

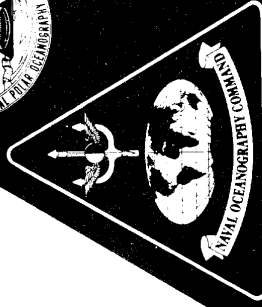
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**EASTERN—WESTERN
ARCTIC SEA ICE ANALYSIS
1992**

**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.

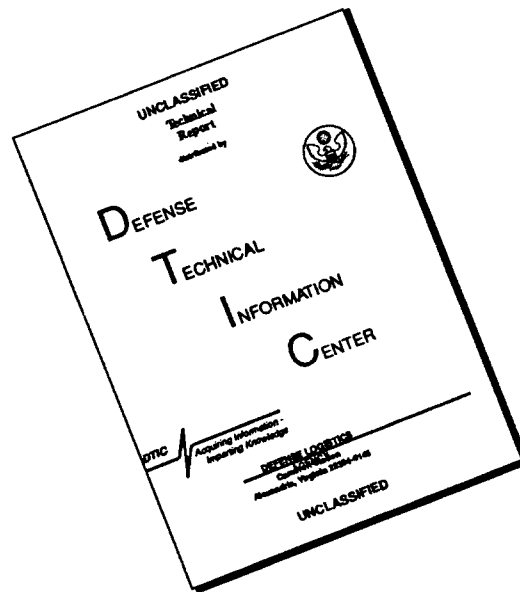
This publication is the 19th edition of the Arctic sea-ice atlases prepared by the JIC. The atlas contains weekly charts depicting Northern Hemisphere and Great Lakes ice conditions and extent. The significant use of high resolution satellite imagery, combined with valuable ice reconnaissance data from 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 products:

- a. Conventional shore station, ship, and aerial reconnaissance observations are plotted and evaluated.
- b. Satellite data from different sensors is compared and analyzed for ice information content. Table 1, located on the inside back cover, summarizes the data availability for 1992.
- 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 used to determine the estimated ice position.

NAVY/NOAA Joint Ice Center
Naval Polar Oceanography Center
4301 Suitland Road
Washington, DC 20395-5180

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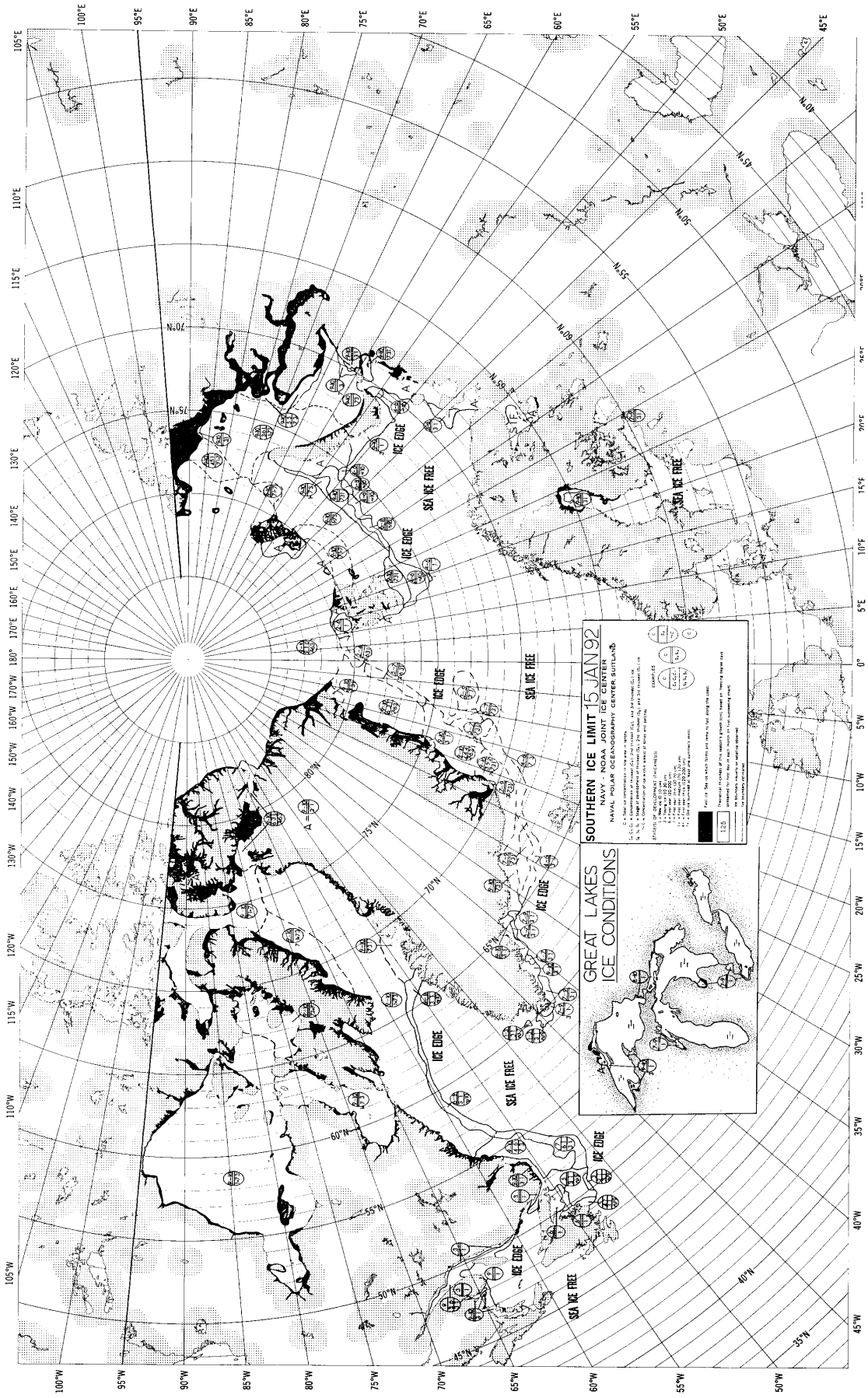
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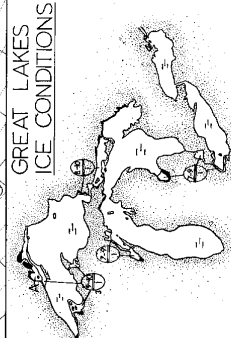


SOUTHERN ICE LIMIT 15 JAN 92
 NAVAL POLAR OCEANOGRAPHY CENTER BUILDING

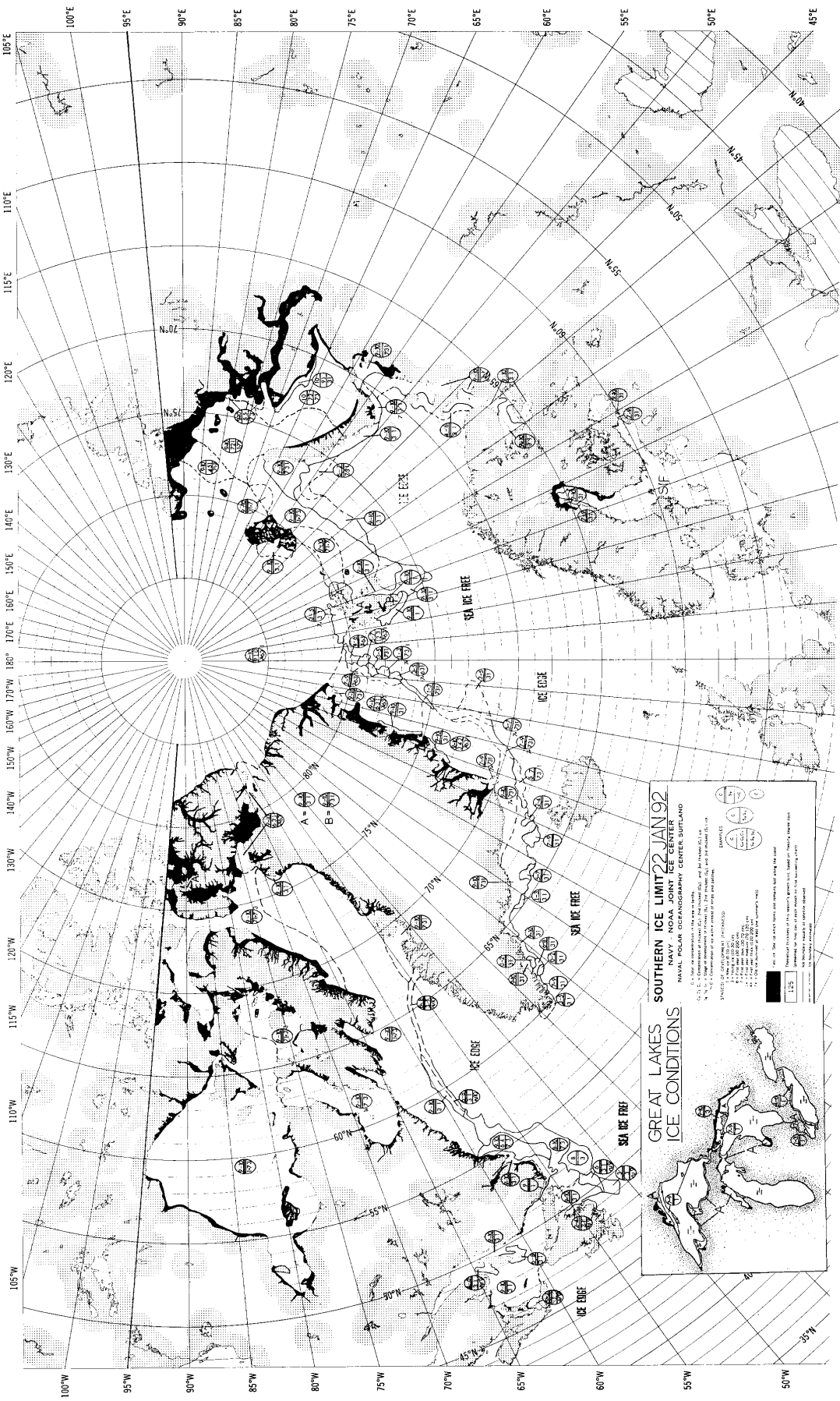
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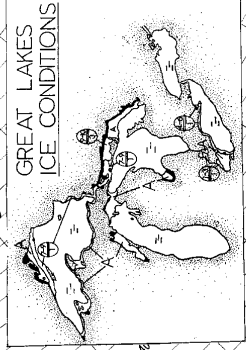


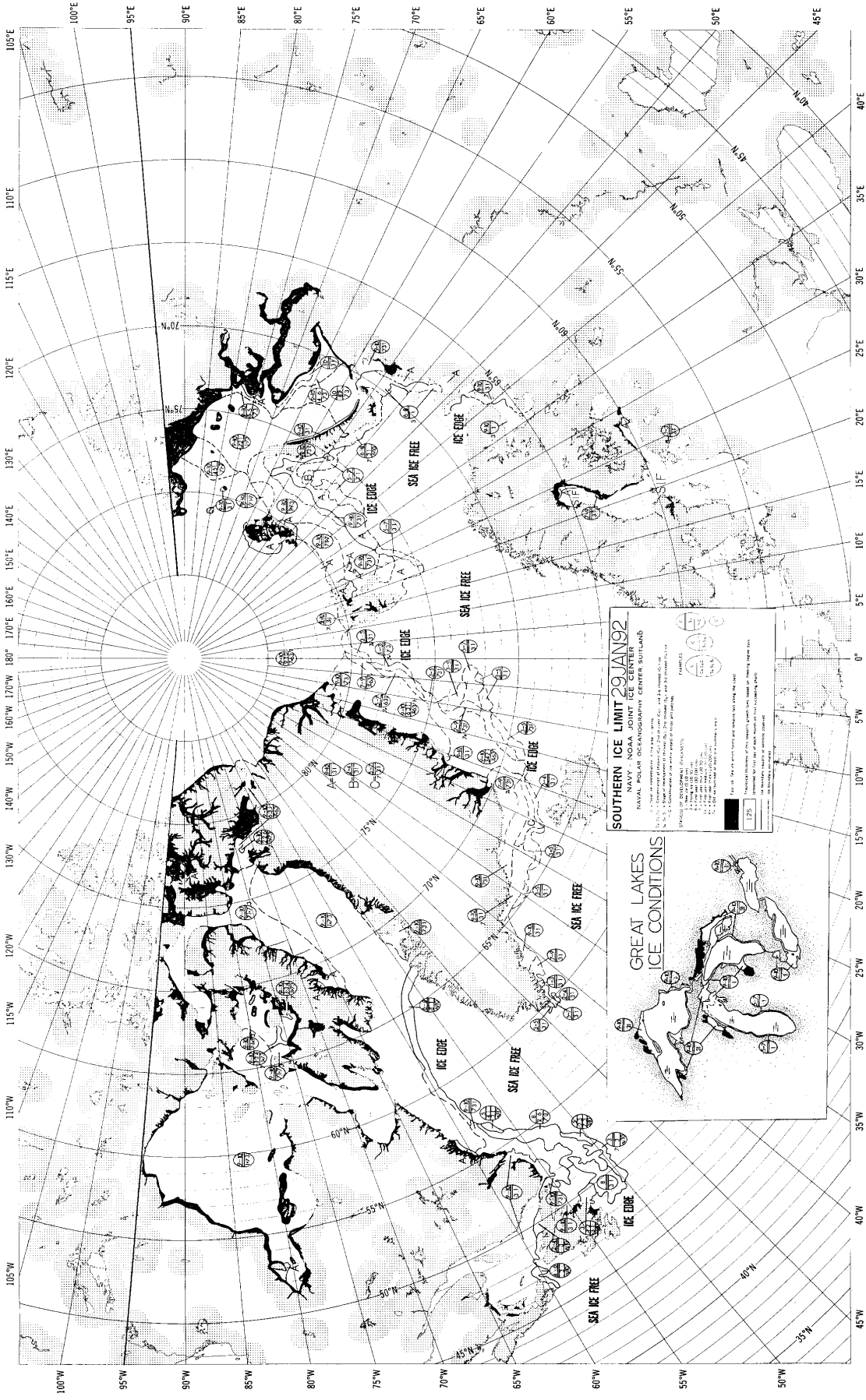
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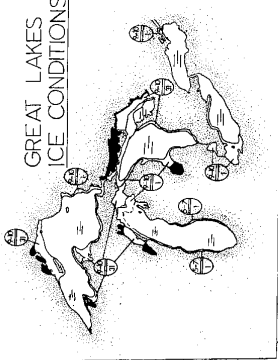
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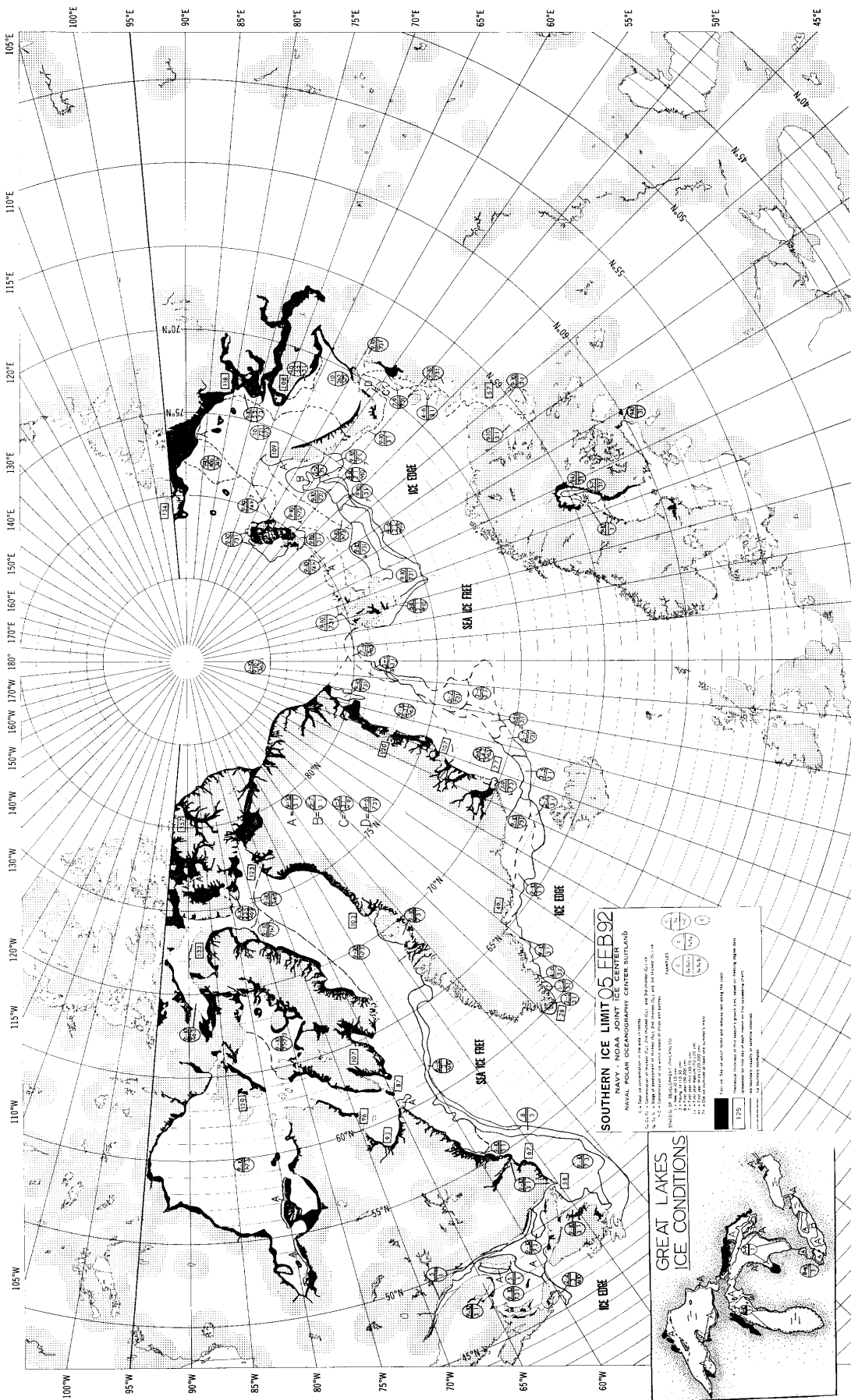


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 NAVY'S POLAR OCEANOGRAPHIC CENTER, SOUTHLAND

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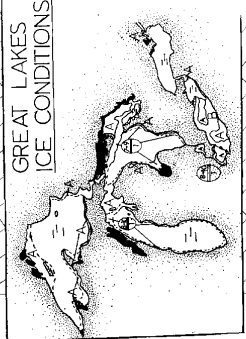


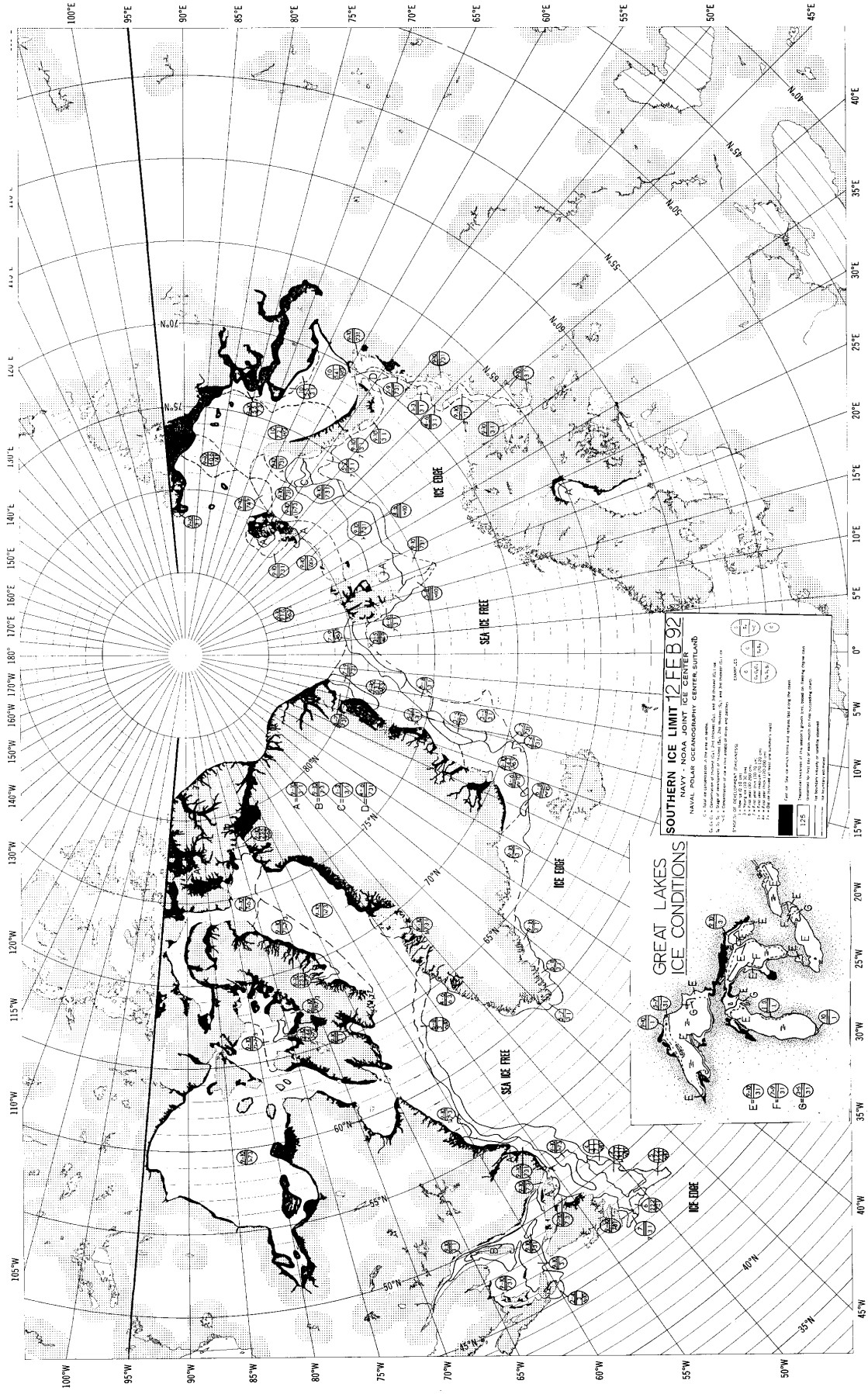
SOUTHERN ICE LIMIT 05 FEB 92
 NAVAL POLAR OCEANOGRAPHY CENTER BUTLAND
 NAVY - NOAA JOINT ICE CENTER

C = 100% ice concentration
 D = 75% ice concentration
 A = 50% ice concentration
 S = 25% ice concentration
 W = 10% ice concentration
 F = 5% ice concentration
 T = 2% ice concentration
 B = 1% ice concentration
 N = 0% ice concentration

VALUES OF ISOLINES (CONTOURS)
 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 = 2% ICE CONCENTRATION
 8 = 1% ICE CONCENTRATION
 9 = 0% ICE CONCENTRATION

1225





SOUTHERN ICE LIMIT 12 FEB 92

NAVAL POLAR OCEANOGRAPHY CENTER/SUTLAND

1. Data for this publication were obtained from the following sources:

- A. U.S. Navy Antarctic Operation Reports
- B. U.S. Navy Antarctic Operation Reports
- C. U.S. Navy Antarctic Operation Reports
- D. U.S. Navy Antarctic Operation Reports
- E. U.S. Navy Antarctic Operation Reports
- F. U.S. Navy Antarctic Operation Reports
- G. U.S. Navy Antarctic Operation Reports
- H. U.S. Navy Antarctic Operation Reports
- I. U.S. Navy Antarctic Operation Reports
- J. U.S. Navy Antarctic Operation Reports
- K. U.S. Navy Antarctic Operation Reports
- L. U.S. Navy Antarctic Operation Reports
- M. U.S. Navy Antarctic Operation Reports
- N. U.S. Navy Antarctic Operation Reports
- O. U.S. Navy Antarctic Operation Reports
- P. U.S. Navy Antarctic Operation Reports
- Q. U.S. Navy Antarctic Operation Reports
- R. U.S. Navy Antarctic Operation Reports
- S. U.S. Navy Antarctic Operation Reports
- T. U.S. Navy Antarctic Operation Reports
- U. U.S. Navy Antarctic Operation Reports
- V. U.S. Navy Antarctic Operation Reports
- W. U.S. Navy Antarctic Operation Reports
- X. U.S. Navy Antarctic Operation Reports
- Y. U.S. Navy Antarctic Operation Reports
- Z. U.S. Navy Antarctic Operation Reports

2. The ice limit is based on the following criteria:

- 1. 100% ice coverage
- 2. 90% ice coverage
- 3. 80% ice coverage
- 4. 70% ice coverage
- 5. 60% ice coverage
- 6. 50% ice coverage
- 7. 40% ice coverage
- 8. 30% ice coverage
- 9. 20% ice coverage
- 10. 10% ice coverage
- 11. No ice coverage

3. The ice limit is based on the following criteria:

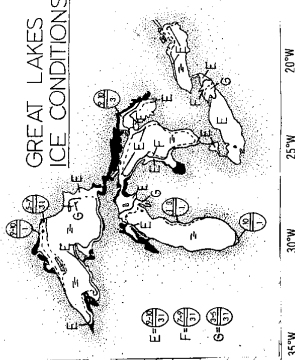
- 1. 100% ice coverage
- 2. 90% ice coverage
- 3. 80% ice coverage
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- 7. 40% ice coverage
- 8. 30% ice coverage
- 9. 20% ice coverage
- 10. 10% ice coverage
- 11. No ice coverage

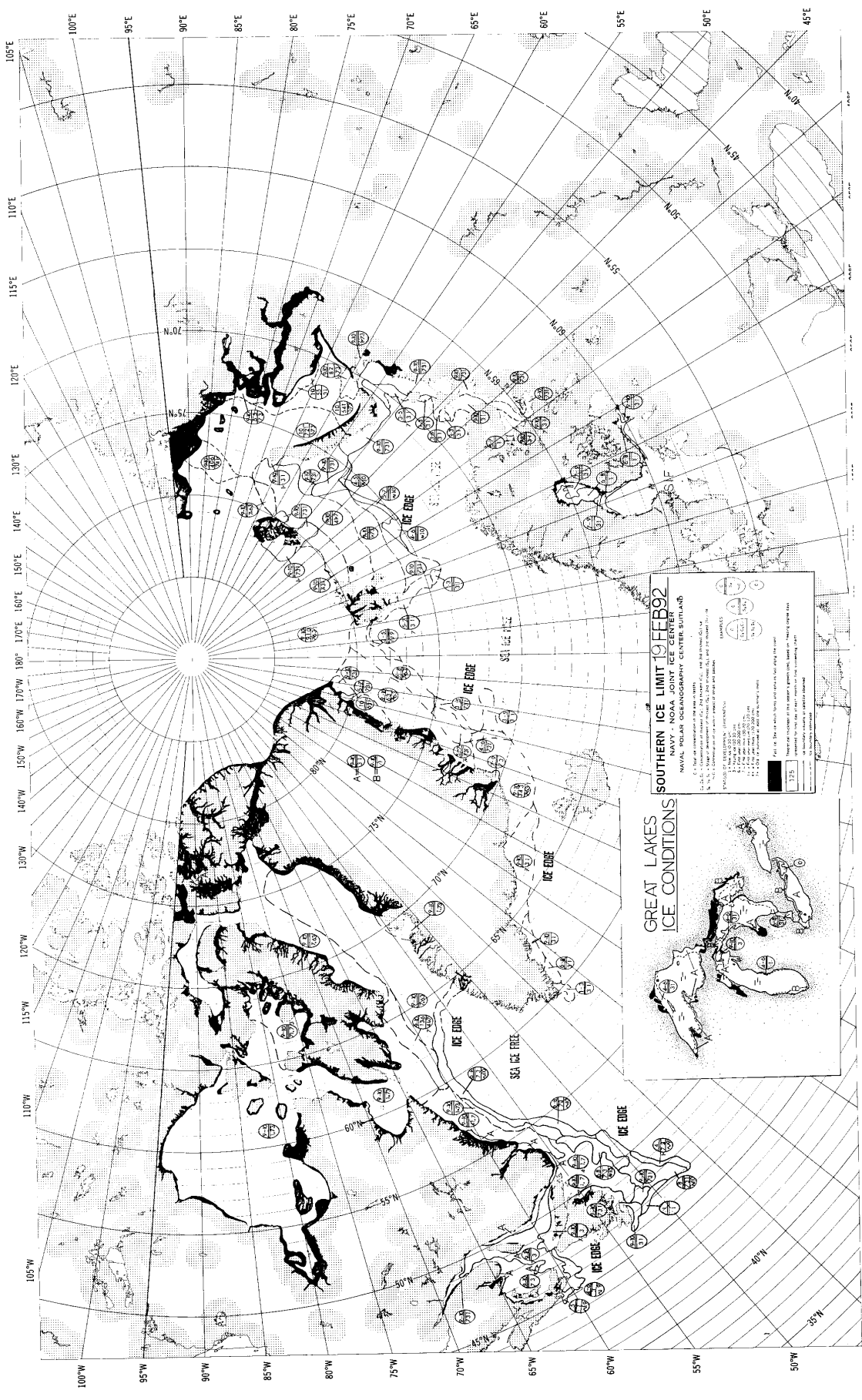
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- 1. 100% ice coverage
- 2. 90% ice coverage
- 3. 80% ice coverage
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- 6. 50% ice coverage
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- 8. 30% ice coverage
- 9. 20% ice coverage
- 10. 10% ice coverage
- 11. No ice coverage

5. The ice limit is based on the following criteria:

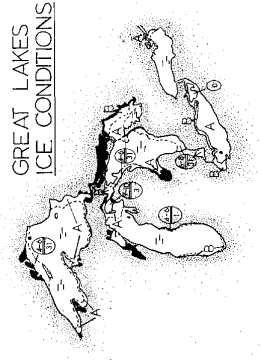
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- 8. 30% ice coverage
- 9. 20% ice coverage
- 10. 10% ice coverage
- 11. No ice coverage

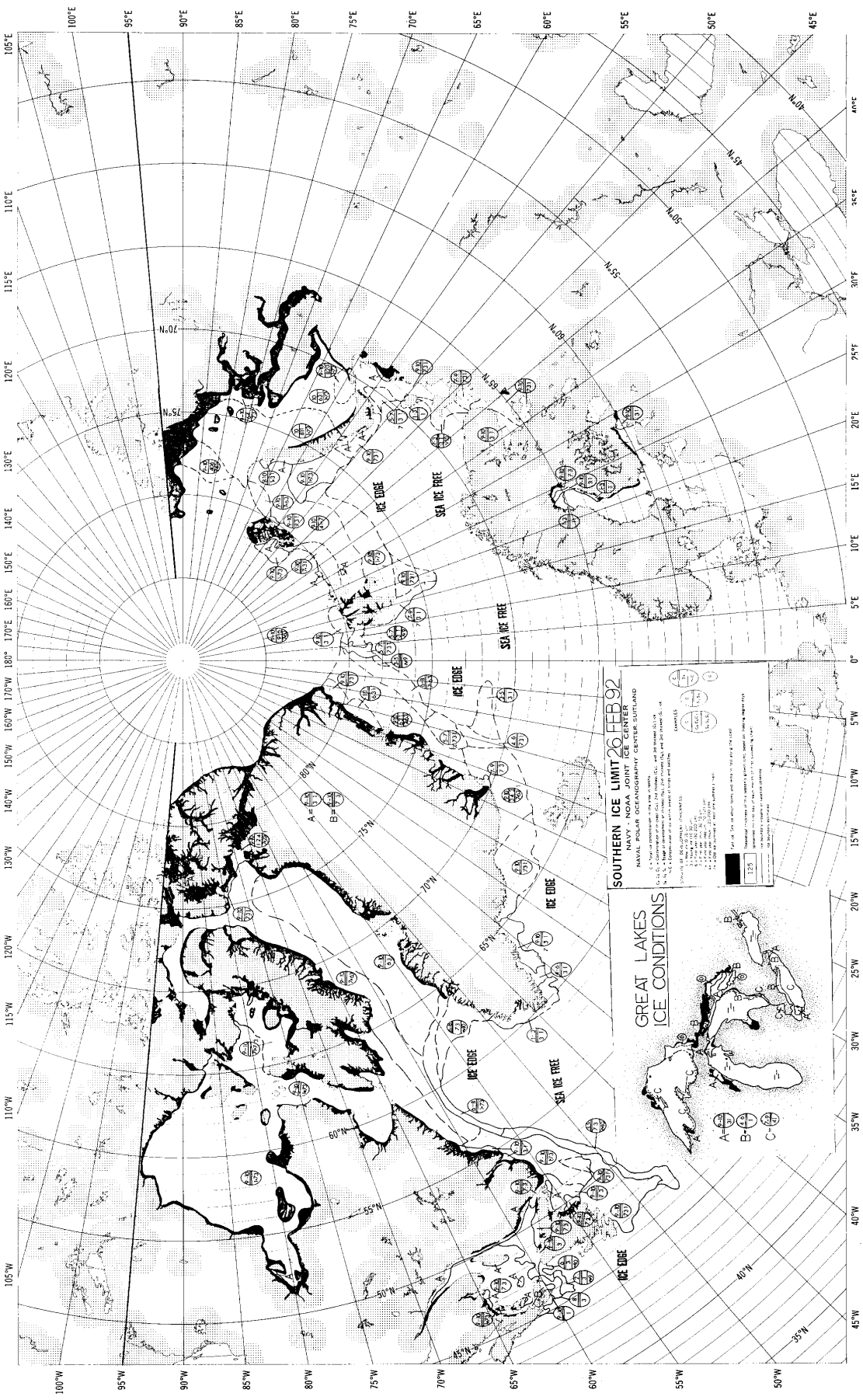


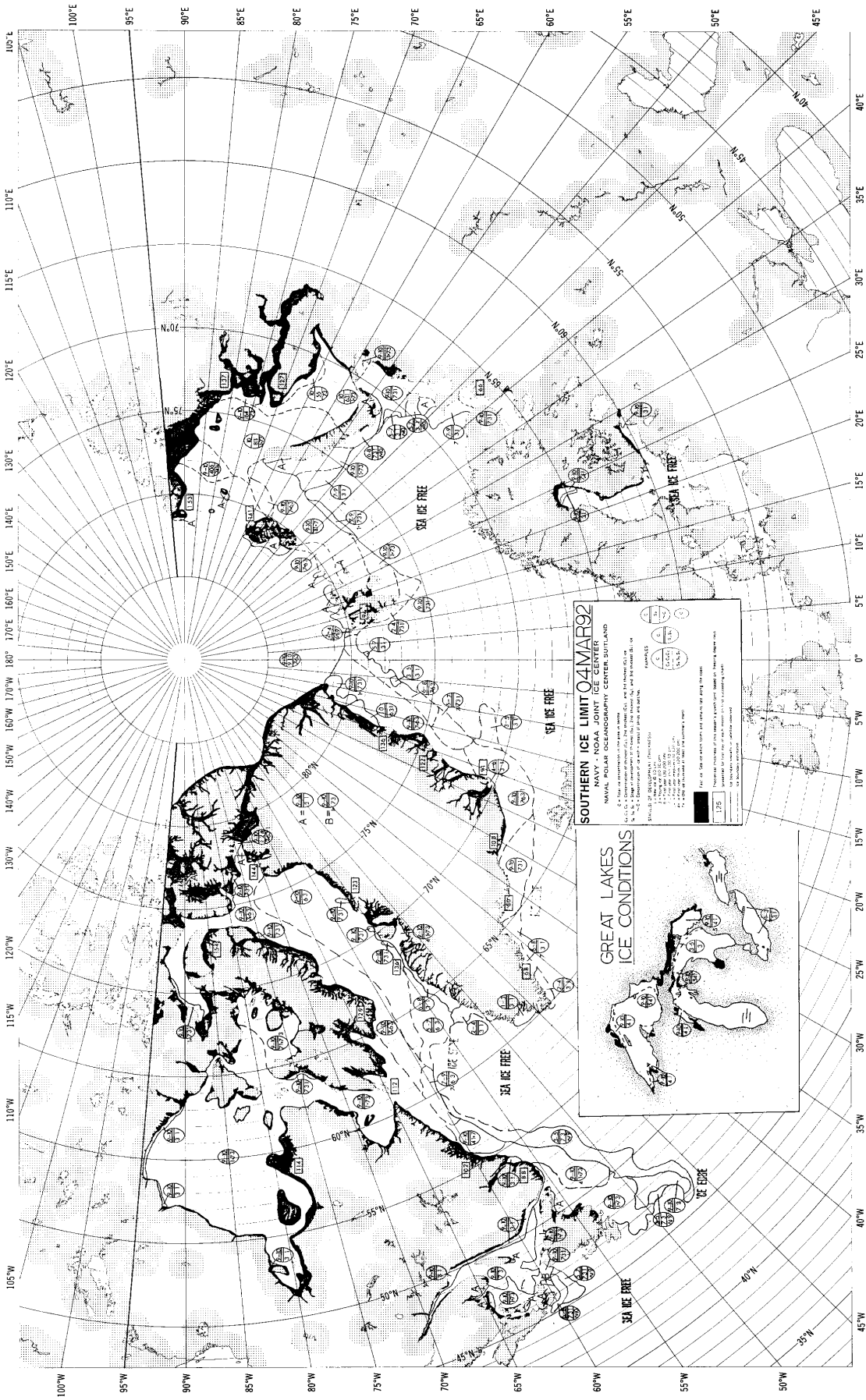


SOUTHERN ICE LIMIT 19 FEB 92
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1. Data are observations from ships, aircraft, and satellite data.
 2. Data are plotted on a 1-degree grid.
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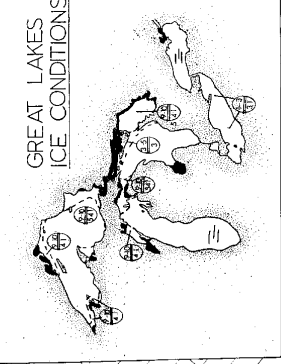


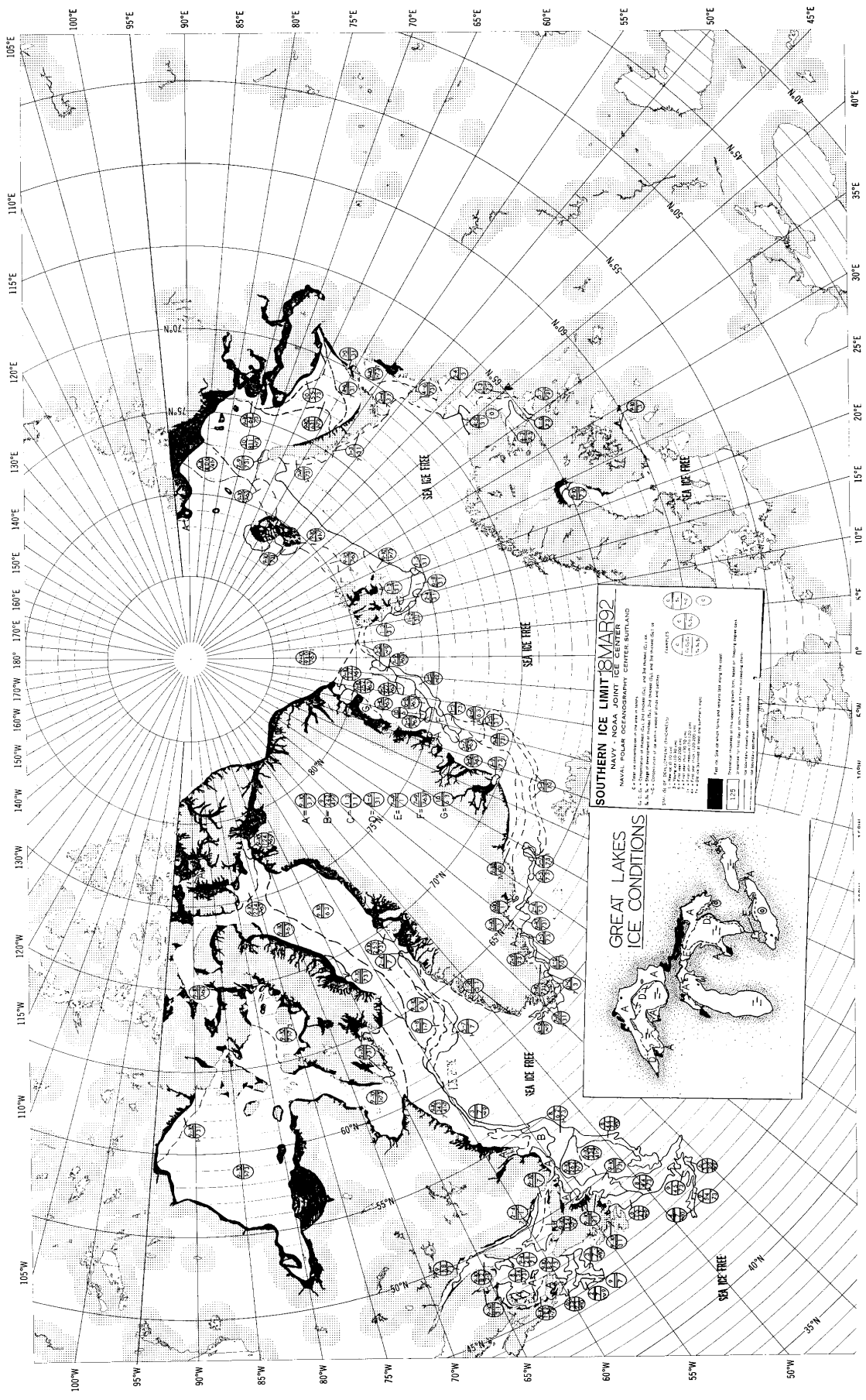




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1. This chart shows the limits of sea ice in the Arctic Ocean. It is based on data received from the Navy and NOAA. It is not a guarantee of accuracy.
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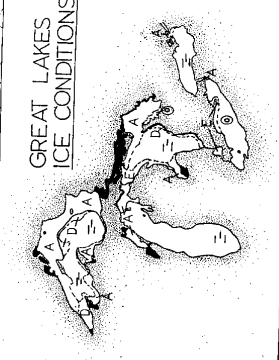
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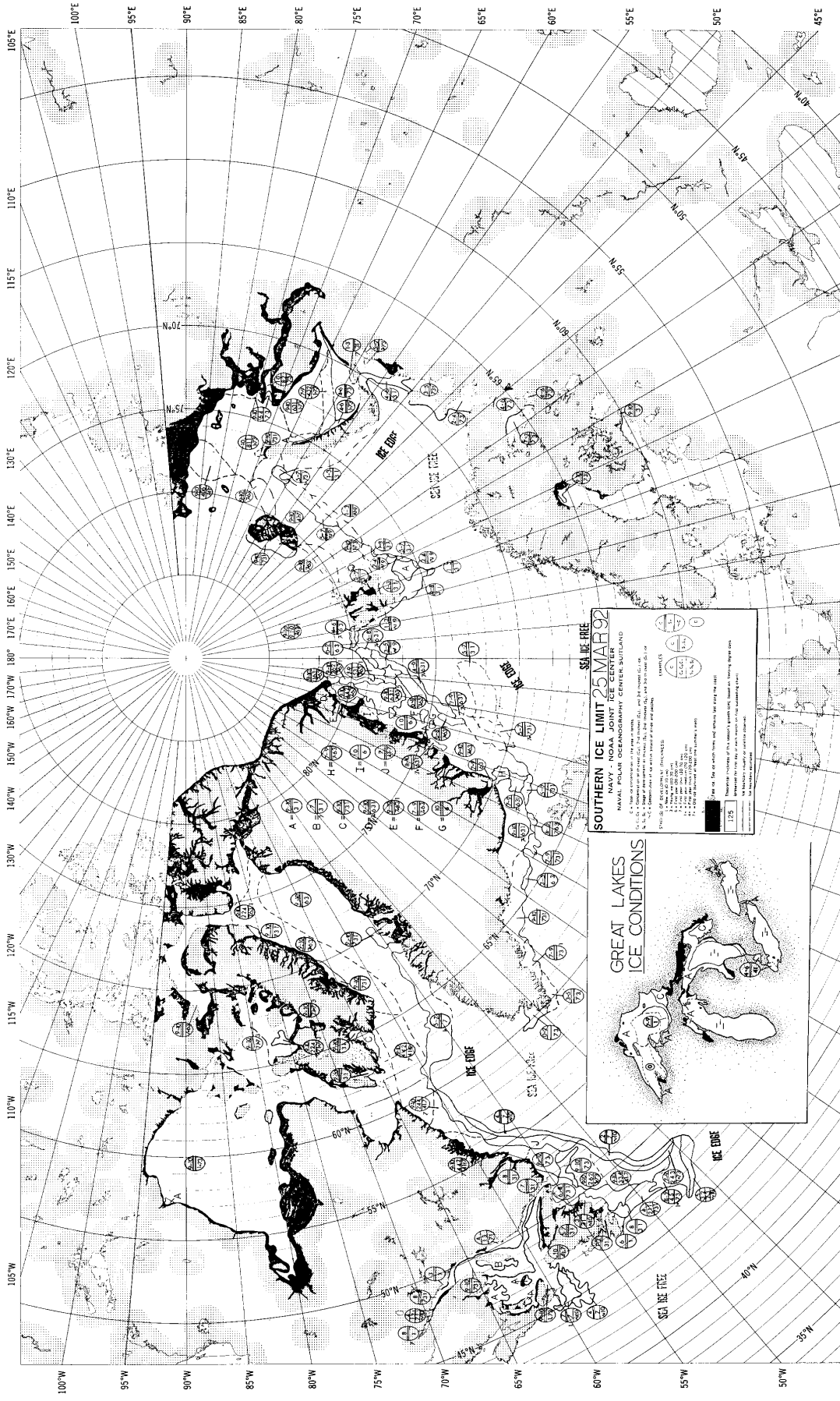
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SOUTHERN ICE LIMIT 25 MAR 92
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U.S.G. - Department of Defense, Office of Naval Intelligence, and the National Oceanic and Atmospheric Administration, Office of Ocean Resources and Assessment, and the National Ice Center.

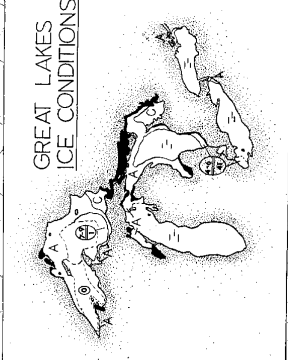
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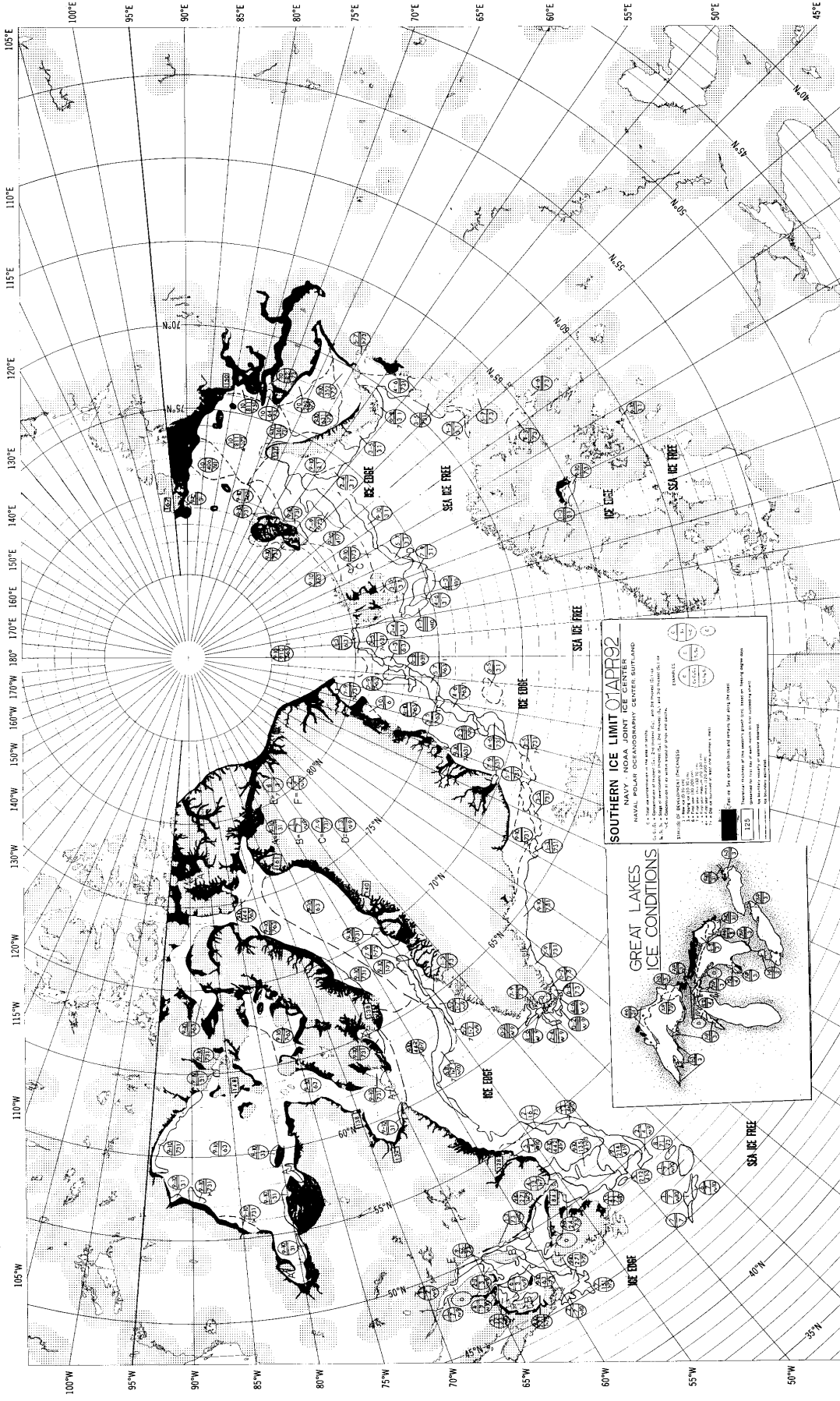
- 1 - 100% ice cover
- 2 - 75% ice cover
- 3 - 50% ice cover
- 4 - 25% ice cover
- 5 - 10% ice cover
- 6 - 5% ice cover
- 7 - 2% ice cover
- 8 - 1% ice cover
- 9 - 0% ice cover

EXAMPLES:

- 100% ice cover
- 75% ice cover
- 50% ice cover
- 25% ice cover
- 10% ice cover
- 5% ice cover
- 2% ice cover
- 1% ice cover
- 0% ice cover

NOTE: The size of each circle and symbol size vary with the amount of ice cover. The size of the circle is proportional to the amount of ice cover. The size of the symbol is proportional to the amount of ice cover.





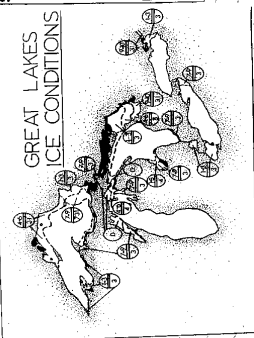
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 U.S. NAVY - NOAA JOINT ICE CENTER SUIFUND
 U.S. NAVY - NOAA JOINT ICE CENTER SUIFUND

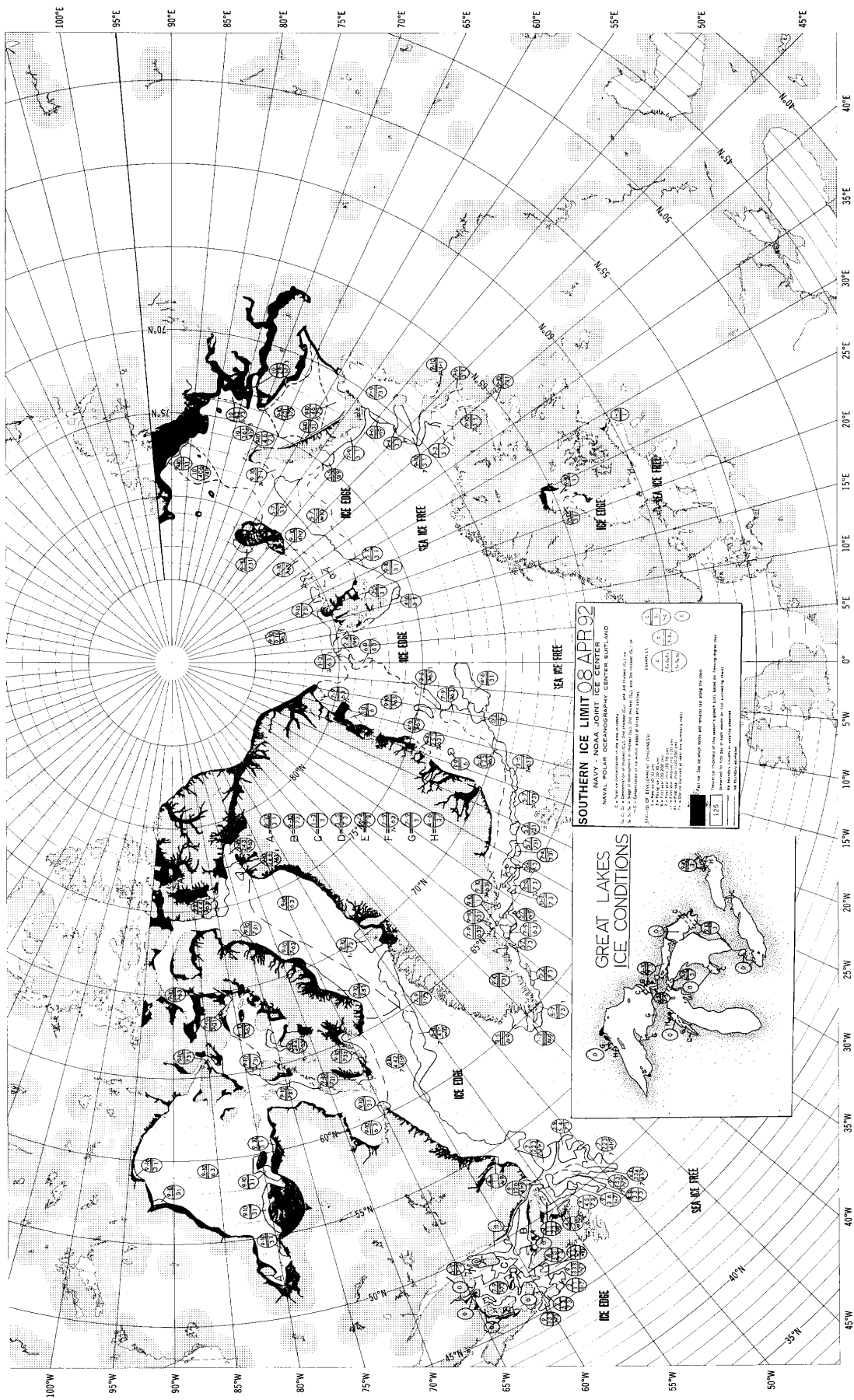
SOURCES OF OBSERVATION DATA:
 1. NAVY POLAR OCEANOGRAPHY CENTER SUIFUND
 2. NAVY POLAR OCEANOGRAPHY CENTER SUIFUND
 3. NAVY POLAR OCEANOGRAPHY CENTER SUIFUND
 4. NAVY POLAR OCEANOGRAPHY CENTER SUIFUND

EXPLANATION:
 1. ICE LIMIT (CIRCLING NUMBER)
 2. ICE LIMIT (CIRCLING NUMBER)
 3. ICE LIMIT (CIRCLING NUMBER)
 4. ICE LIMIT (CIRCLING NUMBER)

NOTES:
 1. THIS MAP IS A GENERALIZATION OF DATA AND SHOULD NOT BE USED FOR
 2. THIS MAP IS A GENERALIZATION OF DATA AND SHOULD NOT BE USED FOR
 3. THIS MAP IS A GENERALIZATION OF DATA AND SHOULD NOT BE USED FOR
 4. THIS MAP IS A GENERALIZATION OF DATA AND SHOULD NOT BE USED FOR

125





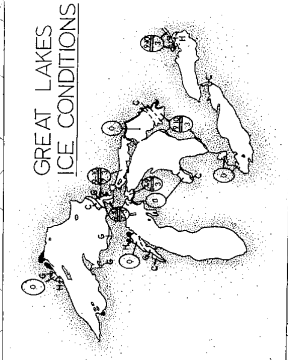
SOUTHERN ICE LIMIT 08 APR 92
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUIF/LAND

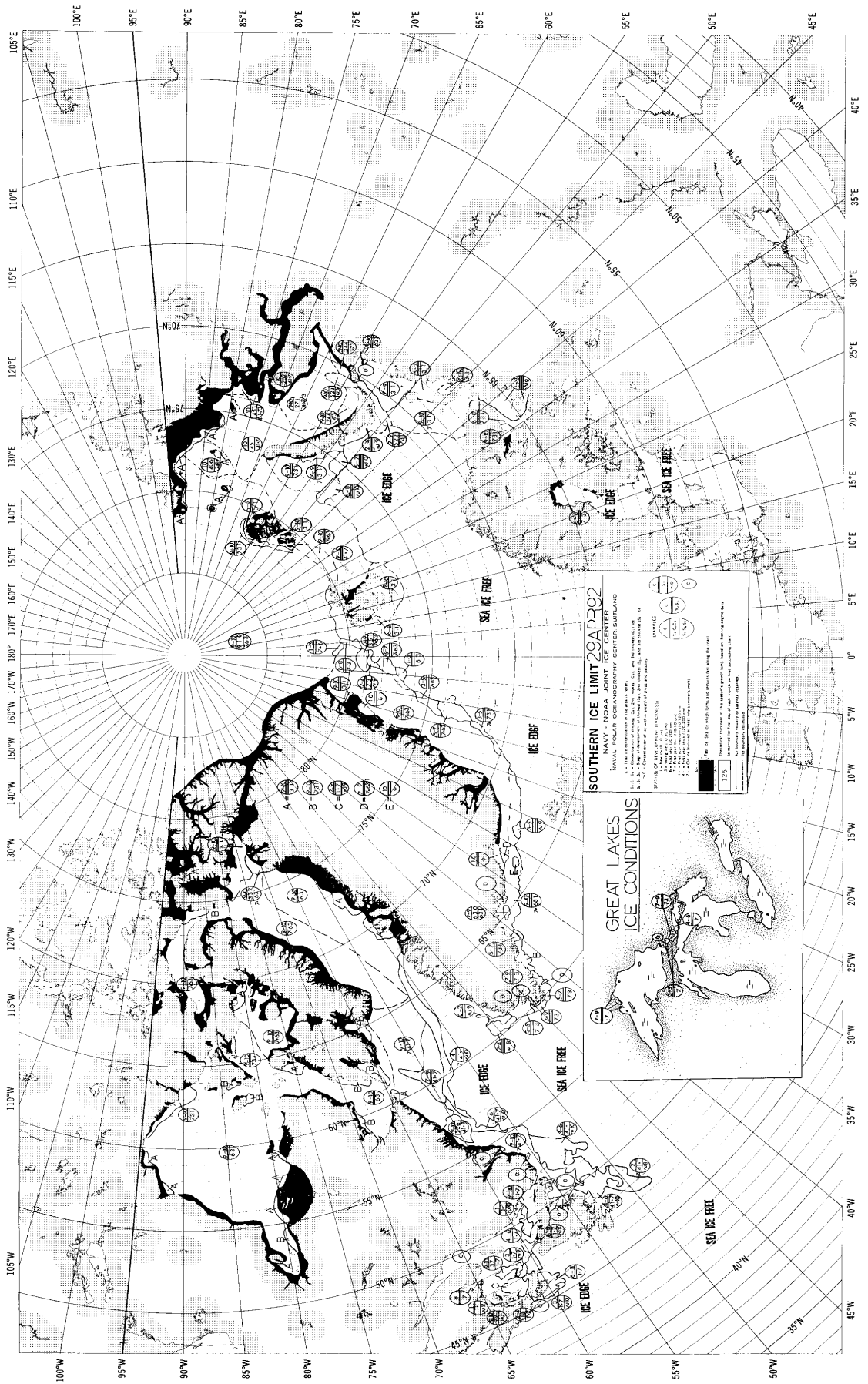
1. 24-Hour Ice Thickness (cm) (from 0 to 100) (from 0 to 100)
 2. 24-Hour Ice Thickness (cm) (from 100 to 200) (from 100 to 200)
 3. 24-Hour Ice Thickness (cm) (from 200 to 300) (from 200 to 300)
 4. 24-Hour Ice Thickness (cm) (from 300 to 400) (from 300 to 400)
 5. 24-Hour Ice Thickness (cm) (from 400 to 500) (from 400 to 500)
 6. 24-Hour Ice Thickness (cm) (from 500 to 600) (from 500 to 600)
 7. 24-Hour Ice Thickness (cm) (from 600 to 700) (from 600 to 700)
 8. 24-Hour Ice Thickness (cm) (from 700 to 800) (from 700 to 800)
 9. 24-Hour Ice Thickness (cm) (from 800 to 900) (from 800 to 900)
 10. 24-Hour Ice Thickness (cm) (from 900 to 1000) (from 900 to 1000)

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 2. 24-Hour Ice Thickness (cm) (from 100 to 200) (from 100 to 200)
 3. 24-Hour Ice Thickness (cm) (from 200 to 300) (from 200 to 300)
 4. 24-Hour Ice Thickness (cm) (from 300 to 400) (from 300 to 400)
 5. 24-Hour Ice Thickness (cm) (from 400 to 500) (from 400 to 500)
 6. 24-Hour Ice Thickness (cm) (from 500 to 600) (from 500 to 600)
 7. 24-Hour Ice Thickness (cm) (from 600 to 700) (from 600 to 700)
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 9. 24-Hour Ice Thickness (cm) (from 800 to 900) (from 800 to 900)
 10. 24-Hour Ice Thickness (cm) (from 900 to 1000) (from 900 to 1000)

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 9. 24-Hour Ice Thickness (cm) (from 800 to 900) (from 800 to 900)
 10. 24-Hour Ice Thickness (cm) (from 900 to 1000) (from 900 to 1000)

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 3. 24-Hour Ice Thickness (cm) (from 200 to 300) (from 200 to 300)
 4. 24-Hour Ice Thickness (cm) (from 300 to 400) (from 300 to 400)
 5. 24-Hour Ice Thickness (cm) (from 400 to 500) (from 400 to 500)
 6. 24-Hour Ice Thickness (cm) (from 500 to 600) (from 500 to 600)
 7. 24-Hour Ice Thickness (cm) (from 600 to 700) (from 600 to 700)
 8. 24-Hour Ice Thickness (cm) (from 700 to 800) (from 700 to 800)
 9. 24-Hour Ice Thickness (cm) (from 800 to 900) (from 800 to 900)
 10. 24-Hour Ice Thickness (cm) (from 900 to 1000) (from 900 to 1000)





SOUTHERN ICE LIMIT 20 APR 92
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND

1. Data from the National Ice Center (NIC) and the Polar Ice Center (PIC) are used to determine the ice limit. The ice limit is defined as the southernmost edge of the ice pack.

2. The ice limit is shown as a solid line. The ice limit is shown as a dashed line when the ice pack is broken up by leads.

3. The ice limit is shown as a dotted line when the ice pack is broken up by leads and the ice limit is not clearly defined.

4. The ice limit is shown as a dash-dot line when the ice pack is broken up by leads and the ice limit is not clearly defined.

5. The ice limit is shown as a solid line with a dashed line when the ice pack is broken up by leads and the ice limit is not clearly defined.

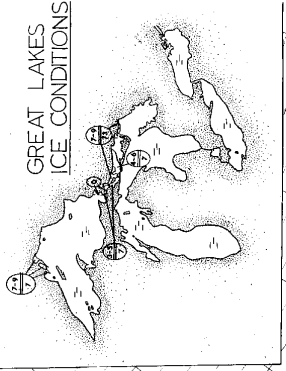
6. The ice limit is shown as a solid line with a dotted line when the ice pack is broken up by leads and the ice limit is not clearly defined.

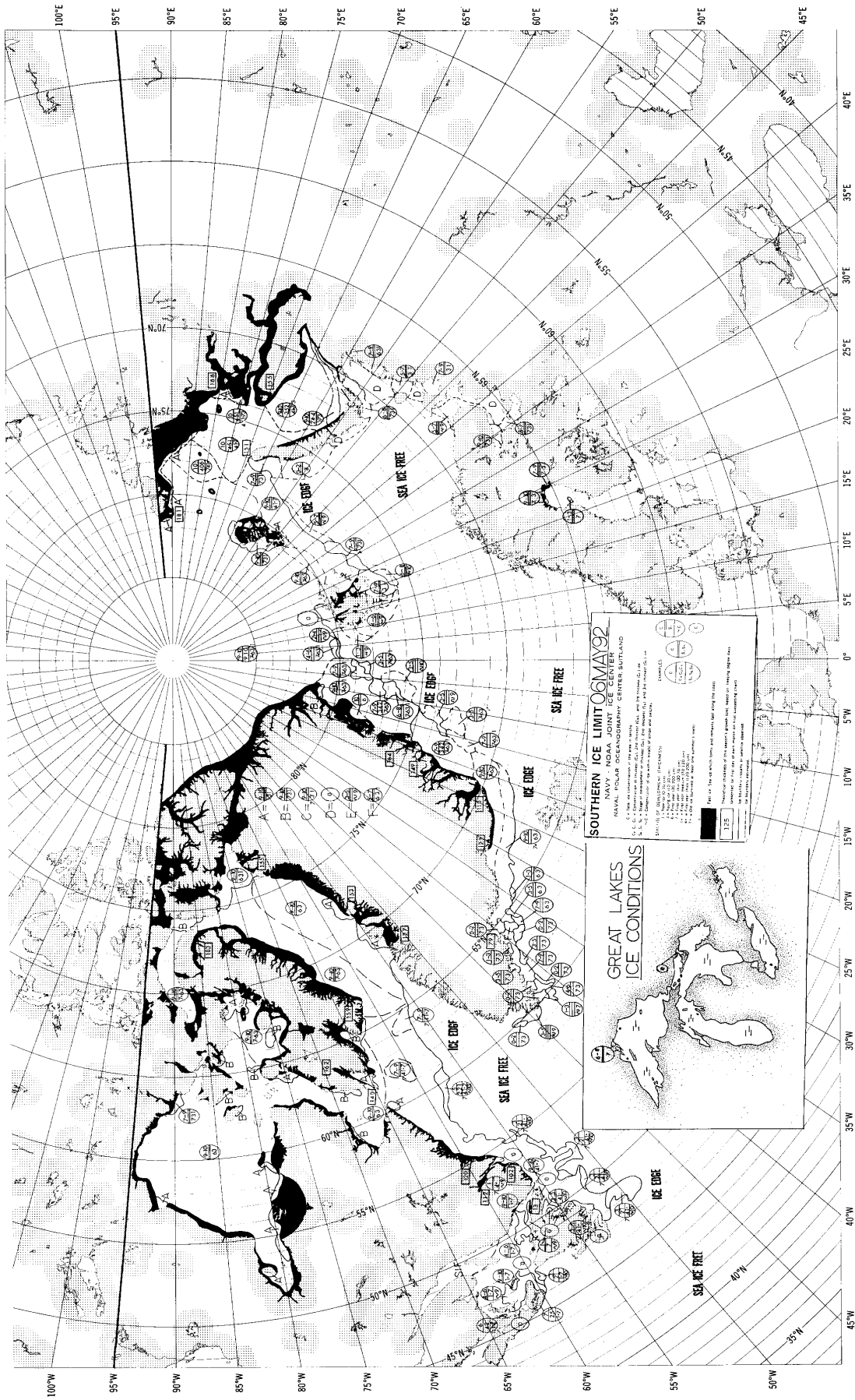
7. The ice limit is shown as a solid line with a dash-dot line when the ice pack is broken up by leads and the ice limit is not clearly defined.

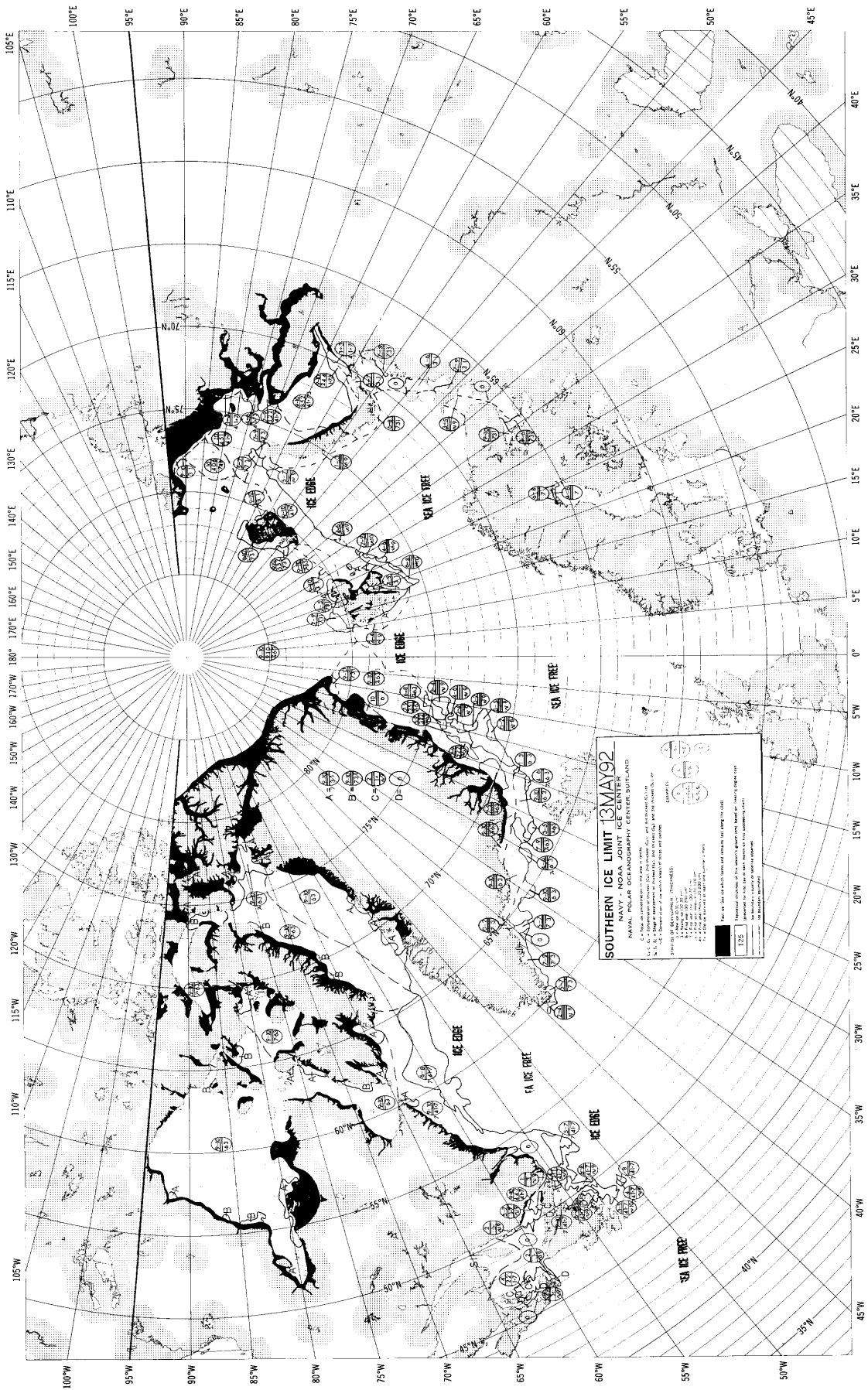
8. The ice limit is shown as a solid line with a dash-dot-dot line when the ice pack is broken up by leads and the ice limit is not clearly defined.

9. The ice limit is shown as a solid line with a dotted line and a dash-dot line when the ice pack is broken up by leads and the ice limit is not clearly defined.

10. The ice limit is shown as a solid line with a dotted line and a dash-dot-dot line when the ice pack is broken up by leads and the ice limit is not clearly defined.







SOUTHERN ICE LIMIT 13 MAY 92
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND

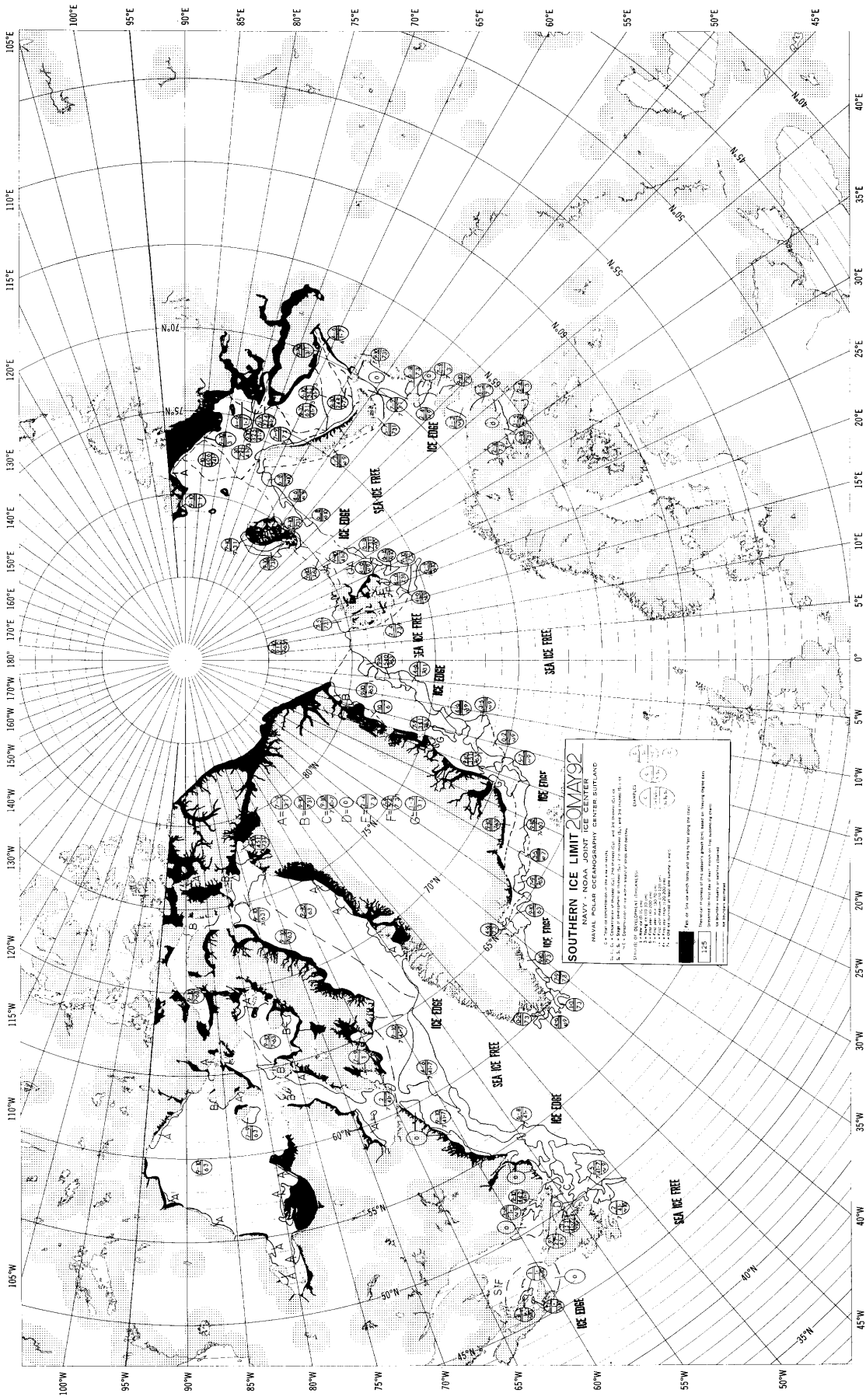
1. This map is a composite of data from the following sources:
 a. U.S. Navy Antarctic Operation Log (AOL) data
 b. U.S. Navy Antarctic Research Expedition (AREX) data
 c. U.S. Navy Antarctic Research Expedition (AREX) data
 d. U.S. Navy Antarctic Research Expedition (AREX) data
 e. U.S. Navy Antarctic Research Expedition (AREX) data
 f. U.S. Navy Antarctic Research Expedition (AREX) data
 g. U.S. Navy Antarctic Research Expedition (AREX) data
 h. U.S. Navy Antarctic Research Expedition (AREX) data
 i. U.S. Navy Antarctic Research Expedition (AREX) data
 j. U.S. Navy Antarctic Research Expedition (AREX) data
 k. U.S. Navy Antarctic Research Expedition (AREX) data
 l. U.S. Navy Antarctic Research Expedition (AREX) data
 m. U.S. Navy Antarctic Research Expedition (AREX) data
 n. U.S. Navy Antarctic Research Expedition (AREX) data
 o. U.S. Navy Antarctic Research Expedition (AREX) data
 p. U.S. Navy Antarctic Research Expedition (AREX) data
 q. U.S. Navy Antarctic Research Expedition (AREX) data
 r. U.S. Navy Antarctic Research Expedition (AREX) data
 s. U.S. Navy Antarctic Research Expedition (AREX) data
 t. U.S. Navy Antarctic Research Expedition (AREX) data
 u. U.S. Navy Antarctic Research Expedition (AREX) data
 v. U.S. Navy Antarctic Research Expedition (AREX) data
 w. U.S. Navy Antarctic Research Expedition (AREX) data
 x. U.S. Navy Antarctic Research Expedition (AREX) data
 y. U.S. Navy Antarctic Research Expedition (AREX) data
 z. U.S. Navy Antarctic Research Expedition (AREX) data

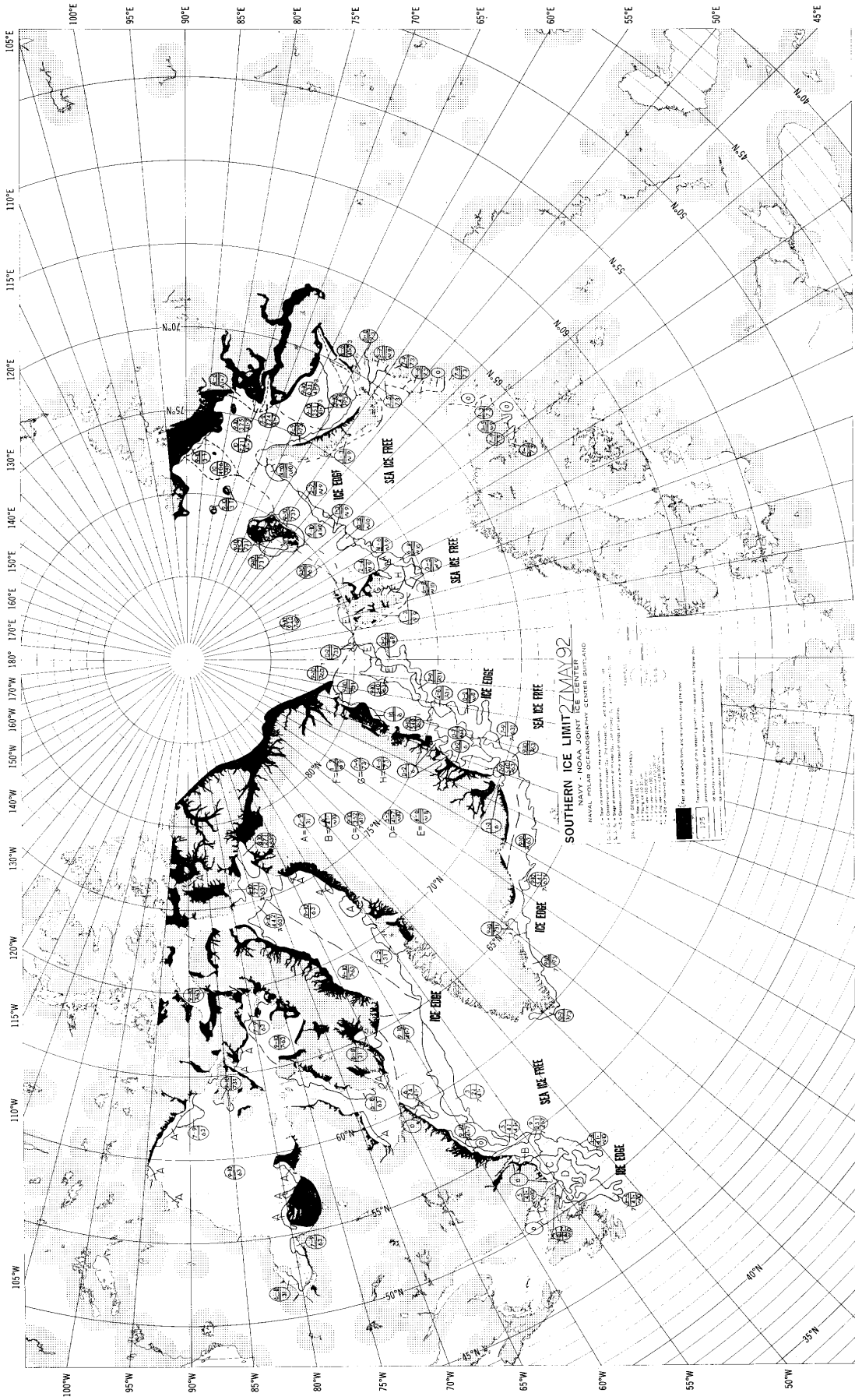
2. Symbols are defined as follows:
 A - 100% Ice Free
 B - 75% Ice Free
 C - 50% Ice Free
 D - 25% Ice Free
 E - 10% Ice Free
 F - 5% Ice Free
 G - 2% Ice Free
 H - 1% Ice Free
 I - 0.5% Ice Free
 J - 0.2% Ice Free
 K - 0.1% Ice Free
 L - 0.05% Ice Free
 M - 0.02% Ice Free
 N - 0.01% Ice Free
 O - 0.005% Ice Free
 P - 0.002% Ice Free
 Q - 0.001% Ice Free
 R - 0.0005% Ice Free
 S - 0.0002% Ice Free
 T - 0.0001% Ice Free
 U - 0.00005% Ice Free
 V - 0.00002% Ice Free
 W - 0.00001% Ice Free
 X - 0.000005% Ice Free
 Y - 0.000002% Ice Free
 Z - 0.000001% Ice Free

3. Symbols with letters A through Z are defined as follows:
 A - 100% Ice Free
 B - 75% Ice Free
 C - 50% Ice Free
 D - 25% Ice Free
 E - 10% Ice Free
 F - 5% Ice Free
 G - 2% Ice Free
 H - 1% Ice Free
 I - 0.5% Ice Free
 J - 0.2% Ice Free
 K - 0.1% Ice Free
 L - 0.05% Ice Free
 M - 0.02% Ice Free
 N - 0.01% Ice Free
 O - 0.005% Ice Free
 P - 0.002% Ice Free
 Q - 0.001% Ice Free
 R - 0.0005% Ice Free
 S - 0.0002% Ice Free
 T - 0.0001% Ice Free
 U - 0.00005% Ice Free
 V - 0.00002% Ice Free
 W - 0.00001% Ice Free
 X - 0.000005% Ice Free
 Y - 0.000002% Ice Free
 Z - 0.000001% Ice Free

4. Symbols with numbers 1 through 9 are defined as follows:
 1 - 100% Ice Free
 2 - 75% Ice Free
 3 - 50% Ice Free
 4 - 25% Ice Free
 5 - 10% Ice Free
 6 - 5% Ice Free
 7 - 2% Ice Free
 8 - 1% Ice Free
 9 - 0.5% Ice Free

5. Symbols with letters A through Z and numbers 1 through 9 are defined as follows:
 A-1 - 100% Ice Free
 B-1 - 75% Ice Free
 C-1 - 50% Ice Free
 D-1 - 25% Ice Free
 E-1 - 10% Ice Free
 F-1 - 5% Ice Free
 G-1 - 2% Ice Free
 H-1 - 1% Ice Free
 I-1 - 0.5% Ice Free
 J-1 - 0.2% Ice Free
 K-1 - 0.1% Ice Free
 L-1 - 0.05% Ice Free
 M-1 - 0.02% Ice Free
 N-1 - 0.01% Ice Free
 O-1 - 0.005% Ice Free
 P-1 - 0.002% Ice Free
 Q-1 - 0.001% Ice Free
 R-1 - 0.0005% Ice Free
 S-1 - 0.0002% Ice Free
 T-1 - 0.0001% Ice Free
 U-1 - 0.00005% Ice Free
 V-1 - 0.00002% Ice Free
 W-1 - 0.00001% Ice Free
 X-1 - 0.000005% Ice Free
 Y-1 - 0.000002% Ice Free
 Z-1 - 0.000001% Ice Free





SOUTHERN ICE LIMIT 21 MAR 02

NAVY - NOAA JOINT ICE CENTER, BURLINGAME, CA

NAVY - NOAA JOINT ICE CENTER, BURLINGAME, CA

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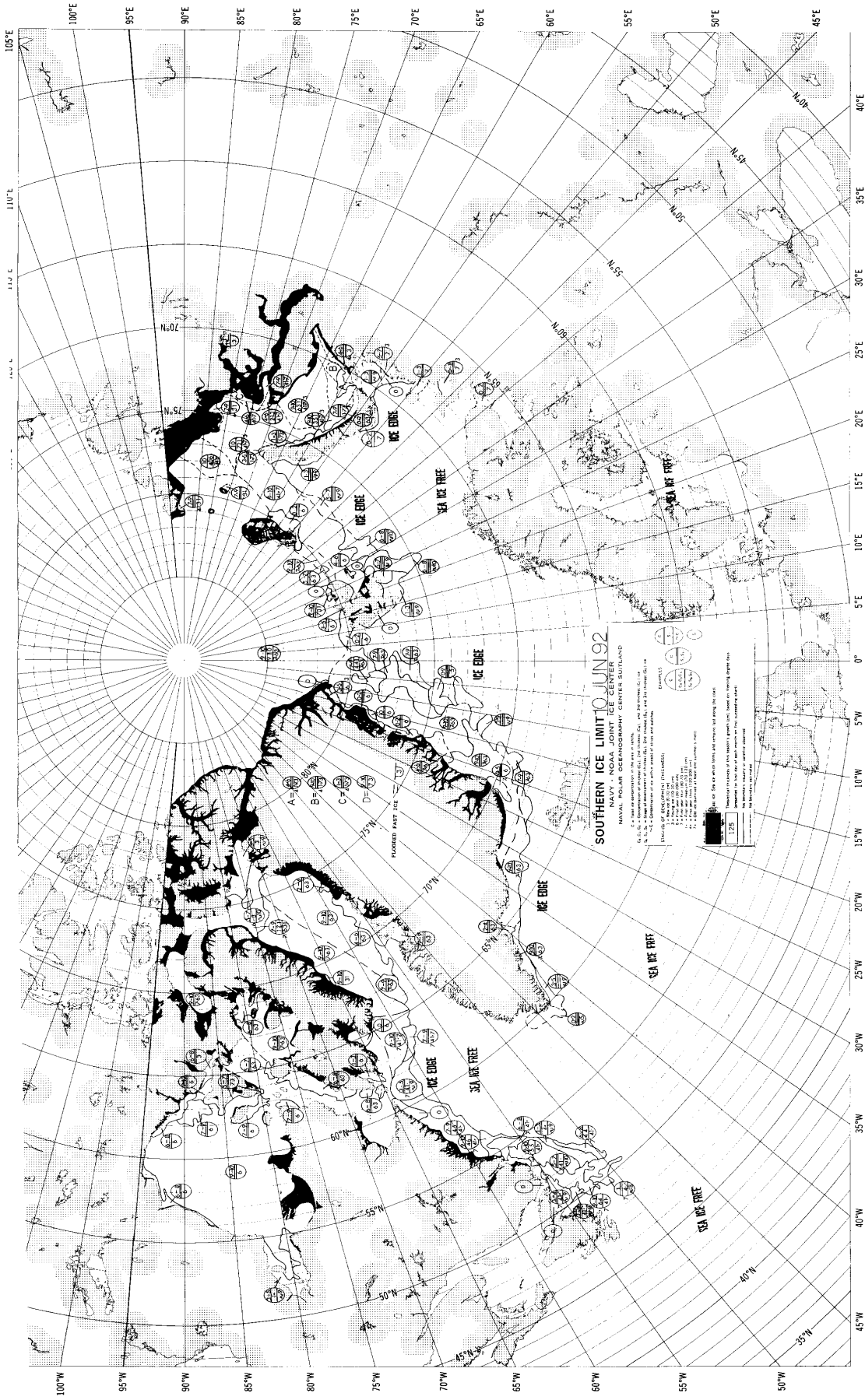
NAVY - NOAA JOINT ICE CENTER, BURLINGAME, CA

NAVY - NOAA JOINT ICE CENTER, BURLINGAME, CA

NAVY - NOAA JOINT ICE CENTER, BURLINGAME, CA

NAVY - NOAA JOINT ICE CENTER, BURLINGAME, CA

NAVY - NOAA JOINT ICE CENTER, BURLINGAME, CA



SOUTHERN ICE LIMIT TO JUN 92

NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

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NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

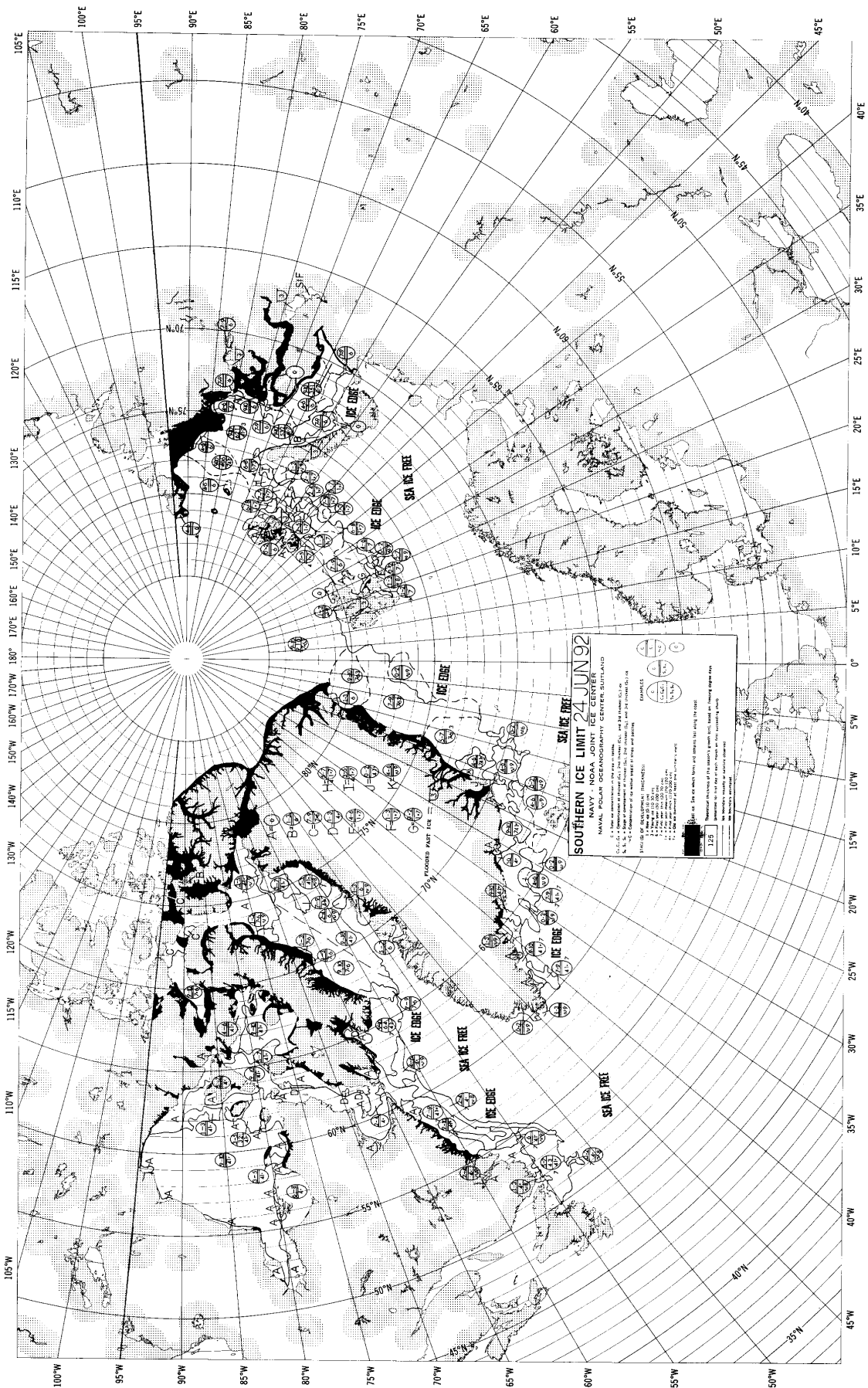
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

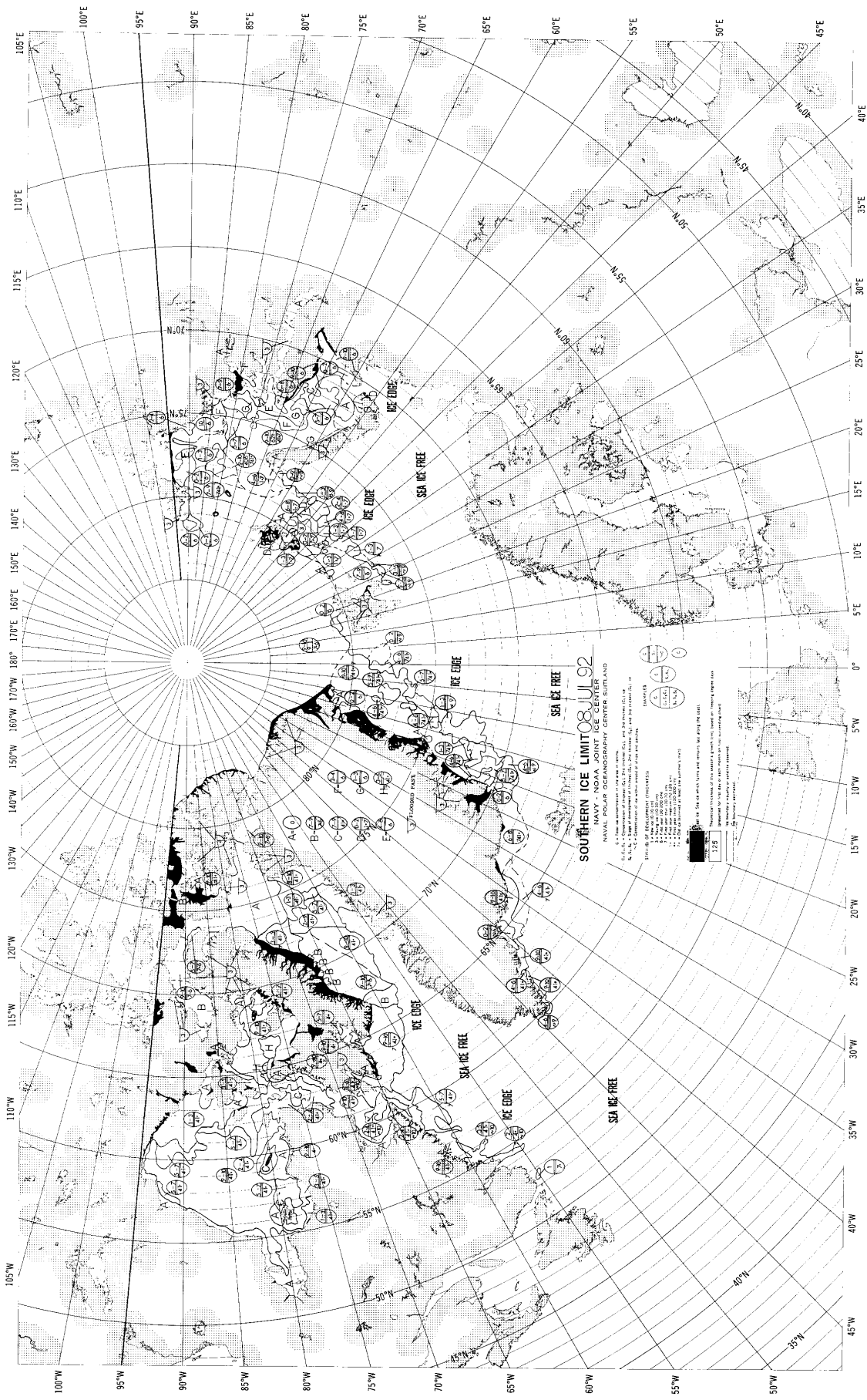
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND



SOUTHERN ICE LIMIT 24 JUN 92
 NAVAL JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, GAITHERSBURG, MD

1. 1" Data for interpretation of the map symbols.
 2. 1" Data for interpretation of the map symbols.
 3. 1" Data for interpretation of the map symbols.
 4. 1" Data for interpretation of the map symbols.
 5. 1" Data for interpretation of the map symbols.
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 9. 1" Data for interpretation of the map symbols.
 10. 1" Data for interpretation of the map symbols.

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 8. 1" Data for interpretation of the map symbols.
 9. 1" Data for interpretation of the map symbols.
 10. 1" Data for interpretation of the map symbols.



SOUTHERN ICE LIMIT 08 JUL 02

NAVY - NOAA JOINT ICE CENTER
ANTARCTIC

1:500,000

DATE: 08 JUL 02
TIME: 0000 UTC

STATION: 128

1. 128 is the station number.

2. 0000 UTC is the time of day.

3. 08 JUL 02 is the date.

4. ANTARCTIC is the region.

5. NAVY - NOAA JOINT ICE CENTER is the organization.

6. SOUTHERN ICE LIMIT 08 JUL 02 is the title.

7. 1:500,000 is the scale.

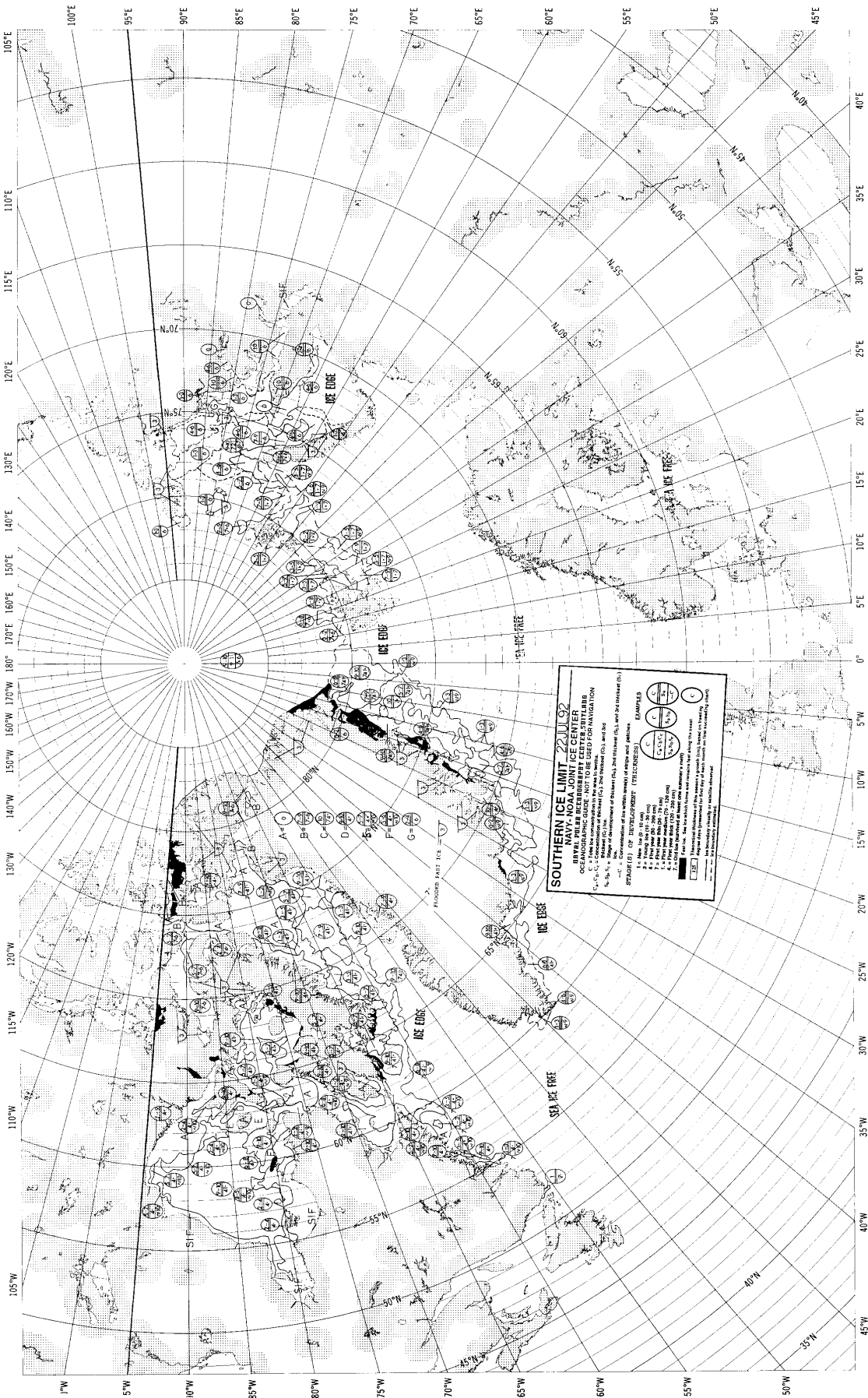
8. ANTARCTIC is the region.

9. NAVY - NOAA JOINT ICE CENTER is the organization.

10. SOUTHERN ICE LIMIT 08 JUL 02 is the title.

11. 1:500,000 is the scale.





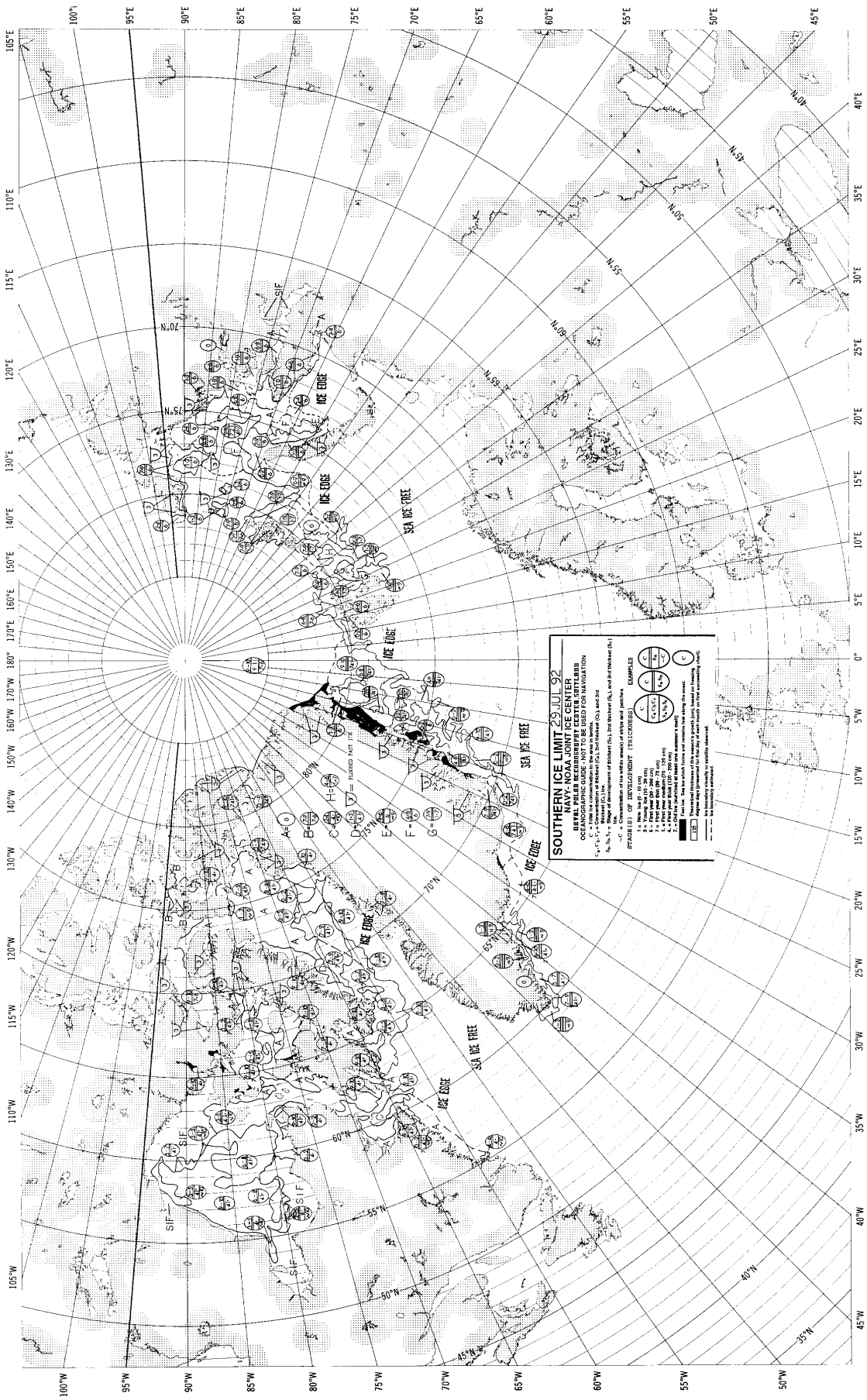
SOUTHERN ICE LIMIT 22 JUL 02
 NAVY-NOAA JOINT ICE CENTER
 HERBERT CENTER STATION
 OCEANOGRAPHIC GUIDE
 OCEANOGRAPHIC GUIDE FOR NAVIGATION

1. Isotherms are shown to the north of the 40°S latitude.
 2. Isotherms are shown to the south of the 40°S latitude.
 3. Isotherms are shown to the south of the 40°S latitude.
 4. Isotherms are shown to the south of the 40°S latitude.
 5. Isotherms are shown to the south of the 40°S latitude.
 6. Isotherms are shown to the south of the 40°S latitude.

EXAMPLES
 A-0
 B-1
 C-2
 D-3
 E-4
 F-5
 G-6

ICE LIMIT
 ICE EDGE
 SEA ICE FREE
 ICE FREE

FLORIAN RAZZ, ICG



SOUTHERN ICE LIMIT 29 JUL 92
 NAVY-NOAA JOINT ICE CENTER
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
 1. A, B, C - Concentration of ice (%); 2. D, E, F, G - Ice thickness (ft); 3. H, I, J, K - Range of development of ice (%); 4. L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z - Other ice types (see text)

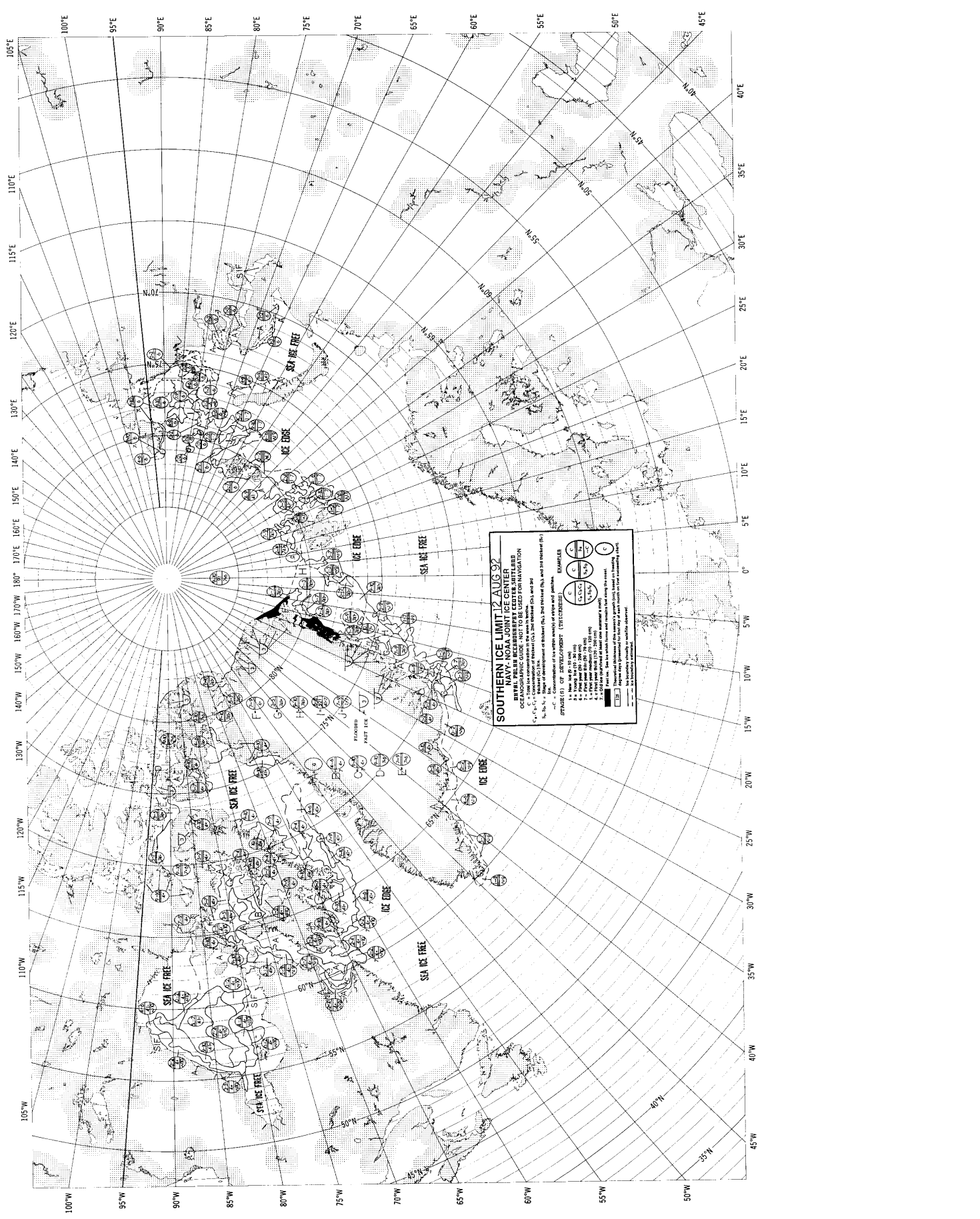
SYMBOLS OF DEVELOPMENT (ICE TYPES)

1. 1-2 - Young ice (1st-2nd year)
 2. 3-4 - Old ice (3rd-4th year)
 3. 5-6 - Heavy ice (5th-6th year)
 4. 7-8 - Very heavy ice (7th-8th year)
 5. 9-10 - Extreme heavy ice (9th-10th year)

EXAMPLES

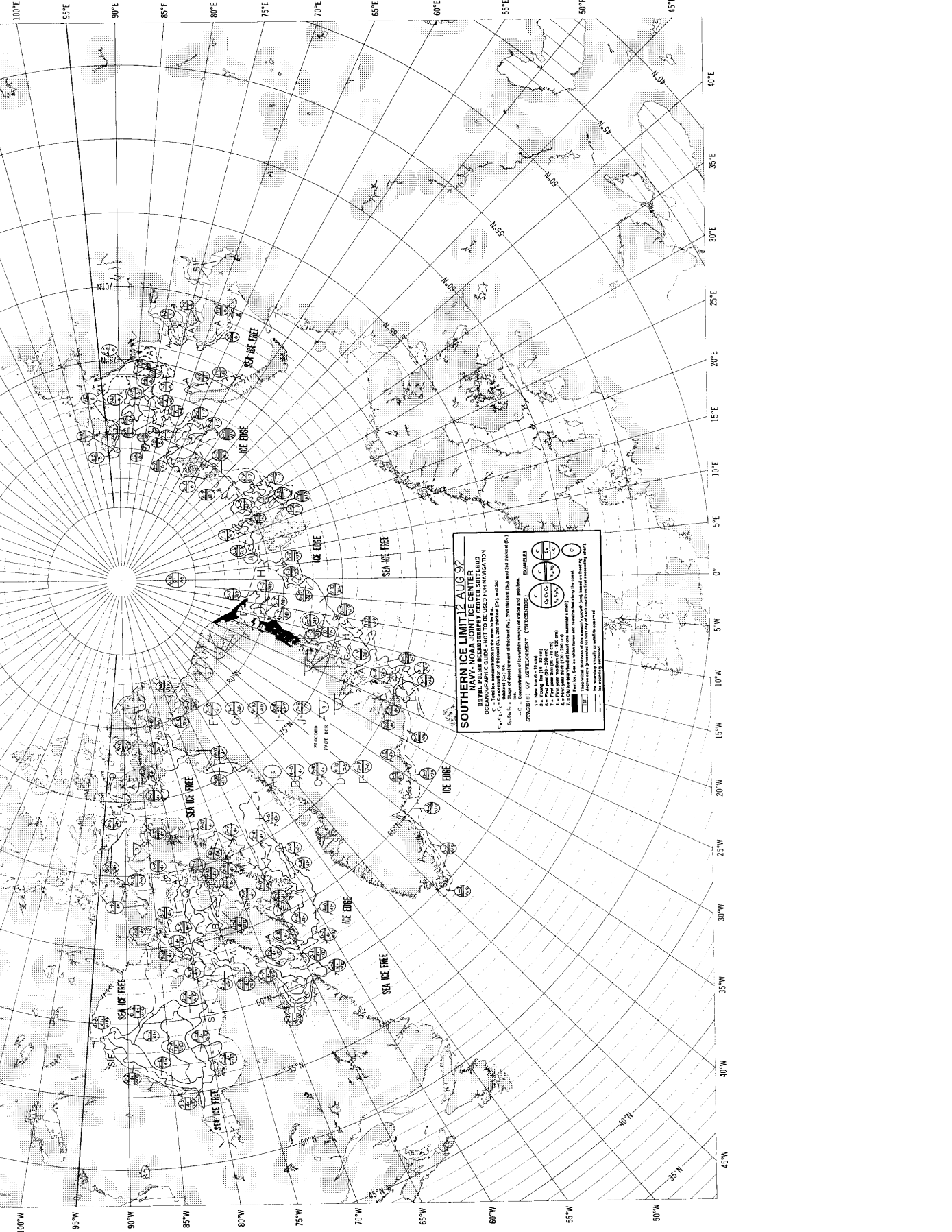
1. $\text{A} \frac{10}{10}$ - 10% concentration of young ice (1st-2nd year)
 2. $\text{B} \frac{10}{10}$ - 10% concentration of old ice (3rd-4th year)
 3. $\text{C} \frac{10}{10}$ - 10% concentration of heavy ice (5th-6th year)
 4. $\text{D} \frac{10}{10}$ - 10% concentration of very heavy ice (7th-8th year)
 5. $\text{E} \frac{10}{10}$ - 10% concentration of extreme heavy ice (9th-10th year)

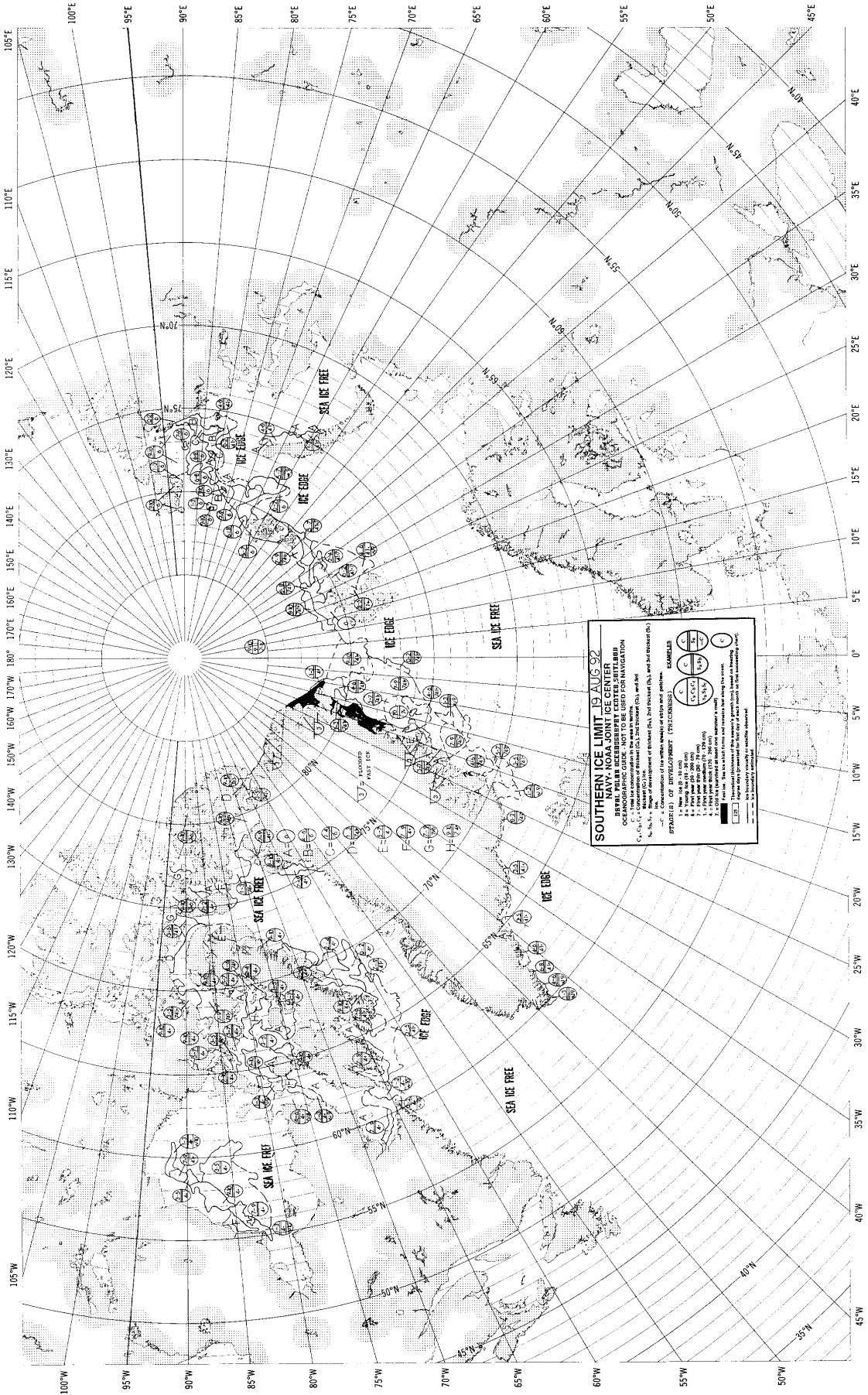
NOTES:
 1. Symbols are plotted on a grid of 1-degree squares.
 2. Symbols are plotted on a grid of 1-degree squares.
 3. Symbols are plotted on a grid of 1-degree squares.



SOUTHERN ICE LIMIT 12 AUG 92
 US NAVY, NOAA AND JOINT ICE CENTER
 DATA FROM 0800 TO 0100 UTC FOR EACH DAY
SYMBOLS RECEIVED TO BE USED FOR NAVIGATION
 O = Ice edge (circles) with day of month in center
 C, F, S, D, A, J, M, J, J, A, S, O, N, D = Ice edge (circles) with day of month in center
 G, L, T, V, W, X, Y, Z = Ice edge (circles) with day of month in center
 1, 2, 3, 4, 5 = Ice edge (circles) with day of month in center
 A - Q = Ice edge (circles) with day of month in center
 - = Sea ice free (dash)
 - = Remarks (dash)
 - = Unintelligible (dash)

EXAMPLES OF DEVELOPMENT (ICE EDGES)
 A - 120°E 45°N
 B - 110°E 45°N
 C - 100°E 45°N
 D - 90°E 45°N
 E - 80°E 45°N
 F - 70°E 45°N
 G - 60°E 45°N
 H - 50°E 45°N
 I - 40°E 45°N
 J - 30°E 45°N
 K - 20°E 45°N
 L - 10°E 45°N
 M - 0°E 45°N
 N - 10°W 45°N
 O - 20°W 45°N
 P - 30°W 45°N
 Q - 40°W 45°N





SOUTHERN ICE LIMIT 10 AUG 92
 DEVEL. FROM ICEBERG CENTER, SATTILBERG
 OCEANOGRAPHIC GUIDE, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992

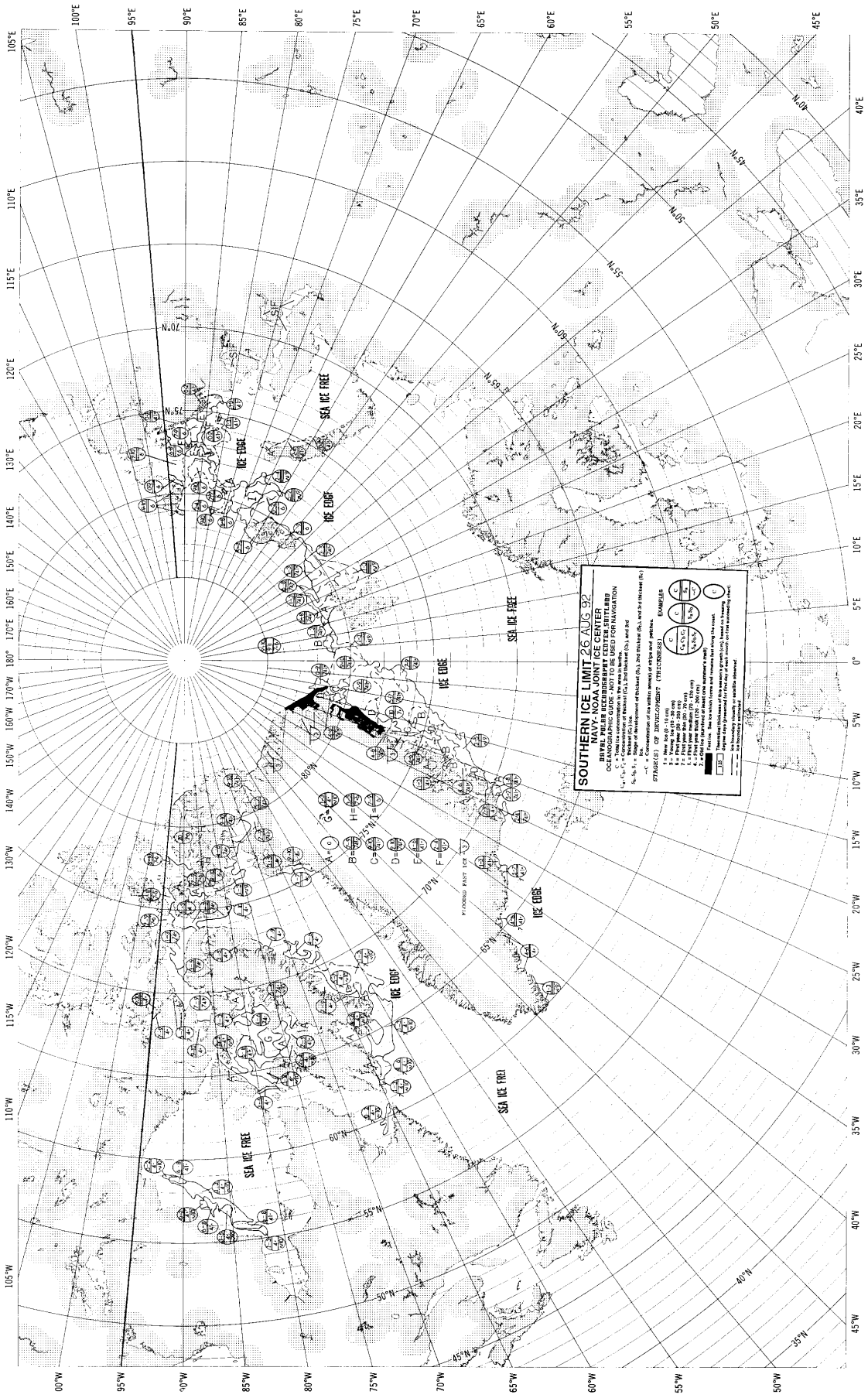
ICEBERG CENTER, SATTILBERG
 1. 1000-1000000 (1000-1000000)
 2. 1000-1000000 (1000-1000000)
 3. 1000-1000000 (1000-1000000)
 4. 1000-1000000 (1000-1000000)
 5. 1000-1000000 (1000-1000000)
 6. 1000-1000000 (1000-1000000)
 7. 1000-1000000 (1000-1000000)
 8. 1000-1000000 (1000-1000000)
 9. 1000-1000000 (1000-1000000)
 10. 1000-1000000 (1000-1000000)

EXAMPLES

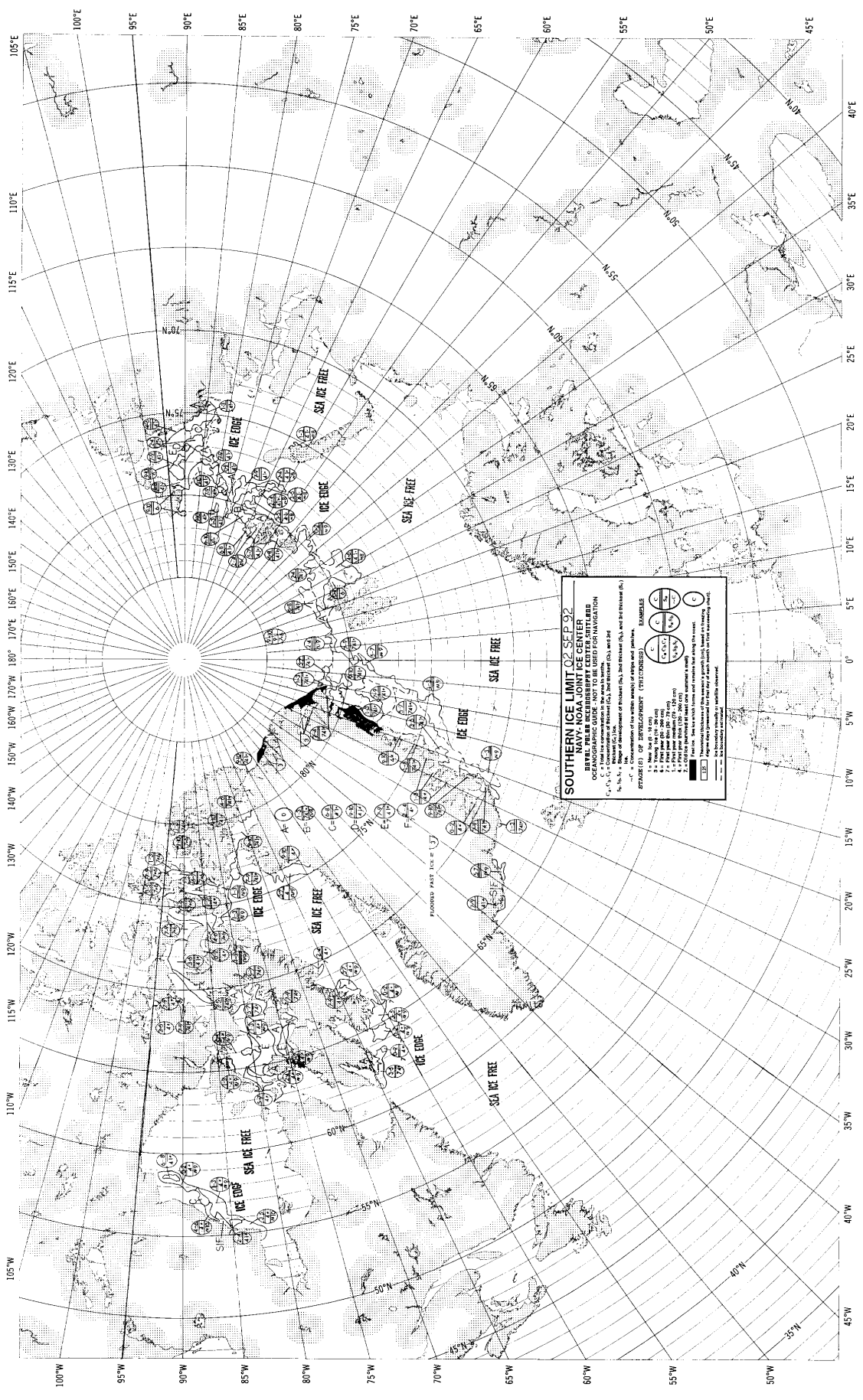
1. 1000-1000000 (1000-1000000)
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SOUTHERN ICE LIMIT 26 AUG 82
 NAVY CENTER FOR ICE INFORMATION
 BRIDGE, PULPER BUCKENBUSH CENTER, SIERRA
 ROAD, WASHINGTON, DC 20340
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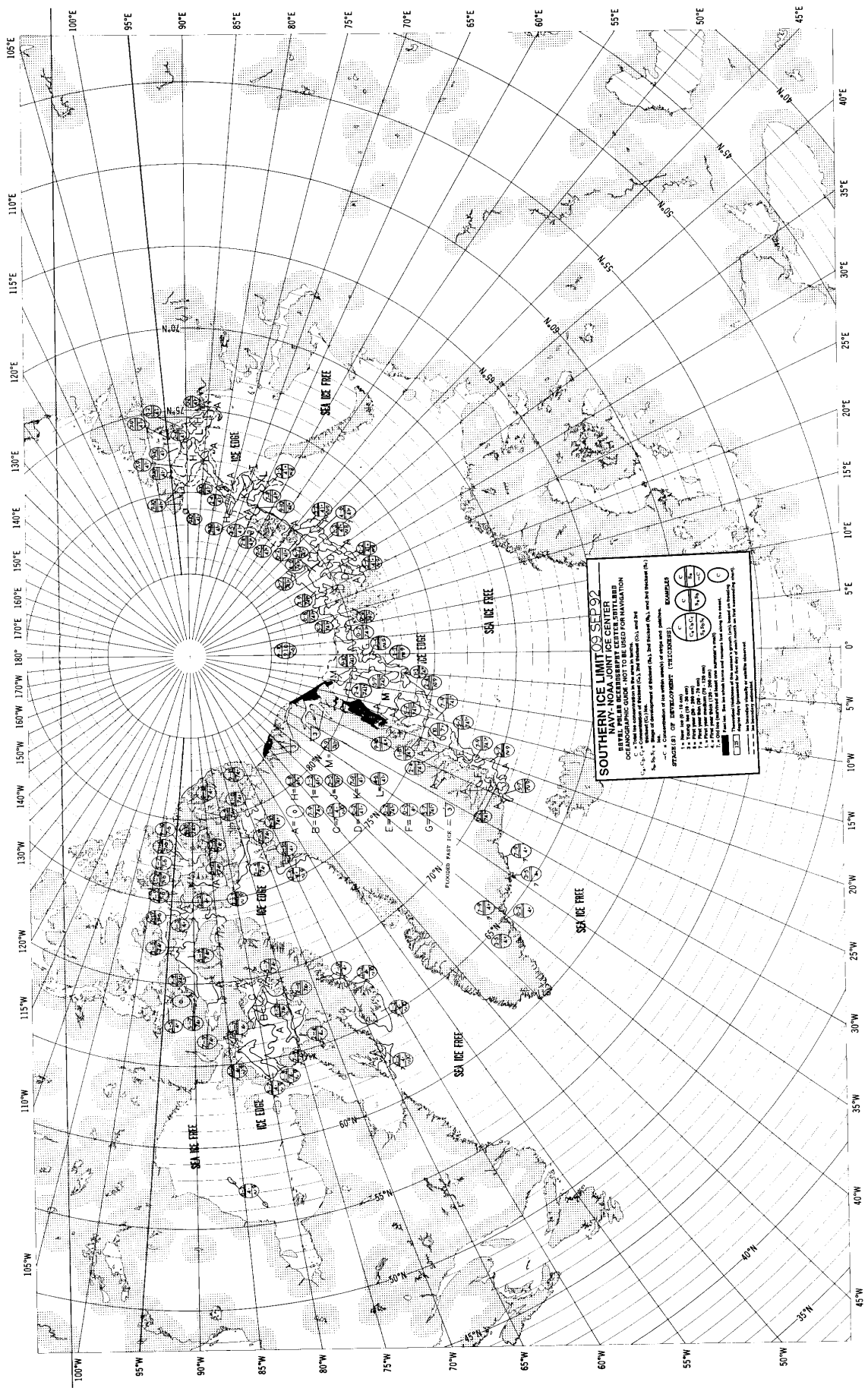
SOUTHERN ICE LIMIT 02 SEP 92
 U.S. NAVY-NOAA JOINT ICE CENTER
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

S₁, S₂, S₃ = Stages of development of brash (S₁), first (S₂) and (S₃)
 C = Concentration of brash (%) and thickness (ft.)
 * = Concentration of ice within areas of stage and patch
 (EXAMPLES)

(S ₁ 10)	(S ₂ 15)	(S ₃ 20)
(C 10)	(C 15)	(C 20)
(S ₁ 10)	(S ₂ 15)	(S ₃ 20)
(C 10)	(C 15)	(C 20)

1. Working ice (10-20 ft)
 2. 1st stage brash (10-20 ft)
 3. 2nd stage brash (10-20 ft)
 4. 3rd stage brash (10-20 ft)
 5. Sea ice concentration (10-20%)
 6. Ice concentration (10-20%)
 7. Ice concentration (10-20%)
 8. Ice concentration (10-20%)
 9. Ice concentration (10-20%)
 10. Ice concentration (10-20%)
 11. Ice concentration (10-20%)
 12. Ice concentration (10-20%)
 13. Ice concentration (10-20%)
 14. Ice concentration (10-20%)
 15. Ice concentration (10-20%)
 16. Ice concentration (10-20%)
 17. Ice concentration (10-20%)
 18. Ice concentration (10-20%)
 19. Ice concentration (10-20%)
 20. Ice concentration (10-20%)

- - - - - SEA ICE FREE
 - - - - - ICE EDGE
 - - - - - DRAKE PASSAGE (L-E)



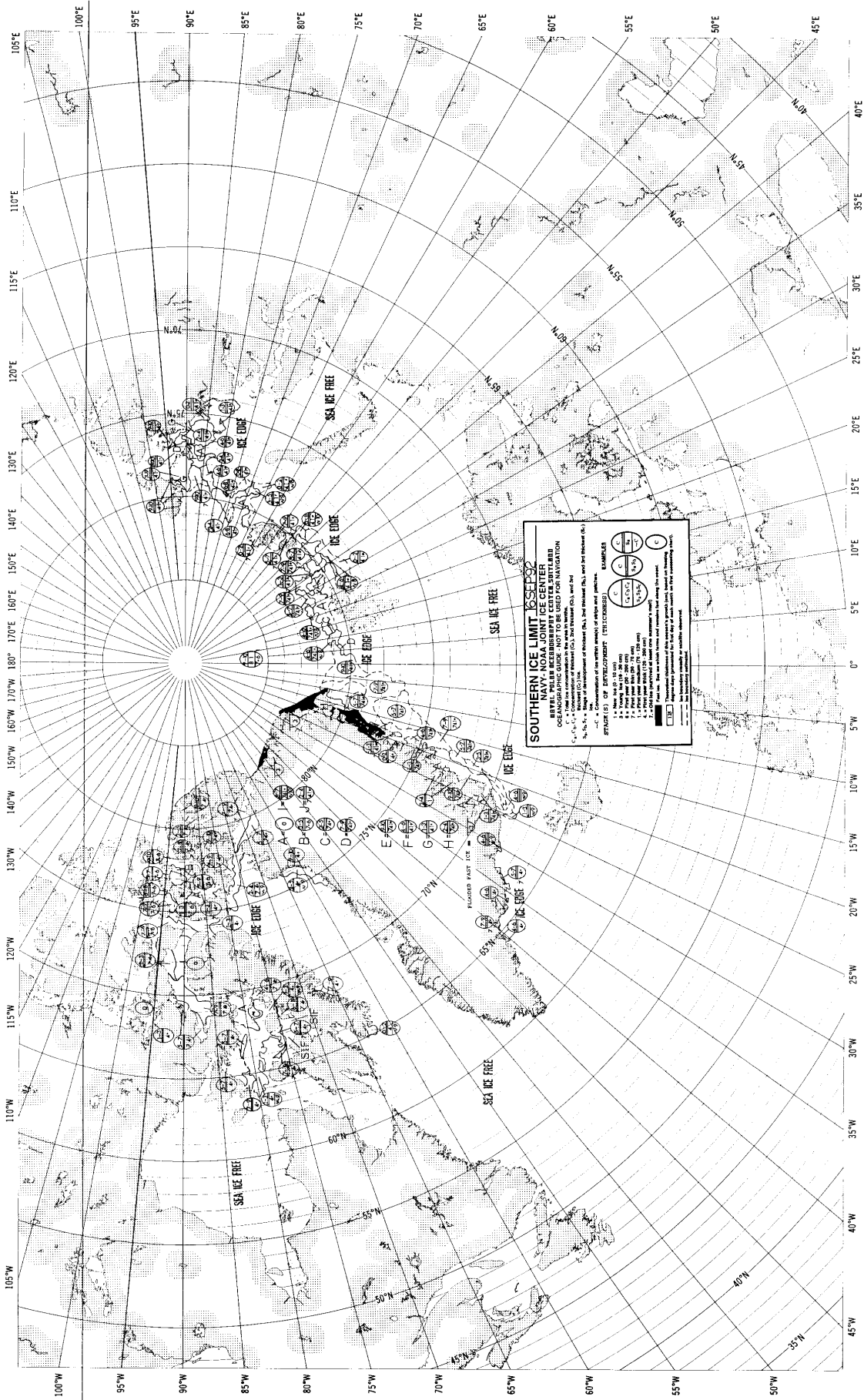
SOUTHERN ICE LIMIT 09 SEP 92
 BRITISH ANTARCTIC SURVEY
 NAVY-NOAA JOINT ICE CENTER
 COAST AND GEODETIC SURVEY
 OFFICE OF NAVAL OPERATIONS
 U.S. NAVY SURVEILLANCE CENTER FOR ANTARCTIC OPERATIONS
 U.S. NAVY SURVEILLANCE CENTER FOR ANTARCTIC OPERATIONS
 U.S. NAVY SURVEILLANCE CENTER FOR ANTARCTIC OPERATIONS
 U.S. NAVY SURVEILLANCE CENTER FOR ANTARCTIC OPERATIONS

SYMBOLS

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 10% ice
 6. 5% ice
 7. 1-2000 ft depth of ice
 8. 2000-4000 ft depth of ice
 9. 4000-6000 ft depth of ice
 10. 6000-8000 ft depth of ice
 11. 8000-10000 ft depth of ice
 12. 10000 ft depth of ice
 13. 10000 ft depth of ice
 14. 10000 ft depth of ice
 15. 10000 ft depth of ice
 16. 10000 ft depth of ice
 17. 10000 ft depth of ice
 18. 10000 ft depth of ice
 19. 10000 ft depth of ice
 20. 10000 ft depth of ice

EXAMPLES

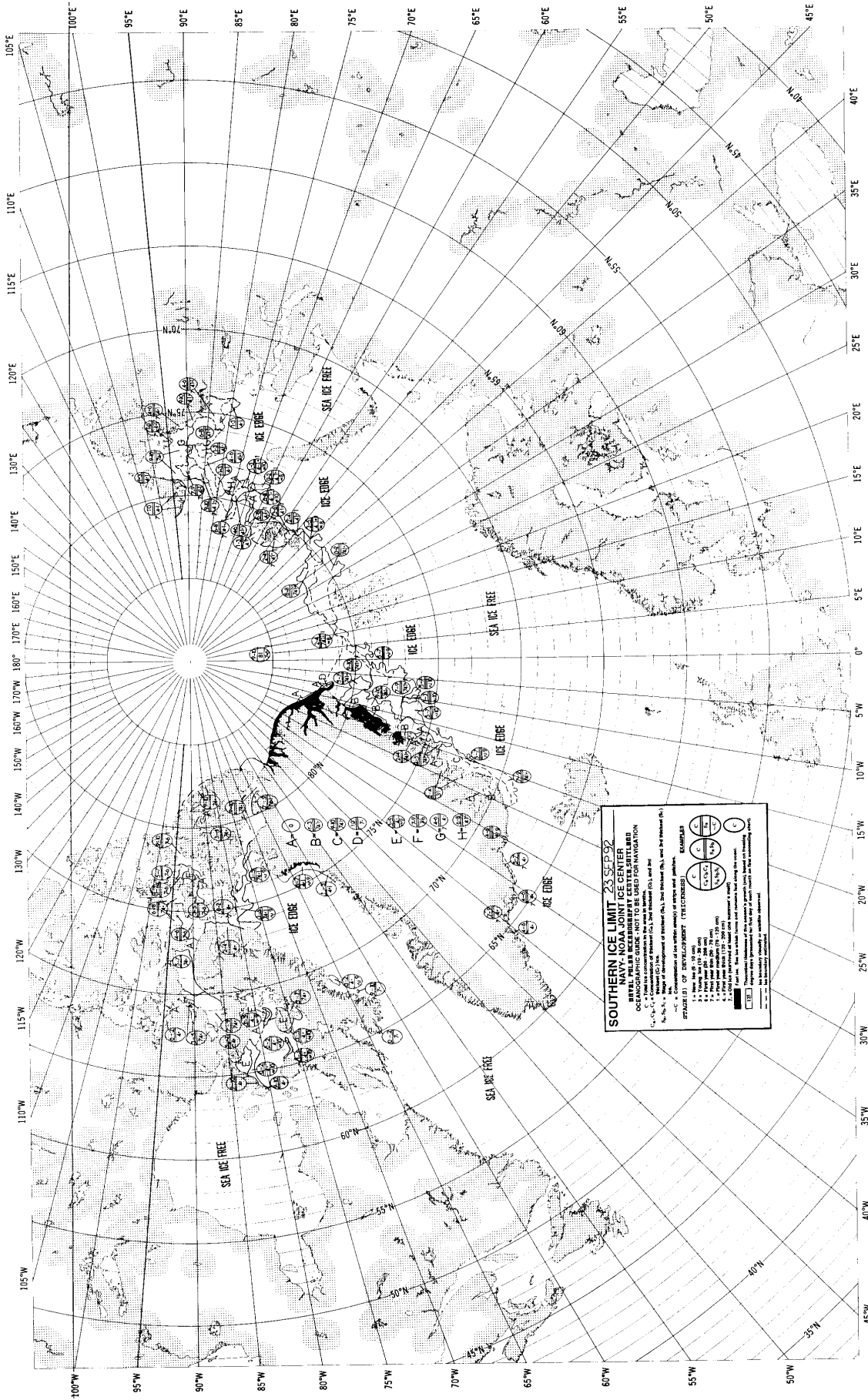
1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 10% ice
 6. 5% ice
 7. 1-2000 ft depth of ice
 8. 2000-4000 ft depth of ice
 9. 4000-6000 ft depth of ice
 10. 6000-8000 ft depth of ice
 11. 8000-10000 ft depth of ice
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 17. 10000 ft depth of ice
 18. 10000 ft depth of ice
 19. 10000 ft depth of ice
 20. 10000 ft depth of ice



SOUTHERN ICE LIMIT 1952-53
NAVY-NOAA JOINT ICE CENTER
ANTARCTIC DATA CENTER
OCEANOGRAPHIC MUSEUM, NOT TO BE USED FOR NAVIGATION
1. Contour lines show ice limits, 1000 yd. (914.4 m) or more from the coast.
2. Contour lines show ice limits, 1000 yd. (914.4 m) or more from the coast.
3. Contour lines show ice limits, 1000 yd. (914.4 m) or more from the coast.
4. Contour lines show ice limits, 1000 yd. (914.4 m) or more from the coast.
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9. Contour lines show ice limits, 1000 yd. (914.4 m) or more from the coast.
10. Contour lines show ice limits, 1000 yd. (914.4 m) or more from the coast.

STATUSES OF DEVELOPMENT (ICE THICKNESS)
1. 1000 yd. (914.4 m) or more
2. 500 yd. (457.2 m) or more
3. 250 yd. (228.6 m) or more
4. 100 yd. (91.4 m) or more
5. 50 yd. (45.7 m) or more
6. 25 yd. (22.86 m) or more
7. 10 yd. (9.14 m) or more
8. 5 yd. (4.57 m) or more
9. 2 yd. (1.83 m) or more
10. 1 yd. (0.91 m) or more
11. 0.5 yd. (0.46 m) or more
12. 0.2 yd. (0.18 m) or more
13. 0.1 yd. (0.09 m) or more
14. 0.05 yd. (0.045 m) or more
15. 0.02 yd. (0.018 m) or more
16. 0.01 yd. (0.009 m) or more
17. 0.005 yd. (0.0045 m) or more
18. 0.002 yd. (0.0018 m) or more
19. 0.001 yd. (0.0009 m) or more
20. 0.0005 yd. (0.00045 m) or more

EXAMPLES
1. 1000 yd. (914.4 m) or more
2. 500 yd. (457.2 m) or more
3. 250 yd. (228.6 m) or more
4. 100 yd. (91.4 m) or more
5. 50 yd. (45.7 m) or more
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18. 0.002 yd. (0.0018 m) or more
19. 0.001 yd. (0.0009 m) or more
20. 0.0005 yd. (0.00045 m) or more



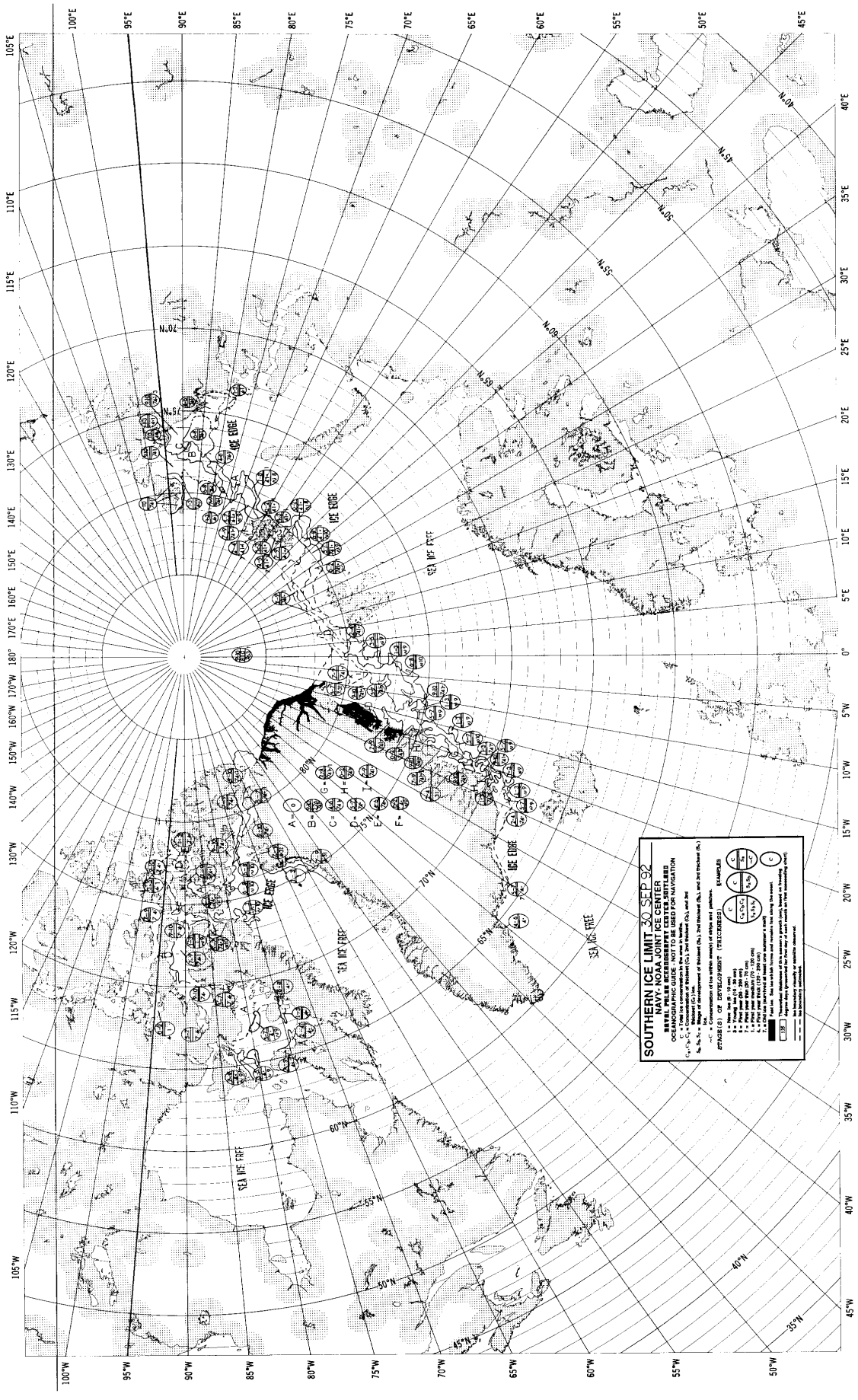
SOUTHERN ICE LIMIT 23 SEP 92
 NAVY, NOAA JOINT ICE CENTER
 OCEANOGRAPHIC GUIDE, NOT TO BE USED FOR NAVIGATION

1. 1st Year Concentration (Ice Thickness, Ice Age, and Ice Type)
 2. 2nd Year Concentration (Ice Thickness, Ice Age, and Ice Type)
 3. 3rd Year Concentration (Ice Thickness, Ice Age, and Ice Type)
 4. 4th Year Concentration (Ice Thickness, Ice Age, and Ice Type)

A-H: 1st Year Concentration of Ice within 1000' of surface and within 1000' of ice edge.
 1-4: 2nd Year Concentration of Ice within 1000' of surface and within 1000' of ice edge.
 5-8: 3rd Year Concentration of Ice within 1000' of surface and within 1000' of ice edge.
 9-12: 4th Year Concentration of Ice within 1000' of surface and within 1000' of ice edge.

EXAMPLES OF INTERPRETATION (ICE CENTERS)
 1. 1st Year Concentration of Ice within 1000' of surface and within 1000' of ice edge.
 2. 2nd Year Concentration of Ice within 1000' of surface and within 1000' of ice edge.
 3. 3rd Year Concentration of Ice within 1000' of surface and within 1000' of ice edge.
 4. 4th Year Concentration of Ice within 1000' of surface and within 1000' of ice edge.

SEA ICE FREE: The boundary between the ice-free area and the ice-covered area.
 ICE EDGE: The boundary between the ice-free area and the ice-covered area.
 SEA ICE FREE: The boundary between the ice-free area and the ice-covered area.



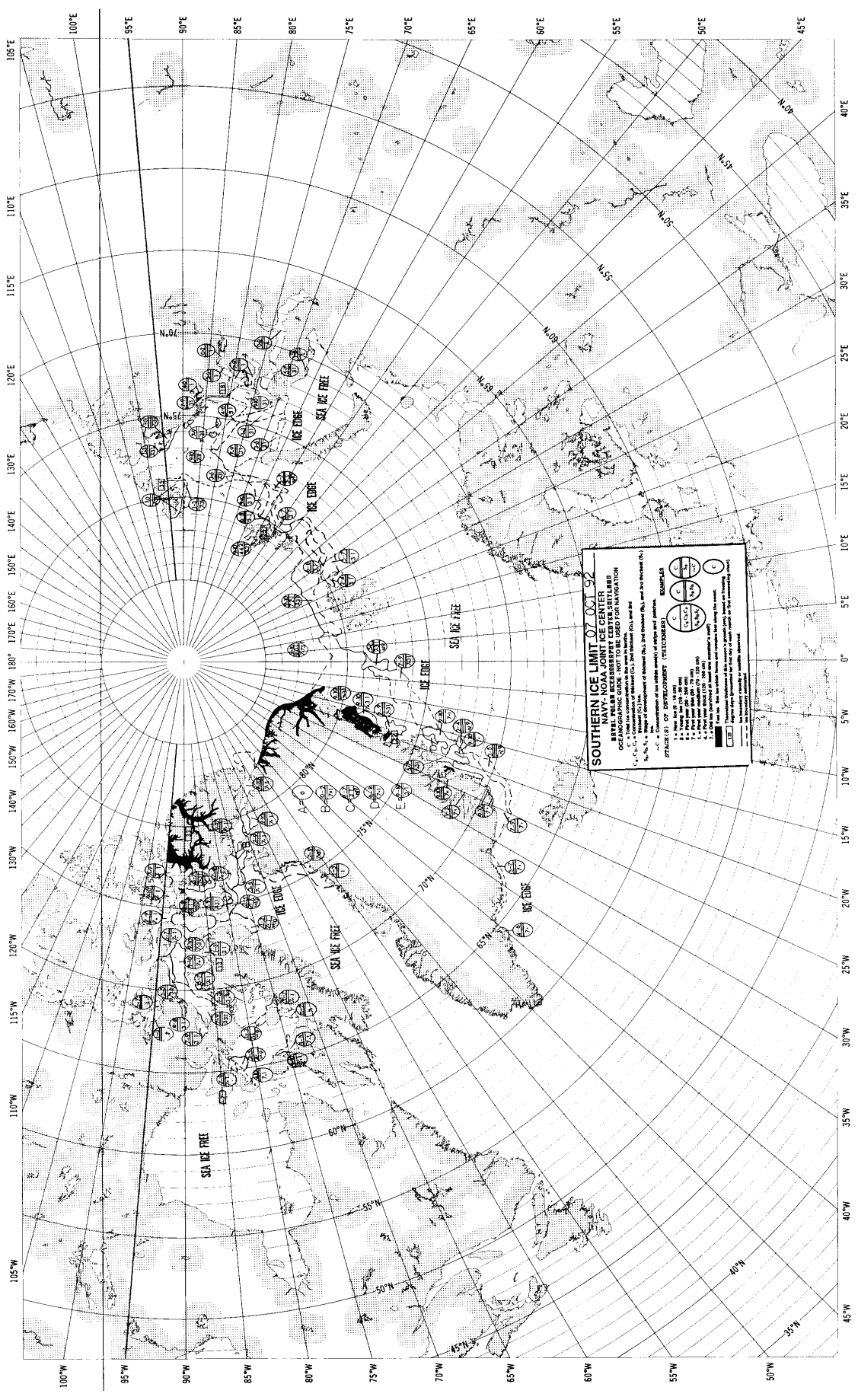
SOUTHERN ICE LIMIT 30 SEP 92
 US NAVY, NAVY, NOAA JOINT ICE CENTER
 DATA SOURCES: US NAVY, NAVY, NOAA JOINT ICE CENTER
 OCCASIONAL WHITE DASHES INDICATE DATA NOT AVAILABLE FOR ANALYSIS

Legend:
 (A) Ice concentration (percent) (0-100)
 (B) Ice concentration (percent) (0-100) and ice thickness (ft)
 (C) Ice concentration (percent) (0-100) and ice thickness (ft)
 (D) Ice concentration (percent) (0-100) and ice thickness (ft)
 (E) Ice concentration (percent) (0-100) and ice thickness (ft)
 (F) Ice concentration (percent) (0-100) and ice thickness (ft)
 (G) Ice concentration (percent) (0-100) and ice thickness (ft)

STAGE(S) OF DEVELOPMENT (YELLOW)
 1. Stage 1
 2. Stage 2
 3. Stage 3
 4. Stage 4
 5. Stage 5
 6. Stage 6
 7. Stage 7
 8. Stage 8
 9. Stage 9
 10. Stage 10

EXAMPLES
 (A) $\frac{100}{100}$
 (B) $\frac{100}{100}$
 (C) $\frac{100}{100}$
 (D) $\frac{100}{100}$
 (E) $\frac{100}{100}$
 (F) $\frac{100}{100}$
 (G) $\frac{100}{100}$

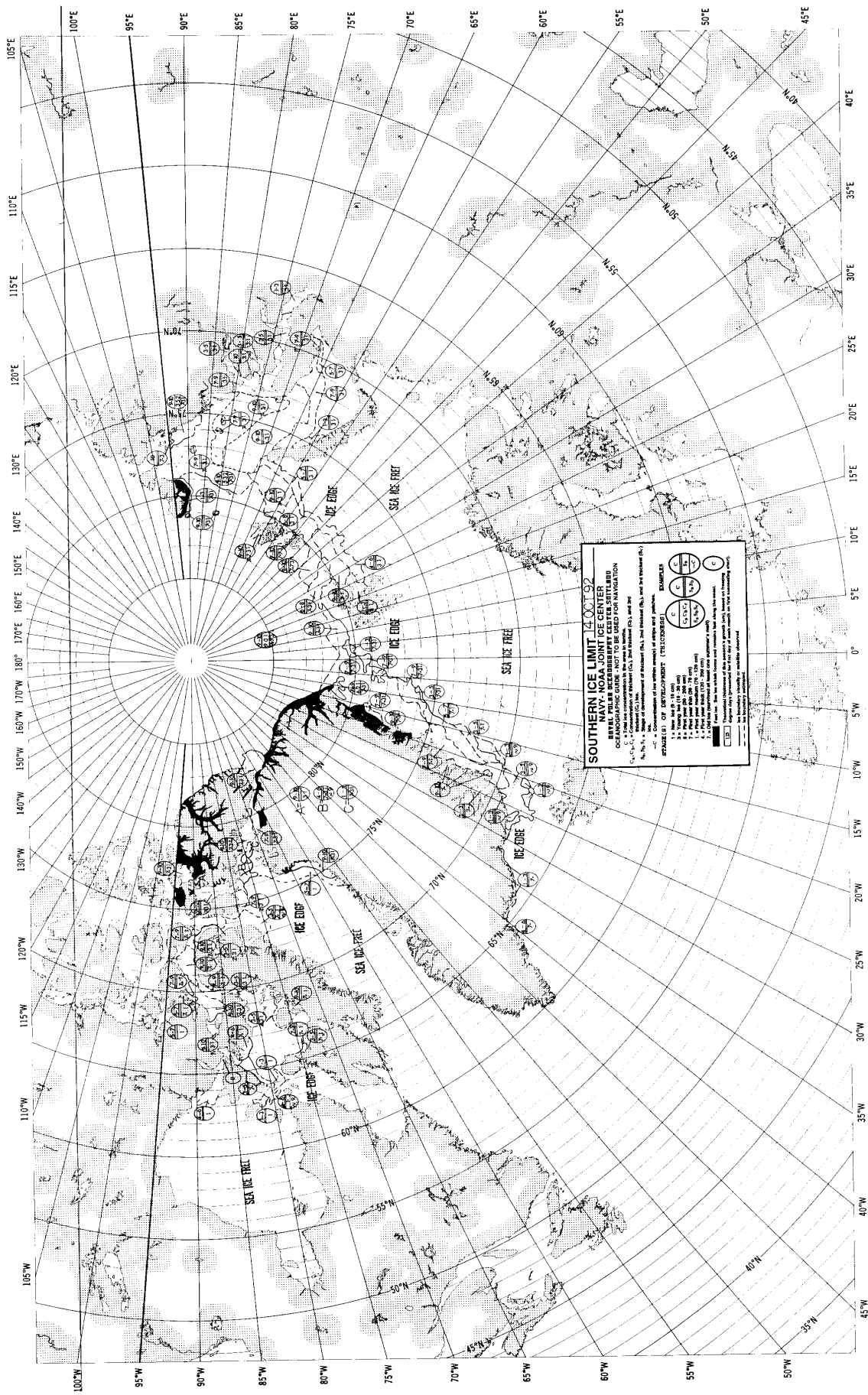
Notes:
 1. Theoretical thickness of the ice is given in parentheses along with the concentration.
 2. Theoretical thickness of the ice is given in parentheses along with the concentration.
 3. Theoretical thickness of the ice is given in parentheses along with the concentration.
 4. Theoretical thickness of the ice is given in parentheses along with the concentration.
 5. Theoretical thickness of the ice is given in parentheses along with the concentration.
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 10. Theoretical thickness of the ice is given in parentheses along with the concentration.



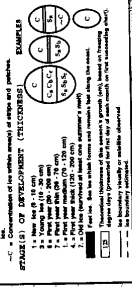
SOUTHERN ICE LIMIT 07 OCT 92
 SEVERAL ICE OBSERVATORY CENTER ANTARCTIC
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
 Symbols: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, 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.

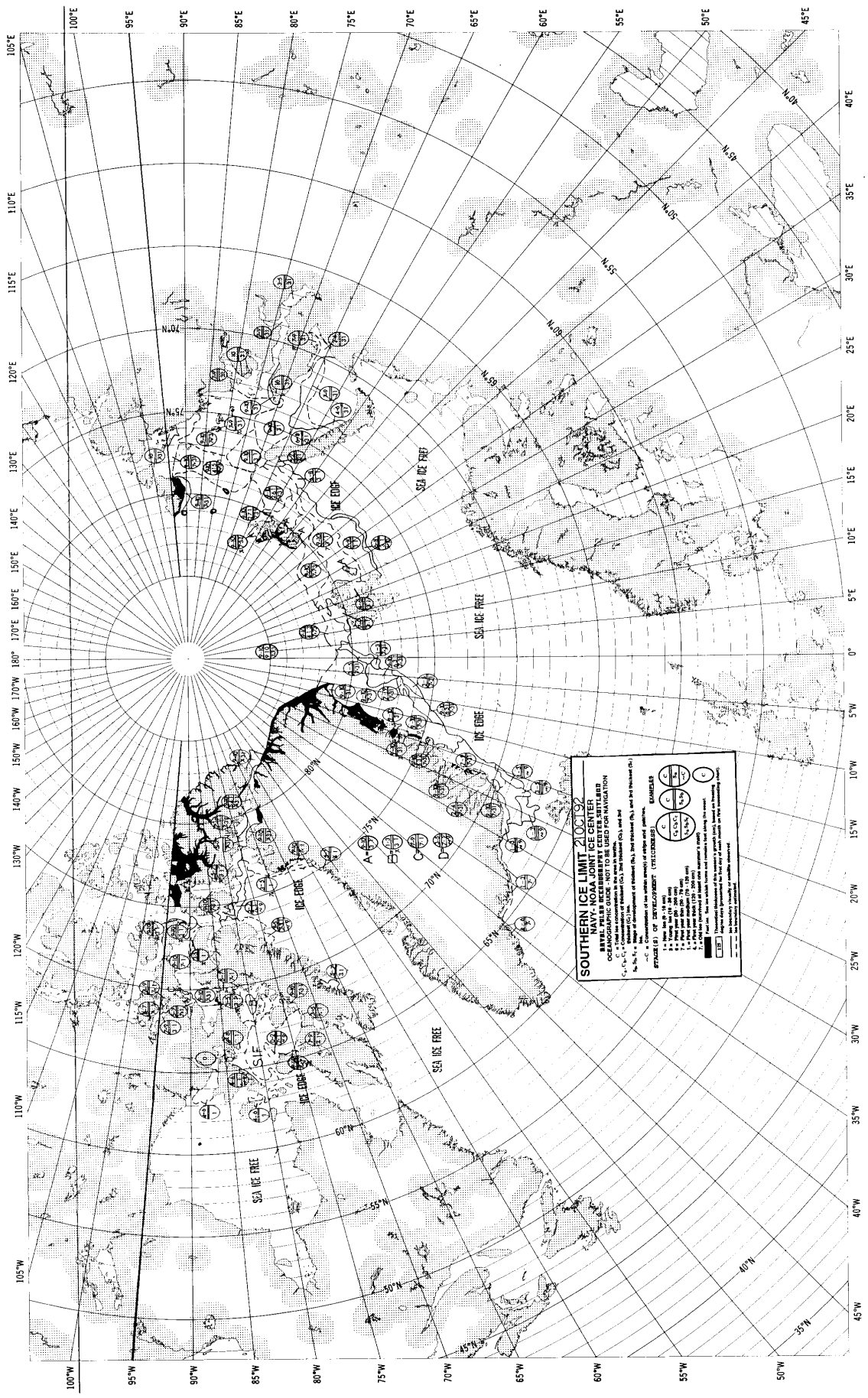
EXAMPLES
 A: 100% Ice
 B: 75% Ice
 C: 50% Ice
 D: 25% Ice
 E: 10% Ice
 F: 5% Ice
 G: 2% Ice
 H: 1% Ice
 I: 0.5% Ice
 J: 0.2% Ice
 K: 0.1% Ice
 L: 0.05% Ice
 M: 0.02% Ice
 N: 0.01% Ice
 O: 0.005% Ice
 P: 0.002% Ice
 Q: 0.001% Ice
 R: 0.0005% Ice
 S: 0.0002% Ice
 T: 0.0001% Ice
 U: 0.00005% Ice
 V: 0.00002% Ice
 W: 0.00001% Ice
 X: 0.000005% Ice
 Y: 0.000002% Ice
 Z: 0.000001% Ice

NOTES:
 1. Symbols A through Z represent the percentage of ice in the area.
 2. Symbols AA through AZ represent the percentage of ice in the area.
 3. Symbols BA through BZ represent the percentage of ice in the area.
 4. Symbols CA through CZ represent the percentage of ice in the area.
 5. Symbols DA through DZ represent the percentage of ice in the area.
 6. Symbols EA through EZ represent the percentage of ice in the area.
 7. Symbols FA through FZ represent the percentage of ice in the area.
 8. Symbols GA through GZ represent the percentage of ice in the area.
 9. Symbols HA through HZ represent the percentage of ice in the area.
 10. Symbols IA through IZ represent the percentage of ice in the area.
 11. Symbols JA through JZ represent the percentage of ice in the area.
 12. Symbols KA through KZ represent the percentage of ice in the area.
 13. Symbols LA through LZ represent the percentage of ice in the area.
 14. Symbols MA through MZ represent the percentage of ice in the area.
 15. Symbols NA through NZ represent the percentage of ice in the area.
 16. Symbols OA through OZ represent the percentage of ice in the area.
 17. Symbols PA through PZ represent the percentage of ice in the area.
 18. Symbols QA through QZ represent the percentage of ice in the area.
 19. Symbols RA through RZ represent the percentage of ice in the area.
 20. Symbols SA through SZ represent the percentage of ice in the area.
 21. Symbols TA through TZ represent the percentage of ice in the area.
 22. Symbols UA through UZ represent the percentage of ice in the area.
 23. Symbols VA through VZ represent the percentage of ice in the area.
 24. Symbols WA through WZ represent the percentage of ice in the area.
 25. Symbols XA through XZ represent the percentage of ice in the area.
 26. Symbols YA through YZ represent the percentage of ice in the area.
 27. Symbols ZA through ZZ represent the percentage of ice in the area.



SOUTHERN ICE LIMIT 1400192
 NAVY-NOAA JOINT ICE CENTER
 OCEANOGRAPHIC SURVEY NOT TO BE USED FOR NAVIGATION
 1. Containing information of value to the mariner
 2. Issued by the Navy-NOAA Joint Ice Center
 3. Not to be used for navigation
 4. Not to be used for navigation
 5. Not to be used for navigation
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 19. Not to be used for navigation
 20. Not to be used for navigation





SOUTHERN ICE LIMIT 21 OCT 82
ANVIL PILES RECESSION CENTER CENTER
OCEANOGRAPHIC GUIDE FOR NAVIGATION

1. This chart is a compilation of the latest available information on the ice limits and ice centers in the Southern Ocean, based on the data received from the Antarctic Peninsula and the Antarctic continent.

2. The ice limits and ice centers are shown in the form of symbols and lines on this chart.

3. The symbols and lines are defined as follows:

4. The symbols and lines are defined as follows:

5. The symbols and lines are defined as follows:

6. The symbols and lines are defined as follows:

7. The symbols and lines are defined as follows:

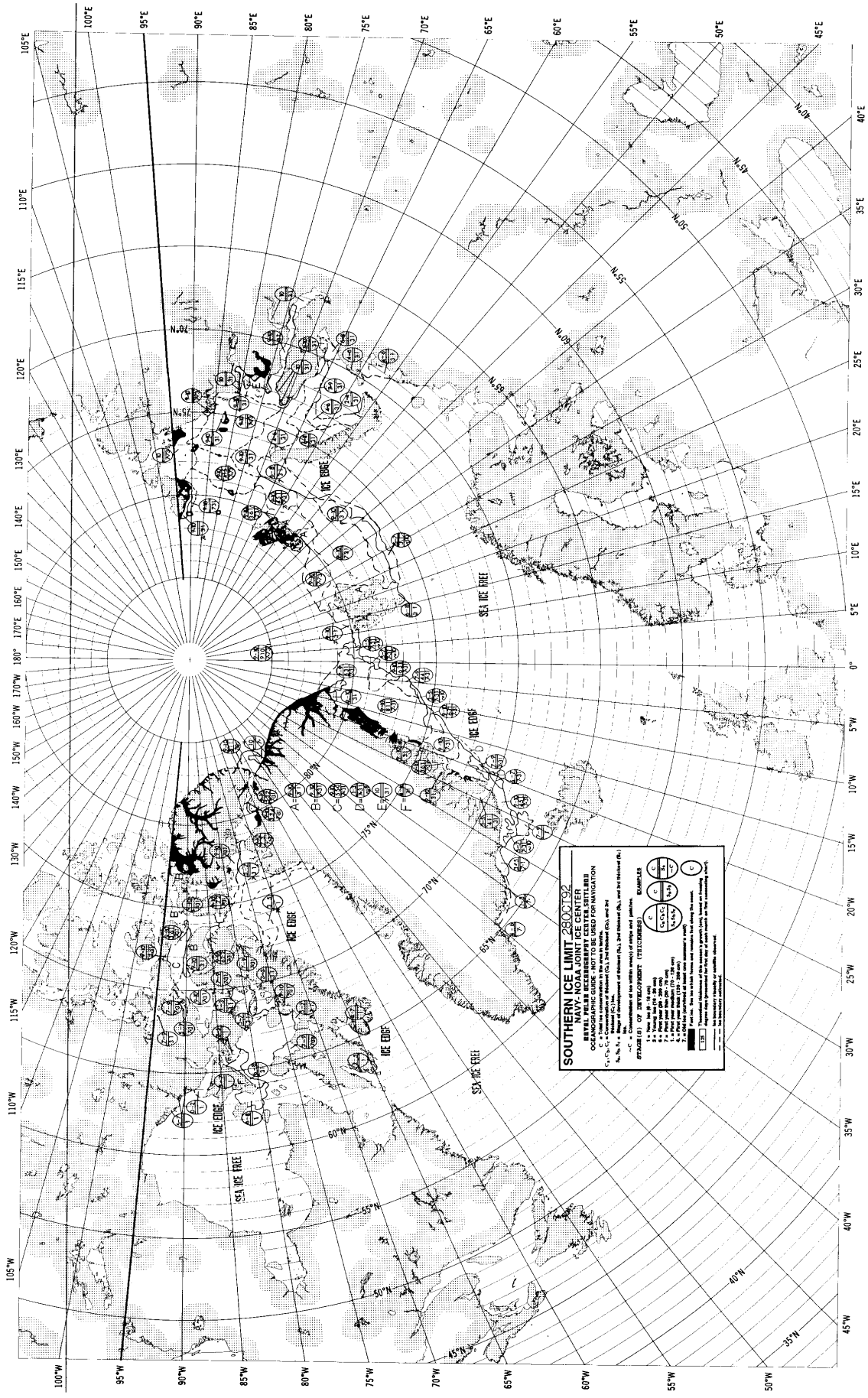
8. The symbols and lines are defined as follows:

9. The symbols and lines are defined as follows:

10. The symbols and lines are defined as follows:

EXAMPLES

(A)	(B)	(C)	(D)	(E)
(A)	(B)	(C)	(D)	(E)
(A)	(B)	(C)	(D)	(E)
(A)	(B)	(C)	(D)	(E)
(A)	(B)	(C)	(D)	(E)



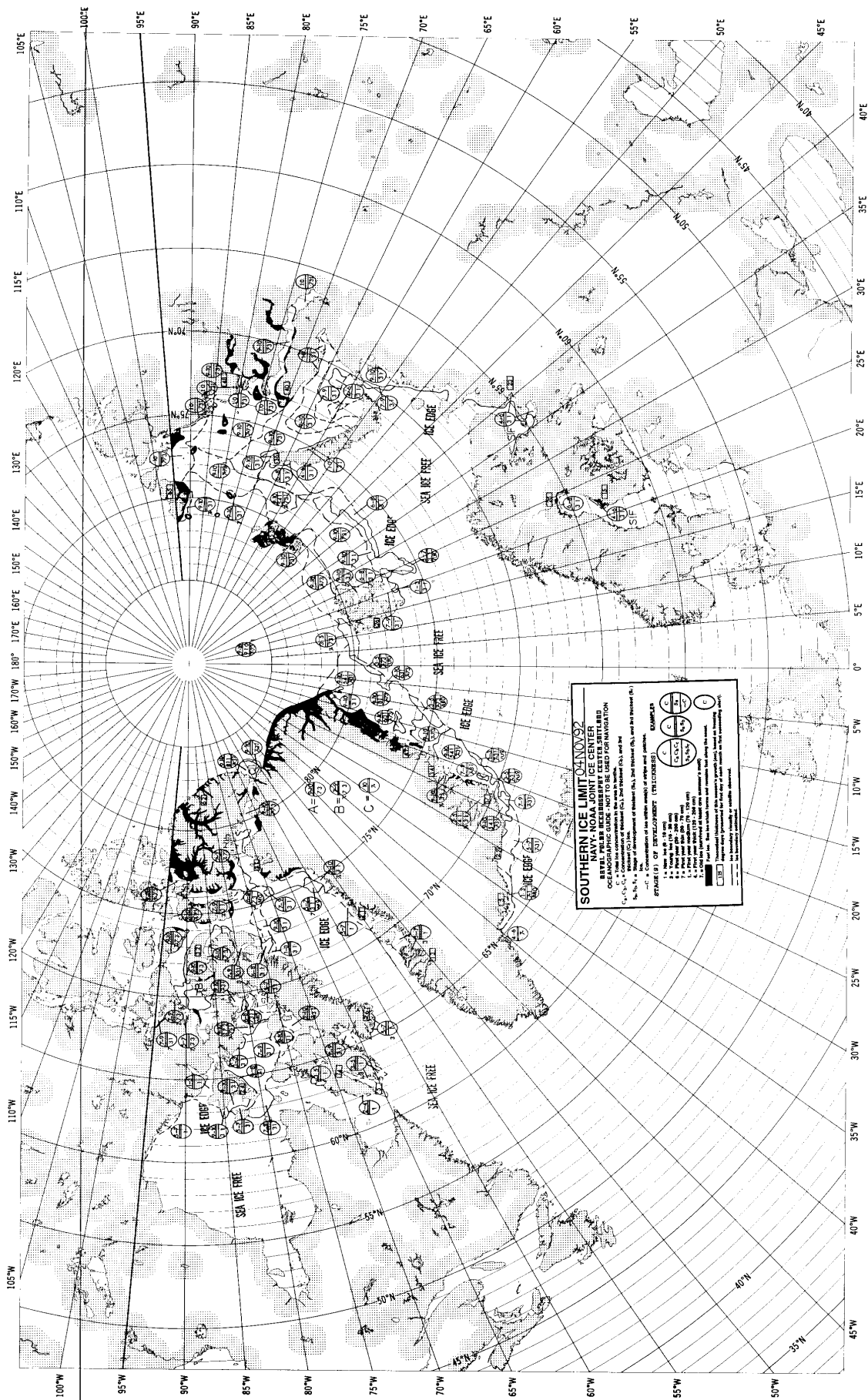
SOUTHERN ICE LIMIT 2800792
 NAVY-NOAA JOINT ICE CENTER
 OCEANOGRAPHIC CHART - NOT TO BE USED FOR NAVIGATION

1. 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 - Number of observations of thickness (in feet) (see text) (A) and (B)
 100 - 1000
 1000 - 2000
 2000 - 3000
 3000 - 4000
 4000 - 5000
 5000 - 6000
 6000 - 7000
 7000 - 8000
 8000 - 9000
 9000 - 10000

EXAMPLES OF DEVELOPMENT (ICE TYPES)

1. Thick ice (1000 ft)
 2. Thin ice (500 ft)
 3. Sea ice (1000 ft)
 4. Ice edge (1000 ft)
 5. Ice limit (1000 ft)

NOTES:
 1. This chart is based on data received from the Navy and NOAA.
 2. The chart is based on data received from the Navy and NOAA.
 3. The chart is based on data received from the Navy and NOAA.
 4. The chart is based on data received from the Navy and NOAA.
 5. The chart is based on data received from the Navy and NOAA.

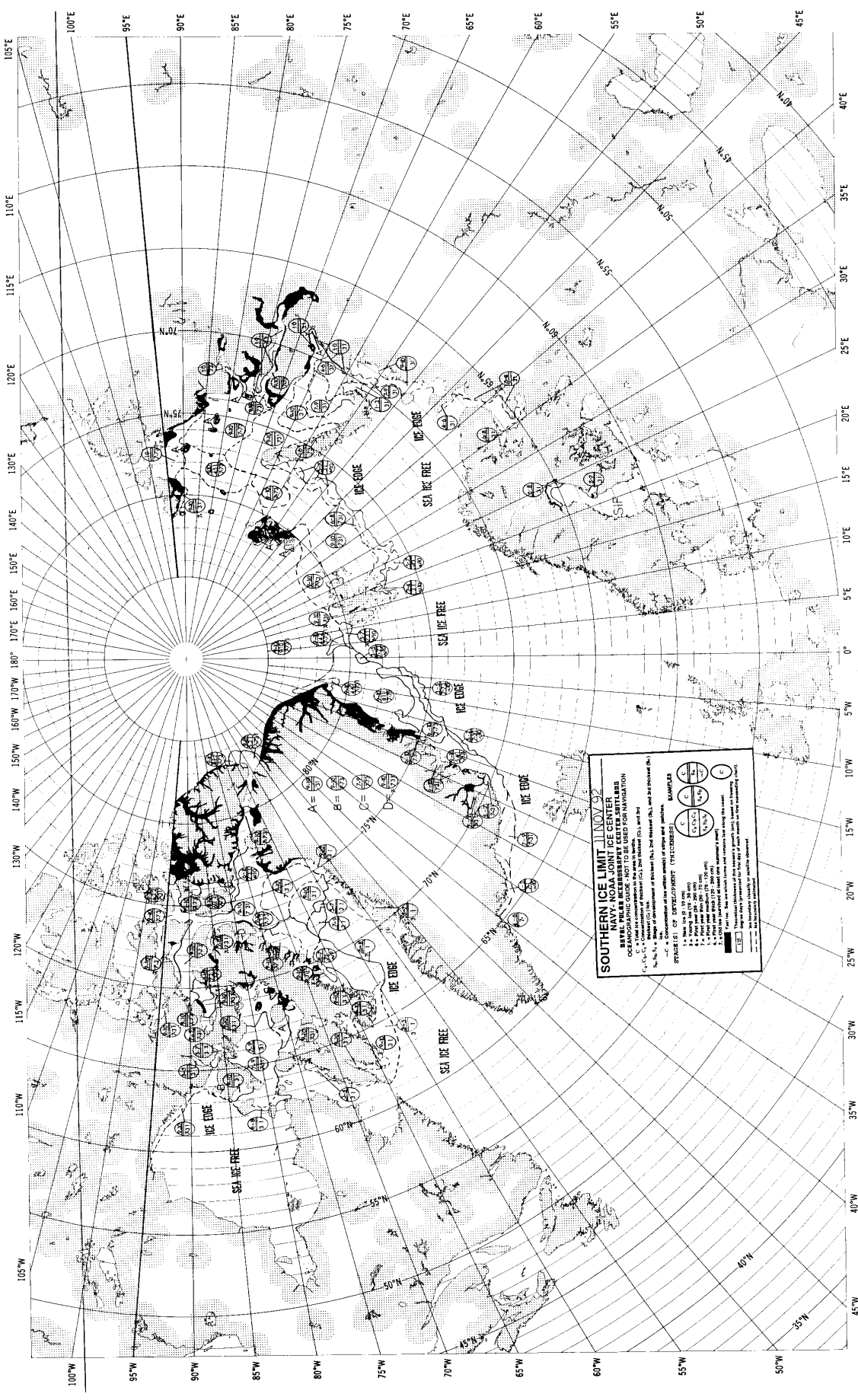


SOUTHERN ICE LIMIT CENTER
 BETWEEN 105°W AND 45°W
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

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, 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, 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

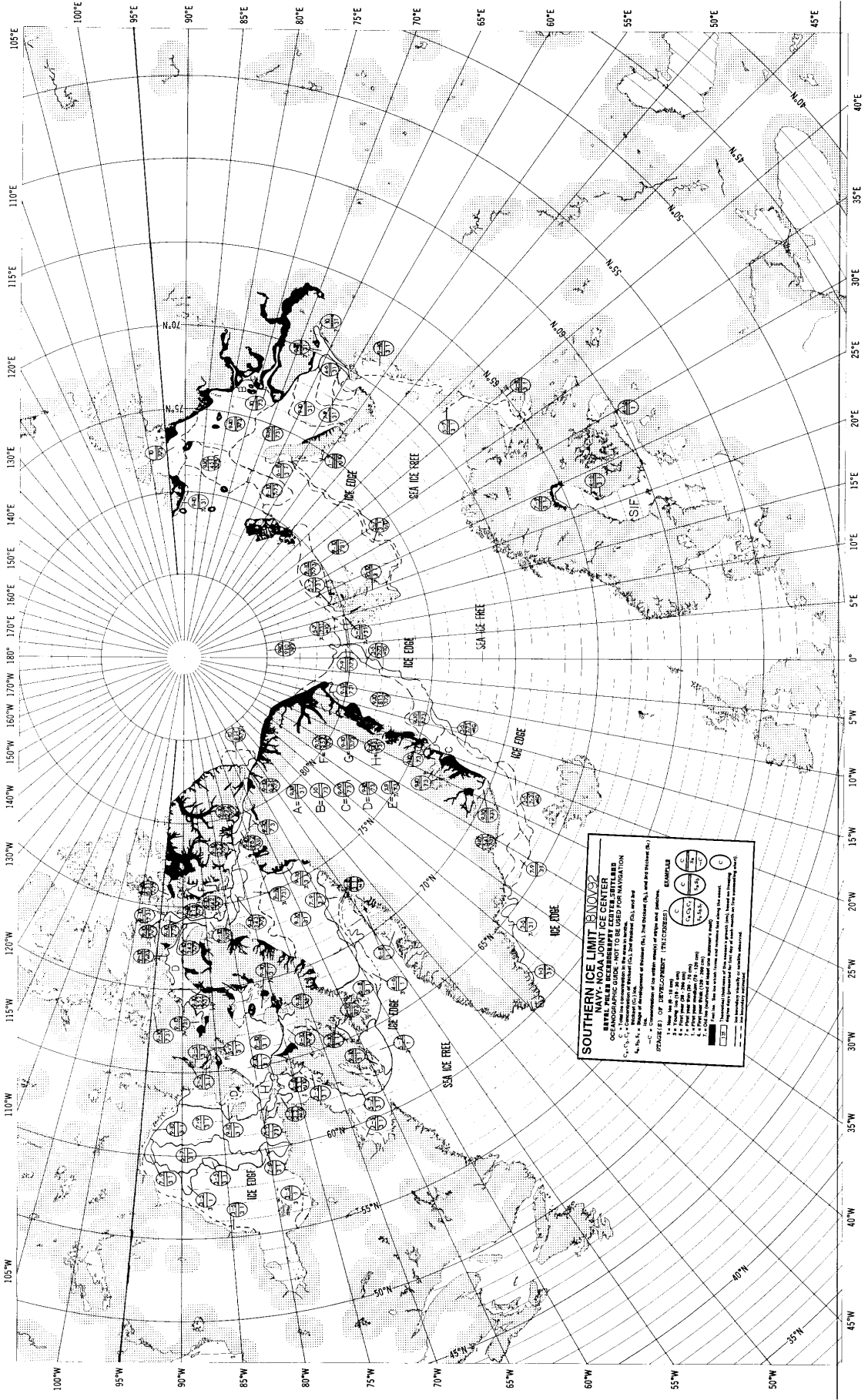
STAGE (S) OF DEVELOPMENT (SYMBOLS):
 1. Young ice (1st year)
 2. First year ice (1st year)
 3. Second year ice (2nd year)
 4. Third year ice (3rd year)
 5. Fourth year ice (4th year)
 6. Fifth year ice (5th year)
 7. Sixth year ice (6th year)
 8. Seventh year ice (7th year)
 9. Eighth year ice (8th year)
 10. Ninth year ice (9th year)
 11. Tenth year ice (10th year)
 12. Eleventh year ice (11th year)
 13. Twelfth year ice (12th year)
 14. Thirteenth year ice (13th year)
 15. Fourteenth year ice (14th year)
 16. Fifteenth year ice (15th year)
 17. Sixteenth year ice (16th year)
 18. Seventeenth year ice (17th year)
 19. Eighteenth year ice (18th year)
 20. Nineteenth year ice (19th year)
 21. Twentieth year ice (20th year)

NOTES:
 1. This chart is based on data from the Southern Ocean Ice Limit Survey.
 2. The chart is not to be used for navigation.
 3. The chart is not to be used for scientific purposes.
 4. The chart is not to be used for commercial purposes.
 5. The chart is not to be used for military purposes.
 6. The chart is not to be used for intelligence purposes.
 7. The chart is not to be used for espionage purposes.
 8. The chart is not to be used for sabotage purposes.
 9. The chart is not to be used for terrorism purposes.
 10. The chart is not to be used for piracy purposes.
 11. The chart is not to be used for slavery purposes.
 12. The chart is not to be used for human trafficking purposes.
 13. The chart is not to be used for child labor purposes.
 14. The chart is not to be used for forced labor purposes.
 15. The chart is not to be used for debt bondage purposes.
 16. The chart is not to be used for modern slavery purposes.
 17. The chart is not to be used for human rights abuses purposes.
 18. The chart is not to be used for violations of international law purposes.
 19. The chart is not to be used for violations of national law purposes.
 20. The chart is not to be used for violations of local law purposes.



SOUTHERN ICE LIMIT 11 NOV 92
 NAVY-NOAA JOINT ICE CENTER
 ICE LIMITS FOR NAVIGATION
 1. 1:50,000 Scale
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 3. 1:50,000 Scale
 4. 1:50,000 Scale
 5. 1:50,000 Scale
 6. 1:50,000 Scale

SYMBOLS
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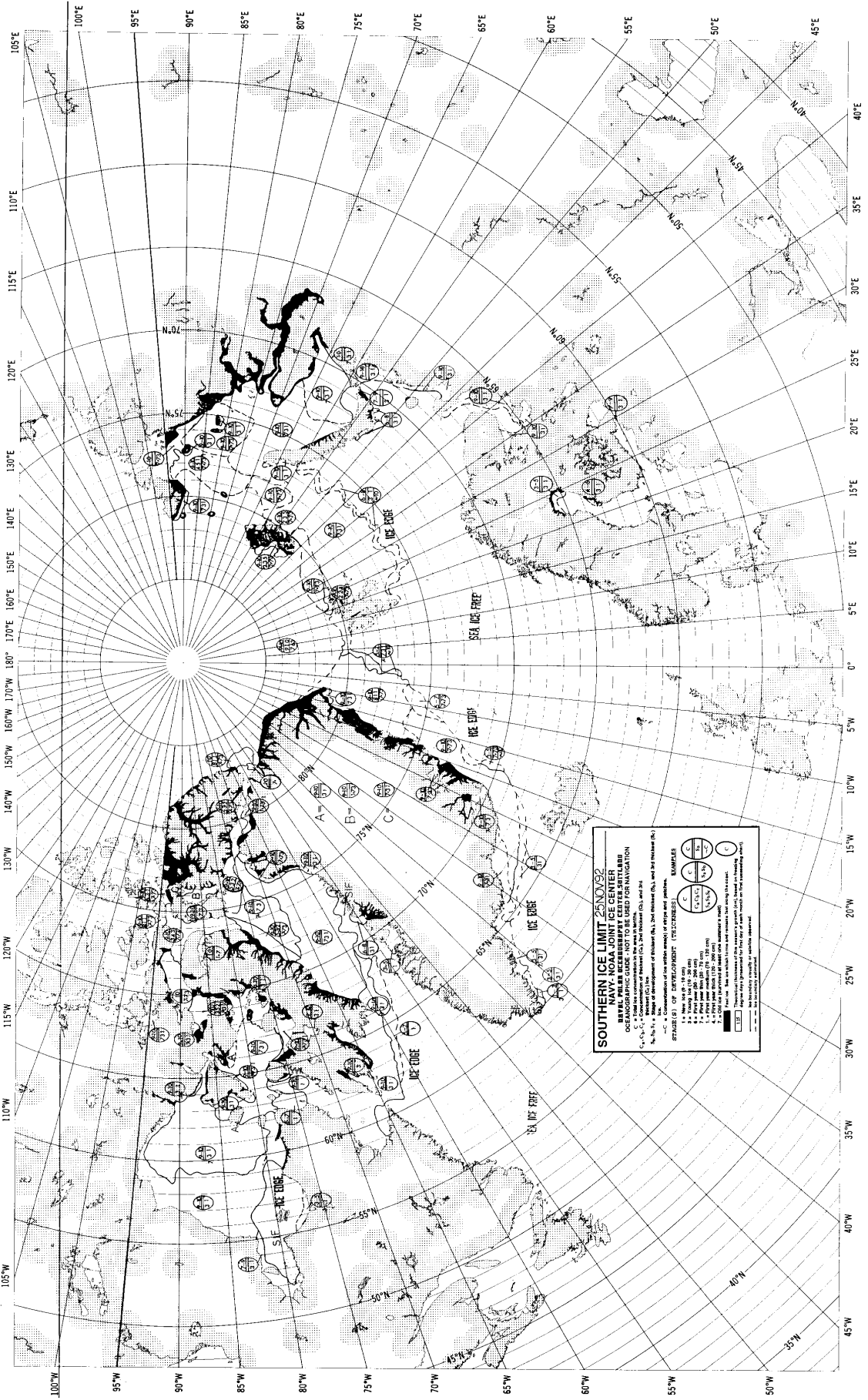
SOUTHERN ICE LIMIT BOUNDARIES
 GENERAL PUBLICATION NO. 1004, JOINT ICE CENTER
 GEOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
 C, C₁, C₂ = Coordinates of observed ice limit (ice edge, ice zone, and sea ice free) and ice limit (ice edge, ice zone, and sea ice free) at the time of observation.
 A, B, C, D, E, F, G, H = Number of observations of observed ice limit (ice edge, ice zone, and sea ice free) at the time of observation.

SYMBOLS:
 (A) - Coordinates of ice limit (edge) at edge and zone.
 (B) - Coordinates of ice limit (edge) at zone and sea ice free.
 (C) - Coordinates of ice limit (edge) at sea ice free and zone.
 (C₁) - Coordinates of ice limit (edge) at zone and sea ice free.
 (C₂) - Coordinates of ice limit (edge) at sea ice free and zone.

EXAMPLES:
 (A) 100°E 70°S
 (B) 100°E 70°S
 (C) 100°E 70°S
 (C₁) 100°E 70°S
 (C₂) 100°E 70°S

ICE LIMIT BOUNDARIES:
 (A) - Ice edge
 (B) - Ice zone
 (C) - Sea ice free

ICE LIMIT BOUNDARIES:
 (A) - Ice edge
 (B) - Ice zone
 (C) - Sea ice free



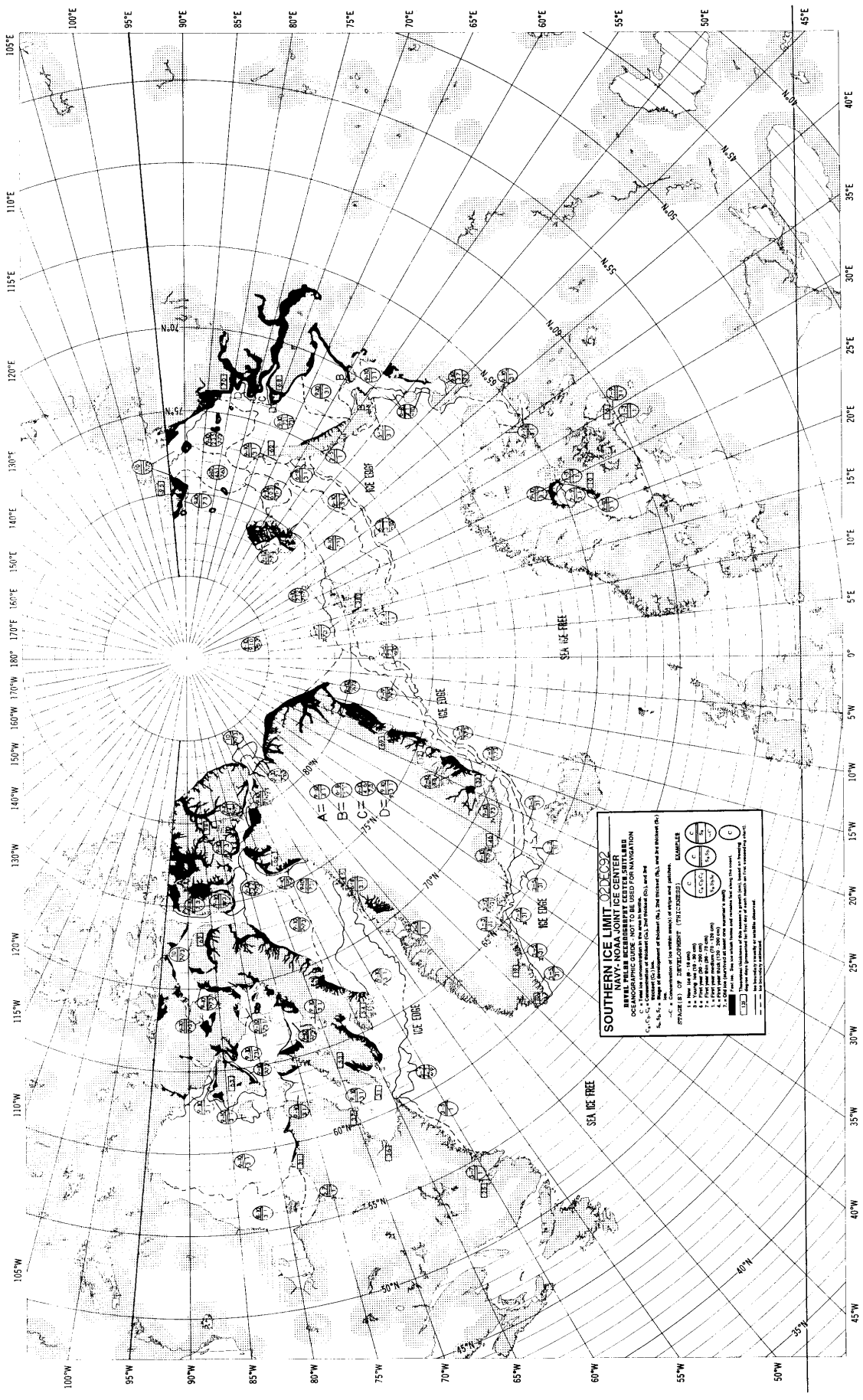
SOUTHERN ICE LIMIT 25NDV92
 (BASED ON DATA FROM 1980-1992)
 (BASED ON DATA FROM 1980-1992)
 (BASED ON DATA FROM 1980-1992)

NAVYAL PALS AND COMBINED ICE LIMITS
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

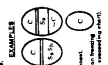
C₁, C₂, C₃ = Concentrations of braked ice
 N₁, N₂, N₃ = Stages of development of braked ice
 S₁, S₂, S₃ = Stages of development of braked ice
 B₁, B₂, B₃ = Stages of development of braked ice
 E₁, E₂, E₃ = Stages of development of braked ice
 F₁, F₂, F₃ = Stages of development of braked ice
 G₁, G₂, G₃ = Stages of development of braked ice
 H₁, H₂, H₃ = Stages of development of braked ice
 I₁, I₂, I₃ = Stages of development of braked ice
 J₁, J₂, J₃ = Stages of development of braked ice
 K₁, K₂, K₃ = Stages of development of braked ice
 L₁, L₂, L₃ = Stages of development of braked ice
 M₁, M₂, M₃ = Stages of development of braked ice
 N₁, N₂, N₃ = Stages of development of braked ice
 O₁, O₂, O₃ = Stages of development of braked ice
 P₁, P₂, P₃ = Stages of development of braked ice
 Q₁, Q₂, Q₃ = Stages of development of braked ice
 R₁, R₂, R₃ = Stages of development of braked ice
 S₁, S₂, S₃ = Stages of development of braked ice
 T₁, T₂, T₃ = Stages of development of braked ice
 U₁, U₂, U₃ = Stages of development of braked ice
 V₁, V₂, V₃ = Stages of development of braked ice
 W₁, W₂, W₃ = Stages of development of braked ice
 X₁, X₂, X₃ = Stages of development of braked ice
 Y₁, Y₂, Y₃ = Stages of development of braked ice
 Z₁, Z₂, Z₃ = Stages of development of braked ice

1. 100% of ice
 2. 75% of ice
 3. 50% of ice
 4. 25% of ice
 5. 10% of ice
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1. 100% of ice
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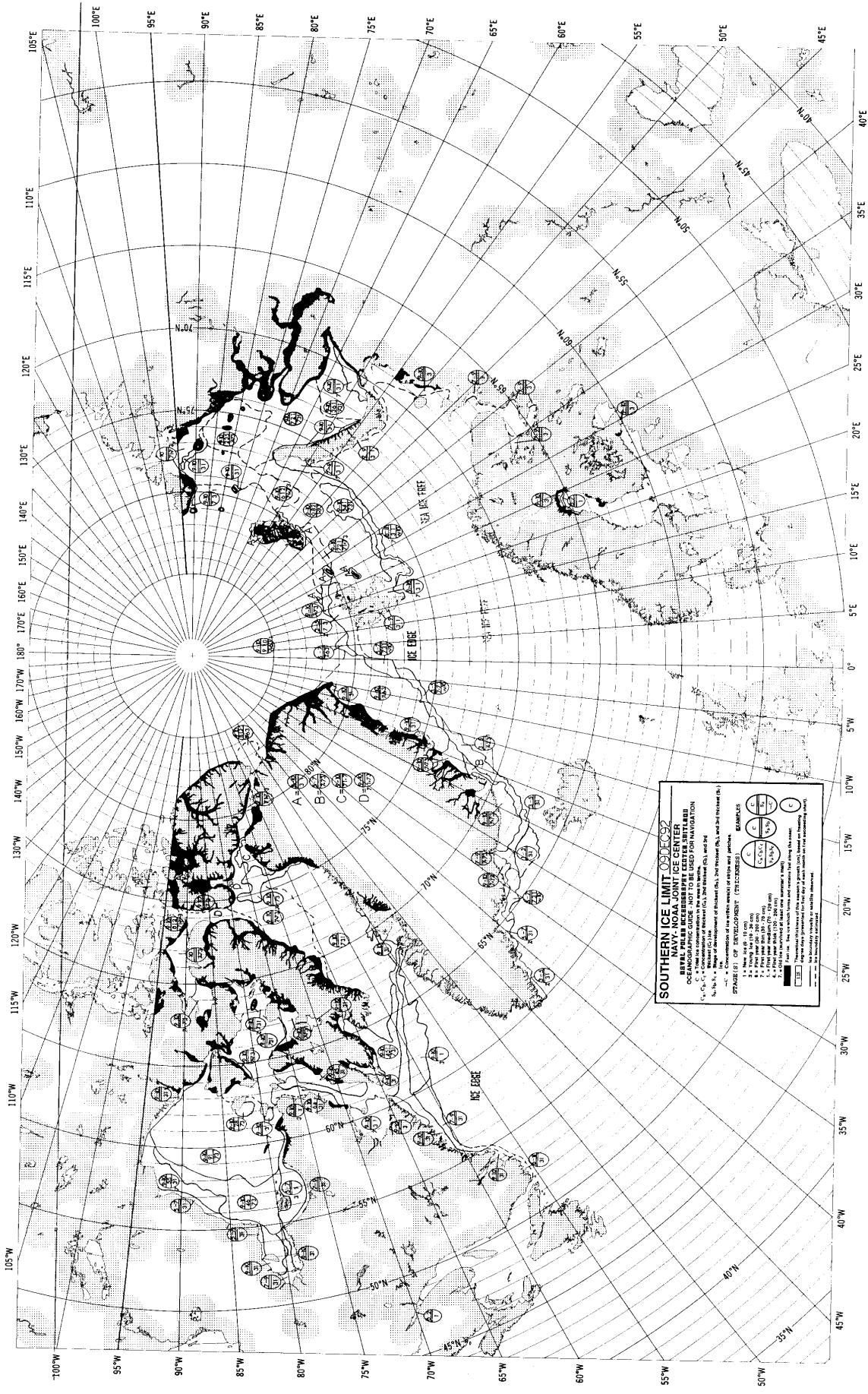


SOUTHERN ICE LIMIT 020692
NAVY, NAVY, LIMIT DE CENTER
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- EXAMPLES**
1. New Ice (N) 100N
 2. Young Ice (Y) 150N
 3. Old Ice (O) 100N
 4. Very Old Ice (VO) 150N
 5. Ice Edge (E) 100N
 6. Ice Dome (D) 150N

1. Ice Edge (E) 100N
 2. Ice Dome (D) 150N
 3. Ice Edge (E) 100N
 4. Ice Dome (D) 150N
 5. Ice Edge (E) 100N
 6. Ice Dome (D) 150N



SOUTHERN ICE LIMIT

ICE LIMIT DATA CENTER
 NAVAL POLAR RESEARCH CENTER
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION

C_1, C_2, C_3 = Concentrations of icebergs (1, 2, and 3 inches or less) and the
 range of development of icebergs (1, 2, and 3 inches or less)

S_1, S_2, S_3 = Concentrations of icebergs (1, 2, and 3 inches or less) and the
 range of development of icebergs (1, 2, and 3 inches or less)

SYMBOLS

C_1, C_2, C_3 = Concentrations of icebergs (1, 2, and 3 inches or less) and the
 range of development of icebergs (1, 2, and 3 inches or less)

S_1, S_2, S_3 = Concentrations of icebergs (1, 2, and 3 inches or less) and the
 range of development of icebergs (1, 2, and 3 inches or less)

EXAMPLES

C_1	C_2	C_3
S_1	S_2	S_3

NOTES

1. Not to be used for navigation.

2. Data is for the period 1958-1960.

3. Data is for the period 1961-1965.

4. Data is for the period 1966-1970.

5. Data is for the period 1971-1975.

6. Data is for the period 1976-1980.

7. Data is for the period 1981-1985.

8. Data is for the period 1986-1990.

9. Data is for the period 1991-1995.

10. Data is for the period 1996-2000.

11. Data is for the period 2001-2005.

12. Data is for the period 2006-2010.

13. Data is for the period 2011-2015.

14. Data is for the period 2016-2020.

15. Data is for the period 2021-2025.

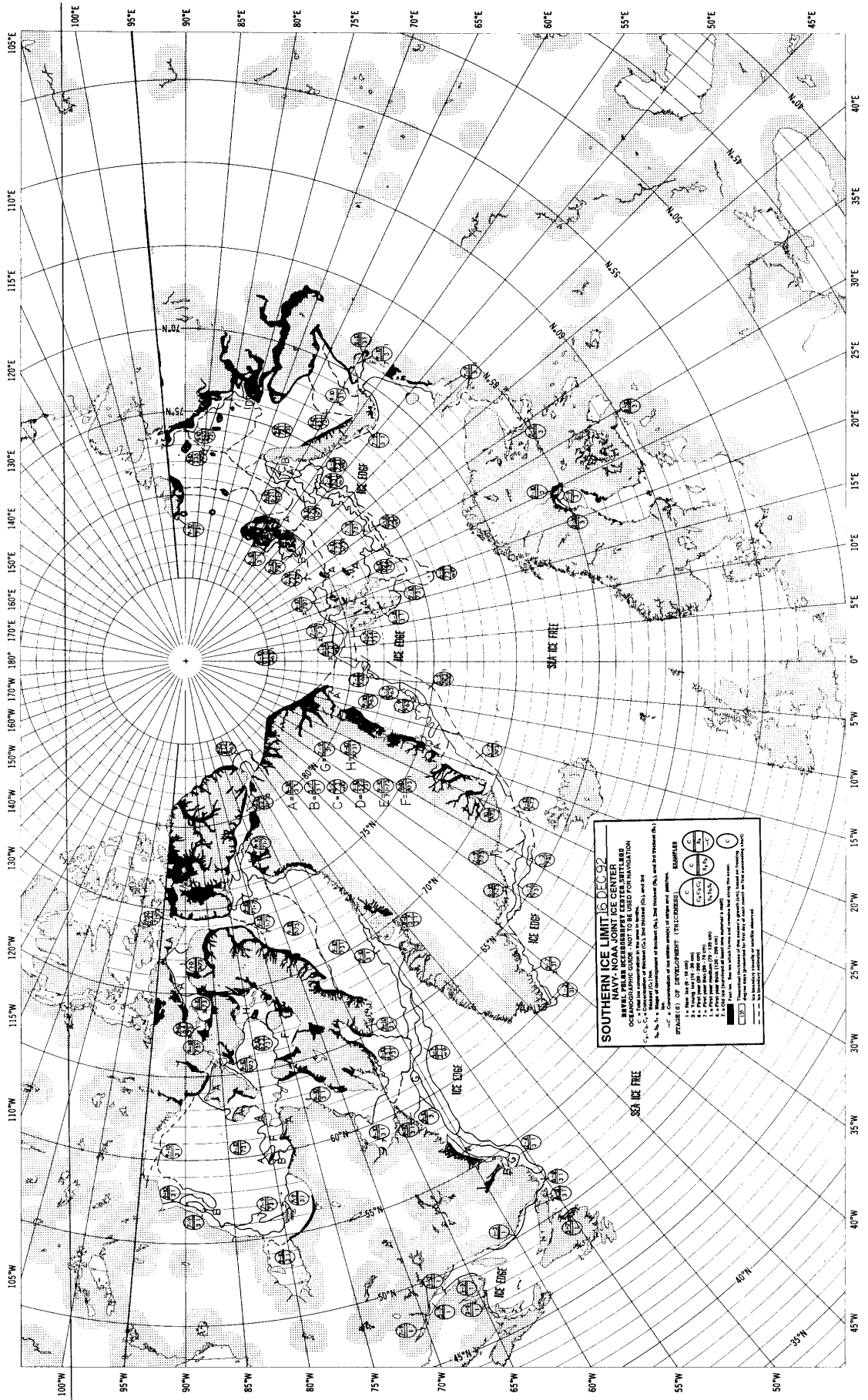
16. Data is for the period 2026-2030.

17. Data is for the period 2031-2035.

18. Data is for the period 2036-2040.

19. Data is for the period 2041-2045.

20. Data is for the period 2046-2050.

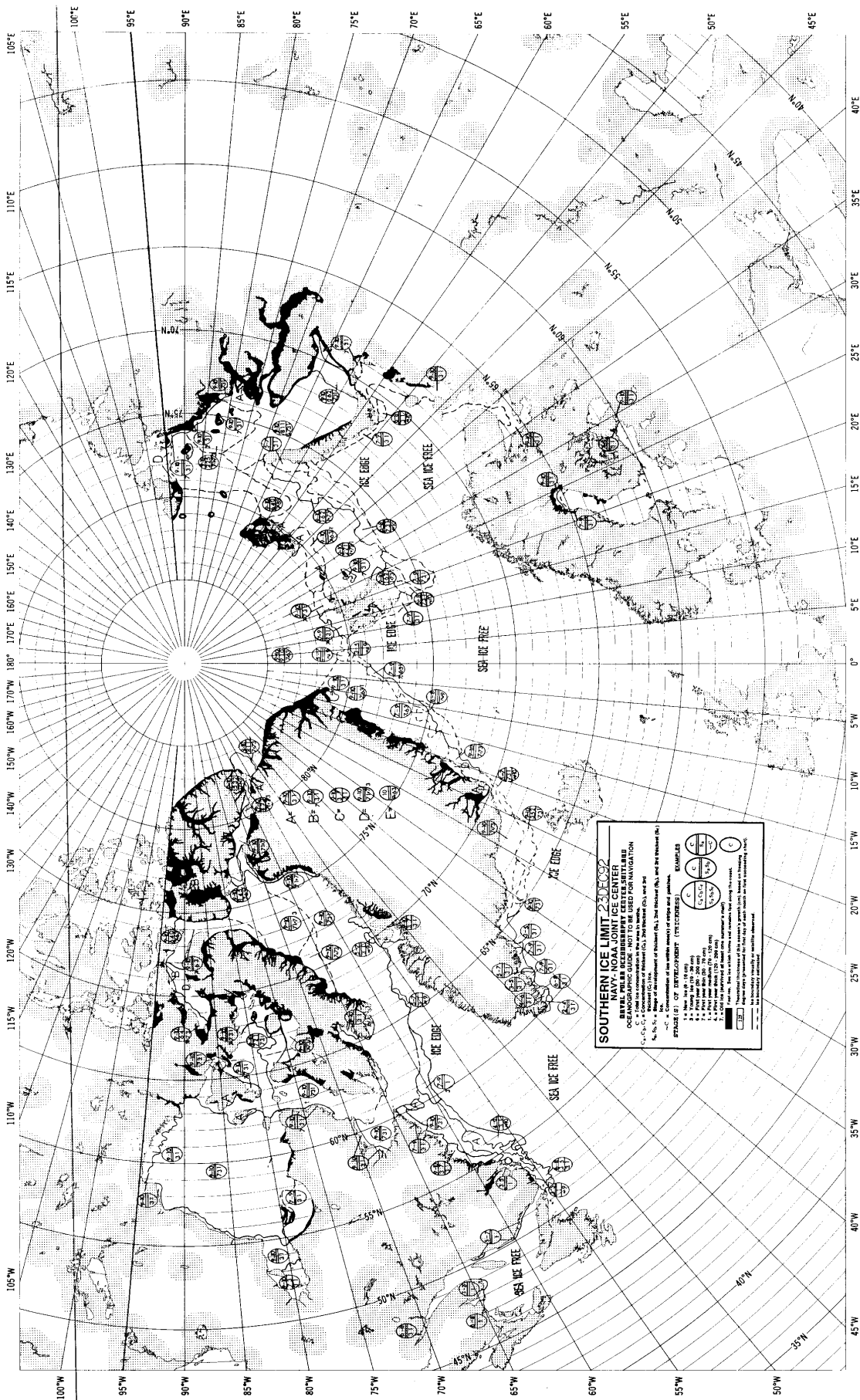


SOUTHERN ICE LIMIT IS DEC 92
NAVAL POLAR OPERATIONS CENTER JOINT ICE CENTER
 NAVAL POLAR OPERATIONS CENTER JOINT ICE CENTER
 6000 WASHINGTON AVENUE, WASHINGTON, DC 20330-5030
 202 755 3300 FAX 202 755 3301

SYMBOLS:
 C, S, L, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
 C, S, L, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
 C, S, L, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

EXAMPLES:
 1. Ice free (0-100%)
 2. Ice free (0-100%)
 3. Ice free (0-100%)
 4. Ice free (0-100%)
 5. Ice free (0-100%)
 6. Ice free (0-100%)
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 9. Ice free (0-100%)
 10. Ice free (0-100%)

NOTES:
 1. Data is from 1982-1992
 2. Data is from 1982-1992
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 7. Data is from 1982-1992
 8. Data is from 1982-1992
 9. Data is from 1982-1992
 10. Data is from 1982-1992



SOUTHERN ICE LIMIT 23DEC62
NAVY-NOAA JOINT ICE CENTER
 OCCURRENCE OF ICE SETTLERS
 OCCURRENCE OF ICE SETTLERS
 OCCURRENCE OF ICE SETTLERS
 OCCURRENCE OF ICE SETTLERS

EXAMPLES

1. 1-1-62 (S.I. 11) [Symbol]

2. 2-1-62 (S.I. 21) [Symbol]

3. 3-1-62 (S.I. 31) [Symbol]

4. 4-1-62 (S.I. 41) [Symbol]

5. 5-1-62 (S.I. 51) [Symbol]

6. 6-1-62 (S.I. 61) [Symbol]

7. 7-1-62 (S.I. 71) [Symbol]

8. 8-1-62 (S.I. 81) [Symbol]

9. 9-1-62 (S.I. 91) [Symbol]

10. 10-1-62 (S.I. 101) [Symbol]

11. 11-1-62 (S.I. 111) [Symbol]

12. 12-1-62 (S.I. 121) [Symbol]

13. 1-2-62 (S.I. 131) [Symbol]

14. 1-3-62 (S.I. 141) [Symbol]

15. 1-4-62 (S.I. 151) [Symbol]

16. 1-5-62 (S.I. 161) [Symbol]

17. 1-6-62 (S.I. 171) [Symbol]

18. 1-7-62 (S.I. 181) [Symbol]

19. 1-8-62 (S.I. 191) [Symbol]

20. 1-9-62 (S.I. 201) [Symbol]

21. 1-10-62 (S.I. 211) [Symbol]

22. 1-11-62 (S.I. 221) [Symbol]

23. 1-12-62 (S.I. 231) [Symbol]

24. 2-1-62 (S.I. 241) [Symbol]

25. 2-2-62 (S.I. 251) [Symbol]

26. 2-3-62 (S.I. 261) [Symbol]

27. 2-4-62 (S.I. 271) [Symbol]

28. 2-5-62 (S.I. 281) [Symbol]

29. 2-6-62 (S.I. 291) [Symbol]

30. 2-7-62 (S.I. 301) [Symbol]

31. 2-8-62 (S.I. 311) [Symbol]

32. 2-9-62 (S.I. 321) [Symbol]

33. 2-10-62 (S.I. 331) [Symbol]

34. 2-11-62 (S.I. 341) [Symbol]

35. 2-12-62 (S.I. 351) [Symbol]

36. 3-1-62 (S.I. 361) [Symbol]

37. 3-2-62 (S.I. 371) [Symbol]

38. 3-3-62 (S.I. 381) [Symbol]

39. 3-4-62 (S.I. 391) [Symbol]

40. 3-5-62 (S.I. 401) [Symbol]

41. 3-6-62 (S.I. 411) [Symbol]

42. 3-7-62 (S.I. 421) [Symbol]

43. 3-8-62 (S.I. 431) [Symbol]

44. 3-9-62 (S.I. 441) [Symbol]

45. 3-10-62 (S.I. 451) [Symbol]

46. 3-11-62 (S.I. 461) [Symbol]

47. 3-12-62 (S.I. 471) [Symbol]

48. 4-1-62 (S.I. 481) [Symbol]

49. 4-2-62 (S.I. 491) [Symbol]

50. 4-3-62 (S.I. 501) [Symbol]

51. 4-4-62 (S.I. 511) [Symbol]

52. 4-5-62 (S.I. 521) [Symbol]

53. 4-6-62 (S.I. 531) [Symbol]

54. 4-7-62 (S.I. 541) [Symbol]

55. 4-8-62 (S.I. 551) [Symbol]

56. 4-9-62 (S.I. 561) [Symbol]

57. 4-10-62 (S.I. 571) [Symbol]

58. 4-11-62 (S.I. 581) [Symbol]

59. 4-12-62 (S.I. 591) [Symbol]

60. 5-1-62 (S.I. 601) [Symbol]

61. 5-2-62 (S.I. 611) [Symbol]

62. 5-3-62 (S.I. 621) [Symbol]

63. 5-4-62 (S.I. 631) [Symbol]

64. 5-5-62 (S.I. 641) [Symbol]

65. 5-6-62 (S.I. 651) [Symbol]

66. 5-7-62 (S.I. 661) [Symbol]

67. 5-8-62 (S.I. 671) [Symbol]

68. 5-9-62 (S.I. 681) [Symbol]

69. 5-10-62 (S.I. 691) [Symbol]

70. 5-11-62 (S.I. 701) [Symbol]

71. 5-12-62 (S.I. 711) [Symbol]

72. 6-1-62 (S.I. 721) [Symbol]

73. 6-2-62 (S.I. 731) [Symbol]

74. 6-3-62 (S.I. 741) [Symbol]

75. 6-4-62 (S.I. 751) [Symbol]

76. 6-5-62 (S.I. 761) [Symbol]

77. 6-6-62 (S.I. 771) [Symbol]

78. 6-7-62 (S.I. 781) [Symbol]

79. 6-8-62 (S.I. 791) [Symbol]

80. 6-9-62 (S.I. 801) [Symbol]

81. 6-10-62 (S.I. 811) [Symbol]

82. 6-11-62 (S.I. 821) [Symbol]

83. 6-12-62 (S.I. 831) [Symbol]

84. 7-1-62 (S.I. 841) [Symbol]

85. 7-2-62 (S.I. 851) [Symbol]

86. 7-3-62 (S.I. 861) [Symbol]

87. 7-4-62 (S.I. 871) [Symbol]

88. 7-5-62 (S.I. 881) [Symbol]

89. 7-6-62 (S.I. 891) [Symbol]

90. 7-7-62 (S.I. 901) [Symbol]

91. 7-8-62 (S.I. 911) [Symbol]

92. 7-9-62 (S.I. 921) [Symbol]

93. 7-10-62 (S.I. 931) [Symbol]

94. 7-11-62 (S.I. 941) [Symbol]

95. 7-12-62 (S.I. 951) [Symbol]

96. 8-1-62 (S.I. 961) [Symbol]

97. 8-2-62 (S.I. 971) [Symbol]

98. 8-3-62 (S.I. 981) [Symbol]

99. 8-4-62 (S.I. 991) [Symbol]

100. 8-5-62 (S.I. 1001) [Symbol]

101. 8-6-62 (S.I. 1011) [Symbol]

102. 8-7-62 (S.I. 1021) [Symbol]

103. 8-8-62 (S.I. 1031) [Symbol]

104. 8-9-62 (S.I. 1041) [Symbol]

105. 8-10-62 (S.I. 1051) [Symbol]

106. 8-11-62 (S.I. 1061) [Symbol]

107. 8-12-62 (S.I. 1071) [Symbol]

108. 9-1-62 (S.I. 1081) [Symbol]

109. 9-2-62 (S.I. 1091) [Symbol]

110. 9-3-62 (S.I. 1101) [Symbol]

111. 9-4-62 (S.I. 1111) [Symbol]

112. 9-5-62 (S.I. 1121) [Symbol]

113. 9-6-62 (S.I. 1131) [Symbol]

114. 9-7-62 (S.I. 1141) [Symbol]

115. 9-8-62 (S.I. 1151) [Symbol]

116. 9-9-62 (S.I. 1161) [Symbol]

117. 9-10-62 (S.I. 1171) [Symbol]

118. 9-11-62 (S.I. 1181) [Symbol]

119. 9-12-62 (S.I. 1191) [Symbol]

120. 10-1-62 (S.I. 1201) [Symbol]

121. 10-2-62 (S.I. 1211) [Symbol]

122. 10-3-62 (S.I. 1221) [Symbol]

123. 10-4-62 (S.I. 1231) [Symbol]

124. 10-5-62 (S.I. 1241) [Symbol]

125. 10-6-62 (S.I. 1251) [Symbol]

126. 10-7-62 (S.I. 1261) [Symbol]

127. 10-8-62 (S.I. 1271) [Symbol]

128. 10-9-62 (S.I. 1281) [Symbol]

129. 10-10-62 (S.I. 1291) [Symbol]

130. 10-11-62 (S.I. 1301) [Symbol]

131. 10-12-62 (S.I. 1311) [Symbol]

132. 11-1-62 (S.I. 1321) [Symbol]

133. 11-2-62 (S.I. 1331) [Symbol]

134. 11-3-62 (S.I. 1341) [Symbol]

135. 11-4-62 (S.I. 1351) [Symbol]

136. 11-5-62 (S.I. 1361) [Symbol]

137. 11-6-62 (S.I. 1371) [Symbol]

138. 11-7-62 (S.I. 1381) [Symbol]

139. 11-8-62 (S.I. 1391) [Symbol]

140. 11-9-62 (S.I. 1401) [Symbol]

141. 11-10-62 (S.I. 1411) [Symbol]

142. 11-11-62 (S.I. 1421) [Symbol]

143. 11-12-62 (S.I. 1431) [Symbol]

144. 12-1-62 (S.I. 1441) [Symbol]

145. 12-2-62 (S.I. 1451) [Symbol]

146. 12-3-62 (S.I. 1461) [Symbol]

147. 12-4-62 (S.I. 1471) [Symbol]

148. 12-5-62 (S.I. 1481) [Symbol]

149. 12-6-62 (S.I. 1491) [Symbol]

150. 12-7-62 (S.I. 1501) [Symbol]

151. 12-8-62 (S.I. 1511) [Symbol]

152. 12-9-62 (S.I. 1521) [Symbol]

153. 12-10-62 (S.I. 1531) [Symbol]

154. 12-11-62 (S.I. 1541) [Symbol]

155. 12-12-62 (S.I. 1551) [Symbol]

156. 1-1-63 (S.I. 1561) [Symbol]

157. 1-2-63 (S.I. 1571) [Symbol]

158. 1-3-63 (S.I. 1581) [Symbol]

159. 1-4-63 (S.I. 1591) [Symbol]

160. 1-5-63 (S.I. 1601) [Symbol]

161. 1-6-63 (S.I. 1611) [Symbol]

162. 1-7-63 (S.I. 1621) [Symbol]

163. 1-8-63 (S.I. 1631) [Symbol]

164. 1-9-63 (S.I. 1641) [Symbol]

165. 1-10-63 (S.I. 1651) [Symbol]

166. 1-11-63 (S.I. 1661) [Symbol]

167. 1-12-63 (S.I. 1671) [Symbol]

168. 2-1-63 (S.I. 1681) [Symbol]

169. 2-2-63 (S.I. 1691) [Symbol]

170. 2-3-63 (S.I. 1701) [Symbol]

171. 2-4-63 (S.I. 1711) [Symbol]

172. 2-5-63 (S.I. 1721) [Symbol]

173. 2-6-63 (S.I. 1731) [Symbol]

174. 2-7-63 (S.I. 1741) [Symbol]

175. 2-8-63 (S.I. 1751) [Symbol]

176. 2-9-63 (S.I. 1761) [Symbol]

177. 2-10-63 (S.I. 1771) [Symbol]

178. 2-11-63 (S.I. 1781) [Symbol]

179. 2-12-63 (S.I. 1791) [Symbol]

180. 3-1-63 (S.I. 1801) [Symbol]

181. 3-2-63 (S.I. 1811) [Symbol]

182. 3-3-63 (S.I. 1821) [Symbol]

183. 3-4-63 (S.I. 1831) [Symbol]

184. 3-5-63 (S.I. 1841) [Symbol]

185. 3-6-63 (S.I. 1851) [Symbol]

186. 3-7-63 (S.I. 1861) [Symbol]

187. 3-8-63 (S.I. 1871) [Symbol]

188. 3-9-63 (S.I. 1881) [Symbol]

189. 3-10-63 (S.I. 1891) [Symbol]

190. 3-11-63 (S.I. 1901) [Symbol]

191. 3-12-63 (S.I. 1911) [Symbol]

192. 4-1-63 (S.I. 1921) [Symbol]

193. 4-2-63 (S.I. 1931) [Symbol]

194. 4-3-63 (S.I. 1941) [Symbol]

195. 4-4-63 (S.I. 1951) [Symbol]

196. 4-5-63 (S.I. 1961) [Symbol]

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199. 4-8-63 (S.I. 1991) [Symbol]

200. 4-9-63 (S.I. 2001) [Symbol]

201. 4-10-63 (S.I. 2011) [Symbol]

202. 4-11-63 (S.I. 2021) [Symbol]

203. 4-12-63 (S.I. 2031) [Symbol]

204. 5-1-63 (S.I. 2041) [Symbol]

205. 5-2-63 (S.I. 2051) [Symbol]

206. 5-3-63 (S.I. 2061) [Symbol]

207. 5-4-63 (S.I. 2071) [Symbol]

208. 5-5-63 (S.I. 2081) [Symbol]

209. 5-6-63 (S.I. 2091) [Symbol]

210. 5-7-63 (S.I. 2101) [Symbol]

211. 5-8-63 (S.I. 2111) [Symbol]

212. 5-9-63 (S.I. 2121) [Symbol]

213. 5-10-63 (S.I. 2131) [Symbol]

214. 5-11-63 (S.I. 2141) [Symbol]

215. 5-12-63 (S.I. 2151) [Symbol]

216. 6-1-63 (S.I. 2161) [Symbol]

217. 6-2-63 (S.I. 2171) [Symbol]

218. 6-3-63 (S.I. 2181) [Symbol]

219. 6-4-63 (S.I. 2191) [Symbol]

220. 6-5-63 (S.I. 2201) [Symbol]

221. 6-6-63 (S.I. 2211) [Symbol]

222. 6-7-63 (S.I. 2221) [Symbol]

223. 6-8-63 (S.I. 2231) [Symbol]

224. 6-9-63 (S.I. 2241) [Symbol]

225. 6-10-63 (S.I. 2251) [Symbol]

226. 6-11-63 (S.I. 2261) [Symbol]

227. 6-12-63 (S.I. 2271) [Symbol]

228. 7-1-63 (S.I. 2281) [Symbol]

229. 7-2-63 (S.I. 2291) [Symbol]

230. 7-3-63 (S.I. 2301) [Symbol]

231. 7-4-63 (S.I. 2311) [Symbol]

232. 7-5-63 (S.I. 2321) [Symbol]

233. 7-6-63 (S.I. 2331) [Symbol]

234. 7-7-63 (S.I. 2341) [Symbol]

235. 7-8-63 (S.I. 2351) [Symbol]

236. 7-9-63 (S.I. 2361) [Symbol]

237. 7-10-63 (S.I. 2371) [Symbol]

238. 7-11-63 (S.I. 2381) [Symbol]

239. 7-12-63 (S.I. 2391) [Symbol]

240. 8-1-63 (S.I. 2401) [Symbol]

241. 8-2-63 (S.I. 2411) [Symbol]

242. 8-3-63 (S.I. 2421) [Symbol]

243. 8-4-63 (S.I. 2431) [Symbol]

244. 8-5-63 (S.I. 2441) [Symbol]

245. 8-6-63 (S.I. 2451) [Symbol]

246. 8-7-63 (S.I. 2461) [Symbol]

247. 8-8-63 (S.I. 2471) [Symbol]

248. 8-9-63 (S.I. 2481) [Symbol]

249. 8-10-63 (S.I. 2491) [Symbol]

250. 8-11-63 (S.I. 2501) [Symbol]

251. 8-12-63 (S.I. 2511) [Symbol]

252. 9-1-63 (S.I. 2521) [Symbol]

253. 9-2-63 (S.I. 2531) [Symbol]

254. 9-3-63 (S.I. 2541) [Symbol]

255. 9-4-63 (S.I. 2551) [Symbol]

256. 9-5-63 (S.I. 2561) [Symbol]

257. 9-6-63 (S.I. 2571) [Symbol]

258. 9-7-63 (S.I. 2581) [Symbol]

259. 9-8-63 (S.I. 2591) [Symbol]

260. 9-9-63 (S.I. 2601) [Symbol]

261. 9-10-63 (S.I. 2611) [Symbol]

262. 9-11-63 (S.I. 2621) [Symbol]

263. 9-12-63 (S.I. 2631) [Symbol]

264. 10-1-63 (S.I. 2641) [Symbol]

265. 10-2-63 (S.I. 2651) [Symbol]

266. 10-3-63 (S.I. 2661) [Symbol]

267. 10-4-63 (S.I. 2671) [Symbol]

268. 10-5-63 (S.I. 2681) [Symbol]

269. 10-6-63 (S.I. 2691) [Symbol]

270. 10-7-63 (S.I. 2701) [Symbol]

271. 10-8-63 (S.I. 2711) [Symbol]

272. 10-9-63 (S.I. 2721) [Symbol]

273. 10-10-63 (S.I. 2731) [Symbol]

274. 10-11-63 (S.I. 2741) [Symbol]

275. 10-12-63 (S.I. 2751) [Symbol]

276. 11-1-63 (S.I. 2761) [Symbol]

277. 11-2-63 (S.I. 2771) [Symbol]

278. 11-3-63 (S.I. 2781) [Symbol]

279. 11-4-63 (S.I. 2791) [Symbol]

280. 11-5-63 (S.I. 2801) [Symbol]

281. 11-6-63 (S.I. 2811) [Symbol]

282. 11-7-63 (S.I. 2821) [Symbol]

283. 11-8-63 (S.I. 2831) [Symbol]

284. 11-9-63 (S.I. 2841) [Symbol]

285. 11-10-63 (S.I. 2851) [Symbol]

286. 11-11-63 (S.I. 2861) [Symbol]

287. 11-12-63 (S.I. 2871) [Symbol]

288. 12-1-63 (S.I. 2881) [Symbol]

289. 12-2-63 (S.I. 2891) [Symbol]

290. 12-3-63 (S.I. 2901) [Symbol]

291. 12-4-63 (S.I. 2911) [Symbol]

292. 12-5-63 (S.I. 2921) [Symbol]

293. 12-6-63 (S.I. 2931) [Symbol]

294. 12-7-63 (S.I. 2941) [Symbol]

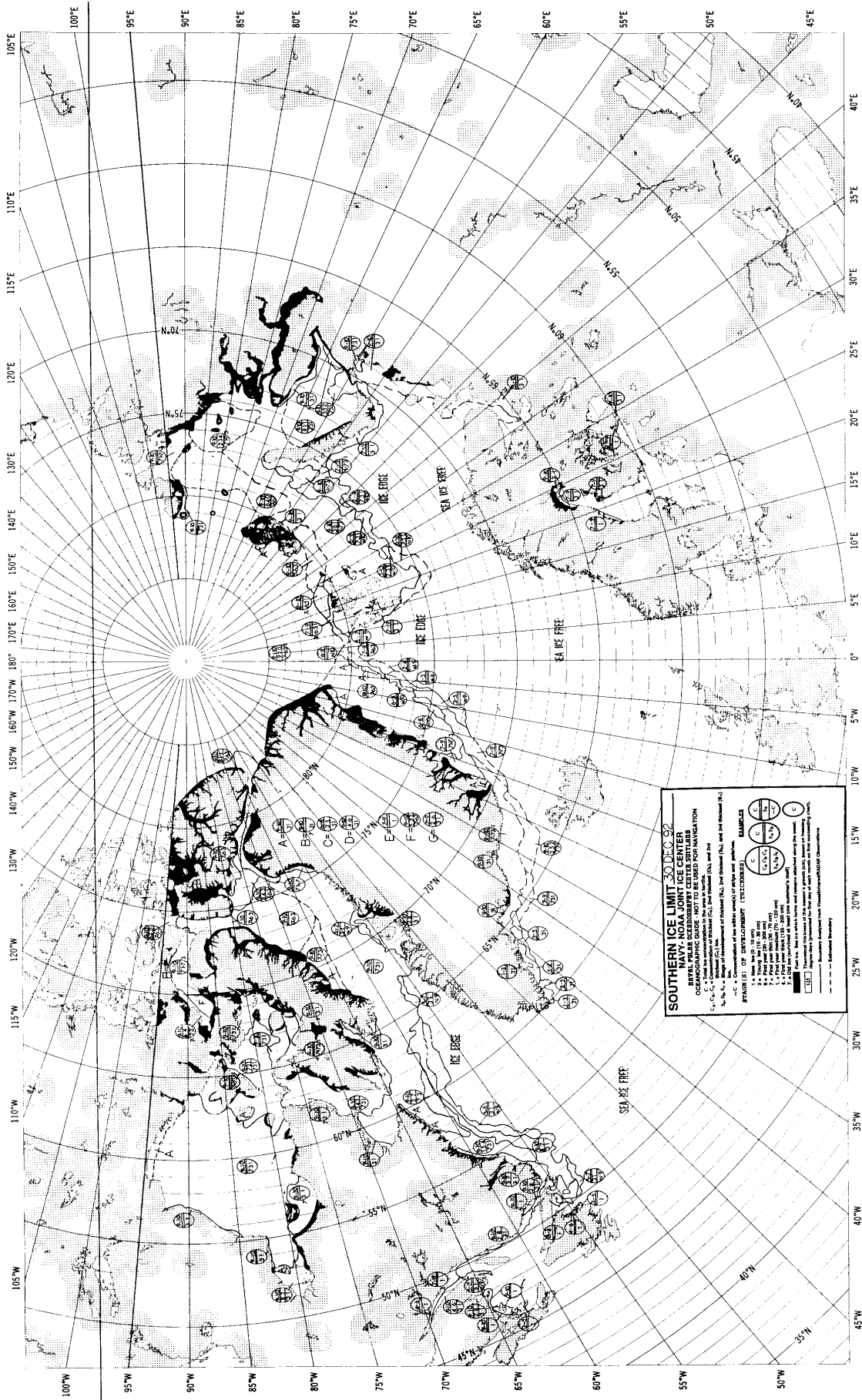
295. 12-8-63 (S.I. 2951) [Symbol]

296. 12-9-63 (S.I. 2961) [Symbol]

297. 12-10-63 (S.I. 2971) [Symbol]

298. 12-11-63 (S.I. 2981) [Symbol]

299. 12-12-63 (S.I. 2991) [Symbol]



SOUTHERN ICE LIMIT 30 DEC 92
SEVERAL PUBLIC DOMAINS AND THE
NAVY-NOAA JOINT ICE CENTER
CONDUCT RESEARCH AND OBSERVATIONS
ON THE SOUTHERN OCEAN. THIS DATA IS NOT TO BE USED FOR NAVIGATION.

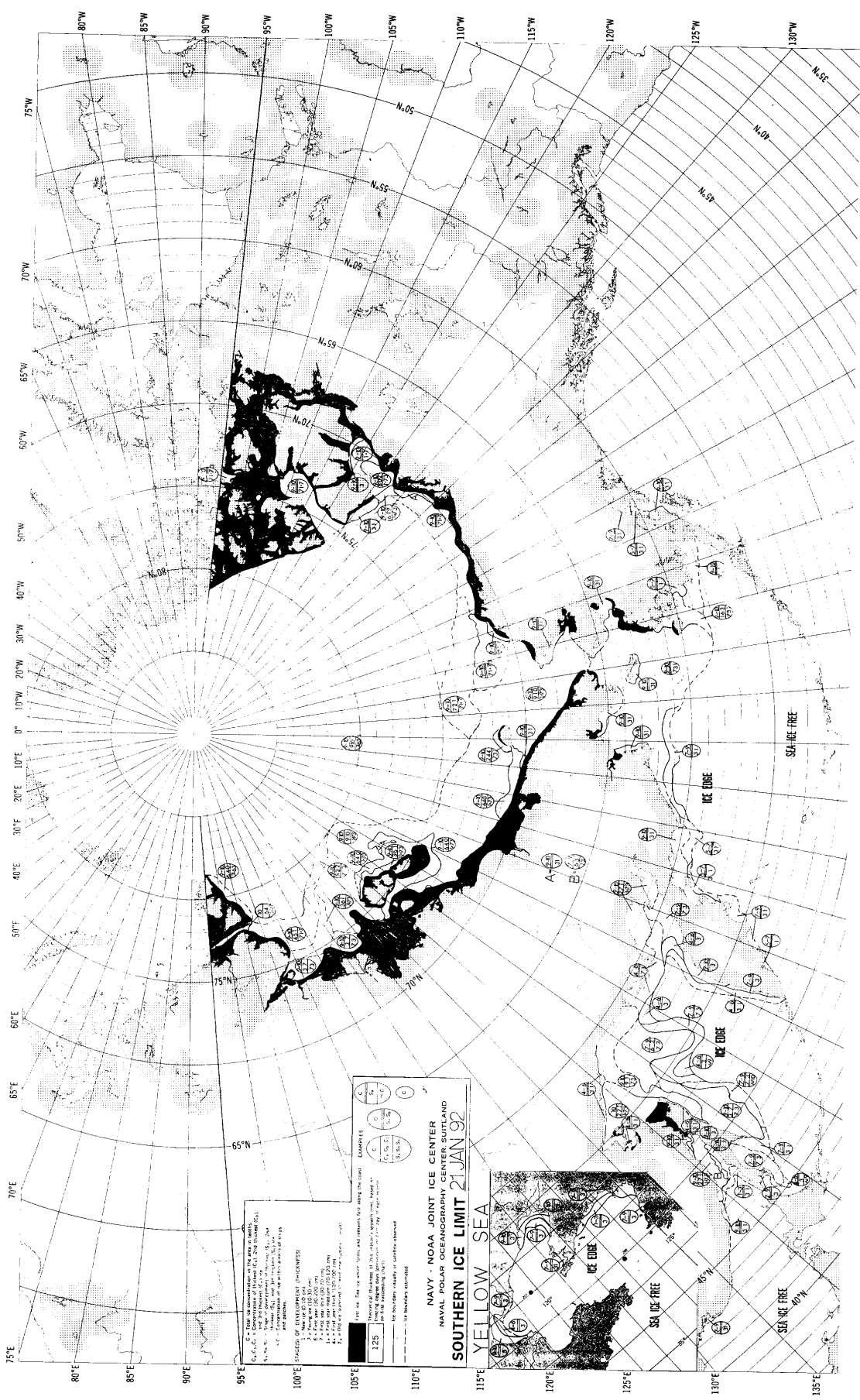
1. 1 to 2000 are the station numbers.
2. 1 to 2000 are the station numbers.
3. 1 to 2000 are the station numbers.
4. 1 to 2000 are the station numbers.
5. 1 to 2000 are the station numbers.
6. 1 to 2000 are the station numbers.

STATION (S) OF DATA EQUIPMENT (TYPE/CODES)

1. 1 to 2000 are the station numbers.
2. 1 to 2000 are the station numbers.
3. 1 to 2000 are the station numbers.
4. 1 to 2000 are the station numbers.
5. 1 to 2000 are the station numbers.
6. 1 to 2000 are the station numbers.

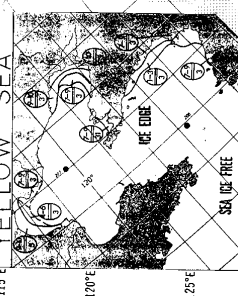
EXAMPLES

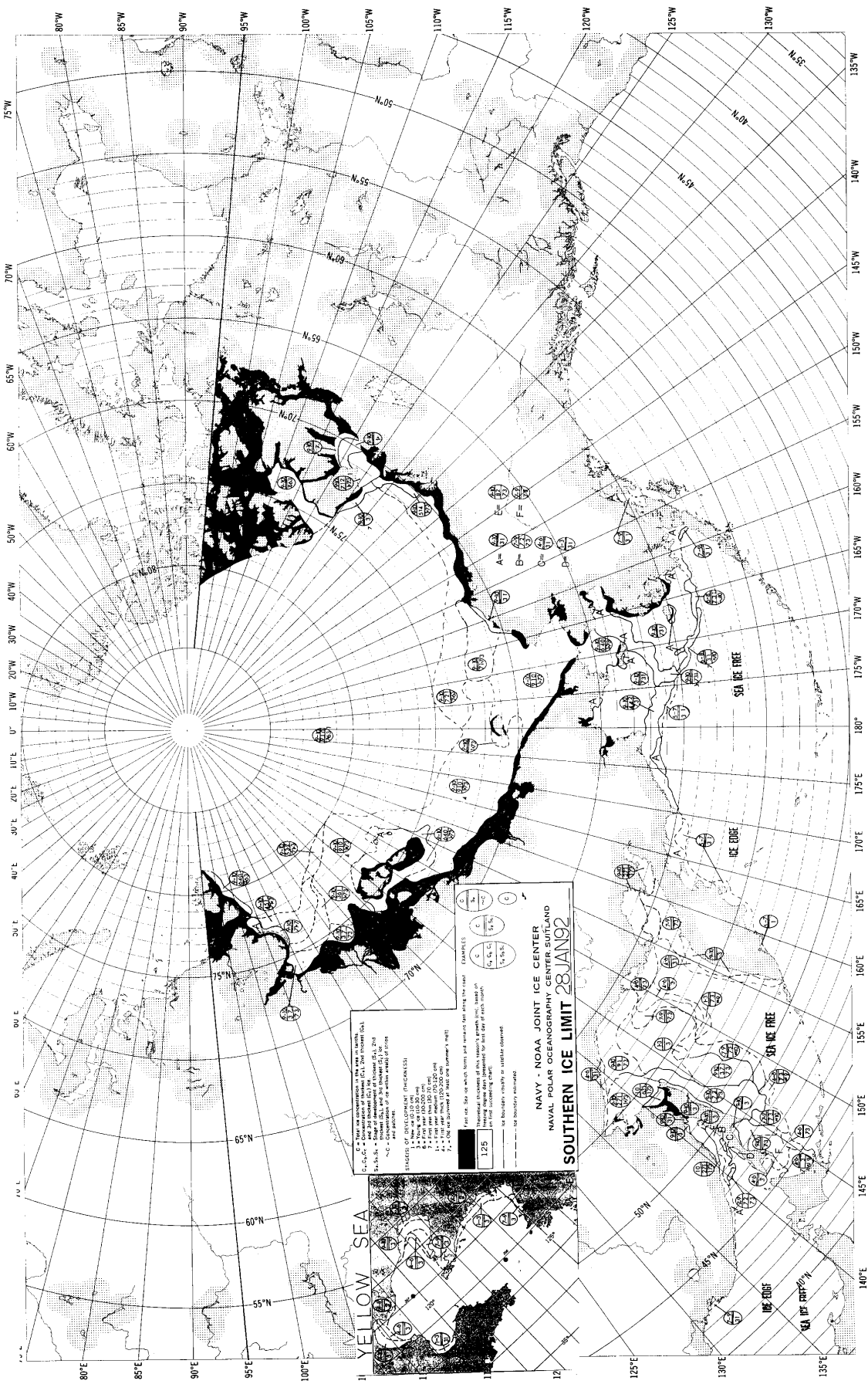
1. 1 to 2000 are the station numbers.
2. 1 to 2000 are the station numbers.
3. 1 to 2000 are the station numbers.
4. 1 to 2000 are the station numbers.
5. 1 to 2000 are the station numbers.
6. 1 to 2000 are the station numbers.



1. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 2. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 3. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 4. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 5. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 6. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 7. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 8. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 9. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.
 10. Data collected by the U.S. Navy and U.S. Coast Guard during the 1980s and 1990s.

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND
SOUTHERN ICE LIMIT 21 JAN 92
YELLOW SEA





YELLOW SEA

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY
CENTRAL ARCTIC
SOUTHERN ICE LIMIT 28 JAN 92

ICE THICKNESS (FT/INCHES)

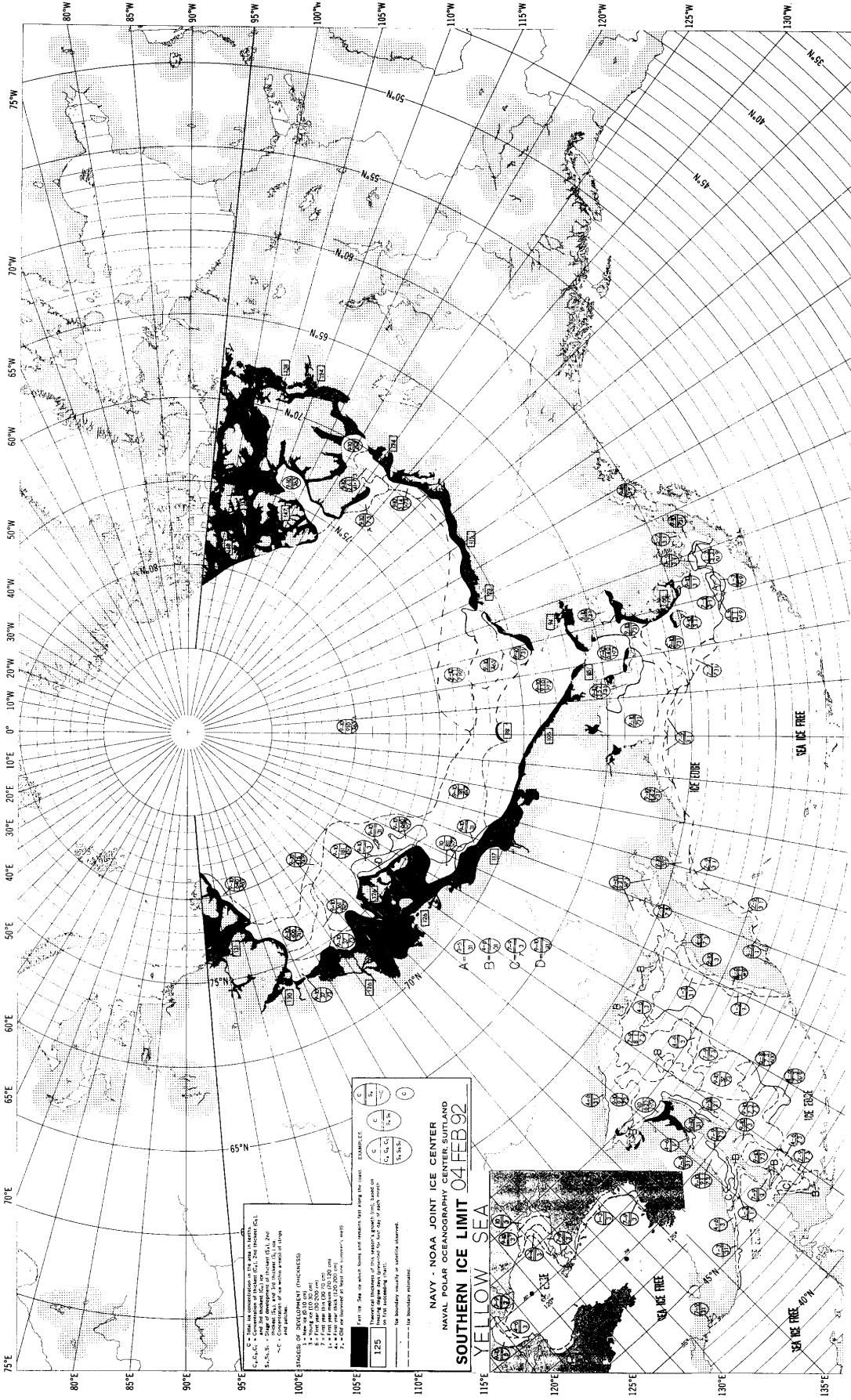
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30.0
4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5	45.0	49.5	54.0	58.5	63.0	67.5	72.0	76.5	81.0	85.5	90.0

ICE EDGE TYPES

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

125 Historical observations of ice thickness at date of each report
125 Recent observations of ice thickness at date of each report
Ice thicknesses in parentheses are estimated
Ice thicknesses in brackets are estimated

ICE EDGE: SEA ICE FREE, ICE EDGE, SEA ICE FREE

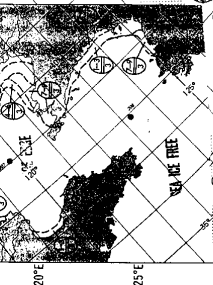


1. 1000m depth contour (1000m isobath)
 2. 2000m depth contour (2000m isobath)
 3. 5000m depth contour (5000m isobath)
 4. 10000m depth contour (10000m isobath)
 5. 20000m depth contour (20000m isobath)
 6. 50000m depth contour (50000m isobath)
 7. 100000m depth contour (100000m isobath)
 8. 200000m depth contour (200000m isobath)
 9. 500000m depth contour (500000m isobath)
 10. 1000000m depth contour (1000000m isobath)

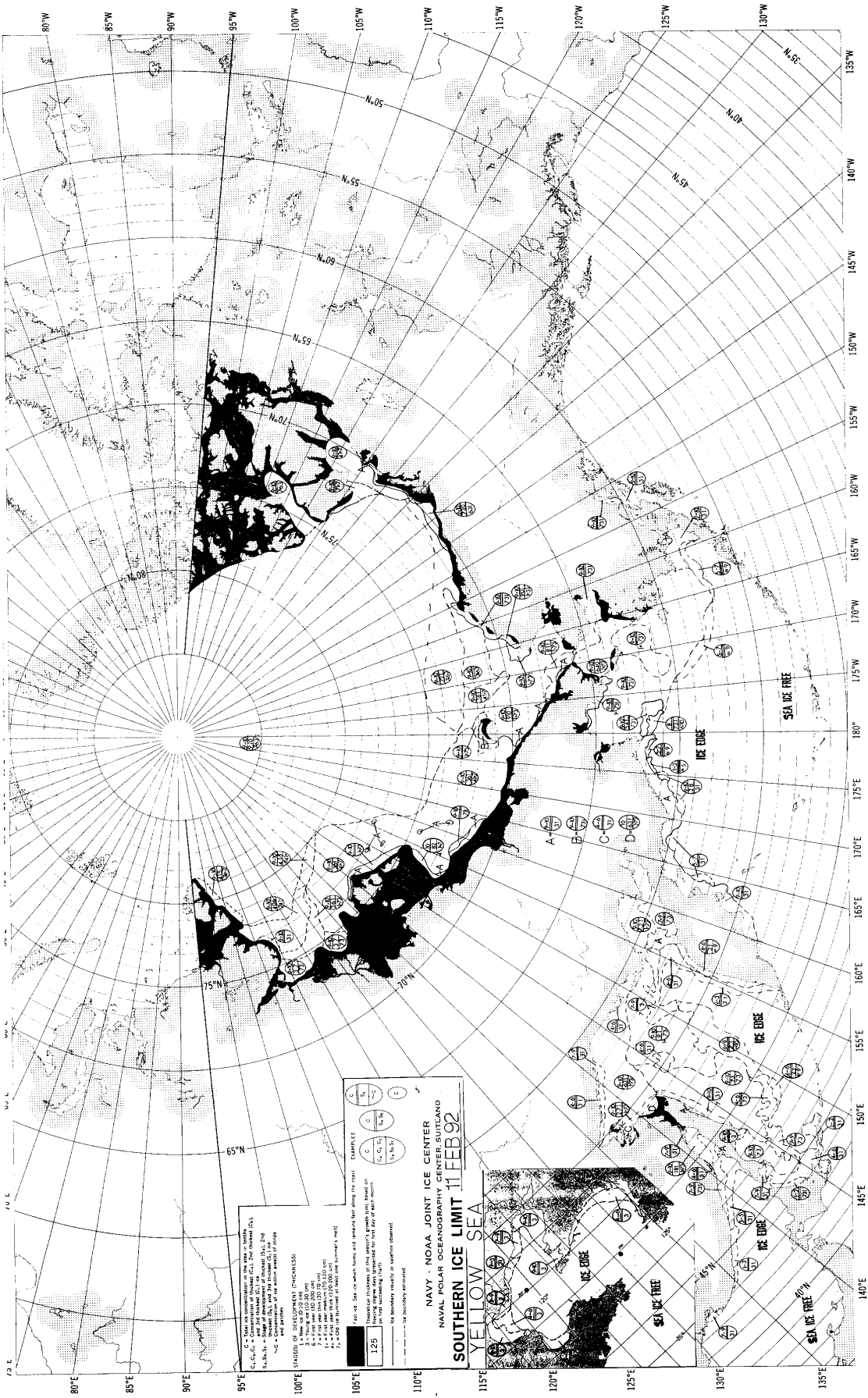
STAGES OF DEVELOPMENT (THICKNESS)
 1. 100% (1000m)
 2. 100% (1000m)
 3. 100% (1000m)
 4. 100% (1000m)
 5. 100% (1000m)
 6. 100% (1000m)
 7. 100% (1000m)
 8. 100% (1000m)
 9. 100% (1000m)
 10. 100% (1000m)

EXAMPLES
 A. 100% (1000m)
 B. 100% (1000m)
 C. 100% (1000m)
 D. 100% (1000m)

NAVY · NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER AND
SOUTHERN ICE LIMIT 04 FEB 92
 YELLOW SEA



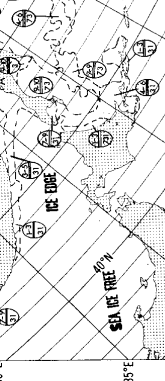
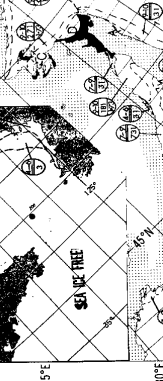
1. 1000m depth contour (1000m isobath)
 2. 2000m depth contour (2000m isobath)
 3. 5000m depth contour (5000m isobath)
 4. 10000m depth contour (10000m isobath)
 5. 20000m depth contour (20000m isobath)
 6. 50000m depth contour (50000m isobath)
 7. 100000m depth contour (100000m isobath)
 8. 200000m depth contour (200000m isobath)
 9. 500000m depth contour (500000m isobath)
 10. 1000000m depth contour (1000000m isobath)

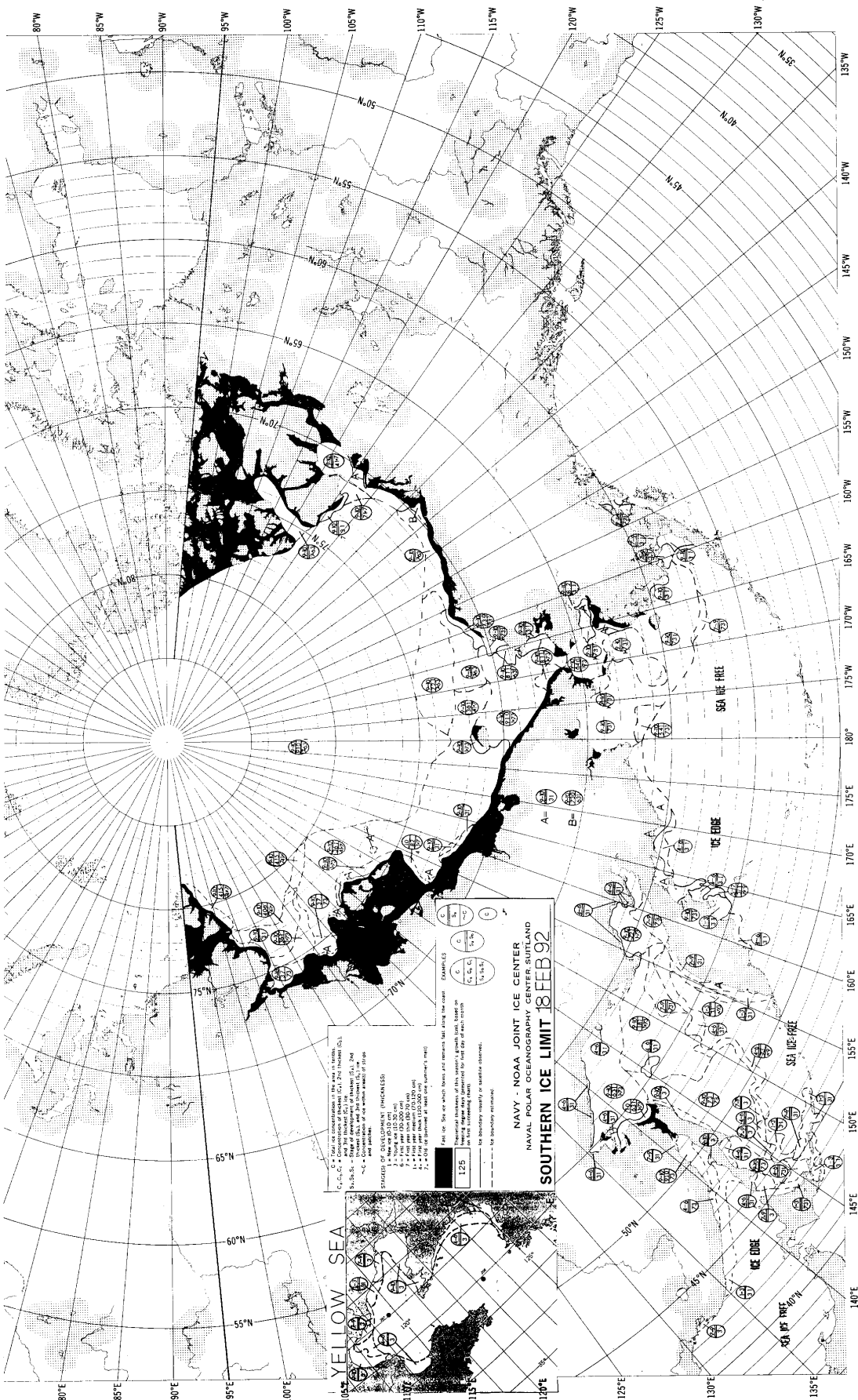


1. * Ocean ice concentration in the area is limited to 1%.
 2. * Ocean ice thickness in the area is limited to 1 m.
 3. * Ocean ice extent is limited to the area shown.
 4. * Ocean ice extent is limited to the area shown.
 5. * Ocean ice extent is limited to the area shown.
 6. * Ocean ice extent is limited to the area shown.
 7. * Ocean ice extent is limited to the area shown.
 8. * Ocean ice extent is limited to the area shown.
 9. * Ocean ice extent is limited to the area shown.
 10. * Ocean ice extent is limited to the area shown.

STAGES OF DEVELOPMENT (TRENCHES)
 1. * Thick ice (100-200 cm)
 2. * Thin ice (50-100 cm)
 3. * Very thin ice (10-50 cm)
 4. * Ice floes (5-10 cm)
 5. * Ice crystals (less than 5 cm)

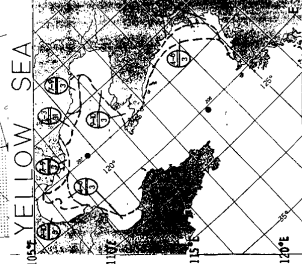
NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 11 FEB 92
 YELLOW SEA



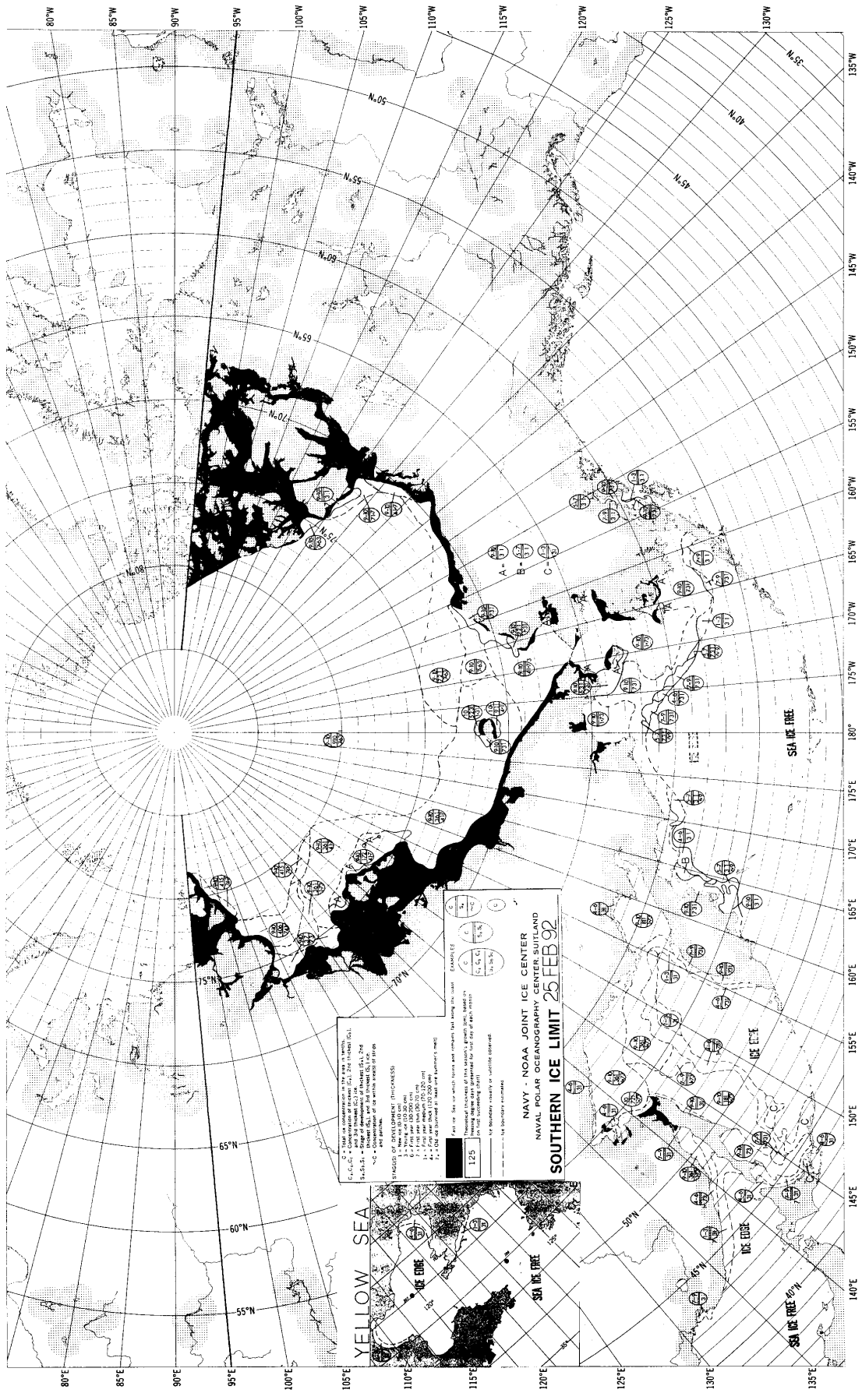


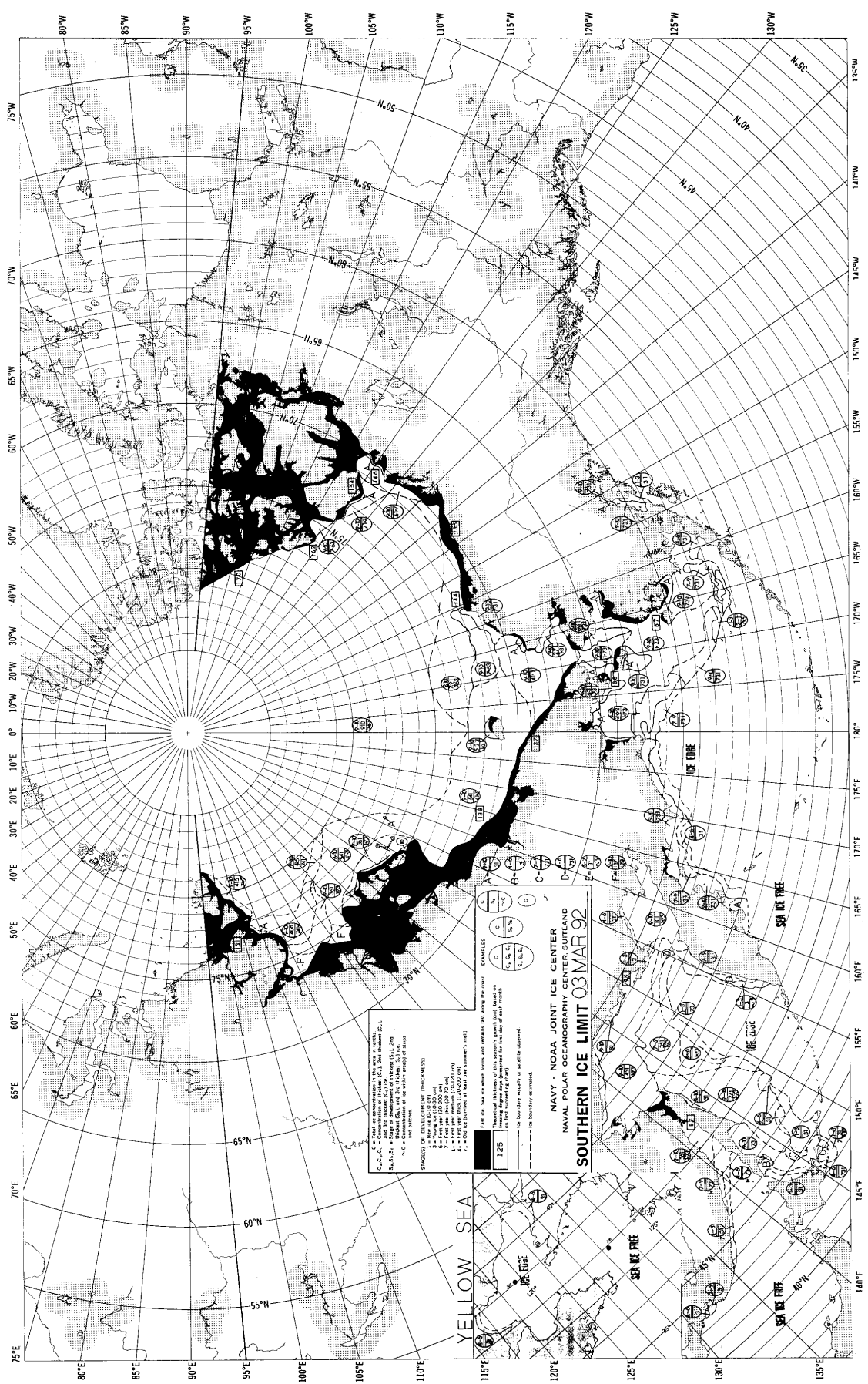
1. 100% of observations are from the period 1958-1992.
 2. 100% of observations are from the period 1958-1992.
 3. 100% of observations are from the period 1958-1992.
 4. 100% of observations are from the period 1958-1992.
 5. 100% of observations are from the period 1958-1992.
 6. 100% of observations are from the period 1958-1992.
 7. 100% of observations are from the period 1958-1992.
 8. 100% of observations are from the period 1958-1992.
 9. 100% of observations are from the period 1958-1992.
 10. 100% of observations are from the period 1958-1992.

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUTLAND
SOUTHERN ICE LIMIT 18 FEB 92



SYMBOLS:
 1 - Sea ice thickness and contours. See page 100.
 2 - Sea ice thickness and contours. See page 100.
 3 - Sea ice thickness and contours. See page 100.
 4 - Sea ice thickness and contours. See page 100.
 5 - Sea ice thickness and contours. See page 100.
 6 - Sea ice thickness and contours. See page 100.
 7 - Sea ice thickness and contours. See page 100.
 8 - Sea ice thickness and contours. See page 100.
 9 - Sea ice thickness and contours. See page 100.
 10 - Sea ice thickness and contours. See page 100.





A - 0.6 M of concentration of the sea ice
 B - 0.3 M of concentration of the sea ice
 C, G, H, I - 0.1 M of concentration of the sea ice
 J, K, L, M - 0.05 M of concentration of the sea ice
 N, O, P, Q, R, S, T, U, V, W, X, Y, Z - 0.02 M of concentration of the sea ice
 - C - 0.1 M of development (thickness)
 1 - New ice (0.15 M)
 2 - First year ice (0.3 M)
 3 - First year ice (0.5 M)
 4 - First year ice (0.7 M)
 5 - First year ice (0.9 M)
 6 - First year ice (1.1 M)
 7 - First year ice (1.3 M)
 8 - First year ice (1.5 M)
 9 - First year ice (1.7 M)
 10 - First year ice (1.9 M)
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 94 - First year ice (18.7 M)
 95 - First year ice (18.9 M)
 96 - First year ice (19.1 M)
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 98 - First year ice (19.5 M)
 99 - First year ice (19.7 M)
 100 - First year ice (19.9 M)

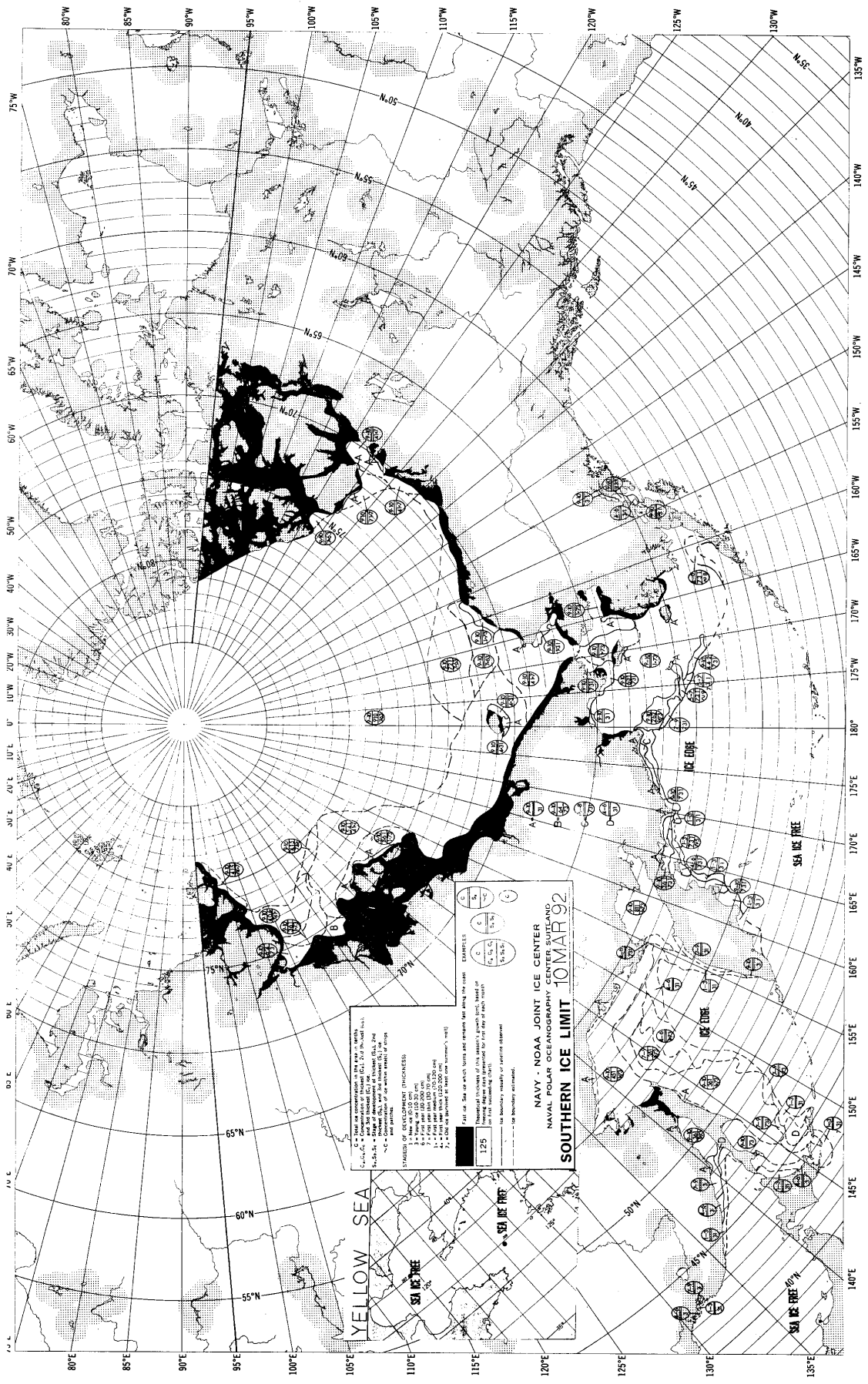
NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 03 MAR 92

125
 100
 75
 50
 25
 0
 -25
 -50
 -75
 -100
 -125
 -150
 -175
 -200

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 140°E 145°E 150°E 155°E 160°E 165°E 170°E 175°E 180°E 185°E

55°N 60°N 65°N 70°N 75°N 80°N 85°N

YELLOW SEA
 ICE EDGE
 SEA ICE FREE



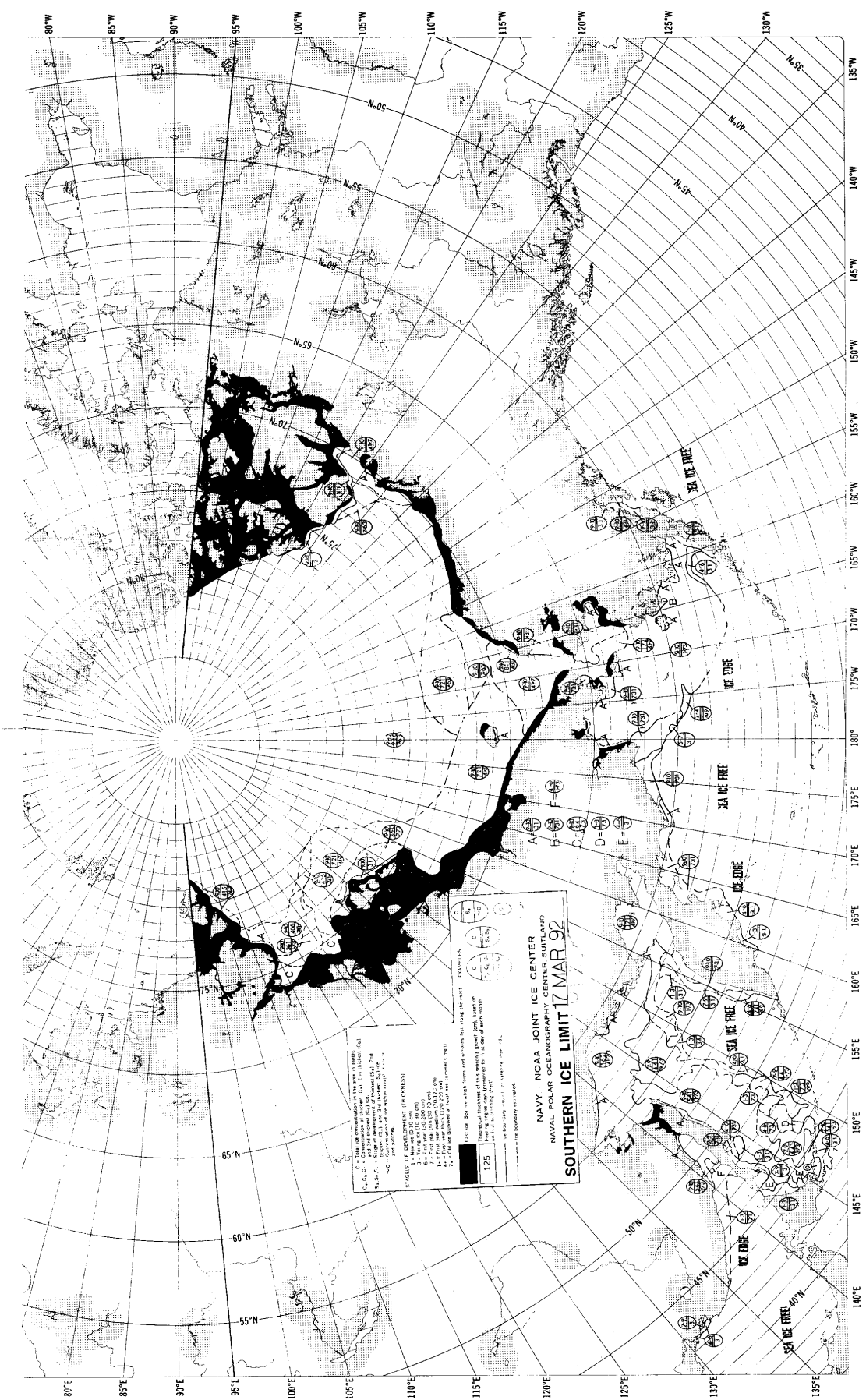
* Data on concentration of ice, ice strength, and ice thickness (CI) are reported (CI, 2nd digit) as follows:
 - 0: 0% ice concentration
 - 1: 10% ice concentration
 - 2: 20% ice concentration
 - 3: 30% ice concentration
 - 4: 40% ice concentration
 - 5: 50% ice concentration
 - 6: 60% ice concentration
 - 7: 70% ice concentration
 - 8: 80% ice concentration
 - 9: 90% ice concentration

SYMBOLS OF ICE-GOUGE AT THICKNESS
 1 - From 100 to 200 cm
 2 - From 200 to 300 cm
 3 - From 300 to 400 cm
 4 - From 400 to 500 cm
 5 - From 500 to 600 cm
 6 - From 600 to 700 cm
 7 - From 700 to 800 cm
 8 - From 800 to 900 cm
 9 - From 900 to 1000 cm
 10 - From 1000 to 1100 cm
 11 - From 1100 to 1200 cm
 12 - From 1200 to 1300 cm
 13 - From 1300 to 1400 cm
 14 - From 1400 to 1500 cm
 15 - From 1500 to 1600 cm
 16 - From 1600 to 1700 cm
 17 - From 1700 to 1800 cm
 18 - From 1800 to 1900 cm
 19 - From 1900 to 2000 cm
 20 - From 2000 to 2100 cm
 21 - From 2100 to 2200 cm
 22 - From 2200 to 2300 cm
 23 - From 2300 to 2400 cm
 24 - From 2400 to 2500 cm
 25 - From 2500 to 2600 cm
 26 - From 2600 to 2700 cm
 27 - From 2700 to 2800 cm
 28 - From 2800 to 2900 cm
 29 - From 2900 to 3000 cm
 30 - From 3000 to 3100 cm
 31 - From 3100 to 3200 cm
 32 - From 3200 to 3300 cm
 33 - From 3300 to 3400 cm
 34 - From 3400 to 3500 cm
 35 - From 3500 to 3600 cm
 36 - From 3600 to 3700 cm
 37 - From 3700 to 3800 cm
 38 - From 3800 to 3900 cm
 39 - From 3900 to 4000 cm
 40 - From 4000 to 4100 cm
 41 - From 4100 to 4200 cm
 42 - From 4200 to 4300 cm
 43 - From 4300 to 4400 cm
 44 - From 4400 to 4500 cm
 45 - From 4500 to 4600 cm
 46 - From 4600 to 4700 cm
 47 - From 4700 to 4800 cm
 48 - From 4800 to 4900 cm
 49 - From 4900 to 5000 cm
 50 - From 5000 to 5100 cm
 51 - From 5100 to 5200 cm
 52 - From 5200 to 5300 cm
 53 - From 5300 to 5400 cm
 54 - From 5400 to 5500 cm
 55 - From 5500 to 5600 cm
 56 - From 5600 to 5700 cm
 57 - From 5700 to 5800 cm
 58 - From 5800 to 5900 cm
 59 - From 5900 to 6000 cm
 60 - From 6000 to 6100 cm
 61 - From 6100 to 6200 cm
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 63 - From 6300 to 6400 cm
 64 - From 6400 to 6500 cm
 65 - From 6500 to 6600 cm
 66 - From 6600 to 6700 cm
 67 - From 6700 to 6800 cm
 68 - From 6800 to 6900 cm
 69 - From 6900 to 7000 cm
 70 - From 7000 to 7100 cm
 71 - From 7100 to 7200 cm
 72 - From 7200 to 7300 cm
 73 - From 7300 to 7400 cm
 74 - From 7400 to 7500 cm
 75 - From 7500 to 7600 cm
 76 - From 7600 to 7700 cm
 77 - From 7700 to 7800 cm
 78 - From 7800 to 7900 cm
 79 - From 7900 to 8000 cm
 80 - From 8000 to 8100 cm
 81 - From 8100 to 8200 cm
 82 - From 8200 to 8300 cm
 83 - From 8300 to 8400 cm
 84 - From 8400 to 8500 cm
 85 - From 8500 to 8600 cm
 86 - From 8600 to 8700 cm
 87 - From 8700 to 8800 cm
 88 - From 8800 to 8900 cm
 89 - From 8900 to 9000 cm
 90 - From 9000 to 9100 cm
 91 - From 9100 to 9200 cm
 92 - From 9200 to 9300 cm
 93 - From 9300 to 9400 cm
 94 - From 9400 to 9500 cm
 95 - From 9500 to 9600 cm
 96 - From 9600 to 9700 cm
 97 - From 9700 to 9800 cm
 98 - From 9800 to 9900 cm
 99 - From 9900 to 10000 cm

For use: See use which limits and symbols for along the coast.

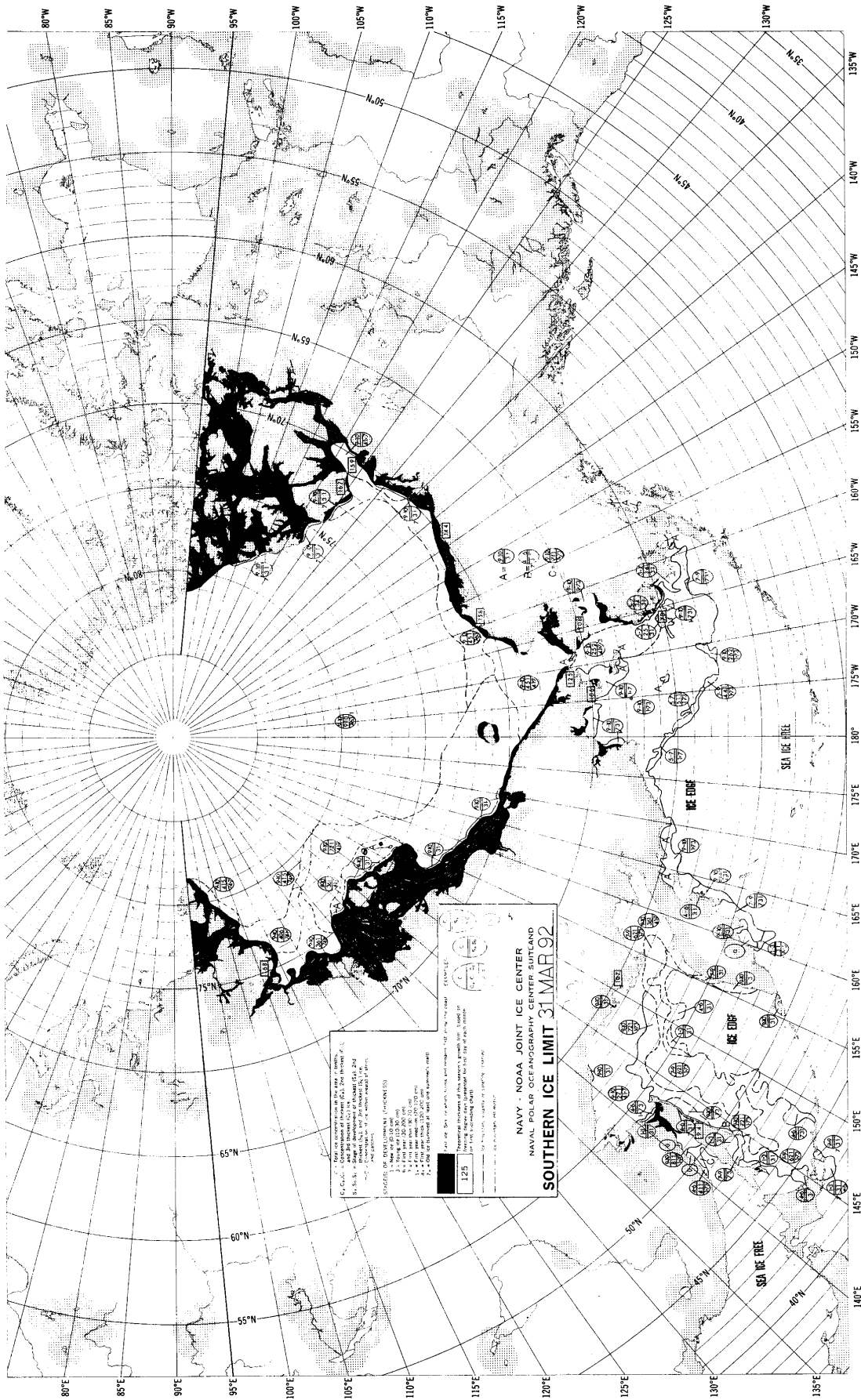
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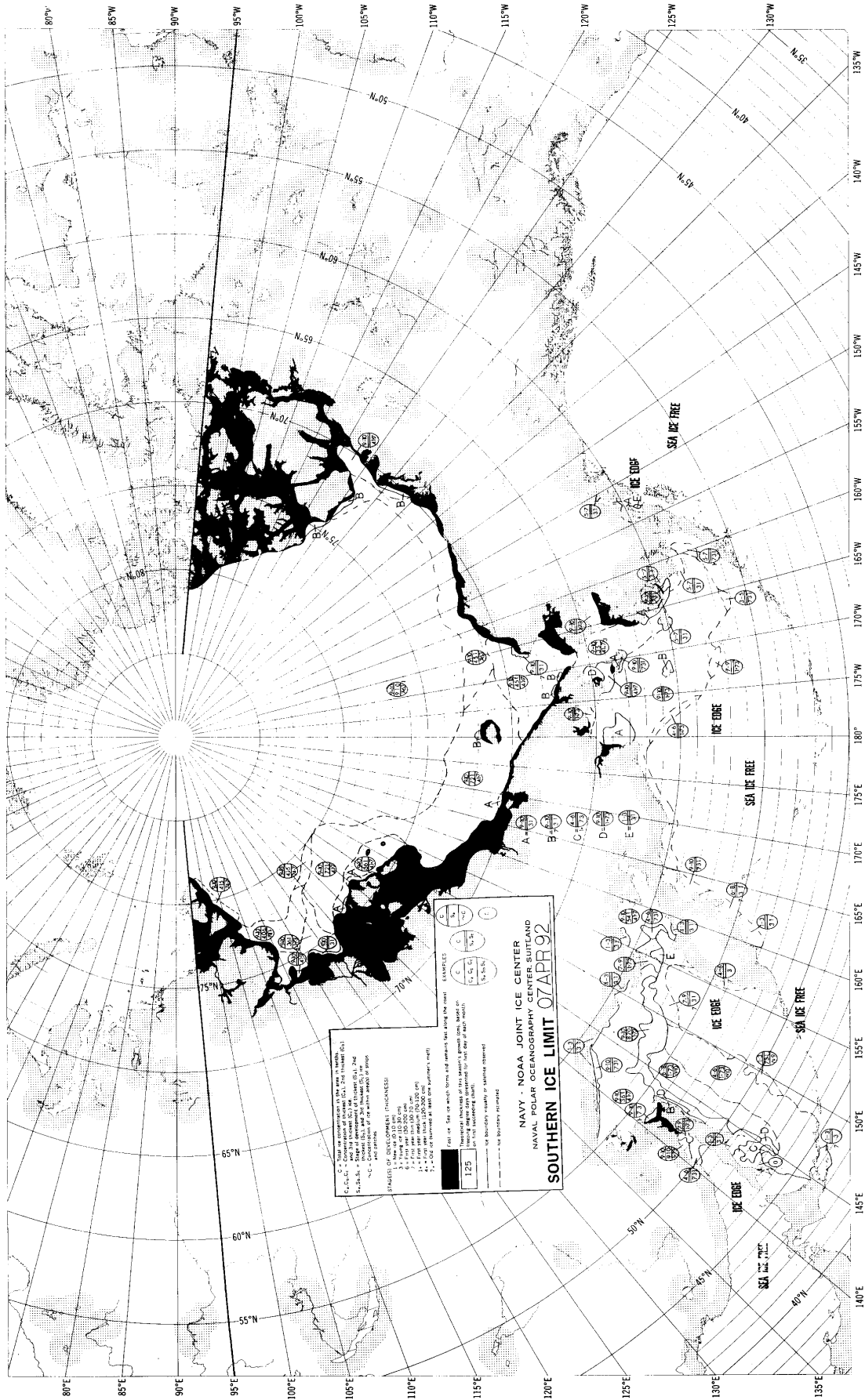
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER
10 MAR 92
SOUTHERN ICE LIMIT



1. Ice thickness in meters is shown in black.
 2. Ice thickness in feet is shown in white.
 3. C, D, E = Concentration of icebergs (C = 100, D = 50, E = 25).
 4. F = Stage of development of icebergs (F = 1, 2, 3, 4, 5).
 5. G, H, I, J = Stage of development of icebergs (G = 1, 2, 3, 4, 5; H = 1, 2, 3, 4, 5; I = 1, 2, 3, 4, 5; J = 1, 2, 3, 4, 5).
 6. K = Concentration of icebergs (K = 1, 2, 3, 4, 5).
 7. L = Concentration of icebergs (L = 1, 2, 3, 4, 5).
 8. M = Concentration of icebergs (M = 1, 2, 3, 4, 5).
 9. N = Concentration of icebergs (N = 1, 2, 3, 4, 5).
 10. O = Concentration of icebergs (O = 1, 2, 3, 4, 5).
 11. P = Concentration of icebergs (P = 1, 2, 3, 4, 5).
 12. Q = Concentration of icebergs (Q = 1, 2, 3, 4, 5).
 13. R = Concentration of icebergs (R = 1, 2, 3, 4, 5).
 14. S = Concentration of icebergs (S = 1, 2, 3, 4, 5).
 15. T = Concentration of icebergs (T = 1, 2, 3, 4, 5).
 16. U = Concentration of icebergs (U = 1, 2, 3, 4, 5).
 17. V = Concentration of icebergs (V = 1, 2, 3, 4, 5).
 18. W = Concentration of icebergs (W = 1, 2, 3, 4, 5).
 19. X = Concentration of icebergs (X = 1, 2, 3, 4, 5).
 20. Y = Concentration of icebergs (Y = 1, 2, 3, 4, 5).
 21. Z = Concentration of icebergs (Z = 1, 2, 3, 4, 5).

SOUTHERN ICE LIMIT 17 MAR 92
 NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SOUTH OCEAN
 125
 17 MAR 92

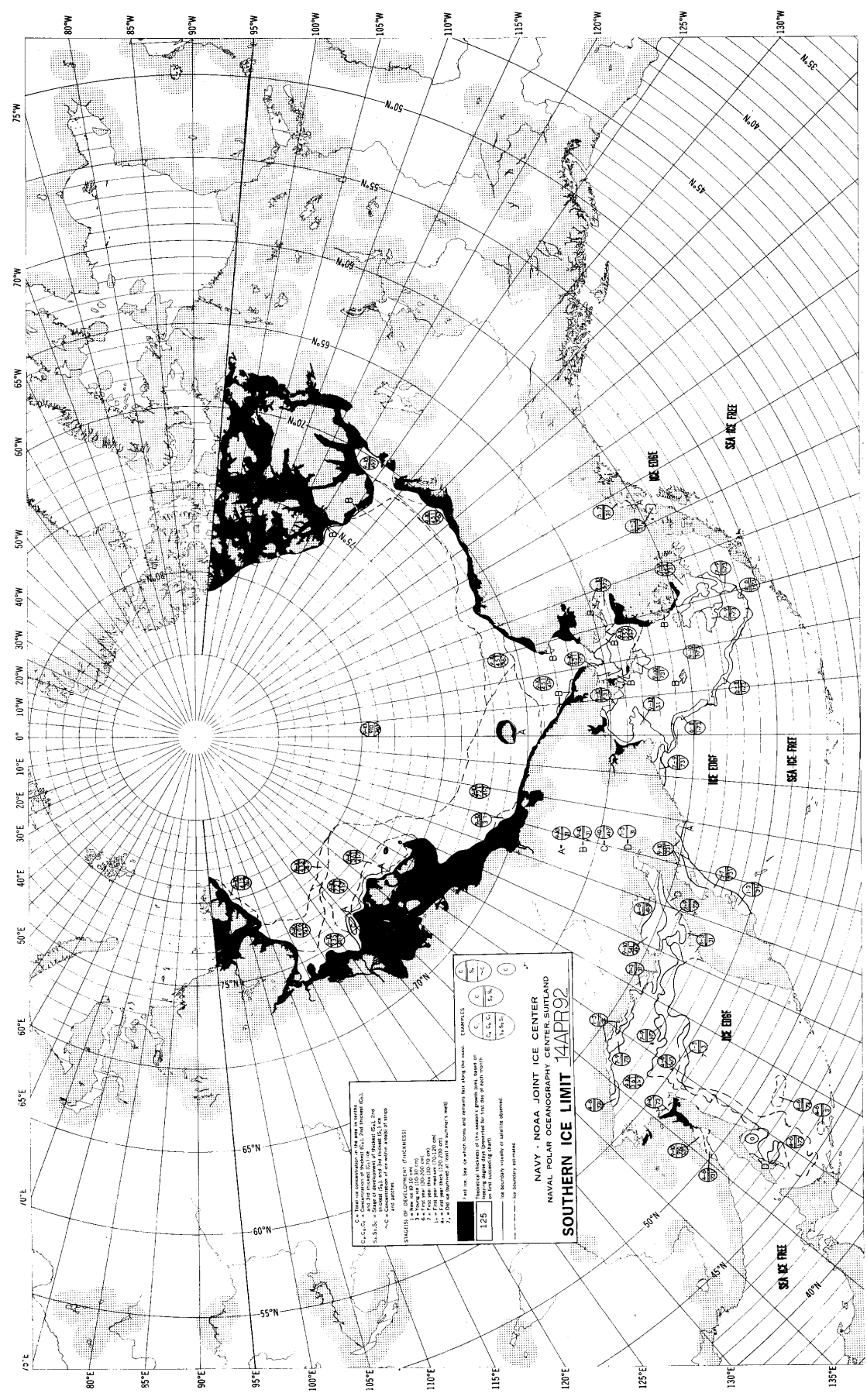




**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 07 APR 92**

EXAMPLES:

<td> <td> <td> <td> </td></td></td></td>	<td> <td> <td> </td></td></td>	<td> <td> </td></td>	<td> </td>	
<td> <td> 125' or greater ice thickness at 100% density 100' or greater ice thickness at 100% density 75' or greater ice thickness at 100% density 50' or greater ice thickness at 100% density 25' or greater ice thickness at 100% density <p>SYMBOLS OF DEVELOPMENT (THICKNESS):</p> <ul style="list-style-type: none"> A - 100% (100 ft) B - 50% (50 ft) C - 25% (25 ft) D - 10% (10 ft) E - 5% (5 ft) <p>SCALE: 1:50,000 (Scale of latitude and longitude markings)</p> <p>NOTES: 1. All sea ice thicknesses are based on a 100% density assumption. 2. Historical thicknesses of this season's growth are shown in white. 3. Historical thicknesses of this season's growth are shown in grey. 4. Historical thicknesses of this season's growth are shown in black. 5. All symbols are based on the 100% density assumption. 6. All symbols are based on the 100% density assumption. 7. All symbols are based on the 100% density assumption.</p> </td></td>	<td> 125' or greater ice thickness at 100% density 100' or greater ice thickness at 100% density 75' or greater ice thickness at 100% density 50' or greater ice thickness at 100% density 25' or greater ice thickness at 100% density <p>SYMBOLS OF DEVELOPMENT (THICKNESS):</p> <ul style="list-style-type: none"> A - 100% (100 ft) B - 50% (50 ft) C - 25% (25 ft) D - 10% (10 ft) E - 5% (5 ft) <p>SCALE: 1:50,000 (Scale of latitude and longitude markings)</p> <p>NOTES: 1. All sea ice thicknesses are based on a 100% density assumption. 2. Historical thicknesses of this season's growth are shown in white. 3. Historical thicknesses of this season's growth are shown in grey. 4. Historical thicknesses of this season's growth are shown in black. 5. All symbols are based on the 100% density assumption. 6. All symbols are based on the 100% density assumption. 7. All symbols are based on the 100% density assumption.</p> </td>	125' or greater ice thickness at 100% density 100' or greater ice thickness at 100% density 75' or greater ice thickness at 100% density 50' or greater ice thickness at 100% density 25' or greater ice thickness at 100% density <p>SYMBOLS OF DEVELOPMENT (THICKNESS):</p> <ul style="list-style-type: none"> A - 100% (100 ft) B - 50% (50 ft) C - 25% (25 ft) D - 10% (10 ft) E - 5% (5 ft) <p>SCALE: 1:50,000 (Scale of latitude and longitude markings)</p> <p>NOTES: 1. All sea ice thicknesses are based on a 100% density assumption. 2. Historical thicknesses of this season's growth are shown in white. 3. Historical thicknesses of this season's growth are shown in grey. 4. Historical thicknesses of this season's growth are shown in black. 5. All symbols are based on the 100% density assumption. 6. All symbols are based on the 100% density assumption. 7. All symbols are based on the 100% density assumption.</p>		



C = Based on observation in the area in vicinity
 of the station. (C, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
 C, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 = Based on observation in the area in vicinity of the station. (C, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
 1 = 1st year ice
 2 = 2nd year ice
 3 = 3rd year ice
 4 = 4th year ice
 5 = 5th year ice
 6 = 6th year ice
 7 = 7th year ice
 8 = 8th year ice
 9 = 9th year ice
 10 = 10th year ice
 11 = 11th year ice
 12 = 12th year ice

STAGES OF DEVELOPMENT (THICKNESS):

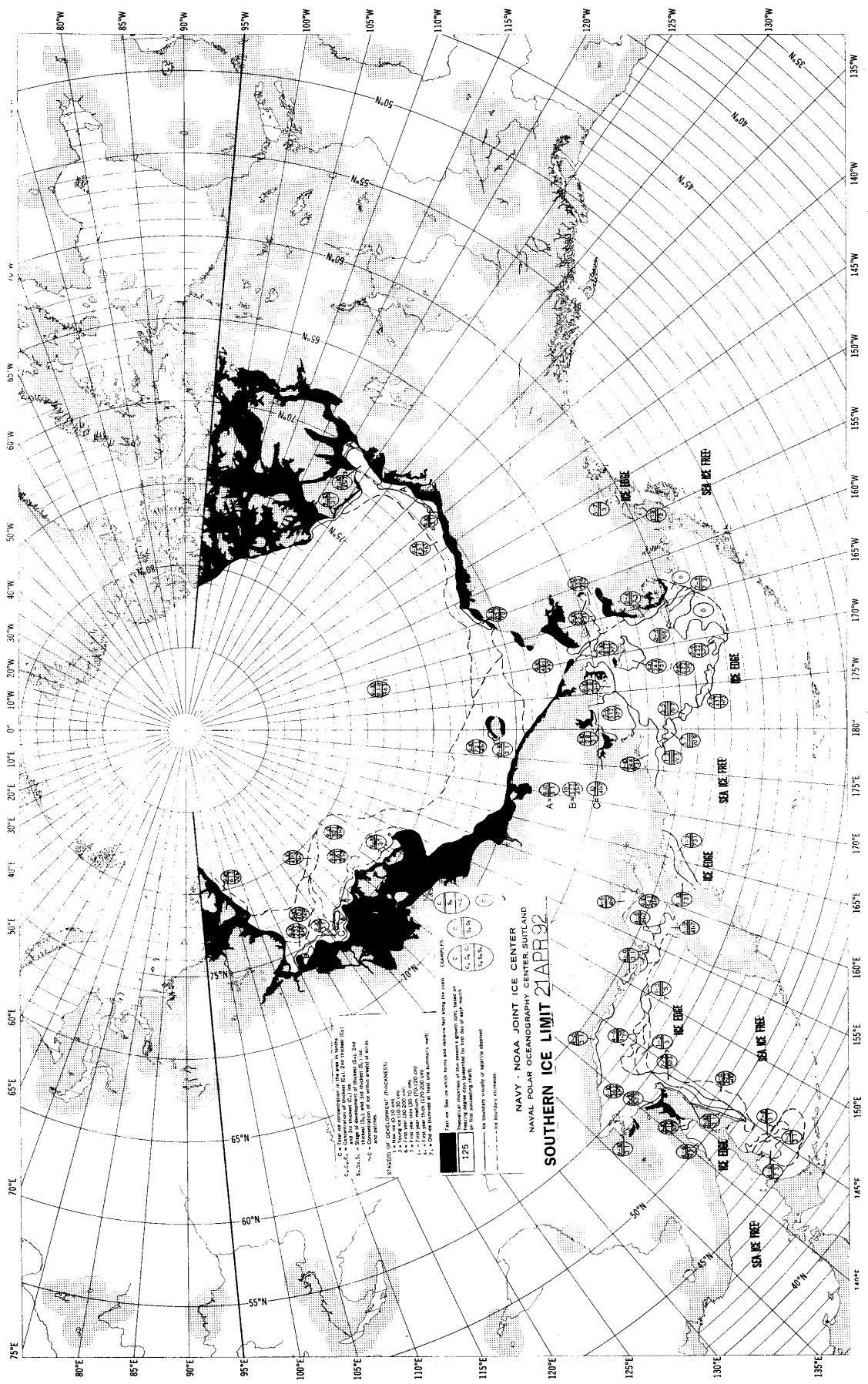
- 1 = 1st year ice (10-15 cm)
- 2 = 2nd year ice (15-30 cm)
- 3 = 3rd year ice (30-50 cm)
- 4 = 4th year ice (50-100 cm)
- 5 = 5th year ice (100-150 cm)
- 6 = 6th year ice (150-200 cm)
- 7 = 7th year ice (200-300 cm)
- 8 = 8th year ice (300-400 cm)
- 9 = 9th year ice (400-500 cm)
- 10 = 10th year ice (500-600 cm)
- 11 = 11th year ice (600-700 cm)
- 12 = 12th year ice (700-800 cm)

EXAMPLES:

- A (1, 2, 3, 4)
- B (1, 2, 3, 4)
- C (1, 2, 3, 4)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SIUTLAND
 SOUTHERN ICE LIMIT 14APR92

1. 1st year ice - 10-15 cm
 2. 2nd year ice - 15-30 cm
 3. 3rd year ice - 30-50 cm
 4. 4th year ice - 50-100 cm
 5. 5th year ice - 100-150 cm
 6. 6th year ice - 150-200 cm
 7. 7th year ice - 200-300 cm
 8. 8th year ice - 300-400 cm
 9. 9th year ice - 400-500 cm
 10. 10th year ice - 500-600 cm
 11. 11th year ice - 600-700 cm
 12. 12th year ice - 700-800 cm



1. 100% of ice concentration (C) in 100% of the area (A) is 100% ice (C/A = 1.0).
 2. 50% of ice concentration (C) in 100% of the area (A) is 50% ice (C/A = 0.5).
 3. 10% of ice concentration (C) in 100% of the area (A) is 10% ice (C/A = 0.1).
 4. 10% of ice concentration (C) in 10% of the area (A) is 100% ice (C/A = 1.0).
 5. 10% of ice concentration (C) in 10% of the area (A) is 50% ice (C/A = 0.5).
 6. 10% of ice concentration (C) in 10% of the area (A) is 10% ice (C/A = 0.1).

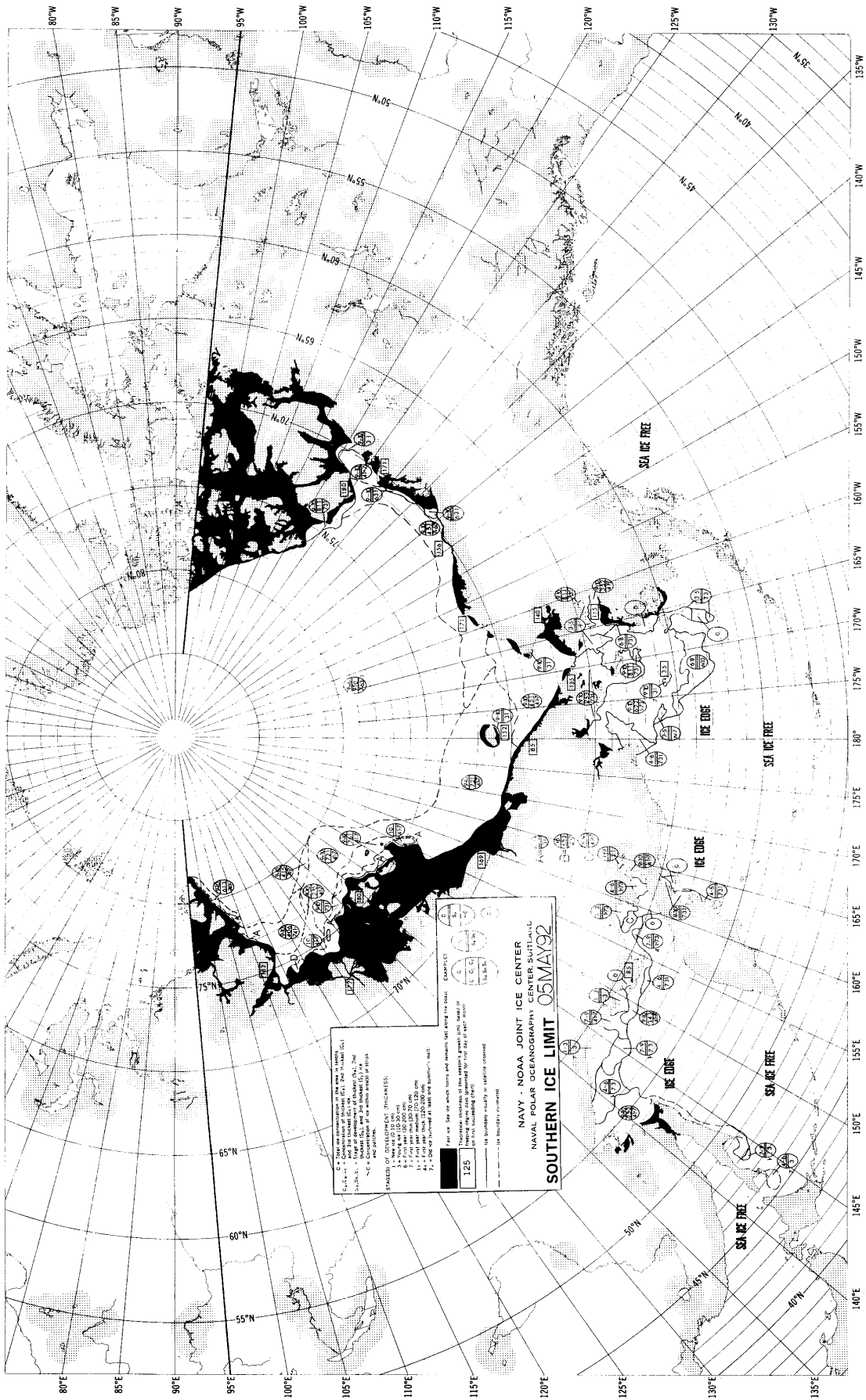
STAGES OF DEVELOPMENT (THICKNESSES)
 1. 1st year ice (100-200 mm)
 2. 2nd year ice (200-300 mm)
 3. 3rd year ice (300-400 mm)
 4. 4th year ice (400-500 mm)
 5. 5th year ice (500-600 mm)
 6. 6th year ice (600-700 mm)
 7. 7th year ice (700-800 mm)
 8. 8th year ice (800-900 mm)
 9. 9th year ice (900-1000 mm)

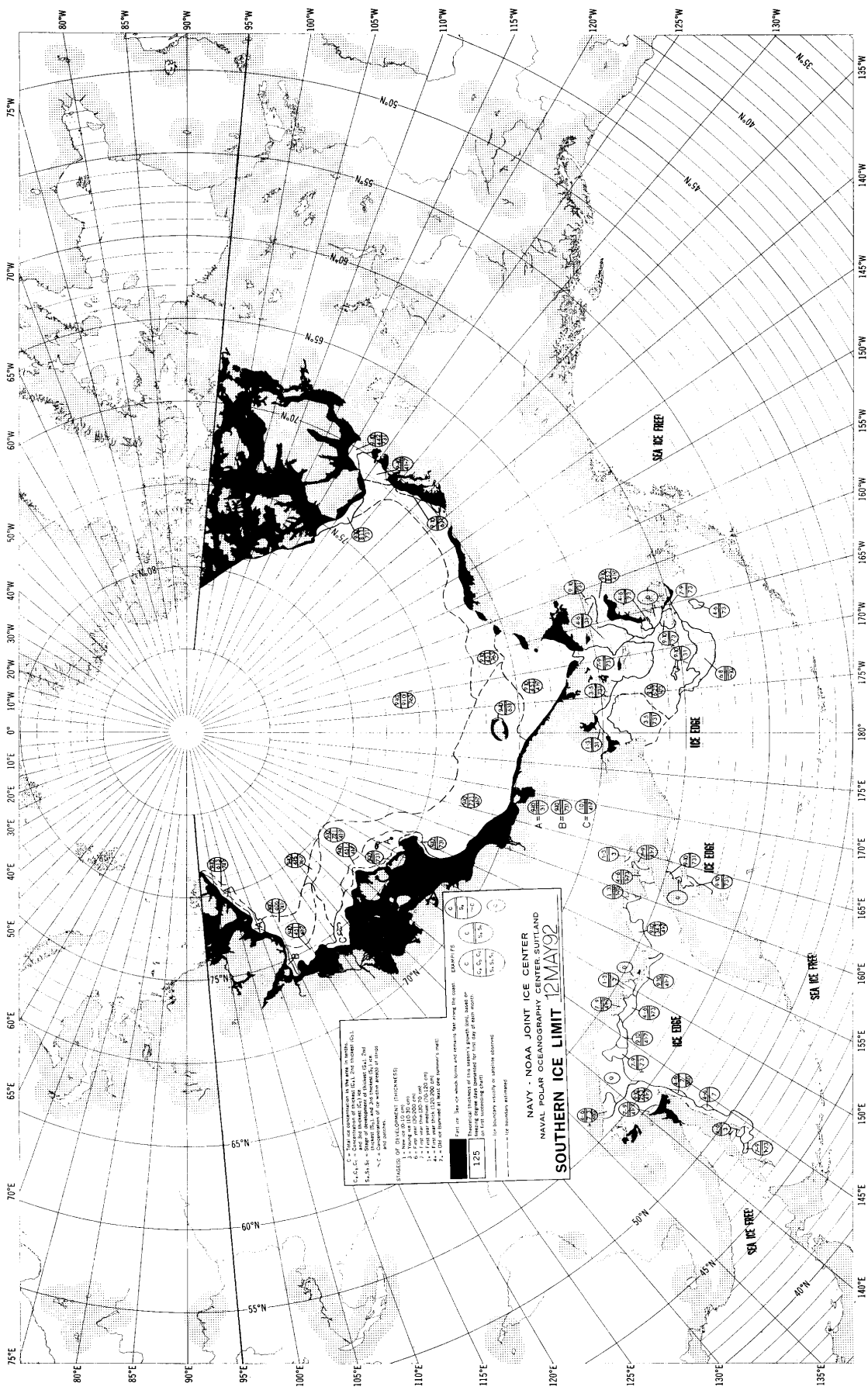
EXAMPLES
 (C/A) (C/A) (C/A)
 (0.1) (0.5) (1.0)
 (1.0) (0.5) (0.1)

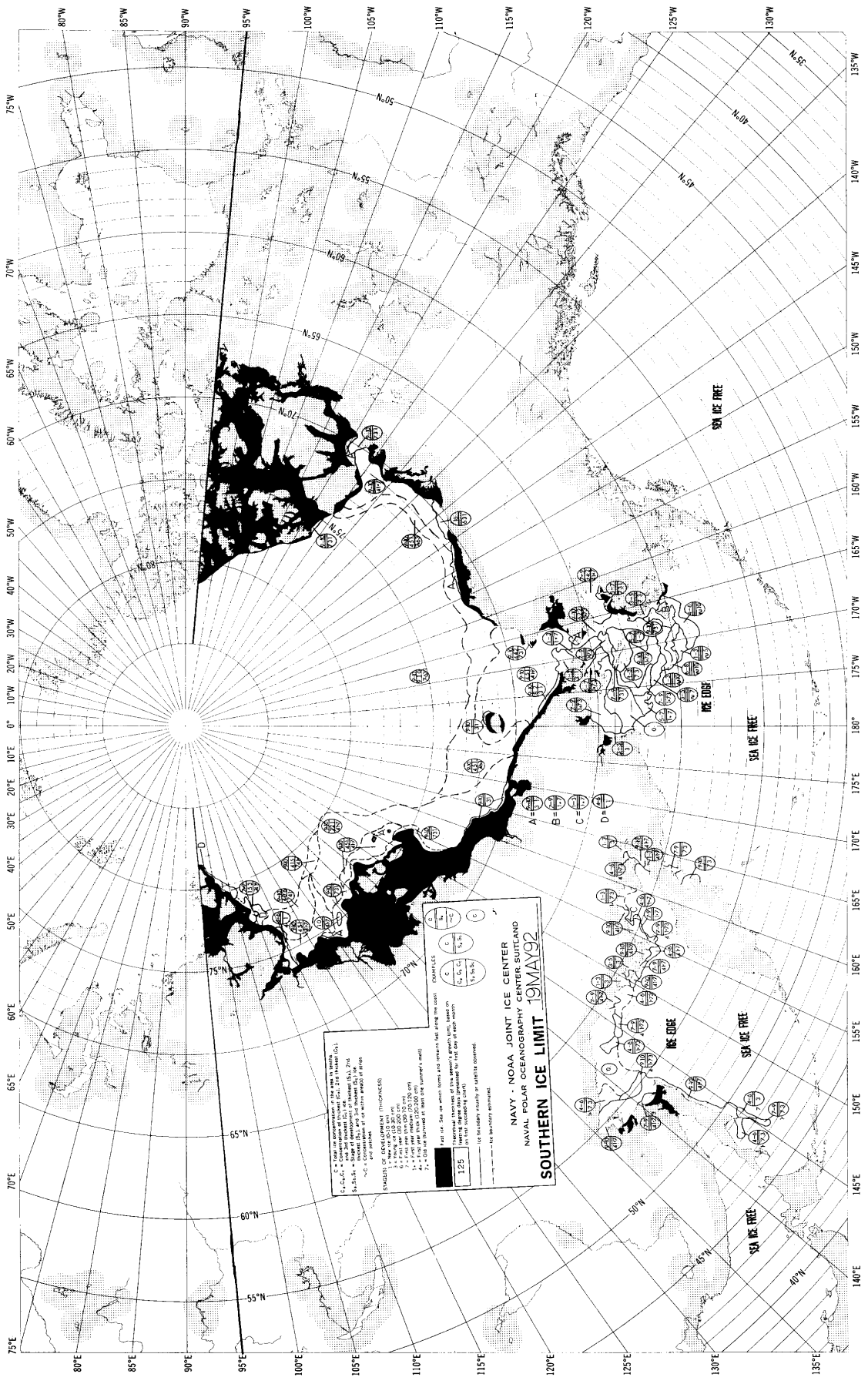
1. 100% of ice concentration (C) in 100% of the area (A) is 100% ice (C/A = 1.0).
 2. 50% of ice concentration (C) in 100% of the area (A) is 50% ice (C/A = 0.5).
 3. 10% of ice concentration (C) in 100% of the area (A) is 10% ice (C/A = 0.1).
 4. 10% of ice concentration (C) in 10% of the area (A) is 100% ice (C/A = 1.0).
 5. 10% of ice concentration (C) in 10% of the area (A) is 50% ice (C/A = 0.5).
 6. 10% of ice concentration (C) in 10% of the area (A) is 10% ice (C/A = 0.1).

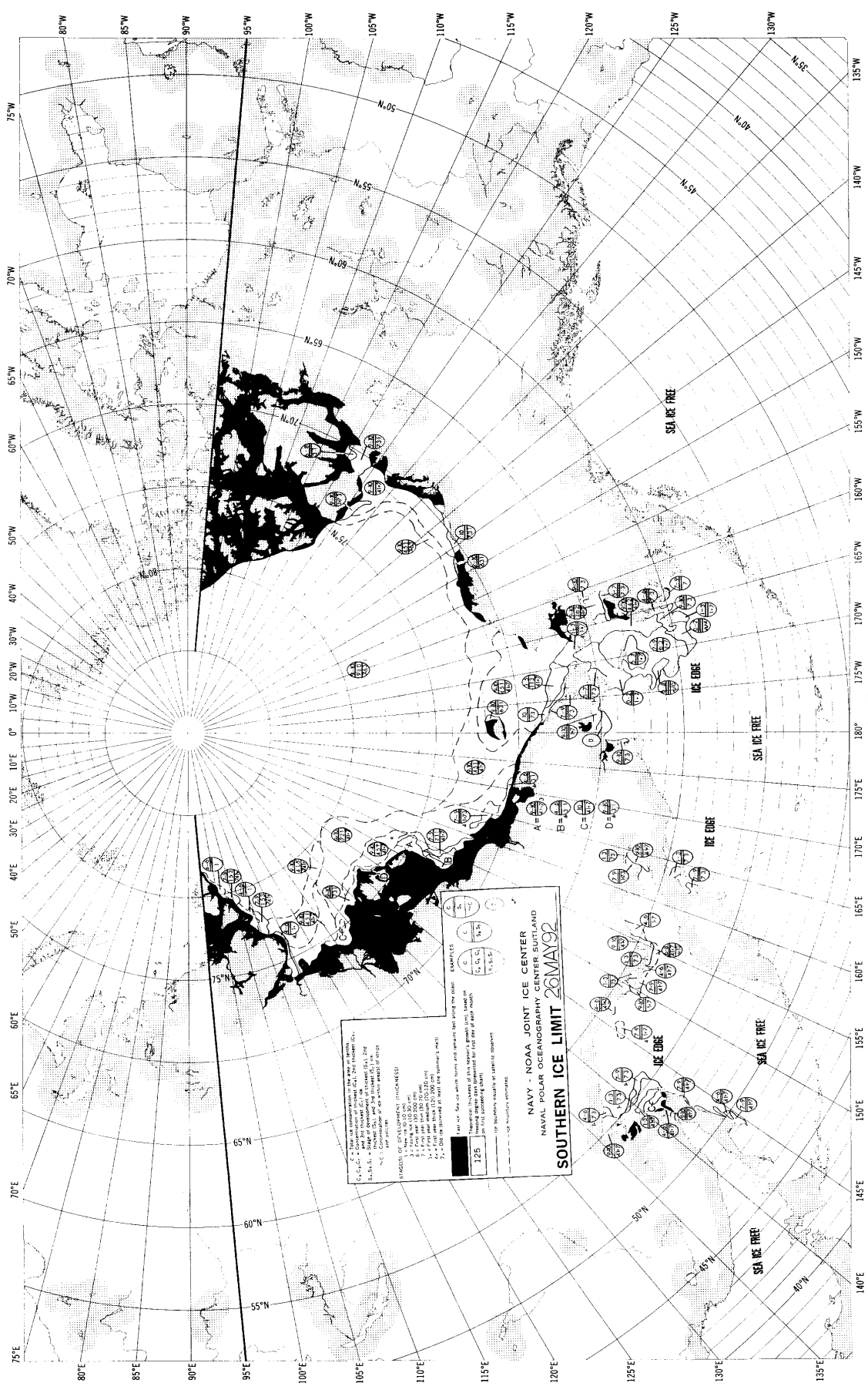
NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUTLAND
SOUTHERN ICE LIMIT 21 APR 92

1. 100% of ice concentration (C) in 100% of the area (A) is 100% ice (C/A = 1.0).
 2. 50% of ice concentration (C) in 100% of the area (A) is 50% ice (C/A = 0.5).
 3. 10% of ice concentration (C) in 100% of the area (A) is 10% ice (C/A = 0.1).
 4. 10% of ice concentration (C) in 10% of the area (A) is 100% ice (C/A = 1.0).
 5. 10% of ice concentration (C) in 10% of the area (A) is 50% ice (C/A = 0.5).
 6. 10% of ice concentration (C) in 10% of the area (A) is 10% ice (C/A = 0.1).









1. Contour lines show ice limits on the basis of depth.
 2. Contour lines show ice limits on the basis of ice thickness.
 3. Contour lines show ice limits on the basis of ice concentration.
 4. Contour lines show ice limits on the basis of ice age.
 5. Contour lines show ice limits on the basis of ice type.
 6. Contour lines show ice limits on the basis of ice motion.
 7. Contour lines show ice limits on the basis of ice strength.
 8. Contour lines show ice limits on the basis of ice color.
 9. Contour lines show ice limits on the basis of ice texture.
 10. Contour lines show ice limits on the basis of ice soundness.
 11. Contour lines show ice limits on the basis of ice luster.
 12. Contour lines show ice limits on the basis of ice temperature.
 13. Contour lines show ice limits on the basis of ice humidity.
 14. Contour lines show ice limits on the basis of ice density.
 15. Contour lines show ice limits on the basis of ice viscosity.
 16. Contour lines show ice limits on the basis of ice elasticity.
 17. Contour lines show ice limits on the basis of ice compressibility.
 18. Contour lines show ice limits on the basis of ice ductility.
 19. Contour lines show ice limits on the basis of ice malleability.
 20. Contour lines show ice limits on the basis of ice tenacity.
 21. Contour lines show ice limits on the basis of ice toughness.
 22. Contour lines show ice limits on the basis of ice resilience.
 23. Contour lines show ice limits on the basis of ice tenacity.
 24. Contour lines show ice limits on the basis of ice toughness.
 25. Contour lines show ice limits on the basis of ice resilience.

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTCLIFF
SOUTHERN ICE LIMIT 20 MAY 92

125
 100
 75
 50
 25

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
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1. 100% ice
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 6. Sea ice free

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 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
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 6. Sea ice free

1. 100% ice
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 3. 50% ice
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 5. 0% ice
 6. Sea ice free

1. 100% ice
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 5. 0% ice
 6. Sea ice free

1. 100% ice
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 4. 25% ice
 5. 0% ice
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1. 100% ice
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1. 100% ice
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1. 100% ice
 2. 75% ice
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 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

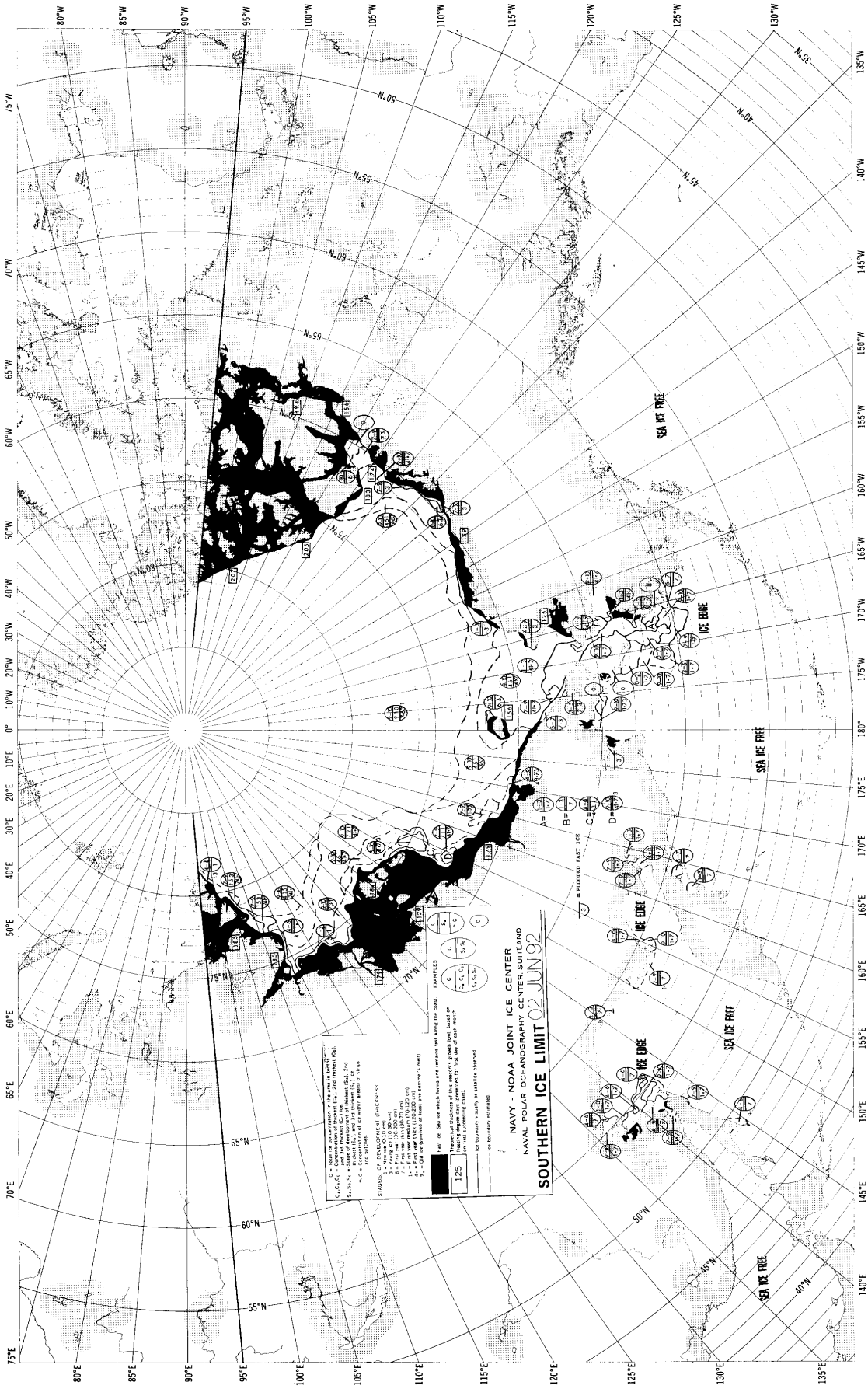
1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free

1. 100% ice
 2. 75% ice
 3. 50% ice
 4. 25% ice
 5. 0% ice
 6. Sea ice free



C - 20m ice concentration (0-100%)
 S - 10m ice concentration (0-100%)
 M - 5m ice concentration (0-100%)
 H - 1m ice concentration (0-100%)
 1 - 1m ice concentration (0-100%)
 2 - 2m ice concentration (0-100%)
 3 - 3m ice concentration (0-100%)
 4 - 4m ice concentration (0-100%)
 5 - 5m ice concentration (0-100%)
 6 - 6m ice concentration (0-100%)
 7 - 7m ice concentration (0-100%)
 8 - 8m ice concentration (0-100%)
 9 - 9m ice concentration (0-100%)
 10 - 10m ice concentration (0-100%)
 11 - 11m ice concentration (0-100%)
 12 - 12m ice concentration (0-100%)
 13 - 13m ice concentration (0-100%)
 14 - 14m ice concentration (0-100%)
 15 - 15m ice concentration (0-100%)
 16 - 16m ice concentration (0-100%)
 17 - 17m ice concentration (0-100%)
 18 - 18m ice concentration (0-100%)
 19 - 19m ice concentration (0-100%)
 20 - 20m ice concentration (0-100%)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 02 JUN 92

A = 20m
 B = 10m
 C = 5m
 D = 1m

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

ICE EDGE

ICE EDGE

ICE EDGE

ICE EDGE

ICE EDGE

ICE EDGE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

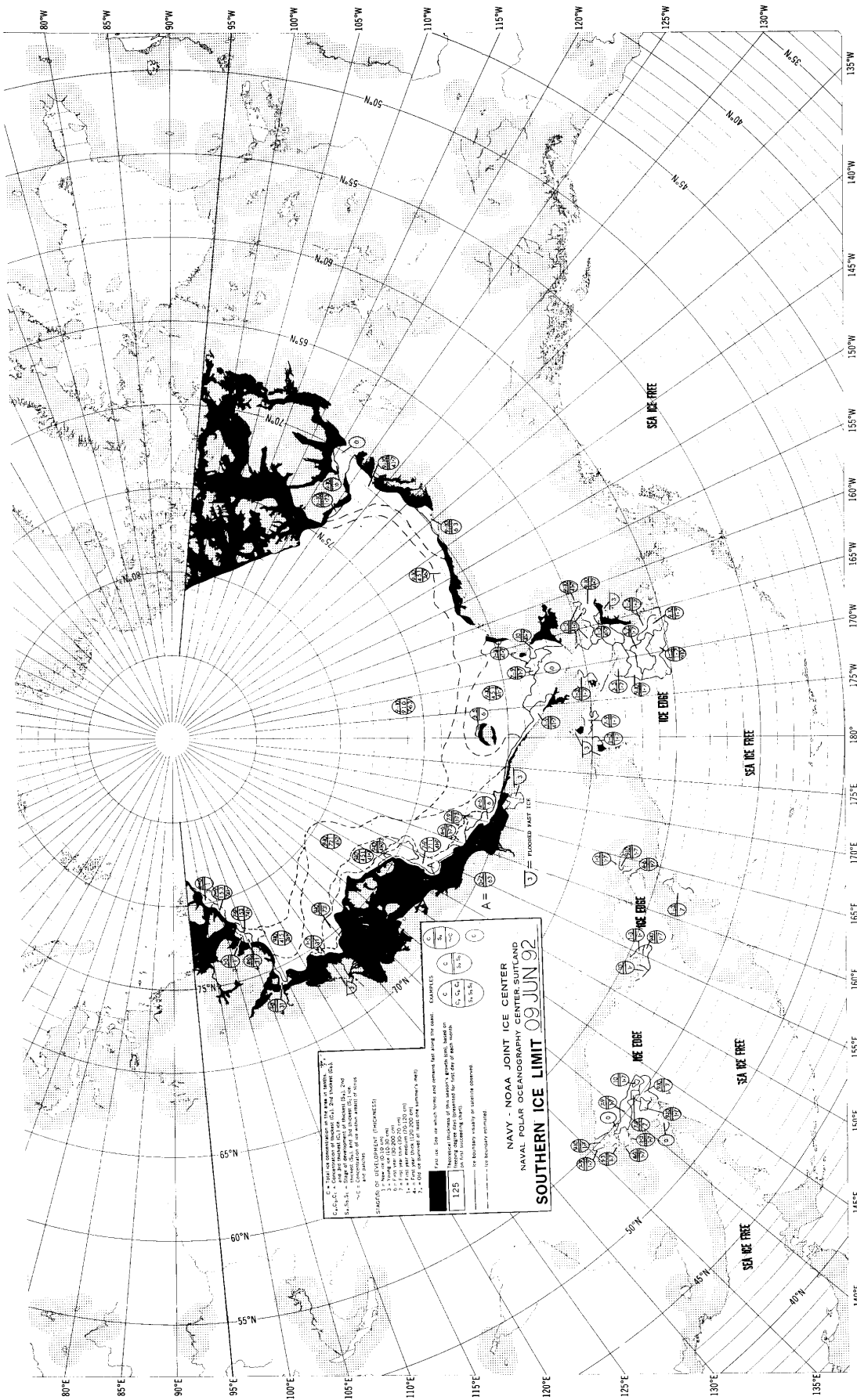
SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

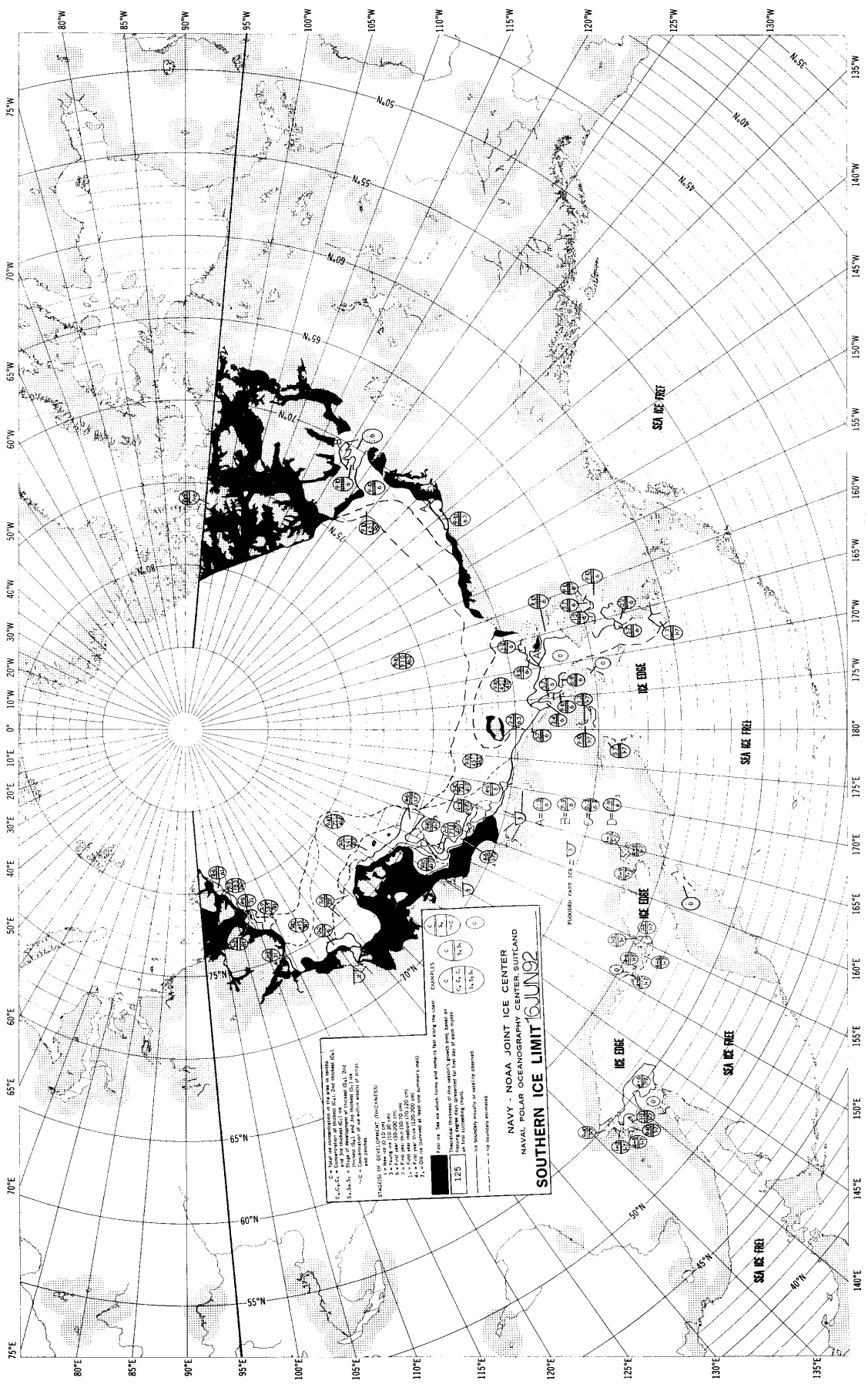


1. 4-7 days ice development at 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000.

STAGES OF DEVELOPMENT (THICKNESS)
 1 - 1st year ice (100-150 cm)
 2 - 2nd year ice (150-200 cm)
 3 - 3rd year ice (200-250 cm)
 4 - 4th year ice (250-300 cm)
 5 - 5th year ice (300-350 cm)
 6 - 6th year ice (350-400 cm)
 7 - 7th year ice (400-450 cm)
 8 - 8th year ice (450-500 cm)
 9 - 9th year ice (500-550 cm)
 10 - 10th year ice (550-600 cm)

EXAMPLES
 A - 100% ice
 B - 75% ice
 C - 50% ice
 D - 25% ice
 E - 10% ice
 F - 5% ice
 G - 2% ice
 H - 1% ice
 I - 0% ice (SEA ICE FREE)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 09 JUN 92



C - 1/2 mile of observation in this area in winter (Oct.-Nov.)
 C-C, C-L - 1/2 mile of observation in this area in summer (Dec.-Feb.)
 S-C, S-L - 1/2 mile of observation in this area in summer (Dec.-Feb.)
 S-C, S-L - 1/2 mile of observation in this area in winter (Oct.-Nov.)
 -C - 1/2 mile of observation in this area in winter (Oct.-Nov.)
 -L - 1/2 mile of observation in this area in summer (Dec.-Feb.)
 -S - 1/2 mile of observation in this area in summer (Dec.-Feb.)
 -W - 1/2 mile of observation in this area in winter (Oct.-Nov.)

RANGES OF DEVELOPMENT (THICKNESS)
 1 - 1/2 ft. to 15 ft.
 2 - 1/2 ft. to 15 ft.
 3 - 1/2 ft. to 15 ft.
 4 - 1/2 ft. to 15 ft.
 5 - 1/2 ft. to 15 ft.
 6 - 1/2 ft. to 15 ft.
 7 - 1/2 ft. to 15 ft.

EXAMPLES

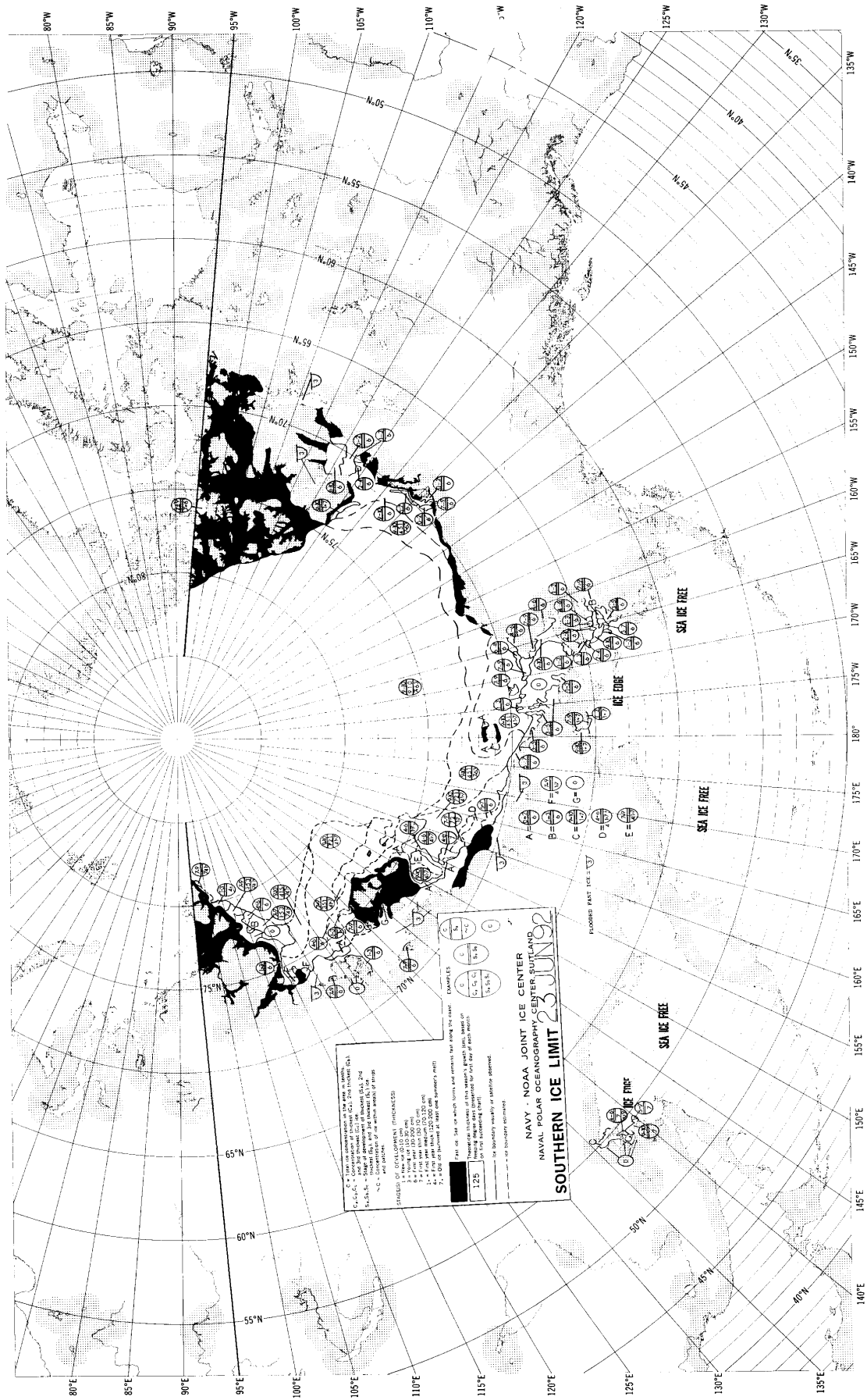
C	1/2	1/2
C-C	1/2	1/2
S-C	1/2	1/2
S-L	1/2	1/2

125 - 1/2 mile of observation in this area in winter (Oct.-Nov.)
 125 - 1/2 mile of observation in this area in summer (Dec.-Feb.)
 125 - 1/2 mile of observation in this area in winter (Oct.-Nov.)
 125 - 1/2 mile of observation in this area in summer (Dec.-Feb.)

125 - 1/2 mile of observation in this area in winter (Oct.-Nov.)
 125 - 1/2 mile of observation in this area in summer (Dec.-Feb.)

125 - 1/2 mile of observation in this area in winter (Oct.-Nov.)
 125 - 1/2 mile of observation in this area in summer (Dec.-Feb.)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 16 JUN 92



* - Area of administration of the United States (A)
 C - Canada (C)
 S - Soviet Union (S)
 I - International waters (I)
 N - North Pole (N)

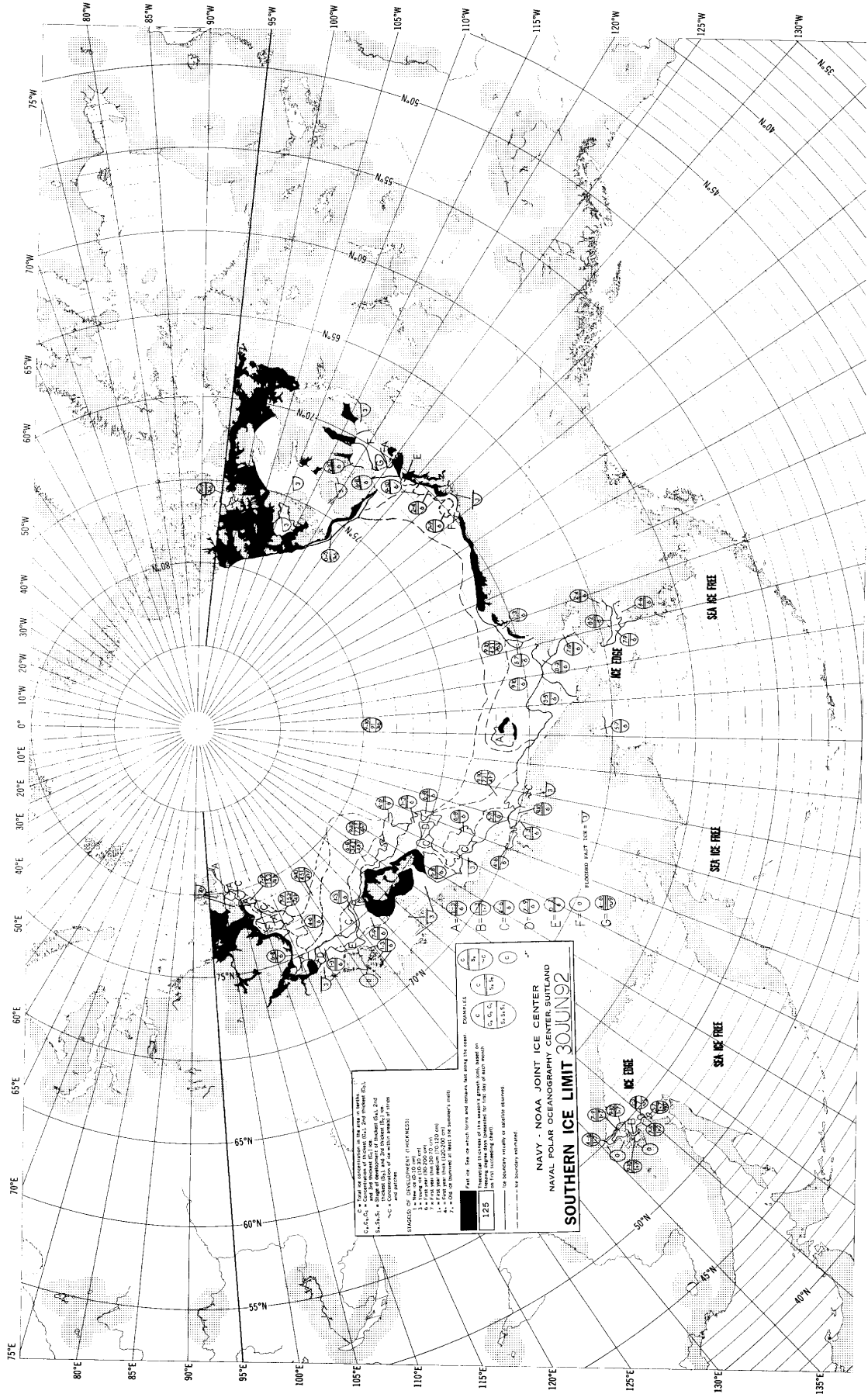
STAGES OF DEVELOPMENT (THICKNESS)
 1 - 1st year ice (less than 1 year old)
 2 - 2nd year ice (1-2 years old)
 3 - 3rd year ice (3-4 years old)
 4 - 4th year ice (5-6 years old)
 5 - 5th year ice (7-8 years old)
 6 - 6th year ice (9-10 years old)
 7 - 7th year ice (11-12 years old)
 8 - 8th year ice (13-14 years old)
 9 - 9th year ice (15-16 years old)
 10 - 10th year ice (17-18 years old)
 11 - 11th year ice (19-20 years old)
 12 - 12th year ice (21-22 years old)
 13 - 13th year ice (23-24 years old)
 14 - 14th year ice (25-26 years old)
 15 - 15th year ice (27-28 years old)
 16 - 16th year ice (29-30 years old)
 17 - 17th year ice (31-32 years old)
 18 - 18th year ice (33-34 years old)
 19 - 19th year ice (35-36 years old)
 20 - 20th year ice (37-38 years old)
 21 - 21st year ice (39-40 years old)
 22 - 22nd year ice (41-42 years old)
 23 - 23rd year ice (43-44 years old)
 24 - 24th year ice (45-46 years old)
 25 - 25th year ice (47-48 years old)
 26 - 26th year ice (49-50 years old)

ICE LIMITS
 - Ice limit (dashed line)
 - Ice edge (solid line)
 - Sea ice free (dotted line)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUTLAND
SOUTHERN ICE LIMIT 23 JUN 92

SYMBOLS
 C, S, I, N
 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

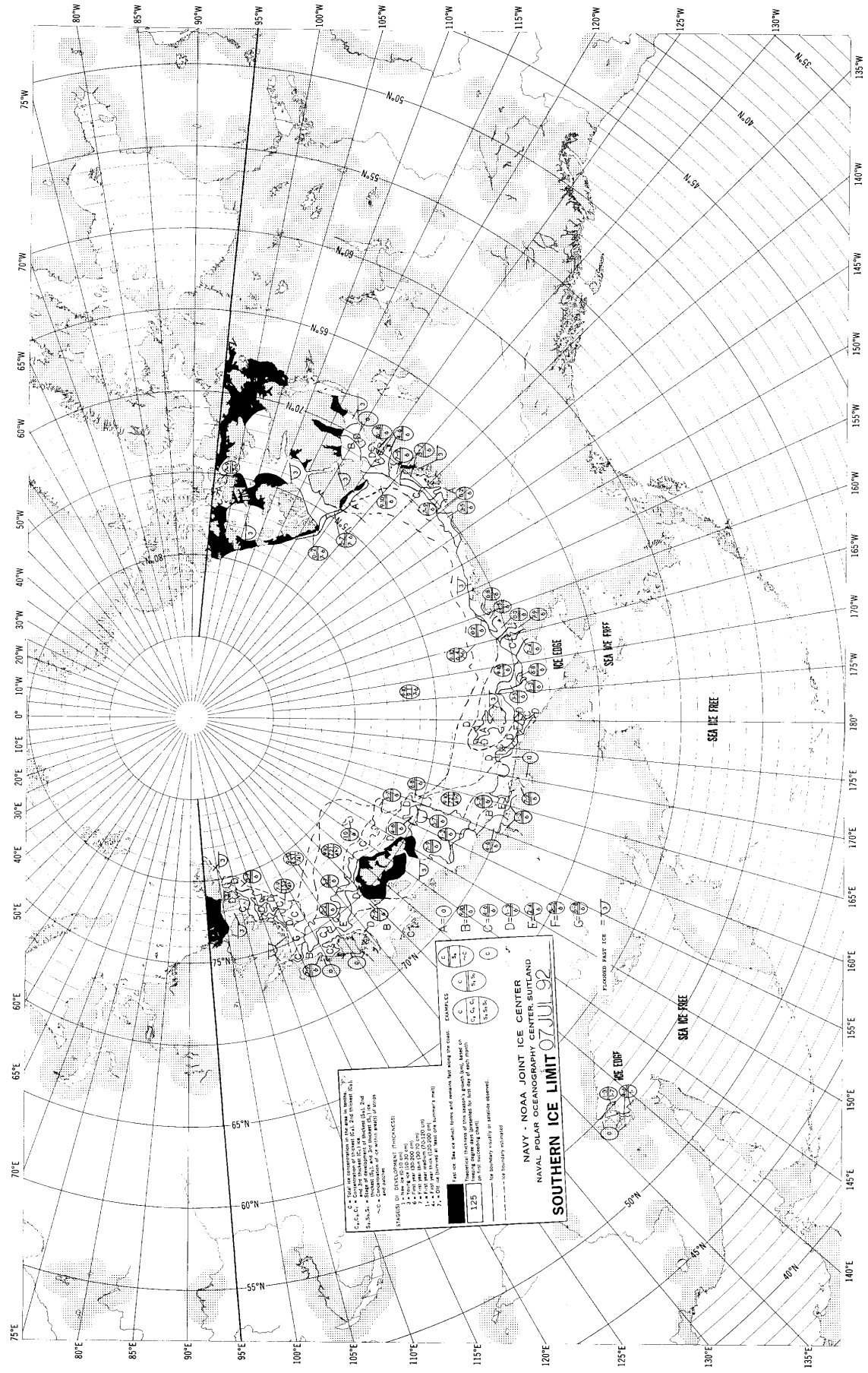
1235
 1236
 1237
 1238
 1239
 1240
 1241
 1242
 1243
 1244
 1245
 1246
 1247
 1248
 1249
 1250



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, UY, 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, 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.

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND
SOUTHERN ICE LIMIT 30JUN92

125
 100
 75
 50
 25
 0
 -25
 -50
 -75
 -100
 -125
 -150
 -175
 -200
 -225
 -250
 -275
 -300
 -325
 -350
 -375
 -400
 -425
 -450
 -475
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 -1950
 -1975
 -2000



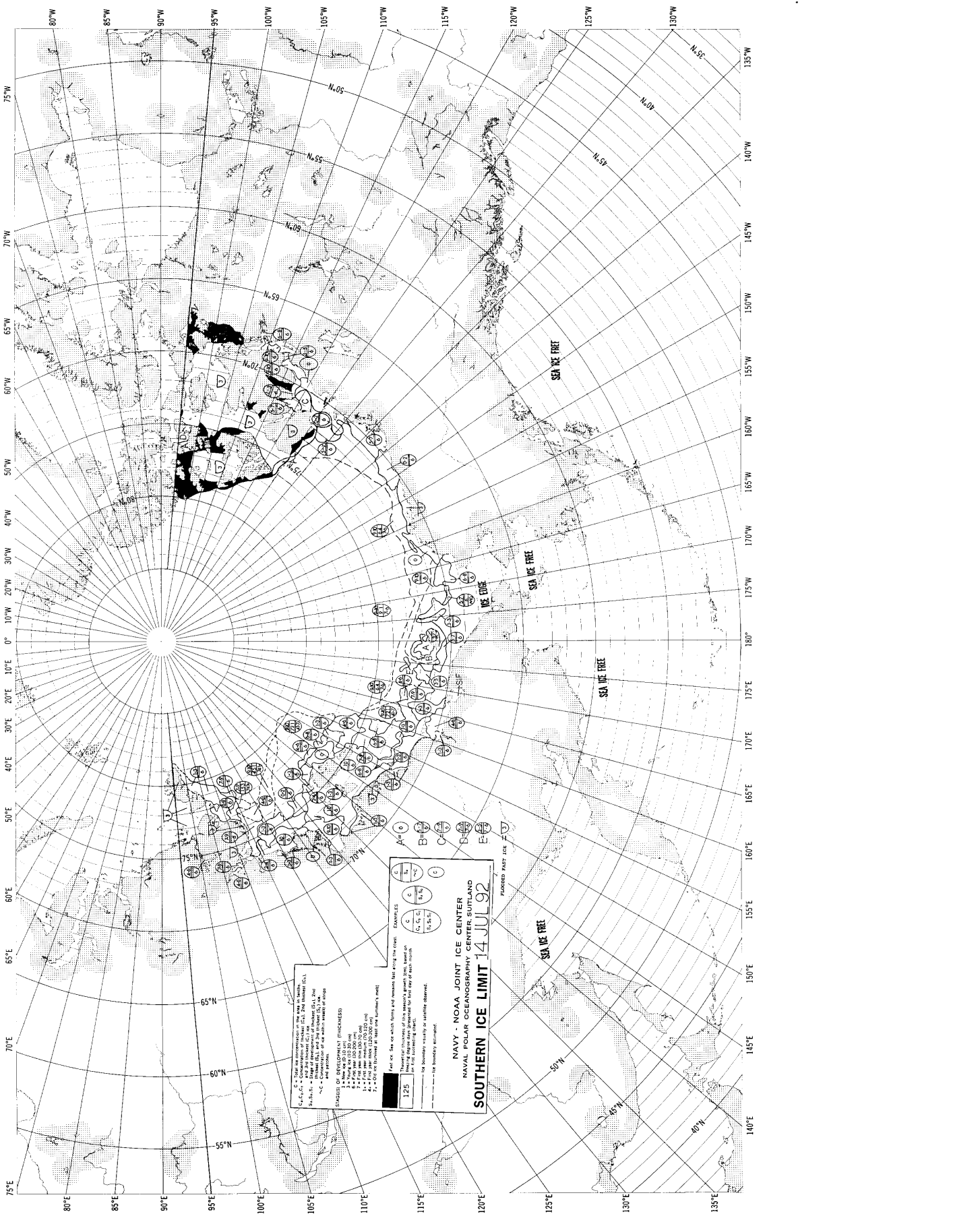
C - 500m contour interval of 25m in 20m intervals (25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475, 500, 525, 550, 575, 600, 625, 650, 675, 700, 725, 750, 775, 800, 825, 850, 875, 900, 925, 950, 975, 1000, 1025, 1050, 1075, 1100, 1125, 1150, 1175, 1200, 1225, 1250, 1275, 1300, 1325, 1350, 1375, 1400, 1425, 1450, 1475, 1500, 1525, 1550, 1575, 1600, 1625, 1650, 1675, 1700, 1725, 1750, 1775, 1800, 1825, 1850, 1875, 1900, 1925, 1950, 1975, 2000, 2025, 2050, 2075, 2100, 2125, 2150, 2175, 2200, 2225, 2250, 2275, 2300, 2325, 2350, 2375, 2400, 2425, 2450, 2475, 2500, 2525, 2550, 2575, 2600, 2625, 2650, 2675, 2700, 2725, 2750, 2775, 2800, 2825, 2850, 2875, 2900, 2925, 2950, 2975, 3000, 3025, 3050, 3075, 3100, 3125, 3150, 3175, 3200, 3225, 3250, 3275, 3300, 3325, 3350, 3375, 3400, 3425, 3450, 3475, 3500, 3525, 3550, 3575, 3600, 3625, 3650, 3675, 3700, 3725, 3750, 3775, 3800, 3825, 3850, 3875, 3900, 3925, 3950, 3975, 4000, 4025, 4050, 4075, 4100, 4125, 4150, 4175, 4200, 4225, 4250, 4275, 4300, 4325, 4350, 4375, 4400, 4425, 4450, 4475, 4500, 4525, 4550, 4575, 4600, 4625, 4650, 4675, 4700, 4725, 4750, 4775, 4800, 4825, 4850, 4875, 4900, 4925, 4950, 4975, 5000, 5025, 5050, 5075, 5100, 5125, 5150, 5175, 5200, 5225, 5250, 5275, 5300, 5325, 5350, 5375, 5400, 5425, 5450, 5475, 5500, 5525, 5550, 5575, 5600, 5625, 5650, 5675, 5700, 5725, 5750, 5775, 5800, 5825, 5850, 5875, 5900, 5925, 5950, 5975, 6000, 6025, 6050, 6075, 6100, 6125, 6150, 6175, 6200, 6225, 6250, 6275, 6300, 6325, 6350, 6375, 6400, 6425, 6450, 6475, 6500, 6525, 6550, 6575, 6600, 6625, 6650, 6675, 6700, 6725, 6750, 6775, 6800, 6825, 6850, 6875, 6900, 6925, 6950, 6975, 7000, 7025, 7050, 7075, 7100, 7125, 7150, 7175, 7200, 7225, 7250, 7275, 7300, 7325, 7350, 7375, 7400, 7425, 7450, 7475, 7500, 7525, 7550, 7575, 7600, 7625, 7650, 7675, 7700, 7725, 7750, 7775, 7800, 7825, 7850, 7875, 7900, 7925, 7950, 7975, 8000, 8025, 8050, 8075, 8100, 8125, 8150, 8175, 8200, 8225, 8250, 8275, 8300, 8325, 8350, 8375, 8400, 8425, 8450, 8475, 8500, 8525, 8550, 8575, 8600, 8625, 8650, 8675, 8700, 8725, 8750, 8775, 8800, 8825, 8850, 8875, 8900, 8925, 8950, 8975, 9000, 9025, 9050, 9075, 9100, 9125, 9150, 9175, 9200, 9225, 9250, 9275, 9300, 9325, 9350, 9375, 9400, 9425, 9450, 9475, 9500, 9525, 9550, 9575, 9600, 9625, 9650, 9675, 9700, 9725, 9750, 9775, 9800, 9825, 9850, 9875, 9900, 9925, 9950, 9975, 10000.

FRAMES OF DEVELOPMENT (THICKNESS)
 1 - 100m
 2 - 100m
 3 - 100m
 4 - 100m
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 99 - 100m
 100 - 100m

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
 SOUTHERN ICE LIMIT 07 JUL 92

EXAMPLES
 (A) (B) (C) (D) (E) (F) (G)

FRAMES OF DEVELOPMENT (THICKNESS)
 1 - 100m
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 4 - 100m
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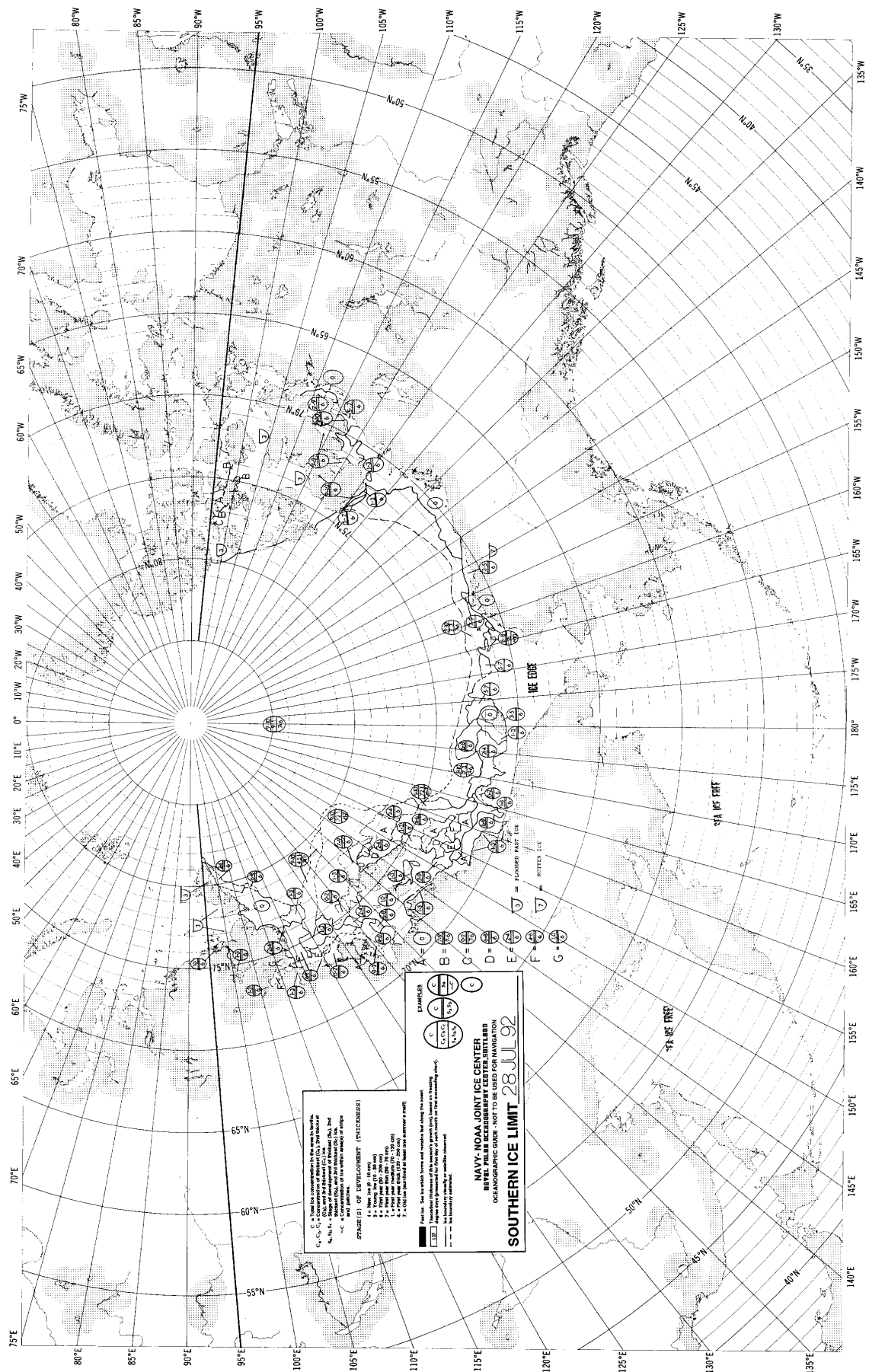


C₁ - 100% ice
 C₂ - 75% ice
 C₃ - 50% ice
 C₄ - 25% ice
 C₅ - 10% ice
 C₆ - 5% ice
 C₇ - 2% ice
 C₈ - 1% ice
 C₉ - 0.5% ice
 C₁₀ - 0.2% ice
 C₁₁ - 0.1% ice
 C₁₂ - 0.05% ice
 C₁₃ - 0.02% ice
 C₁₄ - 0.01% ice
 C₁₅ - 0.005% ice
 C₁₆ - 0.002% ice
 C₁₇ - 0.001% ice
 C₁₈ - 0.0005% ice
 C₁₉ - 0.0002% ice
 C₂₀ - 0.0001% ice
 C₂₁ - 0.00005% ice
 C₂₂ - 0.00002% ice
 C₂₃ - 0.00001% ice
 C₂₄ - 0.000005% ice
 C₂₅ - 0.000002% ice
 C₂₆ - 0.000001% ice
 C₂₇ - 0.0000005% ice
 C₂₈ - 0.0000002% ice
 C₂₉ - 0.0000001% ice
 C₃₀ - 0.00000005% ice
 C₃₁ - 0.00000002% ice
 C₃₂ - 0.00000001% ice
 C₃₃ - 0.000000005% ice
 C₃₄ - 0.000000002% ice
 C₃₅ - 0.000000001% ice
 C₃₆ - 0.0000000005% ice
 C₃₇ - 0.0000000002% ice
 C₃₈ - 0.0000000001% ice
 C₃₉ - 0.00000000005% ice
 C₄₀ - 0.00000000002% ice
 C₄₁ - 0.00000000001% ice
 C₄₂ - 0.000000000005% ice
 C₄₃ - 0.000000000002% ice
 C₄₄ - 0.000000000001% ice
 C₄₅ - 0.0000000000005% ice
 C₄₆ - 0.0000000000002% ice
 C₄₇ - 0.0000000000001% ice
 C₄₈ - 0.00000000000005% ice
 C₄₉ - 0.00000000000002% ice
 C₅₀ - 0.00000000000001% ice

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, BURLINGAME, CALIF.
SOUTHERN ICE LIMIT 14 JUL 92
 DRAWING PAPER 10X 17"

STAGES OF DEVELOPMENT (THICKNESSES)
 1 - New ice
 2 - First year ice
 3 - Second year ice
 4 - Third year ice
 5 - Fourth year ice
 6 - Old ice
 7 - Old ice floes
 8 - Old ice floes
 9 - Old ice floes
 10 - Old ice floes
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 48 - Old ice floes
 49 - Old ice floes
 50 - Old ice floes

EXAMPLES
 C₁ C₂ C₃ C₄ C₅ C₆ C₇ C₈ C₉ C₁₀ C₁₁ C₁₂ C₁₃ C₁₄ C₁₅ C₁₆ C₁₇ C₁₈ C₁₉ C₂₀ C₂₁ C₂₂ C₂₃ C₂₄ C₂₅ C₂₆ C₂₇ C₂₈ C₂₉ C₃₀ C₃₁ C₃₂ C₃₃ C₃₄ C₃₅ C₃₆ C₃₇ C₃₈ C₃₉ C₄₀ C₄₁ C₄₂ C₄₃ C₄₄ C₄₅ C₄₆ C₄₇ C₄₈ C₄₉ C₅₀



1. Ice limit shown and symbols are along the coast.
 2. Ice limit shown and symbols are along the coast.
 3. Ice limit shown and symbols are along the coast.
 4. Ice limit shown and symbols are along the coast.
 5. Ice limit shown and symbols are along the coast.
 6. Ice limit shown and symbols are along the coast.
 7. Ice limit shown and symbols are along the coast.
 8. Ice limit shown and symbols are along the coast.
 9. Ice limit shown and symbols are along the coast.
 10. Ice limit shown and symbols are along the coast.

NAVY-NOAA JOINT ICE CENTER
BEVEL FULTON RESEARCH CENTER, SUTCLIFF
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT 28 JUL 92

- A = (1)
- B = (2)
- C = (3)
- D = (4)
- E = (5)
- F = (6)
- G = (7)

- 1 = (1)
- 2 = (2)
- 3 = (3)
- 4 = (4)
- 5 = (5)
- 6 = (6)
- 7 = (7)

- 1 = (1)
- 2 = (2)
- 3 = (3)
- 4 = (4)
- 5 = (5)
- 6 = (6)
- 7 = (7)

- 1 = (1)
- 2 = (2)
- 3 = (3)
- 4 = (4)
- 5 = (5)
- 6 = (6)
- 7 = (7)

- 1 = (1)
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- 7 = (7)

- 1 = (1)
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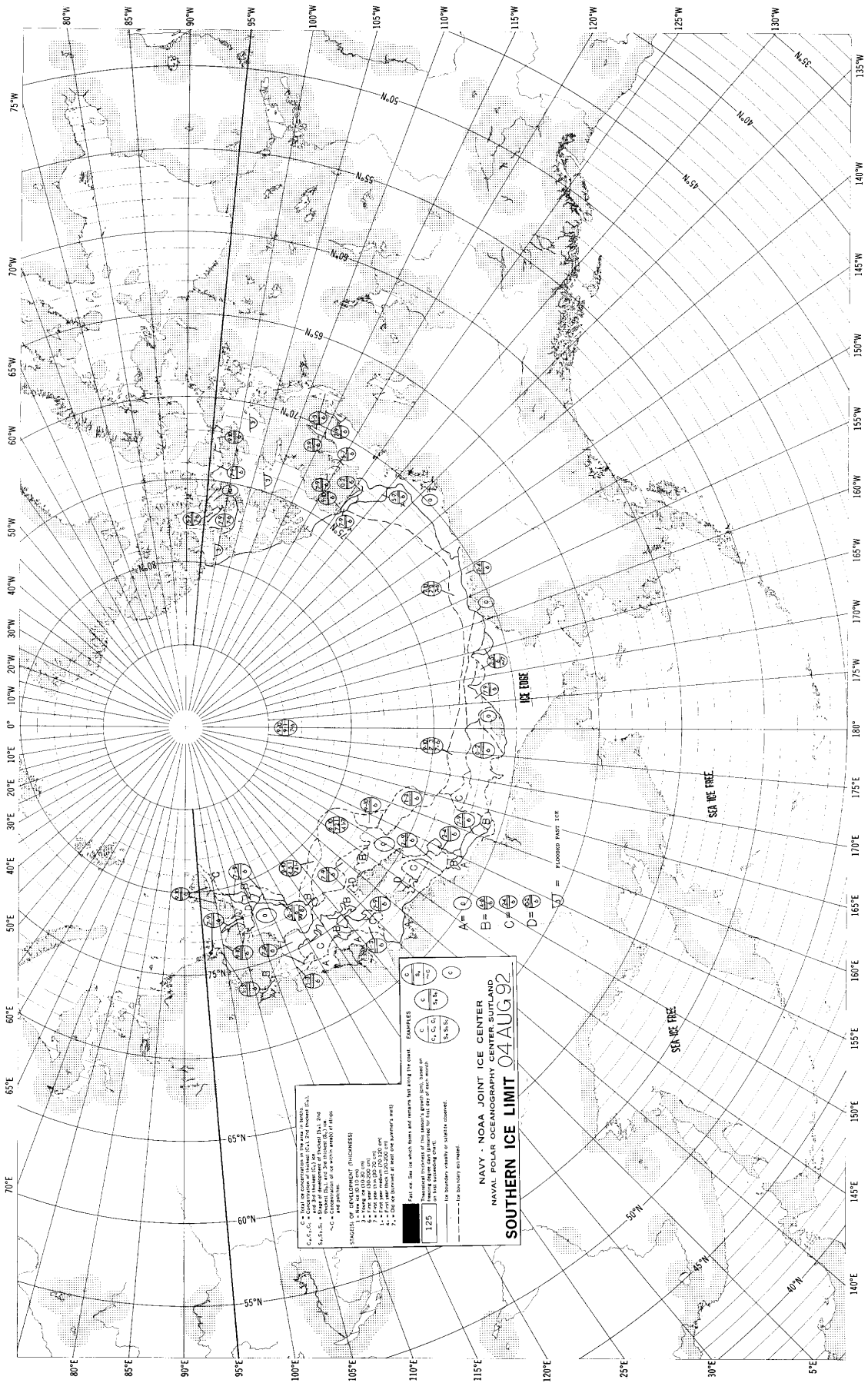
- 1 = (1)
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- 1 = (1)
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- 3 = (3)
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- 6 = (6)
- 7 = (7)



C, C₁, C₂ = Class and concentration of ice (see legend) (C₁ and C₂ are not used for ice concentrations of 10% and 20% respectively)
 S, S₁, S₂ = Stage of development of ice (see legend)
 N, C = Characteristic of ice (see legend)
 and pattern.

SYMBOLS OF ICE THICKNESS (IN INCHES)
 1 = 1/8 inch (3.2 mm)
 2 = 1/4 inch (6.4 mm)
 3 = 3/8 inch (9.6 mm)
 4 = 1/2 inch (12.8 mm)
 5 = 5/8 inch (16.0 mm)
 6 = 3/4 inch (19.2 mm)
 7 = 7/8 inch (22.4 mm)
 8 = 1 inch (25.6 mm)
 9 = 1 1/8 inch (28.8 mm)
 10 = 1 1/4 inch (32.0 mm)
 11 = 1 3/8 inch (35.2 mm)
 12 = 1 1/2 inch (38.4 mm)
 13 = 1 5/8 inch (41.6 mm)
 14 = 1 3/4 inch (44.8 mm)
 15 = 1 7/8 inch (48.0 mm)
 16 = 2 inch (51.2 mm)
 17 = 2 1/8 inch (54.4 mm)
 18 = 2 1/4 inch (57.6 mm)
 19 = 2 3/8 inch (60.8 mm)
 20 = 2 1/2 inch (64.0 mm)
 21 = 2 5/8 inch (67.2 mm)
 22 = 2 3/4 inch (70.4 mm)
 23 = 2 7/8 inch (73.6 mm)
 24 = 3 inch (76.8 mm)
 25 = 3 1/8 inch (80.0 mm)
 26 = 3 1/4 inch (83.2 mm)
 27 = 3 3/8 inch (86.4 mm)
 28 = 3 1/2 inch (89.6 mm)
 29 = 3 5/8 inch (92.8 mm)
 30 = 3 3/4 inch (96.0 mm)
 31 = 3 7/8 inch (99.2 mm)
 32 = 4 inch (102.4 mm)
 33 = 4 1/8 inch (105.6 mm)
 34 = 4 1/4 inch (108.8 mm)
 35 = 4 3/8 inch (112.0 mm)
 36 = 4 1/2 inch (115.2 mm)
 37 = 4 5/8 inch (118.4 mm)
 38 = 4 3/4 inch (121.6 mm)
 39 = 4 7/8 inch (124.8 mm)
 40 = 5 inch (128.0 mm)

See also: Sea ice symbols and abbreviations, and the IGY report "Arctic Oceanographic Data Handbook" for the use of these symbols.
 For full background information, see the "Arctic Oceanographic Data Handbook" for the use of these symbols.
 For full background information, see the "Arctic Oceanographic Data Handbook" for the use of these symbols.

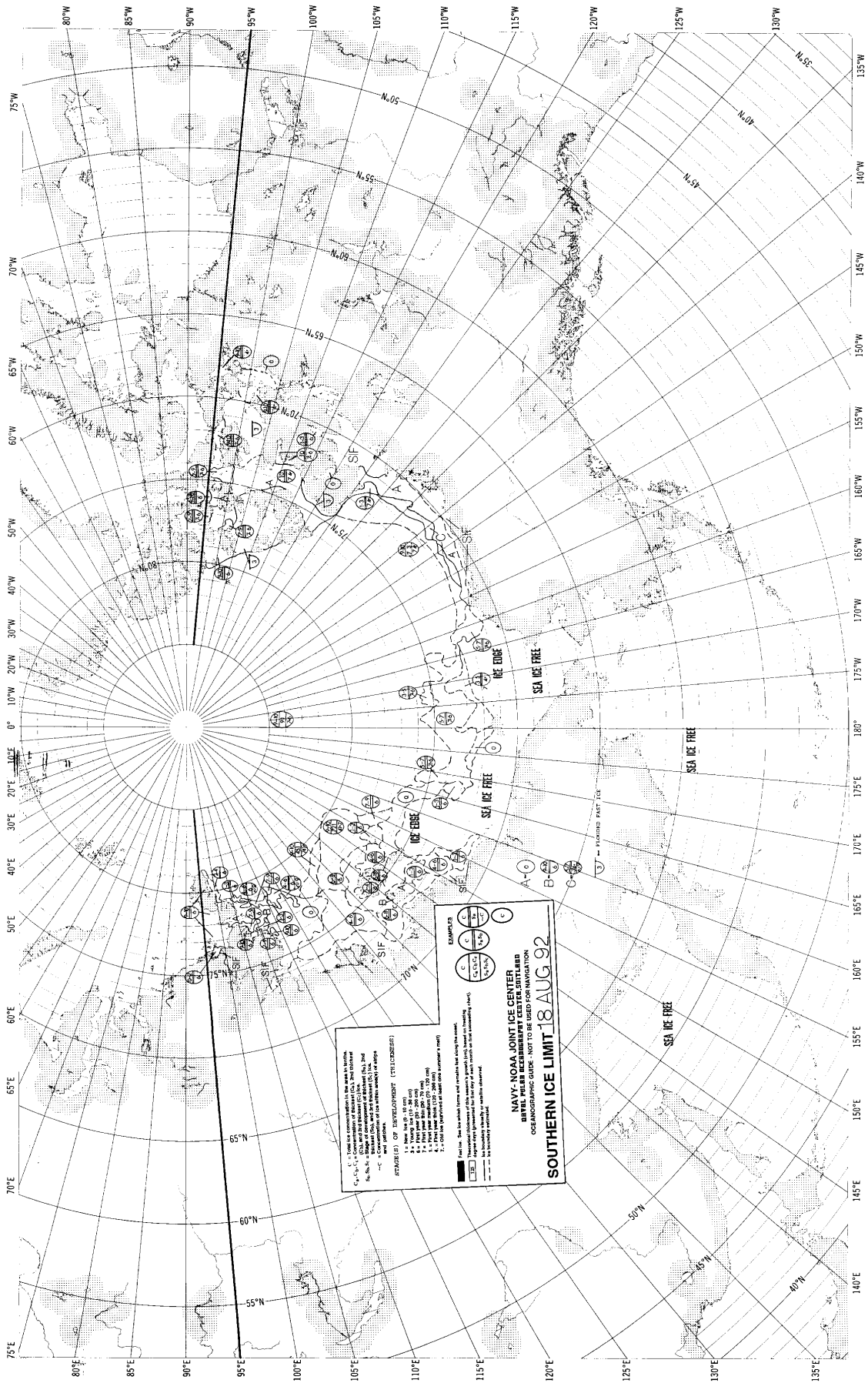
--- Ice thickness contours
 --- Ice concentration contours

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NAVAL POLAR OCEANOGRAPHY CENTER SUI TLAND
SOUTHERN ICE LIMIT 04 AUG 92

CLASSES
 A = 10%
 B = 20%
 C = 30%
 D = 40%
 E = 50%

125
 125
 125
 125
 125

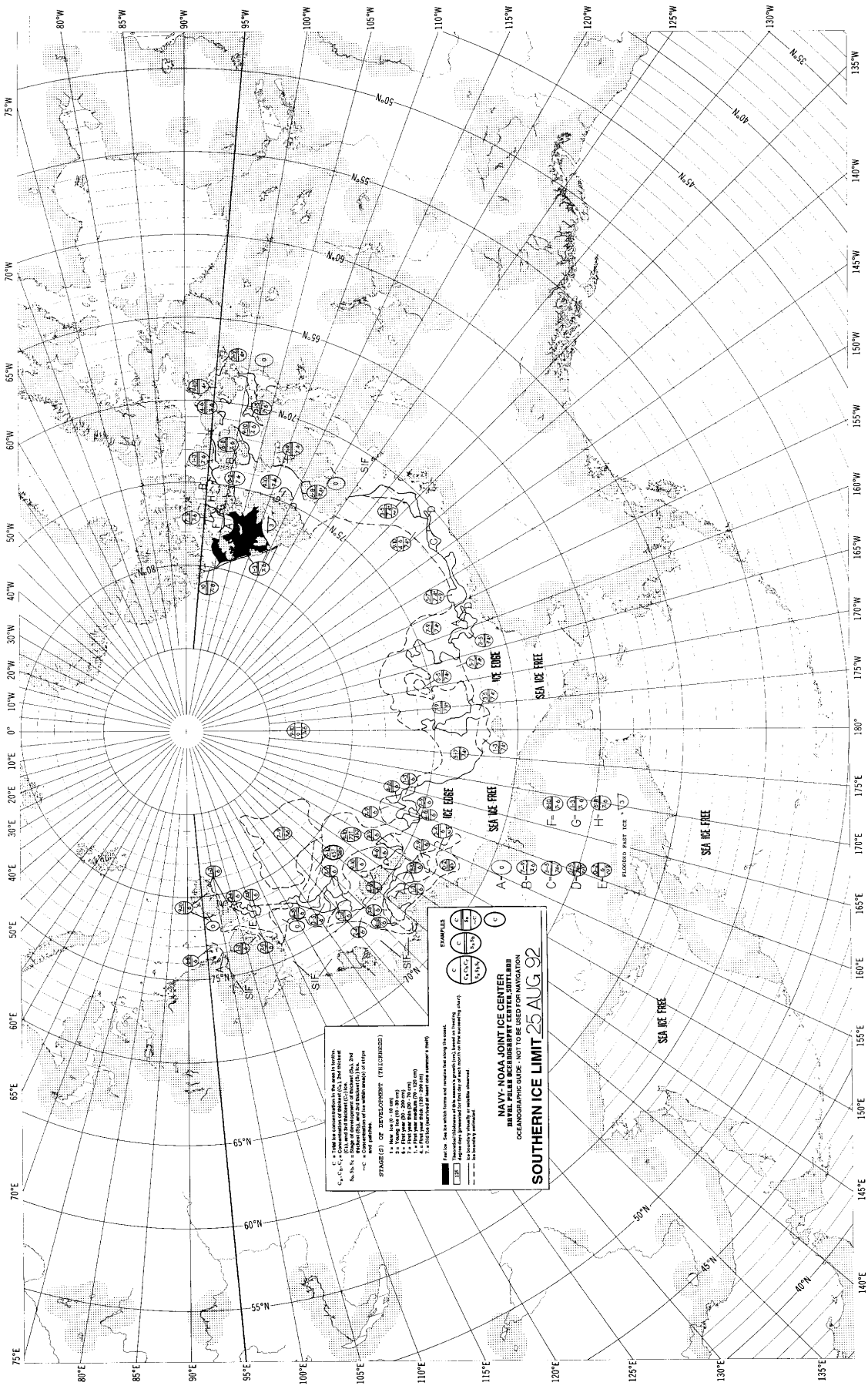
ICE FREE
 SEA ICE FREE
 100% PAKE ICE



1. Ice concentration is the ratio of ice to water.
 2. Ice extent is the area of ice.
 3. Ice edge is the boundary between ice and open water.
 4. Ice concentration is the ratio of ice to water.
 5. Ice extent is the area of ice.
 6. Ice edge is the boundary between ice and open water.

EXAMPLES
 (A) 10% concentration, 100 km² extent
 (B) 20% concentration, 200 km² extent
 (C) 30% concentration, 300 km² extent
 (D) 40% concentration, 400 km² extent
 (E) 50% concentration, 500 km² extent
 (F) 60% concentration, 600 km² extent
 (G) 70% concentration, 700 km² extent
 (H) 80% concentration, 800 km² extent
 (I) 90% concentration, 900 km² extent
 (J) 100% concentration, 1000 km² extent

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NAVY-NOAA JOINT ICE CENTER
ICE CONCENTRATION
ICE EXTENT
SEA ICE FREE
ICE EDGE
EXAMPLES
SOUTHERN ICE LIMIT 18 AUG 92



EXAMPLES

C	0-10%	10-15'
C	10-20%	15-20'
C	20-30%	20-25'
C	30-40%	25-30'
C	40-50%	30-35'
C	50-60%	35-40'
C	60-70%	40-45'
C	70-80%	45-50'
C	80-90%	50-55'
C	90-100%	55-60'

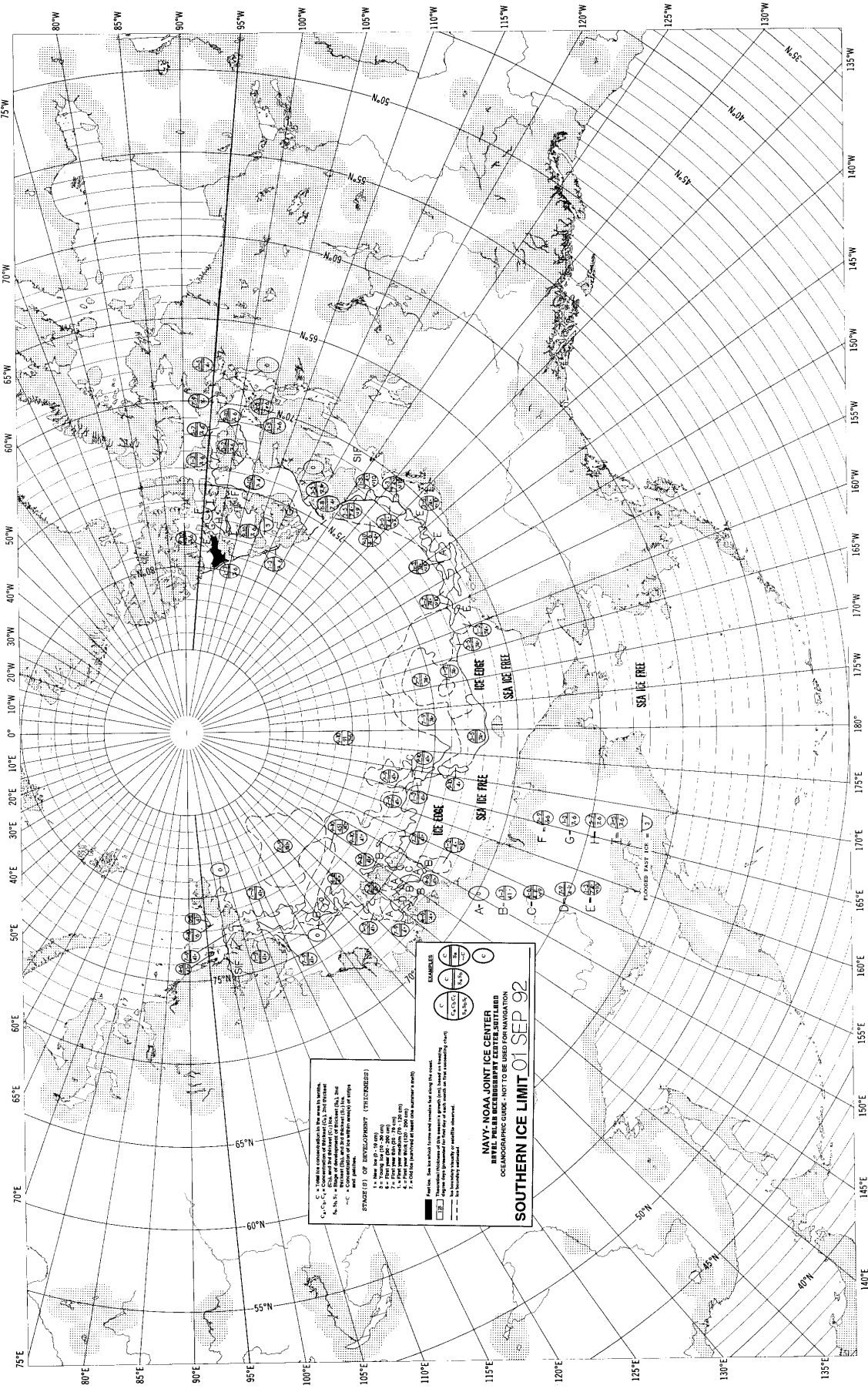
STAGES OF DEVELOPMENT (THICKNESSES)

- 1 - Young Ice (10-15')
- 2 - Thin Ice (15-20')
- 3 - Medium Ice (20-25')
- 4 - Thick Ice (25-30')
- 5 - Very Thick Ice (30-35')
- 6 - Old Ice (35-40')
- 7 - Old Ice (40-45')
- 8 - Old Ice (45-50')
- 9 - Old Ice (50-55')
- 10 - Old Ice (55-60')

NOTES:

- 1 - Ice concentration is the percentage of open water.
- 2 - Ice thickness is the average thickness of the ice.
- 3 - Ice concentration is the percentage of open water.
- 4 - Ice thickness is the average thickness of the ice.
- 5 - Ice concentration is the percentage of open water.
- 6 - Ice thickness is the average thickness of the ice.
- 7 - Ice concentration is the percentage of open water.
- 8 - Ice thickness is the average thickness of the ice.
- 9 - Ice concentration is the percentage of open water.
- 10 - Ice thickness is the average thickness of the ice.

**MARU, NOAA, JOINT ICE CENTER
 MARU, PLANETARIUM, JOINT ICE CENTER, BILTMORH
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
 SOUTHERN ICE LIMIT 25 AUG 92**



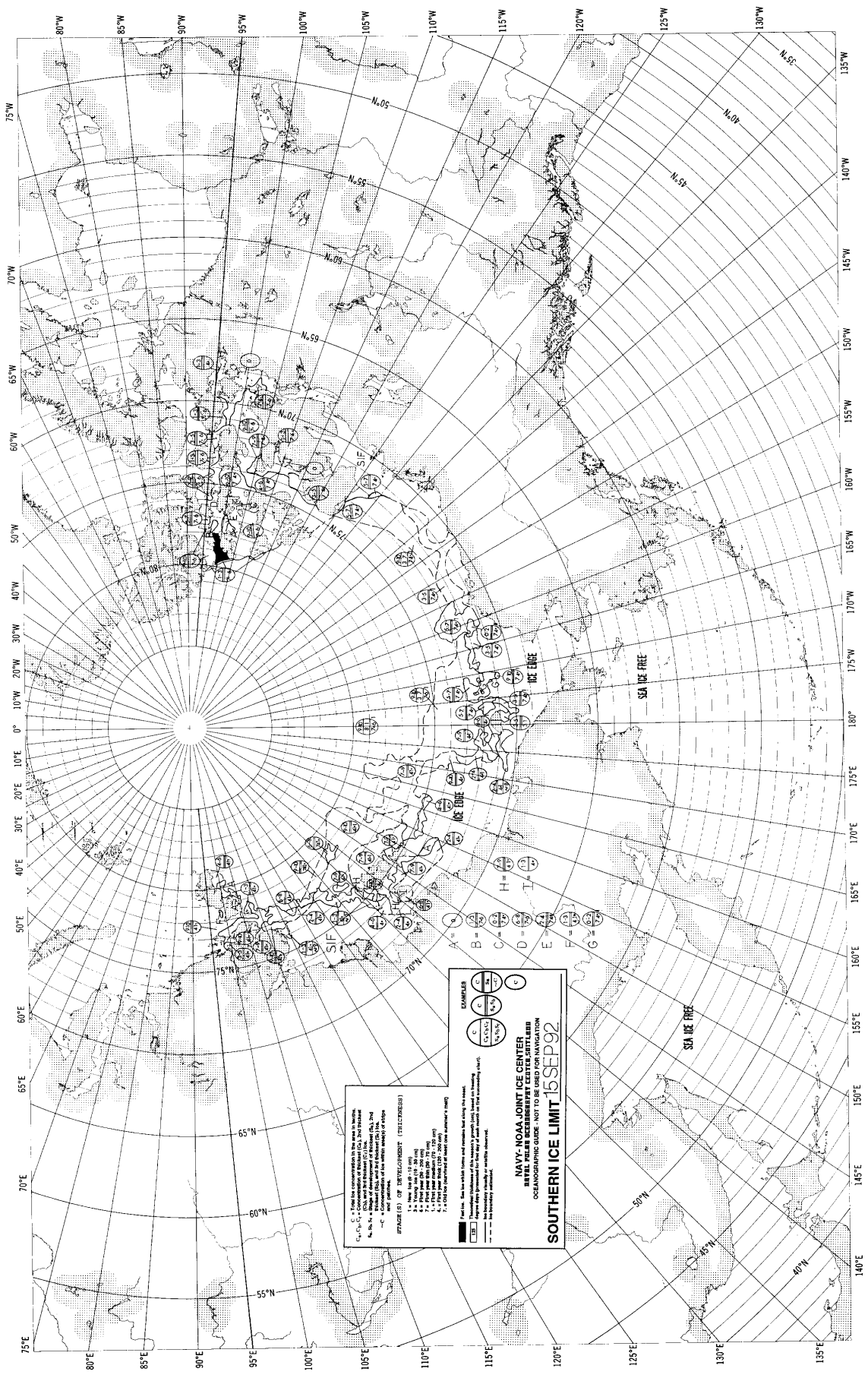
EXAMPLES

SPACINGS OF DEVELOPMENT (METERS)

- 1 - 1000 (328)
- 2 - 2000 (656)
- 3 - 3000 (984)
- 4 - 4000 (1312)
- 5 - 5000 (1640)
- 6 - 6000 (1968)
- 7 - 7000 (2296)
- 8 - 8000 (2624)
- 9 - 9000 (2952)
- 10 - 10000 (3280)

NAVY, NOAA JOINT ICE CENTER
NAVY, PHILIP WEBER CENTER, SUTCLIFF
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT 01 SEP 92

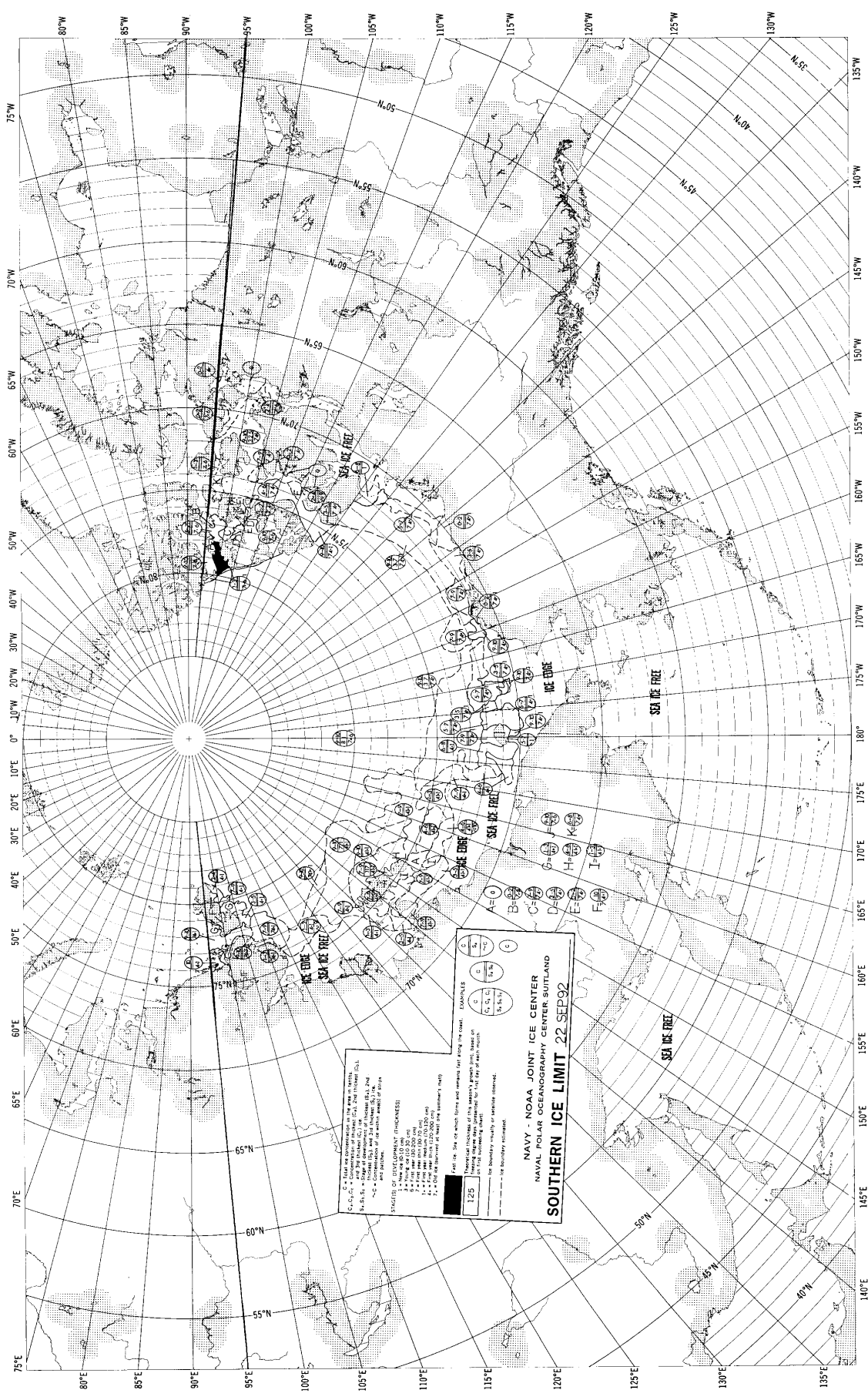
NOTES: Symbols which have not been used are shown for the sake of completeness. Symbols shown are those used in the current issue of this guide. Symbols shown are those used in the current issue of this guide. Symbols shown are those used in the current issue of this guide.



C = Total ice concentration in the area in tenths.
 C₁, C₂, C₃ = Ice concentration in the area in tenths.
 N = Number of observations in the area.
 S = Standard deviation of the area in tenths.
 T = Total area of the area in square miles.
 W = Weight of the area in square miles.
 H = Height of the area in feet.
 T = Total area of the area in square miles.
 W = Weight of the area in square miles.
 H = Height of the area in feet.

EXAMPLES

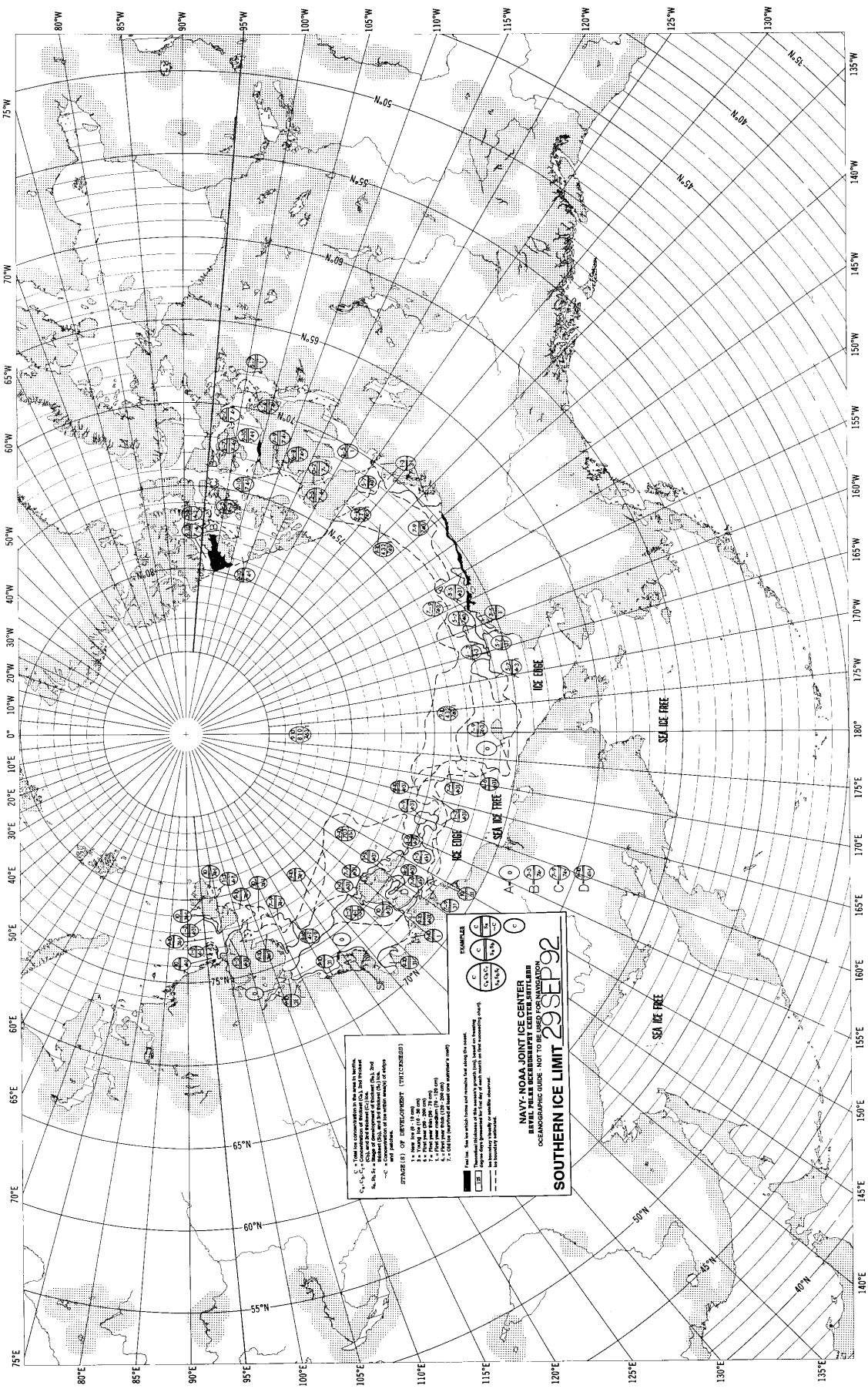
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 BRITISH WATERS
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT 15 SEP 92



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, 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.

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 22 SEP 92

1:25
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1. Shows ice extent and thickness (in meters) for the month of September 1992. The ice extent is shown by the shaded area. The ice thickness is shown by the numbers in the circles. The numbers in the circles are the thickness in meters. The numbers in the circles are the thickness in meters. The numbers in the circles are the thickness in meters.

SYMBOLS OF DISTRIBUTION (IN METERS)

1. 1-1000 (1000)

2. 1000-2000 (2000)

3. 2000-3000 (3000)

4. 3000-4000 (4000)

5. 4000-5000 (5000)

6. 5000-6000 (6000)

7. 6000-7000 (7000)

8. 7000-8000 (8000)

9. 8000-9000 (9000)

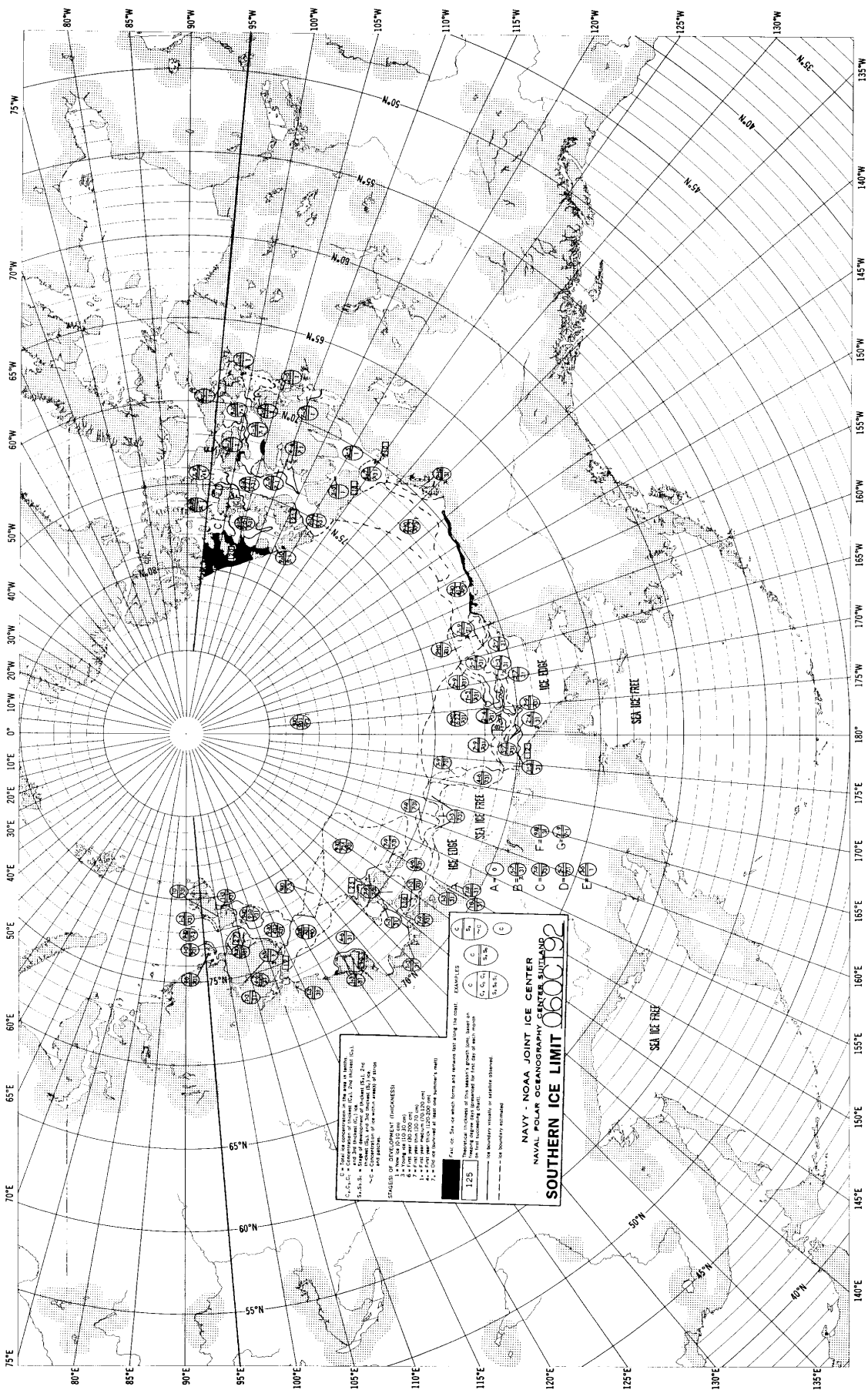
10. 9000-10000 (10000)

EXAMPLES

A	B	C
1000	2000	3000
4000	5000	6000

NAVY-NOAA JOINT ICE CENTER
NAVY MILAN BUREAU CENTER ANTWERP
 OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT 29 SEP 92

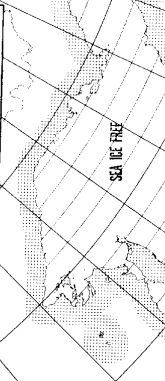
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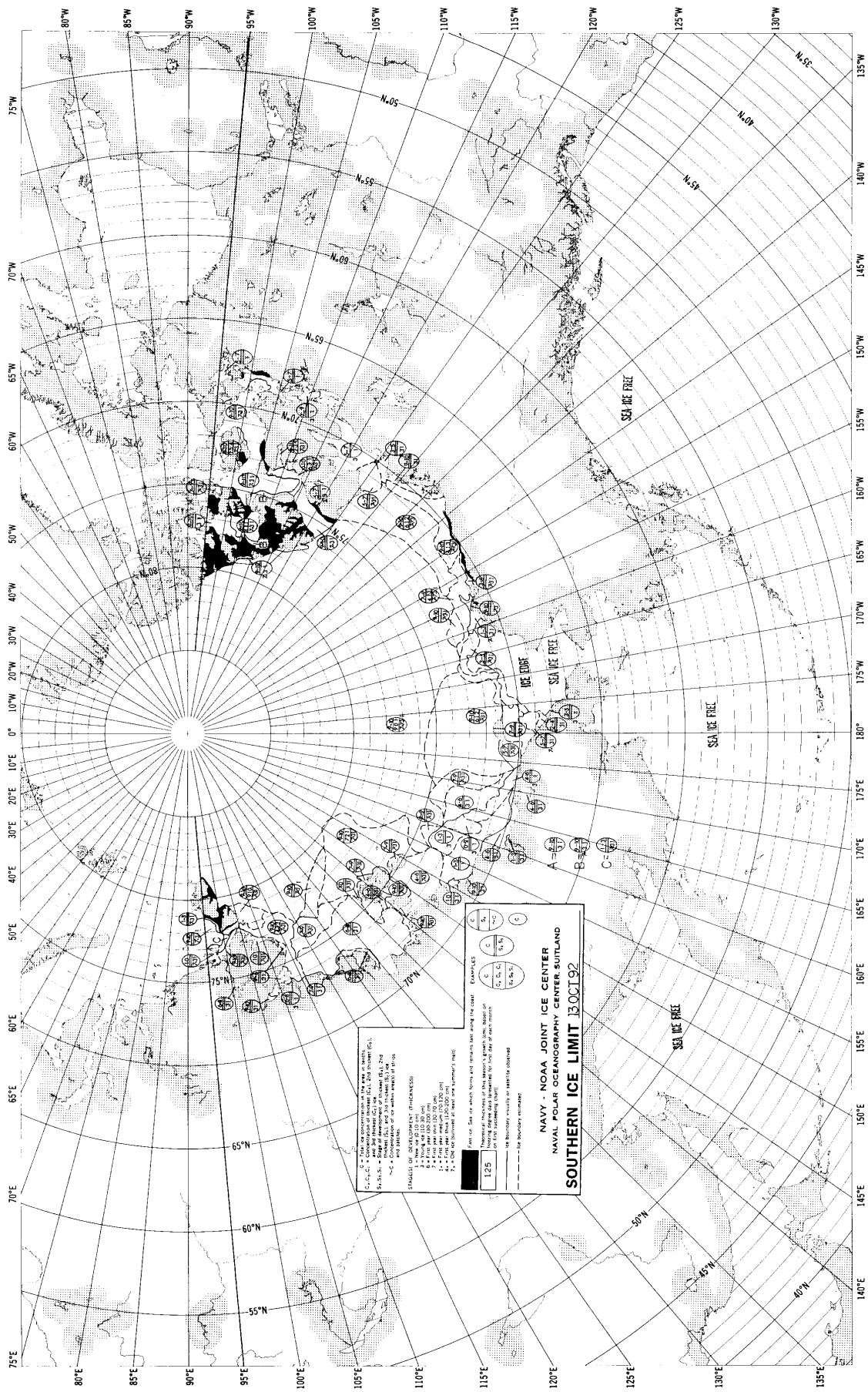


1. Data for the period 1974-1975, 1976-1977, 1978-1979, 1980-1981, 1982-1983, 1984-1985, 1986-1987, 1988-1989, 1990-1991, 1992-1993, 1994-1995, 1996-1997, 1998-1999, 2000-2001, 2002-2003, 2004-2005, 2006-2007, 2008-2009, 2010-2011, 2012-2013, 2014-2015, 2016-2017, 2018-2019, 2020-2021, 2022-2023, 2024-2025.

STATIONS
 1. 1974-1975 (1974-1975)
 2. 1976-1977 (1976-1977)
 3. 1978-1979 (1978-1979)
 4. 1980-1981 (1980-1981)
 5. 1982-1983 (1982-1983)
 6. 1984-1985 (1984-1985)
 7. 1986-1987 (1986-1987)
 8. 1988-1989 (1988-1989)
 9. 1990-1991 (1990-1991)
 10. 1992-1993 (1992-1993)
 11. 1994-1995 (1994-1995)
 12. 1996-1997 (1996-1997)
 13. 1998-1999 (1998-1999)
 14. 2000-2001 (2000-2001)
 15. 2002-2003 (2002-2003)
 16. 2004-2005 (2004-2005)
 17. 2006-2007 (2006-2007)
 18. 2008-2009 (2008-2009)
 19. 2010-2011 (2010-2011)
 20. 2012-2013 (2012-2013)
 21. 2014-2015 (2014-2015)
 22. 2016-2017 (2016-2017)
 23. 2018-2019 (2018-2019)
 24. 2020-2021 (2020-2021)
 25. 2022-2023 (2022-2023)
 26. 2024-2025 (2024-2025)

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SULLY WANG
SOUTHERN ICE LIMIT 0606192





C = Thin ice (maximum in the area shown)
 S = Intermediate thickness (2 to 3 ft thick)
 E = Edge of ice (maximum in the area shown)
 F = First year ice (10 to 20 ft thick)
 A = Second year ice (20 to 30 ft thick)
 B = Third year ice (30 to 40 ft thick)
 C = Old ice (40 ft or more of ice)

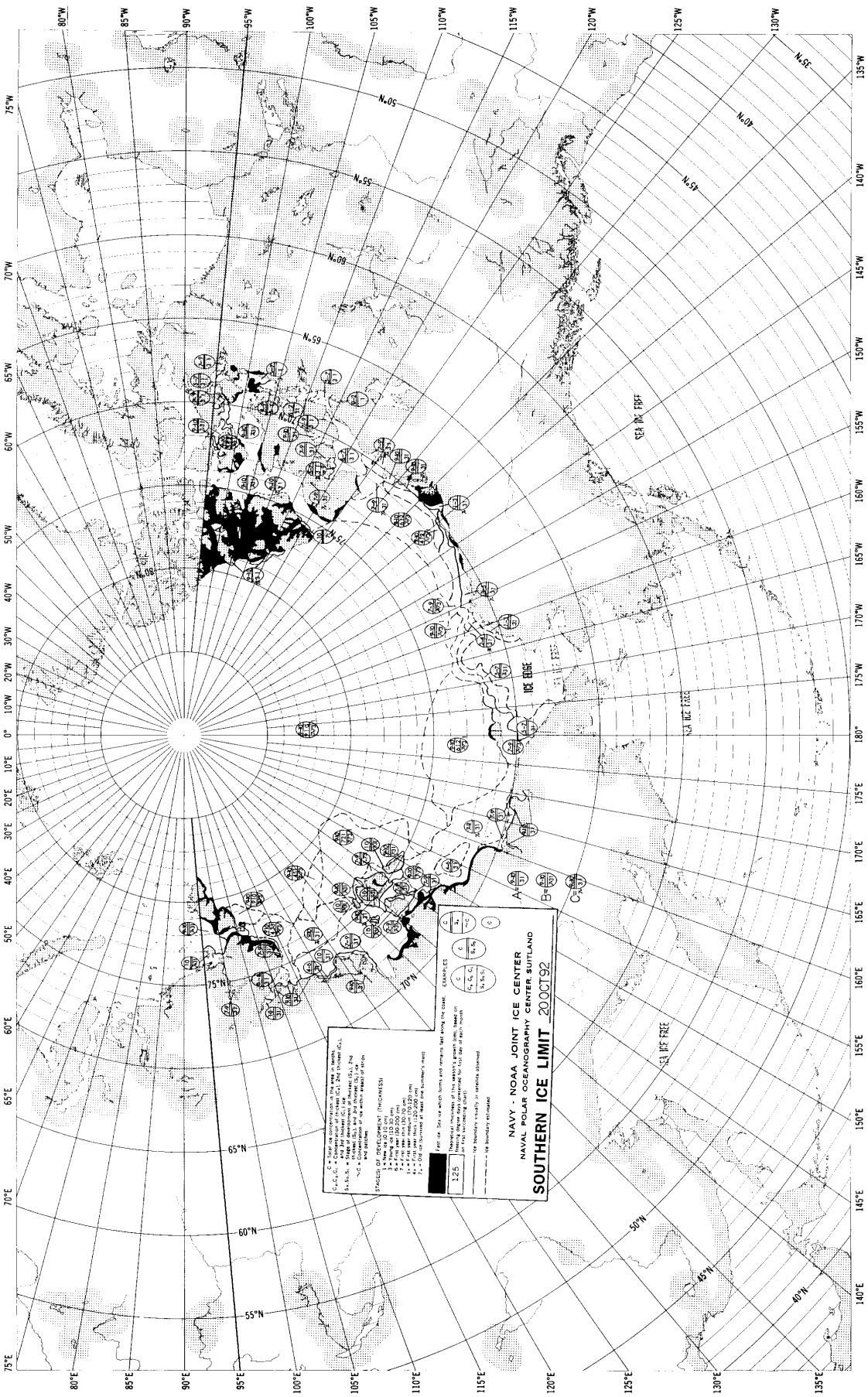
STAGES OF DEVELOPMENT (THICKNESS)
 1 = New ice (10 to 20 cm)
 2 = Thin ice (20 to 30 cm)
 3 = Intermediate thickness (30 to 40 cm)
 4 = Edge of ice (40 to 50 cm)
 5 = First year ice (50 to 60 cm)

125 = Intermediate thickness of this season's growth, based on
 the first observation chart
 126 = Boundary of ice in the previous season
 127 = Ice boundary in winter

NAVY - NOAA JOINT ICE CENTER
 NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND
SOUTHERN ICE LIMIT 13.OCT.92

125 = Intermediate thickness of this season's growth, based on
 the first observation chart
 126 = Boundary of ice in the previous season
 127 = Ice boundary in winter

128 = Sea ice free
 129 = Ice boundary in winter



NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 20OCT02

SYMBOLS OF DEVELOPMENT (THICKNESS)

- 1 - 100% ice (100% ice)
- 2 - 75% ice (75% ice)
- 3 - 50% ice (50% ice)
- 4 - 25% ice (25% ice)
- 5 - 10% ice (10% ice)
- 6 - 5% ice (5% ice)
- 7 - 2% ice (2% ice)
- 8 - 1% ice (1% ice)
- 9 - 0% ice (0% ice)

EXAMPLES

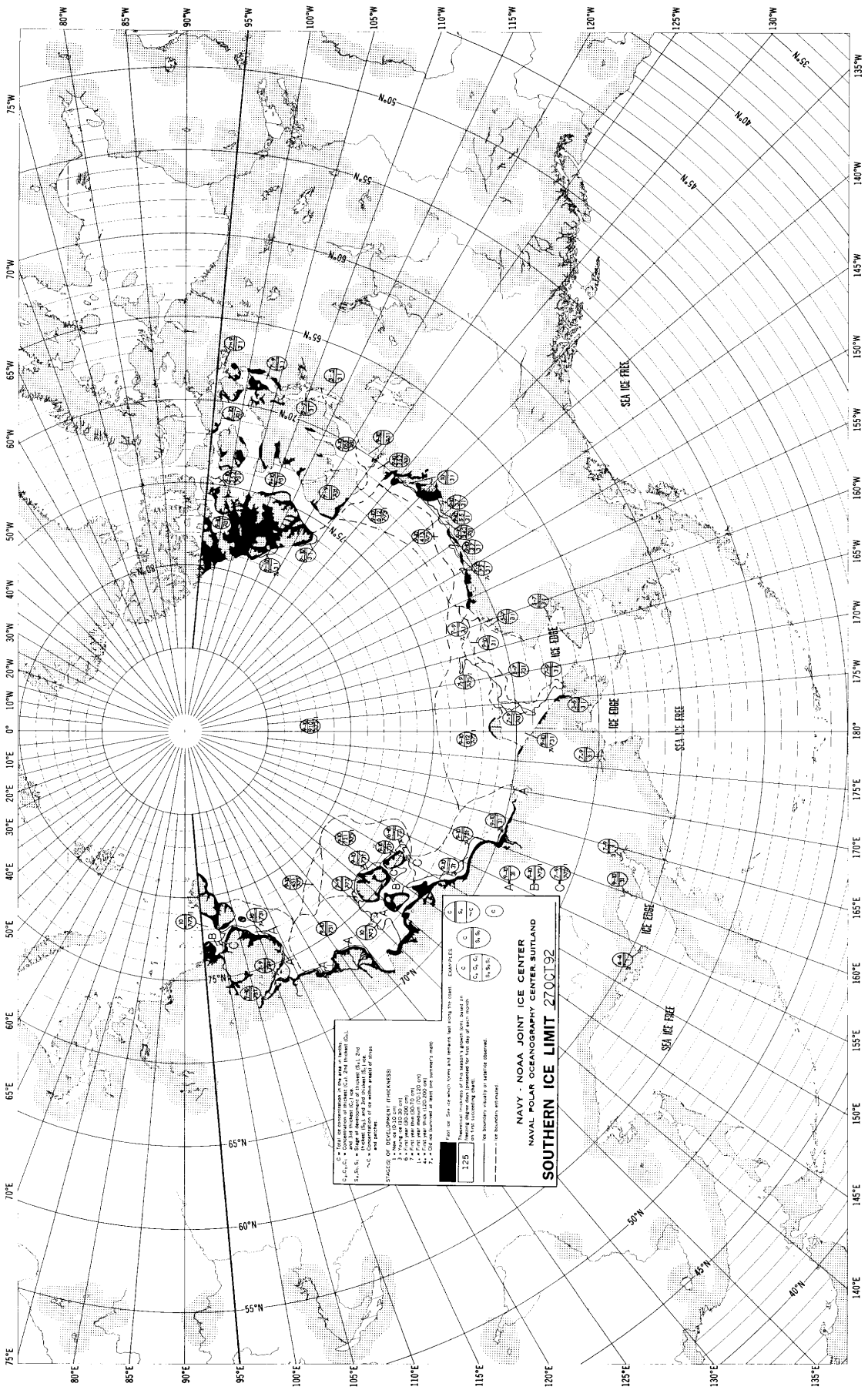
(A)	(B)	(C)
(A)	(A)	(A)
(A)	(A)	(A)
(A)	(A)	(A)

EXPLANATIONS

- 1 - 100% ice (100% ice)
- 2 - 75% ice (75% ice)
- 3 - 50% ice (50% ice)
- 4 - 25% ice (25% ice)
- 5 - 10% ice (10% ice)
- 6 - 5% ice (5% ice)
- 7 - 2% ice (2% ice)
- 8 - 1% ice (1% ice)
- 9 - 0% ice (0% ice)

NOTES

- 1 - 100% ice (100% ice)
- 2 - 75% ice (75% ice)
- 3 - 50% ice (50% ice)
- 4 - 25% ice (25% ice)
- 5 - 10% ice (10% ice)
- 6 - 5% ice (5% ice)
- 7 - 2% ice (2% ice)
- 8 - 1% ice (1% ice)
- 9 - 0% ice (0% ice)



NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER SUTLAND
SOUTHERN ICE LIMIT 2700192

SYMBOLS:

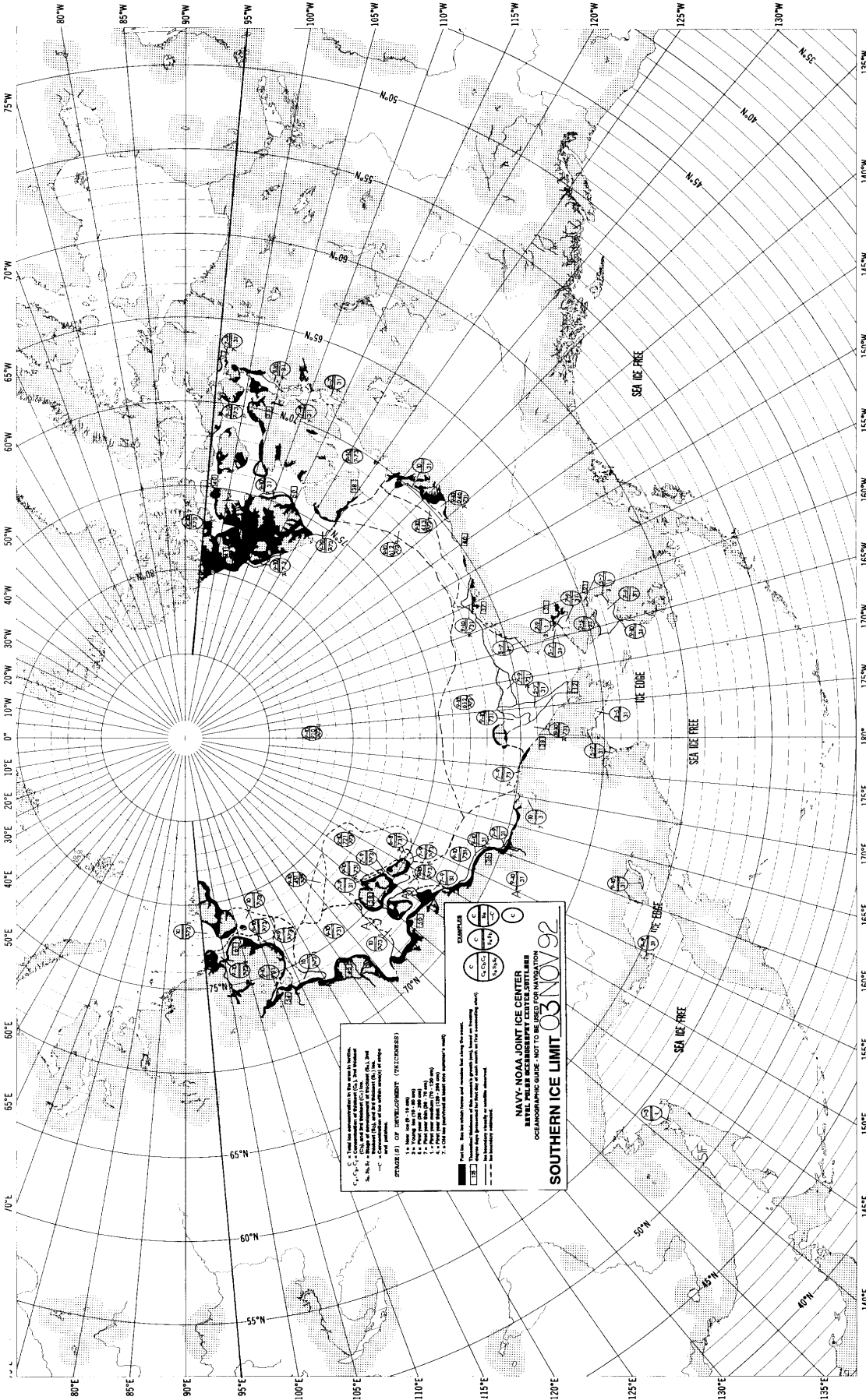
- 1 - Area of 100,000 sq. km.
- 2 - Area of 1,000,000 sq. km.
- 3 - Area of 10,000,000 sq. km.
- 4 - Area of 100,000,000 sq. km.
- 5 - Area of 1,000,000,000 sq. km.
- 6 - Area of 10,000,000,000 sq. km.
- 7 - Area of 100,000,000,000 sq. km.
- 8 - Area of 1,000,000,000,000 sq. km.
- 9 - Area of 10,000,000,000,000 sq. km.
- 0 - Area of 100,000,000,000,000 sq. km.
- 1 - Area of 1,000,000,000,000,000 sq. km.
- 2 - Area of 10,000,000,000,000,000 sq. km.
- 3 - Area of 100,000,000,000,000,000 sq. km.
- 4 - Area of 1,000,000,000,000,000,000 sq. km.
- 5 - Area of 10,000,000,000,000,000,000 sq. km.
- 6 - Area of 100,000,000,000,000,000,000 sq. km.
- 7 - Area of 1,000,000,000,000,000,000,000 sq. km.
- 8 - Area of 10,000,000,000,000,000,000,000 sq. km.
- 9 - Area of 100,000,000,000,000,000,000,000 sq. km.
- 0 - Area of 1,000,000,000,000,000,000,000,000 sq. km.

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
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6

LEGEND:

- 1 - Concentration of ice in percent.
- 2 - Concentration of ice in percent.
- 3 - Concentration of ice in percent.
- 4 - Concentration of ice in percent.
- 5 - Concentration of ice in percent.
- 6 - Concentration of ice in percent.
- 7 - Concentration of ice in percent.
- 8 - Concentration of ice in percent.
- 9 - Concentration of ice in percent.
- 0 - Concentration of ice in percent.
- 1 - Concentration of ice in percent.
- 2 - Concentration of ice in percent.
- 3 - Concentration of ice in percent.
- 4 - Concentration of ice in percent.
- 5 - Concentration of ice in percent.
- 6 - Concentration of ice in percent.
- 7 - Concentration of ice in percent.
- 8 - Concentration of ice in percent.
- 9 - Concentration of ice in percent.
- 0 - Concentration of ice in percent.



1. This chart is prepared by the Navy and NOAA. It is not a navigational chart and should not be used for navigation. It is a reference chart and should be used for information only.

SYMBOLS OF DEVELOPMENT (INCREASING)

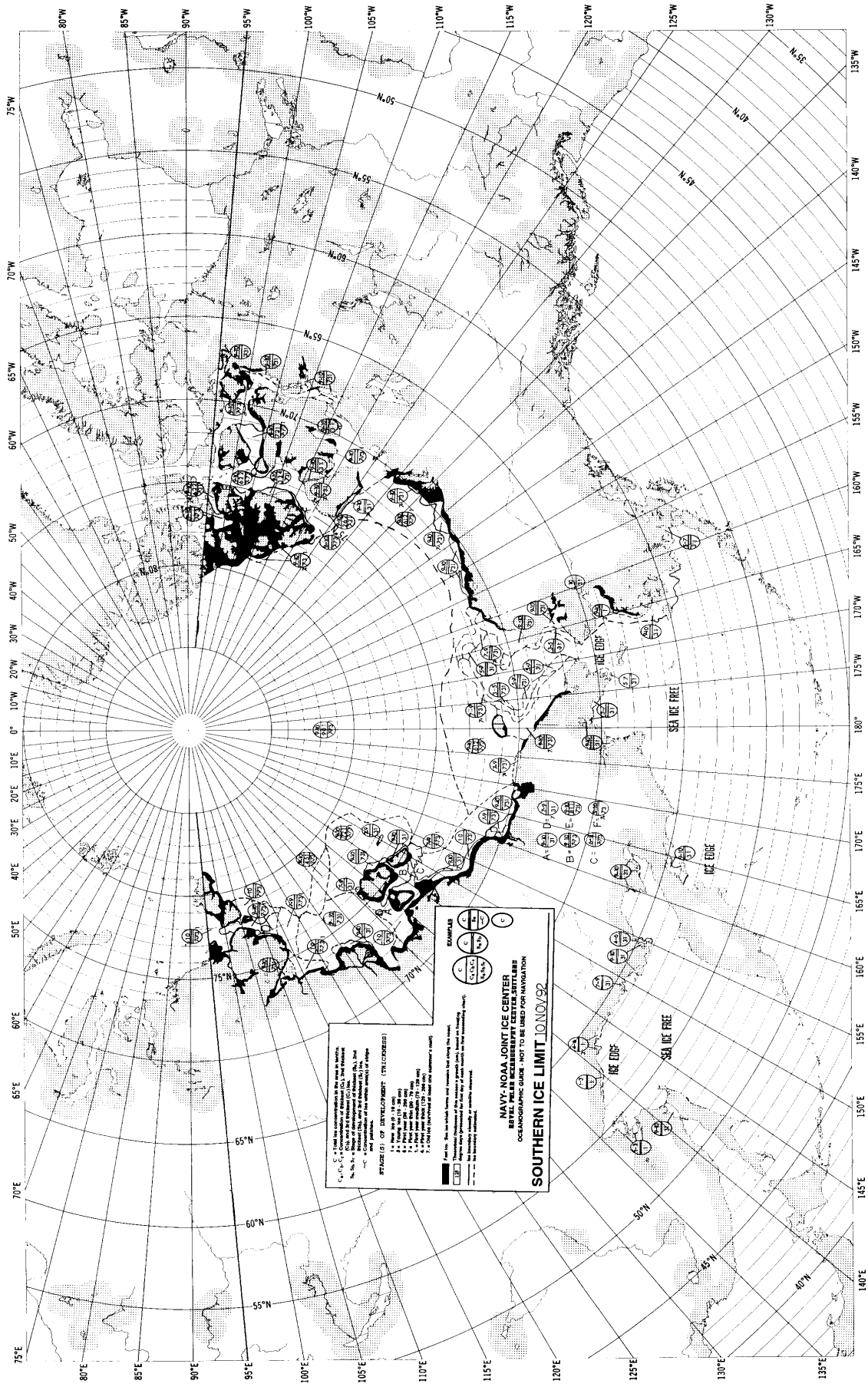
1. 100% Ice
 2. 75% Ice
 3. 50% Ice
 4. 25% Ice
 5. 10% Ice
 6. 5% Ice
 7. 1% Ice
 8. 0% Ice (SEA ICE FREE)

1. 100% Ice
 2. 75% Ice
 3. 50% Ice
 4. 25% Ice
 5. 10% Ice
 6. 5% Ice
 7. 1% Ice
 8. 0% Ice (SEA ICE FREE)

1. 100% Ice
 2. 75% Ice
 3. 50% Ice
 4. 25% Ice
 5. 10% Ice
 6. 5% Ice
 7. 1% Ice
 8. 0% Ice (SEA ICE FREE)

1. 100% Ice
 2. 75% Ice
 3. 50% Ice
 4. 25% Ice
 5. 10% Ice
 6. 5% Ice
 7. 1% Ice
 8. 0% Ice (SEA ICE FREE)

NAVY, NOAA JOINT ICE CENTER
NAVY PEARL AND HERMES CENTER/NOAA
OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT 03 NOV 92

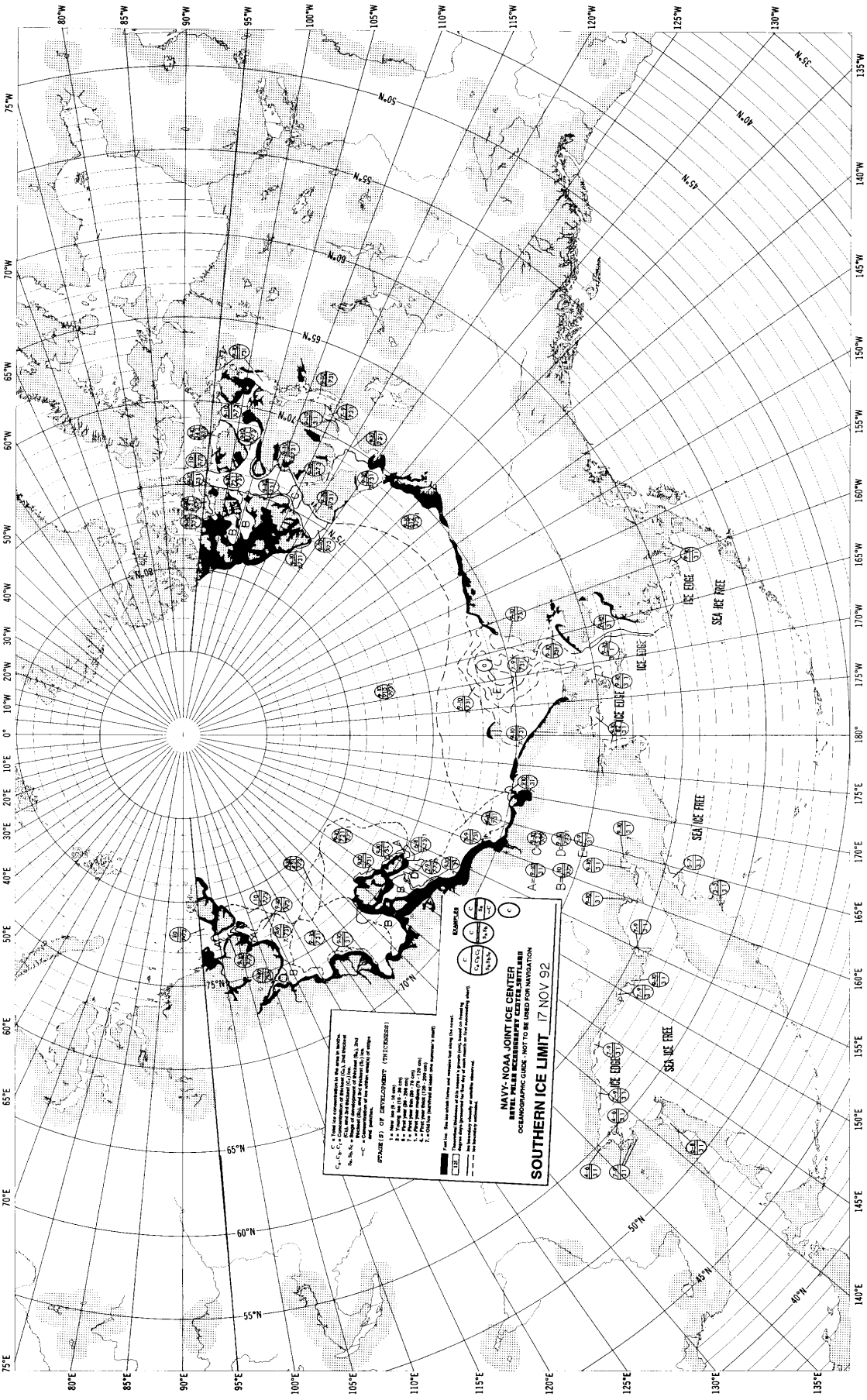


C, C-1, C-2, C-3 (and the corresponding N in the same letter) - Ice concentration in the area in percent.
 N, N-1, N-2, N-3 (and the corresponding C in the same letter) - Ice thickness in meters (3.3, 6.7, and 10.1 meters).
 - - - - - (dashed line) - Ice edge.
 - - - - - (dotted line) - Sea ice free.
 - - - - - (dash-dot line) - Ice edge.
 - - - - - (solid line) - Sea ice free.

SYMBOLS OF DEVELOPMENT (TYPE/ADDRESS)
 1 - 1992 (110°E, 75°N)
 2 - 1992 (115°E, 70°N)
 3 - 1992 (120°E, 65°N)
 4 - 1992 (125°E, 60°N)
 5 - 1992 (130°E, 55°N)
 6 - 1992 (135°E, 50°N)
 7 - 1992 (140°E, 45°N)
 8 - 1992 (145°E, 40°N)
 9 - 1992 (150°E, 35°N)
 10 - 1992 (155°E, 30°N)

EXAMPLES
 C
 C-1
 C-2
 C-3
 N
 N-1
 N-2
 N-3

**NAVY, NOAA JOINT ICE CENTER
 ARCTIC OCEANOGRAPHIC GUIDE - NOT TO BE USED FOR NAVIGATION
 SOUTHERN ICE LIMIT 10NOV92**

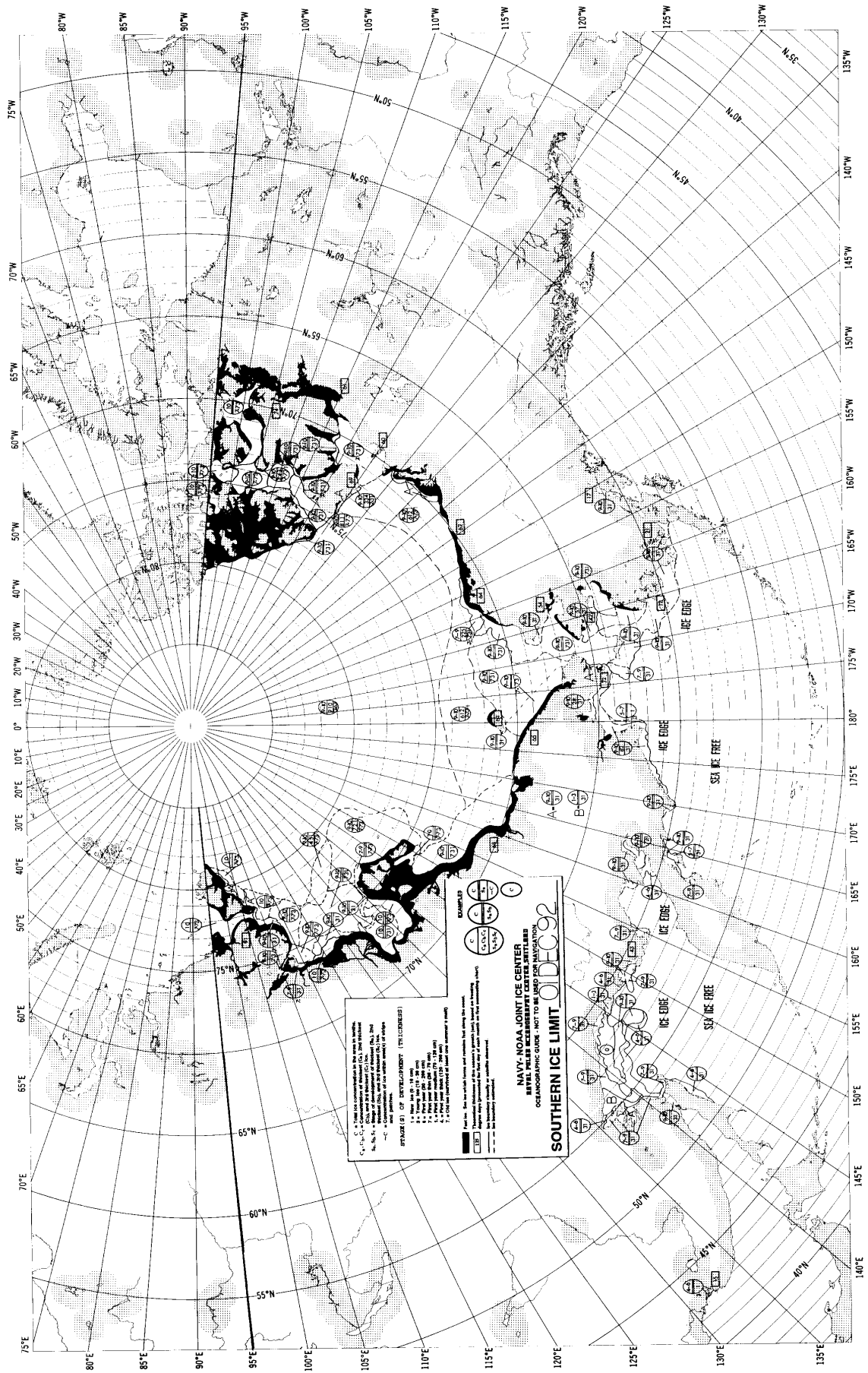


C-1: Coastline
 C-2: Coastline (with depth contours)
 C-3: Coastline (with depth contours and bathymetry)
 C-4: Coastline (with depth contours, bathymetry, and ice limits)
 C-5: Coastline (with depth contours, bathymetry, ice limits, and sea ice free areas)
 C-6: Coastline (with depth contours, bathymetry, ice limits, sea ice free areas, and ice edge)
 C-7: Coastline (with depth contours, bathymetry, ice limits, sea ice free areas, ice edge, and ice extent)
 C-8: Coastline (with depth contours, bathymetry, ice limits, sea ice free areas, ice edge, ice extent, and ice concentration)
 C-9: Coastline (with depth contours, bathymetry, ice limits, sea ice free areas, ice edge, ice extent, ice concentration, and ice thickness)
 C-10: Coastline (with depth contours, bathymetry, ice limits, sea ice free areas, ice edge, ice extent, ice concentration, ice thickness, and ice type)

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	

NAVY-NOAA JOINT ICE CENTER
ICE LIMITS BY CENTER/SETTLERS
OCEANOGRAPHIC CLINO. NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT 17 NOV 92

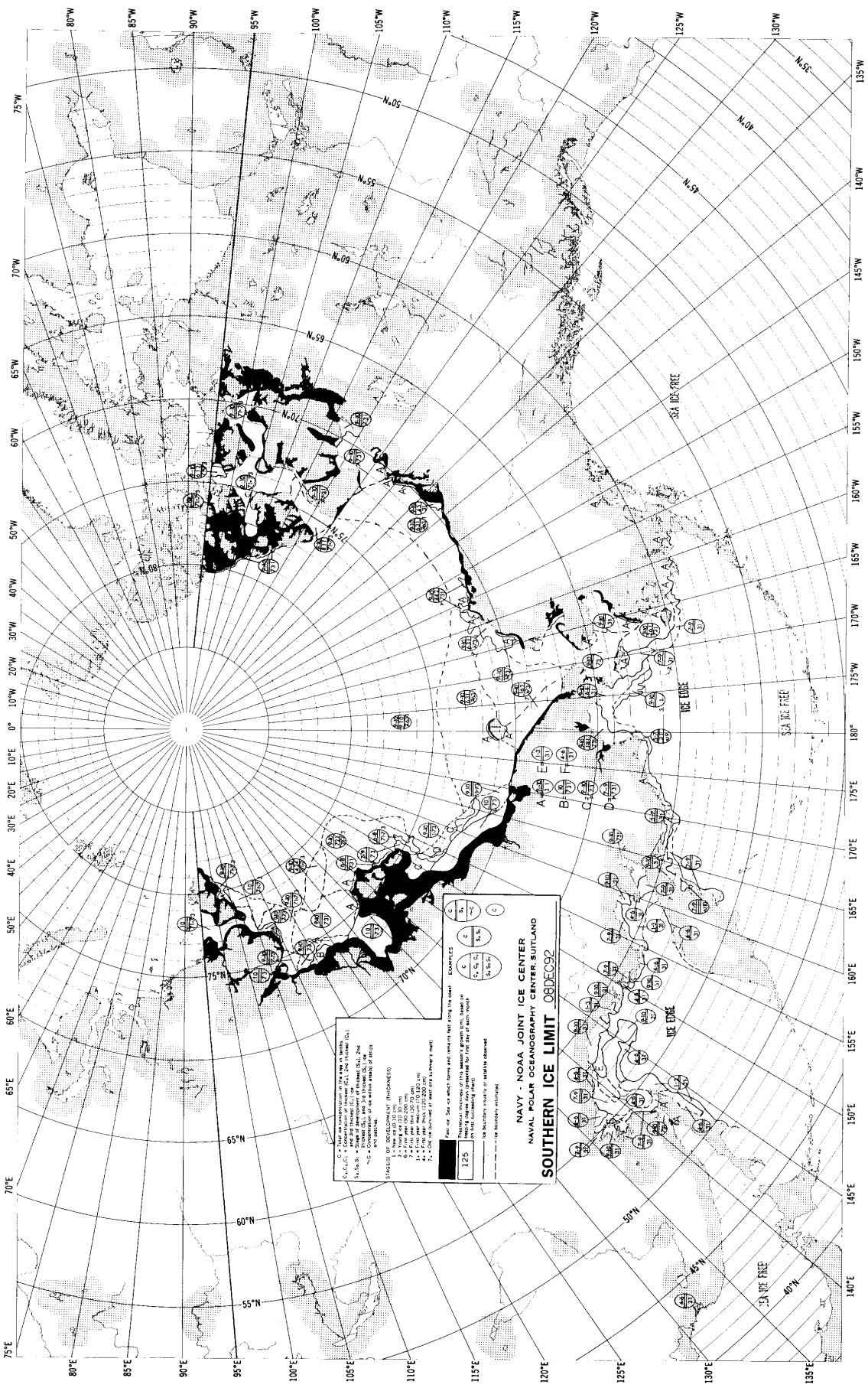


C = Small ice concentration in the area is limited
 C₁, C₂, C₃ = Chart and 200 Meters Chart. The thickness
 in the 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000, 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080, 1090, 1100, 1110, 1120, 1130, 1140, 1150, 1160, 1170, 1180, 1190, 1200, 1210, 1220, 1230, 1240, 1250, 1260, 1270, 1280, 1290, 1300, 1310, 1320, 1330, 1340, 1350, 1360, 1370, 1380, 1390, 1400, 1410, 1420, 1430, 1440, 1450, 1460, 1470, 1480, 1490, 1500, 1510, 1520, 1530, 1540, 1550, 1560, 1570, 1580, 1590, 1600, 1610, 1620, 1630, 1640, 1650, 1660, 1670, 1680, 1690, 1700, 1710, 1720, 1730, 1740, 1750, 1760, 1770, 1780, 1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2010, 2020, 2030, 2040, 2050, 2060, 2070, 2080, 2090, 2100, 2110, 2120, 2130, 2140, 2150, 2160, 2170, 2180, 2190, 2200, 2210, 2220, 2230, 2240, 2250, 2260, 2270, 2280, 2290, 2300, 2310, 2320, 2330, 2340, 2350, 2360, 2370, 2380, 2390, 2400, 2410, 2420, 2430, 2440, 2450, 2460, 2470, 2480, 2490, 2500, 2510, 2520, 2530, 2540, 2550, 2560, 2570, 2580, 2590, 2600, 2610, 2620, 2630, 2640, 2650, 2660, 2670, 2680, 2690, 2700, 2710, 2720, 2730, 2740, 2750, 2760, 2770, 2780, 2790, 2800, 2810, 2820, 2830, 2840, 2850, 2860, 2870, 2880, 2890, 2900, 2910, 2920, 2930, 2940, 2950, 2960, 2970, 2980, 2990, 3000, 3010, 3020, 3030, 3040, 3050, 3060, 3070, 3080, 3090, 3100, 3110, 3120, 3130, 3140, 3150, 3160, 3170, 3180, 3190, 3200, 3210, 3220, 3230, 3240, 3250, 3260, 3270, 3280, 3290, 3300, 3310, 3320, 3330, 3340, 3350, 3360, 3370, 3380, 3390, 3400, 3410, 3420, 3430, 3440, 3450, 3460, 3470, 3480, 3490, 3500, 3510, 3520, 3530, 3540, 3550, 3560, 3570, 3580, 3590, 3600, 3610, 3620, 3630, 3640, 3650, 3660, 3670, 3680, 3690, 3700, 3710, 3720, 3730, 3740, 3750, 3760, 3770, 3780, 3790, 3800, 3810, 3820, 3830, 3840, 3850, 3860, 3870, 3880, 3890, 3900, 3910, 3920, 3930, 3940, 3950, 3960, 3970, 3980, 3990, 4000, 4010, 4020, 4030, 4040, 4050, 4060, 4070, 4080, 4090, 4100, 4110, 4120, 4130, 4140, 4150, 4160, 4170, 4180, 4190, 4200, 4210, 4220, 4230, 4240, 4250, 4260, 4270, 4280, 4290, 4300, 4310, 4320, 4330, 4340, 4350, 4360, 4370, 4380, 4390, 4400, 4410, 4420, 4430, 4440, 4450, 4460, 4470, 4480, 4490, 4500, 4510, 4520, 4530, 4540, 4550, 4560, 4570, 4580, 4590, 4600, 4610, 4620, 4630, 4640, 4650, 4660, 4670, 4680, 4690, 4700, 4710, 4720, 4730, 4740, 4750, 4760, 4770, 4780, 4790, 4800, 4810, 4820, 4830, 4840, 4850, 4860, 4870, 4880, 4890, 4900, 4910, 4920, 4930, 4940, 4950, 4960, 4970, 4980, 4990, 5000, 5010, 5020, 5030, 5040, 5050, 5060, 5070, 5080, 5090, 5100, 5110, 5120, 5130, 5140, 5150, 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EXAMPLES

NAVY-NOAA JOINT ICE CENTERS IN OCEANOGRAPHIC GRID - NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT 01DEC92

1. Area less than 100%
 2. Area less than 200%
 3. Area less than 300%
 4. Area less than 400%
 5. Area less than 500%
 6. Area less than 600%
 7. Other (indicated by the user)



NAVY · NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUTLAND
SOUTHERN ICE LIMIT 08DEC92

LEGEND

THICKNESS OF ICE (INDICATED BY THICKNESS)

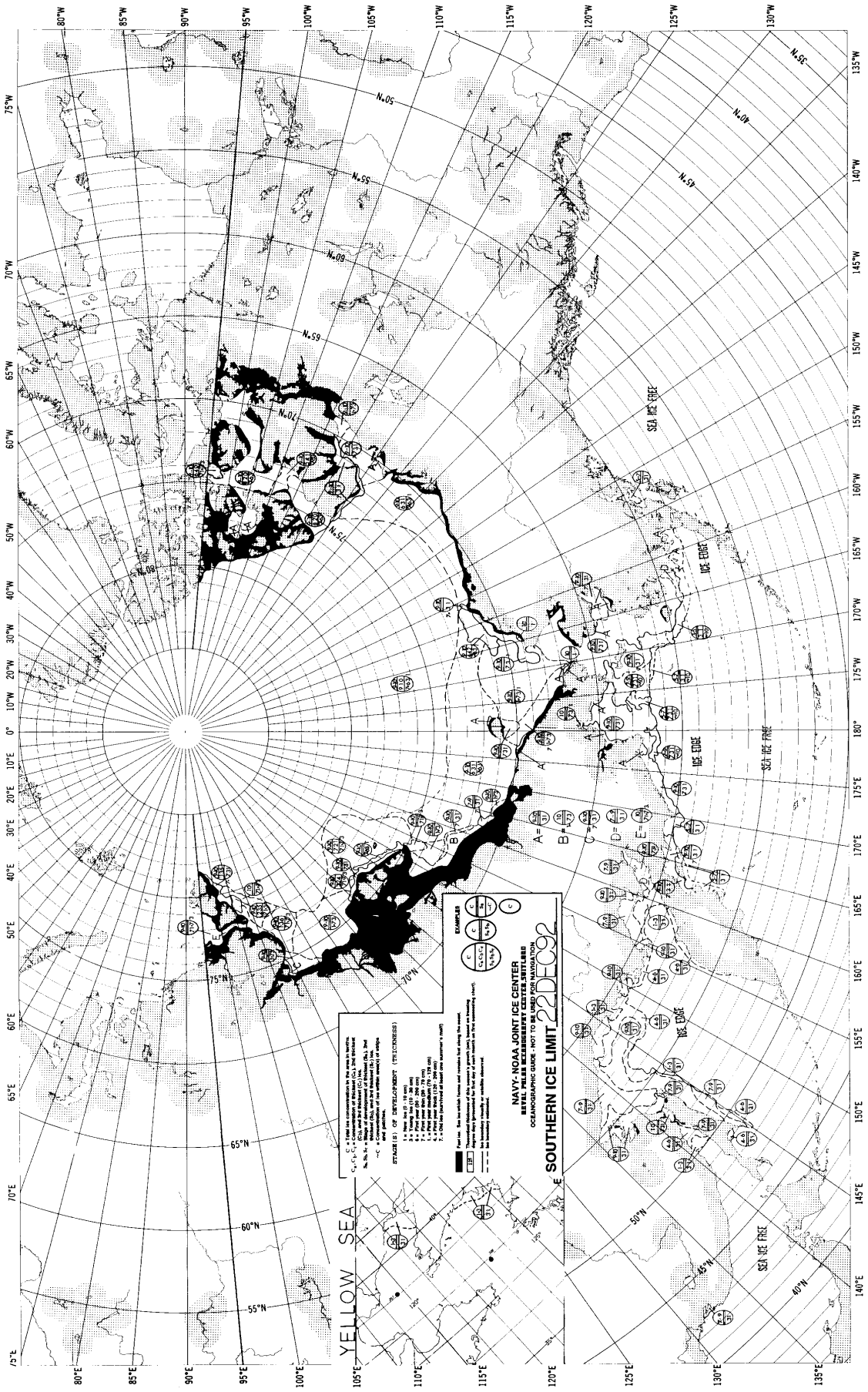
- 1 = 1000 METERS (3280 FEET)
- 2 = 2000 METERS (6560 FEET)
- 3 = 3000 METERS (9840 FEET)
- 4 = 4000 METERS (13120 FEET)
- 5 = 5000 METERS (16400 FEET)
- 6 = 6000 METERS (19680 FEET)
- 7 = 7000 METERS (22960 FEET)
- 8 = 8000 METERS (26240 FEET)
- 9 = 9000 METERS (29520 FEET)
- 10 = 10000 METERS (32800 FEET)

EXAMPLES

- 1. Ice thickness 1000 meters (3280 feet) and ice concentration 10%.
- 2. Ice thickness 2000 meters (6560 feet) and ice concentration 20%.
- 3. Ice thickness 3000 meters (9840 feet) and ice concentration 30%.
- 4. Ice thickness 4000 meters (13120 feet) and ice concentration 40%.
- 5. Ice thickness 5000 meters (16400 feet) and ice concentration 50%.
- 6. Ice thickness 6000 meters (19680 feet) and ice concentration 60%.
- 7. Ice thickness 7000 meters (22960 feet) and ice concentration 70%.
- 8. Ice thickness 8000 meters (26240 feet) and ice concentration 80%.
- 9. Ice thickness 9000 meters (29520 feet) and ice concentration 90%.
- 10. Ice thickness 10000 meters (32800 feet) and ice concentration 100%.

NOTES:

- 1. See the legend for symbols and numbers for the data.
- 2. The symbols are placed at the center of the ice concentration area.
- 3. The symbols are placed at the center of the ice concentration area.
- 4. The symbols are placed at the center of the ice concentration area.
- 5. The symbols are placed at the center of the ice concentration area.
- 6. The symbols are placed at the center of the ice concentration area.
- 7. The symbols are placed at the center of the ice concentration area.
- 8. The symbols are placed at the center of the ice concentration area.
- 9. The symbols are placed at the center of the ice concentration area.
- 10. The symbols are placed at the center of the ice concentration area.



YELLOW SEA

105°E 110°E 115°E 120°E

55°N 60°N 65°N

70°E 75°E 80°E 85°E 90°E

105°W 110°W 115°W 120°W 125°W 130°W 135°W 140°W

30°N 35°N 40°N 45°N 50°N 55°N 60°N 65°N 70°N 75°N 80°N

100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E 140°E

100°W 105°W 110°W 115°W 120°W 125°W 130°W 135°W 140°W

105°E 110°E 115°E 120°E 125°E 130°E 135°E 140°E

30°N 35°N 40°N 45°N 50°N 55°N 60°N 65°N 70°N 75°N 80°N

100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E 140°E

100°W 105°W 110°W 115°W 120°W 125°W 130°W 135°W 140°W

105°E 110°E 115°E 120°E 125°E 130°E 135°E 140°E

30°N 35°N 40°N 45°N 50°N 55°N 60°N 65°N 70°N 75°N 80°N

100°E 105°E 110°E 115°E 120°E 125°E 130°E 135°E 140°E

100°W 105°W 110°W 115°W 120°W 125°W 130°W 135°W 140°W

NAVY-NOAA JOINT ICE CENTER
ICE CENTER
OCEANOGRAPHIC SURVEY - NOT TO BE USED FOR NAVIGATION
SOUTHERN ICE LIMIT 22 DEC 92

EXAMPLES

STAGES OF DEVELOPMENT (EYELEDGES)

1. Snow (up to 10 cm)
 2. Thin ice (10-20 cm)
 3. First year ice (20-30 cm)
 4. Second year ice (30-50 cm)
 5. Third year ice (50-100 cm)
 6. Fourth year ice (100-150 cm)
 7. Old ice (150 cm or more)

ICE CENTER - See the which lines and symbols that using the chart.

ICE EDGE - The outer edge of the ice, or a point where the ice is breaking apart.

SEA ICE FREE - The area where the ice is not present.

ICE EDGE - The outer edge of the ice, or a point where the ice is breaking apart.

SEA ICE FREE - The area where the ice is not present.

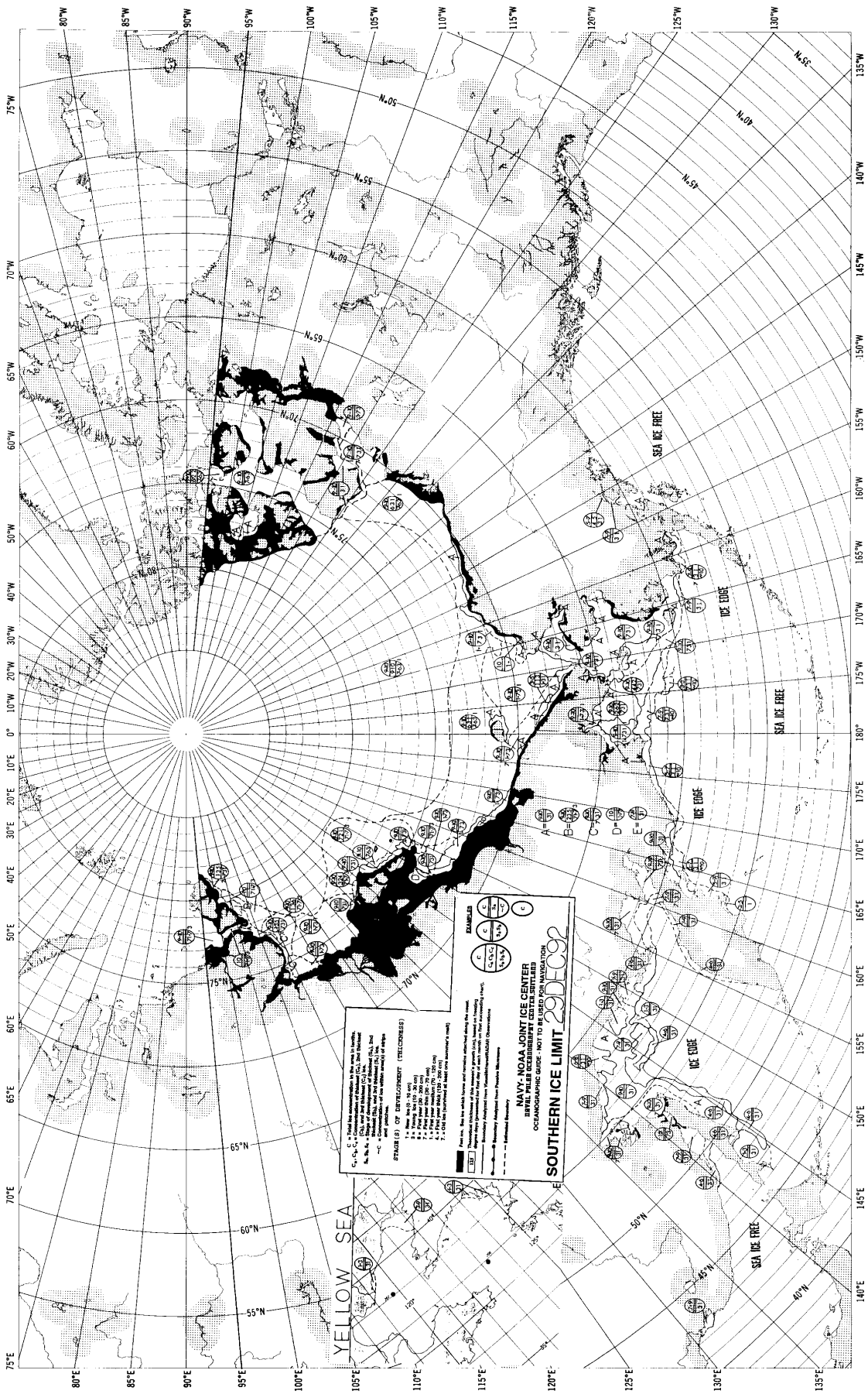


TABLE 1. SATELLITE DATA UTILIZED DURING 1992 (ARCTIC)

Time Period		Satellite Remote Sensing				
From	To	Sensor Platform	Sensor Type	Spectral Region	Resolution	Coverage
1-92	12-92	NOAA-10,11,12	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.725-1.10 um		
			IR	10.5-12.5 um		
			GAC		4 km	Global
			VIS	0.58-0.68 um		
			IR	10.5-12.5 um		
1-92	12-92	DMSP-F(10/11)	OLS			
			VIS	0.4-1.1 um	0.62 km	Regional
			IR	10.2-12.8 um	0.62 km	Regional
			SSM/I			
			PMW	1.55 cm (19.35 GHz)	50 km	Global
				0.81 cm (37.0 GHz)	25 km	Global
3-92	12-92	ERS-1	SAR			
			AMW	C-Band (5.3 GHz)	240 m (FR)	Local
					30 m (LR)	Local

Abbreviations and Acronyms

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