - 630-640 cm
- BM - 640-650 cm
- BN - 650-660 cm
- BO - 660-670 cm
- BP - 670-680 cm
- BQ - 680-690 cm
- BR - 690-700 cm
- BS - 700-710 cm
- BT - 710-720 cm
- BU - 720-730 cm
- BV - 730-740 cm
- BW - 740-750 cm
- BX - 750-760 cm
- BY - 760-770 cm
- BZ - 770-780 cm
- CA - 780-790 cm
- CB - 790-800 cm
- CC - 800-810 cm
- CD - 810-820 cm
- CE - 820-830 cm
- CF - 830-840 cm
- CG - 840-850 cm
- CH - 850-860 cm
- CI - 860-870 cm
- CJ - 870-880 cm
- CK - 880-890 cm
- CL - 890-900 cm
- CM - 900-910 cm
- CN - 910-920 cm
- CO - 920-930 cm
- CP - 930-940 cm
- CQ - 940-950 cm
- CR - 950-960 cm
- CS - 960-970 cm
- CT - 970-980 cm
- CU - 980-990 cm
- CV - 990-1000 cm
- CV - 1000-1010 cm
- CV - 1010-1020 cm
- CV - 1020-1030 cm
- CV - 1030-1040 cm
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- CV - 1110-1120 cm
- CV - 1120-1130 cm
- CV - 1130-1140 cm
- CV - 1140-1150 cm
- CV - 1150-1160 cm
- CV - 1160-1170 cm
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- CV - 1180-1190 cm
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- CV - 1890-1900 cm
- CV - 1900-1910 cm
- CV - 1910-1920 cm
- CV - 1920-1930 cm
- CV - 1930-1940 cm
- CV - 1940-1950 cm
- CV - 1950-1960 cm
- CV - 1960-1970 cm
- CV - 1970-1980 cm
- CV - 1980-1990 cm
- CV - 1990-2000 cm

NOTES

- 1. Ice thickness is based on the 1000m depth.
- 2. Ice thickness is based on the 1000m depth.
- 3. Ice thickness is based on the 1000m depth.
- 4. Ice thickness is based on the 1000m depth.
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- 100. Ice thickness is based on the 1000m depth.



80°E 85°E 90°E 95°E 100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E

75°E 80°E 85°E 90°E 95°E 100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E

75°W 80°W 85°W 90°W 95°W 100°W 105°W 110°W 115°W 120°W 125°W 130°W 135°W

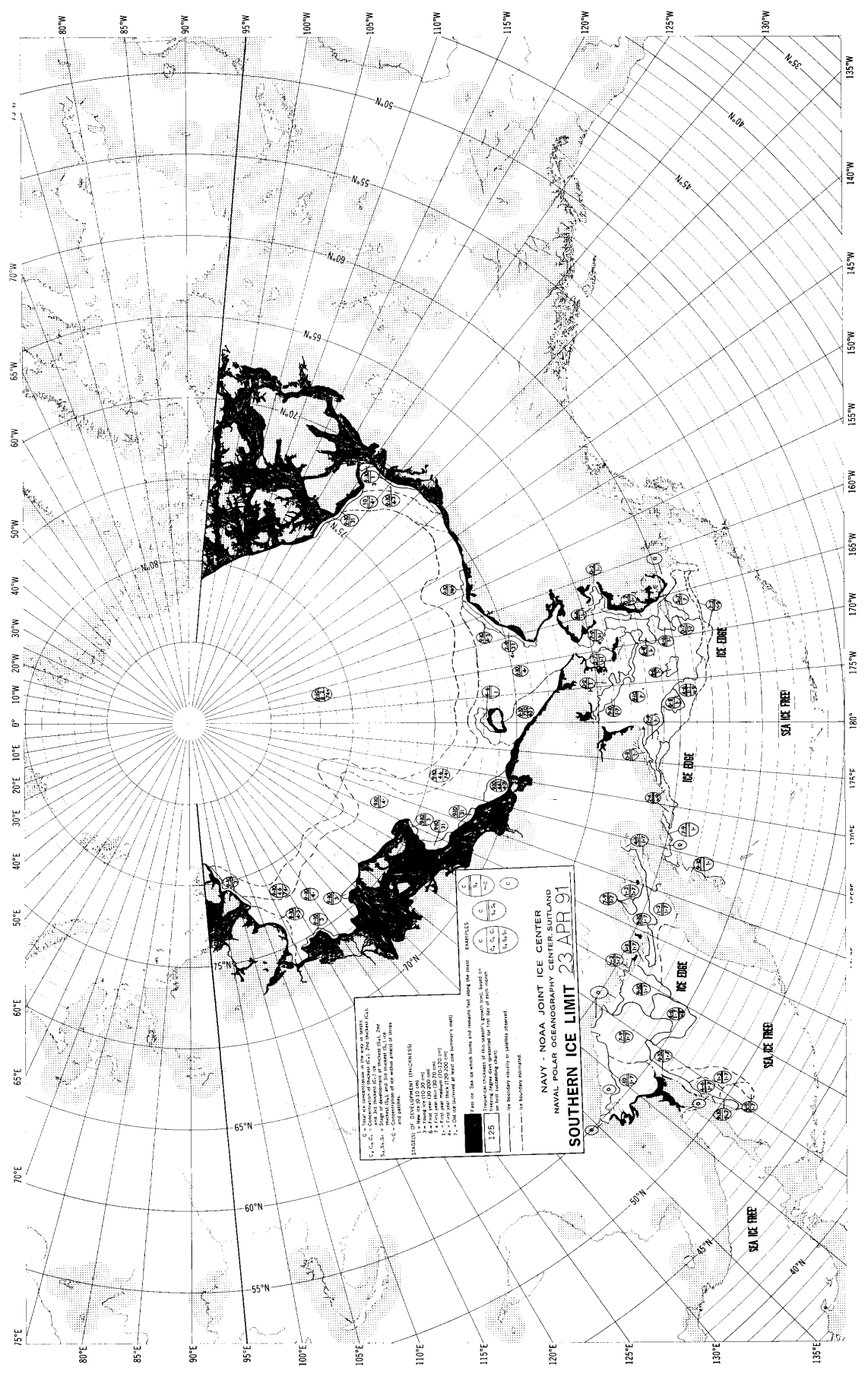
75°W 80°W 85°W 90°W 95°W 100°W 105°W 110°W 115°W 120°W 125°W 130°W 135°W

50°N 55°N 60°N 65°N 70°N 75°N

50°N 55°N 60°N 65°N 70°N 75°N

75°E 80°E 85°E 90°E 95°E 100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E

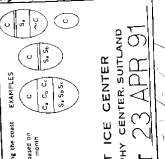
75°E 80°E 85°E 90°E 95°E 100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E



1:250,000

Scale: 1:250,000
1 inch = 40.0 meters
1 centimeter = 0.400 meters

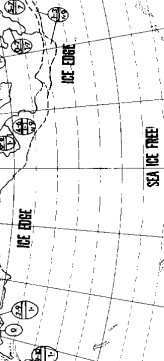
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 23 APR 91

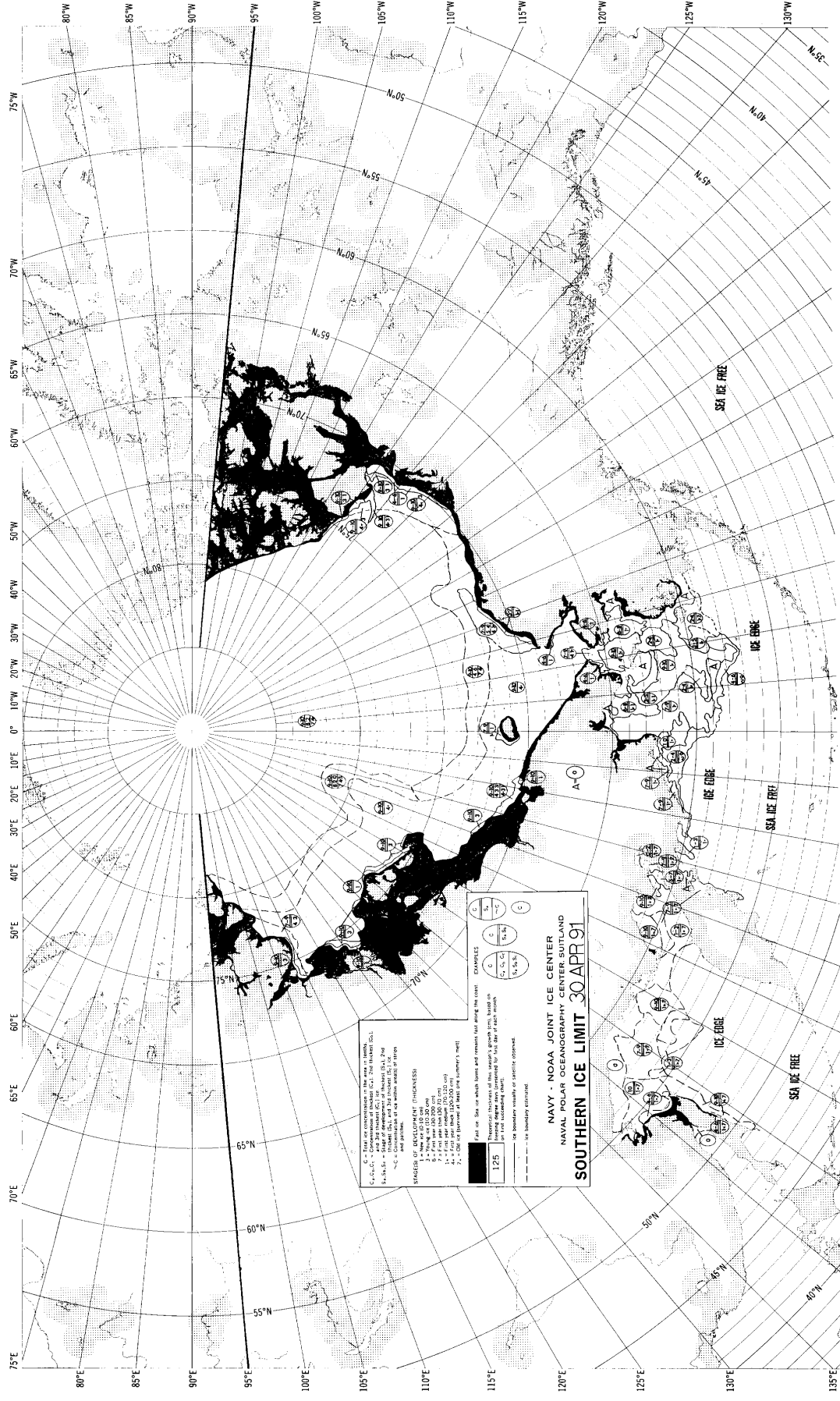


1:250,000

Scale: 1:250,000
1 inch = 40.0 meters
1 centimeter = 0.400 meters

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 23 APR 91





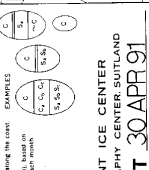
C - Total ice concentration in the area in percent.
 C₁, C₂, C₃ - 1st, 2nd and 3rd thickness classes (C₁ - 7th thickness class).
 S₁, S₂, S₃ - 1st, 2nd and 3rd stages of ice development.
 - C - Ice concentration in the entire sheet or strip.
 - S - Stages of ice development.

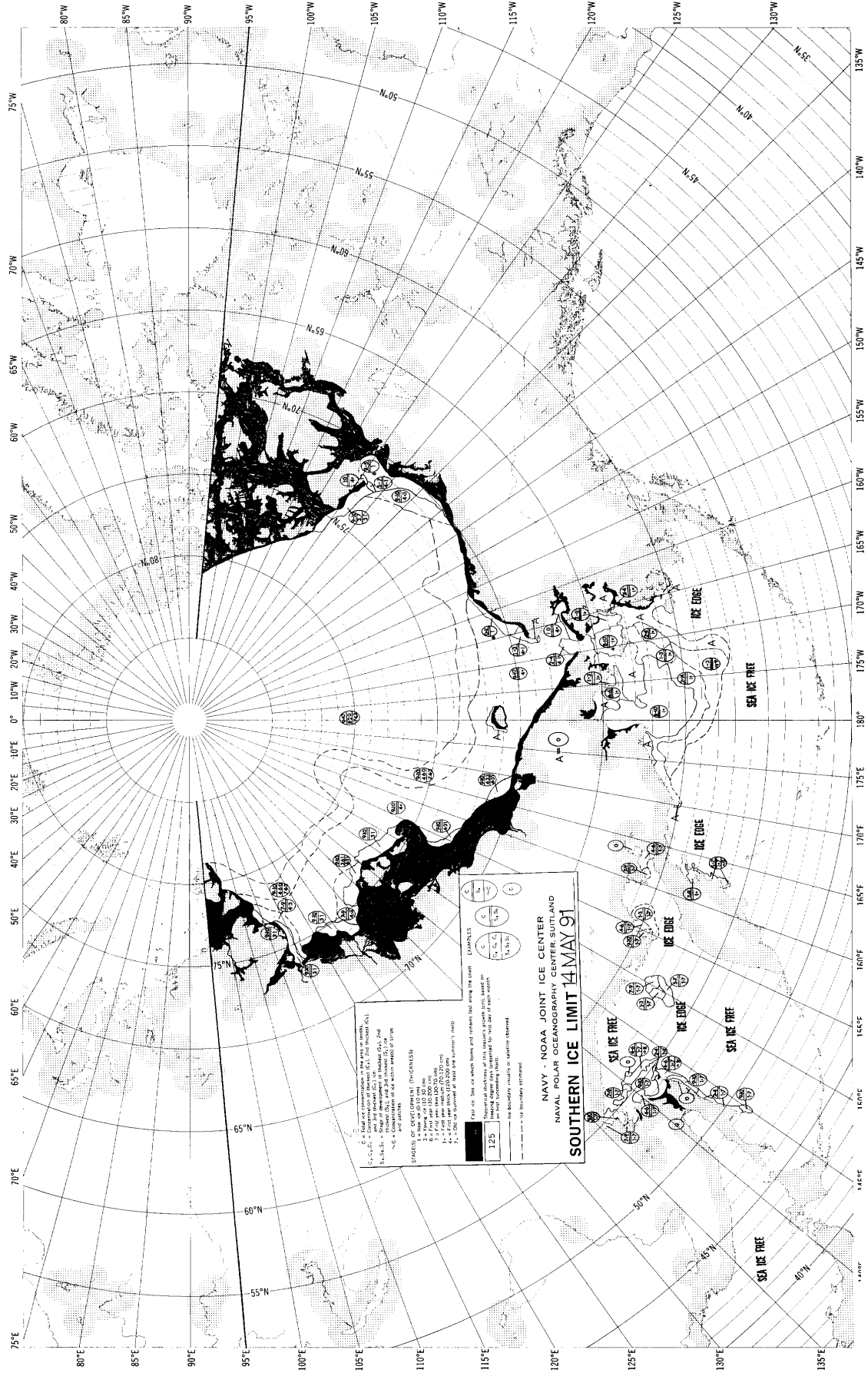
STAGES OF DEVELOPMENT (THICKNESS)
 1 - New ice (10-15 cm)
 2 - First year ice (15-30 cm)
 3 - First year ice (30-50 cm)
 4 - First year ice (50-100 cm)
 5 - First year ice (100-200 cm)
 6 - First year ice (200-300 cm)
 7 - Old ice (300 cm or more)

- - - - - US boundary (estimated)

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 30 APR 91

- - - - - US boundary (estimated)



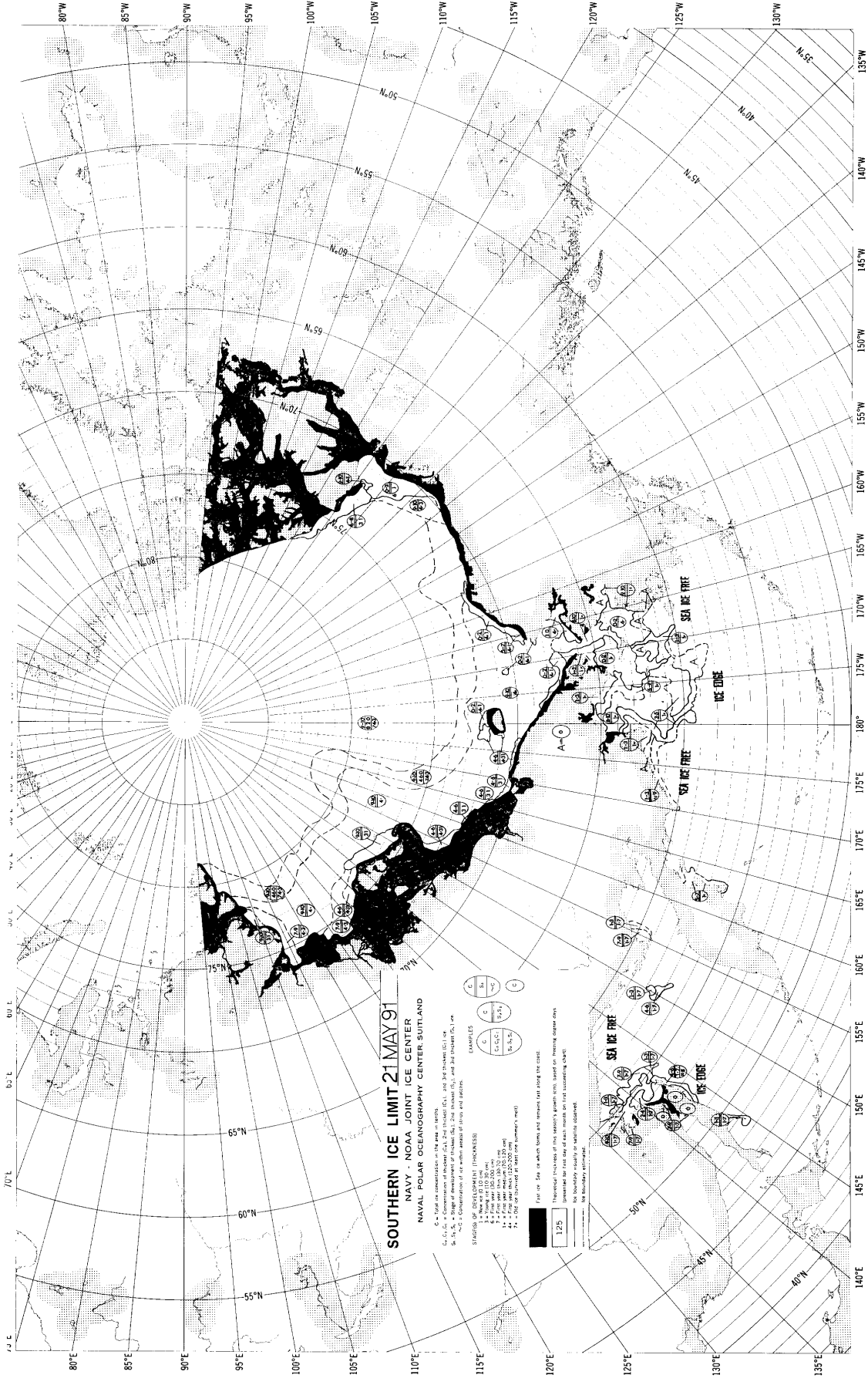


C = Clear area of ice (2.0 m thickness)
 CC = Clear area of ice (1.0 m thickness)
 S = Sea ice (1.0 m thickness)
 SS = Sea ice (0.5 m thickness)
 S.S. = Sea ice (0.25 m thickness)
 S.S.S. = Sea ice (0.125 m thickness)
 S.S.S.S. = Sea ice (0.0625 m thickness)
 S.S.S.S.S. = Sea ice (0.03125 m thickness)
 S.S.S.S.S.S. = Sea ice (0.015625 m thickness)

PHASES OF DEVELOPMENT - THICKNESS
 1 = 1st year ice (0.125-0.25 m)
 2 = 2nd year ice (0.25-0.5 m)
 3 = 3rd year ice (0.5-0.75 m)
 4 = 4th year ice (0.75-1.0 m)
 5 = 5th year ice (1.0-1.25 m)
 6 = 6th year ice (1.25-1.5 m)
 7 = 7th year ice (1.5-1.75 m)
 8 = 8th year ice (1.75-2.0 m)

For use: See the actual limits and markers for each station.
 Interpretations are based on the data for each station.
 The boundaries shown are for the most limiting station.
 The boundaries shown are for the most limiting station.
 The boundaries shown are for the most limiting station.

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 14 MAY 91



SOUTHERN ICE LIMIT 21 MAY 91

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND

0-1 = Total ice concentration in the area in percent.
 2-9 = Range of measurements of thickness (in inches) (1-9) and 3rd thickness (10-14).
 S, N, W, E = Direction of measurement of thickness (S, 2nd thickness (10), and 3rd thickness (14)).

EXAMPLES



STATIONS FOR OBSERVATIONS (SYMBOLS)

- 1 = New survey (100 km)
- 2 = 200 km survey (100 km)
- 3 = 200 km survey (150 km)
- 4 = 200 km survey (100 km)
- 5 = 200 km survey (150 km)
- 6 = 200 km survey (100 km)
- 7 = 200 km survey (150 km)
- 8 = 200 km survey (100 km)
- 9 = 200 km survey (150 km)
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- 89 = 200 km survey (150 km)
- 90 = 200 km survey (100 km)
- 91 = 200 km survey (150 km)
- 92 = 200 km survey (100 km)
- 93 = 200 km survey (150 km)
- 94 = 200 km survey (100 km)
- 95 = 200 km survey (150 km)
- 96 = 200 km survey (100 km)
- 97 = 200 km survey (150 km)
- 98 = 200 km survey (100 km)
- 99 = 200 km survey (150 km)
- 100 = 200 km survey (100 km)

125 = Theoretical thickness of this sector's depth (ft), based on freezing degree days (summed for first six days of each month on first sounding depth).

--- = Boundary of ice or variable observed.

--- = Boundary of ice or variable observed.

--- = Boundary of ice or variable observed.

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--- = Boundary of ice or variable observed.

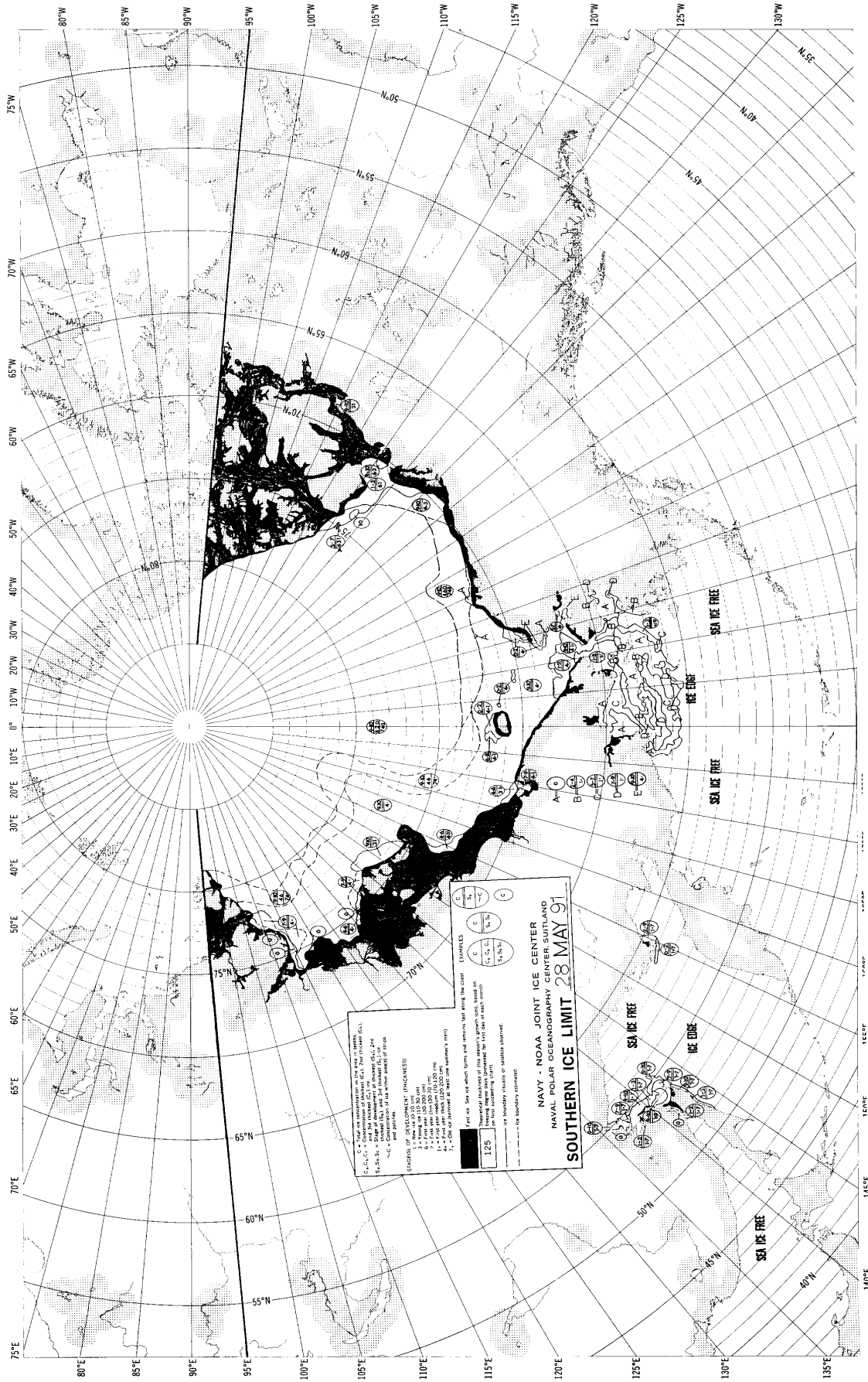
--- = Boundary of ice or variable observed.

--- = Boundary of ice or variable observed.

--- = Boundary of ice or variable observed.

--- = Boundary of ice or variable observed.

--- = Boundary of ice or variable observed.



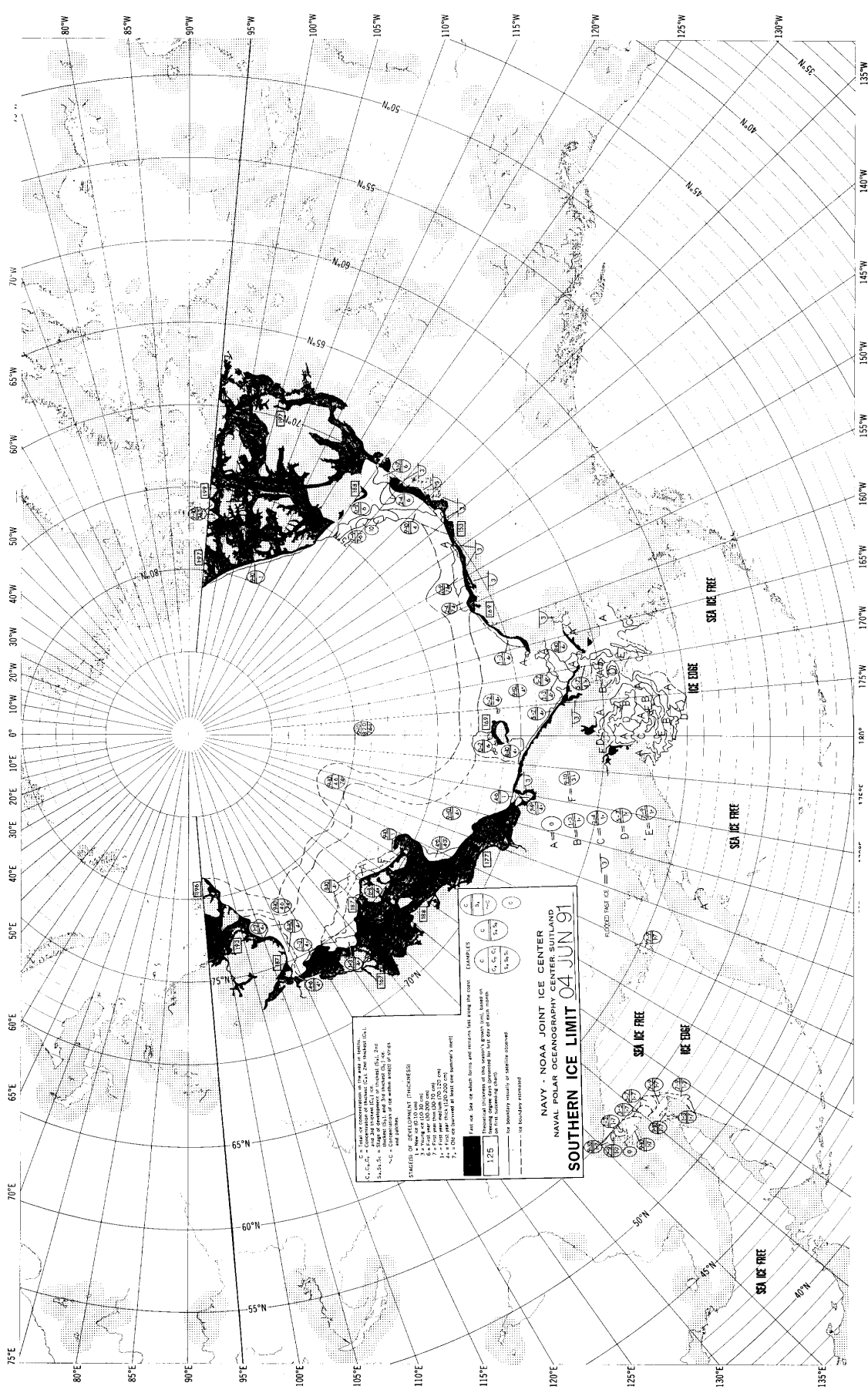
1. 1988-1990 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 2. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 3. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 4. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 5. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 6. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 7. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 8. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 9. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 10. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTTLAND
SOUTHERN ICE LIMIT 28 MAY 91

125
 100
 75
 50
 25
 0
 -25
 -50
 -75
 -100
 -125

1. 1988-1990 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 2. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 3. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 4. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 5. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 6. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 7. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 8. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 9. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).
 10. 1991 data from the U.S. Navy's Arctic Oceanographic Survey (AOS) and the U.S. Navy's Arctic Oceanographic Survey (AOS).

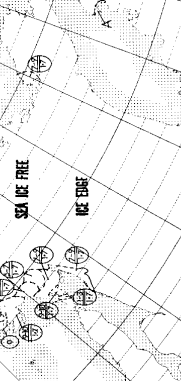
140°E
 135°E
 130°E
 125°E
 120°E
 115°E
 110°E
 105°E
 100°E
 95°E
 90°E
 85°E
 80°E
 75°E
 70°E
 65°E
 60°E
 55°E
 50°E
 45°E
 40°E
 35°E
 30°E
 25°E
 20°E
 15°E
 10°E
 5°E
 0°E
 5°W
 10°W
 15°W
 20°W
 25°W
 30°W
 35°W
 40°W
 45°W
 50°W
 55°W
 60°W
 65°W
 70°W
 75°W
 80°W
 85°W
 90°W
 95°W
 100°W
 105°W
 110°W
 115°W
 120°W
 125°W
 130°W
 135°W
 140°W

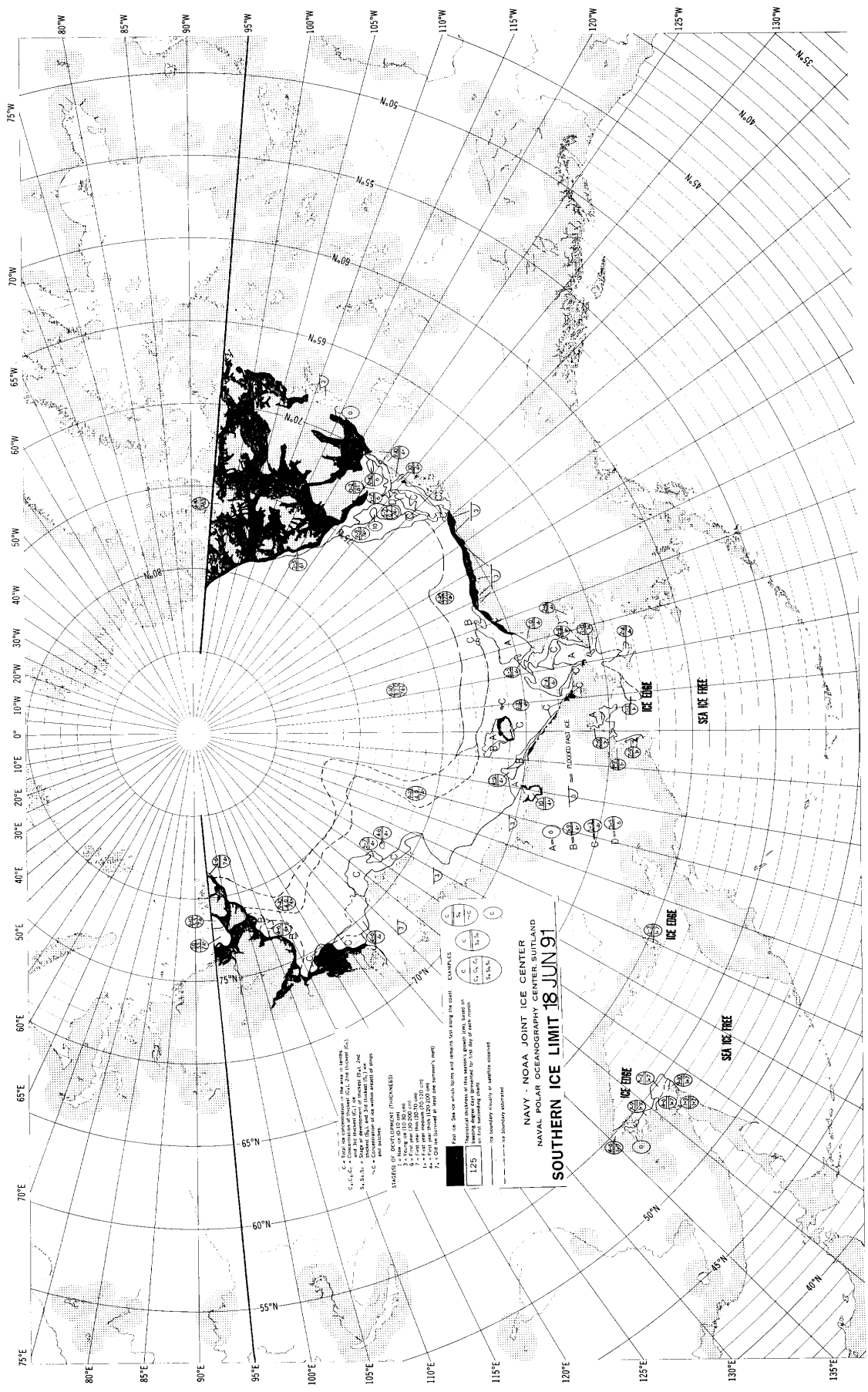


0 = Ice thickness observations in the area of interest.
 1 = Ice thickness observations in the area of interest.
 2 = Ice thickness observations in the area of interest.
 3 = Ice thickness observations in the area of interest.
 4 = Ice thickness observations in the area of interest.
 5 = Ice thickness observations in the area of interest.
 6 = Ice thickness observations in the area of interest.
 7 = Ice thickness observations in the area of interest.
 8 = Ice thickness observations in the area of interest.
 9 = Ice thickness observations in the area of interest.
 10 = Ice thickness observations in the area of interest.

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 04 JUN 91

125 = Theoretical thickness of this season's growth (m), based on
 current observations and historical data for the area.
 125 = Ice boundary (meters) or thickness (meters).
 --- = Ice boundary estimated.





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

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 18 JUN 91

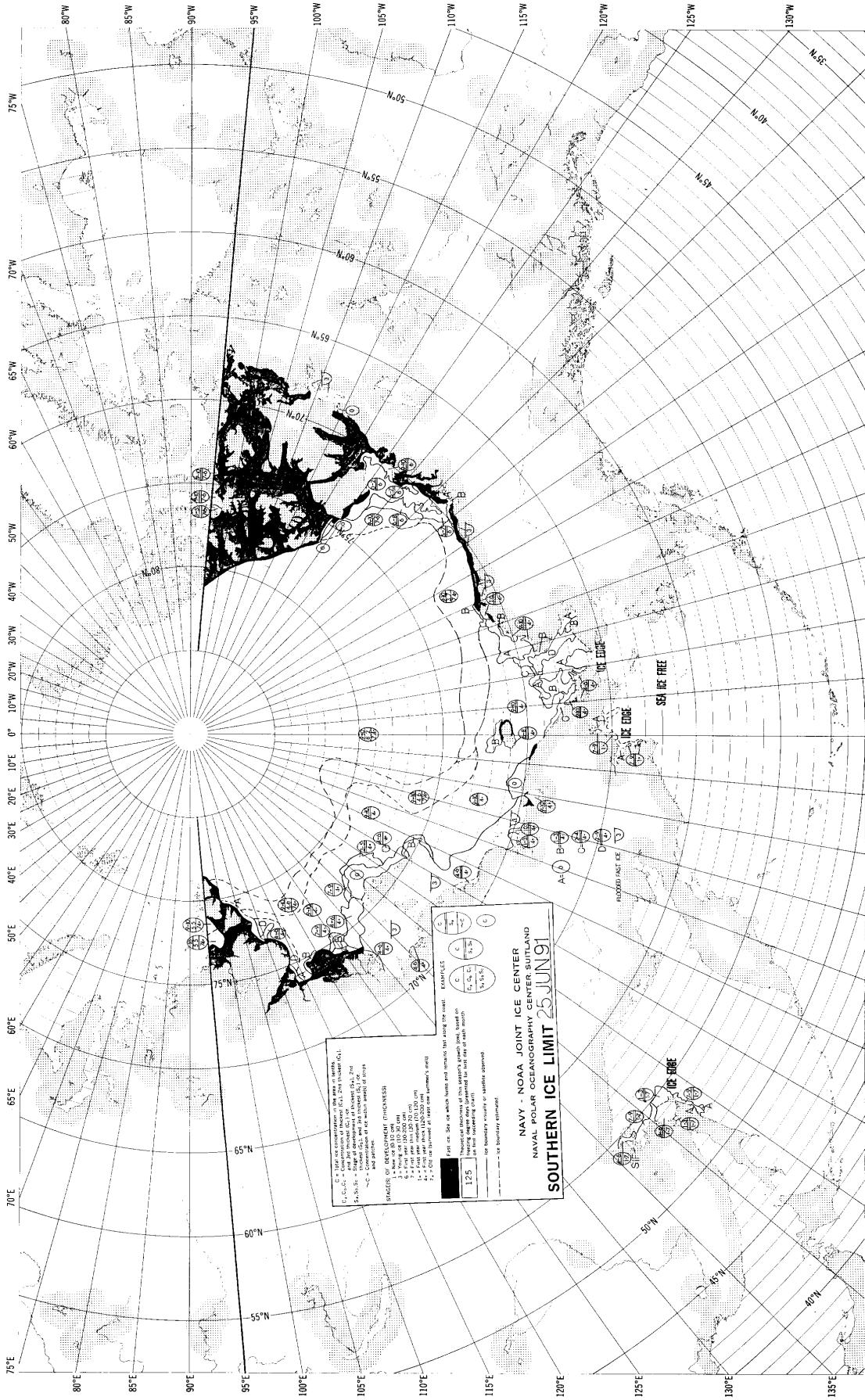
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

1	2	3
4	5	6
7	8	9
10	11	12

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

1 - Ice edge (see text for definition) (see text for definition)
 2 - Ice edge (see text for definition) (see text for definition)
 3 - Ice edge (see text for definition) (see text for definition)
 4 - Ice edge (see text for definition) (see text for definition)
 5 - Ice edge (see text for definition) (see text for definition)
 6 - Ice edge (see text for definition) (see text for definition)
 7 - Ice edge (see text for definition) (see text for definition)
 8 - Ice edge (see text for definition) (see text for definition)
 9 - Ice edge (see text for definition) (see text for definition)
 10 - Ice edge (see text for definition) (see text for definition)
 11 - Ice edge (see text for definition) (see text for definition)
 12 - Ice edge (see text for definition) (see text for definition)
 13 - Ice edge (see text for definition) (see text for definition)
 14 - Ice edge (see text for definition) (see text for definition)
 15 - Ice edge (see text for definition) (see text for definition)
 16 - Ice edge (see text for definition) (see text for definition)



STAGES OF DEVELOPMENT (THICKNESS)

- 1 - New ice (10-20 cm)
- 2 - Young ice (20-50 cm)
- 3 - First year ice (50-250 cm)
- 4 - Second year ice (250-500 cm)
- 5 - Multi-year ice (500-2000 cm)
- 6 - Old ice (2000+ cm)

EXAMPLES

C	100% ice concentration in the area in which the symbol is placed
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm and the ice is multi-year ice
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm and the ice is multi-year ice and the ice is in the vicinity of a port and a station

STAGES OF DEVELOPMENT (THICKNESS)

- 1 - New ice (10-20 cm)
- 2 - Young ice (20-50 cm)
- 3 - First year ice (50-250 cm)
- 4 - Second year ice (250-500 cm)
- 5 - Multi-year ice (500-2000 cm)
- 6 - Old ice (2000+ cm)

EXAMPLES

C	100% ice concentration in the area in which the symbol is placed
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm and the ice is multi-year ice
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm and the ice is multi-year ice and the ice is in the vicinity of a port and a station

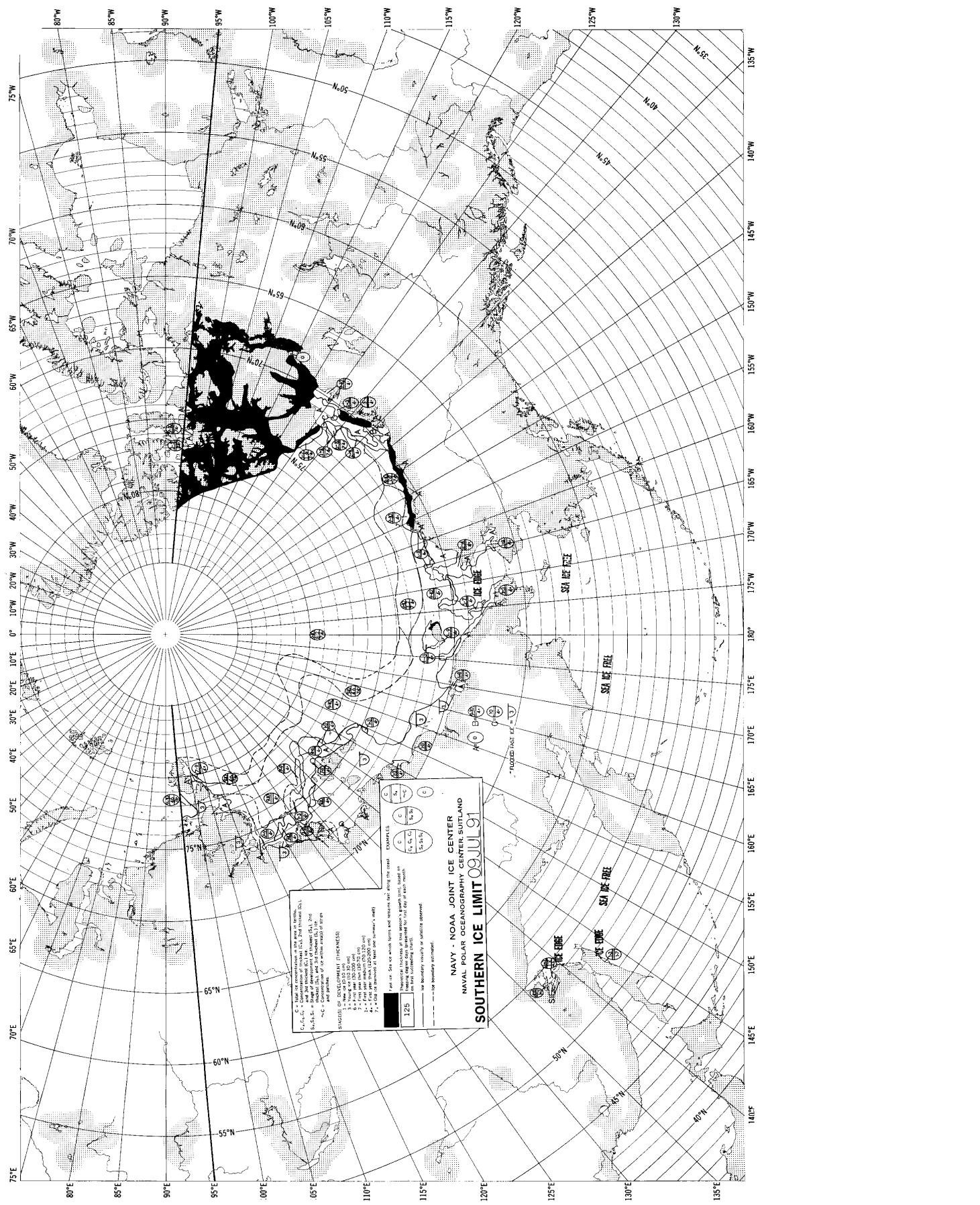
STAGES OF DEVELOPMENT (THICKNESS)

- 1 - New ice (10-20 cm)
- 2 - Young ice (20-50 cm)
- 3 - First year ice (50-250 cm)
- 4 - Second year ice (250-500 cm)
- 5 - Multi-year ice (500-2000 cm)
- 6 - Old ice (2000+ cm)

EXAMPLES

C	100% ice concentration in the area in which the symbol is placed
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm and the ice is multi-year ice
C	100% ice concentration in the area in which the symbol is placed and the thickness of the ice is 100 cm and the ice is multi-year ice and the ice is in the vicinity of a port and a station

**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER/ITLAND
SOUTHERN ICE LIMIT 25 JUN 91**



NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 09 JUL 91

SYMBOLS

C, C, C, C - Concentration of ice
 S, S, S, S - Shape of distribution of ice
 N, E, C, S - Direction of ice
 and pattern.

EXAMPLES

C, C, C, C
 S, S, S, S
 N, E, C, S

NOTES

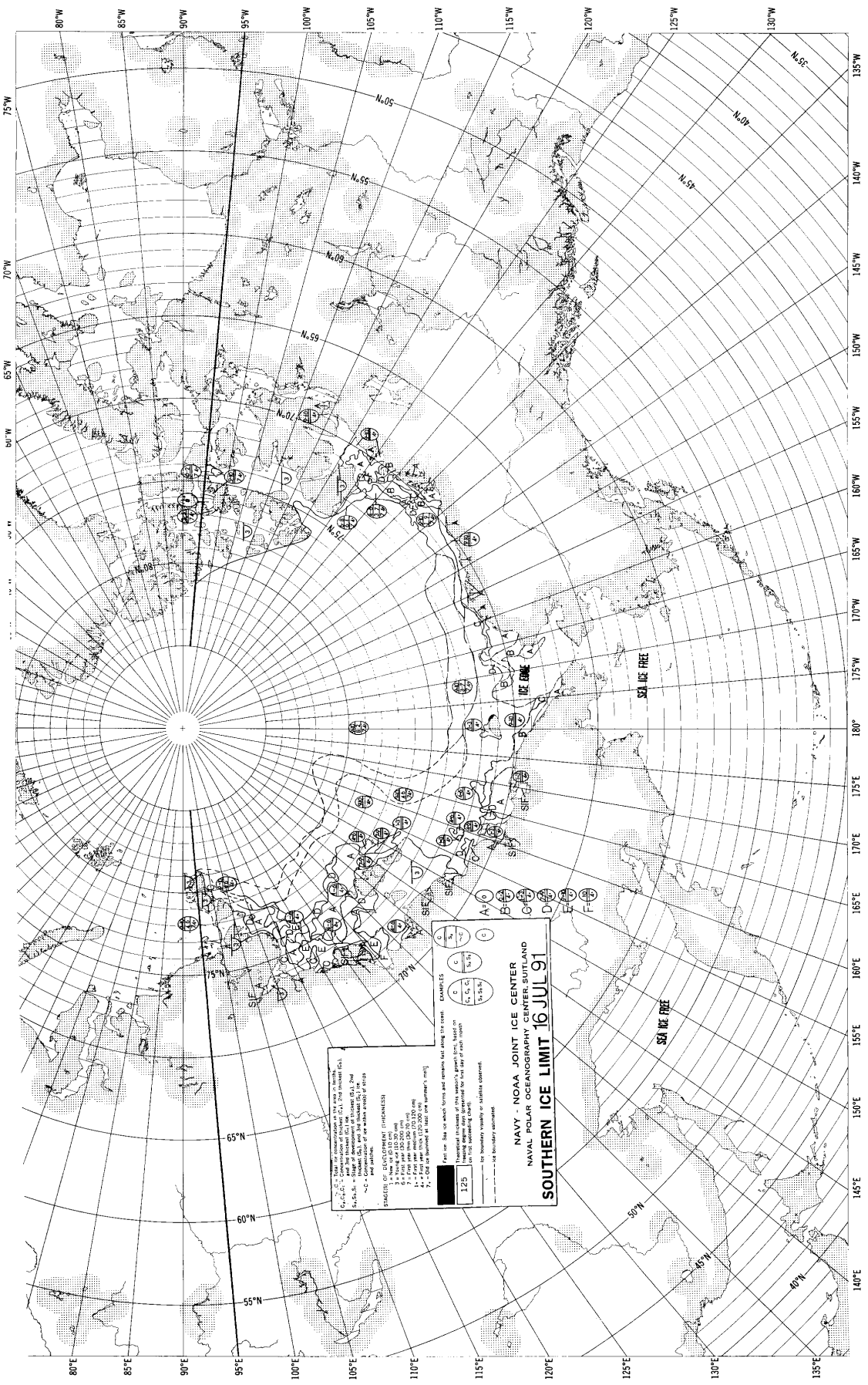
1 - Ice thickness in feet (30.48 cm)
 2 - Ice age in years
 3 - Ice type (see legend)
 4 - Ice color (see legend)
 5 - Ice strength (see legend)
 6 - Ice temperature (see legend)
 7 - Ice salinity (see legend)

LEGEND

125 - Ice thickness in feet (30.48 cm)

EXPLANATIONS

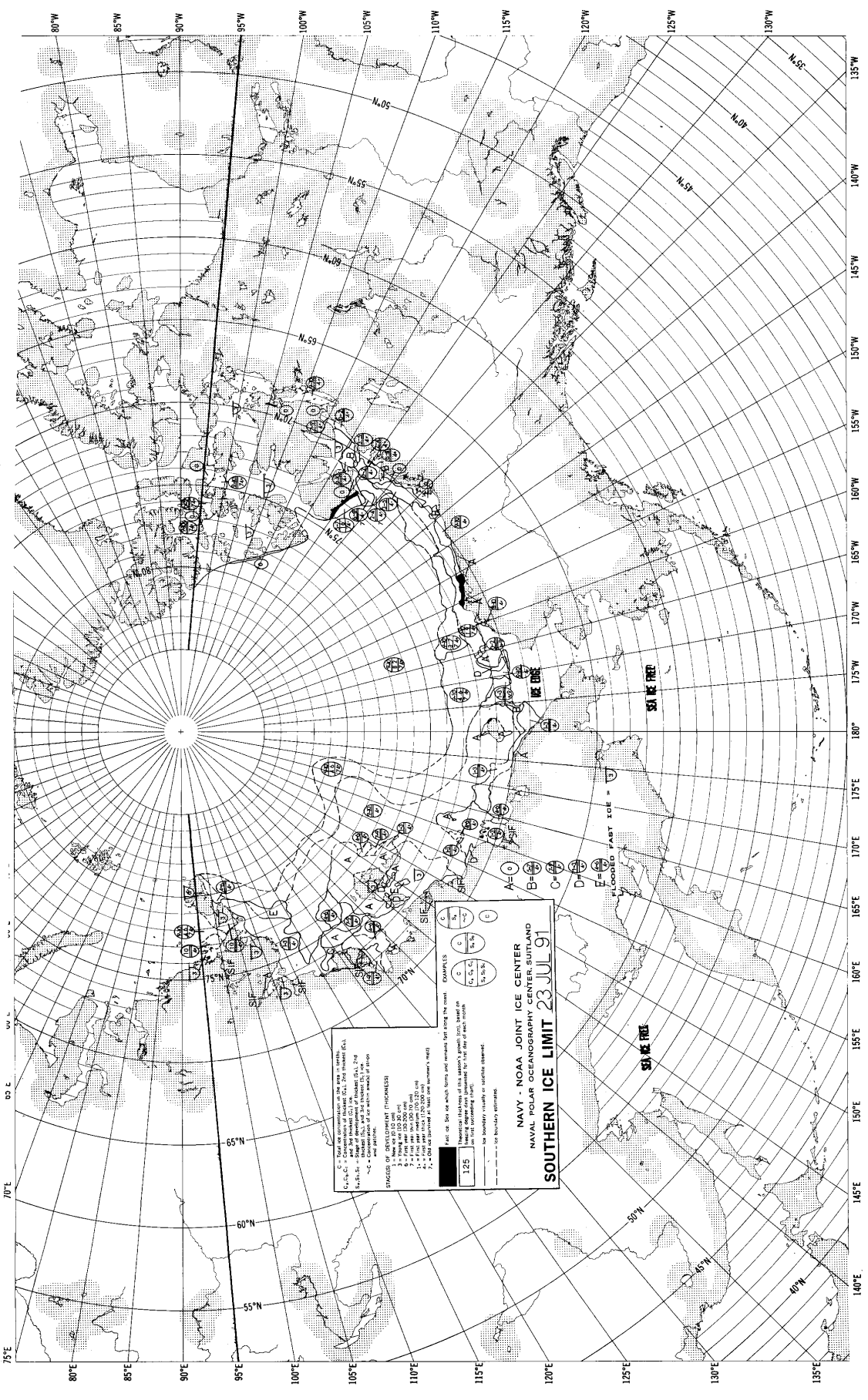
1 - Ice thickness in feet (30.48 cm)
 2 - Ice age in years
 3 - Ice type (see legend)
 4 - Ice color (see legend)
 5 - Ice strength (see legend)
 6 - Ice temperature (see legend)
 7 - Ice salinity (see legend)



1. 0 - 100% ice concentration on the scale in brackets.
2. 100% ice concentration on the scale in brackets.
3. 100% ice concentration on the scale in brackets.
4. 100% ice concentration on the scale in brackets.
5. 100% ice concentration on the scale in brackets.
6. 100% ice concentration on the scale in brackets.
7. 100% ice concentration on the scale in brackets.
8. 100% ice concentration on the scale in brackets.
9. 100% ice concentration on the scale in brackets.
10. 100% ice concentration on the scale in brackets.

Part one: Sea ice which forms and remains fast along the coast.
Part two: Sea ice which forms and remains fast along the coast.
Part three: Sea ice which forms and remains fast along the coast.
Part four: Sea ice which forms and remains fast along the coast.
Part five: Sea ice which forms and remains fast along the coast.

1. 100% ice concentration on the scale in brackets.
2. 100% ice concentration on the scale in brackets.
3. 100% ice concentration on the scale in brackets.
4. 100% ice concentration on the scale in brackets.
5. 100% ice concentration on the scale in brackets.
6. 100% ice concentration on the scale in brackets.
7. 100% ice concentration on the scale in brackets.
8. 100% ice concentration on the scale in brackets.
9. 100% ice concentration on the scale in brackets.
10. 100% ice concentration on the scale in brackets.



Symbols in the map are defined as follows:
 C, A, B, D, E = Concentrations of floes, icebergs, and icebergs (C/I)
 S, B, L, S, L = Size of floes, icebergs, and icebergs (S/I, B/I, L/I)
 % E = Concentration of icebergs (S/I, B/I, L/I)
 % E = Concentration of icebergs (S/I, B/I, L/I)

SIZES OF ICEBERGS (THICKNESS)
 1 = More than 1000 cm
 2 = From 500 to 1000 cm
 3 = From 250 to 500 cm
 4 = From 100 to 250 cm
 5 = From 50 to 100 cm
 6 = From 25 to 50 cm
 7 = Other (as reported at least one summer's age)

Note: All symbols are plotted on the basis of the date of observation.
 The shaded area represents the ice extent on the date of observation.
 The boundary is shown in light gray.

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SOUTHERN ICE LIMIT 23 JUL 91

EXAMPLES
 C 100
 S 100
 B 100
 L 100
 S 100
 B 100
 L 100
 S 100
 B 100
 L 100

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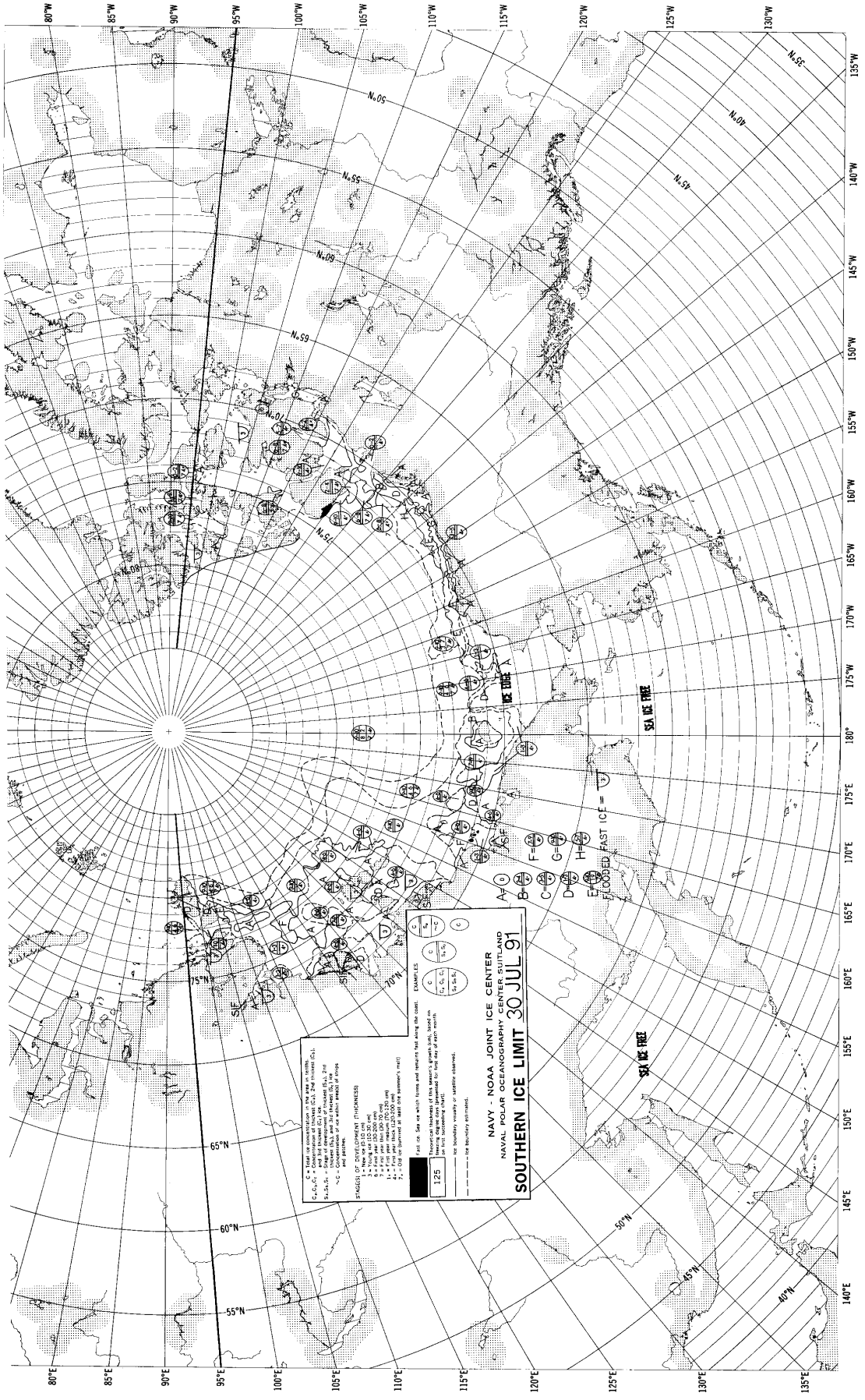
Note: All symbols are plotted on the basis of the date of observation.
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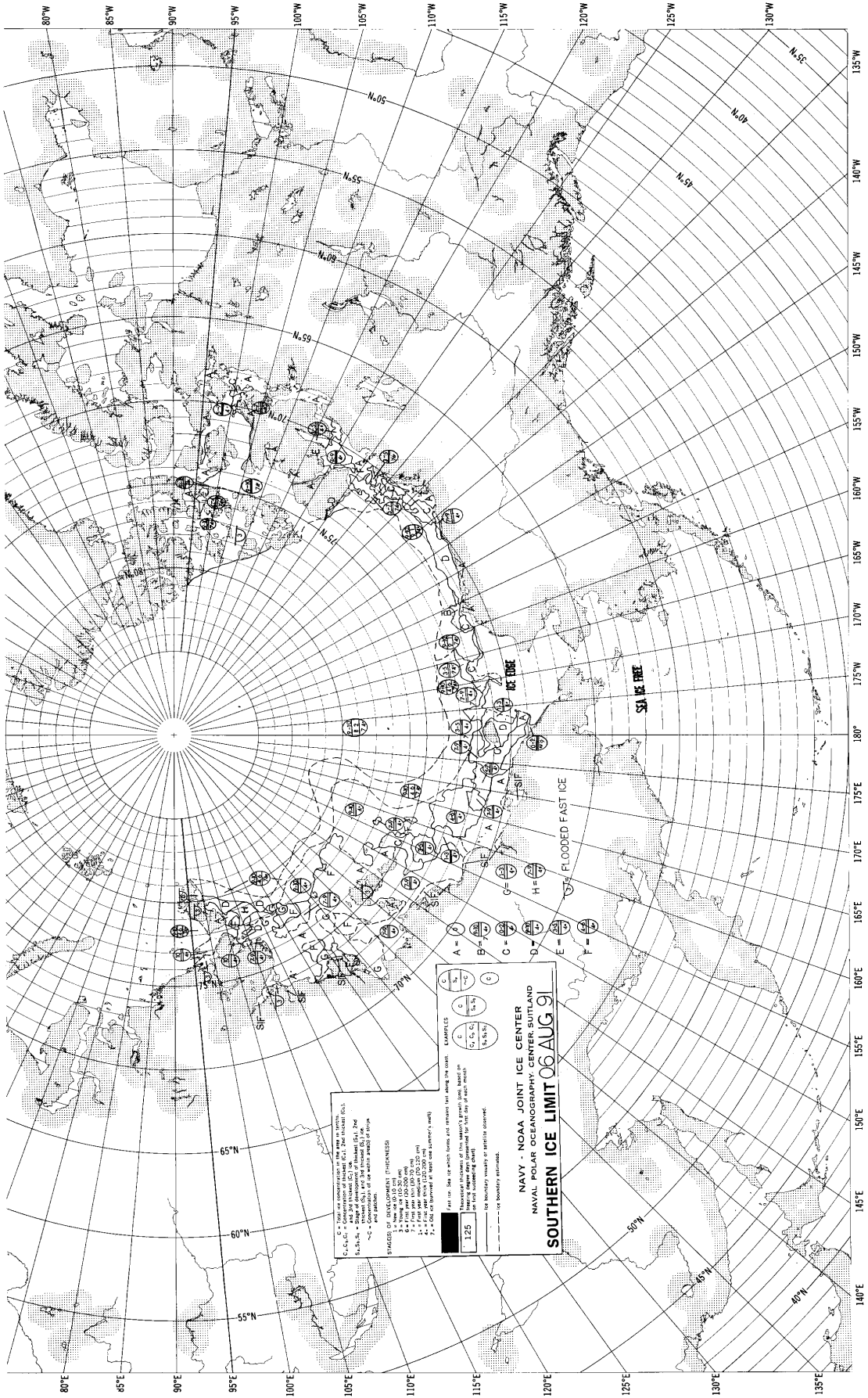
Note: All symbols are plotted on the basis of the date of observation.
 The shaded area represents the ice extent on the date of observation.
 The boundary is shown in light gray.



C.I.C.P. = Concentration of Ice (C.I.C.P. 200 means 20% concentration of ice)
 S.I.C.P. = Stage of Ice (S.I.C.P. 1 means 1st stage of ice)
 C.C. = Concentration of ice (C.C. 200 means 20% concentration of ice)
 S.C. = Concentration of ice (S.C. 200 means 20% concentration of ice)

SPAGHETTI
 1 = 100% ice
 2 = 100% ice
 3 = 100% ice
 4 = 100% ice
 5 = 100% ice
 6 = 100% ice
 7 = 100% ice
 8 = 100% ice
 9 = 100% ice
 10 = 100% ice
 11 = 100% ice
 12 = 100% ice
 13 = 100% ice
 14 = 100% ice
 15 = 100% ice
 16 = 100% ice
 17 = 100% ice
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 96 = 100% ice
 97 = 100% ice
 98 = 100% ice
 99 = 100% ice
 100 = 100% ice

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SOUTHERN ICE LIMIT 30 JUL 91

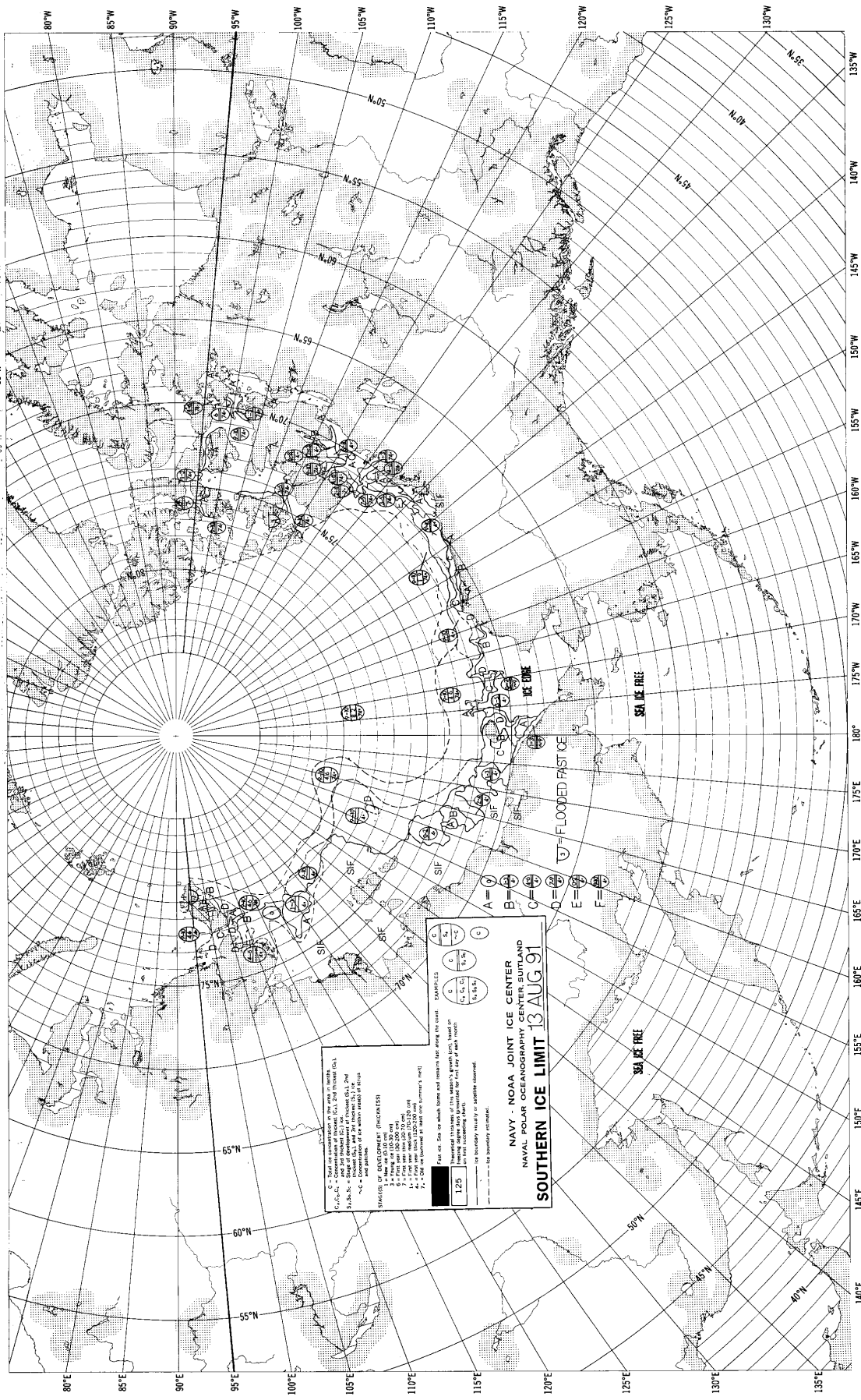


C, 4, 5, 6 = 100% ice concentration in the area in which the
 C, 4, 5, 6 = 100% ice concentration in the area in which the
 thickness is 4, 5, or 6 feet (1.2, 1.5, or 1.8 m).
 Such as: "4, 5, 6" = 100% ice concentration in the area in which the
 thickness is 4, 5, or 6 feet (1.2, 1.5, or 1.8 m).
 and partial.

STAGES OF DEVELOPMENT THICKNESS
 1 = 100% ice concentration in the area in which the
 thickness is 100 mm (0.33 ft).
 2 = 100% ice concentration in the area in which the
 thickness is 150 mm (0.5 ft).
 3 = 100% ice concentration in the area in which the
 thickness is 200 mm (0.66 ft).
 4 = 100% ice concentration in the area in which the
 thickness is 250 mm (0.82 ft).
 5 = 100% ice concentration in the area in which the
 thickness is 300 mm (0.98 ft).
 6 = 100% ice concentration in the area in which the
 thickness is 350 mm (1.15 ft).

EXAMPLES
 (A) 4, 5, 6
 (B) 4, 5, 6
 (C) 4, 5, 6
 (D) 4, 5, 6
 (E) 4, 5, 6
 (F) 4, 5, 6

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SOUTHERN ICE LIMIT 06 AUG 91



C = Data on ice motion (D, T, W, F, S, R, H, A, S, B, C, E, 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, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MI, MJ, 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, NJ, 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, PJ, 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, QJ, 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, RJ, 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, SJ, 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, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, 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, WJ, 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, XJ, 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, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ.

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 NAVAL POLAR OCEANOGRAPHY CENTER, SUTLAND
SOUTHERN ICE LIMIT 13 AUG 91

A = 1
 B = 2
 C = 3
 D = 4
 E = 5
 F = 6

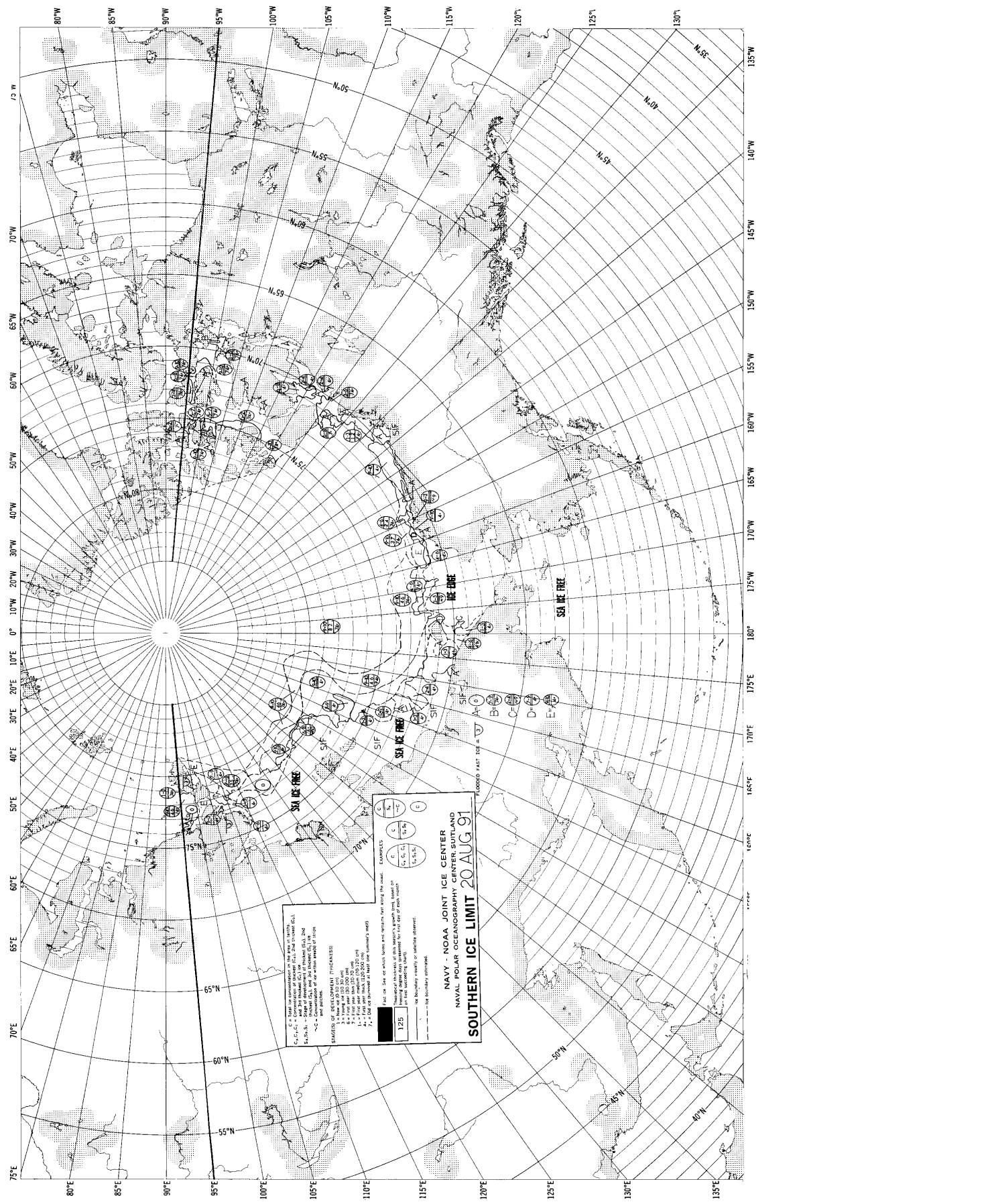
1
 2
 3
 4
 5
 6

SEA ICE FREE
 ICE BUNK
 FLOODED FAST ICE

80°E 85°E 90°E 95°E 100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E 140°E 145°E 150°E 155°E 160°E 165°E 170°E 175°E 180°E 185°E 190°E

55°N 60°N 65°N 70°N 75°N 80°N 85°N 90°N

MA.58 MA.59 MA.60 MA.61 MA.62 MA.63 MA.64 MA.65 MA.66 MA.67 MA.68 MA.69 MA.70 MA.71 MA.72 MA.73 MA.74 MA.75 MA.76 MA.77 MA.78 MA.79 MA.80 MA.81 MA.82 MA.83 MA.84 MA.85 MA.86 MA.87 MA.88 MA.89 MA.90 MA.91 MA.92 MA.93 MA.94 MA.95 MA.96 MA.97 MA.98 MA.99 MA.100 MA.101 MA.102 MA.103 MA.104 MA.105 MA.106 MA.107 MA.108 MA.109 MA.110 MA.111 MA.112 MA.113 MA.114 MA.115 MA.116 MA.117 MA.118 MA.119 MA.120 MA.121 MA.122 MA.123 MA.124 MA.125 MA.126 MA.127 MA.128 MA.129 MA.130 MA.131 MA.132 MA.133 MA.134 MA.135 MA.136 MA.137 MA.138 MA.139 MA.140 MA.141 MA.142 MA.143 MA.144 MA.145 MA.146 MA.147 MA.148 MA.149 MA.150 MA.151 MA.152 MA.153 MA.154 MA.155 MA.156 MA.157 MA.158 MA.159 MA.160 MA.161 MA.162 MA.163 MA.164 MA.165 MA.166 MA.167 MA.168 MA.169 MA.170 MA.171 MA.172 MA.173 MA.174 MA.175 MA.176 MA.177 MA.178 MA.179 MA.180 MA.181 MA.182 MA.183 MA.184 MA.185 MA.186 MA.187 MA.188 MA.189 MA.190 MA.191 MA.192 MA.193 MA.194 MA.195 MA.196 MA.197 MA.198 MA.199 MA.200

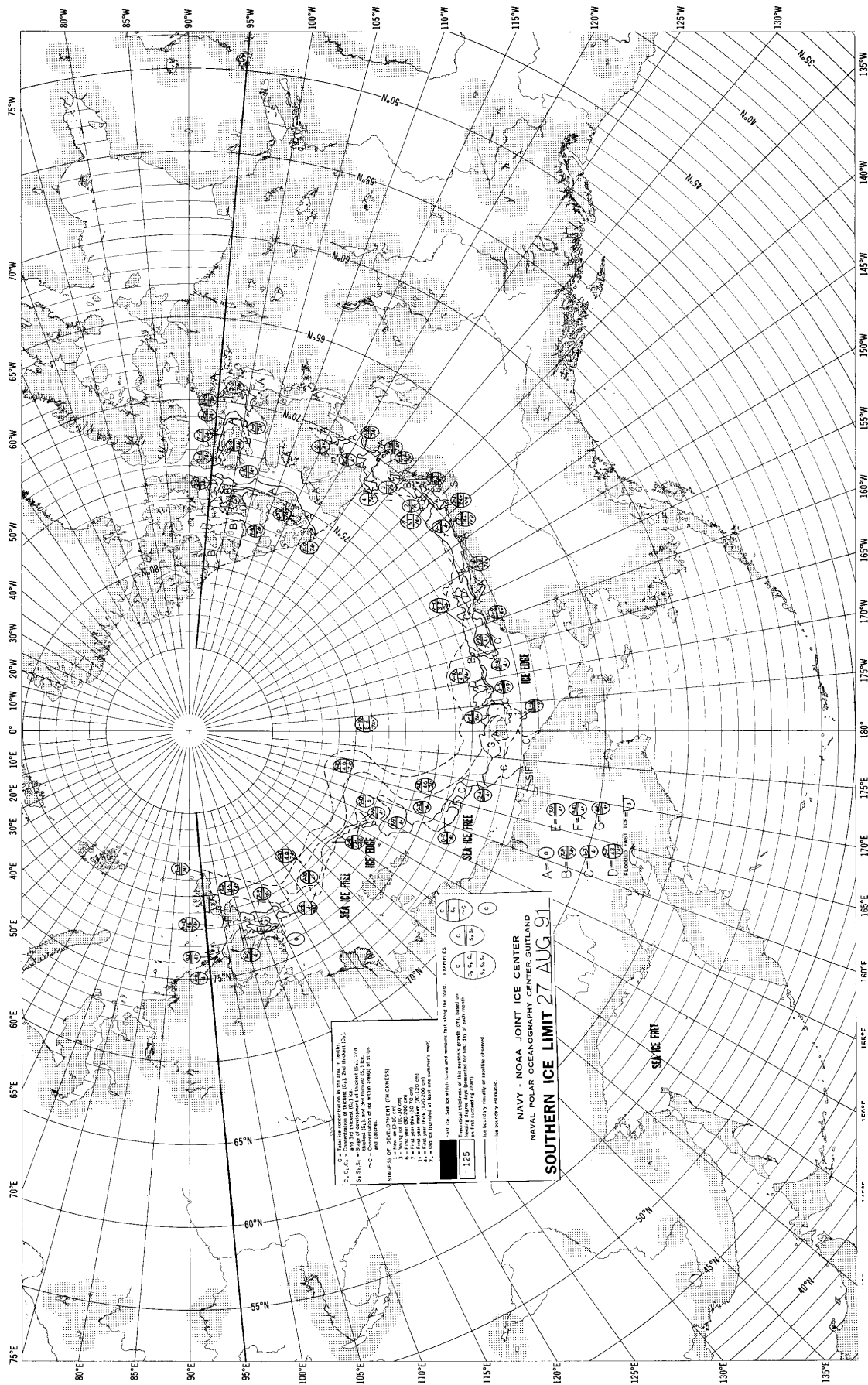


C - Coast or contour of the map is shown.
 G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z - and 200 fathoms (200 meters) depth contours.
 S, L, H, K, - Shaded area, see the notes on the map.
 - - - - - Dotted area, see the notes on the map.
 - - - - - Dashed area, see the notes on the map.
 - - - - - Solid area, see the notes on the map.

STAGES OF DEVELOPMENT (THICKNESS)
 1 - 1000 ft (300 m)
 2 - 1000 ft (300 m)
 3 - 1000 ft (300 m)
 4 - 1000 ft (300 m)
 5 - 1000 ft (300 m)
 6 - 1000 ft (300 m)
 7 - 1000 ft (300 m)
 8 - 1000 ft (300 m)
 9 - 1000 ft (300 m)
 10 - 1000 ft (300 m)

EXAMPLES
 (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) (JJ) (JK) (JL) (JM) (JN) (JO) (JP) (JQ) (JR) (JS) (JT) (JU) (JV) (JW) (JX) (JY) (JZ) (KA) (KB) (KC) (KD) (KE) (KF) (KG) (KH) (KI) (KJ) (KK) (KL) (KM) (KN) (KO) (KP) (KQ) (KR) (KS) (KT) (KU) (KV) (KW) (KX) (KY) (KZ) (LA) (LB) (LC) (LD) (LE) (LF) (LG) (LH) (LI) (LJ) (LK) (LL) (LM) (LN) (LO) (LP) (LQ) (LR) (LS) (LT) (LU) (LV) (LW) (LX) (LY) (LZ) (MA) (MB) (MC) (MD) (ME) (MF) (MG) (MH) (MI) (MJ) (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) (NJ) (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) (PJ) (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) (QJ) (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) (RJ) (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) (SJ) (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) (TJ) (TK) (TL) (TM) (TN) (TO) (TP) (TQ) (TR) (TS) (TT) (TU) (TV) (TW) (TX) (TY) (TZ) (UA) (UB) (UC) (UD) (UE) (UF) (UG) (UH) (UI) (UJ) (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) (VJ) (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) (WJ) (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) (XJ) (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) (YJ) (YK) (YL) (YM) (YN) (YO) (YP) (YQ) (YR) (YS) (YT) (YU) (YV) (YW) (YX) (YZ) (ZA) (ZB) (ZC) (ZD) (ZE) (ZF) (ZG) (ZH) (ZI) (ZJ) (ZK) (ZL) (ZM) (ZN) (ZO) (ZP) (ZQ) (ZR) (ZS) (ZT) (ZU) (ZV) (ZW) (ZX) (ZY) (ZZ)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, BUTLAND
SOUTHERN ICE LIMIT 20 AUG 91



A - Sea ice thickness in meters (meters)
 B - Sea ice concentration in percent (percent)
 C - Sea ice concentration in percent (percent)
 D - Sea ice concentration in percent (percent)
 E - Sea ice concentration in percent (percent)
 F - Sea ice concentration in percent (percent)
 G - Sea ice concentration in percent (percent)

1 - New ice (0-10 cm)
 2 - Thin ice (10-30 cm)
 3 - Medium ice (30-70 cm)
 4 - Thick ice (70-100 cm)
 5 - Very thick ice (100-150 cm)
 6 - Old ice (150-200 cm)
 7 - Old ice (200+ cm)

125 - Icebergs (number of icebergs)
 126 - Icebergs (number of icebergs)
 127 - Icebergs (number of icebergs)

128 - Icebergs (number of icebergs)
 129 - Icebergs (number of icebergs)
 130 - Icebergs (number of icebergs)

131 - Icebergs (number of icebergs)
 132 - Icebergs (number of icebergs)
 133 - Icebergs (number of icebergs)

134 - Icebergs (number of icebergs)
 135 - Icebergs (number of icebergs)
 136 - Icebergs (number of icebergs)

137 - Icebergs (number of icebergs)
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 139 - Icebergs (number of icebergs)

140 - Icebergs (number of icebergs)
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 142 - Icebergs (number of icebergs)

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 145 - Icebergs (number of icebergs)

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152 - Icebergs (number of icebergs)
 153 - Icebergs (number of icebergs)
 154 - Icebergs (number of icebergs)

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173 - Icebergs (number of icebergs)
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176 - Icebergs (number of icebergs)
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179 - Icebergs (number of icebergs)
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182 - Icebergs (number of icebergs)
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 184 - Icebergs (number of icebergs)

185 - Icebergs (number of icebergs)
 186 - Icebergs (number of icebergs)
 187 - Icebergs (number of icebergs)

188 - Icebergs (number of icebergs)
 189 - Icebergs (number of icebergs)
 190 - Icebergs (number of icebergs)

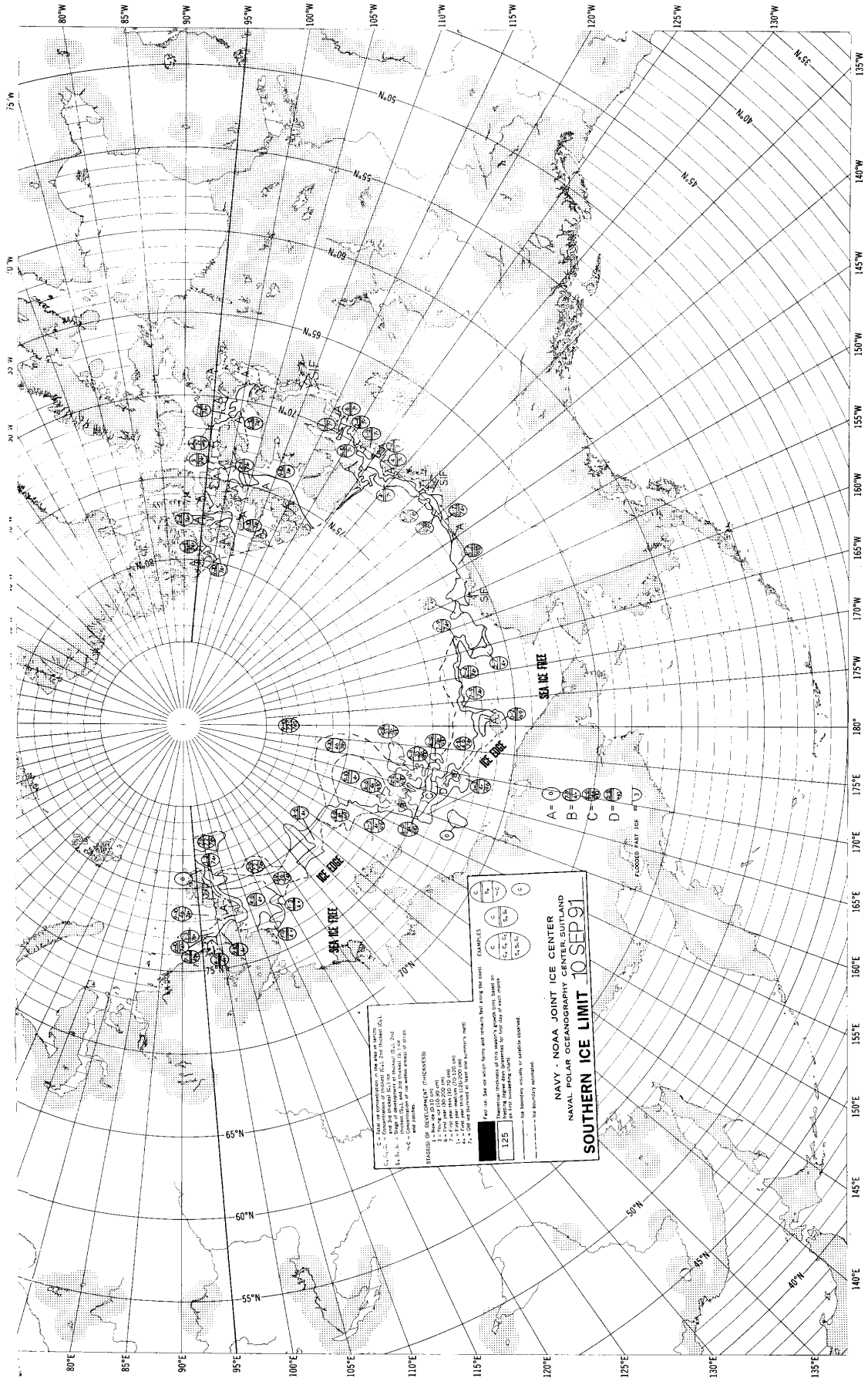
191 - Icebergs (number of icebergs)
 192 - Icebergs (number of icebergs)
 193 - Icebergs (number of icebergs)

194 - Icebergs (number of icebergs)
 195 - Icebergs (number of icebergs)
 196 - Icebergs (number of icebergs)





197 - Icebergs (number of icebergs)
 198 - Icebergs (number of icebergs)
 199 - Icebergs (number of icebergs)

200 - Icebergs (number of icebergs)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 27 AUG 91

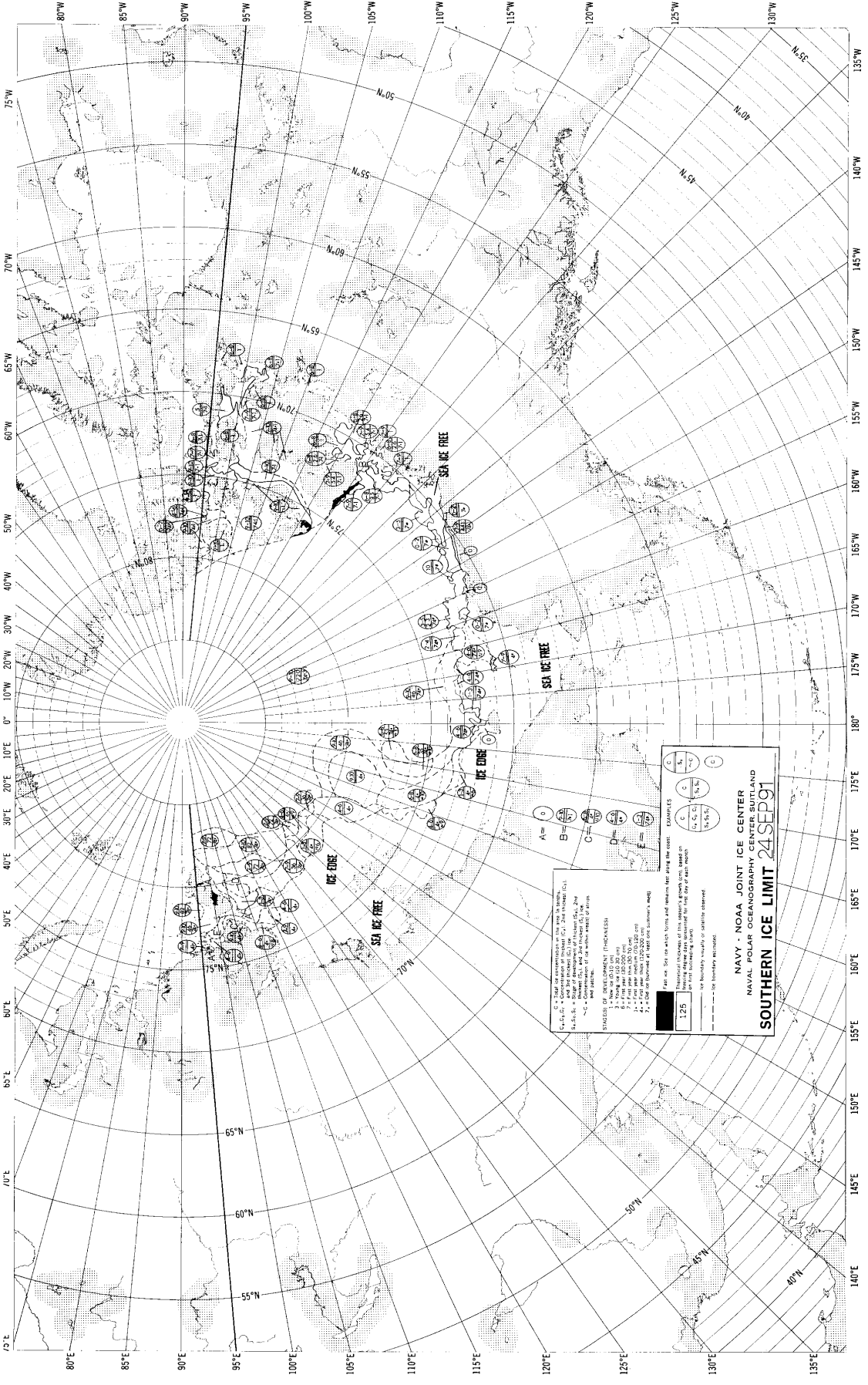


* - Direction of current (SEA ICE LIMIT) (S, N, E, W)
 * - Direction of surface current (SEA ICE LIMIT) (S, N, E, W)
 * - Direction of surface current (SEA ICE LIMIT) (S, N, E, W)
 * - Direction of surface current (SEA ICE LIMIT) (S, N, E, W)
 * - Direction of surface current (SEA ICE LIMIT) (S, N, E, W)

EXAMPLES
 A = 
 B = 
 C = 
 D = 

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, EIGHTH FLOOR
 SOUTHERN ICE LIMIT 10 SEP 91

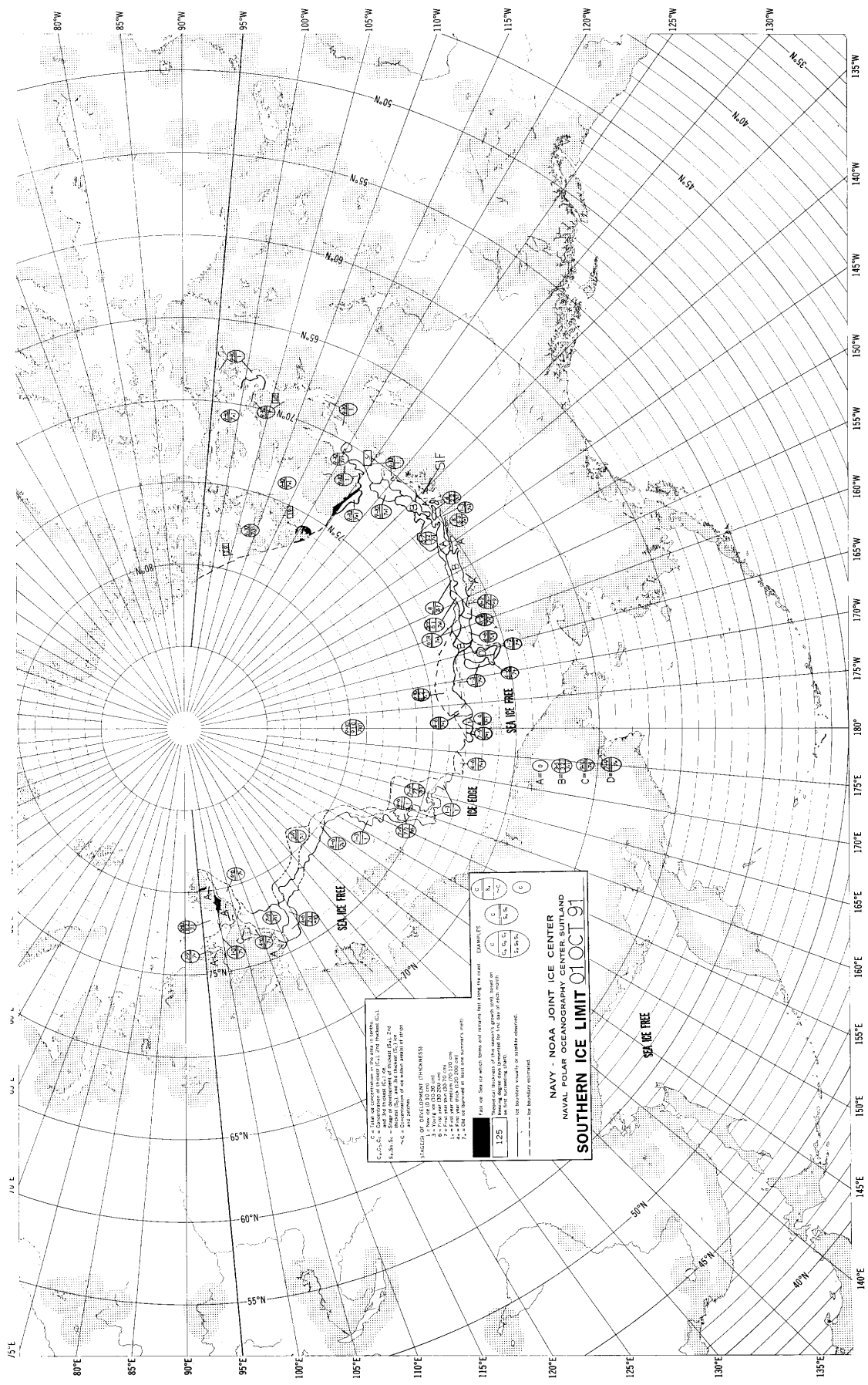
For use: See on which forms and manuals that using the code
 125
 Historical records of this report's growth form, based on
 historical data, are available for use in water models
 for ice dynamics research or scientific purposes



1. 0-100% ice concentration in the 200 m isobath.
 2. 100% ice concentration in the 200 m isobath.
 3. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath.
 4. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath.
 5. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath.
 6. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath.
 7. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath.
 8. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath.
 9. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath.
 10. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath.

STAGES OF DEVELOPMENT (FINCHALEN)
 1. 100% ice concentration in the 200 m isobath.
 2. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath.
 3. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath.
 4. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath.
 5. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath.
 6. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath.
 7. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath.
 8. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath.
 9. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath.
 10. 100% ice concentration in the 200 m isobath, but not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath, and not in the 100 m isobath, and not in the 50 m isobath, and not in the 200 m isobath.

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
 SOUTHERN ICE LIMIT 24 SEP 91



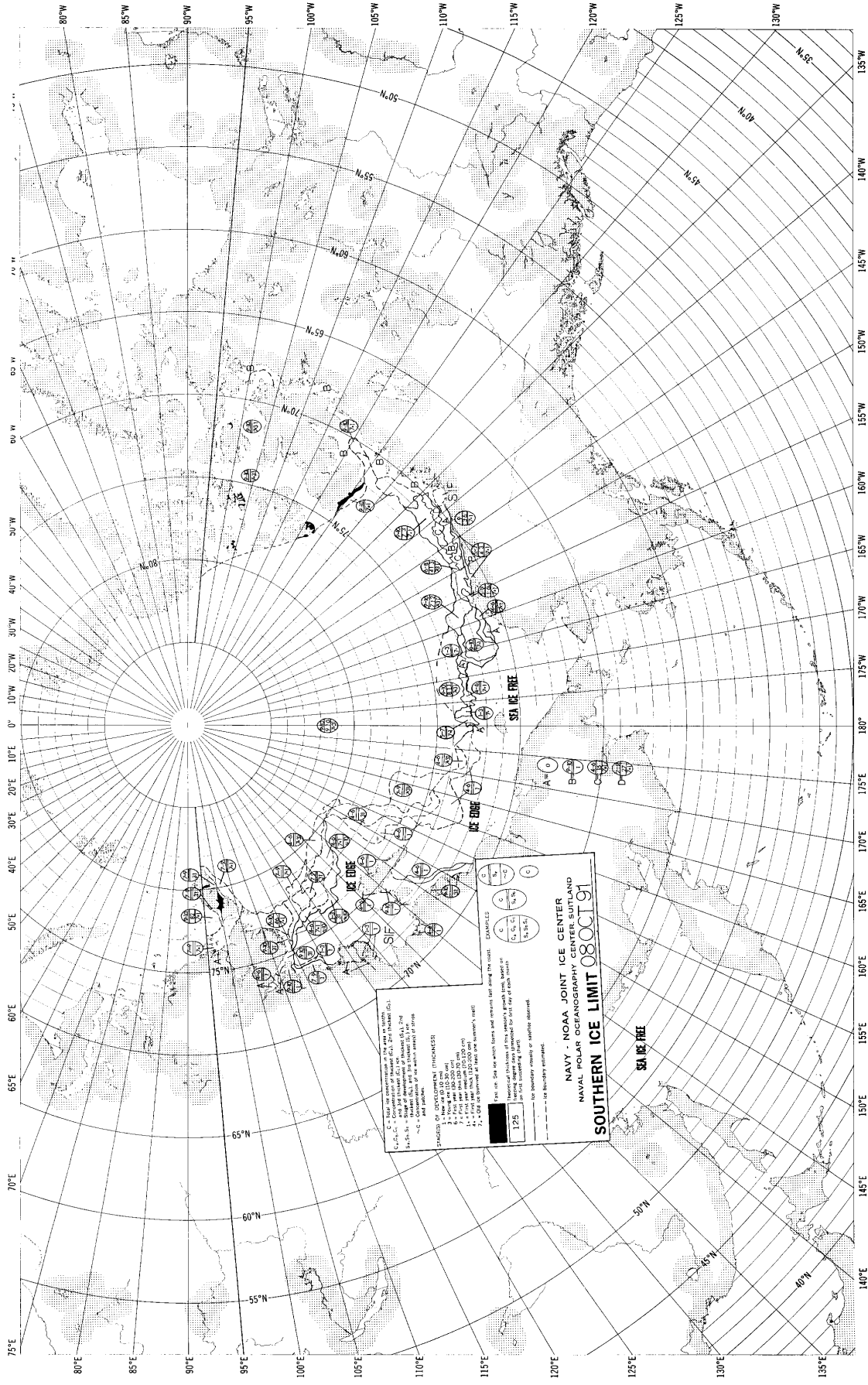
C, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
 Sea ice concentration in the area is shown by the number in the circle. The number in the circle is the number of days of ice in the area. The number in the circle is the number of days of ice in the area. The number in the circle is the number of days of ice in the area.

STAGES OF DEVELOPMENT (THICKNESS)
 1 = New ice (0-30 cm)
 2 = Thin ice (30-70 cm)
 3 = Medium ice (70-150 cm)
 4 = Thick ice (150-200 cm)
 5 = Very thick ice (200-300 cm)
 6 = Old ice (300-500 cm)
 7 = Ice that has melted in last 24 hours (0 cm)

EXAMPLES
 A = 100% concentration, 100 days of ice, 100 cm thick
 B = 100% concentration, 100 days of ice, 100 cm thick
 C = 100% concentration, 100 days of ice, 100 cm thick
 D = 100% concentration, 100 days of ice, 100 cm thick

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 01 OCT 91

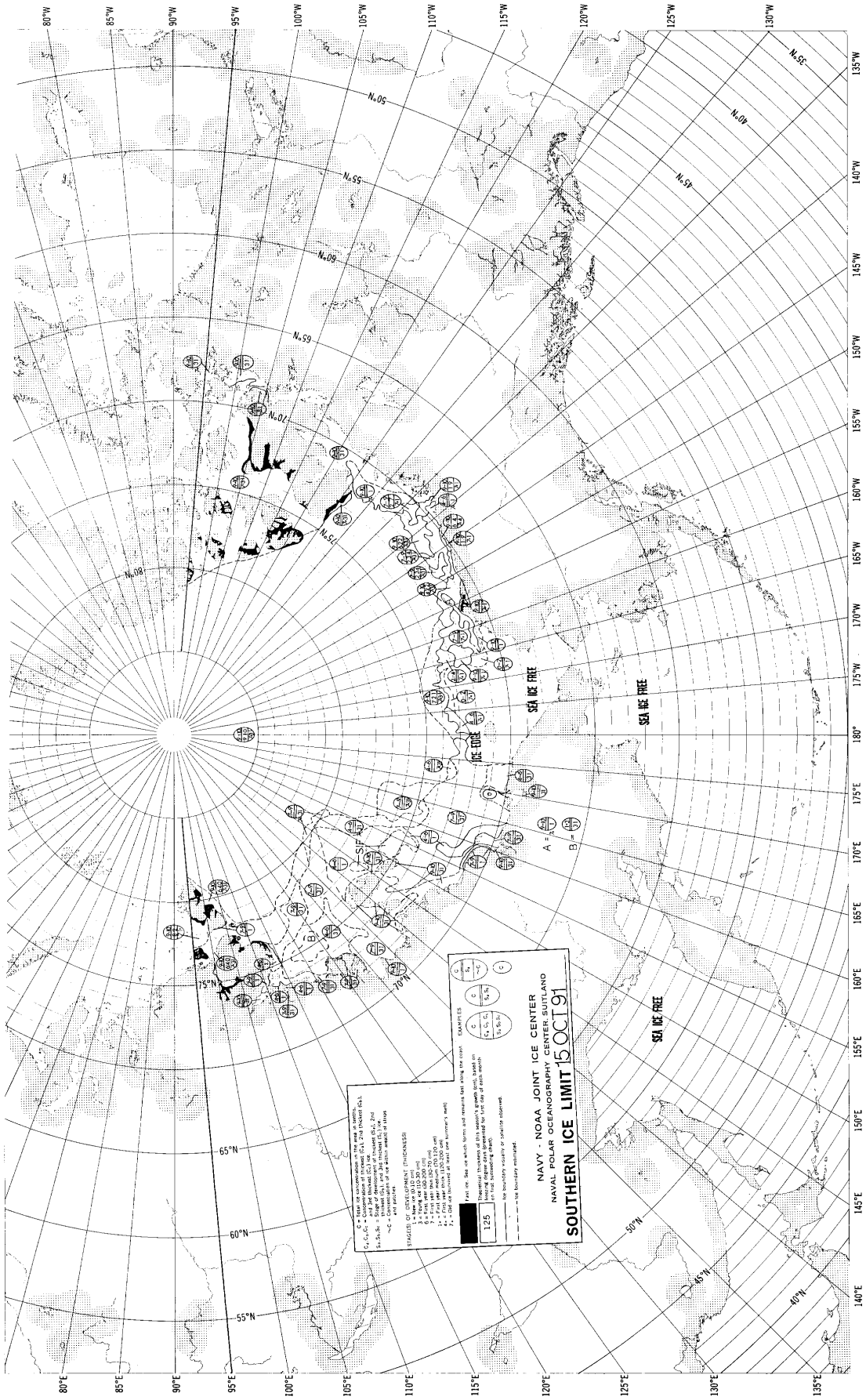
- - - - - Ice boundary estimated



Symbols for ice edge and concentration are shown in South.
 C, C, C, C = Concentration of ice edge (C, 20% thickness (C)).
 S, S, S, S = Concentration of ice edge (S, 20% thickness (S)).
 A, A, A, A = Range of thickness of ice edge (A, 20% thickness (A)).
 B, B, B, B = Range of thickness of ice edge (B, 20% thickness (B)).
 D, D, D, D = Range of thickness of ice edge (D, 20% thickness (D)).
 E, E, E, E = Range of thickness of ice edge (E, 20% thickness (E)).
 F, F, F, F = Range of thickness of ice edge (F, 20% thickness (F)).
 G, G, G, G = Range of thickness of ice edge (G, 20% thickness (G)).
 H, H, H, H = Range of thickness of ice edge (H, 20% thickness (H)).
 I, I, I, I = Range of thickness of ice edge (I, 20% thickness (I)).
 J, J, J, J = Range of thickness of ice edge (J, 20% thickness (J)).
 K, K, K, K = Range of thickness of ice edge (K, 20% thickness (K)).
 L, L, L, L = Range of thickness of ice edge (L, 20% thickness (L)).
 M, M, M, M = Range of thickness of ice edge (M, 20% thickness (M)).
 N, N, N, N = Range of thickness of ice edge (N, 20% thickness (N)).
 O, O, O, O = Range of thickness of ice edge (O, 20% thickness (O)).
 P, P, P, P = Range of thickness of ice edge (P, 20% thickness (P)).
 Q, Q, Q, Q = Range of thickness of ice edge (Q, 20% thickness (Q)).
 R, R, R, R = Range of thickness of ice edge (R, 20% thickness (R)).
 S, S, S, S = Range of thickness of ice edge (S, 20% thickness (S)).
 T, T, T, T = Range of thickness of ice edge (T, 20% thickness (T)).
 U, U, U, U = Range of thickness of ice edge (U, 20% thickness (U)).
 V, V, V, V = Range of thickness of ice edge (V, 20% thickness (V)).
 W, W, W, W = Range of thickness of ice edge (W, 20% thickness (W)).
 X, X, X, X = Range of thickness of ice edge (X, 20% thickness (X)).
 Y, Y, Y, Y = Range of thickness of ice edge (Y, 20% thickness (Y)).
 Z, Z, Z, Z = Range of thickness of ice edge (Z, 20% thickness (Z)).

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUIT 08 OCT 91
SOUTHERN ICE LIMIT 08 OCT 91

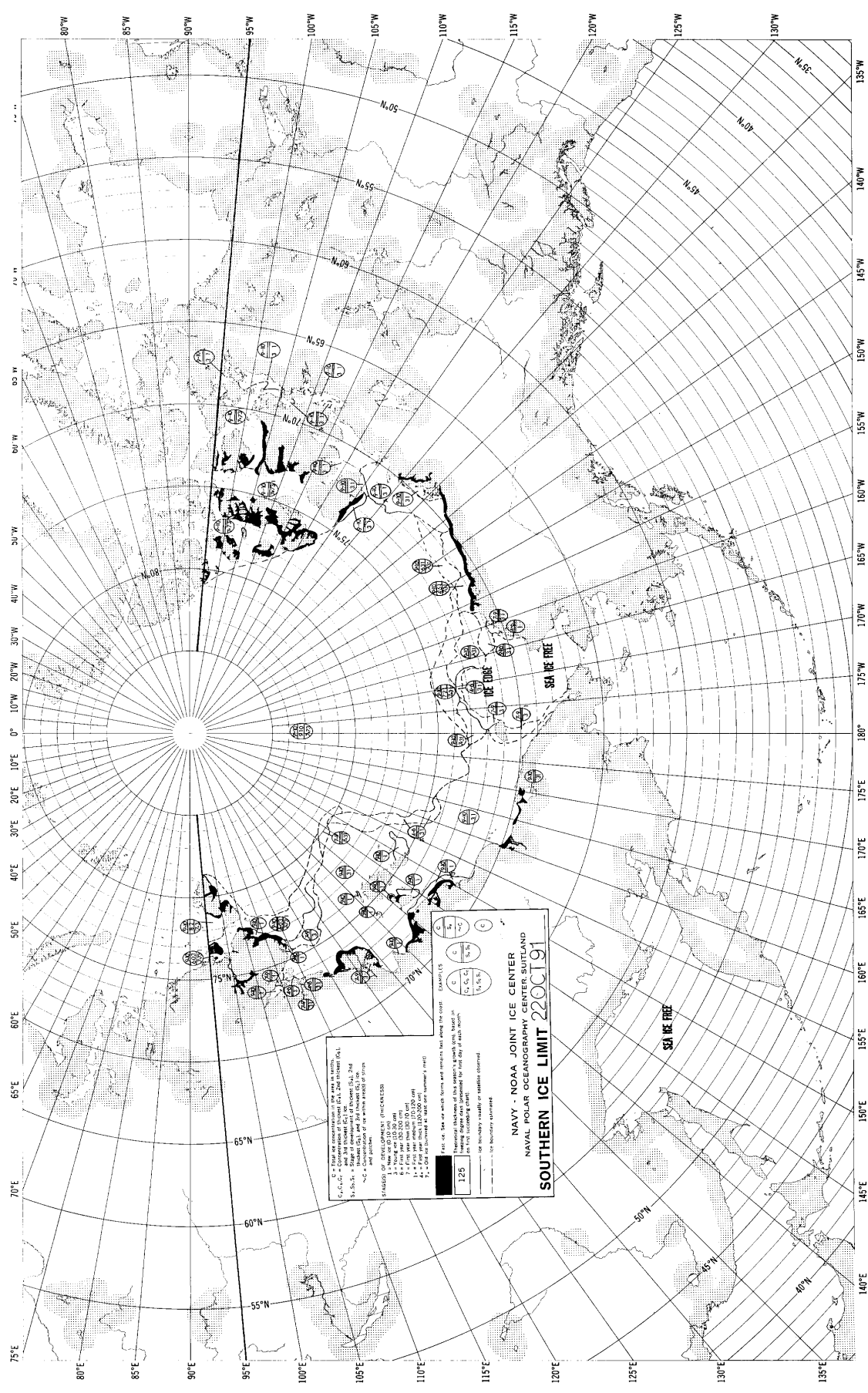
Ice Thickness (m)	Symbol
0-10	○
10-20	○
20-30	○
30-40	○
40-50	○
50-60	○
60-70	○
70-80	○
80-90	○
90-100	○
100-110	○
110-120	○
120-130	○
130-140	○
140-150	○
150-160	○
160-170	○
170-180	○
180-190	○
190-200	○
200-210	○
210-220	○
220-230	○
230-240	○
240-250	○
250-260	○
260-270	○
270-280	○
280-290	○
290-300	○
300-310	○
310-320	○
320-330	○
330-340	○
340-350	○
350-360	○
360-370	○
370-380	○
380-390	○
390-400	○
400-410	○
410-420	○
420-430	○
430-440	○
440-450	○
450-460	○
460-470	○
470-480	○
480-490	○
490-500	○
500-510	○
510-520	○
520-530	○
530-540	○
540-550	○
550-560	○
560-570	○
570-580	○
580-590	○
590-600	○
600-610	○
610-620	○
620-630	○
630-640	○
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650-660	○
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670-680	○
680-690	○
690-700	○
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710-720	○
720-730	○
730-740	○
740-750	○
750-760	○
760-770	○
770-780	○
780-790	○
790-800	○
800-810	○
810-820	○
820-830	○
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930-940	○
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960-970	○
970-980	○
980-990	○
990-1000	○



C = Total ice cover (includes 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, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

STAGES OF DEVELOPMENT (THICKNESS)
 1 = 1st year ice (0.5-0.9m)
 2 = 2nd year ice (0.9-1.5m)
 3 = 3rd year ice (1.5-2.0m)
 4 = 4th year ice (2.0-2.5m)
 5 = 5th year ice (2.5-3.0m)
 6 = 6th year ice (3.0-3.5m)
 7 = 7th year ice (3.5-4.0m)
 8 = 8th year ice (4.0-4.5m)
 9 = 9th year ice (4.5-5.0m)
 10 = 10th year ice (5.0-5.5m)
 11 = 11th year ice (5.5-6.0m)
 12 = 12th year ice (6.0-6.5m)
 13 = 13th year ice (6.5-7.0m)
 14 = 14th year ice (7.0-7.5m)
 15 = 15th year ice (7.5-8.0m)
 16 = 16th year ice (8.0-8.5m)
 17 = 17th year ice (8.5-9.0m)
 18 = 18th year ice (9.0-9.5m)
 19 = 19th year ice (9.5-10.0m)
 20 = 20th year ice (10.0-10.5m)
 21 = 21st year ice (10.5-11.0m)
 22 = 22nd year ice (11.0-11.5m)
 23 = 23rd year ice (11.5-12.0m)
 24 = 24th year ice (12.0-12.5m)
 25 = 25th year ice (12.5-13.0m)
 26 = 26th year ice (13.0-13.5m)
 27 = 27th year ice (13.5-14.0m)
 28 = 28th year ice (14.0-14.5m)
 29 = 29th year ice (14.5-15.0m)
 30 = 30th year ice (15.0-15.5m)
 31 = 31st year ice (15.5-16.0m)
 32 = 32nd year ice (16.0-16.5m)
 33 = 33rd year ice (16.5-17.0m)
 34 = 34th year ice (17.0-17.5m)
 35 = 35th year ice (17.5-18.0m)
 36 = 36th year ice (18.0-18.5m)
 37 = 37th year ice (18.5-19.0m)
 38 = 38th year ice (19.0-19.5m)
 39 = 39th year ice (19.5-20.0m)
 40 = 40th year ice (20.0-20.5m)
 41 = 41st year ice (20.5-21.0m)
 42 = 42nd year ice (21.0-21.5m)
 43 = 43rd year ice (21.5-22.0m)
 44 = 44th year ice (22.0-22.5m)
 45 = 45th year ice (22.5-23.0m)
 46 = 46th year ice (23.0-23.5m)
 47 = 47th year ice (23.5-24.0m)
 48 = 48th year ice (24.0-24.5m)
 49 = 49th year ice (24.5-25.0m)
 50 = 50th year ice (25.0-25.5m)
 51 = 51st year ice (25.5-26.0m)
 52 = 52nd year ice (26.0-26.5m)
 53 = 53rd year ice (26.5-27.0m)
 54 = 54th year ice (27.0-27.5m)
 55 = 55th year ice (27.5-28.0m)
 56 = 56th year ice (28.0-28.5m)
 57 = 57th year ice (28.5-29.0m)
 58 = 58th year ice (29.0-29.5m)
 59 = 59th year ice (29.5-30.0m)
 60 = 60th year ice (30.0-30.5m)
 61 = 61st year ice (30.5-31.0m)
 62 = 62nd year ice (31.0-31.5m)
 63 = 63rd year ice (31.5-32.0m)
 64 = 64th year ice (32.0-32.5m)
 65 = 65th year ice (32.5-33.0m)
 66 = 66th year ice (33.0-33.5m)
 67 = 67th year ice (33.5-34.0m)
 68 = 68th year ice (34.0-34.5m)
 69 = 69th year ice (34.5-35.0m)
 70 = 70th year ice (35.0-35.5m)
 71 = 71st year ice (35.5-36.0m)
 72 = 72nd year ice (36.0-36.5m)
 73 = 73rd year ice (36.5-37.0m)
 74 = 74th year ice (37.0-37.5m)
 75 = 75th year ice (37.5-38.0m)
 76 = 76th year ice (38.0-38.5m)
 77 = 77th year ice (38.5-39.0m)
 78 = 78th year ice (39.0-39.5m)
 79 = 79th year ice (39.5-40.0m)
 80 = 80th year ice (40.0-40.5m)
 81 = 81st year ice (40.5-41.0m)
 82 = 82nd year ice (41.0-41.5m)
 83 = 83rd year ice (41.5-42.0m)
 84 = 84th year ice (42.0-42.5m)
 85 = 85th year ice (42.5-43.0m)
 86 = 86th year ice (43.0-43.5m)
 87 = 87th year ice (43.5-44.0m)
 88 = 88th year ice (44.0-44.5m)
 89 = 89th year ice (44.5-45.0m)
 90 = 90th year ice (45.0-45.5m)
 91 = 91st year ice (45.5-46.0m)
 92 = 92nd year ice (46.0-46.5m)
 93 = 93rd year ice (46.5-47.0m)
 94 = 94th year ice (47.0-47.5m)
 95 = 95th year ice (47.5-48.0m)
 96 = 96th year ice (48.0-48.5m)
 97 = 97th year ice (48.5-49.0m)
 98 = 98th year ice (49.0-49.5m)
 99 = 99th year ice (49.5-50.0m)
 100 = 100th year ice (50.0-50.5m)

NAVY - NOAA JOINT ICE CENTER
 NAVAL - POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 15 OCT 91



C = Total ice concentration (the area is mostly open water)
 C₁, C₂, C₃ = Ice concentration in 10% thickness (10%, 20%, 30%)
 S₁, S₂, S₃ = Ice thickness (100, 200, 300 feet)
 T = Ice temperature (in degrees Fahrenheit)
 and direction of ice motion (arrow) or drift

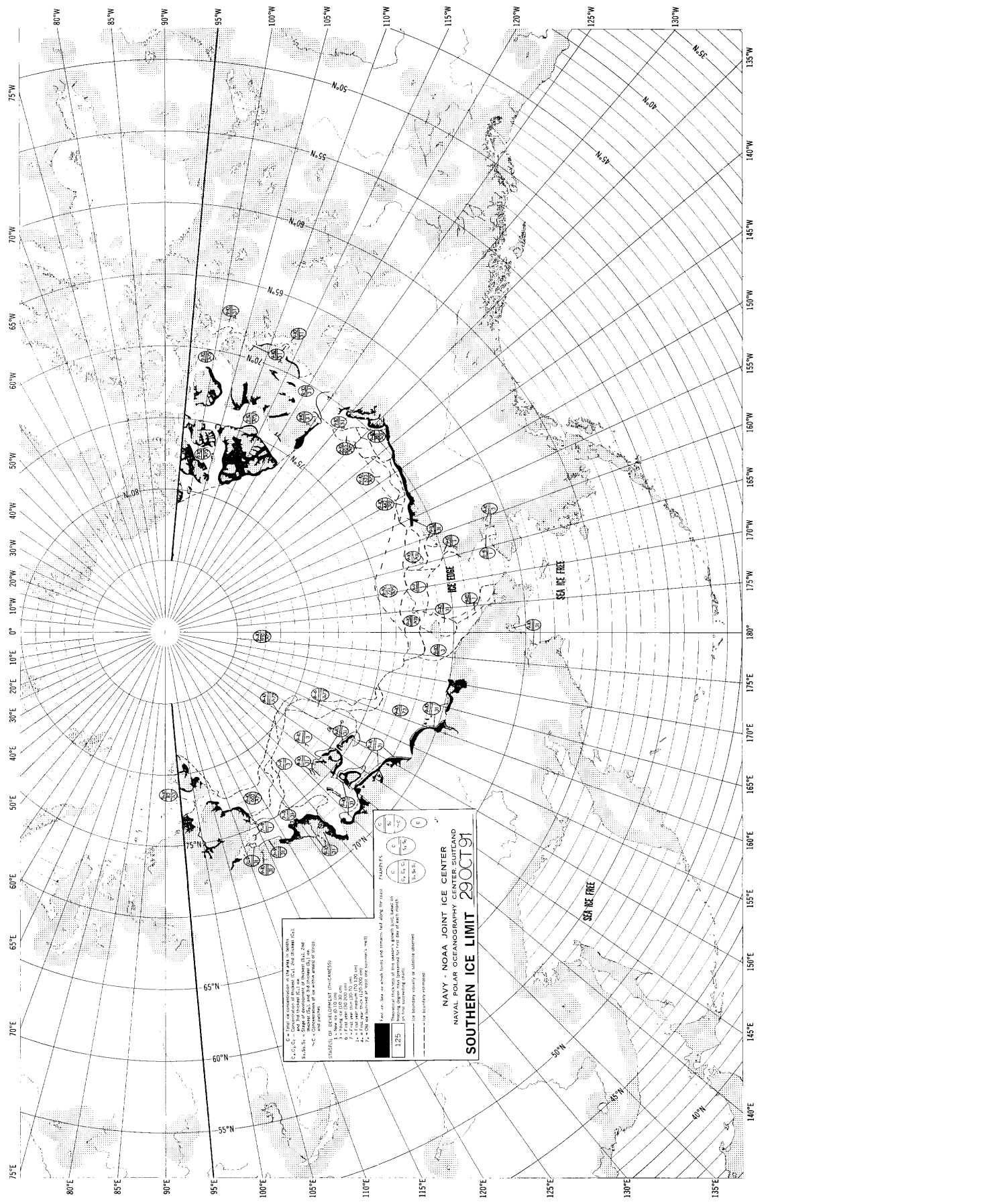
STAGES OF DEVELOPMENT (THICKNESS)
 1 = Young ice (10-30 cm)
 2 = First-year ice (30-100 cm)
 3 = First-year ice (100-200 cm)
 4 = First-year ice (200-300 cm)
 5 = Second-year ice (300-500 cm)
 6 = Second-year ice (500-1000 cm)

125 = Temperature thickness of this season's growth from bottom of this ice including chart
 126 = Ice thickness visually or satellite observed
 127 = Ice thickness estimated

128 = Ice motion estimated
 129 = Ice motion estimated

130 = Ice motion estimated

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SURVEIL
SOUTHERN ICE LIMIT 22OCT91



1. Data on concentration, area, and extent of ice in the Arctic Ocean are from the International Arctic Buoy Program (IABP) and the Arctic Ocean Survey (AOS) conducted by the U.S. Navy and the U.S. Coast Guard. Data are from the period 1980-1990.

2. Data on ice extent are from the International Arctic Buoy Program (IABP) and the Arctic Ocean Survey (AOS) conducted by the U.S. Navy and the U.S. Coast Guard. Data are from the period 1980-1990.

3. Data on ice concentration are from the International Arctic Buoy Program (IABP) and the Arctic Ocean Survey (AOS) conducted by the U.S. Navy and the U.S. Coast Guard. Data are from the period 1980-1990.

4. Data on ice area are from the International Arctic Buoy Program (IABP) and the Arctic Ocean Survey (AOS) conducted by the U.S. Navy and the U.S. Coast Guard. Data are from the period 1980-1990.

5. Data on ice extent are from the International Arctic Buoy Program (IABP) and the Arctic Ocean Survey (AOS) conducted by the U.S. Navy and the U.S. Coast Guard. Data are from the period 1980-1990.

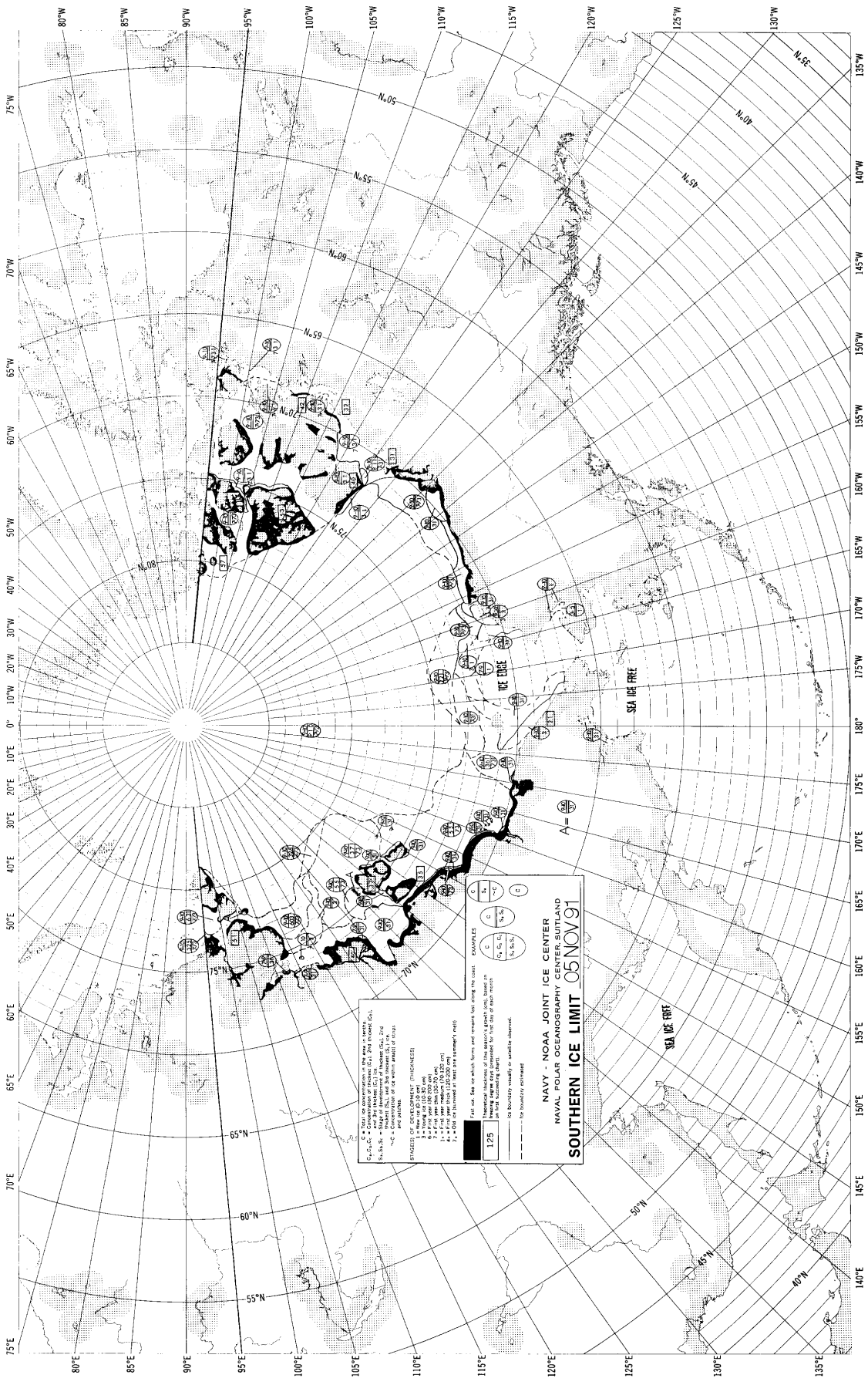
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 29 OCT 91

Symbols:

- 125: Ice extent (miles)
- 126: Ice concentration (%)
- 127: Ice area (1000 sq miles)
- 128: Ice extent (miles)
- 129: Ice concentration (%)
- 130: Ice area (1000 sq miles)

Symbols:

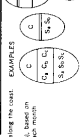
- 131: Ice extent (miles)
- 132: Ice concentration (%)
- 133: Ice area (1000 sq miles)
- 134: Ice extent (miles)
- 135: Ice concentration (%)
- 136: Ice area (1000 sq miles)

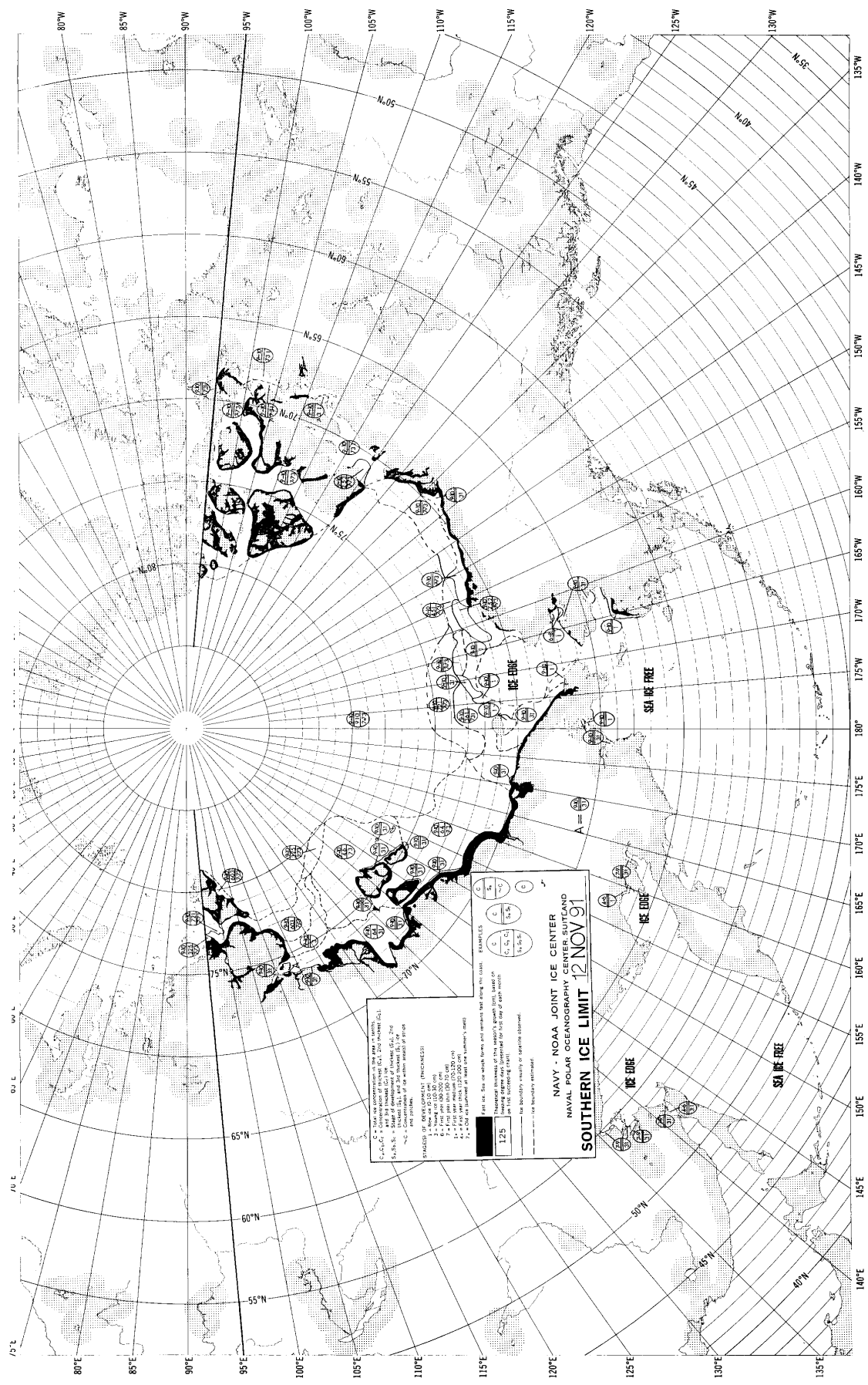


1. Area of observation in this chart is shown by a thick black line.
 2. Concentration of ice in percent (C.I.) is shown by the number in the circle.
 3. Direction of ice drift is shown by the arrow in the circle.
 4. Direction of ice drift in degrees (D.I.) is shown by the number in the circle.
 5. Direction of ice drift in degrees (D.I.) is shown by the number in the circle.
 6. Direction of ice drift in degrees (D.I.) is shown by the number in the circle.
 7. Direction of ice drift in degrees (D.I.) is shown by the number in the circle.

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 05 NOV 91

125
 100
 75
 50
 25
 0
 25
 50
 75
 100
 125



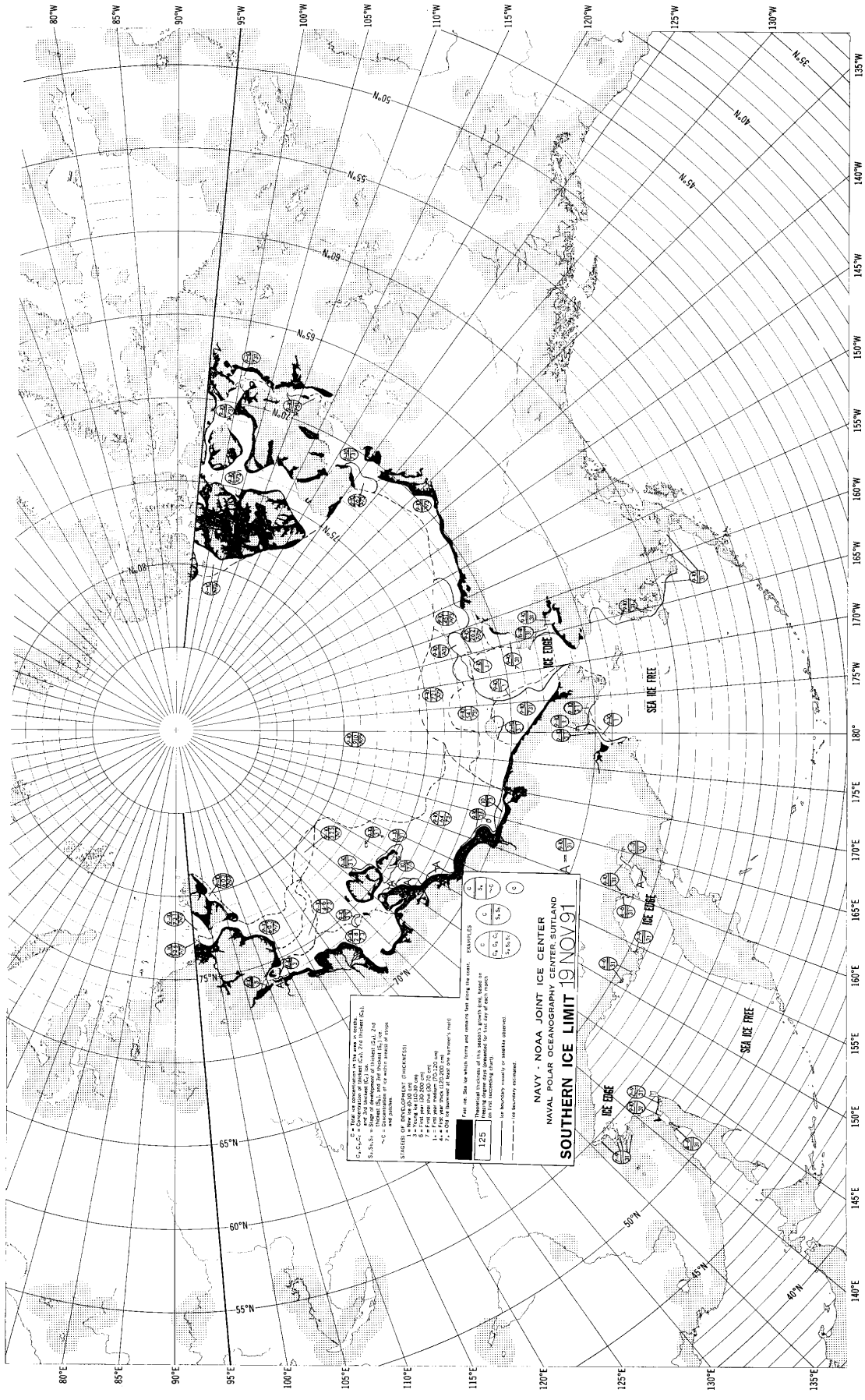


1. - Data for concentration in the area in which
 2. - A.C.A.T. - Concentration of Ice (Ice, 20% thickness)
 3. - S.S.S. - State of Development of Ice (Ice, 20% thickness)
 4. - S.S.S. - State of Development of Ice (Ice, 20% thickness)
 5. - S.S.S. - State of Development of Ice (Ice, 20% thickness)
 6. - S.S.S. - State of Development of Ice (Ice, 20% thickness)
 7. - S.S.S. - State of Development of Ice (Ice, 20% thickness)

1. - Ice thickness (meters)
 2. - Ice thickness (meters)
 3. - Ice thickness (meters)
 4. - Ice thickness (meters)
 5. - Ice thickness (meters)
 6. - Ice thickness (meters)
 7. - Ice thickness (meters)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND
SOUTHERN ICE LIMIT 12 NOV 91

1. - Ice thickness (meters)
 2. - Ice thickness (meters)
 3. - Ice thickness (meters)
 4. - Ice thickness (meters)
 5. - Ice thickness (meters)
 6. - Ice thickness (meters)
 7. - Ice thickness (meters)



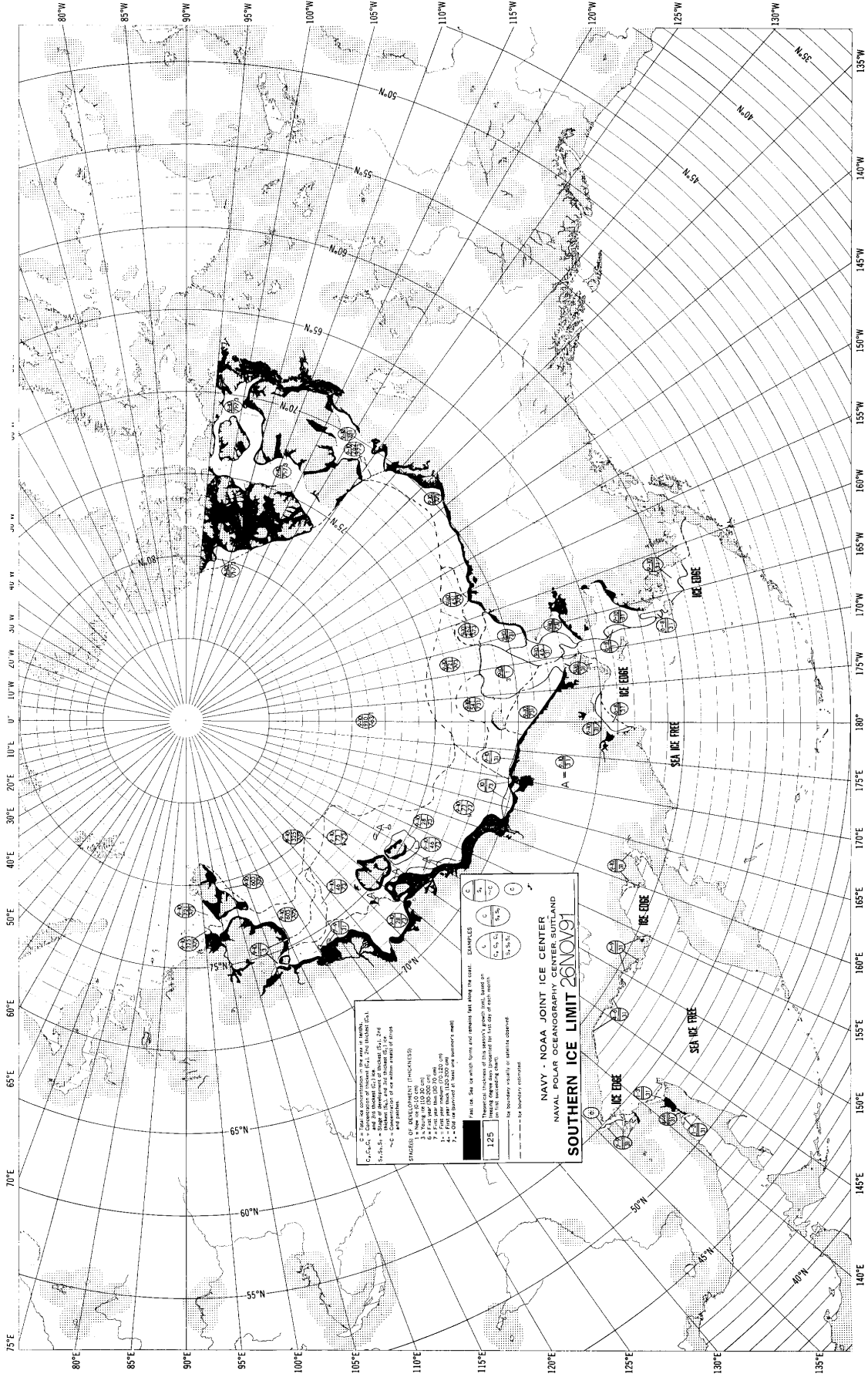
C = Data for concentration in the north
 C₁, C₂, C₃ = Concentration of ice (C₁, 20% thicker ice)
 S₁, S₂, S₃ = Range of depth of ice (S₁, 20% thicker ice)
 * = Concentration of ice in various areas of track
 * = Concentration of ice in various areas of track

STAGES OF DEVELOPMENT - CHANGES
 1 = New ice 100-200 cm
 2 = First year 100-200 cm
 3 = First year 200-300 cm
 4 = First year medium 300-350 cm
 5 = First year thick 350-400 cm
 6 = 20% or thicker at least one summer's melt

For use with the symbols and numbers for the ice limit.
 Symbols for ice limit: (C₁, C₂, C₃, S₁, S₂, S₃)
 Symbols for ice limit: (C₁, C₂, C₃, S₁, S₂, S₃)
 Symbols for ice limit: (C₁, C₂, C₃, S₁, S₂, S₃)
 Symbols for ice limit: (C₁, C₂, C₃, S₁, S₂, S₃)

NAVY · NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUTLAND
SOUTHERN ICE LIMIT 19 NOV 91

SYMBOLS	
C ₁	C ₂
C ₃	S ₁
S ₂	S ₃



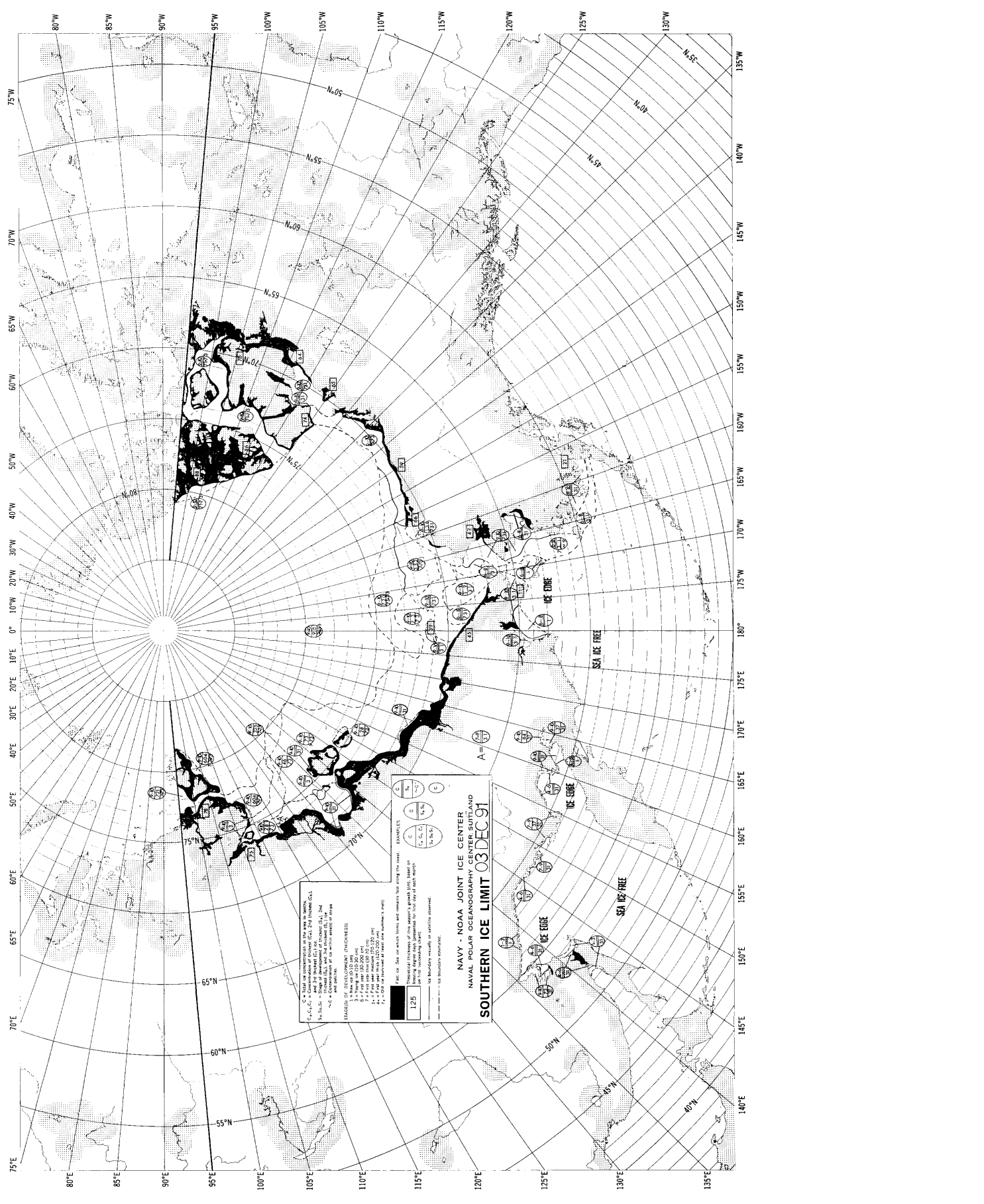
C₁ - 200 m depth contour in the area of charts.
 C₂, C₃, C₄ - depth contours of 100, 200, 300, 400 meters.
 S₁, S₂, S₃ - depth contours of 100, 200, 300 meters.
 -C₁ - depth contours of 100, 200, 300, 400 meters.
 -S₁ - depth contours of 100, 200, 300 meters.

SYMBOLS OF DEVELOPMENT (THICKNESSES)
 1 - New ice (10-15 cm)
 2 - Thin ice (15-30 cm)
 3 - Medium ice (30-50 cm)
 4 - Thick ice (50-100 cm)
 5 - Very thick ice (100-150 cm)
 6 - Ice with snow (150-200 cm)
 7 - Old ice (more than 2 years old)

See also the symbols for ice types and reports in the text.
 125 - Maximum thickness of this season's growth limit, based on
 historical data for the month.
 150 - Maximum thickness of this season's growth limit, based on
 historical data for the month, with a 50% margin of safety.
 175 - Maximum thickness of this season's growth limit, based on
 historical data for the month, with a 100% margin of safety.

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUTLAND
SOUTHERN ICE LIMIT 26NOV91

This map was prepared by the Naval Oceanography Center, SUTLAND, and is based on data from the Navy's ice charting program. It is not to be used for navigation purposes.



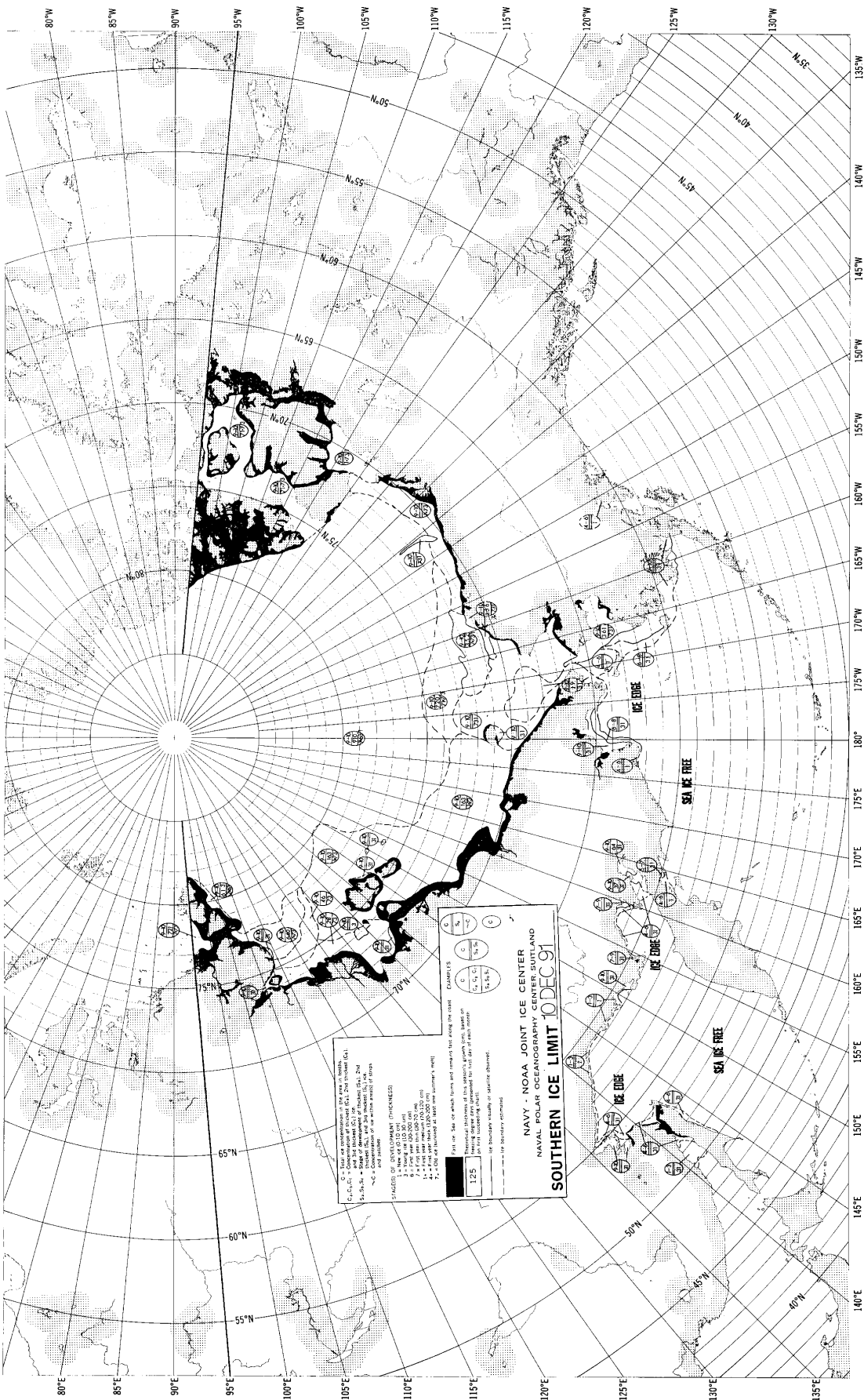
1. All ice, sea ice which floats and remains, has along this limit.
 2. This limit is based on observations and reports received from ships and aircraft.
 3. This limit is based on observations and reports received from ships and aircraft.
 4. This limit is based on observations and reports received from ships and aircraft.
 5. This limit is based on observations and reports received from ships and aircraft.
 6. This limit is based on observations and reports received from ships and aircraft.
 7. This limit is based on observations and reports received from ships and aircraft.
 8. This limit is based on observations and reports received from ships and aircraft.
 9. This limit is based on observations and reports received from ships and aircraft.
 10. This limit is based on observations and reports received from ships and aircraft.

LEGEND

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

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 03 DEC 91

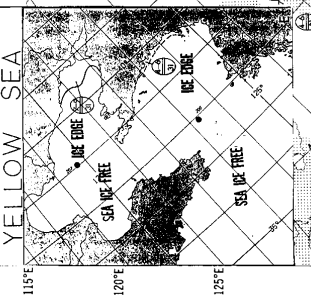
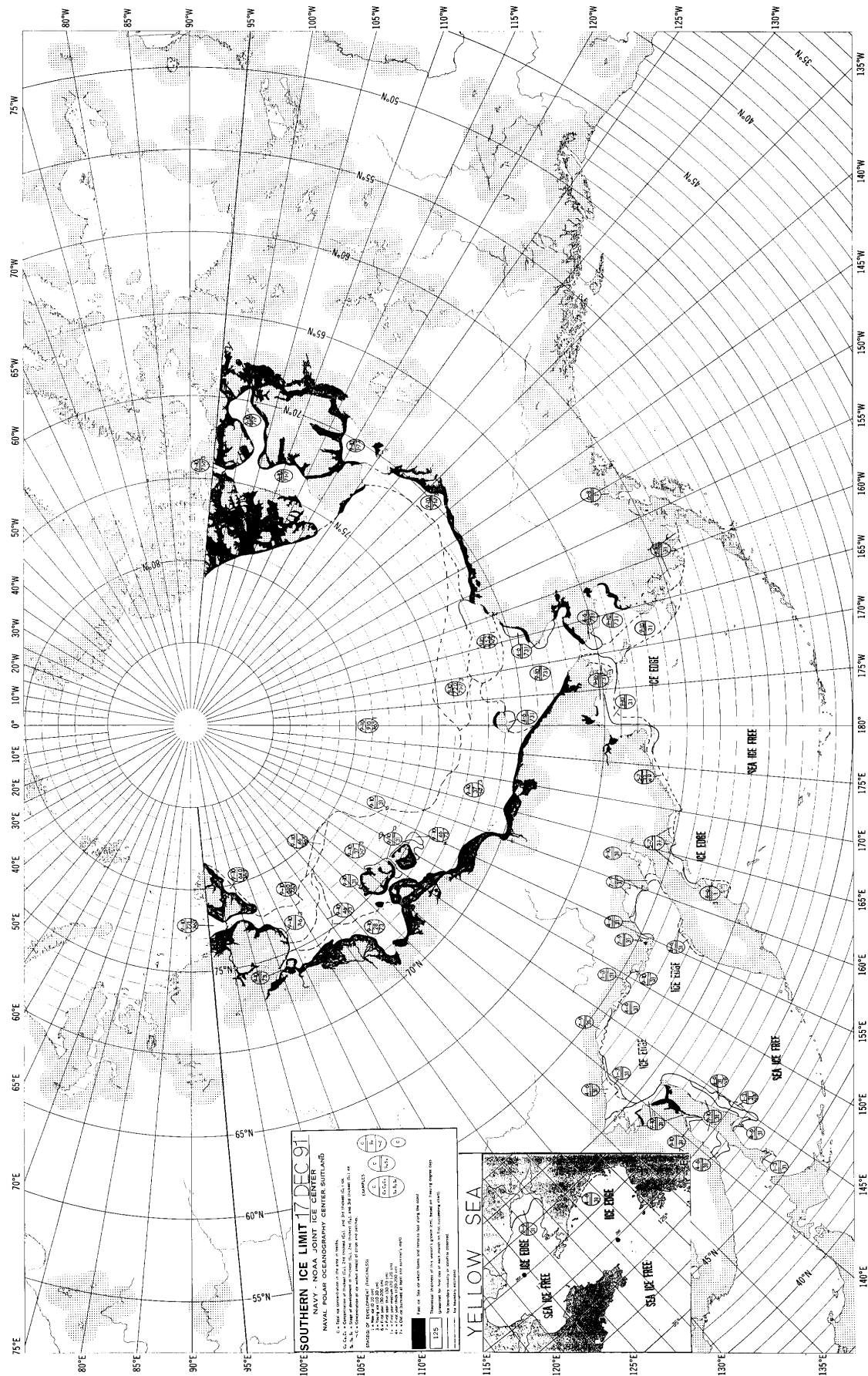
A = (Symbol A)
 (Symbol A) = (Symbol A)

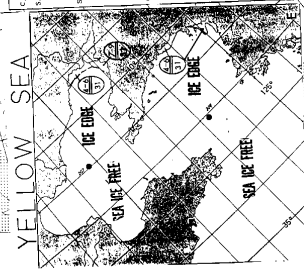
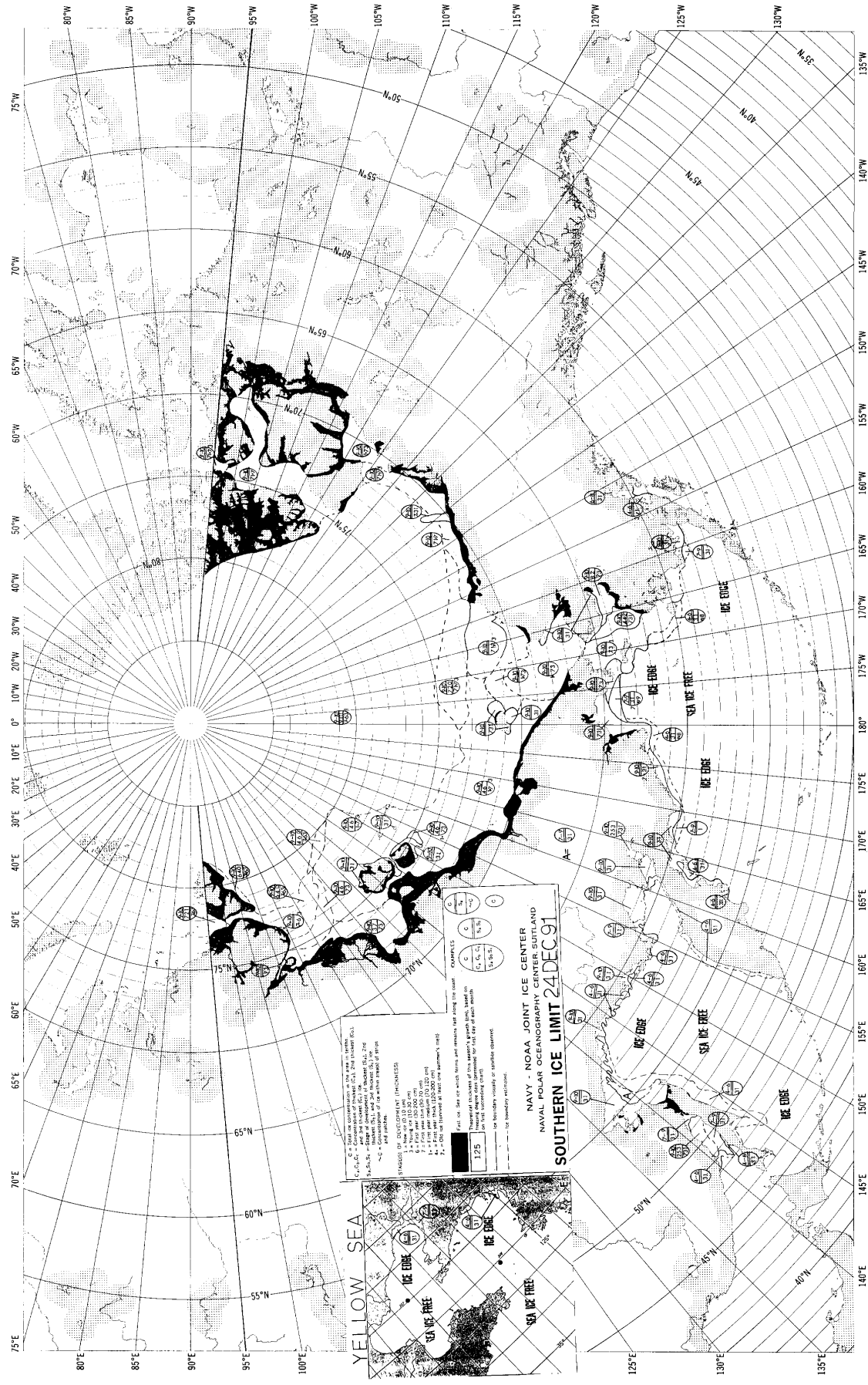


1 = Bare or snow covered (less than 100 mm) ice
 2 = Thin ice (100-200 mm)
 3 = Medium ice (200-400 mm)
 4 = Thick ice (400-600 mm)
 5 = Very thick ice (600-800 mm)
 6 = Ice of unknown thickness
 7 = Ice of unknown thickness, but with a maximum thickness of 1000 mm
 8 = Ice of unknown thickness, but with a maximum thickness of 1500 mm
 9 = Ice of unknown thickness, but with a maximum thickness of 2000 mm
 10 = Ice of unknown thickness, but with a maximum thickness of 2500 mm
 11 = Ice of unknown thickness, but with a maximum thickness of 3000 mm
 12 = Ice of unknown thickness, but with a maximum thickness of 3500 mm
 13 = Ice of unknown thickness, but with a maximum thickness of 4000 mm
 14 = Ice of unknown thickness, but with a maximum thickness of 4500 mm
 15 = Ice of unknown thickness, but with a maximum thickness of 5000 mm
 16 = Ice of unknown thickness, but with a maximum thickness of 5500 mm
 17 = Ice of unknown thickness, but with a maximum thickness of 6000 mm
 18 = Ice of unknown thickness, but with a maximum thickness of 6500 mm
 19 = Ice of unknown thickness, but with a maximum thickness of 7000 mm
 20 = Ice of unknown thickness, but with a maximum thickness of 7500 mm
 21 = Ice of unknown thickness, but with a maximum thickness of 8000 mm
 22 = Ice of unknown thickness, but with a maximum thickness of 8500 mm
 23 = Ice of unknown thickness, but with a maximum thickness of 9000 mm
 24 = Ice of unknown thickness, but with a maximum thickness of 9500 mm
 25 = Ice of unknown thickness, but with a maximum thickness of 10000 mm

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUTLAND
SOUTHERN ICE LIMIT 10 DEC 91

First use for each form and number for each day of the month.
 Example: 1225 (12 = Dec, 25 = 25th day of month)
 Example: 1225 (12 = Dec, 25 = 25th day of month)
 Example: 1225 (12 = Dec, 25 = 25th day of month)
 Example: 1225 (12 = Dec, 25 = 25th day of month)





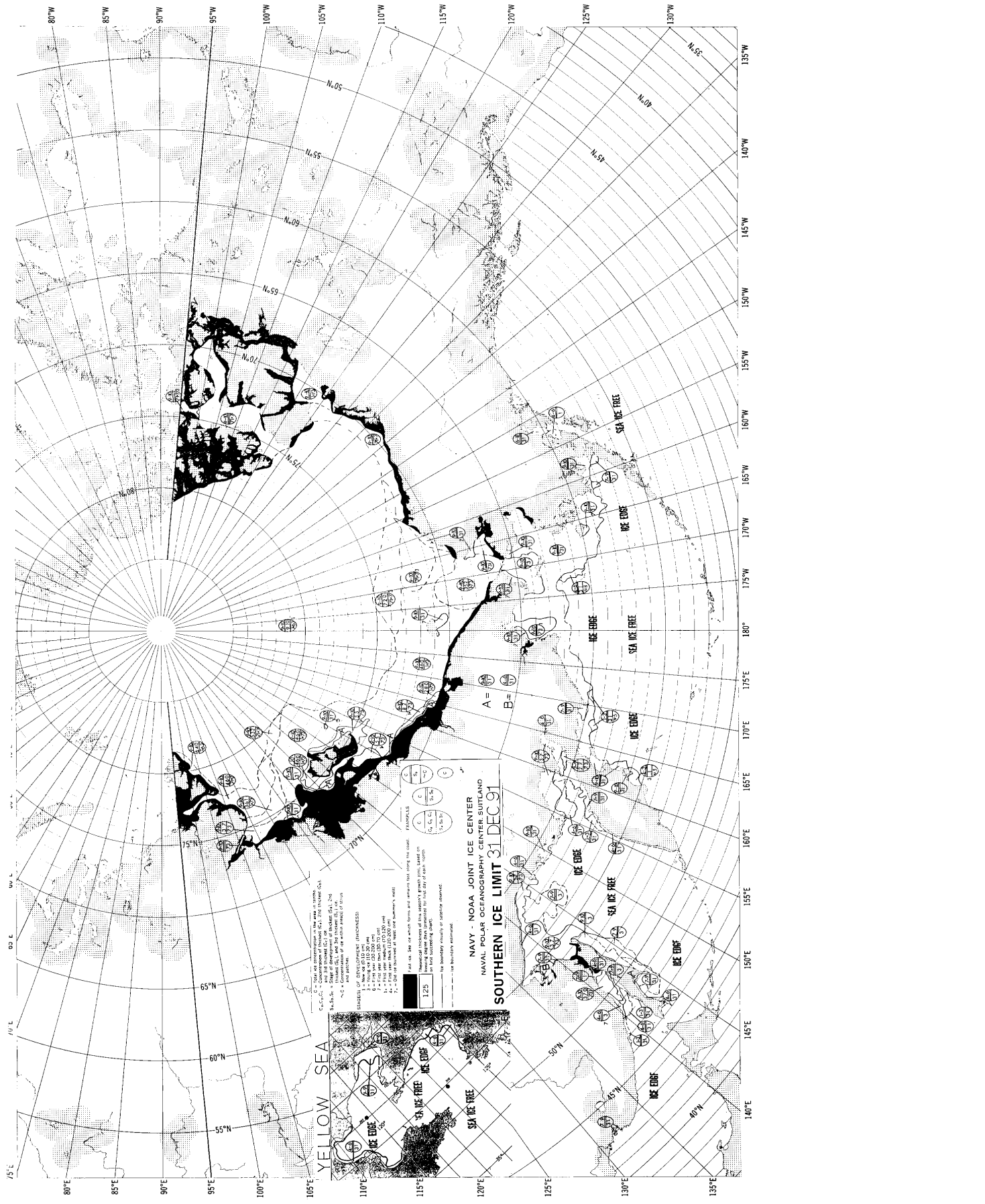
12. Shall be accompanied in the case of a vessel.
 13. Shall be accompanied in the case of a vessel.
 14. Shall be accompanied in the case of a vessel.
 15. Shall be accompanied in the case of a vessel.
 16. Shall be accompanied in the case of a vessel.
 17. Shall be accompanied in the case of a vessel.
 18. Shall be accompanied in the case of a vessel.
 19. Shall be accompanied in the case of a vessel.
 20. Shall be accompanied in the case of a vessel.

1. 1:250,000
 2. 1:250,000
 3. 1:250,000
 4. 1:250,000
 5. 1:250,000
 6. 1:250,000
 7. 1:250,000
 8. 1:250,000
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 16. 1:250,000
 17. 1:250,000
 18. 1:250,000
 19. 1:250,000
 20. 1:250,000

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 24DEC91

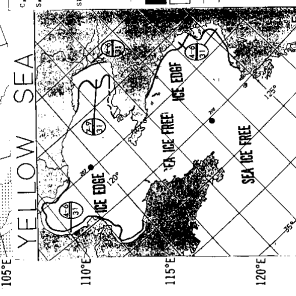
EXAMPLES

1	2	3	4	5
1, 2, 3, 4	5, 6, 7, 8	9, 10, 11, 12	13, 14, 15, 16	17, 18, 19, 20

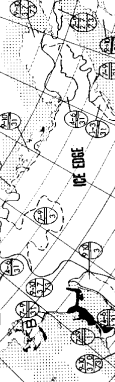


C, C, C = 100% ice concentration
 C, C, C = 75% ice concentration
 C, C, C = 50% ice concentration
 C, C, C = 25% ice concentration
 C, C, C = 10% ice concentration
 C, C, C = 5% ice concentration
 C, C, C = 1% ice concentration
 C, C, C = 0% ice concentration
 C, C, C = 100% ice concentration
 C, C, C = 75% ice concentration
 C, C, C = 50% ice concentration
 C, C, C = 25% ice concentration
 C, C, C = 10% ice concentration
 C, C, C = 5% ice concentration
 C, C, C = 1% ice concentration
 C, C, C = 0% ice concentration

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 31 DEC 91



A = 100% ice concentration
 B = 75% ice concentration



125
 100
 75
 50
 25
 10
 5
 1

100% ice concentration
 75% ice concentration
 50% ice concentration
 25% ice concentration
 10% ice concentration
 5% ice concentration
 1% ice concentration
 0% ice concentration

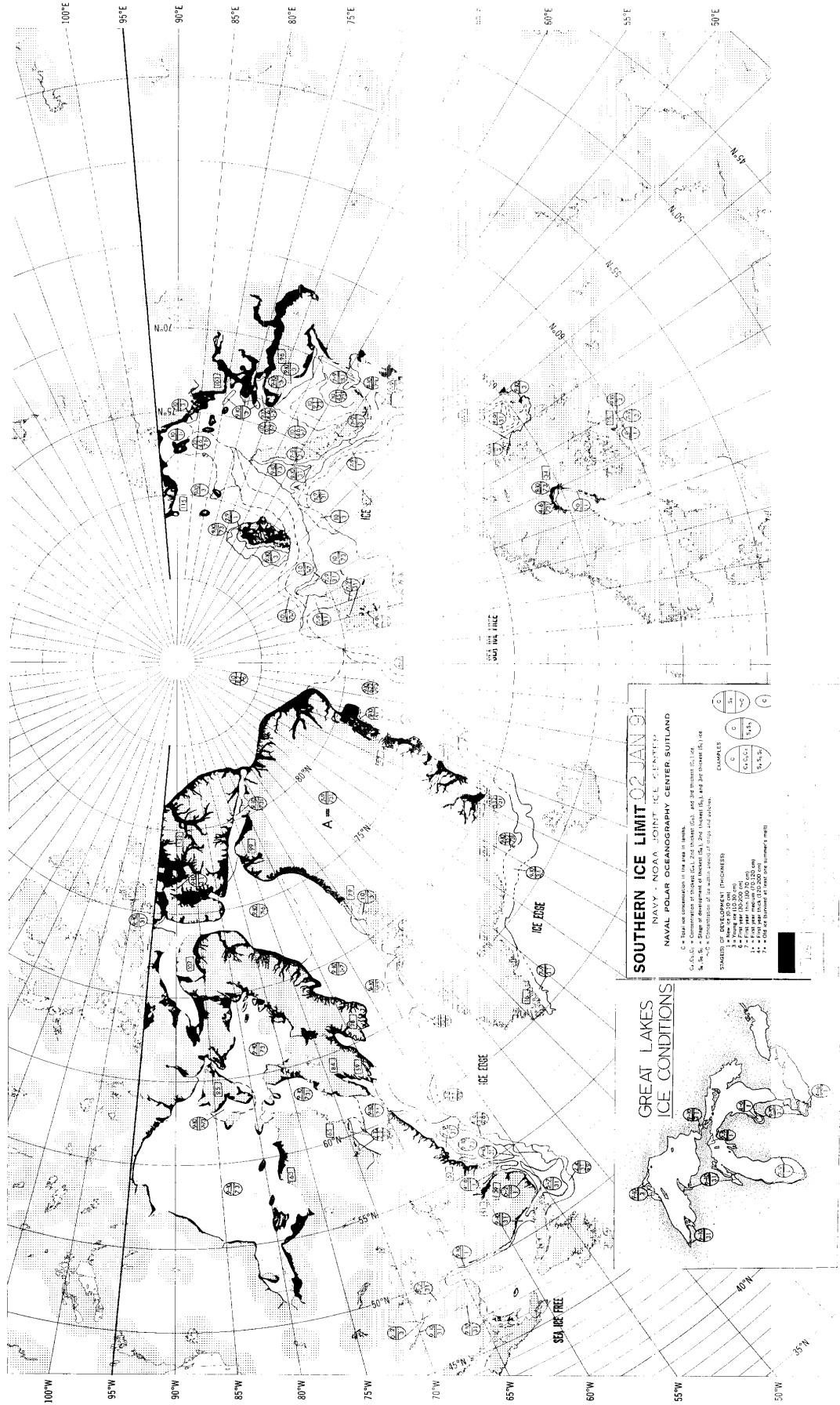
100% ice concentration
 75% ice concentration
 50% ice concentration
 25% ice concentration
 10% ice concentration
 5% ice concentration
 1% ice concentration
 0% ice concentration

100% ice concentration
 75% ice concentration
 50% ice concentration
 25% ice concentration
 10% ice concentration
 5% ice concentration
 1% ice concentration
 0% ice concentration

100% ice concentration
 75% ice concentration
 50% ice concentration
 25% ice concentration
 10% ice concentration
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 1% ice concentration
 0% ice concentration

100% ice concentration
 75% ice concentration
 50% ice concentration
 25% ice concentration
 10% ice concentration
 5% ice concentration
 1% ice concentration
 0% ice concentration

100% ice concentration
 75% ice concentration
 50% ice concentration
 25% ice concentration
 10% ice concentration
 5% ice concentration
 1% ice concentration
 0% ice concentration



SOUTHERN ICE LIMIT 02 JAN 91
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND

STANDARD ICE DIRECTION (THICKNESS)

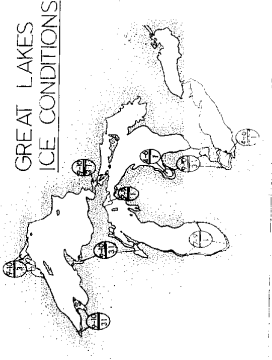
1	1 = Thickness 20-100 cm
2	2 = Thickness 100-200 cm
3	3 = Thickness 200-500 cm
4	4 = Thickness 500-1000 cm
5	5 = Thickness more than 1000 cm

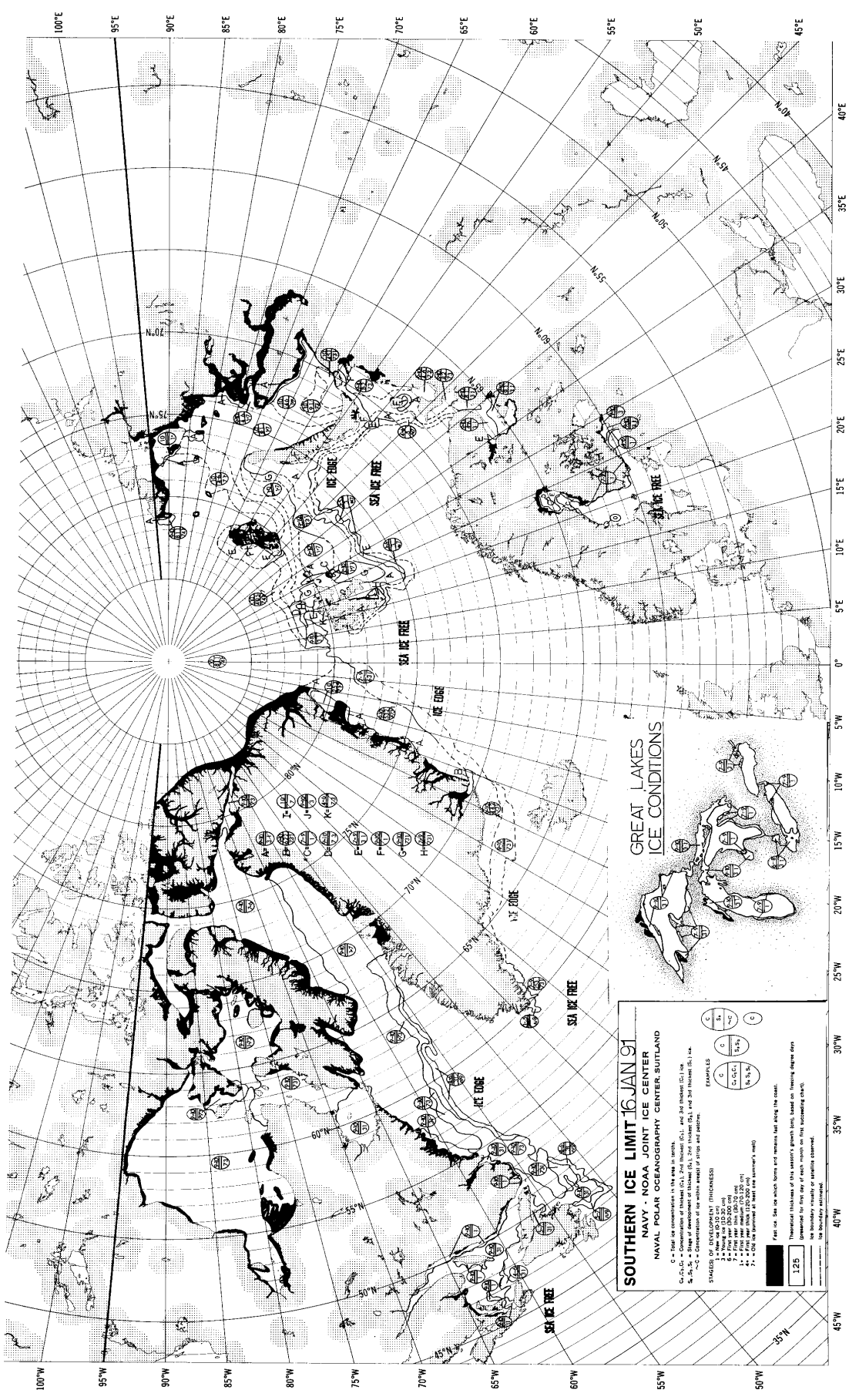
EXAMPLES

①	②	③	④	⑤
$\frac{C}{000}$	$\frac{00}{15}$	$\frac{00}{30}$	$\frac{00}{45}$	$\frac{00}{60}$

KEY

S - Data are concentration in the area in which
 G.C.C. - Concentration of thickets (G.L. and 200 ft thick) (G.L. and 300 ft thick) (S. 1 or 2)
 N, E, W - Direction of movement of thickets (G.L. and 200 ft thick) (S. 1 or 2)
 S, N, E, W - Direction of movement of thickets (S. 1 or 2)





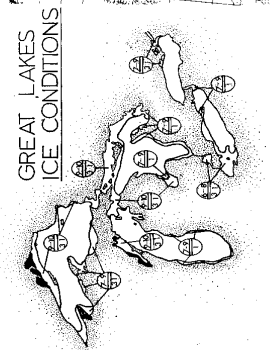
SOUTHERN ICE LIMIT 16 JAN 91
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in percent.
 C.C.L.C. = Concentration of loosest (C), 2nd thickest (C), and 3rd thickest (C) ice.
 S, S.C., and S.C.C. = Thickness (S) in feet and 3rd thickest (C) in feet.
 S.C.C.C. = Concentration of ice within 300 ft of ship and patches.

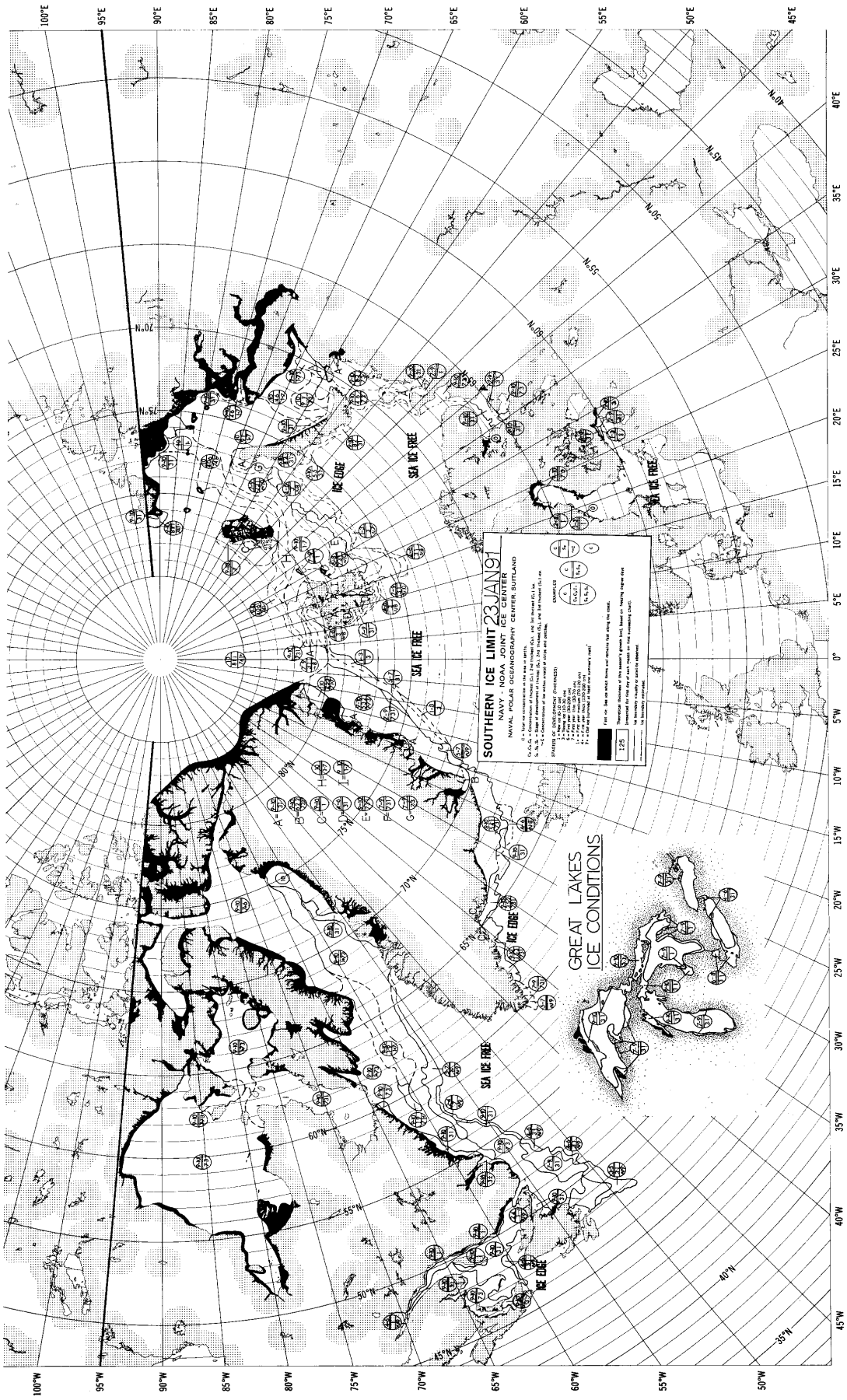
STAGES OF DEVELOPMENT (THICKNESS)
 1 = New ice (0-0.25 m)
 2 = First year ice (0.25-0.50 m)
 3 = First year ice (0.50-0.75 m)
 4 = First year ice (0.75-1.00 m)
 5 = First year ice (1.00-1.25 m)
 6 = First year ice (1.25-1.50 m)
 7 = Old ice (formed at least one summer's melt)

Refer to the scale below for details not shown on this chart.
 Thickness of this season's growth lines, based on history, agree only to the nearest 100 ft. (30 m).
 Ice boundary indicated by dashed line.

1:250,000



45°E 30°E 15°E 0° 15°W 30°W 45°W 60°W 75°W 90°W 100°W
 45°N 50°N 55°N 60°N 65°N 70°N 75°N 80°N 85°N 90°N



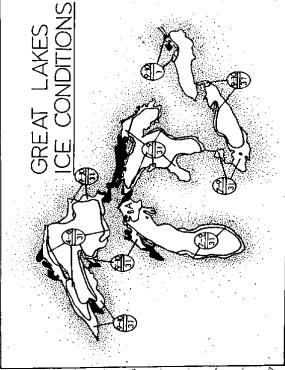
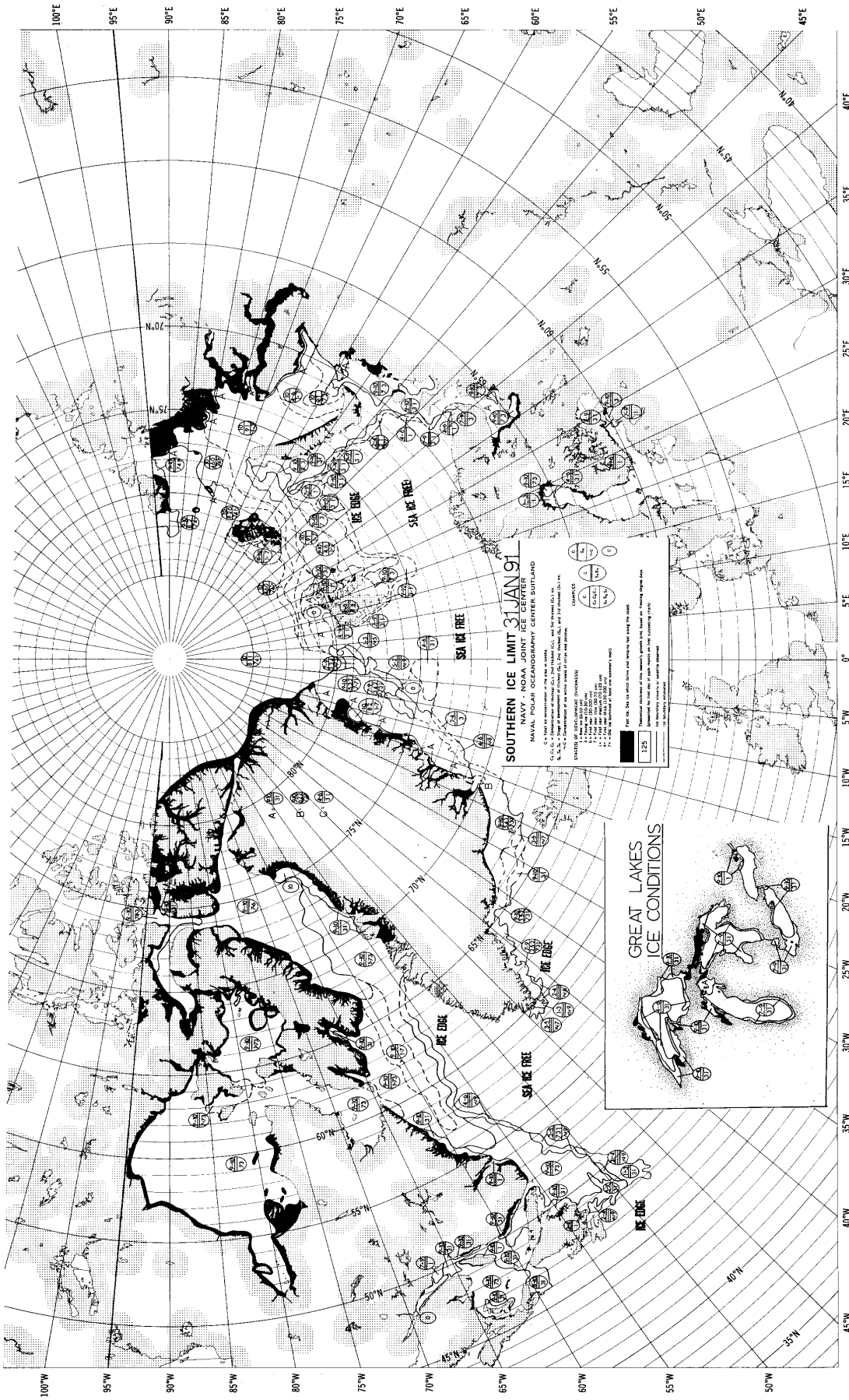
SOUTHERN ICE LIMIT 23 JAN 91
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, BUTLAND

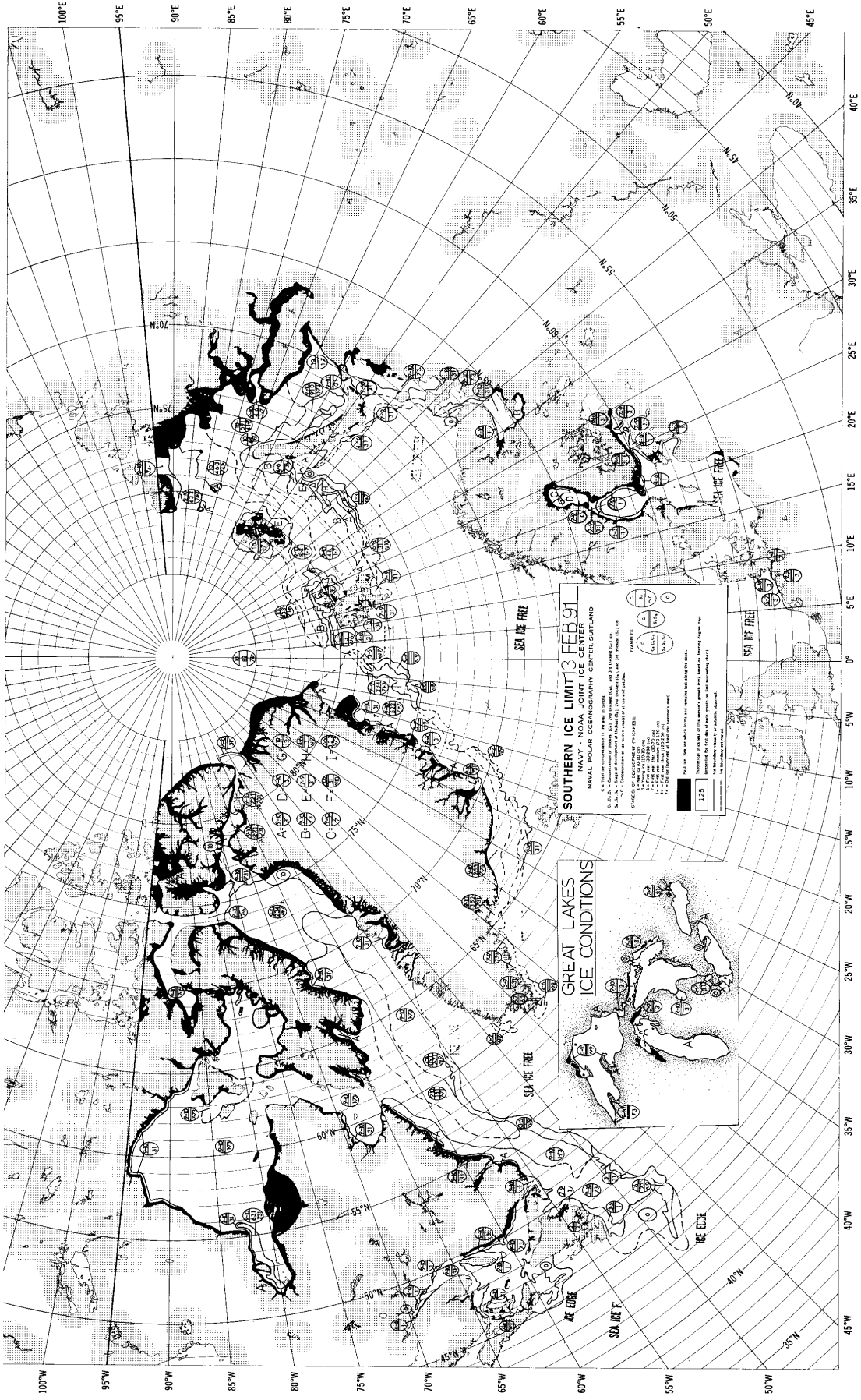
1 - 1000 FT contour interval in the area shown.
 2 - 500 FT contour interval in the area shown.
 3 - 200 FT contour interval in the area shown.
 4 - 100 FT contour interval in the area shown.
 5 - 50 FT contour interval in the area shown.
 6 - 25 FT contour interval in the area shown.
 7 - 10 FT contour interval in the area shown.
 8 - 5 FT contour interval in the area shown.
 9 - 2 FT contour interval in the area shown.
 10 - 1 FT contour interval in the area shown.

SYMBOLS:
 (A) - 1000 FT contour interval in the area shown.
 (B) - 500 FT contour interval in the area shown.
 (C) - 200 FT contour interval in the area shown.
 (D) - 100 FT contour interval in the area shown.
 (E) - 50 FT contour interval in the area shown.
 (F) - 25 FT contour interval in the area shown.
 (G) - 10 FT contour interval in the area shown.
 (H) - 5 FT contour interval in the area shown.
 (I) - 2 FT contour interval in the area shown.
 (J) - 1 FT contour interval in the area shown.

125

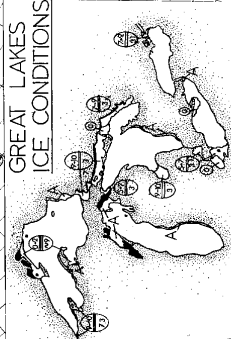
**GREAT LAKES
 ICE CONDITIONS**





SOUTHERN ICE LIMIT 13 FEB 91
 NAVAL POLAR OCEANOGRAPHY CENTER BUTLAND

0-100% = 0-100% of the area covered by ice
 1-2 = 1-2 cm of ice thickness
 3-4 = 3-4 cm of ice thickness
 5-6 = 5-6 cm of ice thickness
 7-8 = 7-8 cm of ice thickness
 9-10 = 9-10 cm of ice thickness
 11-12 = 11-12 cm of ice thickness
 13-14 = 13-14 cm of ice thickness
 15-16 = 15-16 cm of ice thickness
 17-18 = 17-18 cm of ice thickness
 19-20 = 19-20 cm of ice thickness
 21-22 = 21-22 cm of ice thickness
 23-24 = 23-24 cm of ice thickness
 25-26 = 25-26 cm of ice thickness
 27-28 = 27-28 cm of ice thickness
 29-30 = 29-30 cm of ice thickness
 31-32 = 31-32 cm of ice thickness
 33-34 = 33-34 cm of ice thickness
 35-36 = 35-36 cm of ice thickness
 37-38 = 37-38 cm of ice thickness
 39-40 = 39-40 cm of ice thickness
 41-42 = 41-42 cm of ice thickness
 43-44 = 43-44 cm of ice thickness
 45-46 = 45-46 cm of ice thickness
 47-48 = 47-48 cm of ice thickness
 49-50 = 49-50 cm of ice thickness
 51-52 = 51-52 cm of ice thickness
 53-54 = 53-54 cm of ice thickness
 55-56 = 55-56 cm of ice thickness
 57-58 = 57-58 cm of ice thickness
 59-60 = 59-60 cm of ice thickness
 61-62 = 61-62 cm of ice thickness
 63-64 = 63-64 cm of ice thickness
 65-66 = 65-66 cm of ice thickness
 67-68 = 67-68 cm of ice thickness
 69-70 = 69-70 cm of ice thickness
 71-72 = 71-72 cm of ice thickness
 73-74 = 73-74 cm of ice thickness
 75-76 = 75-76 cm of ice thickness
 77-78 = 77-78 cm of ice thickness
 79-80 = 79-80 cm of ice thickness
 81-82 = 81-82 cm of ice thickness
 83-84 = 83-84 cm of ice thickness
 85-86 = 85-86 cm of ice thickness
 87-88 = 87-88 cm of ice thickness
 89-90 = 89-90 cm of ice thickness
 91-92 = 91-92 cm of ice thickness
 93-94 = 93-94 cm of ice thickness
 95-96 = 95-96 cm of ice thickness
 97-98 = 97-98 cm of ice thickness
 99-100 = 99-100 cm of ice thickness



100°E 95°E 90°E 85°E 80°E 75°E 70°E 65°E 60°E 55°E 50°E 45°E

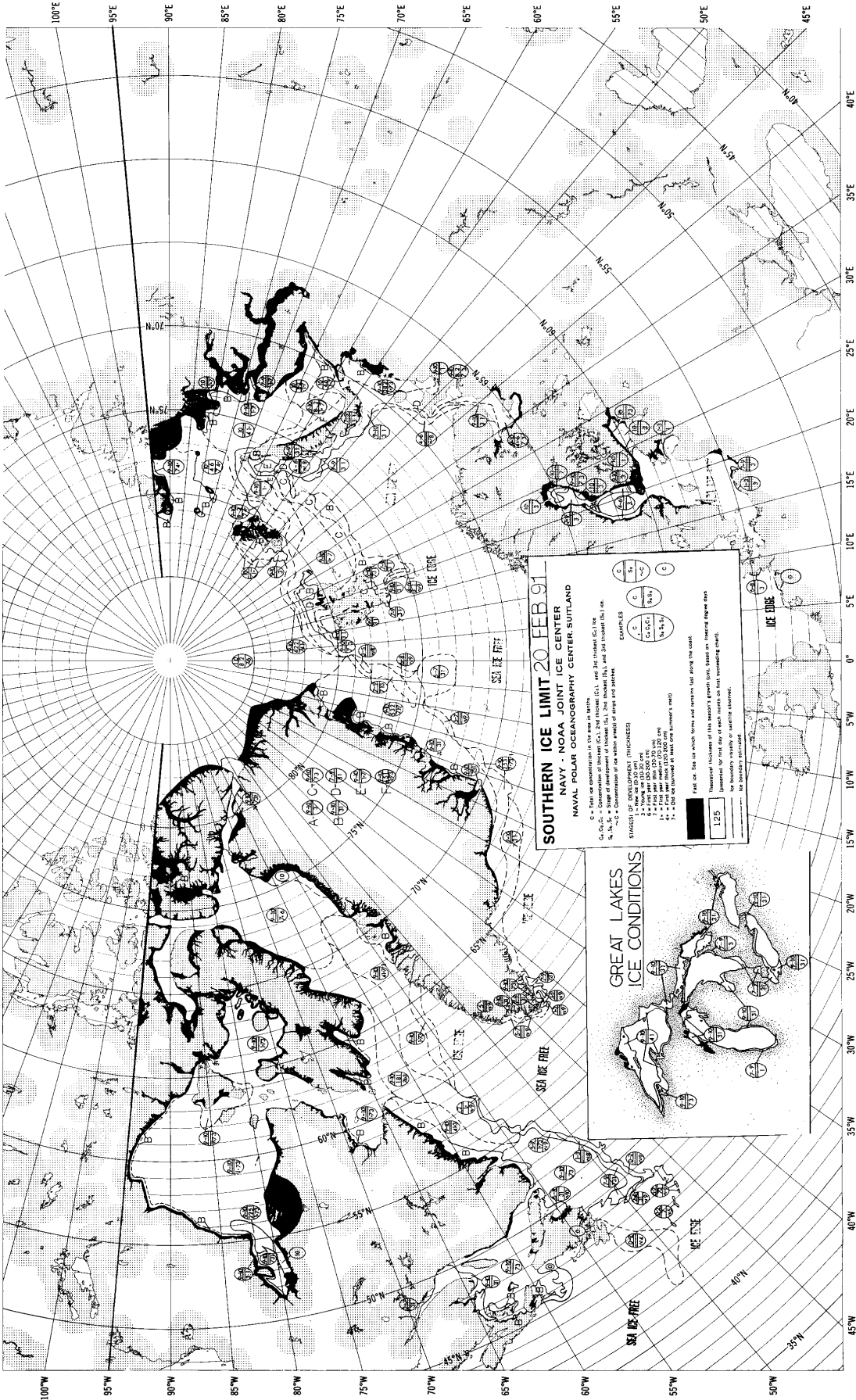
100°W 95°W 90°W 85°W 80°W 75°W 70°W 65°W 60°W 55°W 50°W 45°W

85°N 80°N 75°N 70°N 65°N 60°N 55°N 50°N 45°N

100°E 95°E 90°E 85°E 80°E 75°E 70°E 65°E 60°E 55°E 50°E 45°E

100°W 95°W 90°W 85°W 80°W 75°W 70°W 65°W 60°W 55°W 50°W 45°W

85°N 80°N 75°N 70°N 65°N 60°N 55°N 50°N 45°N



SOUTHERN ICE LIMIT 20 FEB 91
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Data unobtainable in this area or month.
 C, D, S = Stage of development of icebergs (1, 2, 3) thickness (ft), and 3rd (max) thickness (ft).
 N, N, S = Stage of development of icebergs (1, 2, 3) thickness (ft), and 3rd (max) thickness (ft).
 N, C = Determination of ice margin (width of margin in feet).

EXAMPLES

STAGES OF DEVELOPMENT OF ICEBERGS (THICKNESSES)

1	2	3
0-100 ft	100-200 ft	200-300 ft

1 = First year ice (100-200 cm)
 2 = First year ice (200-300 cm)
 3 = Old ice (300-500 cm)
 N = Old ice (500-700 cm)
 S = Old ice (700-1000 cm)

ICE LIMITS

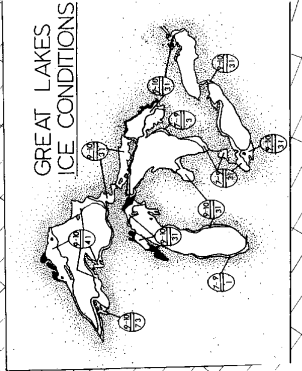
- ICE LIMIT
- ICE EDGE
- SEA ICE FREE
- ICE FREE

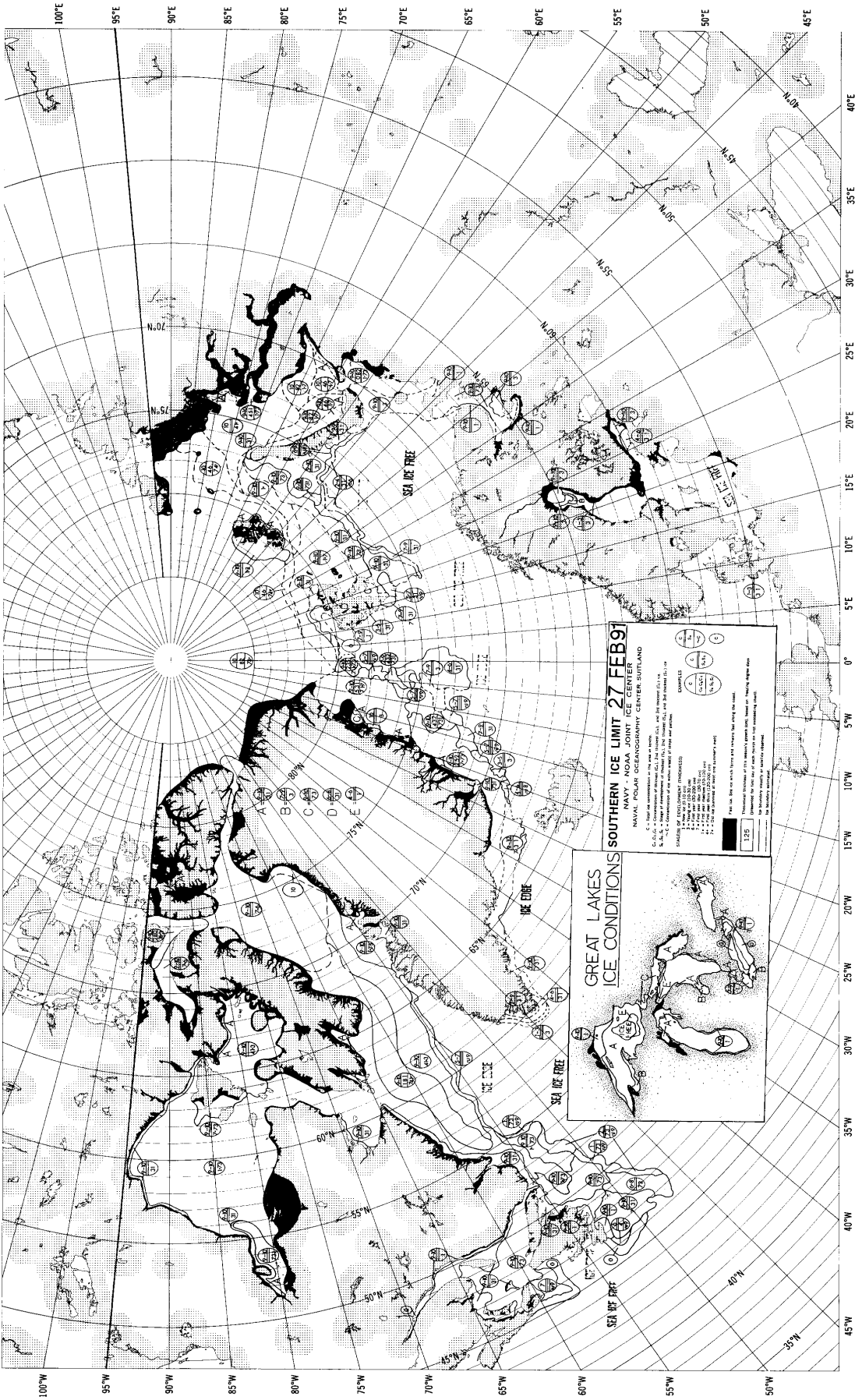
ICE LIMITS

- ICE LIMIT
- ICE EDGE
- SEA ICE FREE
- ICE FREE

ICE LIMITS

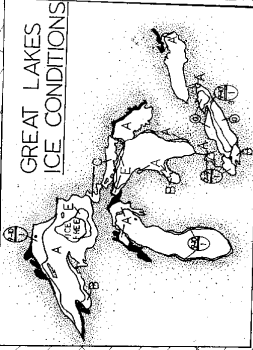
- ICE LIMIT
- ICE EDGE
- SEA ICE FREE
- ICE FREE

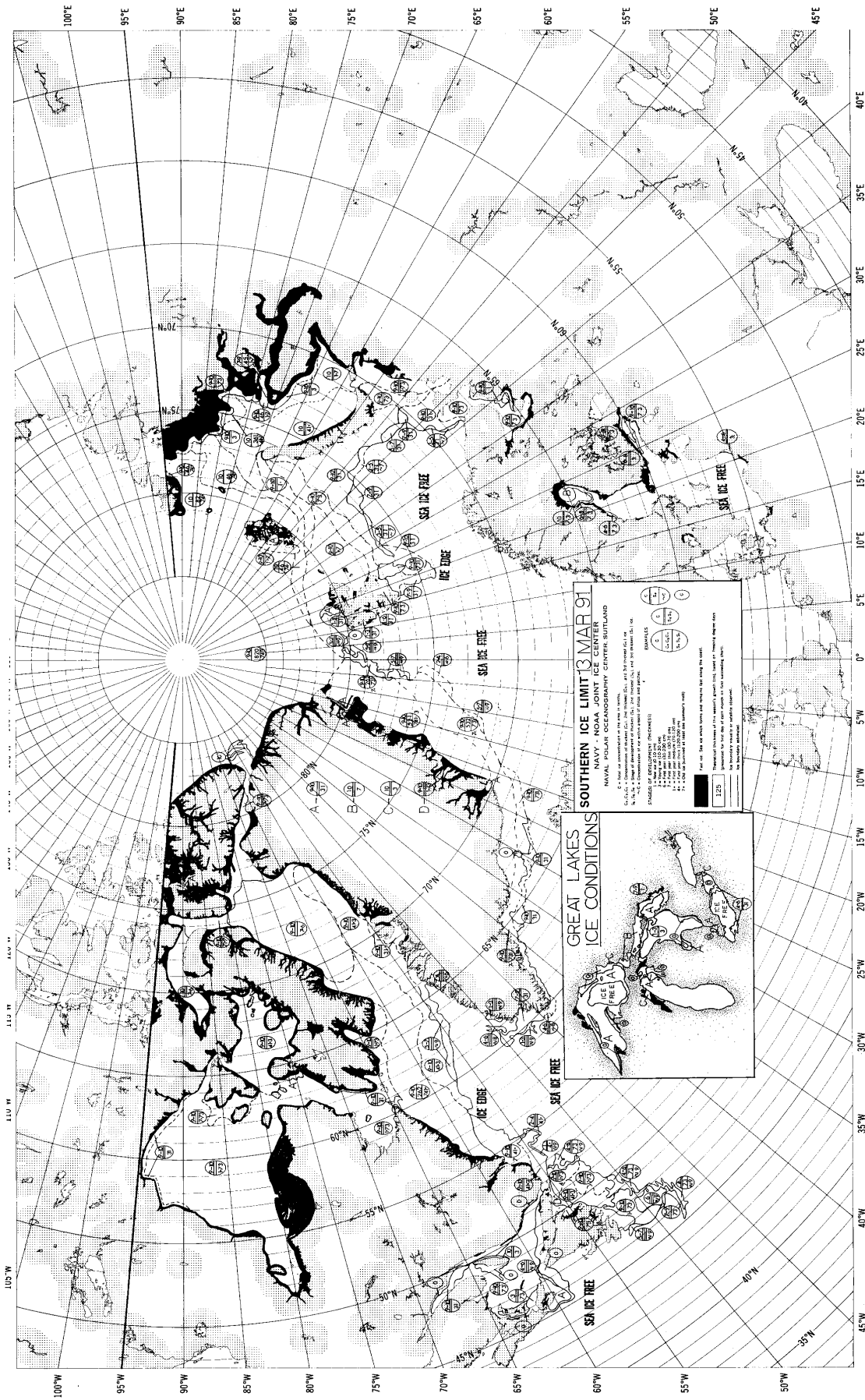




SOUTHERN ICE LIMIT 27 FEB 69
 U.S. NAVY
 NAVAL POLAR PROGRAM JOINT ICE CENTER
 NAVAL POLAR RESEARCH CENTER SUTCLIFF

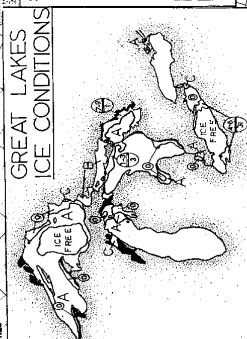
C - 1000' contour of ice limit
 D - 2000' contour of ice limit
 E - 3000' contour of ice limit
 F - 4000' contour of ice limit
 G - 5000' contour of ice limit
 H - 6000' contour of ice limit
 I - 7000' contour of ice limit
 J - 8000' contour of ice limit
 K - 9000' contour of ice limit
 L - 10000' contour of ice limit
 M - 11000' contour of ice limit
 N - 12000' contour of ice limit
 O - 13000' contour of ice limit
 P - 14000' contour of ice limit
 Q - 15000' contour of ice limit
 R - 16000' contour of ice limit
 S - 17000' contour of ice limit
 T - 18000' contour of ice limit
 U - 19000' contour of ice limit
 V - 20000' contour of ice limit
 W - 21000' contour of ice limit
 X - 22000' contour of ice limit
 Y - 23000' contour of ice limit
 Z - 24000' contour of ice limit
 AA - 25000' contour of ice limit
 AB - 26000' contour of ice limit
 AC - 27000' contour of ice limit
 AD - 28000' contour of ice limit
 AE - 29000' contour of ice limit
 AF - 30000' contour of ice limit
 AG - 31000' contour of ice limit
 AH - 32000' contour of ice limit
 AI - 33000' contour of ice limit
 AJ - 34000' contour of ice limit
 AK - 35000' contour of ice limit
 AL - 36000' contour of ice limit
 AM - 37000' contour of ice limit
 AN - 38000' contour of ice limit
 AO - 39000' contour of ice limit
 AP - 40000' contour of ice limit
 AQ - 41000' contour of ice limit
 AR - 42000' contour of ice limit
 AS - 43000' contour of ice limit
 AT - 44000' contour of ice limit
 AU - 45000' contour of ice limit
 AV - 46000' contour of ice limit
 AW - 47000' contour of ice limit
 AX - 48000' contour of ice limit
 AY - 49000' contour of ice limit
 AZ - 50000' contour of ice limit
 BA - 51000' contour of ice limit
 BB - 52000' contour of ice limit
 BC - 53000' contour of ice limit
 BD - 54000' contour of ice limit
 BE - 55000' contour of ice limit
 BF - 56000' contour of ice limit
 BG - 57000' contour of ice limit
 BH - 58000' contour of ice limit
 BI - 59000' contour of ice limit
 BJ - 60000' contour of ice limit
 BK - 61000' contour of ice limit
 BL - 62000' contour of ice limit
 BM - 63000' contour of ice limit
 BN - 64000' contour of ice limit
 BO - 65000' contour of ice limit
 BP - 66000' contour of ice limit
 BQ - 67000' contour of ice limit
 BR - 68000' contour of ice limit
 BS - 69000' contour of ice limit
 BT - 70000' contour of ice limit
 BU - 71000' contour of ice limit
 BV - 72000' contour of ice limit
 BW - 73000' contour of ice limit
 BX - 74000' contour of ice limit
 BY - 75000' contour of ice limit
 BZ - 76000' contour of ice limit
 CA - 77000' contour of ice limit
 CB - 78000' contour of ice limit
 CC - 79000' contour of ice limit
 CD - 80000' contour of ice limit
 CE - 81000' contour of ice limit
 CF - 82000' contour of ice limit
 CG - 83000' contour of ice limit
 CH - 84000' contour of ice limit
 CI - 85000' contour of ice limit
 CJ - 86000' contour of ice limit
 CK - 87000' contour of ice limit
 CL - 88000' contour of ice limit
 CM - 89000' contour of ice limit
 CN - 90000' contour of ice limit
 CO - 91000' contour of ice limit
 CP - 92000' contour of ice limit
 CQ - 93000' contour of ice limit
 CR - 94000' contour of ice limit
 CS - 95000' contour of ice limit
 CT - 96000' contour of ice limit
 CU - 97000' contour of ice limit
 CV - 98000' contour of ice limit
 CW - 99000' contour of ice limit
 CX - 100000' contour of ice limit

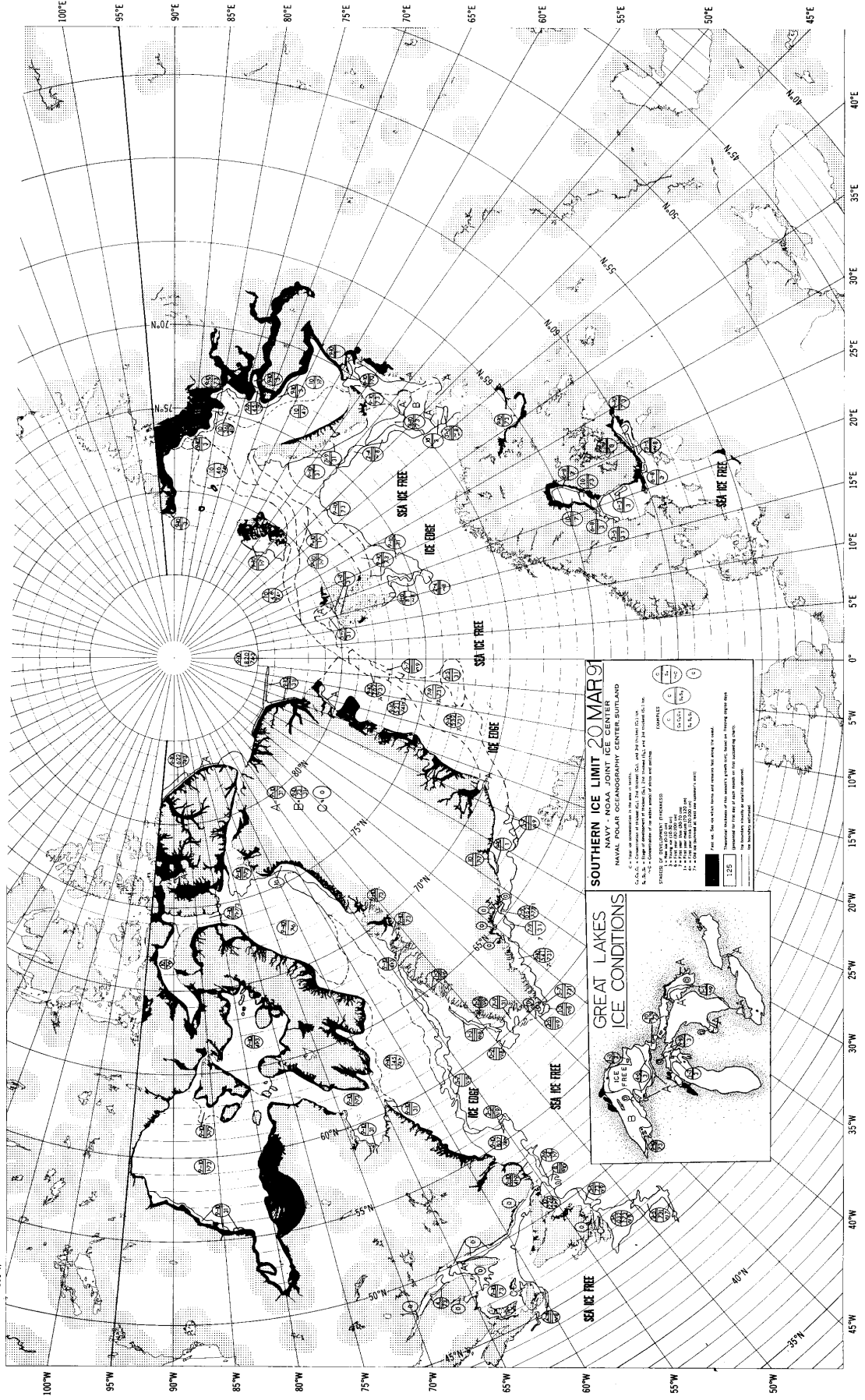




SOUTHERN ICE LIMIT 3 MAR 91
 NAVAL POLAR OCEANOGRAPHY CENTER BUTLIDAR
 NAVY-NASA JOINT ICE CENTER

1. Ice thicknesses are in centimeters.
 2. Ice thicknesses are in feet.
 3. Ice thicknesses are in meters.
 4. Ice thicknesses are in kilometers.
 5. Ice thicknesses are in miles.
 6. Ice thicknesses are in nautical miles.
 7. Ice thicknesses are in statute miles.
 8. Ice thicknesses are in kilometers.
 9. Ice thicknesses are in miles.
 10. Ice thicknesses are in nautical miles.
 11. Ice thicknesses are in statute miles.
 12. Ice thicknesses are in kilometers.
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 15. Ice thicknesses are in statute miles.
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 38. Ice thicknesses are in nautical miles.
 39. Ice thicknesses are in statute miles.
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 43. Ice thicknesses are in statute miles.
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 47. Ice thicknesses are in statute miles.
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 51. Ice thicknesses are in statute miles.
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 54. Ice thicknesses are in nautical miles.
 55. Ice thicknesses are in statute miles.
 56. Ice thicknesses are in kilometers.
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 58. Ice thicknesses are in nautical miles.
 59. Ice thicknesses are in statute miles.
 60. Ice thicknesses are in kilometers.
 61. Ice thicknesses are in miles.
 62. Ice thicknesses are in nautical miles.
 63. Ice thicknesses are in statute miles.
 64. Ice thicknesses are in kilometers.
 65. Ice thicknesses are in miles.
 66. Ice thicknesses are in nautical miles.
 67. Ice thicknesses are in statute miles.
 68. Ice thicknesses are in kilometers.
 69. Ice thicknesses are in miles.
 70. Ice thicknesses are in nautical miles.
 71. Ice thicknesses are in statute miles.
 72. Ice thicknesses are in kilometers.
 73. Ice thicknesses are in miles.
 74. Ice thicknesses are in nautical miles.
 75. Ice thicknesses are in statute miles.
 76. Ice thicknesses are in kilometers.
 77. Ice thicknesses are in miles.
 78. Ice thicknesses are in nautical miles.
 79. Ice thicknesses are in statute miles.
 80. Ice thicknesses are in kilometers.
 81. Ice thicknesses are in miles.
 82. Ice thicknesses are in nautical miles.
 83. Ice thicknesses are in statute miles.
 84. Ice thicknesses are in kilometers.
 85. Ice thicknesses are in miles.
 86. Ice thicknesses are in nautical miles.
 87. Ice thicknesses are in statute miles.
 88. Ice thicknesses are in kilometers.
 89. Ice thicknesses are in miles.
 90. Ice thicknesses are in nautical miles.
 91. Ice thicknesses are in statute miles.
 92. Ice thicknesses are in kilometers.
 93. Ice thicknesses are in miles.
 94. Ice thicknesses are in nautical miles.
 95. Ice thicknesses are in statute miles.
 96. Ice thicknesses are in kilometers.
 97. Ice thicknesses are in miles.
 98. Ice thicknesses are in nautical miles.
 99. Ice thicknesses are in statute miles.
 100. Ice thicknesses are in kilometers.



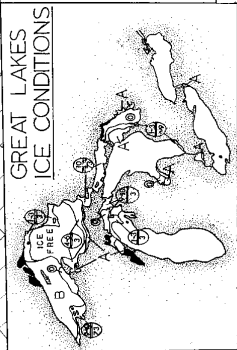


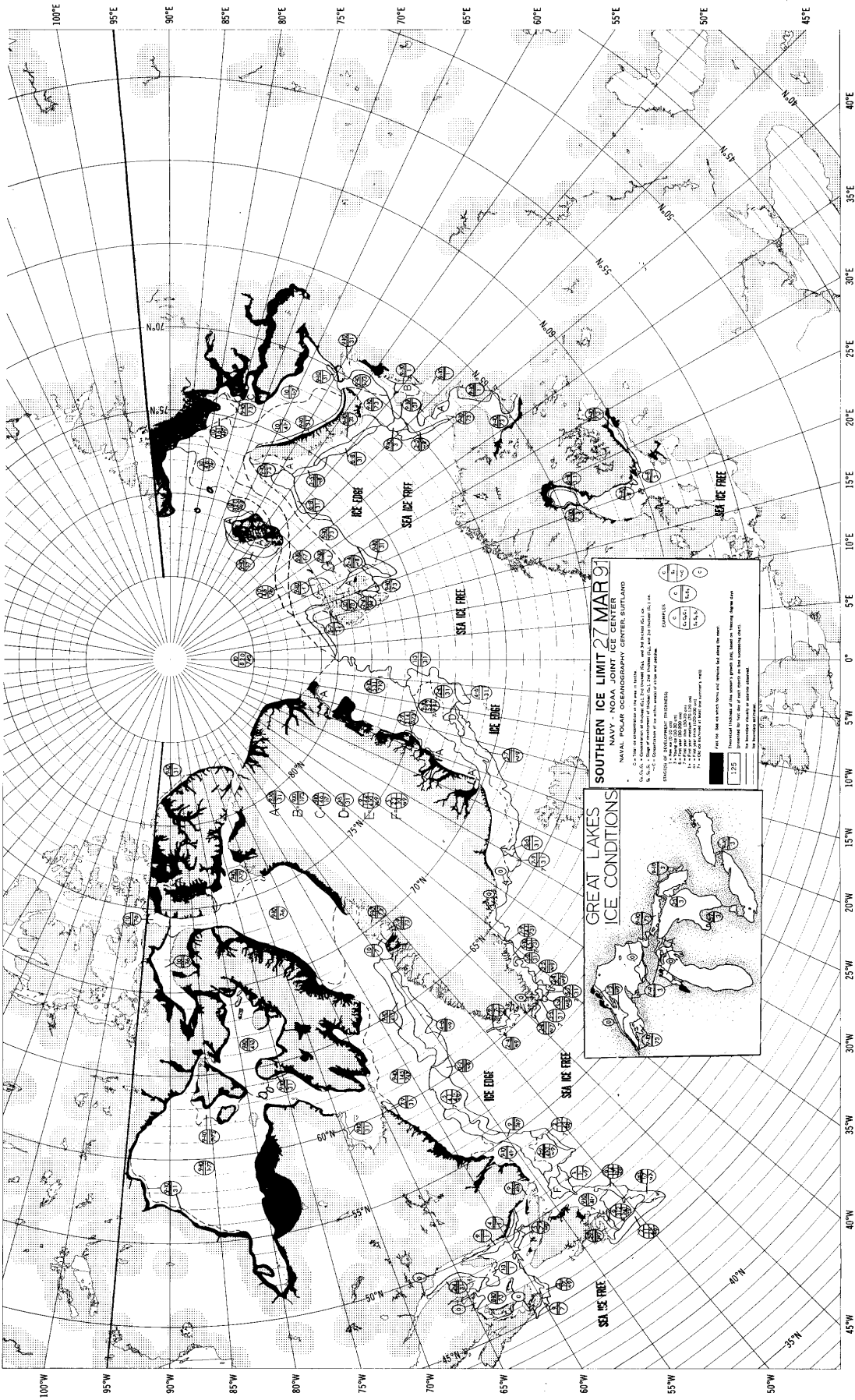
SOUTHERN ICE LIMIT 20 MAR 91
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OPERATIONS CENTER, SUTCLIFF

C-I, C-II = Concentration of broken ice, 7th frame: C-I, and 2nd frame: C-II
 S-I, S-II = Concentration of snow cover, 7th frame: S-I, and 2nd frame: S-II
 H-I, H-II = Concentration of ice under snow, 7th frame: H-I, and 2nd frame: H-II

SHAPES OF DEVELOPMENT: (FRAMES)
 1 - 1st frame: 0-100%
 2 - 2nd frame: 100-200%
 3 - 3rd frame: 200-300%
 4 - 4th frame: 300-400%
 5 - 5th frame: 400-500%
 6 - 6th frame: 500-600%
 7 - 7th frame: 600-700%
 8 - 8th frame: 700-800%
 9 - 9th frame: 800-900%
 10 - 10th frame: 900-1000%

For use: See on which frame and symbols that apply for each
 1:250
 (Downloaded by the user's profile ID, based on viewing rights)
 The numbers are not intended to be used for any other purpose.
 The numbers are not intended to be used for any other purpose.





SOUTHERN ICE LIMIT 27 MAR 91
 NAVY POLAR OCEANOGRAPHY CENTER, SUITLAND

1. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

2. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

3. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

4. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

5. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

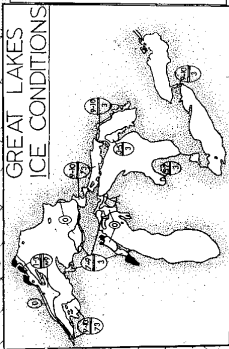
6. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

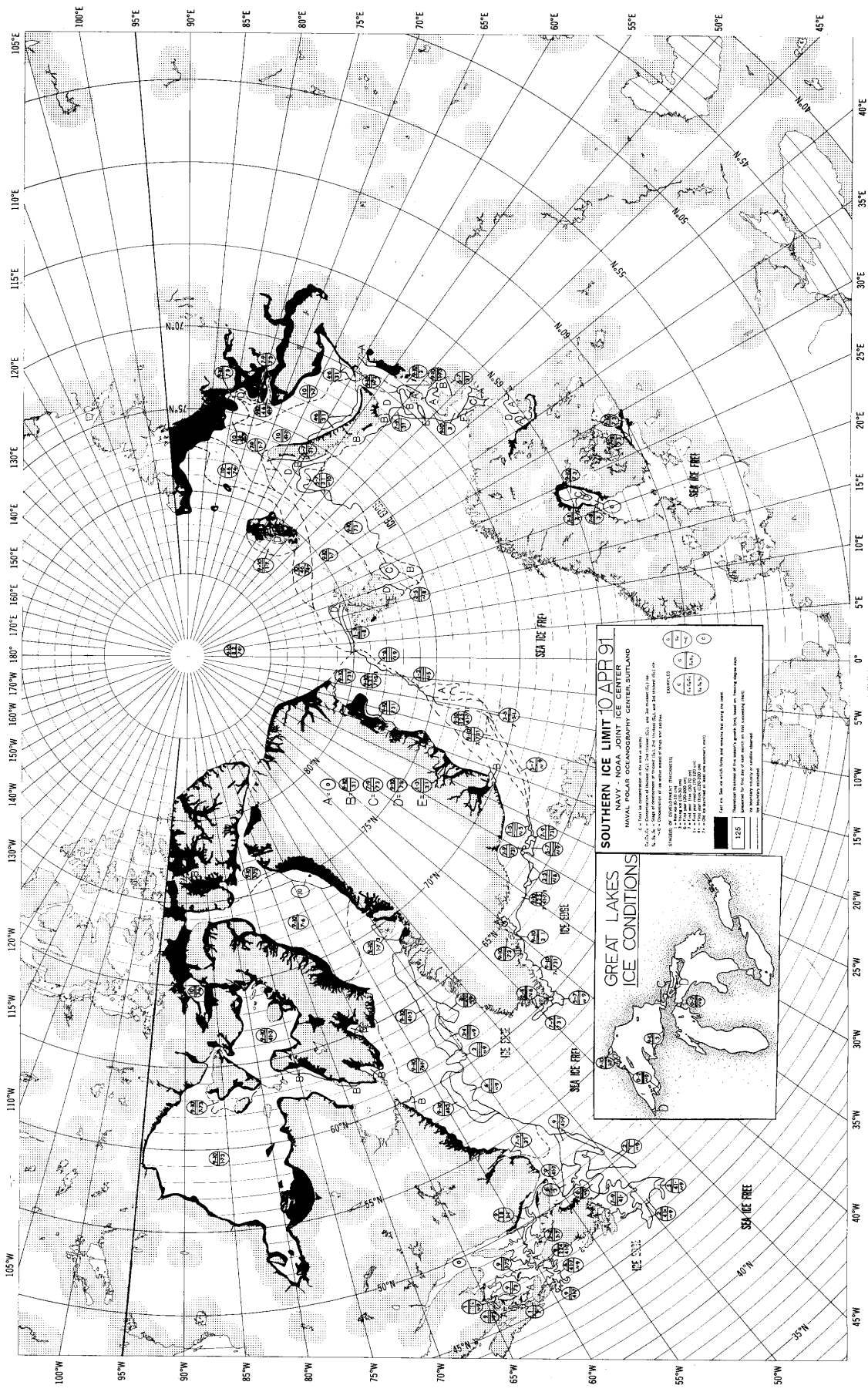
7. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

8. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

9. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.

10. This chart is based on the latest available information and is subject to change without notice. It is not to be used for navigation purposes. For more information, contact the Hydrographic Office, Washington, D.C.





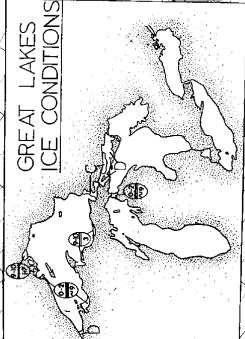
SOUTHERN ICE LIMIT 10 APR 91
 NAVAL POLAR OCEANOGRAPHY CENTER, BUTLAND

1. 100% ice concentration
 2. 75% ice concentration
 3. 50% ice concentration
 4. 25% ice concentration
 5. 10% ice concentration
 6. 5% ice concentration
 7. 1% ice concentration
 8. 0% ice concentration
 9. 100% open water
 10. 75% open water
 11. 50% open water
 12. 25% open water
 13. 10% open water
 14. 5% open water
 15. 1% open water
 16. 0% open water

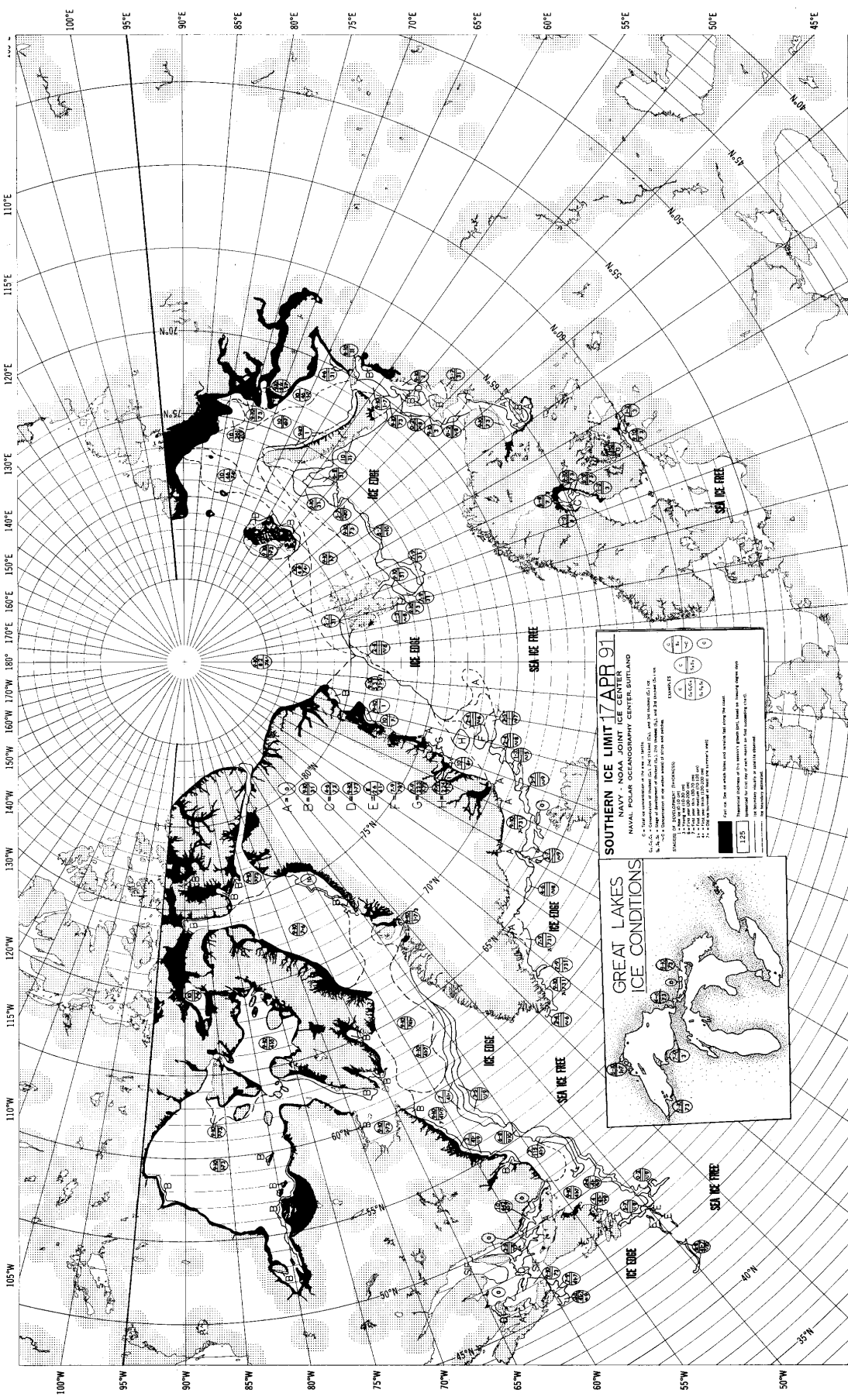
A. 100% ice concentration
 B. 75% ice concentration
 C. 50% ice concentration
 D. 25% ice concentration
 E. 10% ice concentration
 F. 5% ice concentration
 G. 1% ice concentration
 H. 100% open water
 I. 75% open water
 J. 50% open water
 K. 25% open water
 L. 10% open water
 M. 5% open water
 N. 1% open water
 O. 0% open water

1. 100% ice concentration
 2. 75% ice concentration
 3. 50% ice concentration
 4. 25% ice concentration
 5. 10% ice concentration
 6. 5% ice concentration
 7. 1% ice concentration
 8. 100% open water
 9. 75% open water
 10. 50% open water
 11. 25% open water
 12. 10% open water
 13. 5% open water
 14. 1% open water
 15. 0% open water

1. 100% ice concentration
 2. 75% ice concentration
 3. 50% ice concentration
 4. 25% ice concentration
 5. 10% ice concentration
 6. 5% ice concentration
 7. 1% ice concentration
 8. 100% open water
 9. 75% open water
 10. 50% open water
 11. 25% open water
 12. 10% open water
 13. 5% open water
 14. 1% open water
 15. 0% open water



105°W 110°W 115°W 120°W 125°W 130°W 135°W 140°W 145°W 150°W 155°W 160°W 165°W 170°W 175°W 180°W 185°W 190°W 195°W 200°W
 100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E 140°E 145°E 150°E 155°E 160°E 165°E 170°E 175°E 180°E 185°E 190°E 195°E 200°E



SOUTHERN ICE LIMIT 17 APR 91
 NAVAL - NOAA JOINT ICE CENTER
 NAVY - NAVAL OCEANOGRAPHY CENTER SUITLAND

1. 0 - Total ice concentration in the area shown. (0% = no ice, 100% = solid ice)

2. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

3. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

4. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

5. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

6. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

7. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

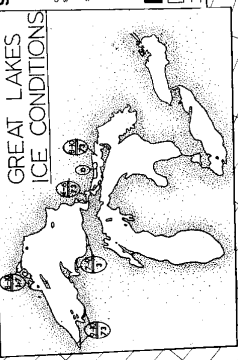
8. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

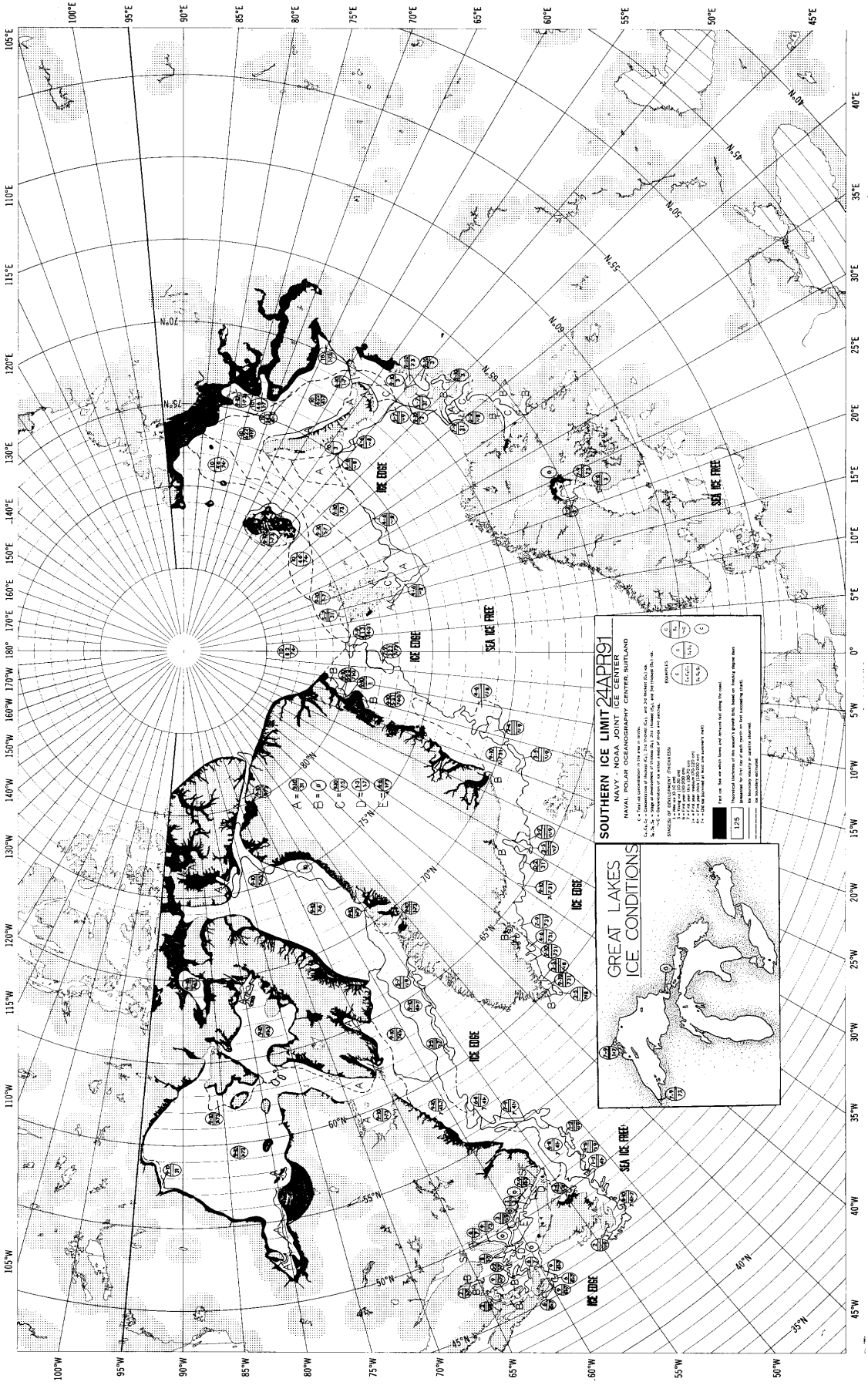
9. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

10. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

11. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)

12. 1 - 100% of area covered by ice. (1 = 100% ice, 2 = 90% ice, 3 = 80% ice, 4 = 70% ice, 5 = 60% ice, 6 = 50% ice, 7 = 40% ice, 8 = 30% ice, 9 = 20% ice, 10 = 10% ice, 11 = 5% ice, 12 = 0% ice)





SOUTHERN ICE LIMIT 24APR91
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUDBURY

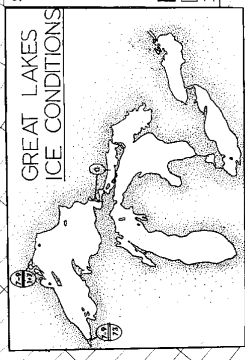
U.S. & CANADIAN JURISDICTIONS IN THIS AREA ARE INDICATED BY DASHED LINES.
 U.S. & CANADIAN TERRITORIES OF GREENLAND, IZOR, JANZEN, GIL, AND JARVIS ARE SHOWN IN BLACK.
 U.S. & CANADIAN TERRITORIES OF ALASKA, IZOR, JANZEN, GIL, AND JARVIS ARE SHOWN IN BLACK.

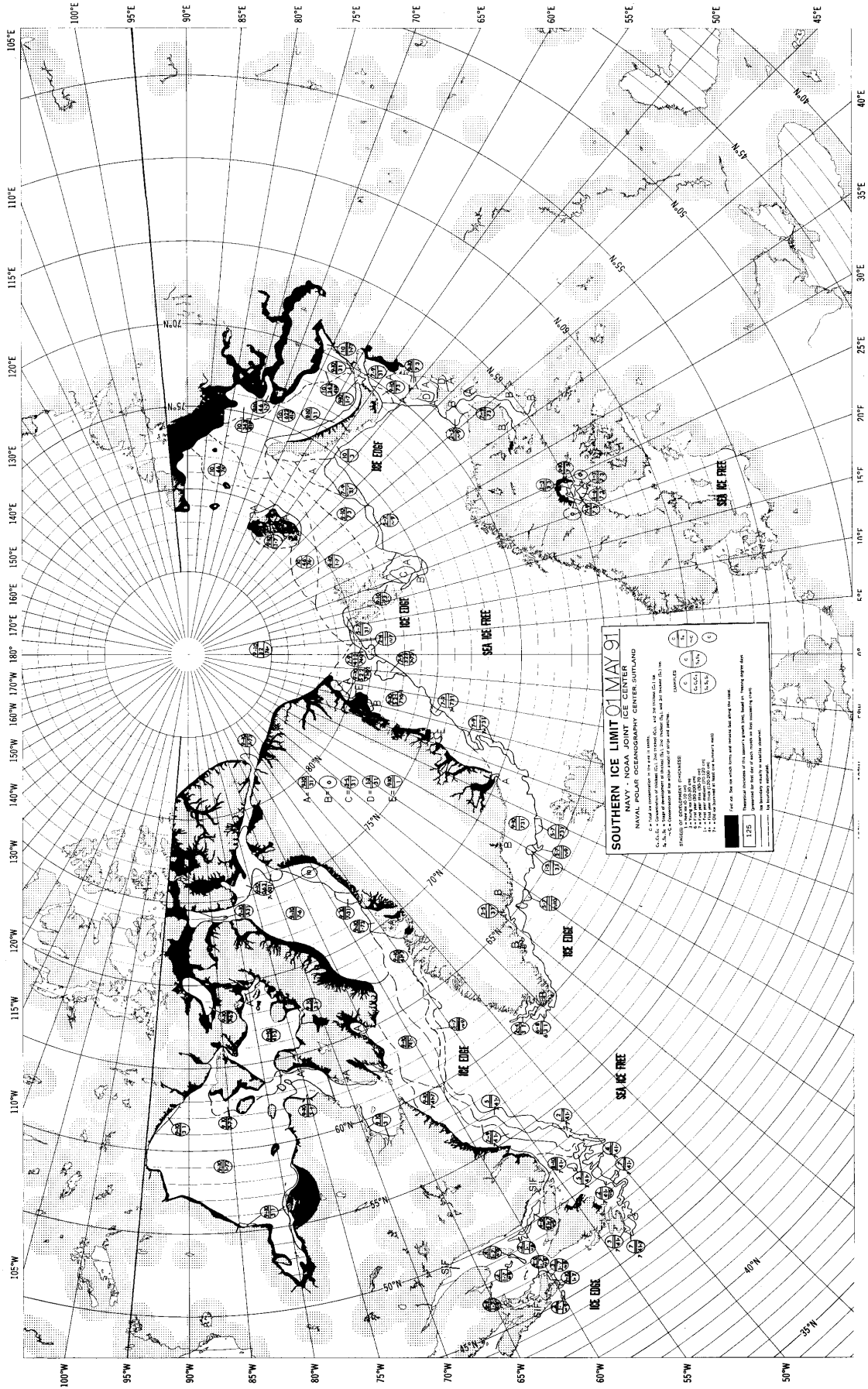
STAGES OF DEVELOPMENT PROCESSES

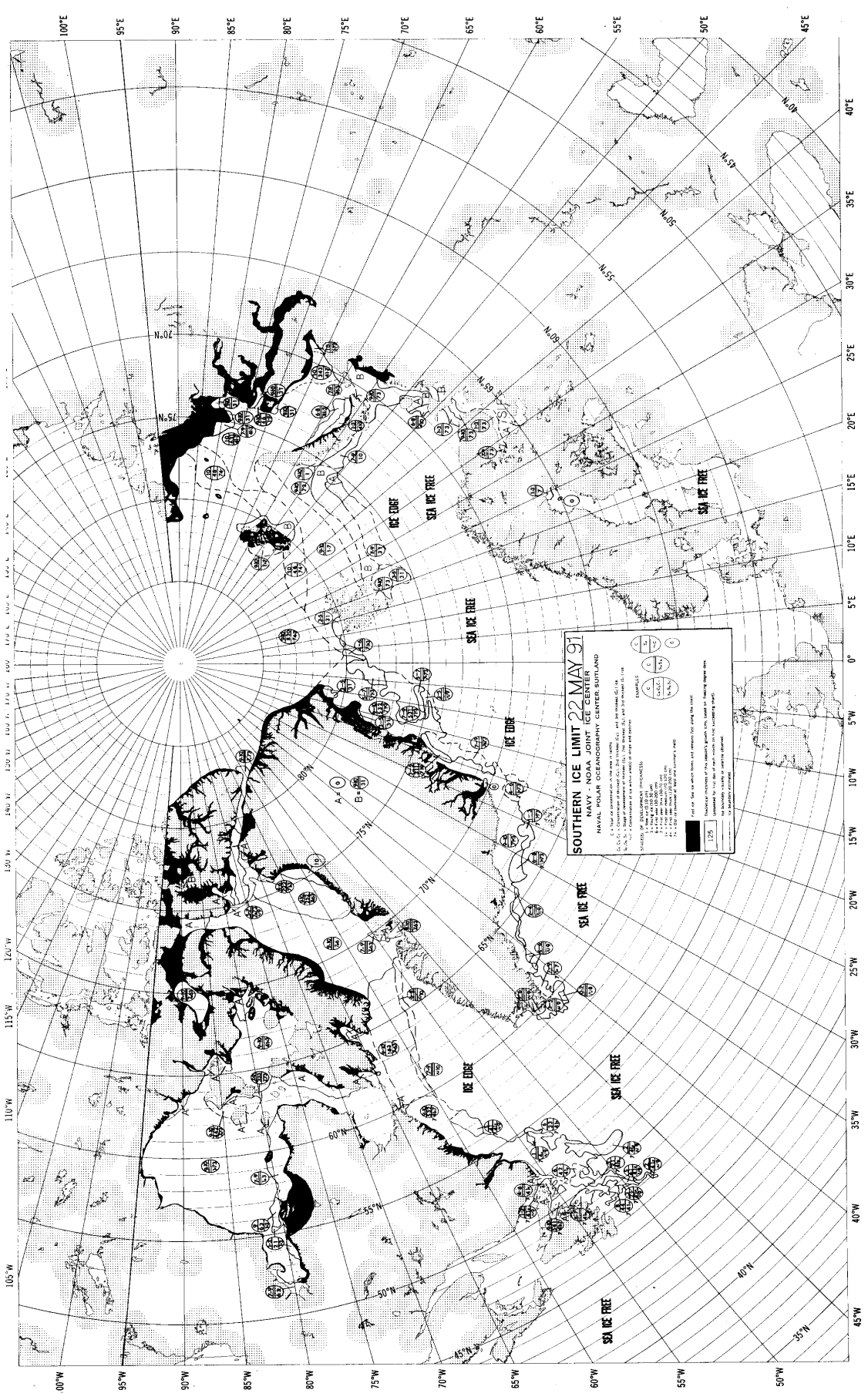
1	2	3	4	5	6	7	8	9	10
(Symbol)	(Symbol)	(Symbol)	(Symbol)	(Symbol)	(Symbol)	(Symbol)	(Symbol)	(Symbol)	(Symbol)

EXPLANATIONS:
 1 - Ice Limit
 2 - Ice Edge
 3 - Sea Ice Free
 4 - Ice Limit
 5 - Ice Edge
 6 - Sea Ice Free
 7 - Ice Limit
 8 - Ice Edge
 9 - Sea Ice Free
 10 - Ice Limit

For use with other maps, and symbols, see page 1000.
 "Notwithstanding to the extent that the above information is derived from the information provided by the user, the user shall be responsible for the accuracy of the information."







SOUTHERN ICE LIMIT 22 MAY 91
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
 NAVAL NAVY - NOAA JOINT ICE CENTER

1. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

2. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

3. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

4. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

5. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

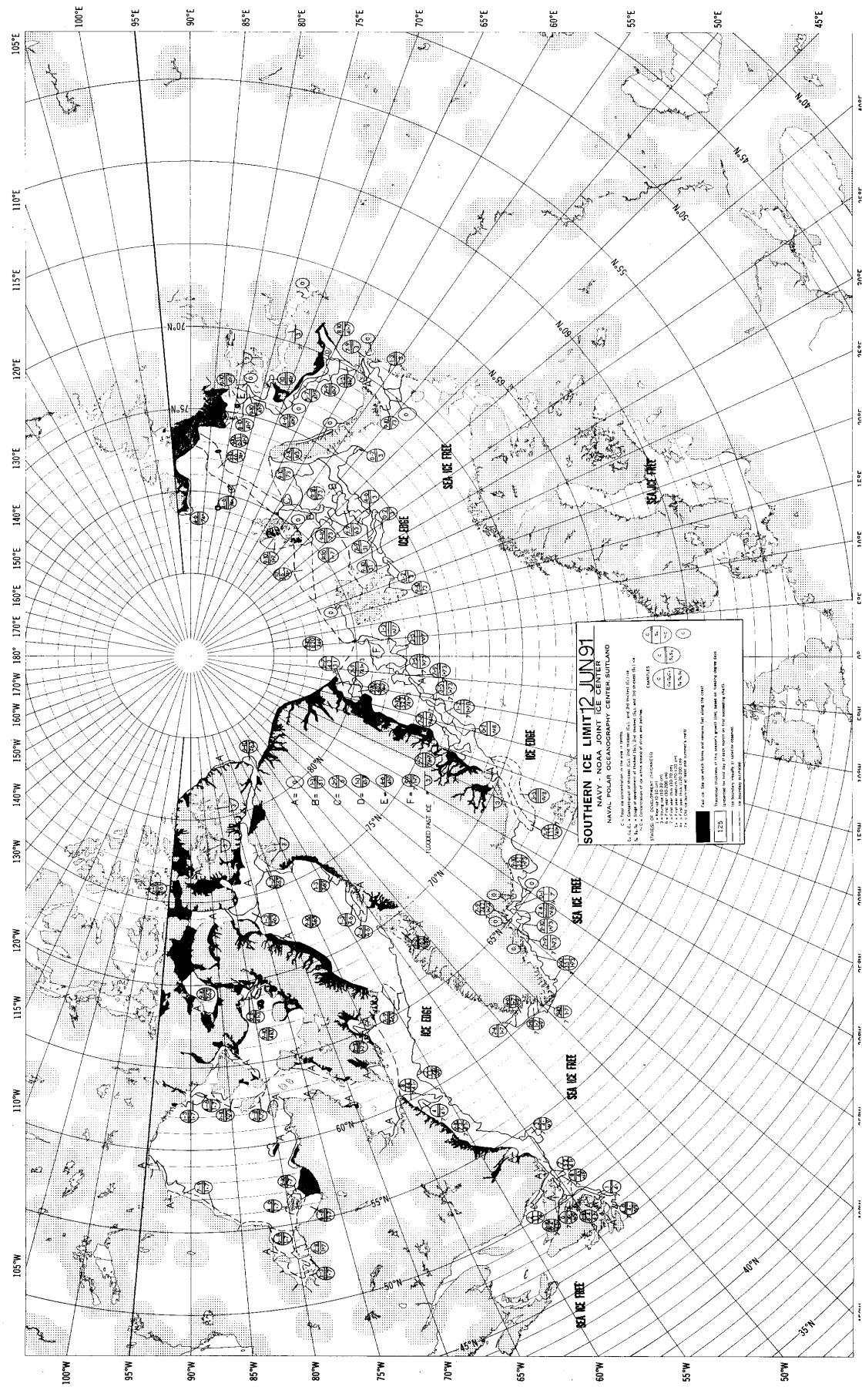
6. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

7. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

8. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

9. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991

10. Data on observation in the area is limited to:
 a. 1980-1981
 b. 1982-1983
 c. 1984-1985
 d. 1986-1987
 e. 1988-1989
 f. 1990-1991



SOUTHERN ICE LIMIT 2 JUN 91

NAVAL POLAR OCEANOGRAPHY CENTER SOUTHLAND
 NAVY - NOAA JOINT ICE CENTER

C - Data on interpretation from sea surface
 N - Data on interpretation from satellite
 N, N, N - Large concentrations of icebergs (2000 meters dia. and less than 10¹⁴ kg)
 N, N, N - Small concentrations of icebergs (1000 meters dia. and less than 10¹⁴ kg)

STATUS OF OBSERVATION SYMBOLS

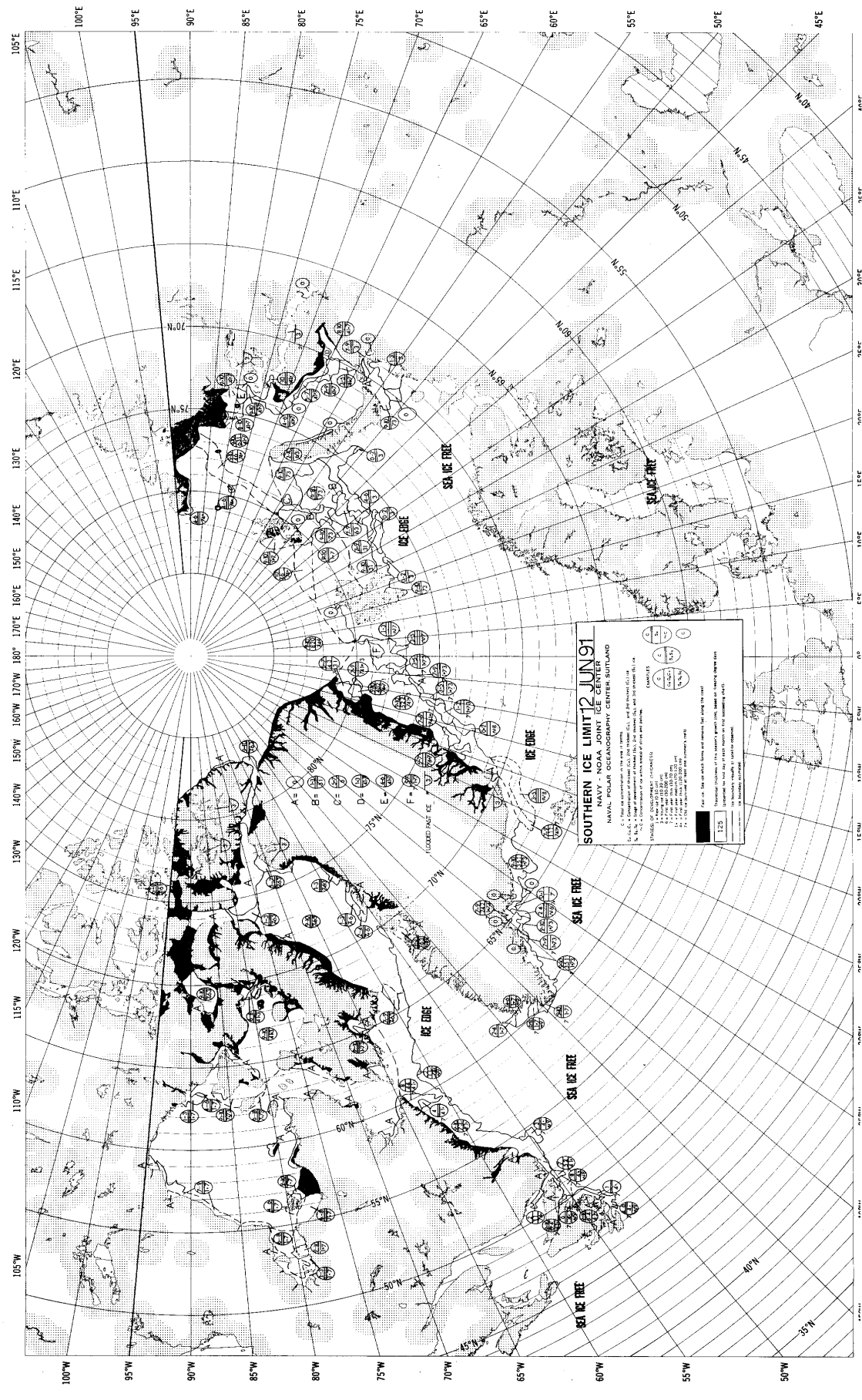
1 - Data from 1980-1990
 2 - Data from 1991-1992
 3 - Data from 1993-1994
 4 - Data from 1995-1996
 5 - Data from 1997-1998
 6 - Data from 1999-2000
 7 - Data from 2001-2002
 8 - Data from 2003-2004
 9 - Data from 2005-2006
 10 - Data from 2007-2008
 11 - Data from 2009-2010
 12 - Data from 2011-2012
 13 - Data from 2013-2014
 14 - Data from 2015-2016
 15 - Data from 2017-2018
 16 - Data from 2019-2020
 17 - Data from 2021-2022

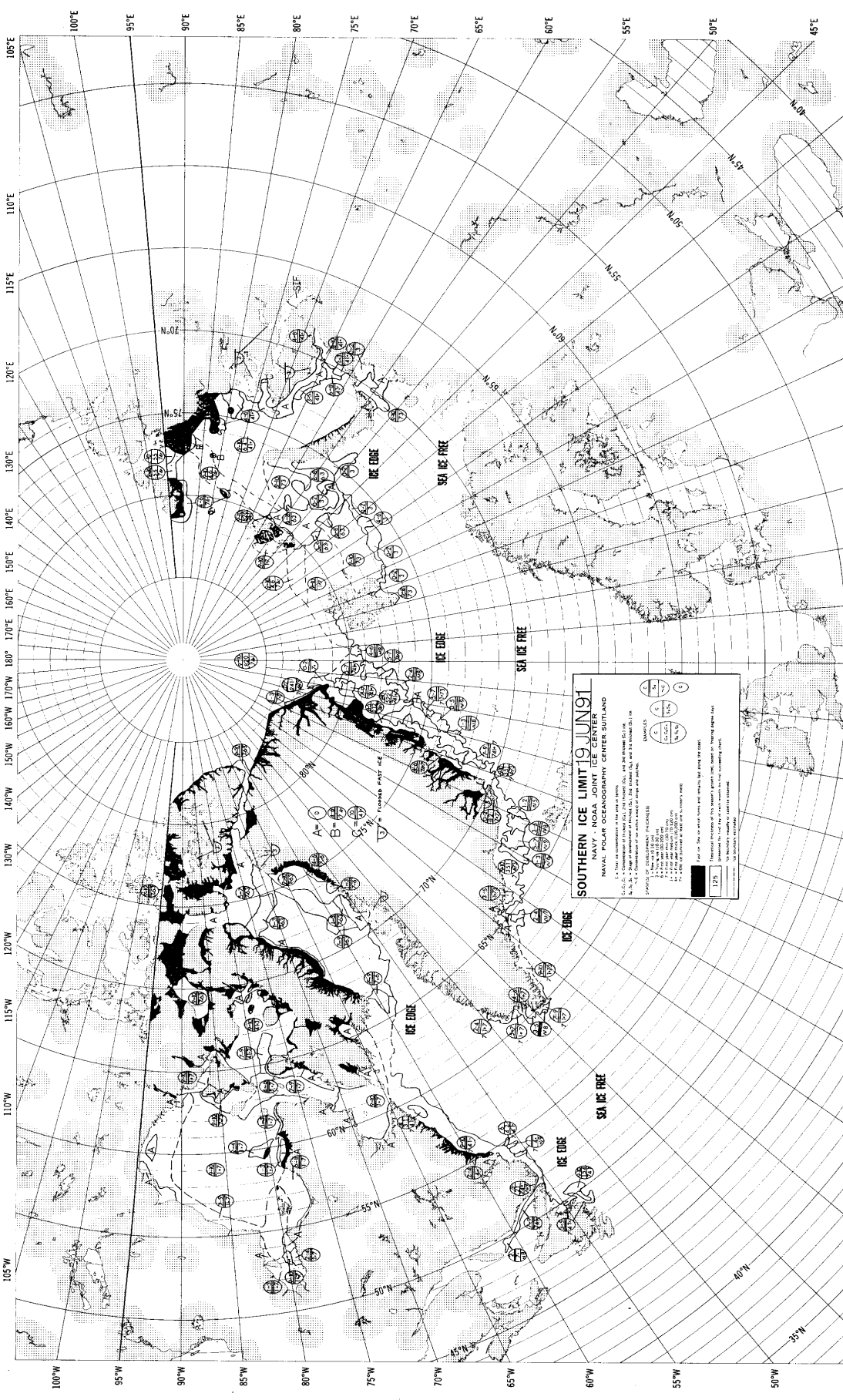
For use: Data on which lines and symbols are based for this map

123 - Unreliable data for this month in this hemisphere, N/A, N/A

For monthly quality of satellite imagery

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SOUTHERN ICE LIMIT 19 JUN 91
 NAVAL POLAR OCEANOGRAPHY CENTER SUTCLAND
 NAVAL NAVY - NOAA JOINT ICE CENTER

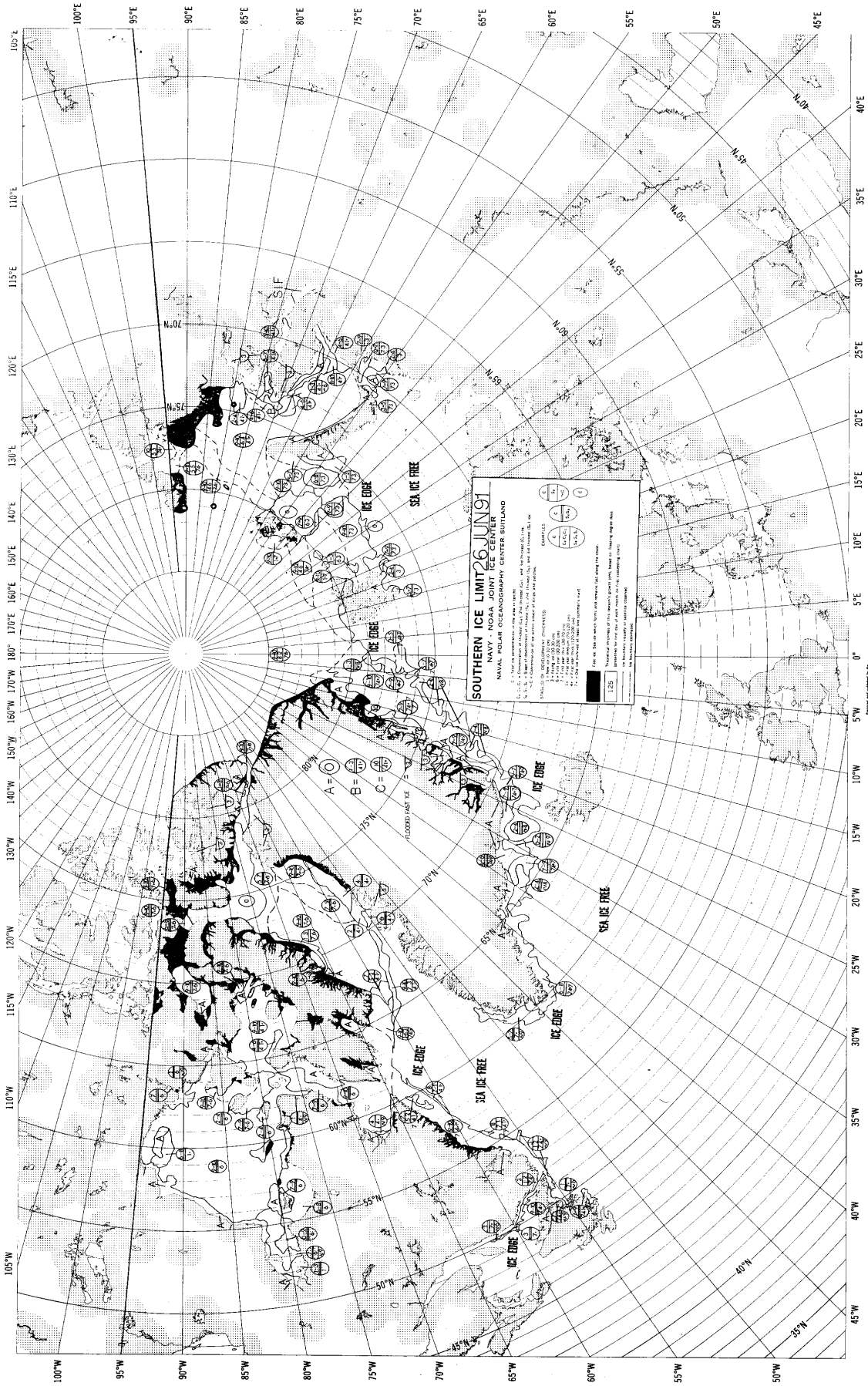
C = Total ice concentration in the year of survey.
 S = Sea ice thickness in meters.
 M, H, L = Range of maximum ice thickness in meters. M = Maximum, H = Half Maximum, L = Minimum.
 N, S, E = Classification of ice state based on shape and motion.

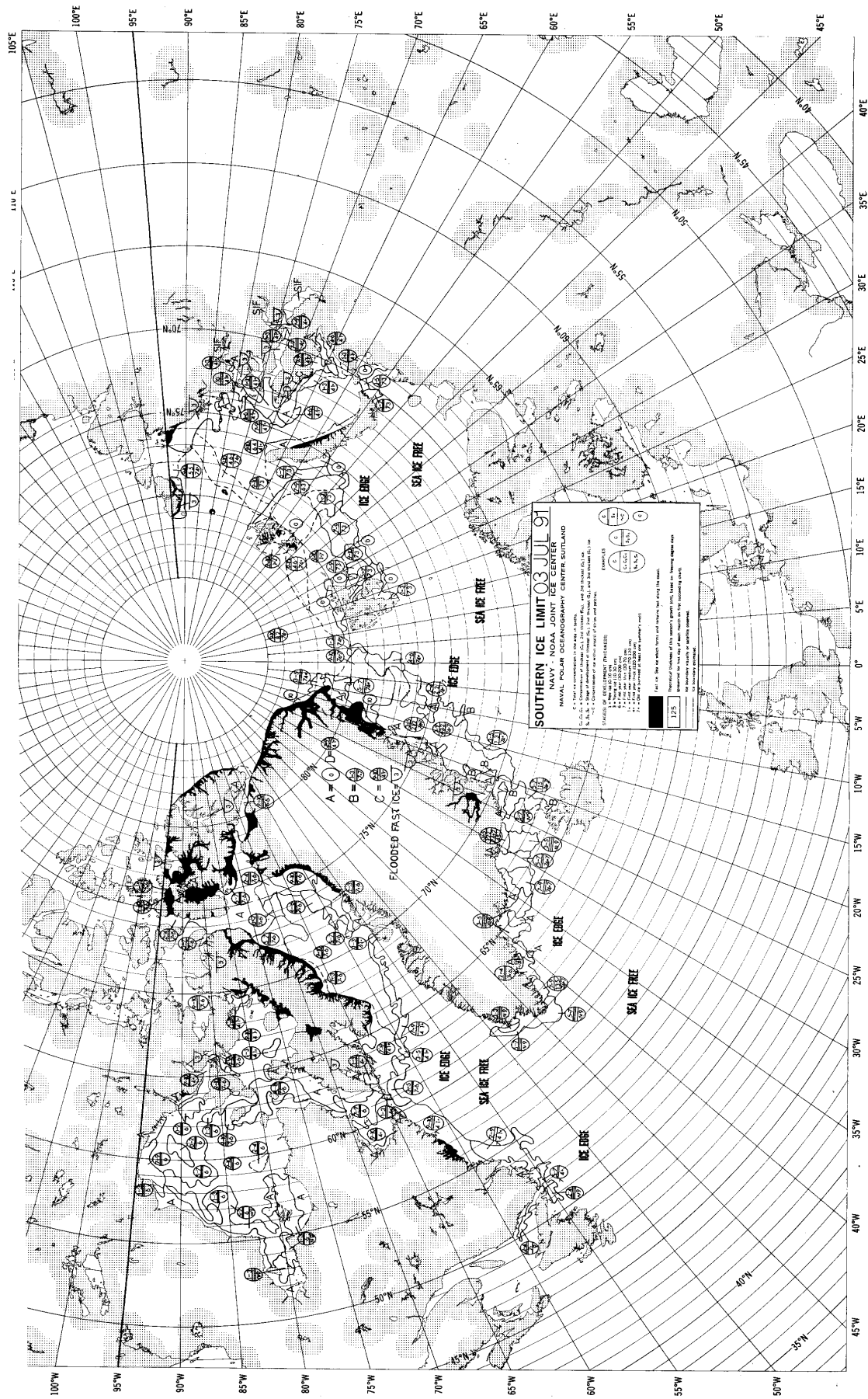
SYMBOLS

1. Ice thickness in meters (M) and sea ice thickness in meters (S).
 2. Ice concentration in percent (C).
 3. Maximum ice thickness in meters (M).
 4. Half maximum ice thickness in meters (H).
 5. Minimum ice thickness in meters (L).
 6. Ice state classification (N, S, E).

EXAMPLES

For an ice state classification of N, S, E, the symbols are plotted as shown in the legend box.
 For an ice state classification of S, E, the symbols are plotted as shown in the legend box.
 For an ice state classification of N, S, E, the symbols are plotted as shown in the legend box.

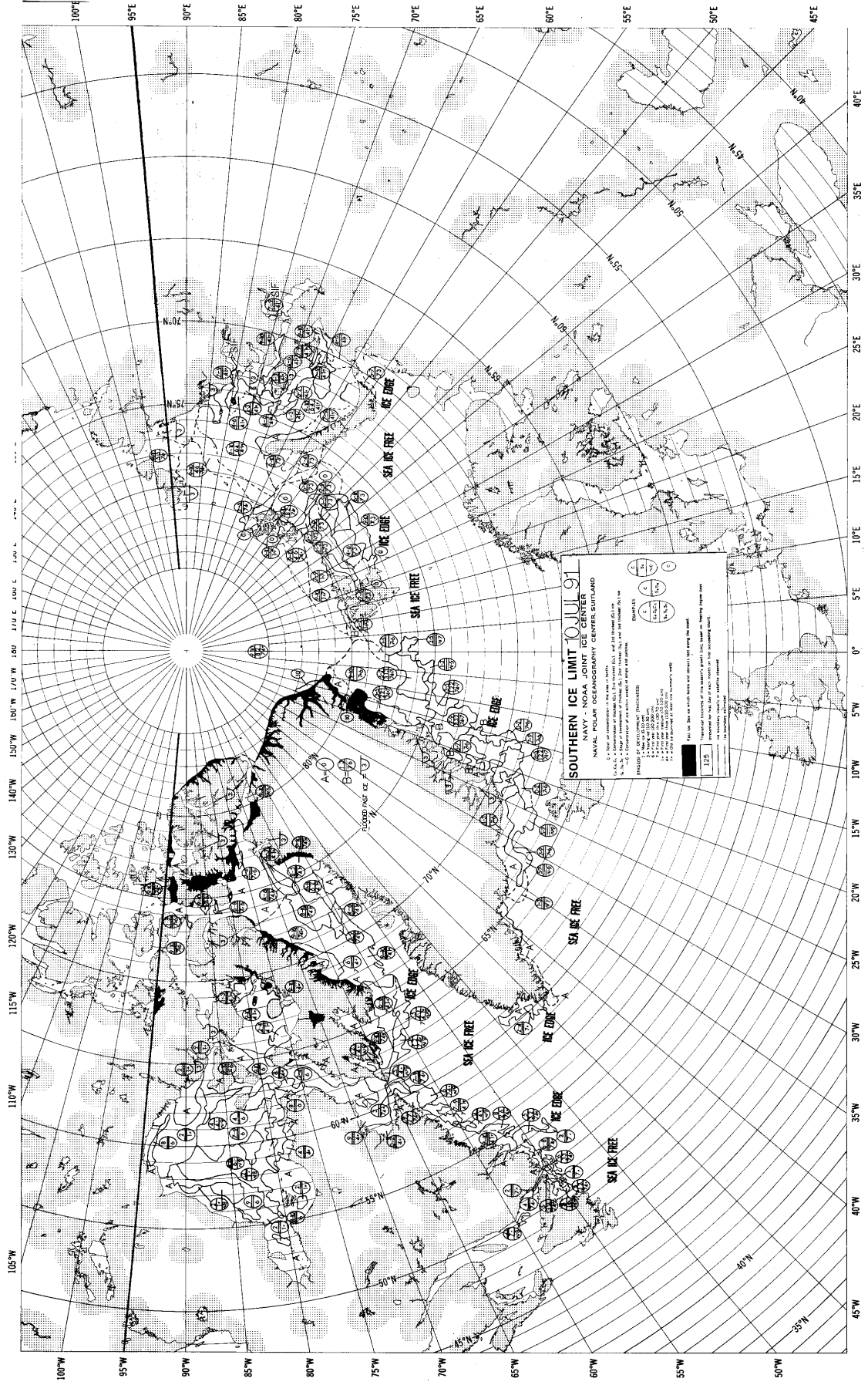




SOUTHERN ICE LIMIT 03 JUL 91
 ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER OUTLAND

1. This chart is intended for use in the Southern Ocean.
 2. This chart is based on data received from the following sources:
 A. U.S. Navy Ships (including the USNSC, USNSP, USNSI, and USNSP)
 B. U.S. Navy Ships (including the USNSC, USNSP, USNSI, and USNSP)
 C. U.S. Navy Ships (including the USNSC, USNSP, USNSI, and USNSP)

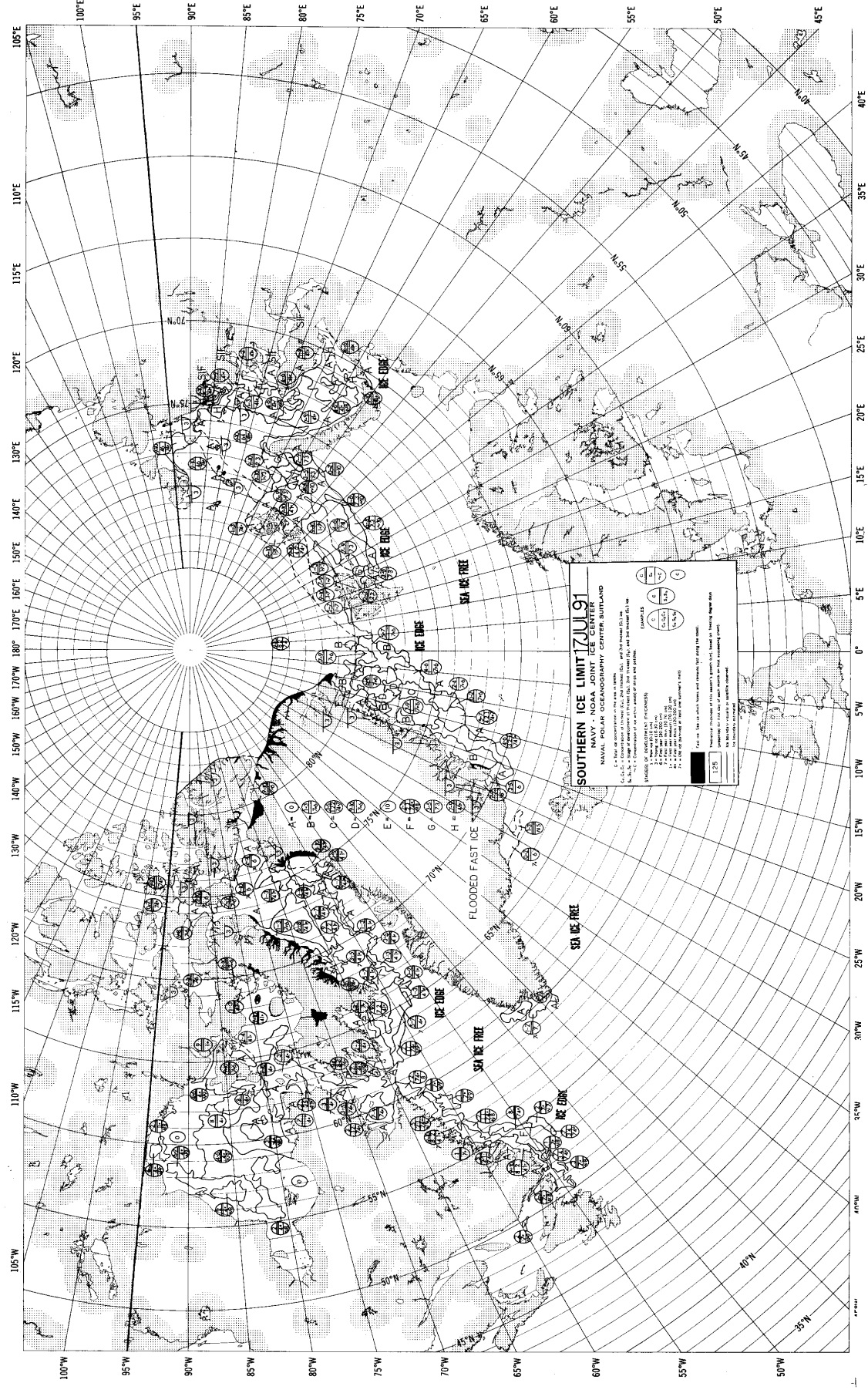
ICE CLASSIFICATION
 A = 0-4
 B = 5-9
 C = 10-14
 D = 15-19
 E = 20-24
 F = 25-29
 G = 30-34
 H = 35-39
 I = 40-44
 J = 45-49
 K = 50-54
 L = 55-59
 M = 60-64
 N = 65-69
 O = 70-74
 P = 75-79
 Q = 80-84
 R = 85-89
 S = 90-94
 T = 95-99
 U = 100-104
 V = 105-109
 W = 110-114
 X = 115-119
 Y = 120-124
 Z = 125-129
 AA = 130-134
 AB = 135-139
 AC = 140-144
 AD = 145-149
 AE = 150-154
 AF = 155-159
 AG = 160-164
 AH = 165-169
 AI = 170-174
 AJ = 175-179
 AK = 180-184
 AL = 185-189
 AM = 190-194
 AN = 195-199
 AO = 200-204
 AP = 205-209
 AQ = 210-214
 AR = 215-219
 AS = 220-224
 AT = 225-229
 AU = 230-234
 AV = 235-239
 AW = 240-244
 AX = 245-249
 AY = 250-254
 AZ = 255-259
 BA = 260-264
 BB = 265-269
 BC = 270-274
 BD = 275-279
 BE = 280-284
 BF = 285-289
 BG = 290-294
 BH = 295-299
 BI = 300-304
 BJ = 305-309
 BK = 310-314
 BL = 315-319
 BM = 320-324
 BN = 325-329
 BO = 330-334
 BP = 335-339
 BQ = 340-344
 BR = 345-349
 BS = 350-354
 BT = 355-359
 BU = 360-364
 BV = 365-369
 BW = 370-374
 BX = 375-379
 BY = 380-384
 BZ = 385-389
 CA = 390-394
 CB = 395-399
 CC = 400-404
 CD = 405-409
 CE = 410-414
 CF = 415-419
 CG = 420-424
 CH = 425-429
 CI = 430-434
 CJ = 435-439
 CK = 440-444
 CL = 445-449
 CM = 450-454
 CN = 455-459
 CO = 460-464
 CP = 465-469
 CQ = 470-474
 CR = 475-479
 CS = 480-484
 CT = 485-489
 CU = 490-494
 CV = 495-499
 CW = 500-504
 CX = 505-509
 CY = 510-514
 CZ = 515-519
 DA = 520-524
 DB = 525-529
 DC = 530-534
 DD = 535-539
 DE = 540-544
 DF = 545-549
 DG = 550-554
 DH = 555-559
 DI = 560-564
 DJ = 565-569
 DK = 570-574
 DL = 575-579
 DM = 580-584
 DN = 585-589
 DO = 590-594
 DP = 595-599
 DQ = 600-604
 DR = 605-609
 DS = 610-614
 DT = 615-619
 DU = 620-624
 DV = 625-629
 DW = 630-634
 DX = 635-639
 DY = 640-644
 DZ = 645-649
 EA = 650-654
 EB = 655-659
 EC = 660-664
 ED = 665-669
 EE = 670-674
 EF = 675-679
 EG = 680-684
 EH = 685-689
 EI = 690-694
 EJ = 695-699
 EK = 700-704
 EL = 705-709
 EM = 710-714
 EN = 715-719
 EO = 720-724
 EP = 725-729
 EQ = 730-734
 ER = 735-739
 ES = 740-744
 ET = 745-749
 EU = 750-754
 EV = 755-759
 EW = 760-764
 EX = 765-769
 EY = 770-774
 EZ = 775-779
 FA = 780-784
 FB = 785-789
 FC = 790-794
 FD = 795-799
 FE = 800-804
 FF = 805-809
 FG = 810-814
 FH = 815-819
 FI = 820-824
 FJ = 825-829
 FK = 830-834
 FL = 835-839
 FM = 840-844
 FN = 845-849
 FO = 850-854
 FP = 855-859
 FQ = 860-864
 FR = 865-869
 FS = 870-874
 FT = 875-879
 FU = 880-884
 FV = 885-889
 FW = 890-894
 FX = 895-899
 FY = 900-904
 FZ = 905-909
 GA = 910-914
 GB = 915-919
 GC = 920-924
 GD = 925-929
 GE = 930-934
 GF = 935-939
 GH = 940-944
 GI = 945-949
 GJ = 950-954
 GK = 955-959
 GL = 960-964
 GM = 965-969
 GN = 970-974
 GO = 975-979
 GP = 980-984
 GQ = 985-989
 GR = 990-994
 GS = 995-999
 HA = 1000-1004
 HB = 1005-1009
 HC = 1010-1014
 HD = 1015-1019
 HE = 1020-1024
 HF = 1025-1029
 HG = 1030-1034
 HH = 1035-1039
 HI = 1040-1044
 HJ = 1045-1049
 HK = 1050-1054
 HL = 1055-1059
 HM = 1060-1064
 HN = 1065-1069
 HO = 1070-1074
 HP = 1075-1079
 HQ = 1080-1084
 HR = 1085-1089
 HS = 1090-1094
 HT = 1095-1099
 HU = 1100-1104
 HV = 1105-1109
 HW = 1110-1114
 HX = 1115-1119
 HY = 1120-1124
 HZ = 1125-1129
 IA = 1130-1134
 IB = 1135-1139
 IC = 1140-1144
 ID = 1145-1149
 IE = 1150-1154
 IF = 1155-1159
 IG = 1160-1164
 IH = 1165-1169
 II = 1170-1174
 IJ = 1175-1179
 IK = 1180-1184
 IL = 1185-1189
 IM = 1190-1194
 IN = 1195-1199
 IO = 1200-1204
 IP = 1205-1209
 IQ = 1210-1214
 IR = 1215-1219
 IS = 1220-1224
 IT = 1225-1229
 IU = 1230-1234
 IV = 1235-1239
 IW = 1240-1244
 IX = 1245-1249
 IY = 1250-1254
 IZ = 1255-1259
 JA = 1260-1264
 JB = 1265-1269
 JC = 1270-1274
 JD = 1275-1279
 JE = 1280-1284
 JF = 1285-1289
 JG = 1290-1294
 JH = 1295-1299
 JI = 1300-1304
 JJ = 1305-1309
 JK = 1310-1314
 JL = 1315-1319
 JM = 1320-1324
 JN = 1325-1329
 JO = 1330-1334
 JP = 1335-1339
 JQ = 1340-1344
 JR = 1345-1349
 JS = 1350-1354
 JT = 1355-1359
 JU = 1360-1364
 JV = 1365-1369
 JW = 1370-1374
 JX = 1375-1379
 JY = 1380-1384
 JZ = 1385-1389
 KA = 1390-1394
 KB = 1395-1399
 KC = 1400-1404
 KD = 1405-1409
 KE = 1410-1414
 KF = 1415-1419
 KG = 1420-1424
 KH = 1425-1429
 KI = 1430-1434
 KJ = 1435-1439
 KK = 1440-1444
 KL = 1445-1449
 KM = 1450-1454
 KN = 1455-1459
 KO = 1460-1464
 KP = 1465-1469
 KQ = 1470-1474
 KR = 1475-1479
 KS = 1480-1484
 KT = 1485-1489
 KU = 1490-1494
 KV = 1495-1499
 KW = 1500-1504
 KX = 1505-1509
 KY = 1510-1514
 KZ = 1515-1519
 LA = 1520-1524
 LB = 1525-1529
 LC = 1530-1534
 LD = 1535-1539
 LE = 1540-1544
 LF = 1545-1549
 LG = 1550-1554
 LH = 1555-1559
 LI = 1560-1564
 LJ = 1565-1569
 LK = 1570-1574
 LL = 1575-1579
 LM = 1580-1584
 LN = 1585-1589
 LO = 1590-1594
 LP = 1595-1599
 LQ = 1600-1604
 LR = 1605-1609
 LS = 1610-1614
 LT = 1615-1619
 LU = 1620-1624
 LV = 1625-1629
 LW = 1630-1634
 LX = 1635-1639
 LY = 1640-1644
 LZ = 1645-1649
 MA = 1650-1654
 MB = 1655-1659
 MC = 1660-1664
 MD = 1665-1669
 ME = 1670-1674
 MF = 1675-1679
 MG = 1680-1684
 MH = 1685-1689
 MI = 1690-1694
 MJ = 1695-1699
 MK = 1700-1704
 ML = 1705-1709
 MM = 1710-1714
 MN = 1715-1719
 MO = 1720-1724
 MP = 1725-1729
 MQ = 1730-1734
 MR = 1735-1739
 MS = 1740-1744
 MT = 1745-1749
 MU = 1750-1754
 MV = 1755-1759
 MW = 1760-1764
 MX = 1765-1769
 MY = 1770-1774
 MZ = 1775-1779
 NA = 1780-1784
 NB = 1785-1789
 NC = 1790-1794
 ND = 1795-1799
 NE = 1800-1804
 NF = 1805-1809
 NG = 1810-1814
 NH = 1815-1819
 NI = 1820-1824
 NJ = 1825-1829
 NK = 1830-1834
 NL = 1835-1839
 NM = 1840-1844
 NN = 1845-1849
 NO = 1850-1854
 NP = 1855-1859
 NQ = 1860-1864
 NR = 1865-1869
 NS = 1870-1874
 NT = 1875-1879
 NU = 1880-1884
 NV = 1885-1889
 NW = 1890-1894
 NX = 1895-1899
 NY = 1900-1904
 NZ = 1905-1909
 OA = 1910-1914
 OB = 1915-1919
 OC = 1920-1924
 OD = 1925-1929
 OE = 1930-1934
 OF = 1935-1939
 OG = 1940-1944
 OH = 1945-1949
 OI = 1950-1954
 OJ = 1955-1959
 OK = 1960-1964
 OL = 1965-1969
 OM = 1970-1974
 ON = 1975-1979
 OO = 1980-1984
 OP = 1985-1989
 OQ = 1990-1994
 OR = 1995-1999
 OS = 2000-2004
 OT = 2005-2009
 OU = 2010-2014
 OV = 2015-2019
 OW = 2020-2024
 OX = 2025-2029
 OY = 2030-2034
 OZ = 2035-2039
 PA = 2040-2044
 PB = 2045-2049
 PC = 2050-2054
 PD = 2055-2059
 PE = 2060-2064
 PF = 2065-2069
 PG = 2070-2074
 PH = 2075-2079
 PI = 2080-2084
 PJ = 2085-2089
 PK = 2090-2094
 PL = 2095-2099
 PM = 2100-2104
 PN = 2105-2109
 PO = 2110-2114
 PP = 2115-2119
 PQ = 2120-2124
 PR = 2125-2129
 PS = 2130-2134
 PT = 2135-2139
 PU = 2140-2144
 PV = 2145-2149
 PW = 2150-2154
 PX = 2155-2159
 PY = 2160-2164
 PZ = 2165-2169
 QA = 2170-2174
 QB = 2175-2179
 QC = 2180-2184
 QD = 2185-2189
 QE = 2190-2194
 QF = 2195-2199
 QG = 2200-2204
 QH = 2205-2209
 QI = 2210-2214
 QJ = 2215-2219
 QK = 2220-2224
 QL = 2225-2229
 QM = 2230-2234
 QN = 2235-2239
 QO = 2240-2244
 QP = 2245-2249
 QQ = 2250-2254
 QR = 2255-2259
 QS = 2260-2264
 QT = 2265-2269
 QU = 2270-2274
 QV = 2275-2279
 QW = 2280-2284
 QX = 2285-2289
 QY = 2290-2294
 QZ = 2295-2299
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 RB = 2305-2309
 RC = 2310-2314
 RD = 2315-2319
 RE = 2320-2324
 RF = 2325-2329
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 RK = 2350-2354
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 RM = 2360-2364
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 RO = 2370-2374
 RP = 2375-2379
 RQ = 2380-2384
 RS = 2385-2389
 RU = 2390-2394
 RV = 2395-2399
 RW = 2400-2404
 RX = 2405-2409
 RY = 2410-2414
 RZ = 2415-2419
 SA = 2420-2424
 SB = 2425-2429
 SC = 2430-2434
 SD = 2435-2439
 SE = 2440-2444
 SF = 2445-2449
 SG = 2450-2454
 SH = 2455-2459
 SI = 2460-2464
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 SP = 2495-2499
 SQ = 2500-2504
 SR = 2505-2509
 SS = 2510-2514
 ST = 2515-2519
 SU = 2520-2524
 SV = 2525-2529
 SW = 2530-2534
 SX = 2535-2539
 SY = 2540-2544
 SZ = 2545-2549
 TA = 2550-2554
 TB = 2555-2559
 TC = 2560-2564
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 TF = 2575-2579
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 TJ = 2595-2599
 TK = 2600-2604
 TL = 2605-2609
 TM = 2610-2614
 TN = 2615-2619
 TO = 2620-2624
 TP = 2625-2629
 TQ = 2630-2634
 TR = 2635-2639
 TS = 2640-2644
 TT = 2645-2649
 TU = 2650-2654
 TV = 2655-2659
 TW = 2660-2664
 TX = 2665-2669
 TY = 2670-2674
 TZ = 2675-2679
 UA = 2680-2684
 UB = 2685-2689
 UC = 2690-2694
 UD = 2695-2699
 UE = 2700-2704
 UF = 2705-2709
 UG = 2710-2714
 UH = 2715-2719
 UI = 2720-2724
 UJ = 2725-2729
 UK = 2730-2734
 UL = 2735-2739
 UM = 2740-2744
 UN = 2745-2749
 UO = 2750-2754
 UP = 2755-2759
 UQ = 2760-2764
 UR = 2765-2769
 US = 2770-2774
 UT = 2775-2779
 UY = 2780-2784
 UZ = 2785-2789
 VA = 2790-2794
 VB = 2795-2799
 VC = 2800-2804
 VD = 2805-2809
 VE = 2810-2814
 VF = 2815-2819
 VG = 2820-2824
 VH = 2825-2829
 VI = 2830-2834
 VJ = 2835-2839
 VK = 2840-2844
 VL = 2845-2849
 VM = 2850-2854
 VN = 2855-2859
 VO = 2860-2864
 VP = 2865-2869
 VQ = 2870-2874
 VR = 2875-2879
 VS = 2880-2884
 VT = 2885-2889
 VU = 2890-2894
 VV = 2895-2899
 VW = 2900-2904
 VX = 2905-2909
 VY = 2910-2914
 VZ = 2915-2919
 WA = 2920-2924
 WB = 2925-2929
 WC = 2930-2934
 WD = 2935-2939
 WE = 2940-2944
 WF = 2945-2949
 WG = 2950-2954
 WH = 2955-2959
 WI = 2960-2964
 WJ = 2965-2969
 WK = 2970-2974
 WL = 2975-2979
 WM = 2980-2984
 WN = 2985-2989
 WO = 2990-2994
 WP = 2995-2999
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 WY = 3040-3044
 WZ = 3045-3049
 XA = 3050-3054
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 XD = 3065-3069
 XE = 3070-3074
 XF = 3075-3079
 XG = 3080-3084
 XH = 3085-3089
 XI = 3090-3094
 XJ = 3095-3099
 XK = 3100-3104
 XL = 3105-3109
 XM = 3110-3114
 XN = 3115-3119
 XO = 3120-3124
 XP = 3125-3129
 XQ = 3130-3134
 XR = 3135-3139
 XS = 3140-3144
 XT = 3145-3149
 XU = 3150-3154
 XV = 3155-3159
 XW = 3160-3164
 XX = 3165-3169
 XY = 3170-3174
 XZ = 3175-3179
 YA = 3180-3184
 YB = 3185-3189
 YC = 3190-3194
 YD = 3195-3199
 YE = 3200-3204
 YF = 3205-3209
 YG = 3210-3214
 YH = 3215-3219
 YI = 3220-3224
 YJ = 3225-3229
 YK = 3230-3234
 YL = 3235-3239
 YM = 3240-3244
 YN = 3245-3249
 YO = 3250-3254
 YP = 3255-3259
 YQ = 3260-3264
 YR = 3265-3269
 YS = 3270-3274
 YT = 3275-3279
 YU = 3280-3284
 YV = 3285-3289
 YW = 3290-3294
 YX = 3295-3299
 YZ = 3300-3304
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 ZG = 3335-3339
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 ZM = 3365-3369

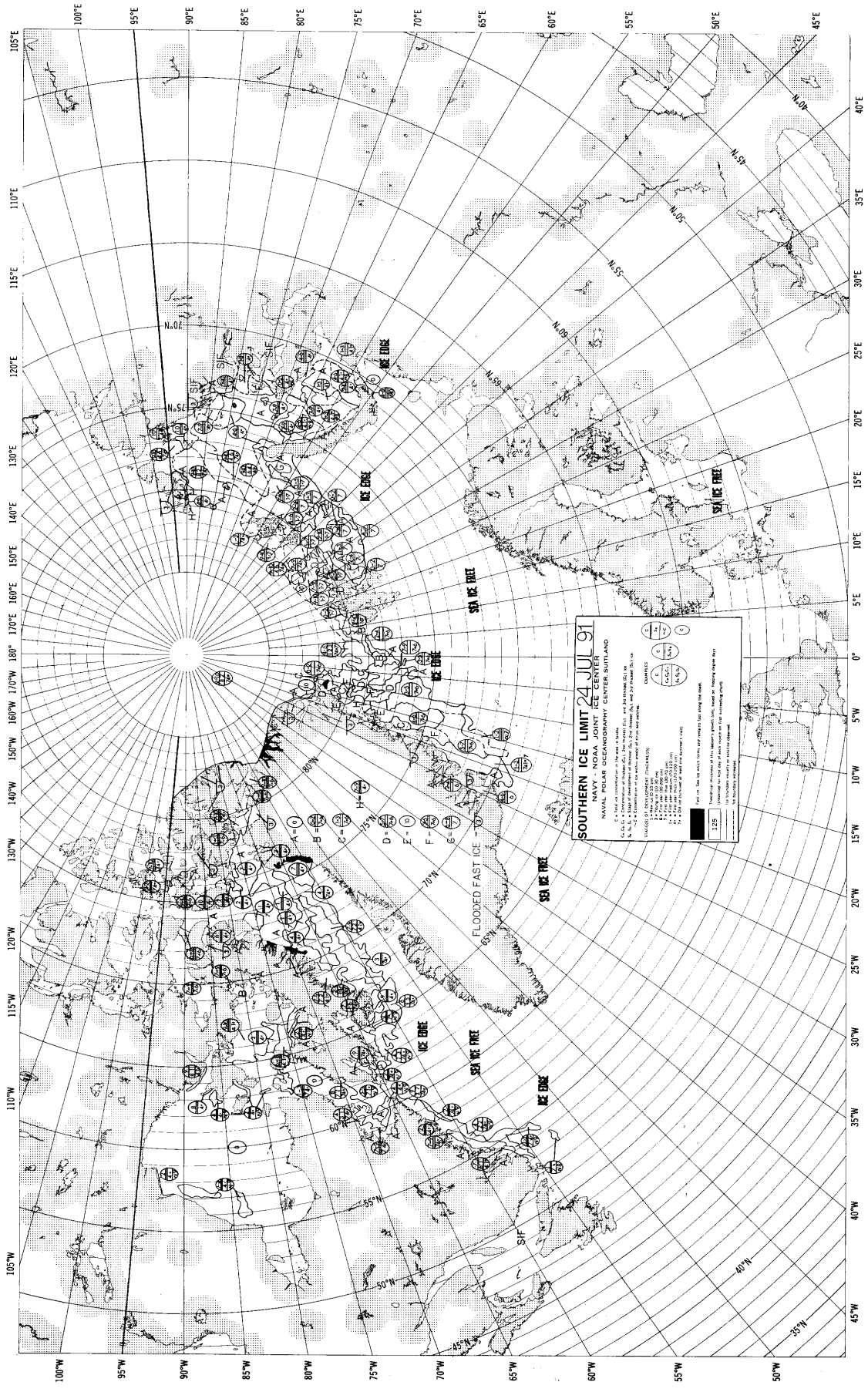


SOUTHERN ICE LIMIT 1991
 NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND
 JOINT ICE CENTER

1. Date of observations on which based: 1991
 2. Date of publication of this report: 1991
 3. Date of revision of this report: 1991
 4. Date of revision of this report: 1991
 5. Date of revision of this report: 1991
 6. Date of revision of this report: 1991
 7. Date of revision of this report: 1991
 8. Date of revision of this report: 1991
 9. Date of revision of this report: 1991
 10. Date of revision of this report: 1991

1. Date of observations on which based: 1991
 2. Date of publication of this report: 1991
 3. Date of revision of this report: 1991
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 9. Date of revision of this report: 1991
 10. Date of revision of this report: 1991





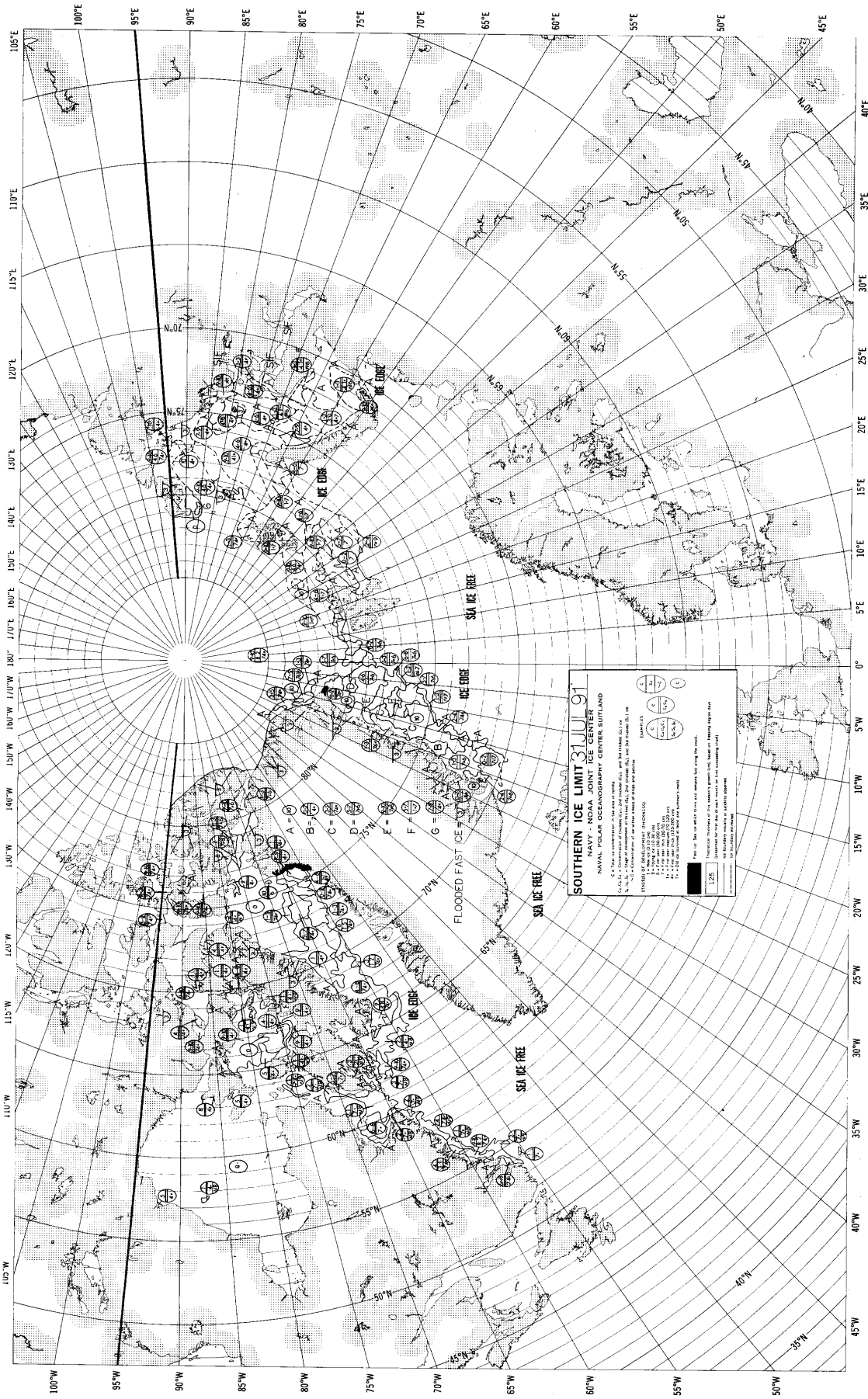
SOUTHERN ICE LIMIT 24 JUL 91
 NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND
 NAVY - NOAA JOINT ICE CENTER

1. Data as indicated on the map sheets.
 2. Data as indicated on the map sheets.
 3. Data as indicated on the map sheets.
 4. Data as indicated on the map sheets.
 5. Data as indicated on the map sheets.
 6. Data as indicated on the map sheets.
 7. Data as indicated on the map sheets.
 8. Data as indicated on the map sheets.
 9. Data as indicated on the map sheets.
 10. Data as indicated on the map sheets.

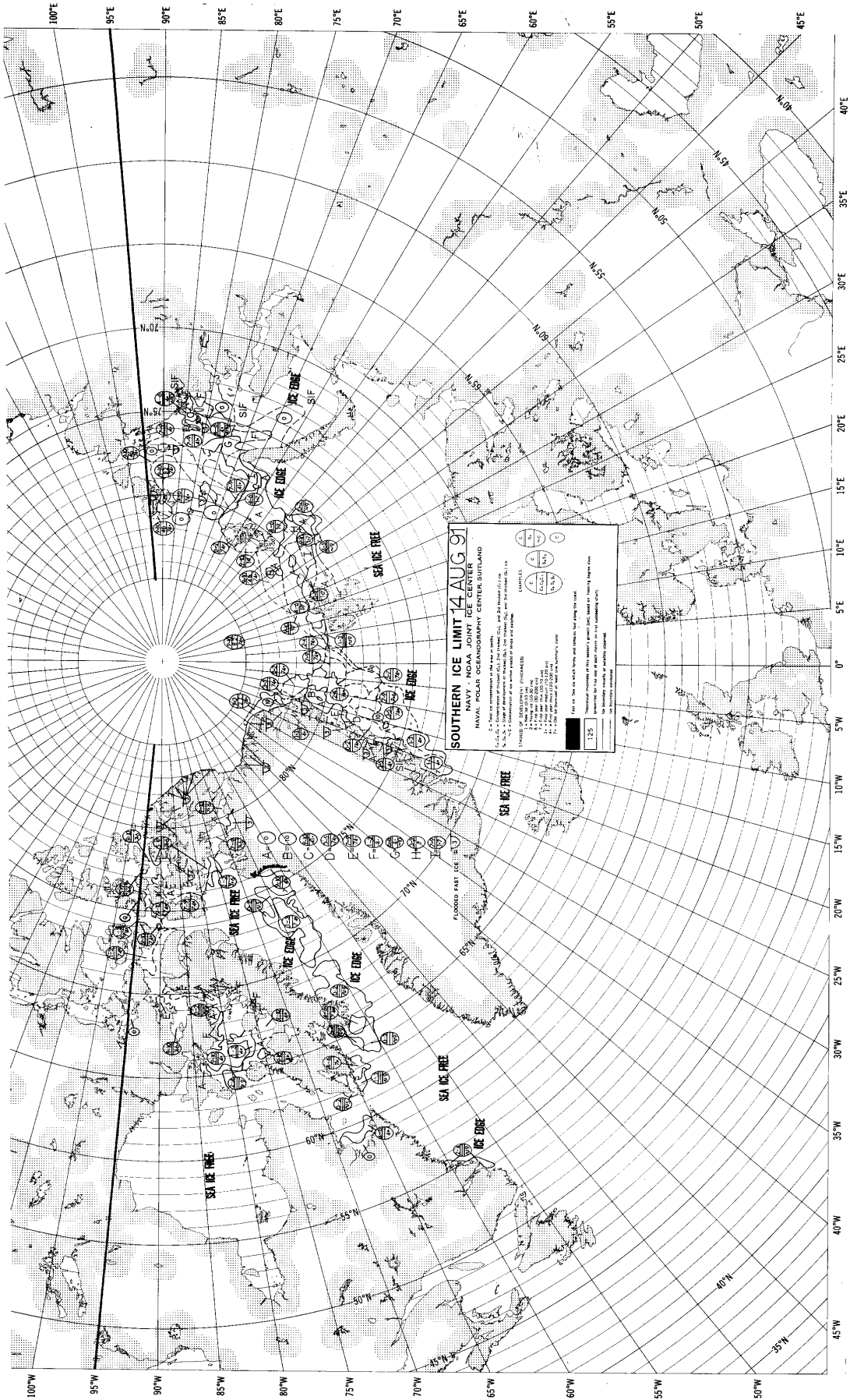
SYMBOLS

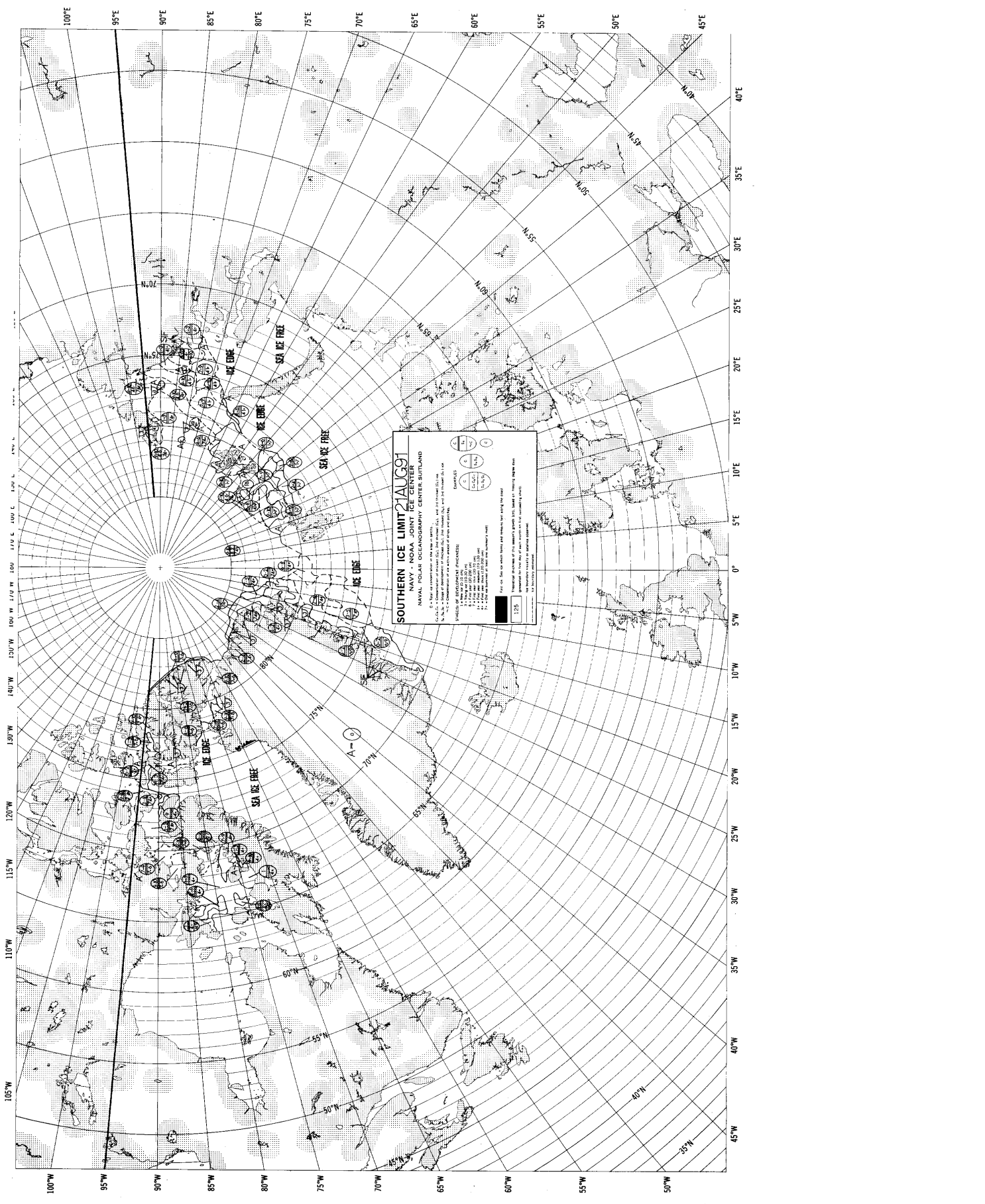
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)	(S)	(T)	(U)	(V)	(W)	(X)	(Y)	(Z)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

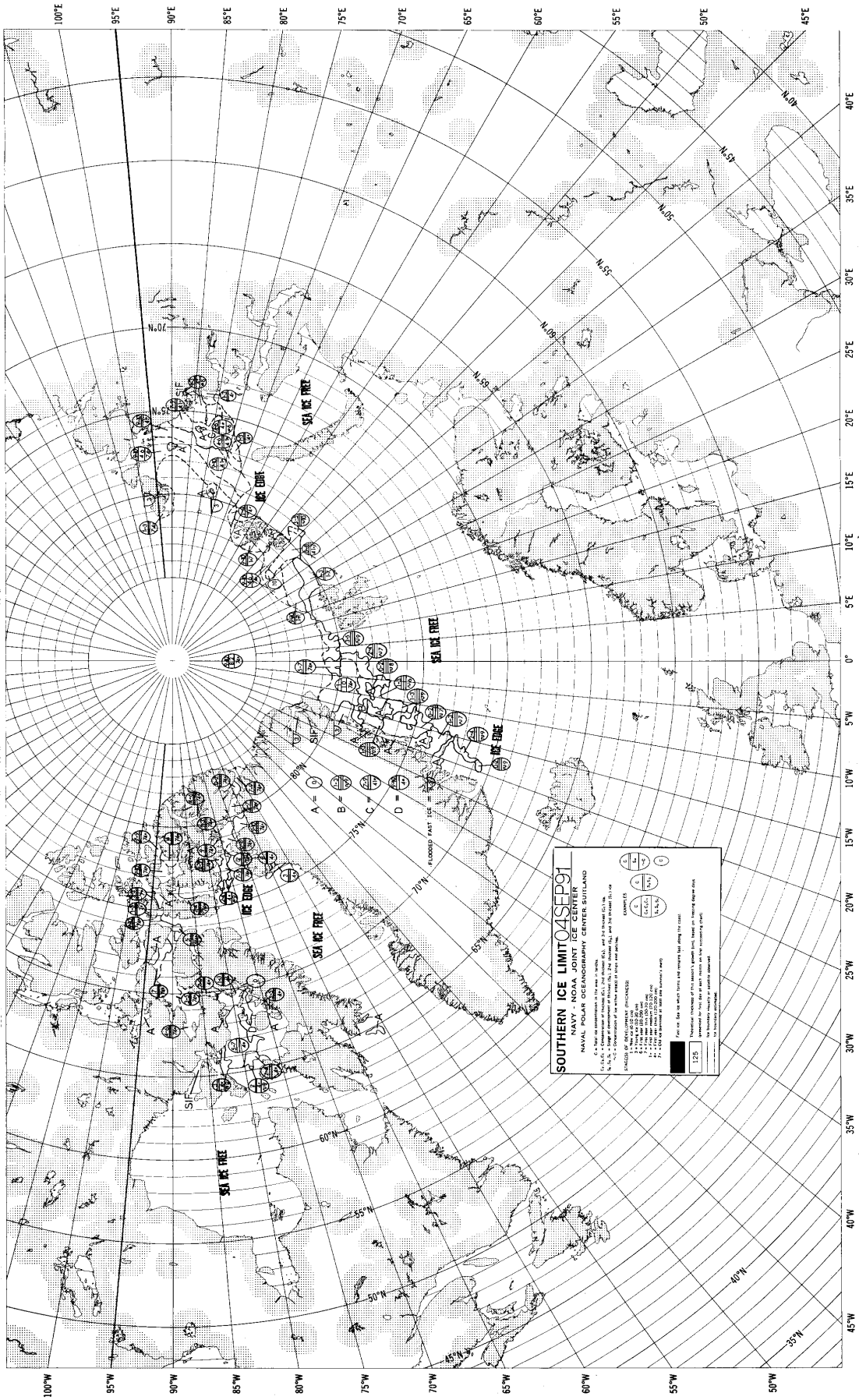
100% Sea Ice Free
 125% Sea Ice Free
 150% Sea Ice Free
 175% Sea Ice Free
 200% Sea Ice Free
 225% Sea Ice Free
 250% Sea Ice Free
 275% Sea Ice Free
 300% Sea Ice Free
 325% Sea Ice Free
 350% Sea Ice Free
 375% Sea Ice Free
 400% Sea Ice Free
 425% Sea Ice Free
 450% Sea Ice Free
 475% Sea Ice Free
 500% Sea Ice Free
 525% Sea Ice Free
 550% Sea Ice Free
 575% Sea Ice Free
 600% Sea Ice Free
 625% Sea Ice Free
 650% Sea Ice Free
 675% Sea Ice Free
 700% Sea Ice Free
 725% Sea Ice Free
 750% Sea Ice Free
 775% Sea Ice Free
 800% Sea Ice Free
 825% Sea Ice Free
 850% Sea Ice Free
 875% Sea Ice Free
 900% Sea Ice Free
 925% Sea Ice Free
 950% Sea Ice Free
 975% Sea Ice Free
 1000% Sea Ice Free



100°E 95°E 90°E 85°E 80°E 75°E 70°E 65°E 60°E 55°E 50°E 45°E
 105°E 110°E 115°E 120°E 125°E 130°E 135°E 140°E 145°E 150°E 155°E 160°E 165°E 170°E 175°E 180°E 170°W 165°W 160°W 155°W 150°W 145°W 140°W 135°W 130°W 125°W 120°W 115°W 110°W 105°W 100°W 95°W 90°W 85°W 80°W 75°W 70°W 65°W 60°W 55°W 50°W 45°W 40°W 35°W 30°W 25°W 20°W 15°W 10°W 5°W 0° 5°E 10°E 15°E 20°E 25°E 30°E 35°E 40°E
 M.101 M.105 M.106 M.108 M.109 M.151 M.155 M.156 M.158 M.159 M.160 M.165 M.166 M.168 M.169 M.170 M.175 M.176 M.178 M.179 M.180 M.185 M.186 M.188 M.189 M.190 M.195 M.196 M.198 M.199 M.200 M.205 M.206 M.208 M.209 M.210 M.215 M.216 M.218 M.219 M.220 M.225 M.226 M.228 M.229 M.230 M.235 M.236 M.238 M.239 M.240 M.245 M.246 M.248 M.249 M.250 M.255 M.256 M.258 M.259 M.260 M.265 M.266 M.268 M.269 M.270 M.275 M.276 M.278 M.279 M.280 M.285 M.286 M.288 M.289 M.290 M.295 M.296 M.298 M.299 M.300 M.305 M.306 M.308 M.309 M.310 M.315 M.316 M.318 M.319 M.320 M.325 M.326 M.328 M.329 M.330 M.335 M.336 M.338 M.339 M.340 M.345 M.346 M.348 M.349 M.350 M.355 M.356 M.358 M.359 M.360 M.365 M.366 M.368 M.369 M.370 M.375 M.376 M.378 M.379 M.380 M.385 M.386 M.388 M.389 M.390 M.395 M.396 M.398 M.399 M.400 M.405 M.406 M.408 M.409 M.410 M.415 M.416 M.418 M.419 M.420 M.425 M.426 M.428 M.429 M.430 M.435 M.436 M.438 M.439 M.440 M.445 M.446 M.448 M.449 M.450 M.455 M.456 M.458 M.459 M.460 M.465 M.466 M.468 M.469 M.470 M.475 M.476 M.478 M.479 M.480 M.485 M.486 M.488 M.489 M.490 M.495 M.496 M.498 M.499 M.500







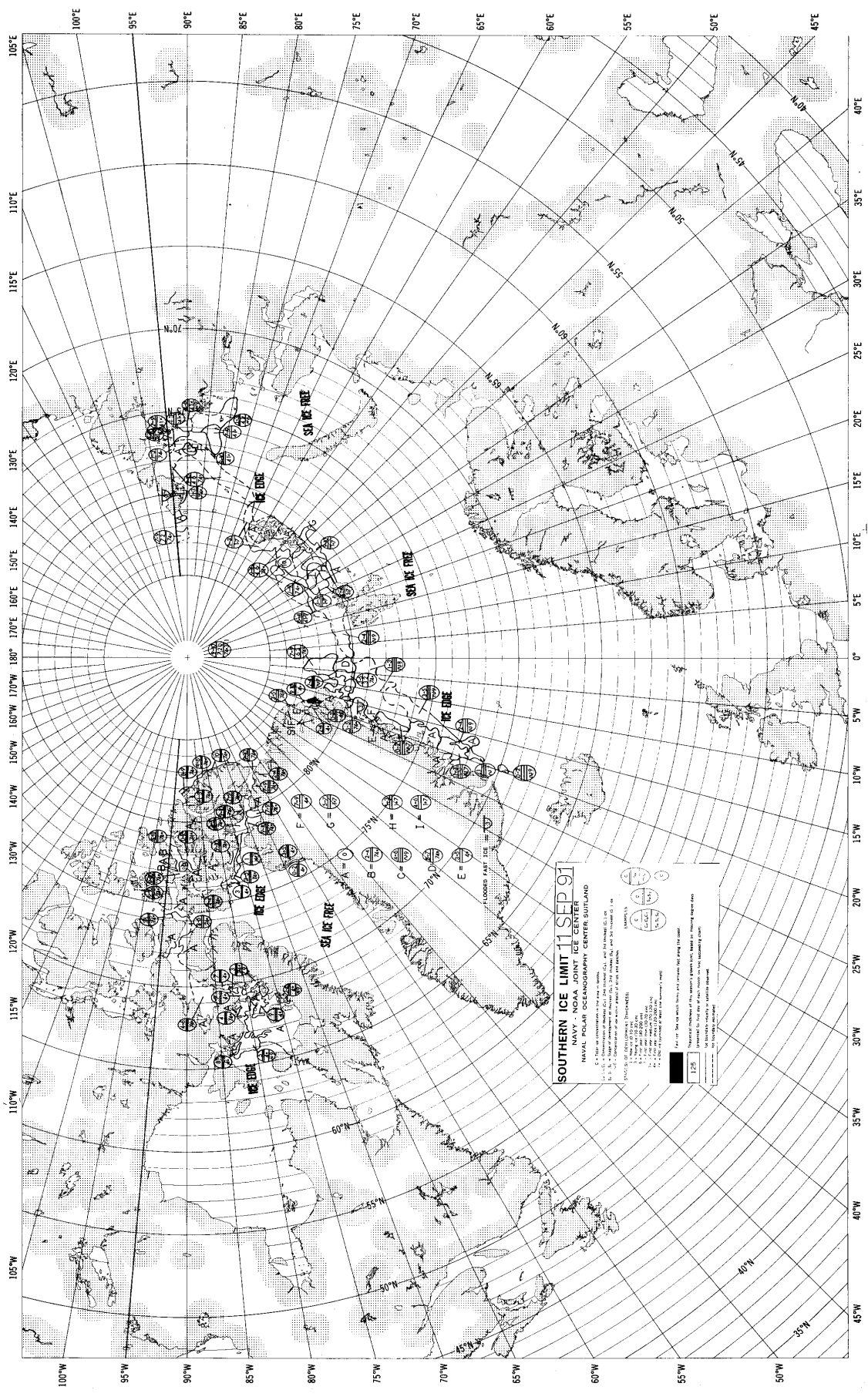
SOUTHERN ICE LIMIT 04SEP01
 NAVY POLAR OCEANOGRAPHY CENTER
 NAVY POLAR OCEANOGRAPHY CENTER, STANFORD

U.S. & U.S. - 0.5 degree resolution
 U.S. & U.S. - 0.5 degree resolution
 U.S. & U.S. - 0.5 degree resolution

SYMBOLS:

(Symbol)	SEA ICE FREE
(Symbol)	ICE FREE
(Symbol)	ICE DIRT
(Symbol)	ICE DIRTY

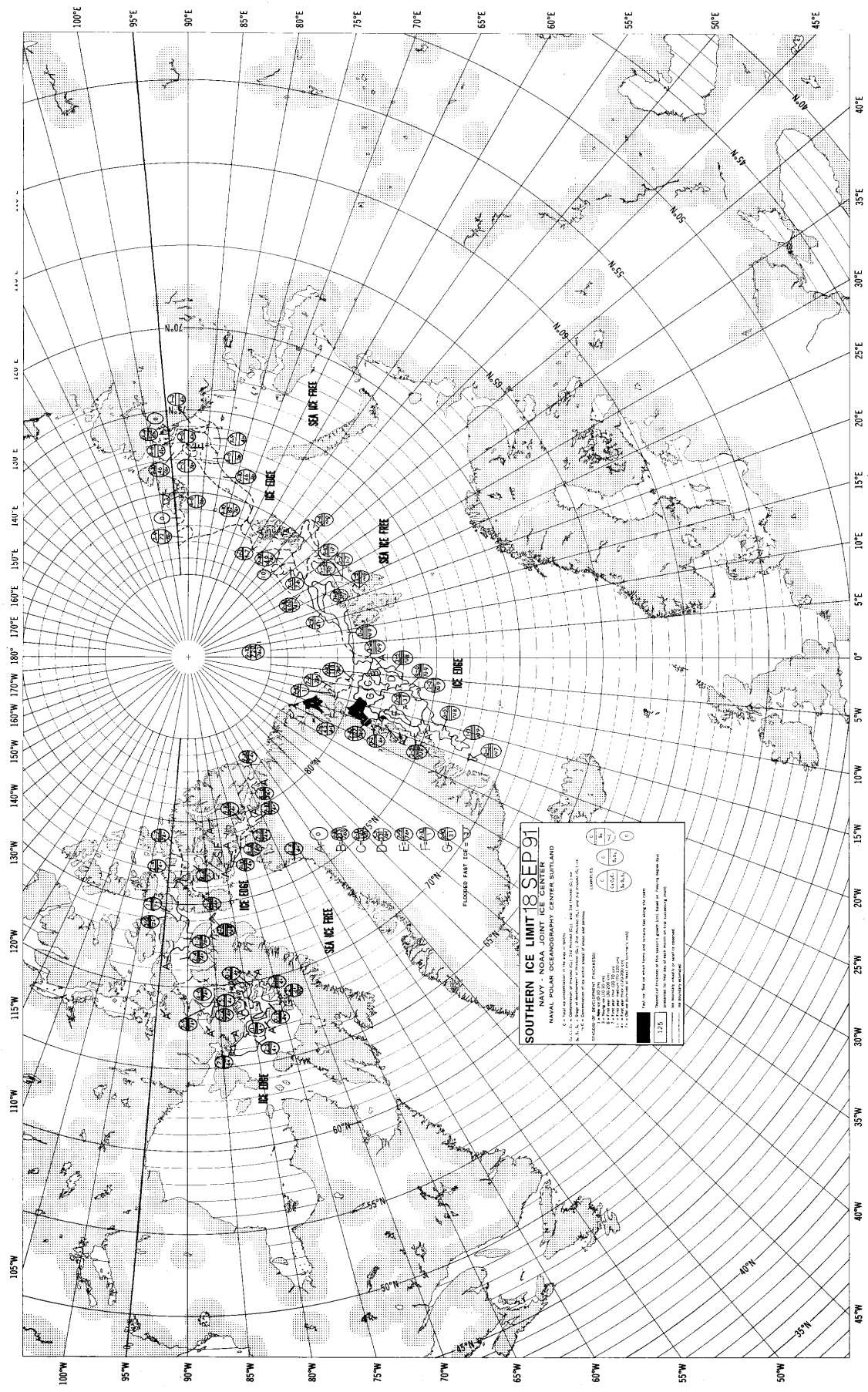
For use: This map is for informational purposes only and should not be used for navigation. It is not a substitute for a nautical chart. It is not a substitute for a nautical chart. It is not a substitute for a nautical chart.

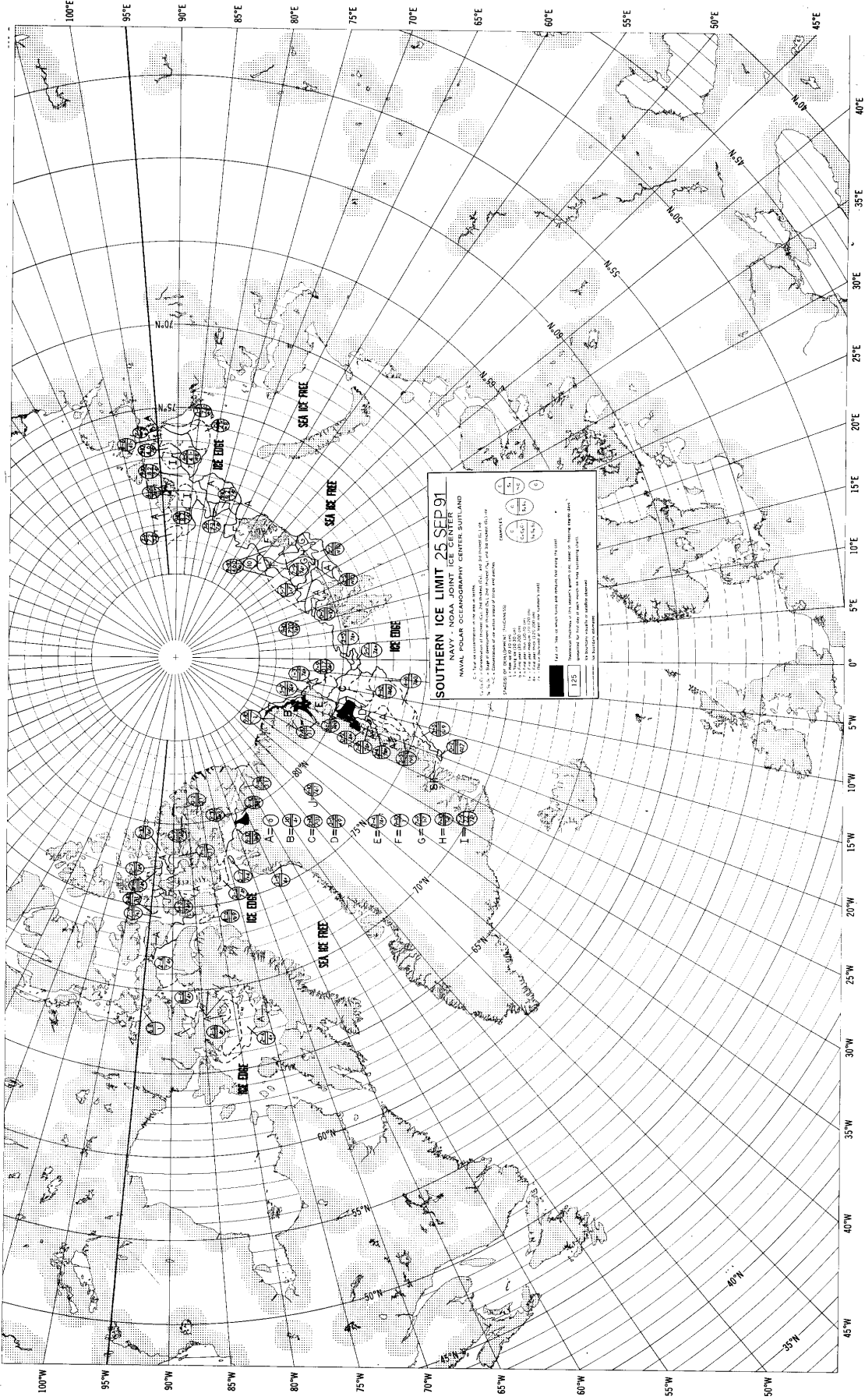


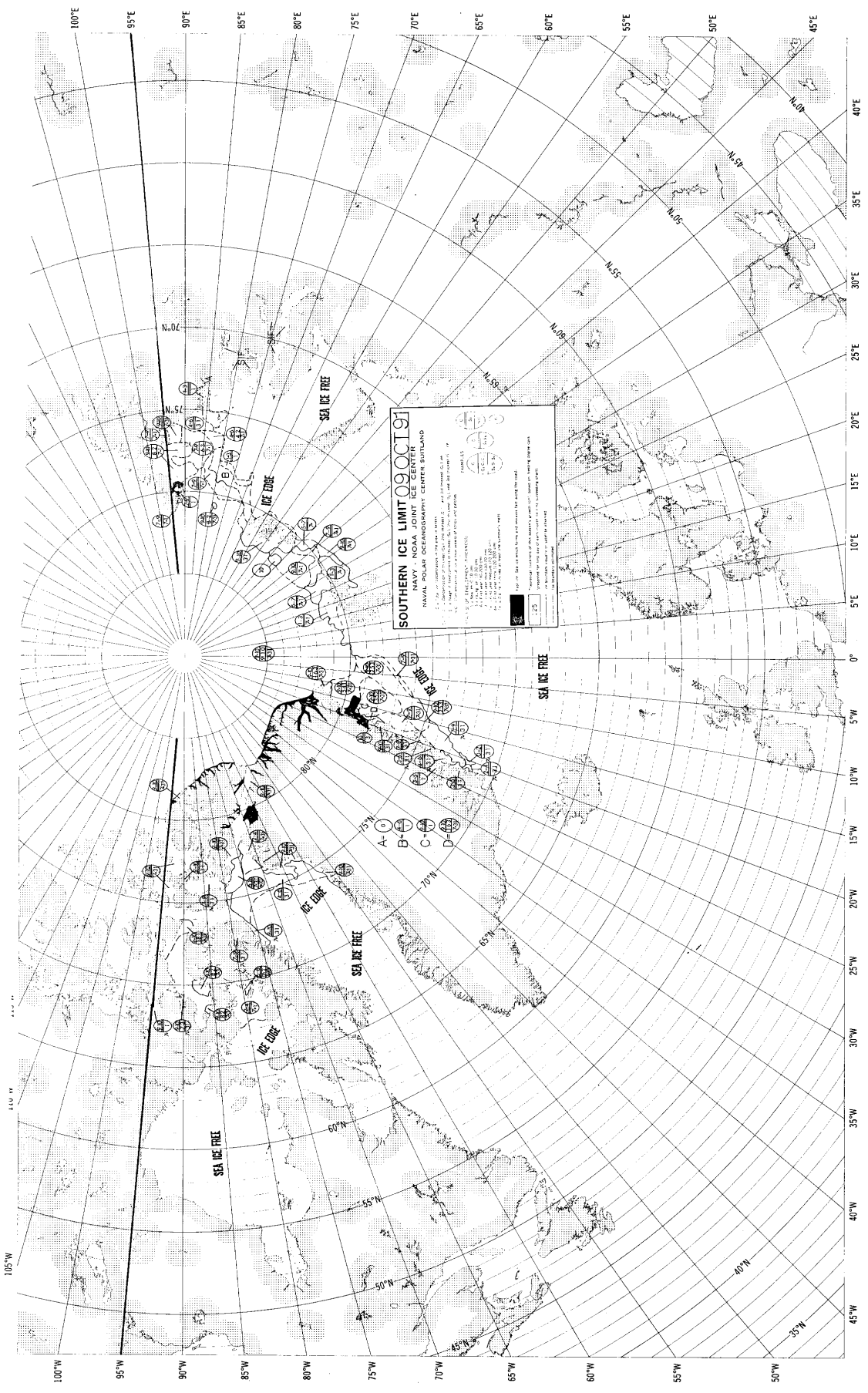
SOUTHERN ICE LIMIT 11 SEP 91

NAVY & NOAA JOINT ICE CENTER
 NAVY OCEANOGRAPHY CENTER, SUITLAND

1 - 100% Ice
 2 - 75% Ice
 3 - 50% Ice
 4 - 25% Ice
 5 - 10% Ice
 6 - 5% Ice
 7 - 2% Ice
 8 - 1% Ice
 9 - 0% Ice
 10 - 0% Ice
 11 - 0% Ice
 12 - 0% Ice
 13 - 0% Ice
 14 - 0% Ice
 15 - 0% Ice
 16 - 0% Ice
 17 - 0% Ice
 18 - 0% Ice
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 97 - 0% Ice
 98 - 0% Ice
 99 - 0% Ice
 100 - 0% Ice
 101 - 0% Ice
 102 - 0% Ice
 103 - 0% Ice
 104 - 0% Ice
 105 - 0% Ice







SOUTHERN ICE LIMIT 09 OCT 1971
 NAVY - NOVA JOINT CENTER FOR THE STUDY OF
 NAVAL POLAR OPERATIONS

1. This map shows the southern ice limit for the month of October 1971, based on the following information:
 a. Data from the U.S.S. Icebreaker Healy (WMEC-903) and the U.S.S. Icebreaker Healy (WMEC-903) during their operations in the Southern Ocean.
 b. Data from the U.S.S. Icebreaker Healy (WMEC-903) during their operations in the Southern Ocean.
 c. Data from the U.S.S. Icebreaker Healy (WMEC-903) during their operations in the Southern Ocean.
 d. Data from the U.S.S. Icebreaker Healy (WMEC-903) during their operations in the Southern Ocean.

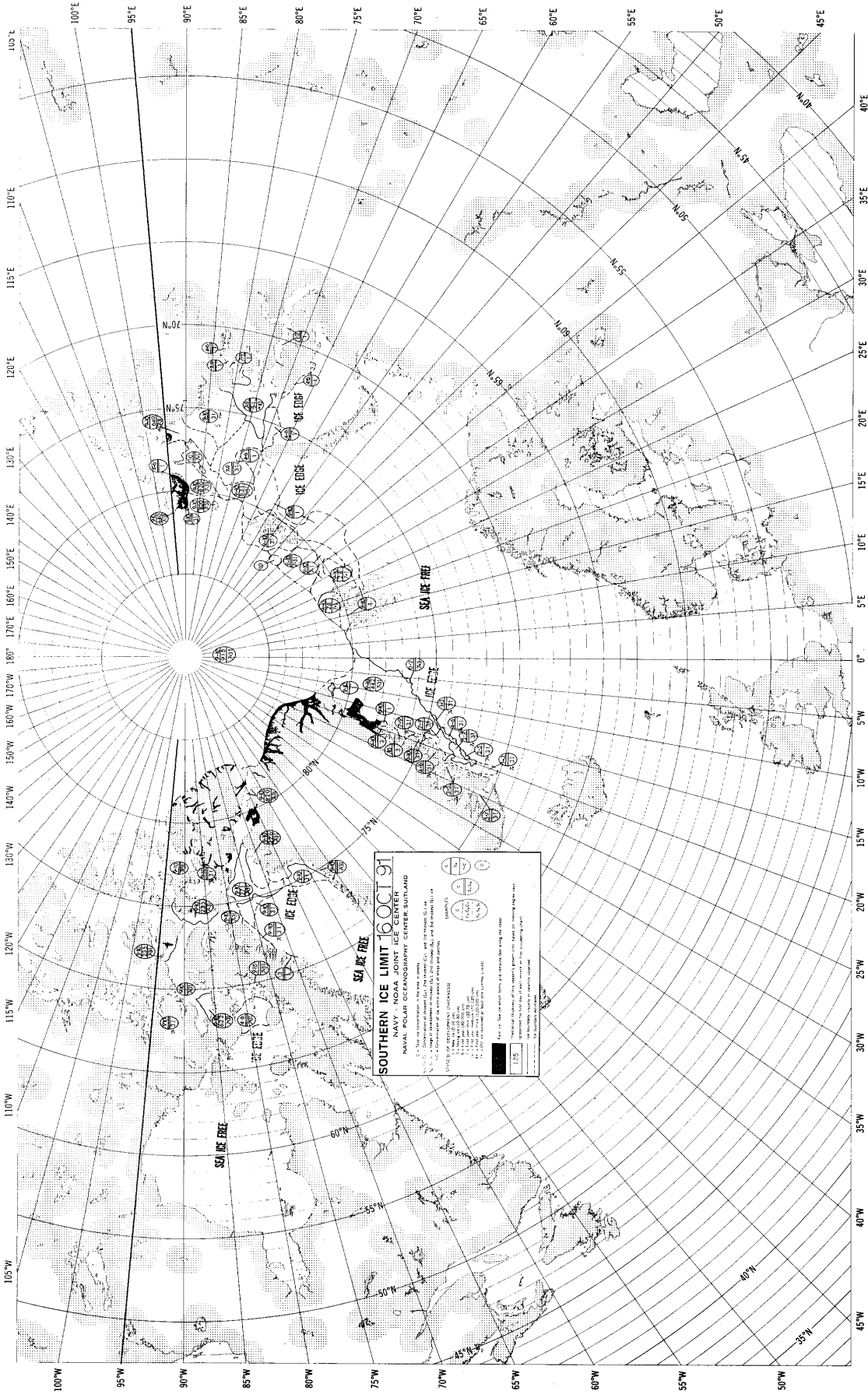
2. The ice limit is defined as the southernmost edge of the ice pack, based on the following information:
 a. Data from the U.S.S. Icebreaker Healy (WMEC-903) and the U.S.S. Icebreaker Healy (WMEC-903) during their operations in the Southern Ocean.
 b. Data from the U.S.S. Icebreaker Healy (WMEC-903) during their operations in the Southern Ocean.
 c. Data from the U.S.S. Icebreaker Healy (WMEC-903) during their operations in the Southern Ocean.
 d. Data from the U.S.S. Icebreaker Healy (WMEC-903) during their operations in the Southern Ocean.

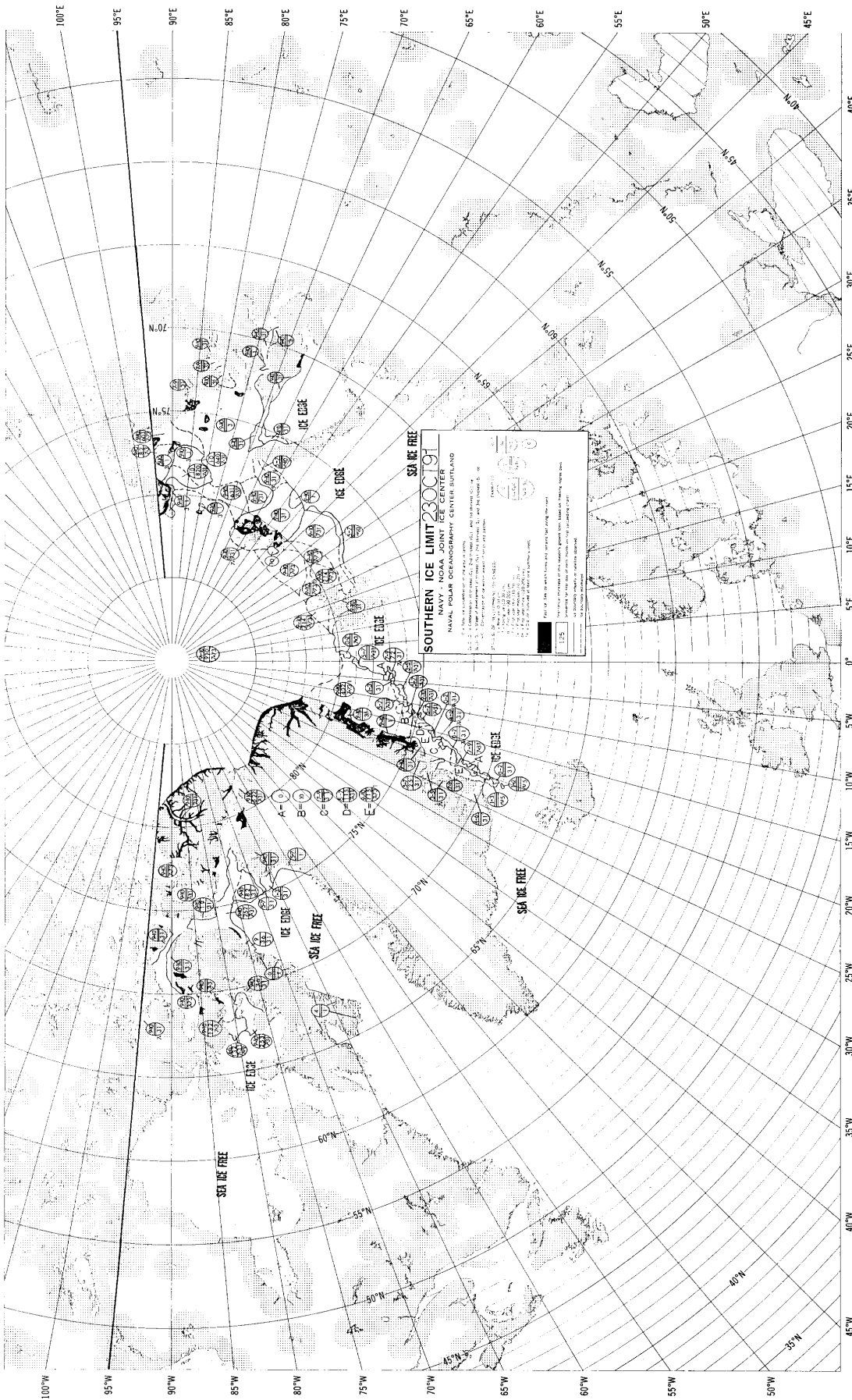
3. The ice limit is shown as a solid line, with the area to the south of the line shaded to indicate the presence of ice. The area to the north of the line is unshaded, indicating that the sea is free of ice.

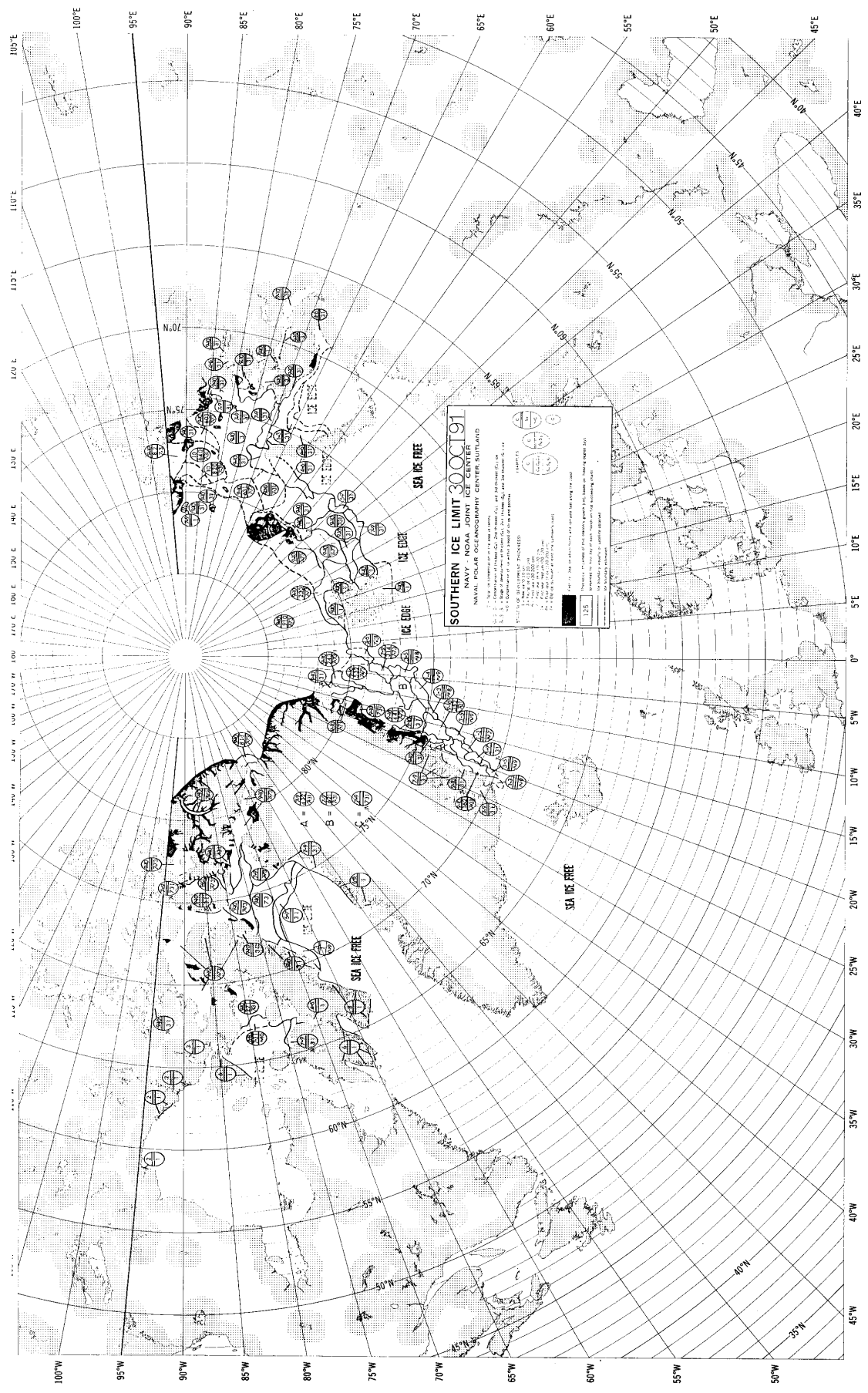
4. The ice limit is shown as a solid line, with the area to the south of the line shaded to indicate the presence of ice. The area to the north of the line is unshaded, indicating that the sea is free of ice.

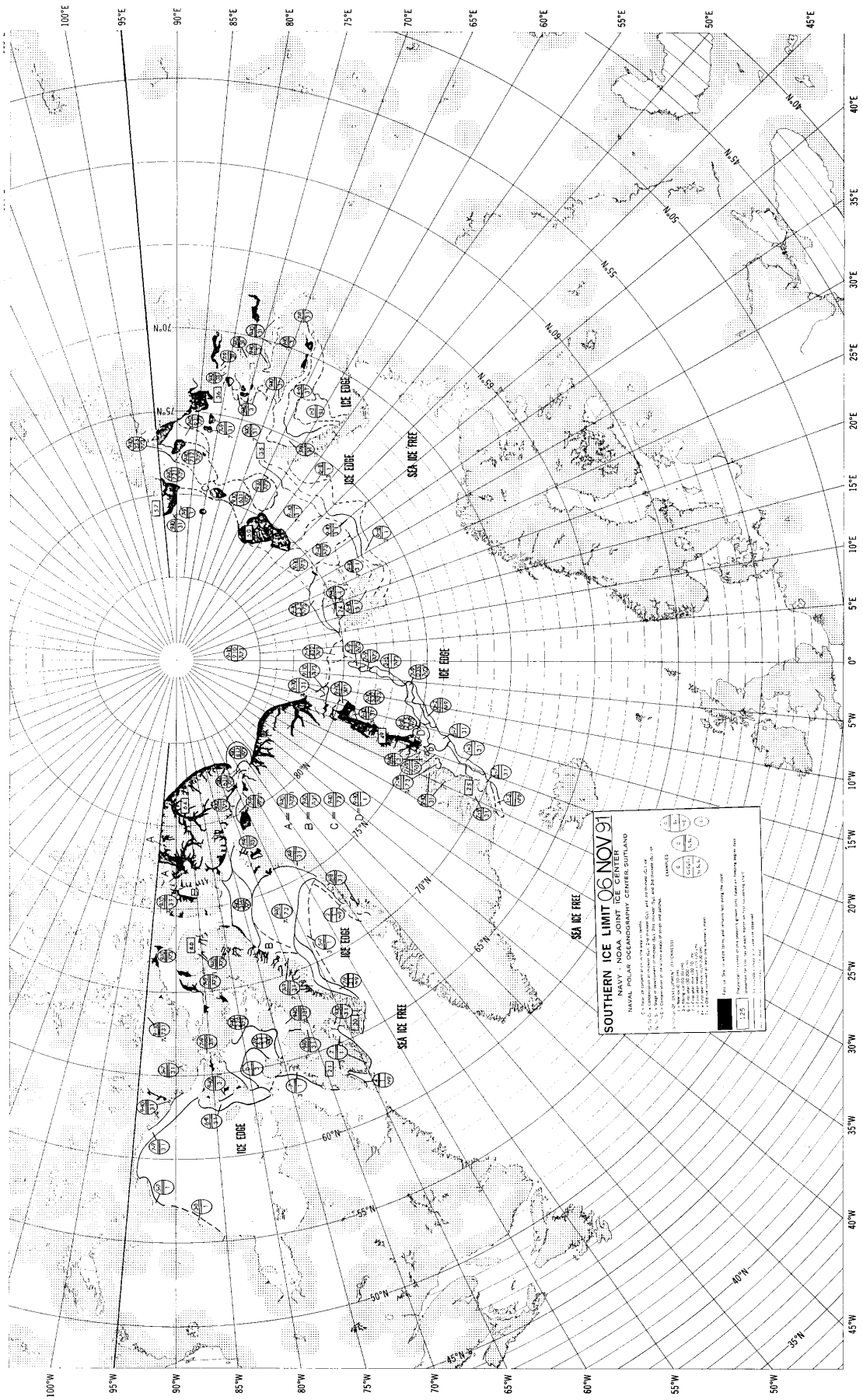
5. The ice limit is shown as a solid line, with the area to the south of the line shaded to indicate the presence of ice. The area to the north of the line is unshaded, indicating that the sea is free of ice.

- A = ○
- B = ⊕
- C = ⊗
- D = ⊙









SOUTHERN ICE LIMIT 06 NOV 91
 NAVAL POLAR OCEANOGRAPHY CENTER/SUTLAND
 NAVAL NAVY - NOAA JOINT ICE CENTER

LEGEND

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

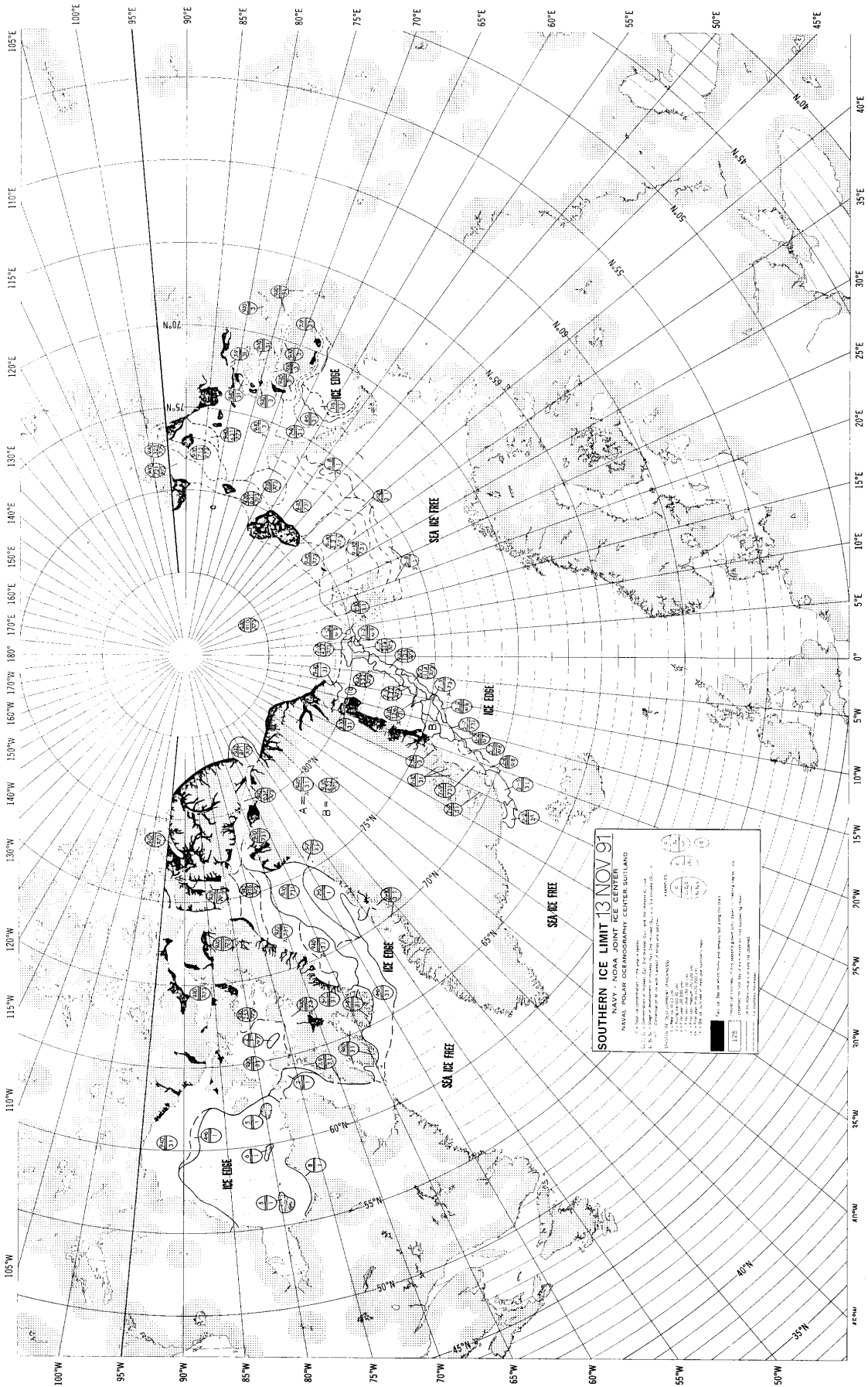
NOTES:

1. Data from 0100 UTC 06 NOV 91.
2. Data from 0200 UTC 06 NOV 91.
3. Data from 0400 UTC 06 NOV 91.
4. Data from 0600 UTC 06 NOV 91.
5. Data from 0800 UTC 06 NOV 91.
6. Data from 1000 UTC 06 NOV 91.
7. Data from 1200 UTC 06 NOV 91.
8. Data from 1400 UTC 06 NOV 91.
9. Data from 1600 UTC 06 NOV 91.
10. Data from 1800 UTC 06 NOV 91.
11. Data from 2000 UTC 06 NOV 91.
12. Data from 2200 UTC 06 NOV 91.

CONTACTS:

- 1. NAVAL POLAR OCEANOGRAPHY CENTER/SUTLAND
- 2. NAVAL NAVY - NOAA JOINT ICE CENTER
- 3. NAVAL POLAR OCEANOGRAPHY CENTER/SUTLAND
- 4. NAVAL NAVY - NOAA JOINT ICE CENTER

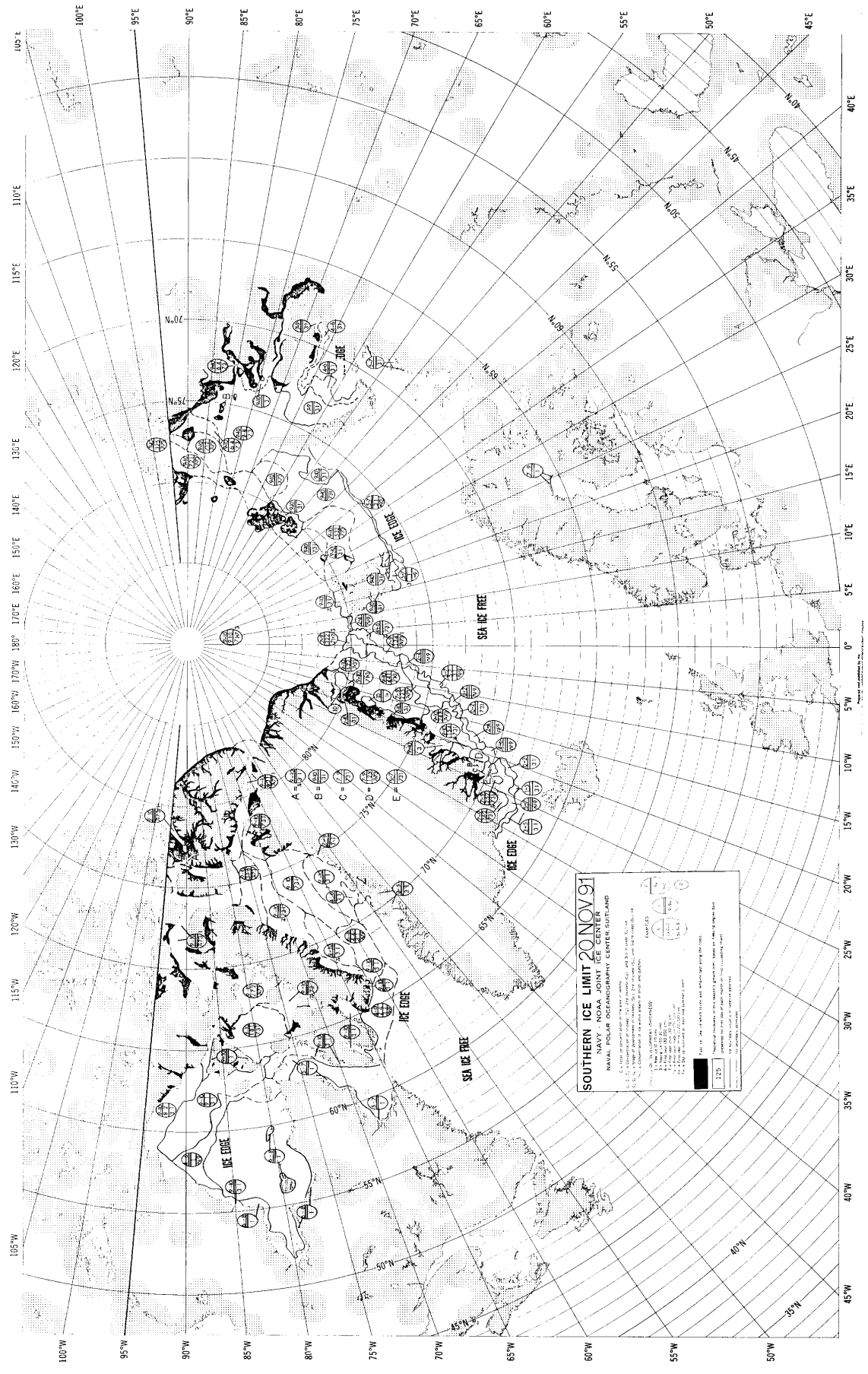
For more information, contact the Naval Polar Oceanography Center/Sutland, 1000 Naval Air Station Road, Orlando, FL 32803-3700. Phone: 407/320-2500. Fax: 407/320-2501. Email: npo@npo.navy.mil. Website: www.npo.navy.mil



SOUTHERN ICE LIMIT 13 NOV 91
 ICE LIMIT
 NAVAL POLAR OCEANOGRAPHY CENTER SULLAND

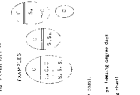
1. A major ice concentration: 70% and above
 2. A minor ice concentration: 50% and above
 3. A very minor ice concentration: 30% and above
 4. A light ice concentration: 15% and above
 5. A moderate ice concentration: 10% and above
 6. A heavy ice concentration: 5% and above
 7. A very heavy ice concentration: 2% and above
 8. A light ice concentration: 15% and below
 9. A moderate ice concentration: 10% and below
 10. A heavy ice concentration: 5% and below
 11. A very heavy ice concentration: 2% and below

1225
 1226
 1227
 1228
 1229
 1230
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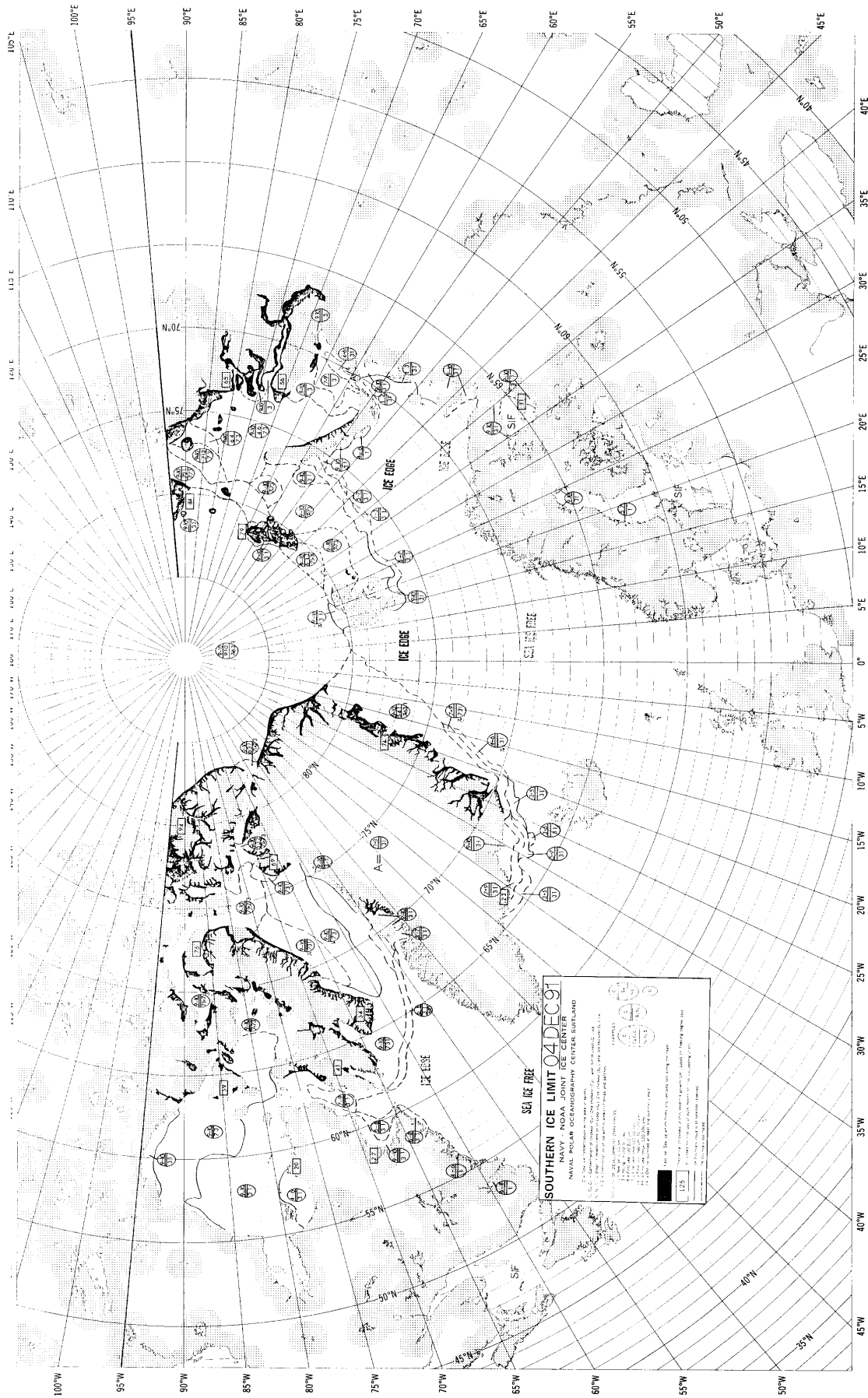


SOUTHERN ICE LIMIT 20 NOV 91
 NAVAL POLAR OCEANOGRAPHY CENTER-SUITLAND
 NAVY - NOAA JOINT ICE CENTER

1. This chart is based on the data of the 1991-92 season.
 2. The data is based on the 1991-92 season.
 3. The data is based on the 1991-92 season.
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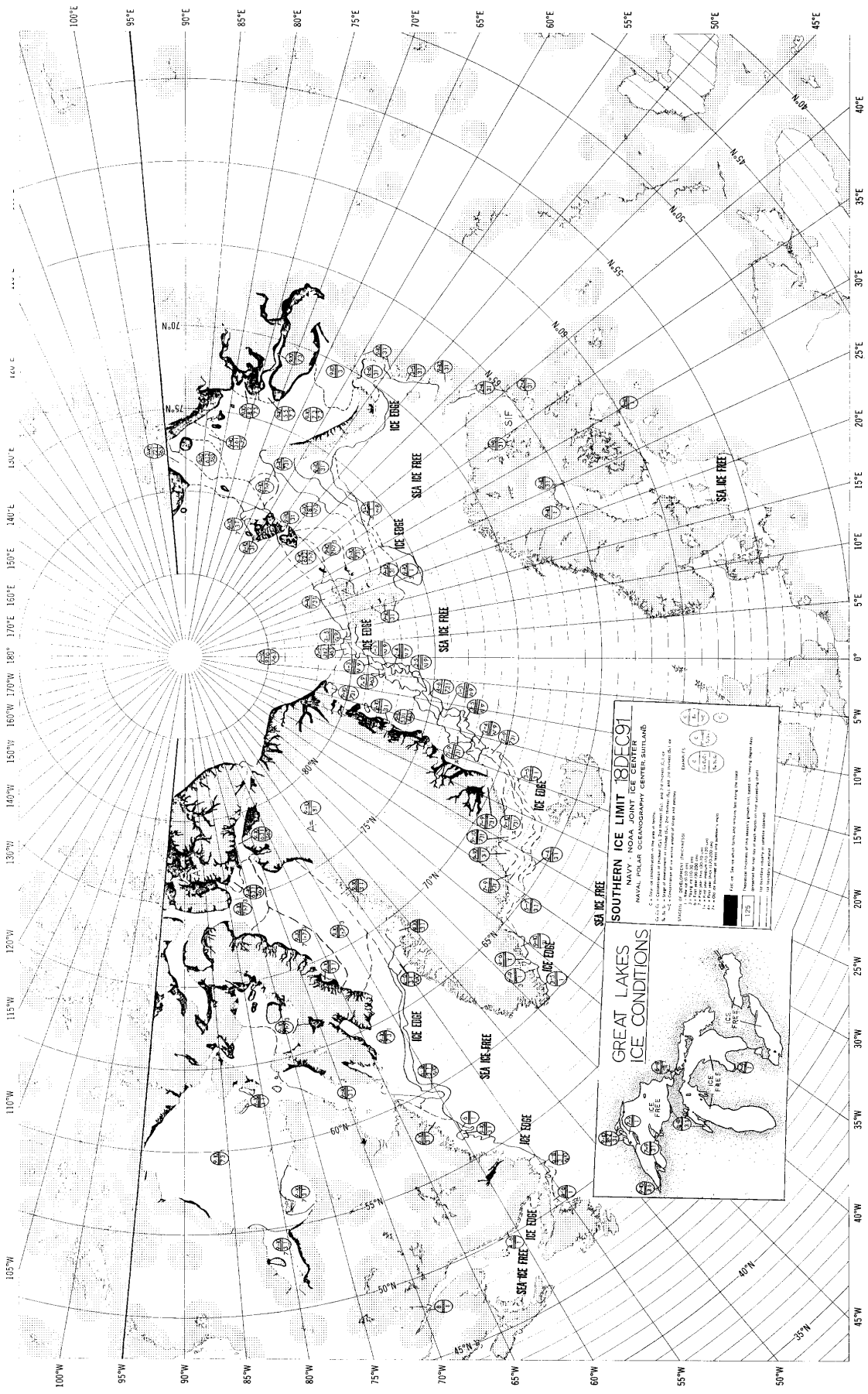


NOAA/Navy Joint Ice Center



SOUTHERN ICE LIMIT 04 DEC 91
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
 NAVY - NOAA JOINT ICE CENTER

1. DATE OF OBSERVATION: 04 DEC 91
 2. DATA SOURCE: SUTLAND
 3. DATA TYPE: ICE LIMIT
 4. DATA STATUS: OBSERVED
 5. DATA QUALITY: GOOD
 6. DATA RESOLUTION: 1000 METERS
 7. DATA INTERVAL: 1 HOUR
 8. DATA GROUNDWATER: 0
 9. DATA SURFACE: 0
 10. DATA SUBSURFACE: 0
 11. DATA TYPE: ICE LIMIT
 12. DATA STATUS: OBSERVED
 13. DATA QUALITY: GOOD
 14. DATA RESOLUTION: 1000 METERS
 15. DATA INTERVAL: 1 HOUR
 16. DATA GROUNDWATER: 0
 17. DATA SURFACE: 0
 18. DATA SUBSURFACE: 0



SOUTHERN ICE LIMIT 18 DEC 69
 NAVY - NOAA JOINT POLAR OCEANOGRAPHY CENTER, SUTLAND

1. DATE: 18 DEC 69
 2. TIME: 0000Z
 3. POSITION: 75°N 150°W
 4. OBSERVER: J. R. ...

SYMBOLS: (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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GREAT LAKES ICE CONDITIONS

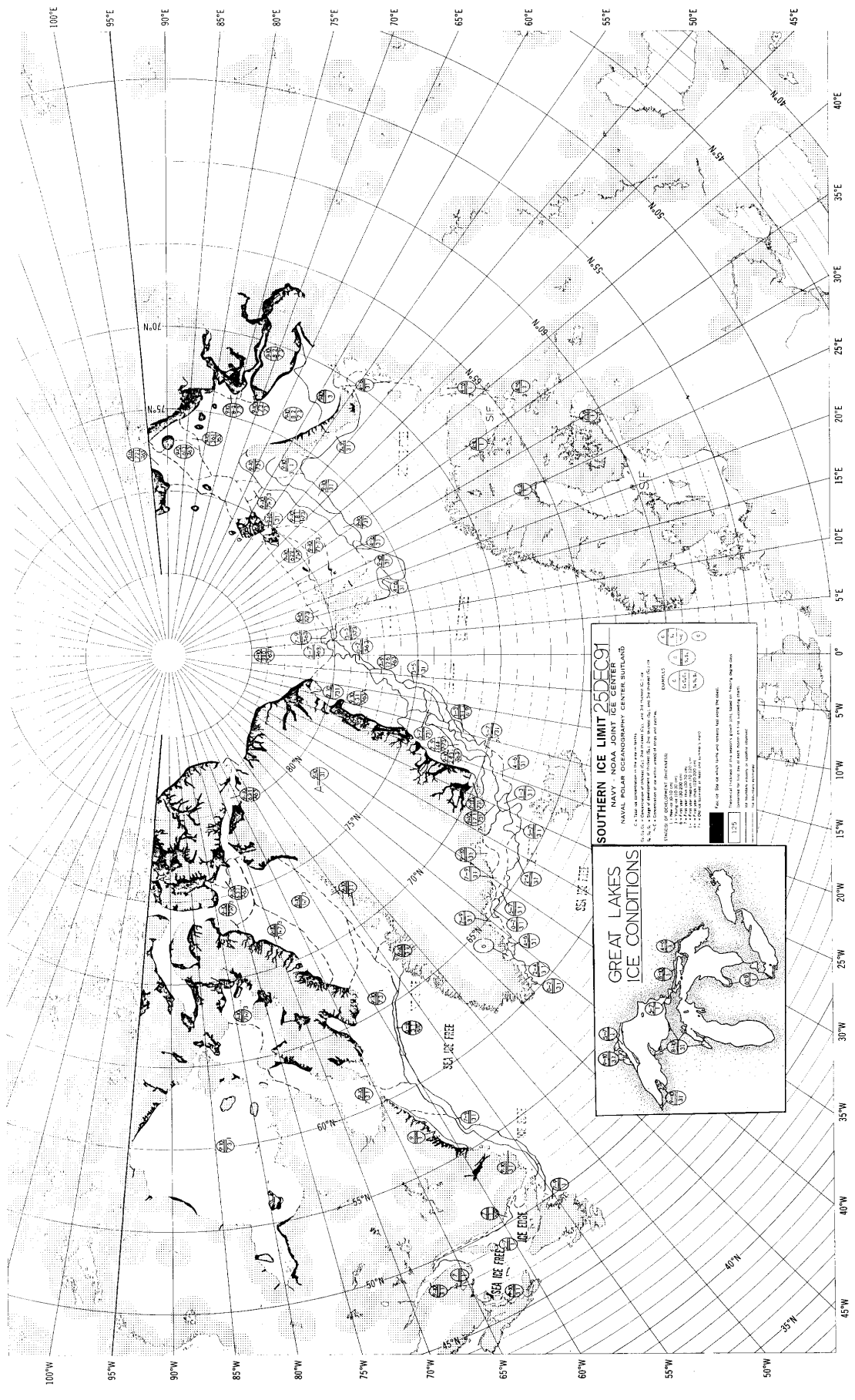


TABLE 1. SATELLITE DATA UTILIZED DURING 1991 (ARCTIC)

Time period		Satellite Remote Sensing				
From	To	Sensor Platform	Sensor Type	Spectral Region	Resolution	Coverage
1-91	9-91	NOAA-10	AVHRR	0.58-0.68 um 0.725-1.10 um 10.5-11.5 um	1 km	Regional
			HRPT/LAC			
VIS						
NIR						
			GAC	0.58-0.68 um 10.5-11.5 um	4 km	Global
			VIS			
			IR			
1-91	12-91	NOAA-11	AVHRR	0.58-0.68 um 0.725-1.10 um 10.5-11.5 um	1 km	Regional
			HRPT/LAC			
VIS						
NIR						
			GAC	0.58-0.68 um 10.5-11.5 um	4 km	Regional
			VIS			
			IR			
1-91	12-91	DMSF-F (10/11)	OLS	0.4-1.1 um	.62 km	Regional
			VIS	10.2-12.8 um	.62 km	Regional
			IR			
			SSM/I	1.55 cm	50 km	Global
			MW	(19.35 GHz) 0.81 cm (37.0 GHz)	35 km	Global
9-91	12-91	NOAA-12	AVHRR	0.58-0.68 um 0.725-1.10 um 10.5-11.5 um	1 km	Regional
			HRPT/LAC			
			VIS			
			NIR			
			IR			

Abbreviations and Acronyms

AVHRR - Advanced Very High Resolution Radiometer
 cm - Centimeter
 GAC - Global Area Coverage
 GHz - Giga-hertz
 HRPT - High Resolution Picture Transmission
 IR - Infrared
 km - Kilometer
 LAC - Local Area Coverage
 LW - Microwave
 NIR - Near Infrared
 OLS - Operational Line Scan System
 SSM/I - Special Sensor Microwave Imager
 um - Micrometer
 VIS - Visible