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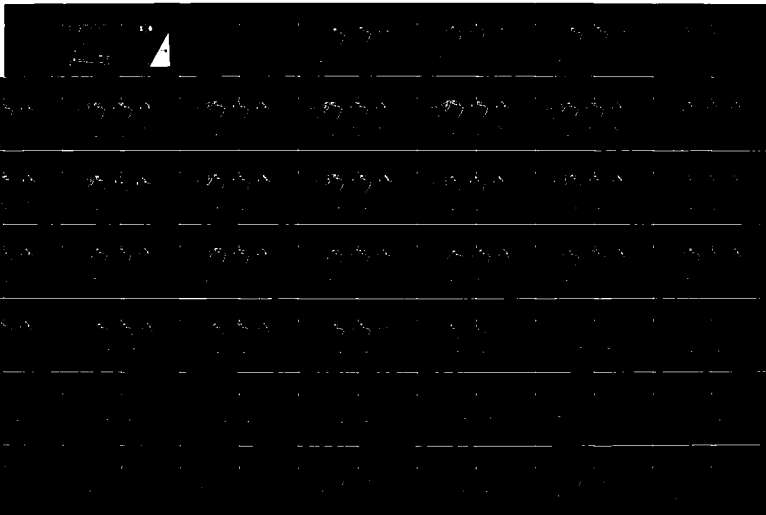
EASTERN - WESTERN ARCTIC SEA ICE ANALYSIS 1985(U) NAVAL  
POLAR OCEANOGRAPHY CENTER WASHINGTON DC 1985

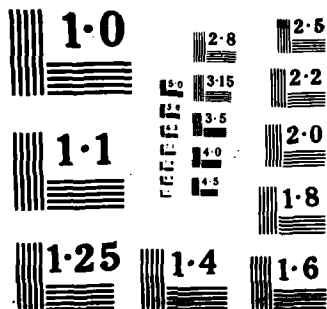
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# EASTERN—WESTERN ARCTIC SEA ICE ANALYSIS 1985

PREPARED BY  
NAVAL POLAR OCEANOGRAPHY CENTER,  
SUITLAND, MD

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PREPARED FOR  
COMMANDER,  
NAVAL OCEANOGRAPHY COMMAND  
NSTL STATION, BAY ST. LOUIS, MS 39529

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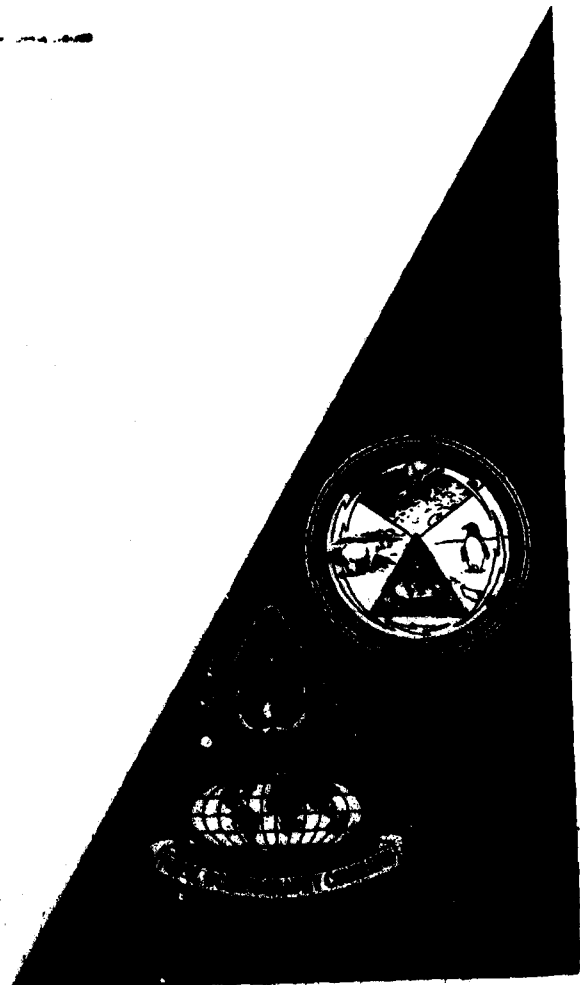
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## FOREWORD

The U.S. Navy has a long and colorful history of polar exploration and currently is an active participant in the growing national activity in the Arctic and Antarctic. The strategic importance and increased demand for the natural resources of these areas have resulted in a greater requirement for environmental information. In 1976, the National Oceanic and Atmospheric Administration (NOAA) joined the Navy in forming a Joint Ice Center (JIC) to combine efforts and resources in sea ice analysis and forecasting.

Through 1972, reliable sea ice information in the polar regions was based on relatively few shore station and ship reports augmented by limited aerial reconnaissance data. These data were further restricted mainly to the relatively small areas observed primarily during the ship operating seasons. The advent of high resolution satellite imagery combined with the ground truth of conventional observations has in recent years enabled a description of the polar ice fields on a semi-synoptic scale in both polar regions.

This publication is the twelfth in a continuing yearly series of Arctic sea ice atlases prepared in the Joint Ice Center at the Naval Polar Oceanography Center, Suitland. The atlas contains weekly charts depicting Northern Hemisphere and Great Lakes ice conditions and extents. The information presented was prepared under operational time constraints principally from satellite imagery supplemented by conventional observations. The Great Lakes ice analyses are derived from satellite imagery and information provided by the National Weather Service Forecast Office, Ann Arbor, Michigan. Table 1 located on the inside back cover summarized satellite data availability for 1985. ←

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## FOREWORD

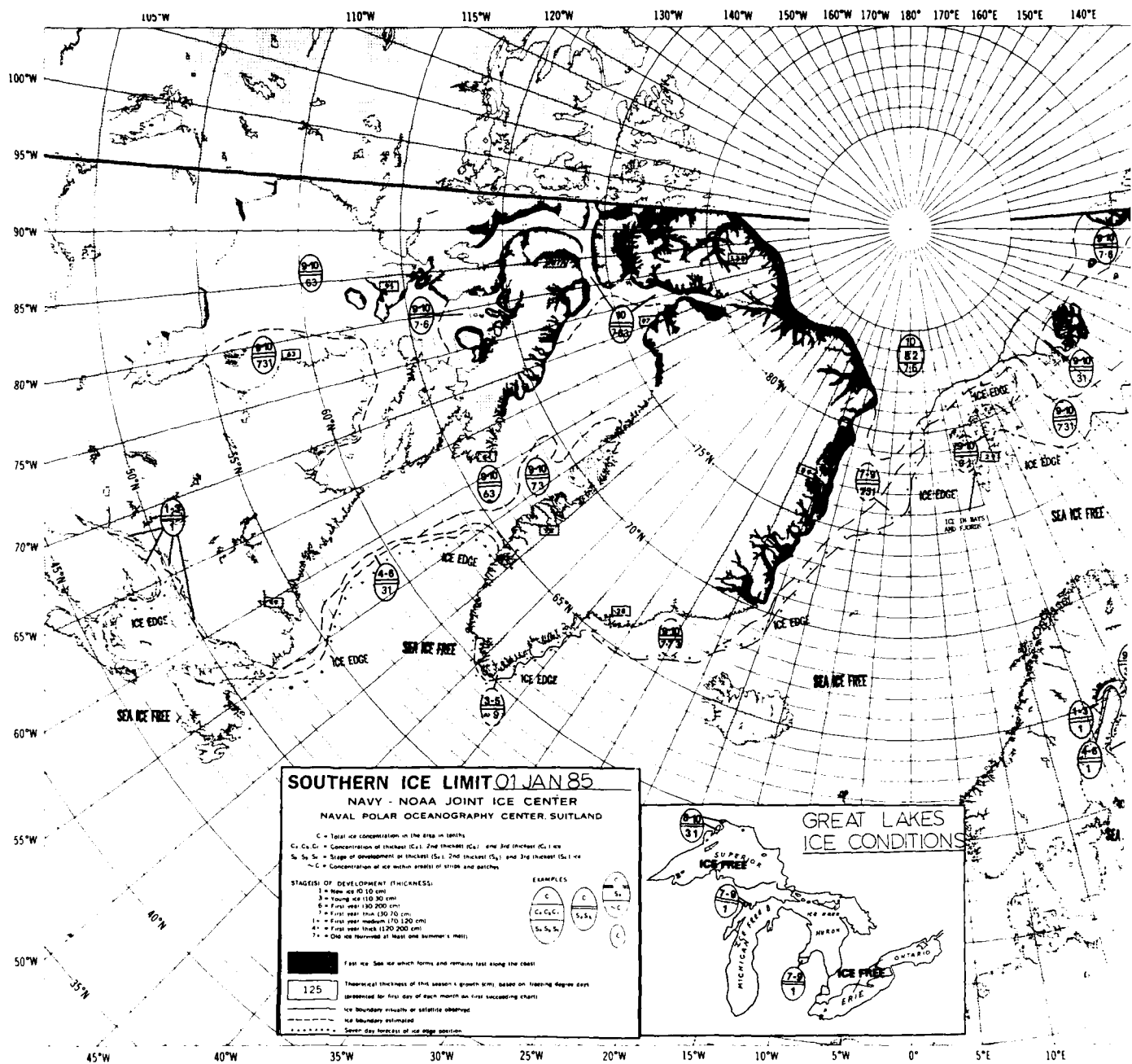
The purpose of this atlas is to provide operators and researchers with panoramic weekly hemispheric sea ice analyses. Satellite data limitations and other difficulties involved in manually synthesizing various forms of ice data have evolved the following analysis procedures:

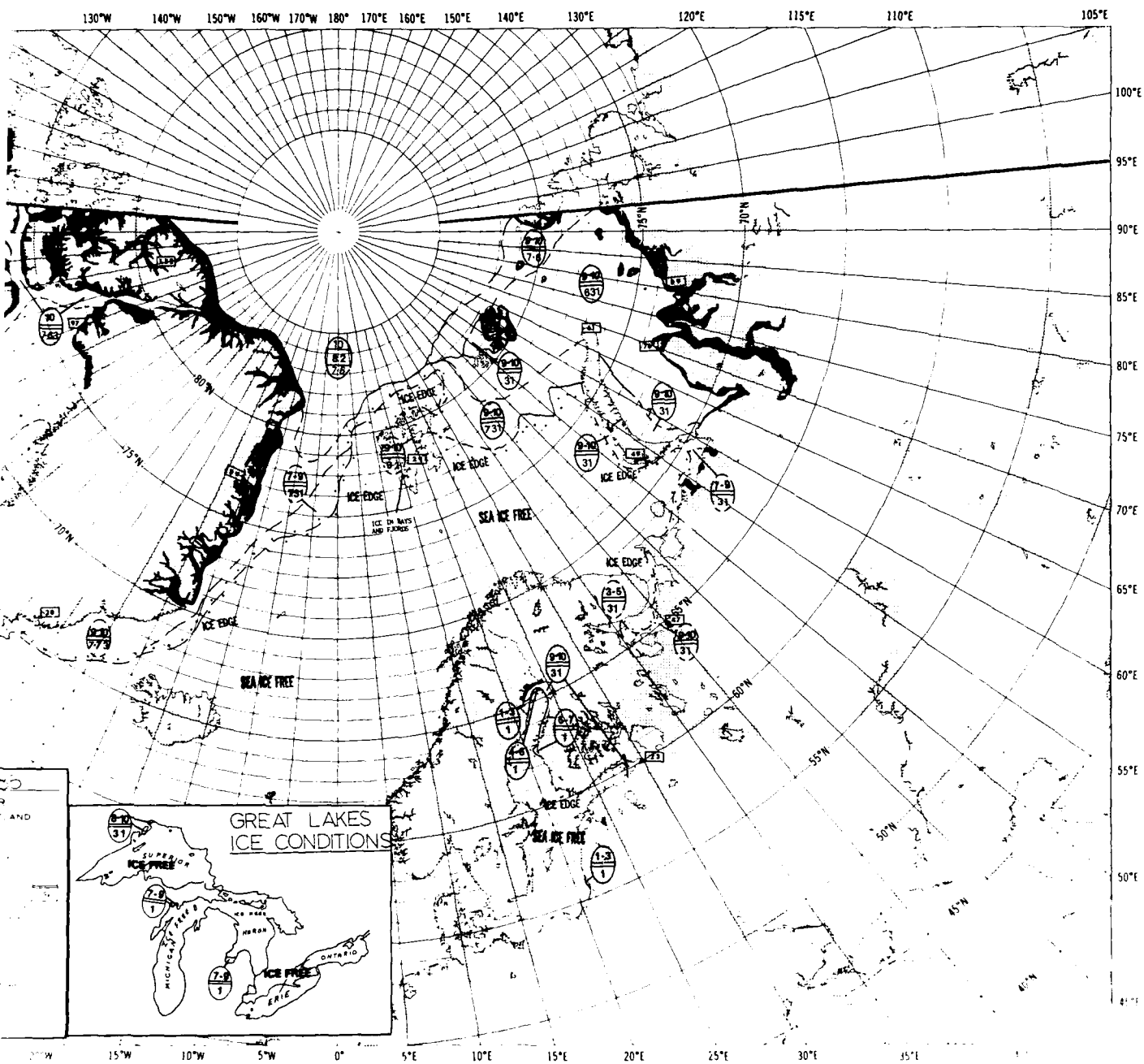
a. Conventional shore station, ship and aerial ice reconnaissance observations are plotted on base charts and evaluated for timeliness.

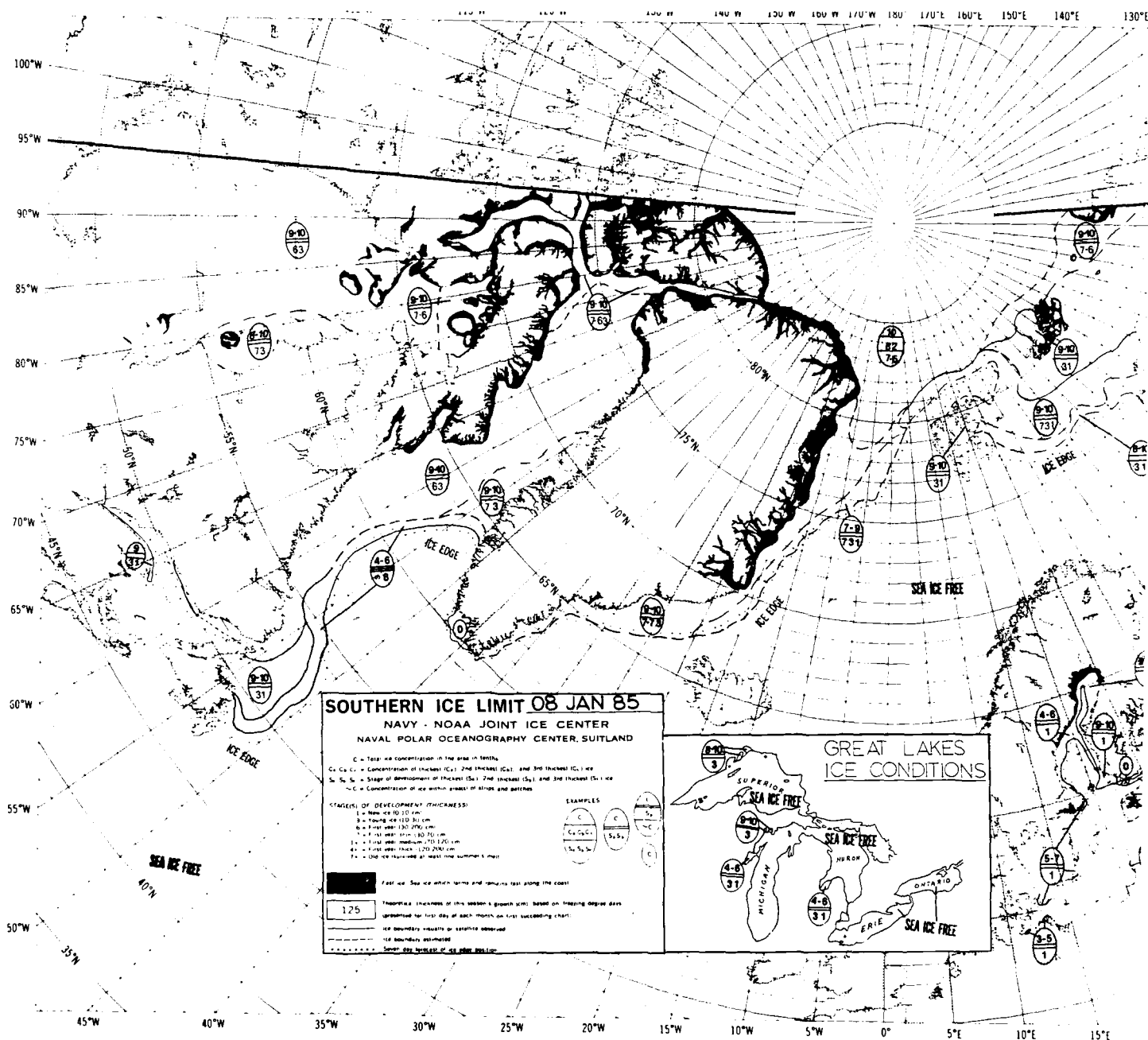
b. Satellite data is analyzed for ice information content, with the most recent and highest resolution considered first. Synthesis of conventional with satellite data yields the final analysis.

c. Where sufficient data are not available to define the sea ice limit, an estimated boundary is depicted. After one week of no data availability the ice edge position is based on analyzed theoretical ice drift data and other diagnostic aids. During subsequent weeks of no data availability the ice edges approach seasonal mean positions.

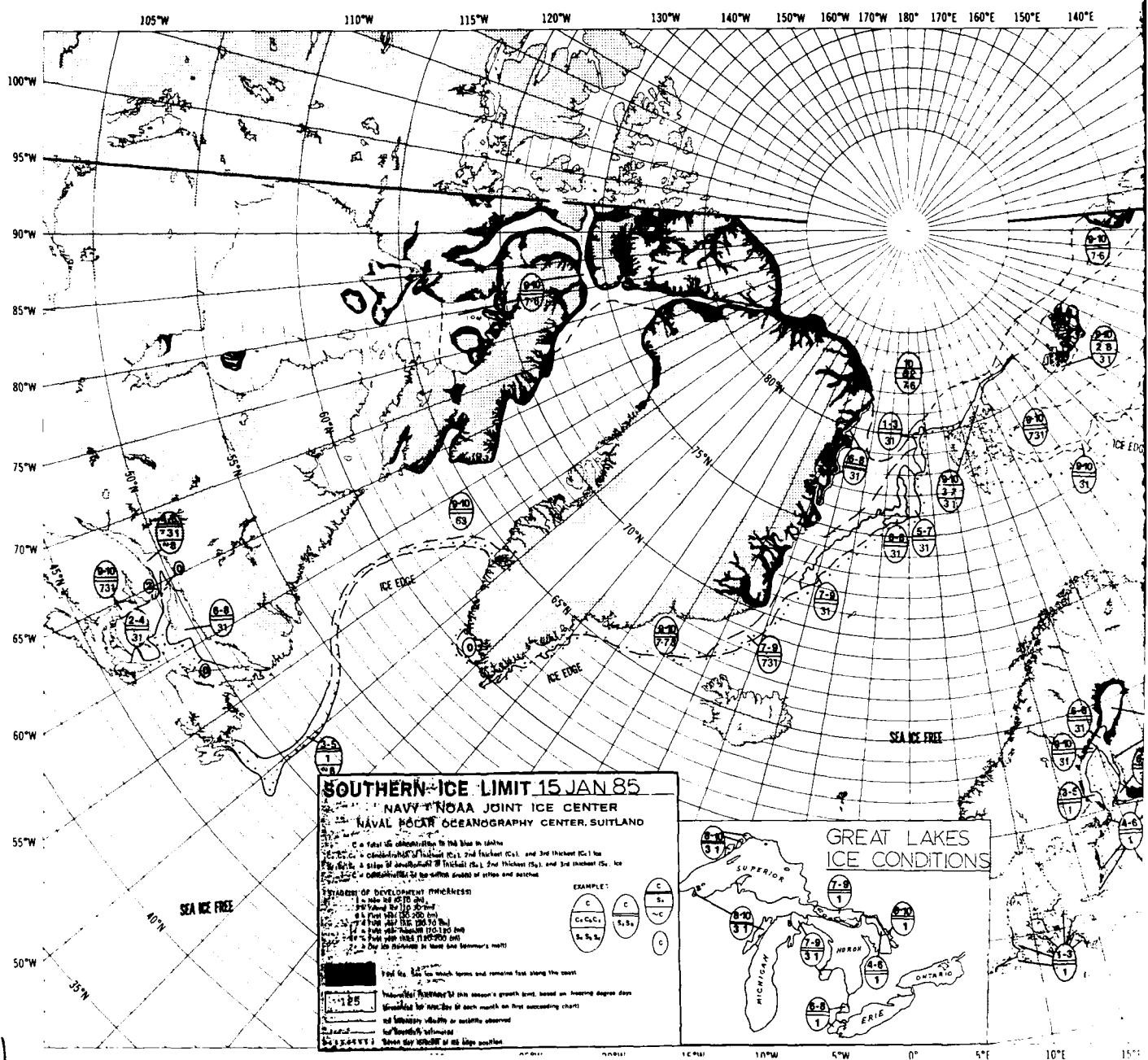
Joint Ice Center  
Naval Polar Oceanography Center  
4301 Suitland Road  
Washington, DC 20390-5180

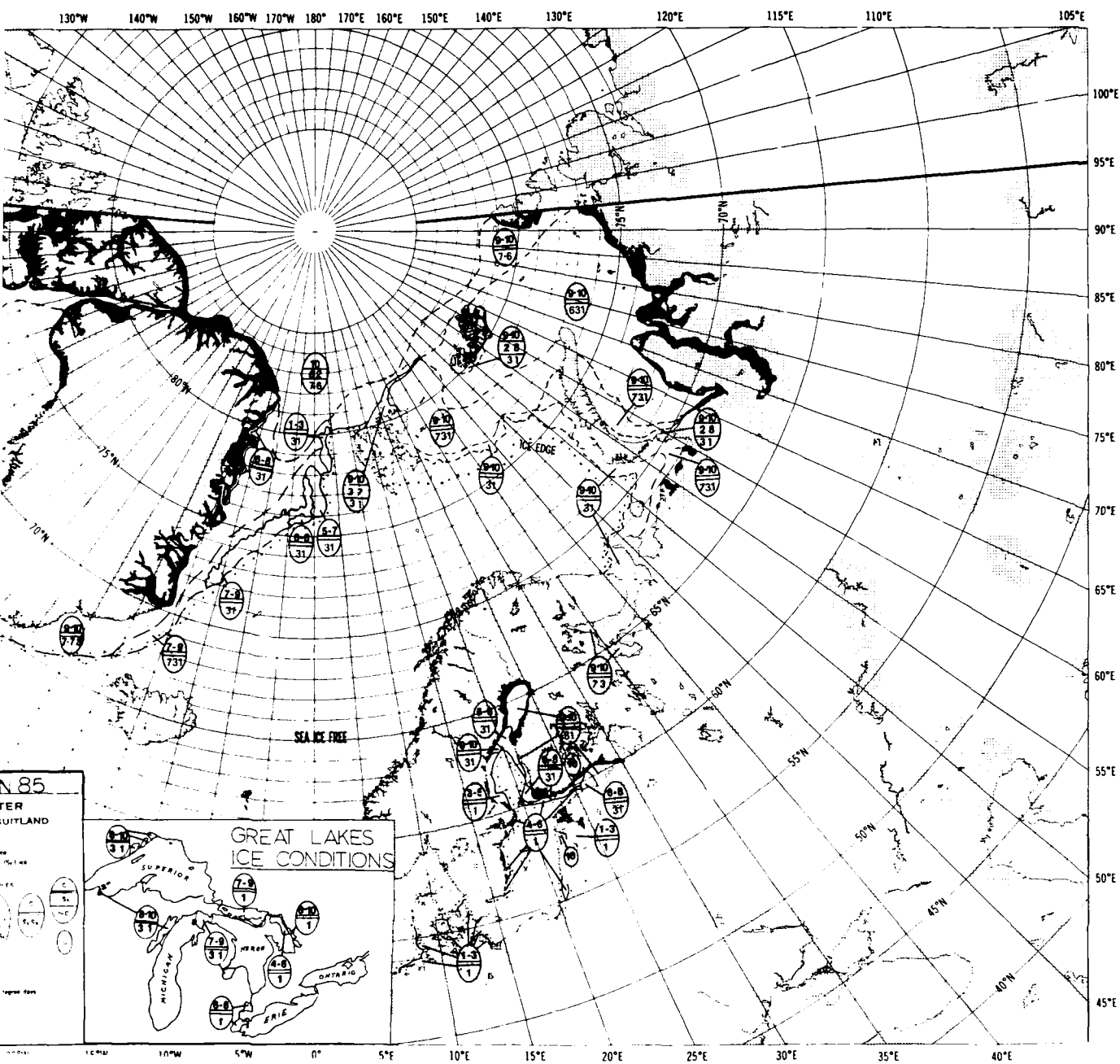




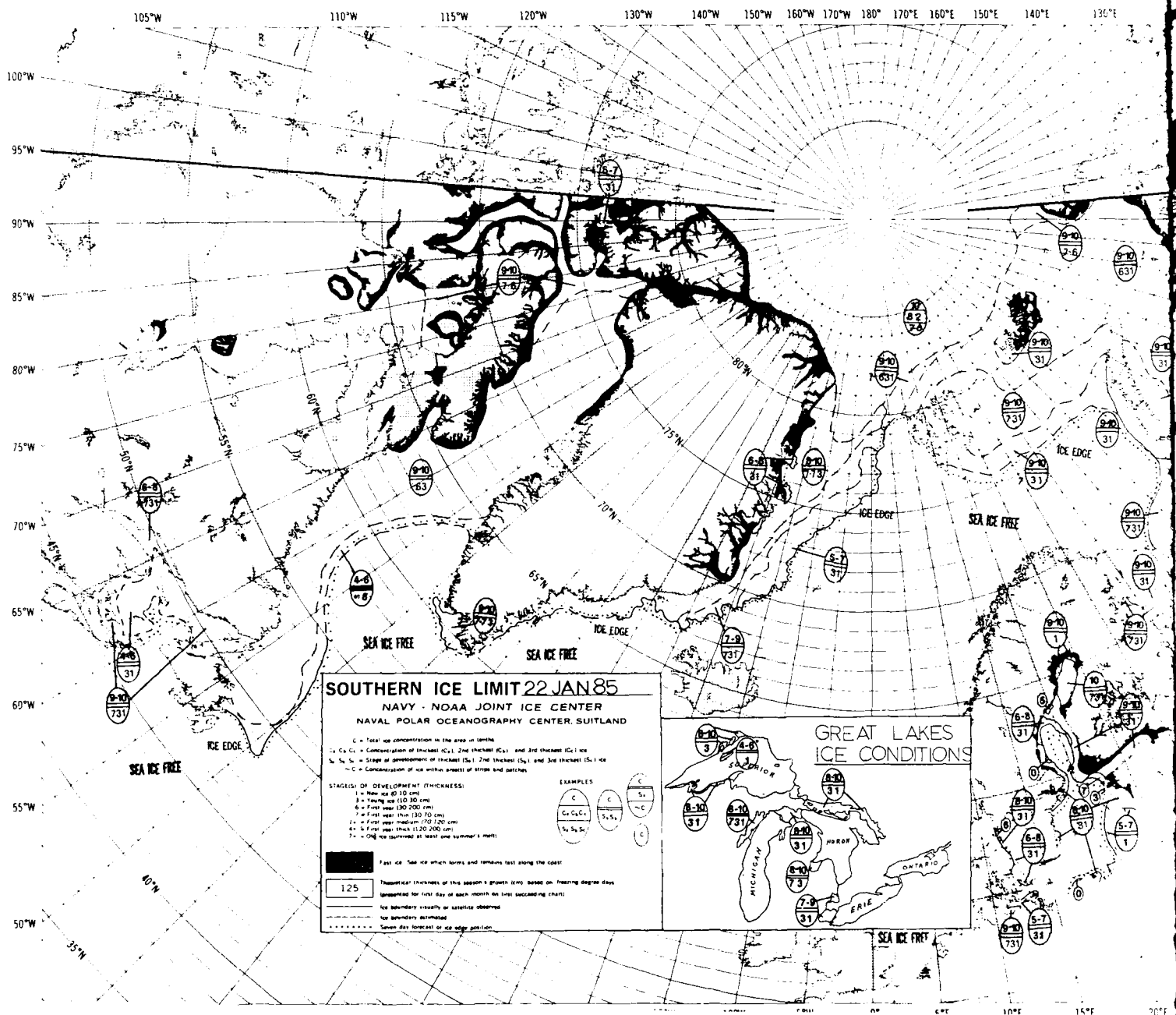


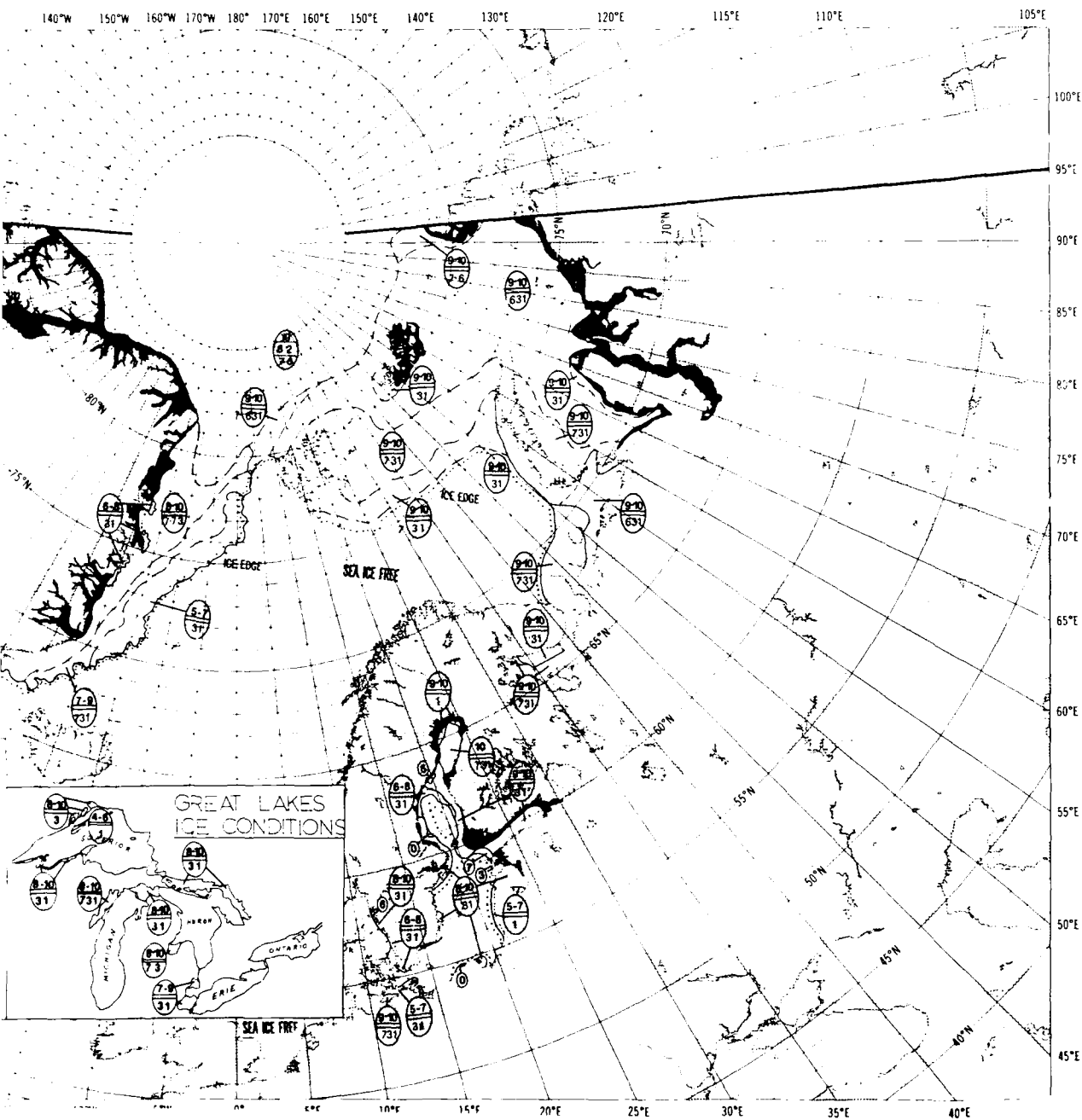


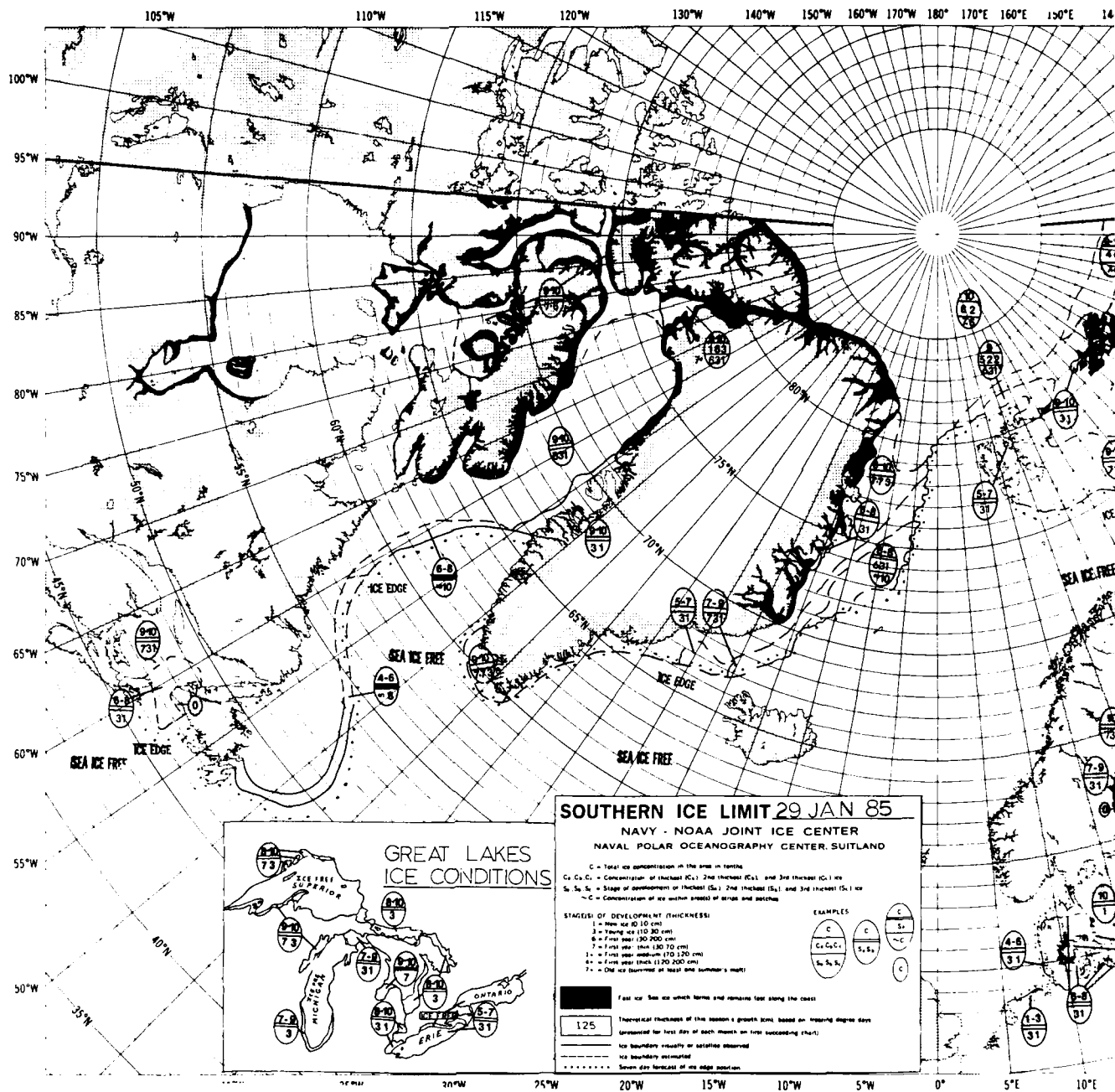


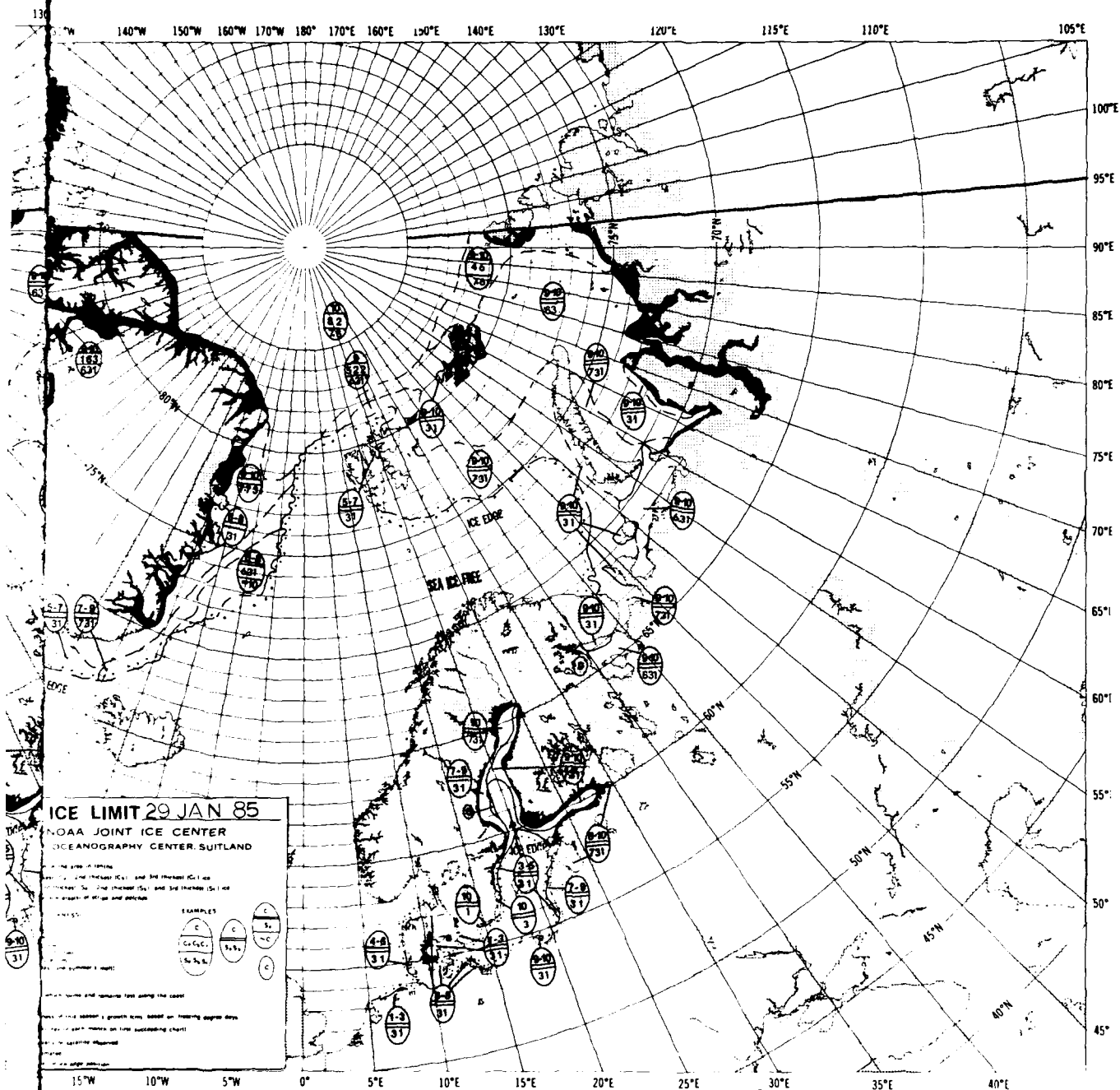


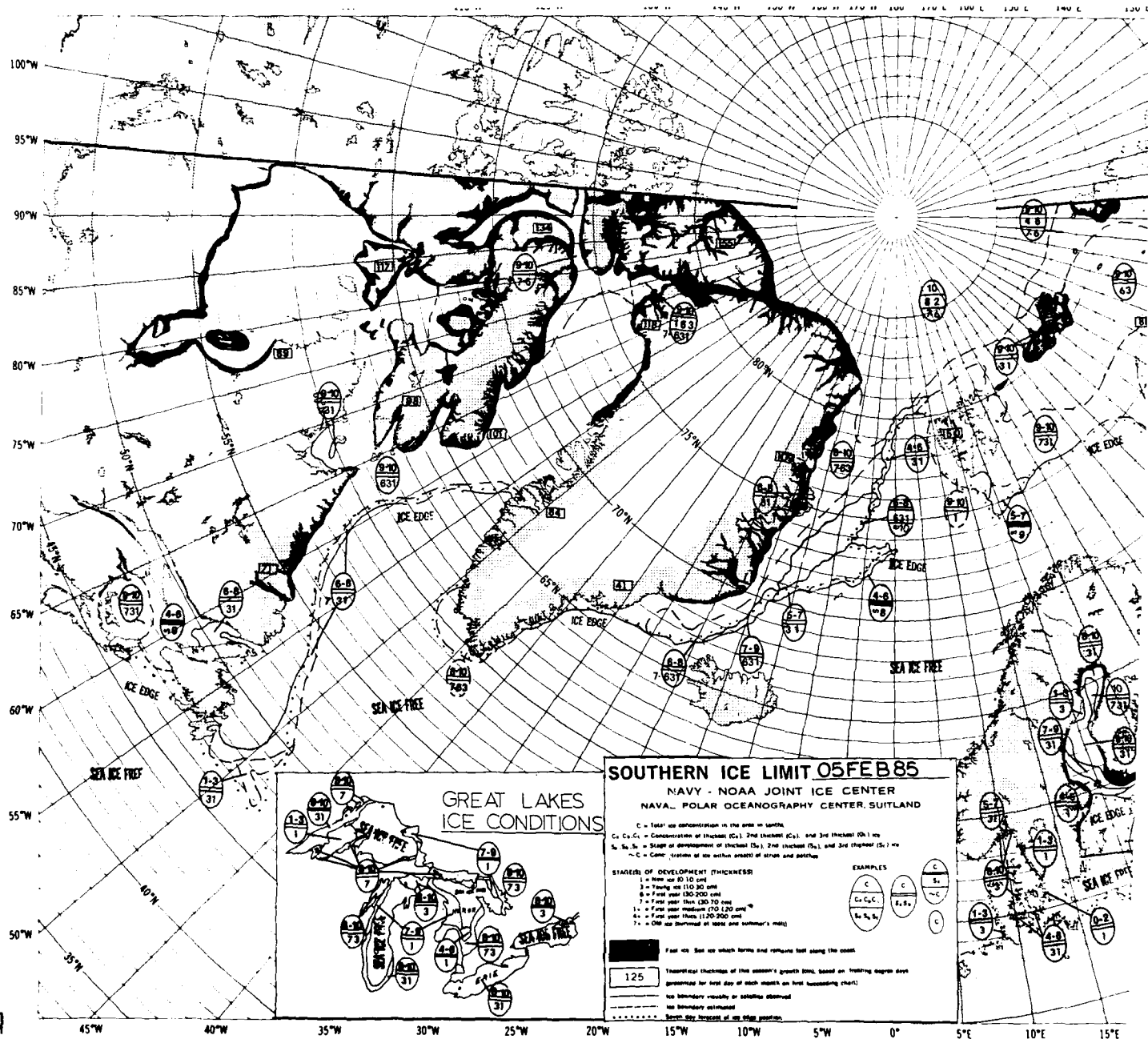
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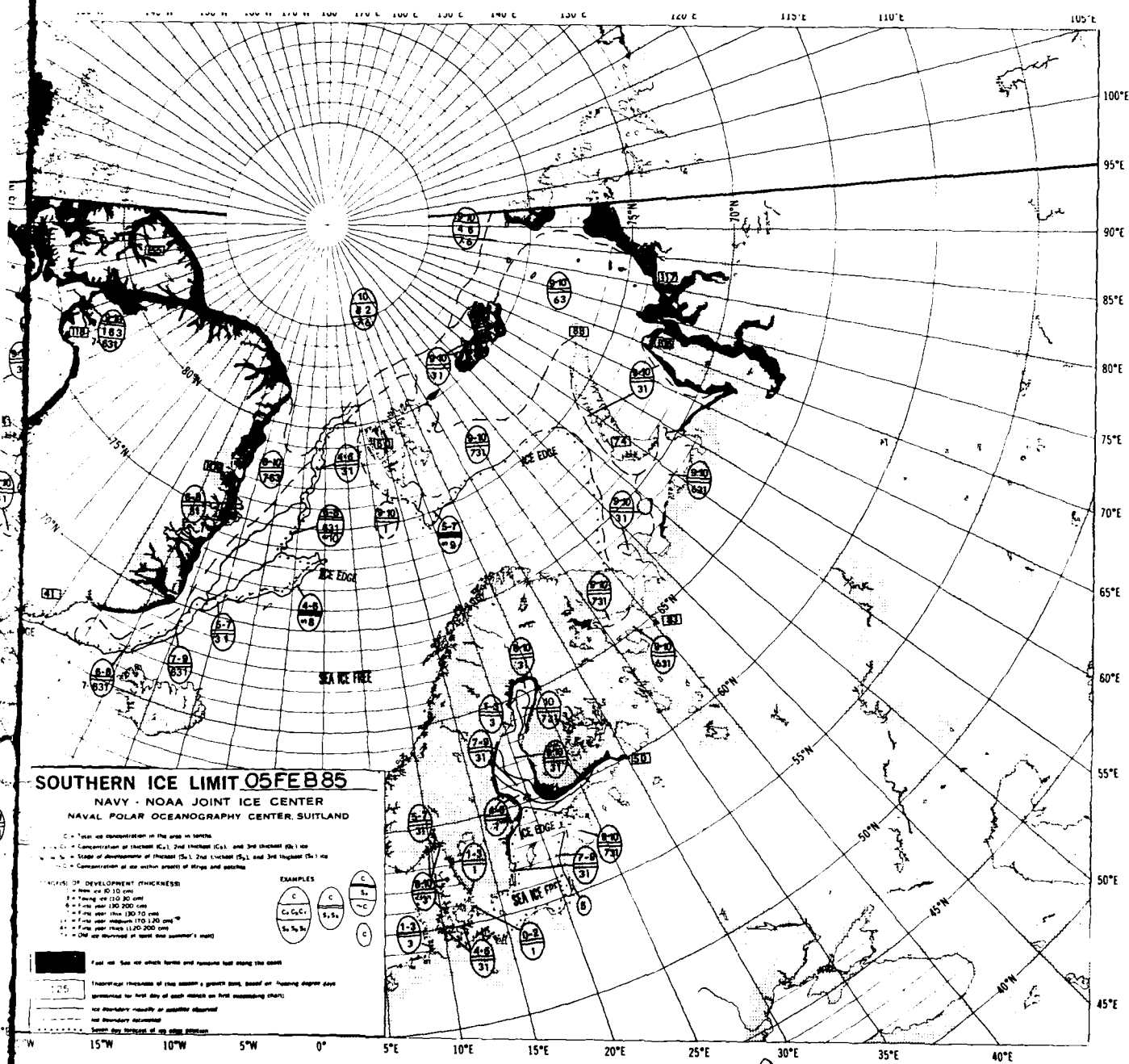


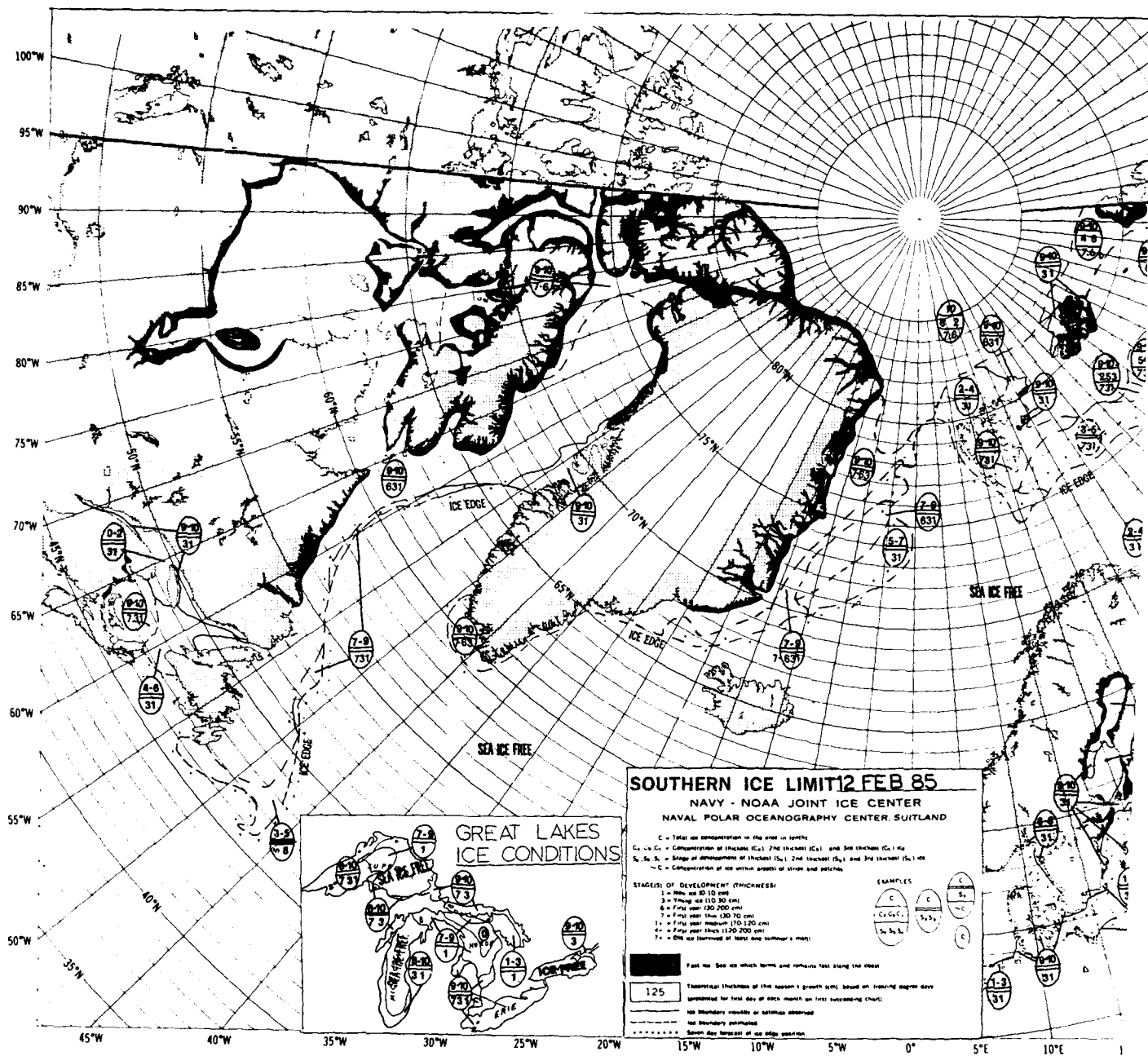


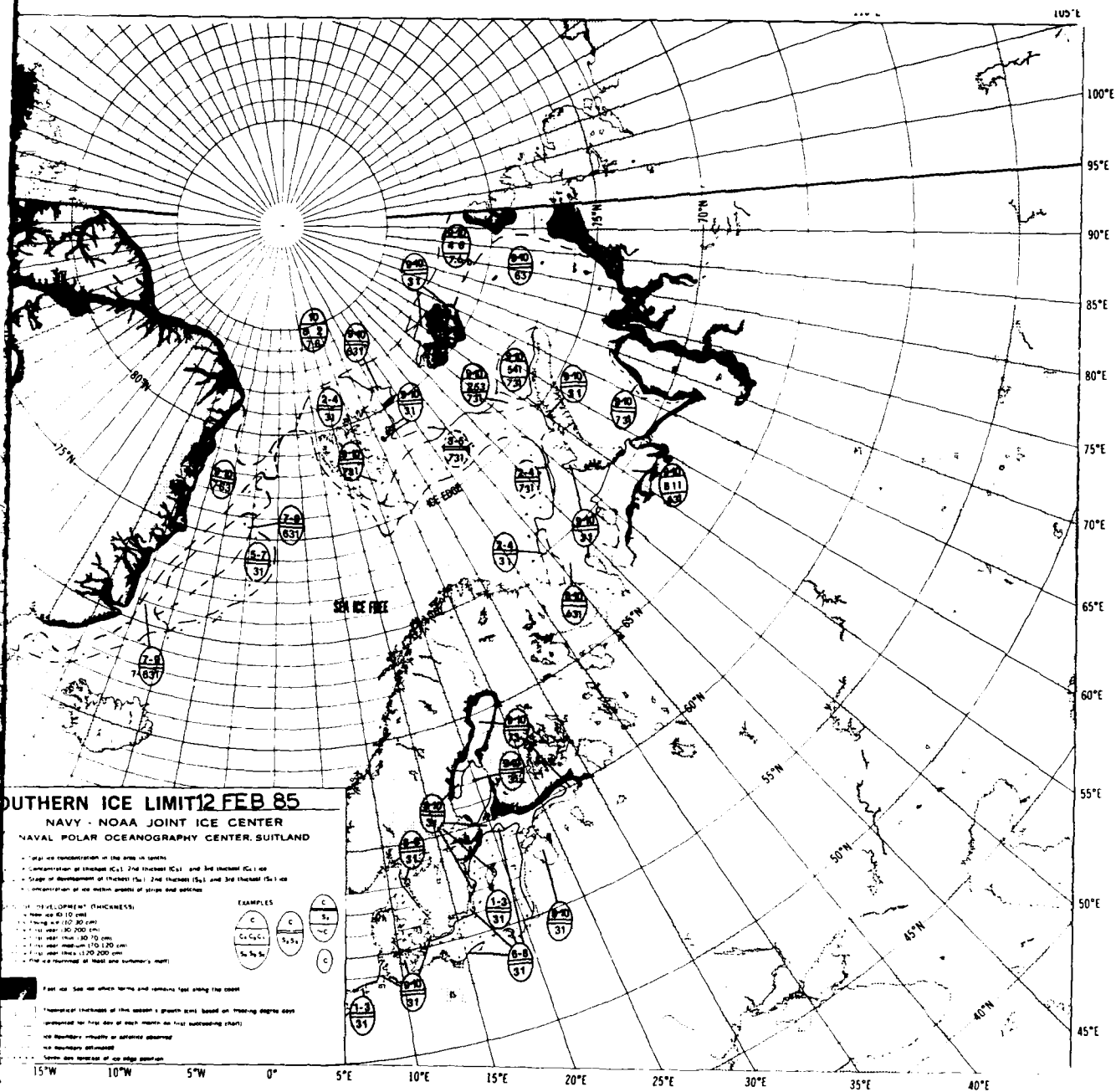


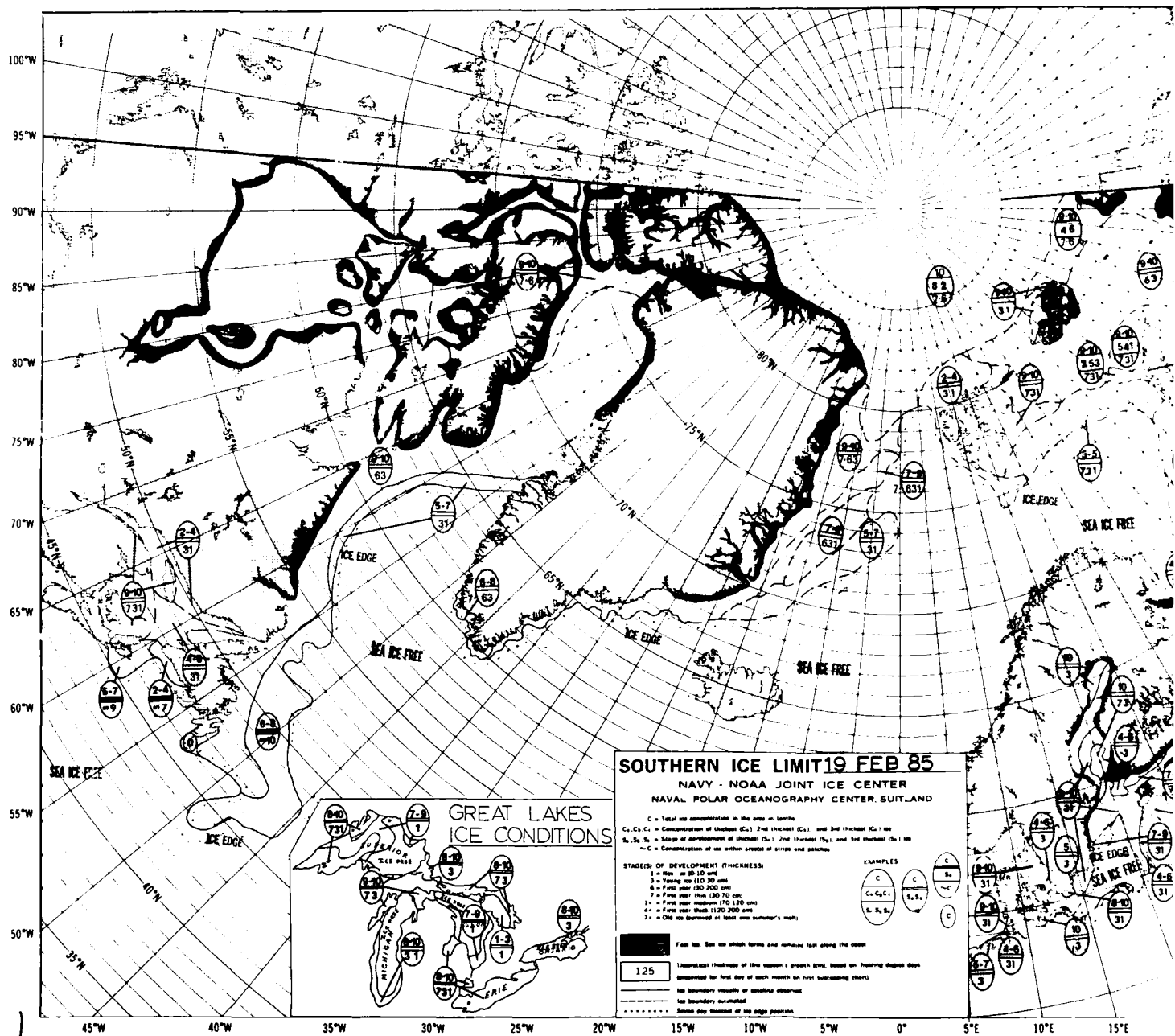




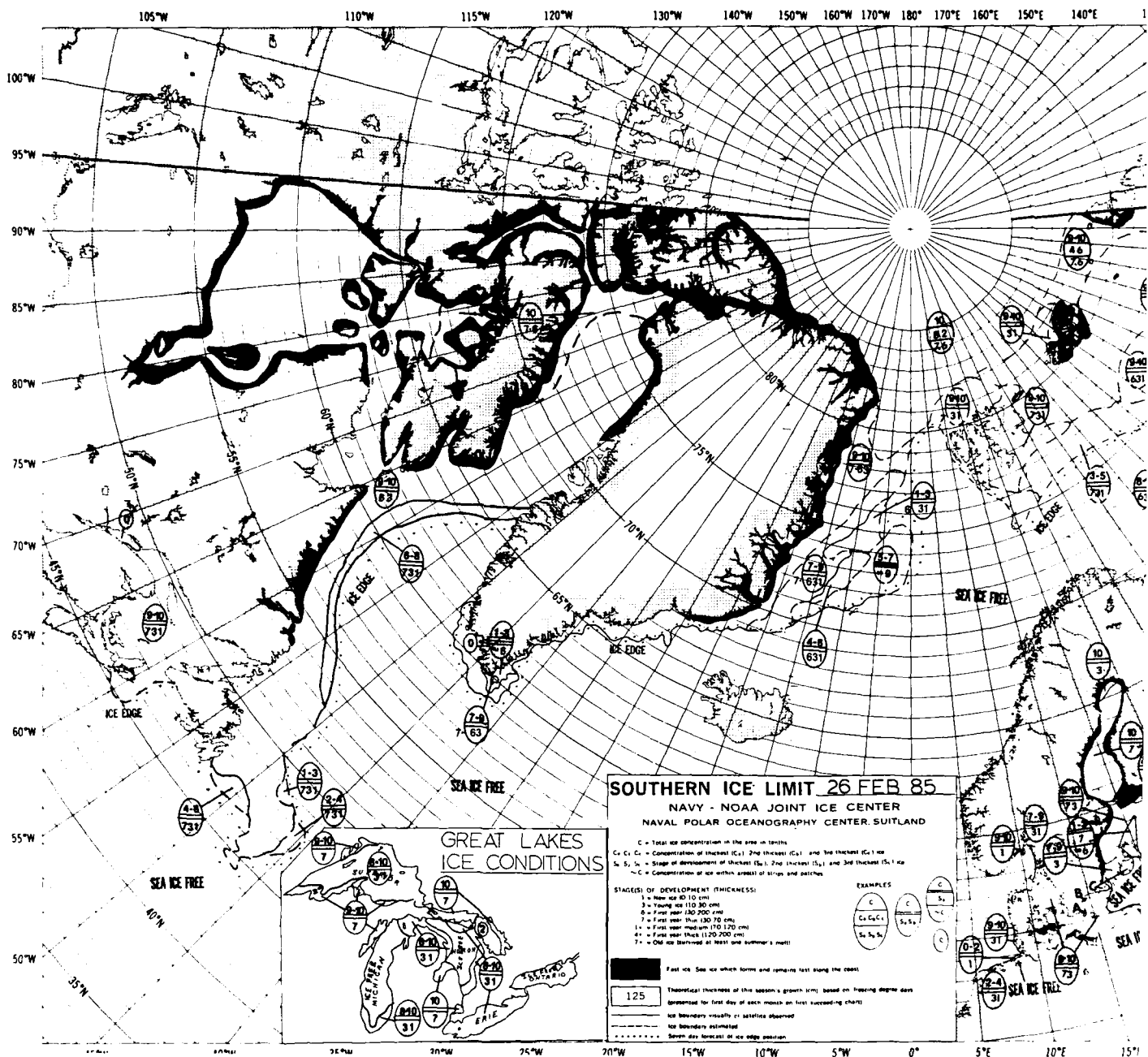


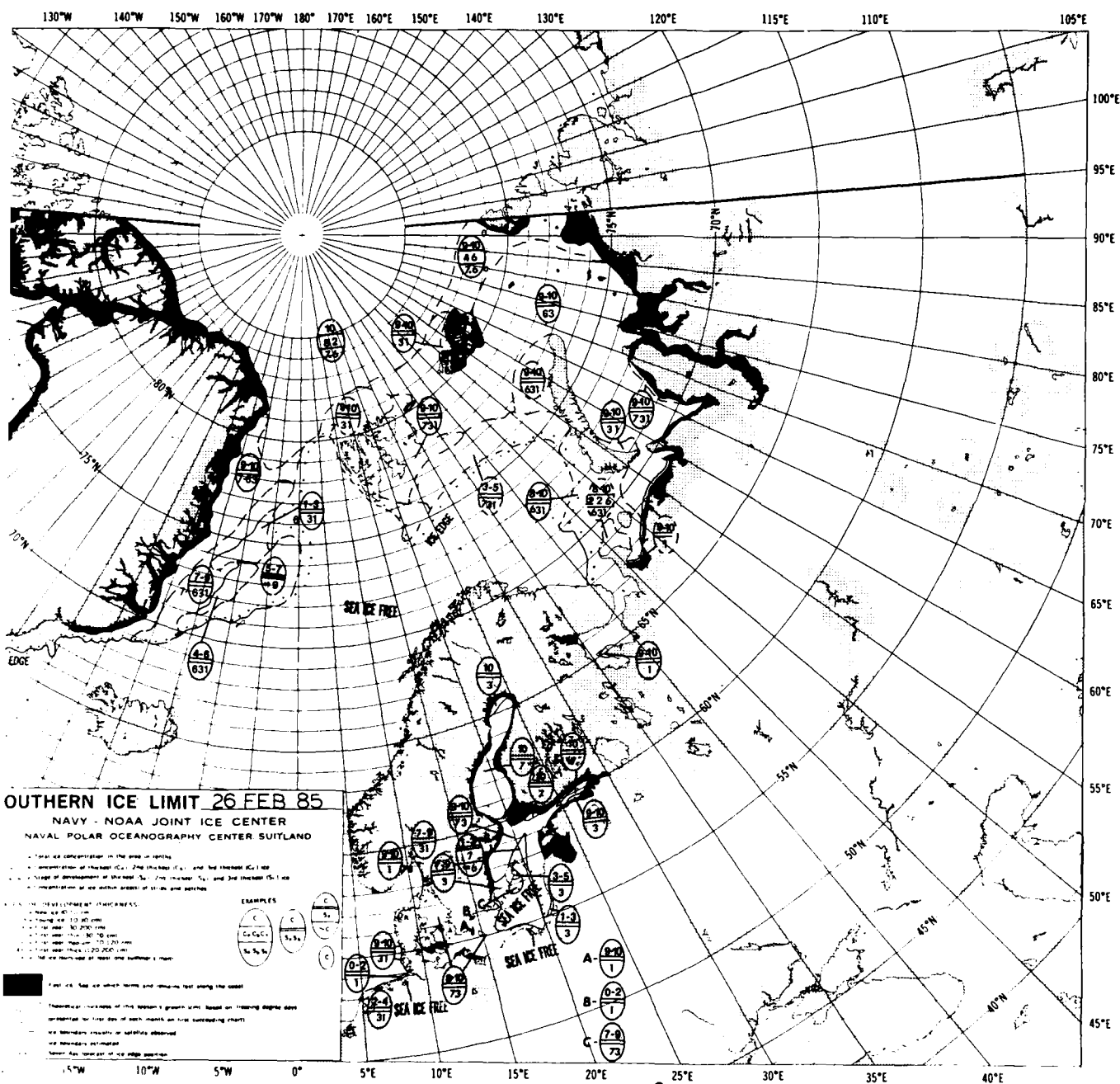


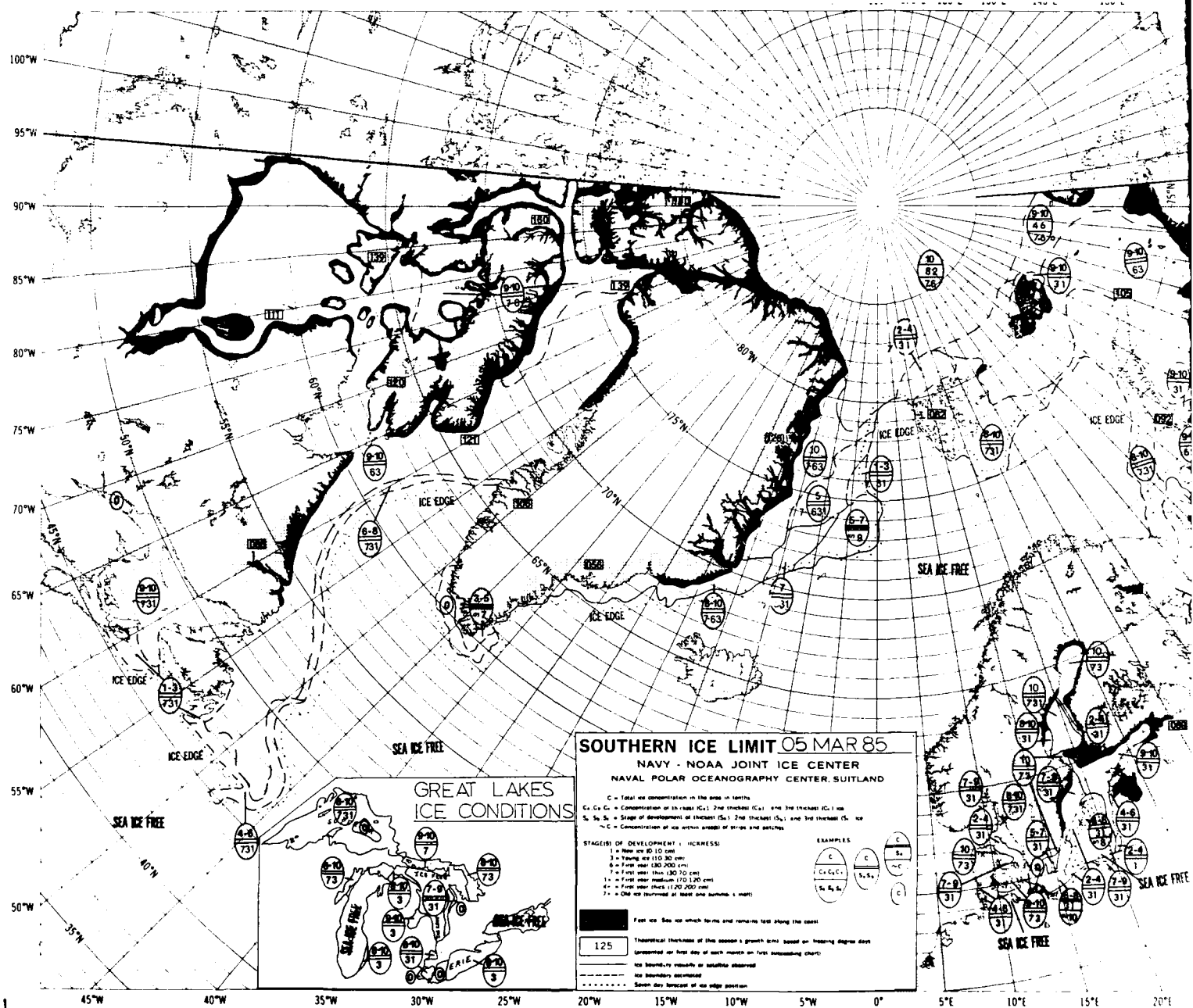


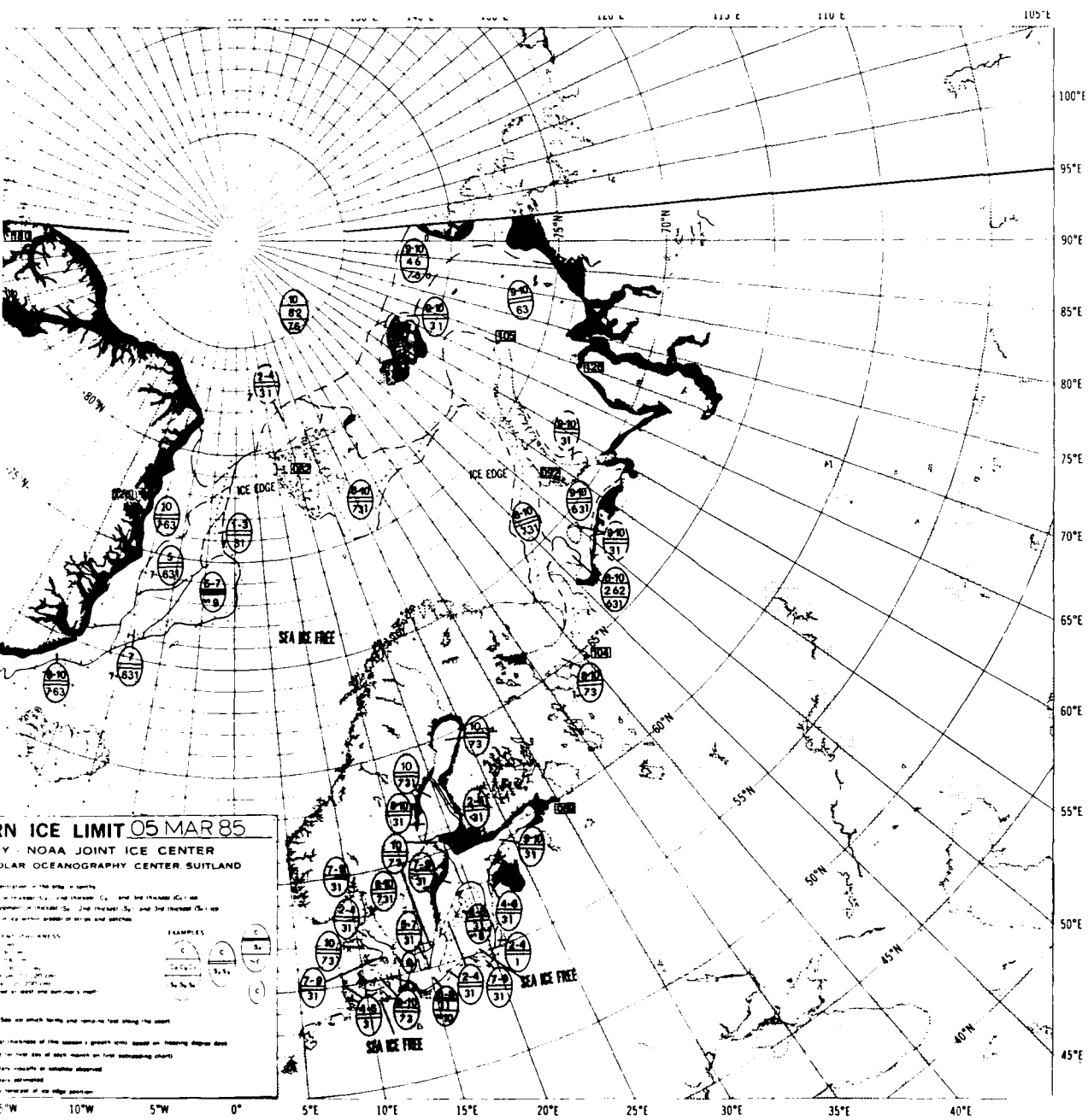


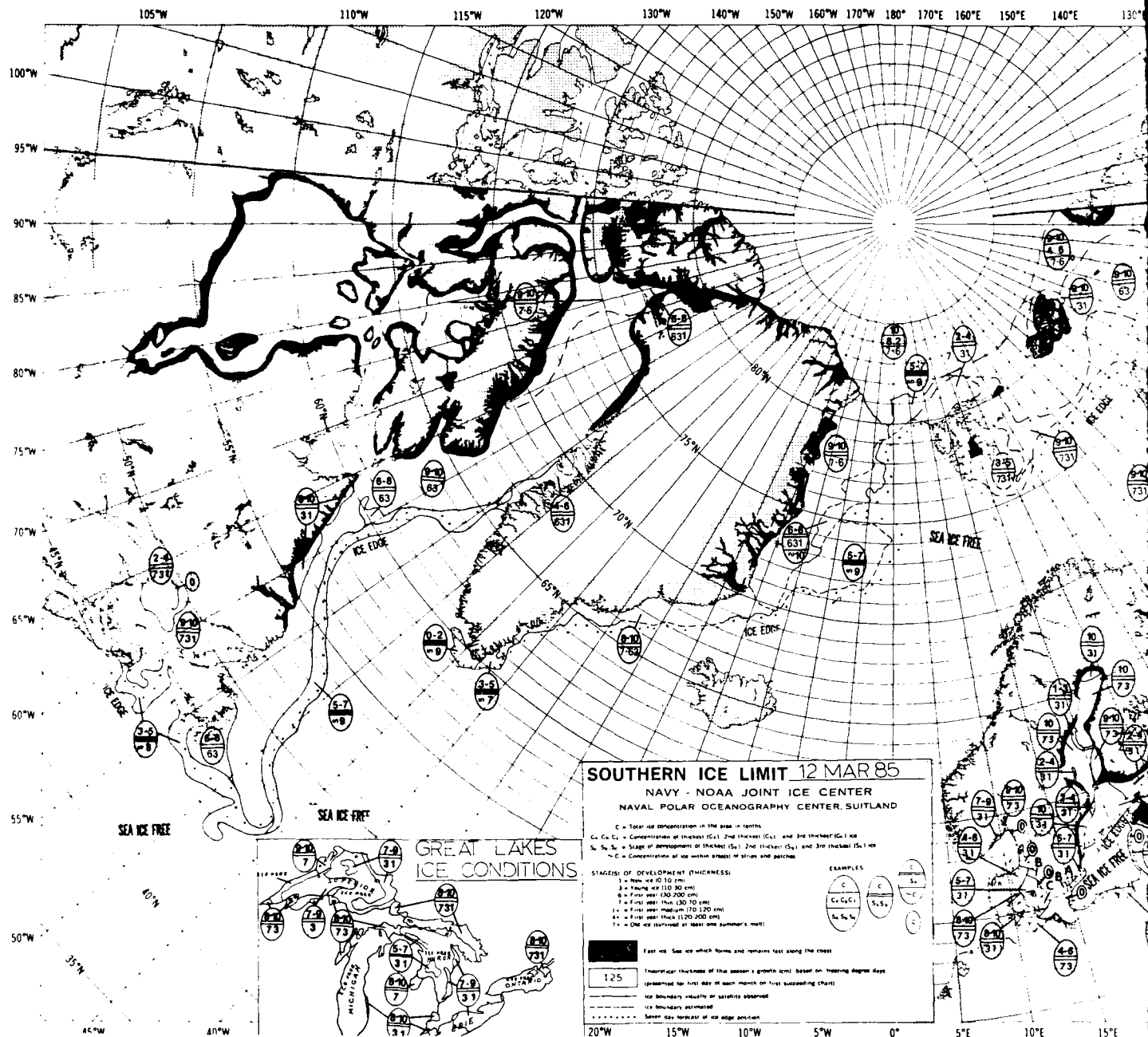


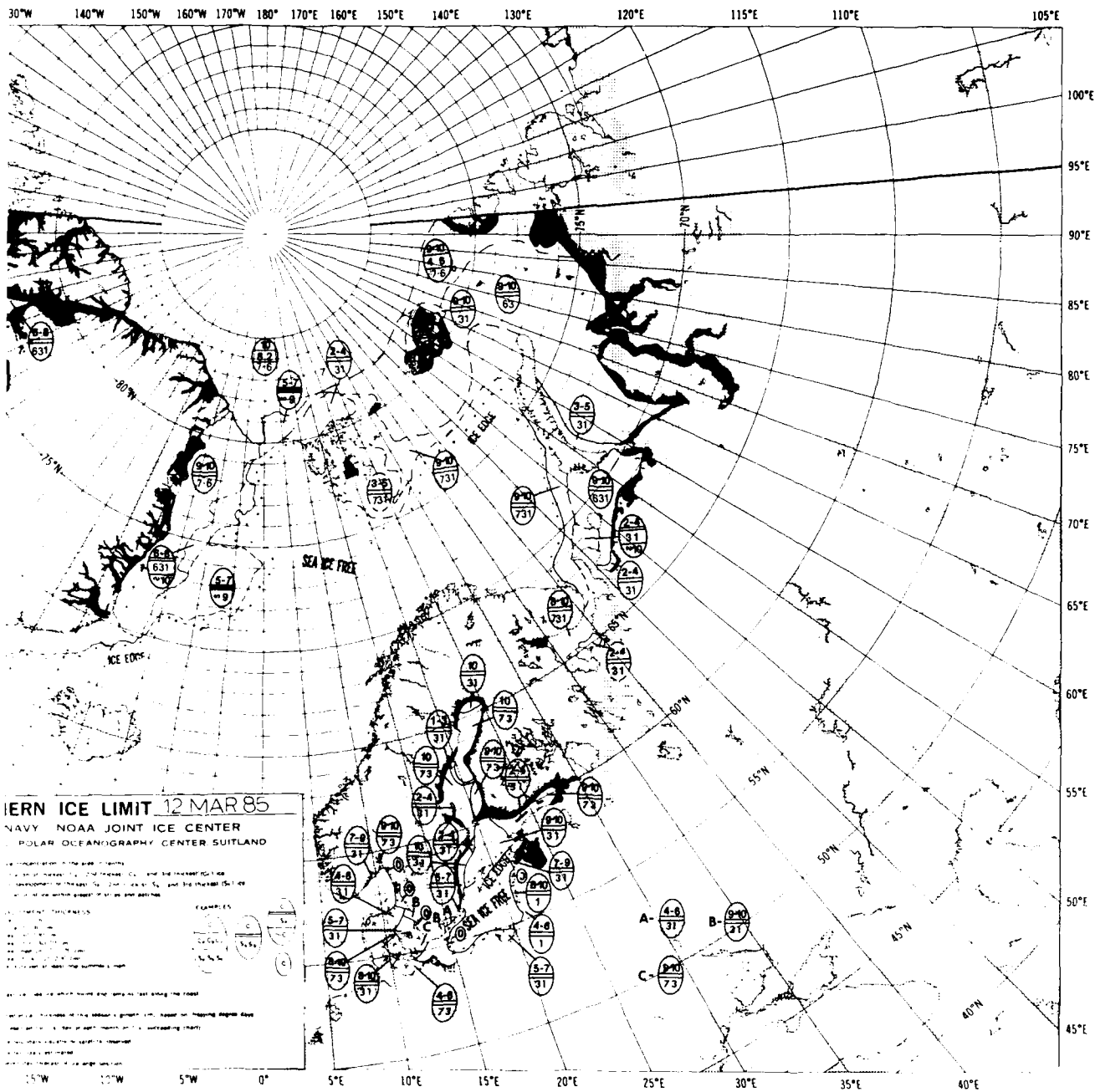


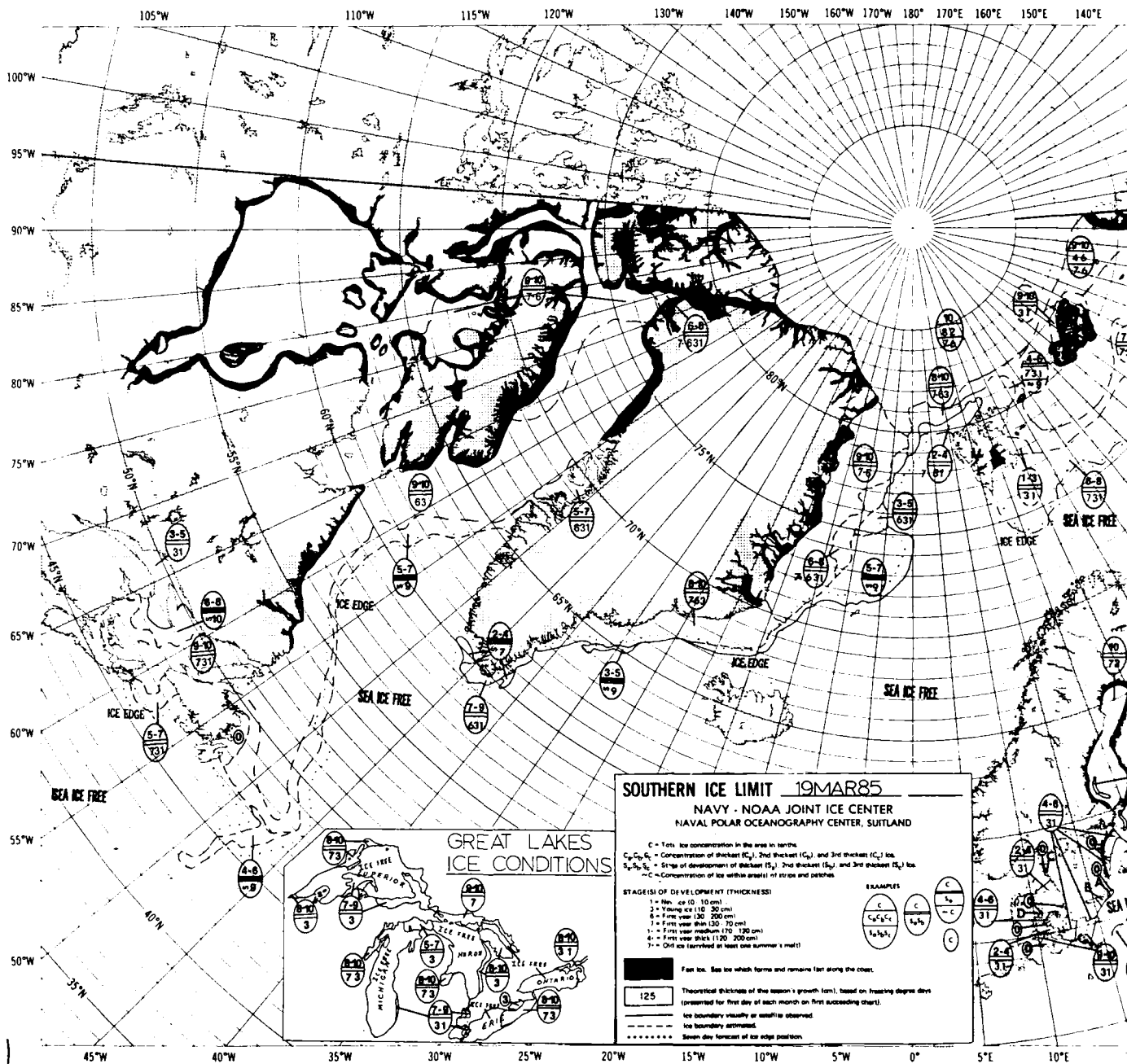




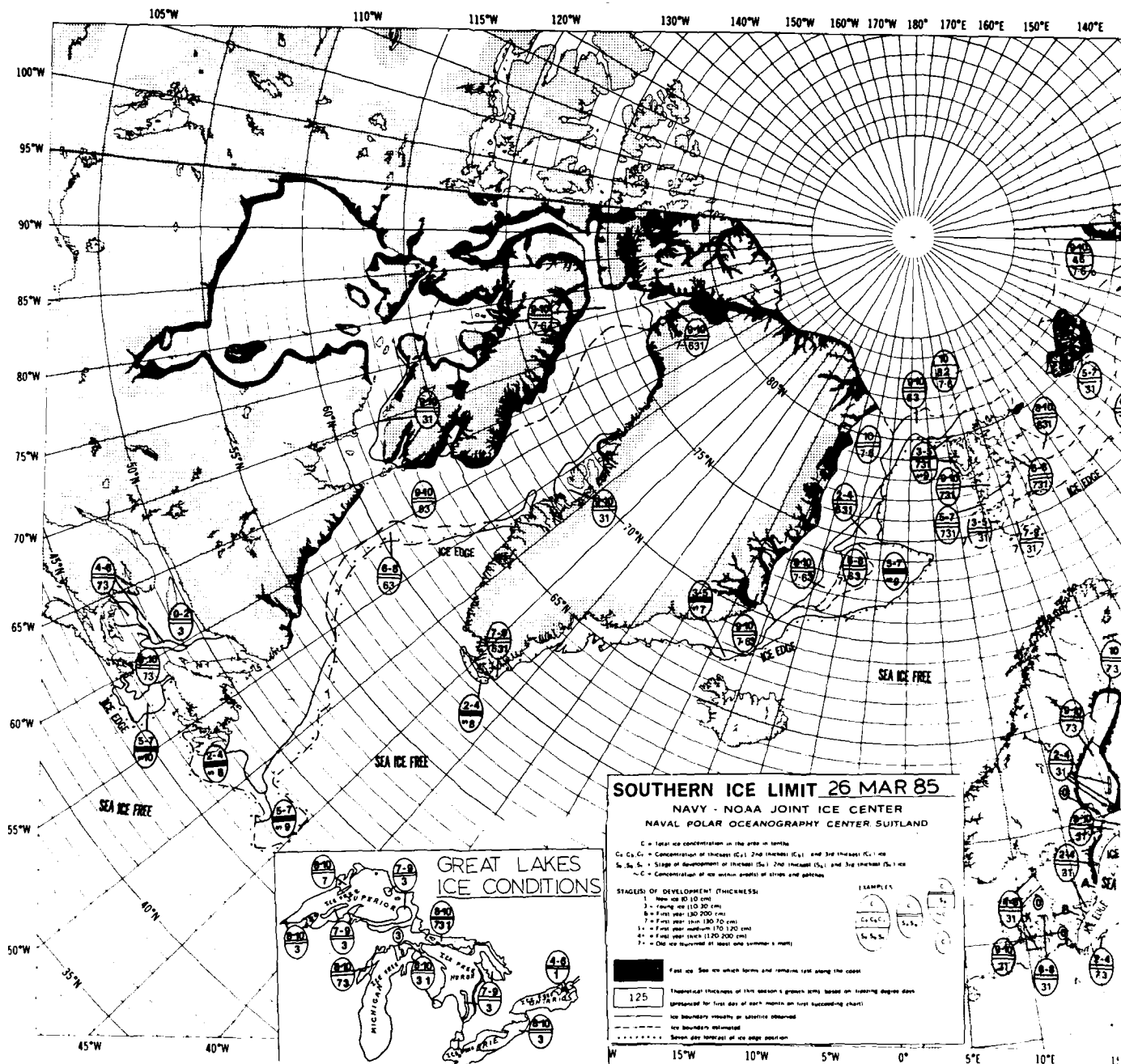


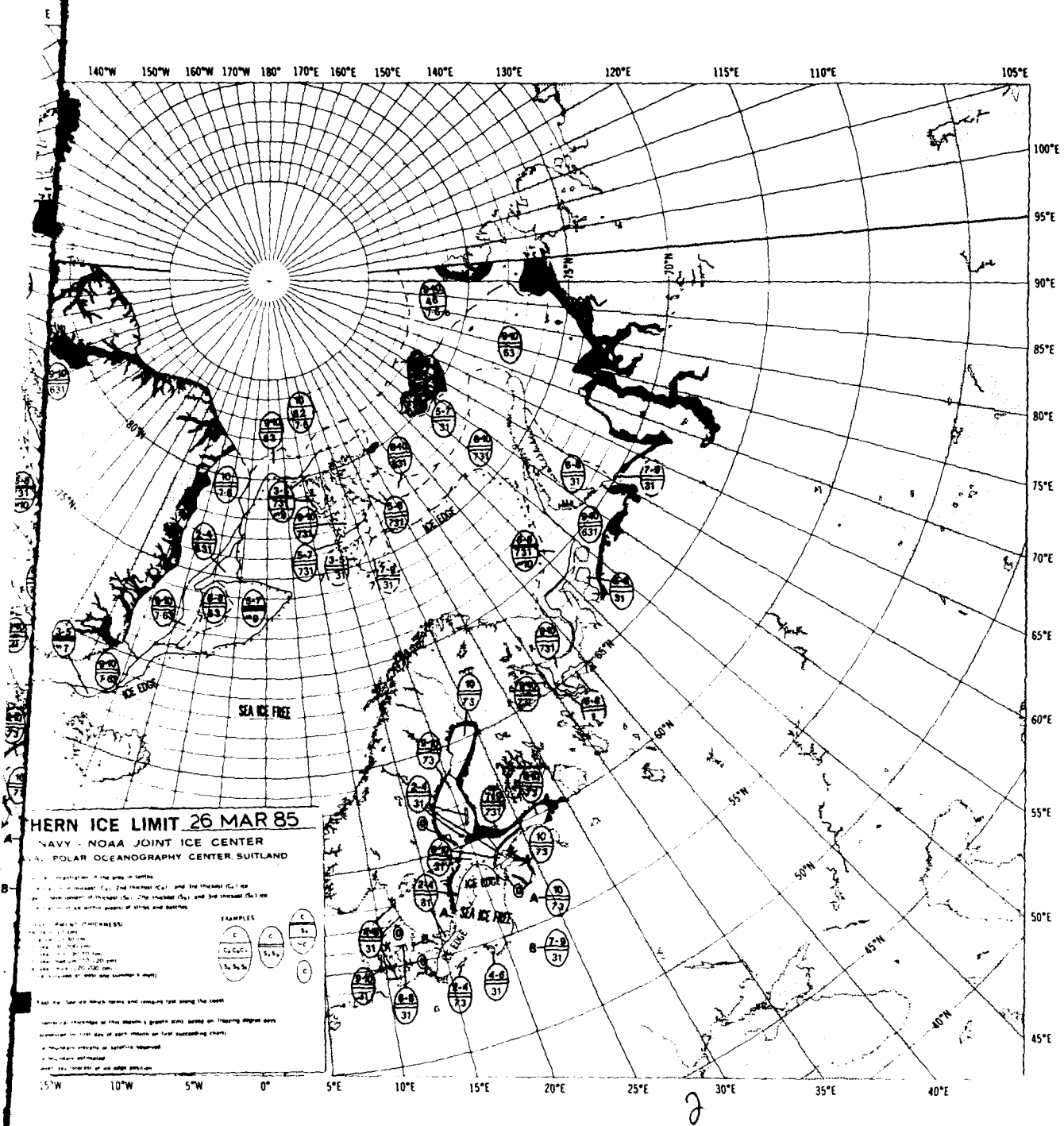


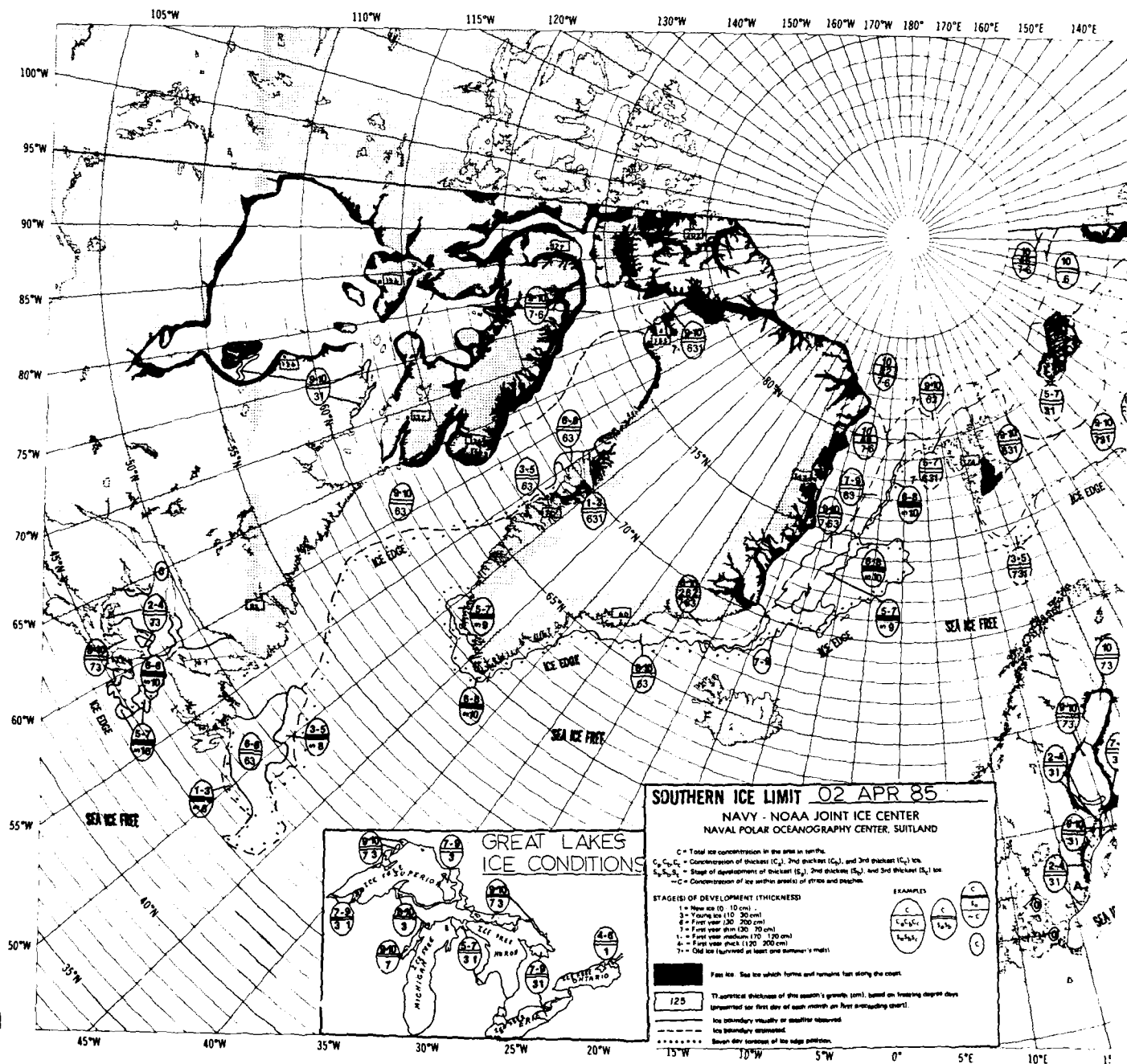


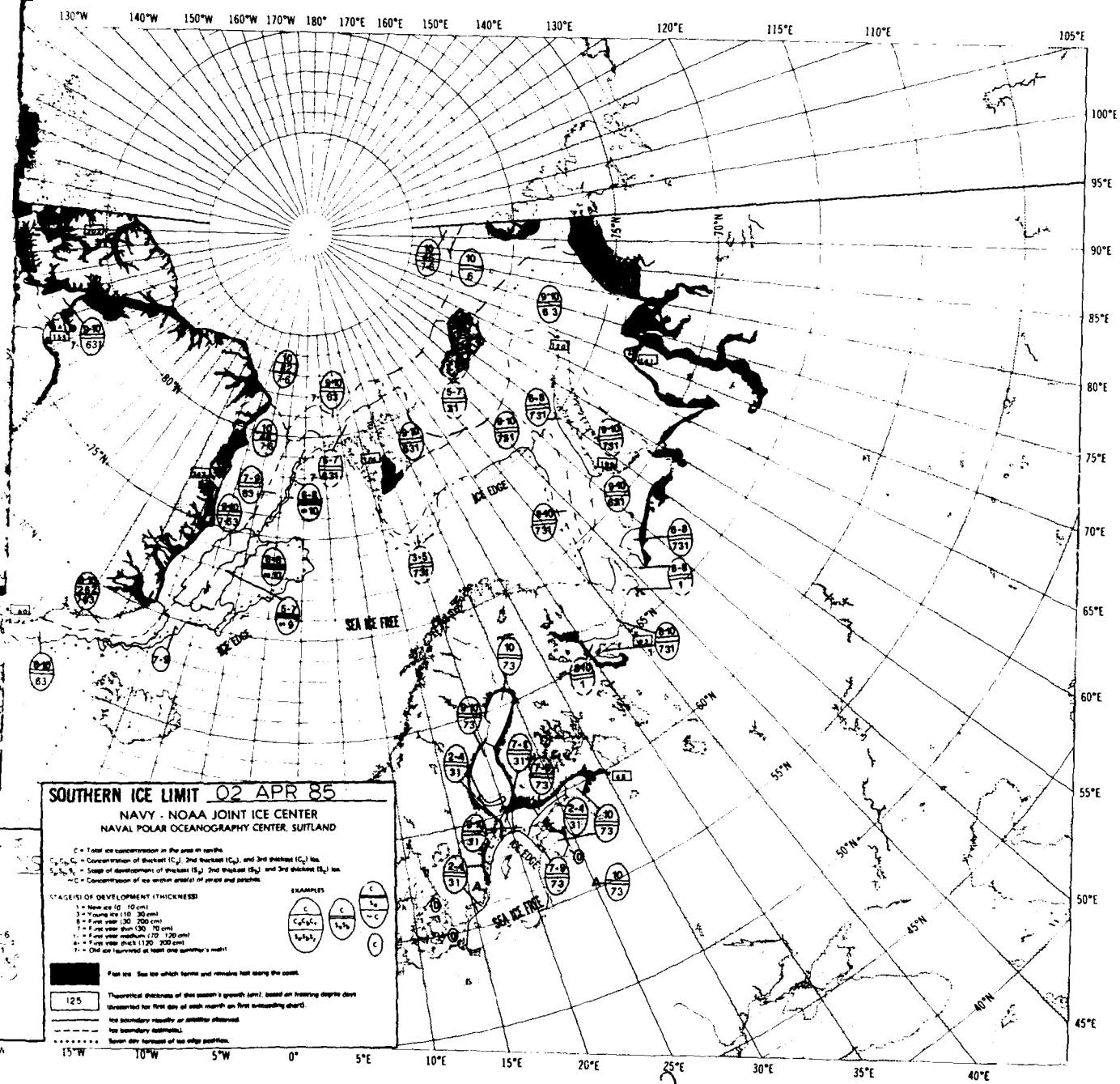


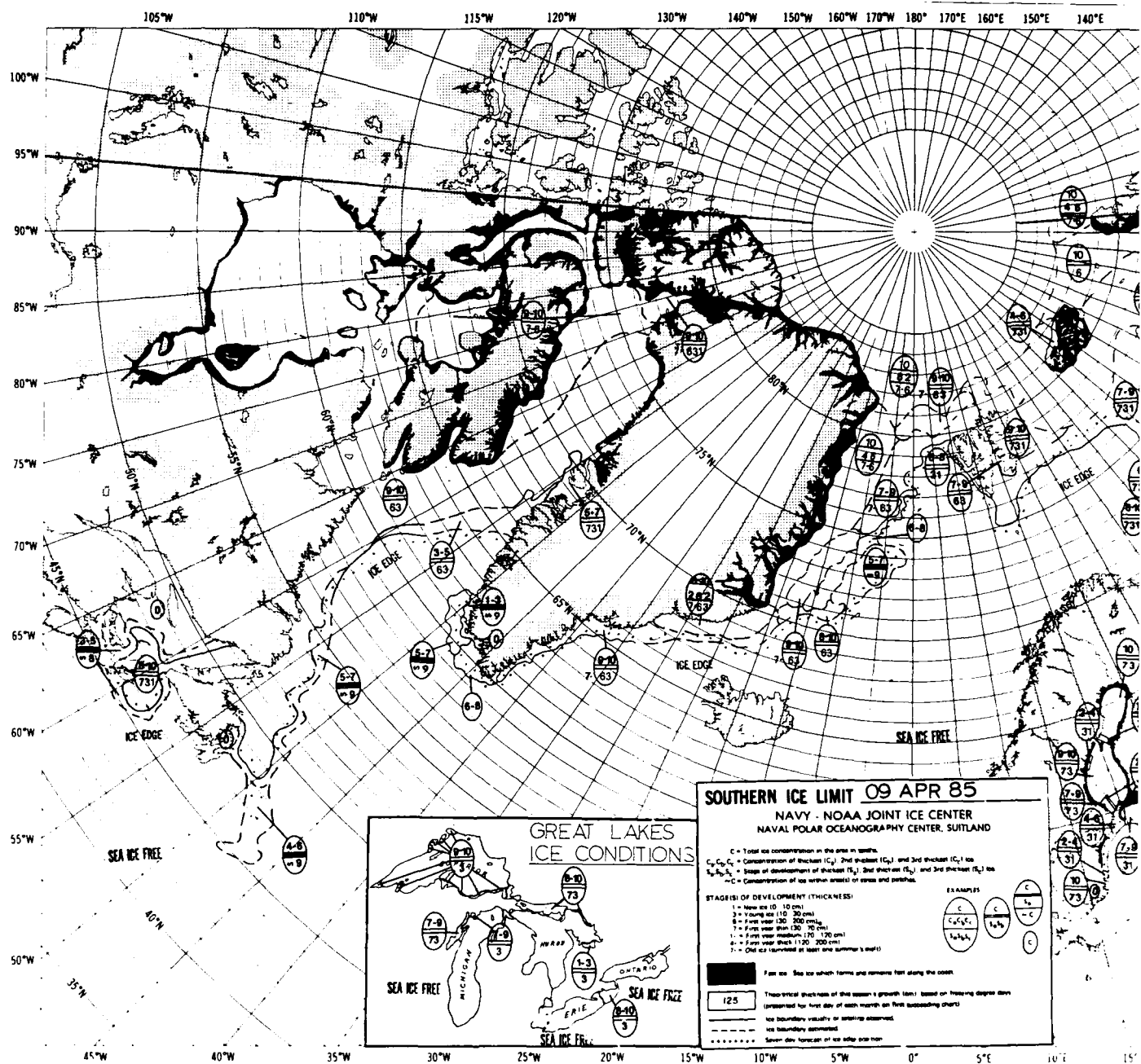


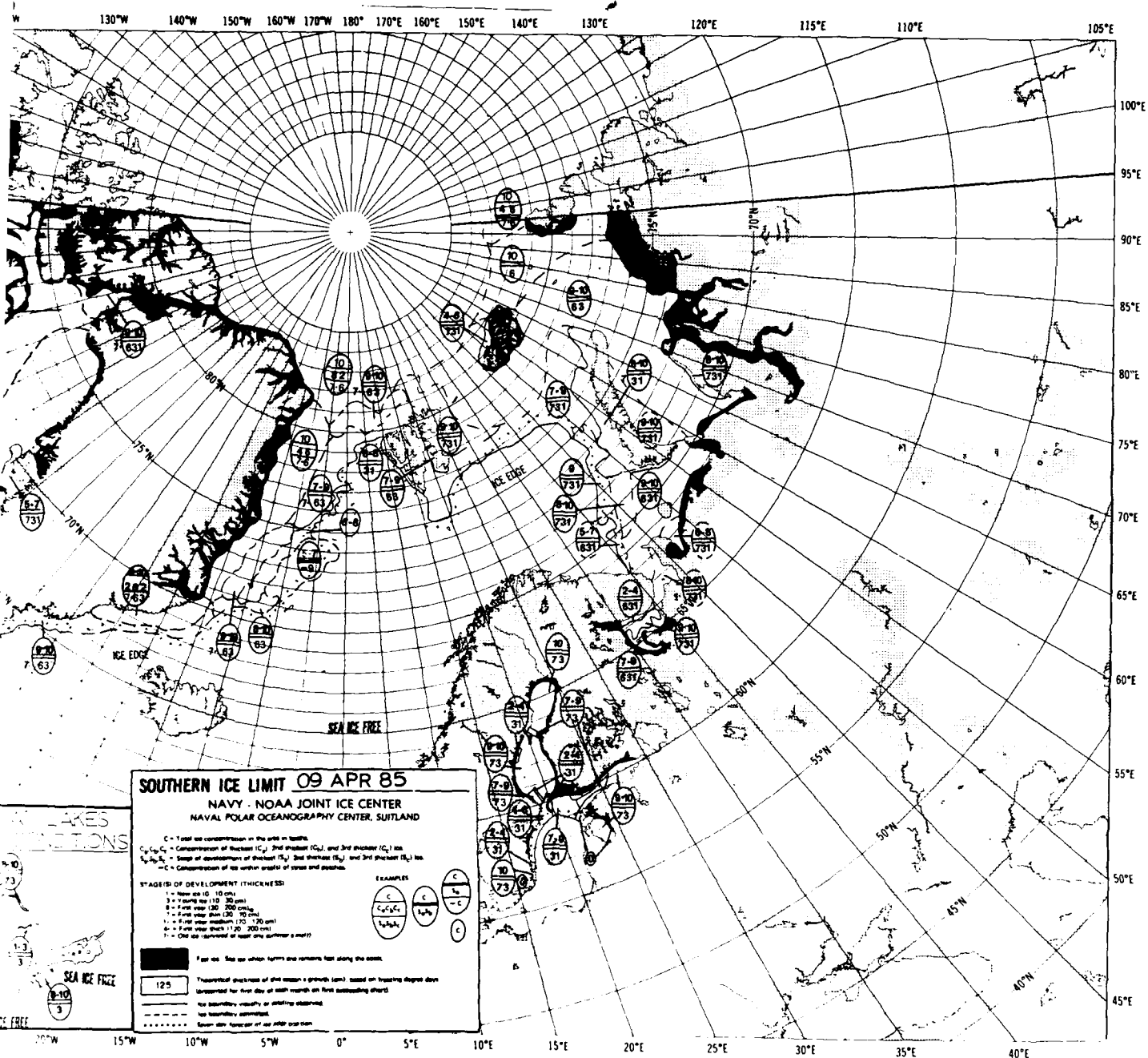


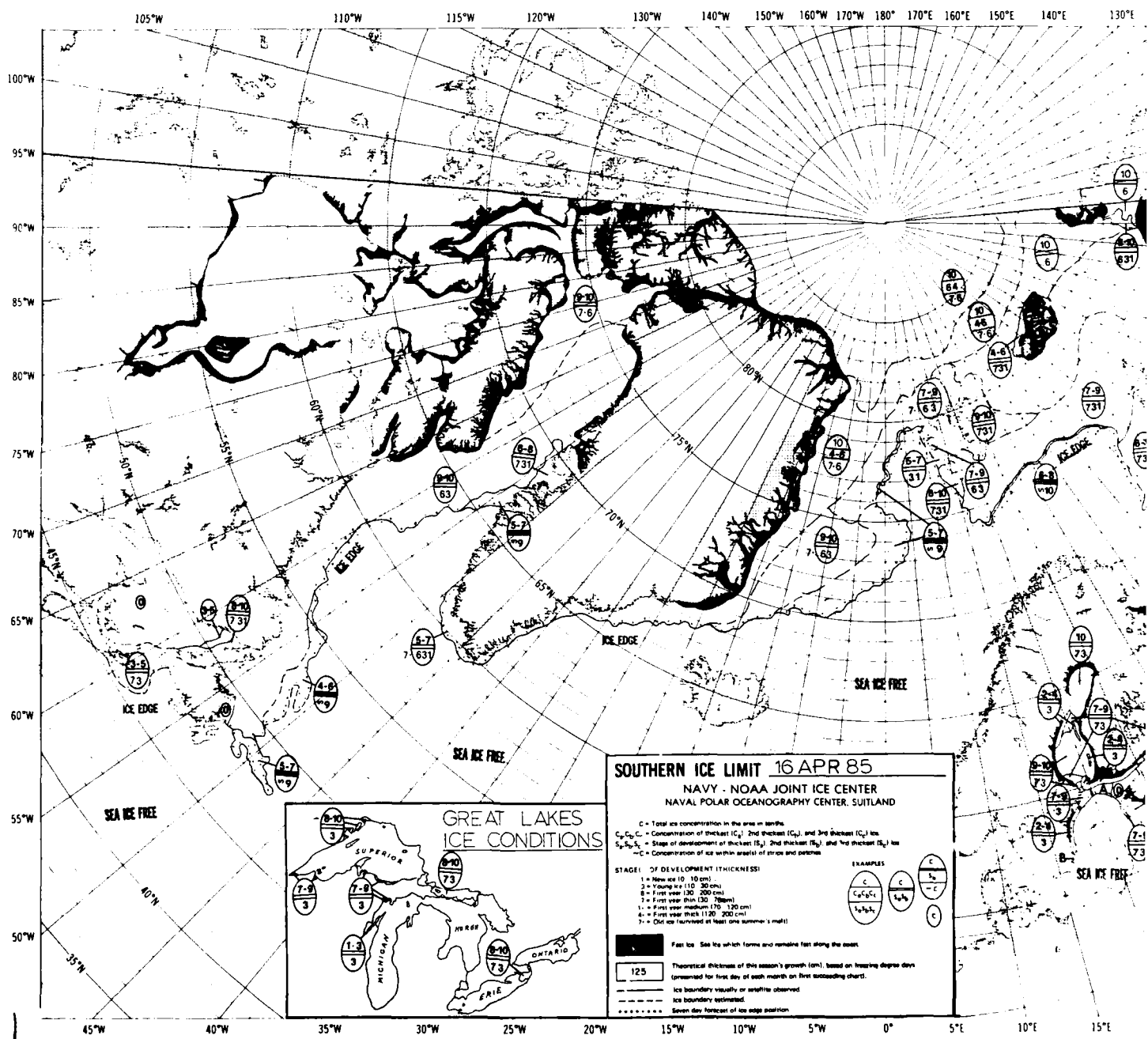


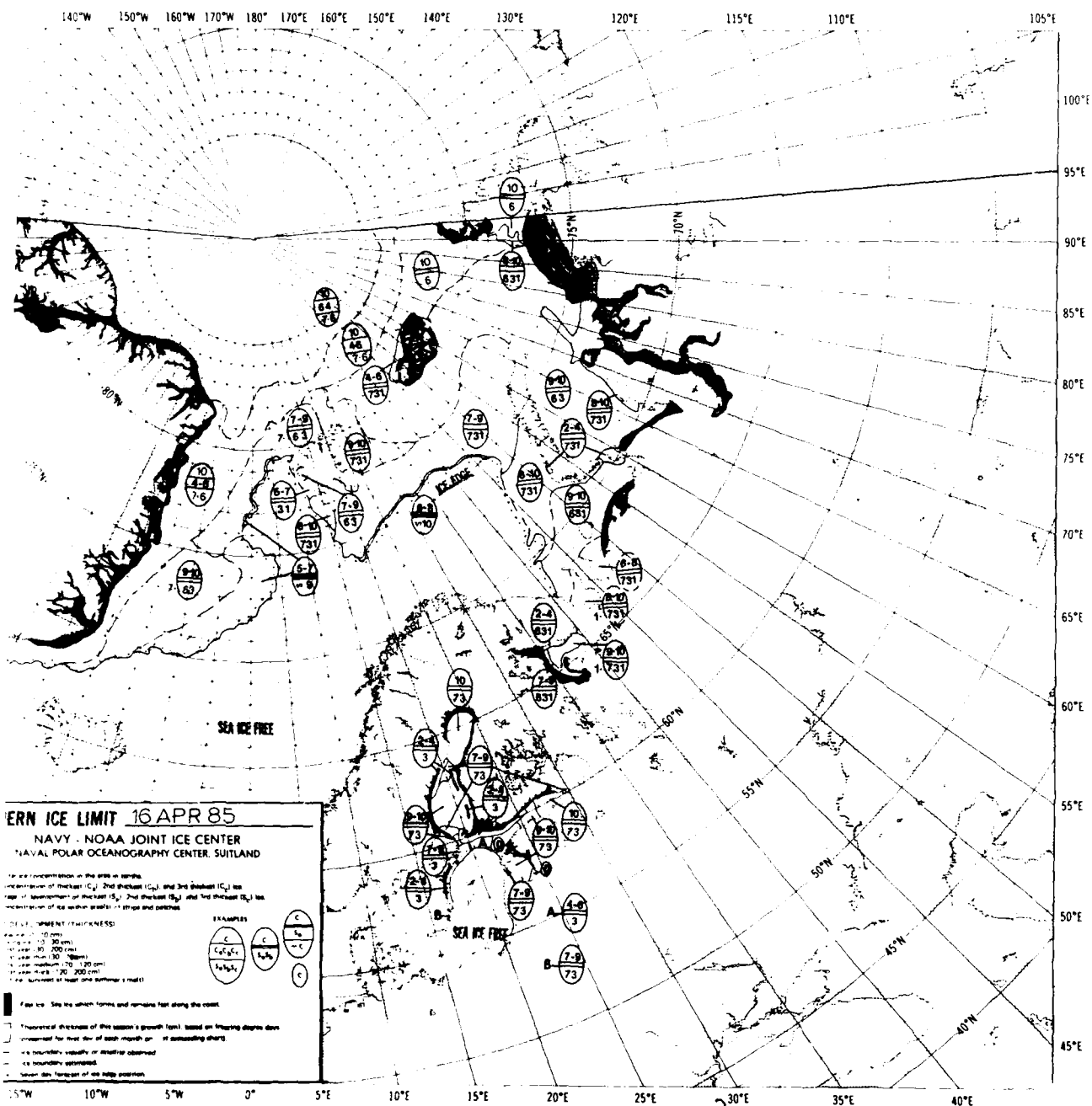


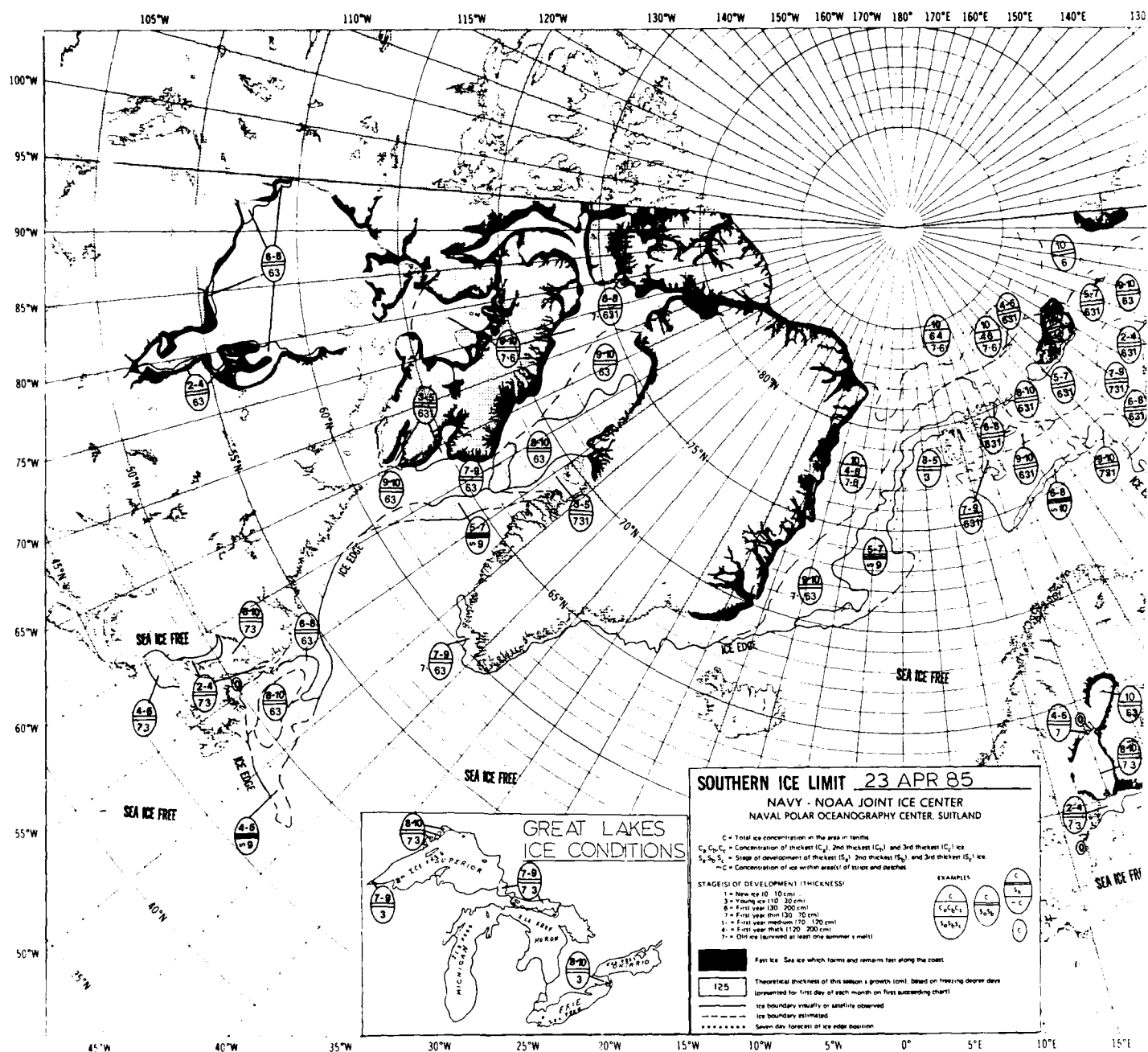


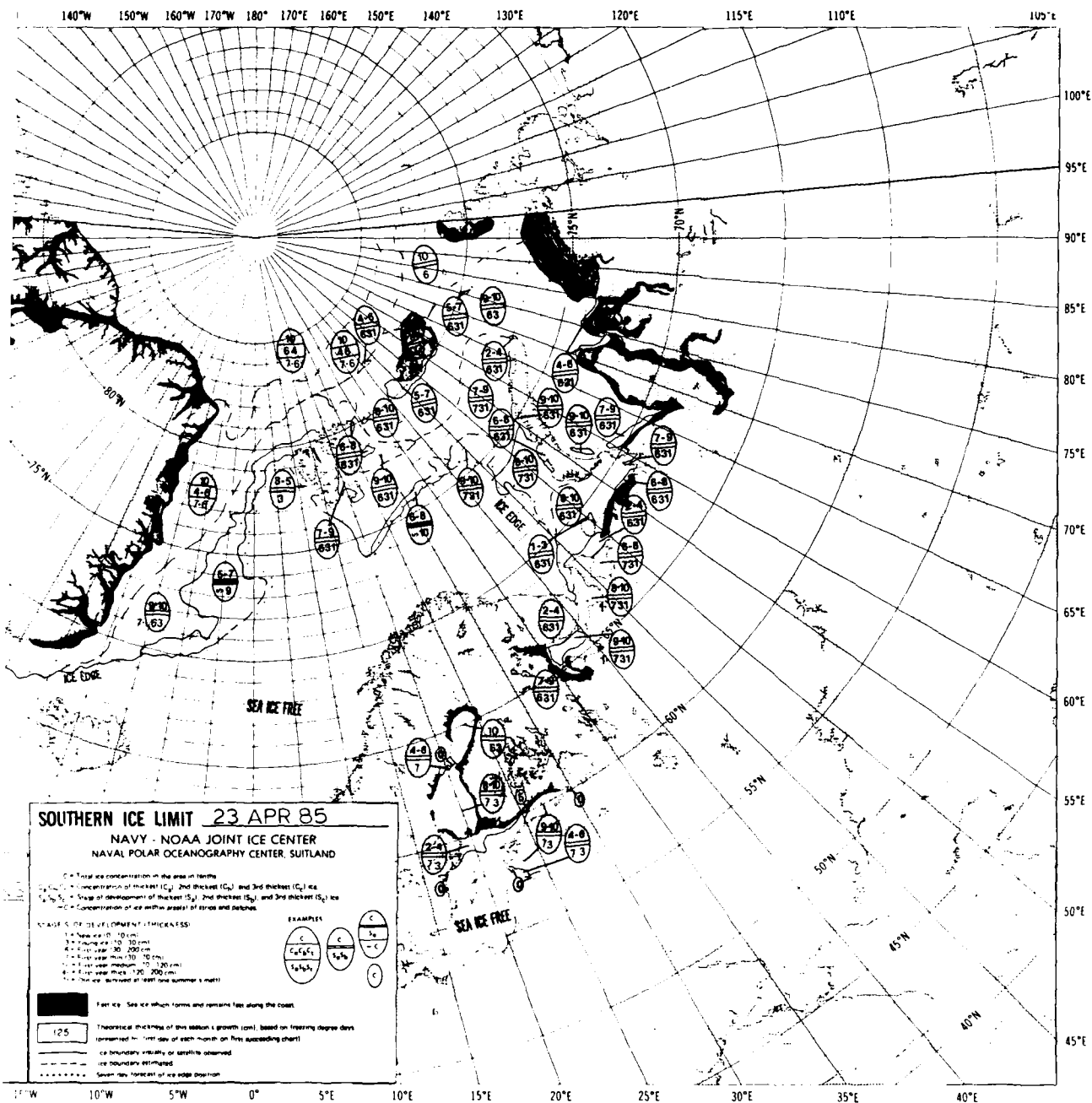


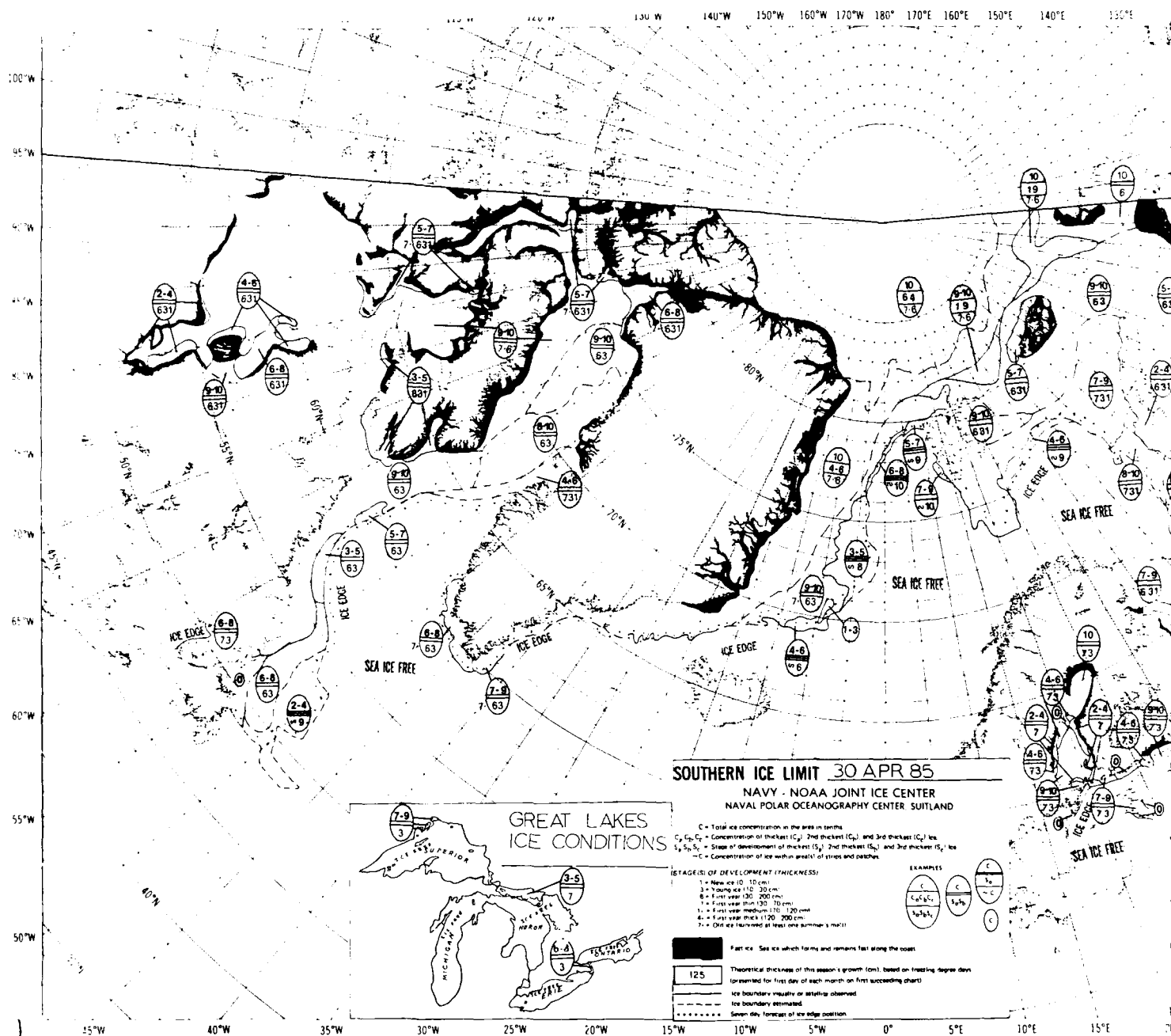




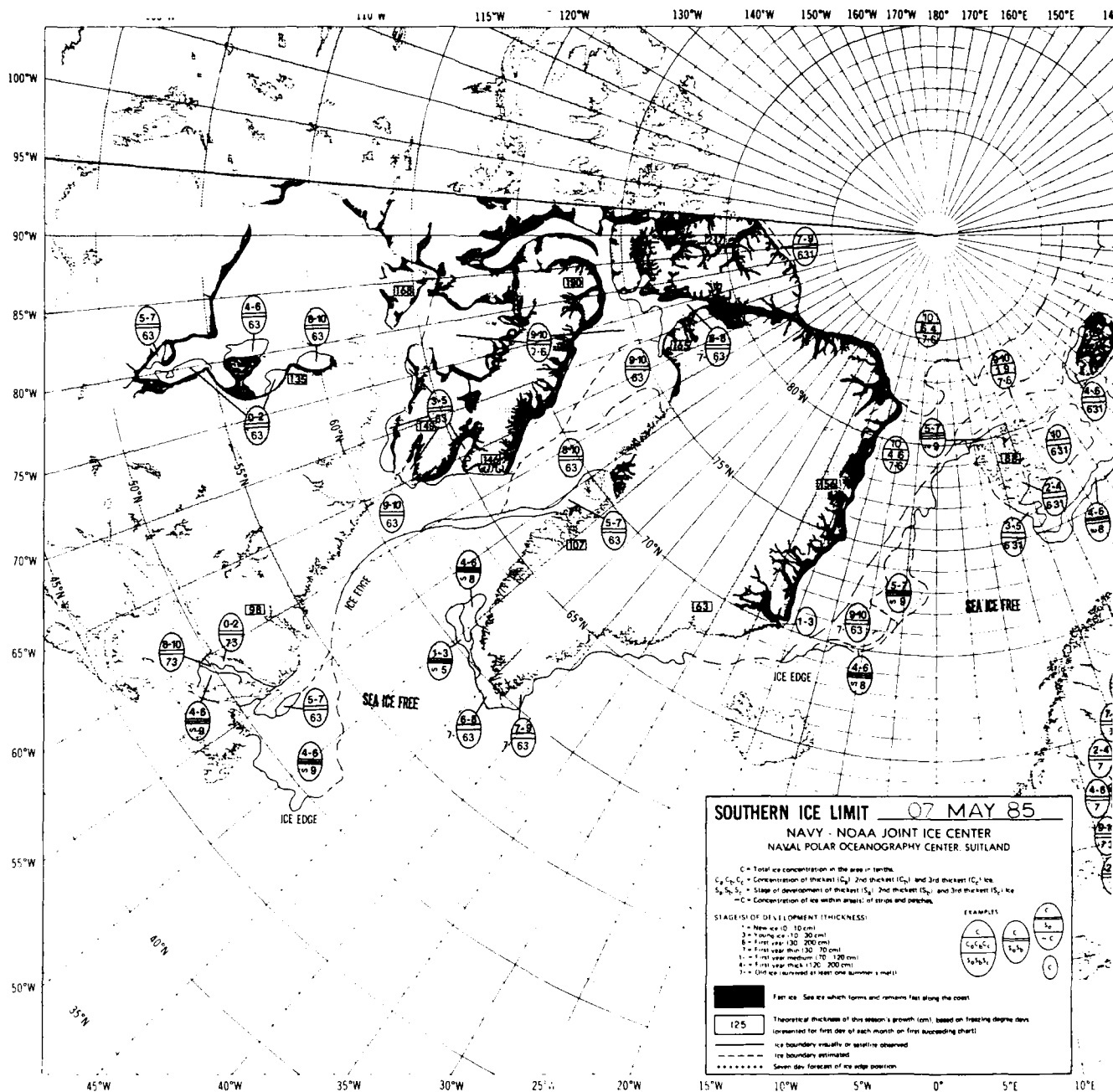




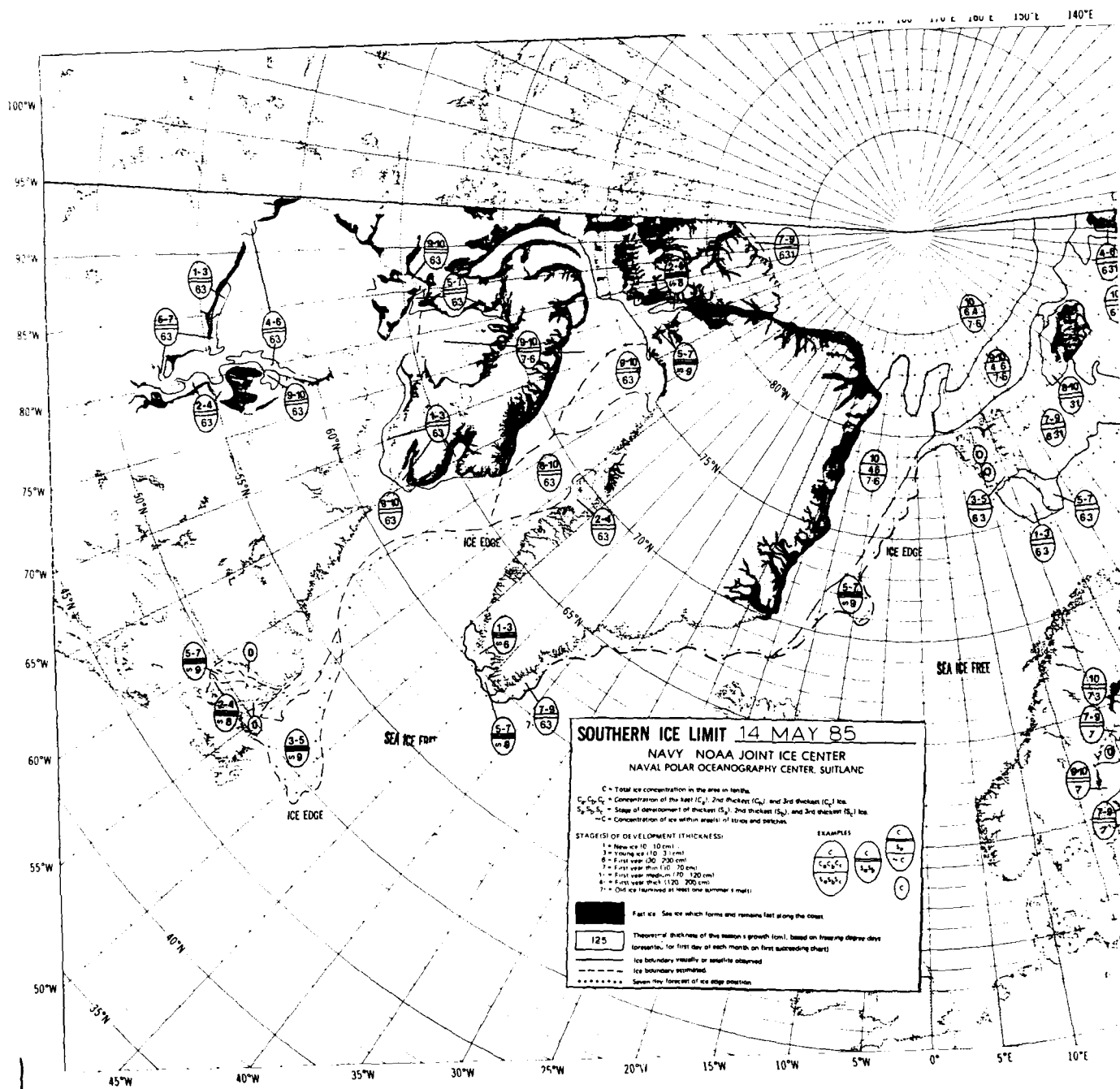




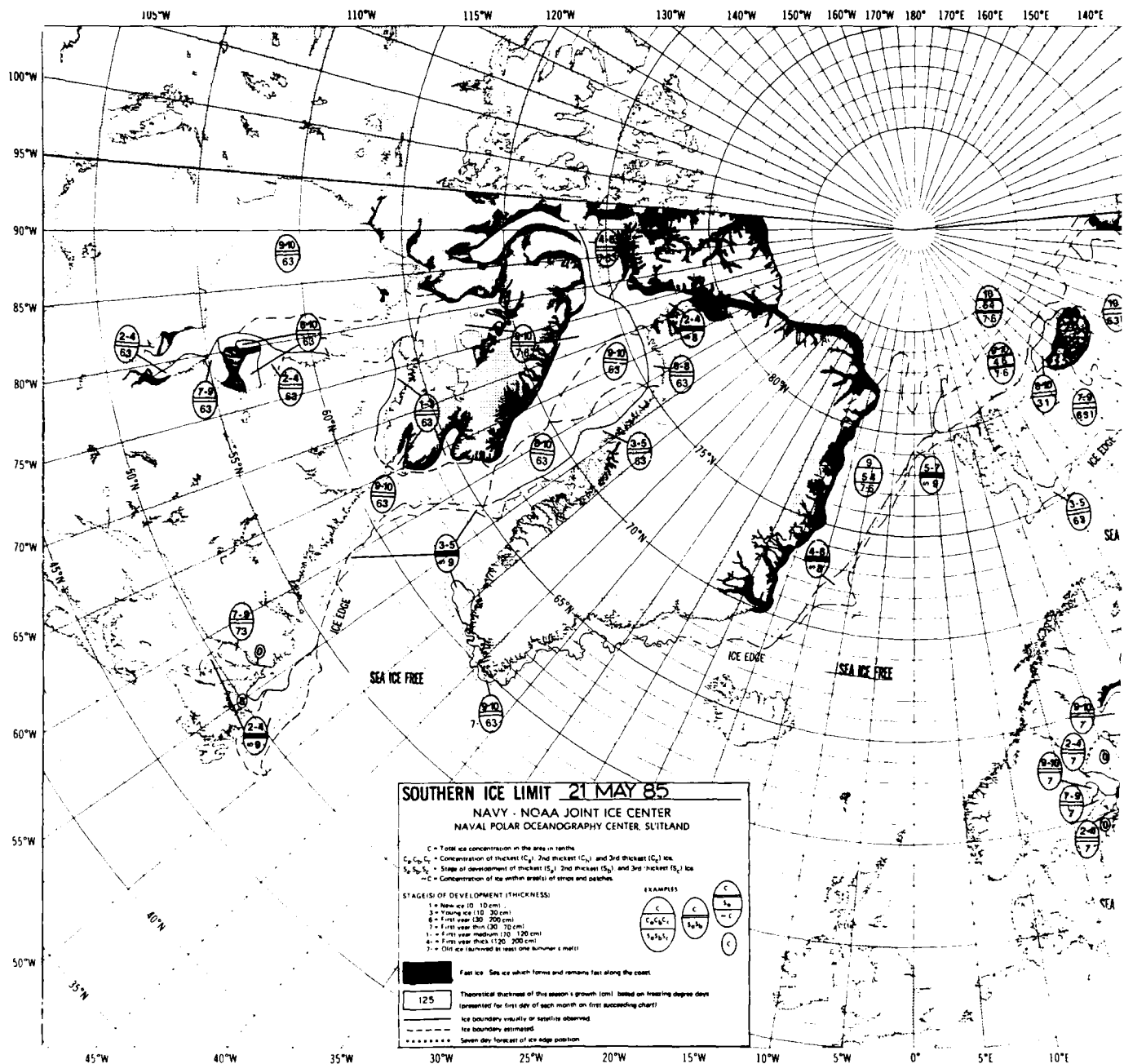


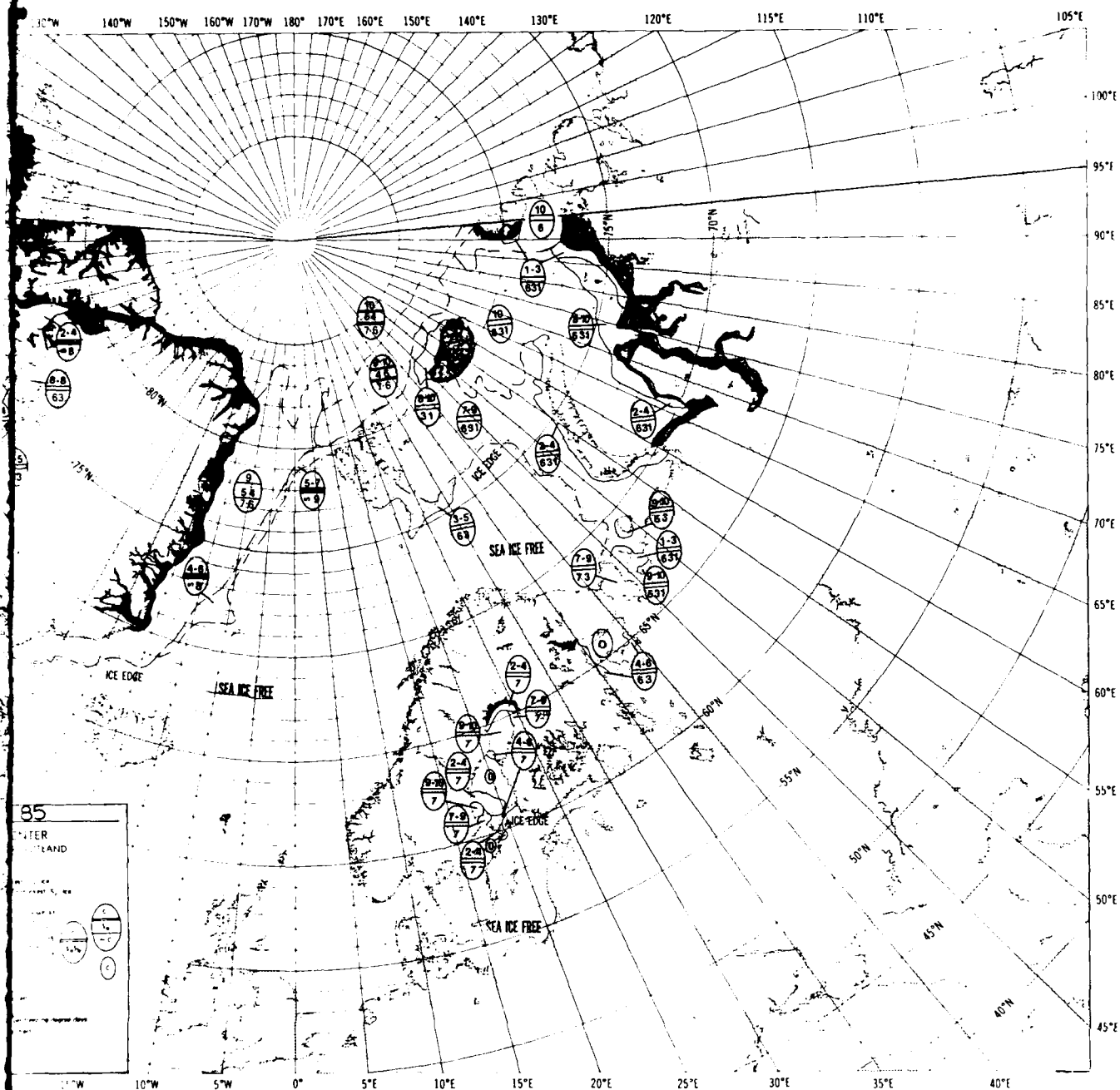


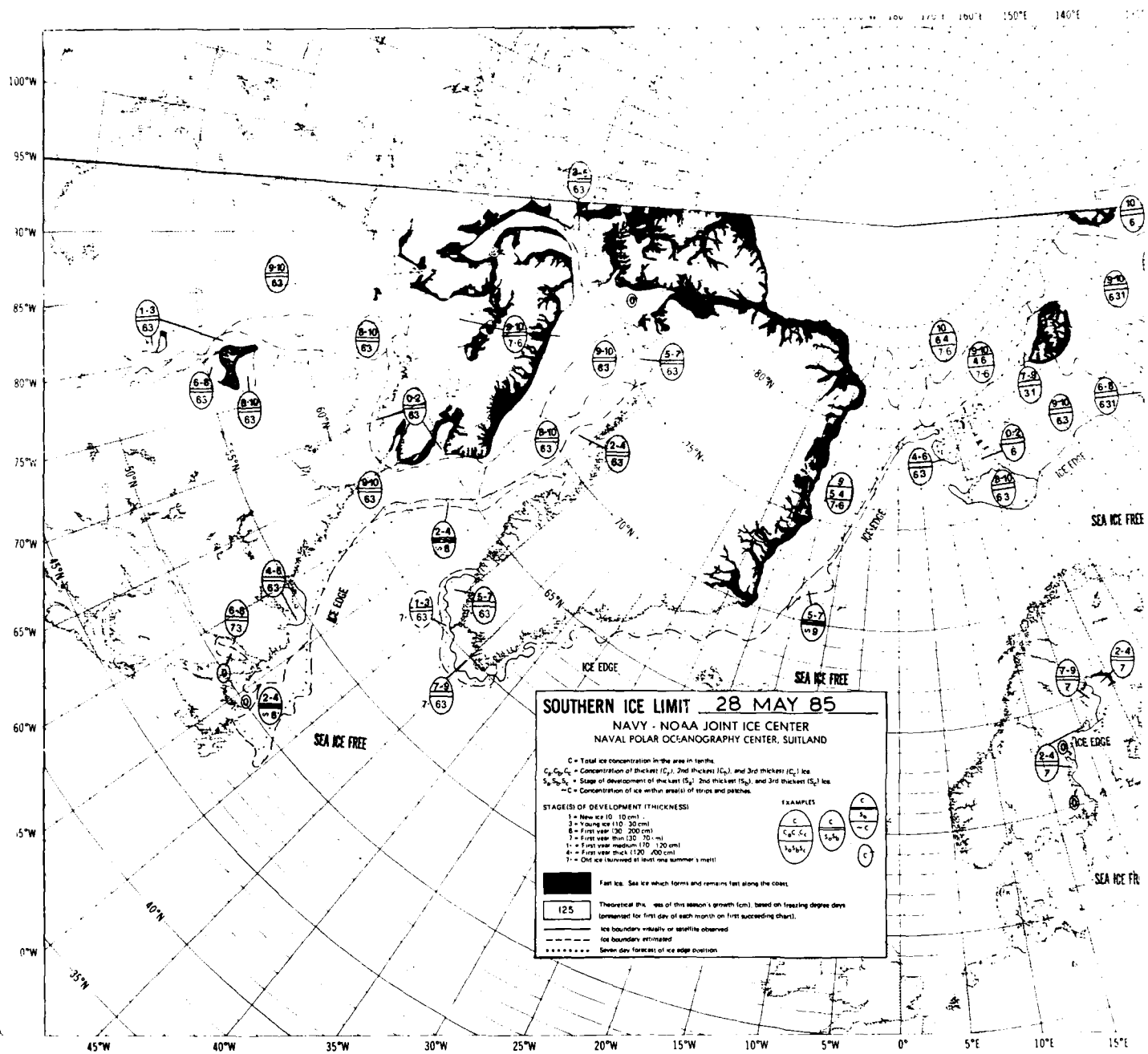


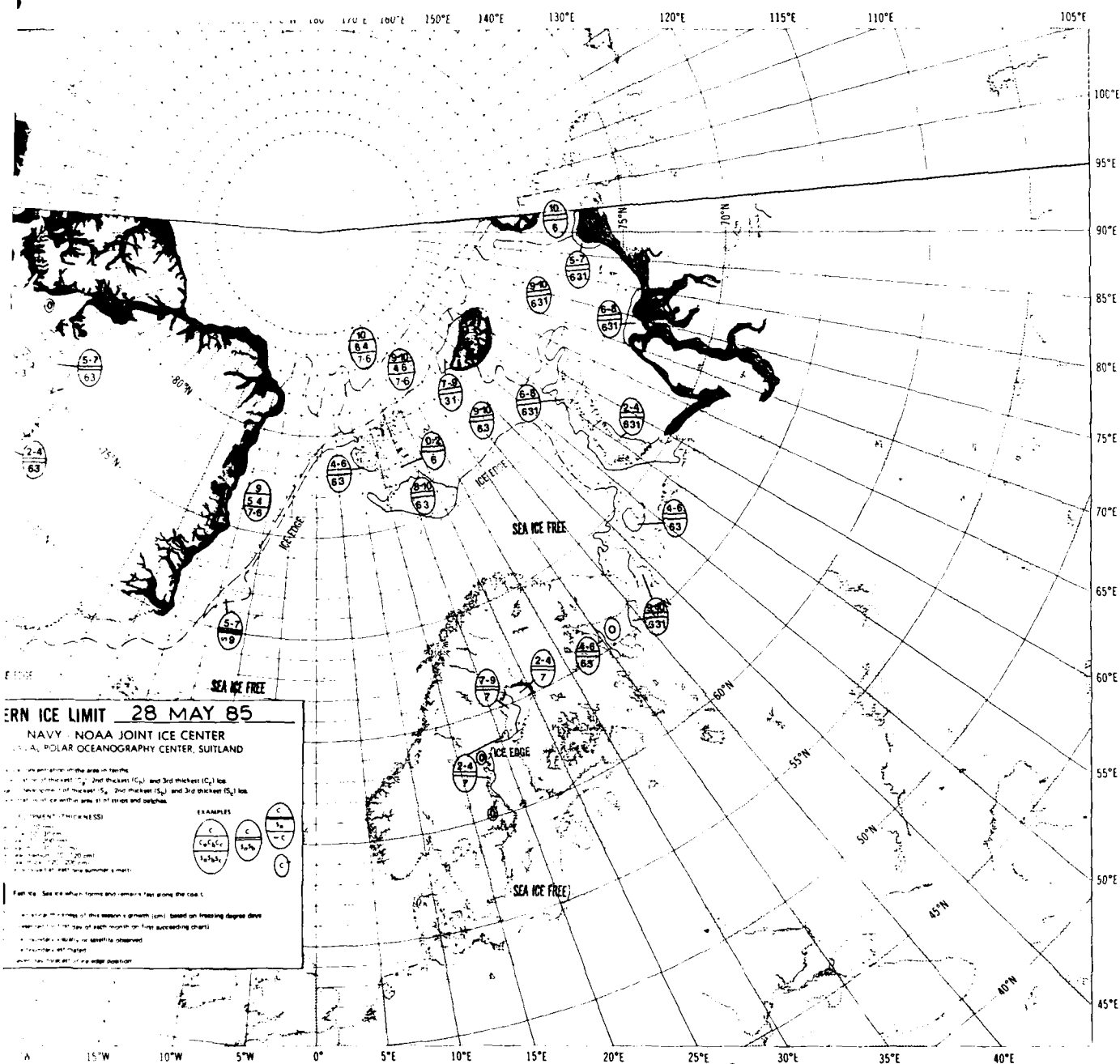




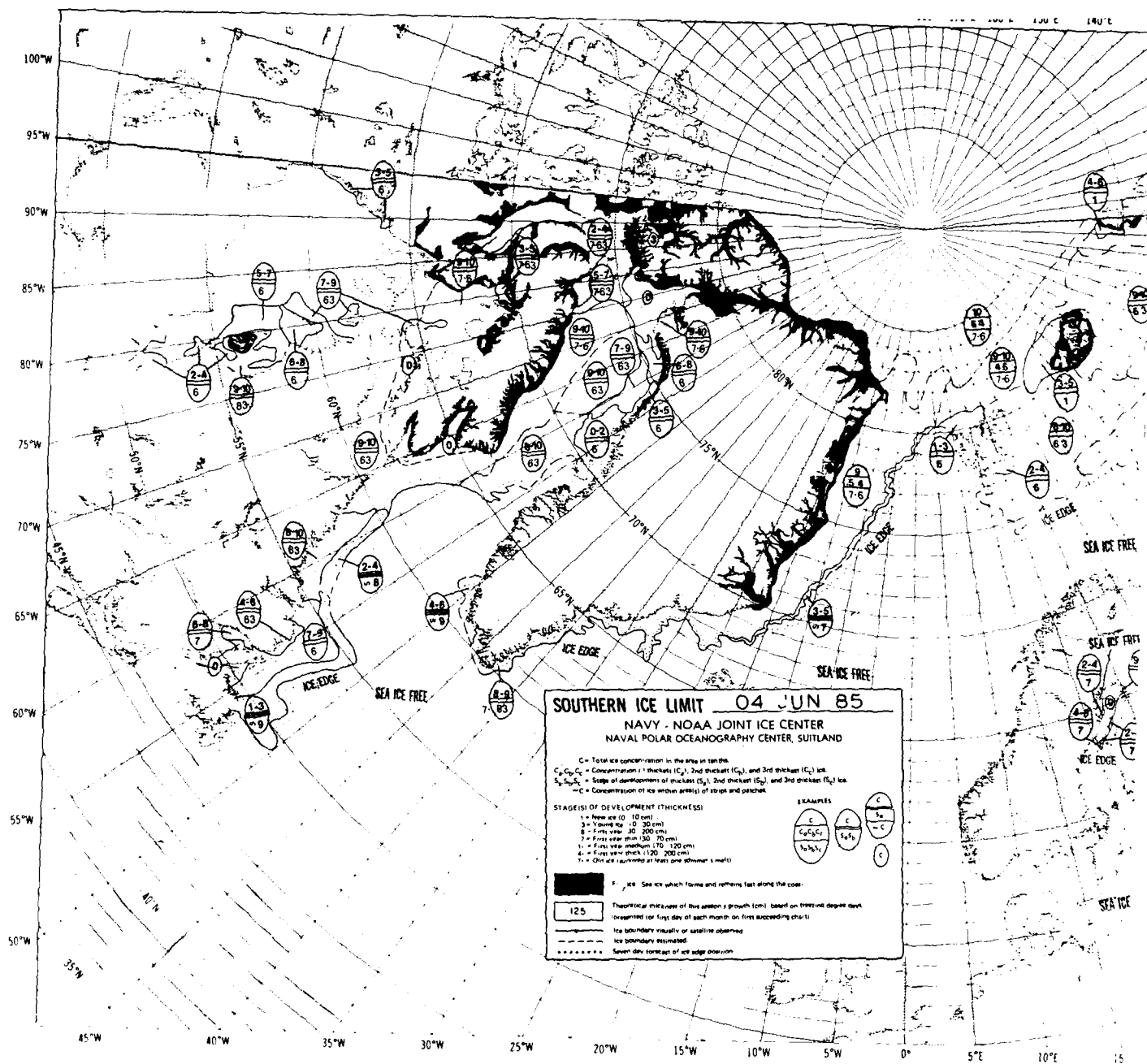


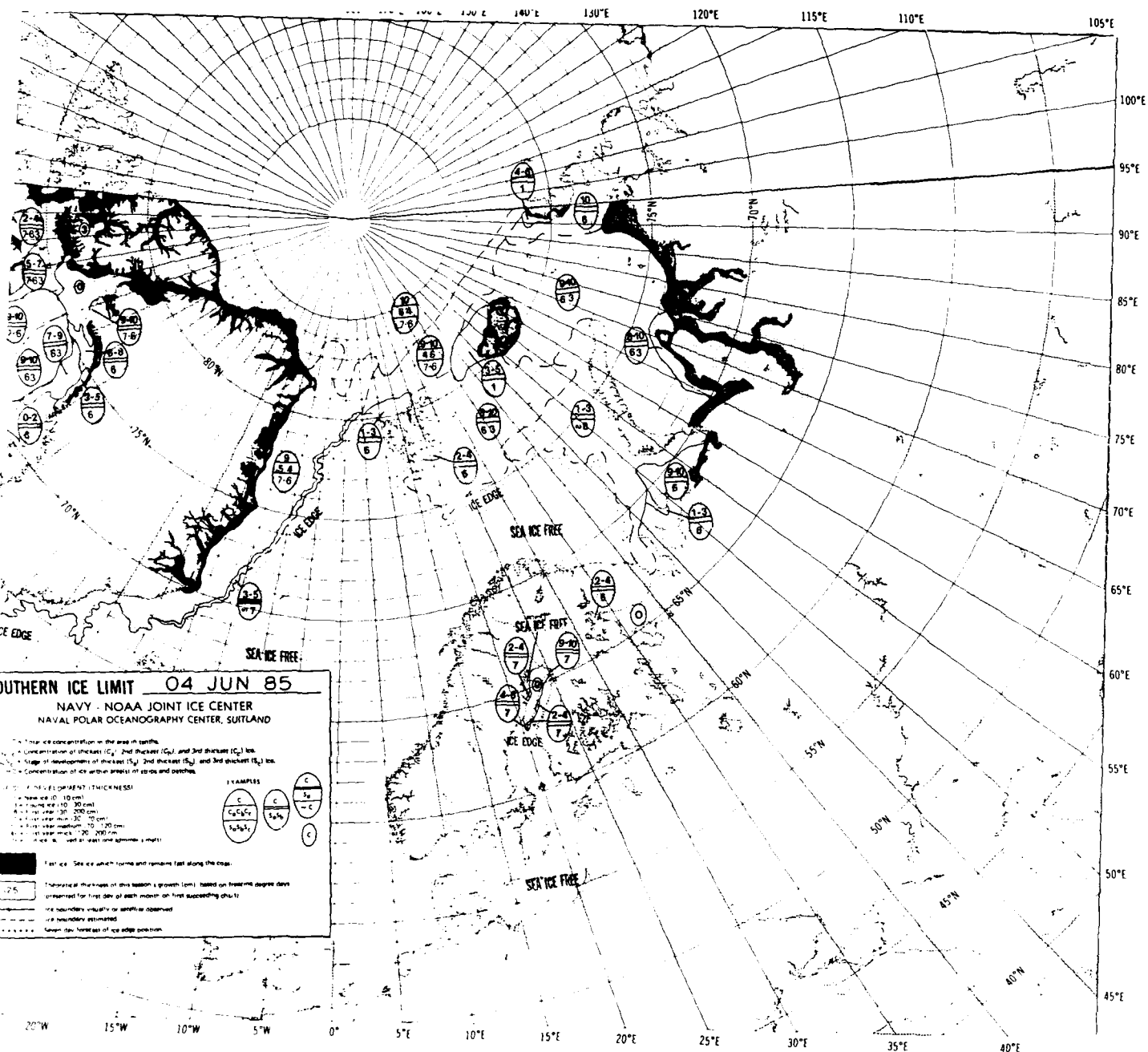


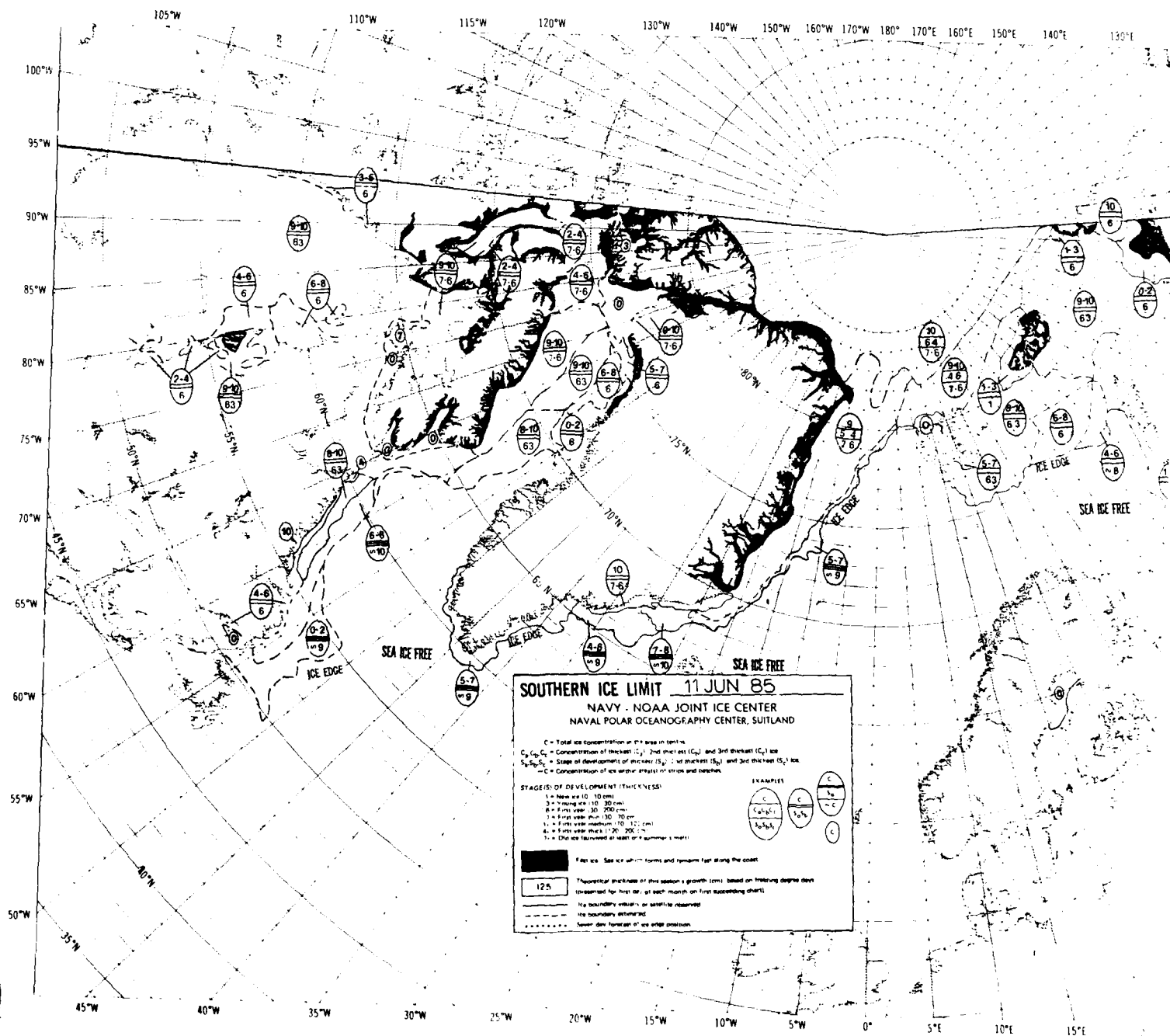


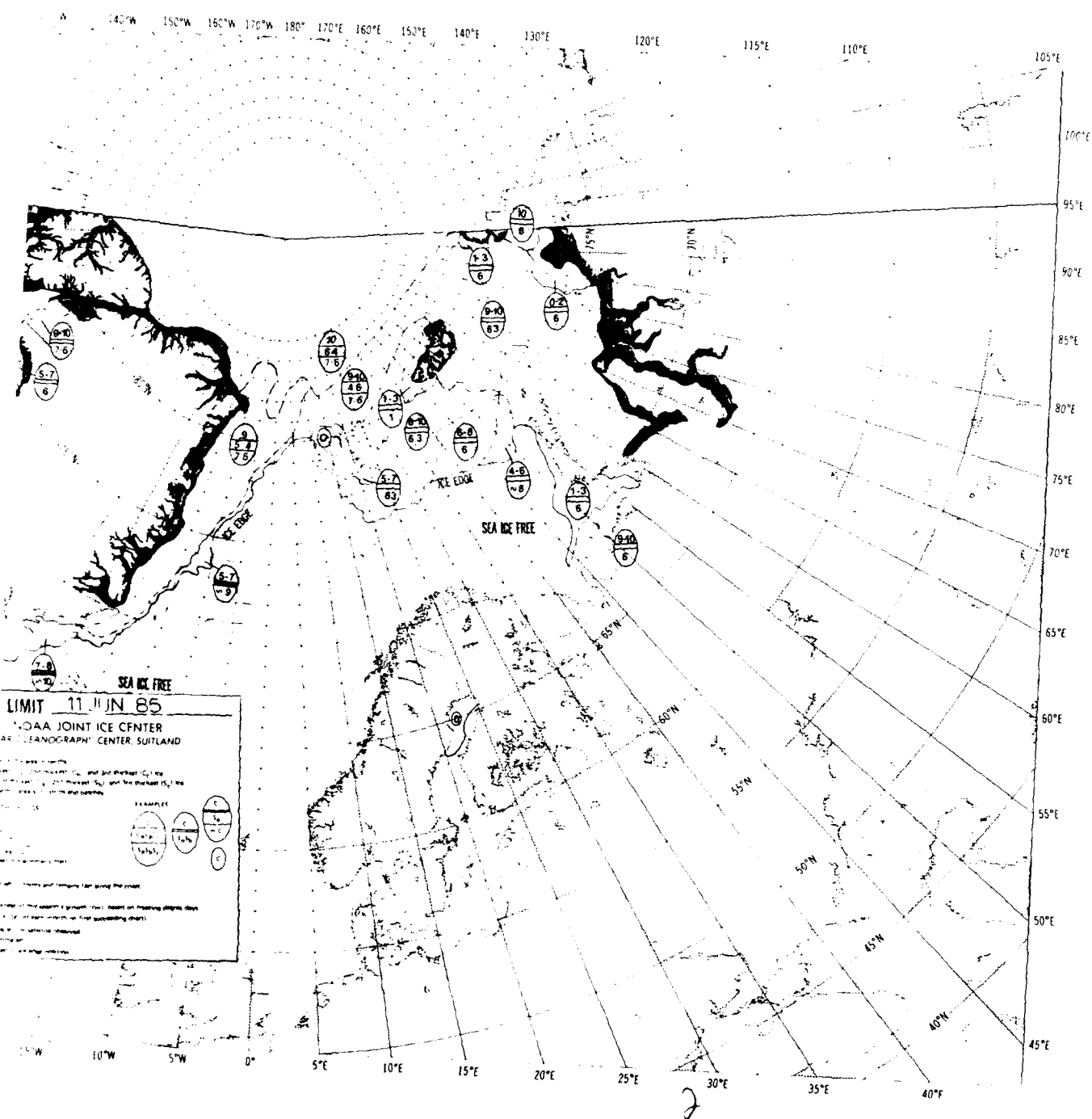


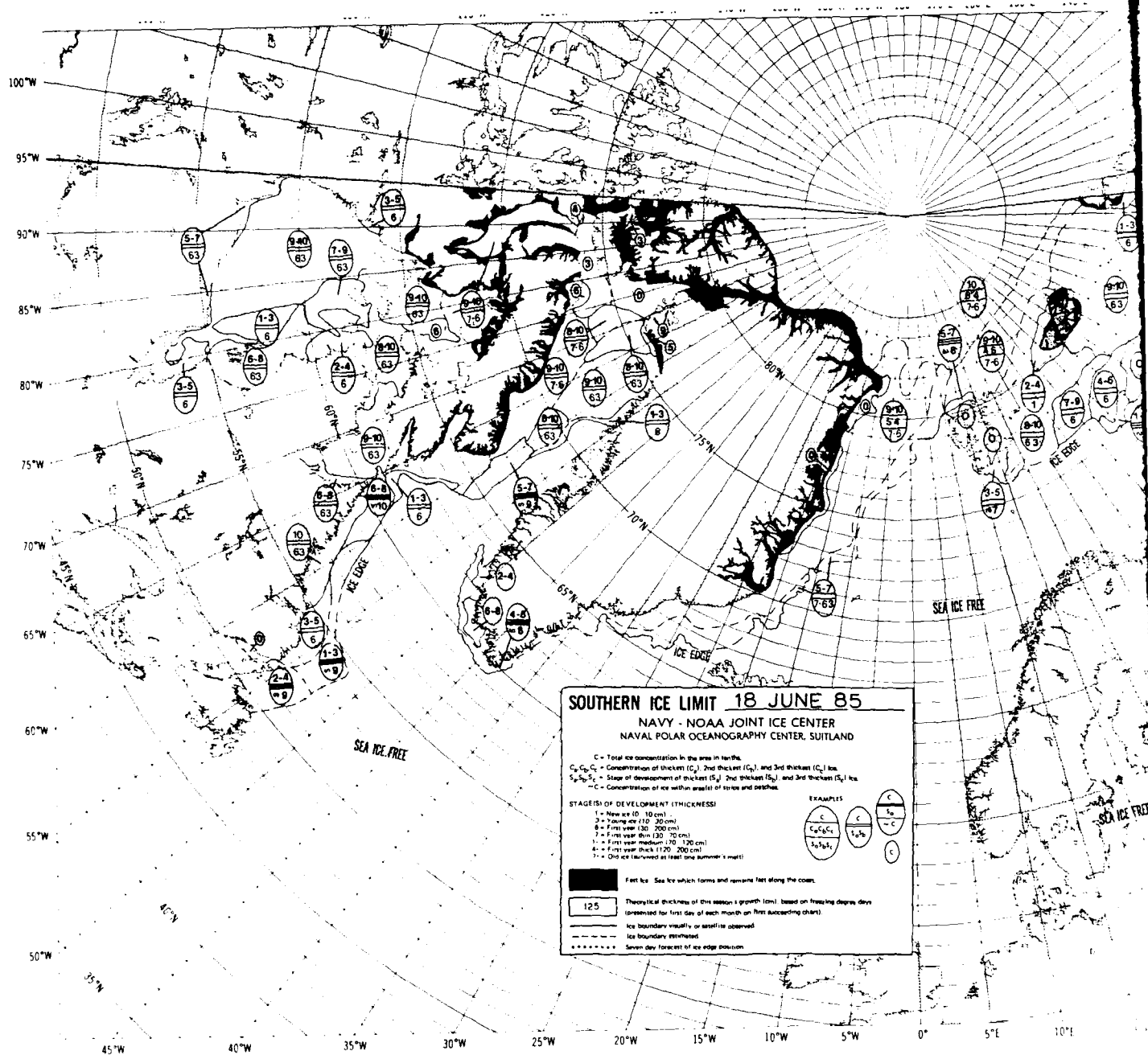
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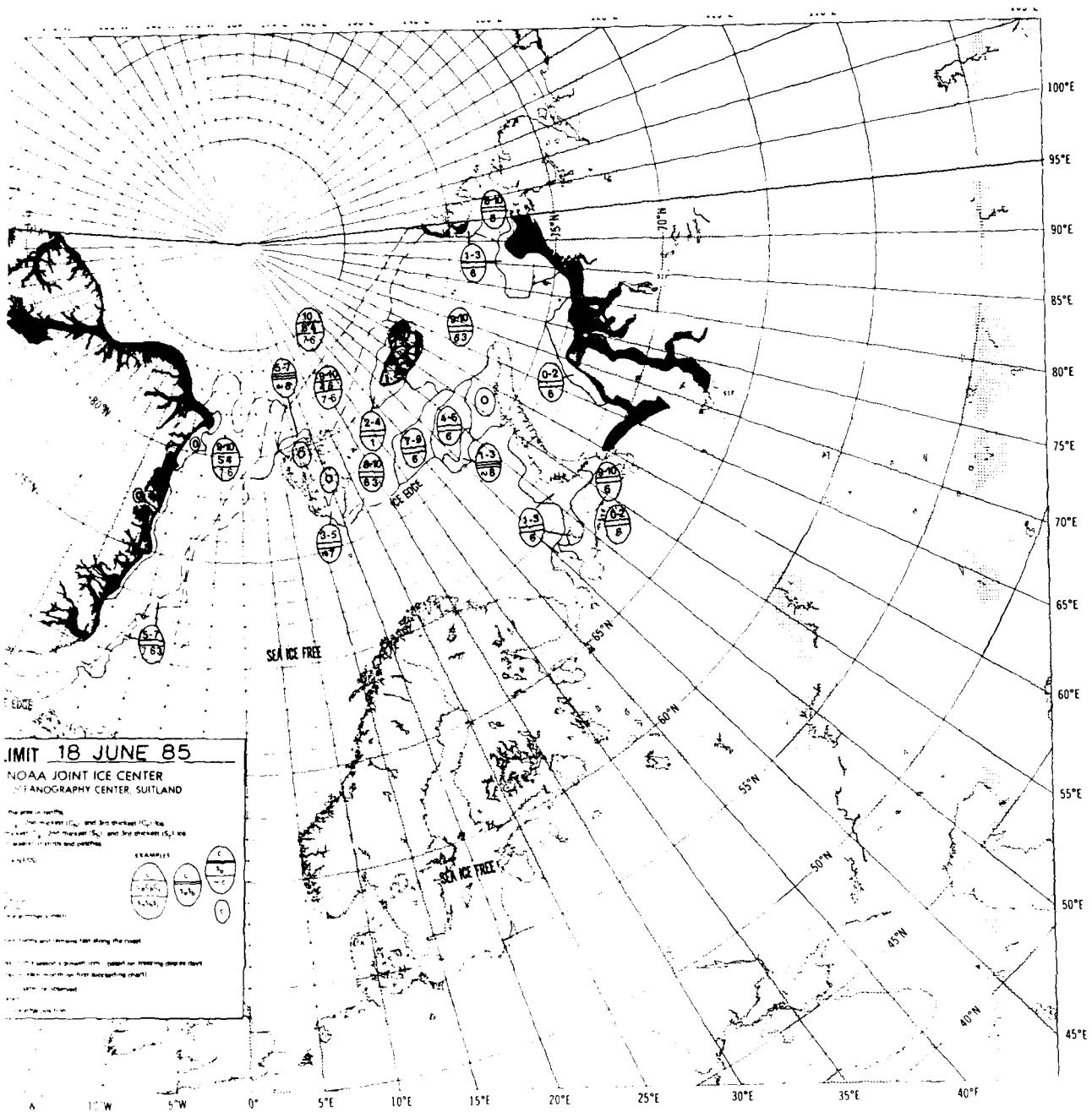












**LIMIT 18 JUNE 85**  
 NOAA JOINT ICE CENTER  
 HYDROGRAPHIC CENTER, SUTLAND

For use in reports:  
 The first number (C<sub>1</sub>) and the second number (C<sub>2</sub>) are  
 the number of icebergs (C<sub>1</sub>) and the number of ice  
 chunks (C<sub>2</sub>) in the area.

EXAMPLES:

|                  |                |                |
|------------------|----------------|----------------|
| $\frac{10}{100}$ | $\frac{5}{10}$ | $\frac{0}{10}$ |
|------------------|----------------|----------------|

For use in reports:  
 The first number (C<sub>1</sub>) and the second number (C<sub>2</sub>) are  
 the number of icebergs (C<sub>1</sub>) and the number of ice  
 chunks (C<sub>2</sub>) in the area.

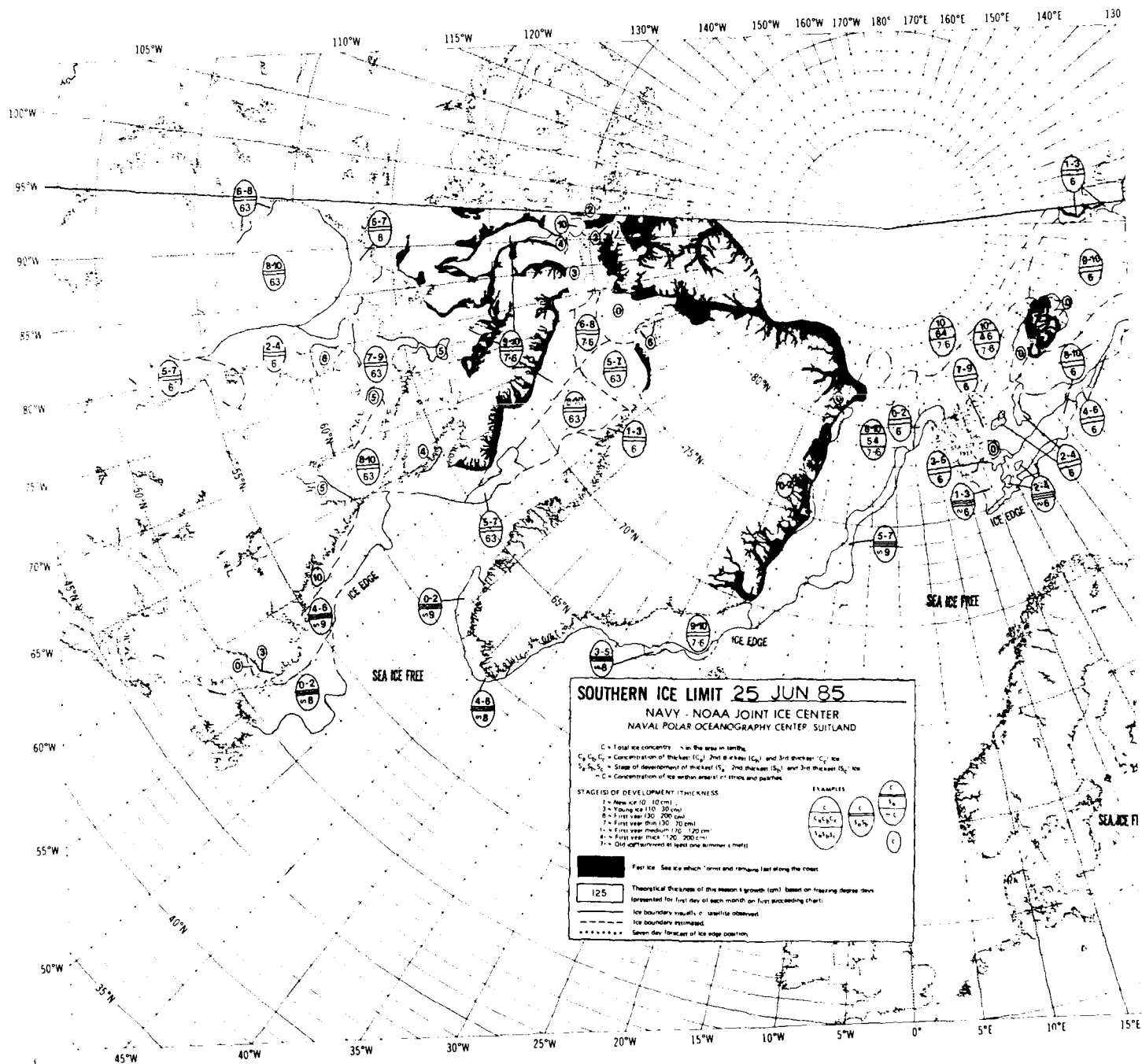
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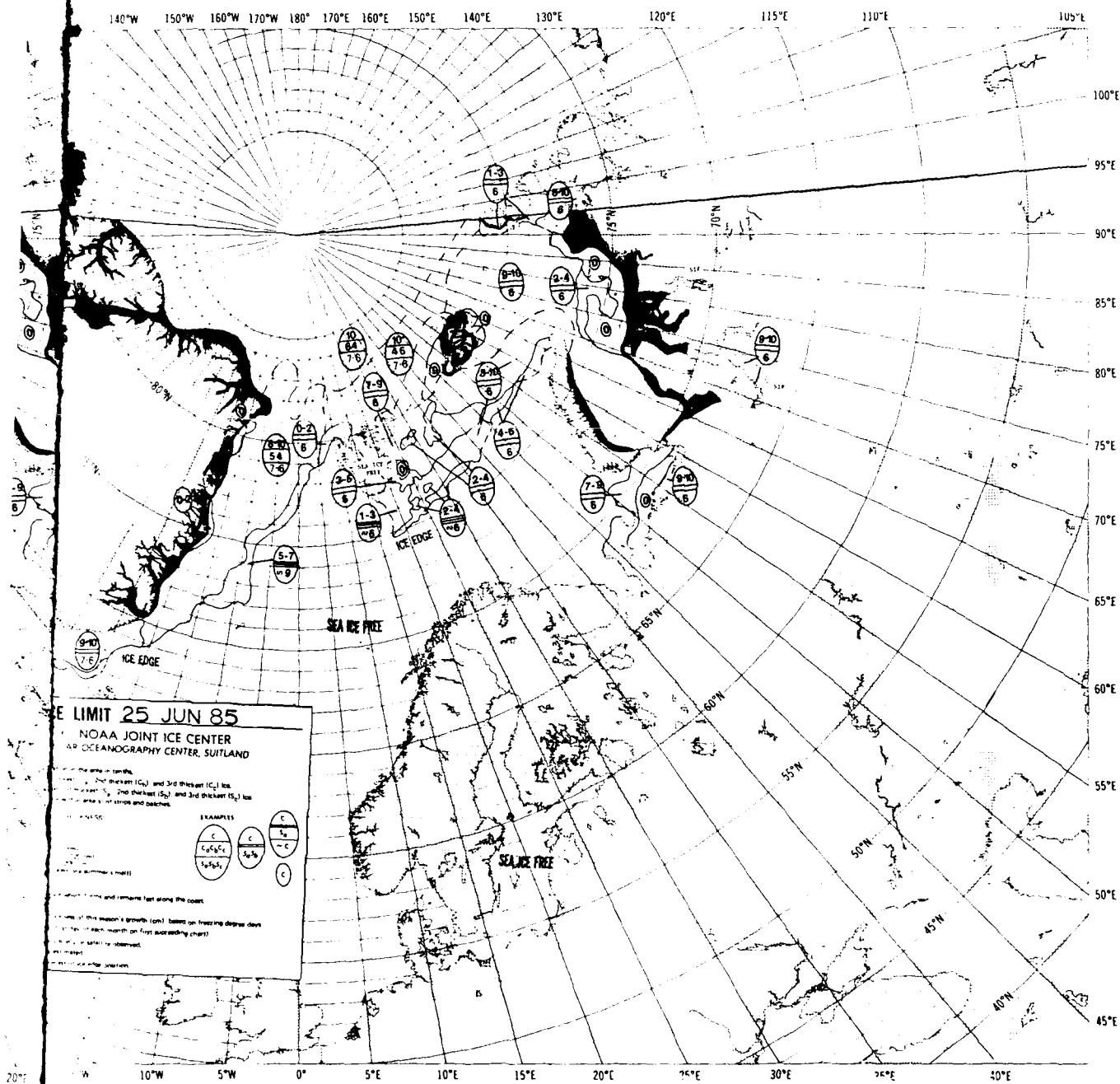
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| $\frac{10}{100}$ | $\frac{5}{10}$ | $\frac{0}{10}$ |
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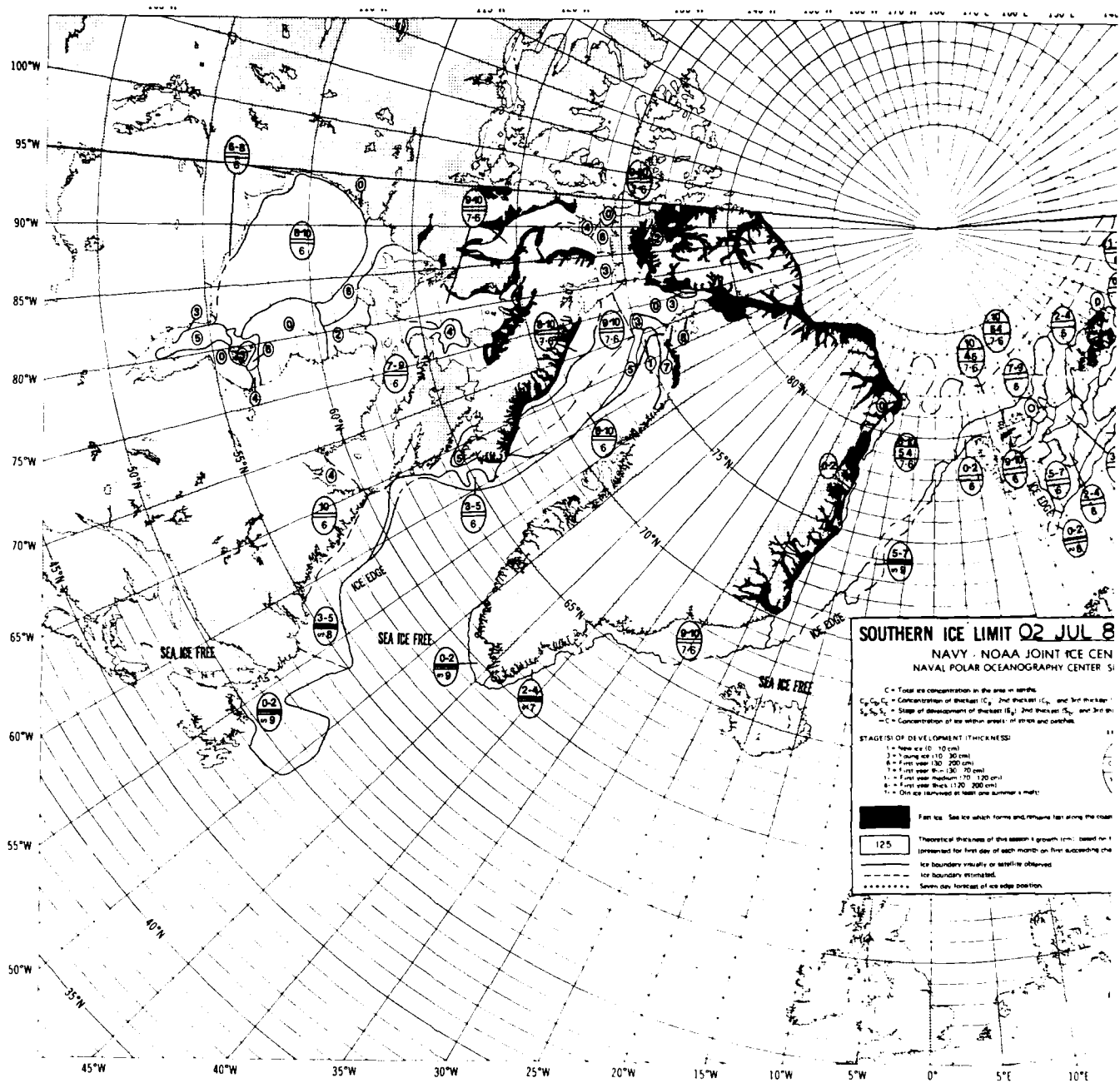
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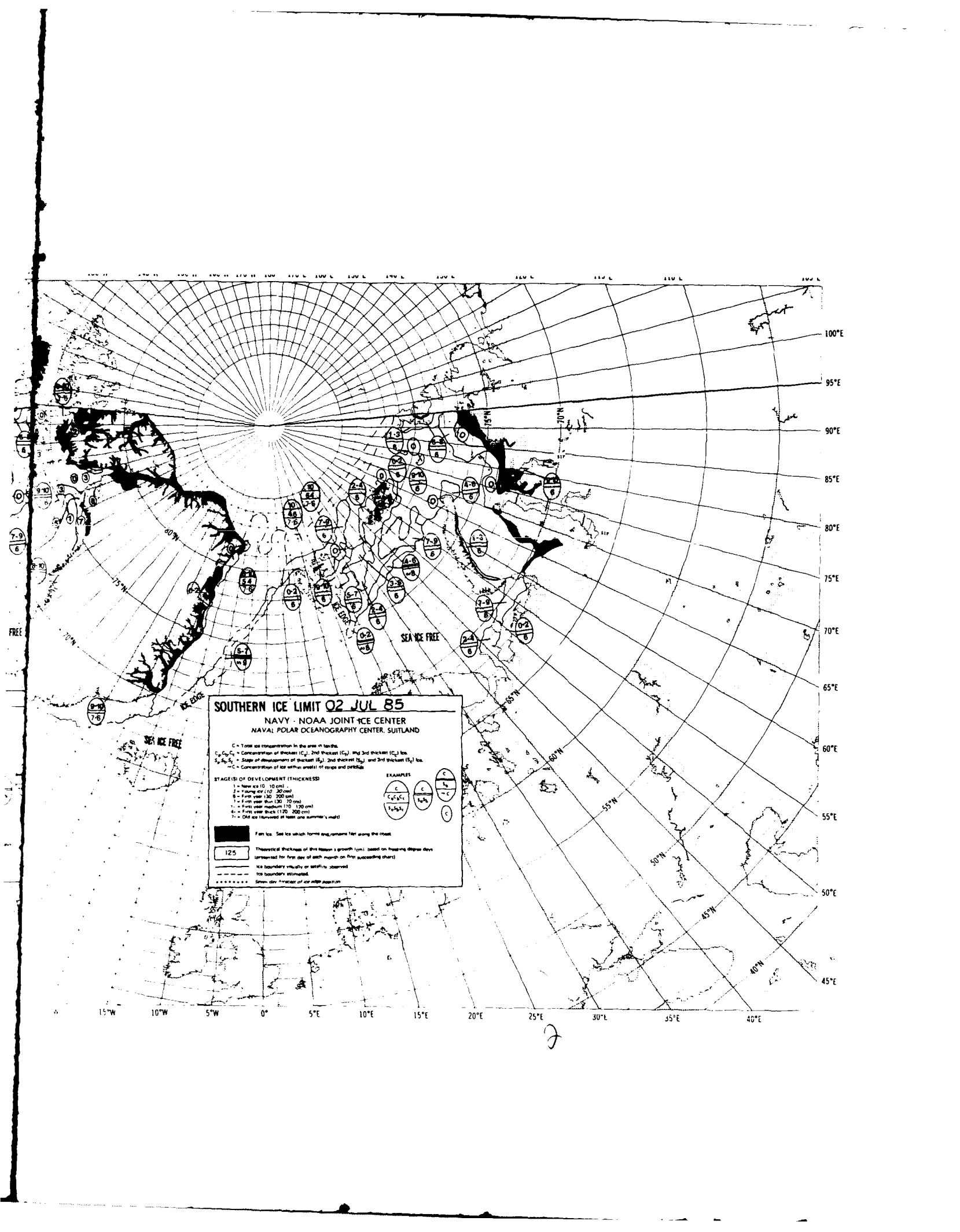
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| $\frac{10}{100}$ | $\frac{5}{10}$ | $\frac{0}{10}$ |
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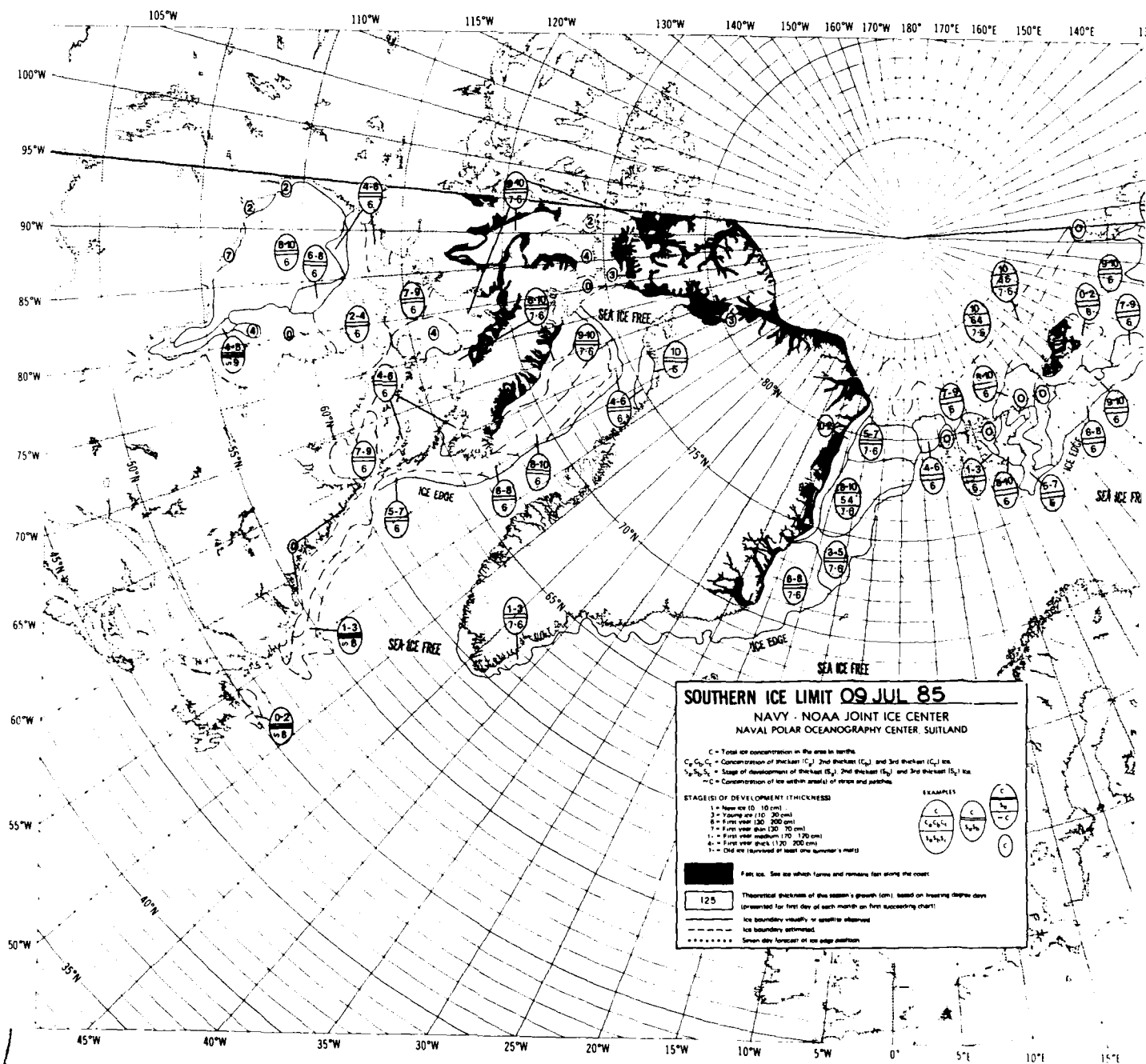


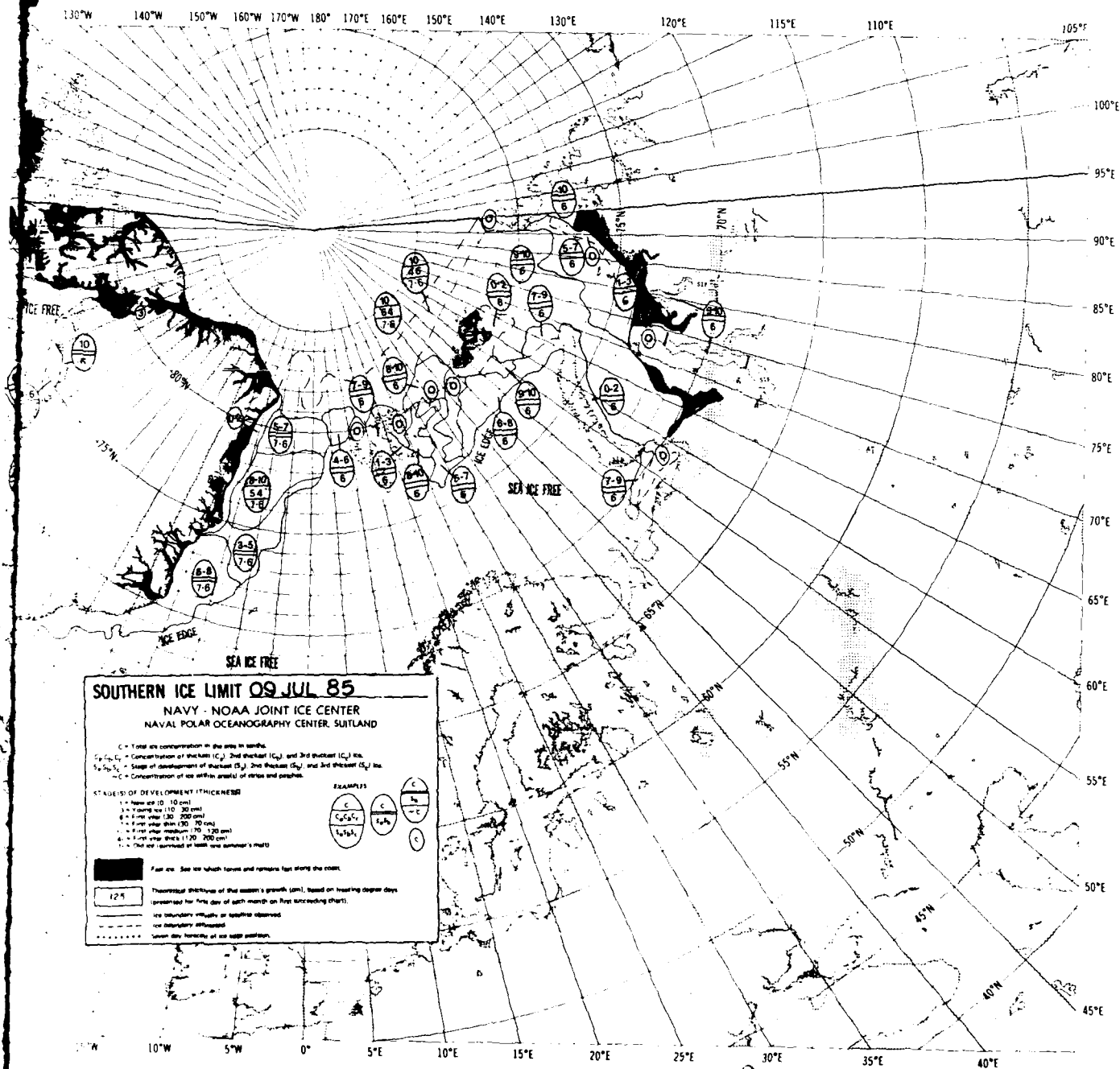


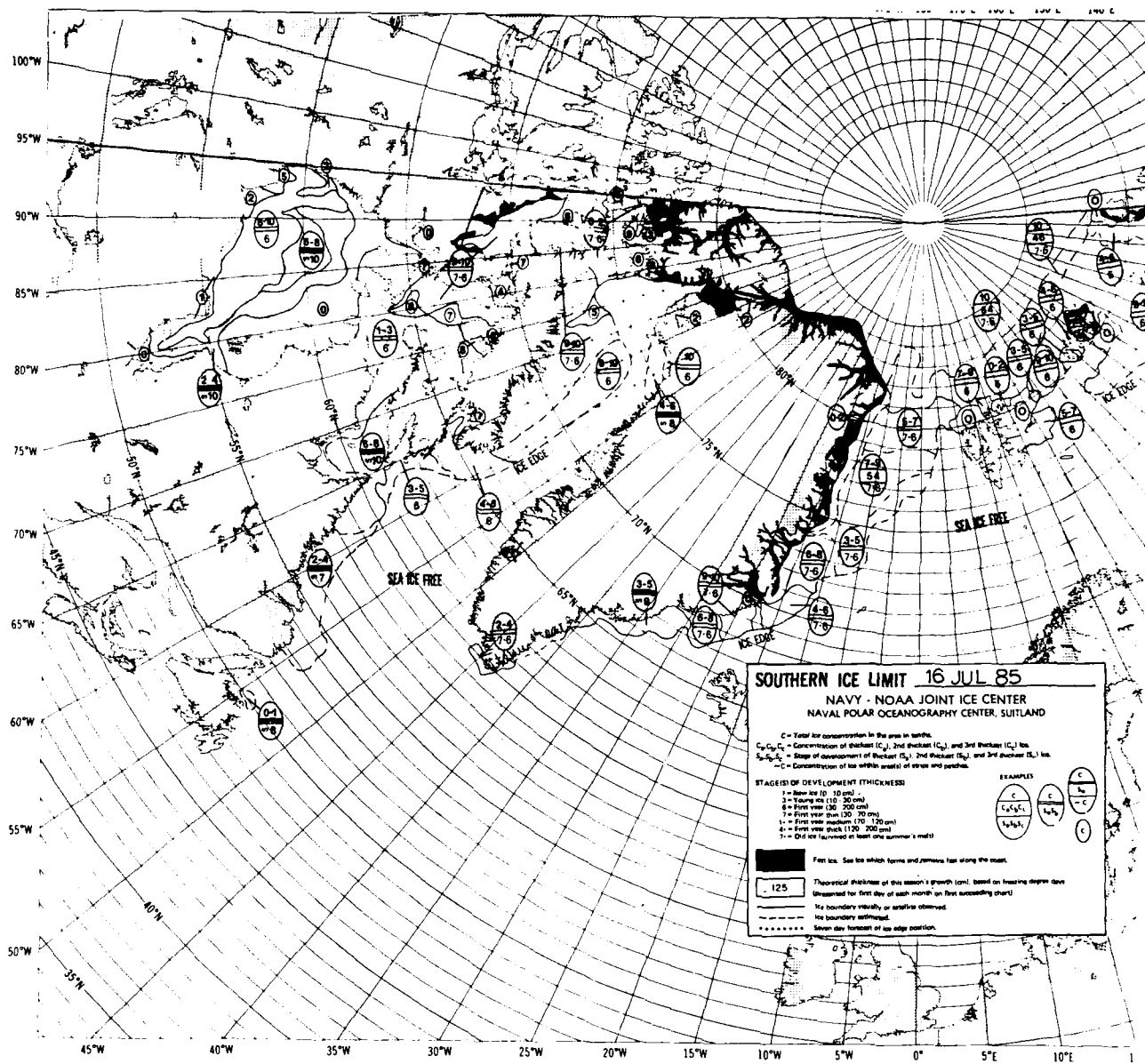
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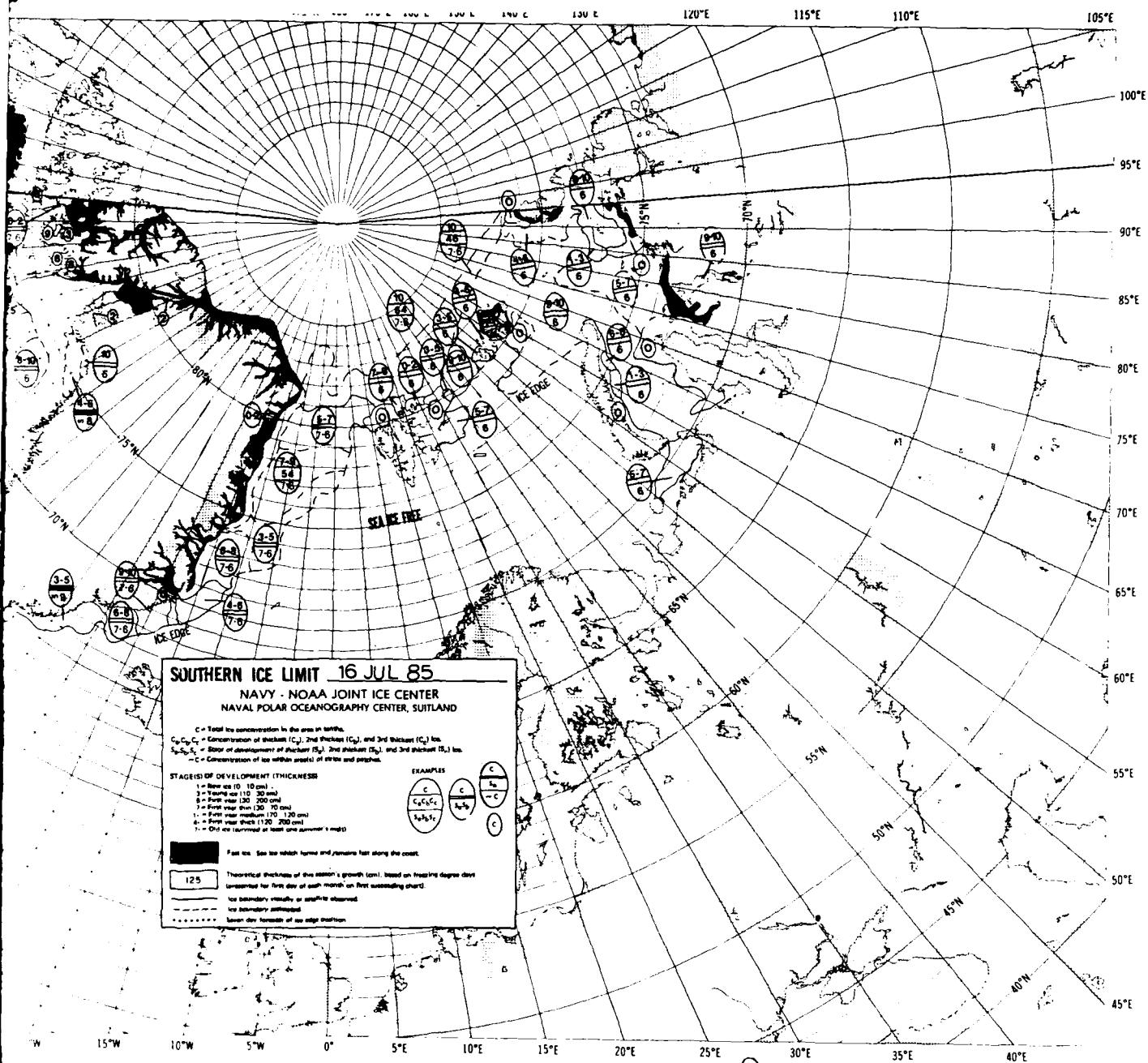


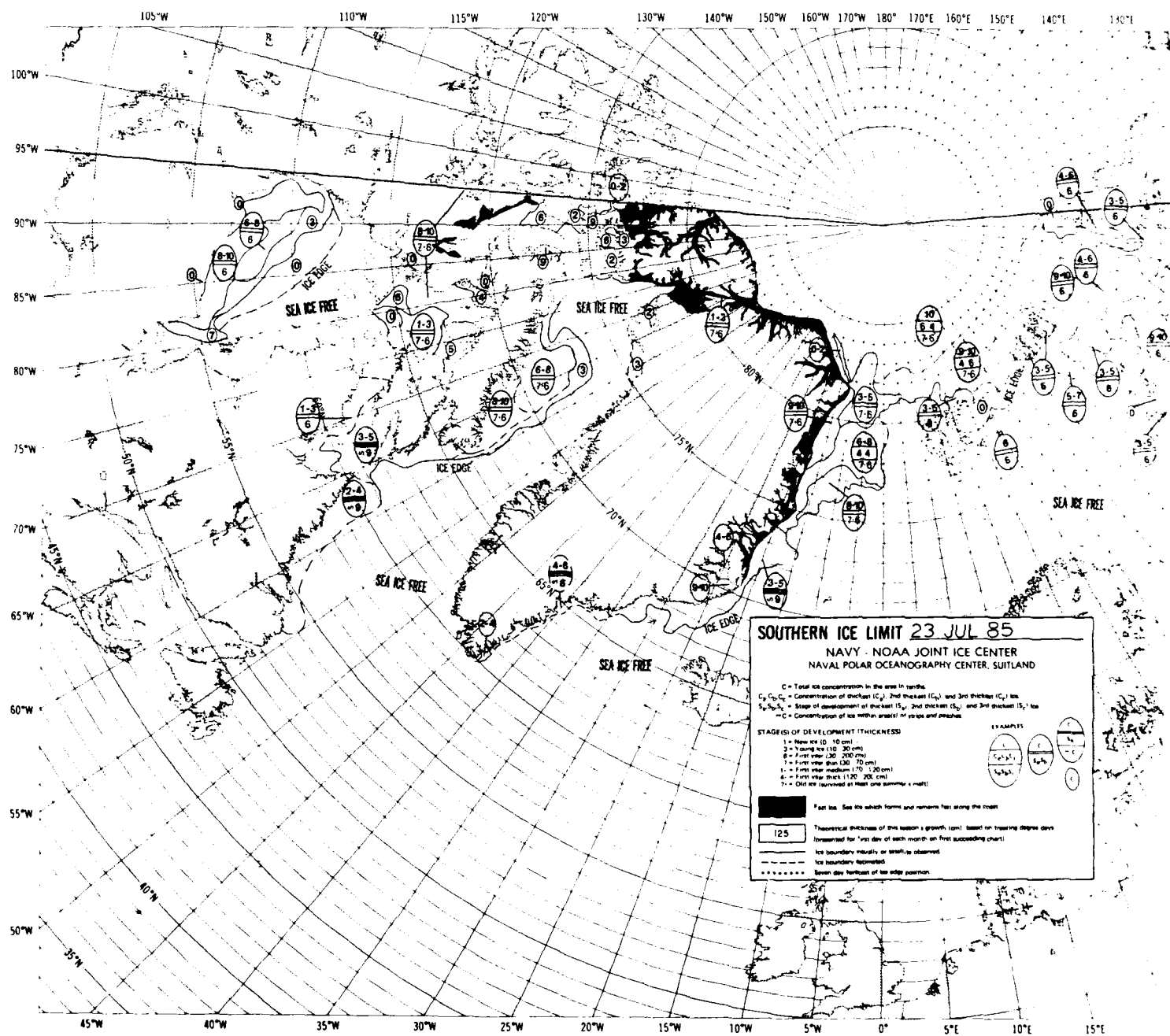


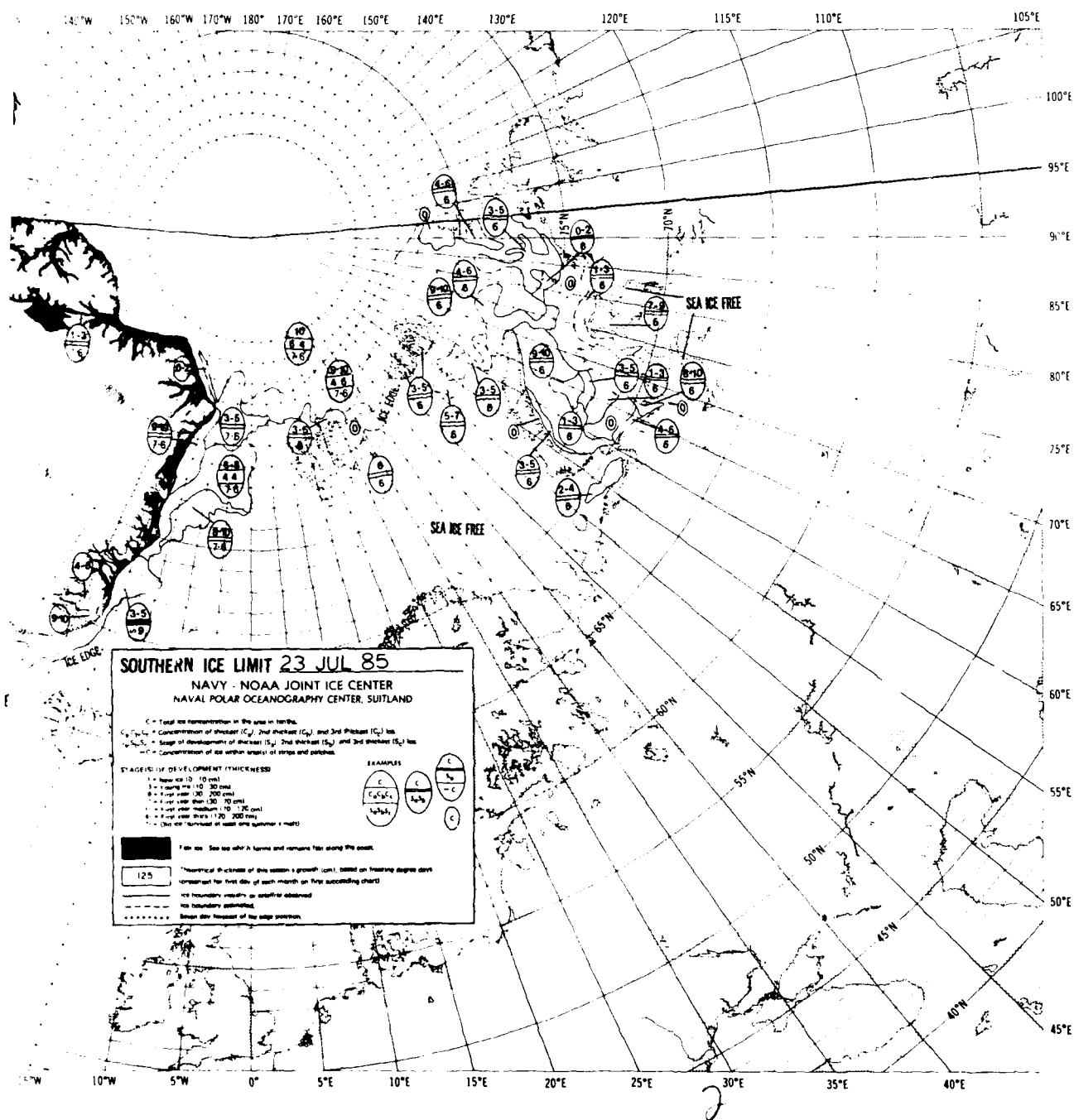


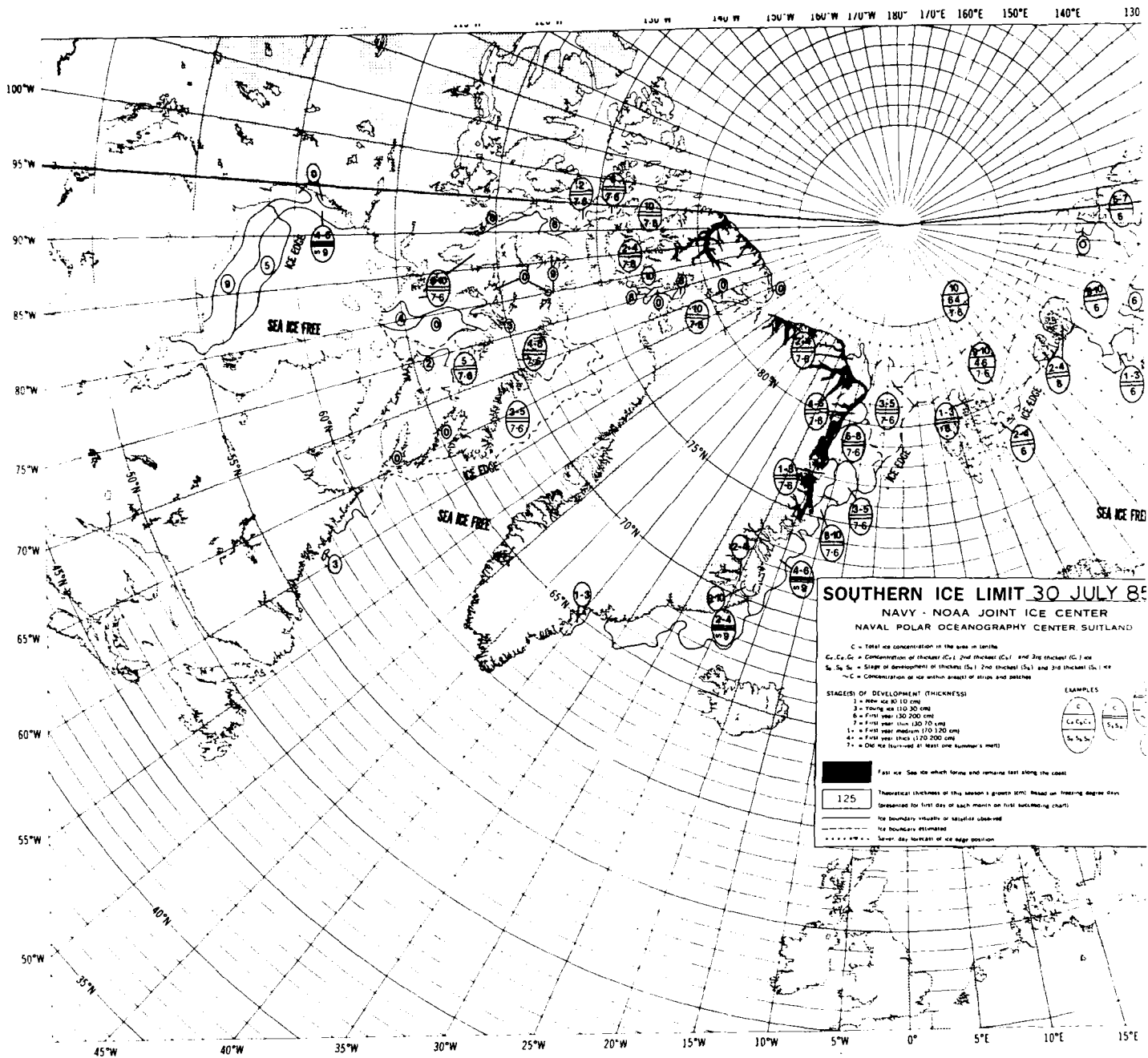


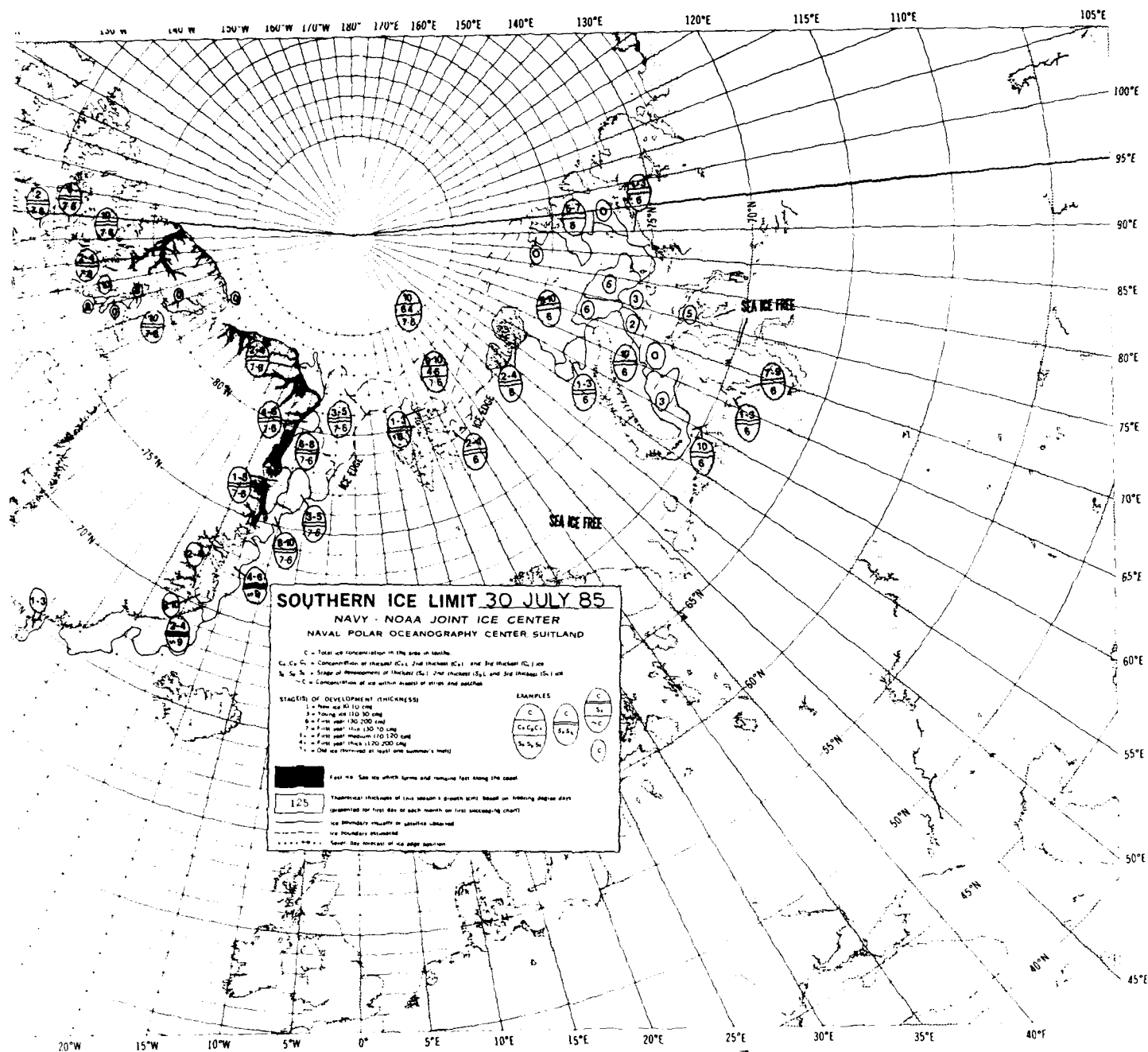


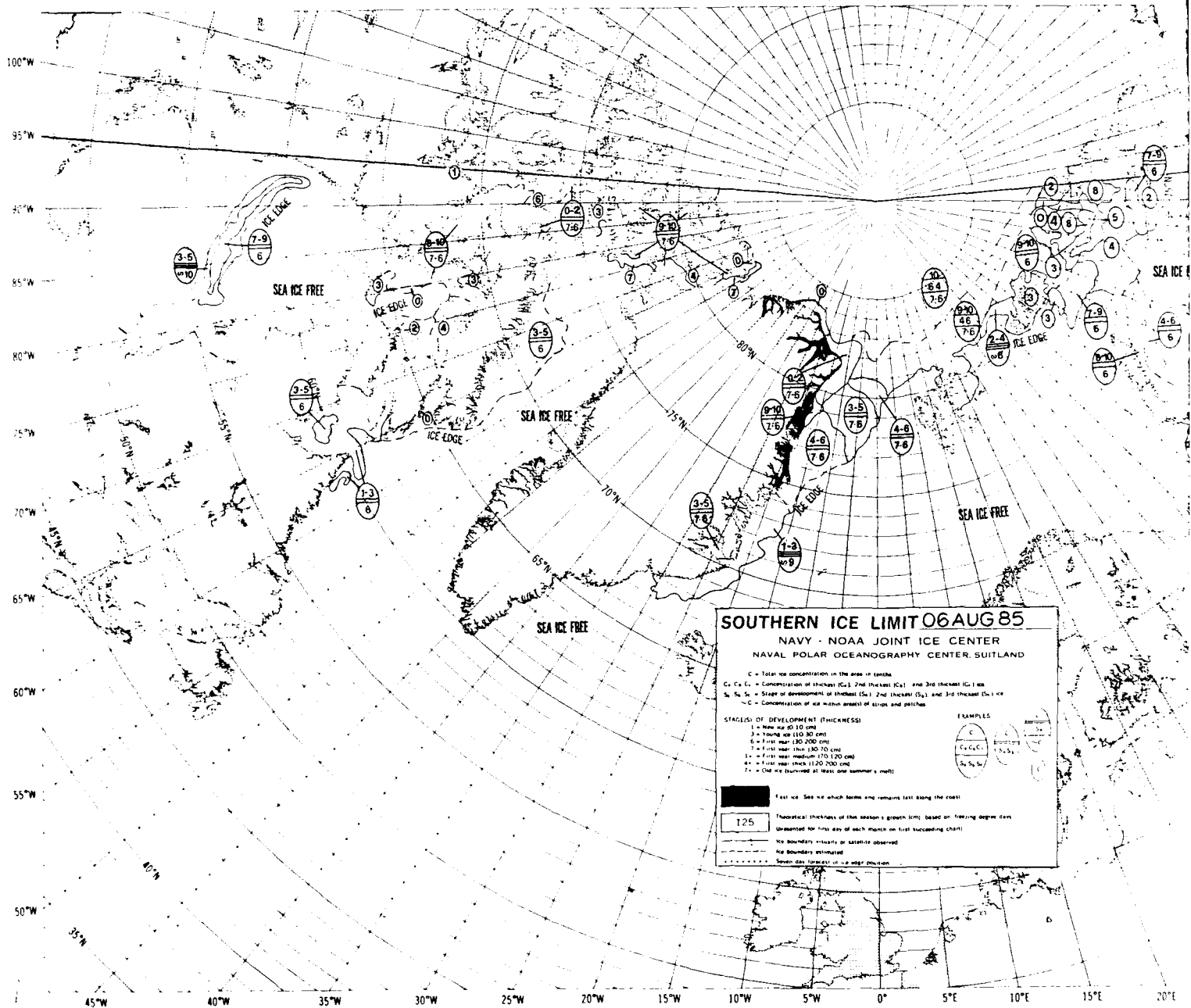


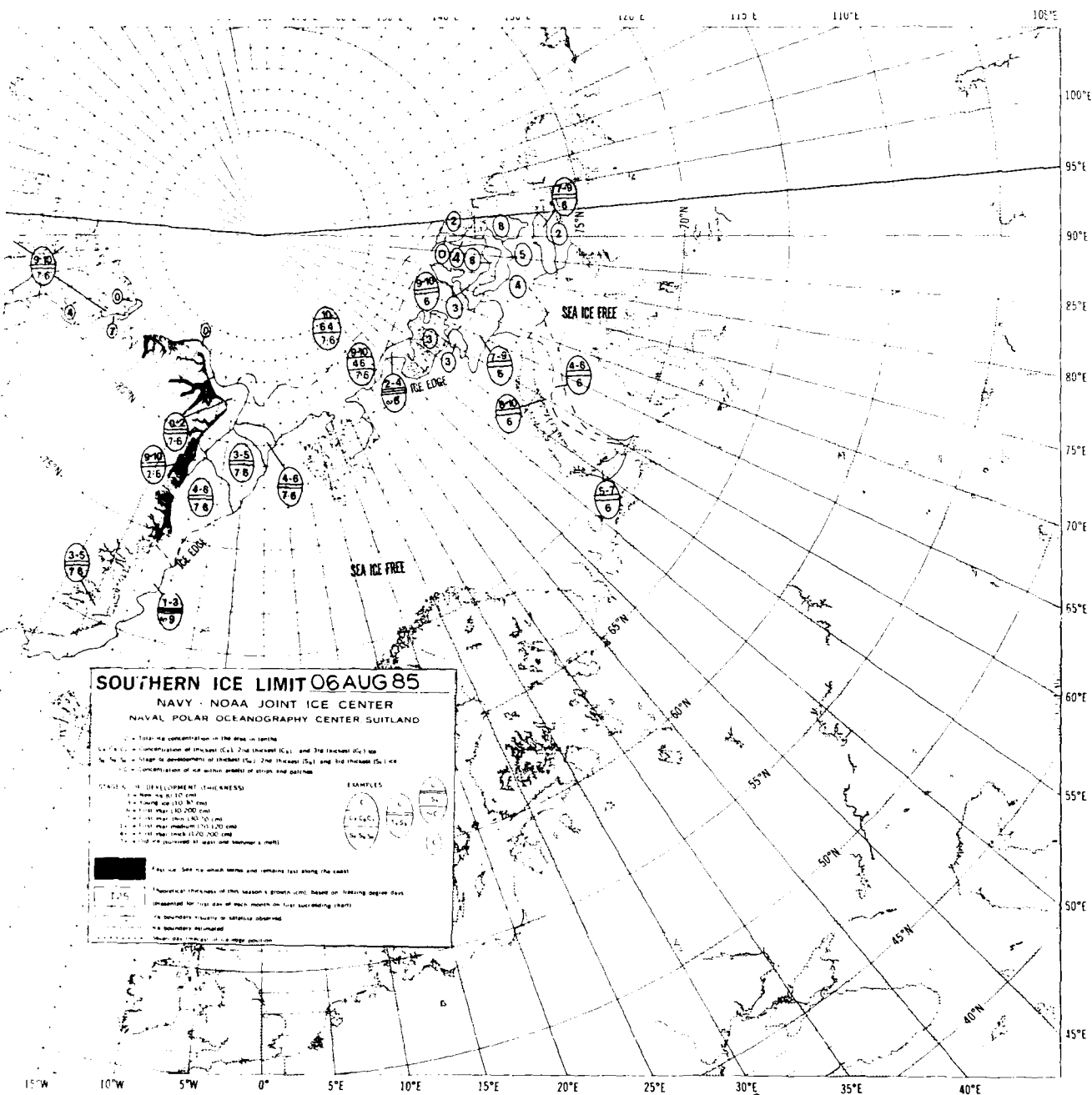


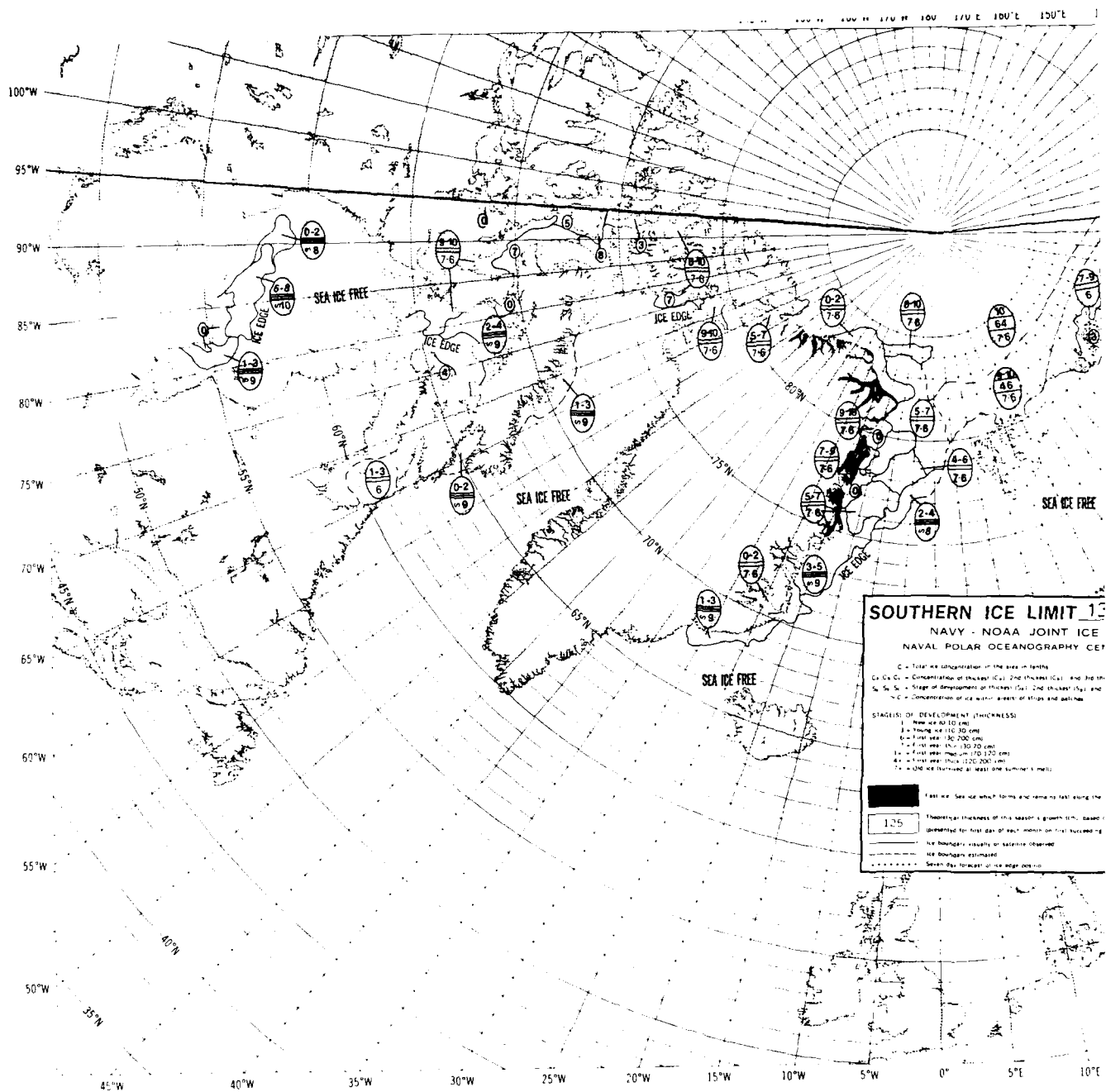


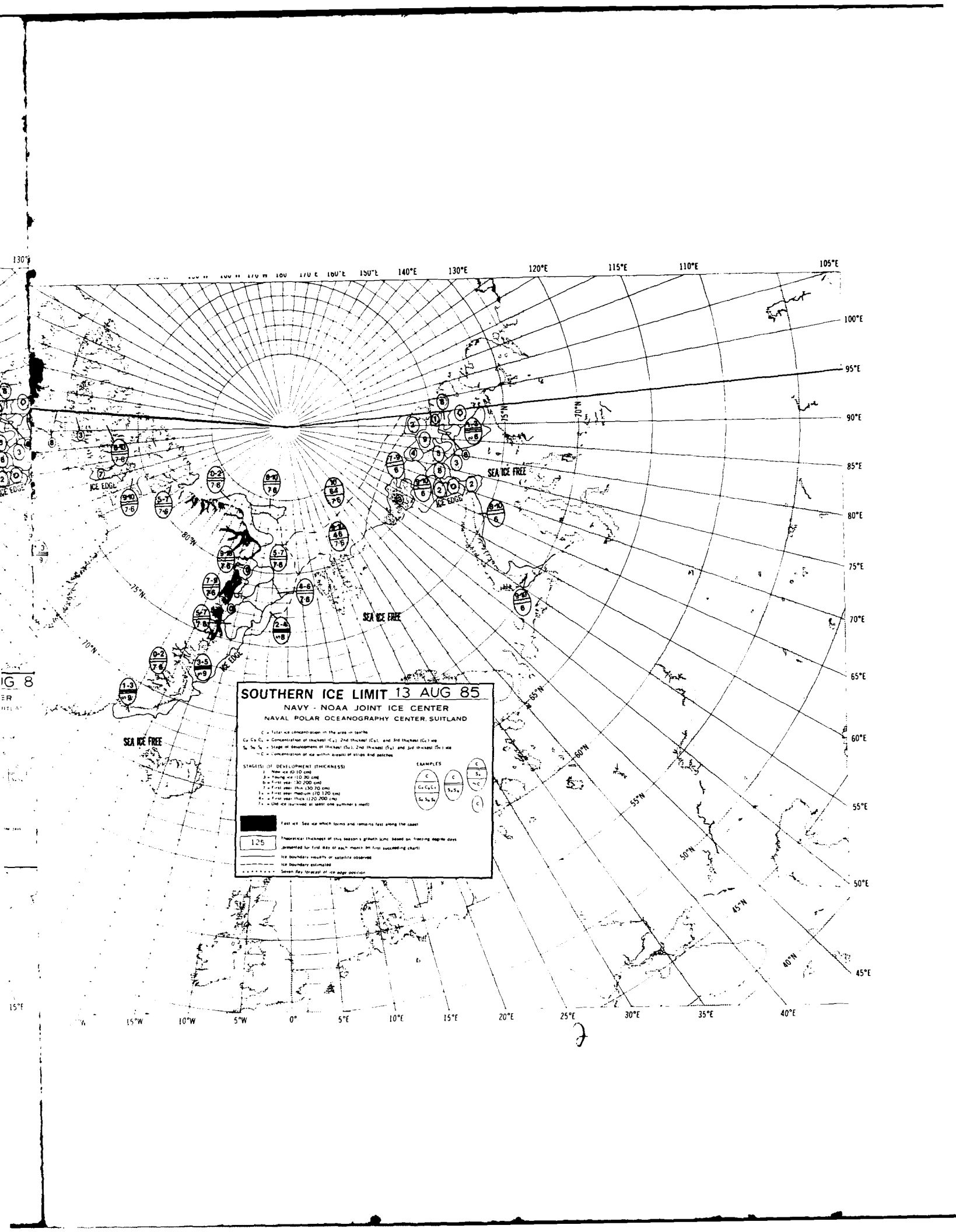


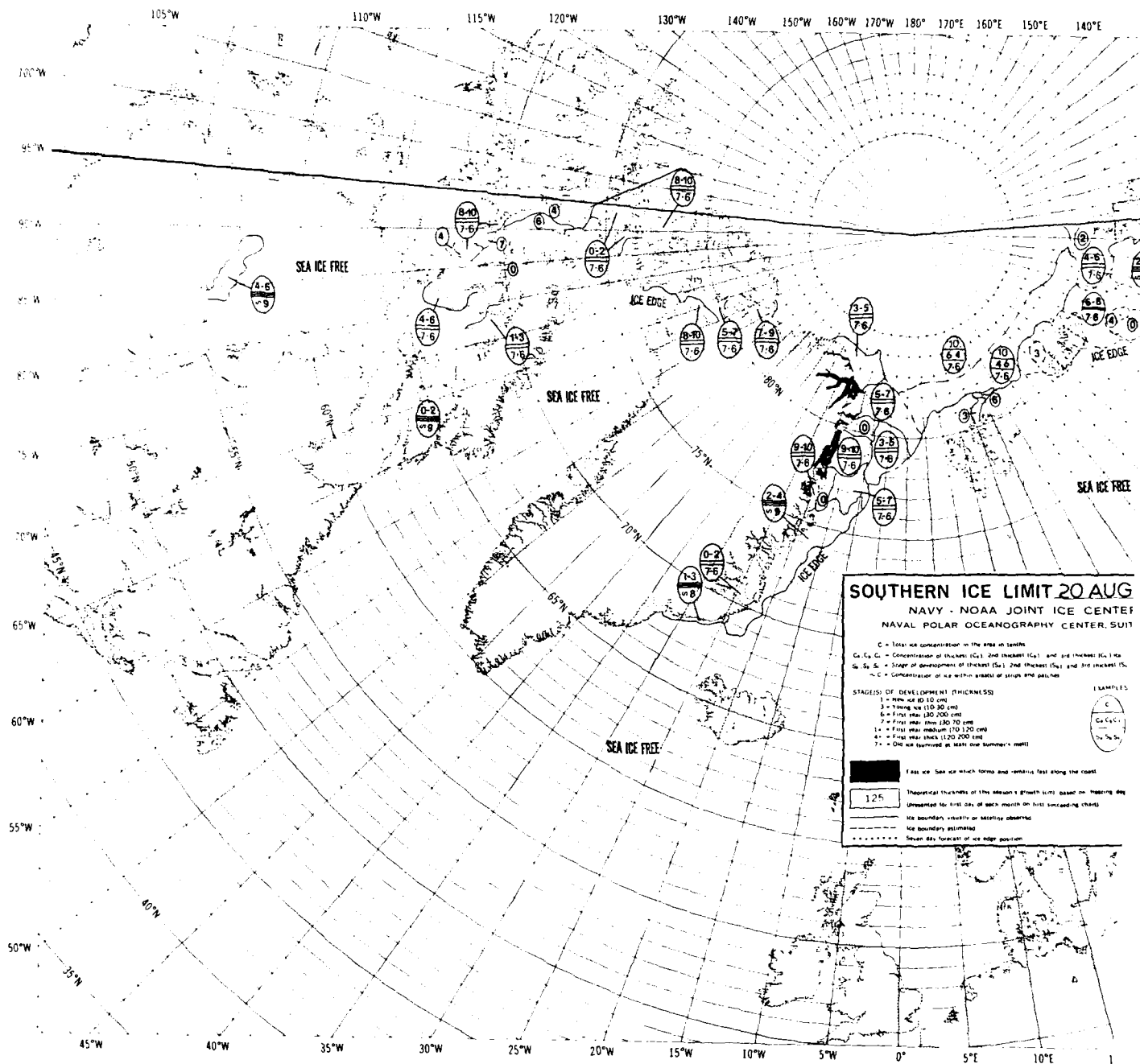


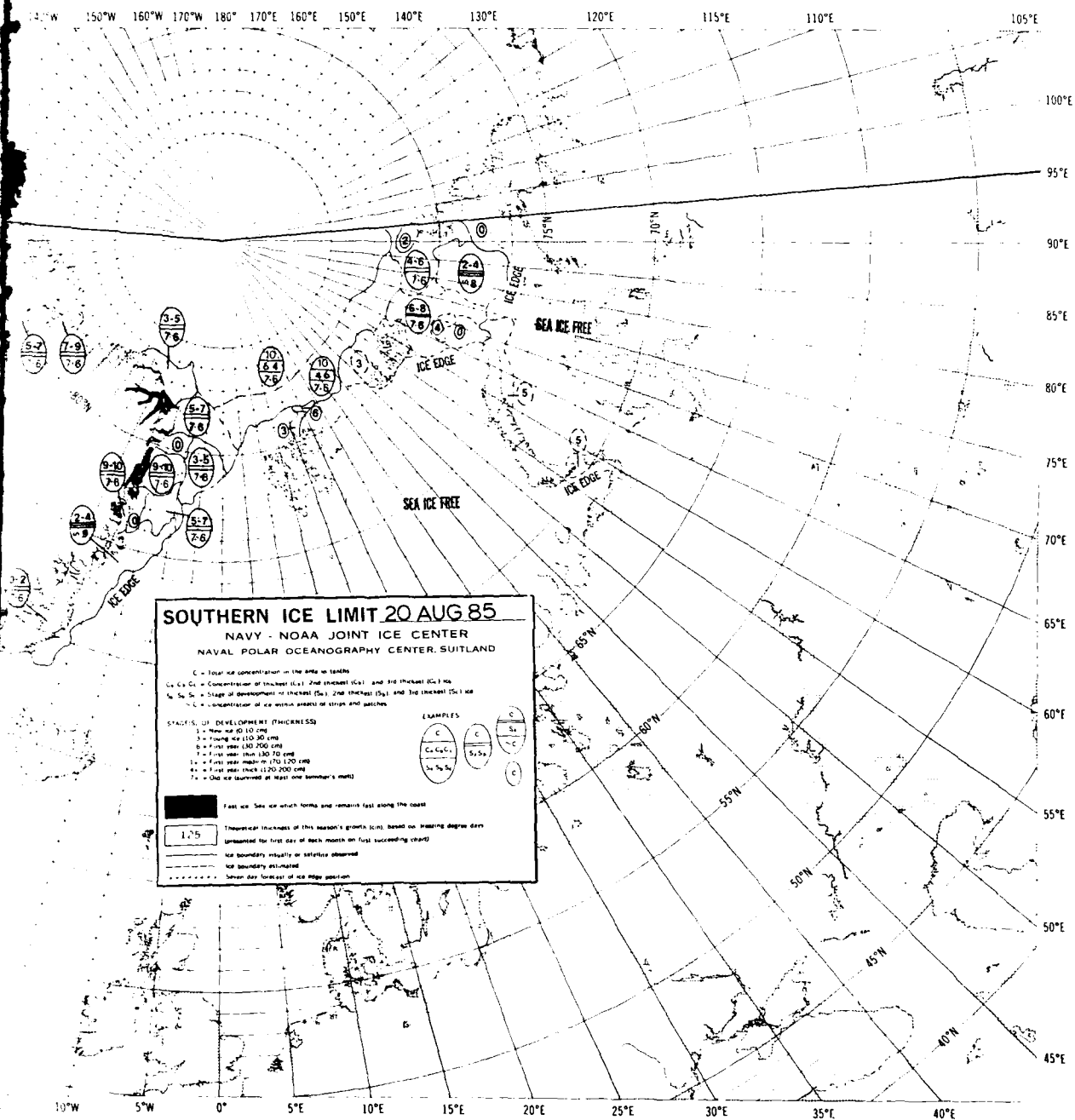


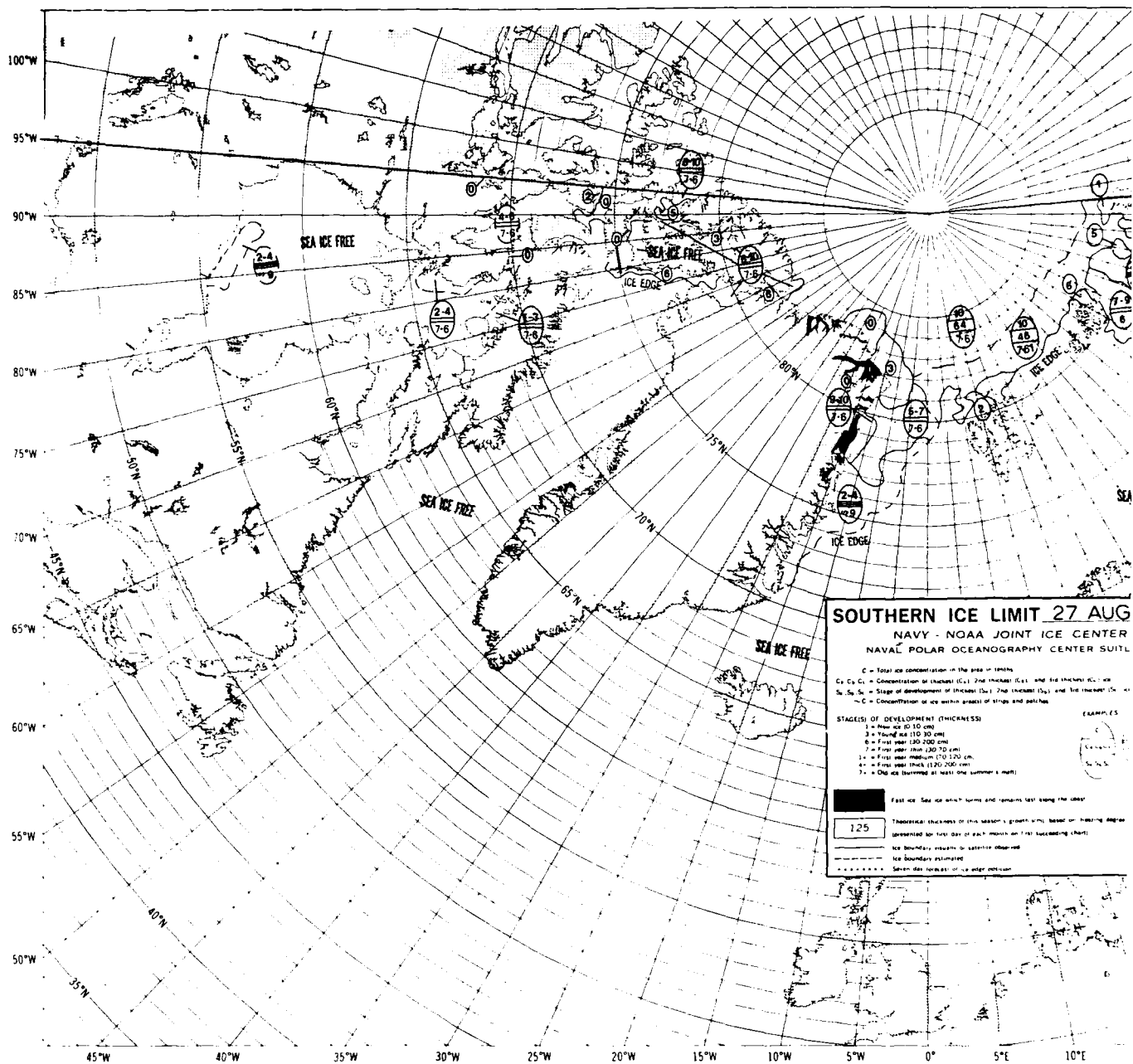












# SOUTHERN ICE LIMIT 27 AUG 85

NAVY - NOAA JOINT ICE CENTER  
NAVAL POLAR OCEANOGRAPHY CENTER SUITLAND

C = Total ice concentration in the area in tenths  
C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub> = Concentration of thickness (C<sub>1</sub>), 2nd thickness (C<sub>2</sub>), and 3rd thickness (C<sub>3</sub>) in tenths  
S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub> = Slope or percentage of thickness (S<sub>1</sub>), 2nd thickness (S<sub>2</sub>), and 3rd thickness (S<sub>3</sub>) in tenths  
C = Concentration of ice within strakes of strake and patches

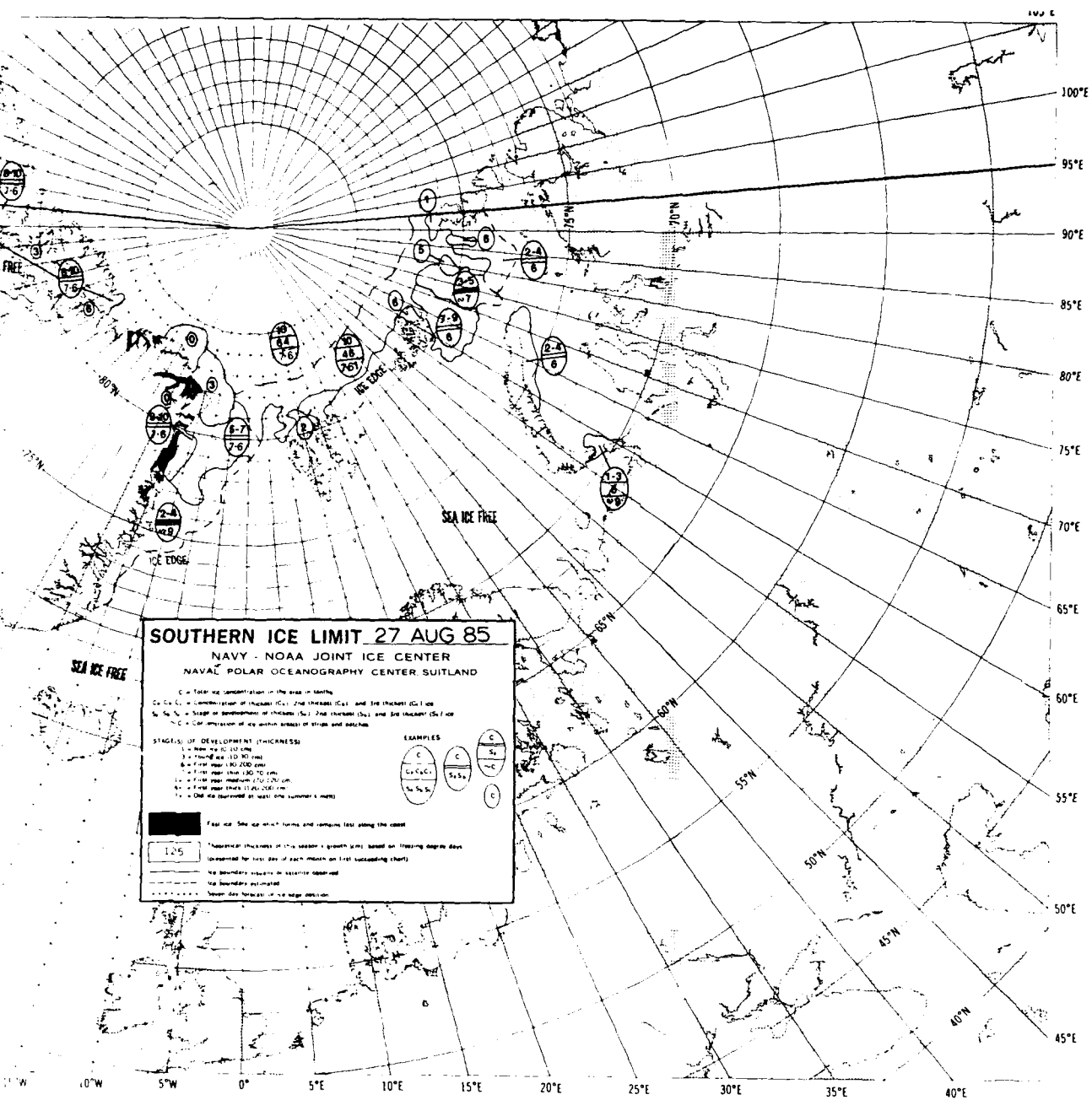
## STAGES OF DEVELOPMENT (THICKNESS)

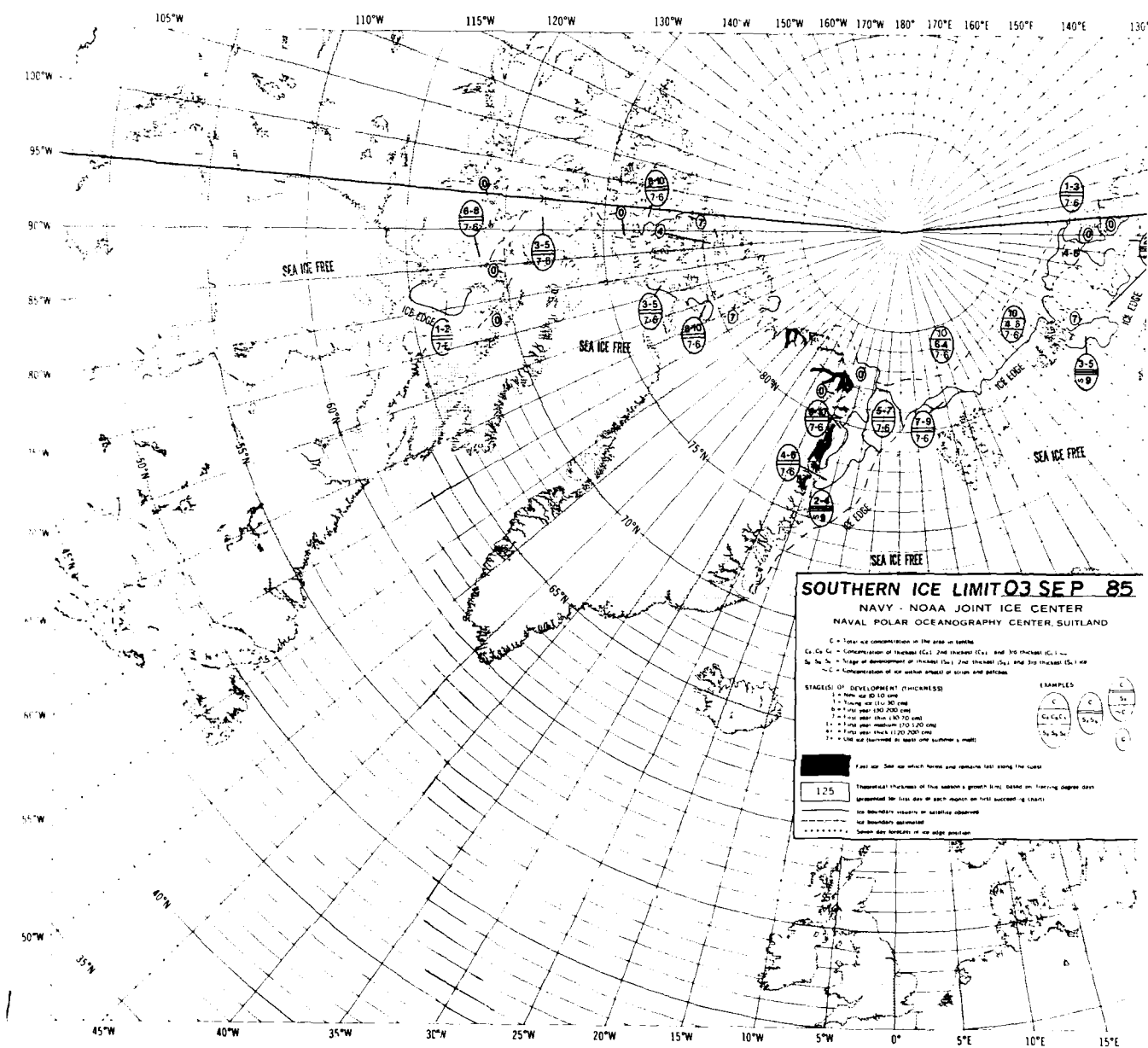
- 1 = New ice (0-10 cm)
- 2 = Young ice (10-30 cm)
- 3 = First year (30-200 cm)
- 4 = First year (over 200 cm)
- 5 = First year (over 100-150 cm)
- 6 = First year (over 150-200 cm)
- 7 = First year (over 200-250 cm)
- 8 = First year (over 250-300 cm)
- 9 = Old ice (over 300 cm)

## EXAMPLES

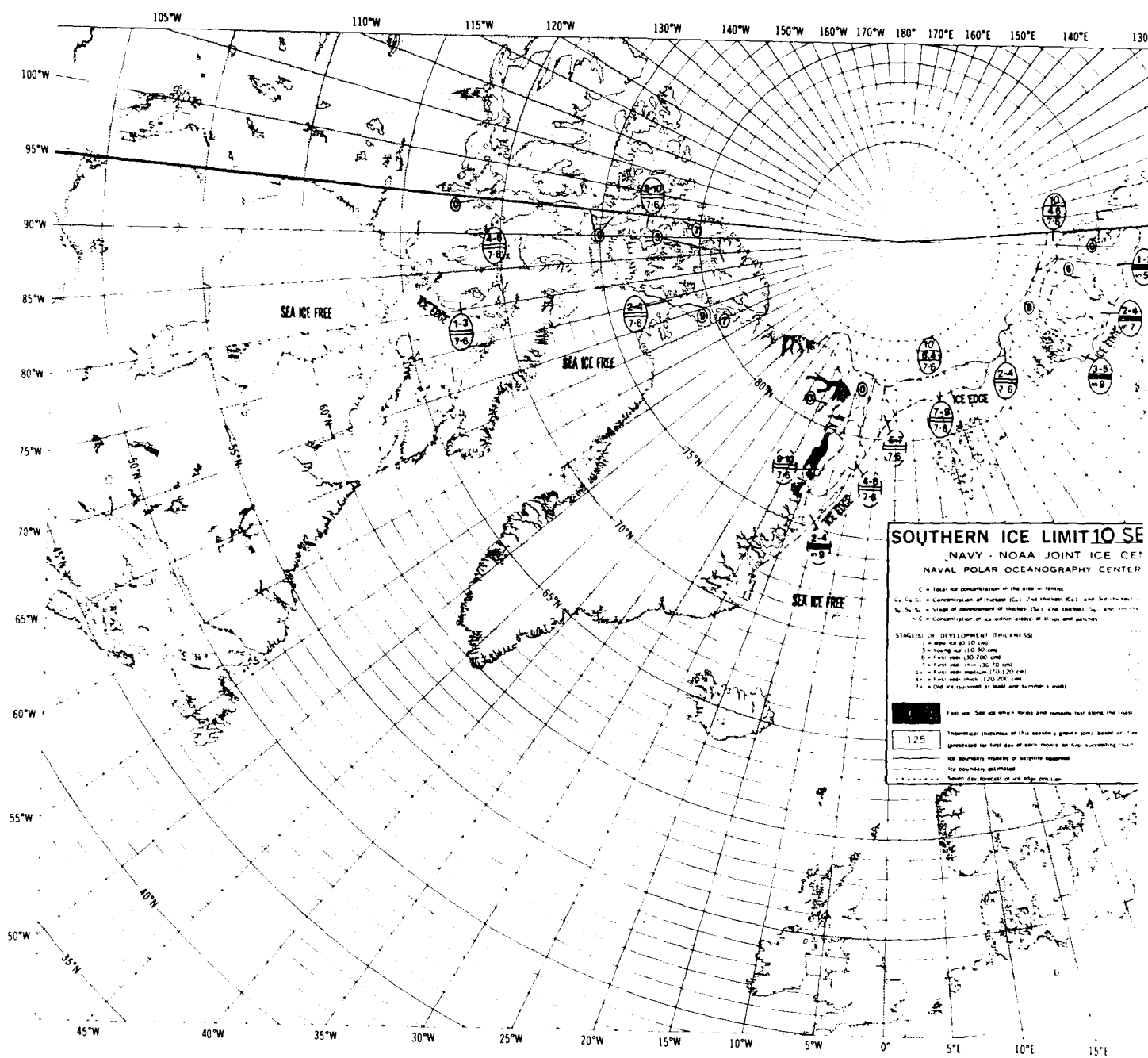


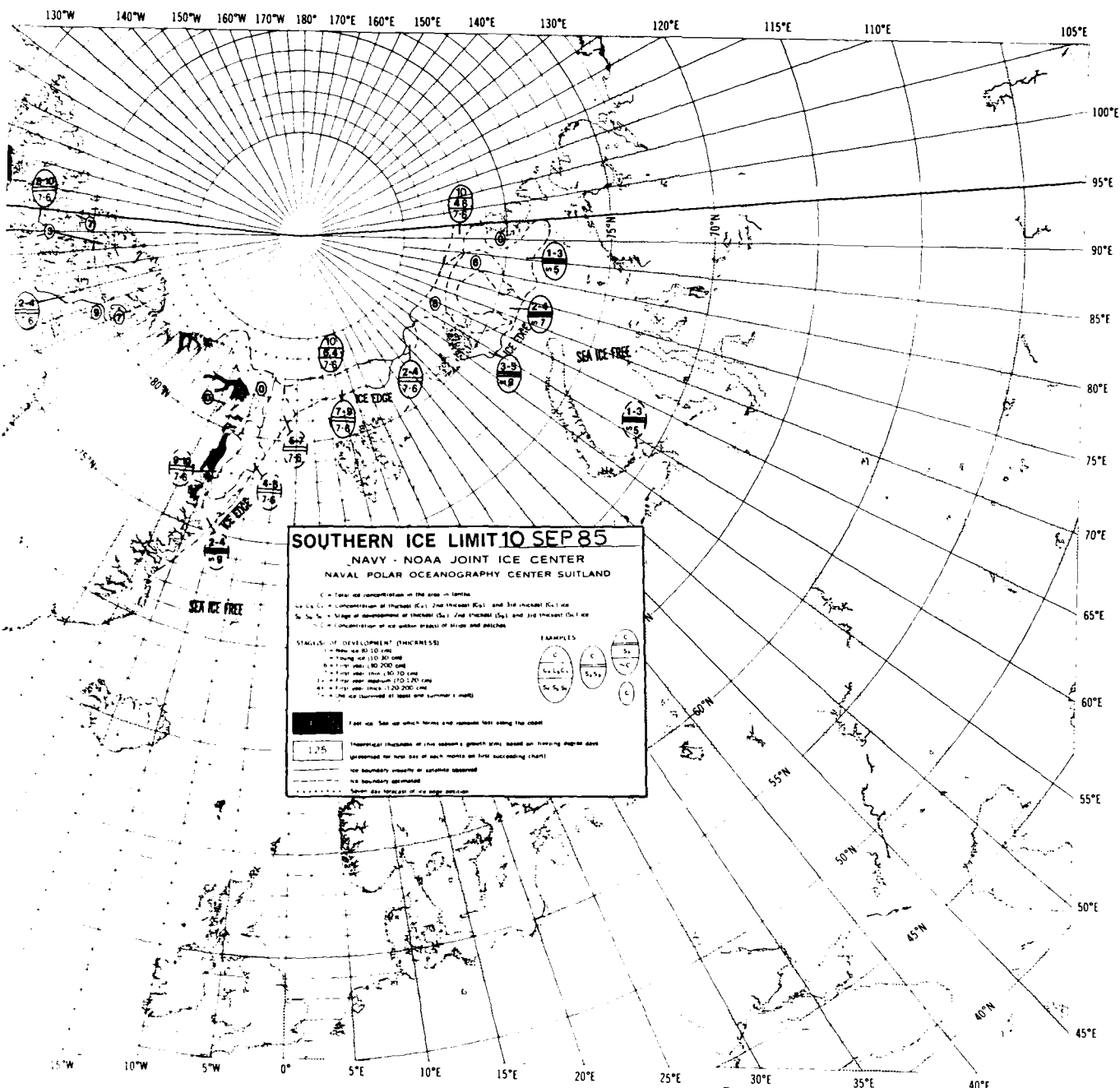
- 125 = Ice concentration in the area in tenths (based on floating degree days) (represented by two dots of each number on first succeeding chart)
- Ice boundary visible in satellite observation
- Ice boundary not visible
- Seamless border of ice edge detection

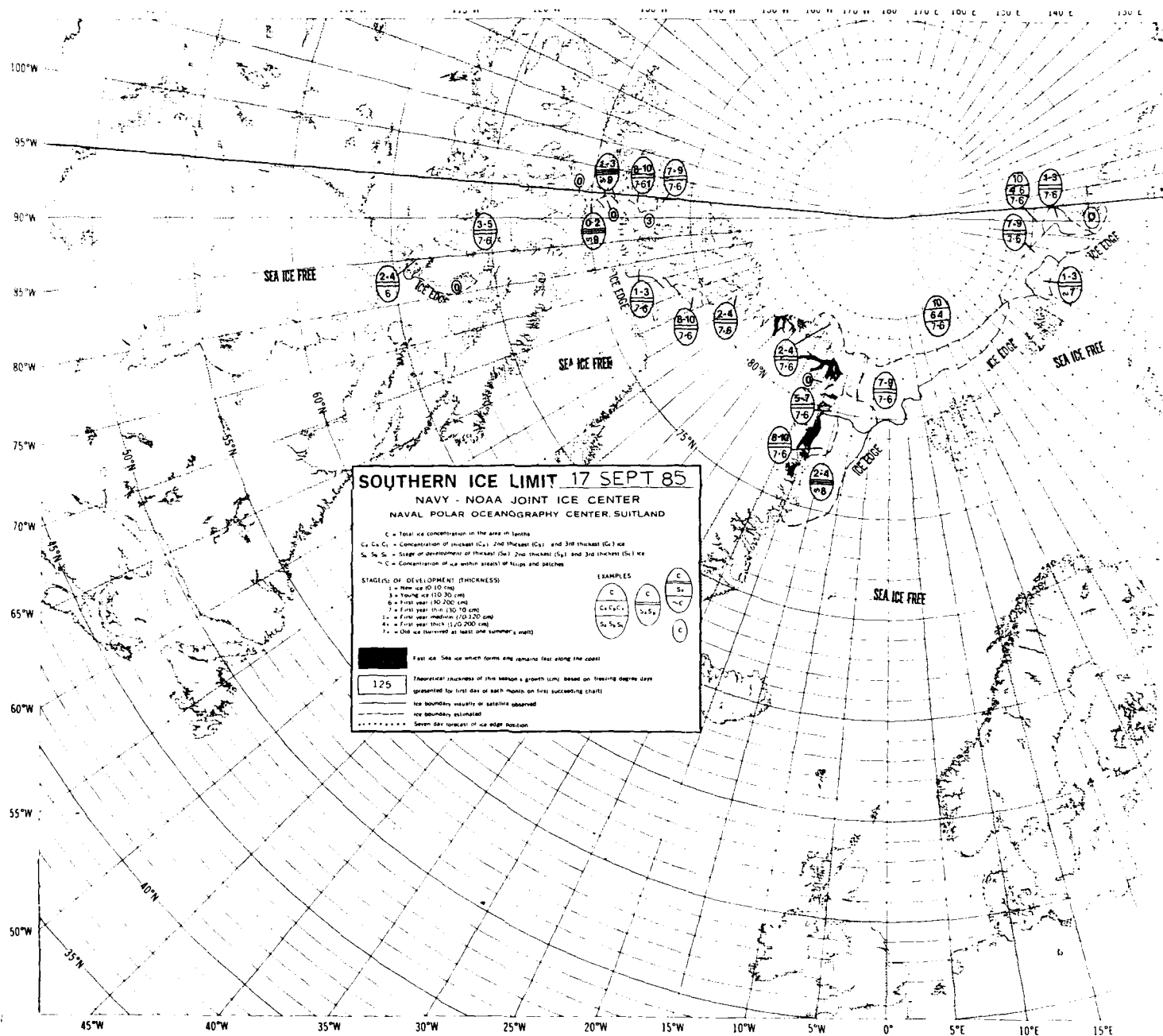


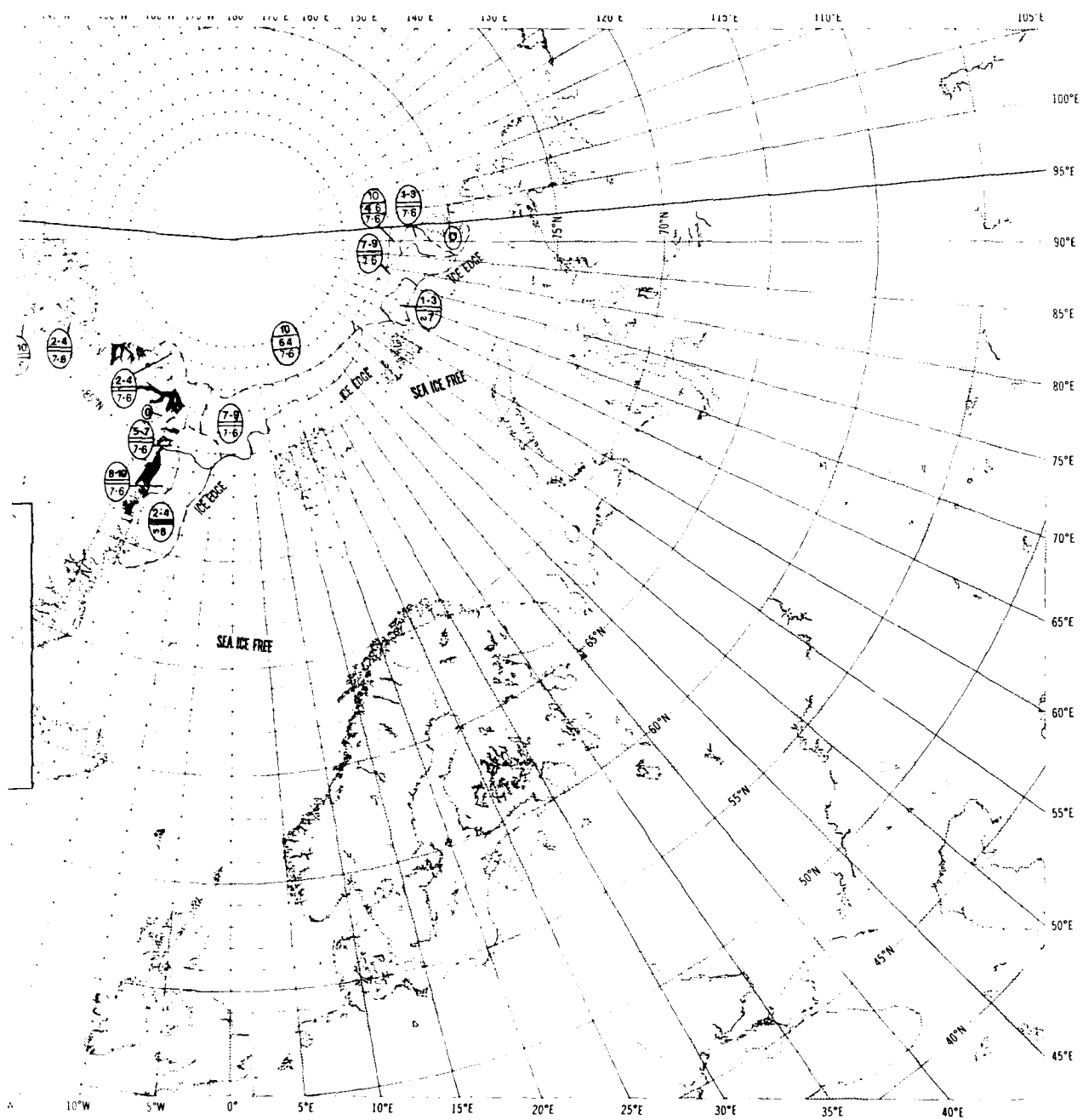


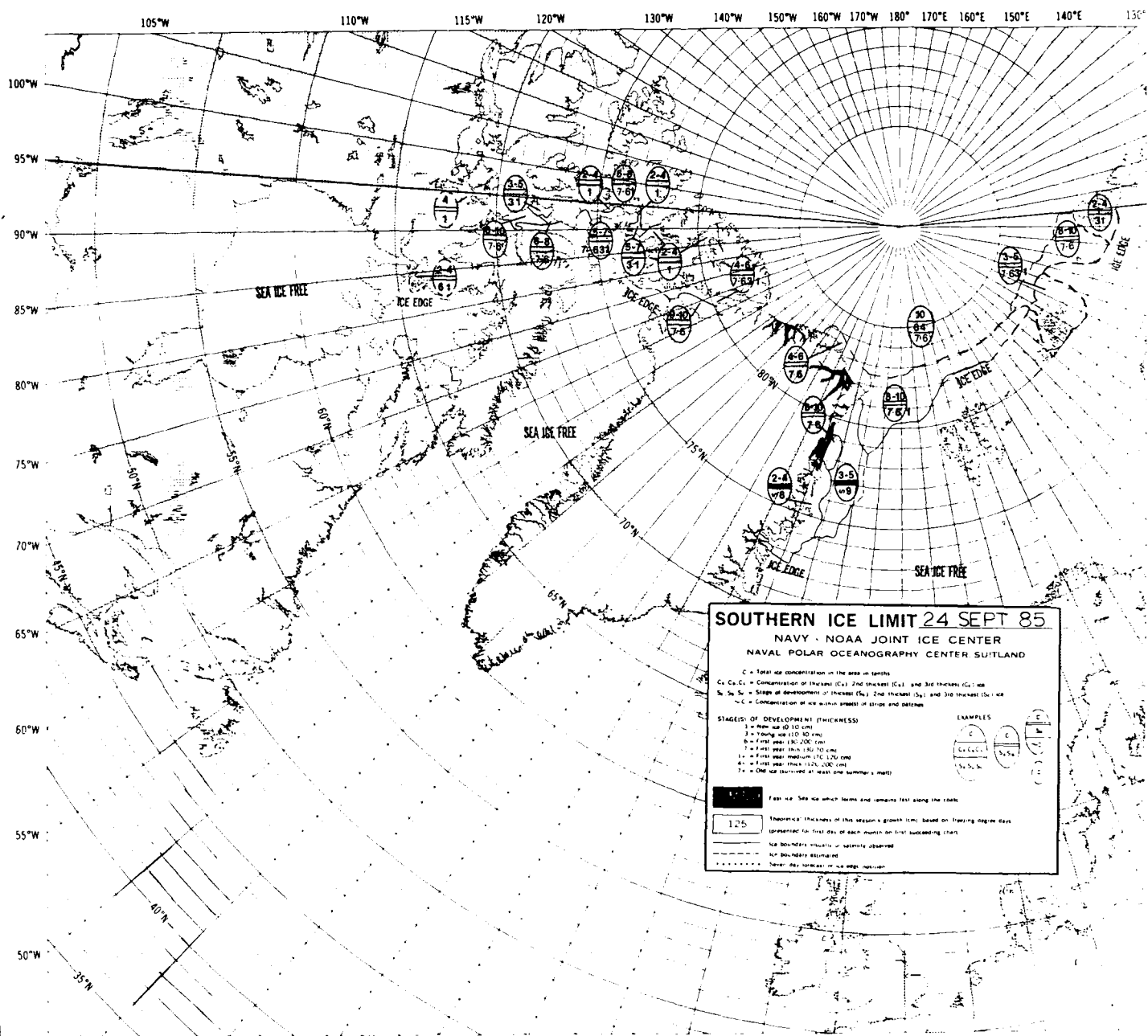


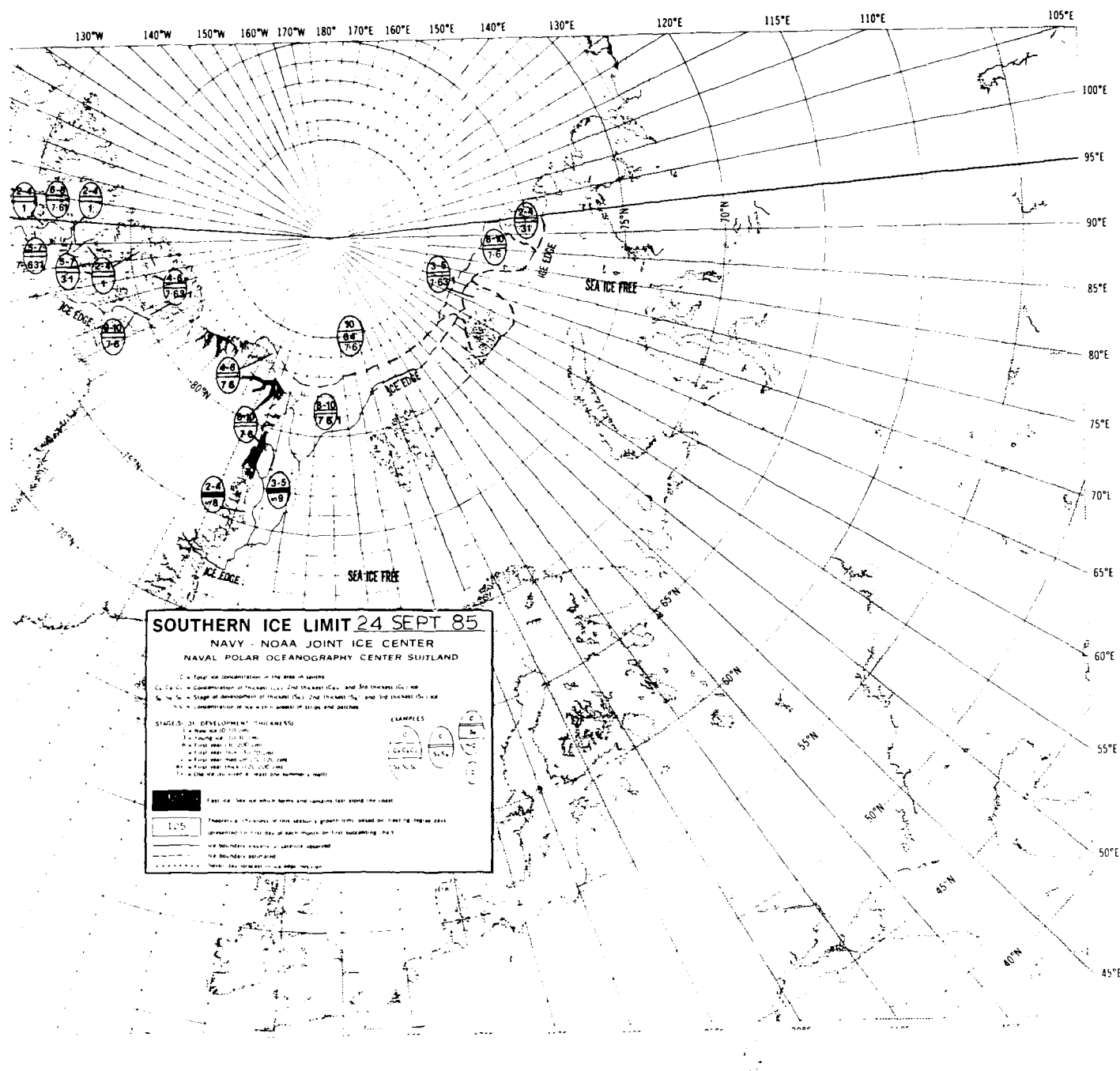


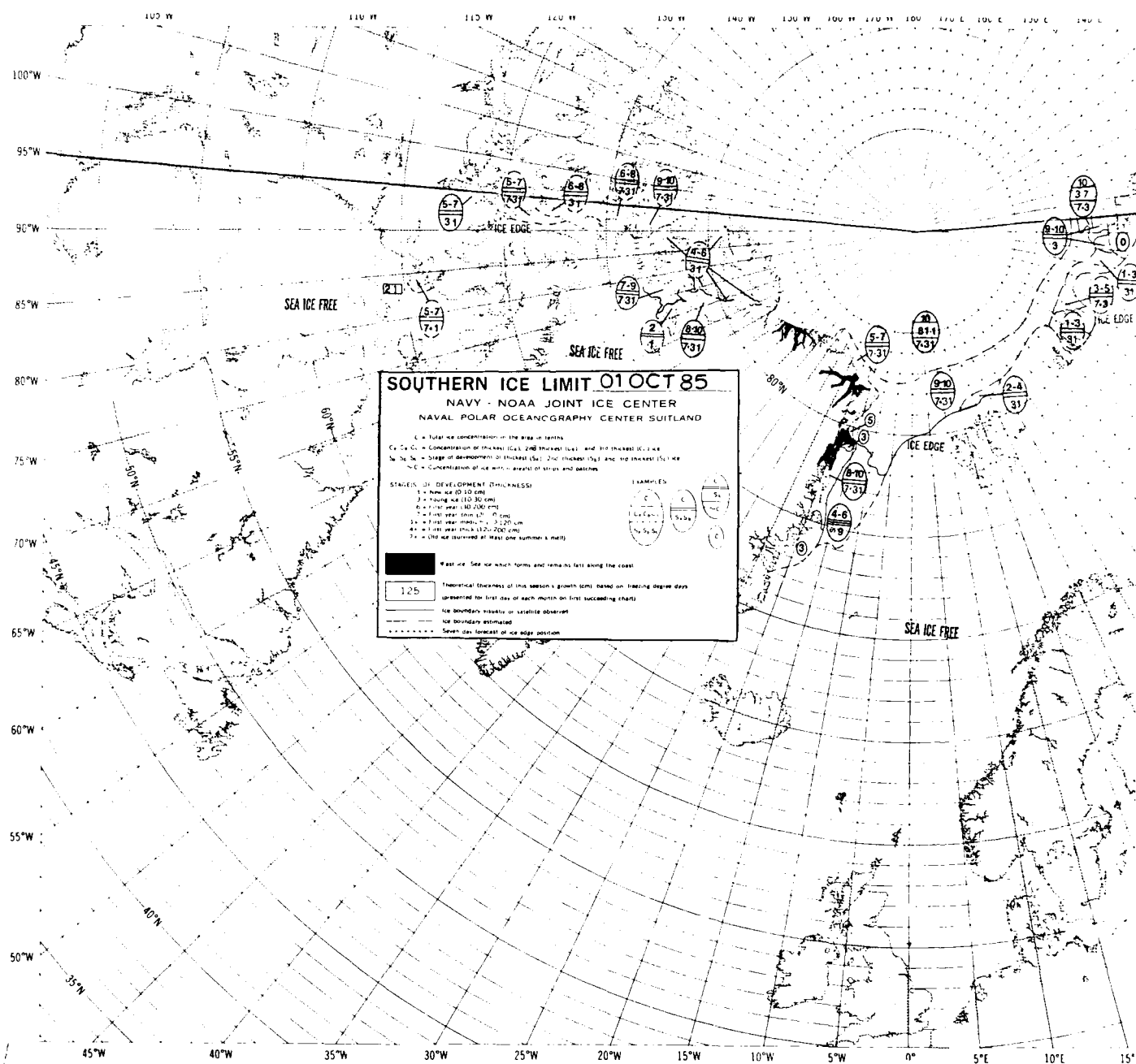


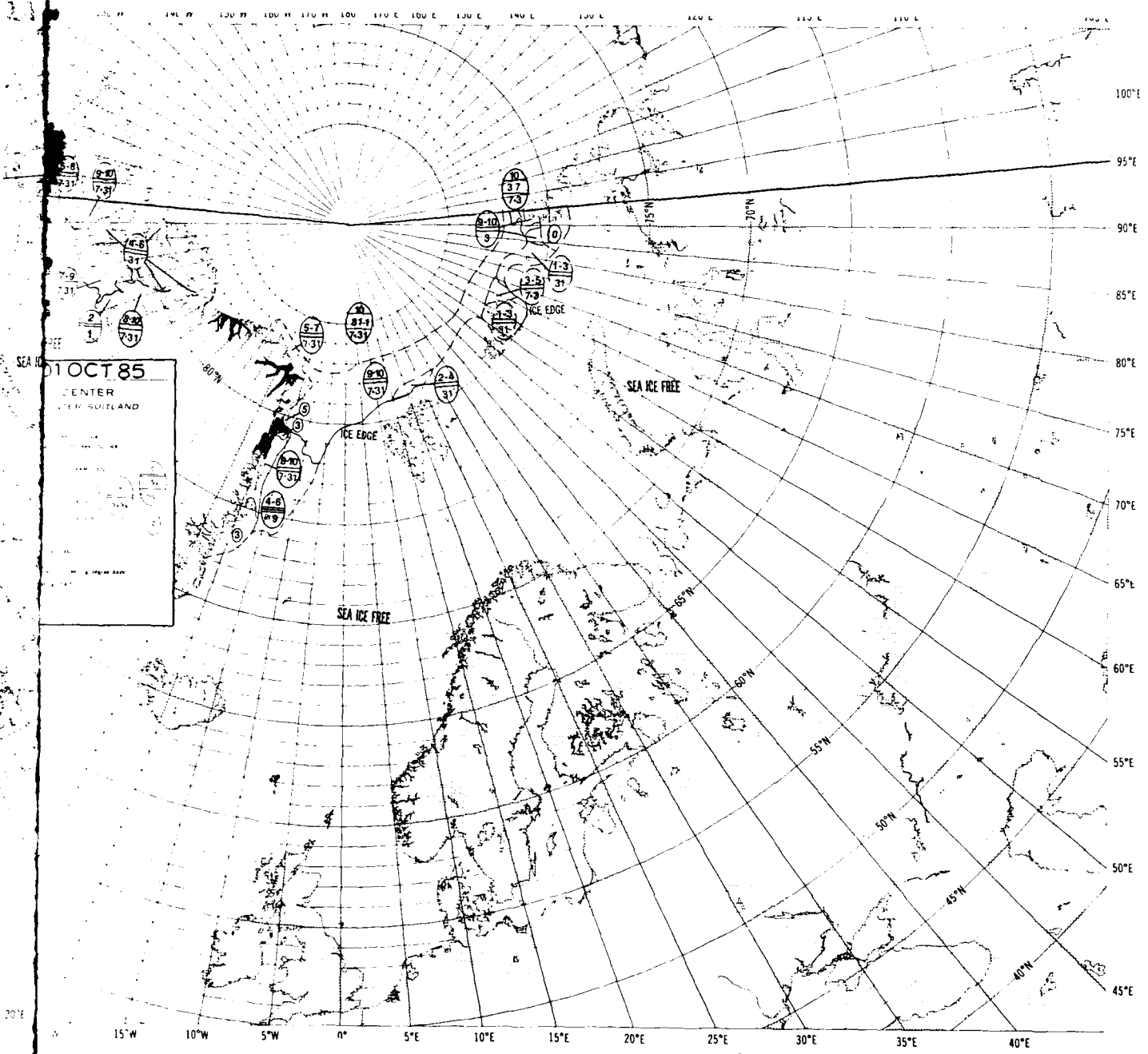






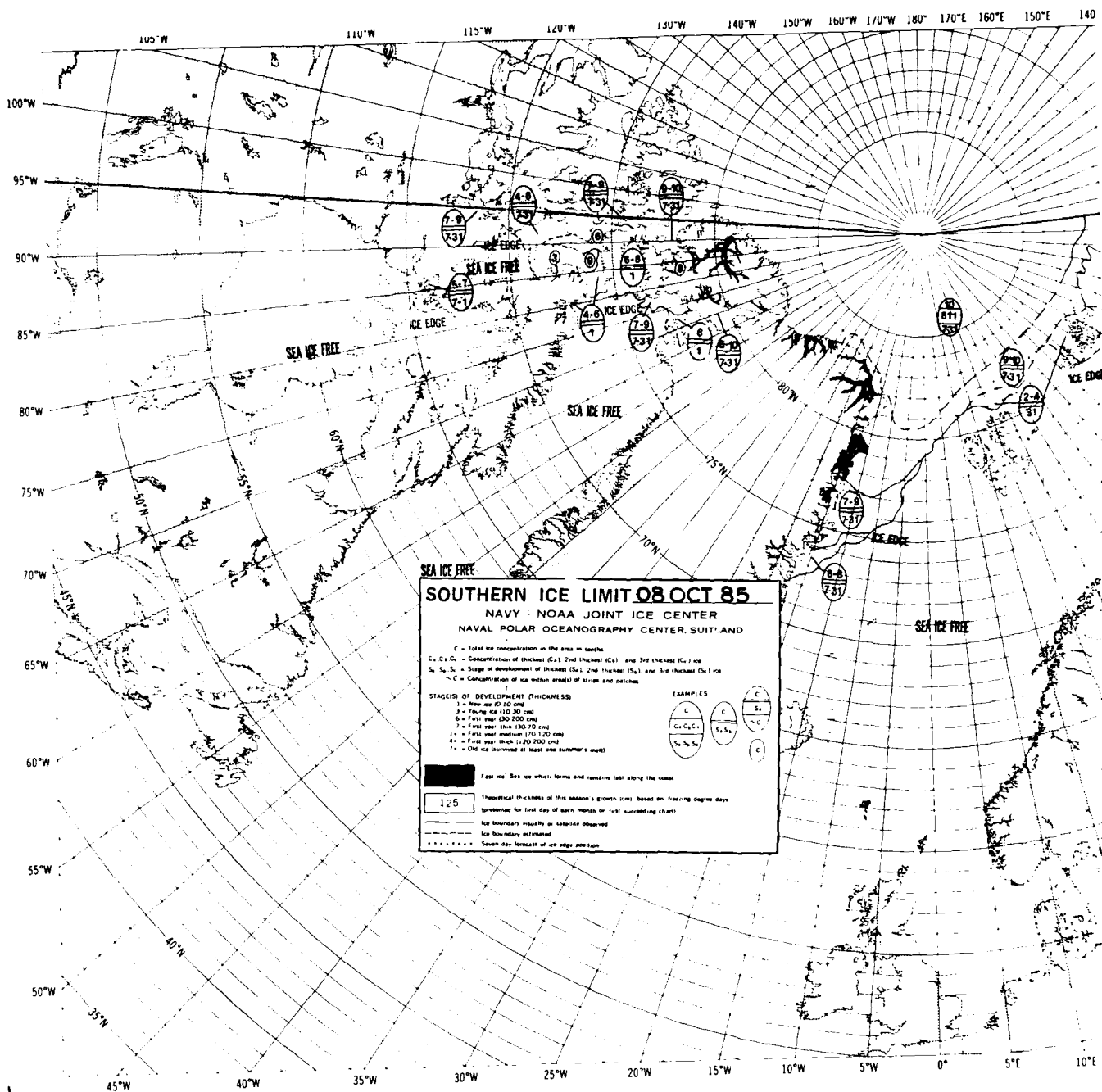


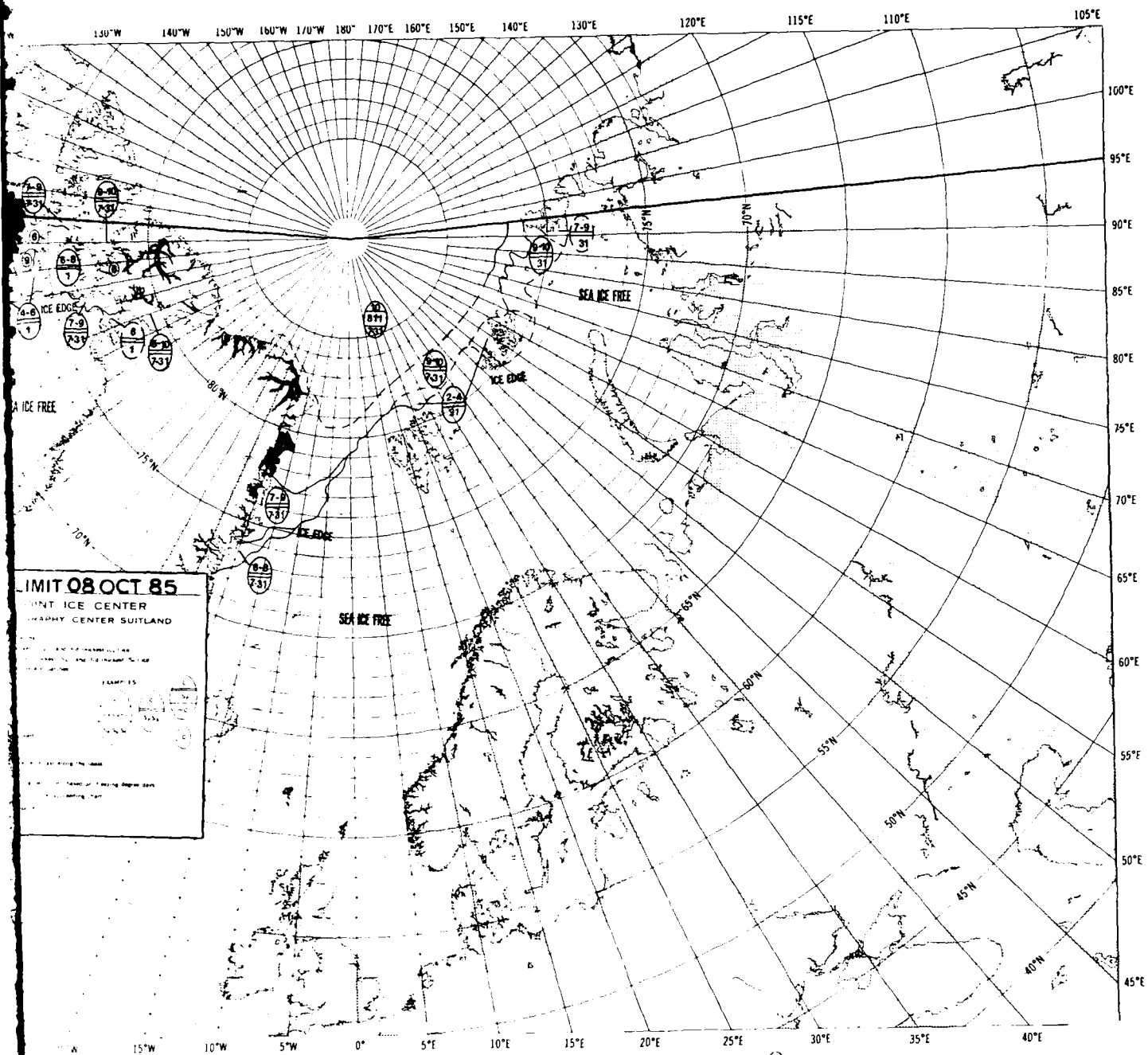


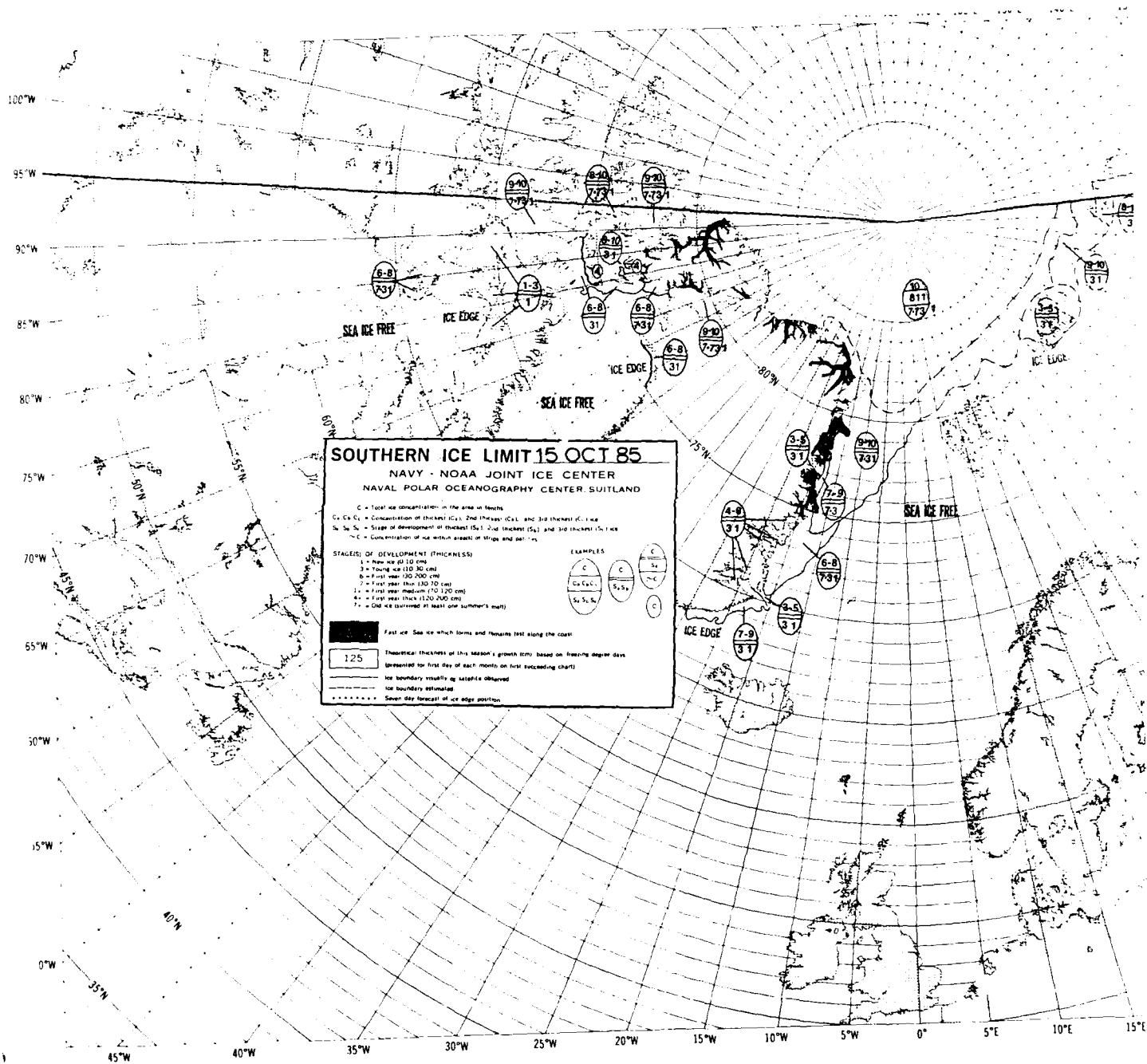


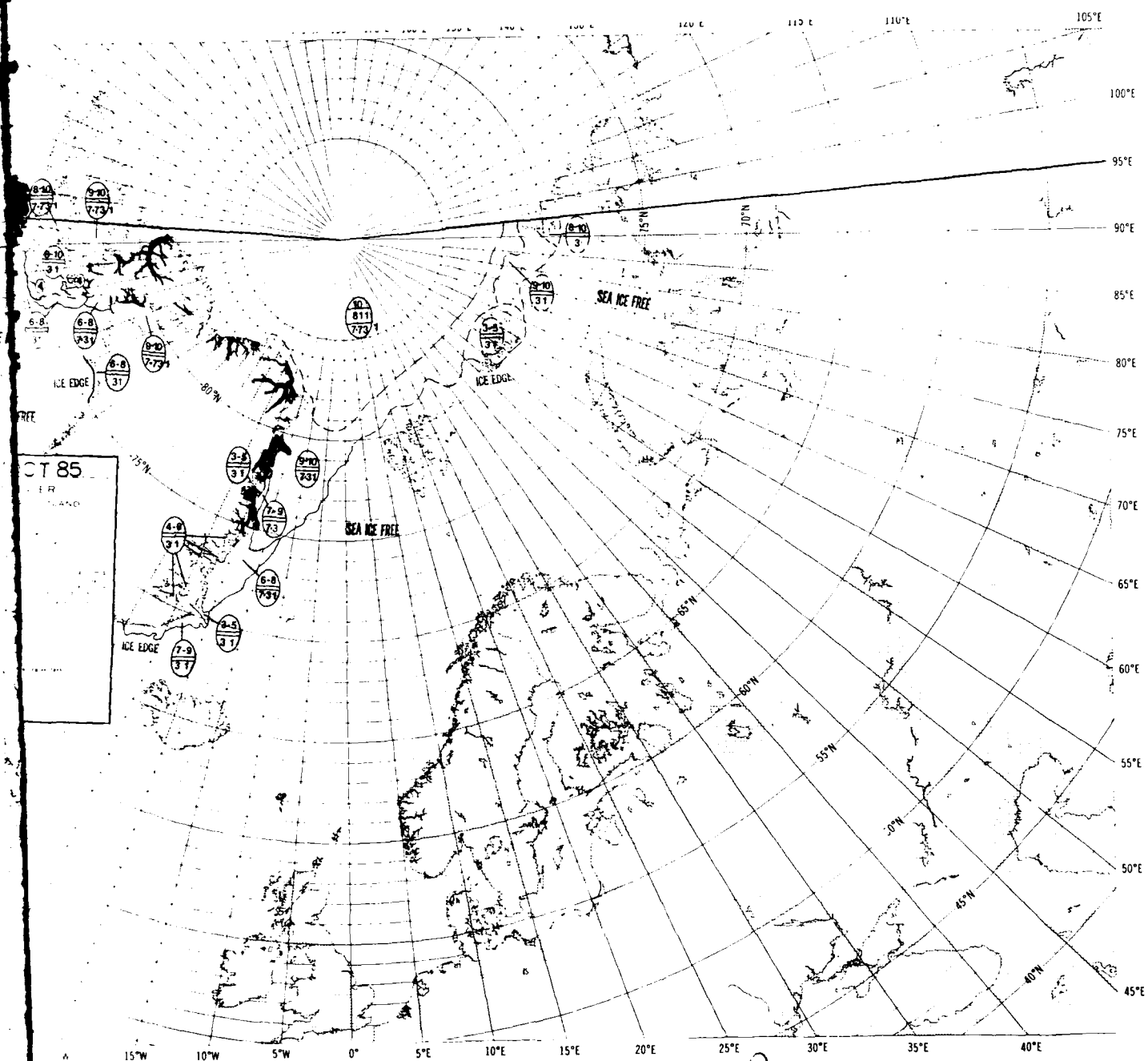
1 OCT 85  
CENTER  
GREENLAND

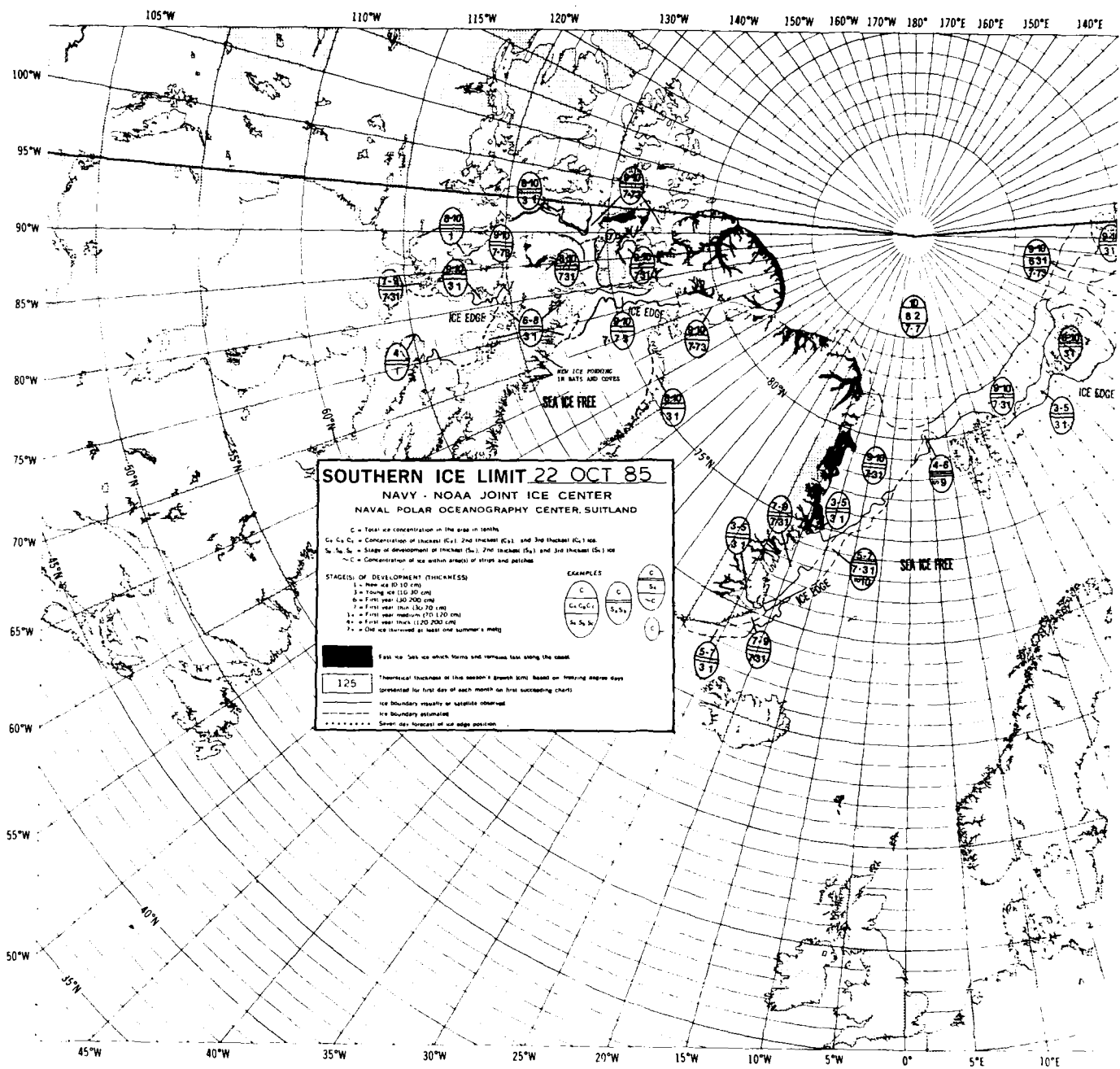
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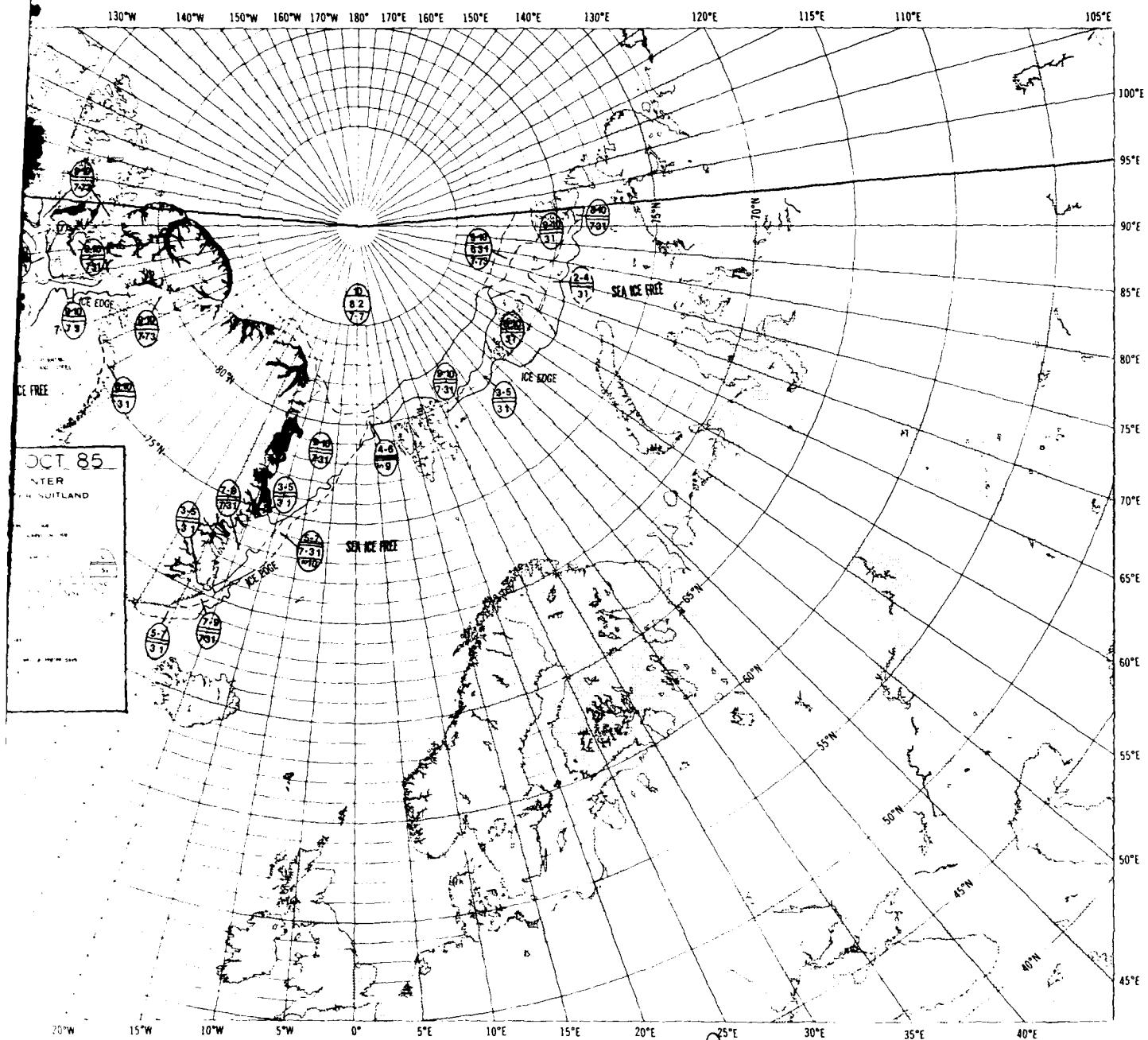




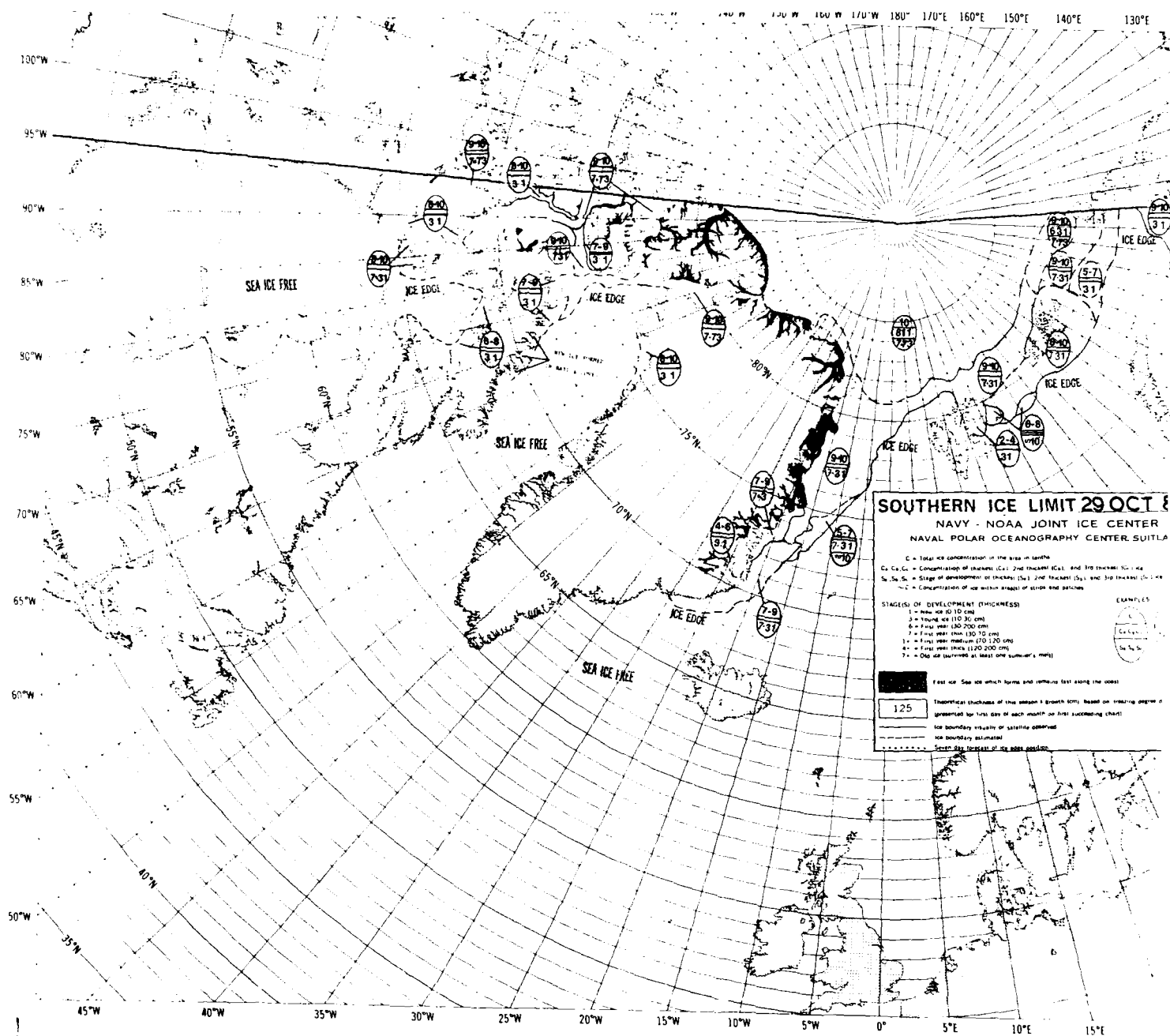


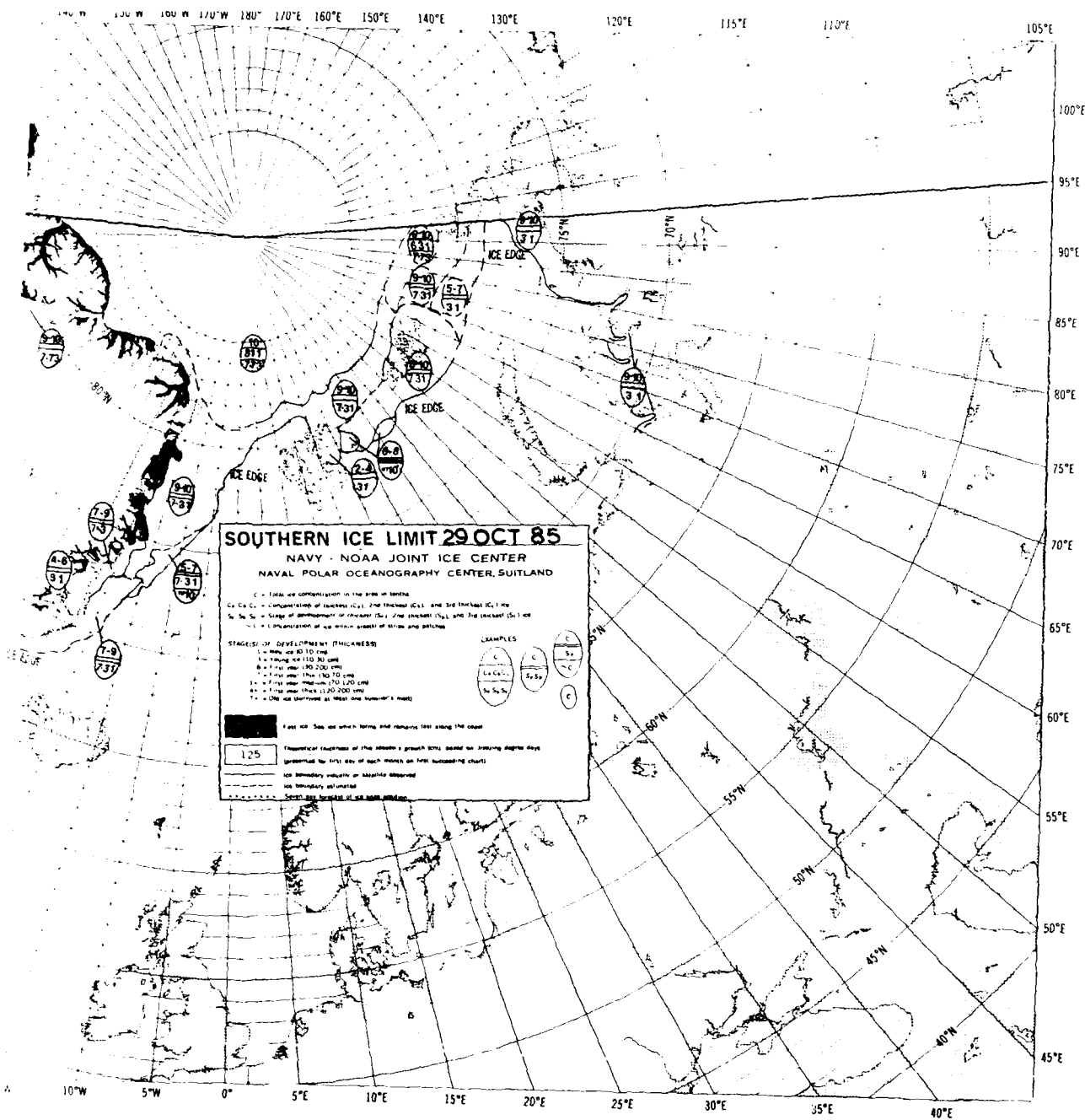


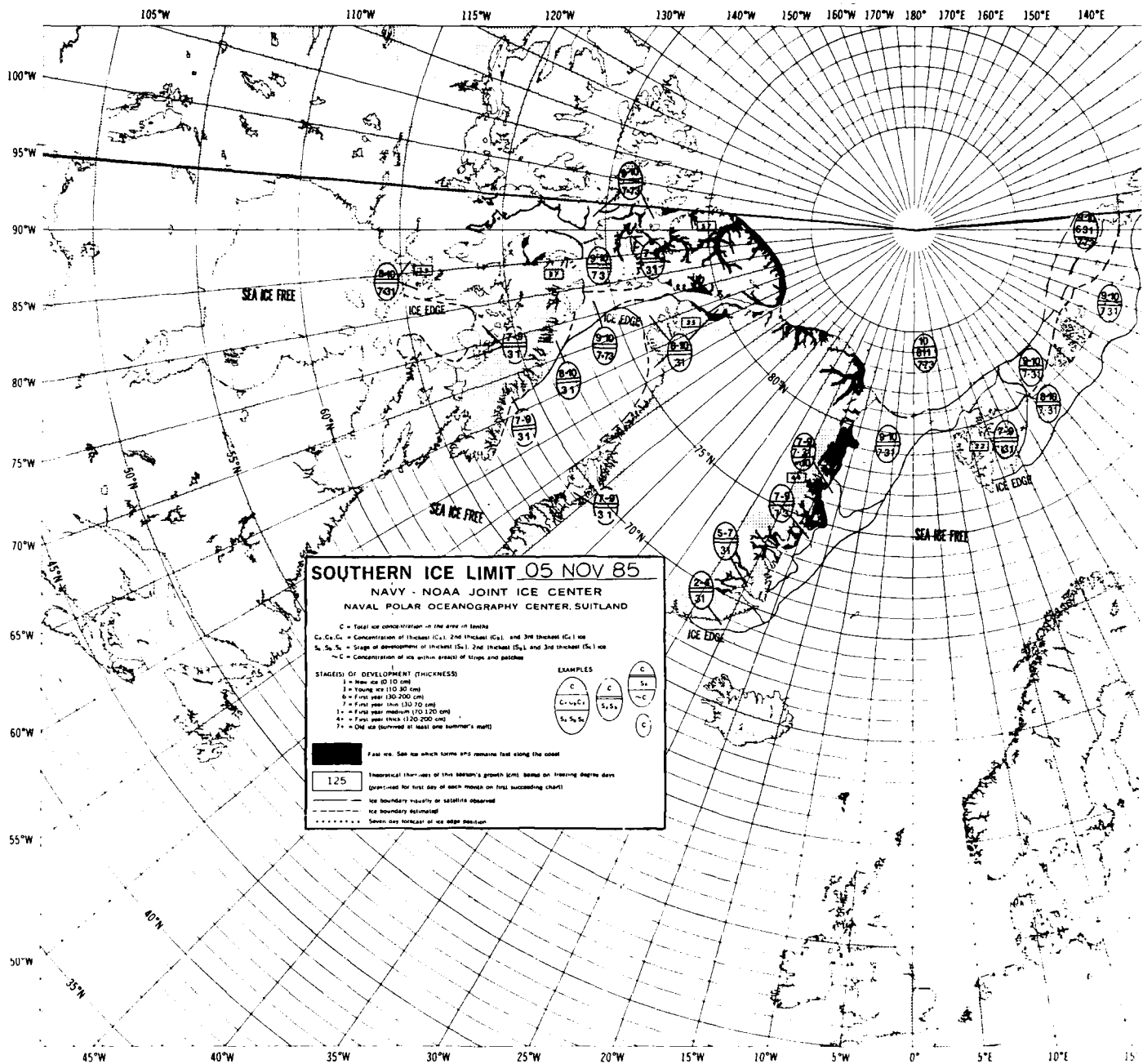


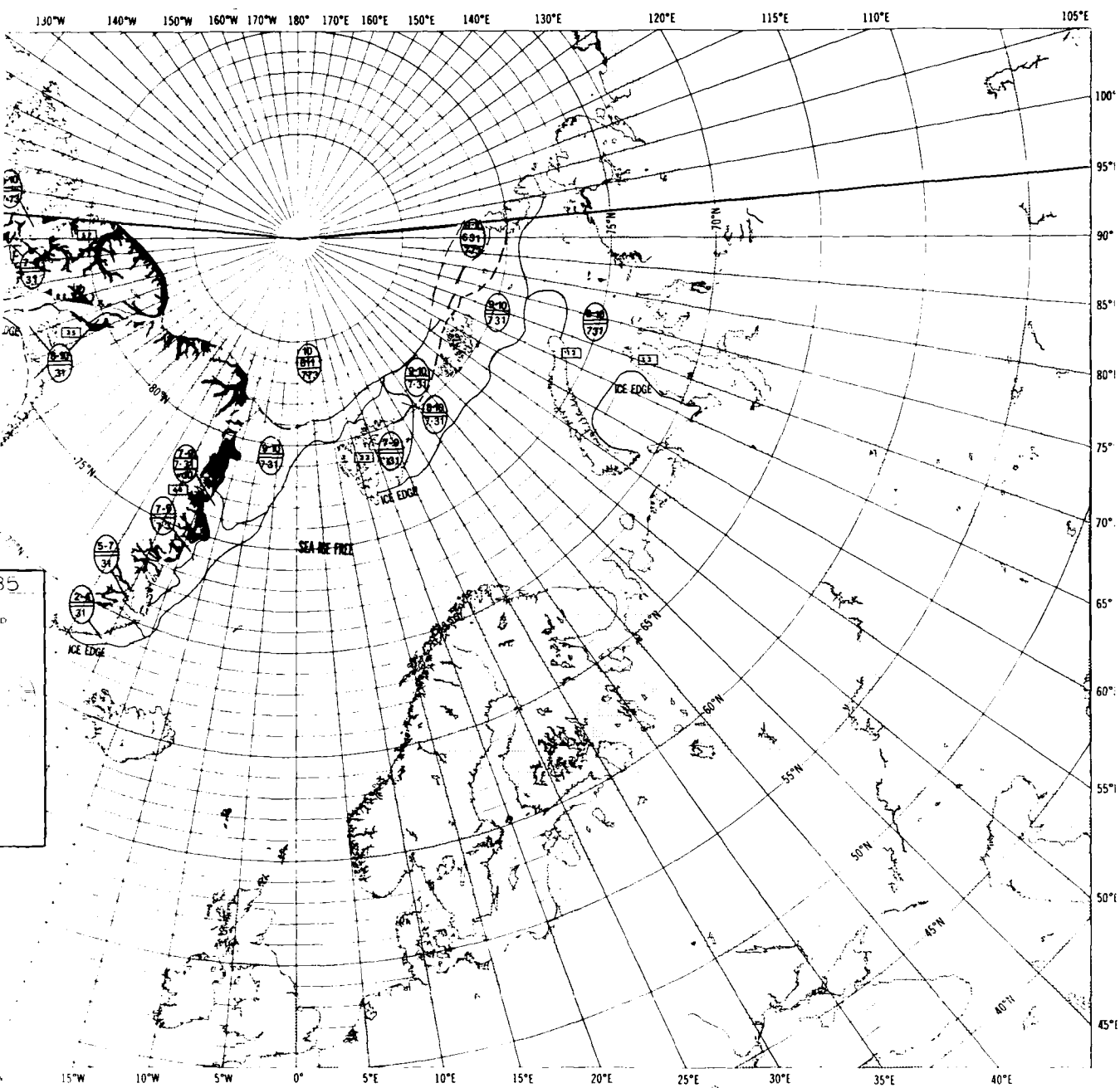


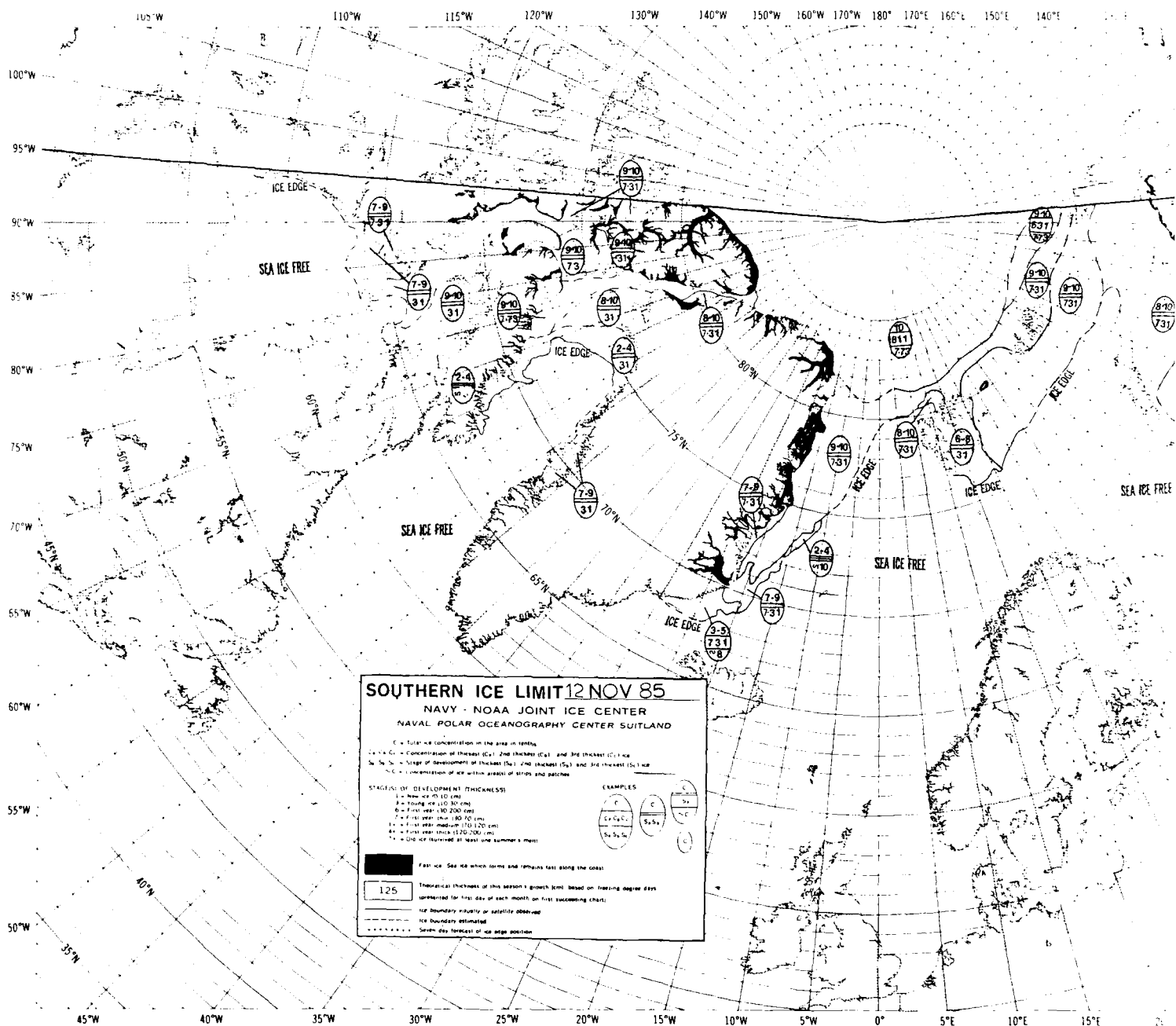
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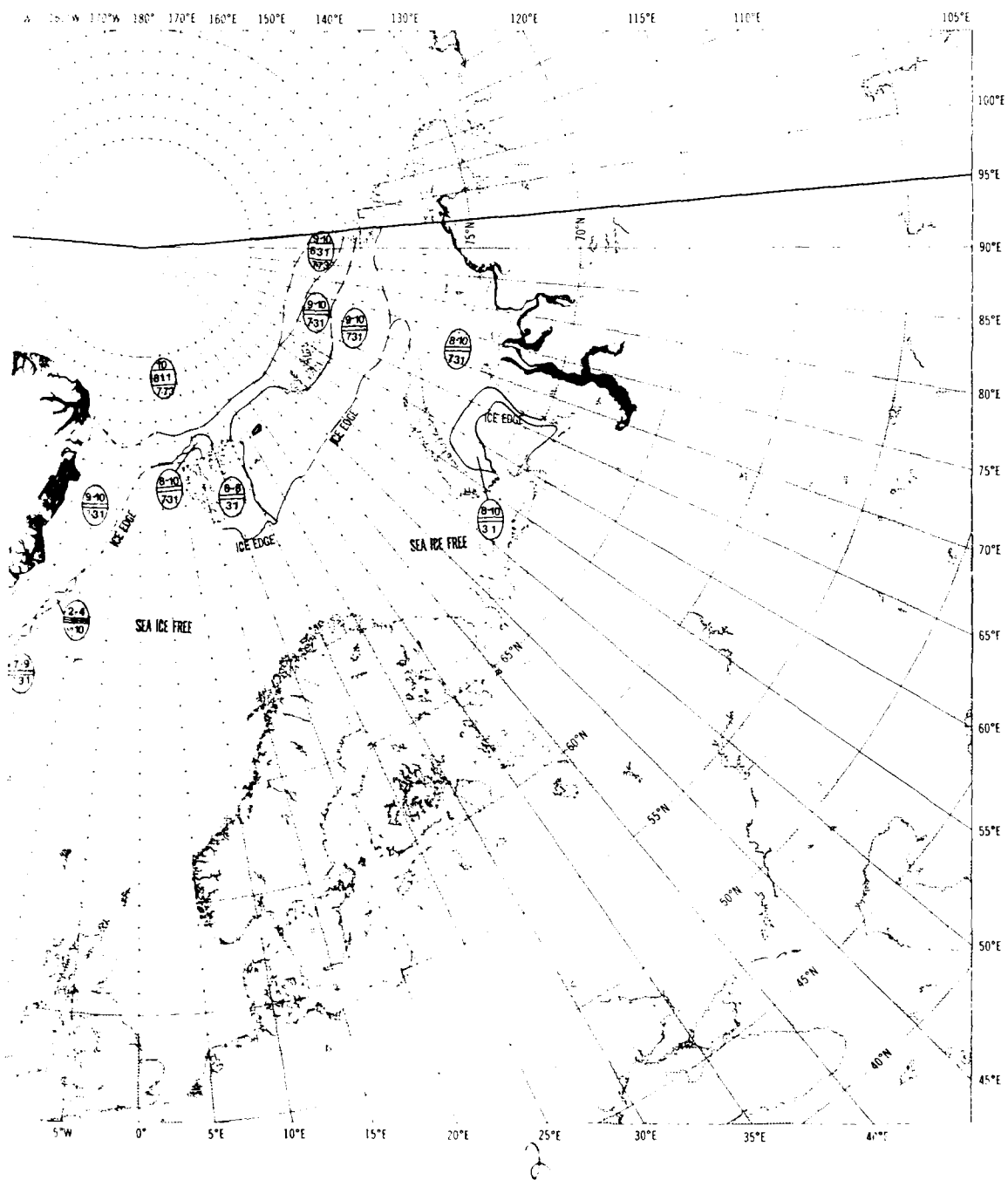










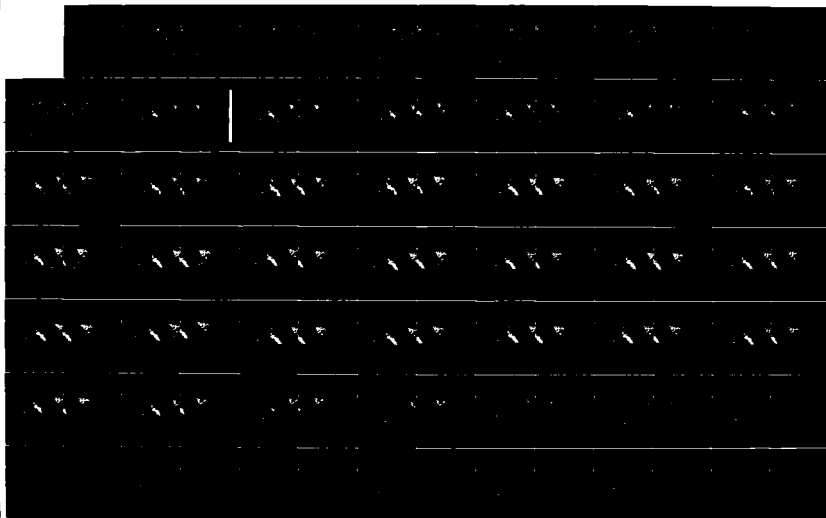


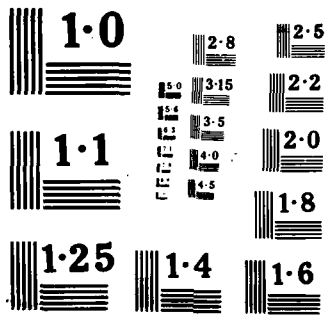
AD-A172 722

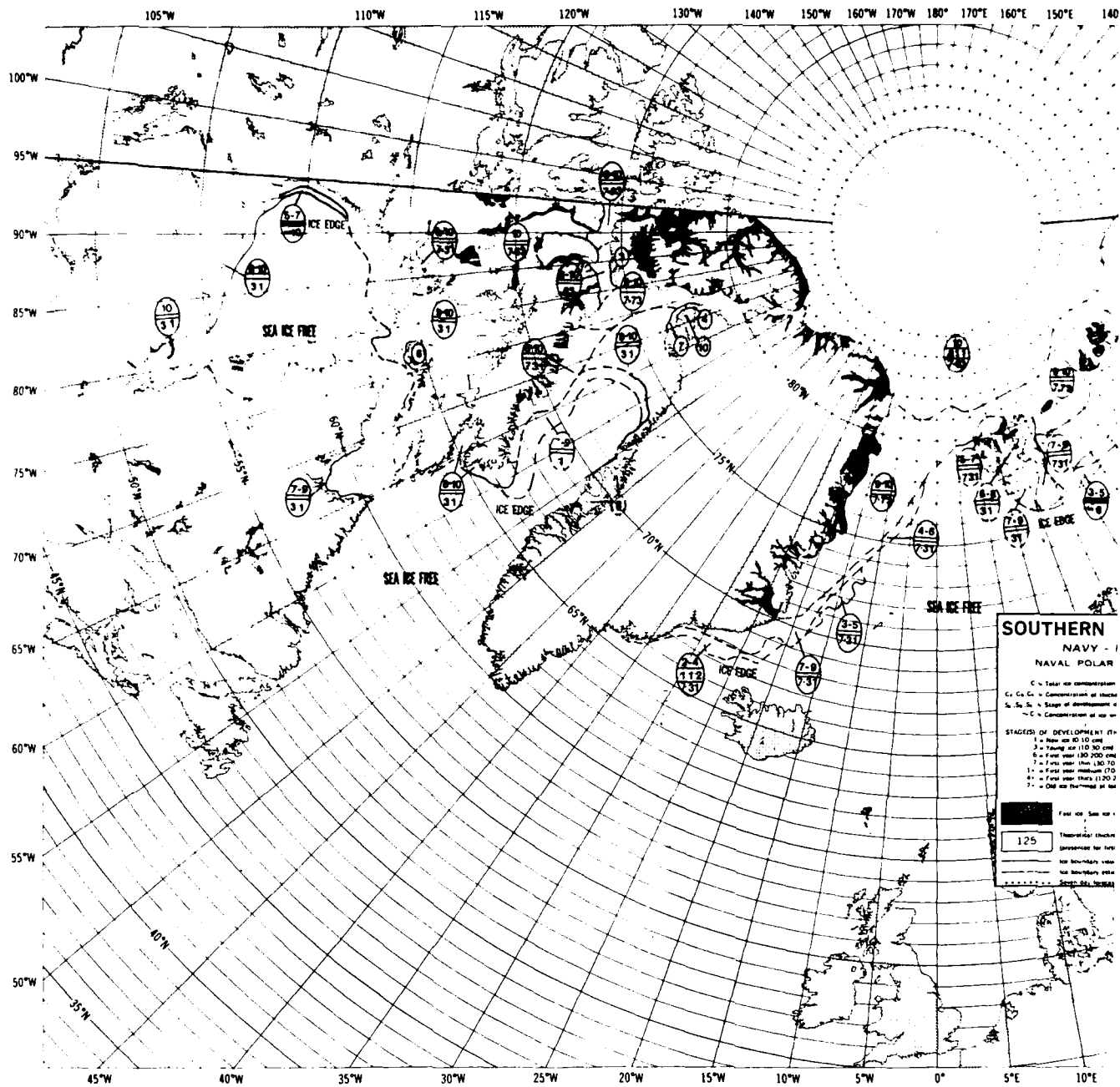
EASTERN - WESTERN ARCTIC SEA ICE ANALYSIS 1985(U) NAVAL 2/3  
POLAR OCEANOGRAPHY CENTER WASHINGTON DC 1985

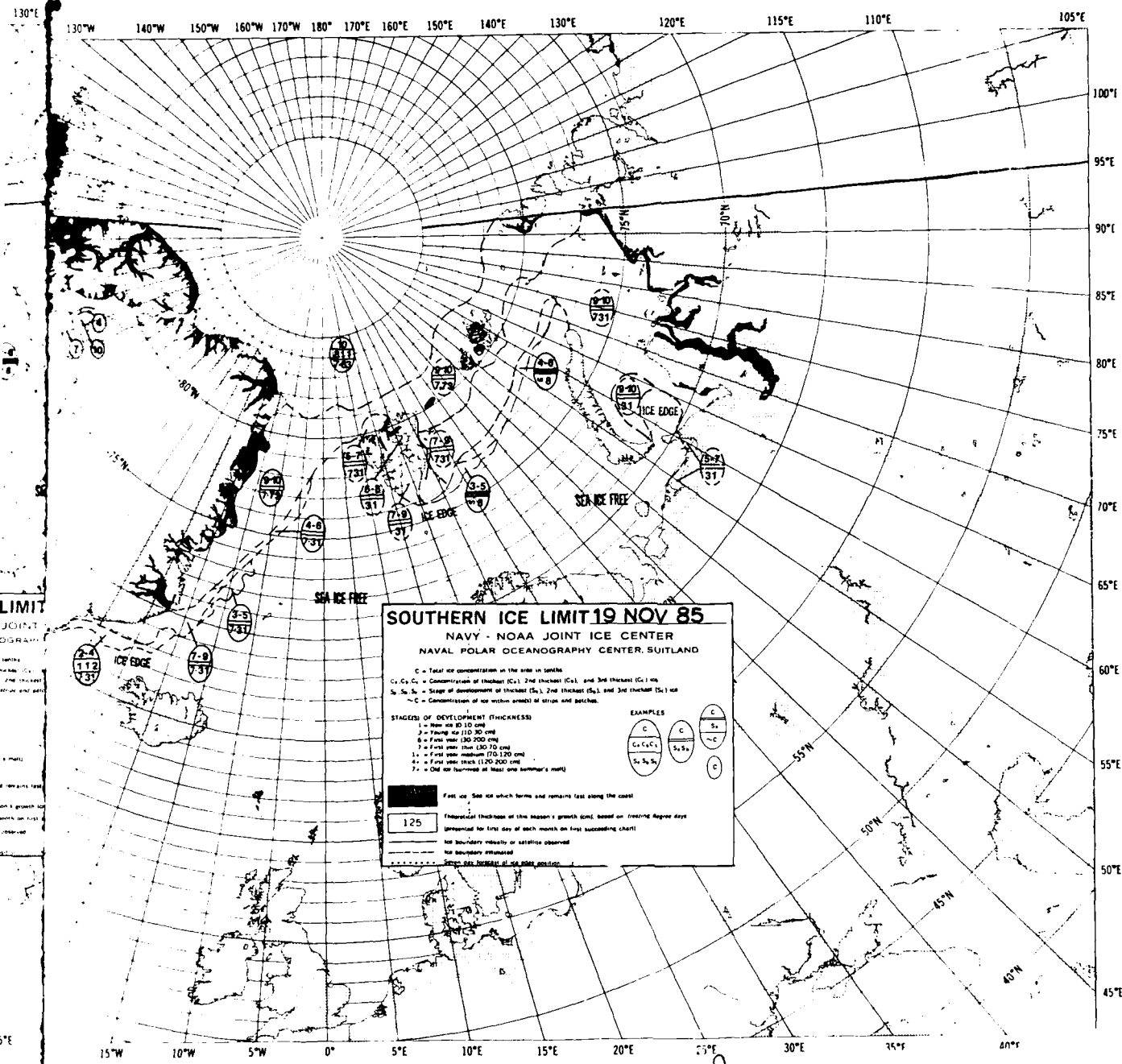
UNCLASSIFIED

F/G 8/12 NL









**SOUTHERN ICE LIMIT 19 NOV 85**  
 NAVY - NOAA JOINT ICE CENTER  
 NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths  
 C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub> = Concentration of thickest (C<sub>1</sub>), 2nd thickest (C<sub>2</sub>), and 3rd thickest (C<sub>3</sub>) ice  
 S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub> = Stage of development of thickest (S<sub>1</sub>), 2nd thickest (S<sub>2</sub>), and 3rd thickest (S<sub>3</sub>) ice  
 ~C = Concentration of ice within period of strip and patches

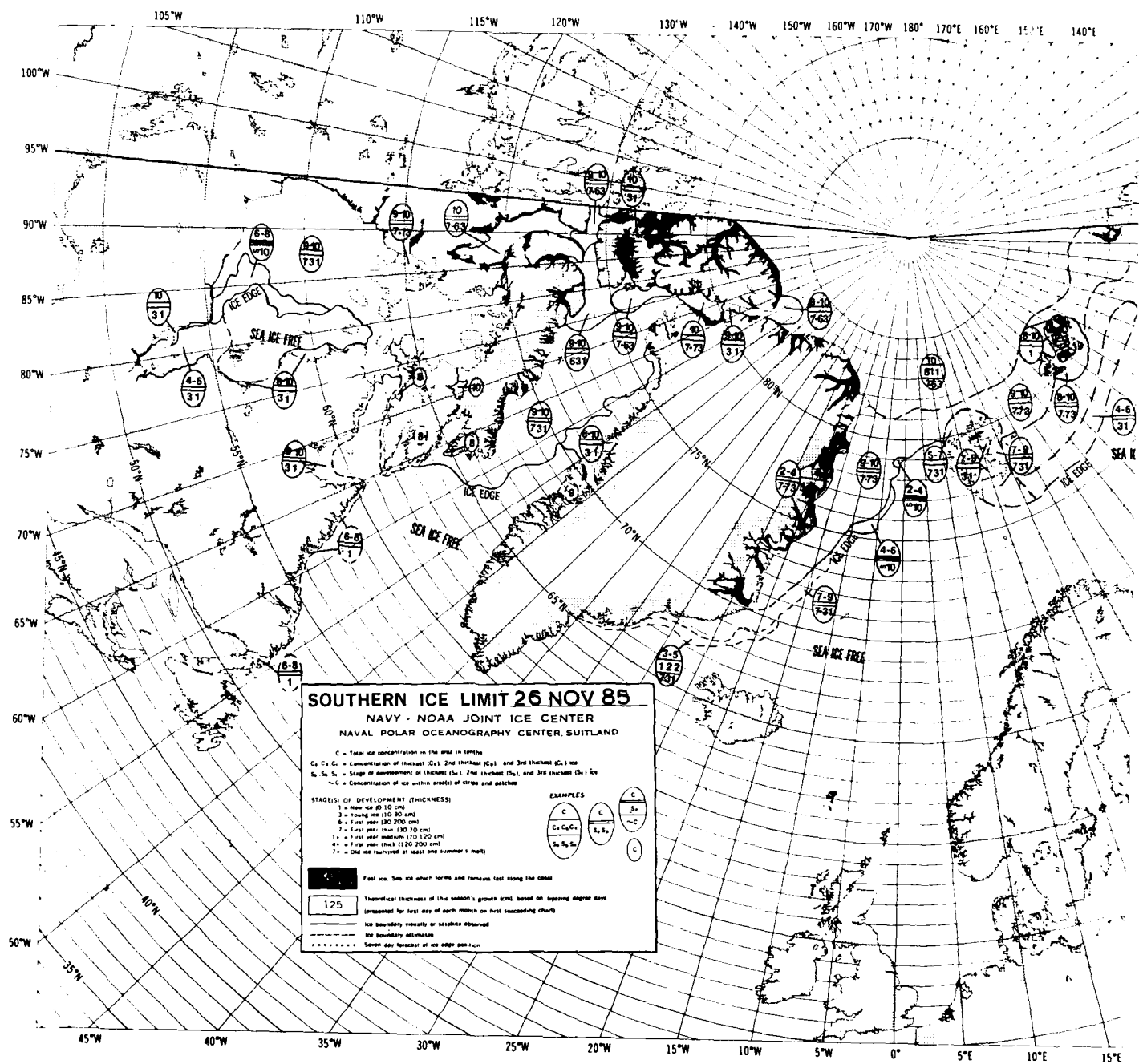
**STAGES OF DEVELOPMENT (THICKNESS)**  
 1 = New ice (10-30 cm)  
 2 = Young ice (30-100 cm)  
 3 = First year (100-200 cm)  
 4 = First year (200-300 cm)  
 5 = First year (300-400 cm)  
 6 = First year (400-500 cm)  
 7 = Old ice (500 cm or more)

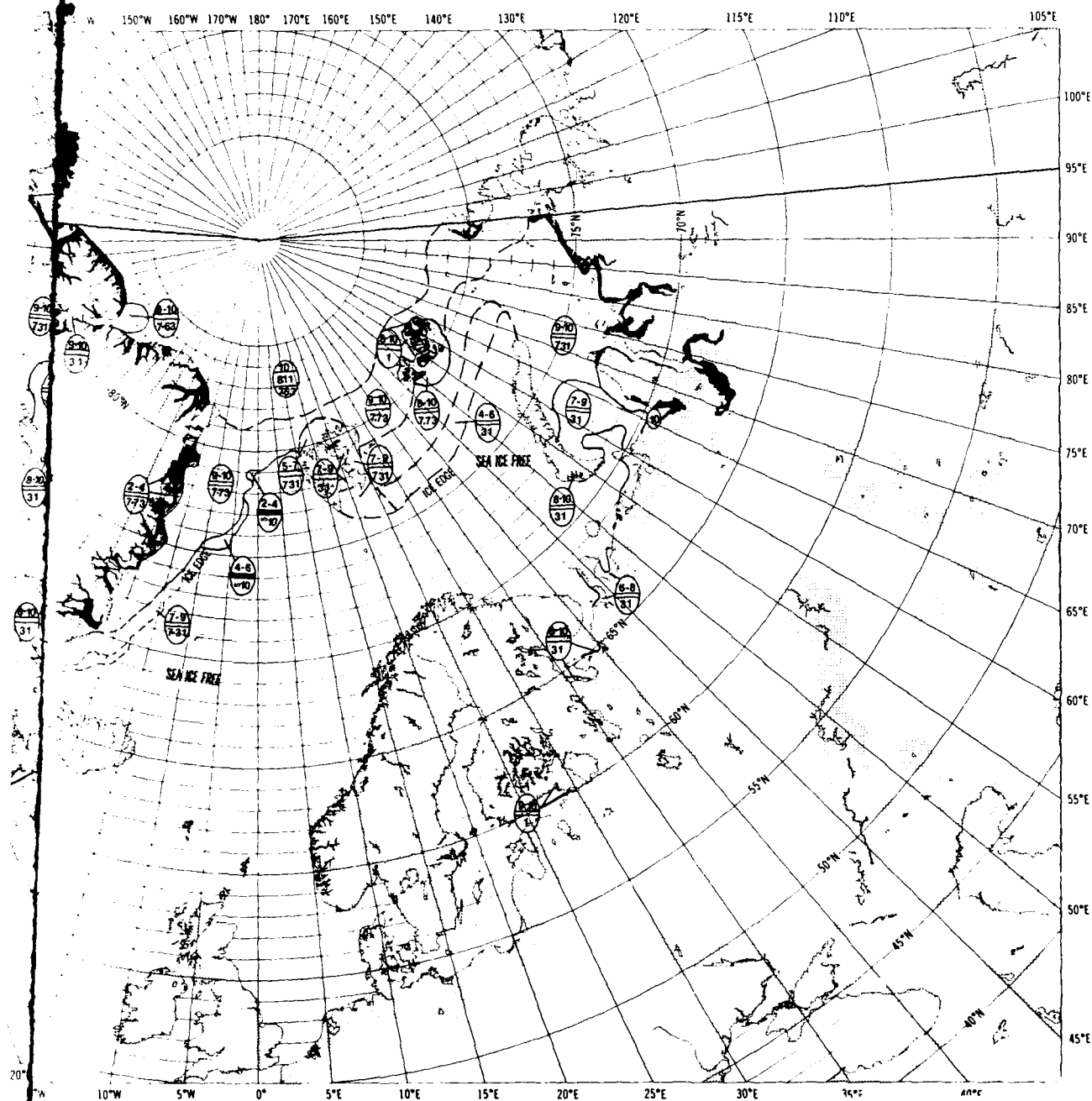
**EXAMPLES**

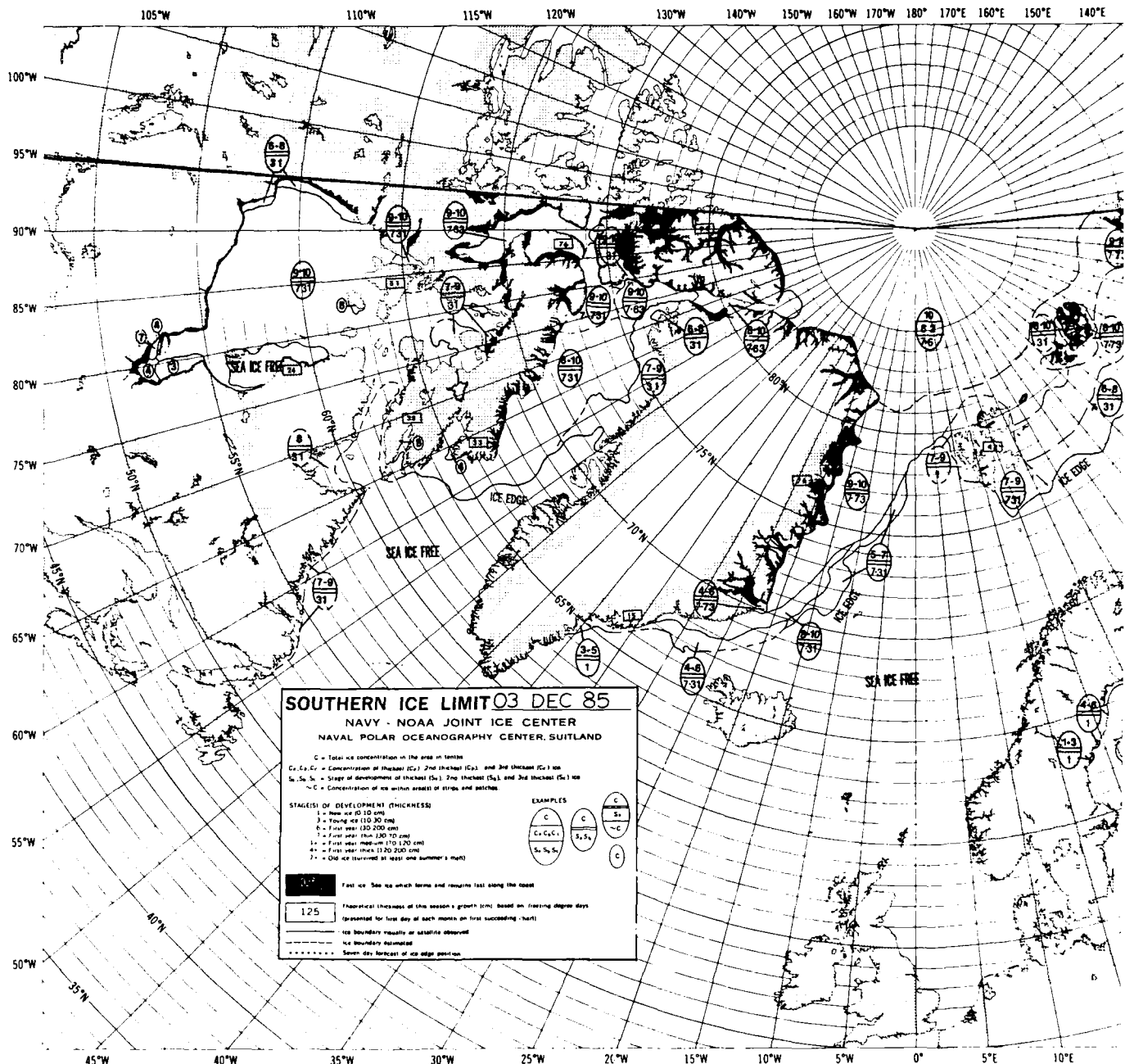
|                |                |                |                |
|----------------|----------------|----------------|----------------|
| C              | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> |
| S <sub>1</sub> | S <sub>2</sub> | S <sub>3</sub> |                |

Fast ice: Sea ice which forms and remains fast along the coast  
 125: Thickness of this season's growth (cm), based on freezing degree days  
 (measured for first day of each month on first succeeding chart)  
 ---: Ice boundaries actually or satellite observed  
 .....: Ice boundaries estimated  
 .....: Other sea ice limit at sea area position

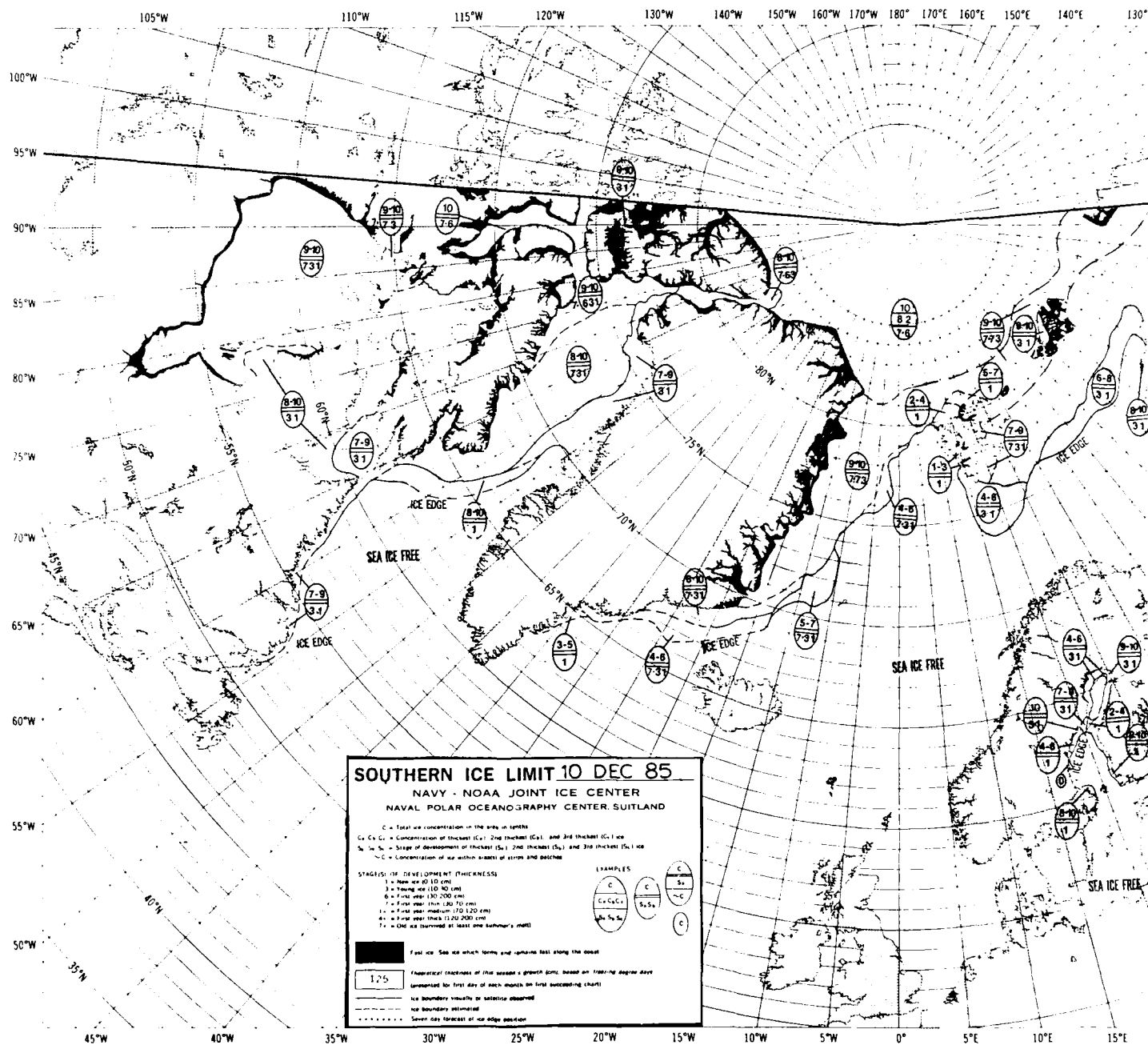
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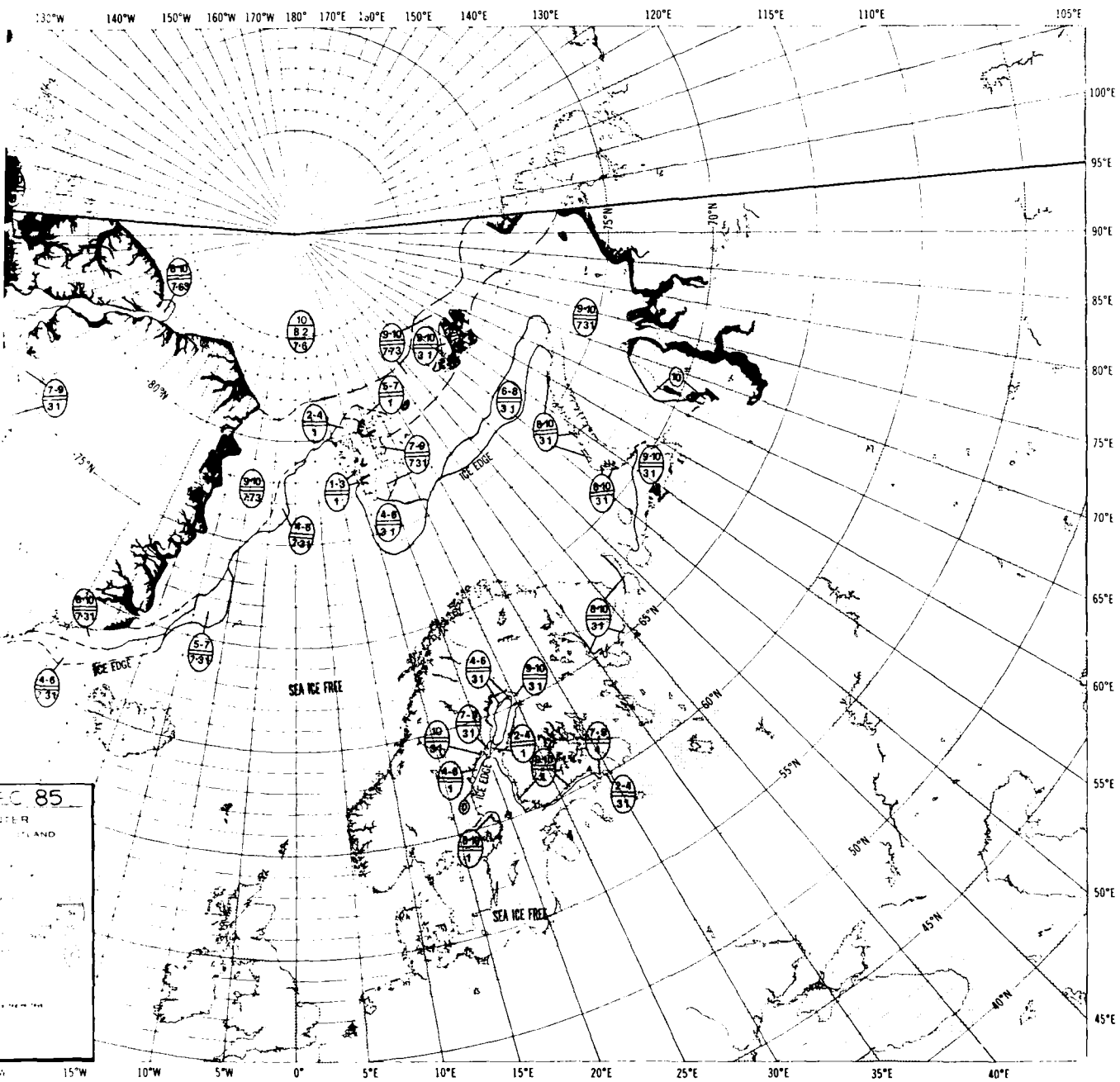


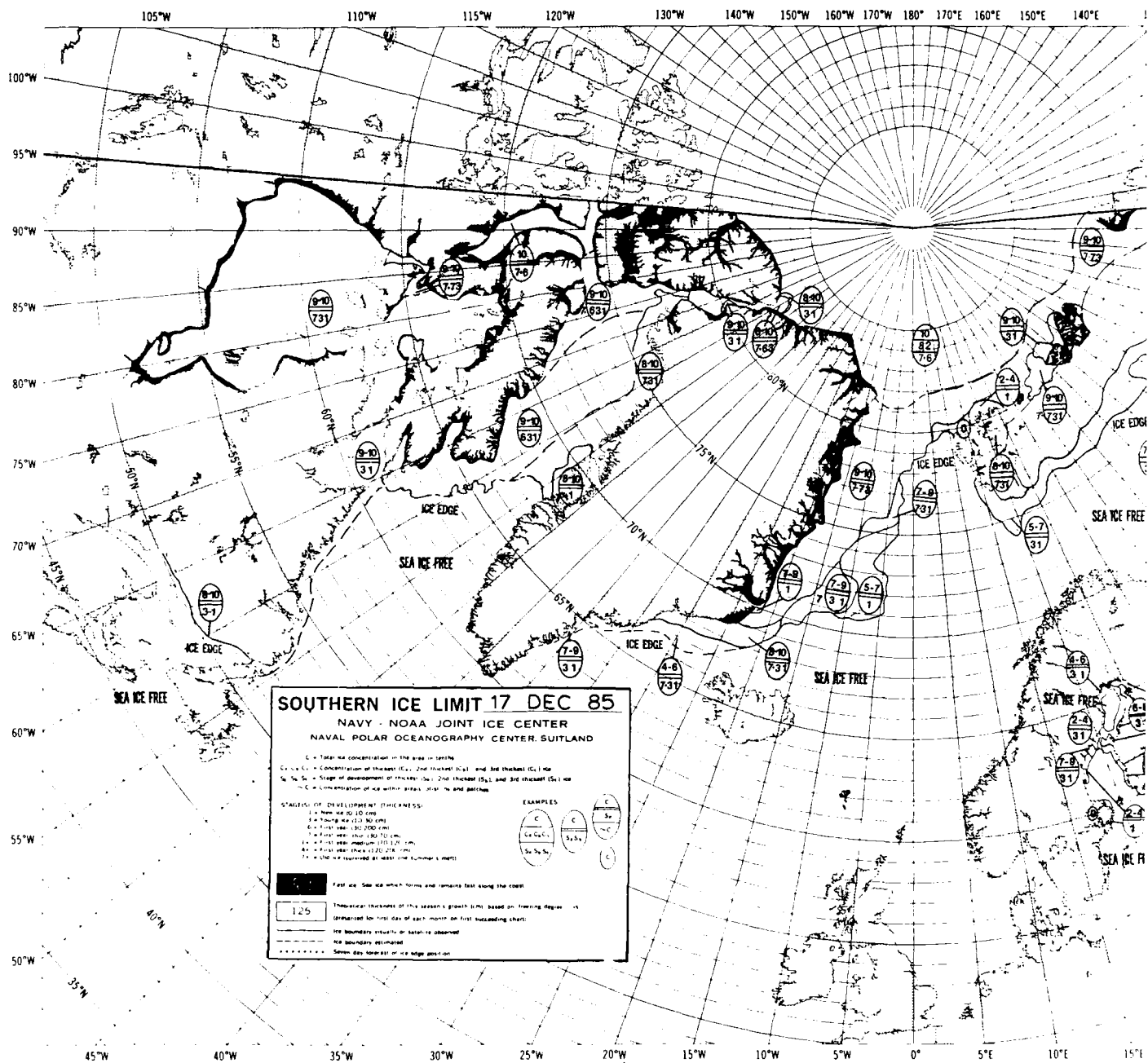


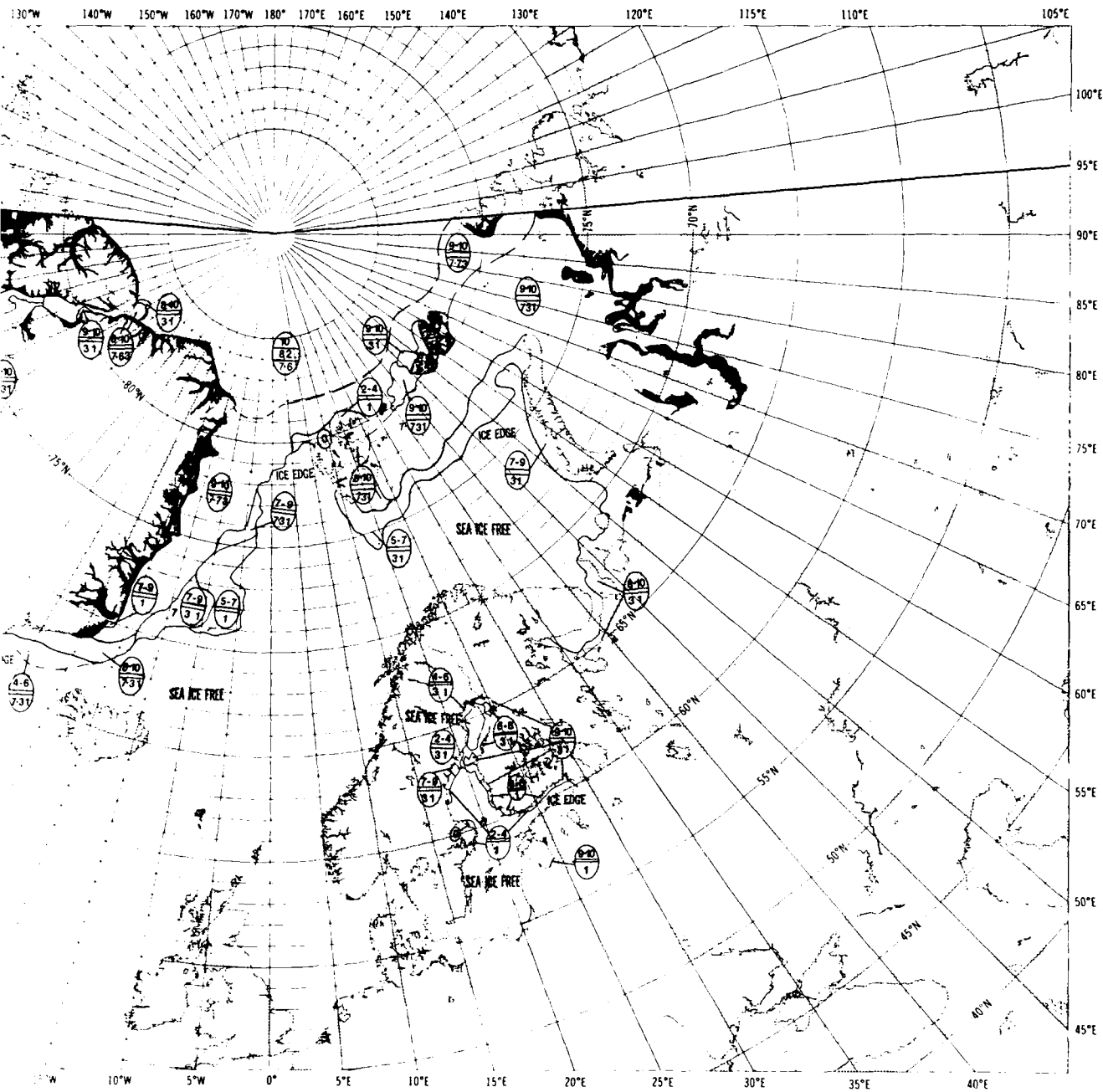


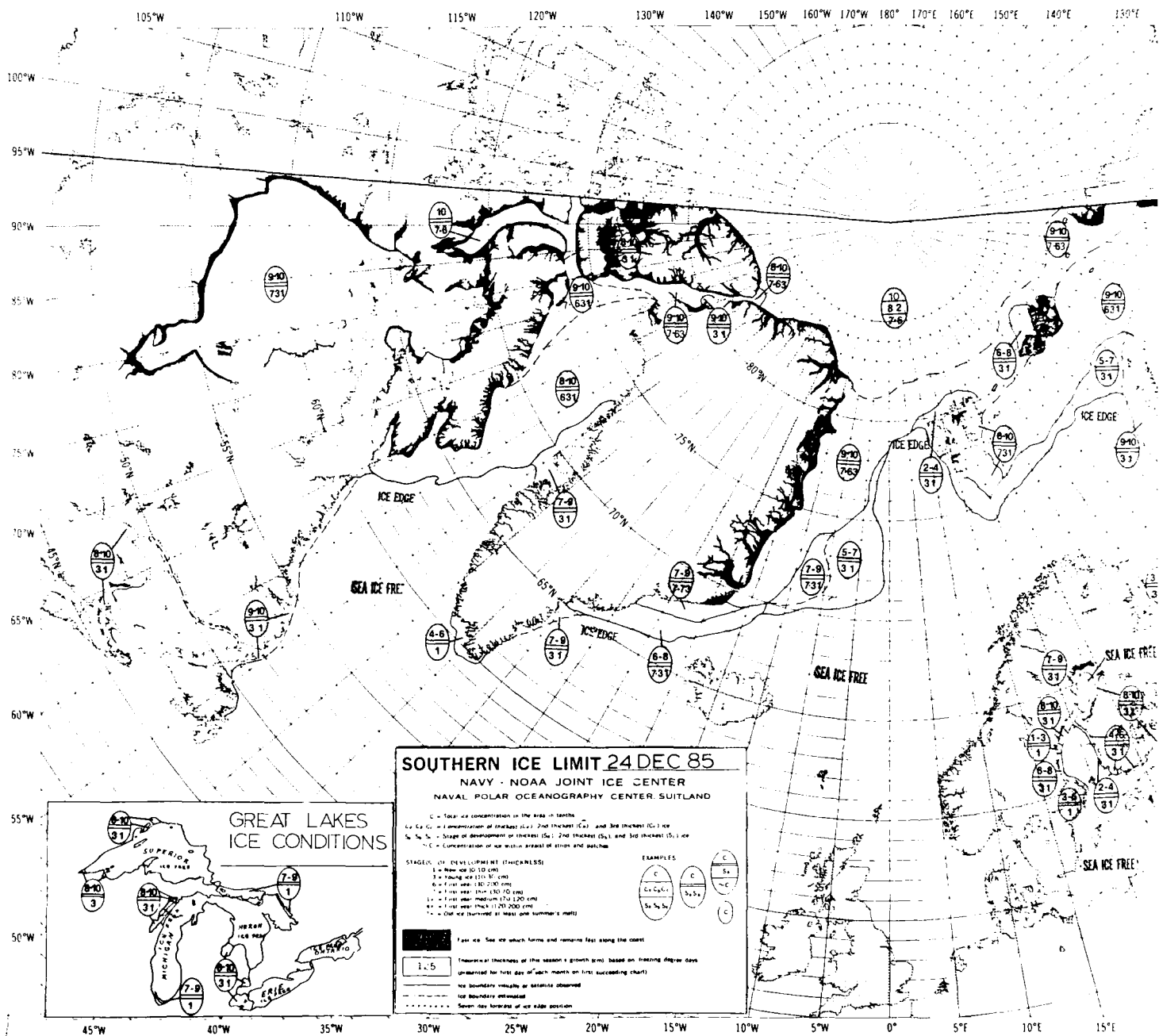


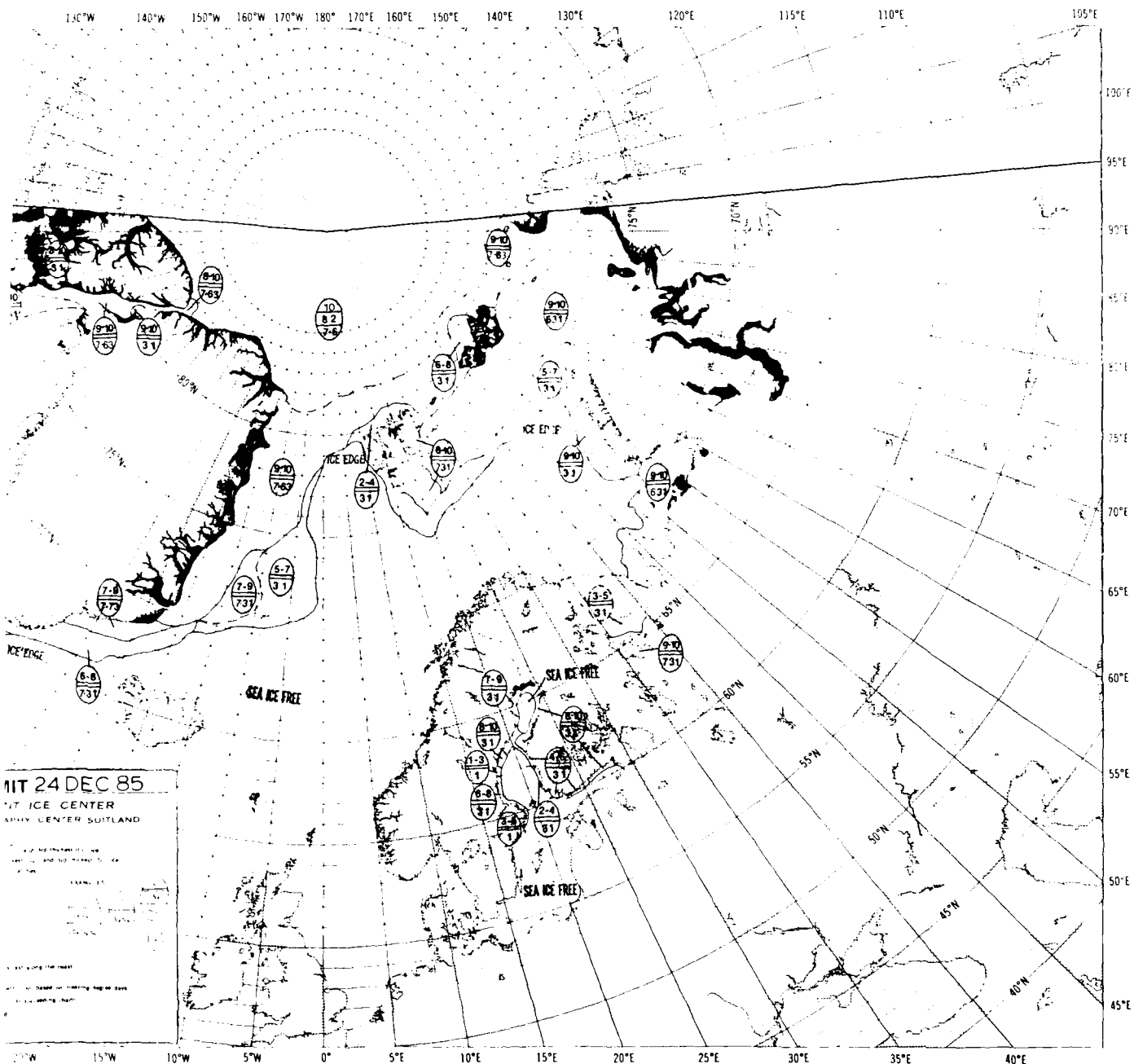


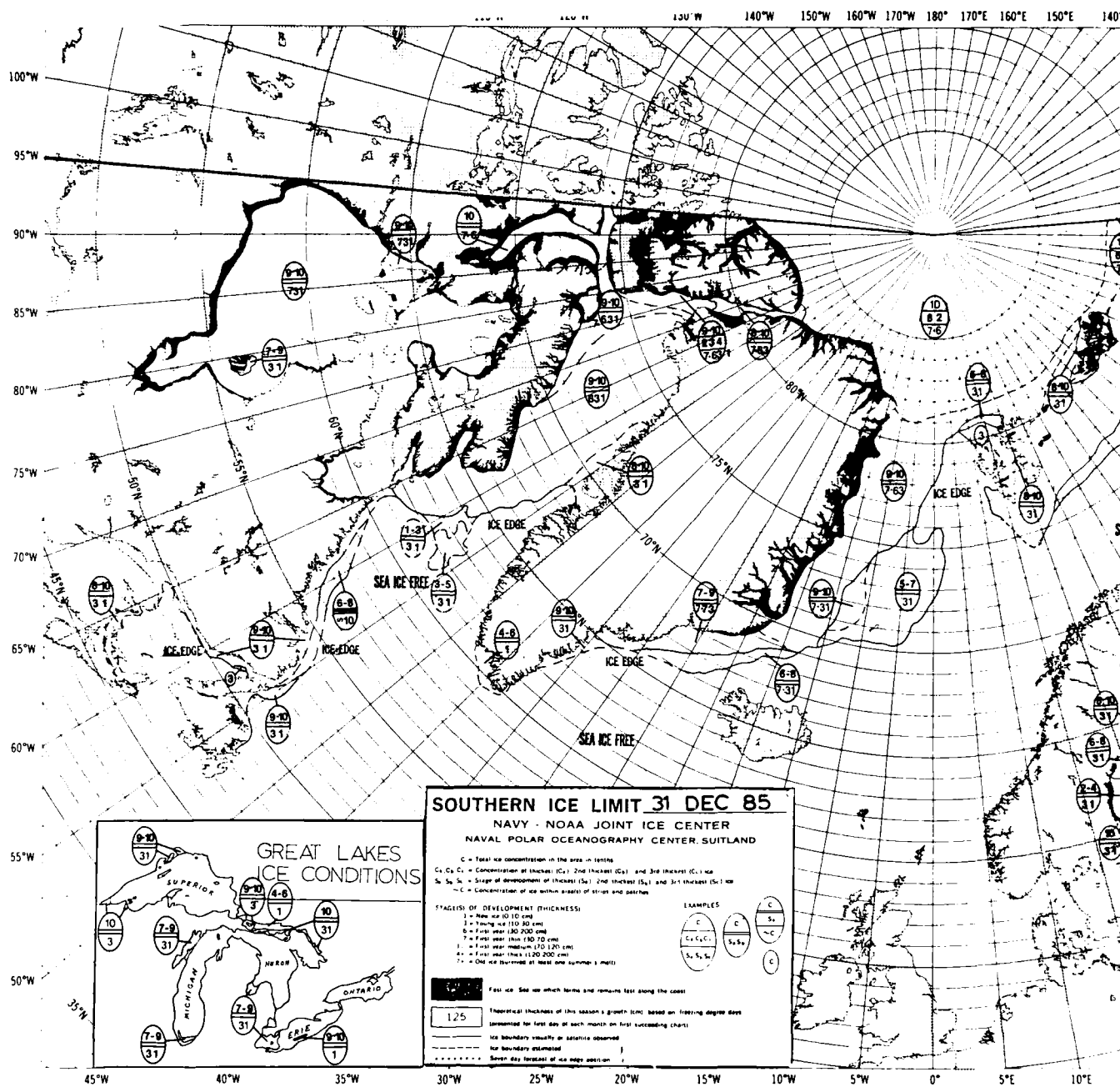


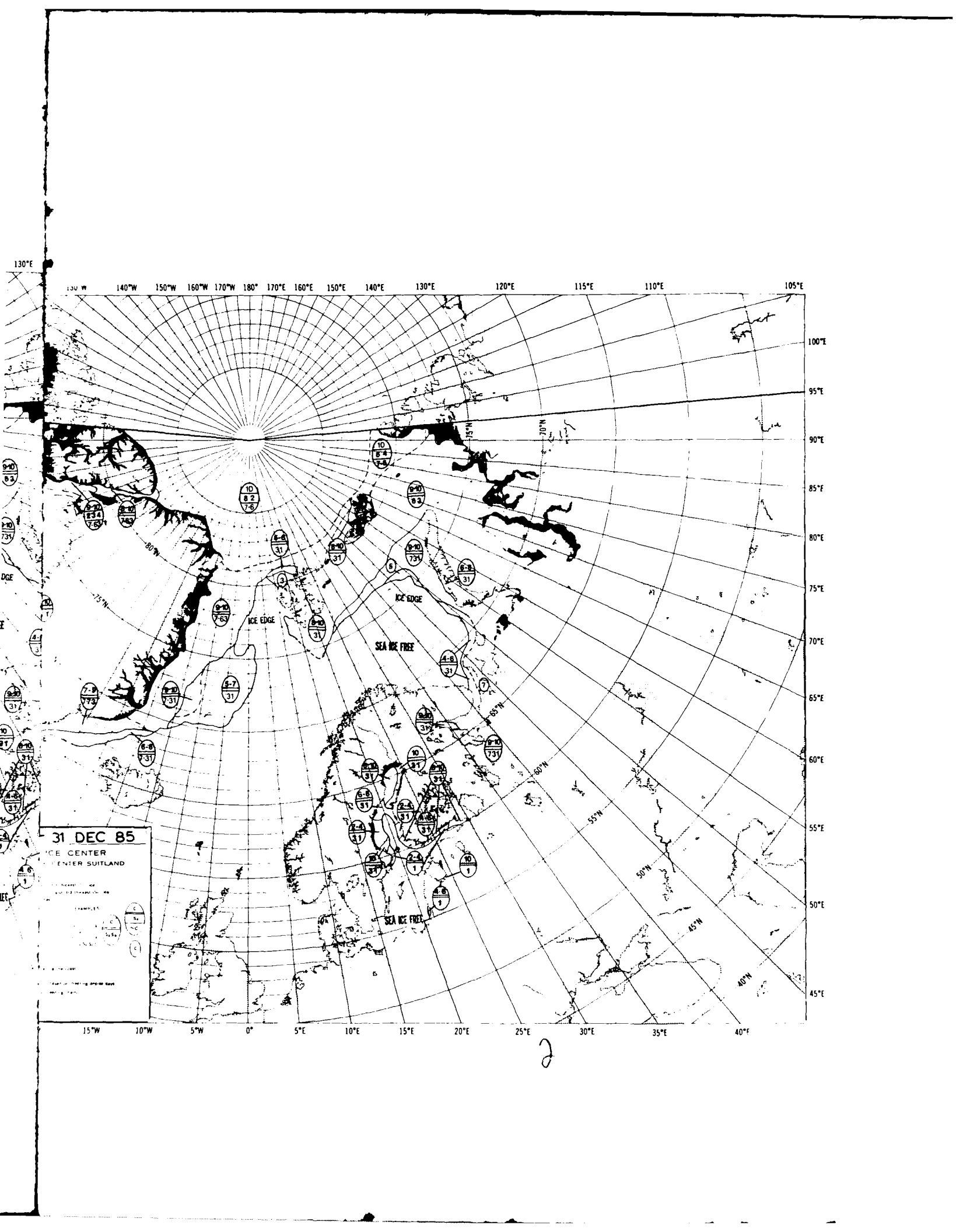


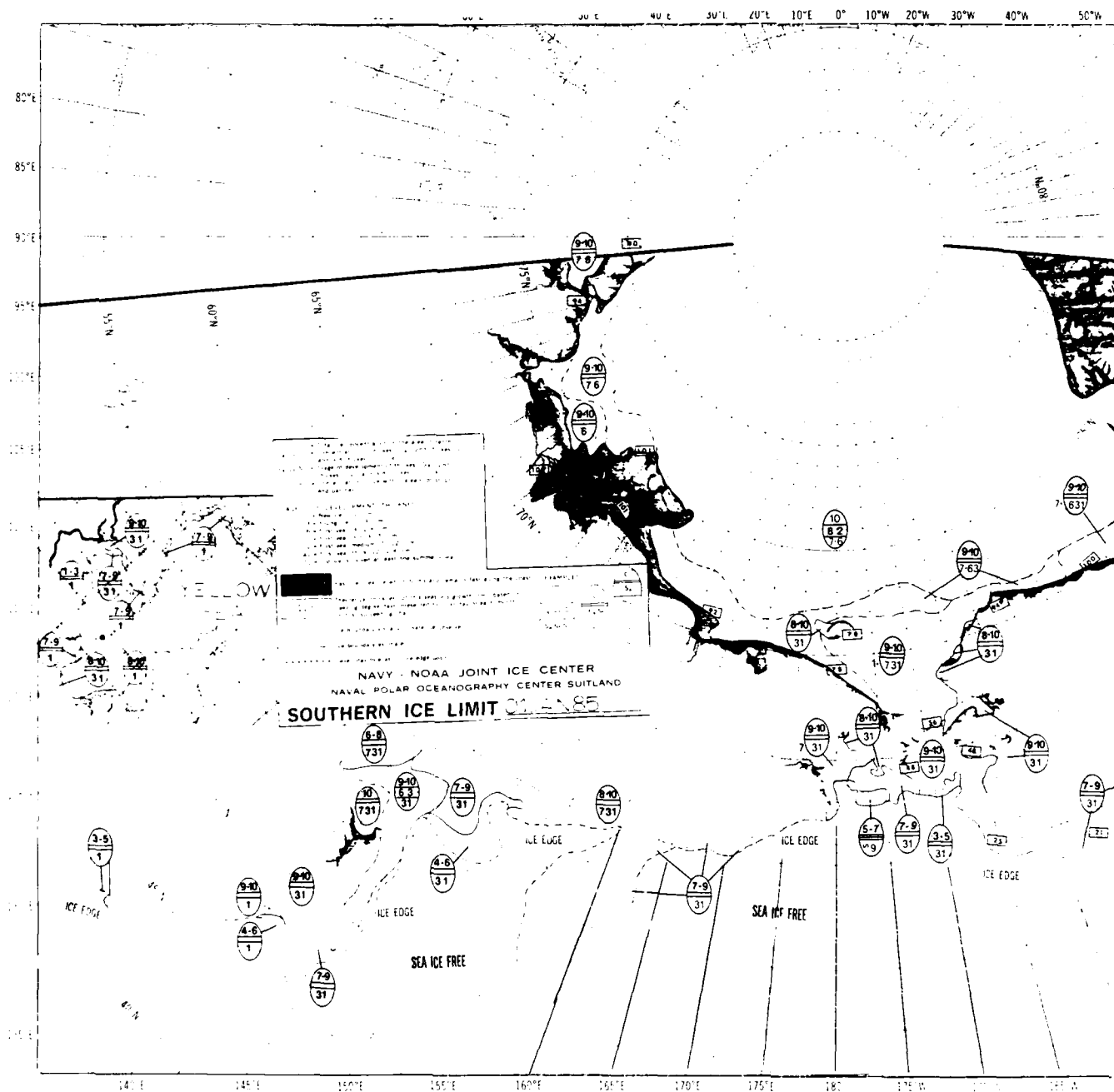


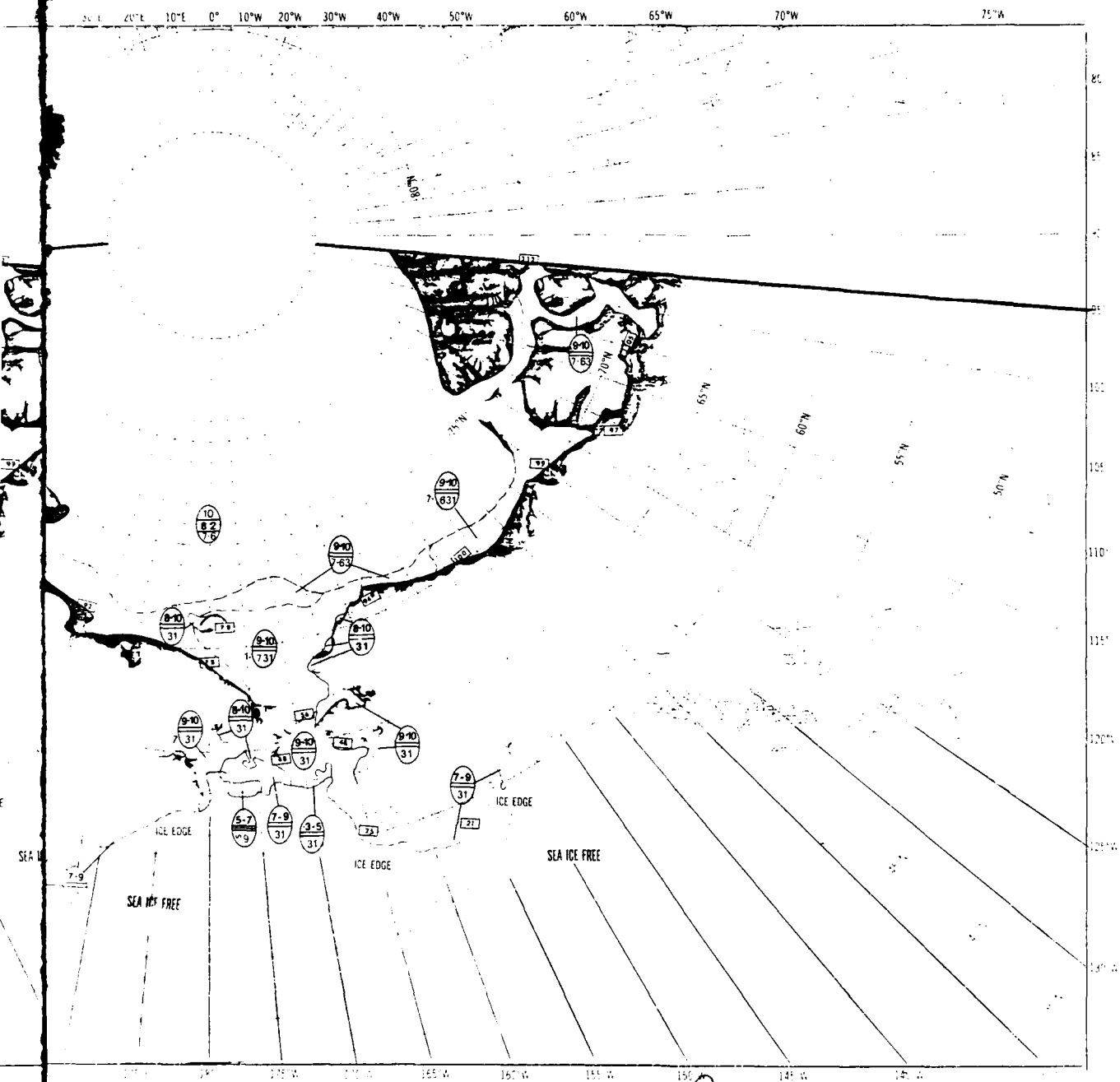


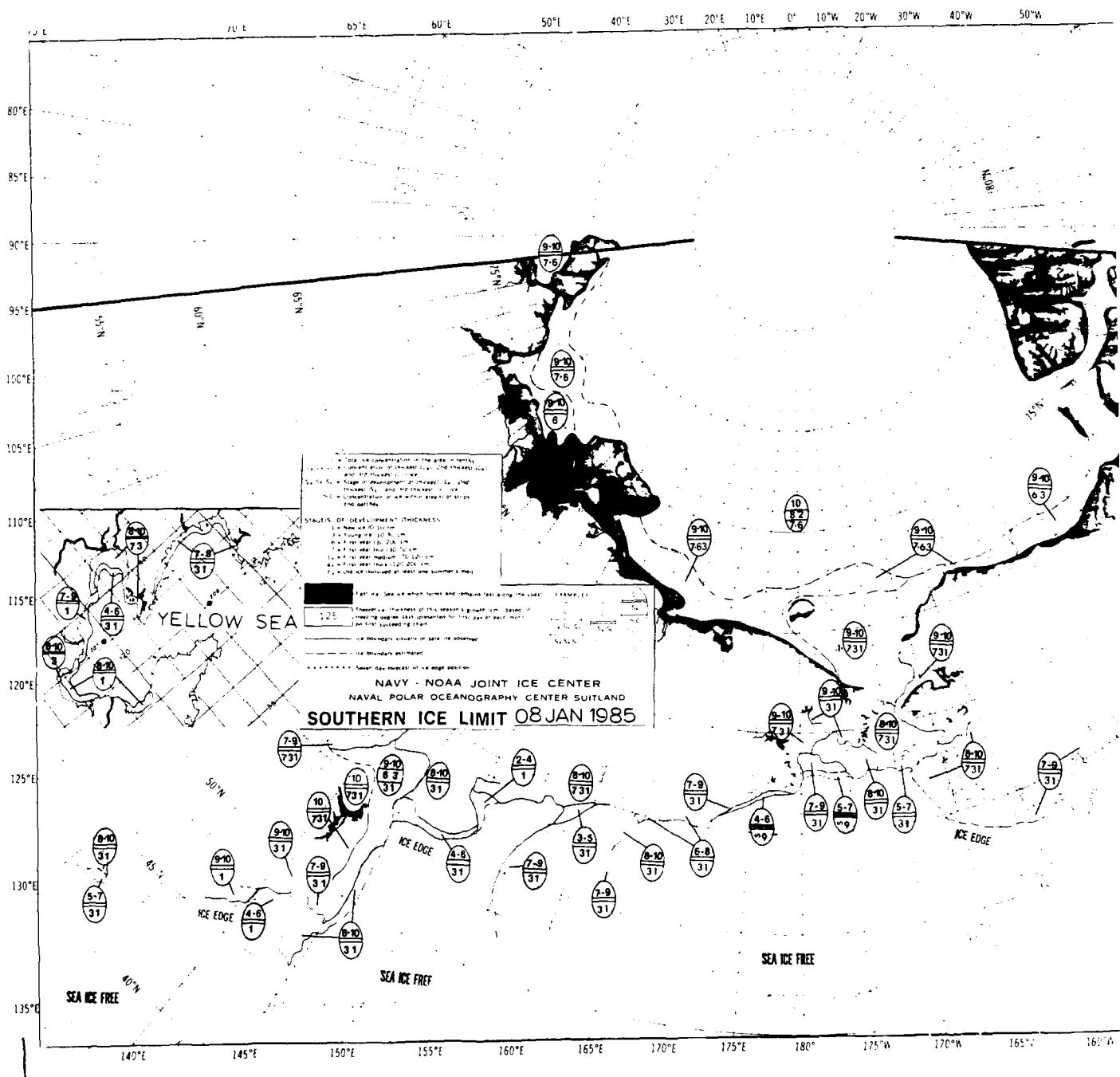


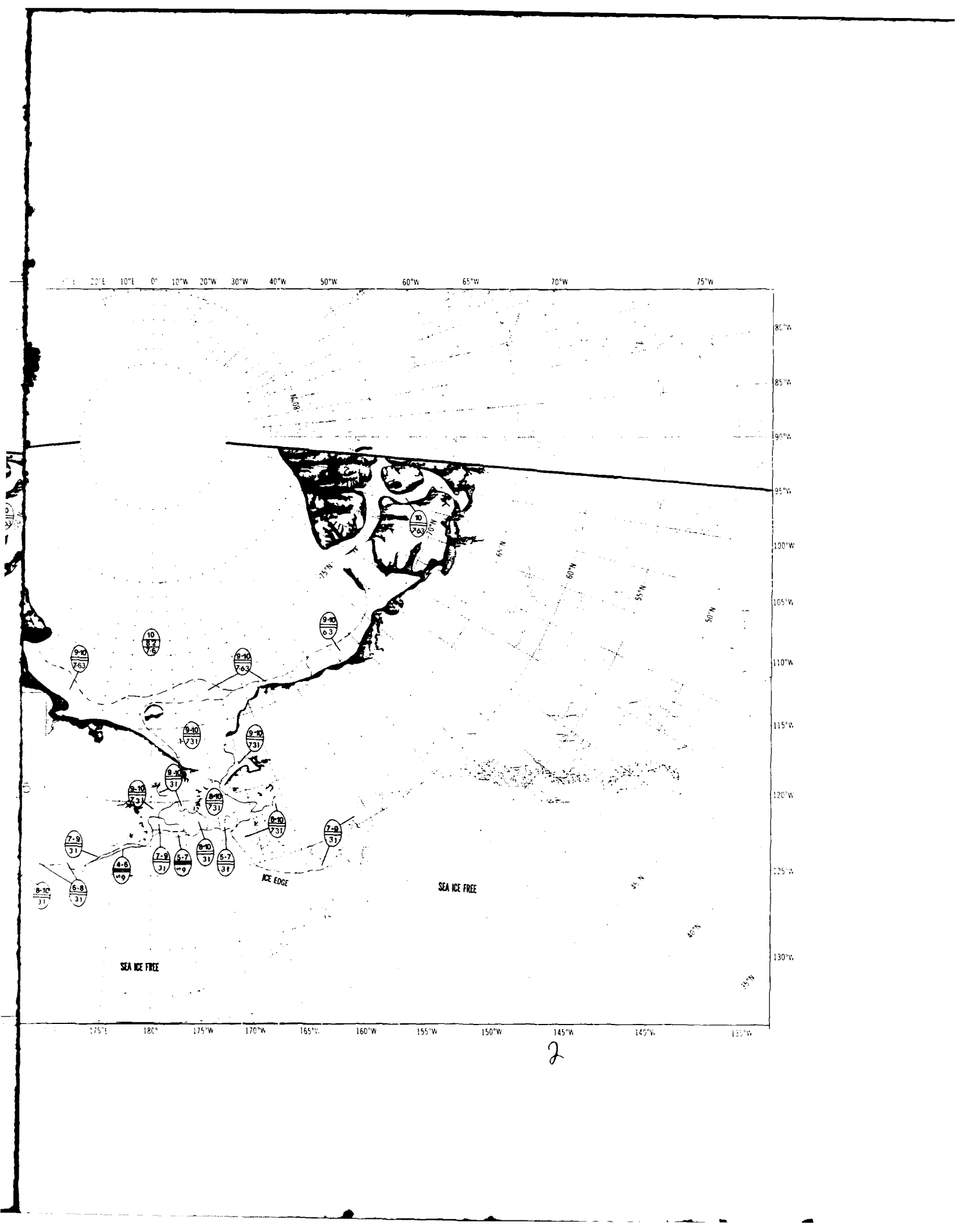


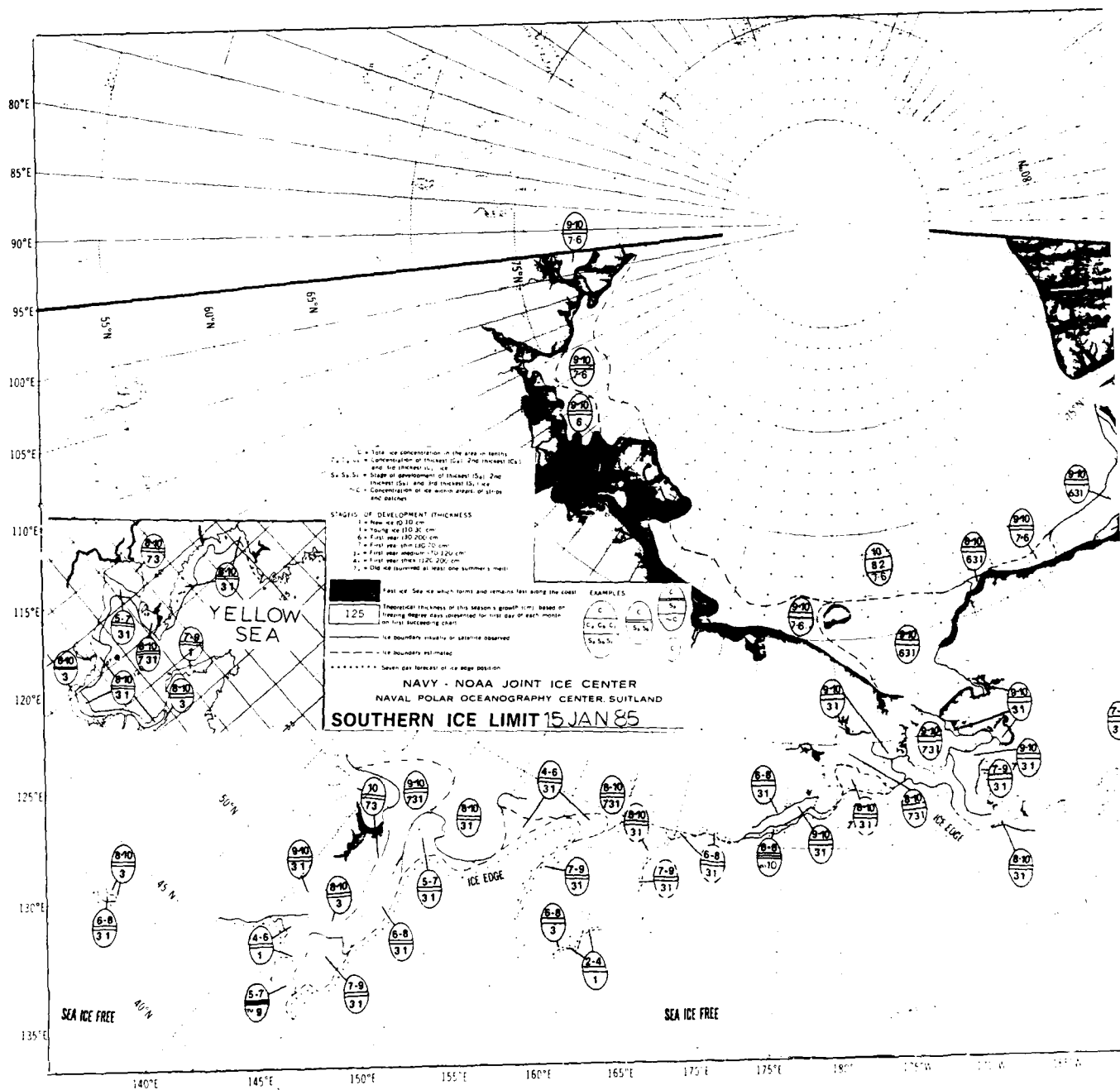


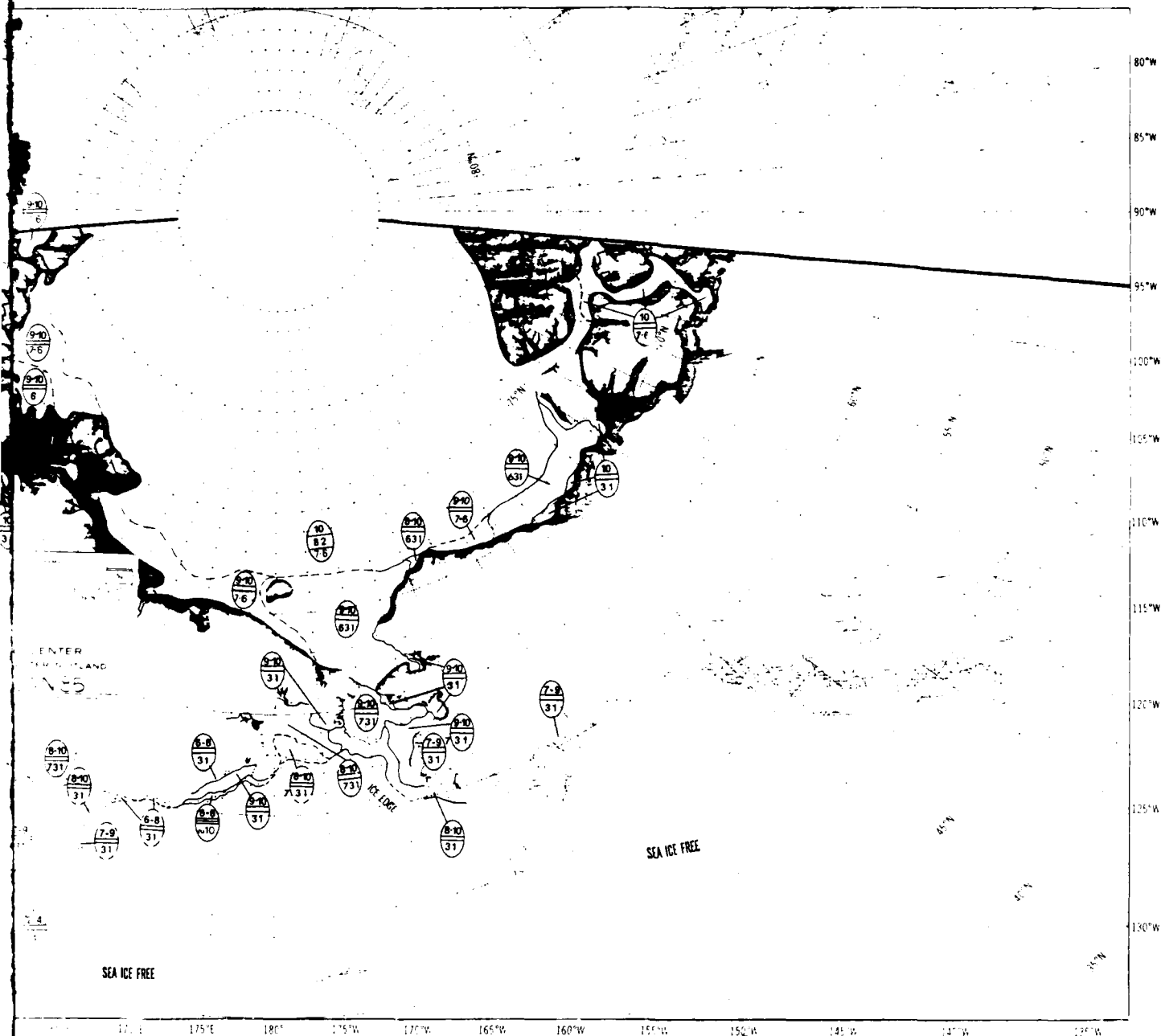




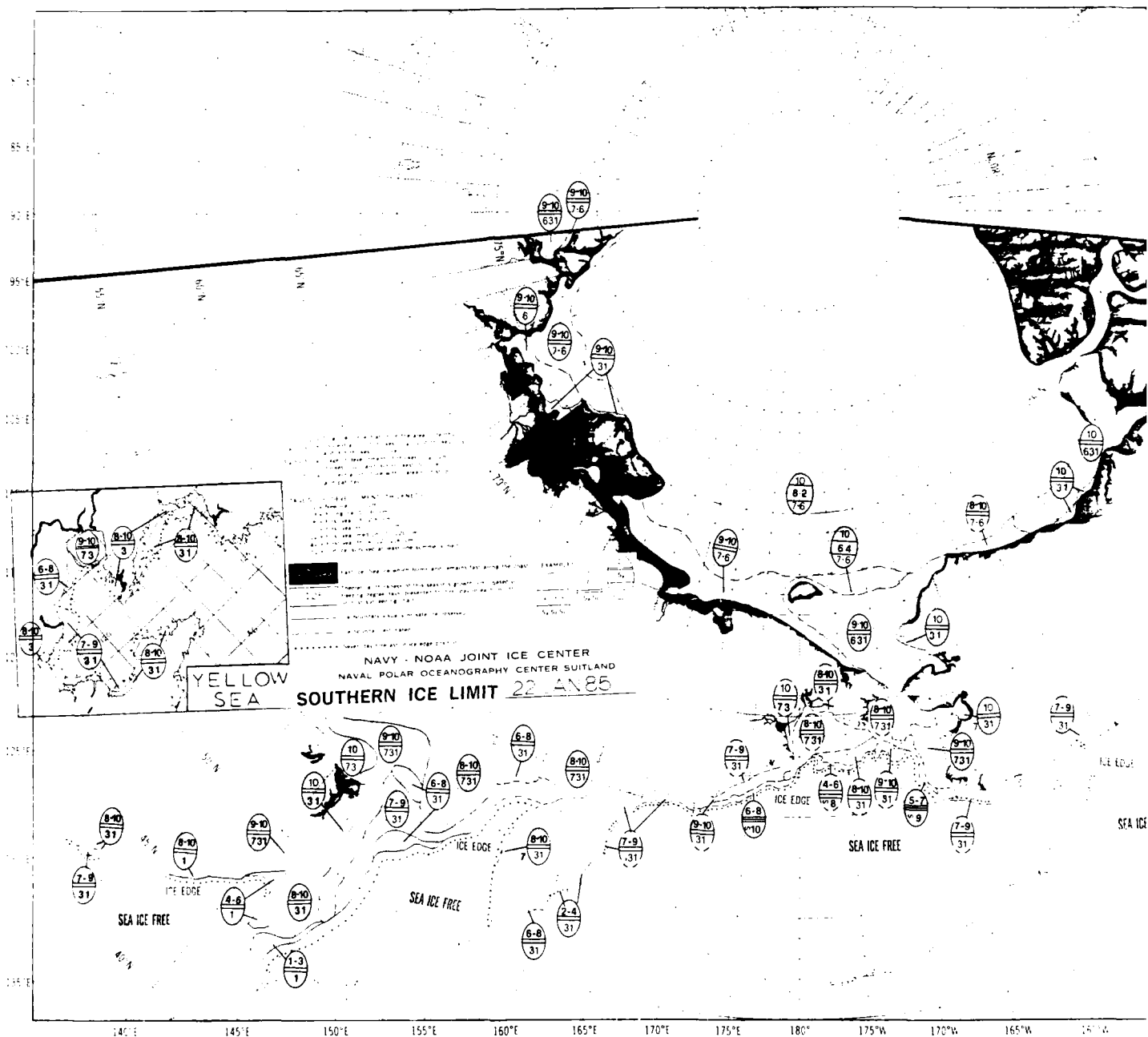


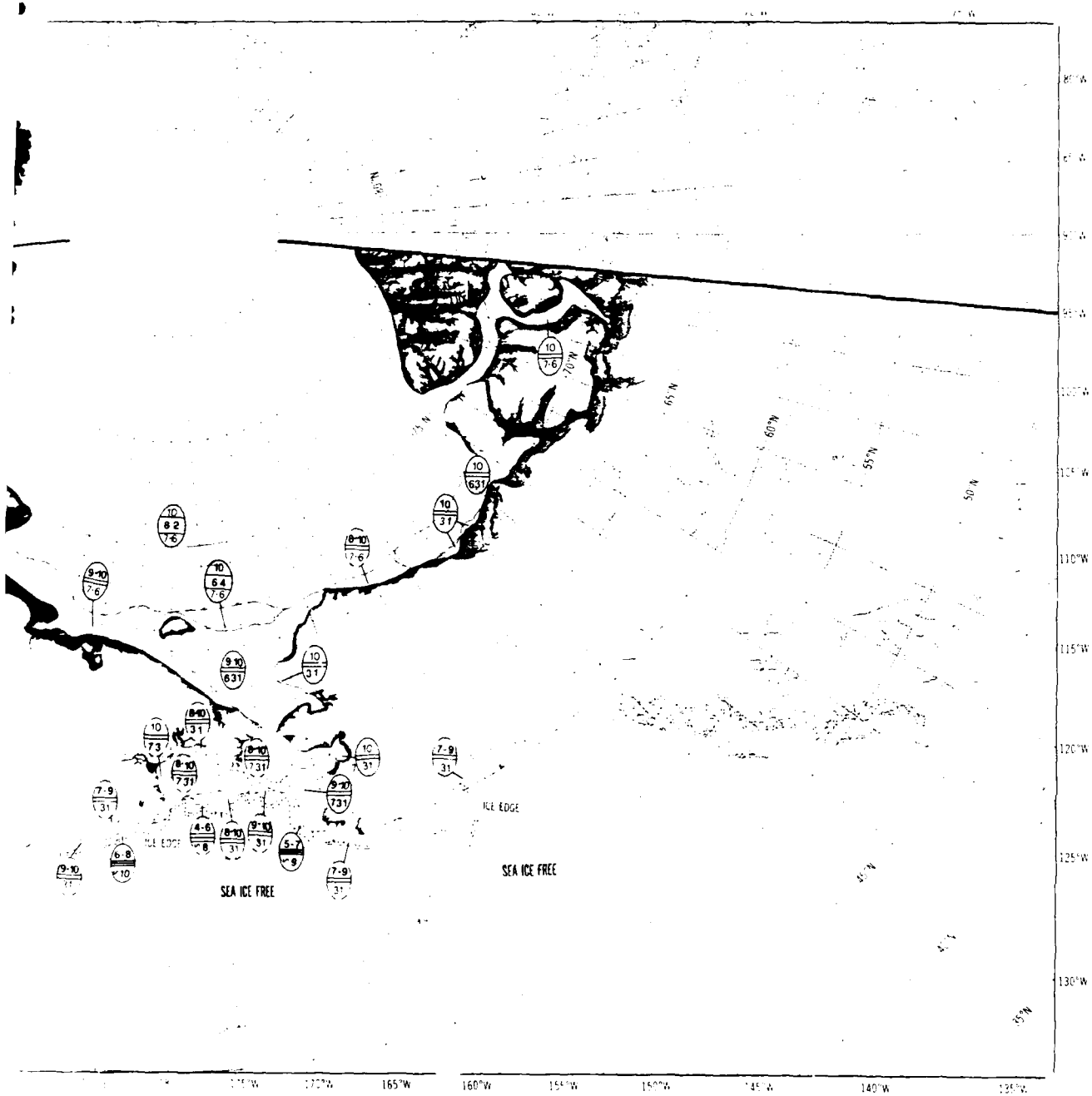


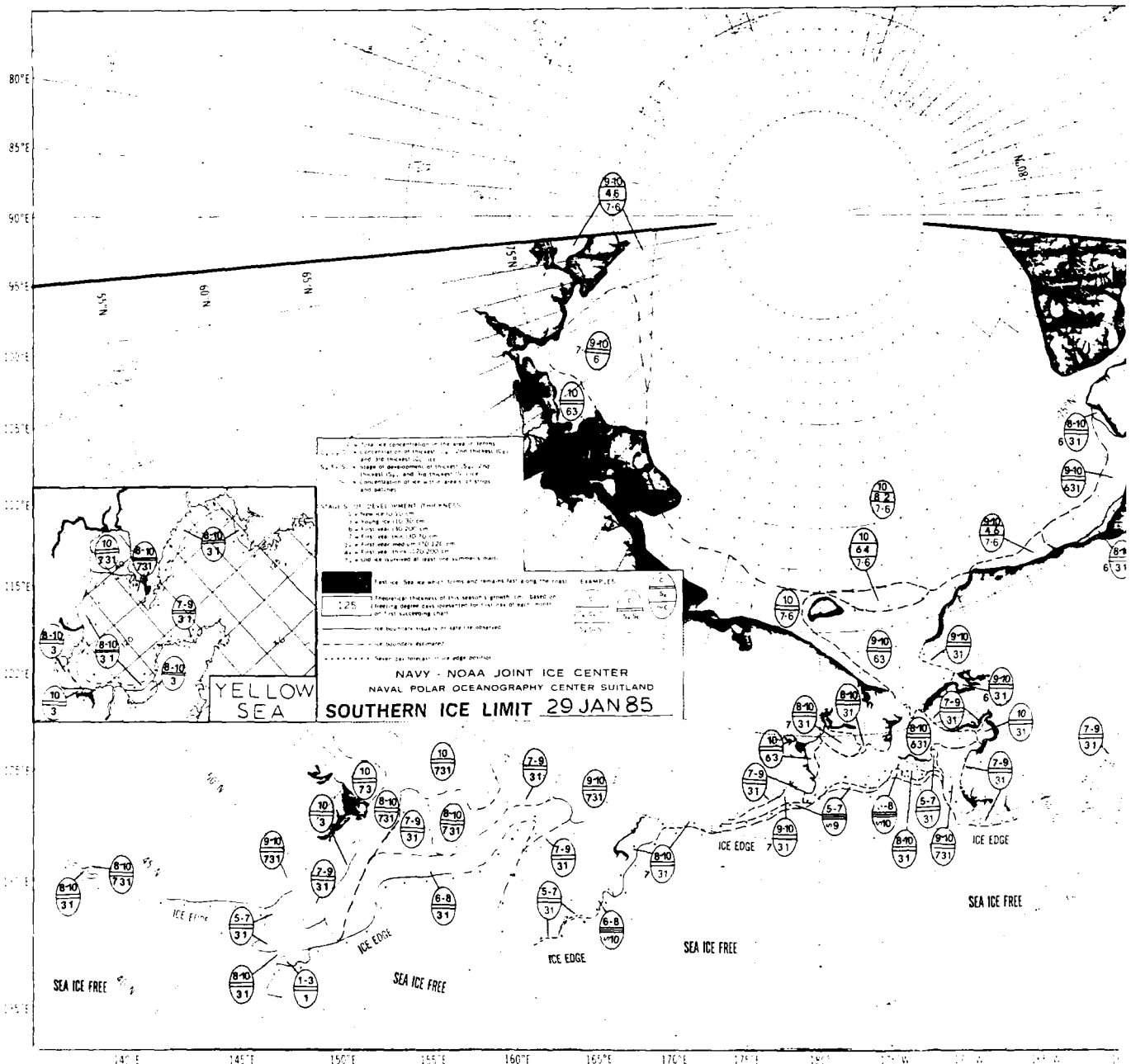


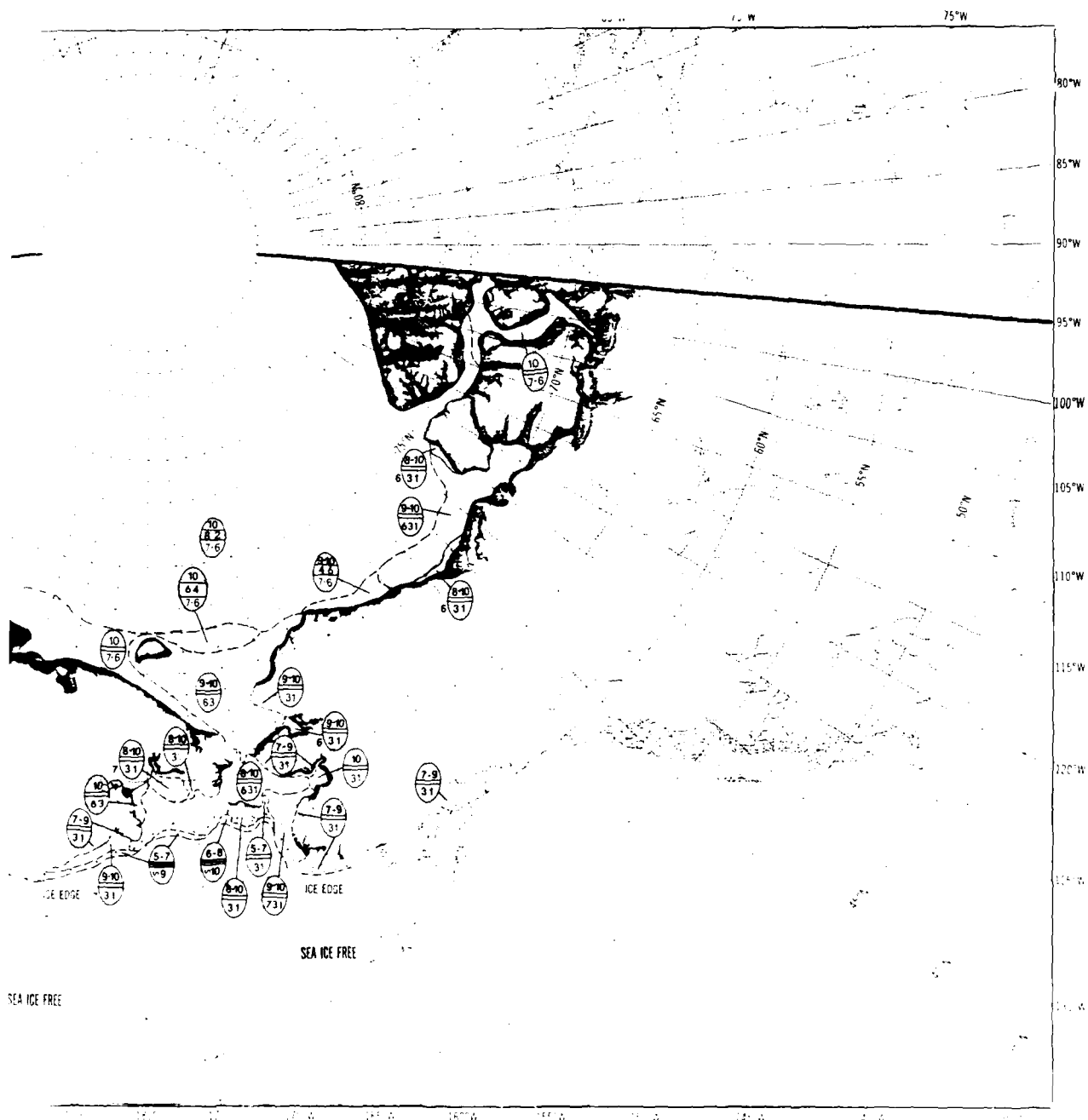


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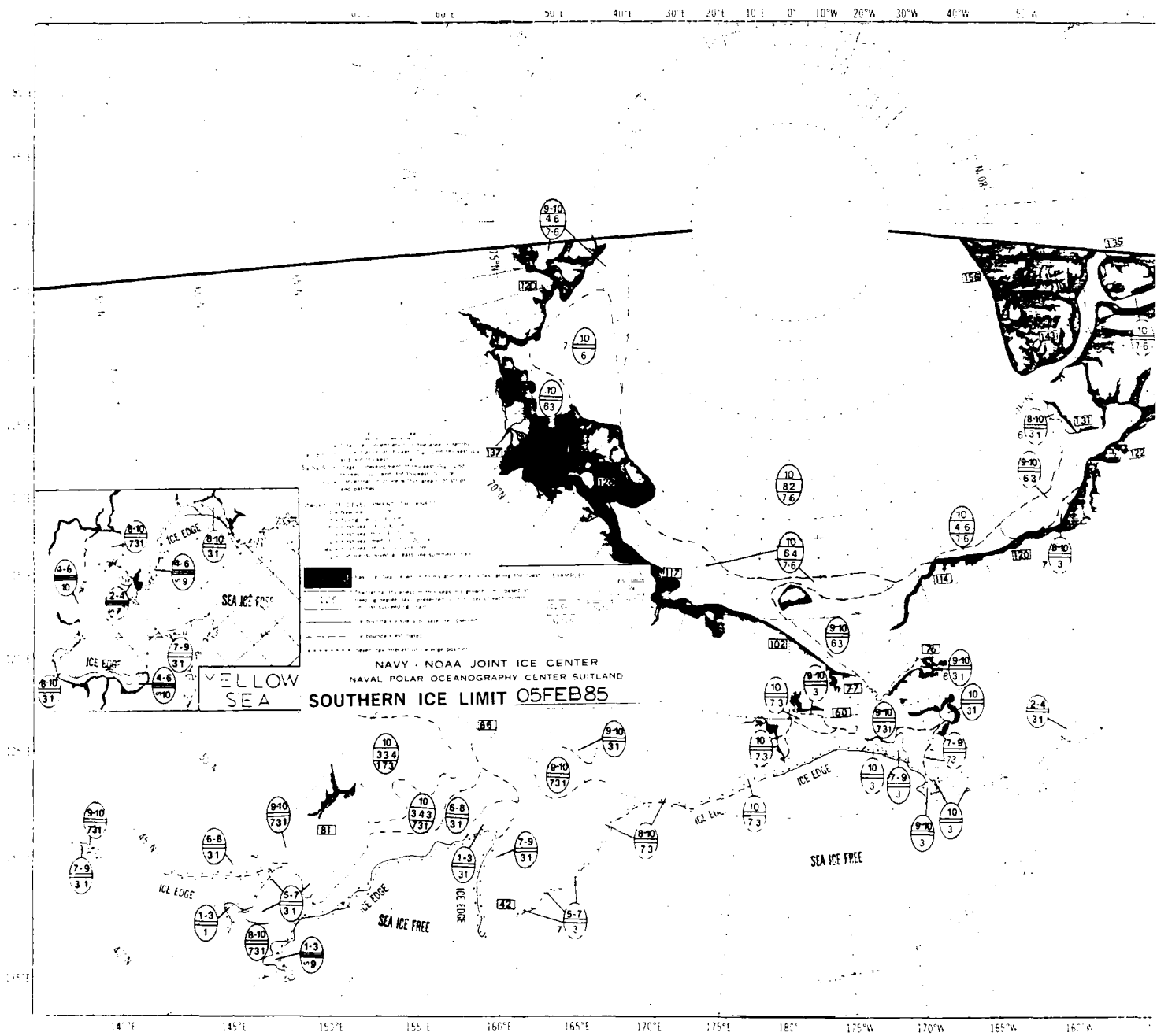


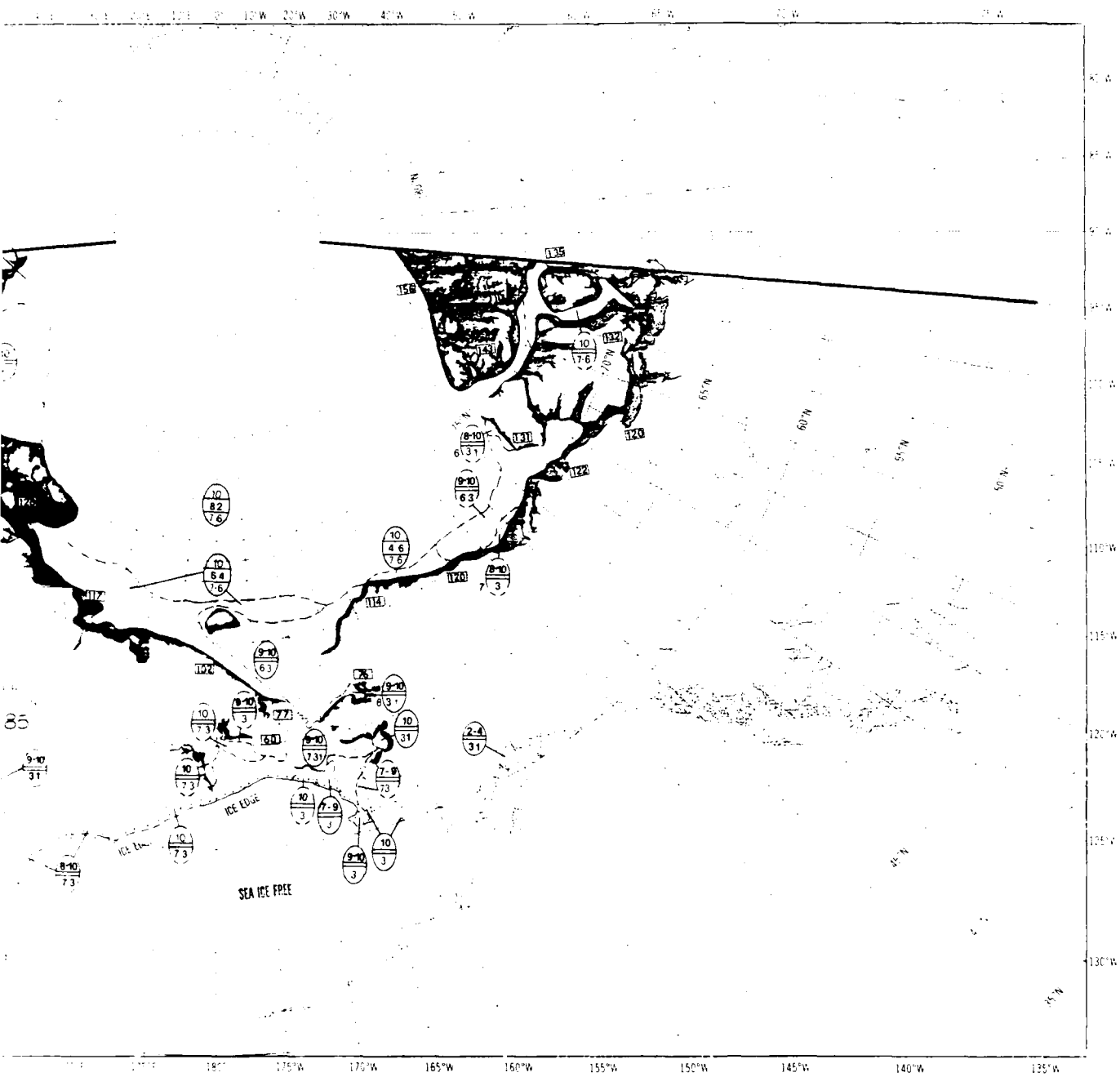




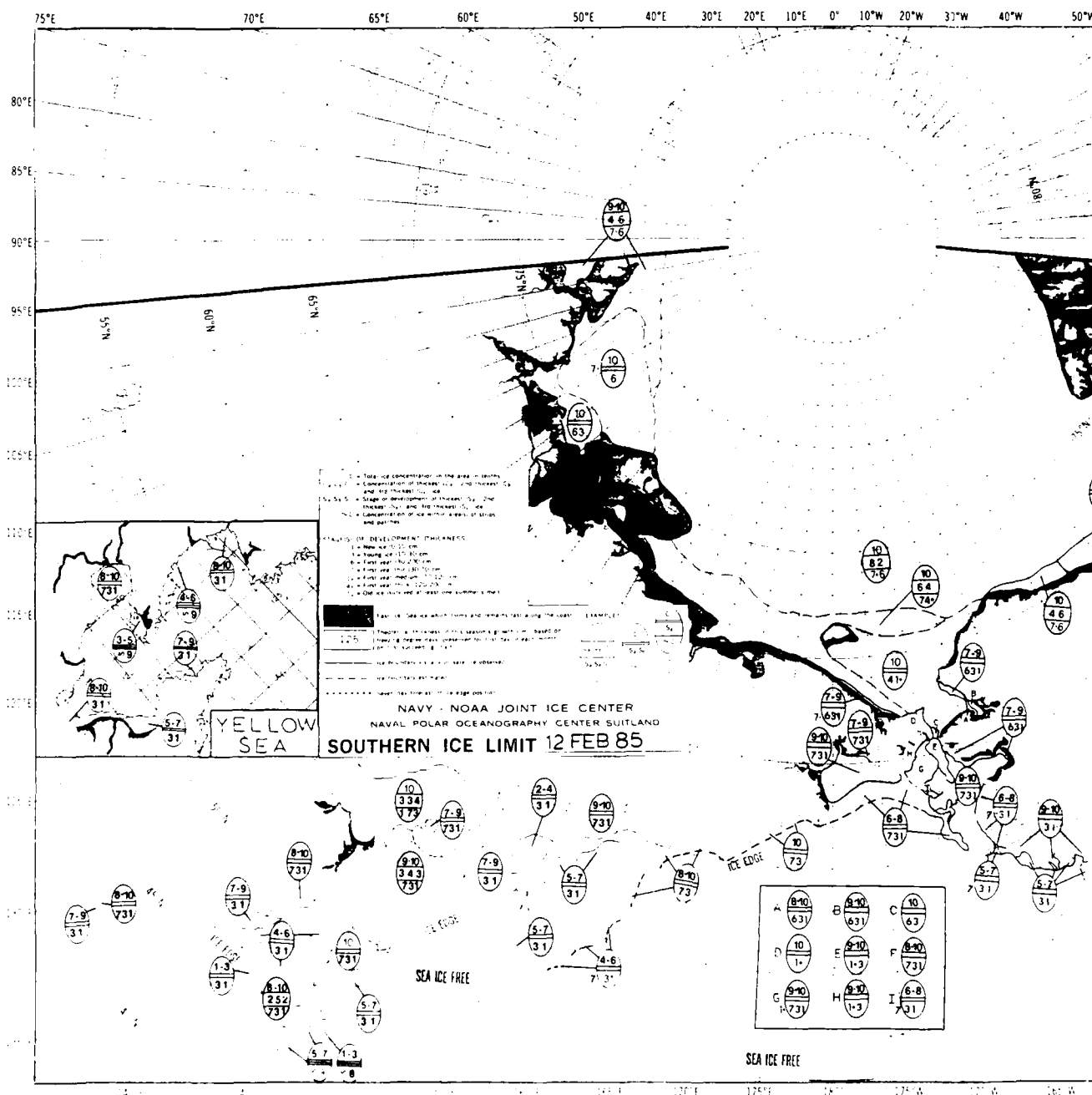


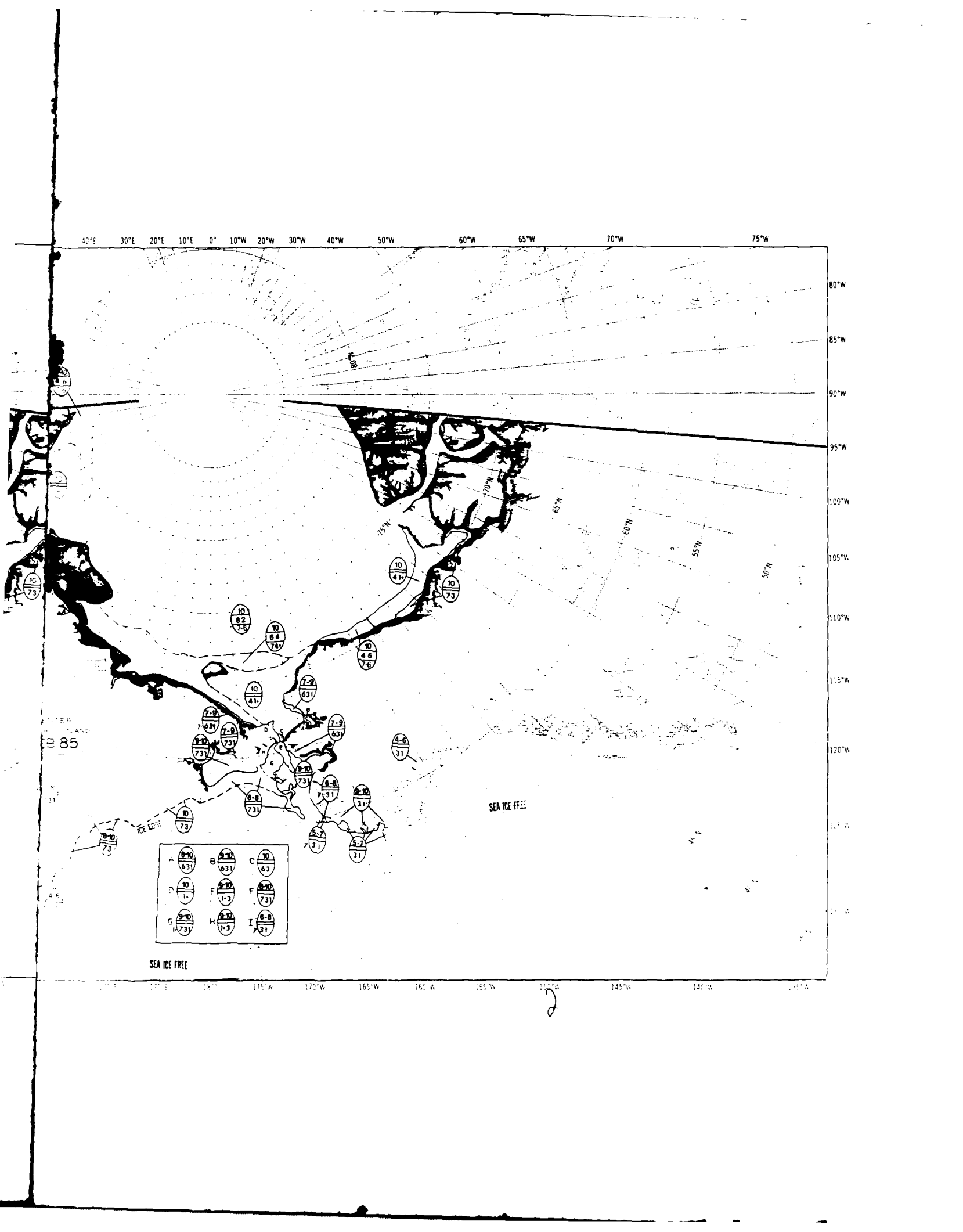
SEA ICE FREE

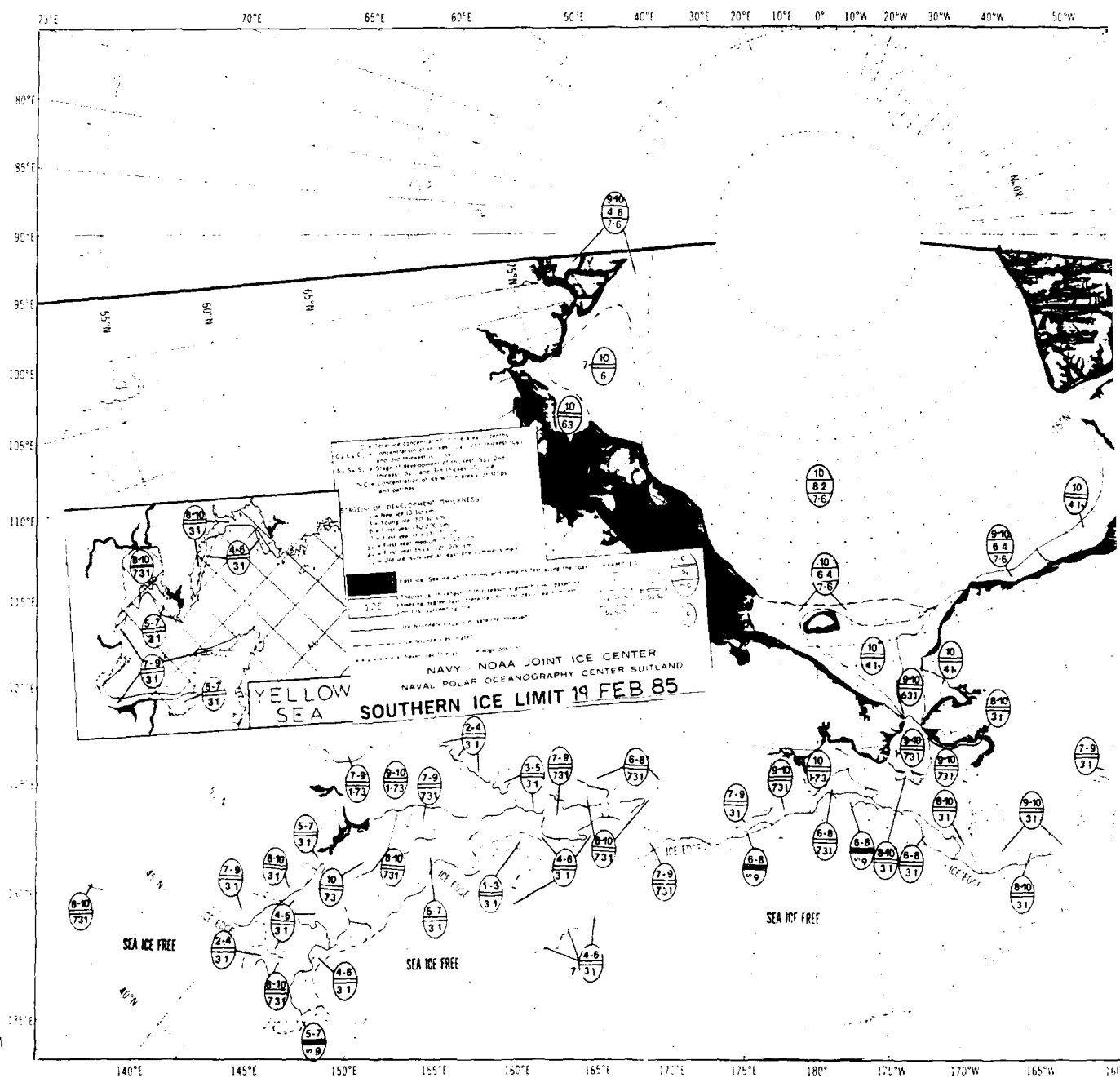


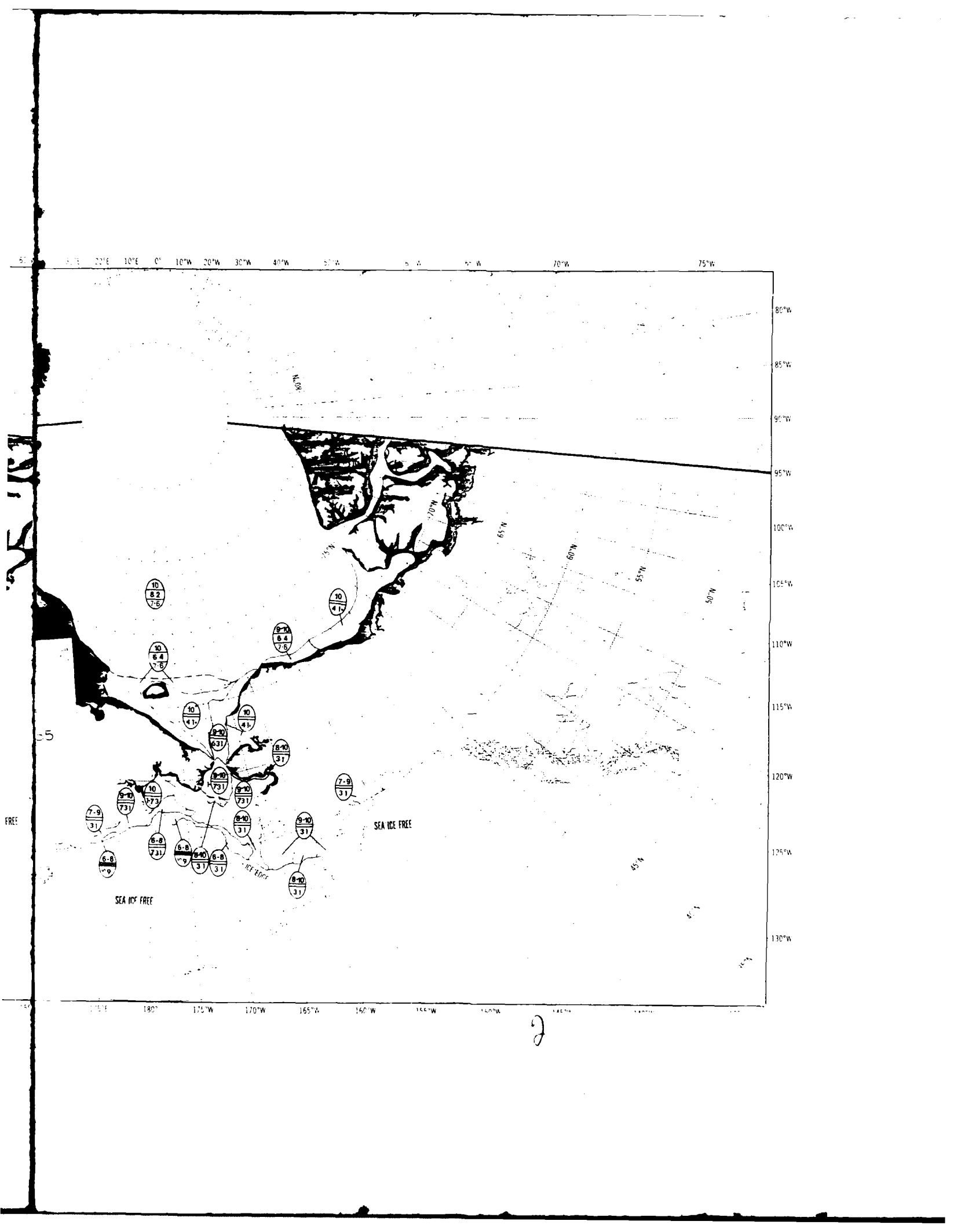


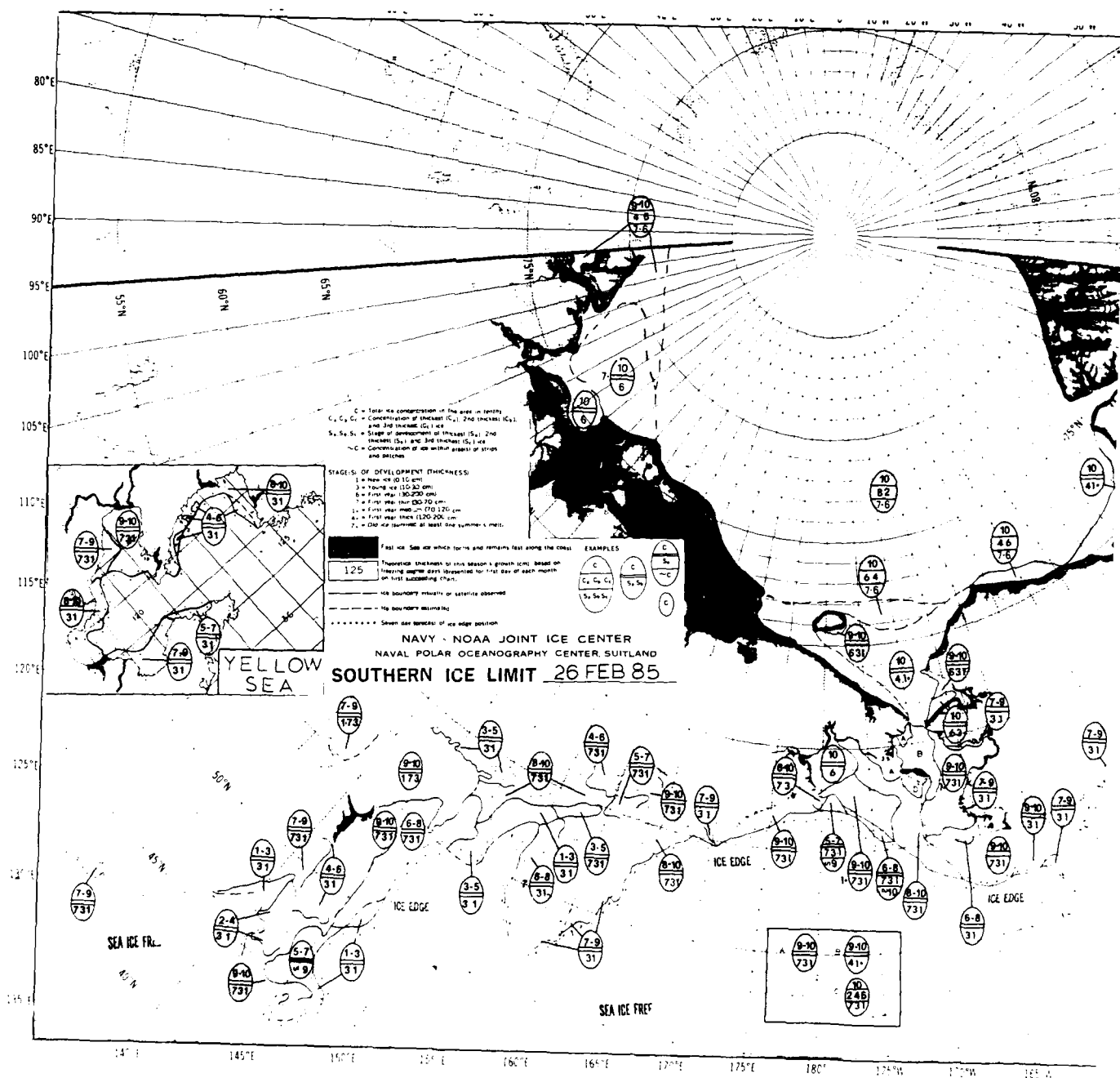
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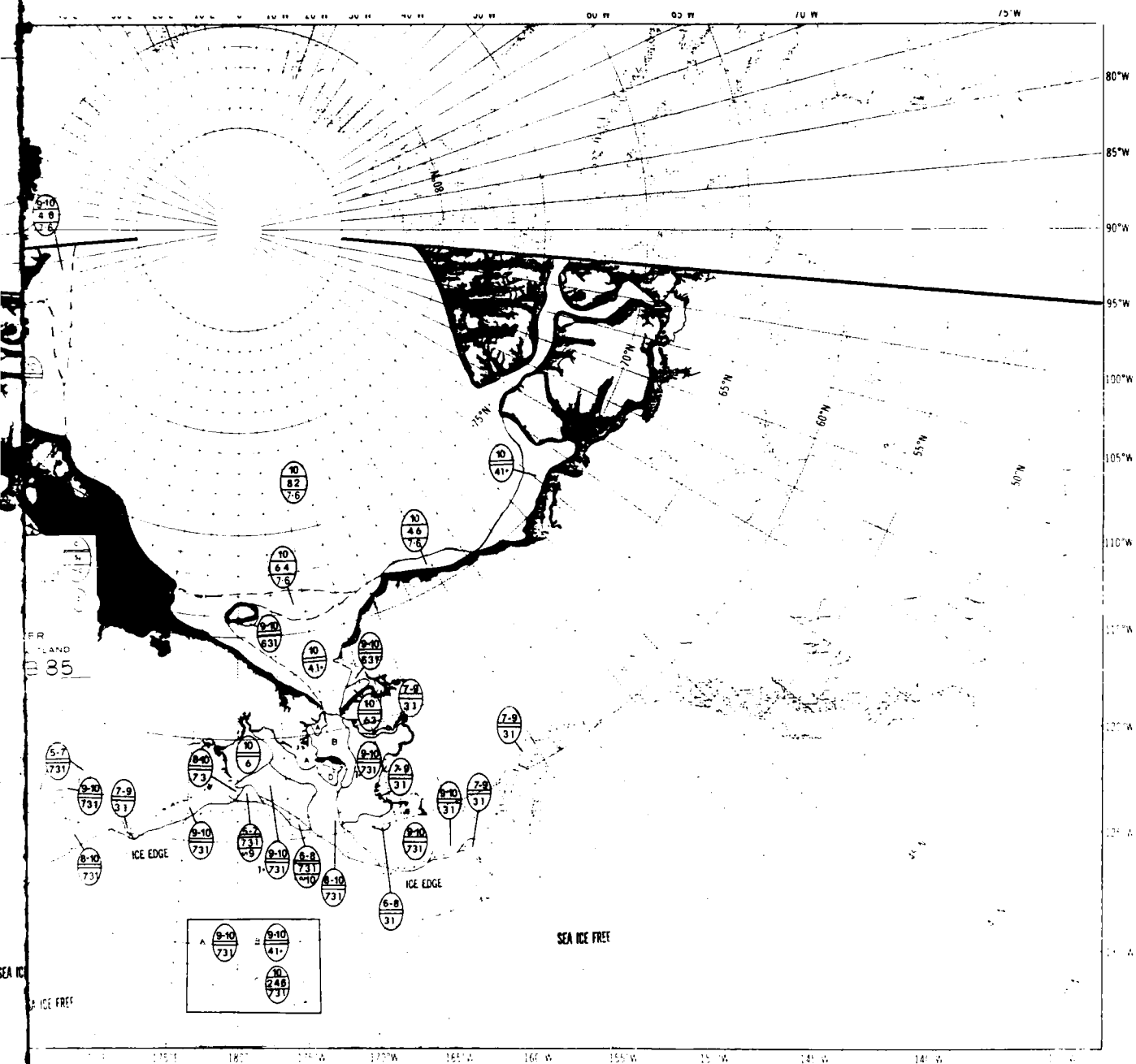


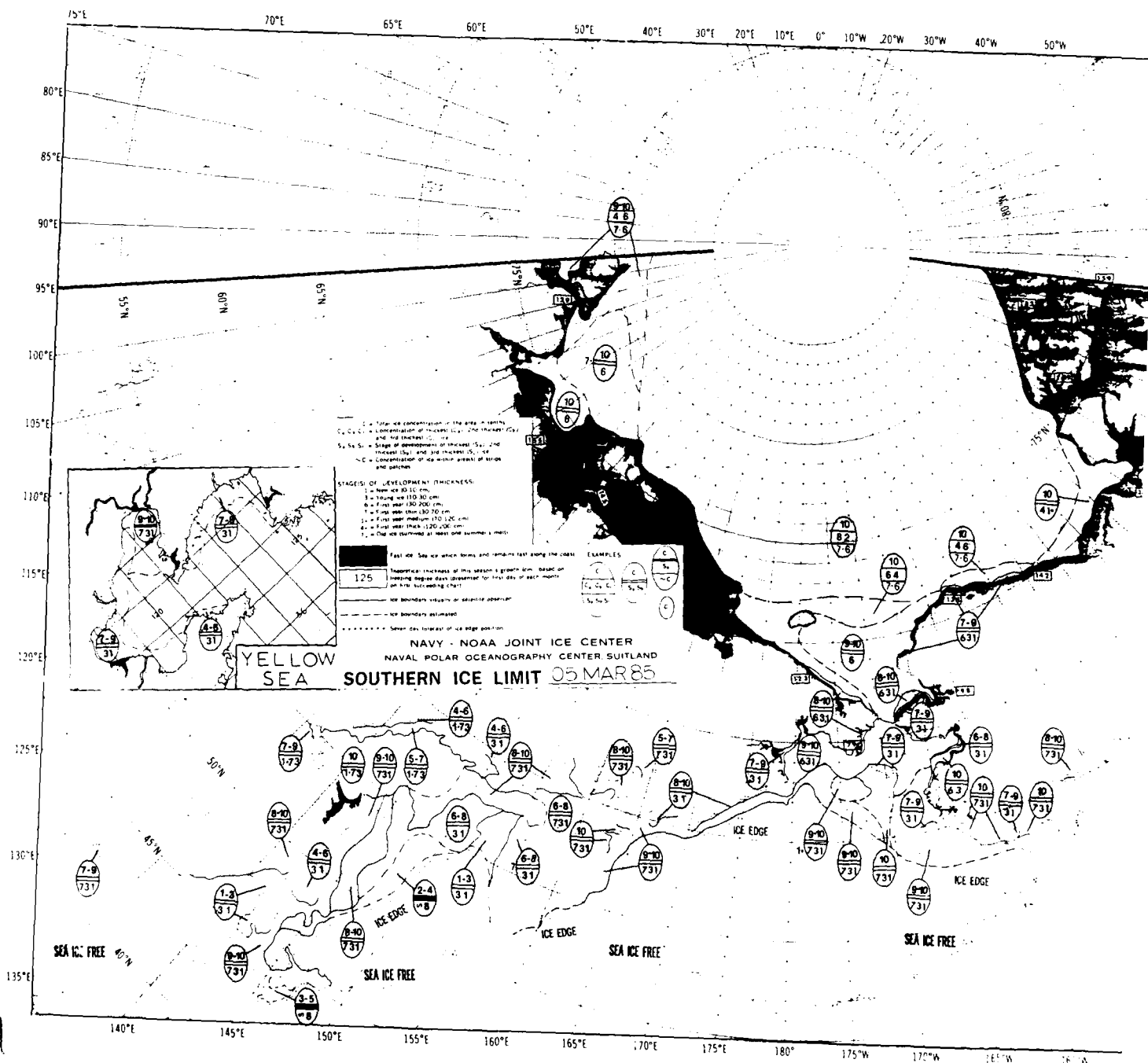


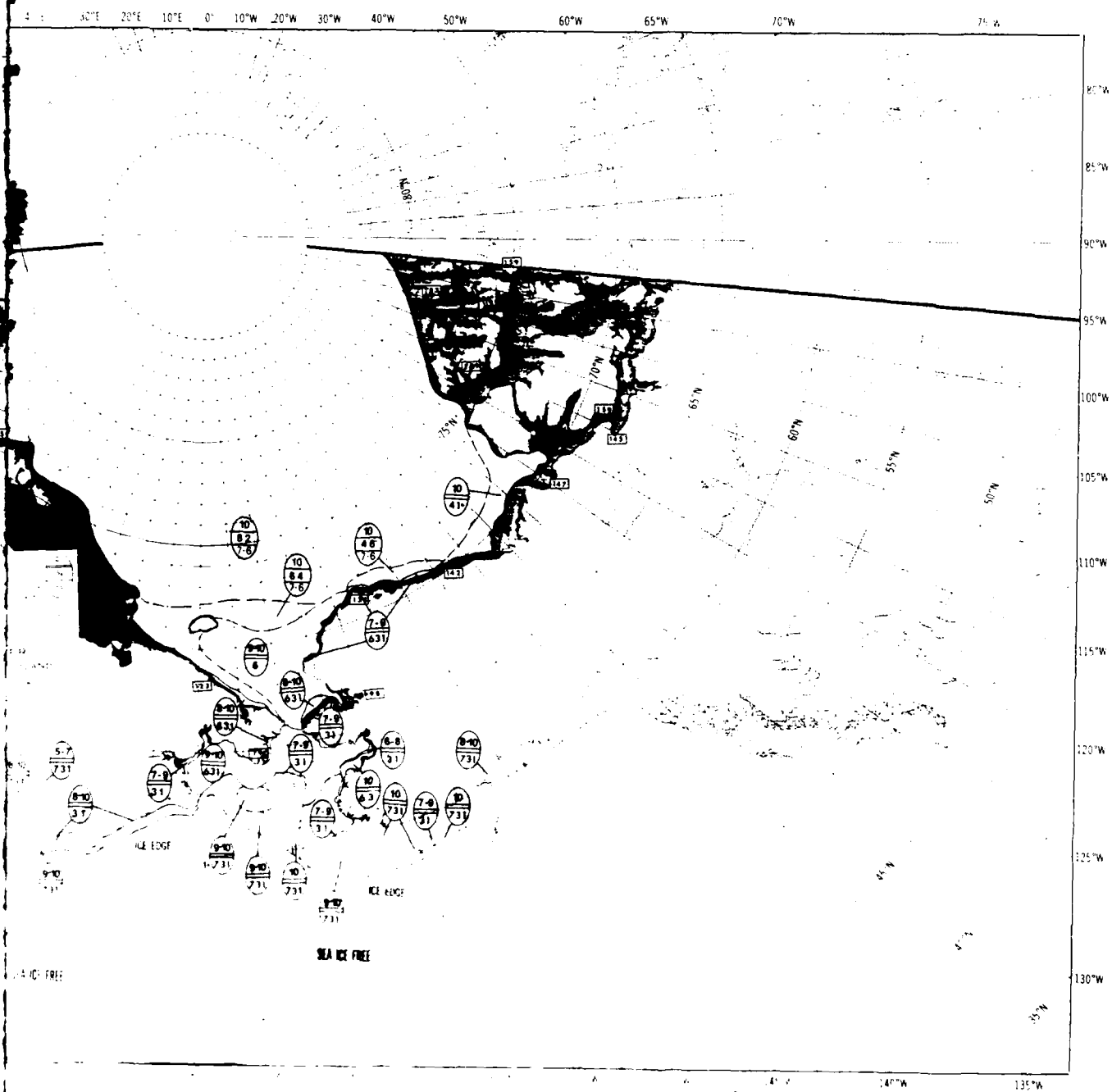


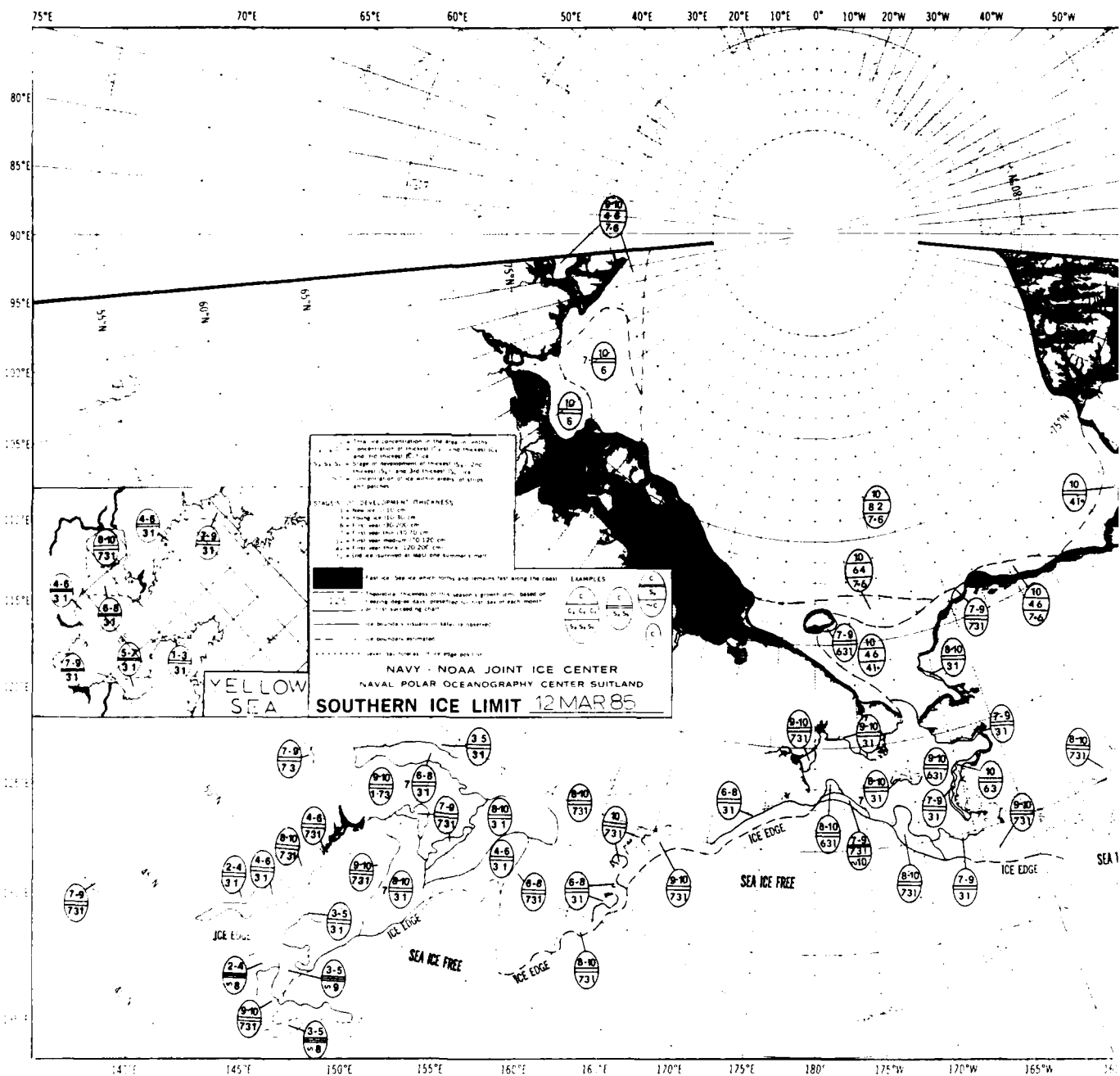




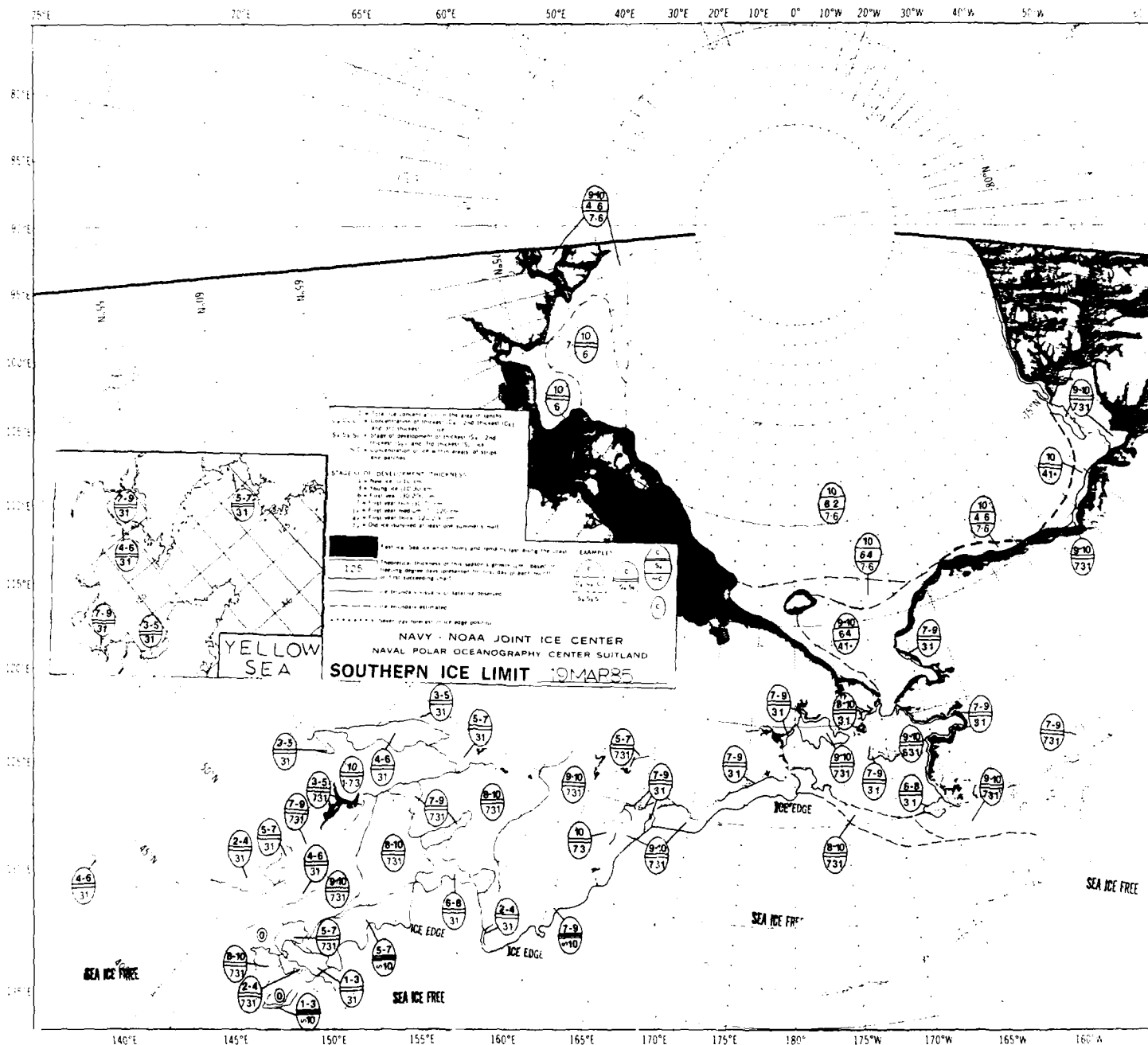


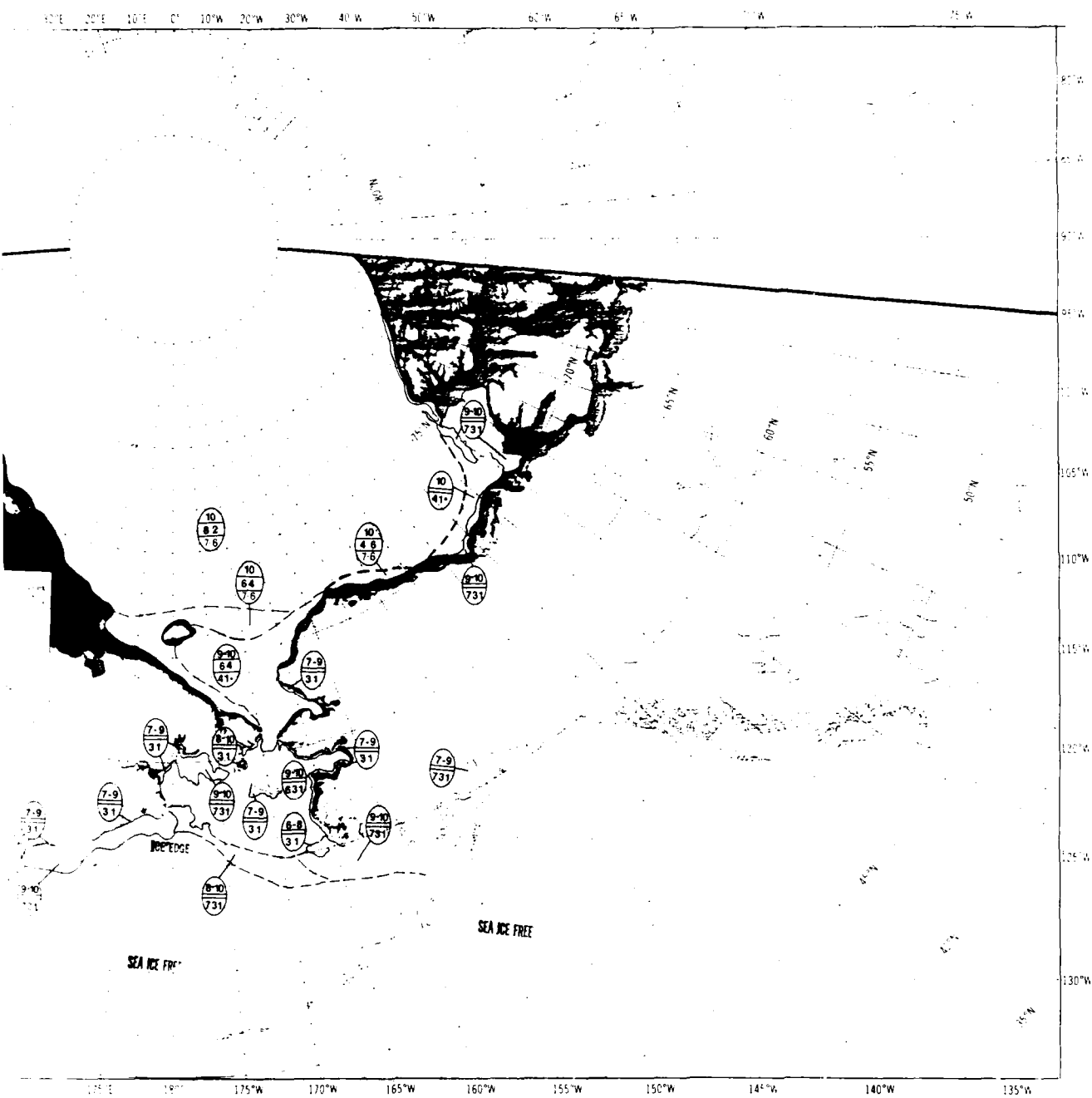


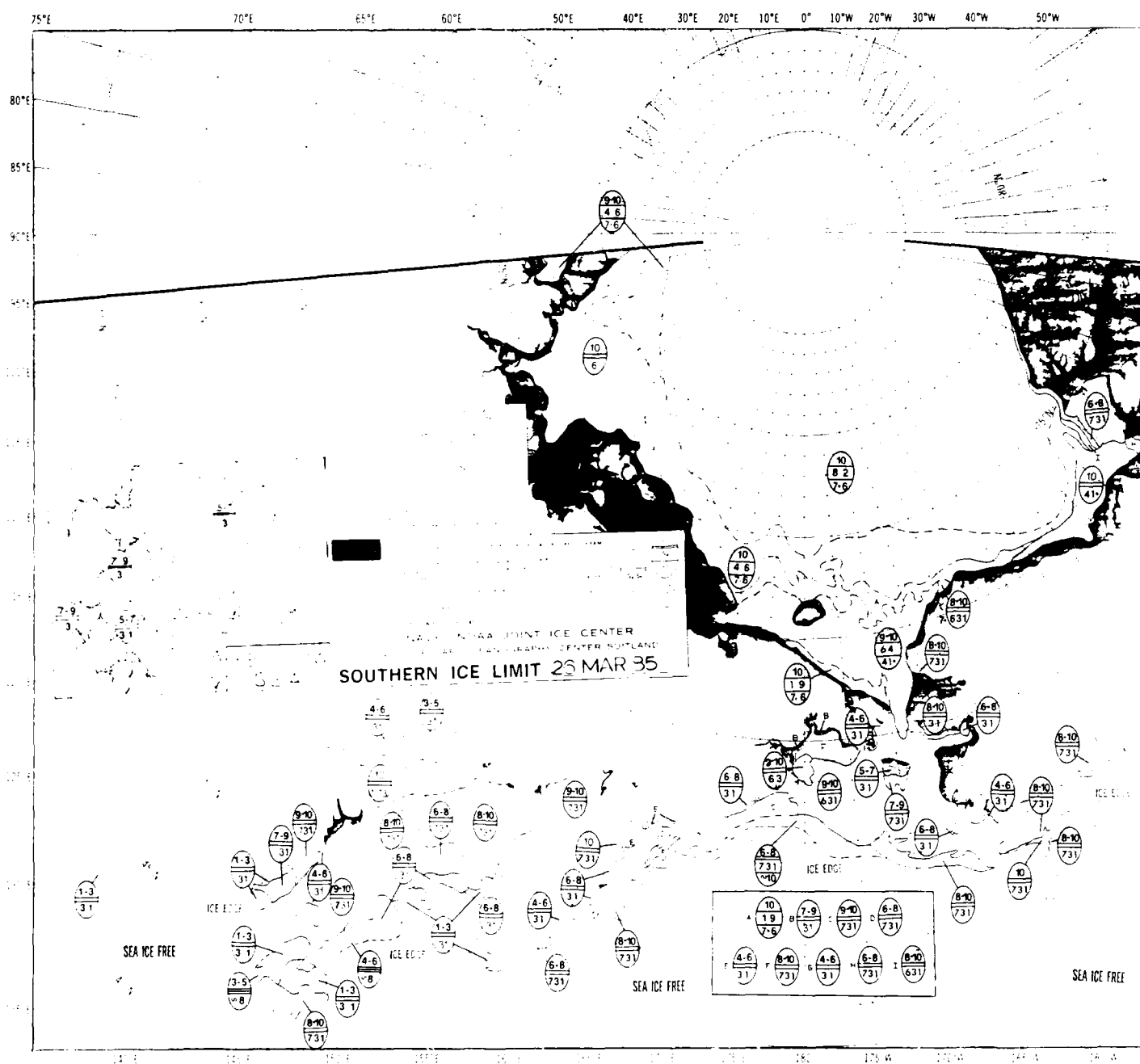


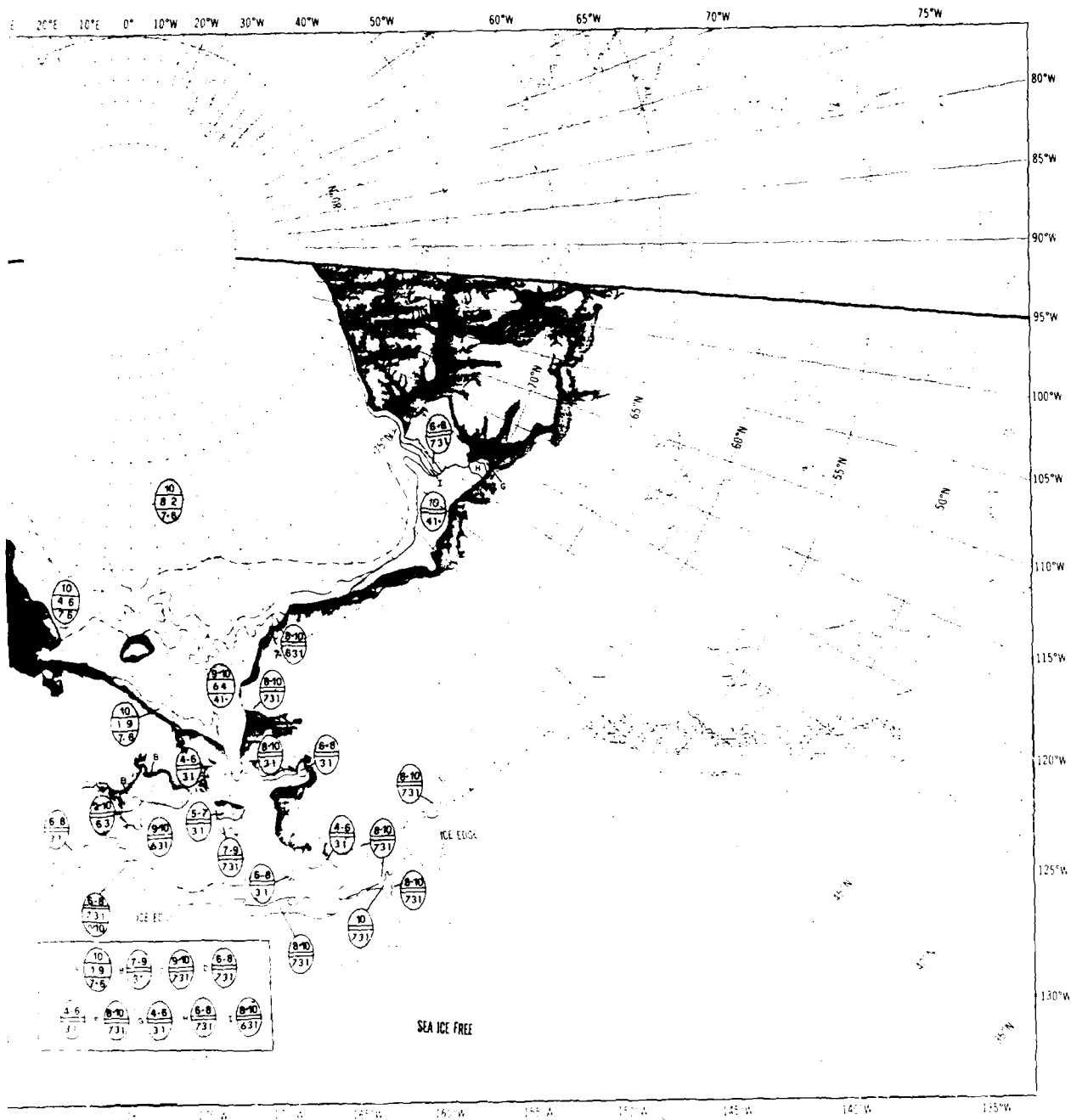


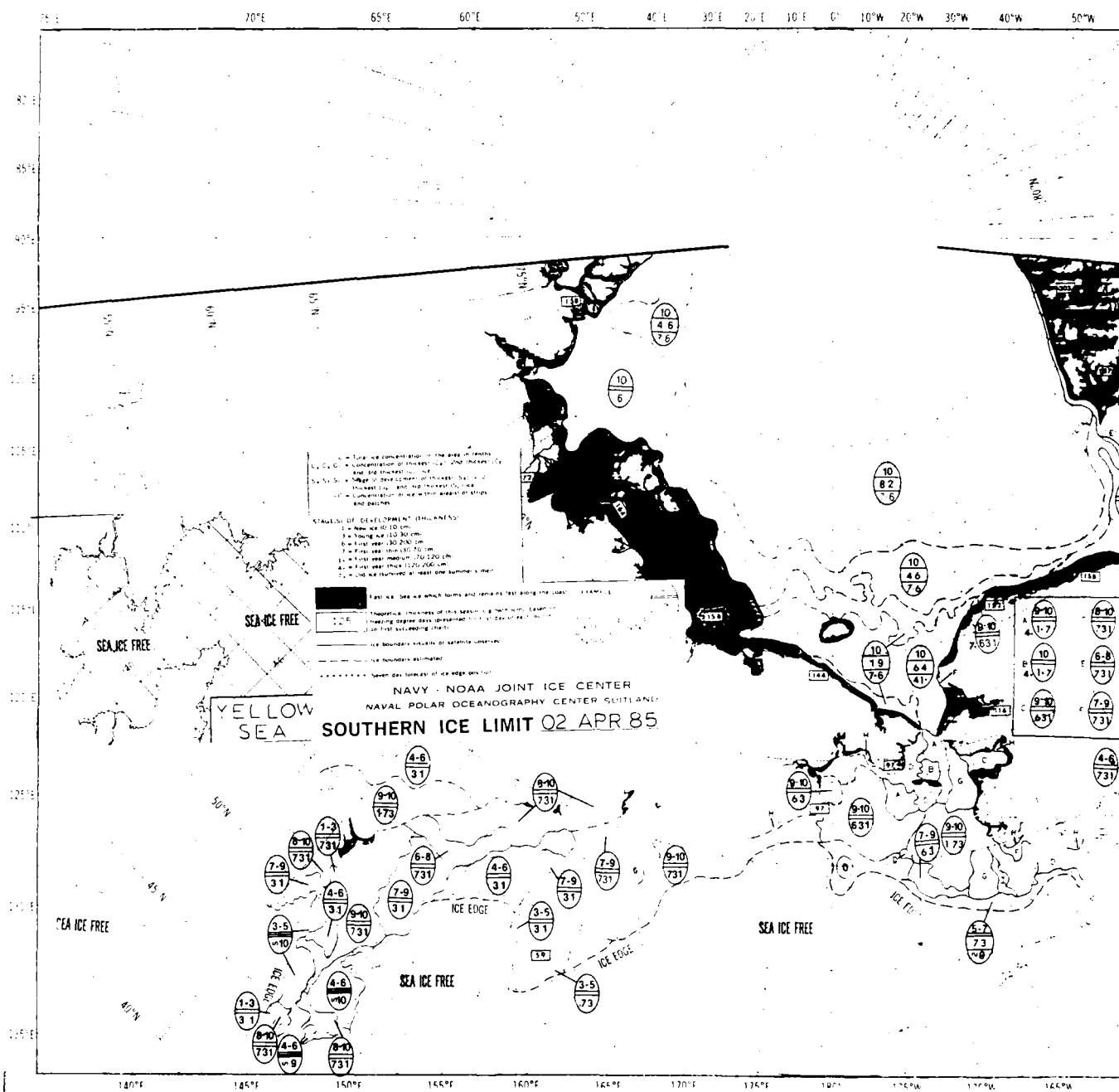


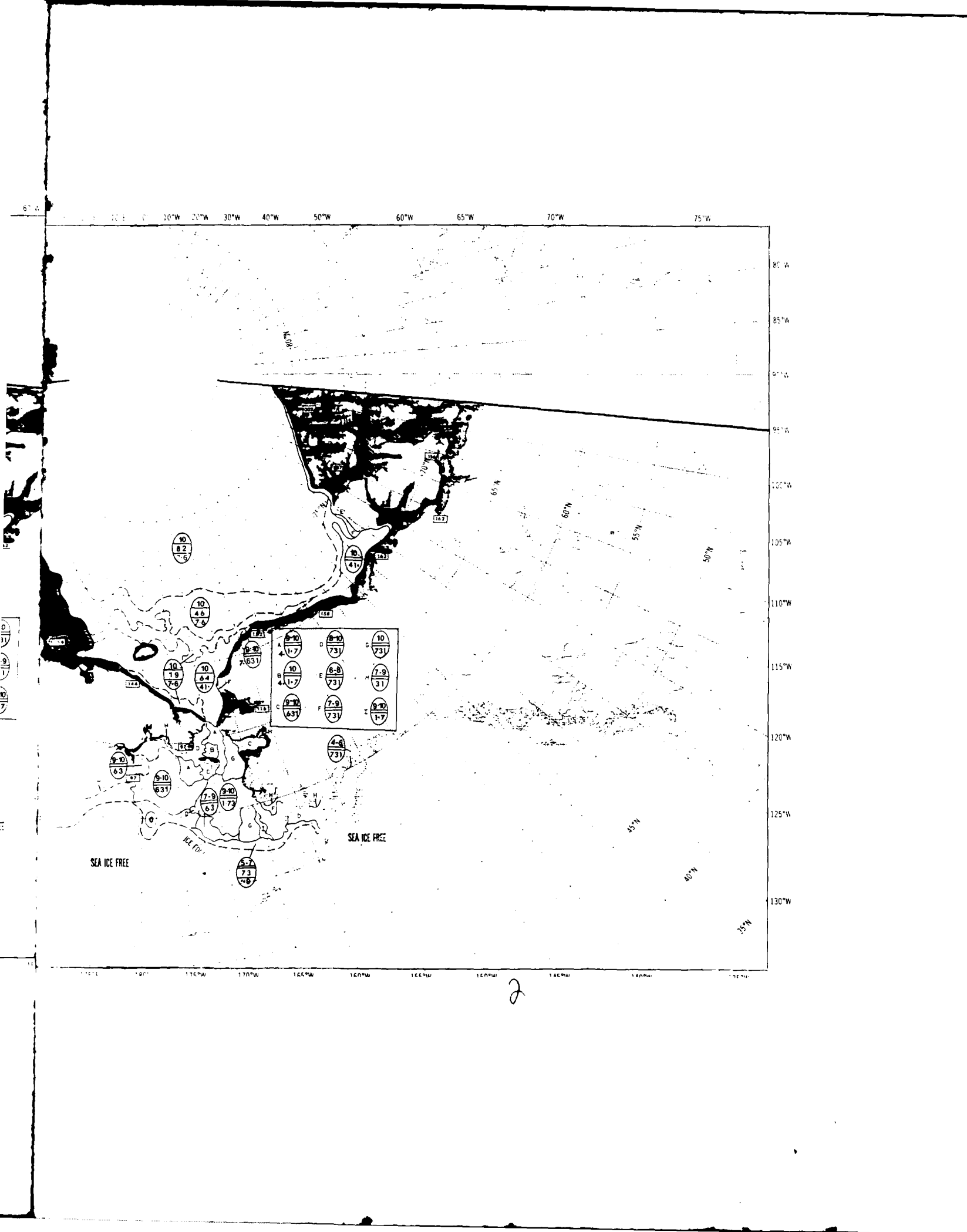




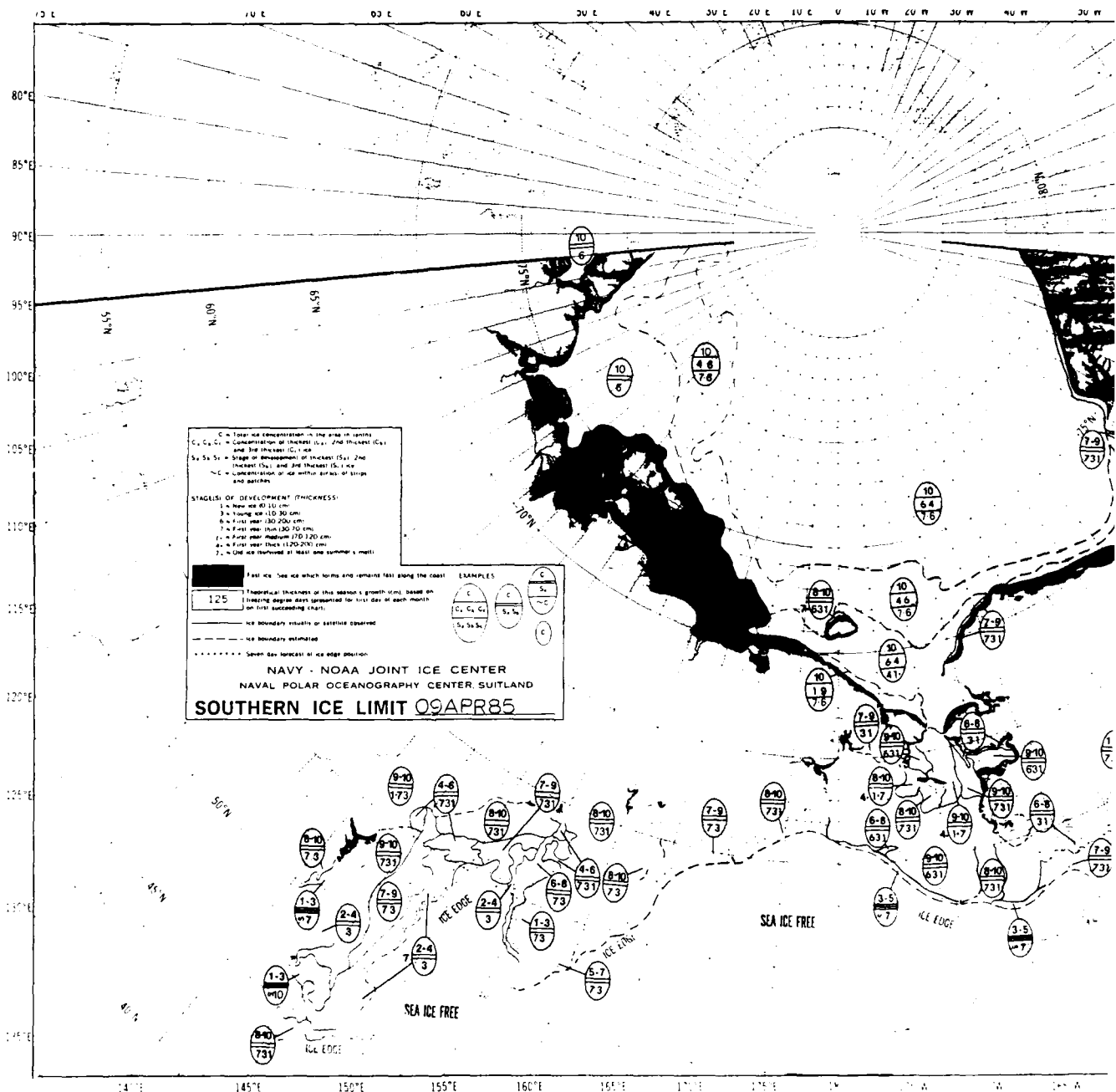


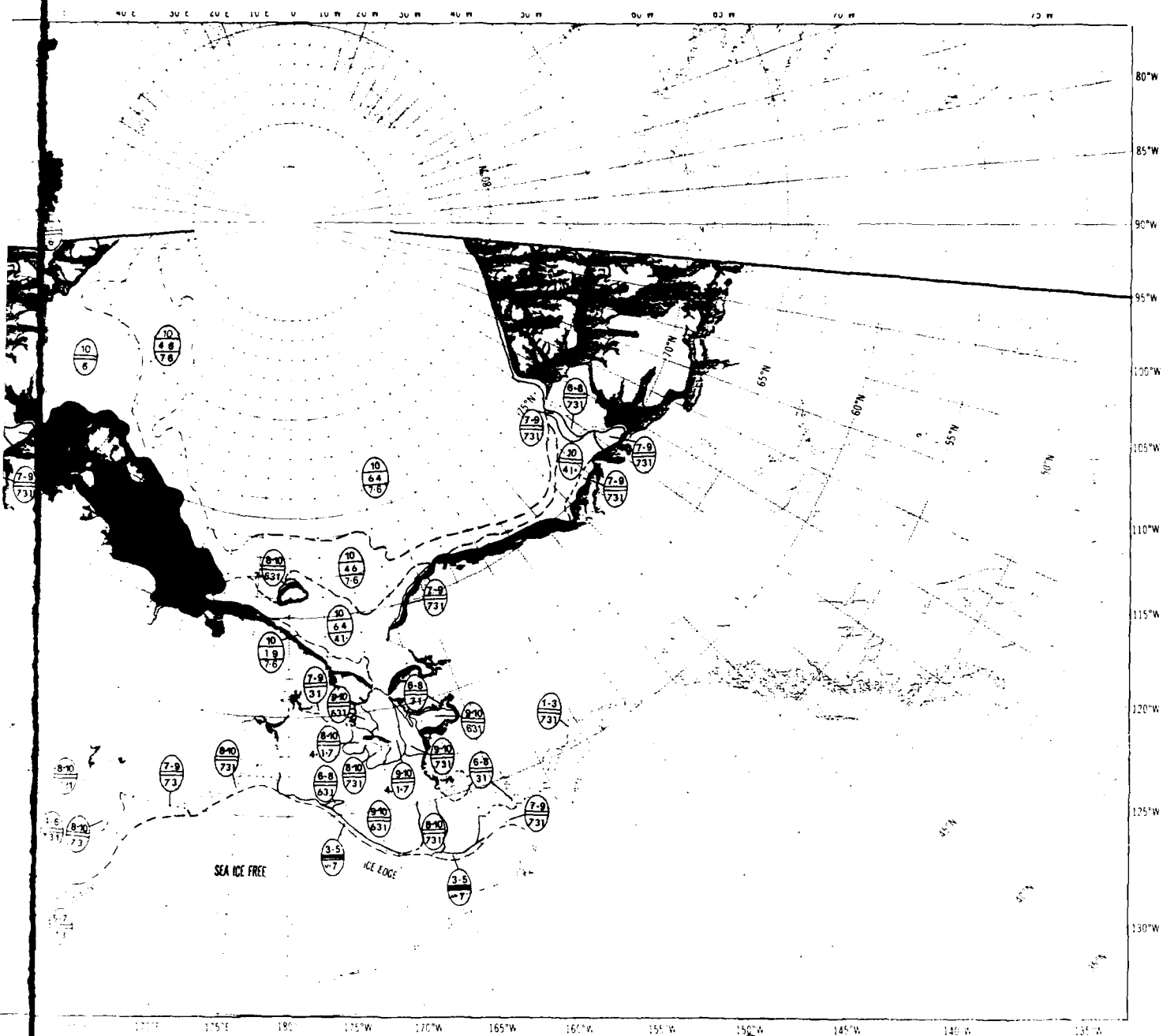


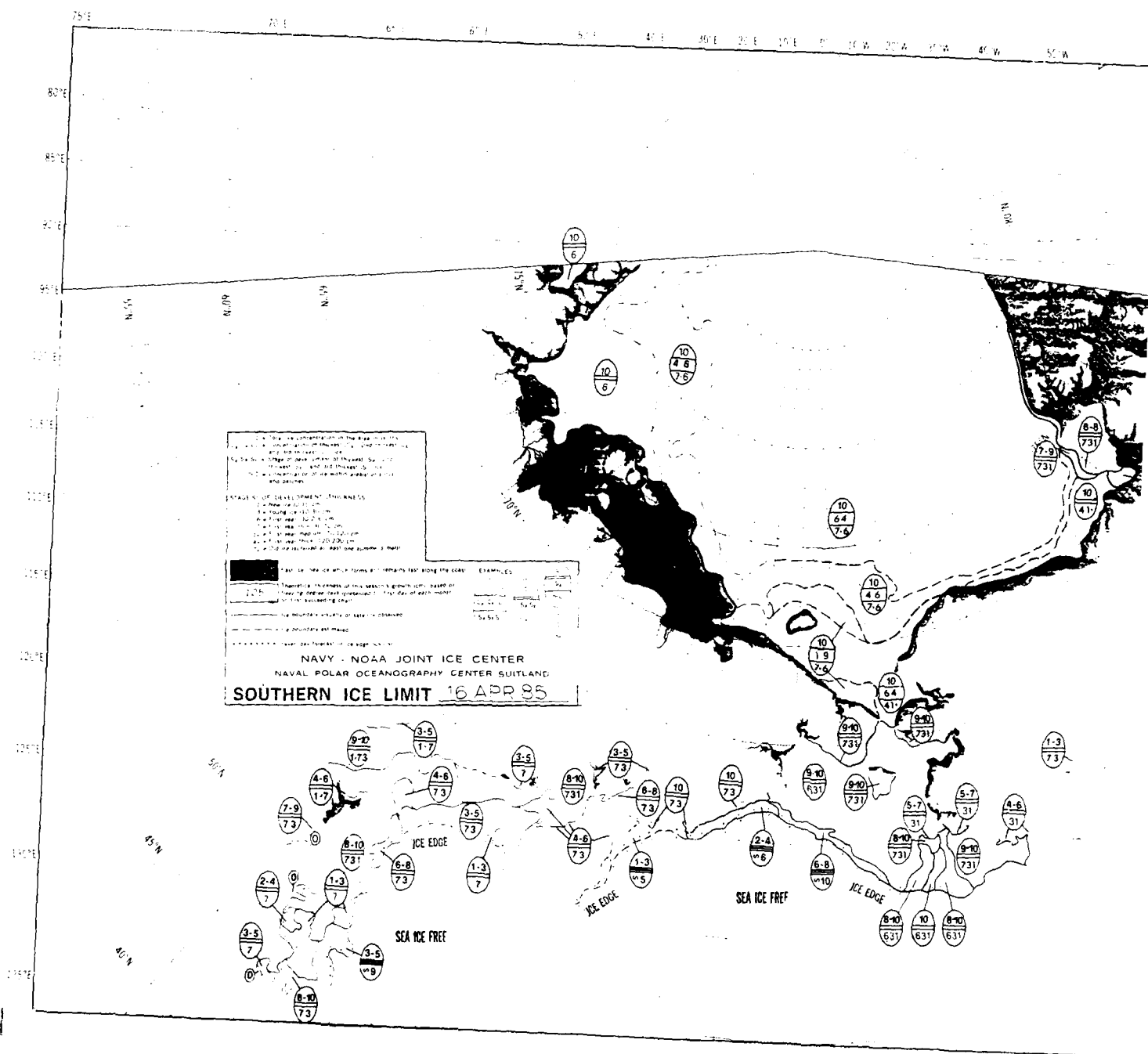


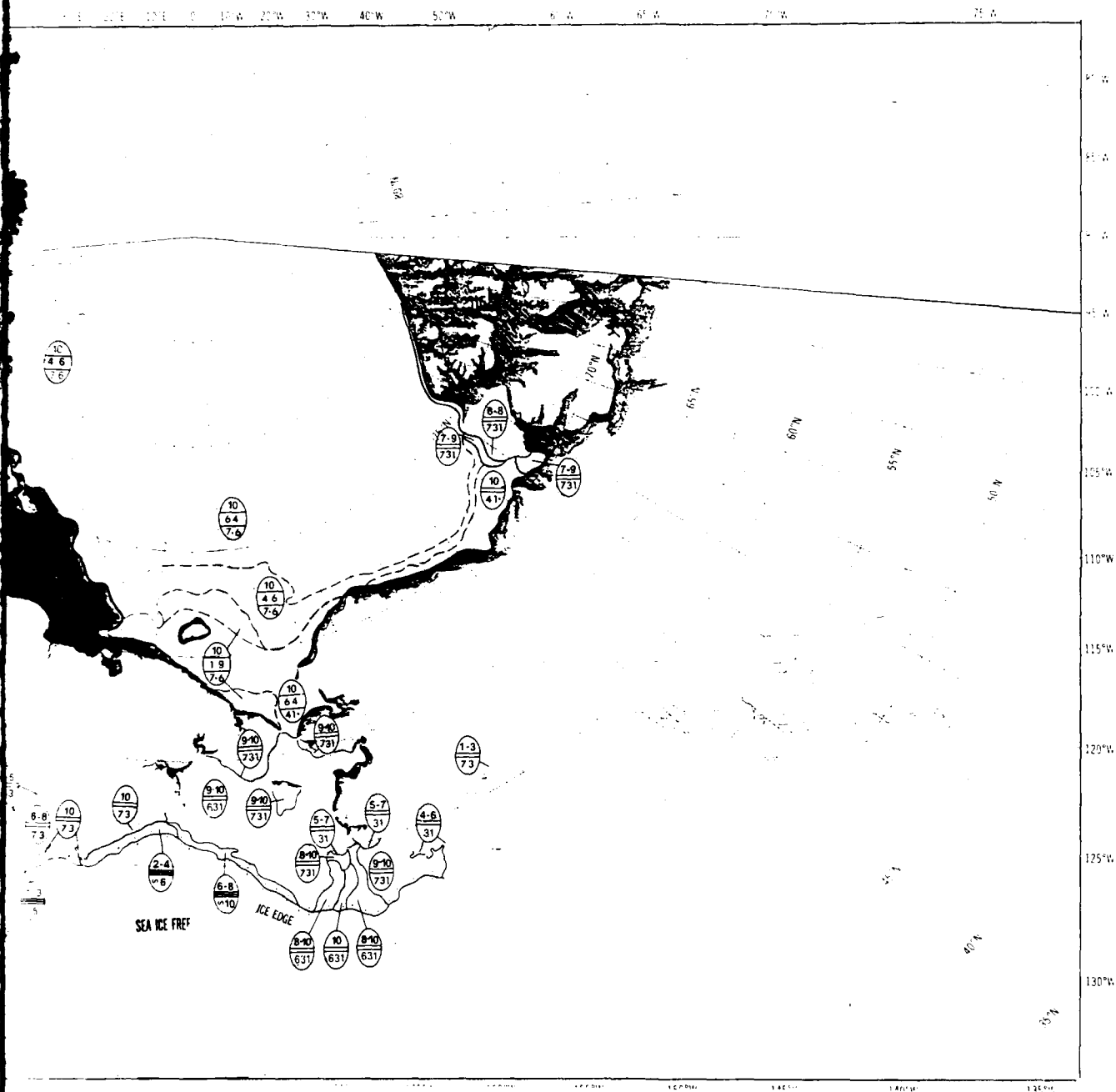


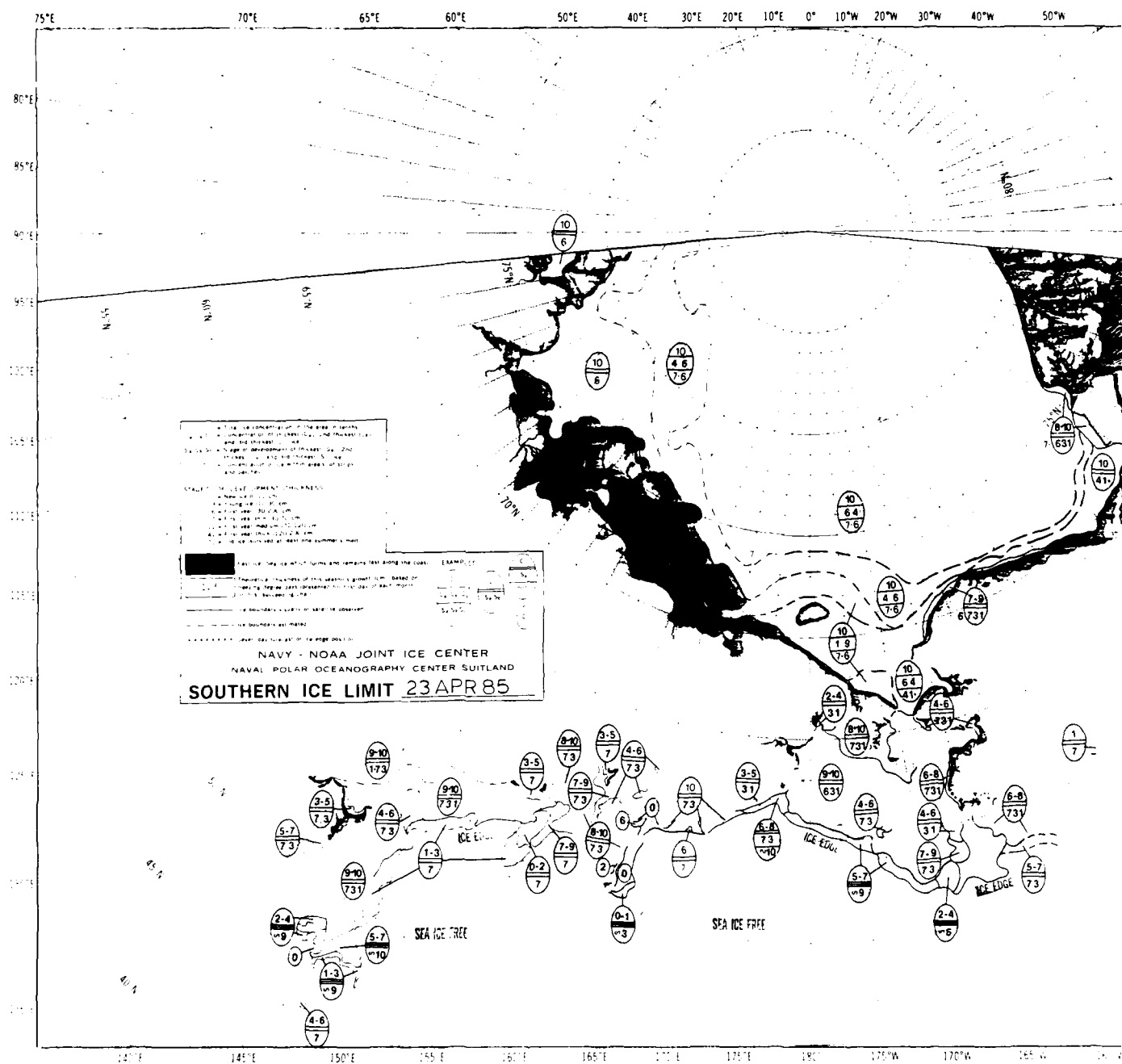
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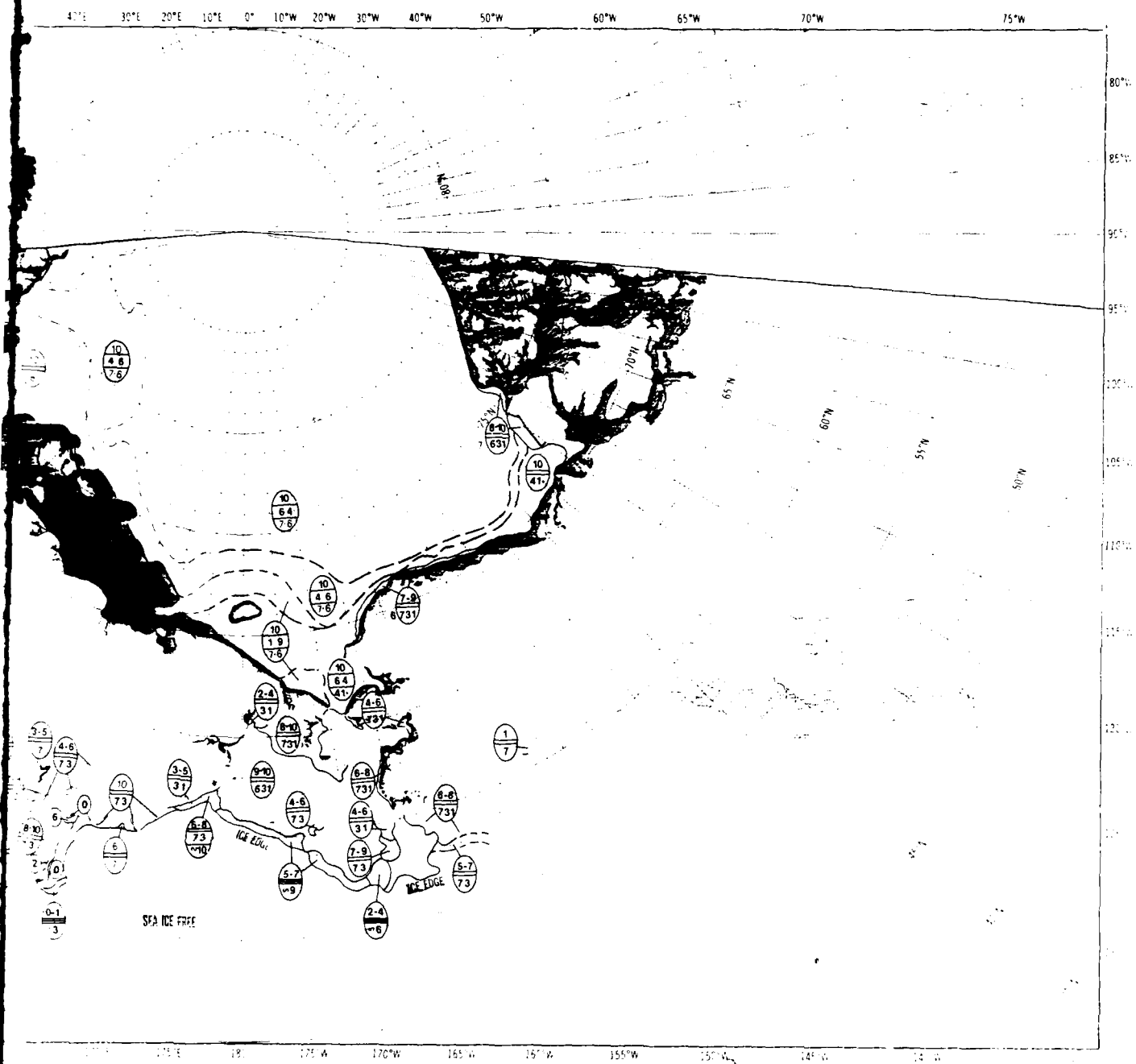


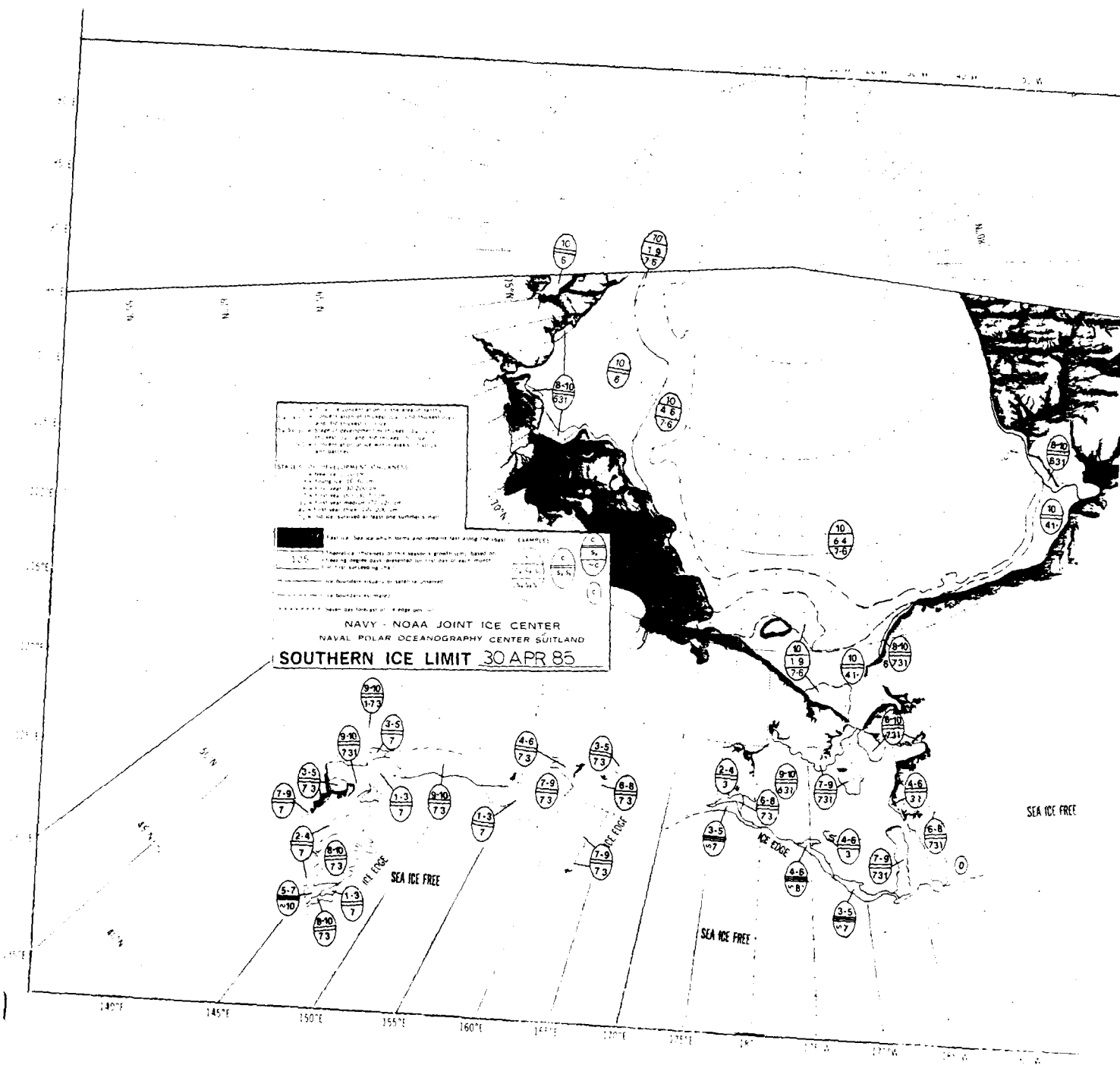


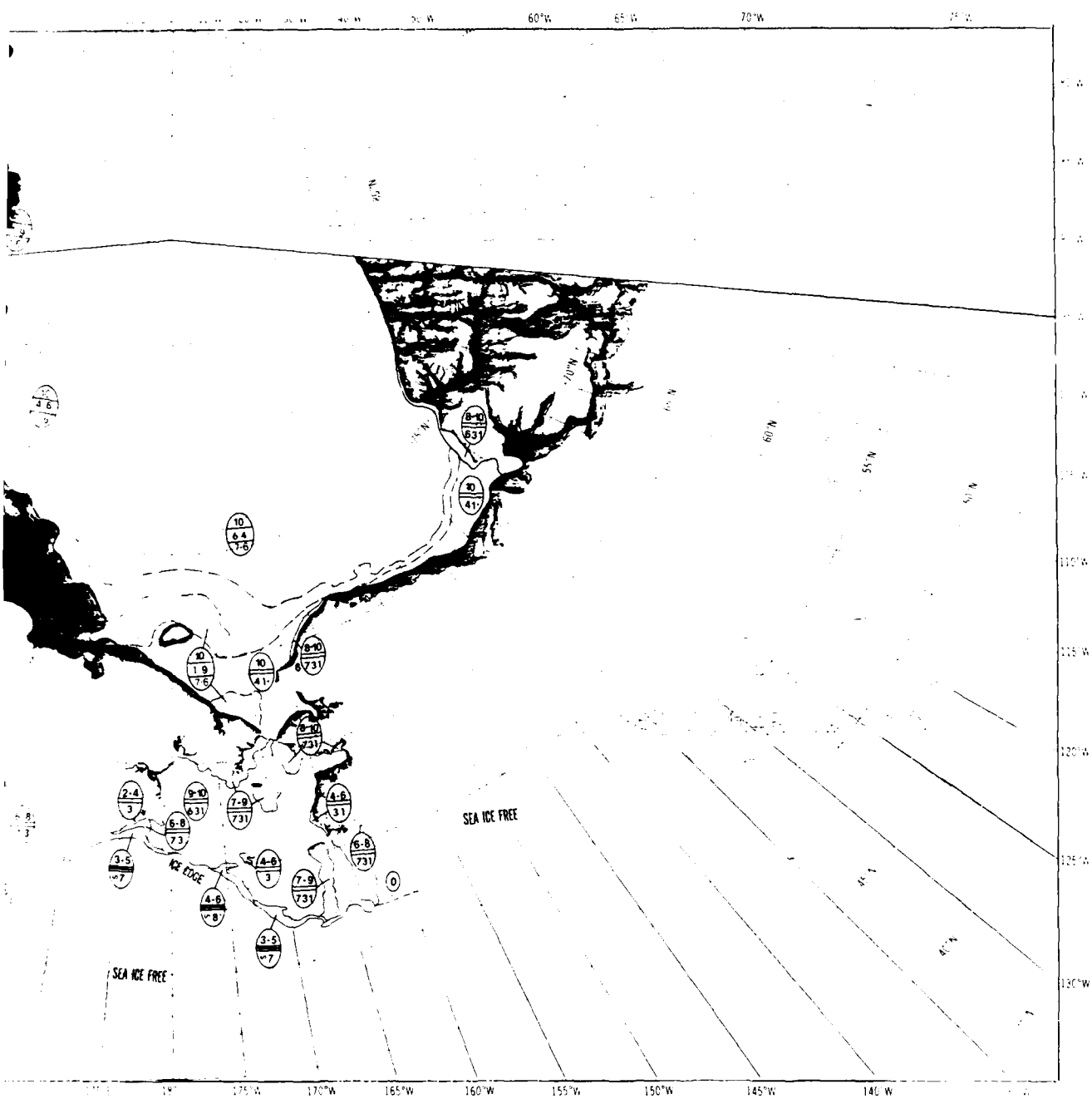


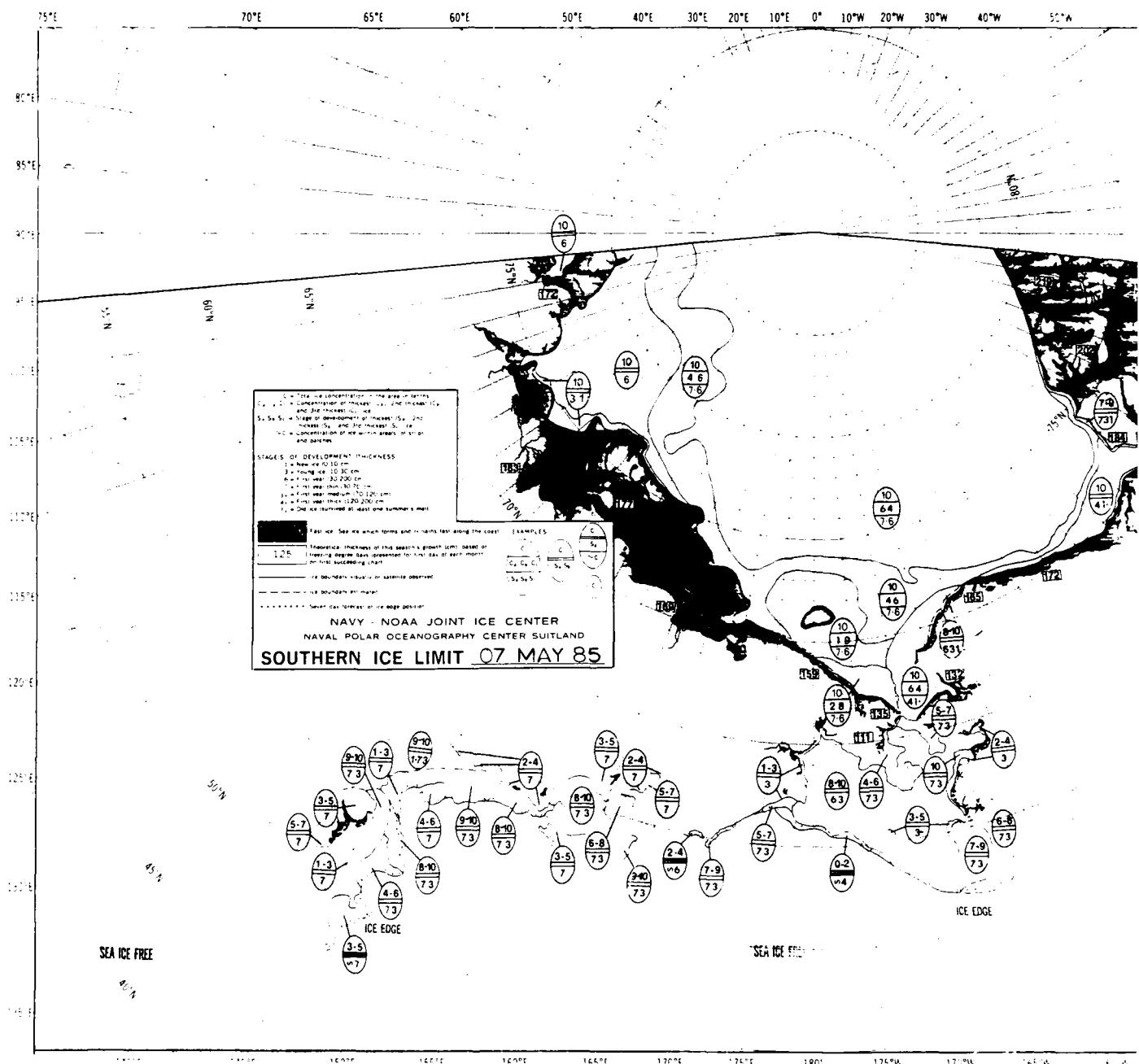


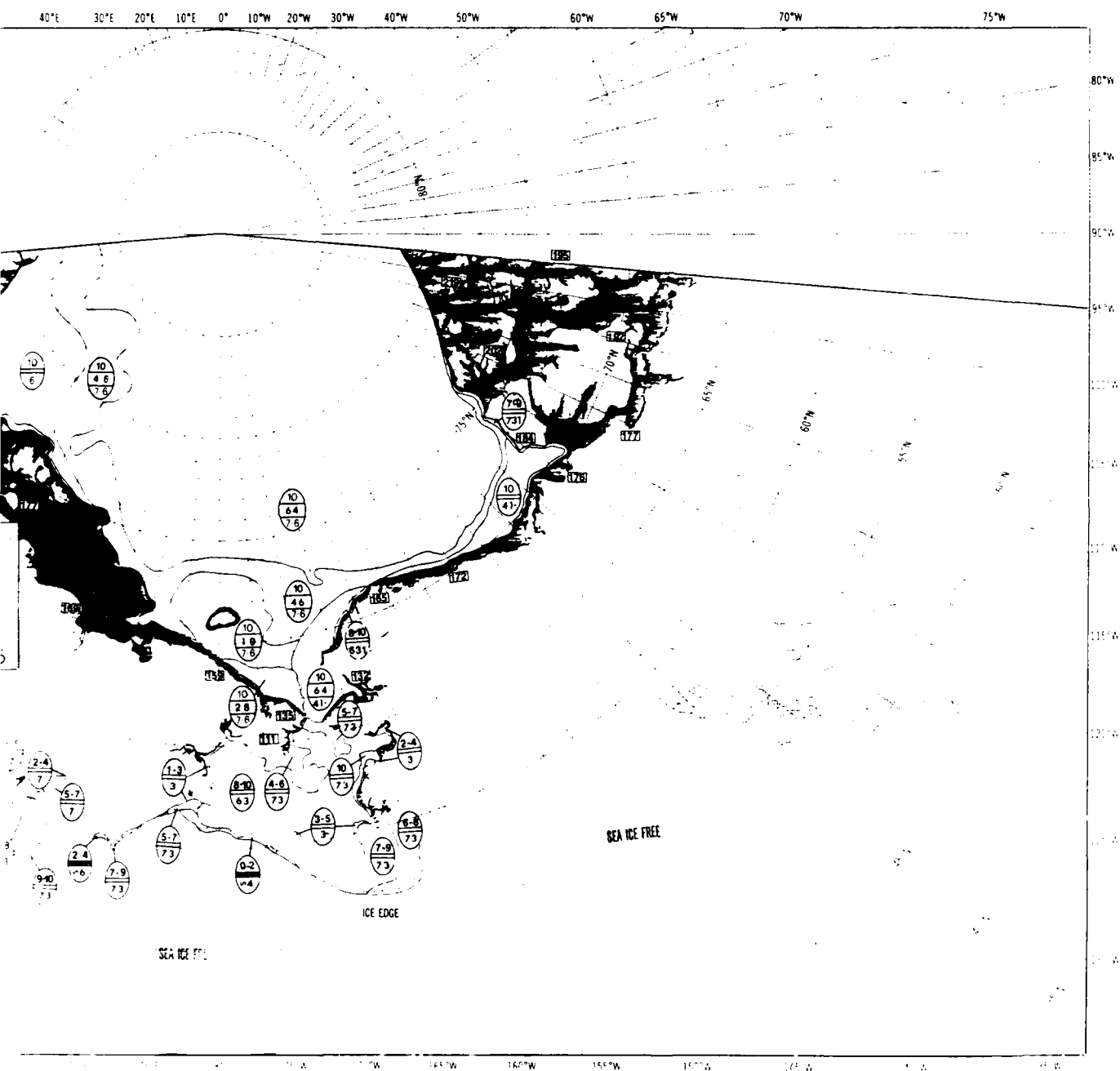


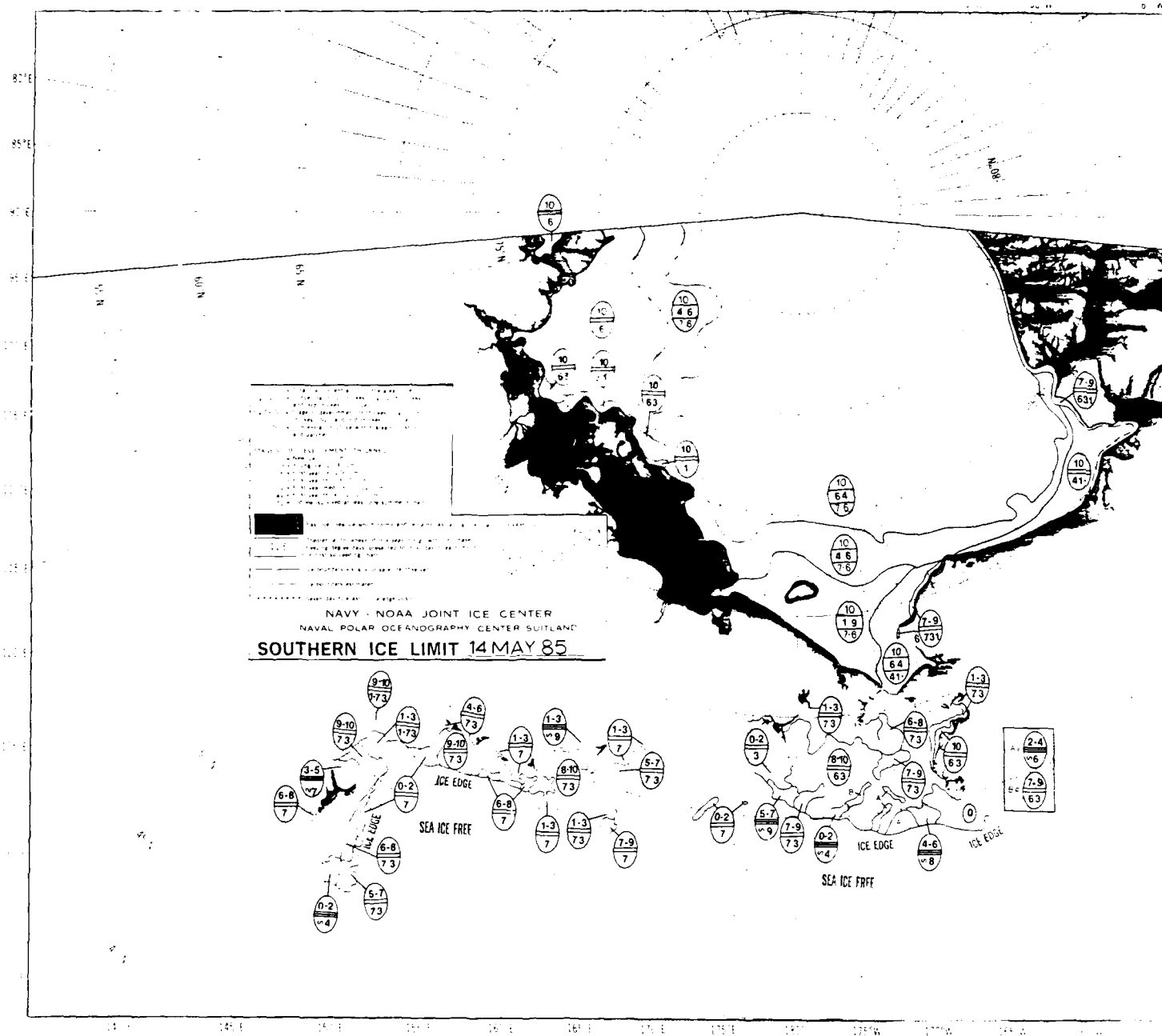


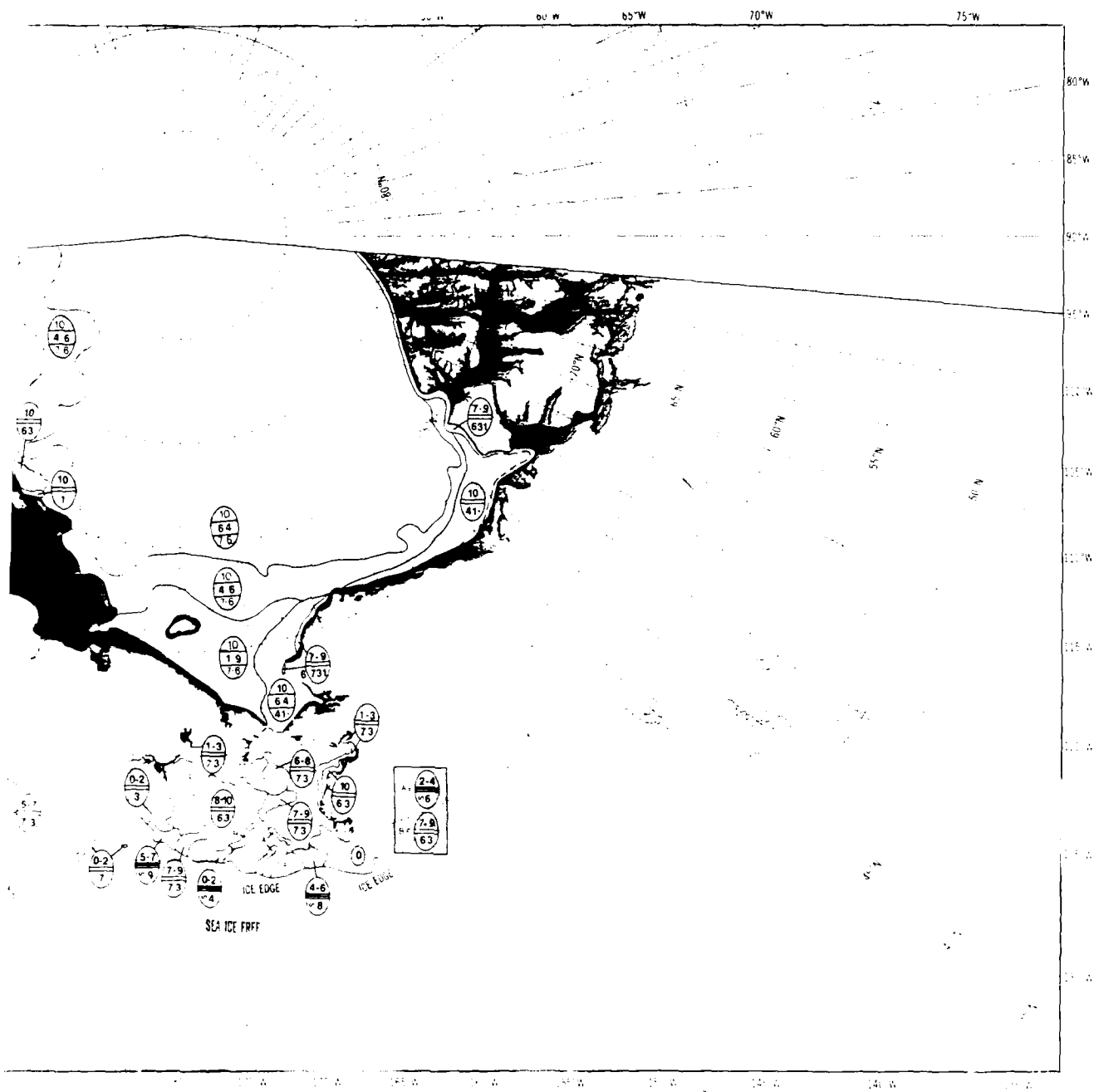


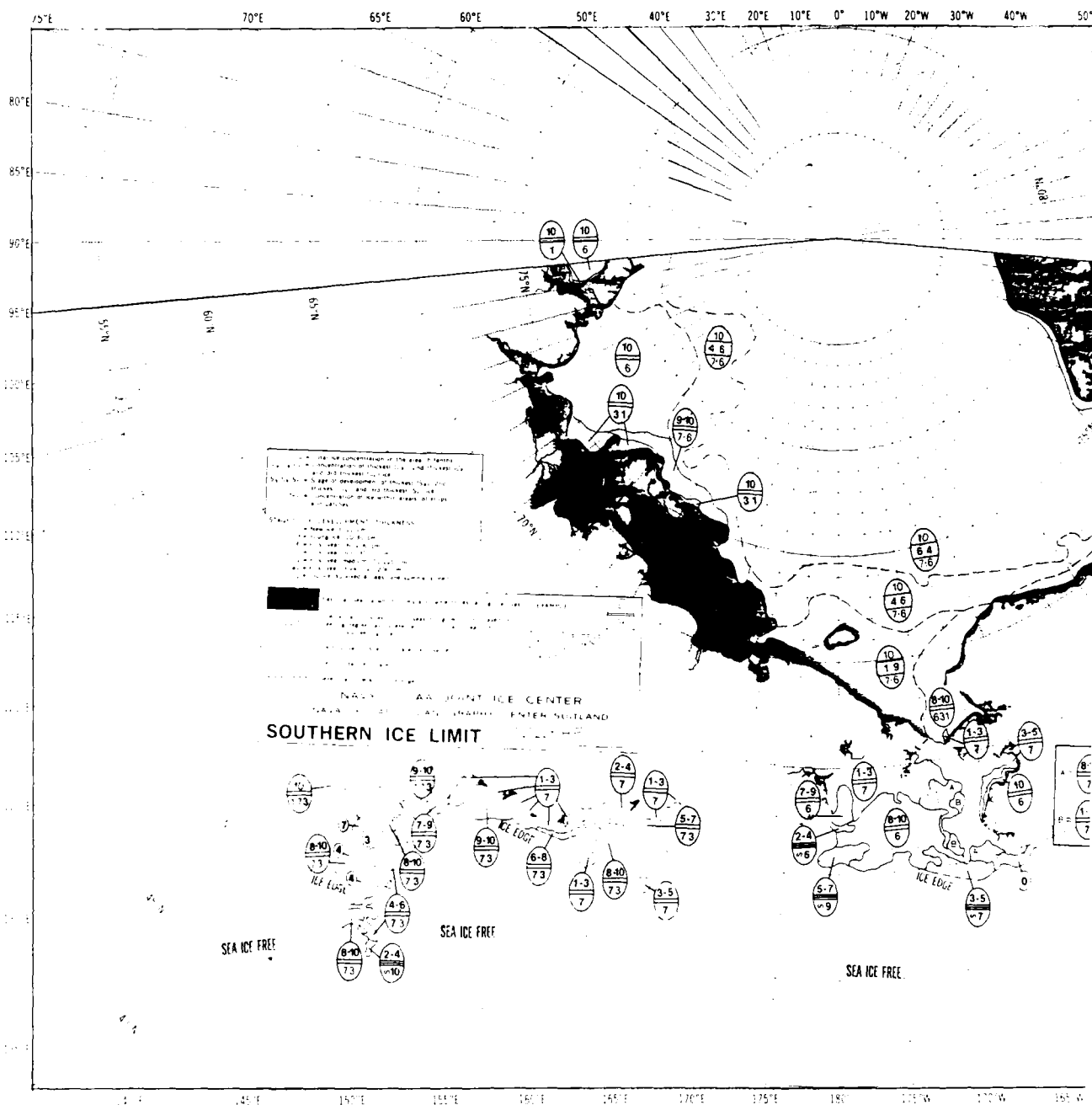


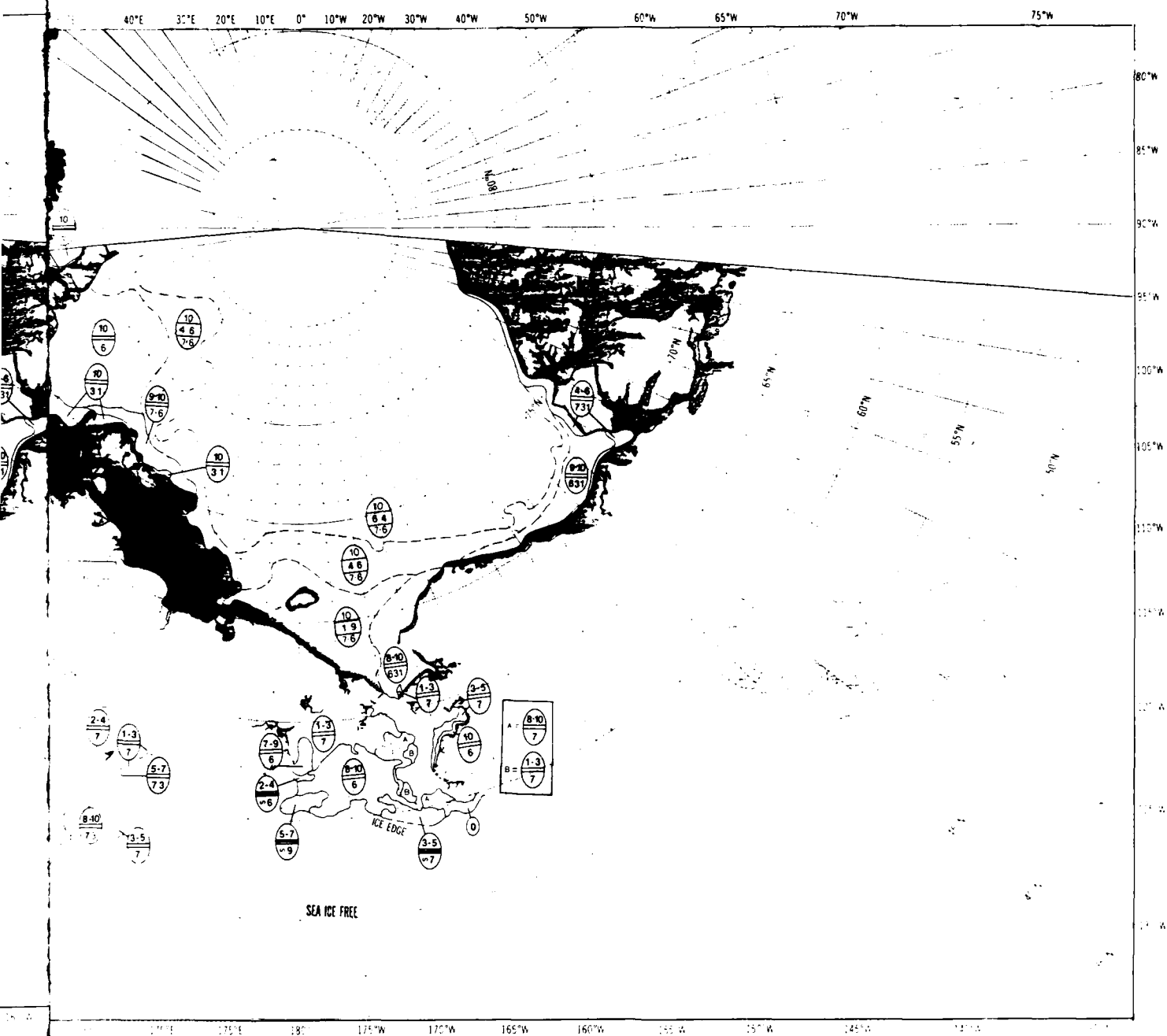


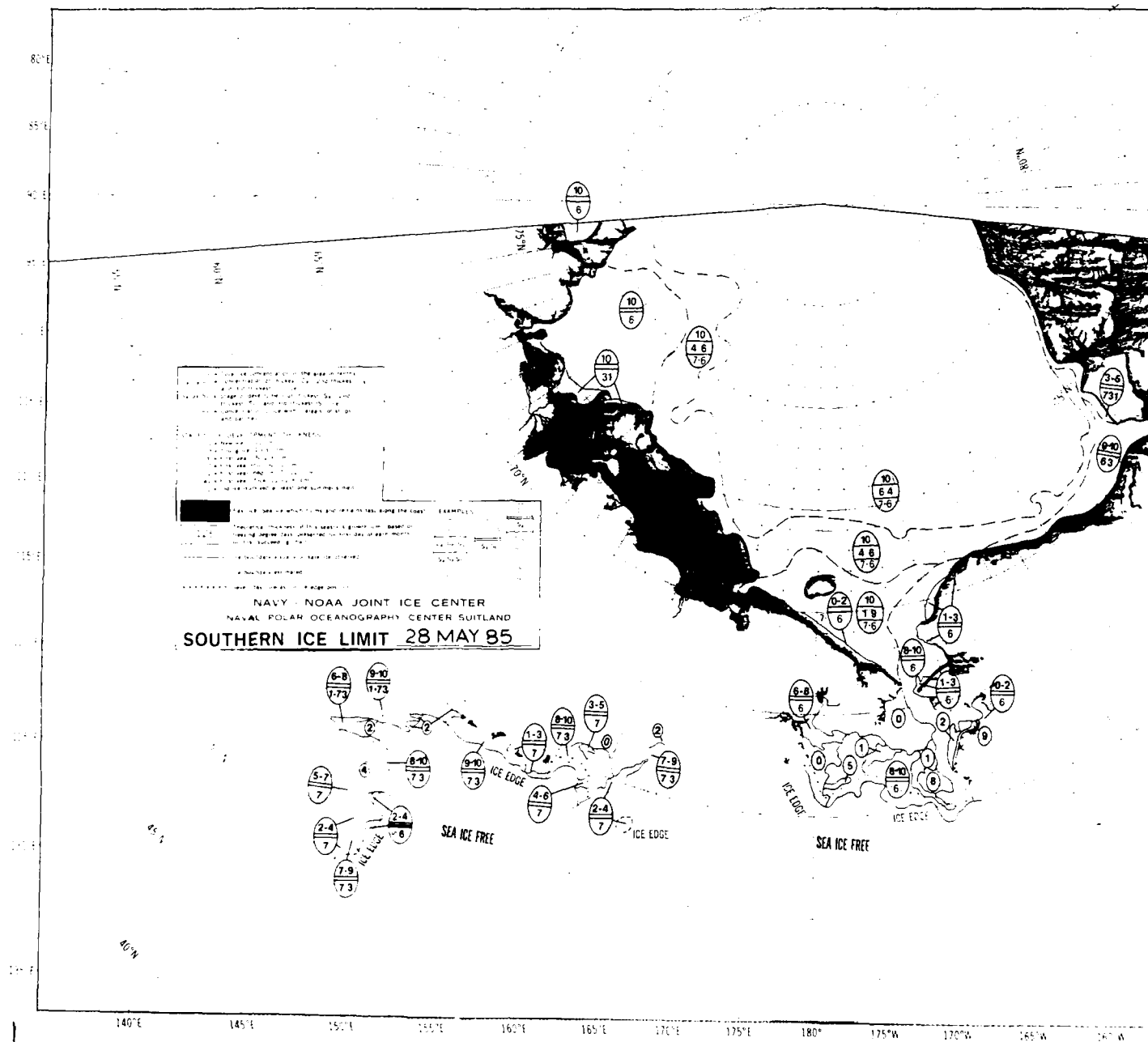


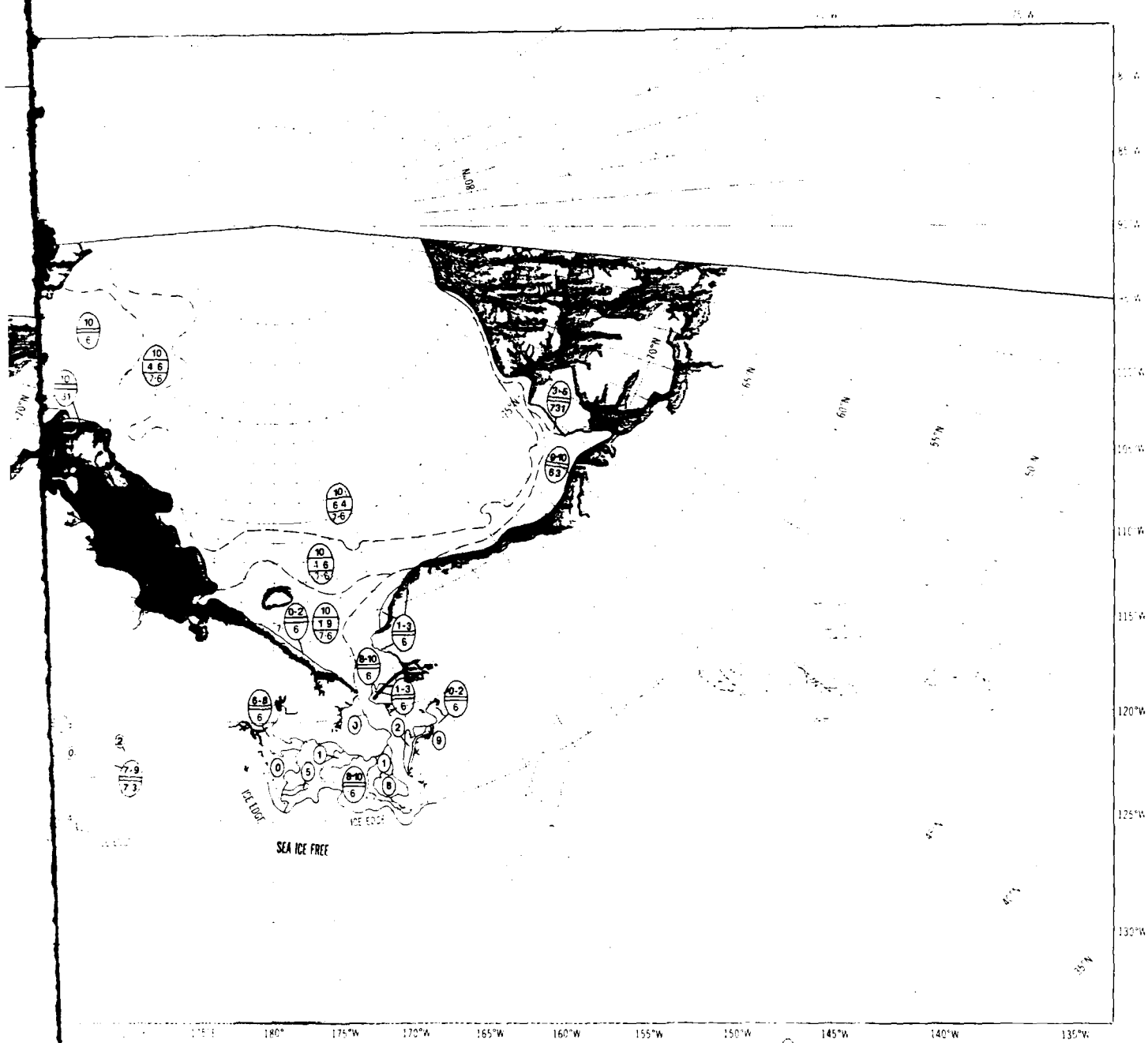


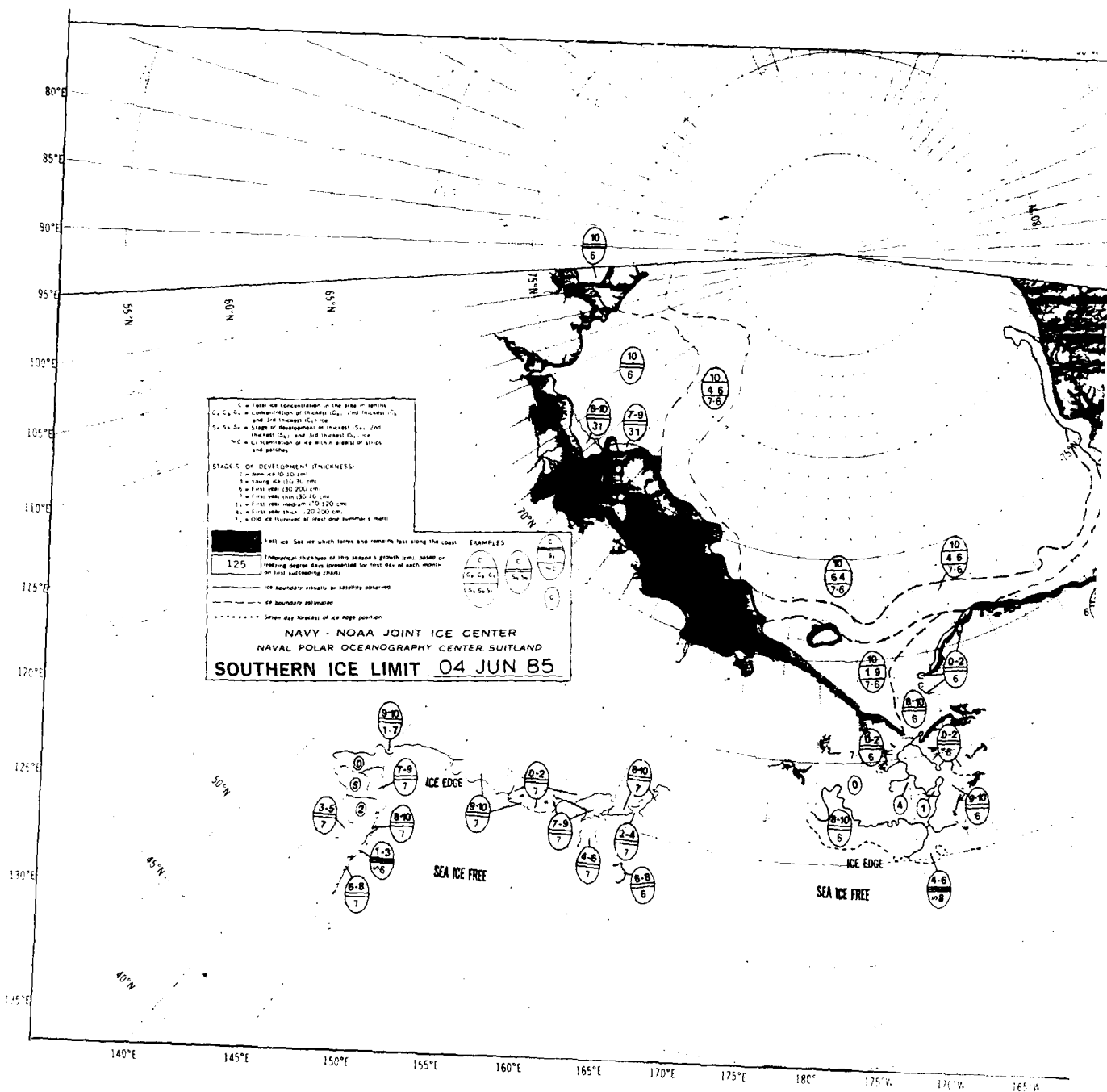


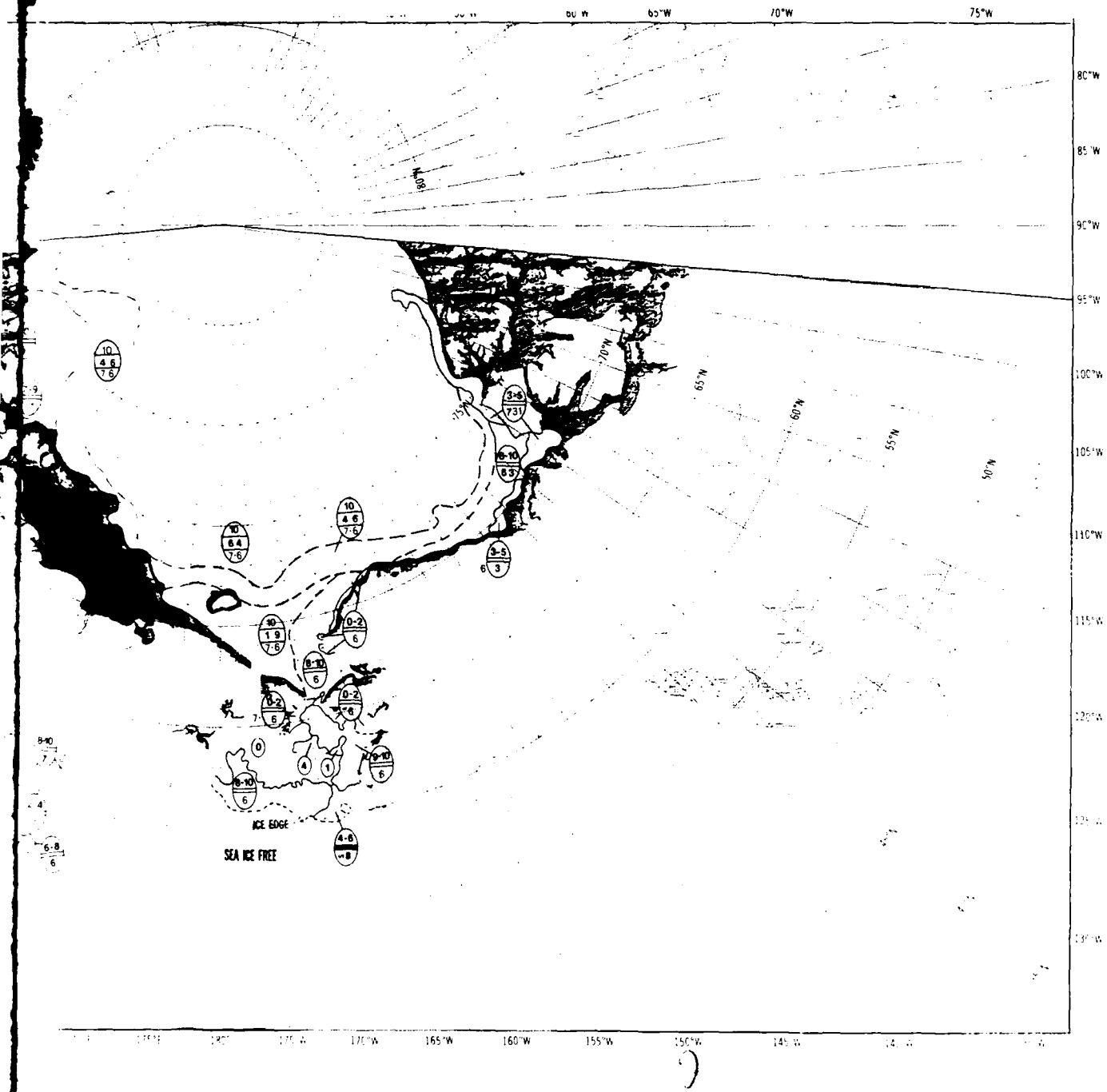


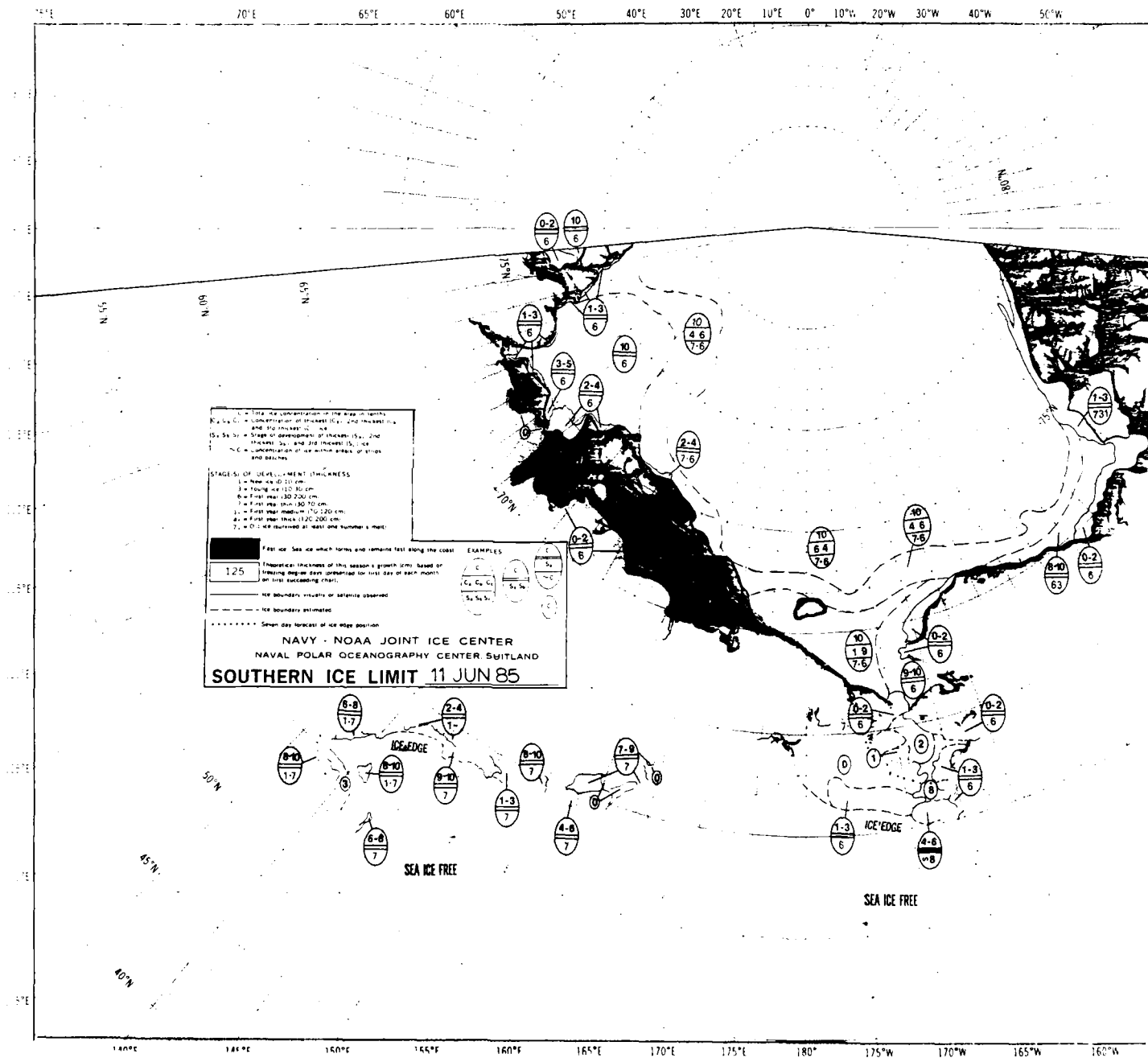


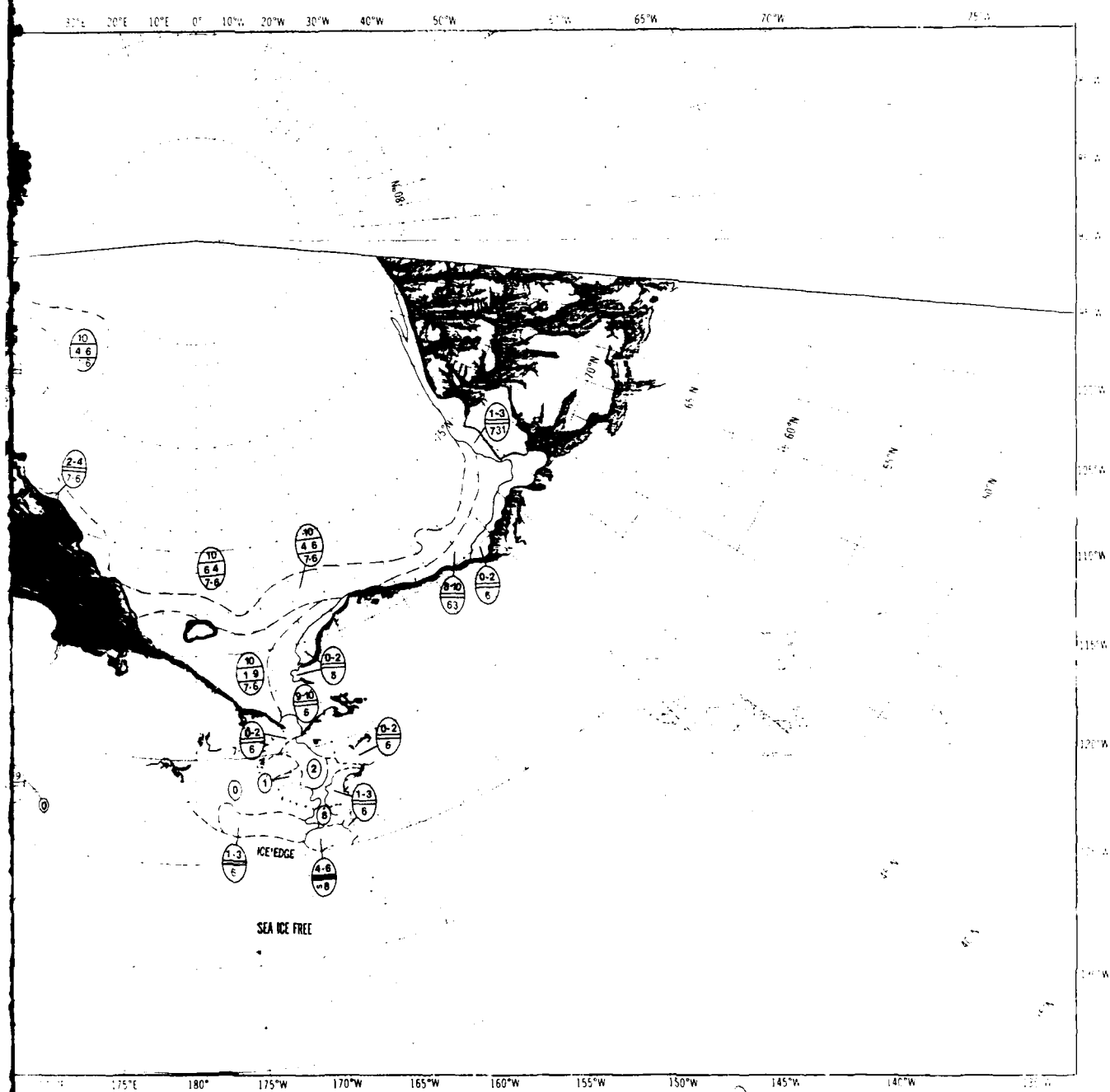


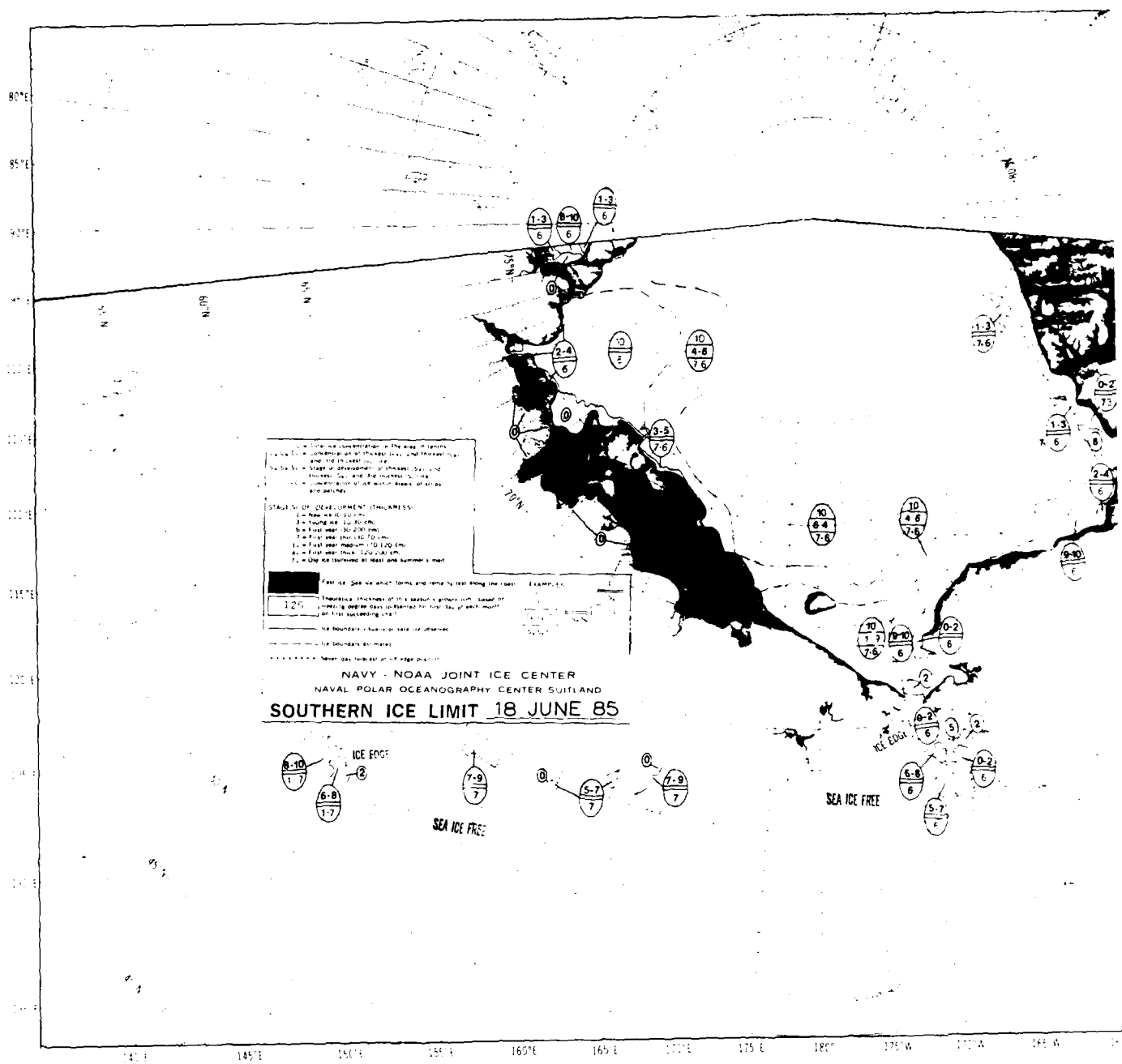


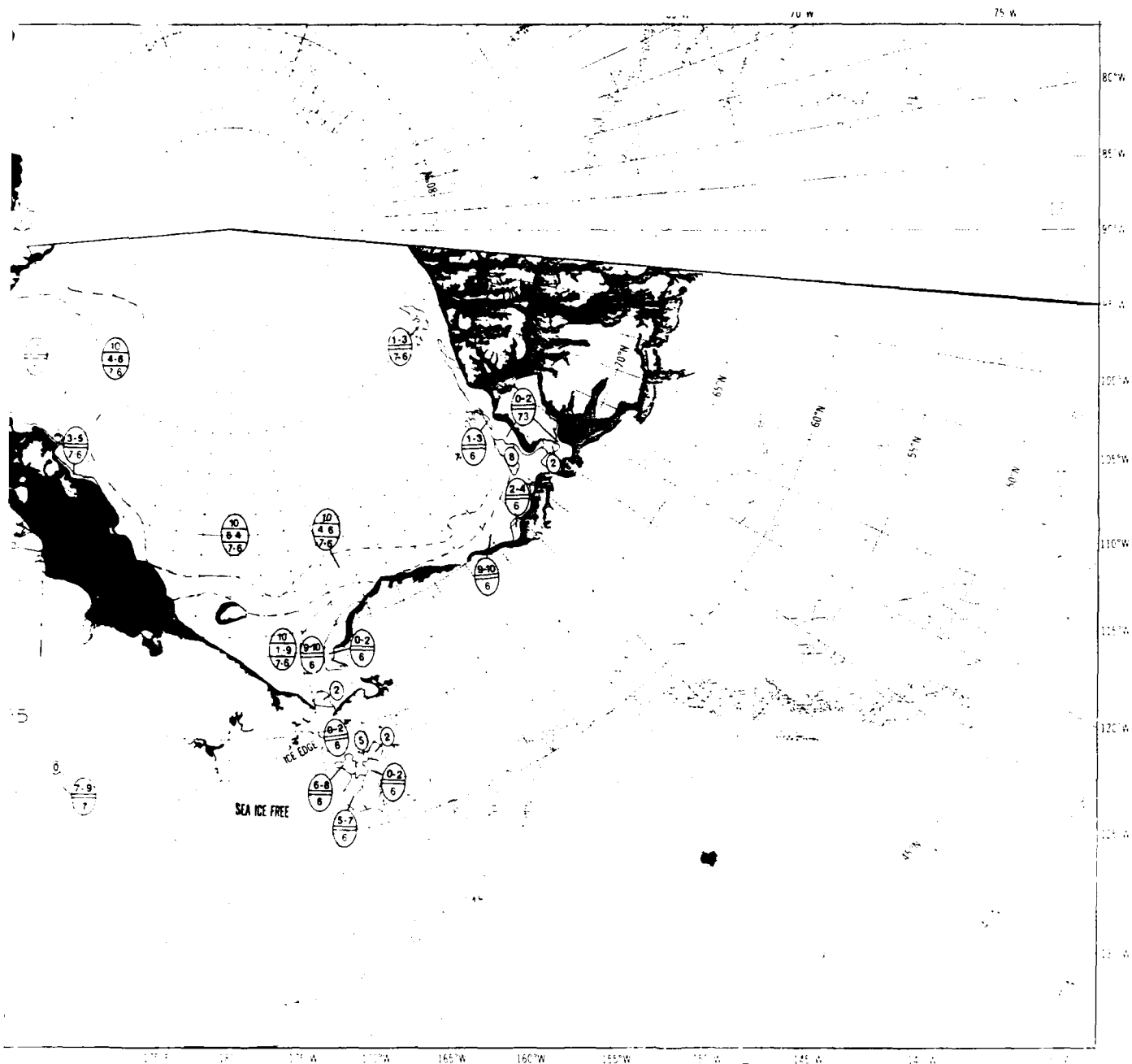


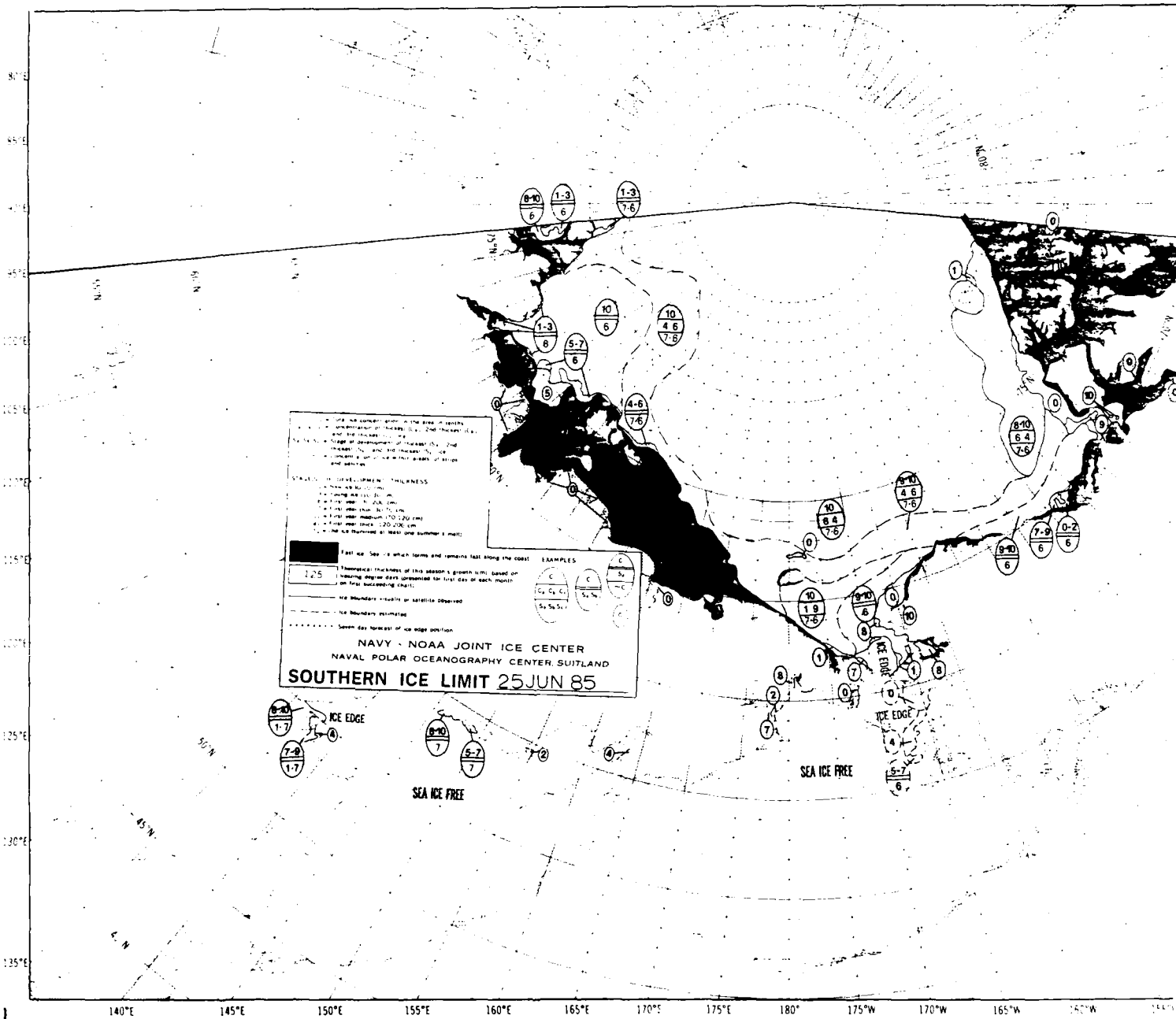


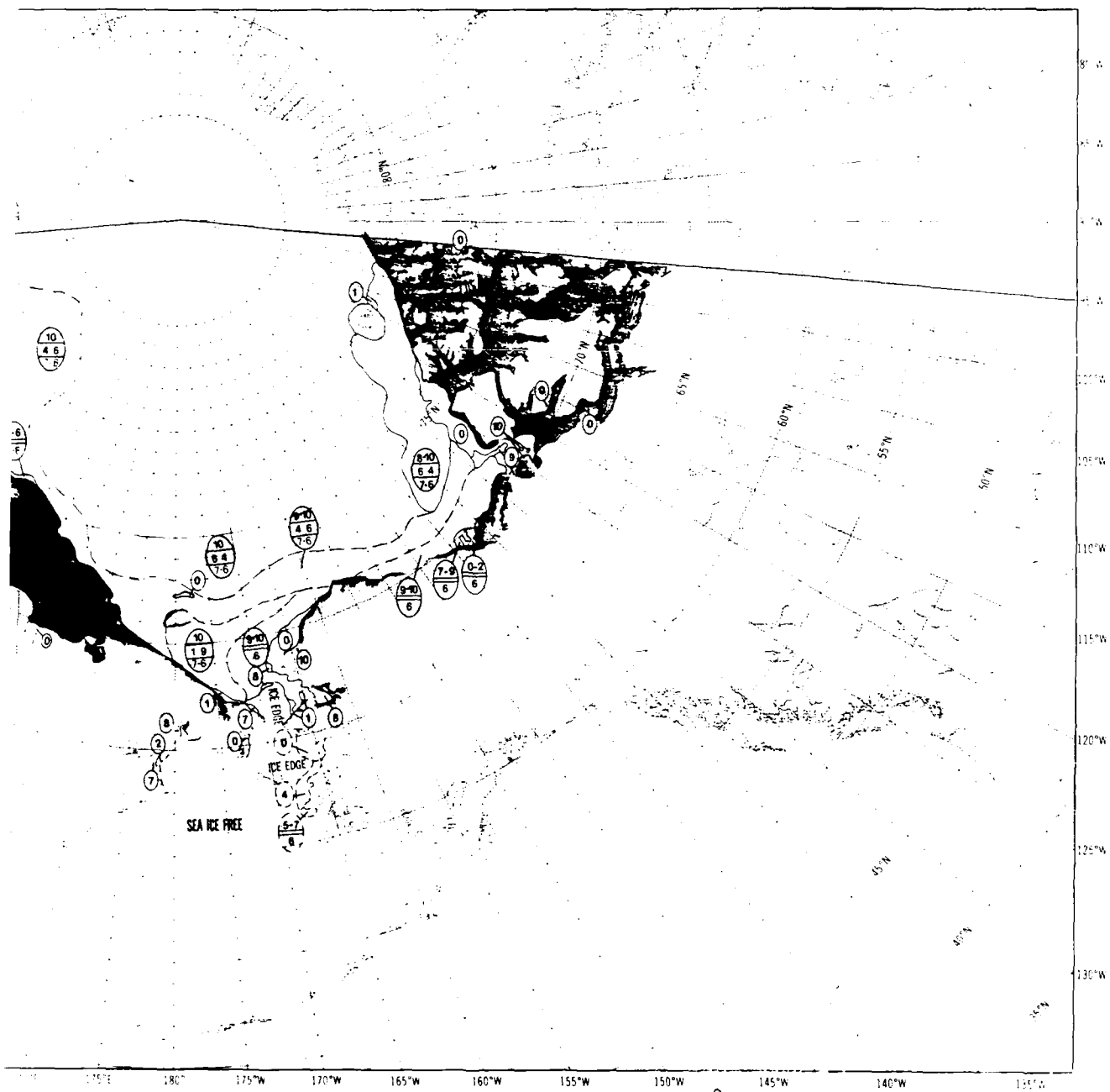


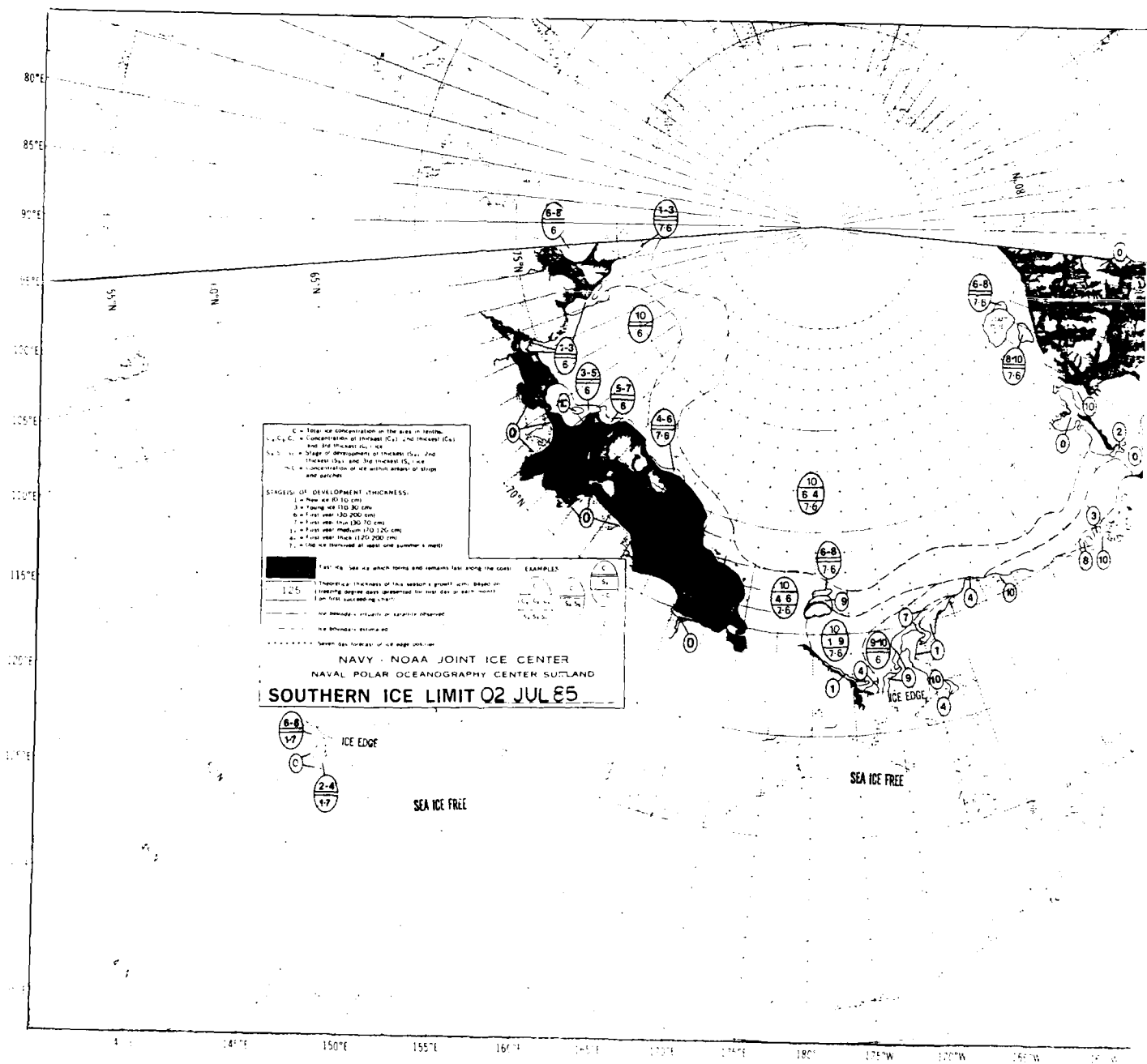


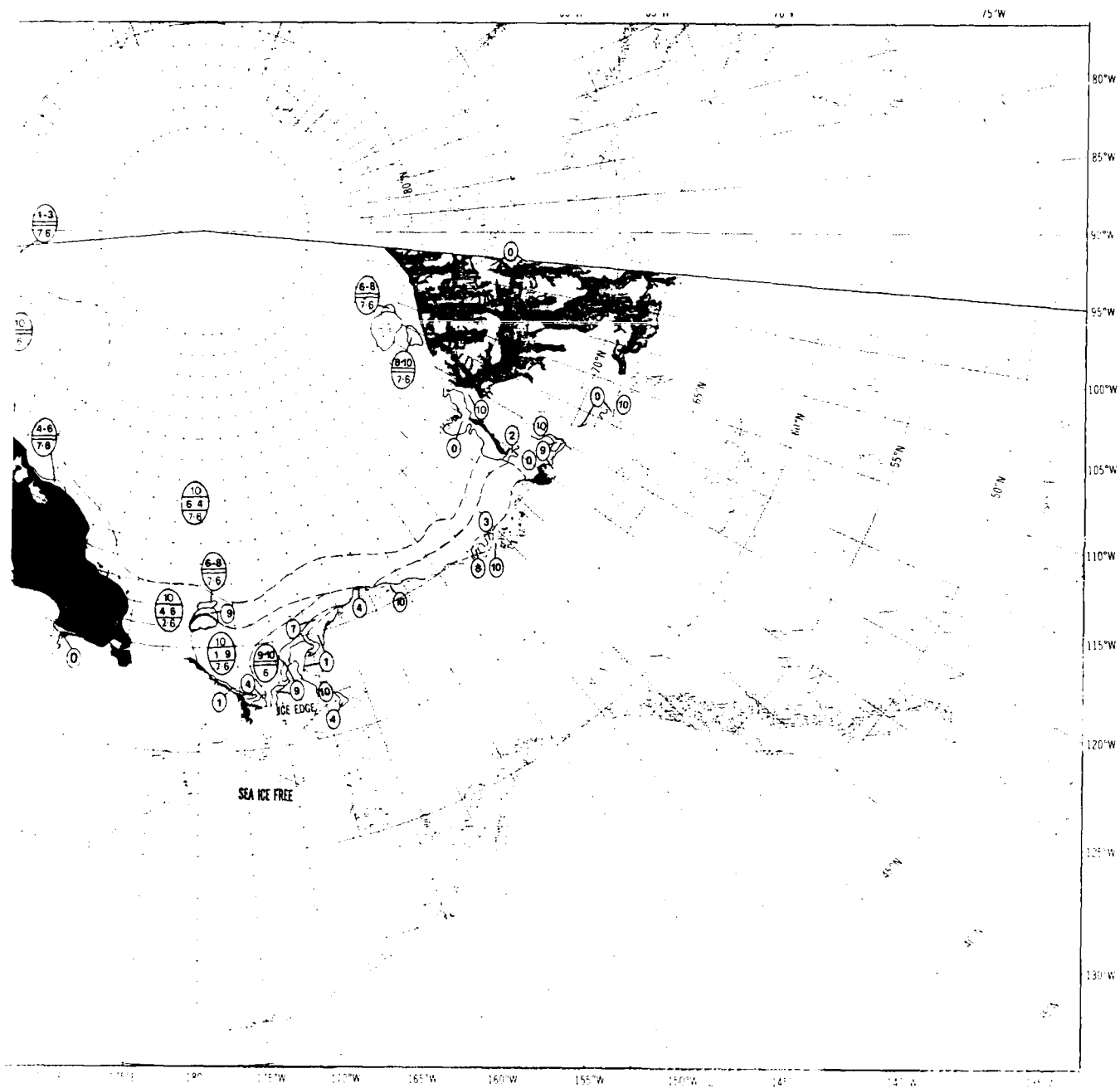


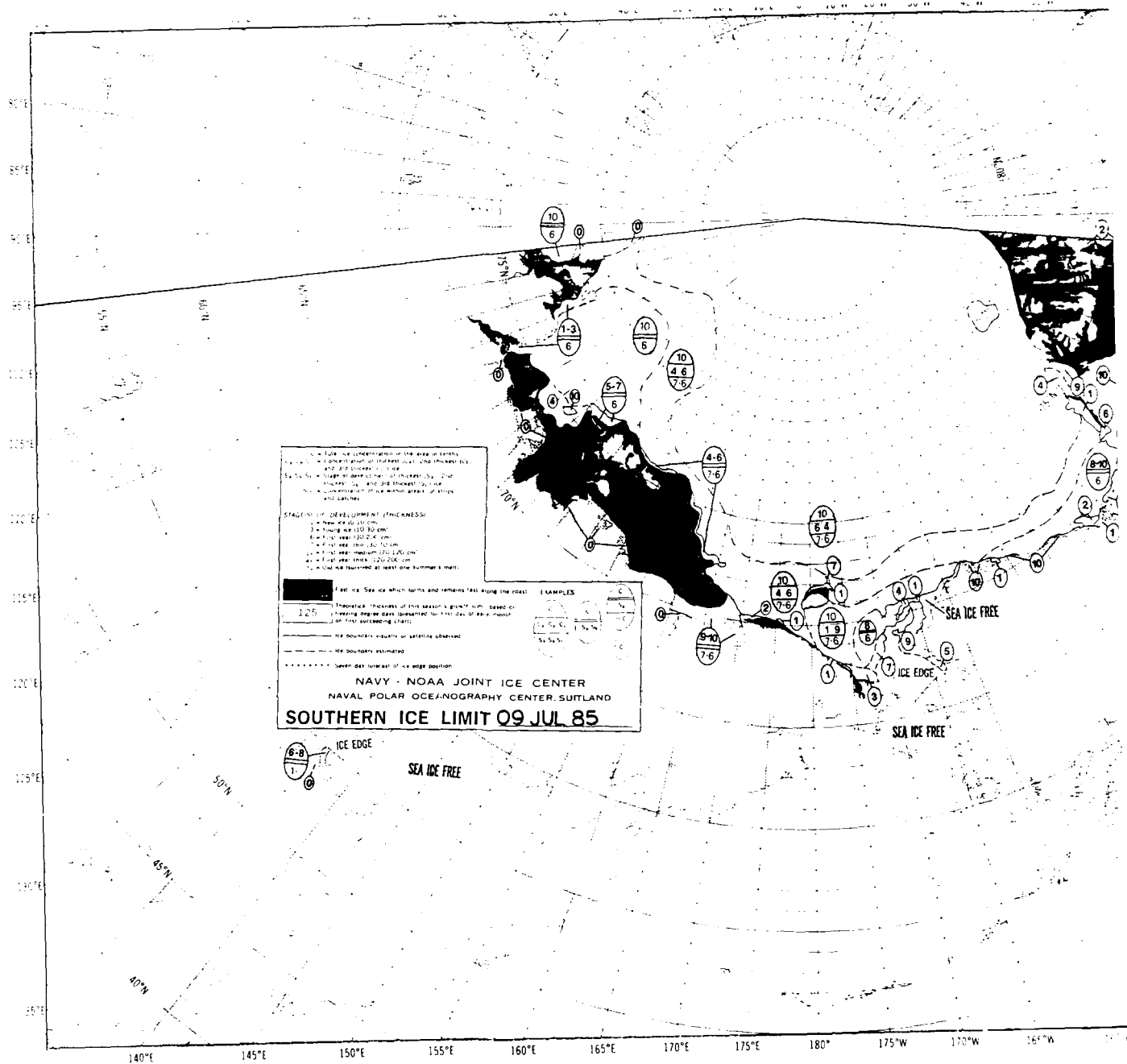


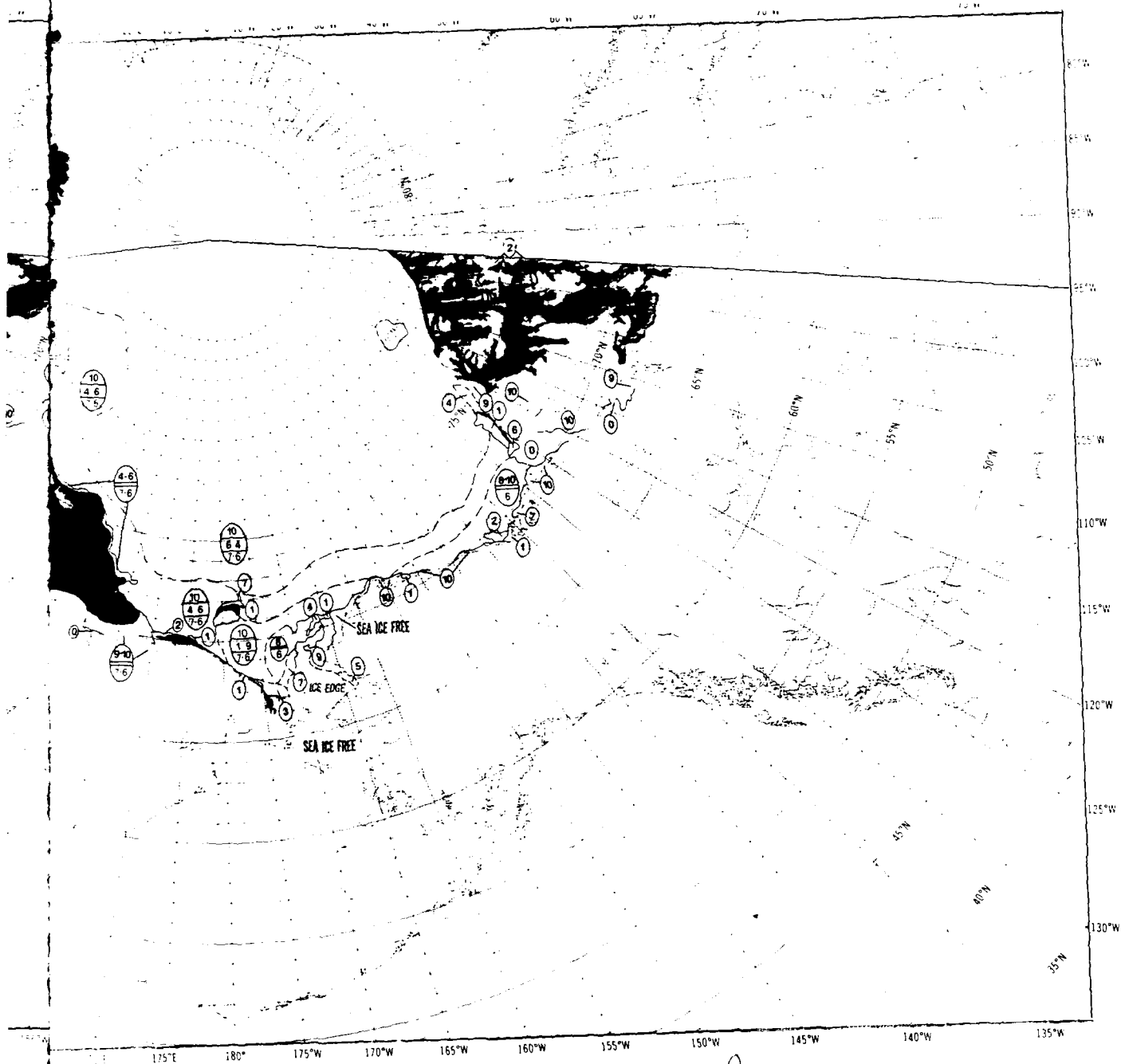




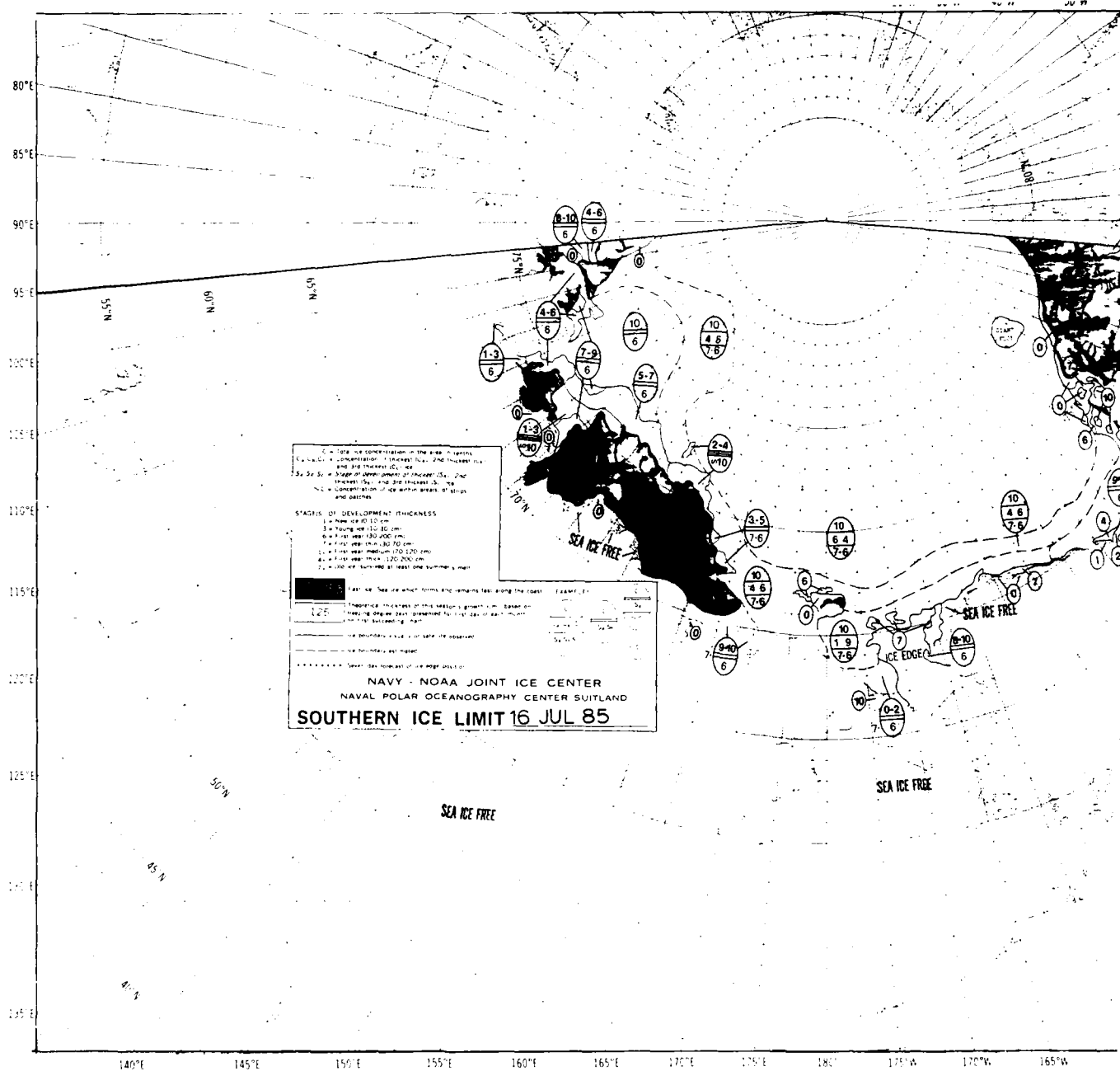


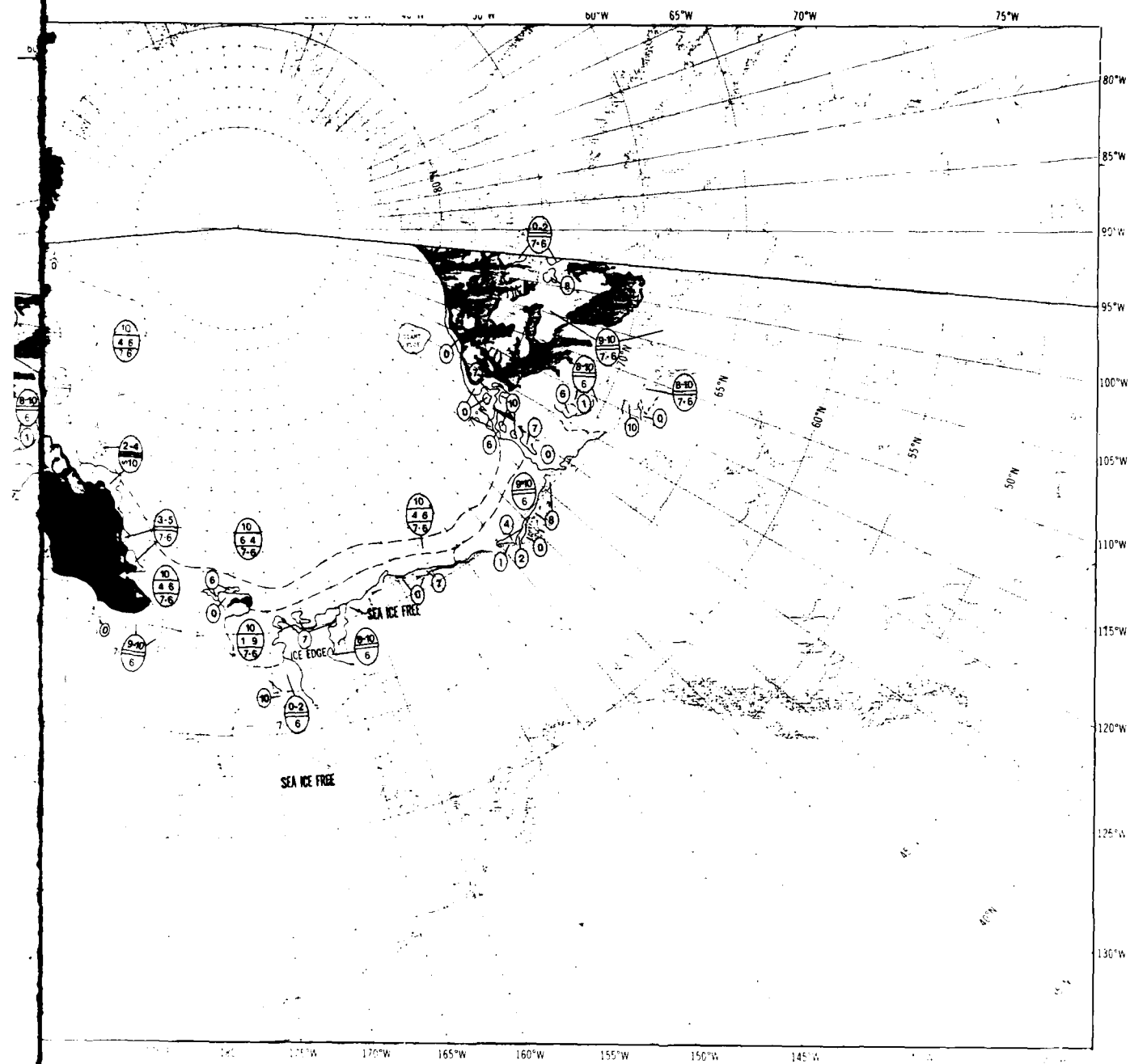


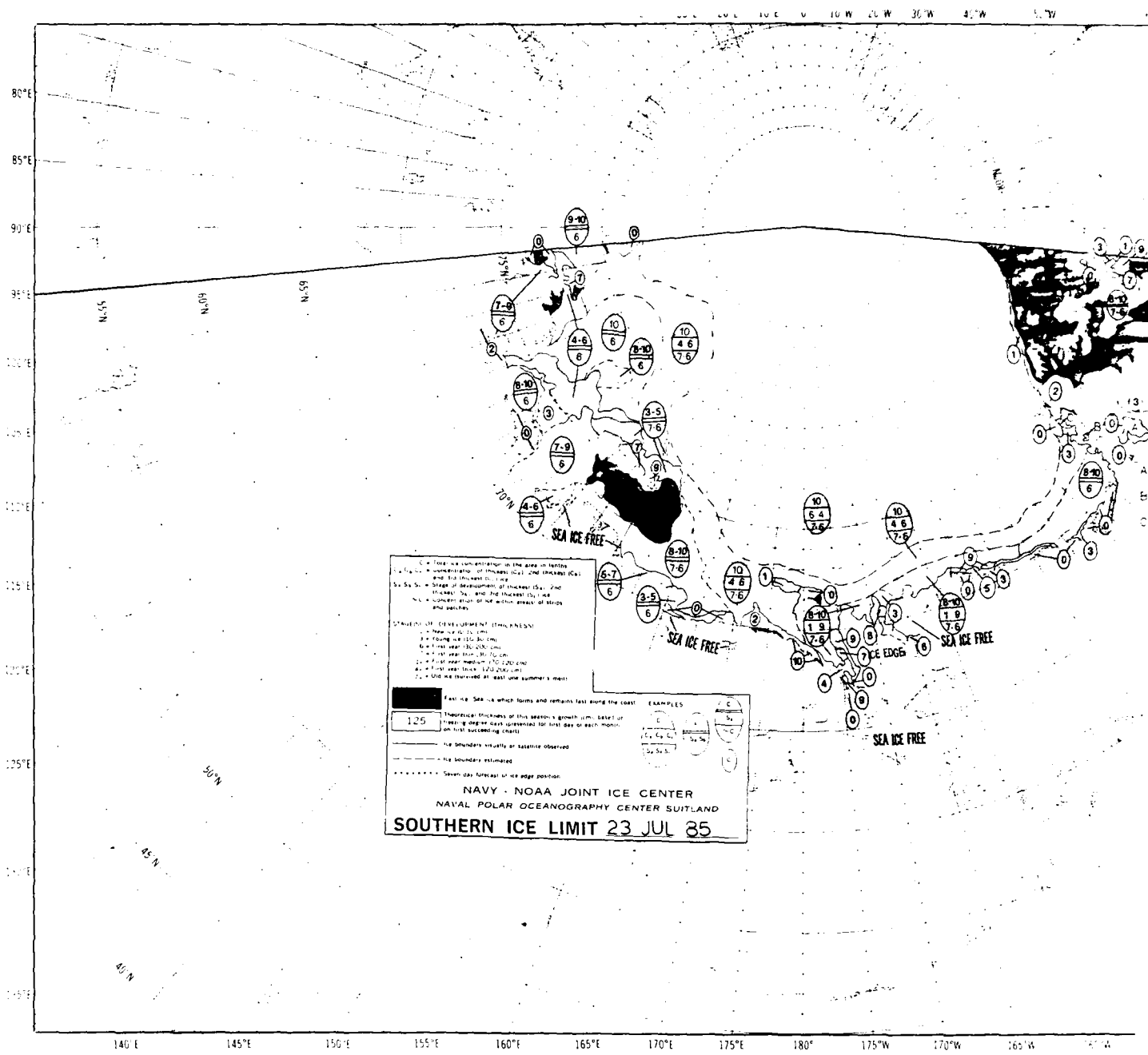




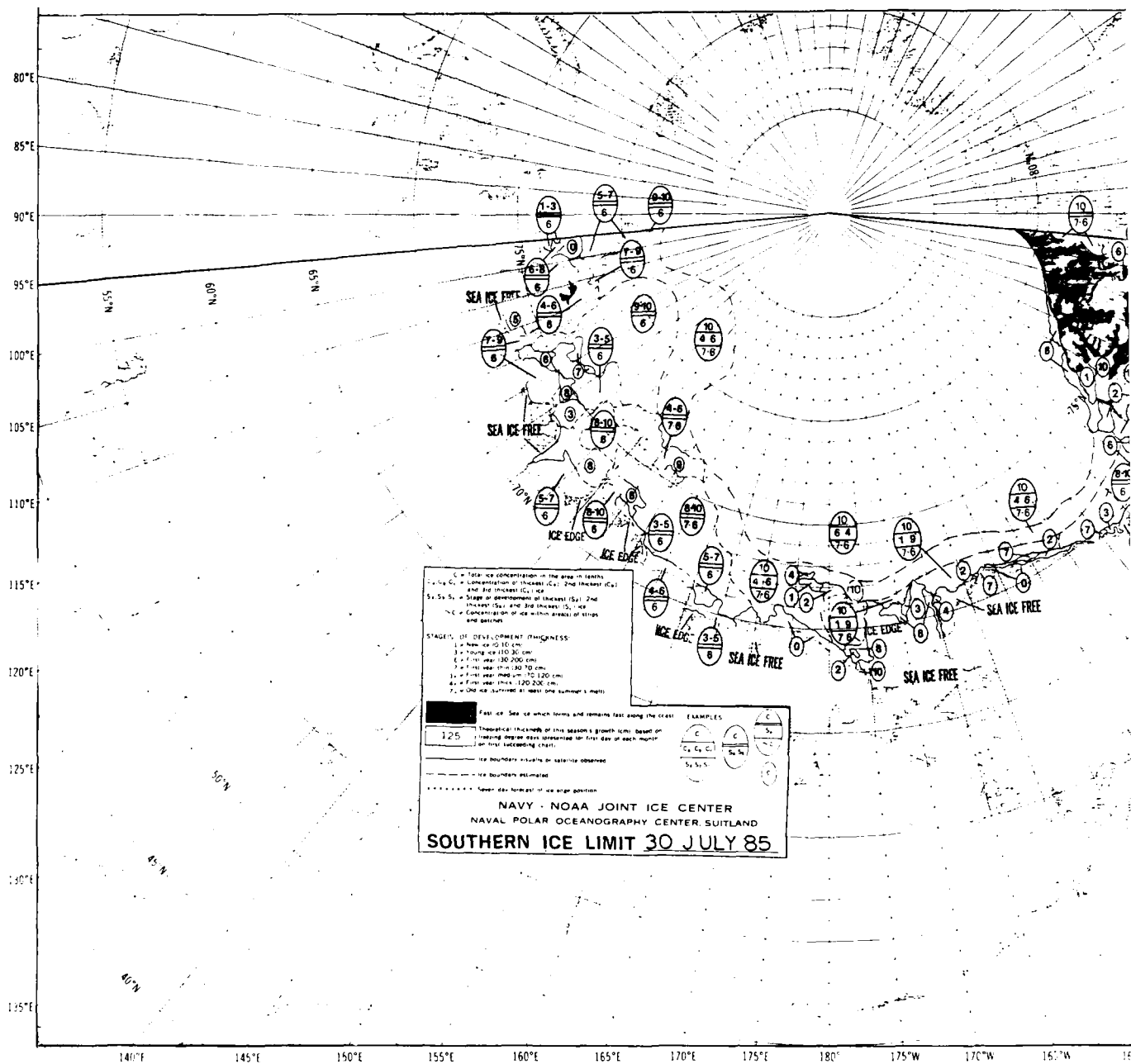
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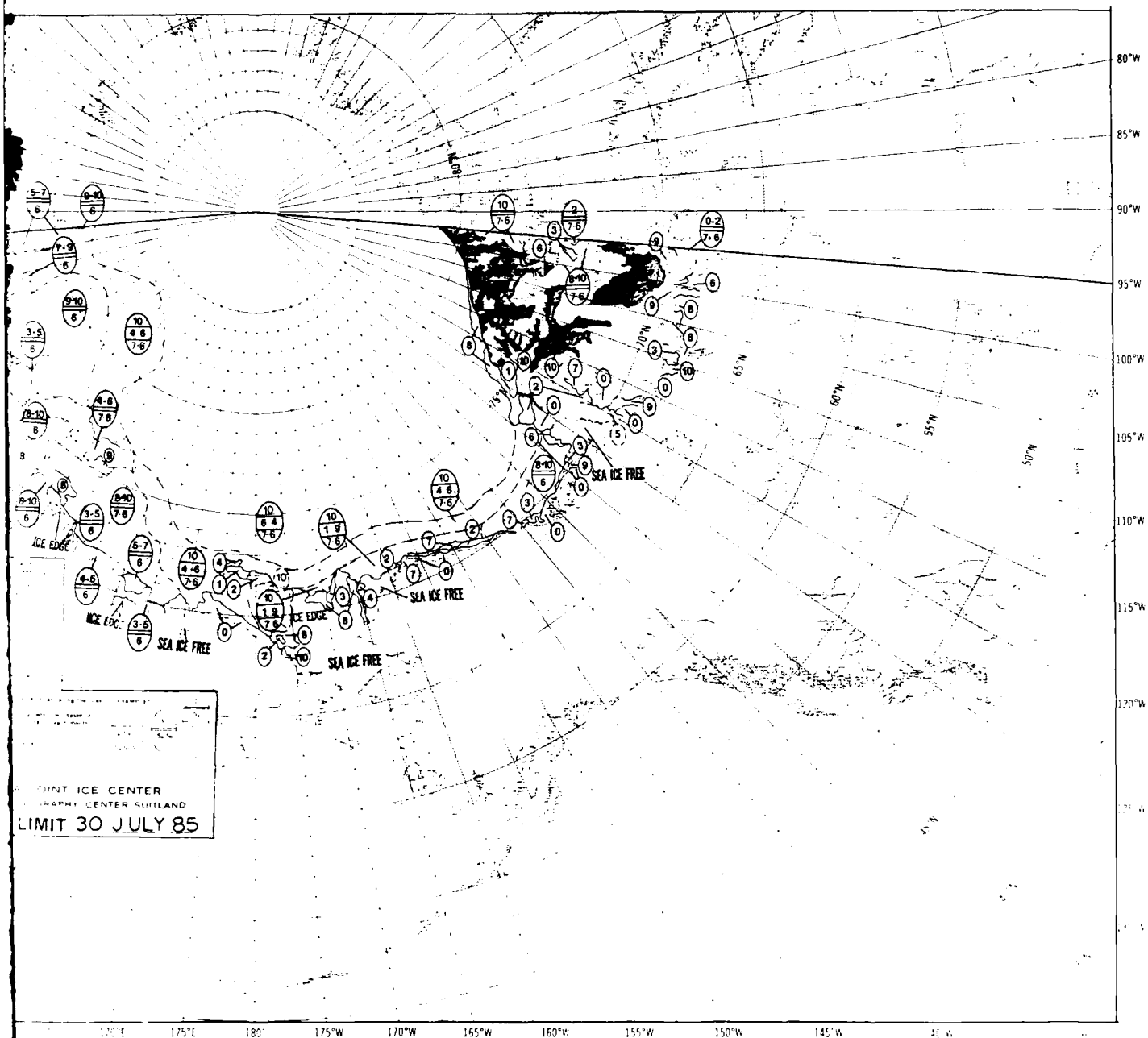


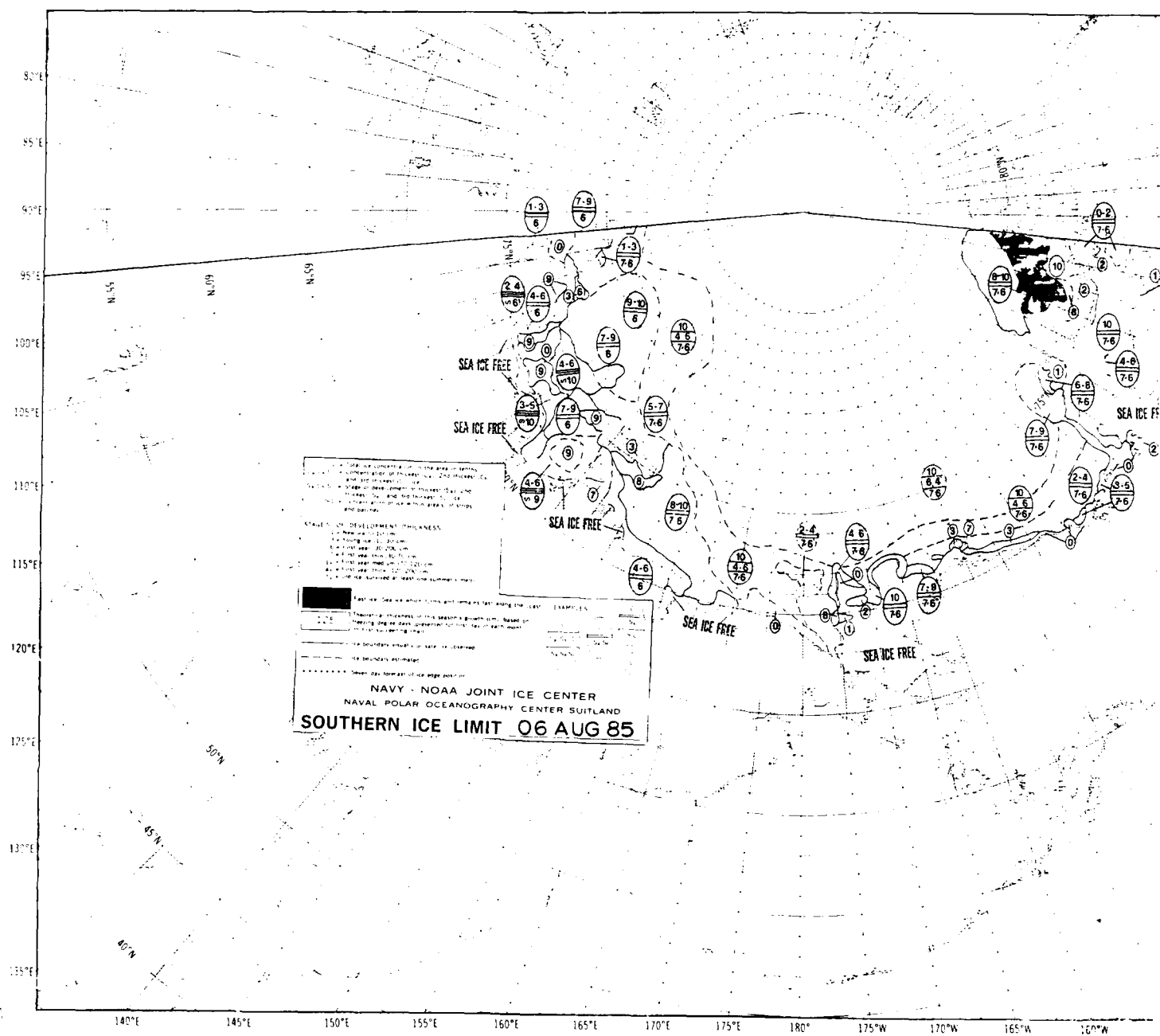


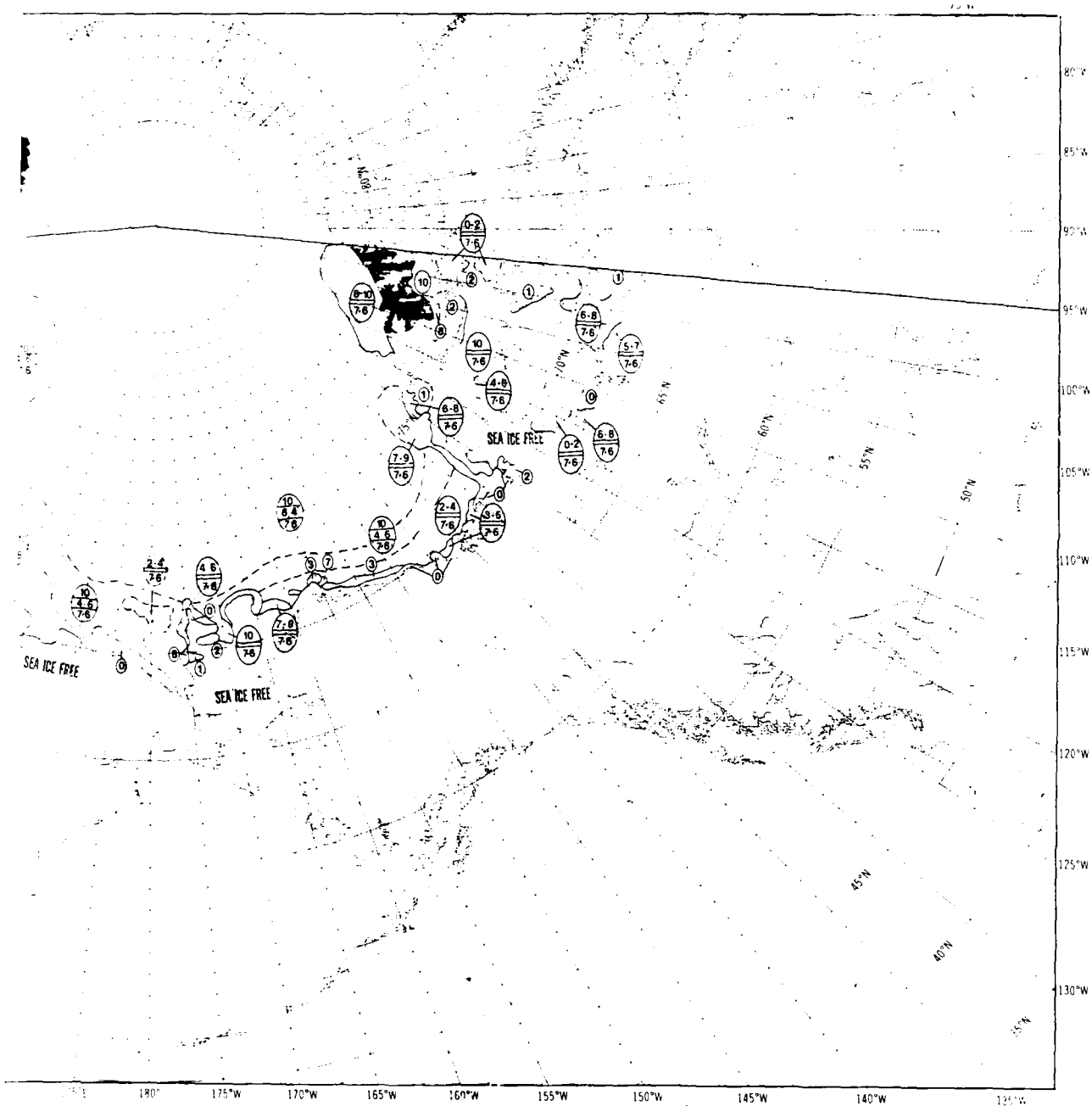


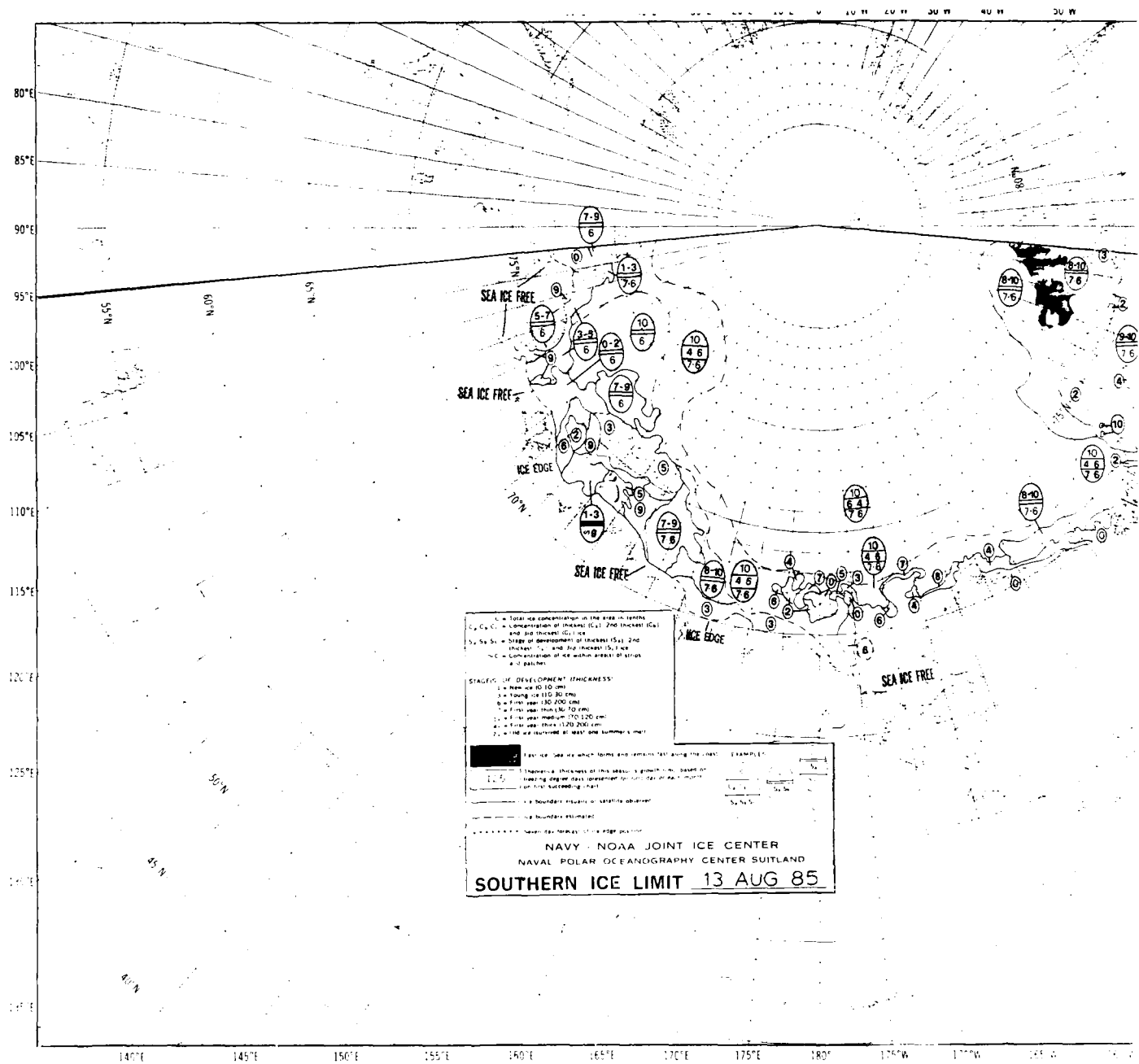


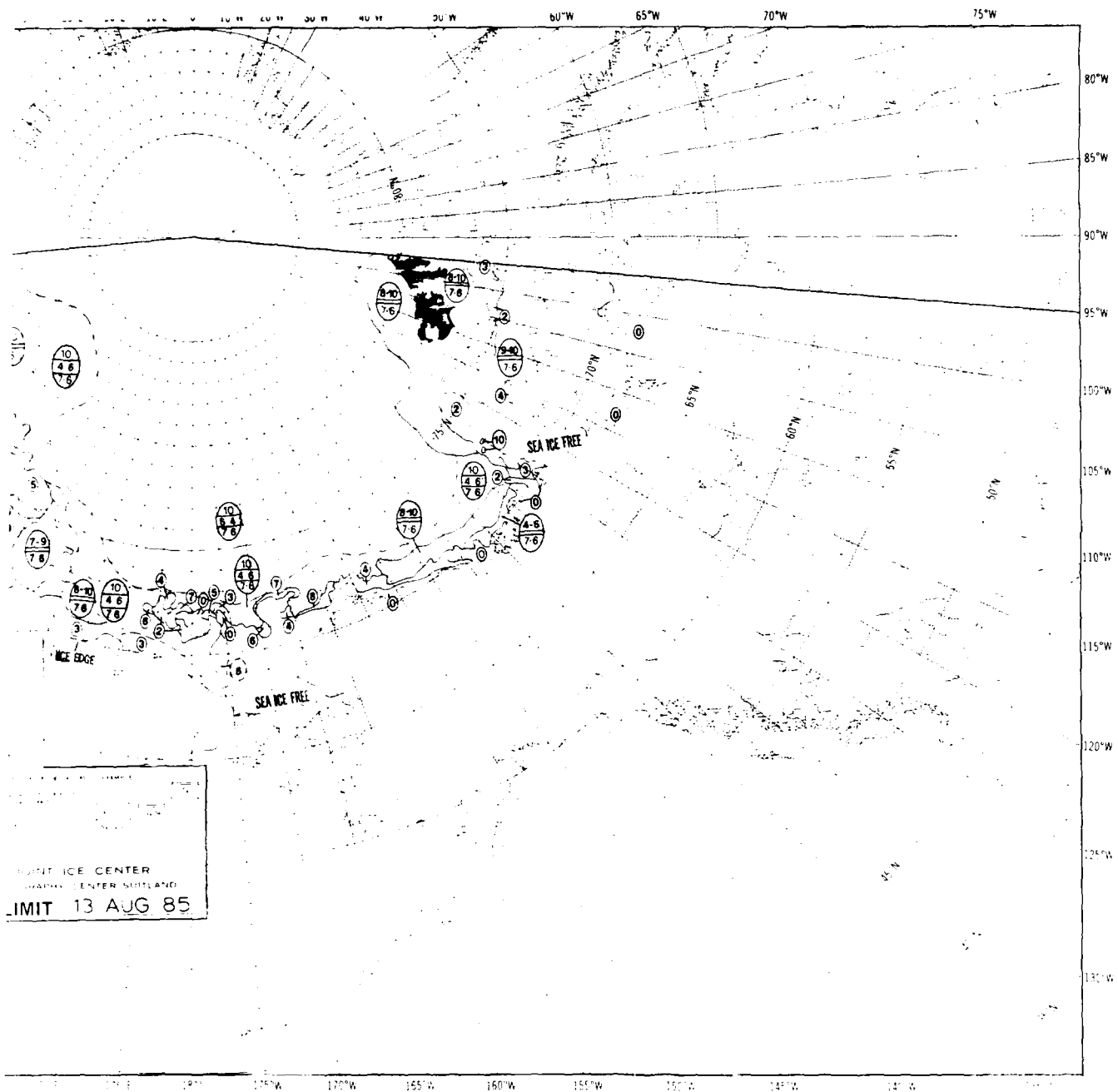




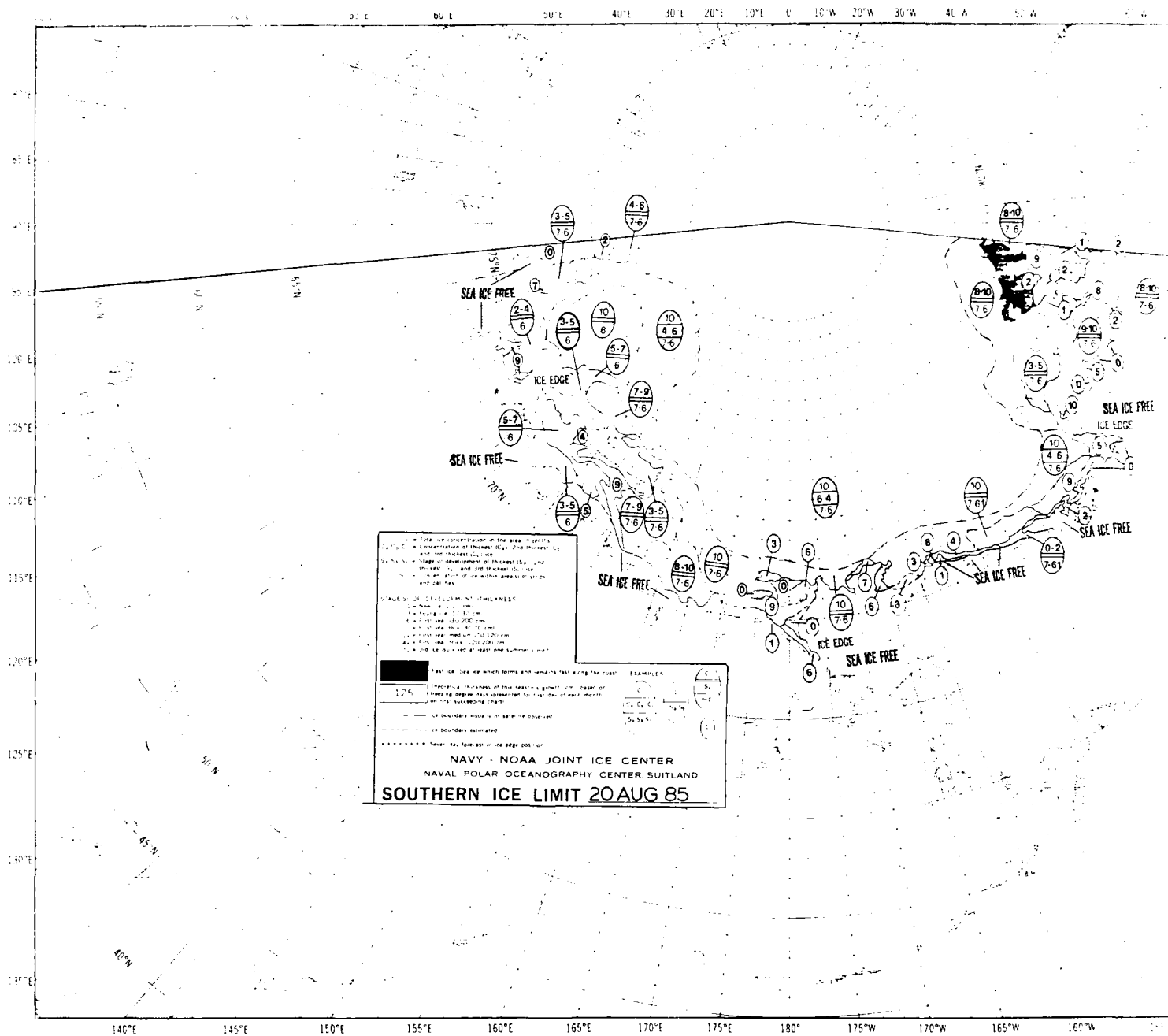


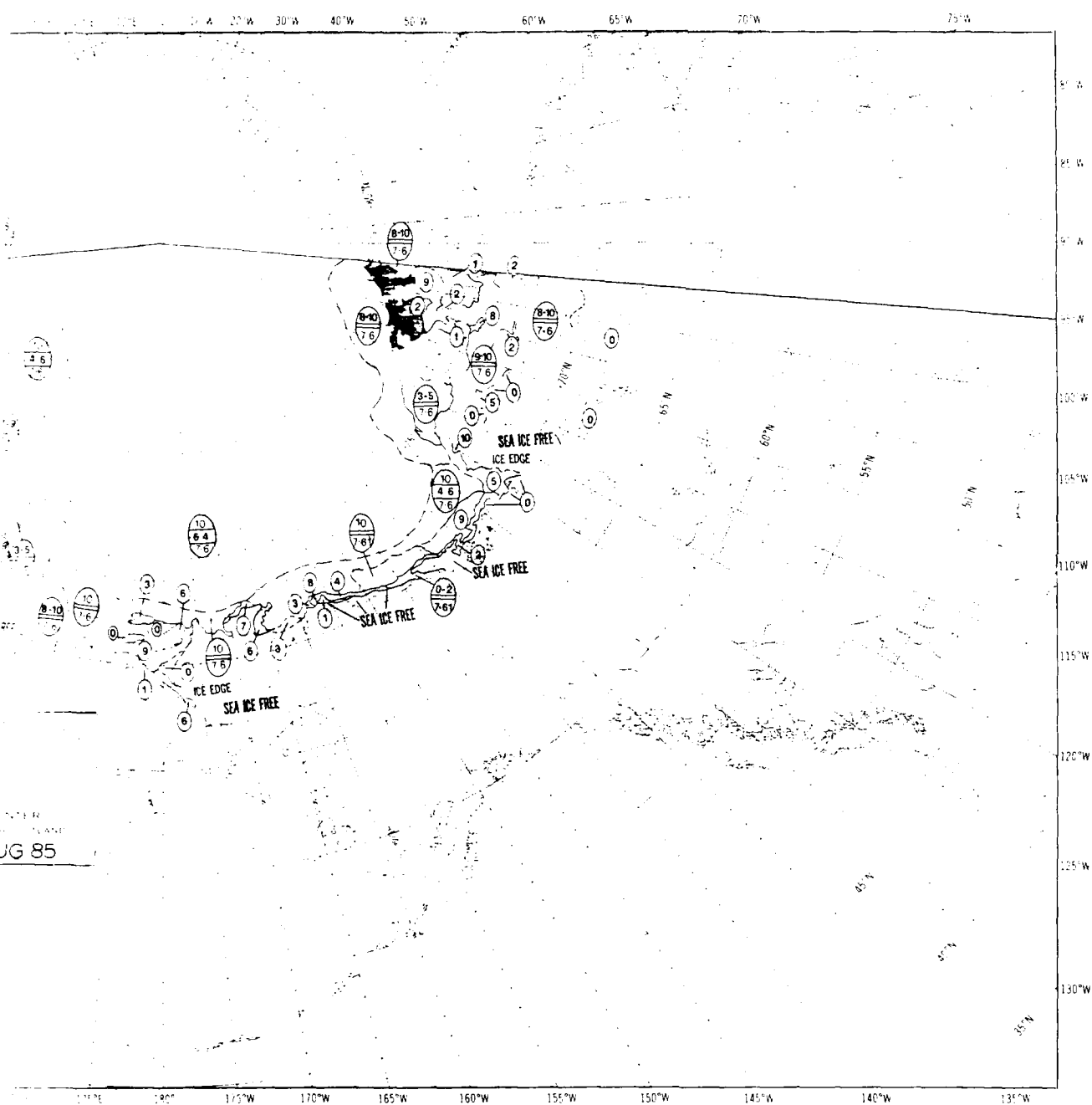


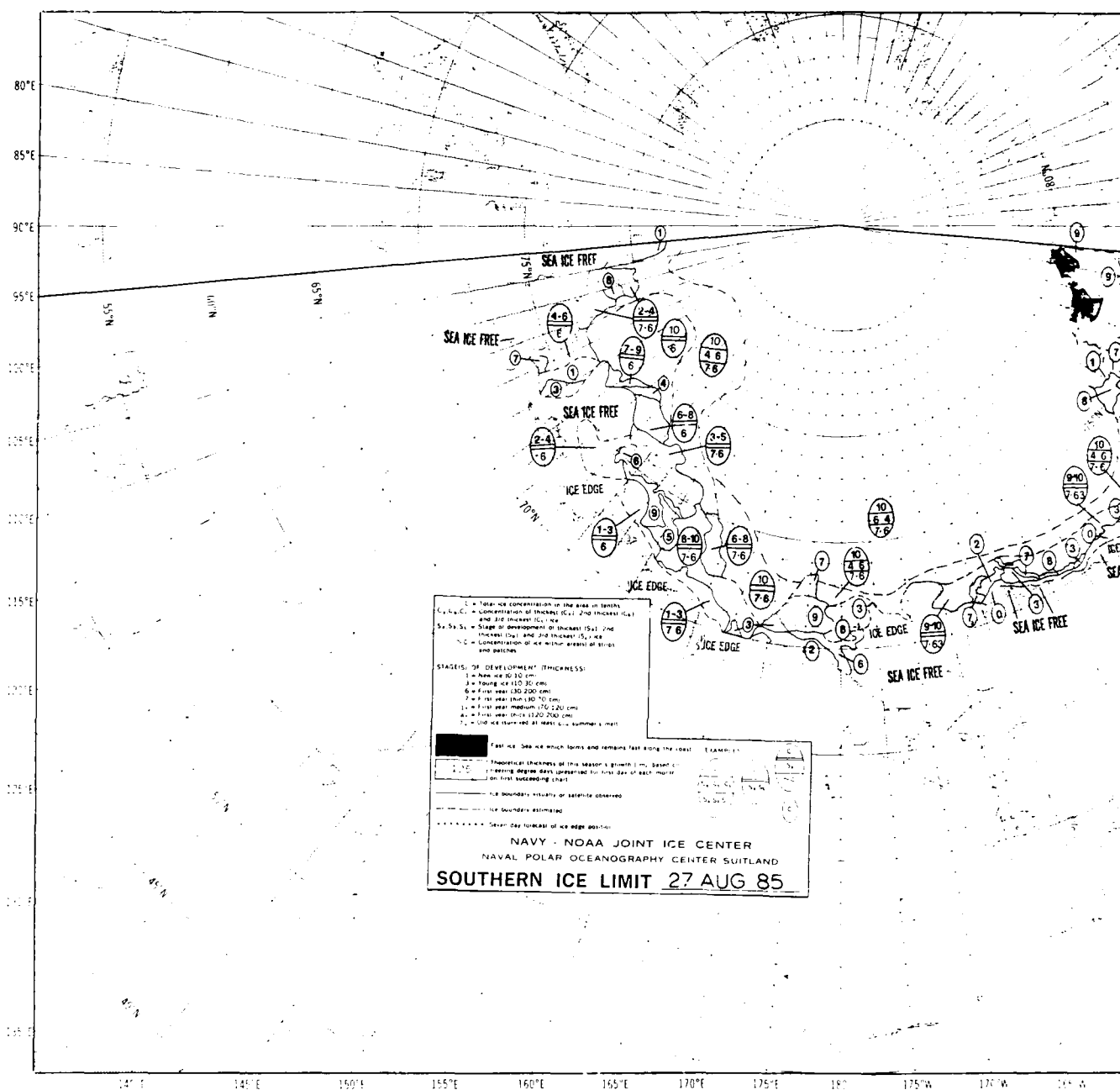


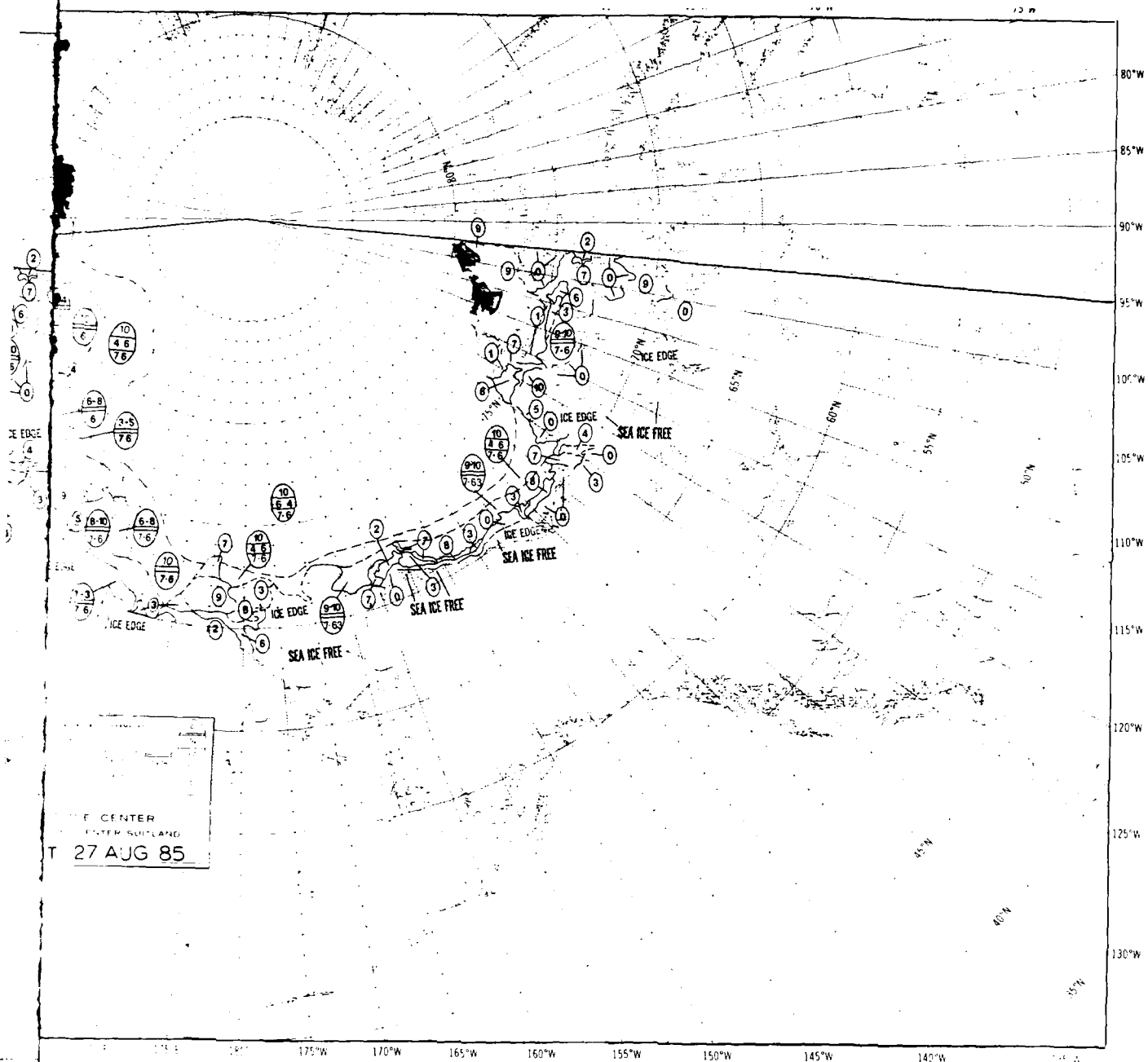


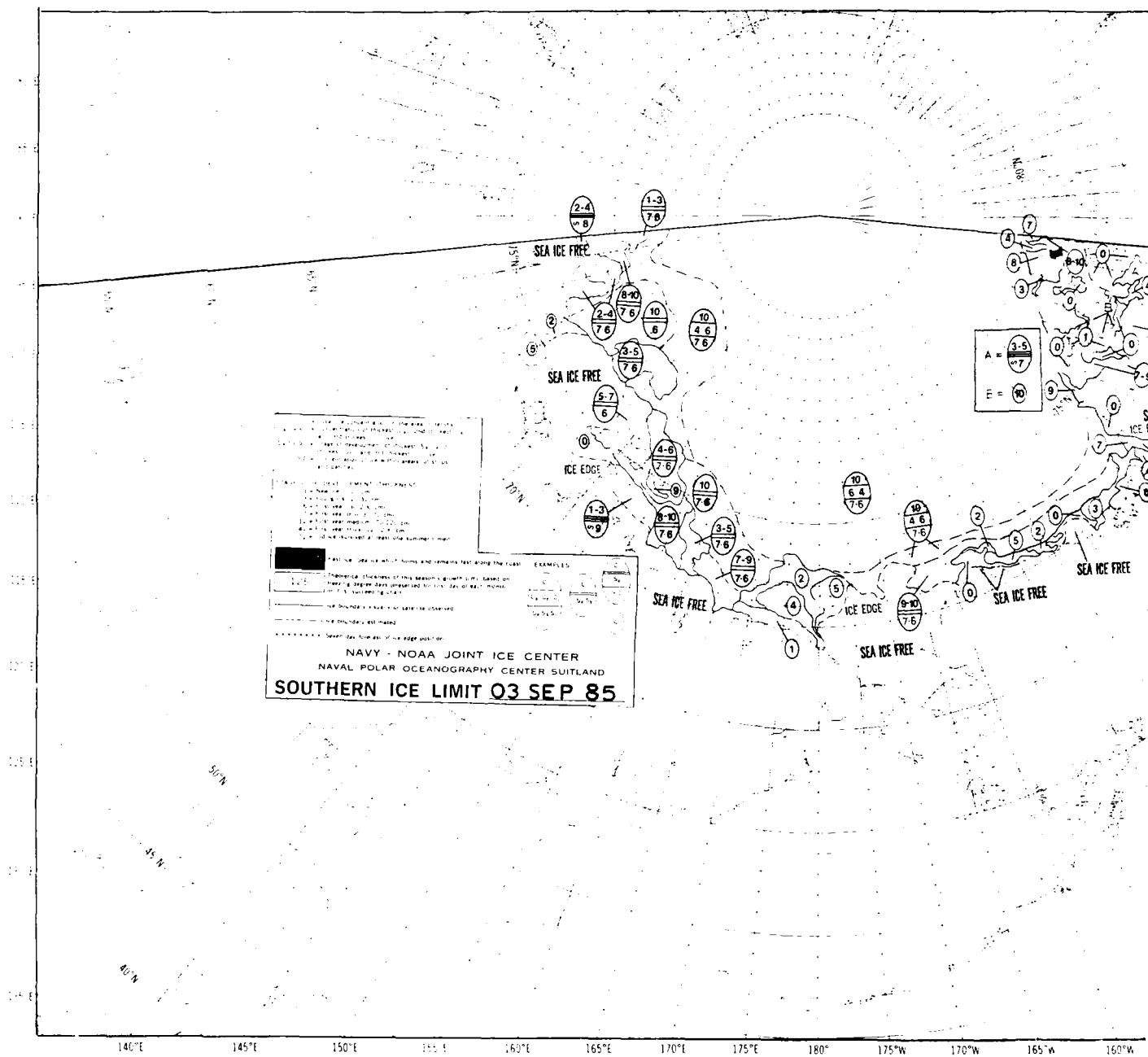
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NORTH PACIFIC CENTER  
LIMIT 13 AUG 85

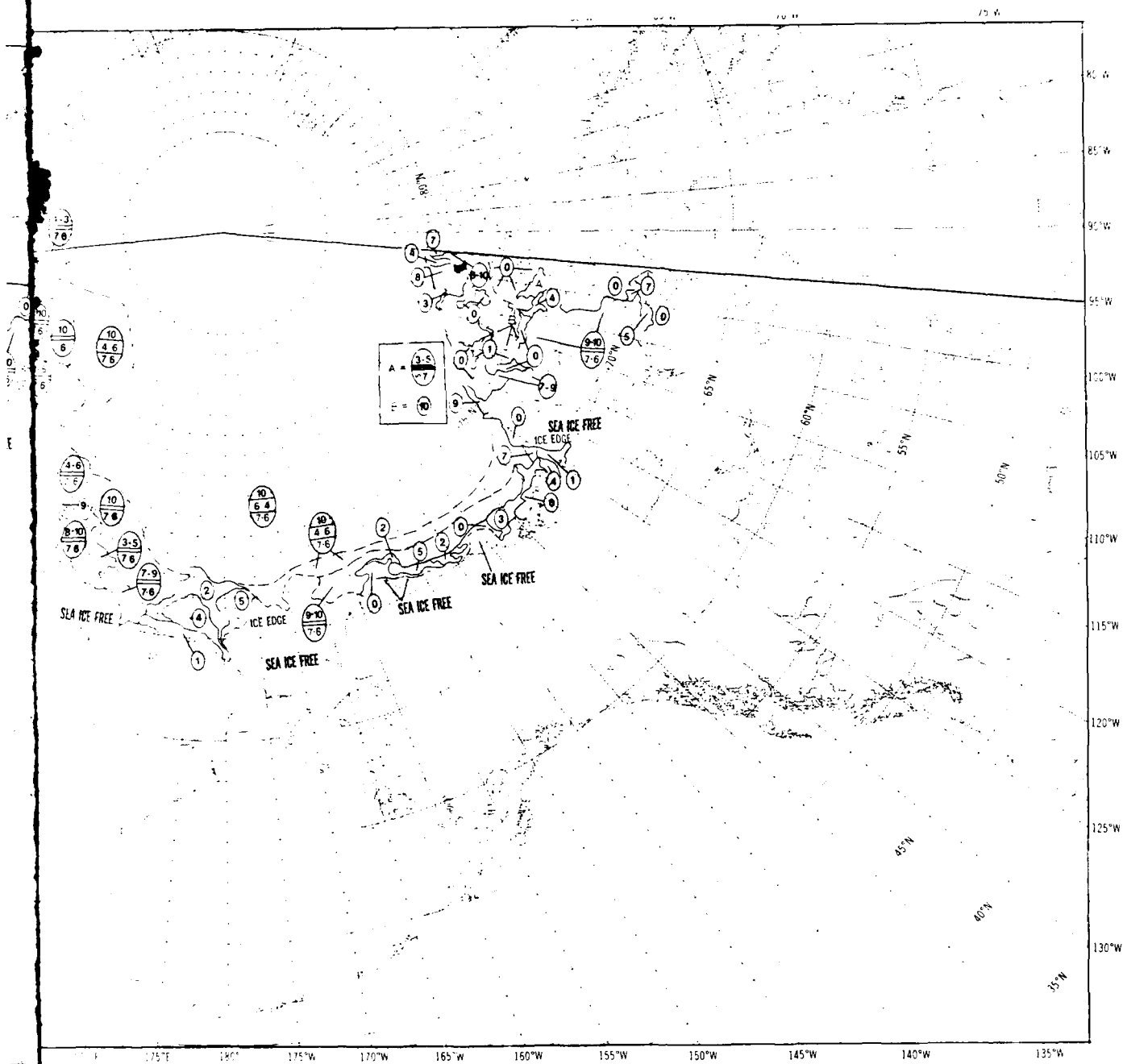


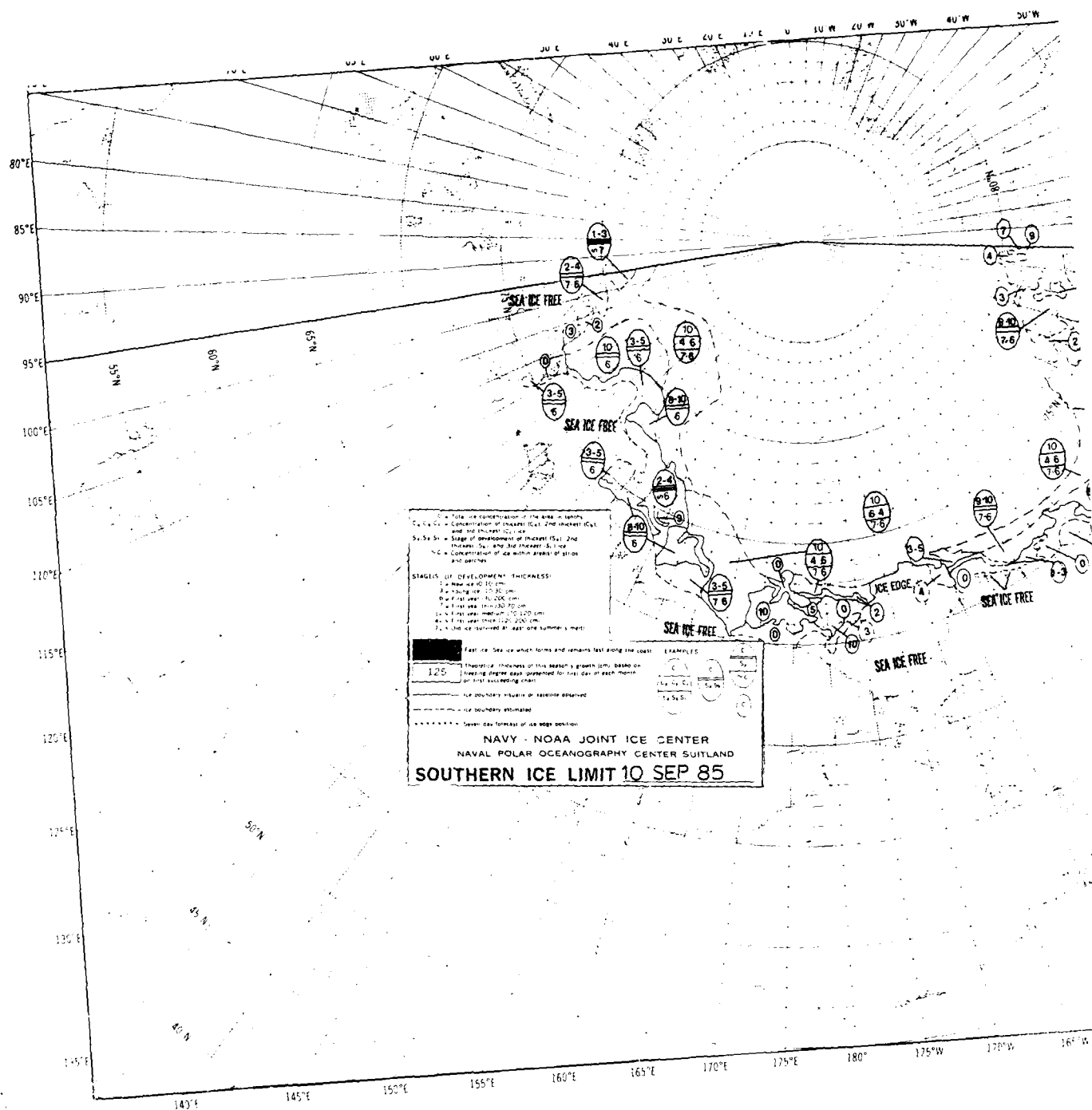


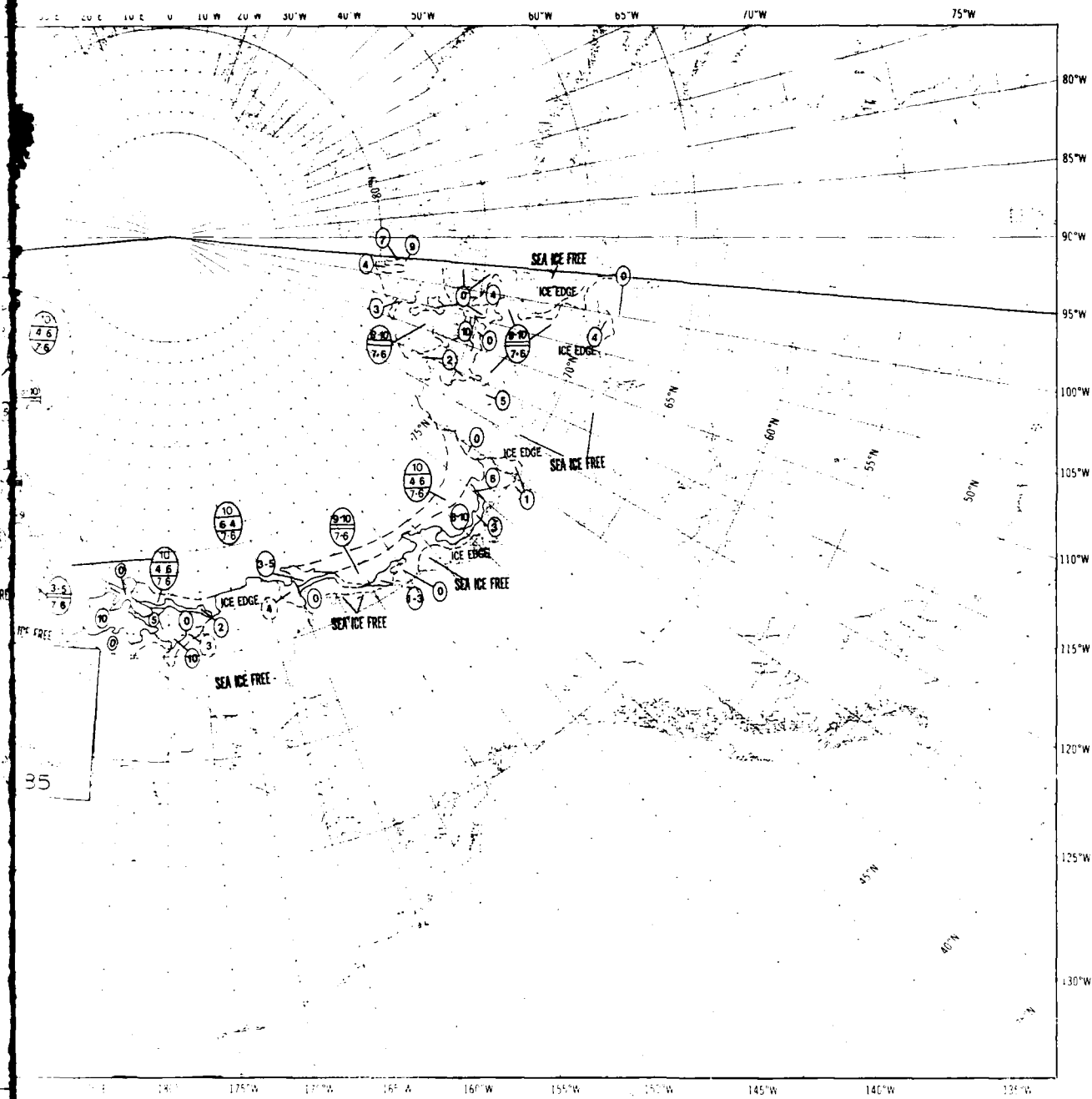


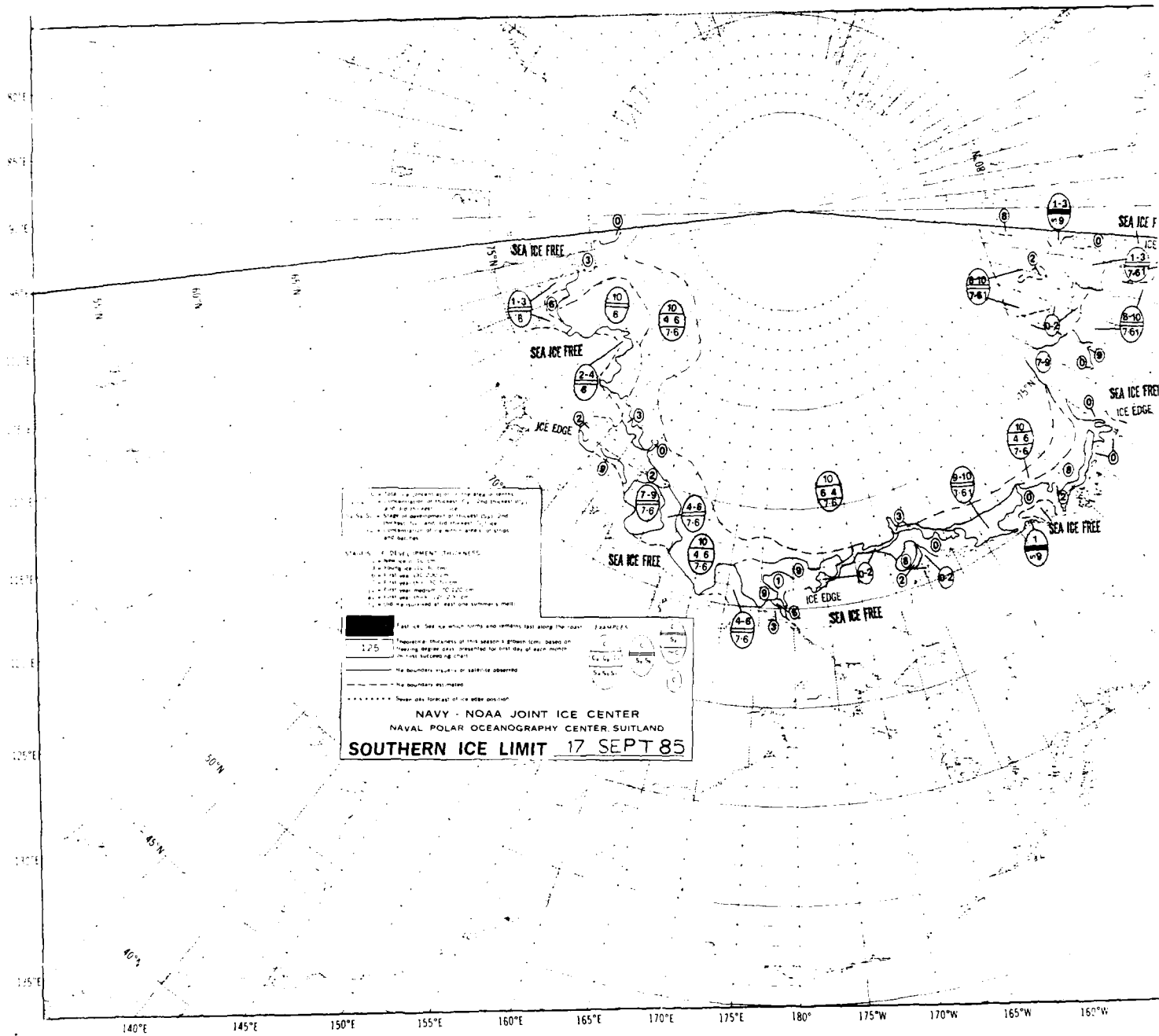


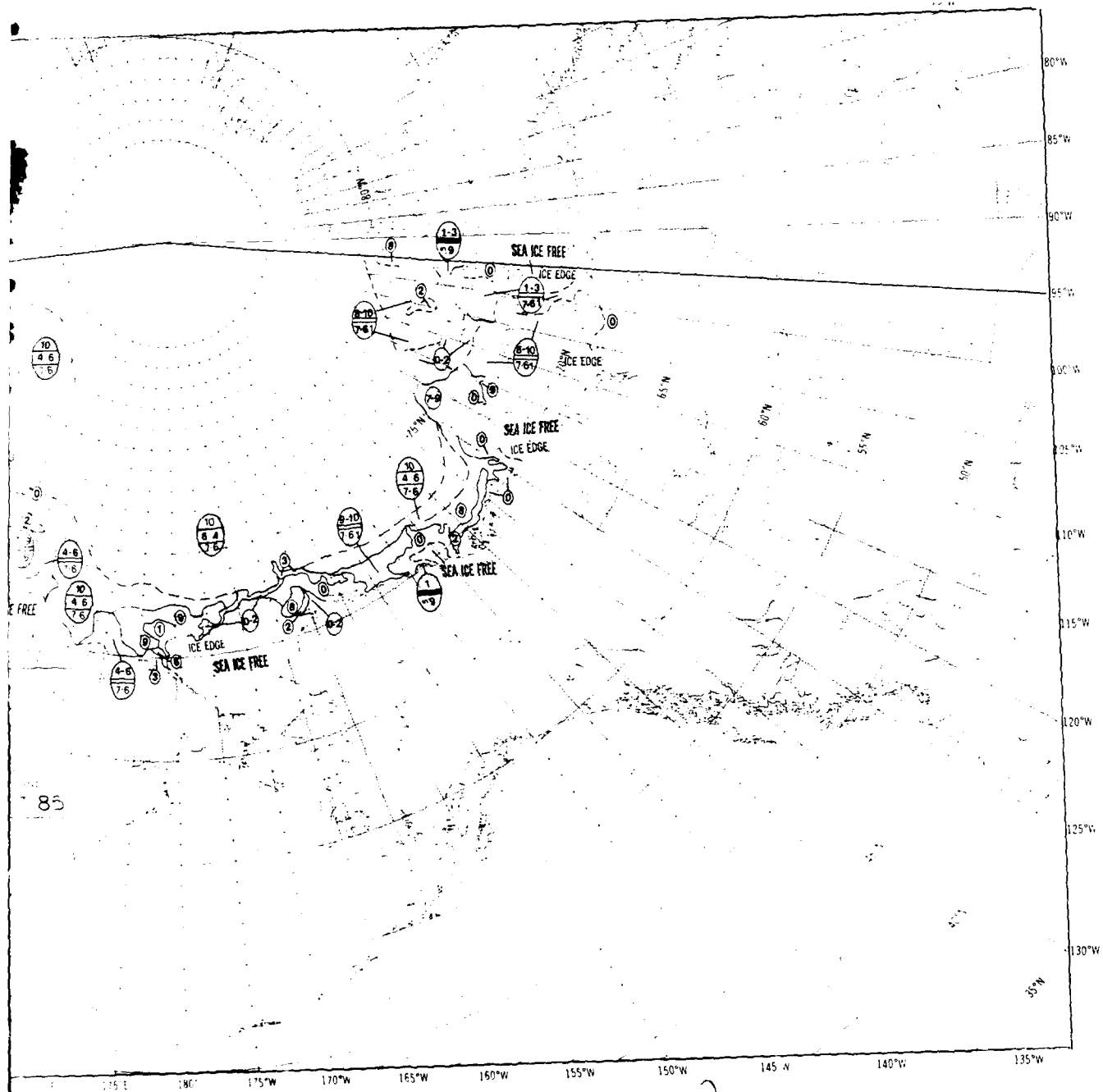


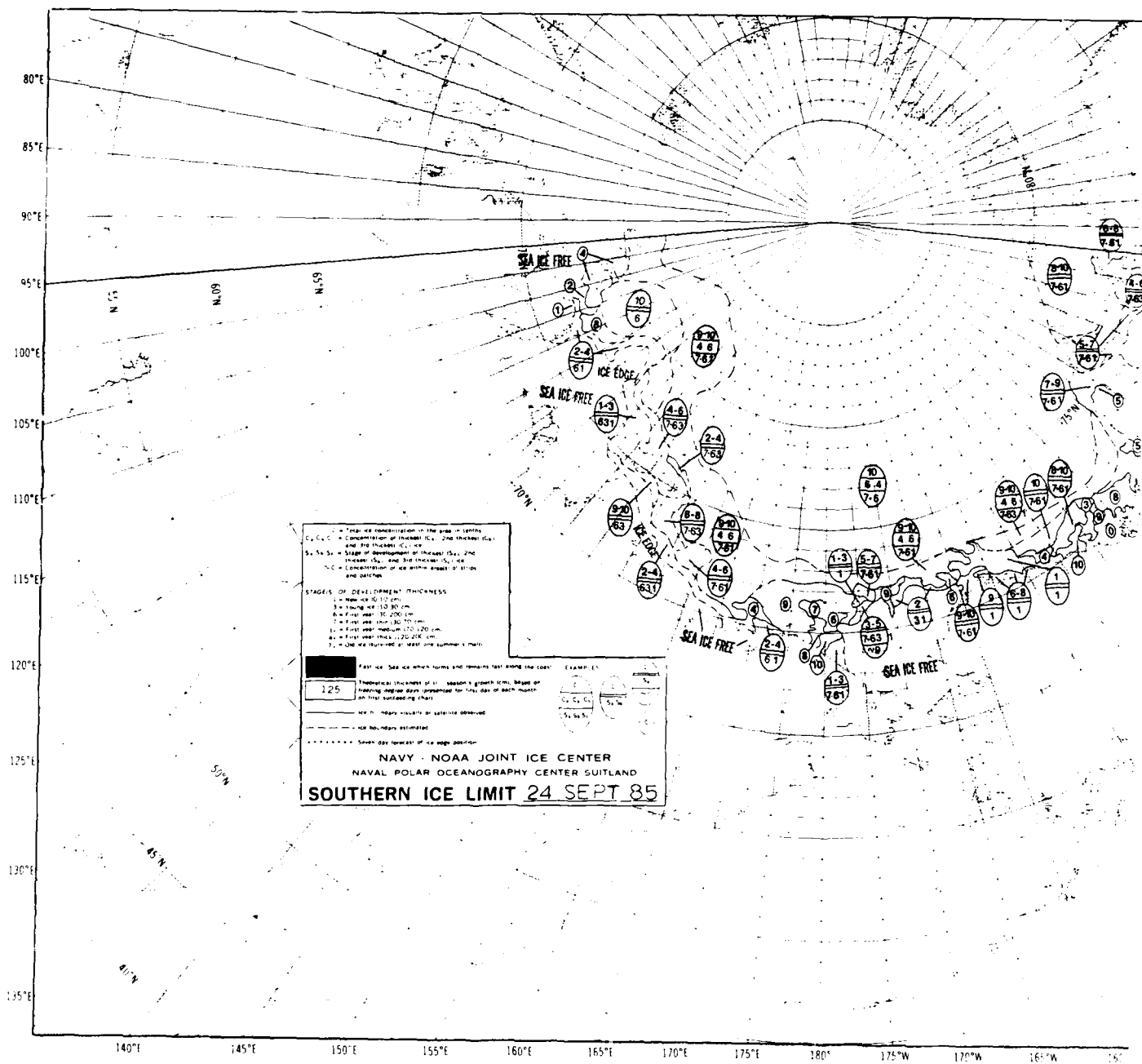


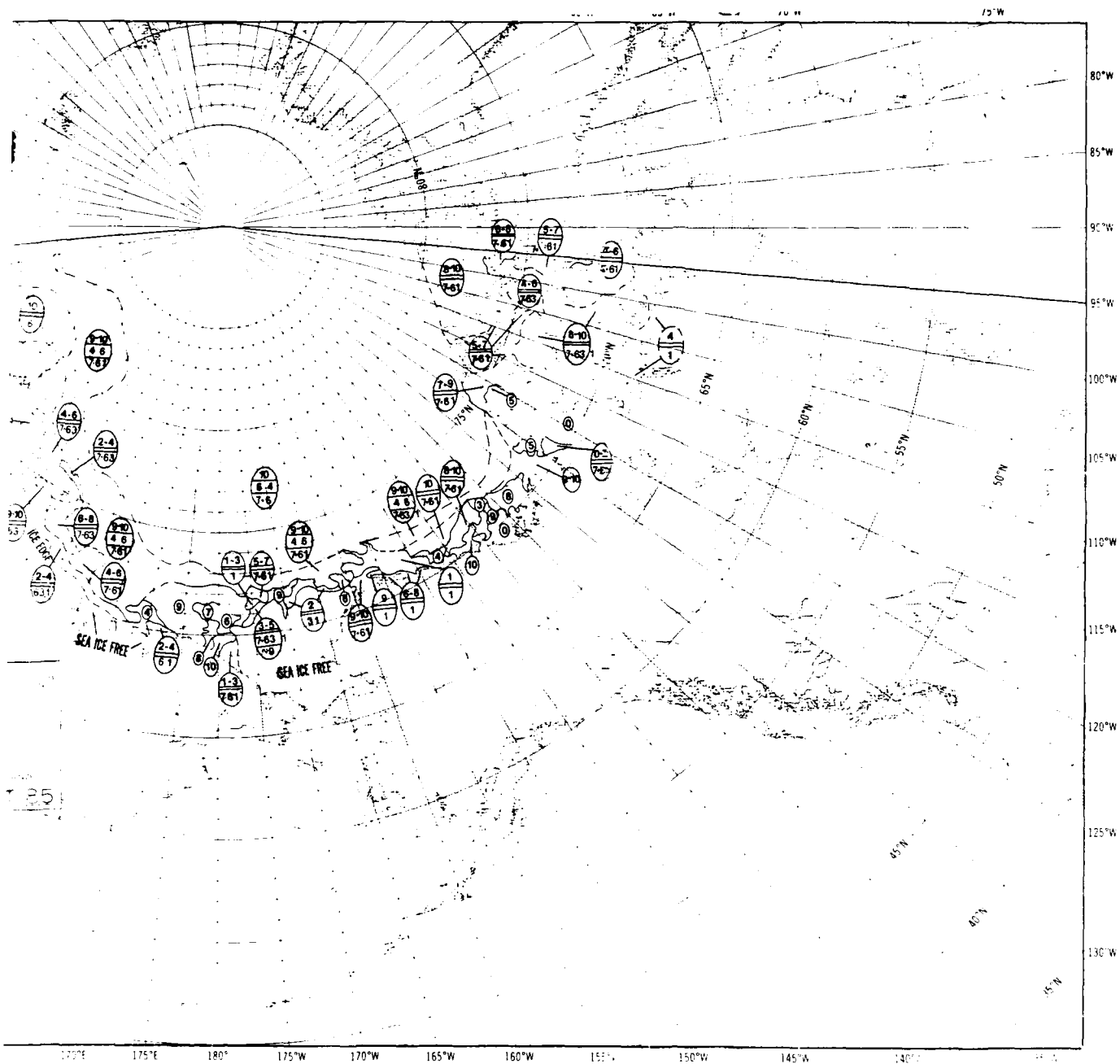


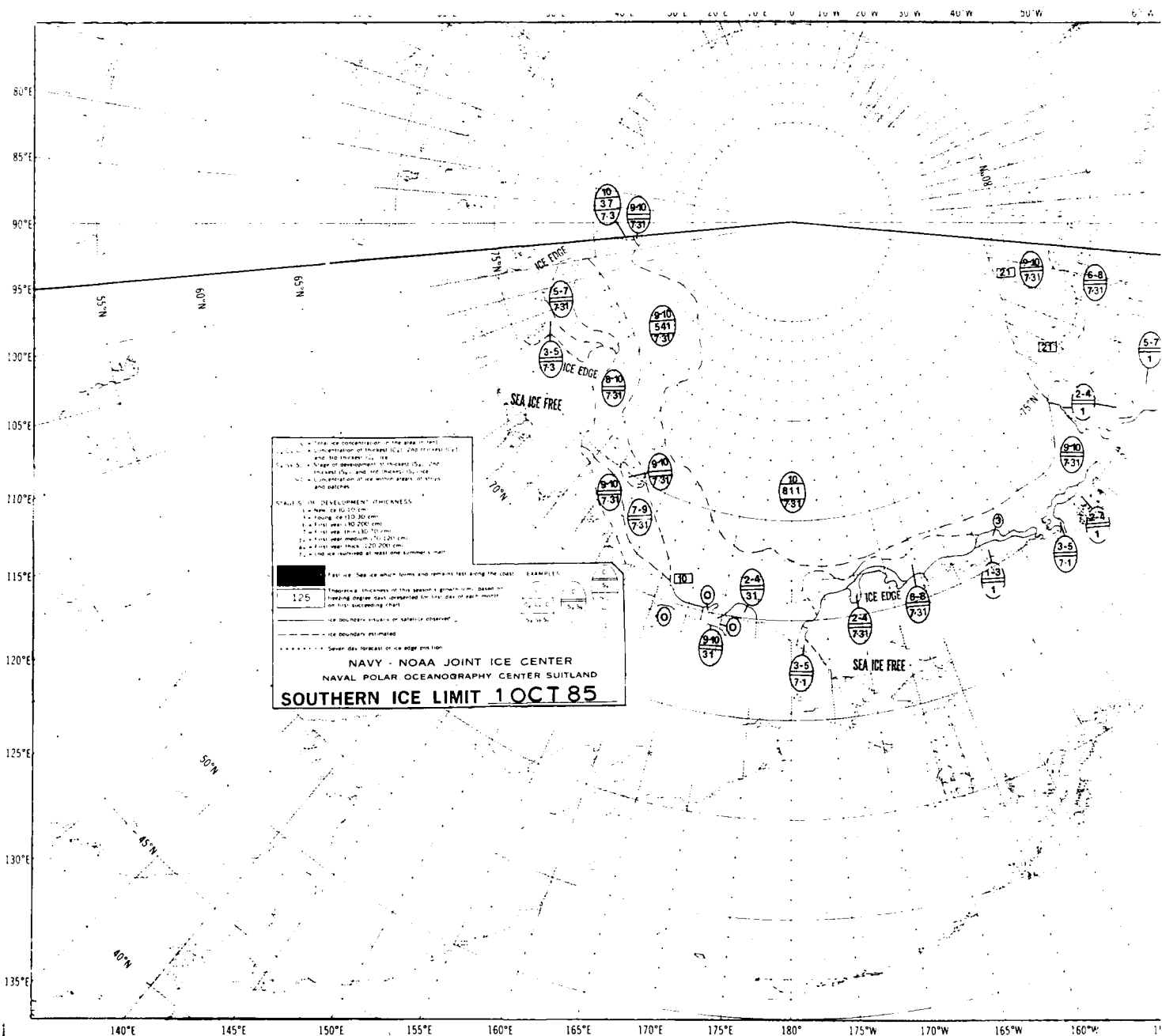


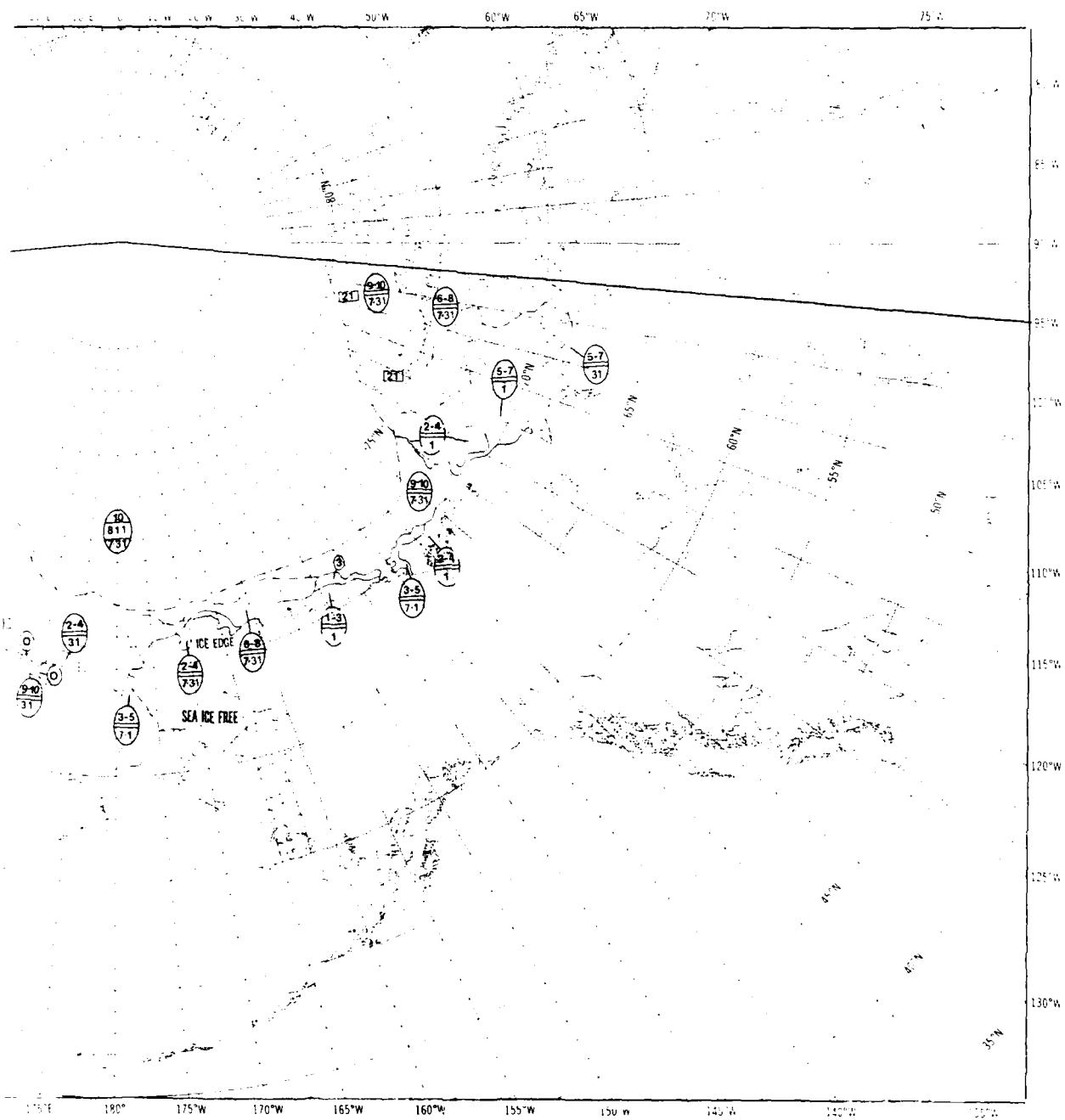


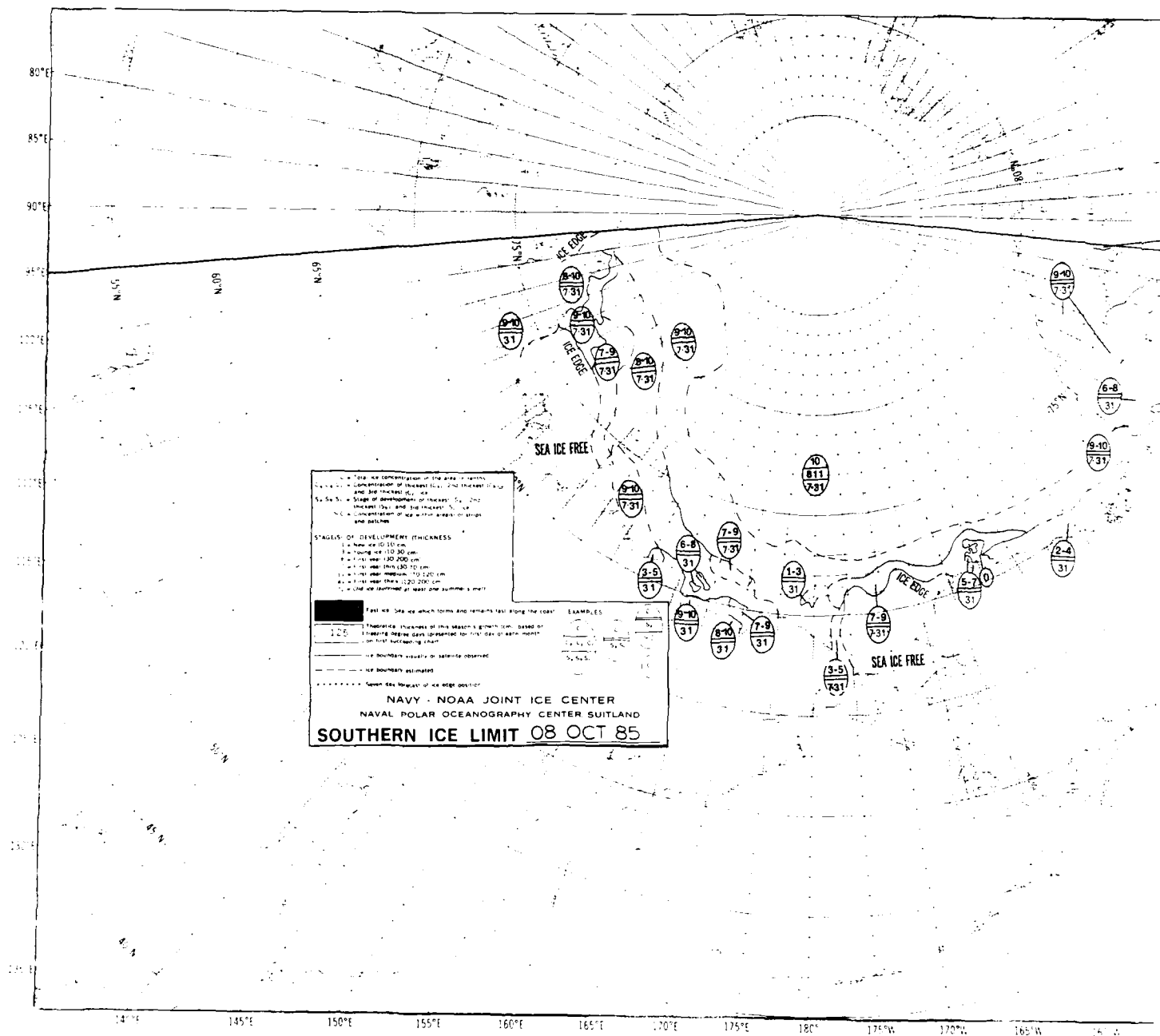


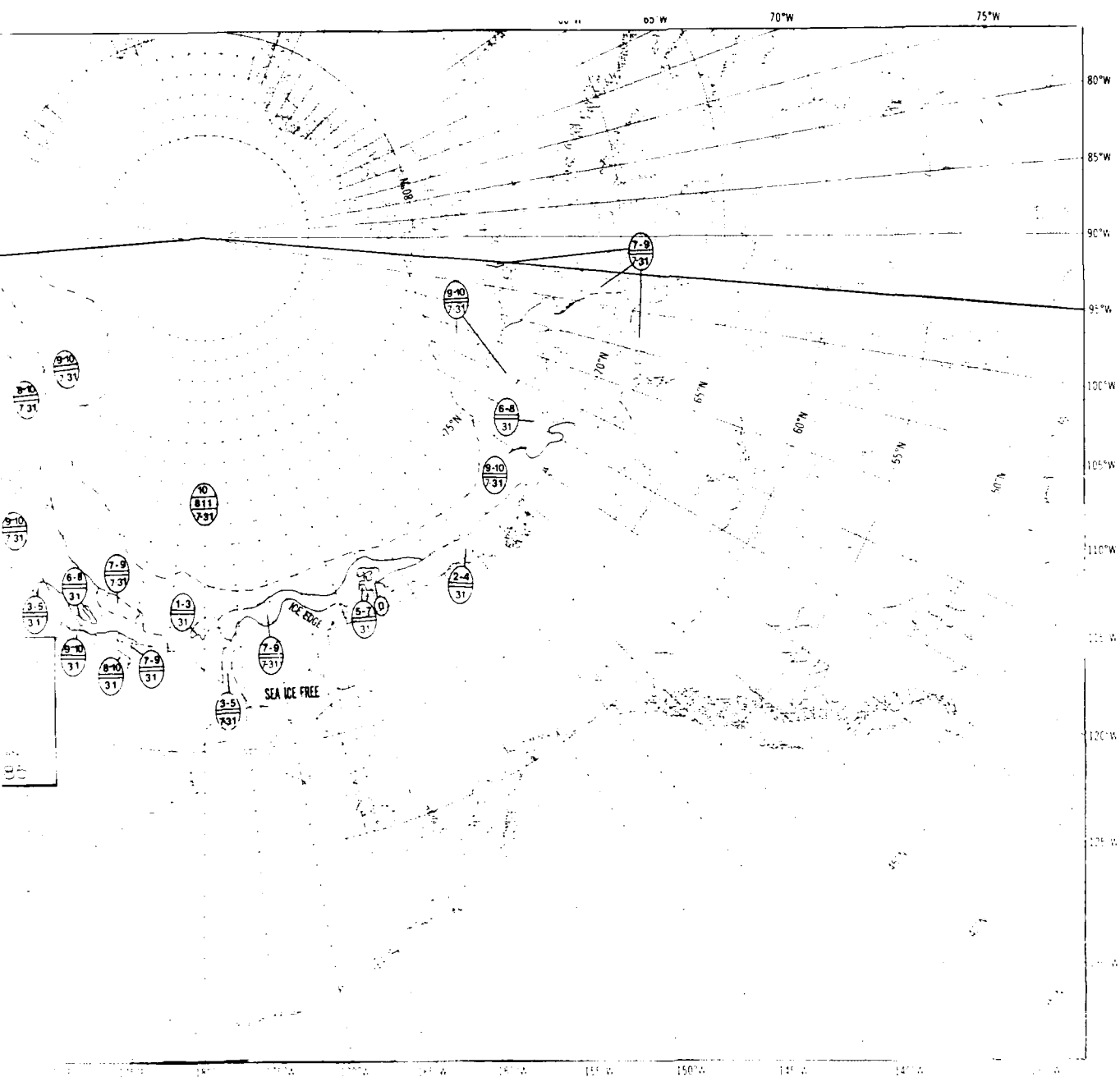












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EASTERN - WESTERN ARCTIC SEA ICE ANALYSIS 1985(U) NAVAL 3/3  
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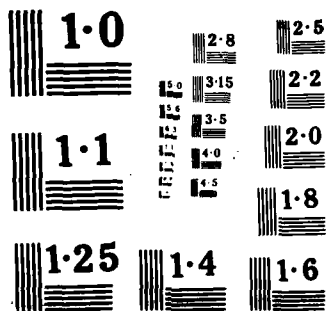
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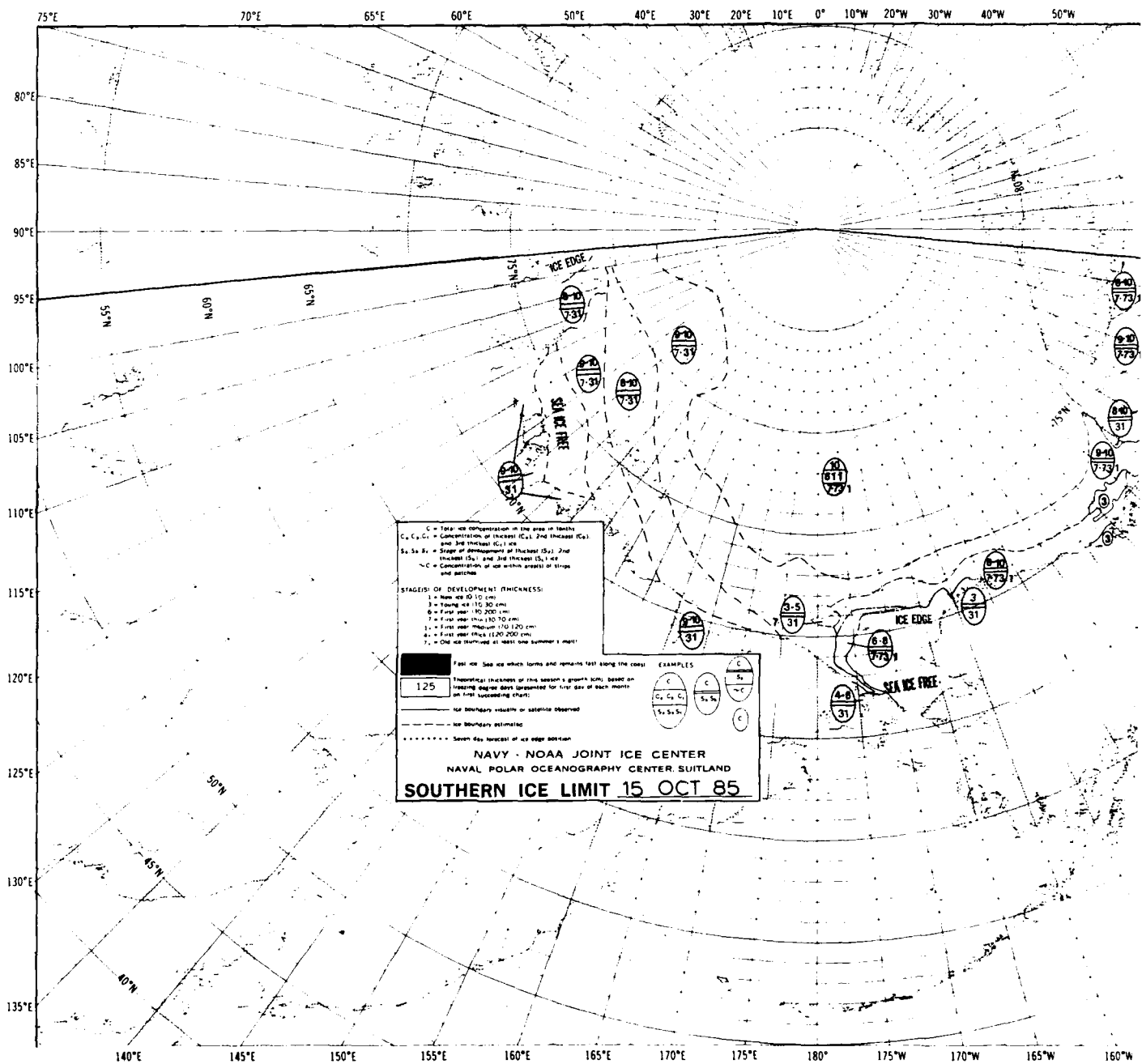
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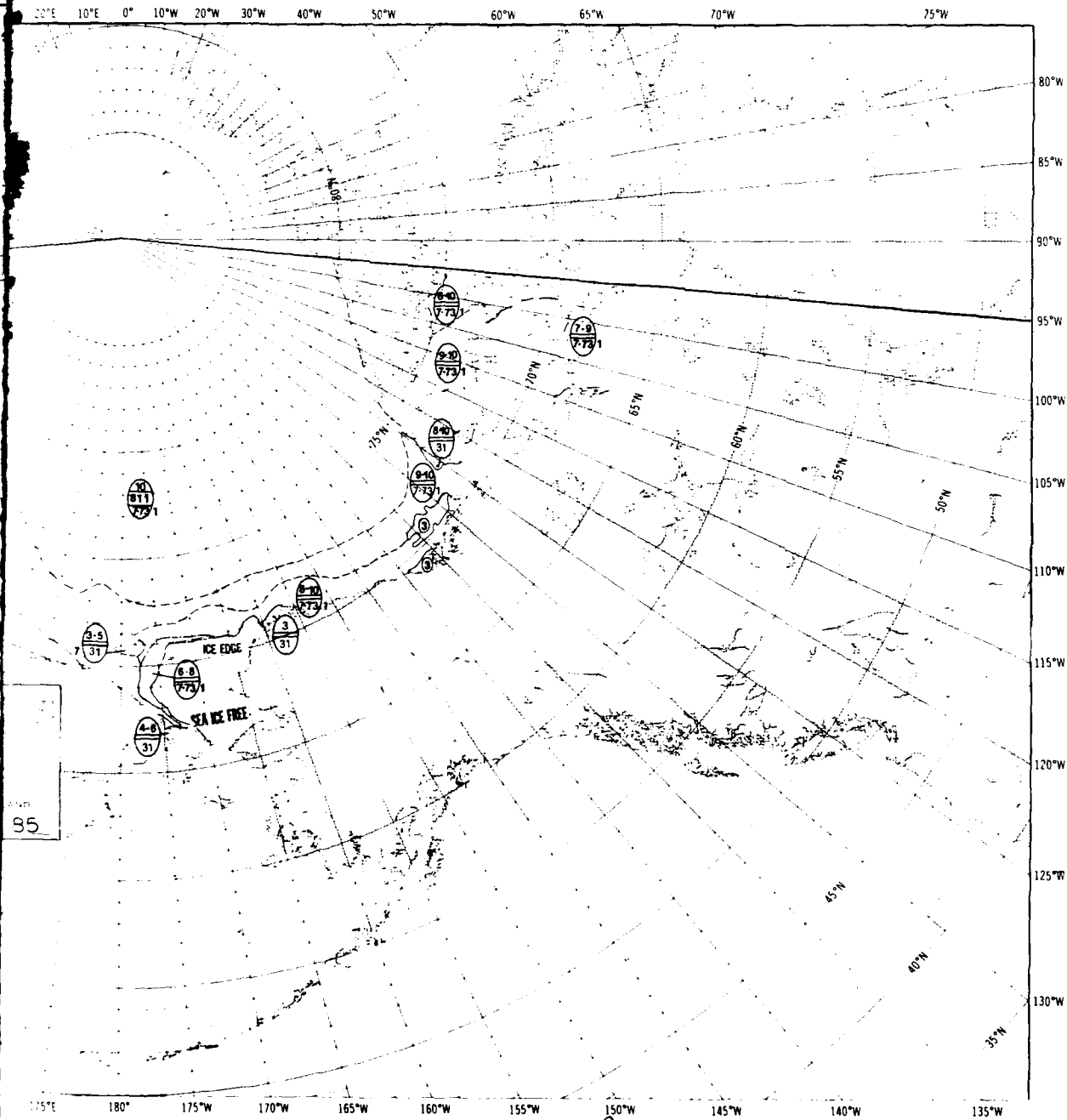
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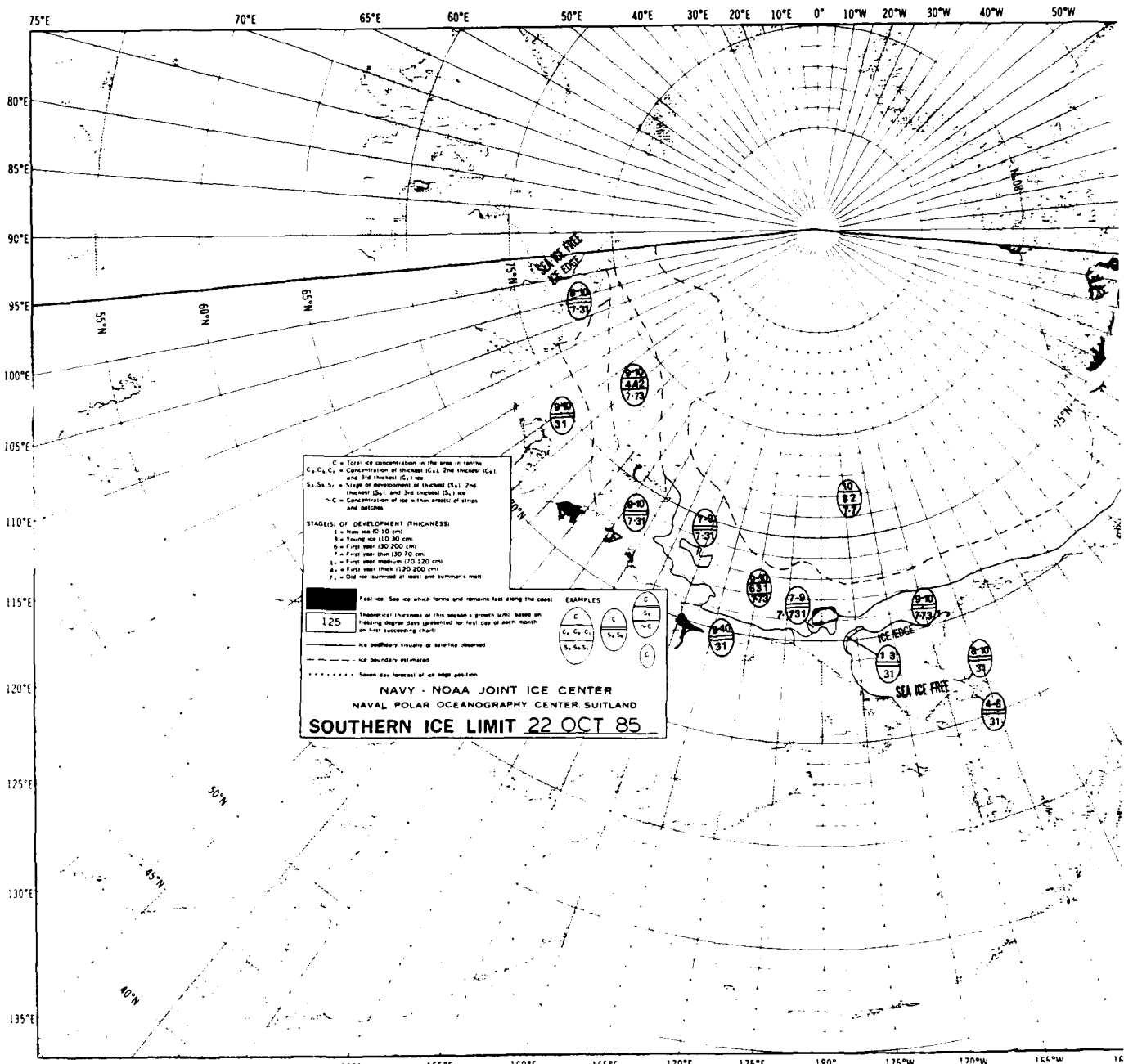
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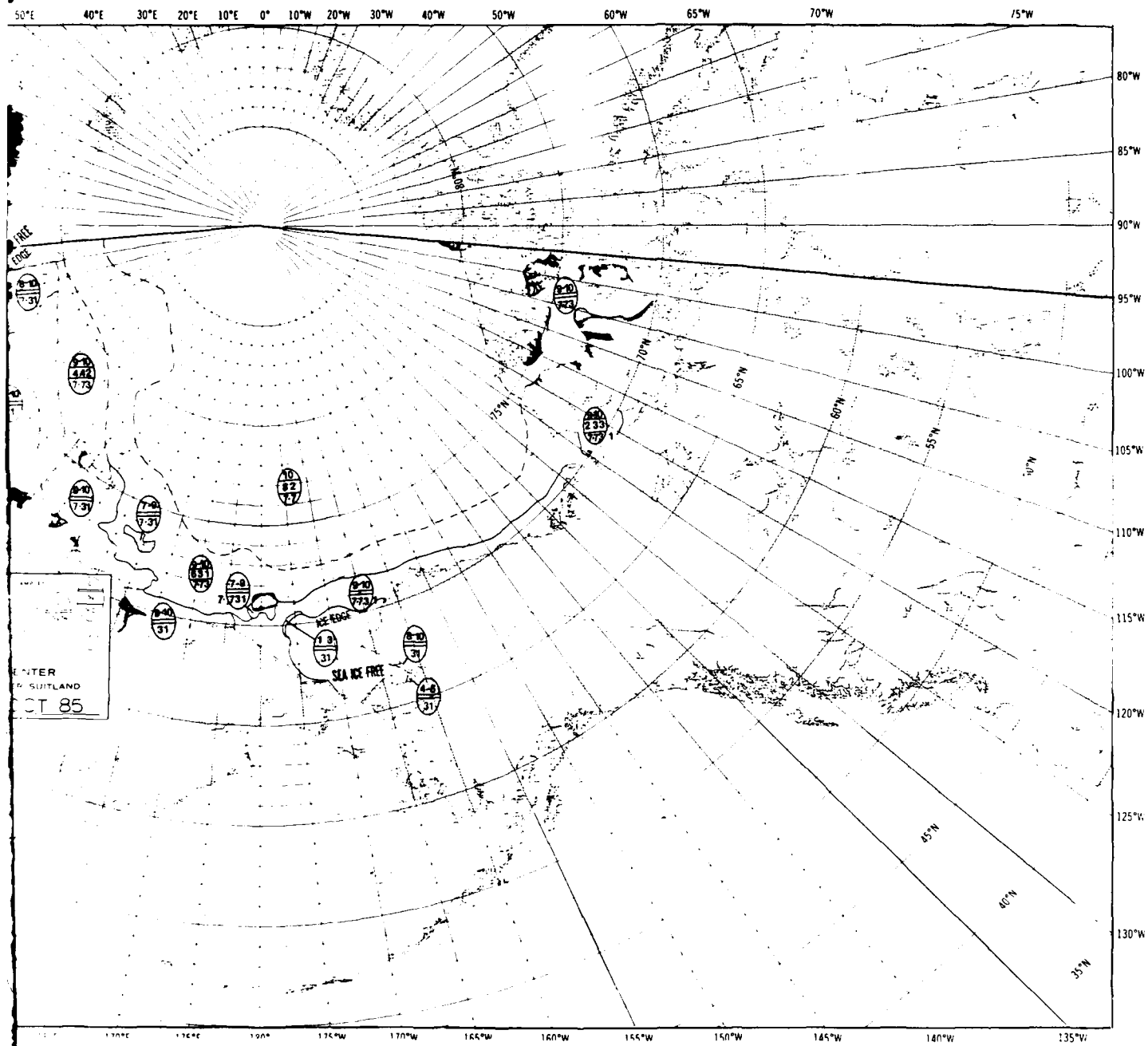
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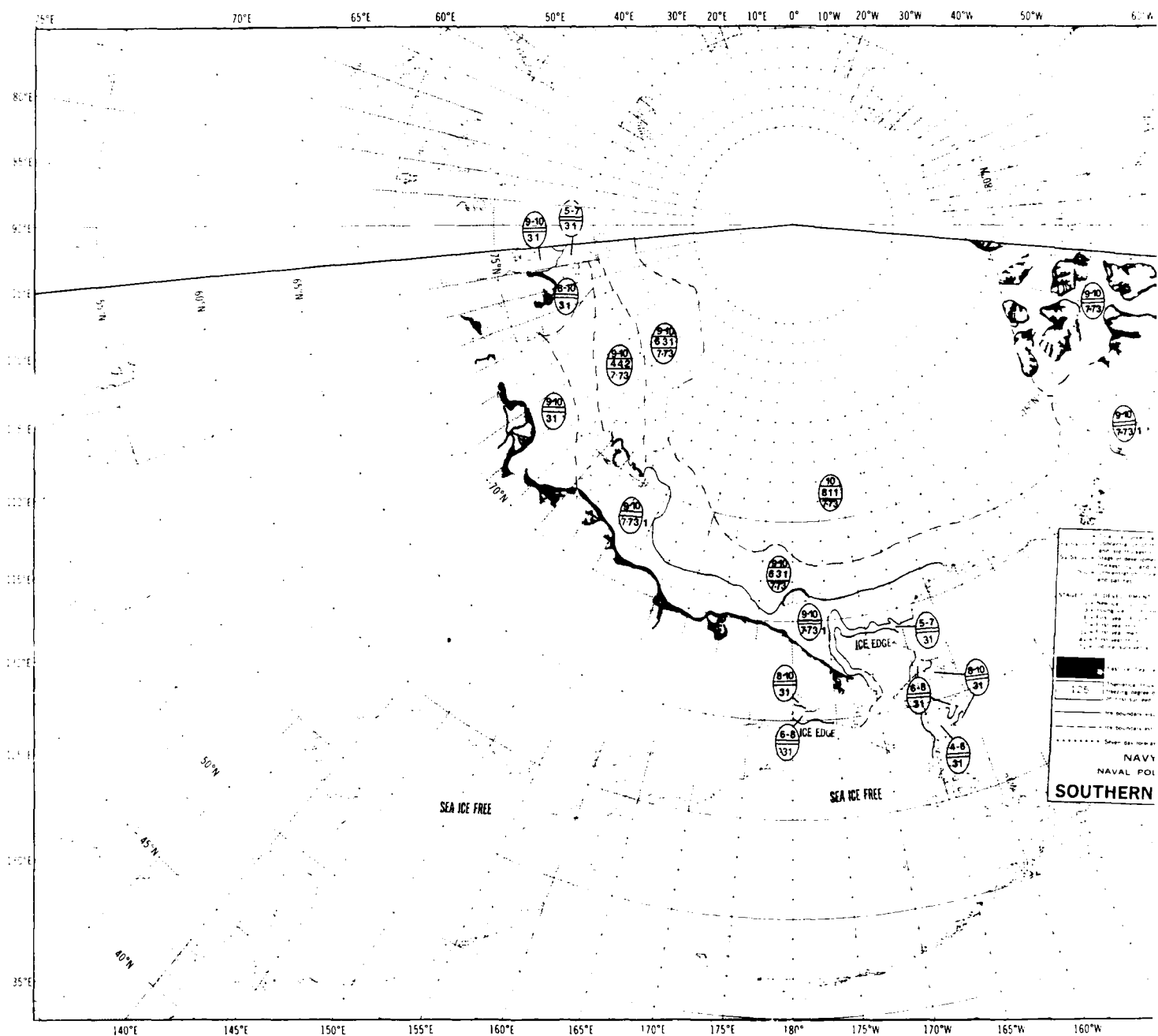


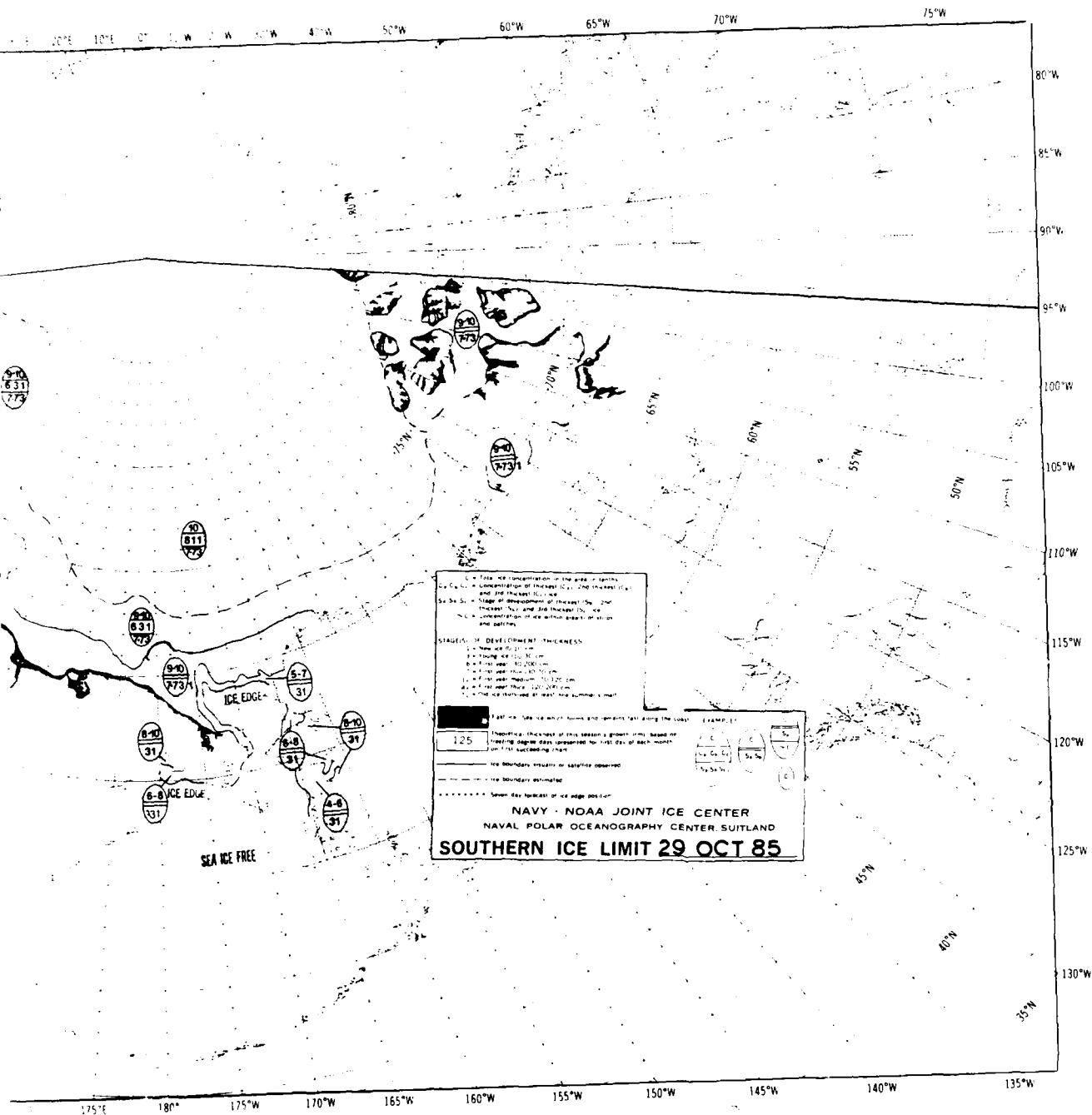


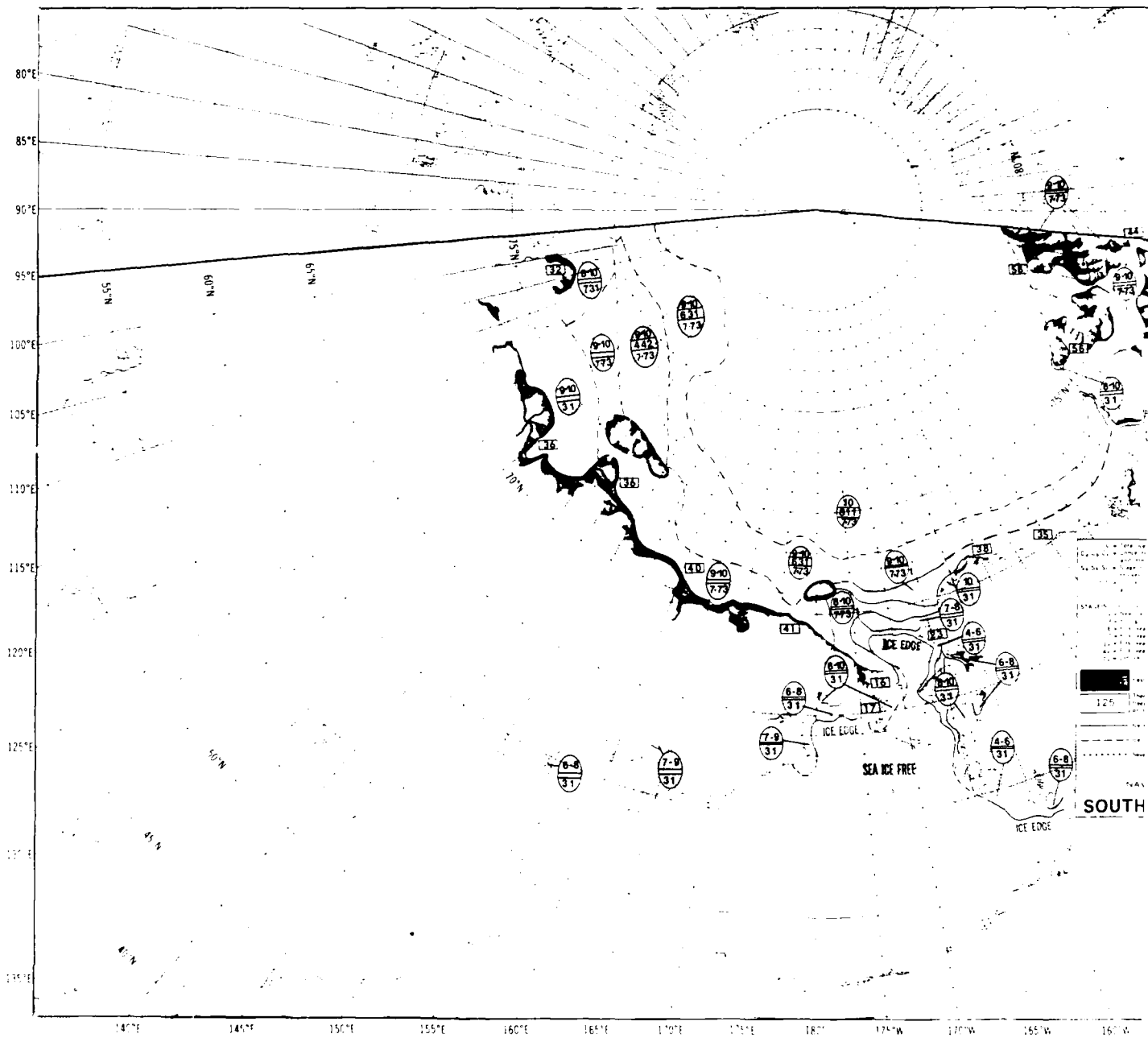


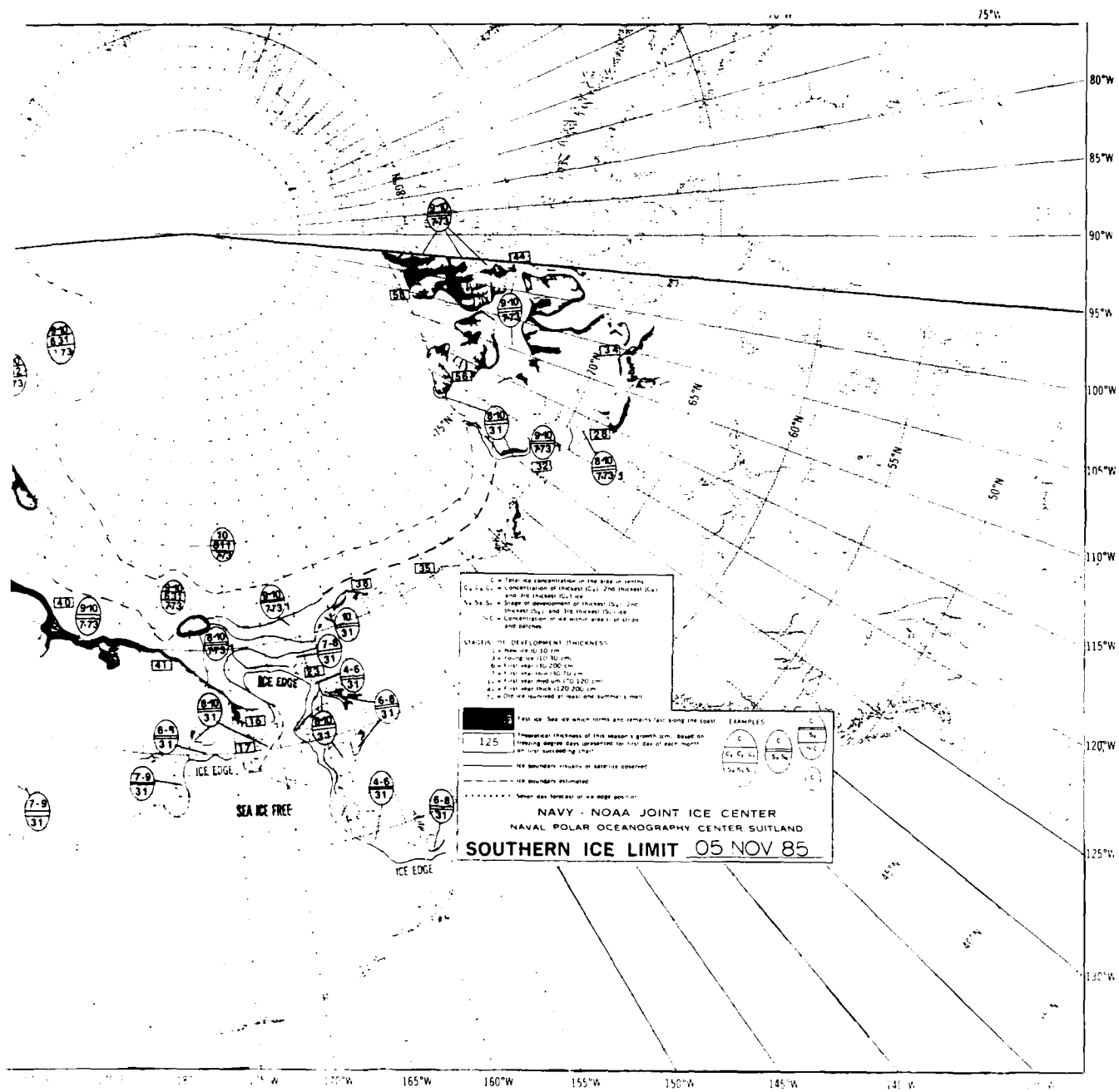


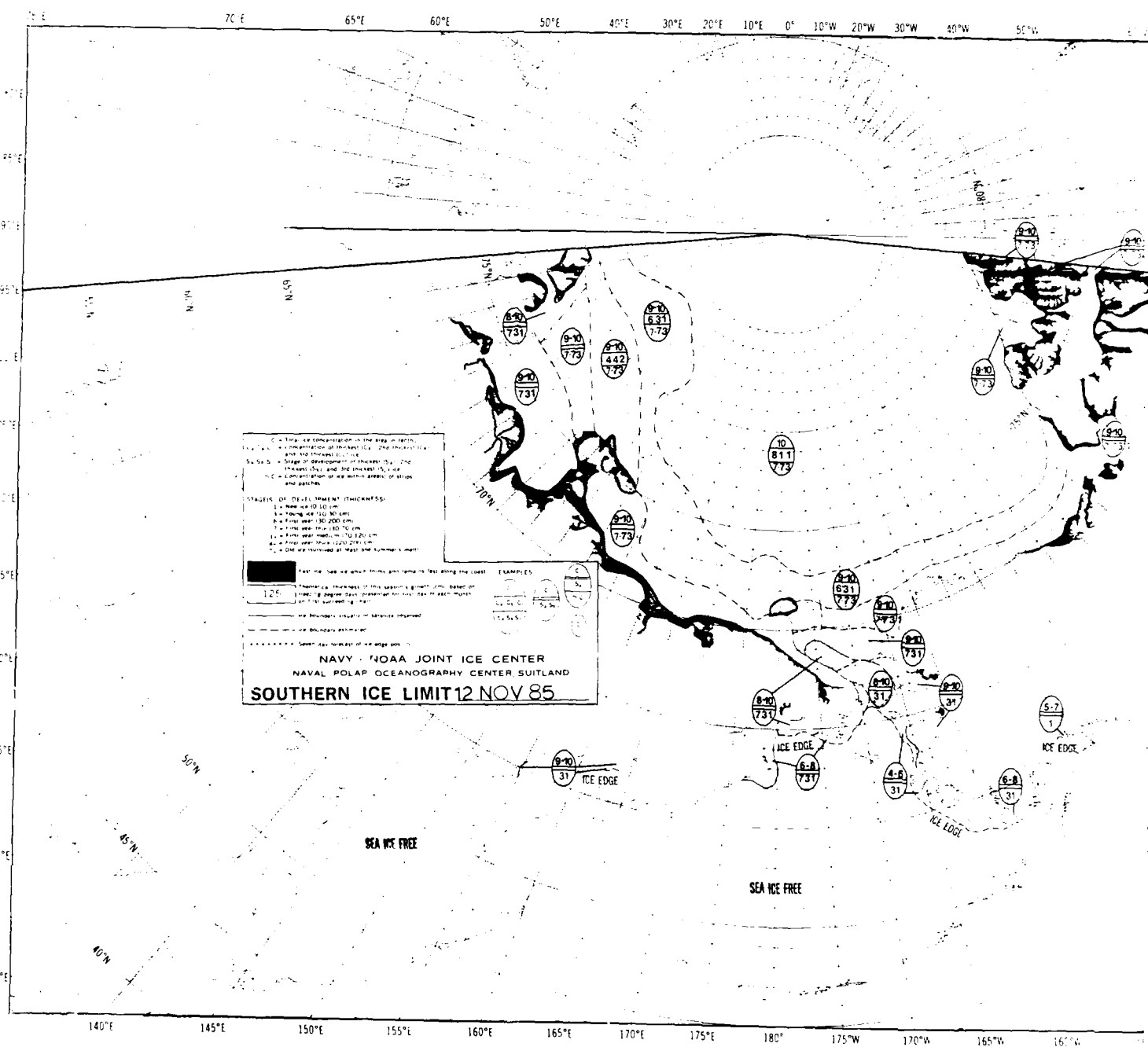








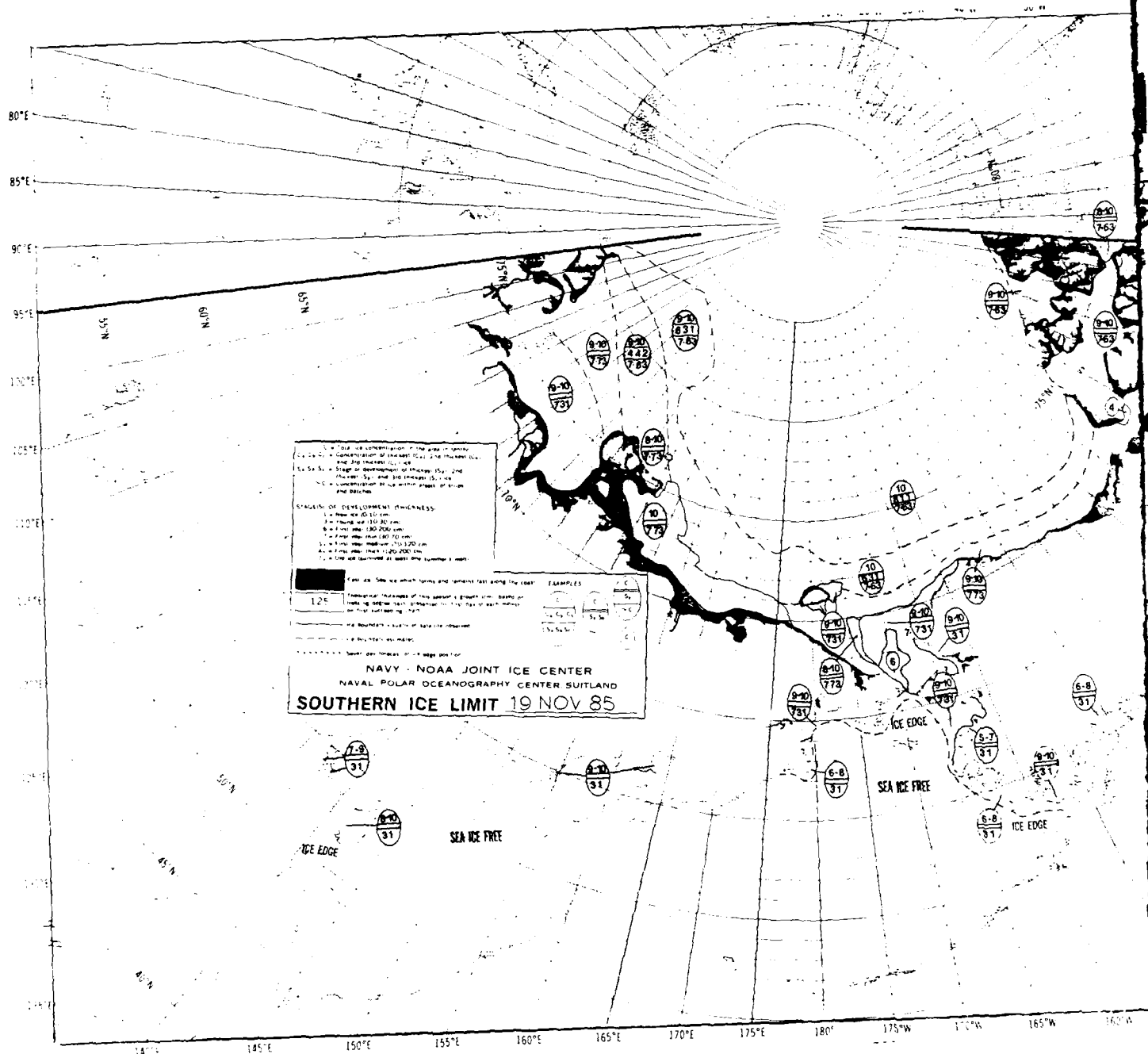


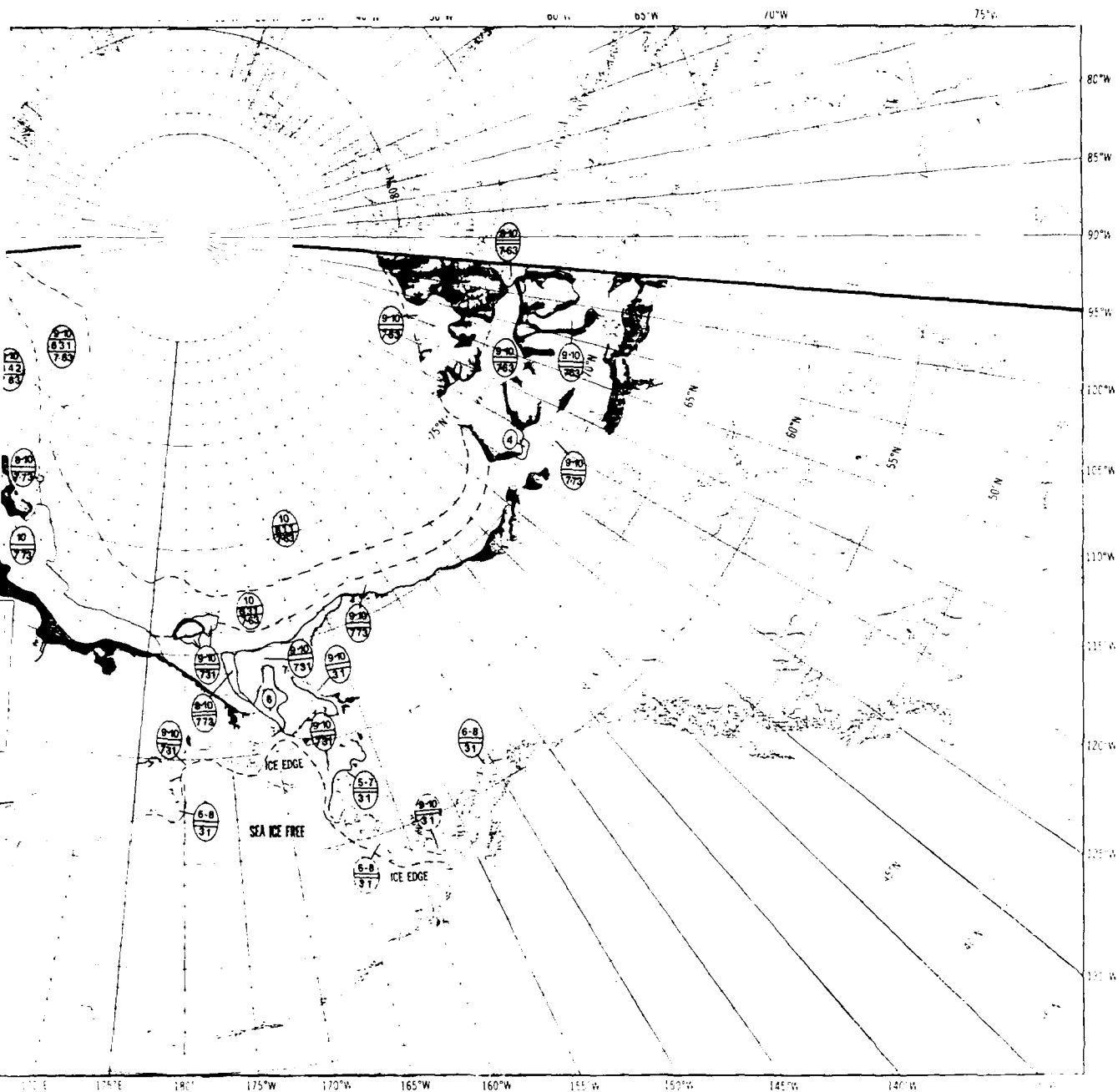


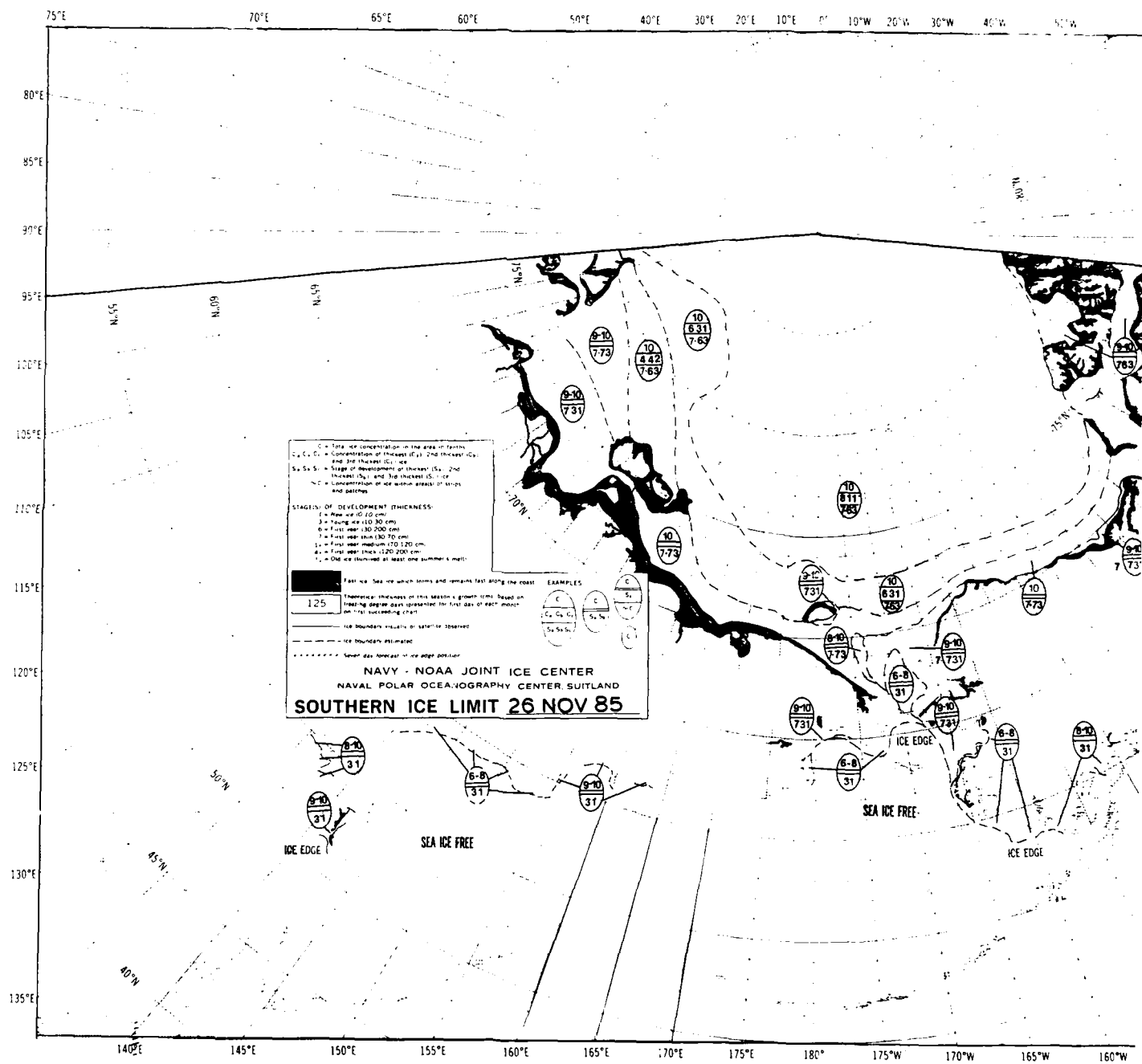


**SEA ICE FREE**

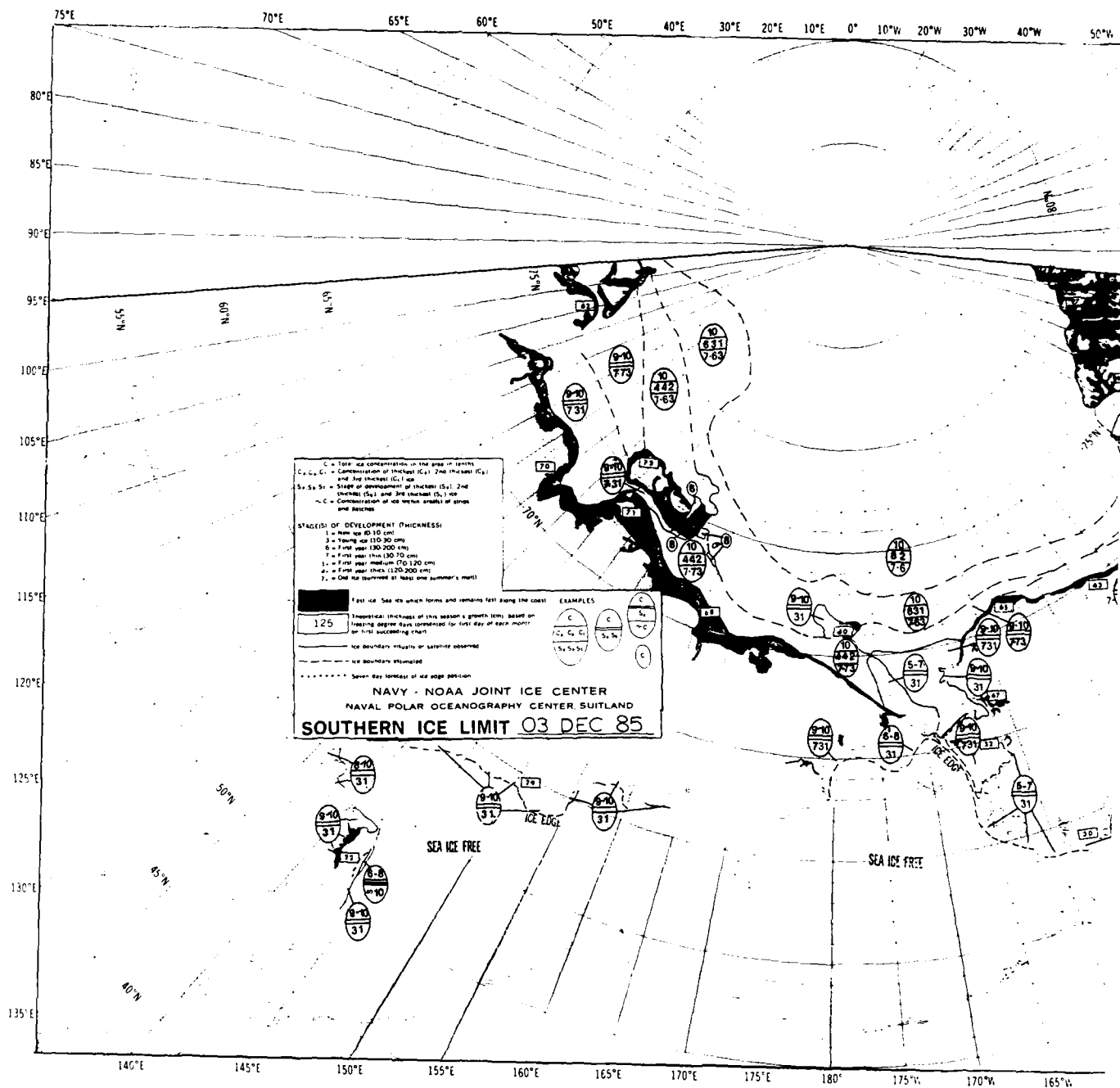
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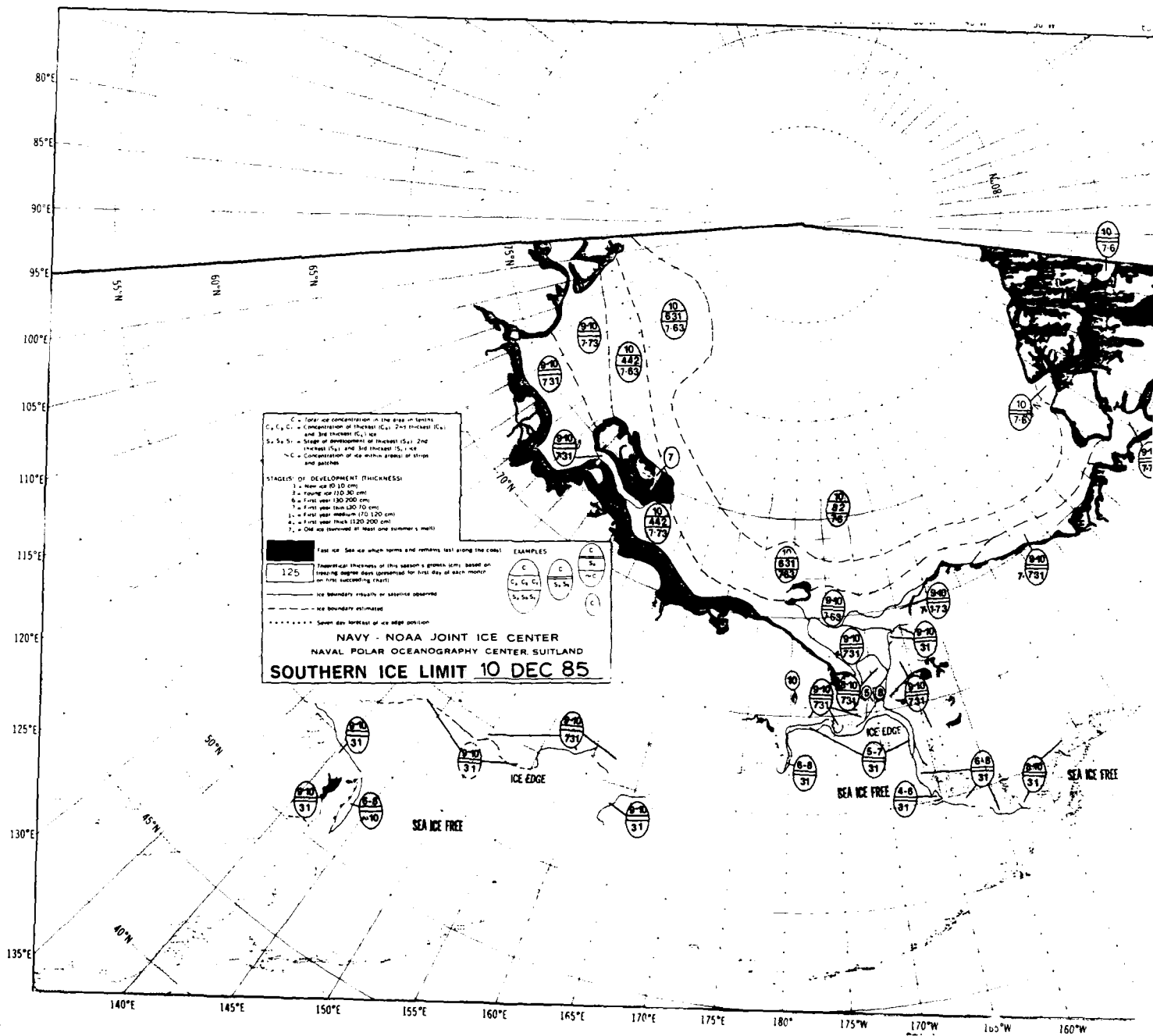




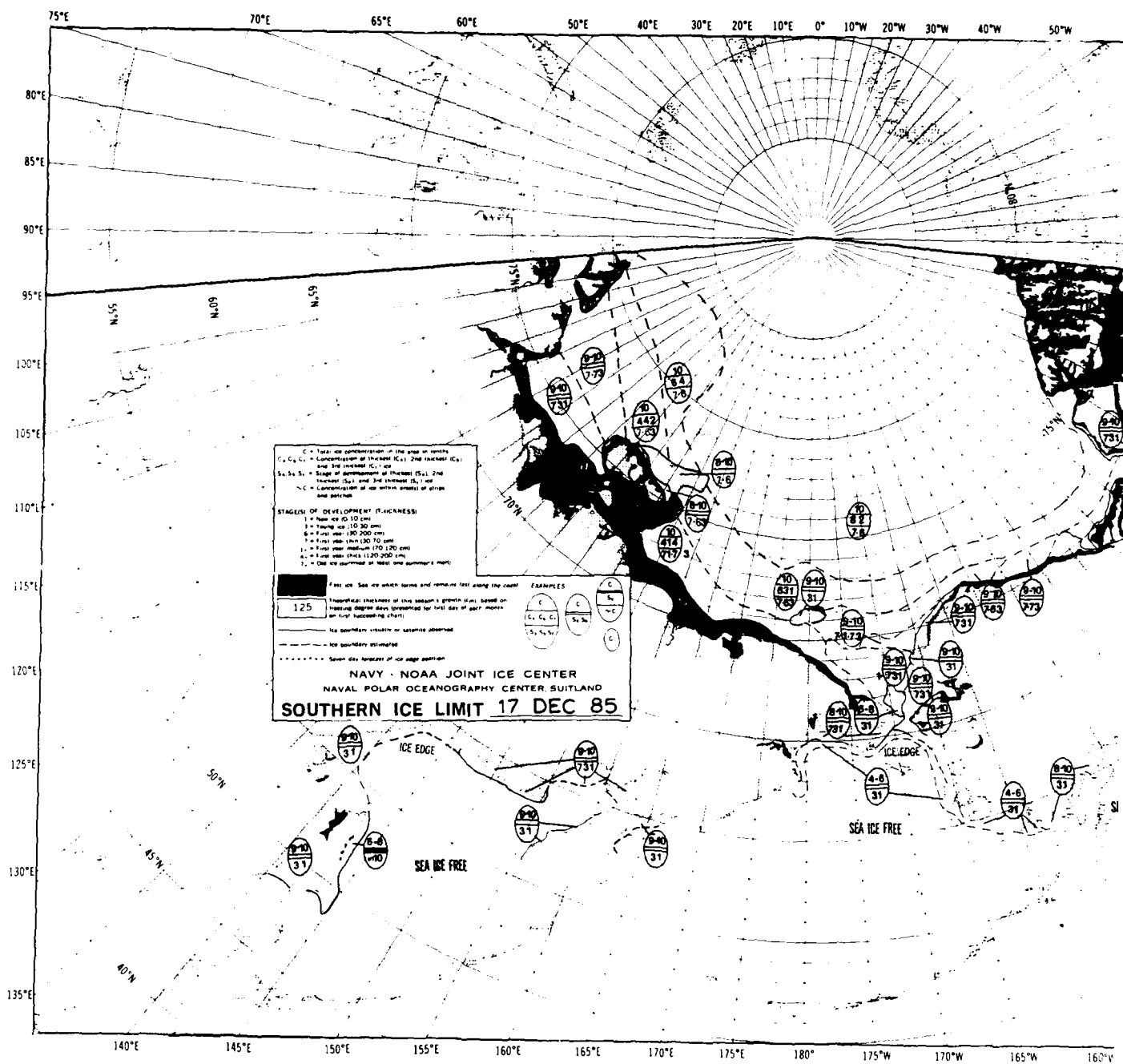


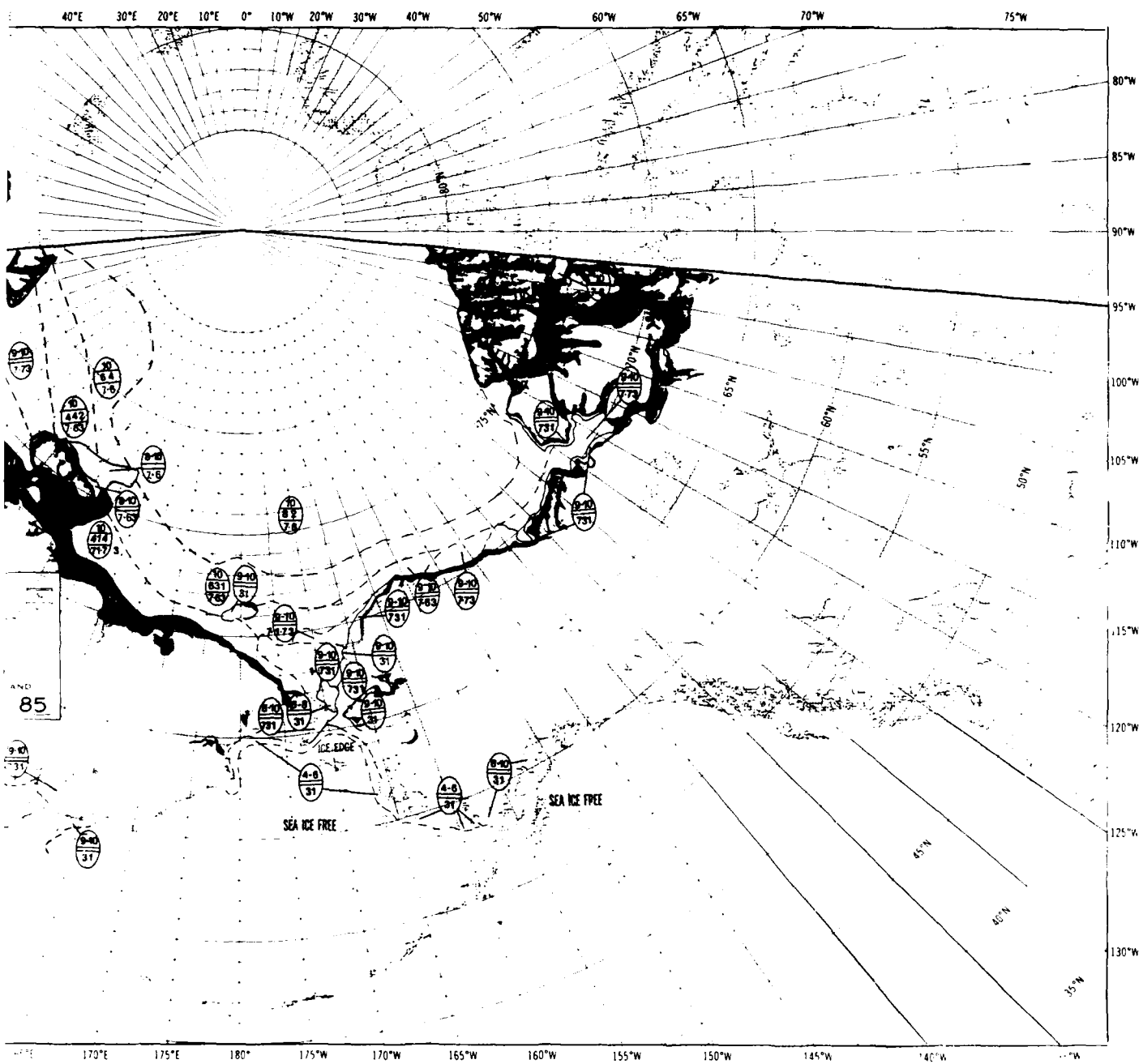


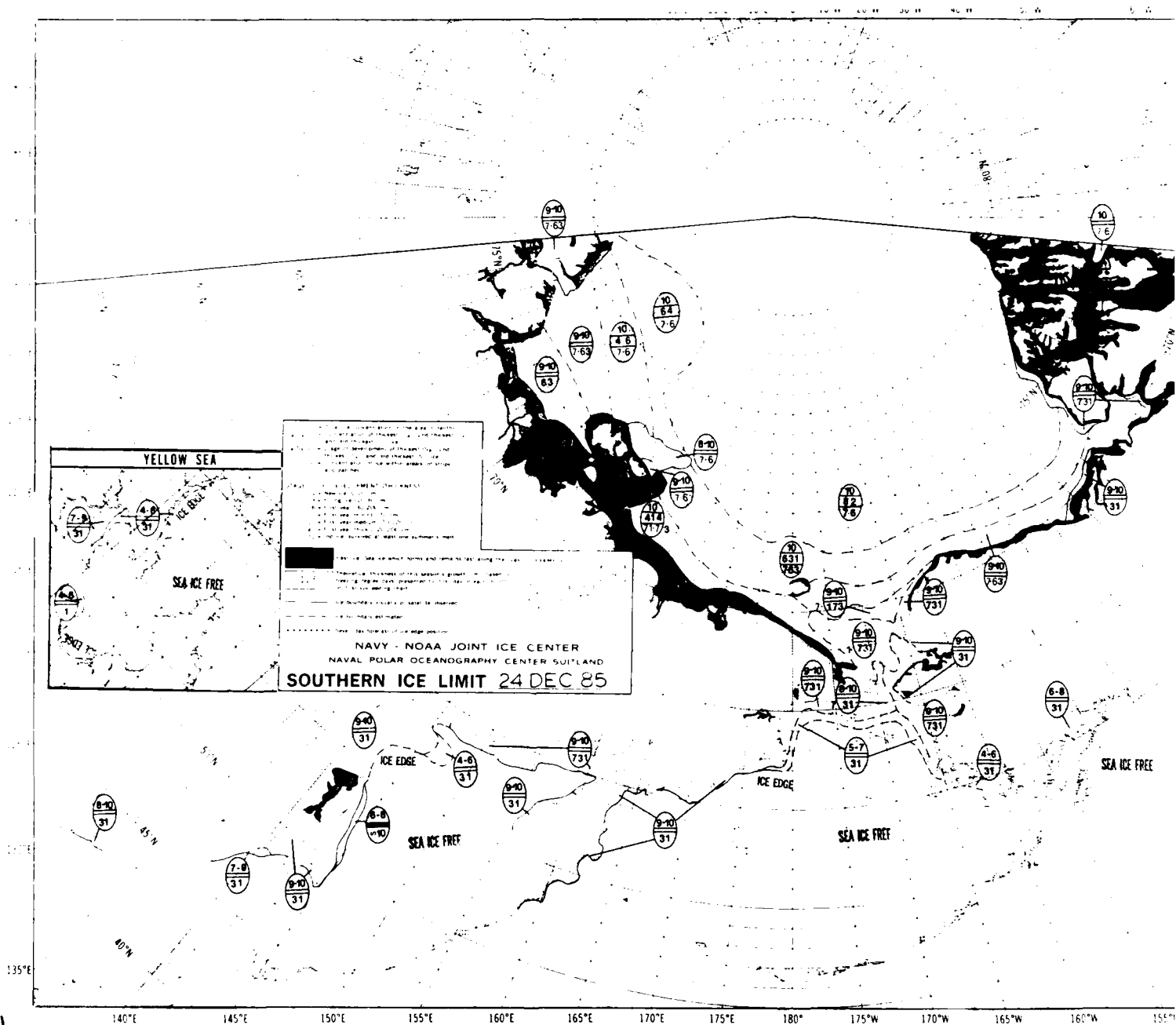




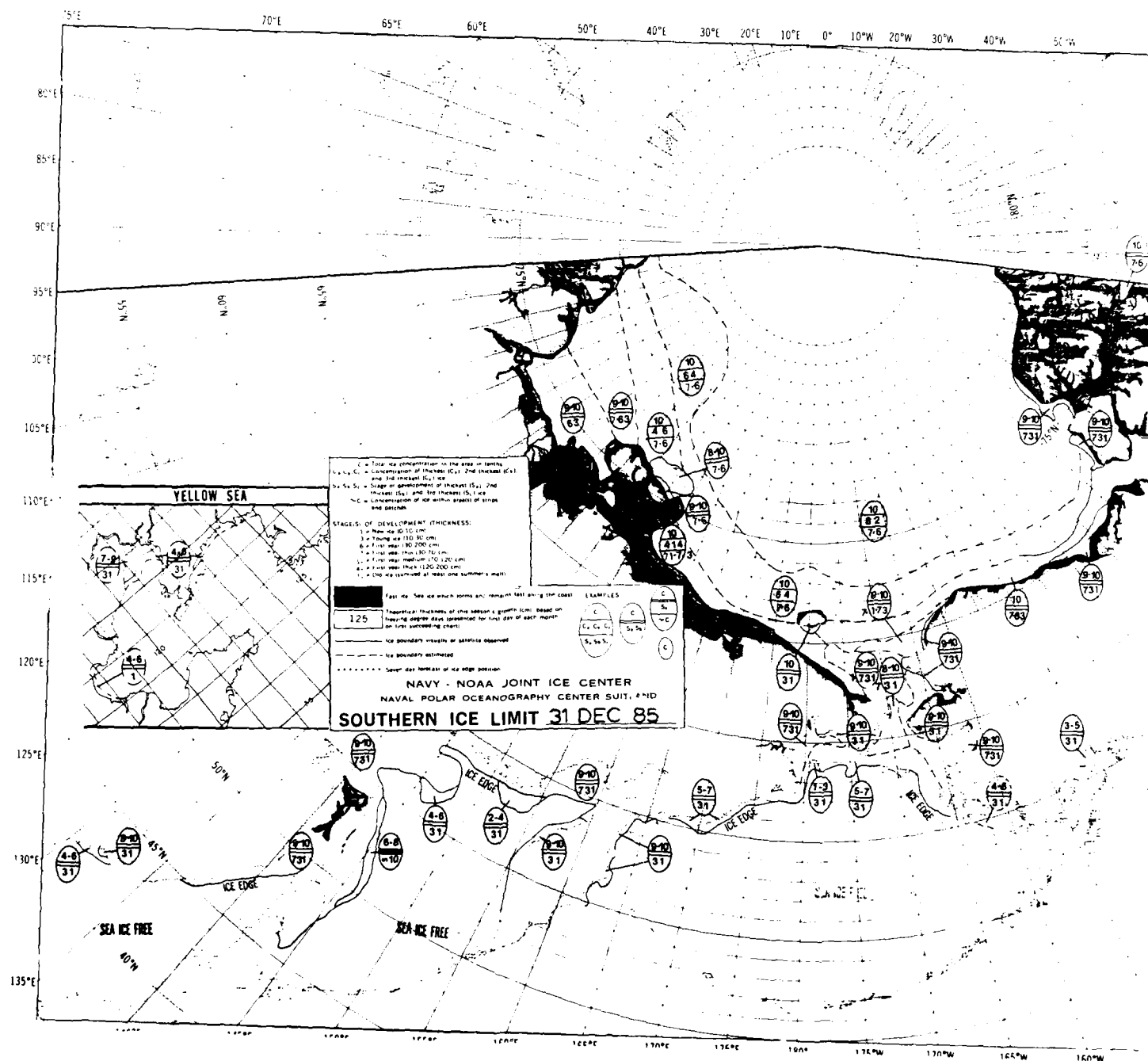


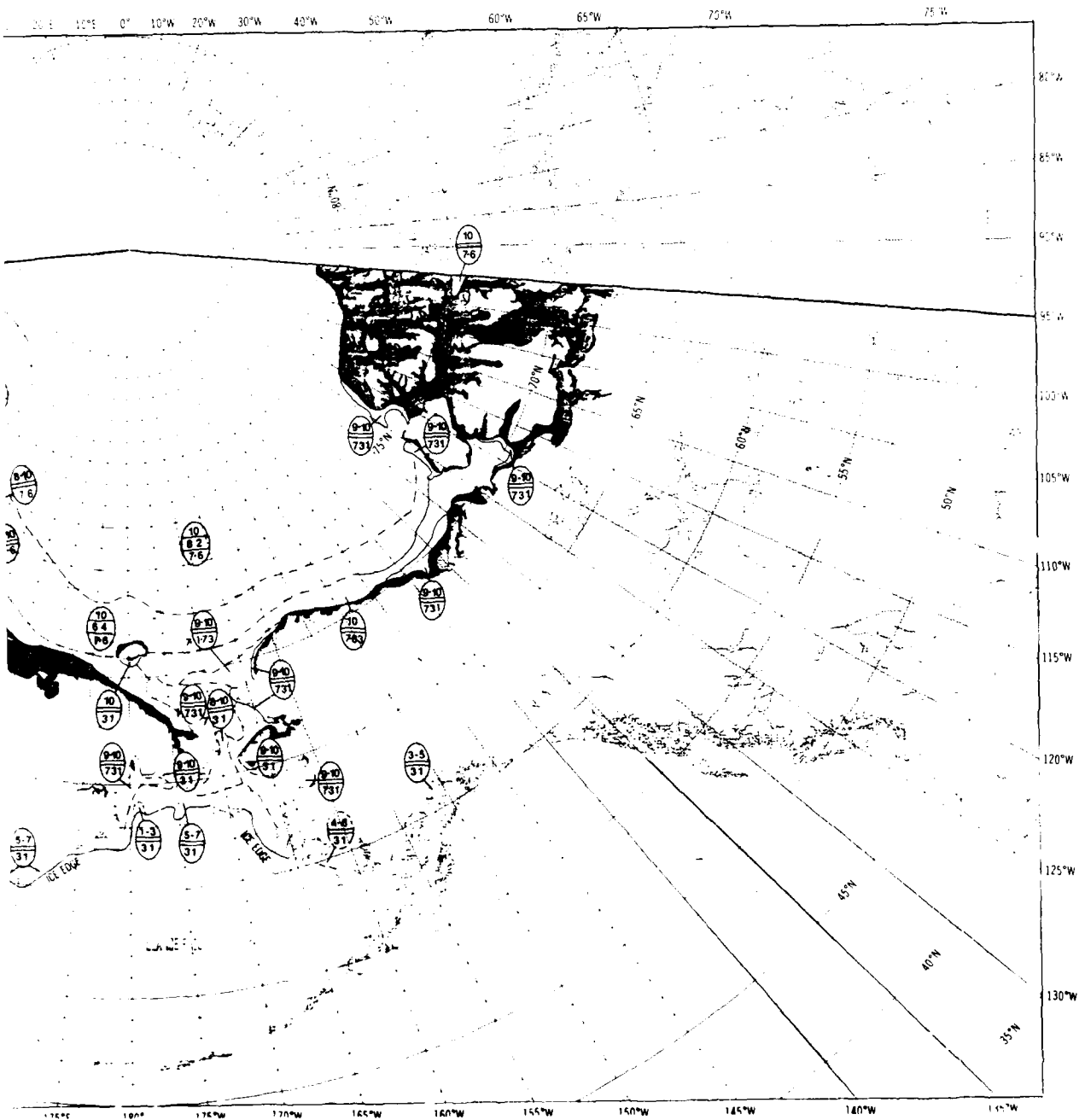












USCOMM-NOAA-ASHEVILLE, NC 9-86-175

TABLE I SATELLITE DATA UTILIZED DURING 1985

| Time Period          |                       | Satellite Remote Sensing |                                       |                                              | Resolution       | Coverage |
|----------------------|-----------------------|--------------------------|---------------------------------------|----------------------------------------------|------------------|----------|
| From                 | To                    | Sensor Platform          | Sensor Type                           | Spectral Region                              |                  |          |
| 1-85<br>2-85<br>9-85 | 1-85<br>6-85<br>12-85 | NOAA-6                   | AVHRR<br>HRPT/LAC<br>VIS<br>NIR<br>IR | 0.58-0.68 um<br>0.73-1.10 um<br>10.5-11.5 um | 1 km             | Regional |
|                      |                       |                          | GAC<br>VIS<br>IR                      | 0.58-0.68 um<br>10.5-11.5 um                 | 4 km             | Global   |
| 1-85                 | 2-85                  | NOAA-7                   | AVHRR<br>HRPT/LAC<br>VIS<br>NIR<br>IR | 0.58-0.68 um<br>0.73-1.10 um<br>10.5-11.3 um | 1 km             | Regional |
|                      |                       |                          | GAC<br>VIS<br>IR                      | 0.58-0.68 um<br>10.5-11.3 um                 | 4 km             | Global   |
| 7-85                 | 10-85                 | NOAA-8                   | AVHRR<br>HRPT/LAC<br>VIS<br>NIR<br>IR | 0.58-0.68 um<br>0.73-1.10 um<br>10.5-11.5 um | 1 km             | Regional |
|                      |                       |                          | GAC<br>VIS<br>IR                      | 0.58-0.68 um<br>10.5-11.5 um                 | 4 km             | Global   |
| 1-85                 | 12-85                 | NOAA-9                   | AVHRR<br>HRPT/LAC<br>VIS<br>NIR<br>IR | 0.58-0.68 um<br>0.73-1.10 um<br>10.5-11.5 um | 1 km             | Regional |
|                      |                       |                          | GAC<br>VIS<br>IR                      | 0.58-0.68 um<br>10.5-11.5 um                 | 4 km             | Global   |
| 1-85                 | 12-85                 | NIMBUS-7                 | SMMR                                  | 0.81 cm<br>1.66 cm                           | 50 km            | Global   |
| 1-85                 | 12-85                 | DMSP-F (6)               | VIS<br>IR                             | 0.4-1.1 um<br>10.2-12.8 um                   | 3.7 km<br>4.4 km | Global   |
| 1-85                 | 12-85                 | DMSP-F (7)               | VIS<br>IR                             | 0.4-1.1 um<br>10.2-12.8 um                   | 3.7 km<br>4.4 km | Global   |

## Abbreviations and Acronyms

AVHRR - Advanced Very High Resolution Radiometer  
 cm - Centimeter  
 GAC - Global Area Coverage  
 HRPT - High Resolution Picture Transmission  
 IR - Infrared  
 km - Kilometer  
 LAC - Local Area Coverage  
 NIR - Near Infrared  
 SMMR - Scanning Multifrequency Microwave Radiometer  
 VIS - Visible  
 um - Micrometer

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