

ANTARCTIC ICE CHARTS 1987-1988

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PREPARED BY
NAVAL POLAR OCEANOGRAPHY CENTER
SUITLAND, MD

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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 8th edition in a continuing bi-yearly series of Antarctic sea ice atlases prepared by the JIC. The atlas contains weekly charts depicting Southern Hemisphere ice conditions and extent. The significant use of high resolution satellite imagery has greatly improved the accuracy of these analyses.

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

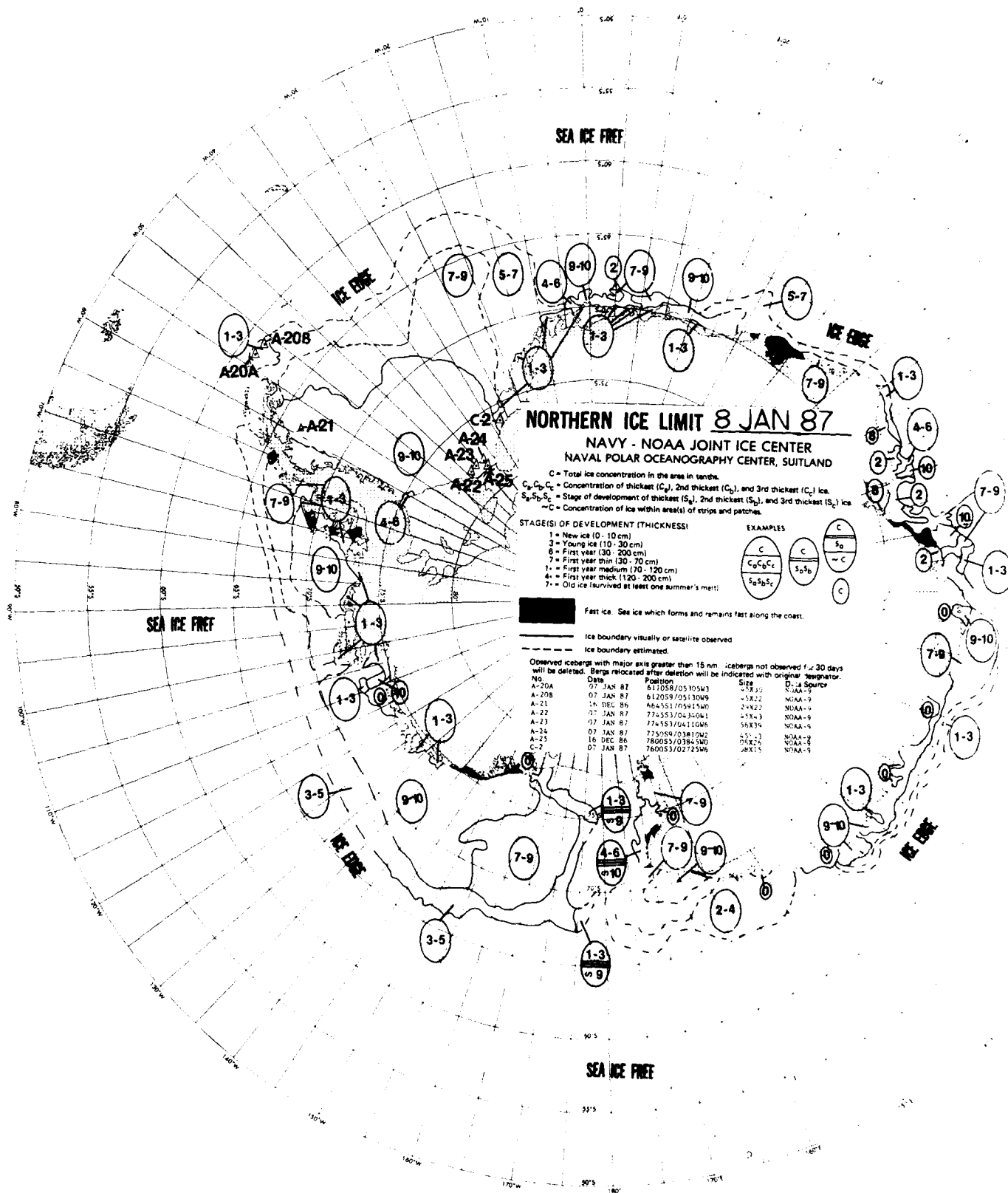
a. Satellite data from different sensors is compared and analyzed for ice information content. Table I, located on the inside back cover, summarizes satellite data available during 1987 and 1988.

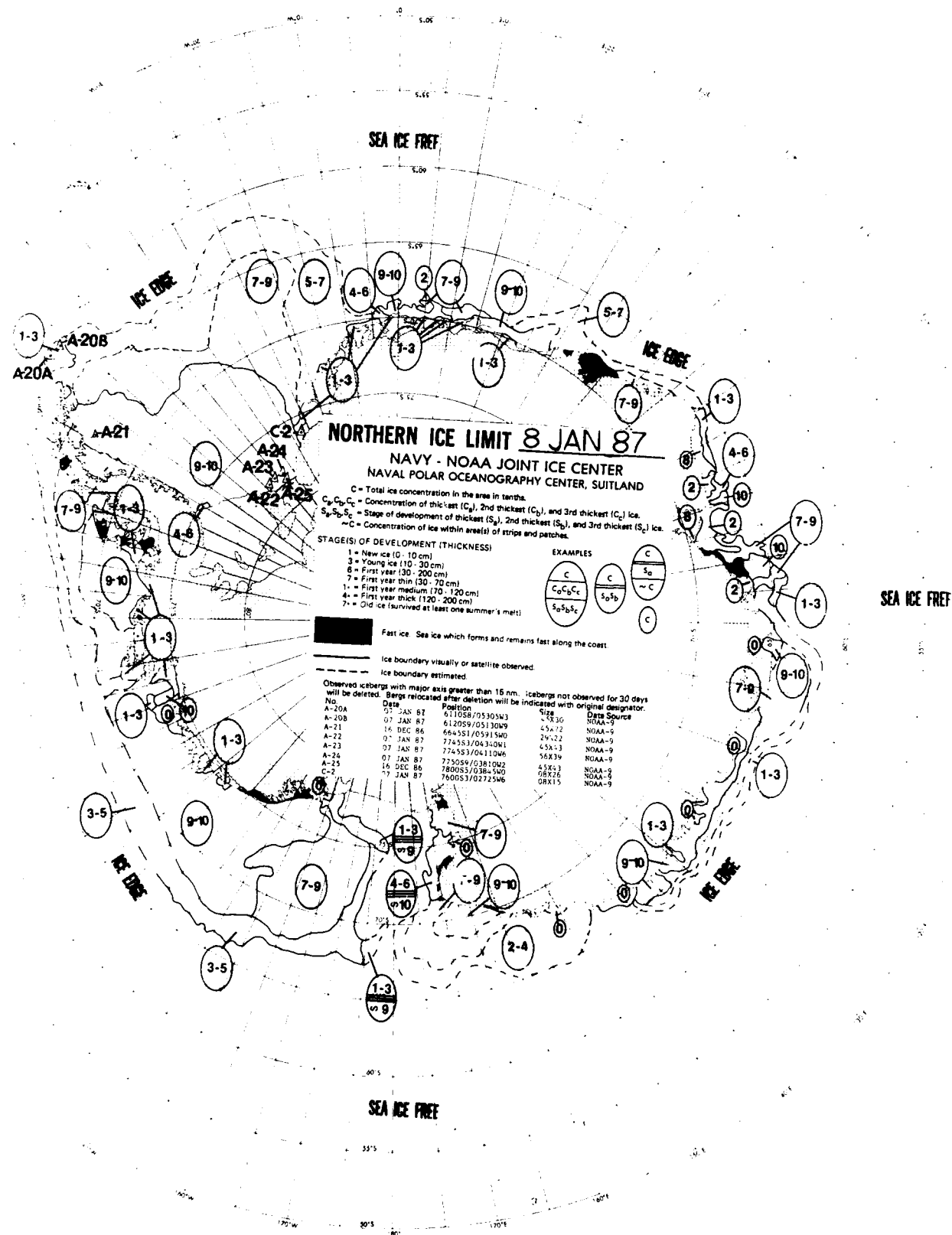
b. Where insufficient data is available, an estimated boundary will be depicted. Meteorological data and theoretical ice drift data are utilized to determine the estimated ice edge position.

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

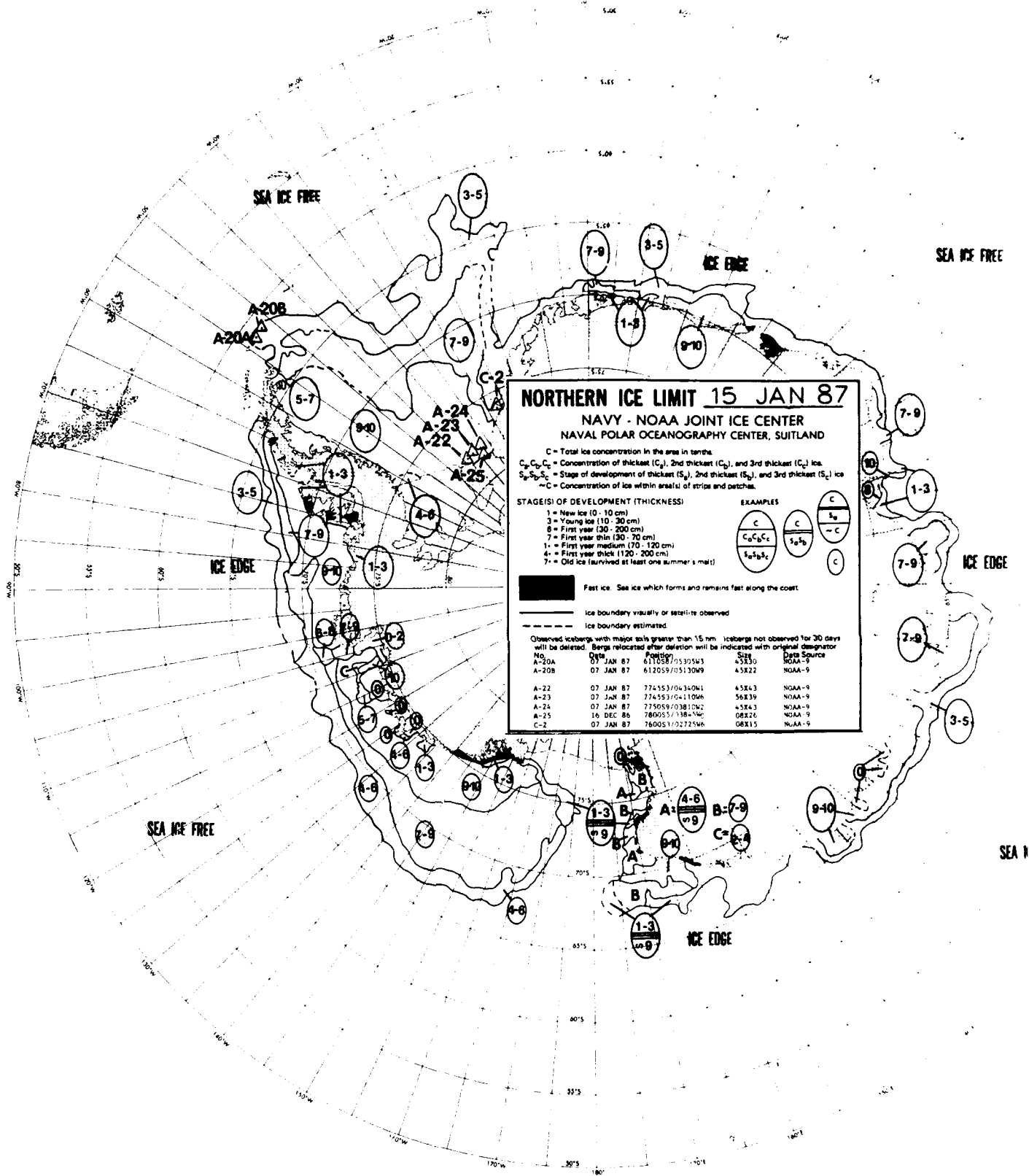
REPORT DOCUMENTATION PAGE

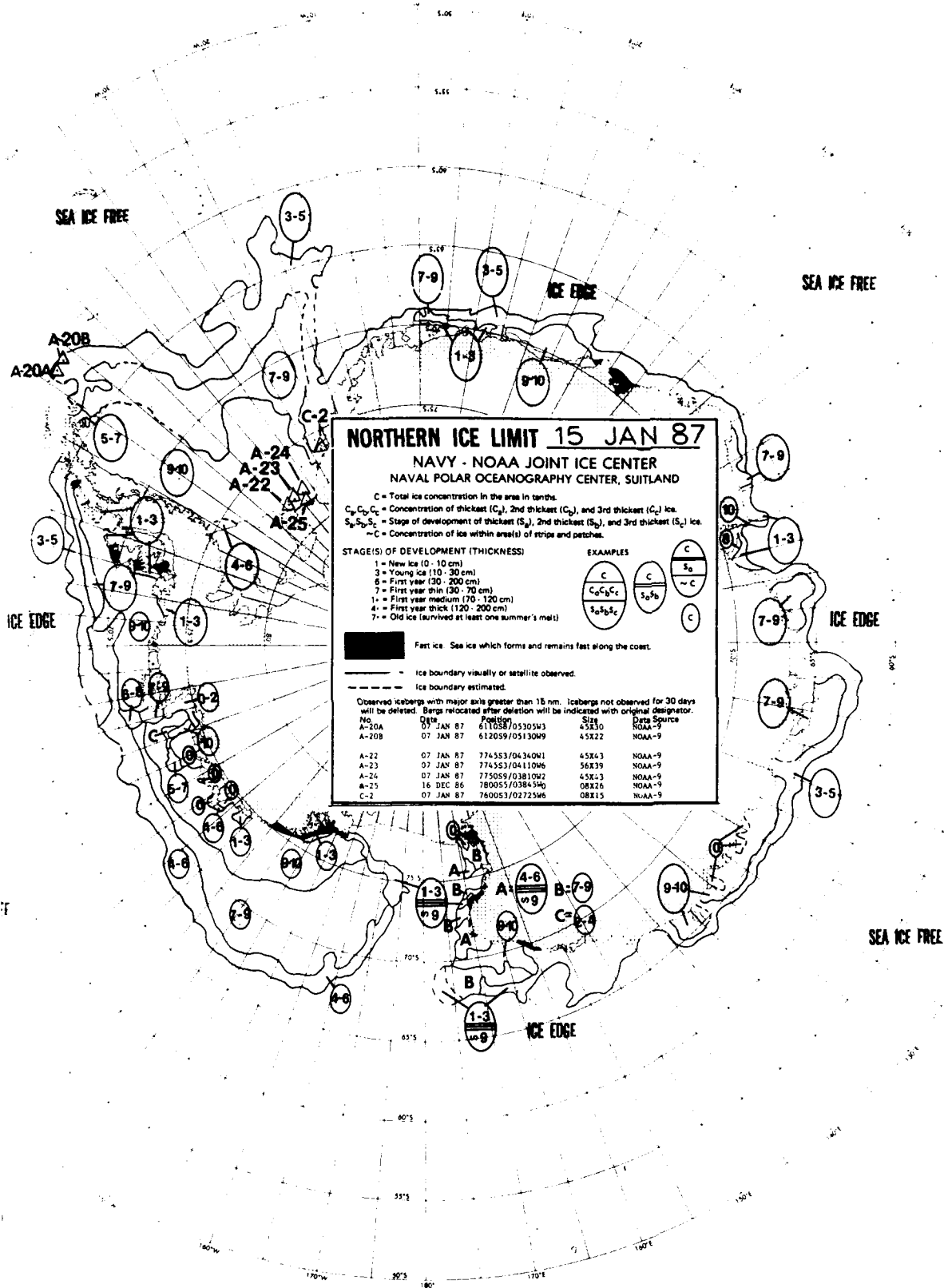
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FIELD	GROUP	SUB-GROUP	
		Sea ice, polar ice fields, satellite imagery, concentration stage of development, fast ice, concentration of thickness, theoretical thickness, Arctic	
19 ABSTRACT (Continue on reverse if necessary and identify by block number) These are approximately 7-day analyses of sea ice prepared by the Naval Polar Oceanography Center, Suitland, MD. Included are ice concentrations and ice thickness (age). <i>✓</i>			
20 DISTRIBUTION/AVAILABILITY OF ABSTRACT ☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT ☐ DTIC USERS		21 ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a NAME OF RESPONSIBLE INDIVIDUAL Brian L. Wallace		22b TELEPHONE (Include Area Code) (704) 252-7865	22c OFFICE SYMBOL

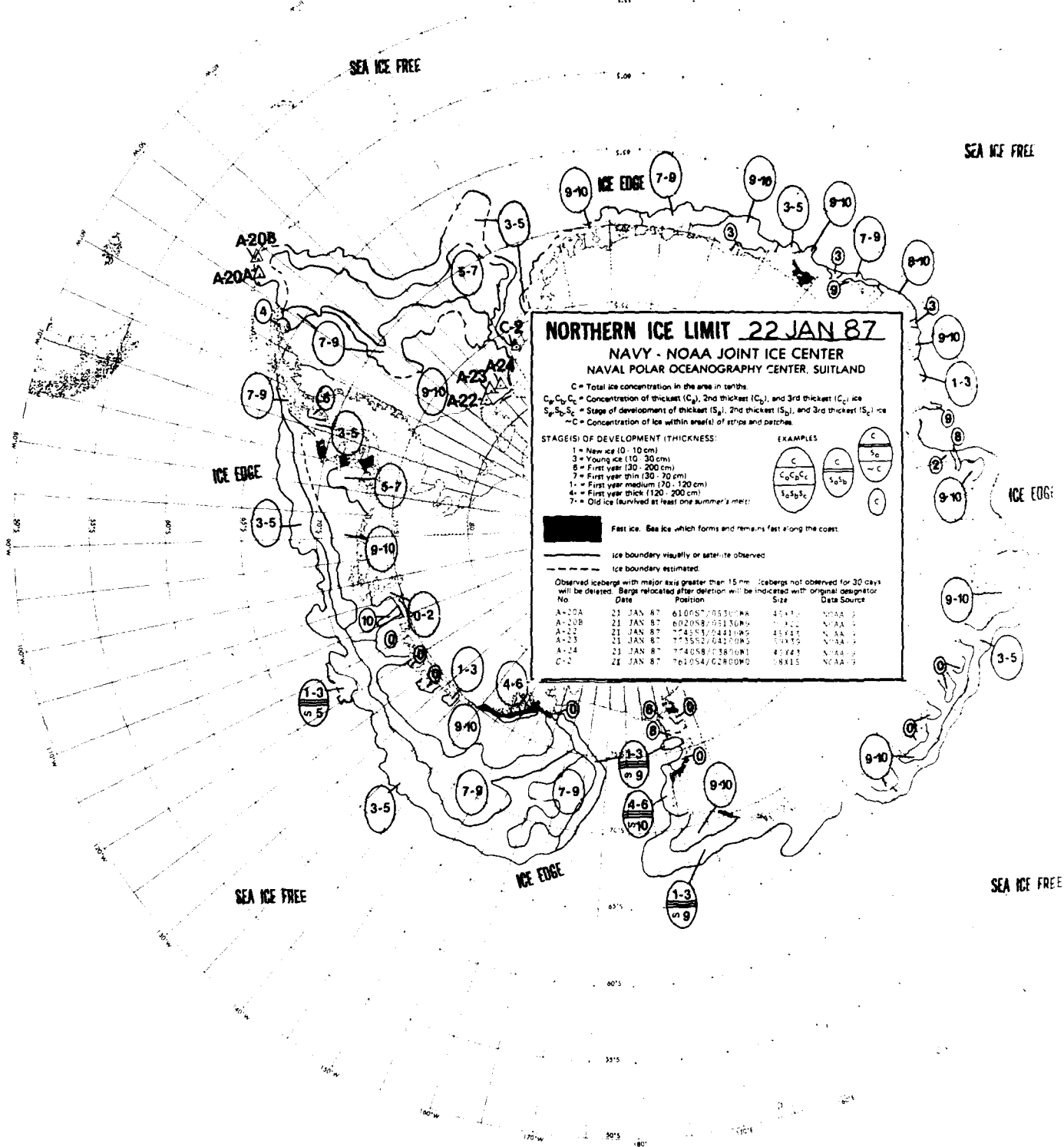




A-1







SEA ICE FREE

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NORTHERN ICE LIMIT 22 JAN 87

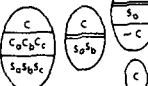
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 ~C = Concentration of ice within area(s) of stripe and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS):

- 1 = New ice (10 - 10 cm)
 3 = Young ice (10 - 30 cm)
 6 = First year (30 - 200 cm)
 7 = First year thin (30 - 70 cm)
 1 = First year medium (70 - 120 cm)
 4 = First year thick (120 - 200 cm)
 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. See ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed.

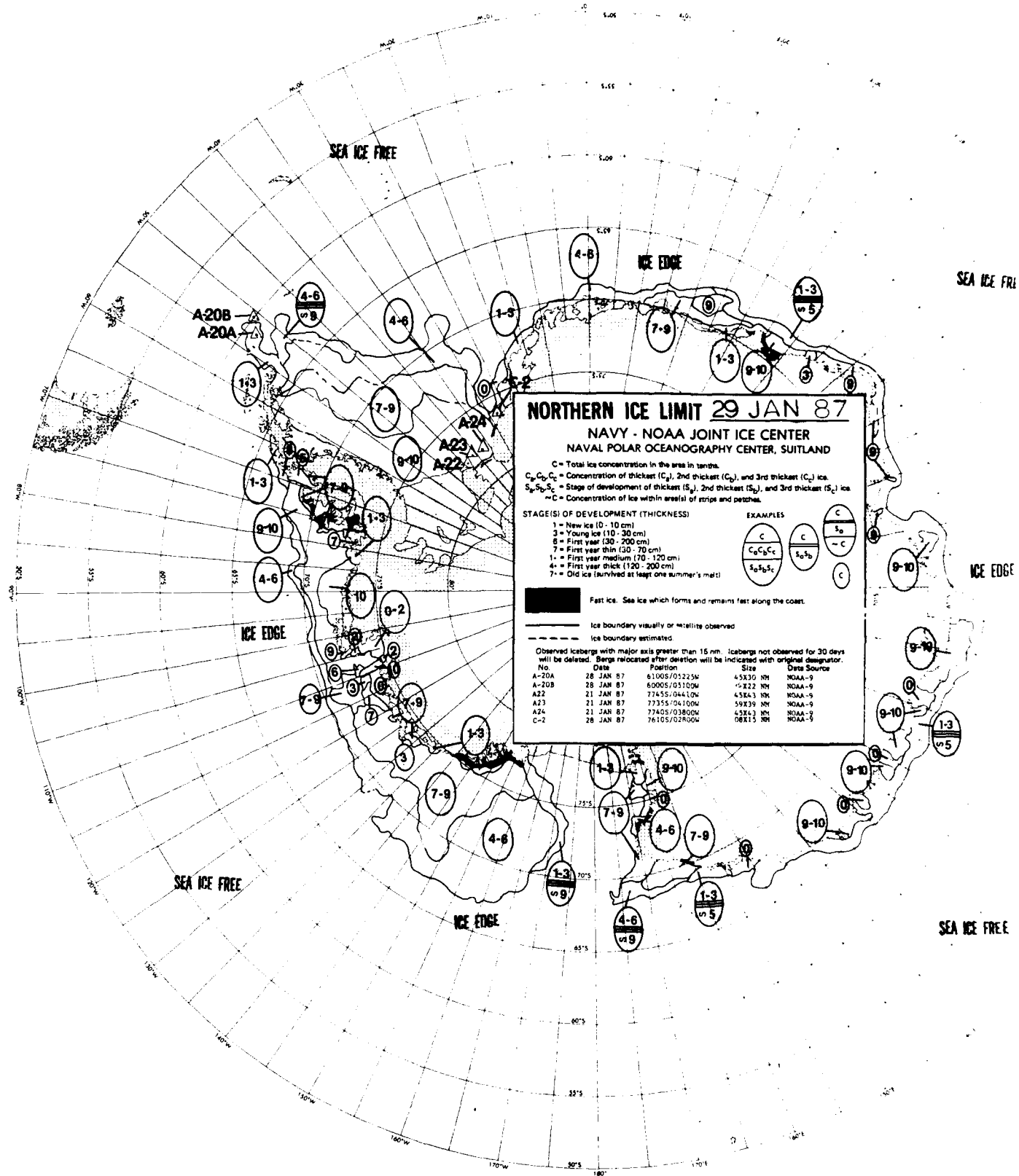
Ice boundary estimated.
 Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

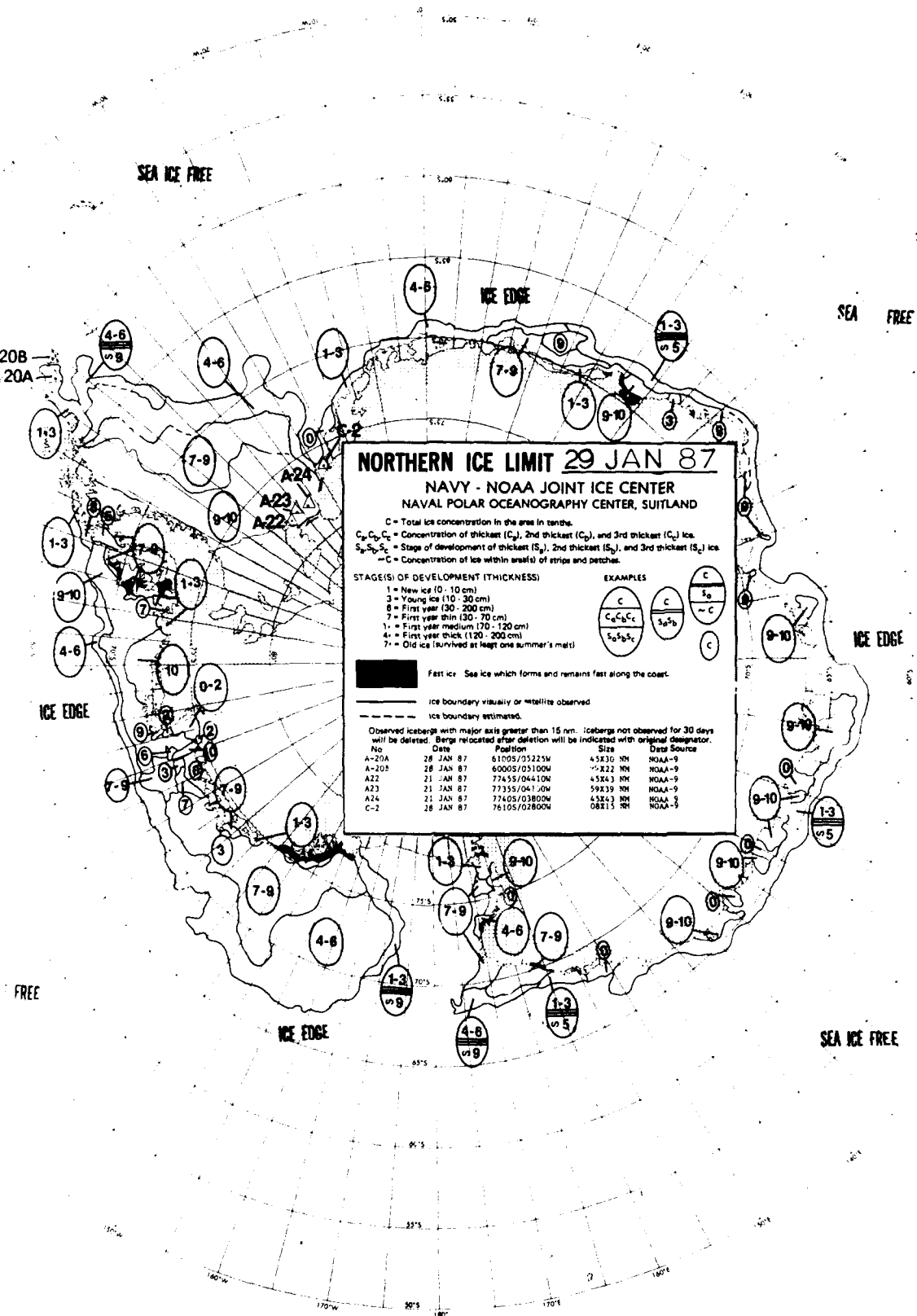
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A-20B	21 JAN 87	602058/0511009	11X12	NOAA-9
A-22	21 JAN 87	774553/0441009	45X43	NOAA-9
A-23	21 JAN 87	775352/0410005	59X39	NOAA-9
A-24	21 JAN 87	774058/0380001	45X43	NOAA-9
C-2	21 JAN 87	761054/0280000	98X15	NOAA-9

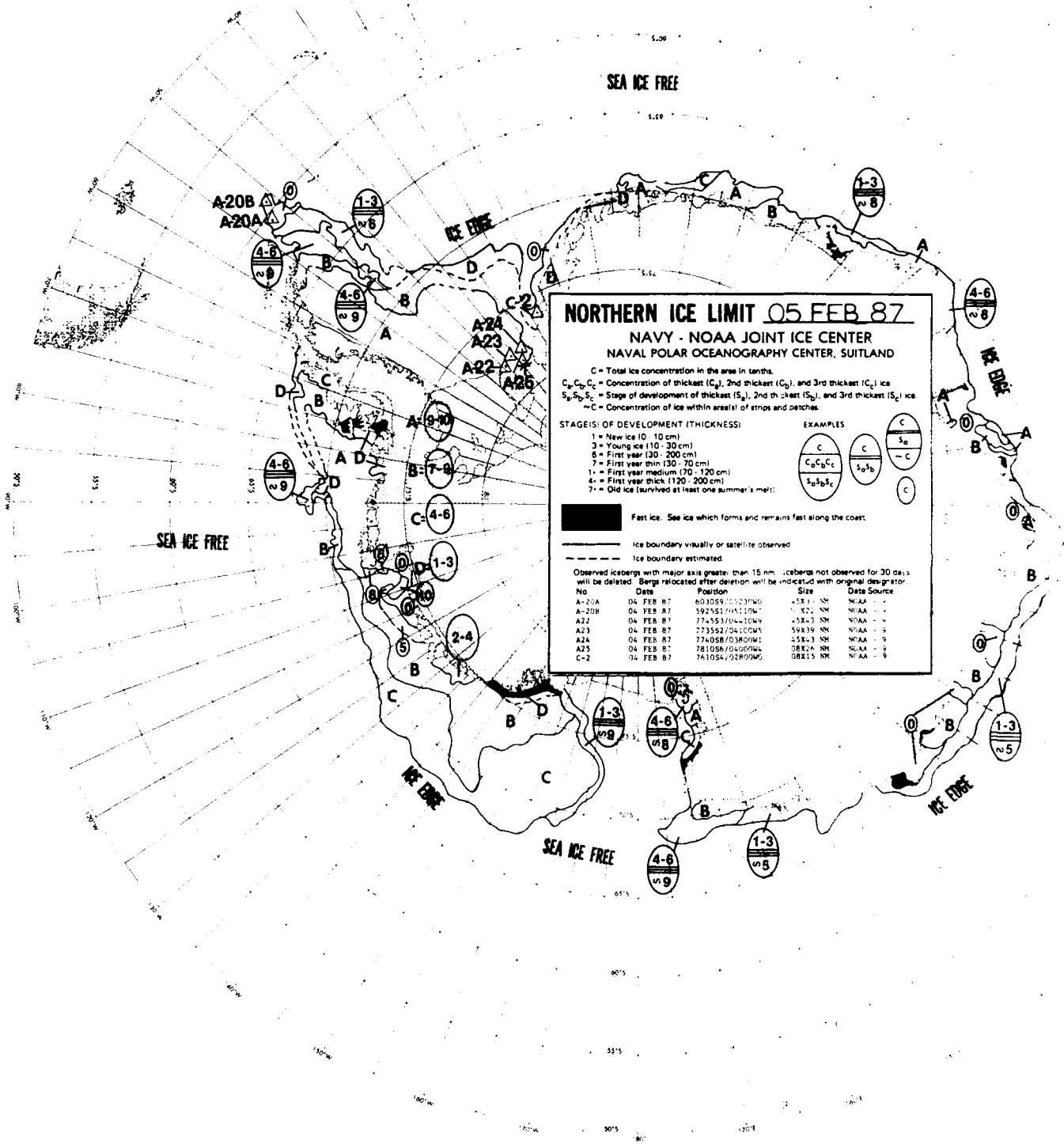
ICE EDGE

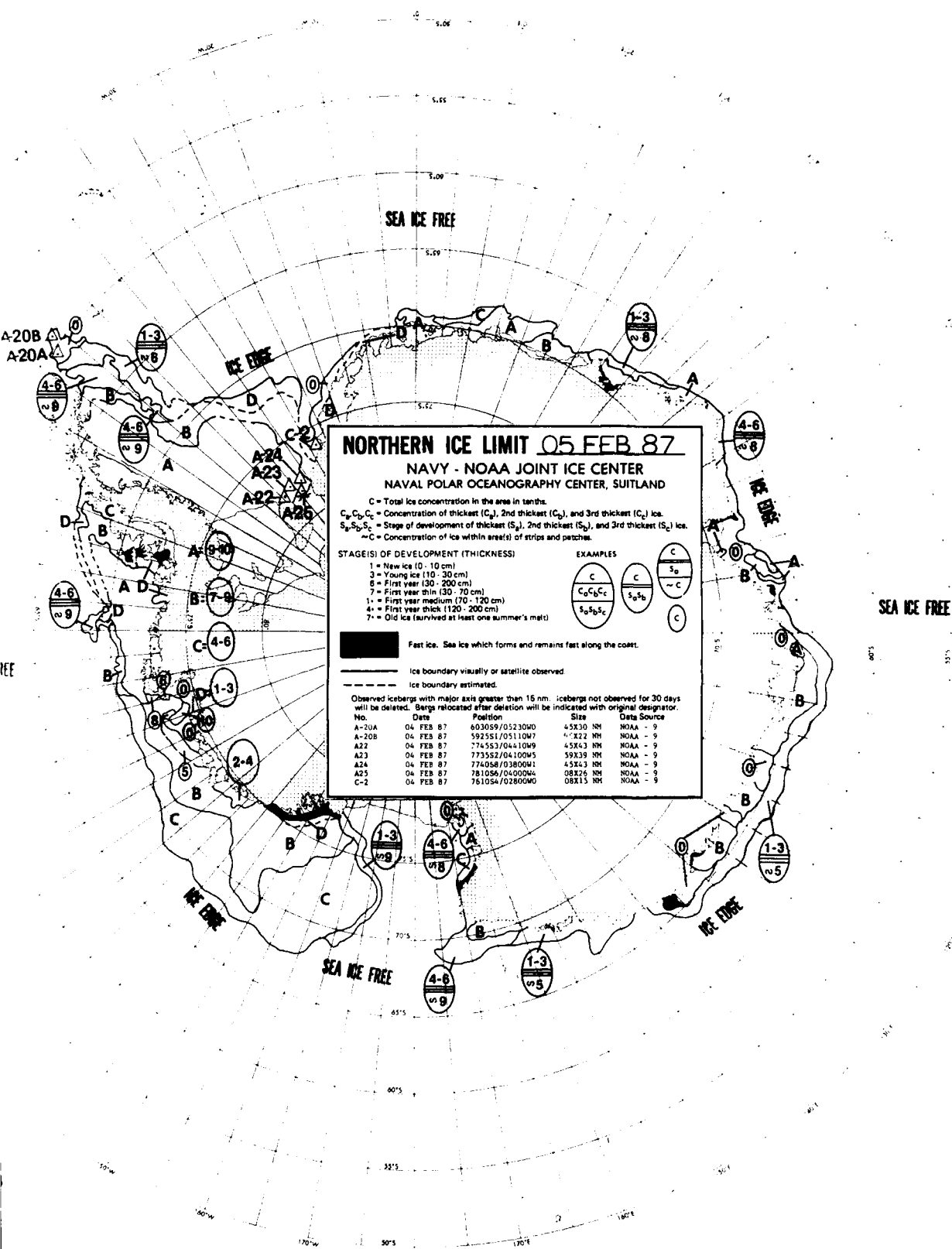
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NORTHERN ICE LIMIT 05 FEB 87

NAVY - NOAA JOINT ICE CENTER
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- 7 = Old ice (survived at least one summer's melt)

EXAMPLES

$\frac{C}{C_1 C_2 C_3}$
 $\frac{S_1 S_2 S_3}{S_1 S_2 S_3}$

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

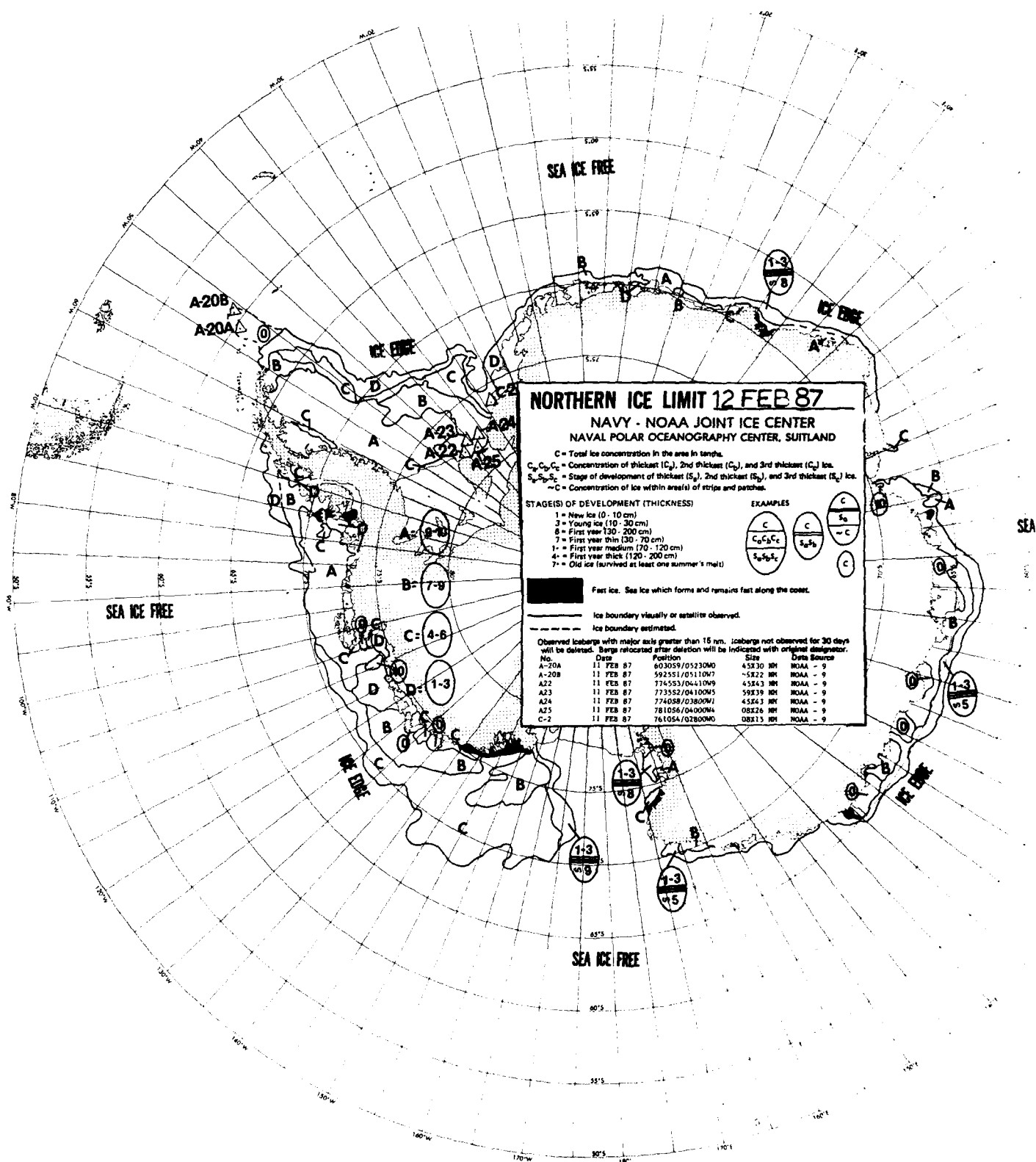
$\frac{C}{S_1 S_2 S_3}$
 $\frac{C}{S_1 S_2 S_3}$

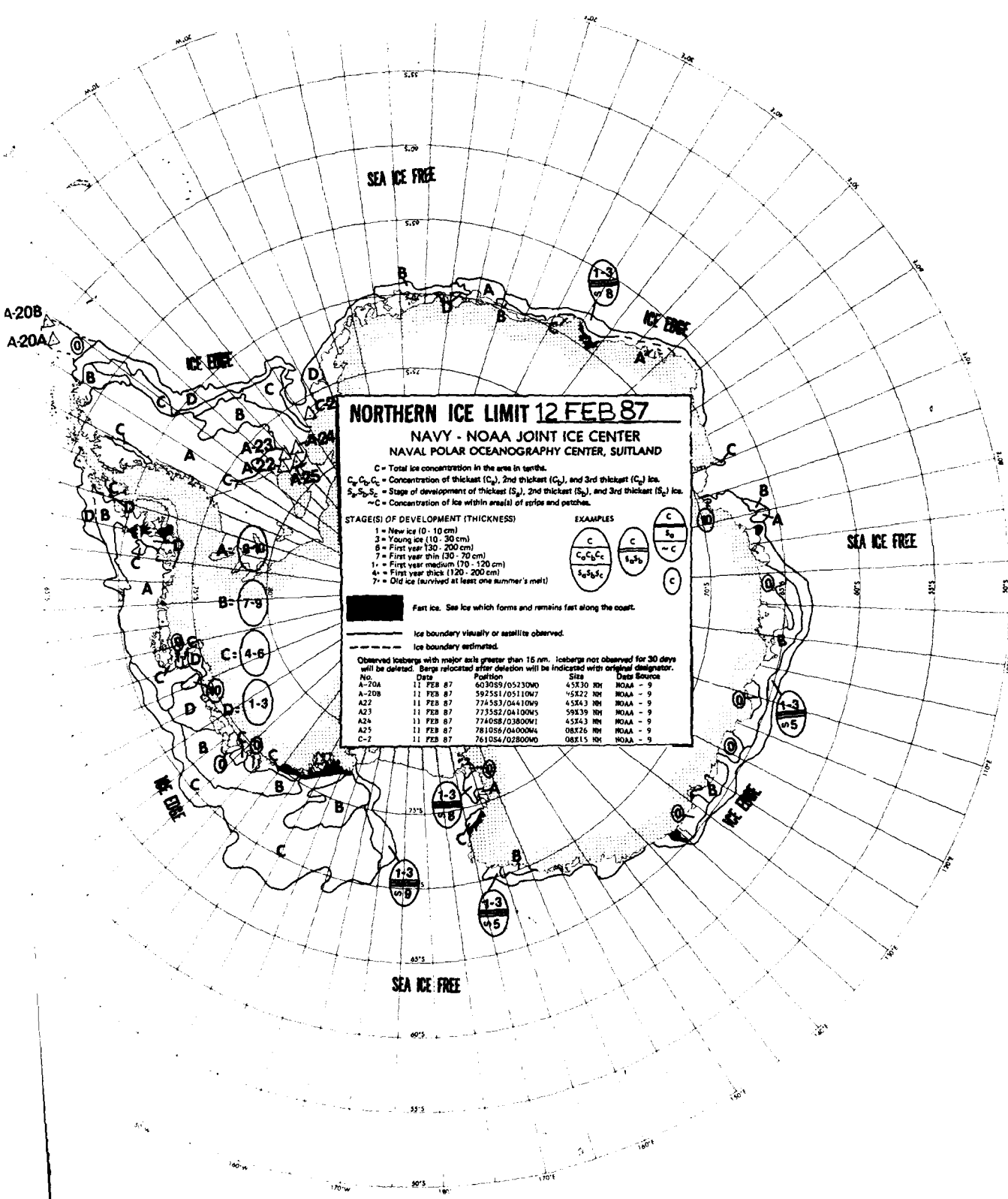
Legend:

- Fast ice. Sea ice which forms and remains fast along the coast.
- Ice boundary visually or satellite observed
- Ice boundary estimated.

Observed icebergs with major axis greater than 15 nm. icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	04 FEB 87	603059/052300W	45X30 NM	NOAA - 9
A-20B	04 FEB 87	592551/051100W	45X22 NM	NOAA - 9
A-22	04 FEB 87	774553/044100W	45X43 NM	NOAA - 9
A-23	04 FEB 87	773552/041000W	59X35 NM	NOAA - 9
A-24	04 FEB 87	774058/038000W	45X43 NM	NOAA - 9
A-25	04 FEB 87	781056/040000W	08X26 NM	NOAA - 9
C-2	04 FEB 87	761054/028000W	08X15 NM	NOAA - 9





NORTHERN ICE LIMIT 12 FEB 87

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- 6 = Old ice (survived at least one summer's melt)

EXAMPLES

$\frac{C}{C_1 C_2 C_3}$
 $\frac{S_1 S_2 S_3}{S_1 S_2 S_3}$

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

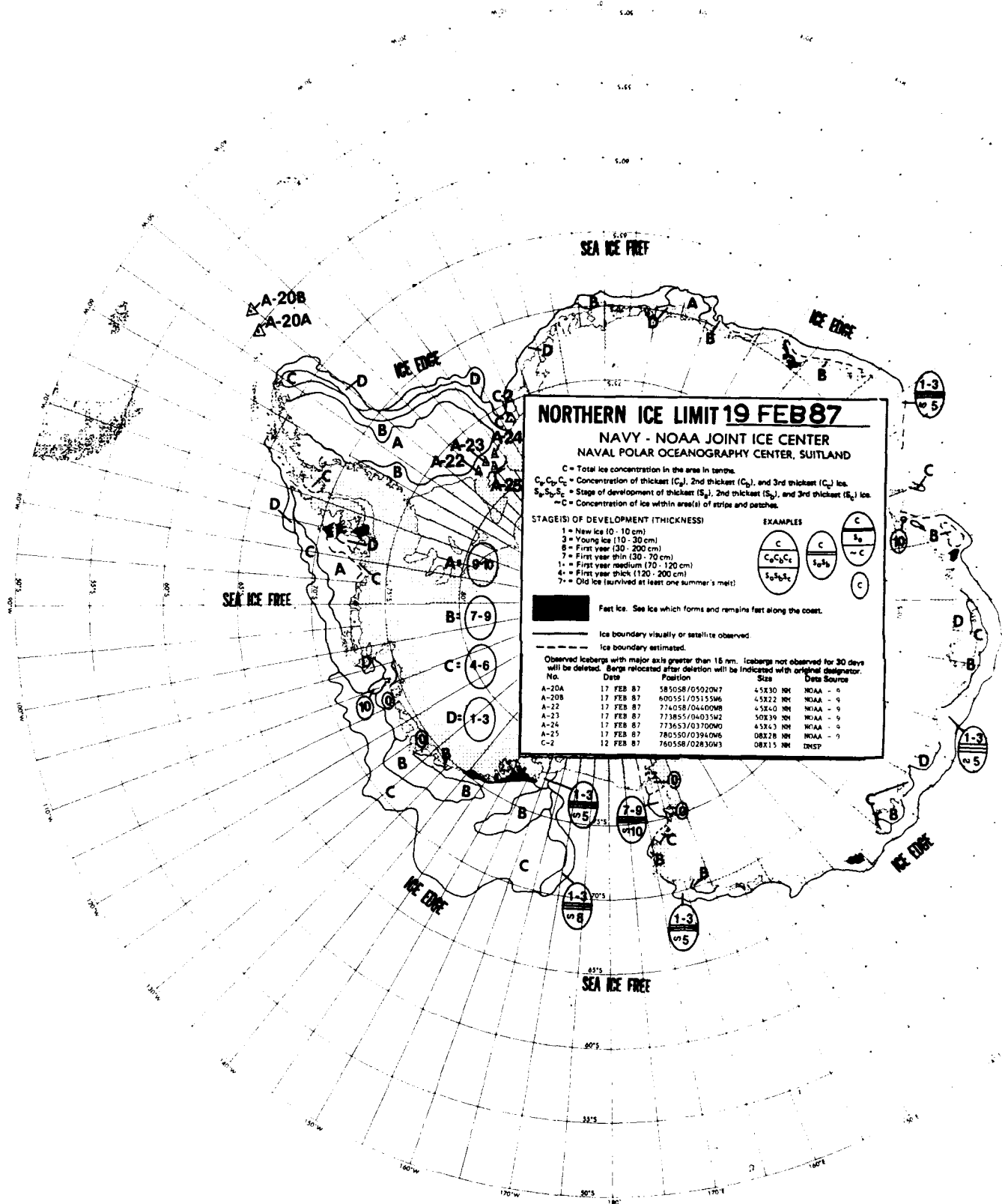
$\frac{C}{S_1}$
 $\frac{C}{S_2}$
 $\frac{C}{S_3}$

Fast ice. See ice which forms and remains fast along the coast.

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 --- Ice boundary estimated.

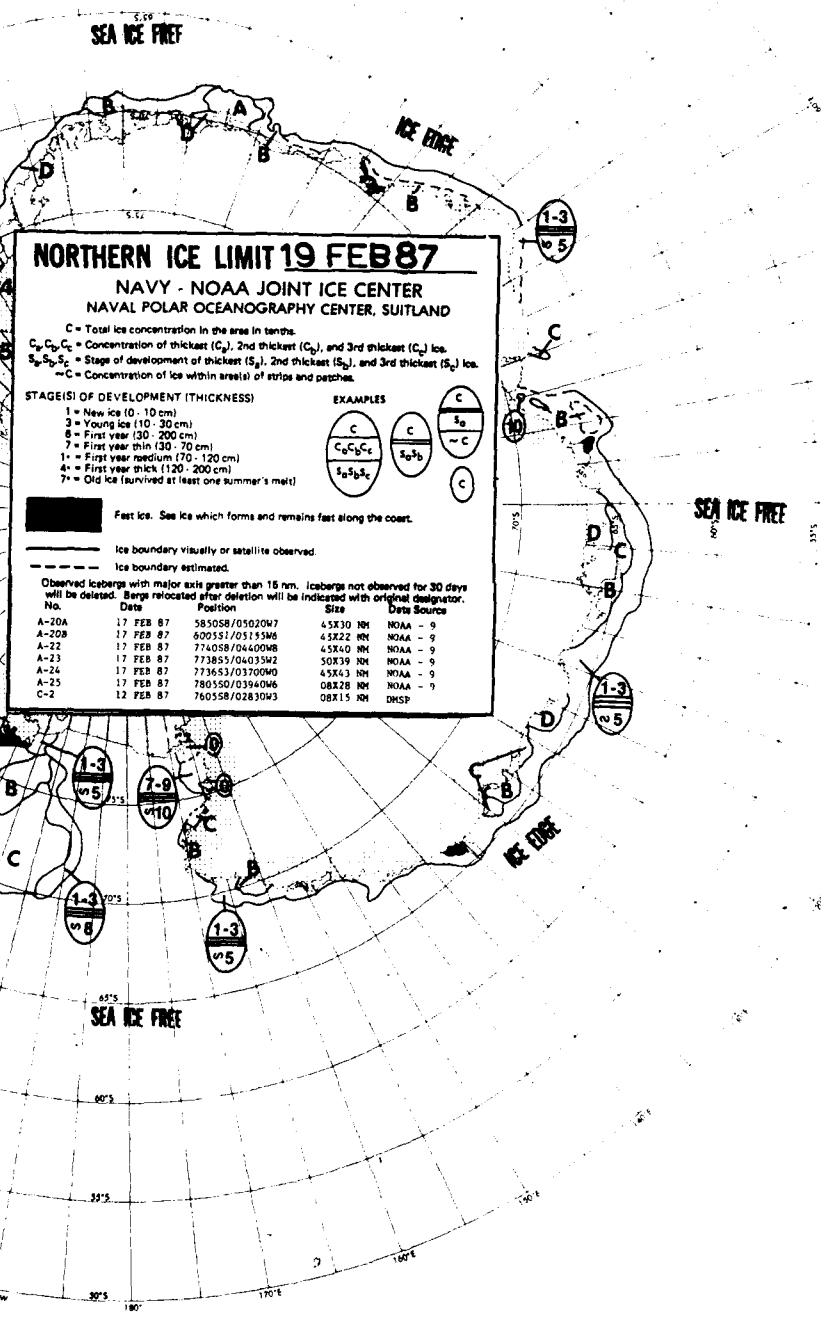
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No.	Date	Position	Size	Data Source
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A-20B	11 FEB 87	592551/0511047	45X22 NM	NOAA - 9
A-22	11 FEB 87	774553/0441049	45X43 NM	NOAA - 9
A-23	11 FEB 87	773552/0410045	59X39 NM	NOAA - 9
A-24	11 FEB 87	774058/0380041	43X43 NM	NOAA - 9
A-25	11 FEB 87	781056/0400044	08X26 NM	NOAA - 9
C-2	11 FEB 87	761054/0280040	08X15 NM	NOAA - 9



A-20B
A-20A

SEA ICE FREE



NORTHERN ICE LIMIT 19 FEB 87

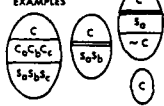
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- 7+ = Old ice (survived at least one summer's melt)

EXAMPLES



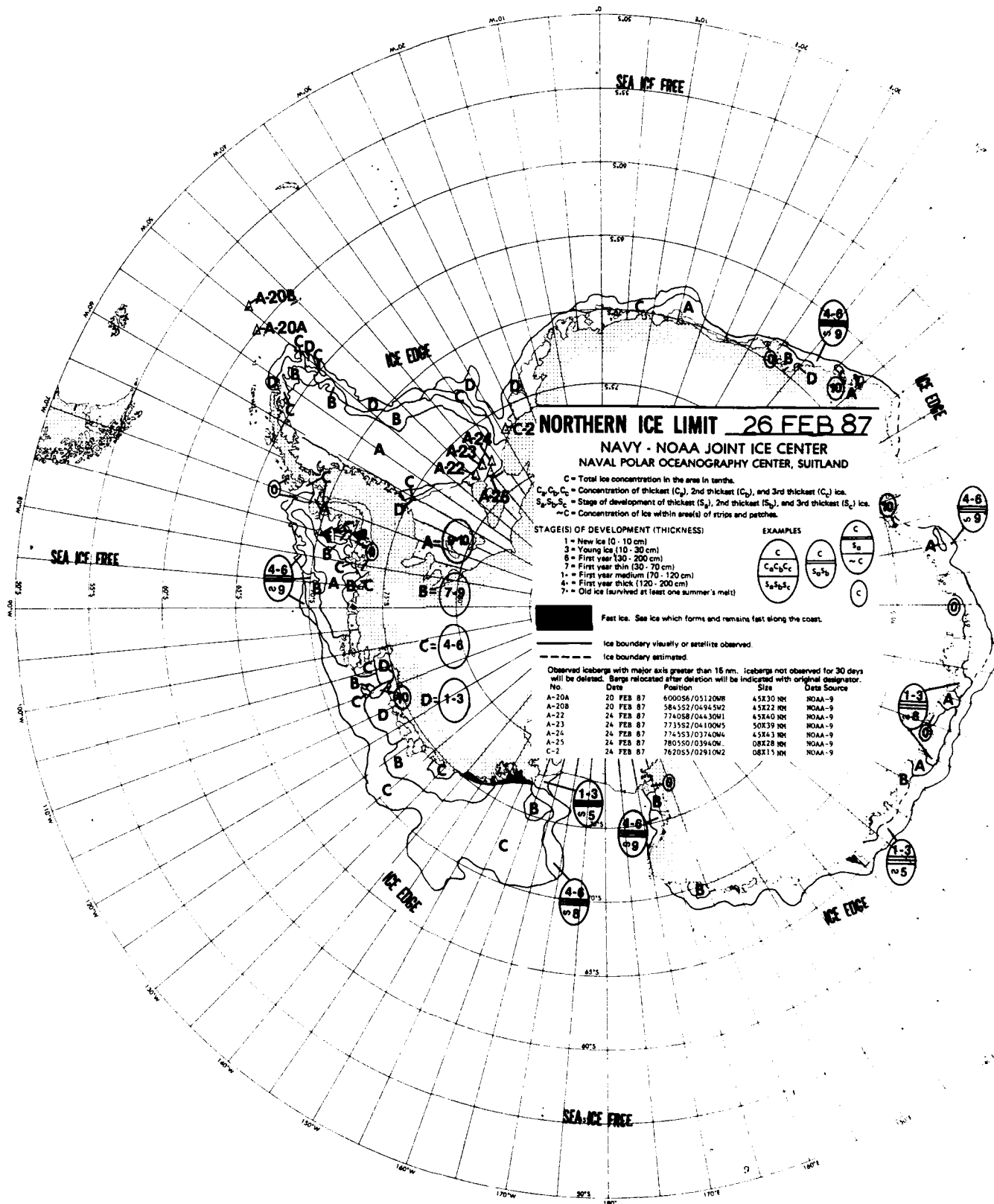
Fast ice. See ice which forms and remains fast along the coast.

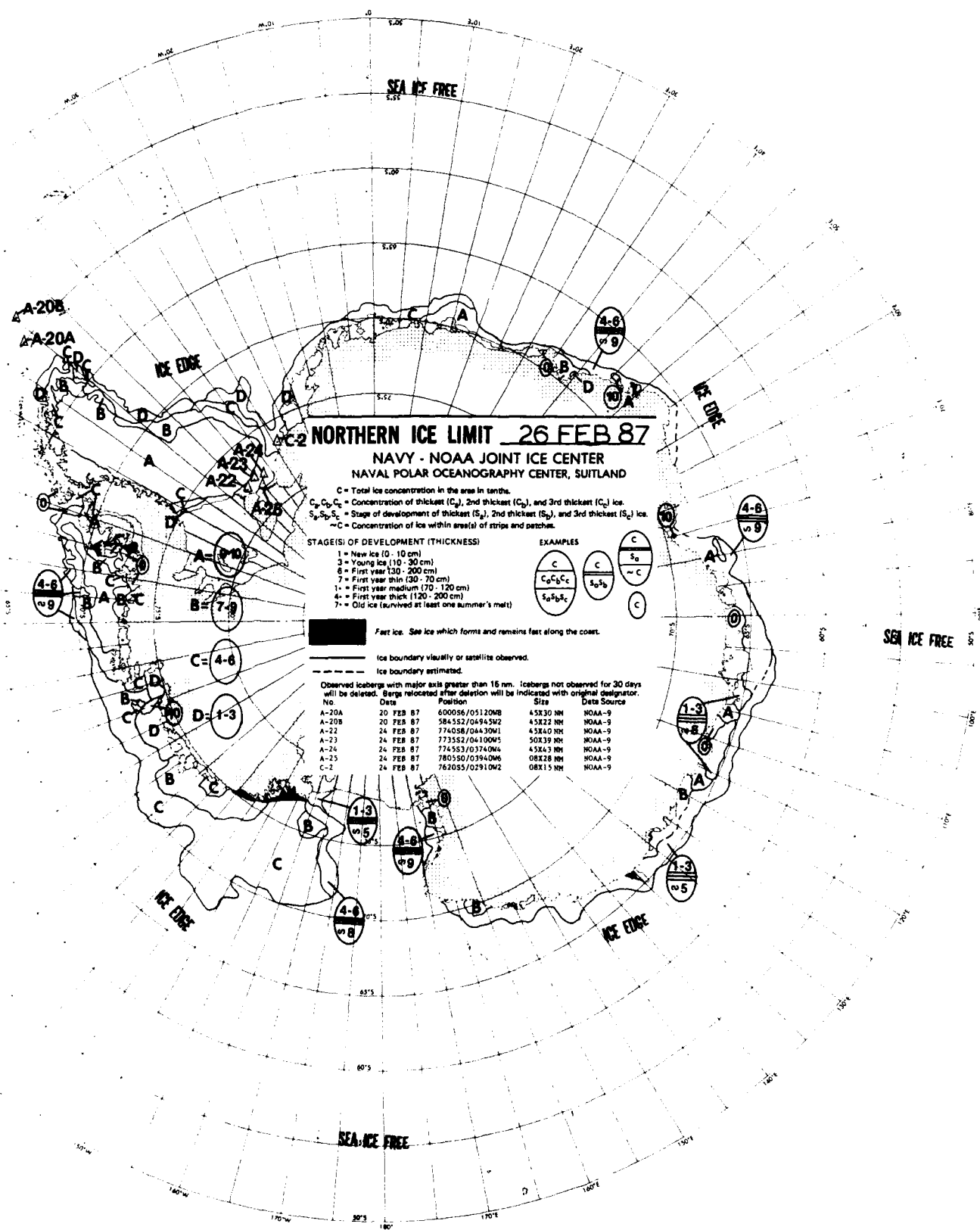
Ice boundary visually or satellite observed.
Ice boundary estimated.

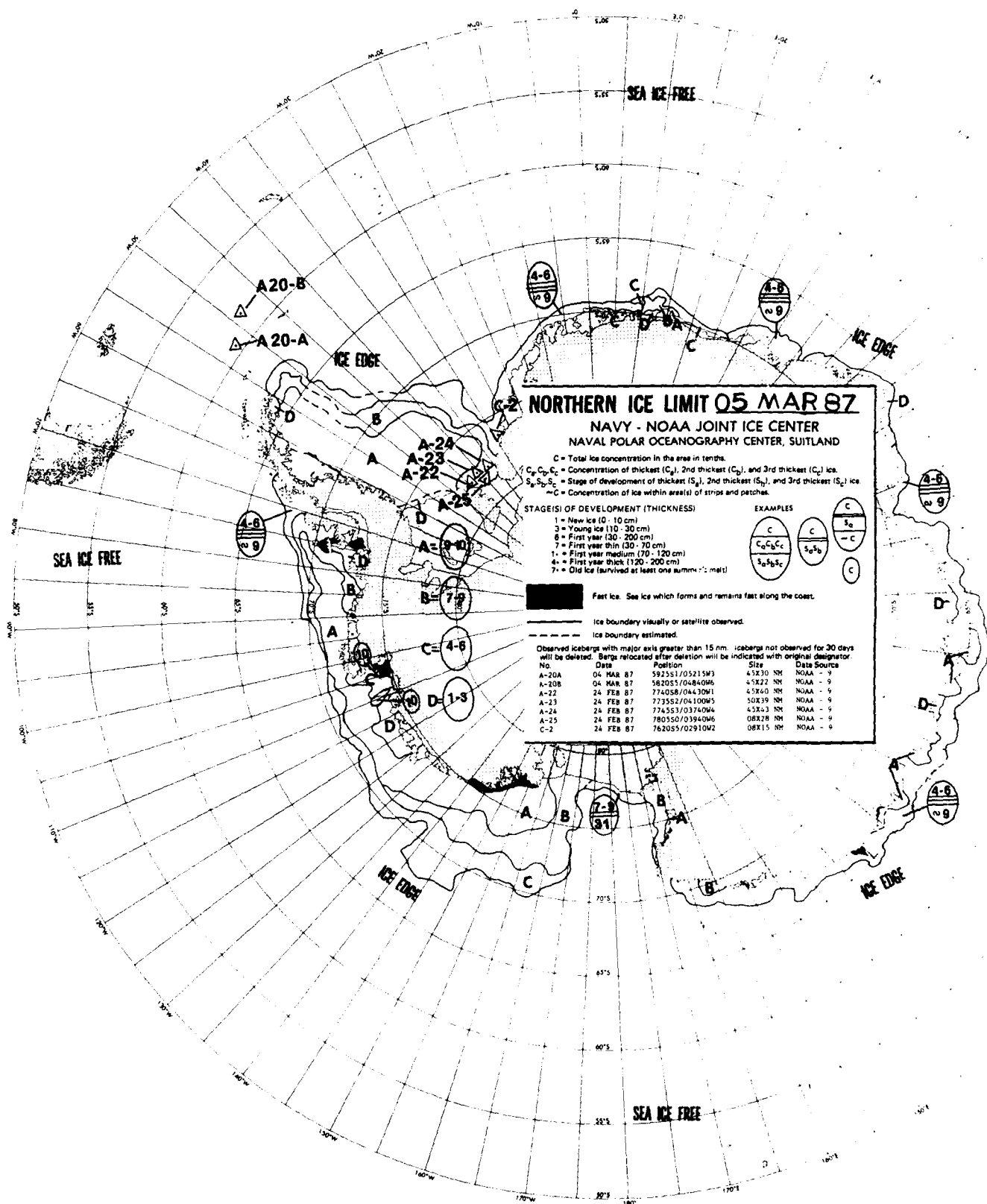
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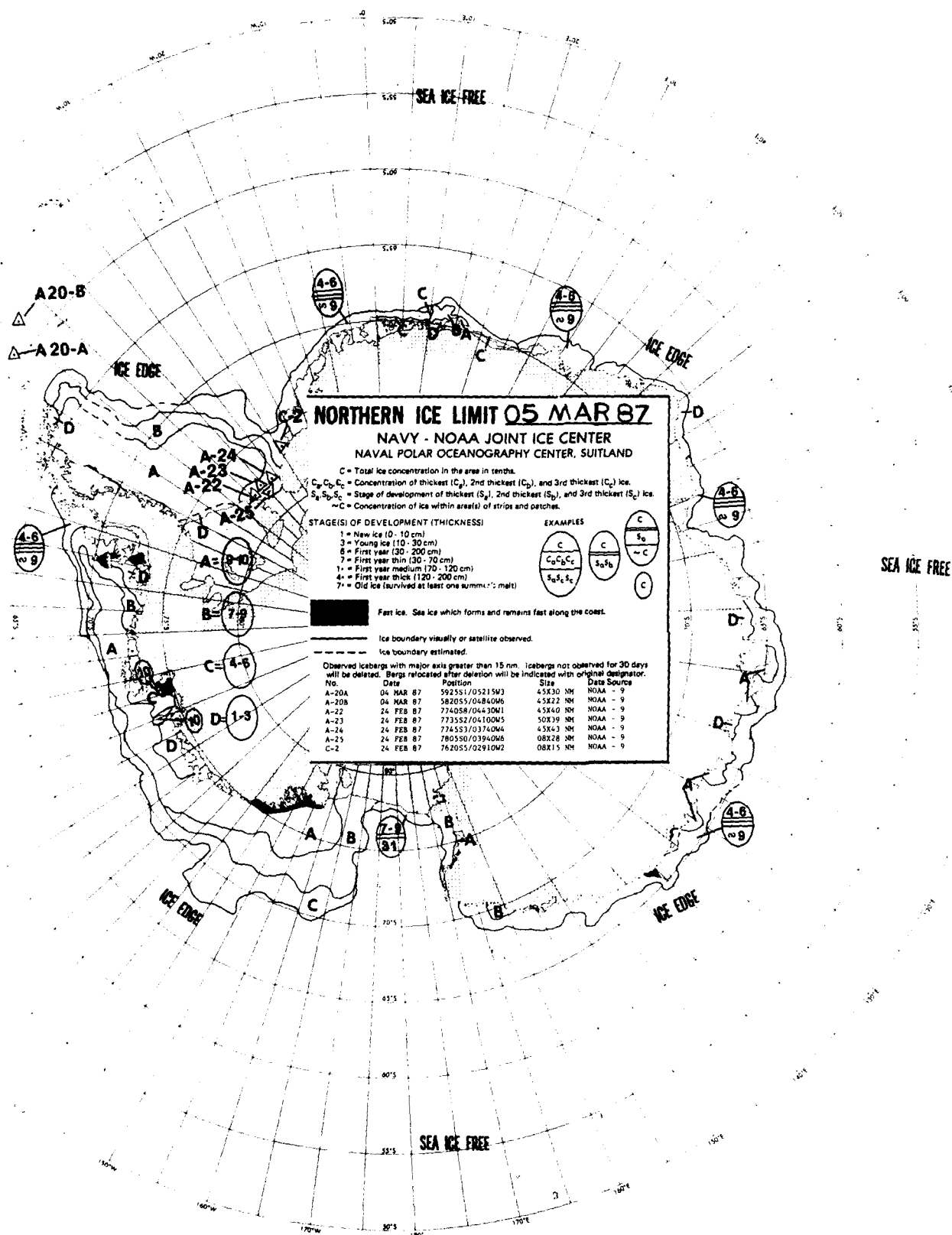
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A-20B	17 FEB 87	600551/05153W6	45X22 NM	NOAA - 9
A-22	17 FEB 87	774058/04400W8	45X40 NM	NOAA - 9
A-23	17 FEB 87	773855/04035W2	50X39 NM	NOAA - 9
A-24	17 FEB 87	773653/03700W0	45X43 NM	NOAA - 9
A-25	17 FEB 87	780550/03940W6	08X28 NM	NOAA - 9
C-2	12 FEB 87	760558/02830W3	08X15 NM	DMSP

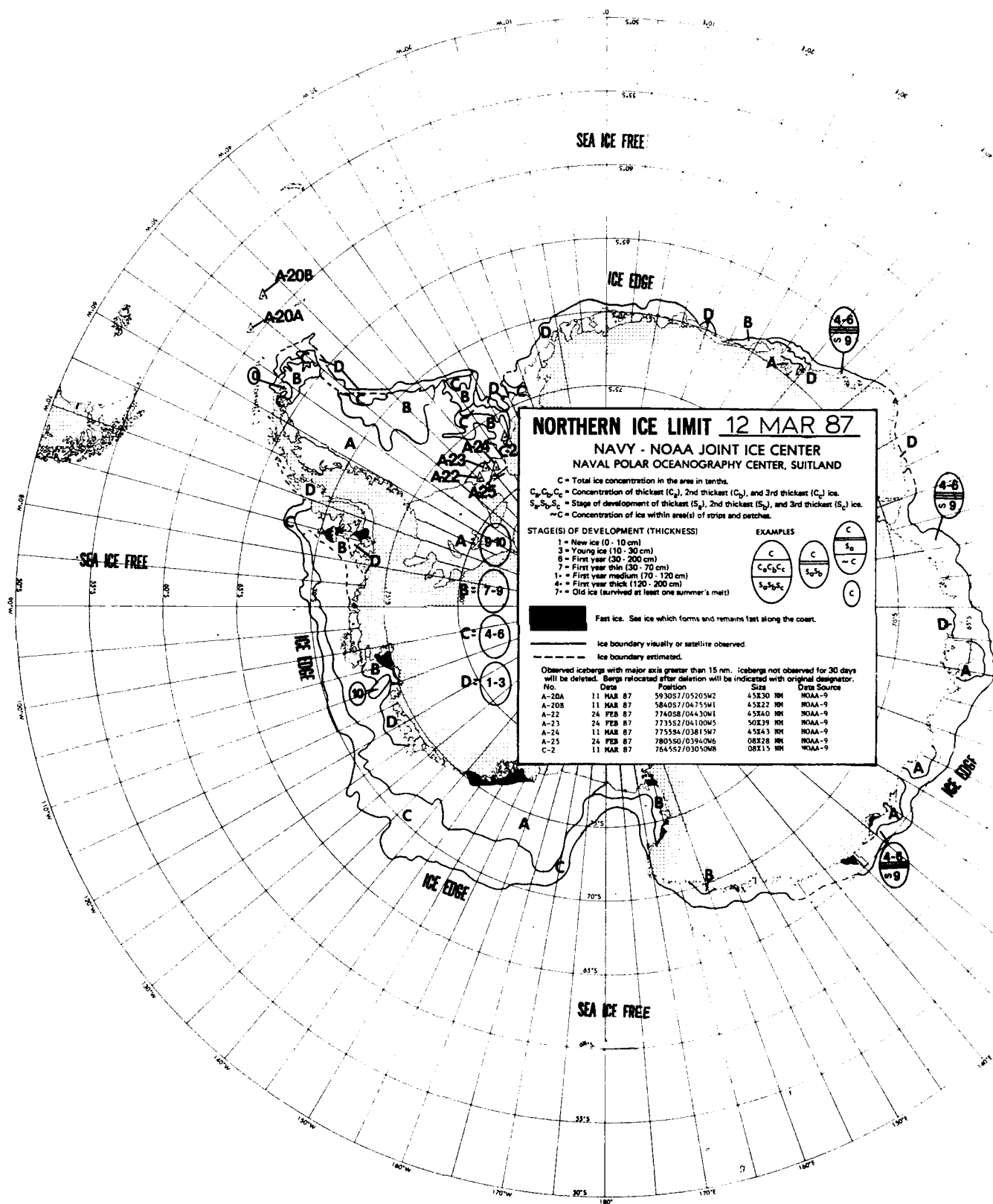
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ICE EDGE

NORTHERN ICE LIMIT 12 MAR 87

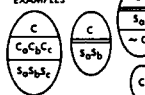
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EXAMPLES



Fast ice. Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed.

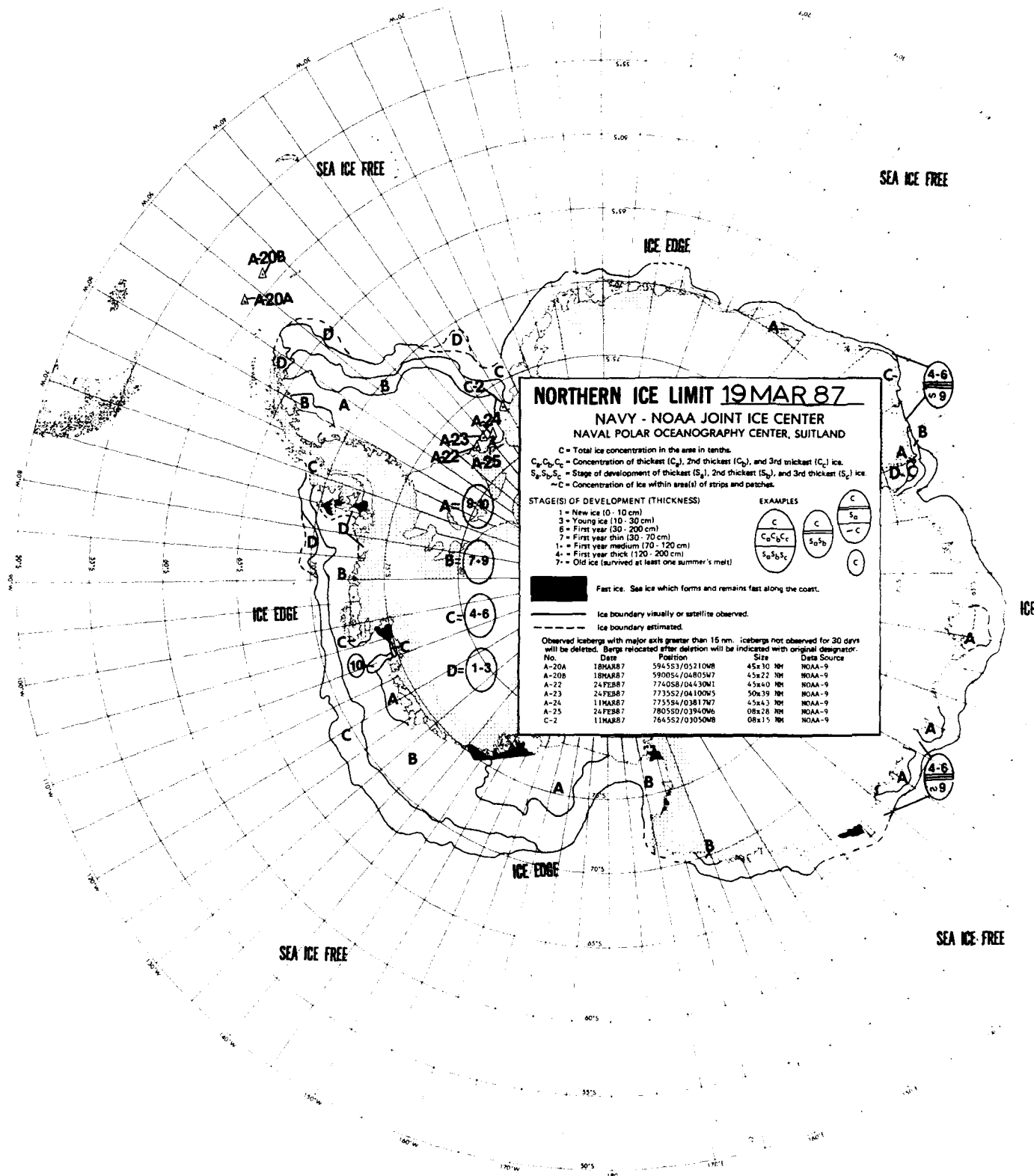
Ice boundary estimated.

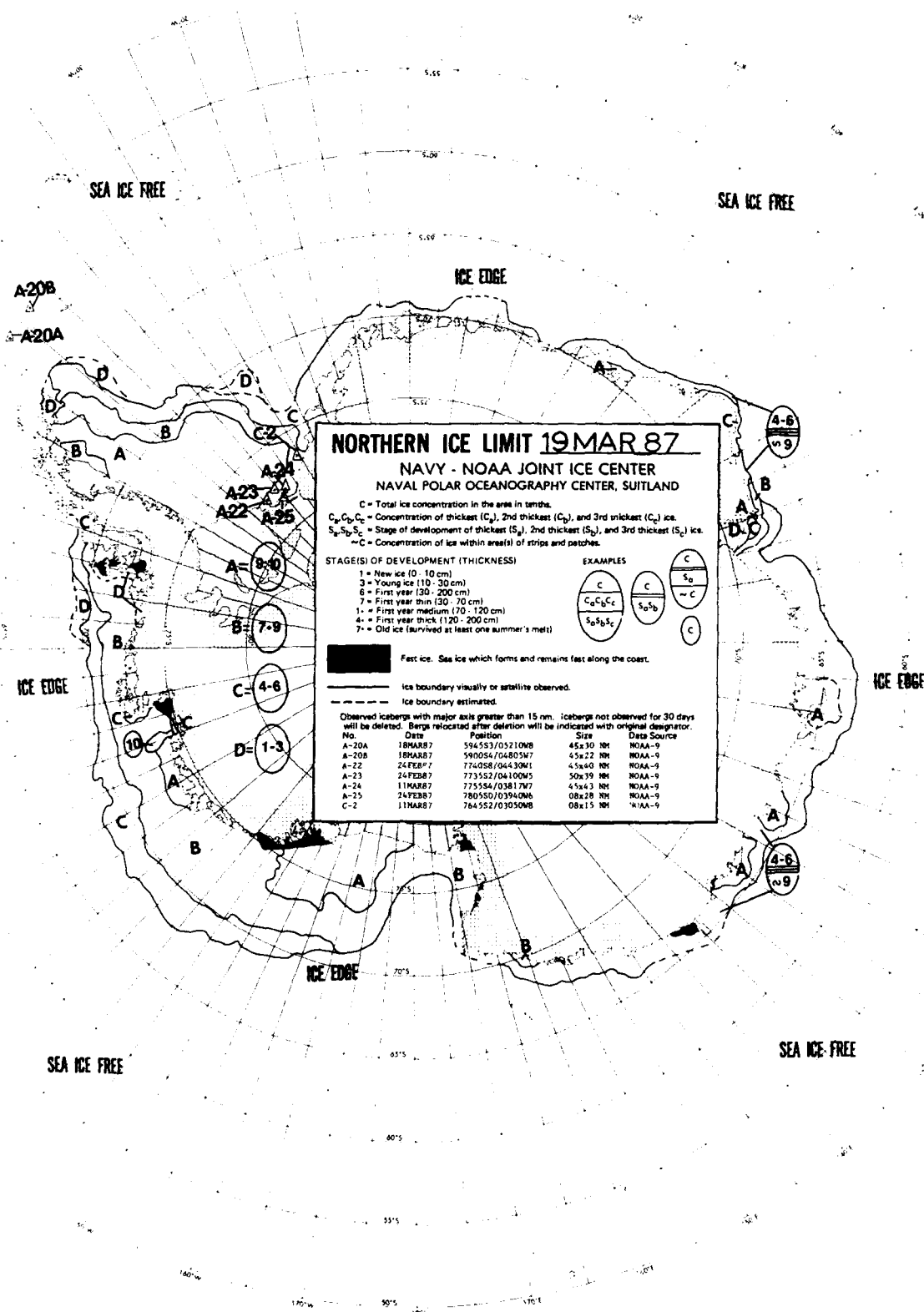
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

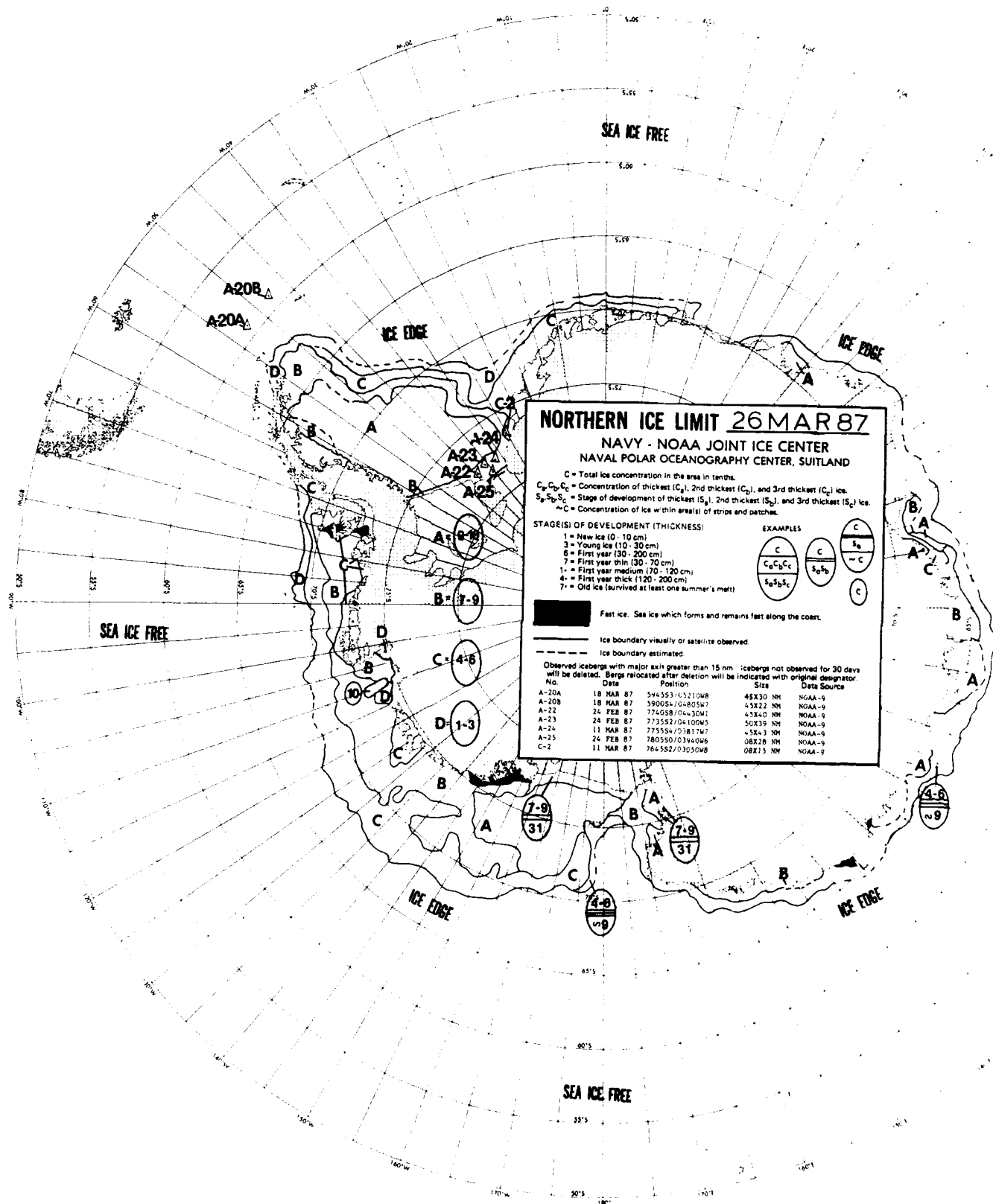
No.	Date	Position	Size	Data Source
A-20A	11 MAR 87	593057/05105W2	45X30 NM	NOAA-9
A-20B	11 MAR 87	584057/04755W1	45X22 NM	NOAA-9
A-22	24 FEB 87	774058/04430W1	45X40 NM	NOAA-9
A-23	24 FEB 87	773552/04100W5	50X39 NM	NOAA-9
A-24	11 MAR 87	775554/03815W7	45X43 NM	NOAA-9
A-25	24 FEB 87	780550/03940W6	08X28 NM	NOAA-9
C-2	11 MAR 87	764552/03050W8	08X15 NM	NOAA-9

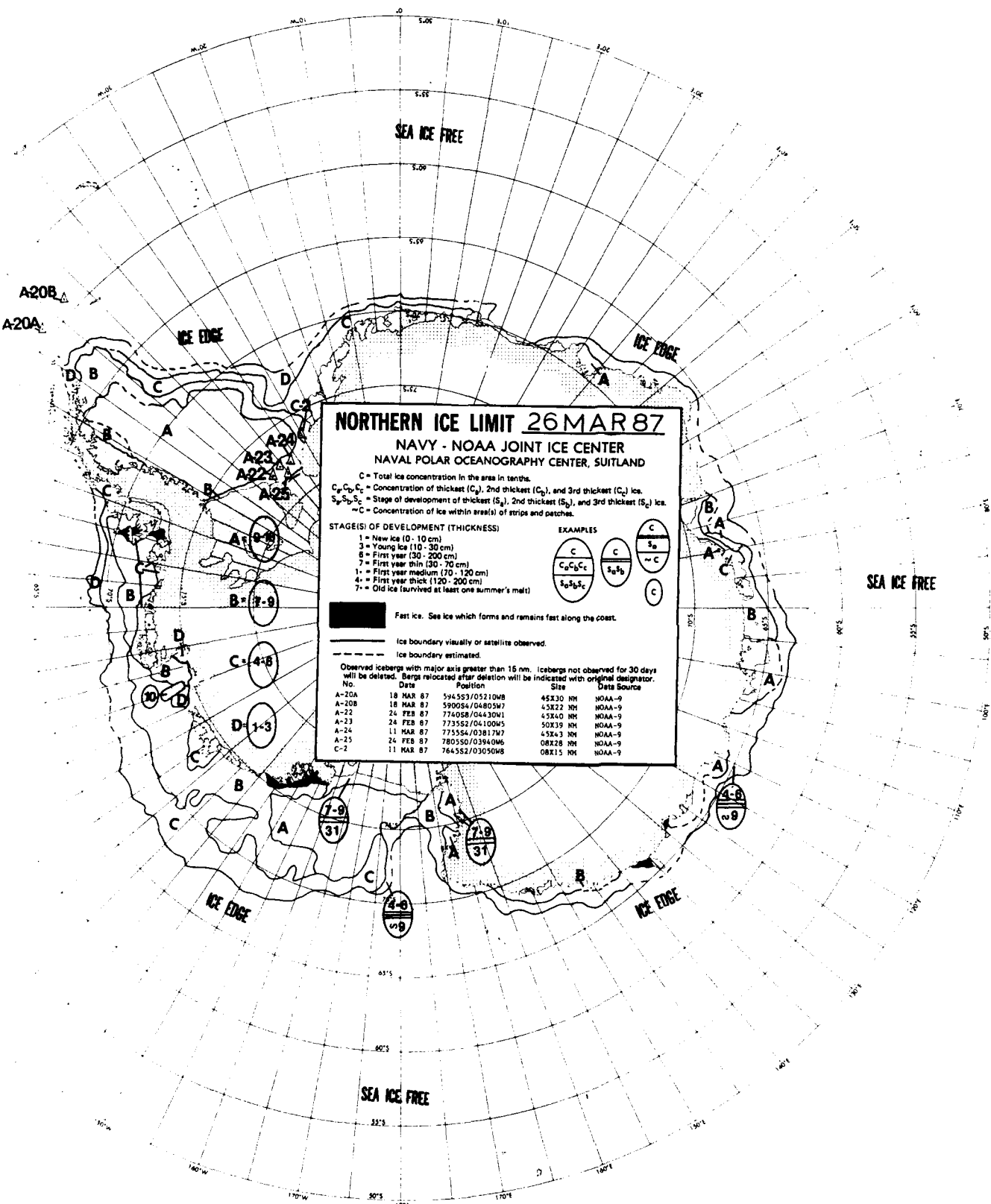
SEA ICE FREE

SEA ICE FREE









NORTHERN ICE LIMIT 26 MAR 87

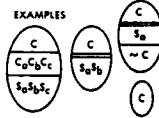
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EXAMPLES



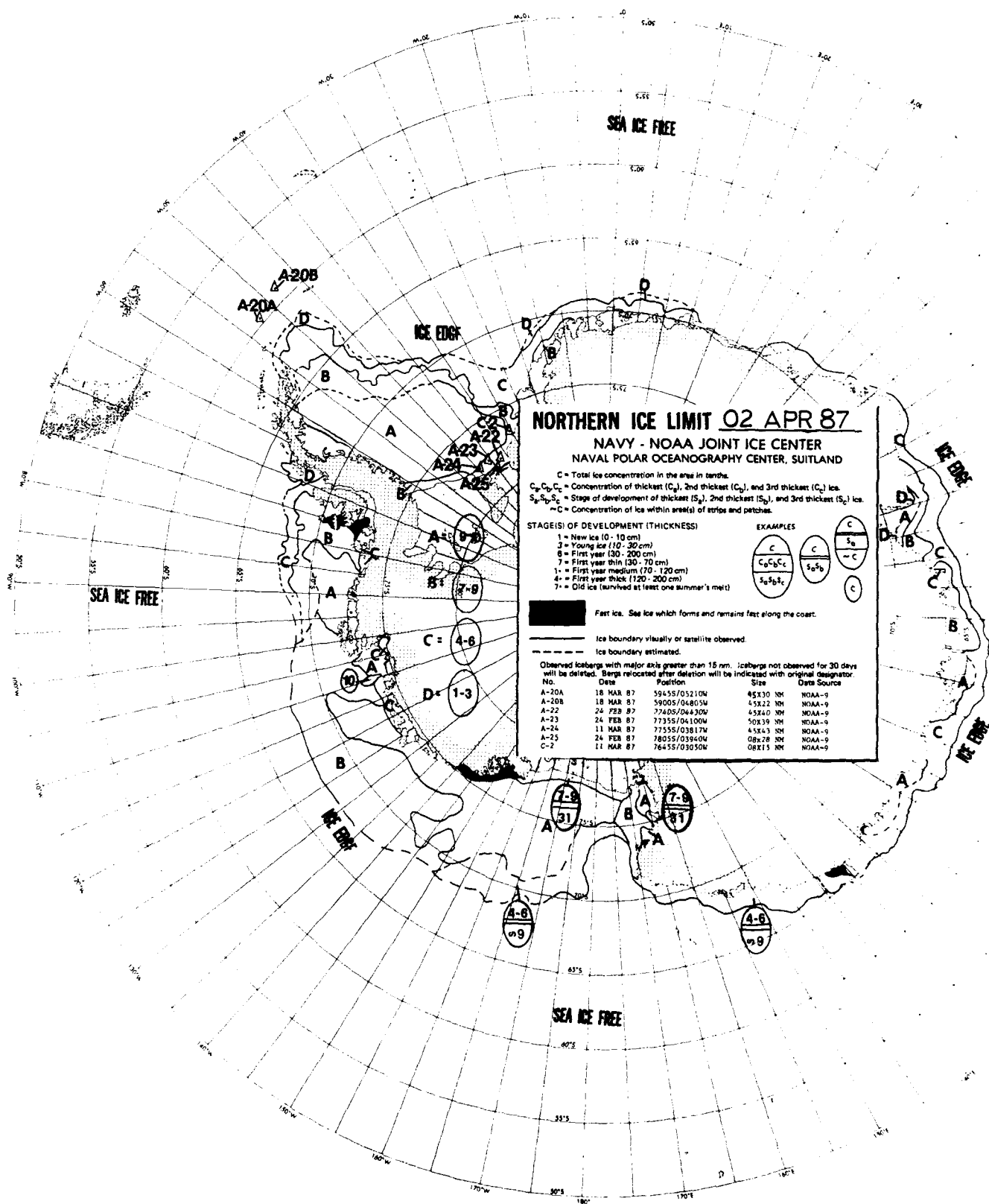
Fast ice. See ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed.

Ice boundary estimated.

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No.	Date	Position	Size	Data Source
A-20A	18 MAR 87	594553/052104B	45X30 NM	NOAA-9
A-20B	18 MAR 87	590054/04805W7	45X22 NM	NOAA-9
A-22	24 FEB 87	774058/04430W1	45X40 NM	NOAA-9
A-23	24 FEB 87	773552/04100W5	50X39 NM	NOAA-9
A-24	11 MAR 87	775554/03817W7	45X43 NM	NOAA-9
A-25	24 FEB 87	780550/03840W6	08X28 NM	NOAA-9
C-2	11 MAR 87	764552/03050W8	08X15 NM	NOAA-9



SEA ICE FREE

NORTHERN ICE LIMIT 02 APR 87

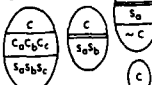
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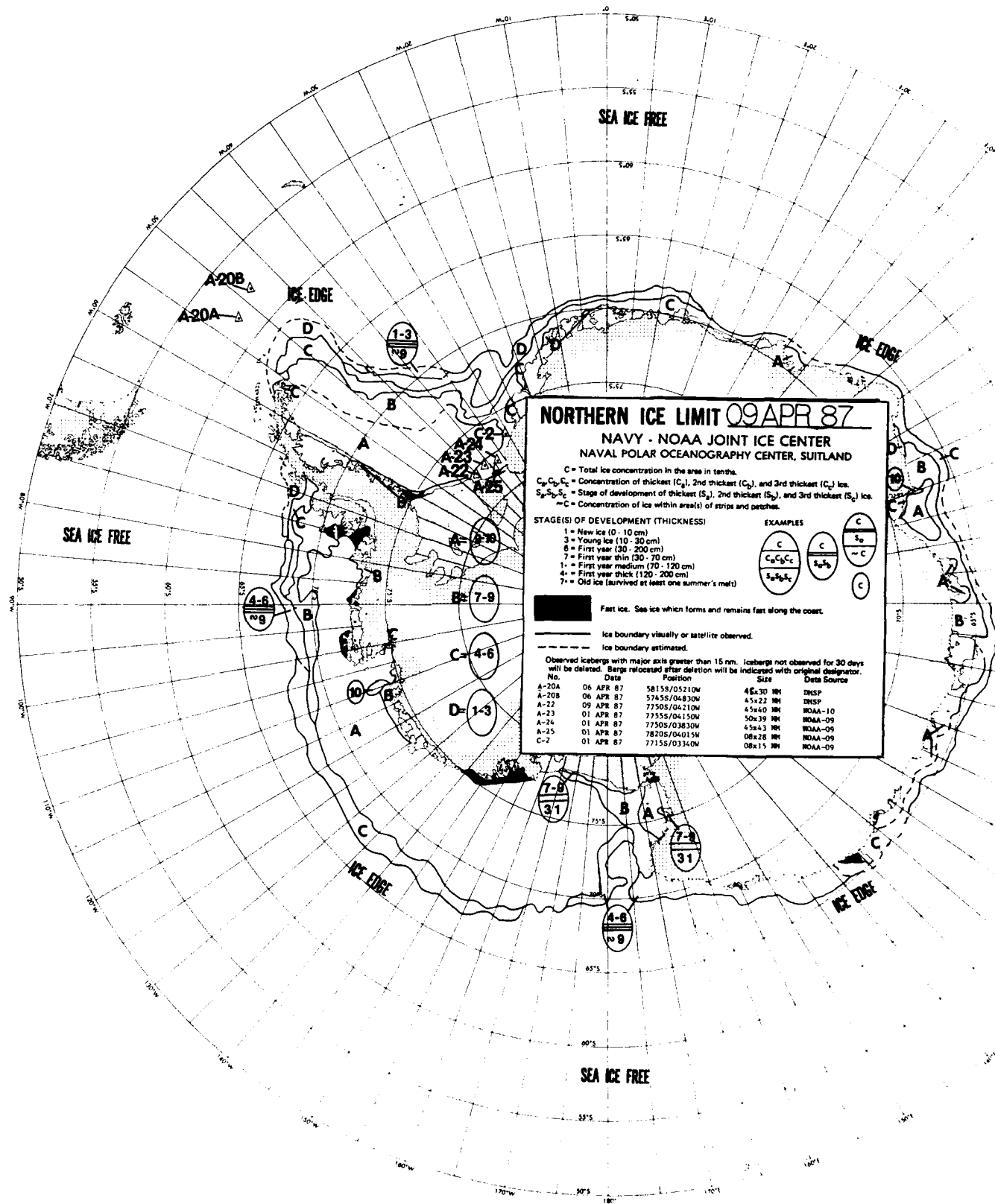
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No.	Date	Position	Size	Data Source
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A-20B	18 MAR 87	59005/04805W	45X22 NM	NOAA-9
A-22	24 FEB 87	77405/04430W	45X40 NM	NOAA-9
A-23	24 FEB 87	77355/04100W	50X30 NM	NOAA-9
A-24	11 MAR 87	77535/03817W	45X43 NM	NOAA-9
A-25	24 FEB 87	18035/03940W	08X28 NM	NOAA-9
C-2	11 MAR 87	76455/03050W	08X15 NM	NOAA-9

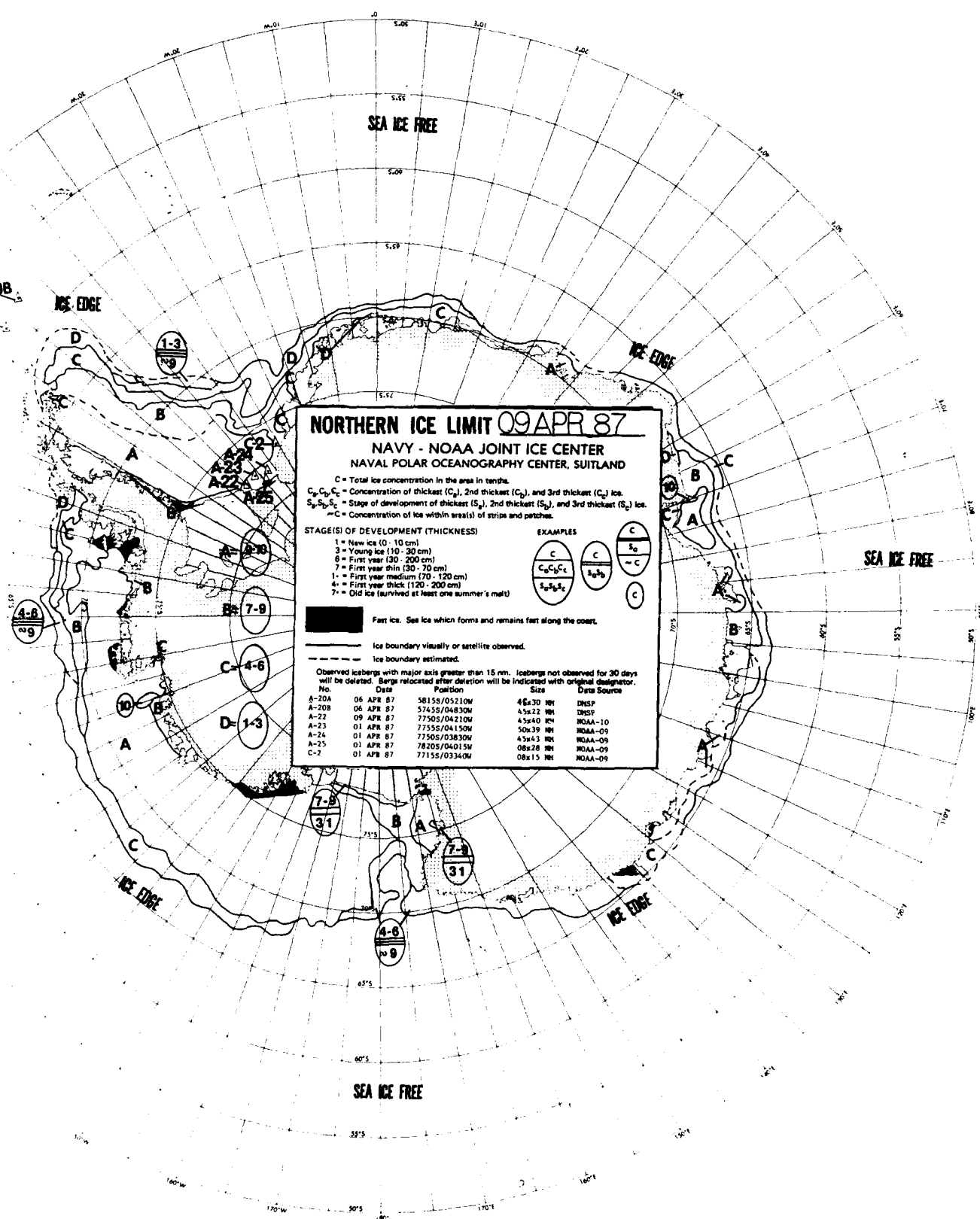
SEA ICE FREE

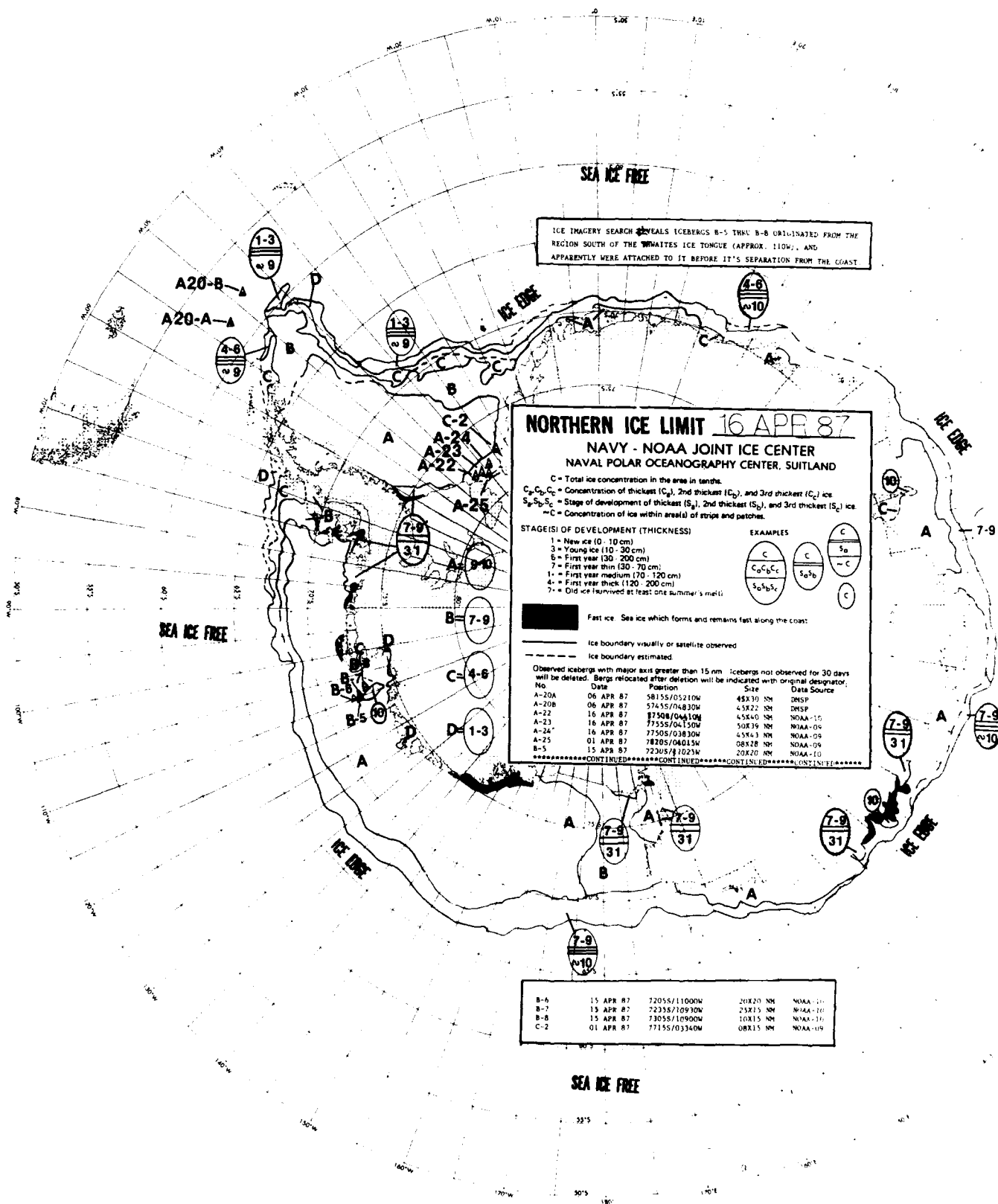
SEA ICE FREE

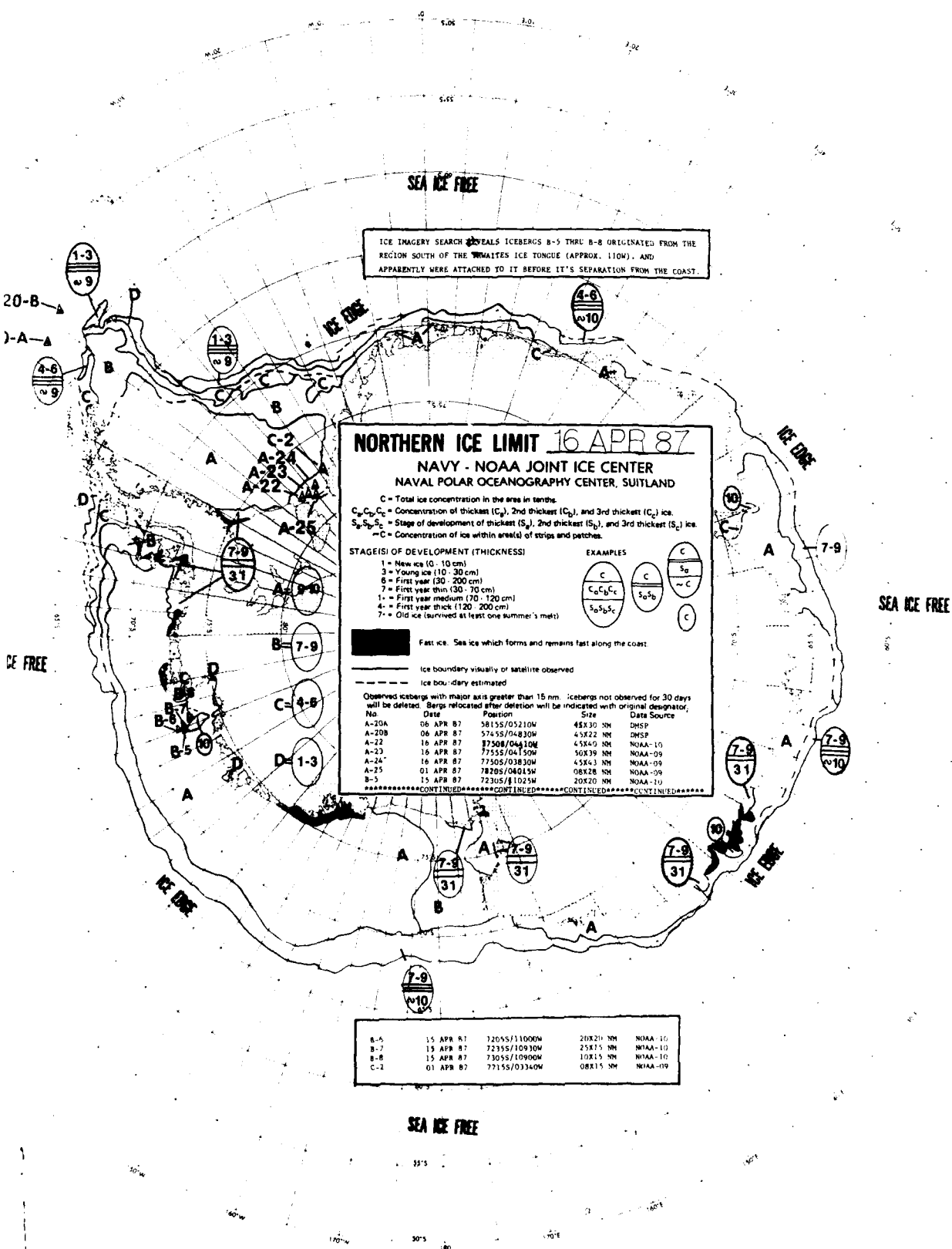


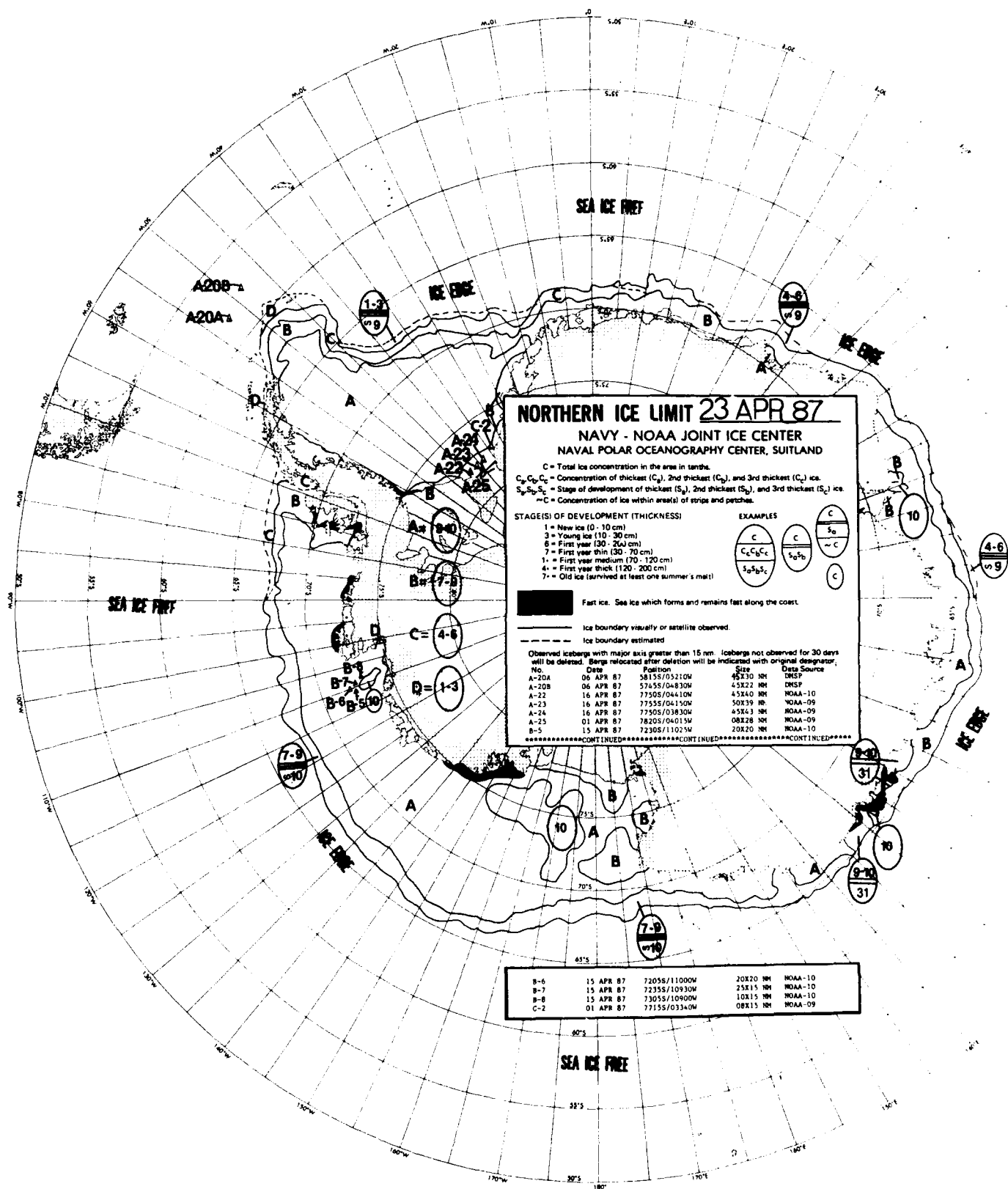
A-20B

JA









A20B
A20A

SEA ICE FREE

NORTHERN ICE LIMIT 23 APR 87

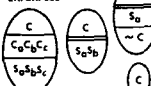
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. See ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed.

Ice boundary estimated.

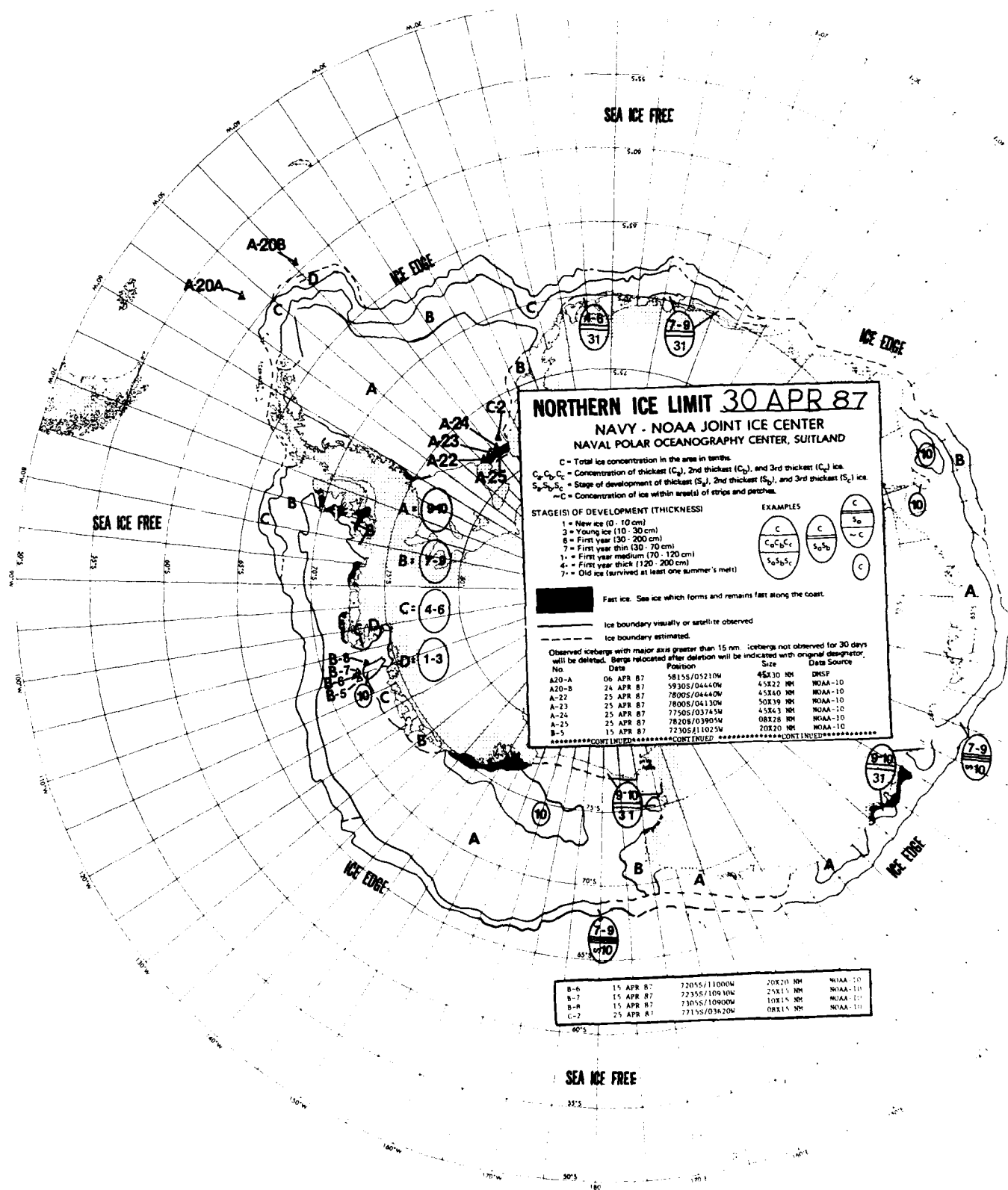
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.
No. Date Position Size Data Source
A-20A 06 APR 87 58155/05210W 45X30 NM DMSP
A-20B 06 APR 87 57455/04830W 45X22 NM DMSP
A-22 16 APR 87 77505/04410W 45X40 NM NOAA-10
A-23 16 APR 87 77555/04150W 50X30 NM NOAA-09
A-24 16 APR 87 77505/03830W 45X43 NM NOAA-09
A-25 01 APR 87 78205/04015W 48X28 NM NOAA-09
B-5 15 APR 87 72305/11025W 20X20 NM NOAA-10

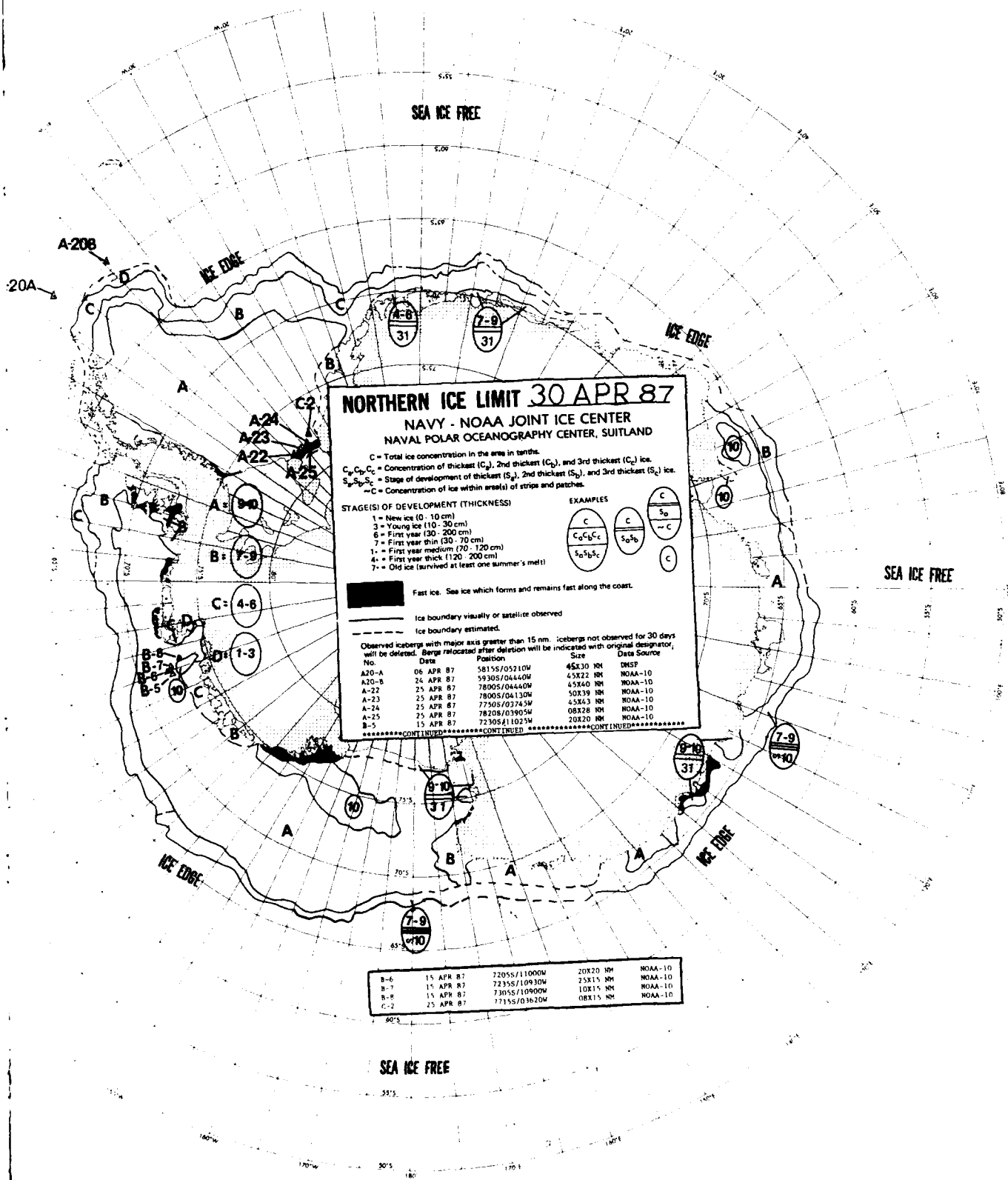
*****CONTINUED*****CONTINUED*****CONTINUED*****

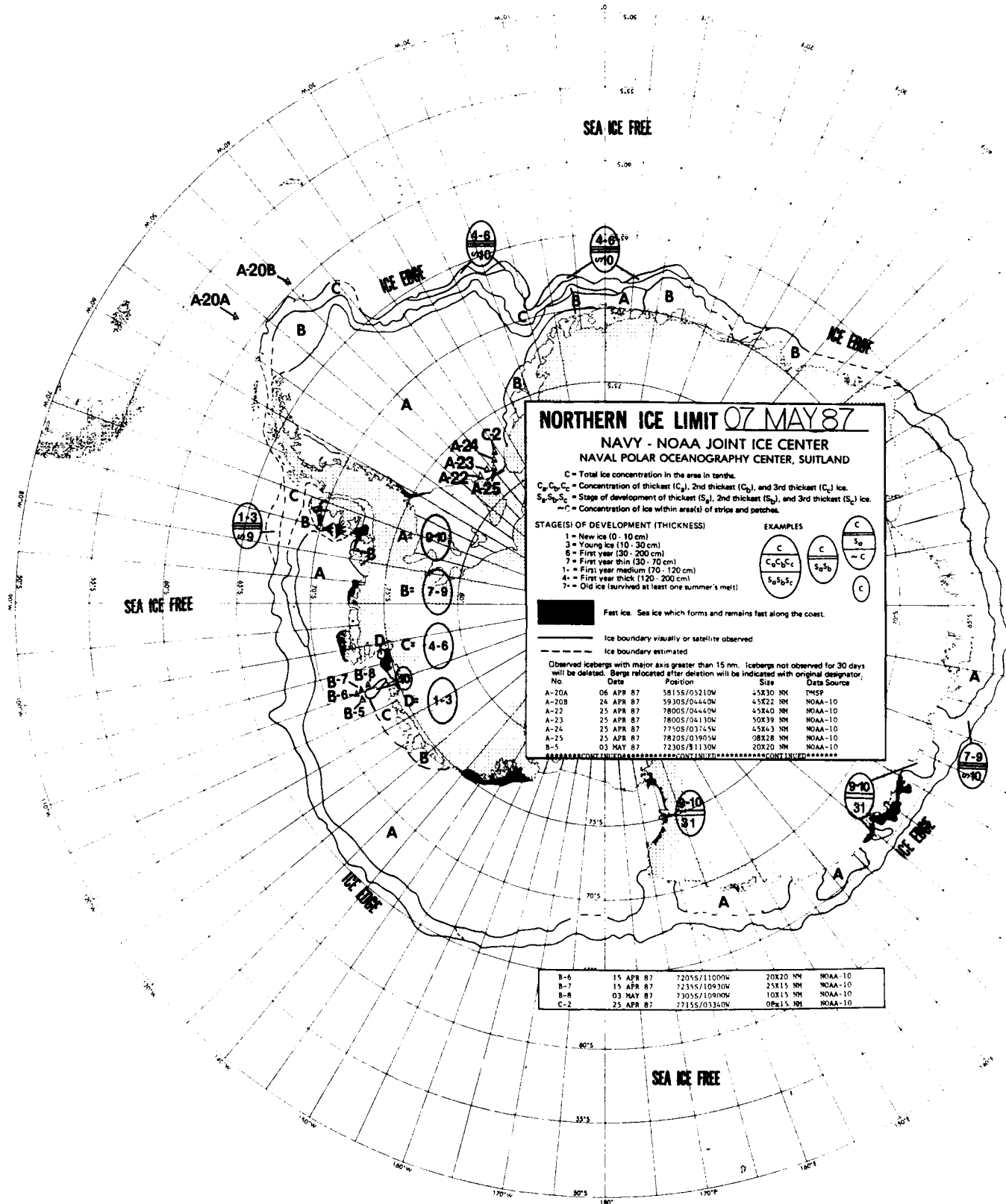
B-6	15 APR 87	72055/11000W	20X20 NM	NOAA-10
B-7	15 APR 87	72355/10930W	25X15 NM	NOAA-10
B-8	15 APR 87	73055/10900W	10X15 NM	NOAA-10
C-2	01 APR 87	57155/03340W	08X15 NM	NOAA-09

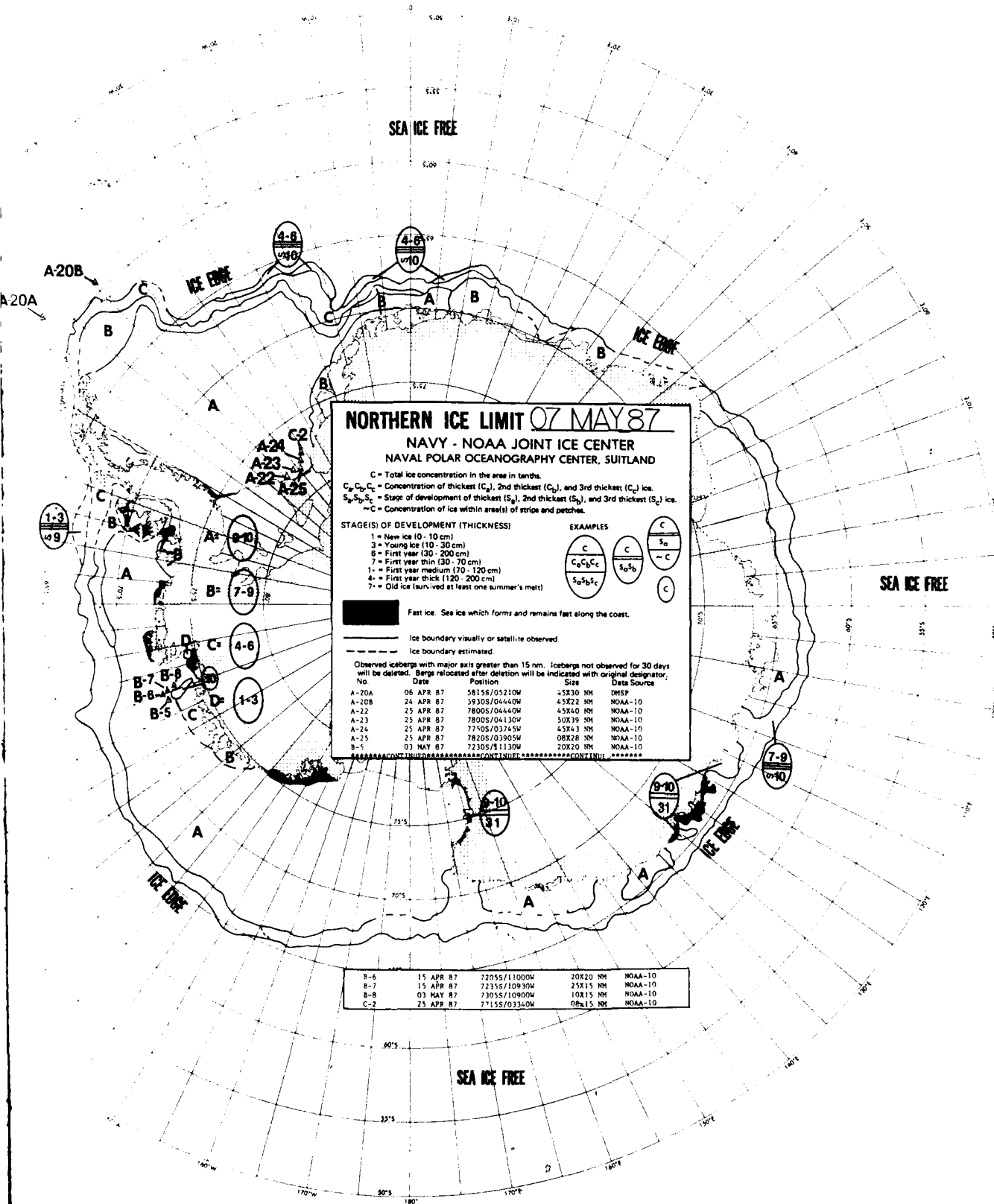
SEA ICE FREE

SEA ICE FREE

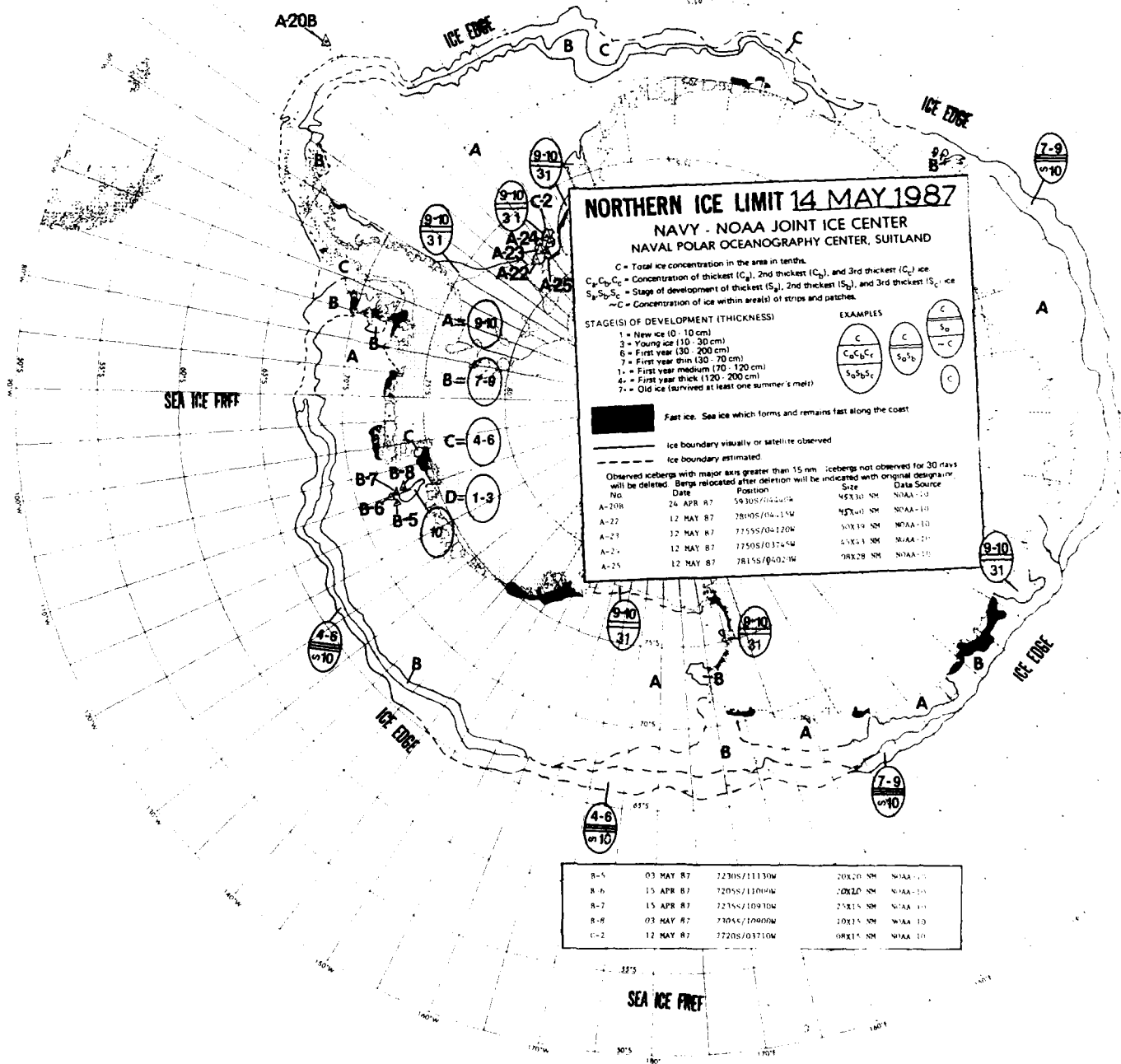




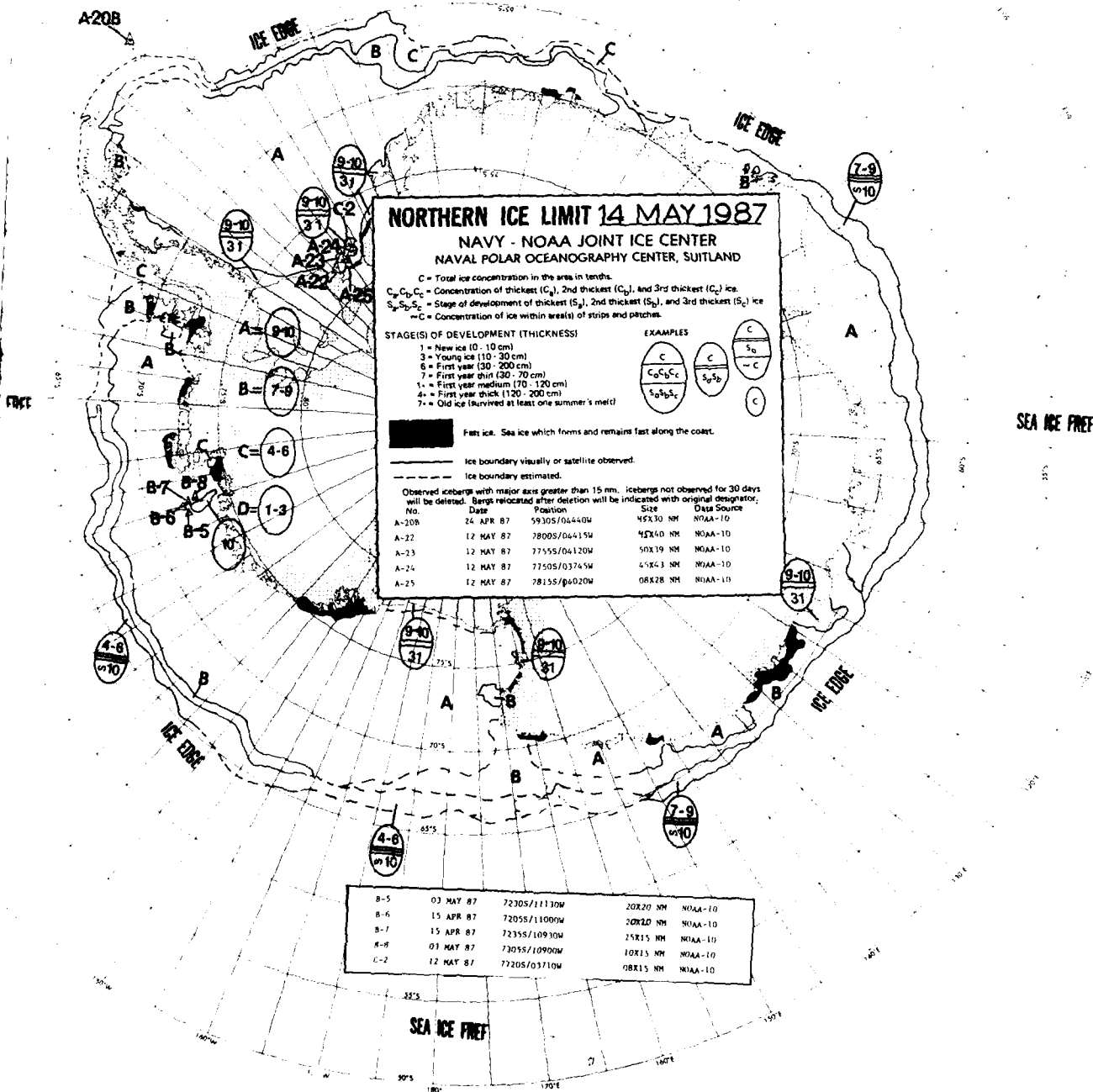


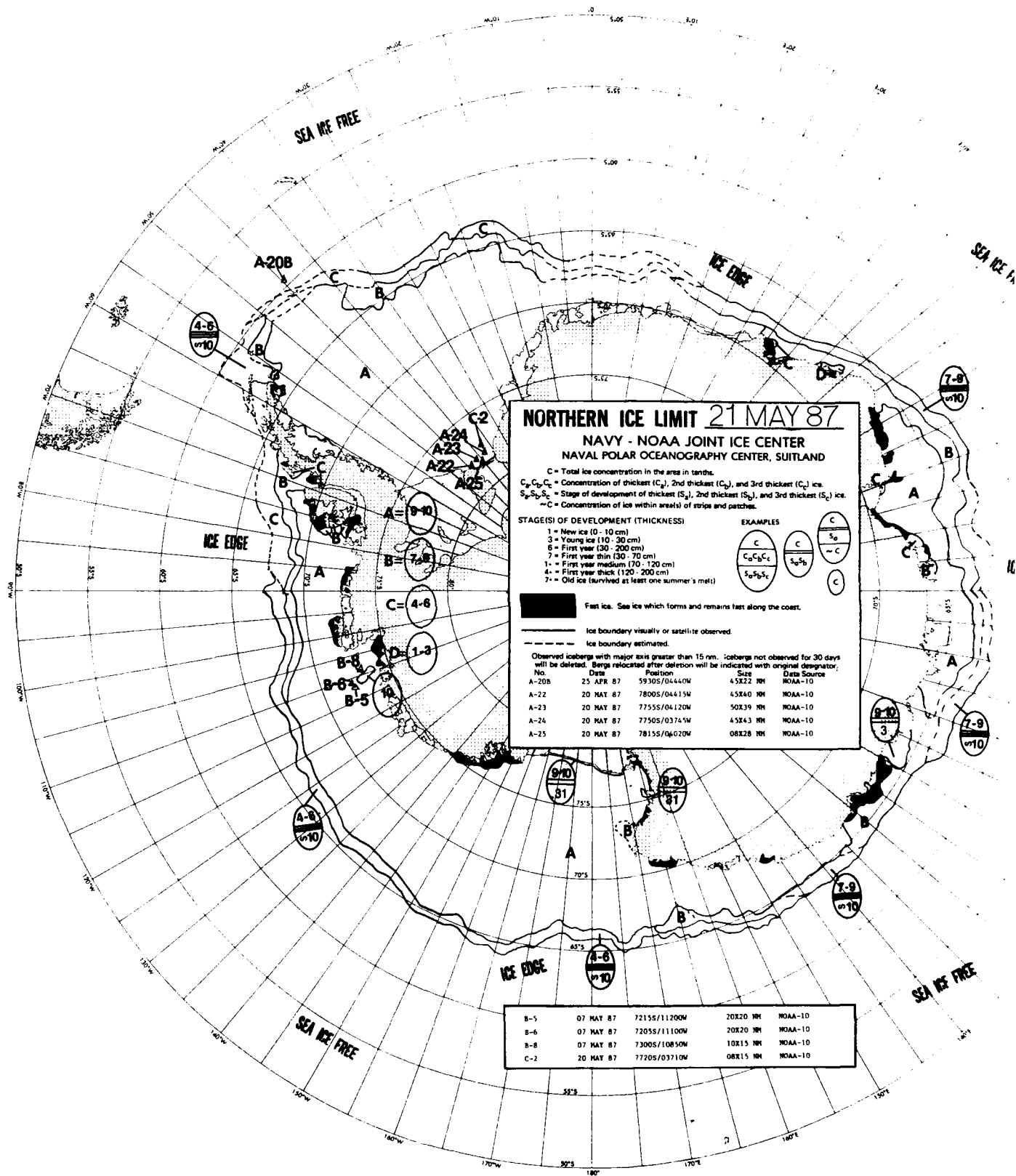


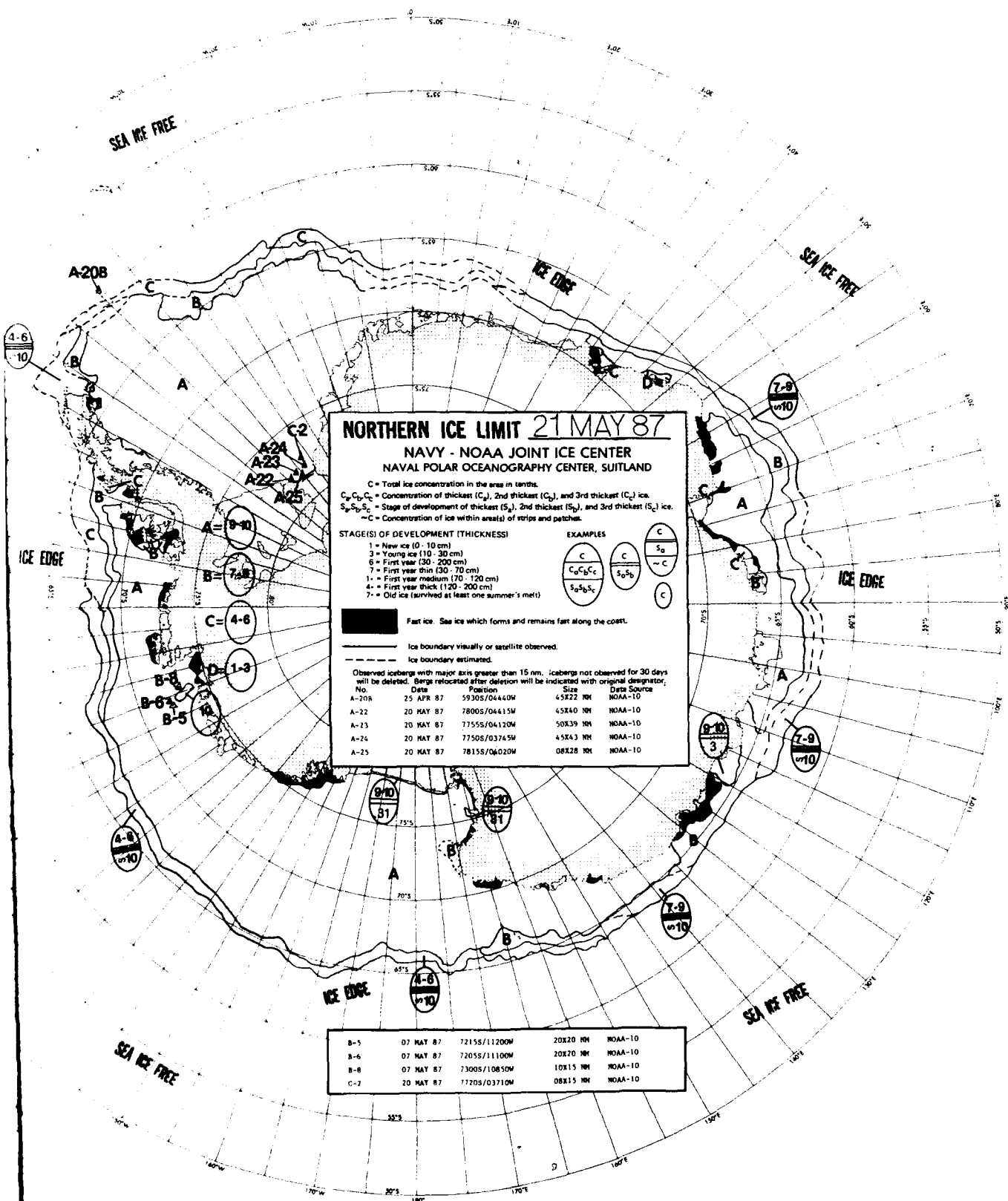
SEA ICE FREE

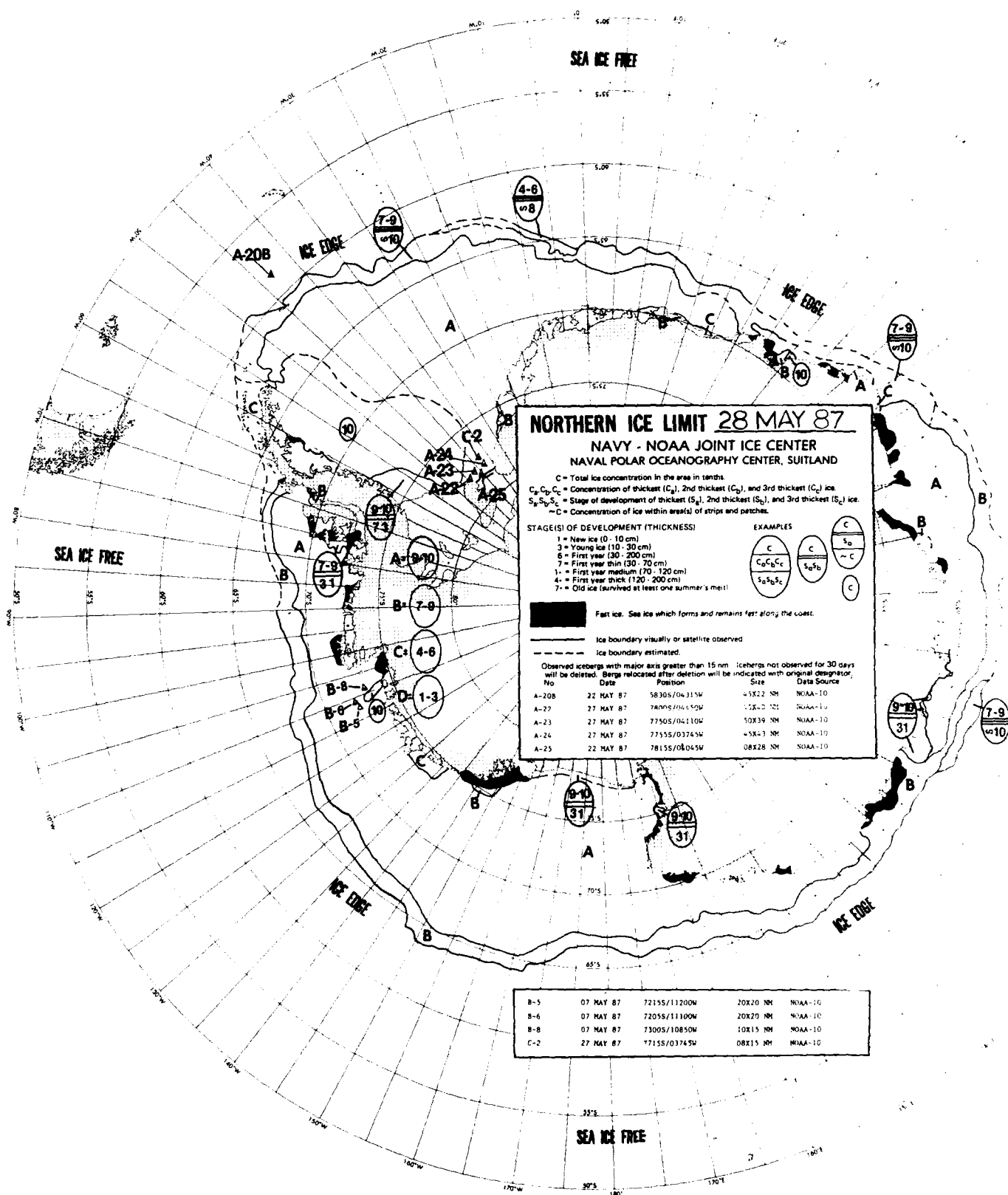


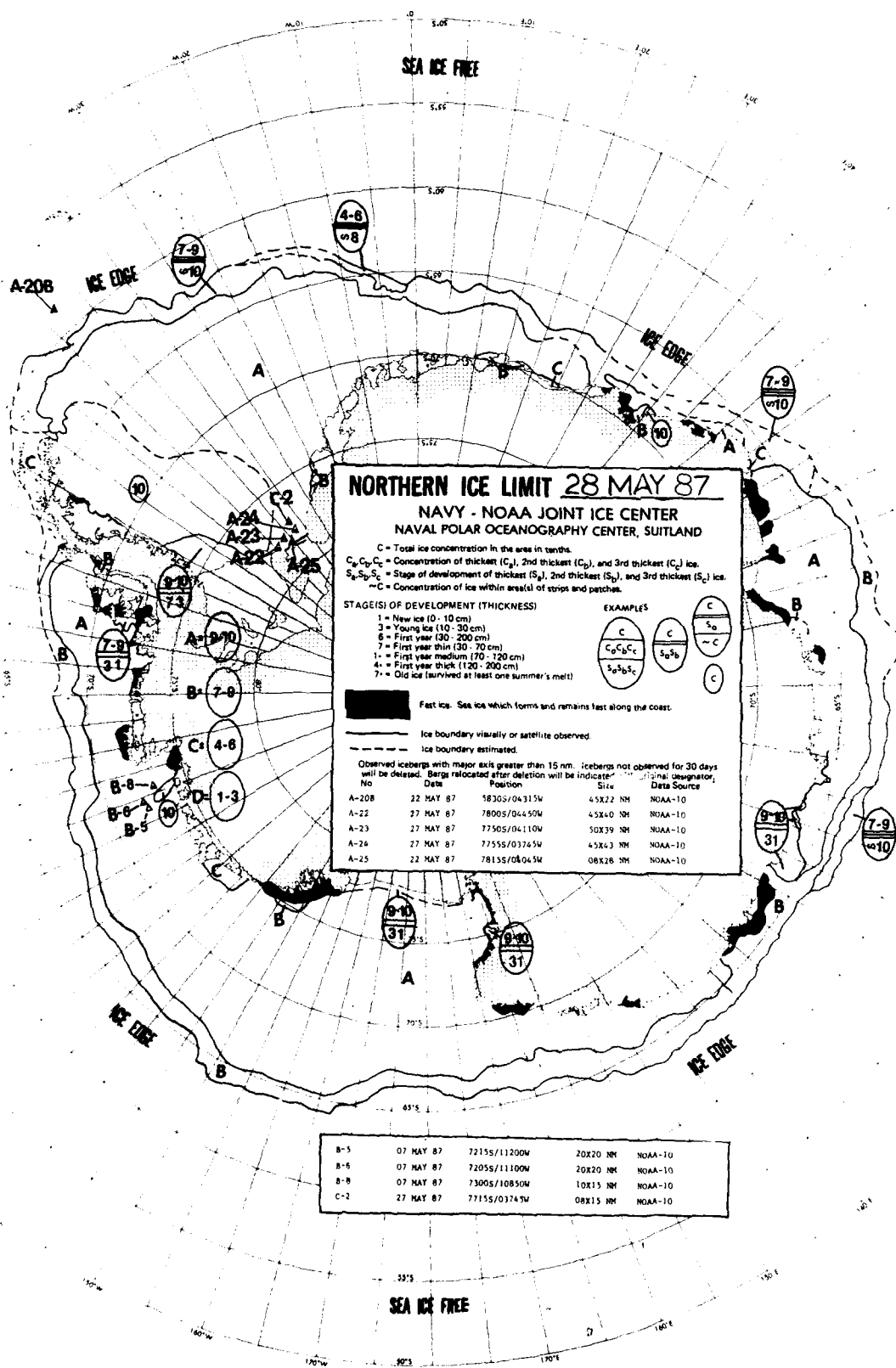
SEA ICE PREF

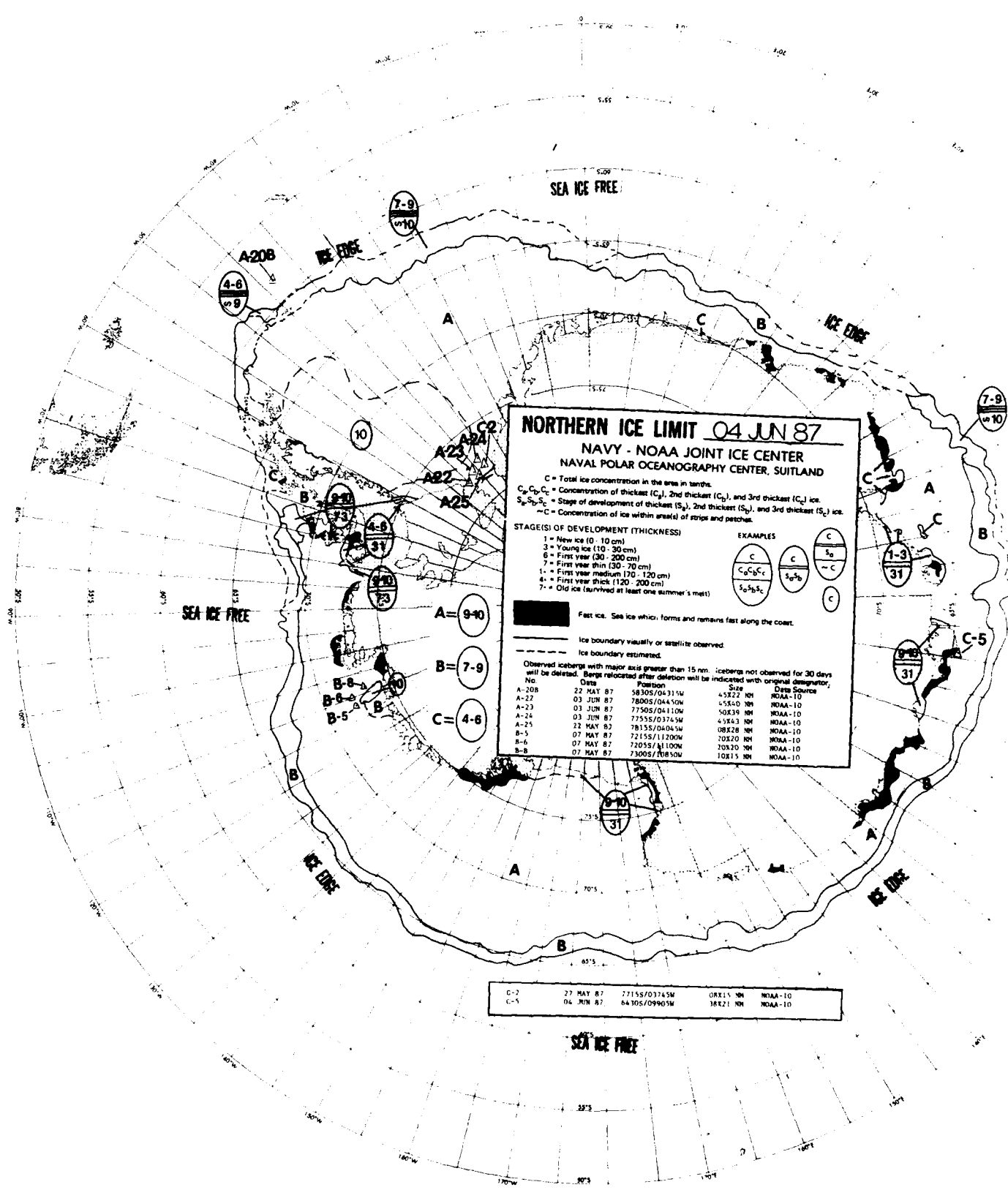




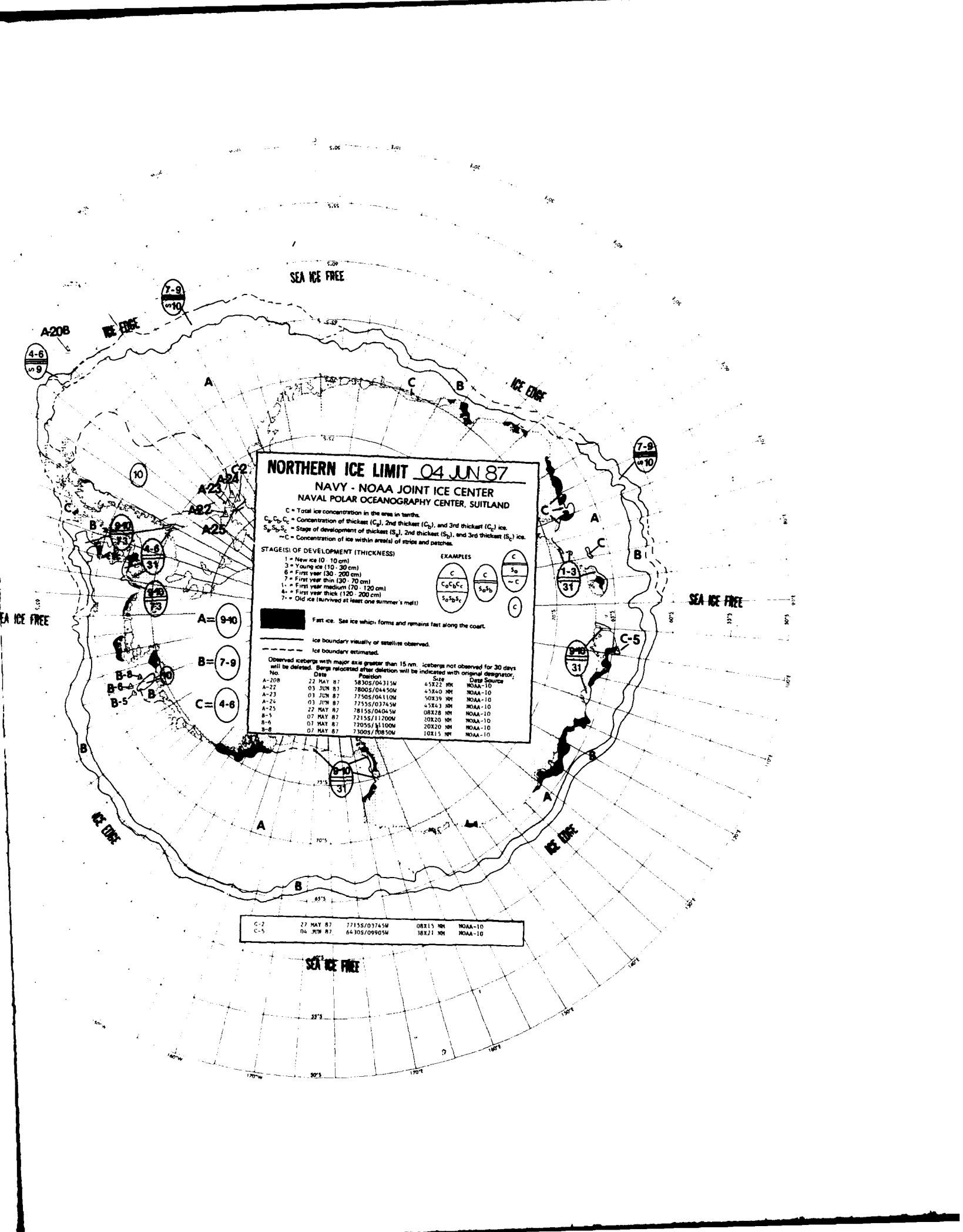


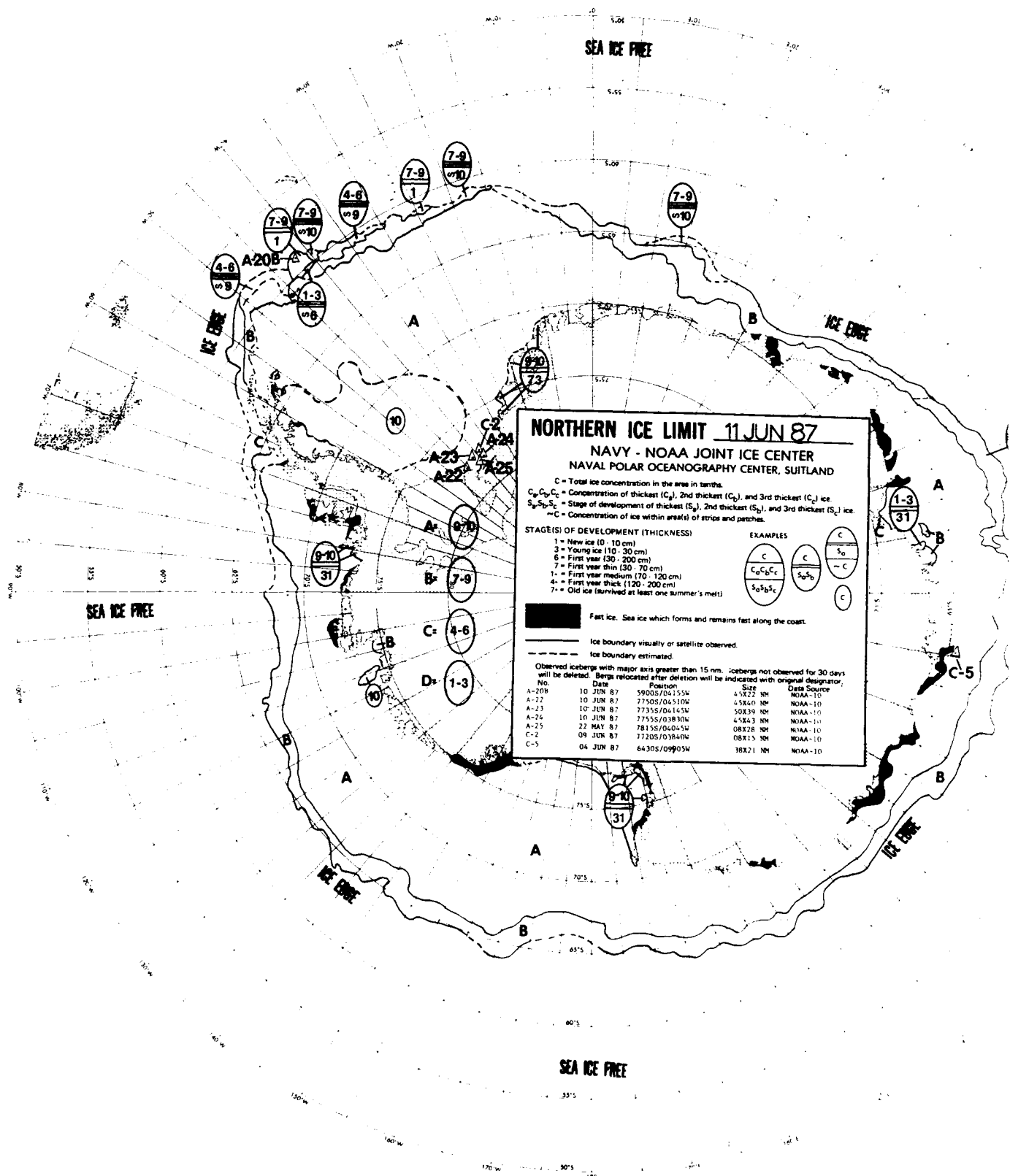


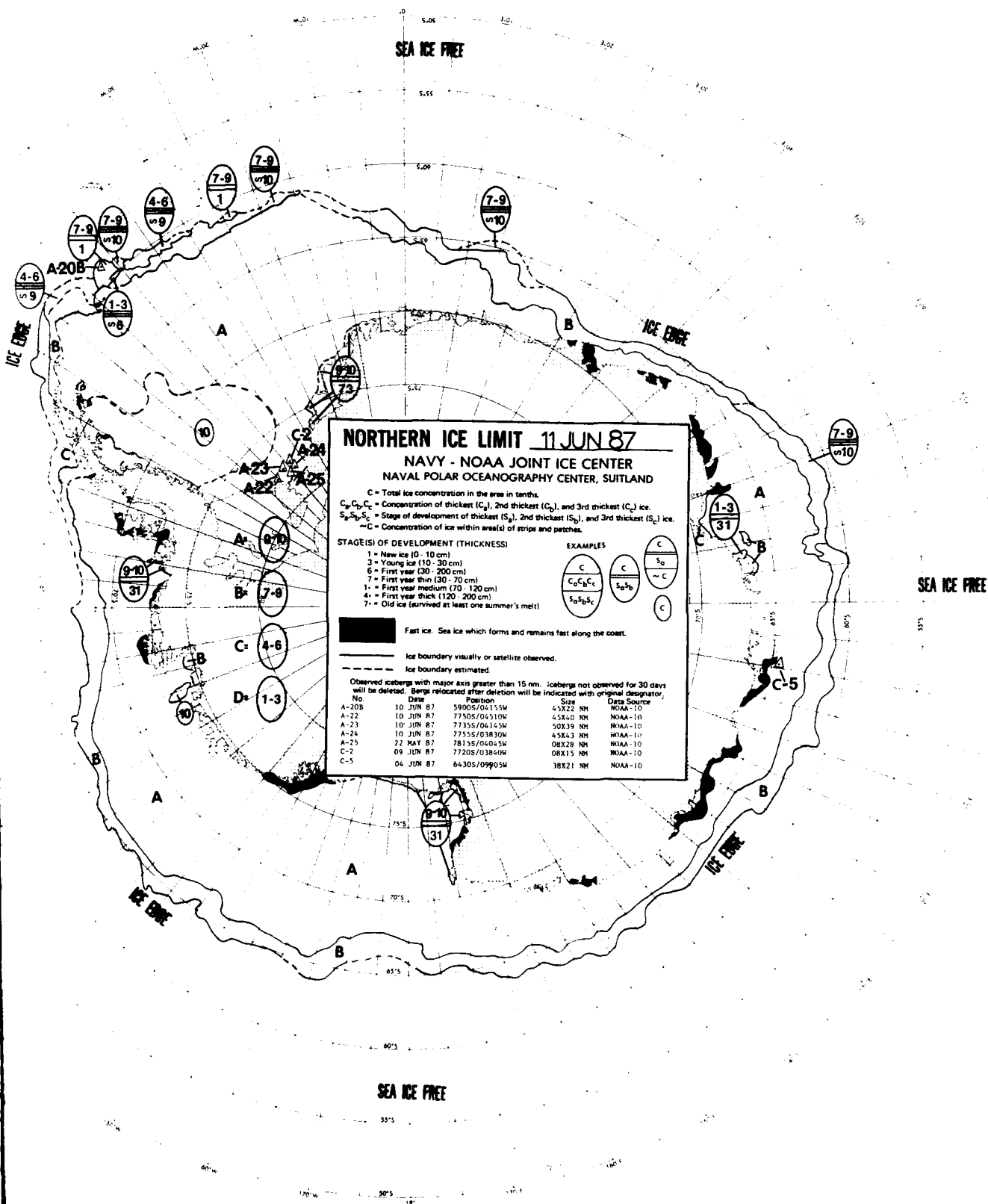


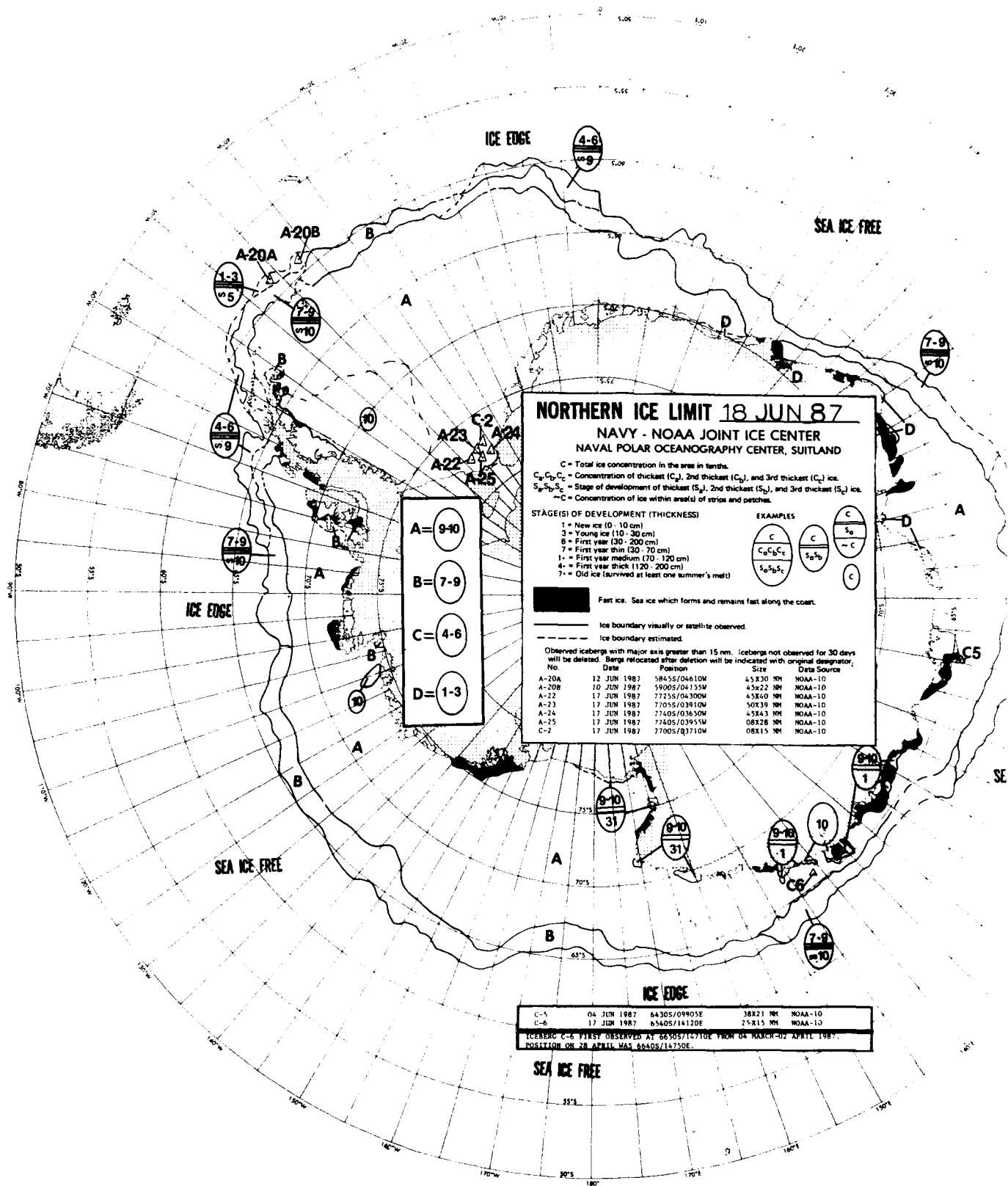


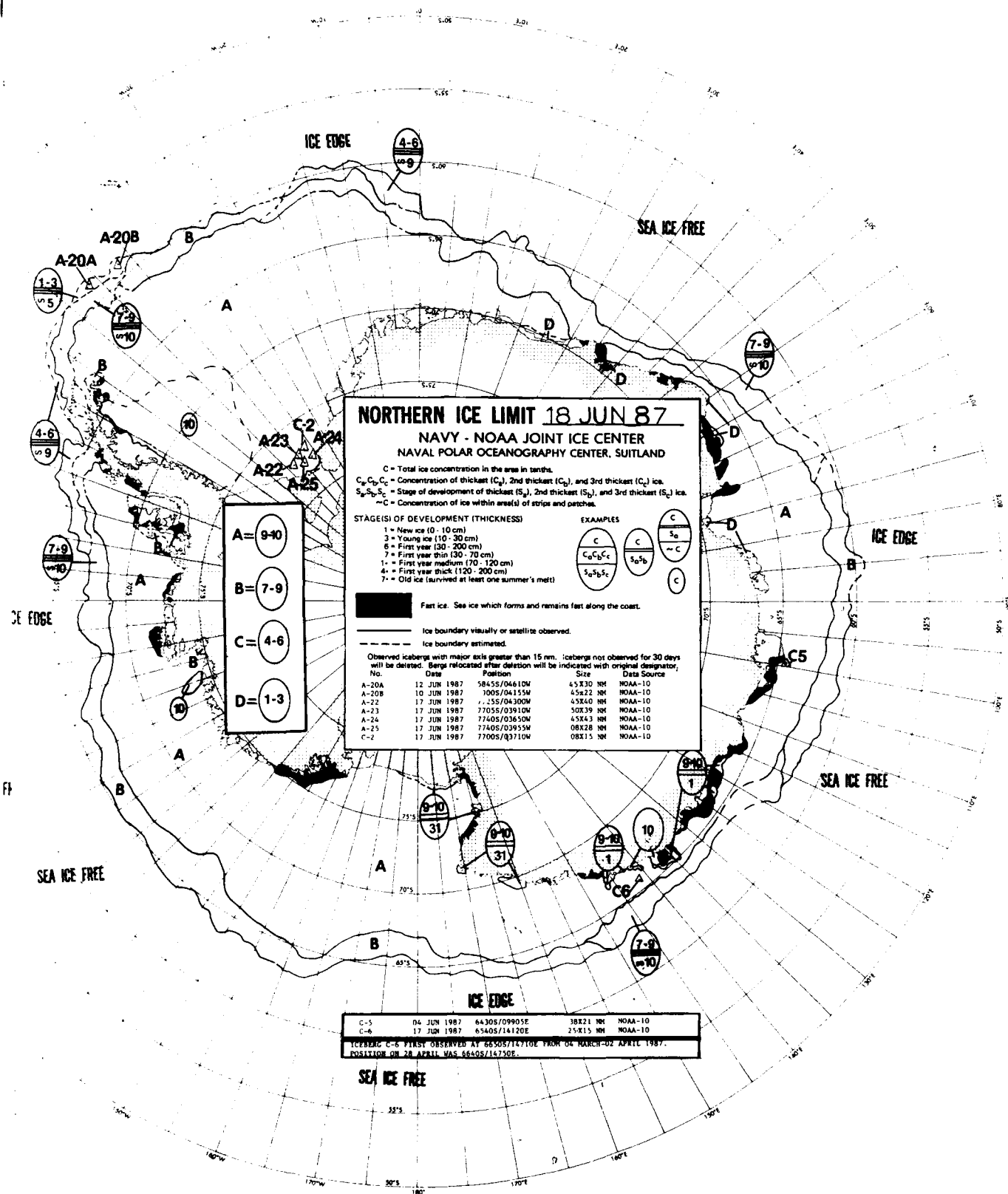
C-2	27 MAY 87	7715S/0374W	08X11 NM	NOAA-10
C-5	04 JUN 87	4430S/0990W	38X21 NM	NOAA-10

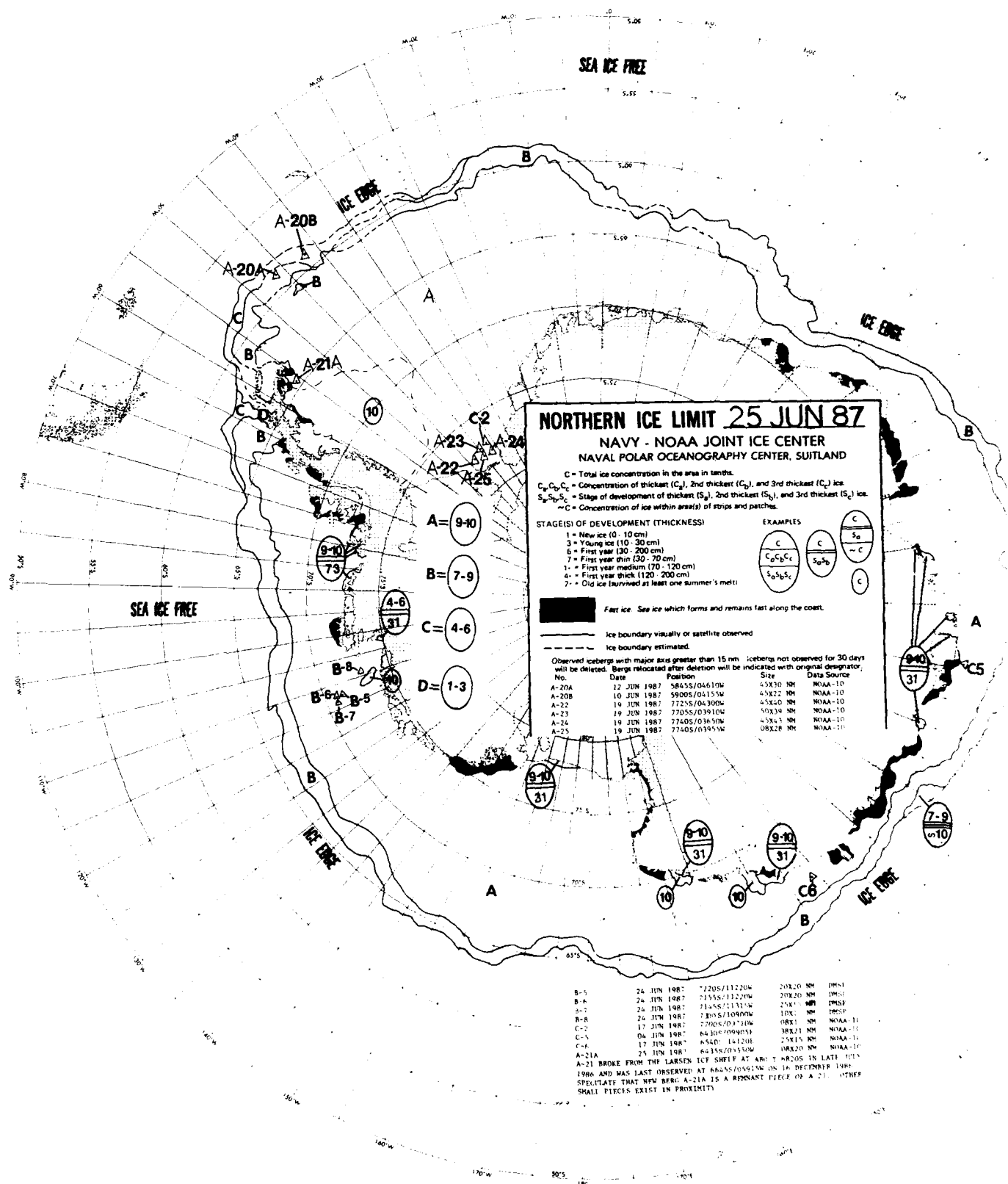


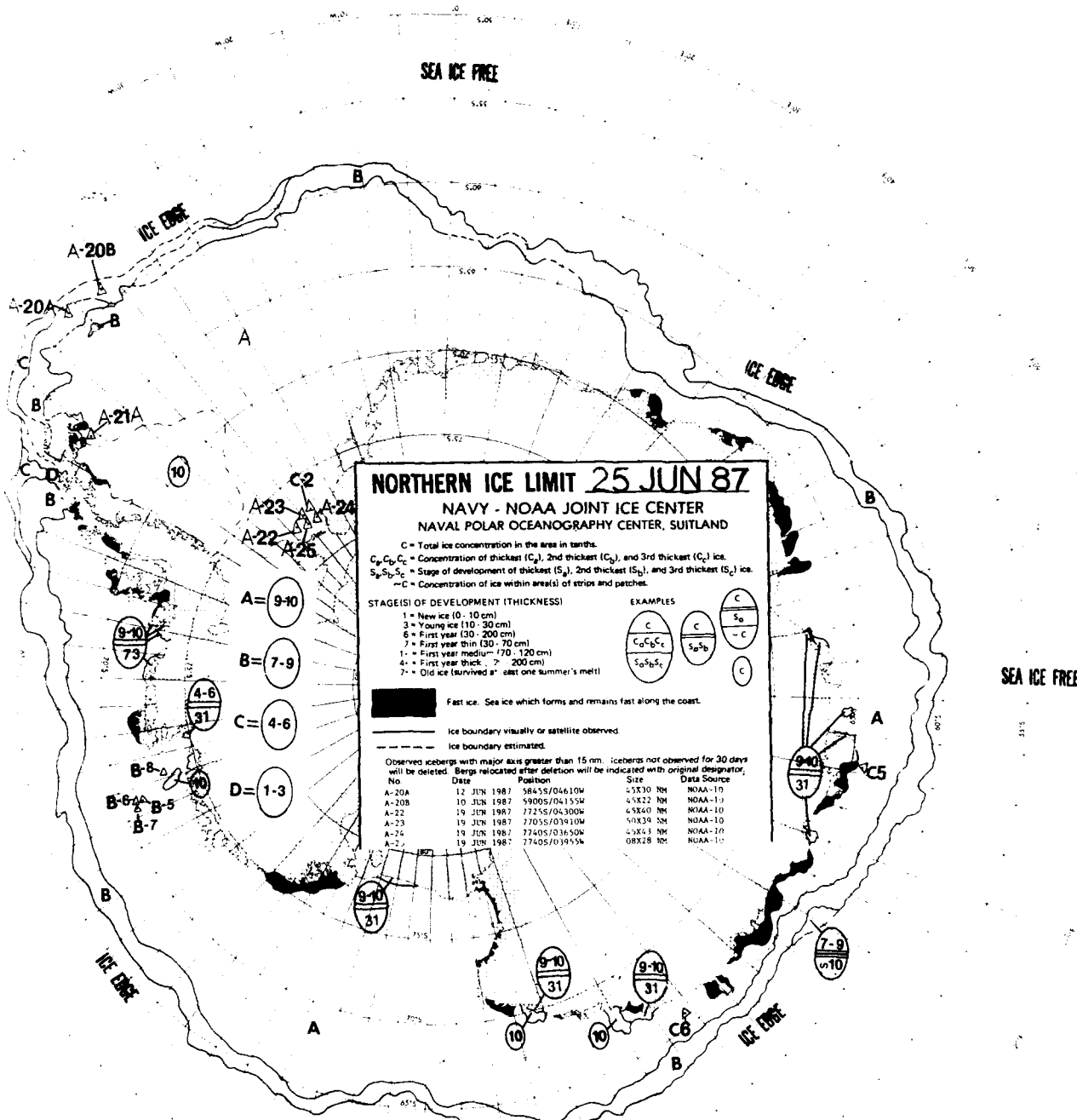








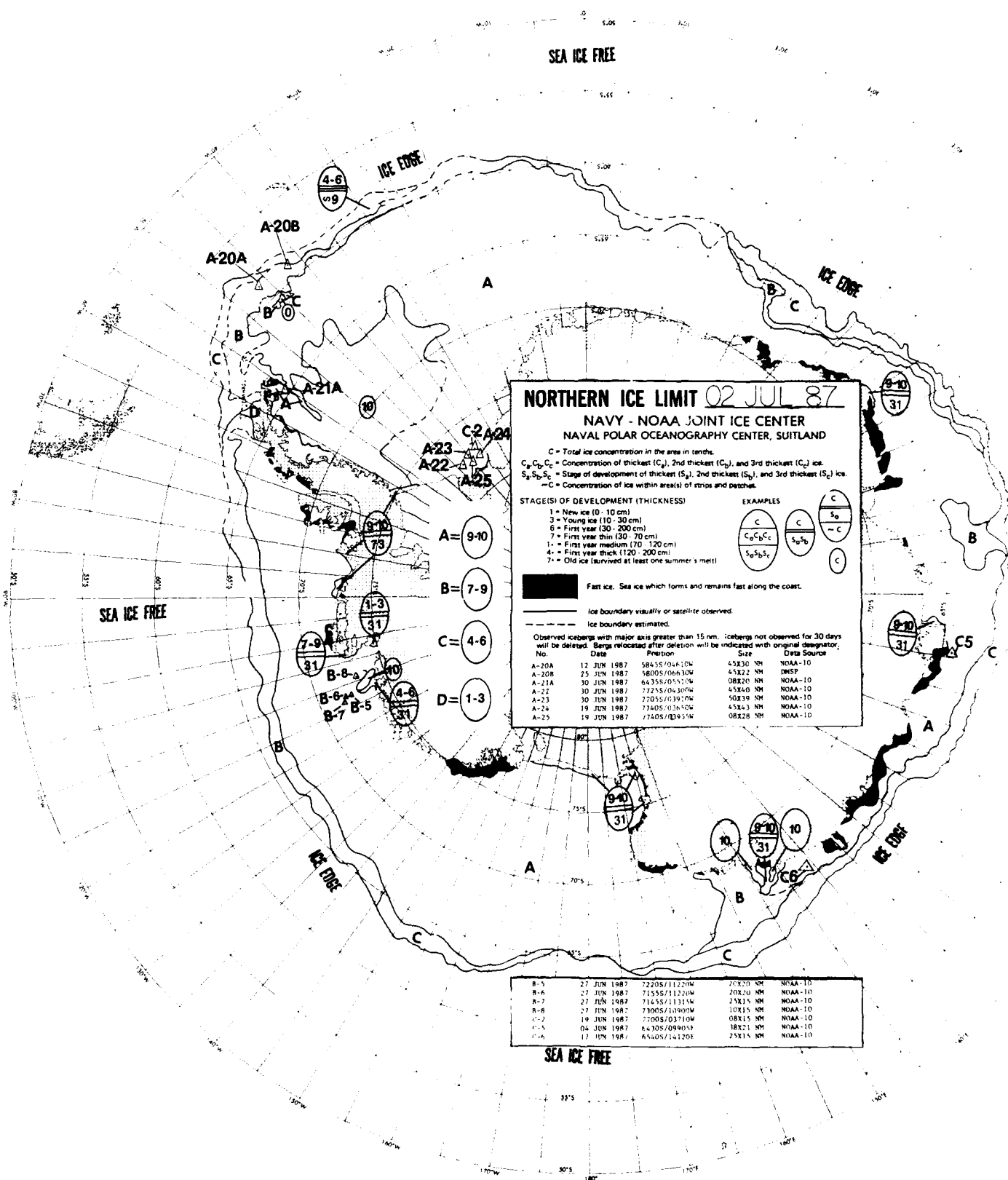


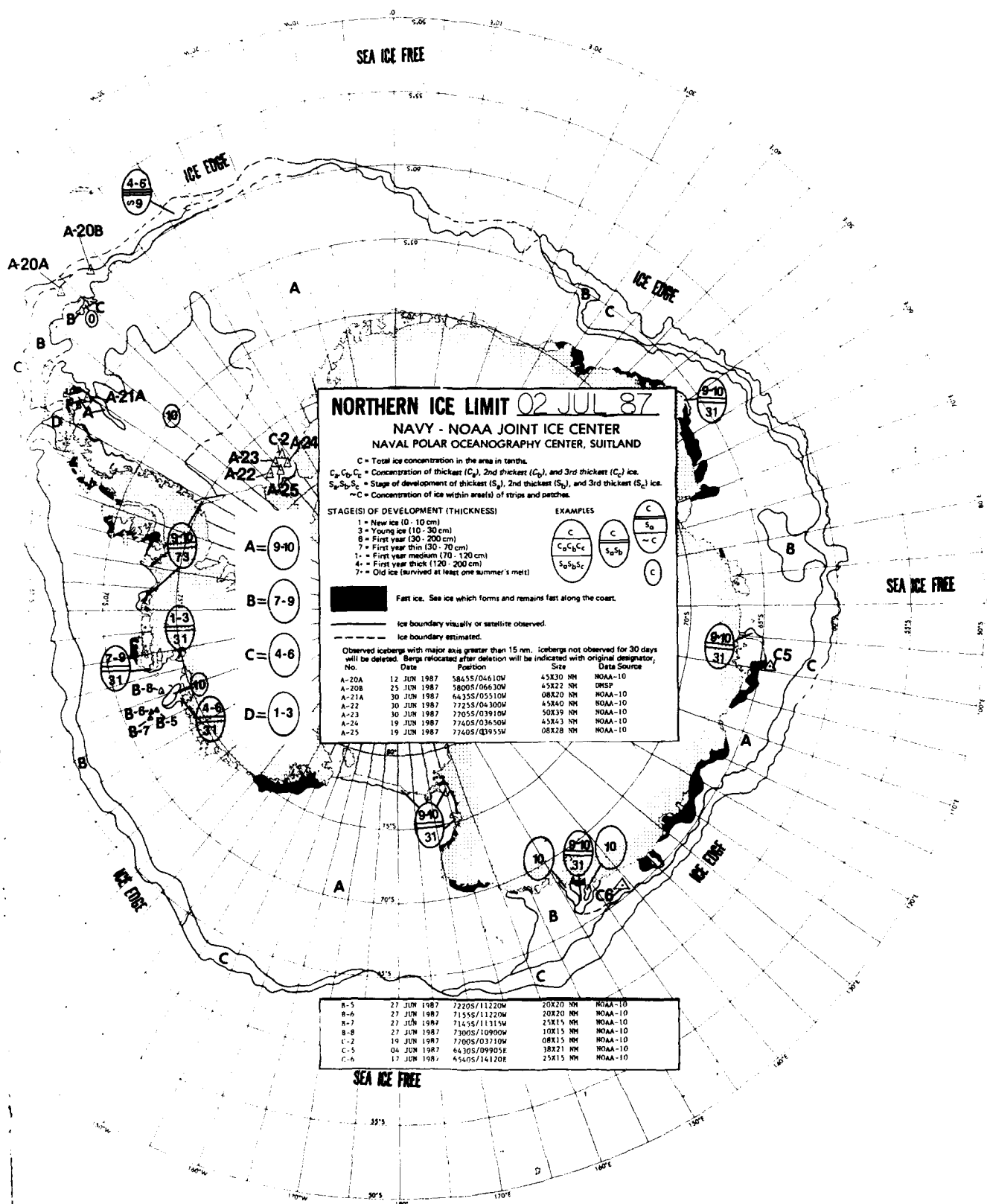


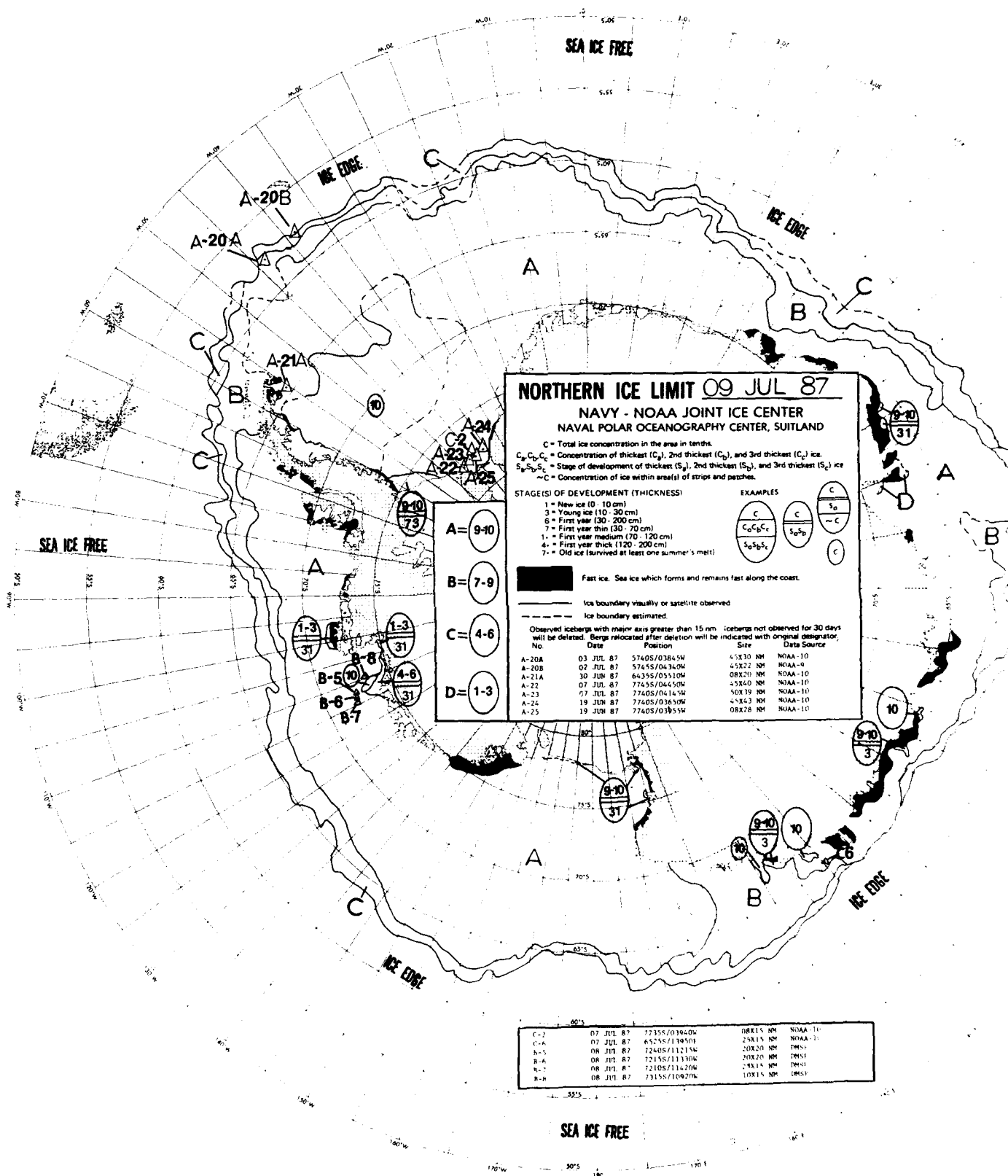
B-3	24 JUN 1987	7220S/11220W	20X20 NM	DMSP
B-4	24 JUN 1987	7155S/11220W	20X20 NM	DMSP
B-7	24 JUN 1987	7145S/11315W	25X15 NM	DMSP
B-8	24 JUN 1987	7105S/11600W	10X15 NM	DMSP
C-2	17 JUN 1987	7705S/03710W	08X15 NM	NOAA-10
C-4	04 JUN 1987	6430S/09905E	18X24 NM	NOAA-10
C-6	17 JUN 1987	6340S/11120E	25X15 NM	NOAA-10
A-21A	25 JUN 1987	6435S/05550W	08X20 NM	NOAA-10

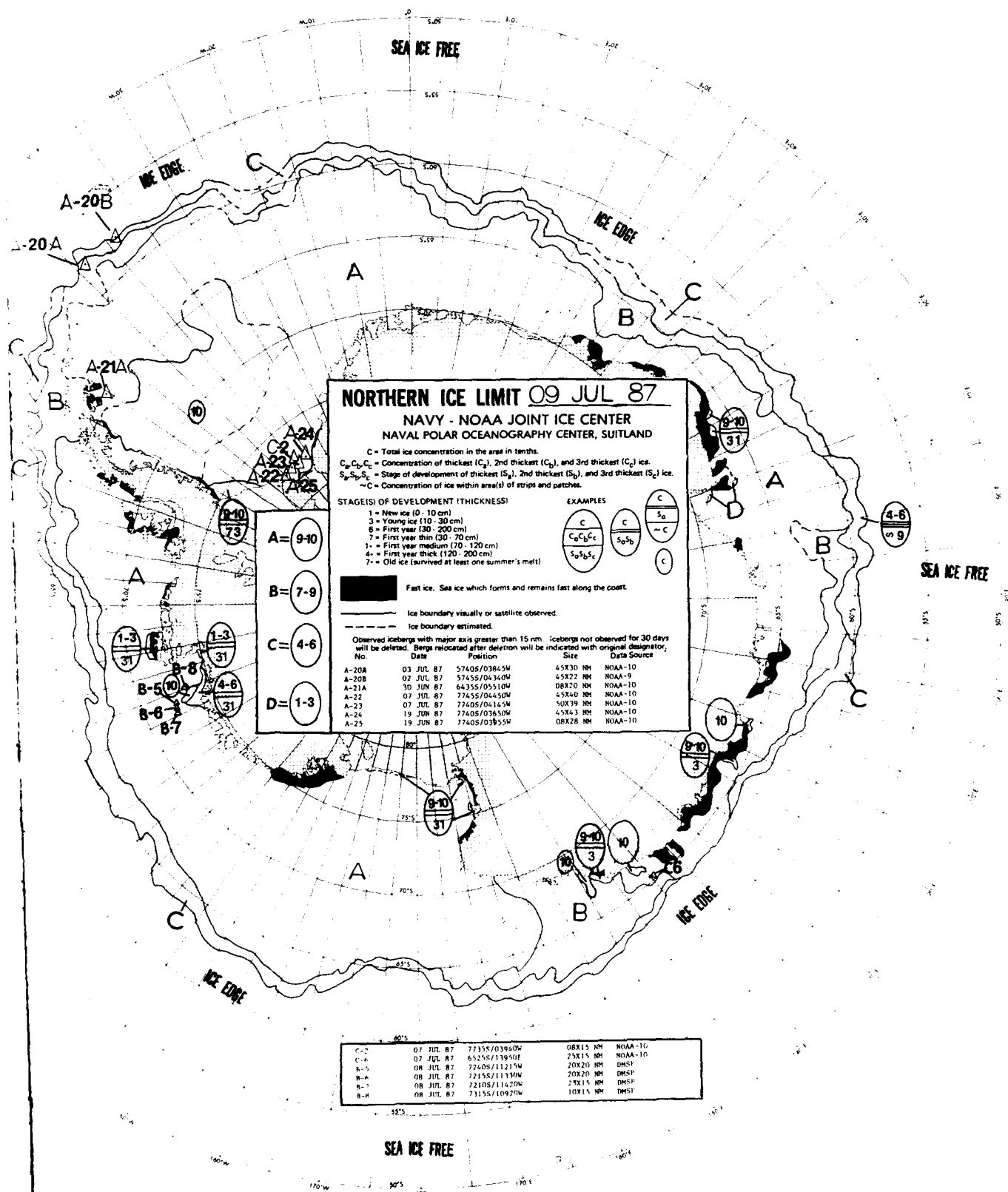
A-21 BROKE FROM THE LARSEN ICE SHEET AT ABOUT 6400S IN LATE JULY 1986 AND WAS LAST OBSERVED AT 6435S/05550W ON 16 DECEMBER 1986. SPECULATED THAT NEW BERGE A-21A IS A REMNANT PIECE OF A-21. OTHER SMALL PIECES EXIST IN PROXIMITY.

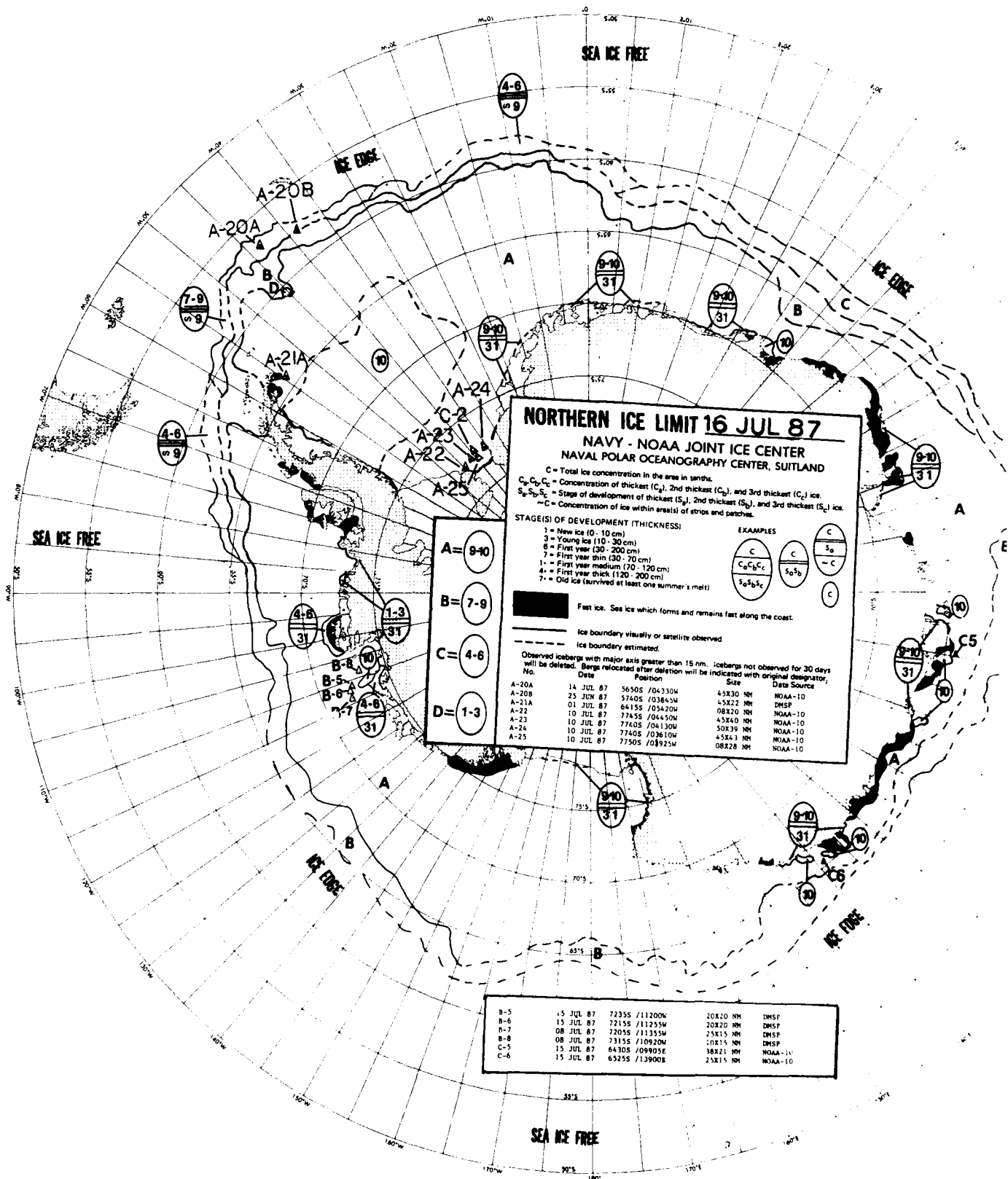
SEA ICE FREE

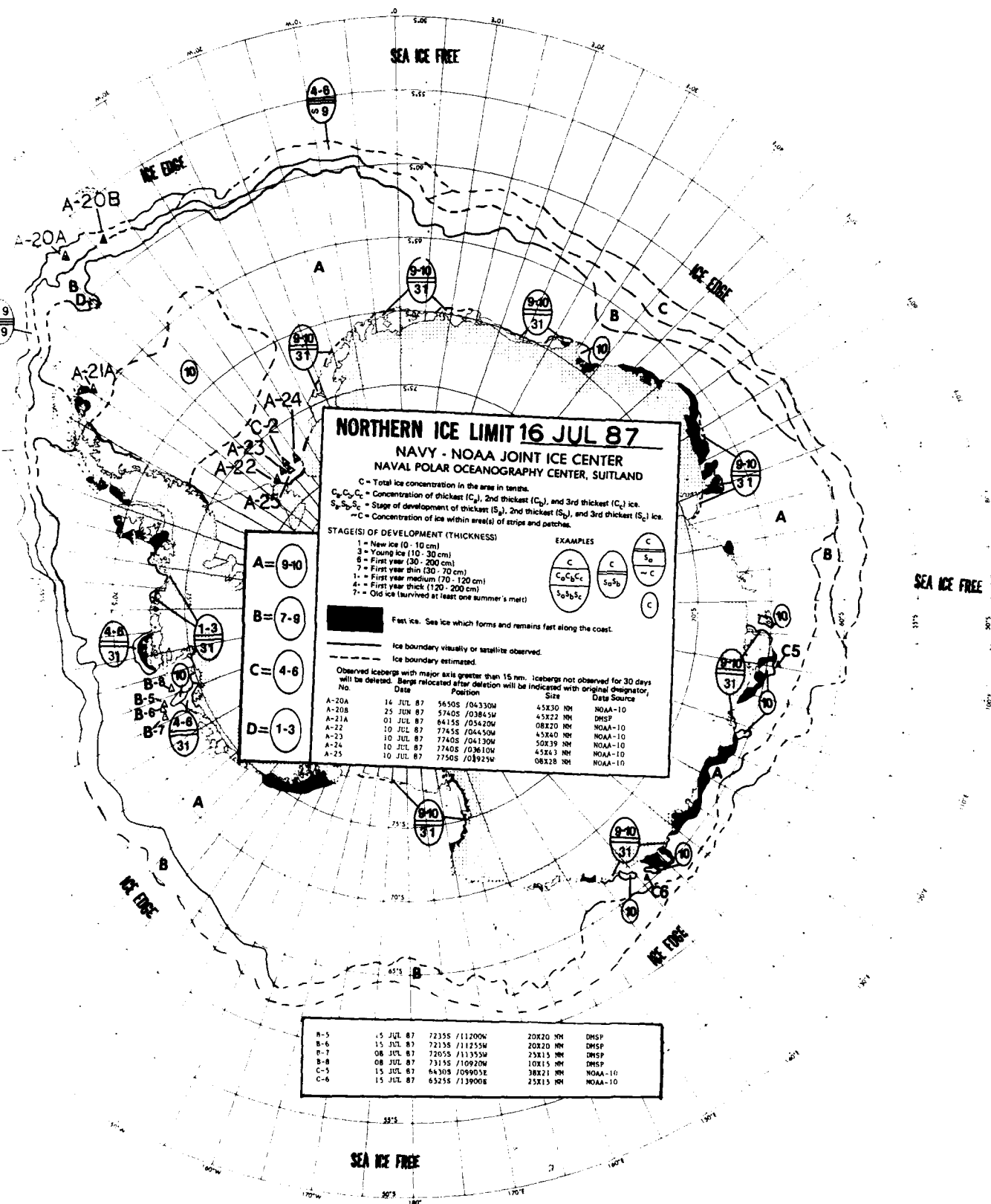


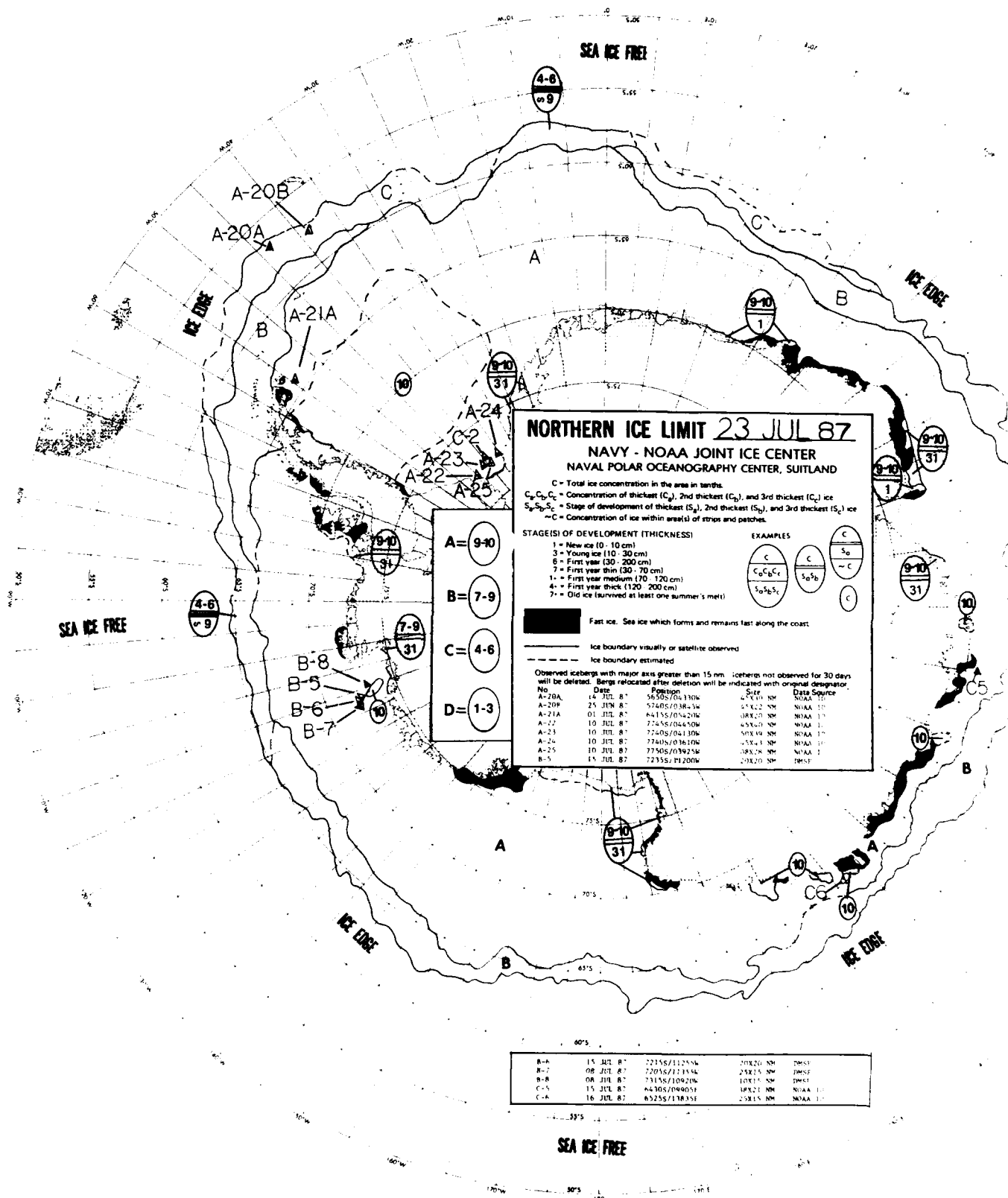


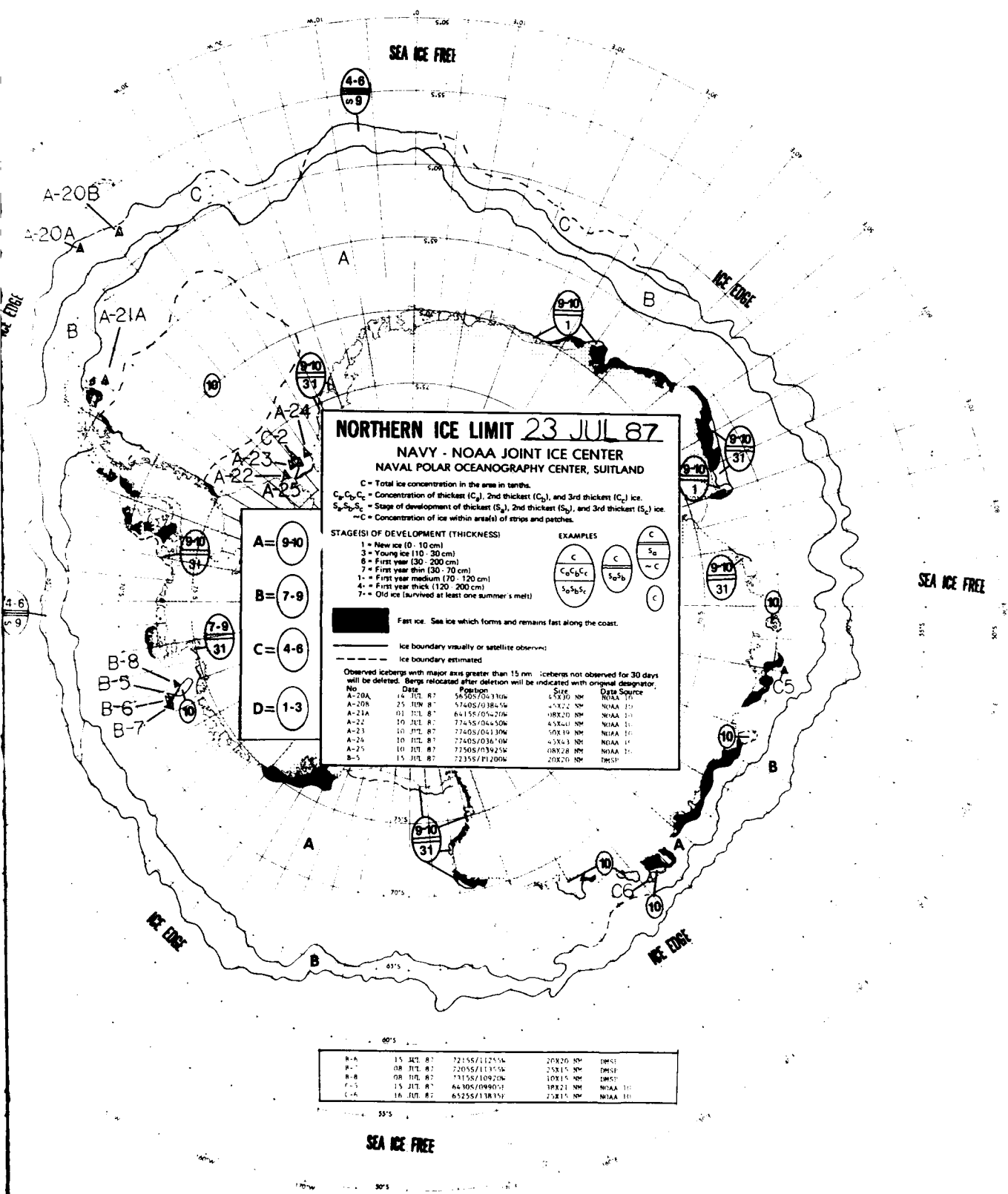


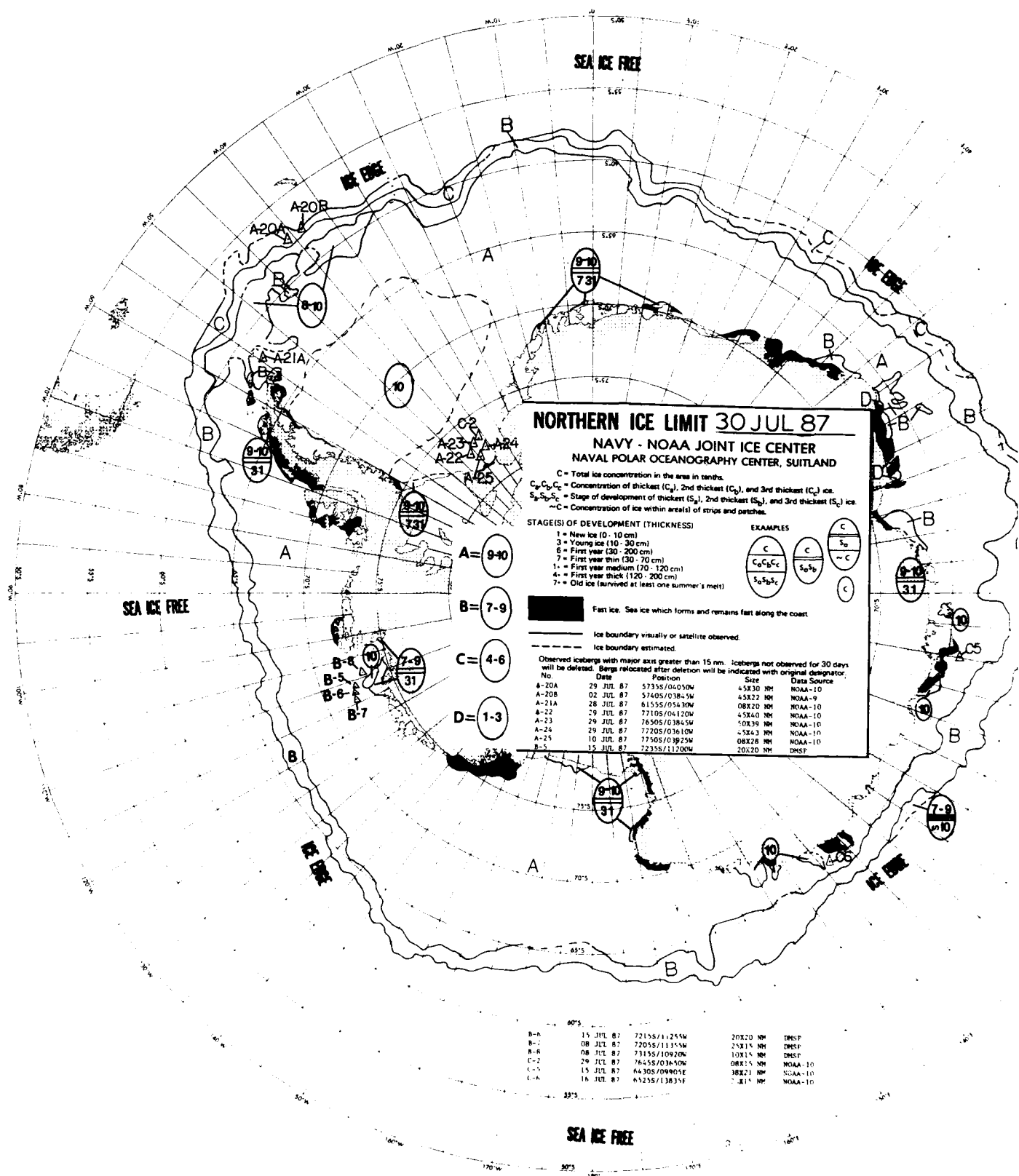


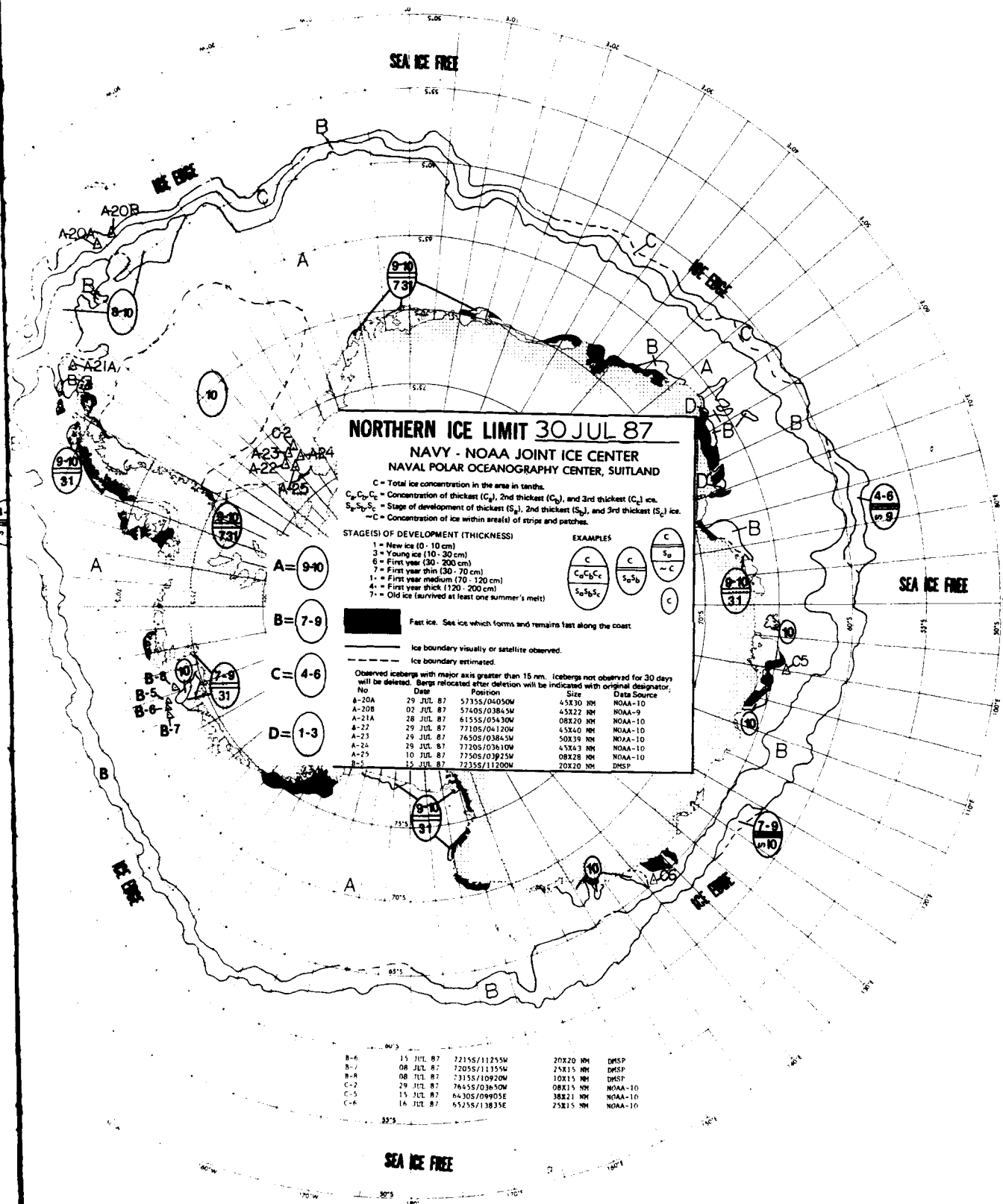


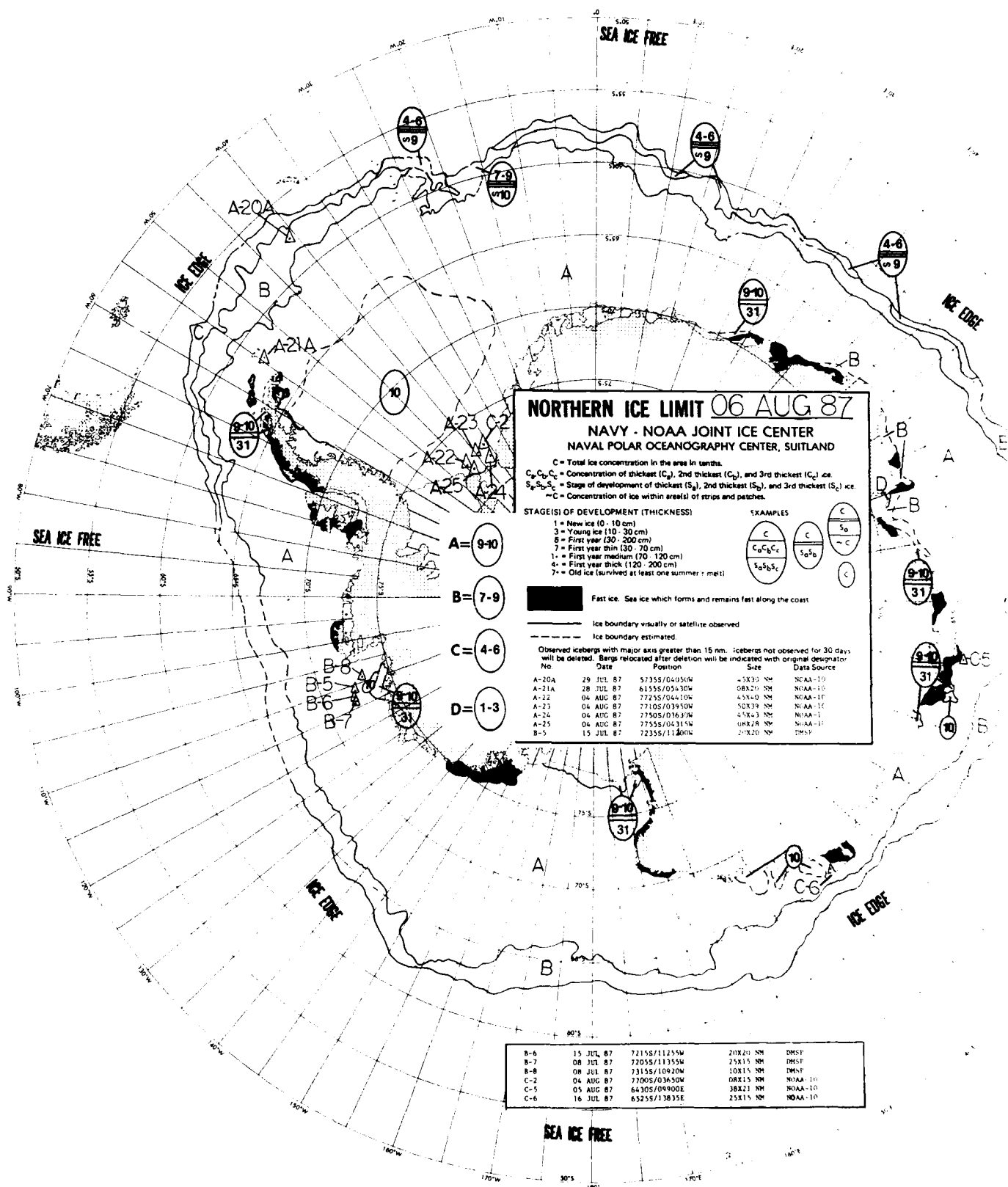


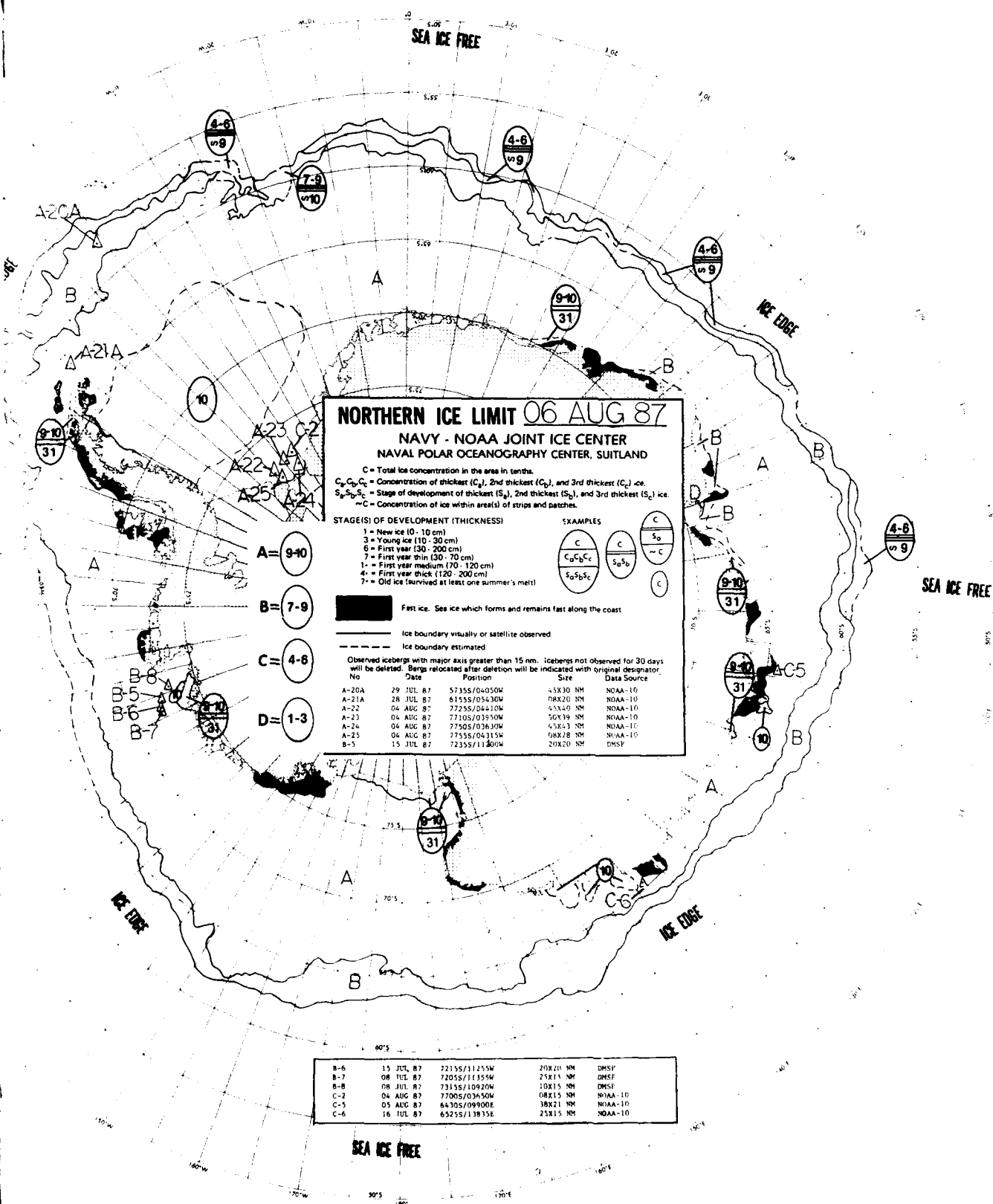


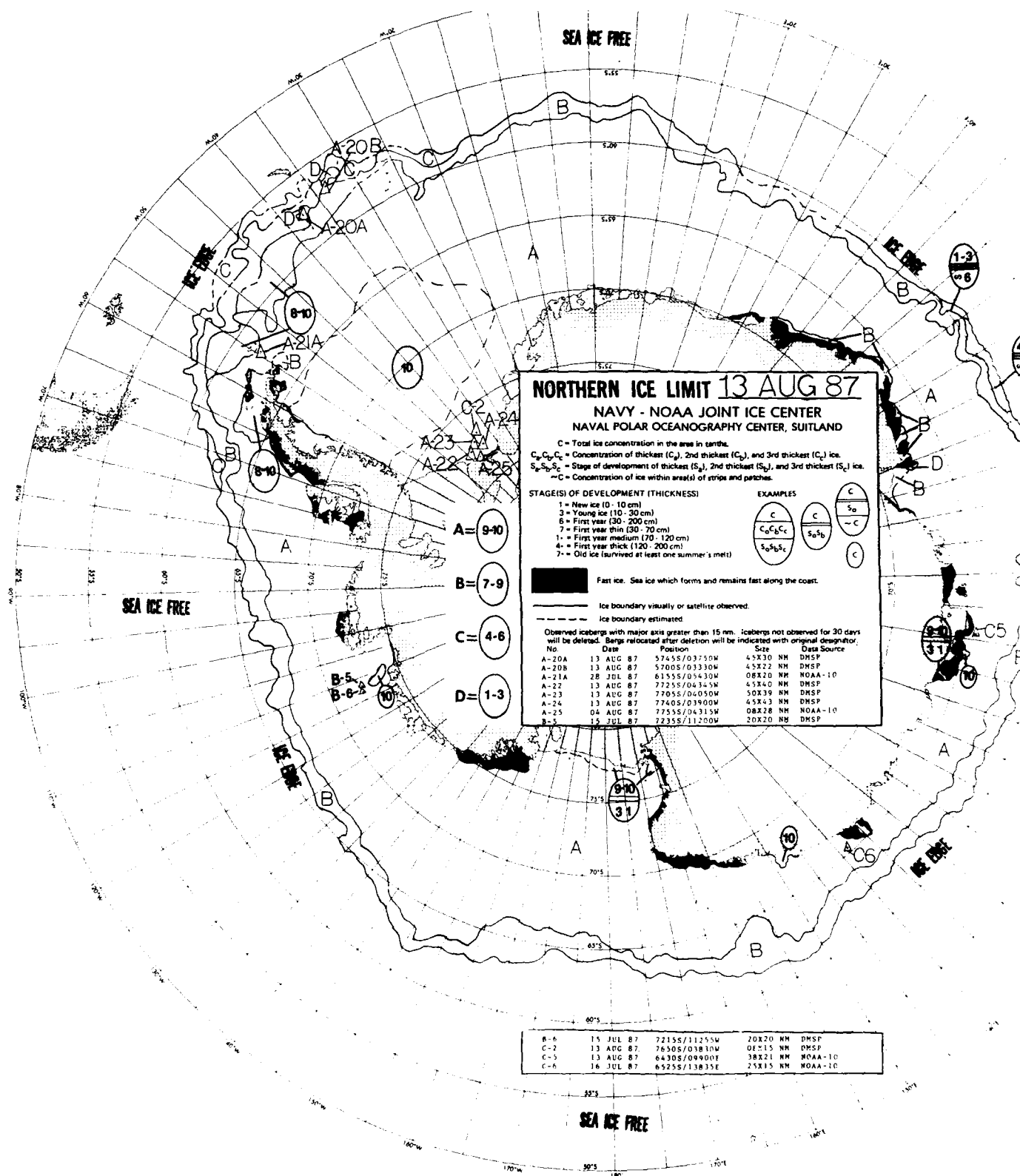


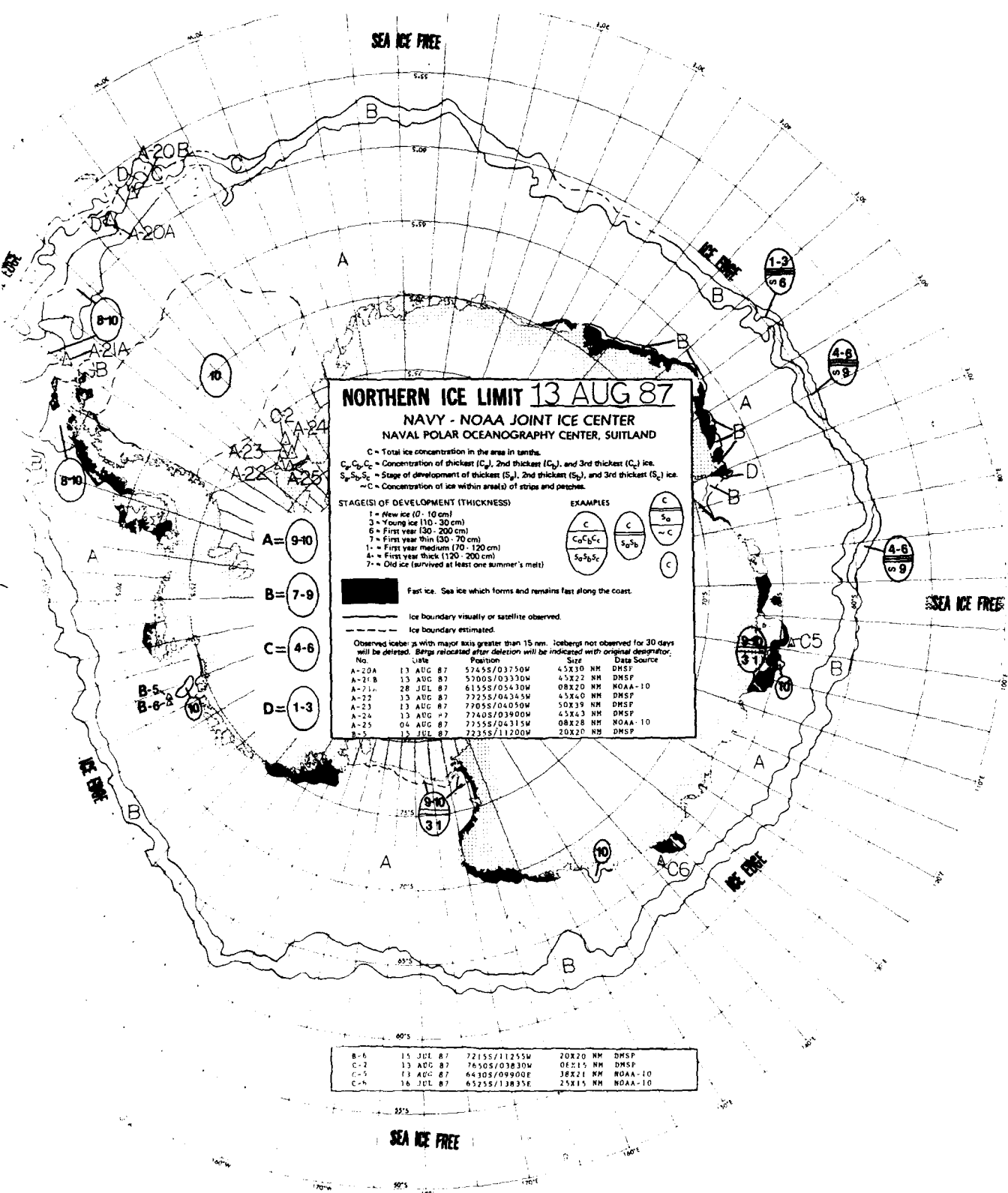


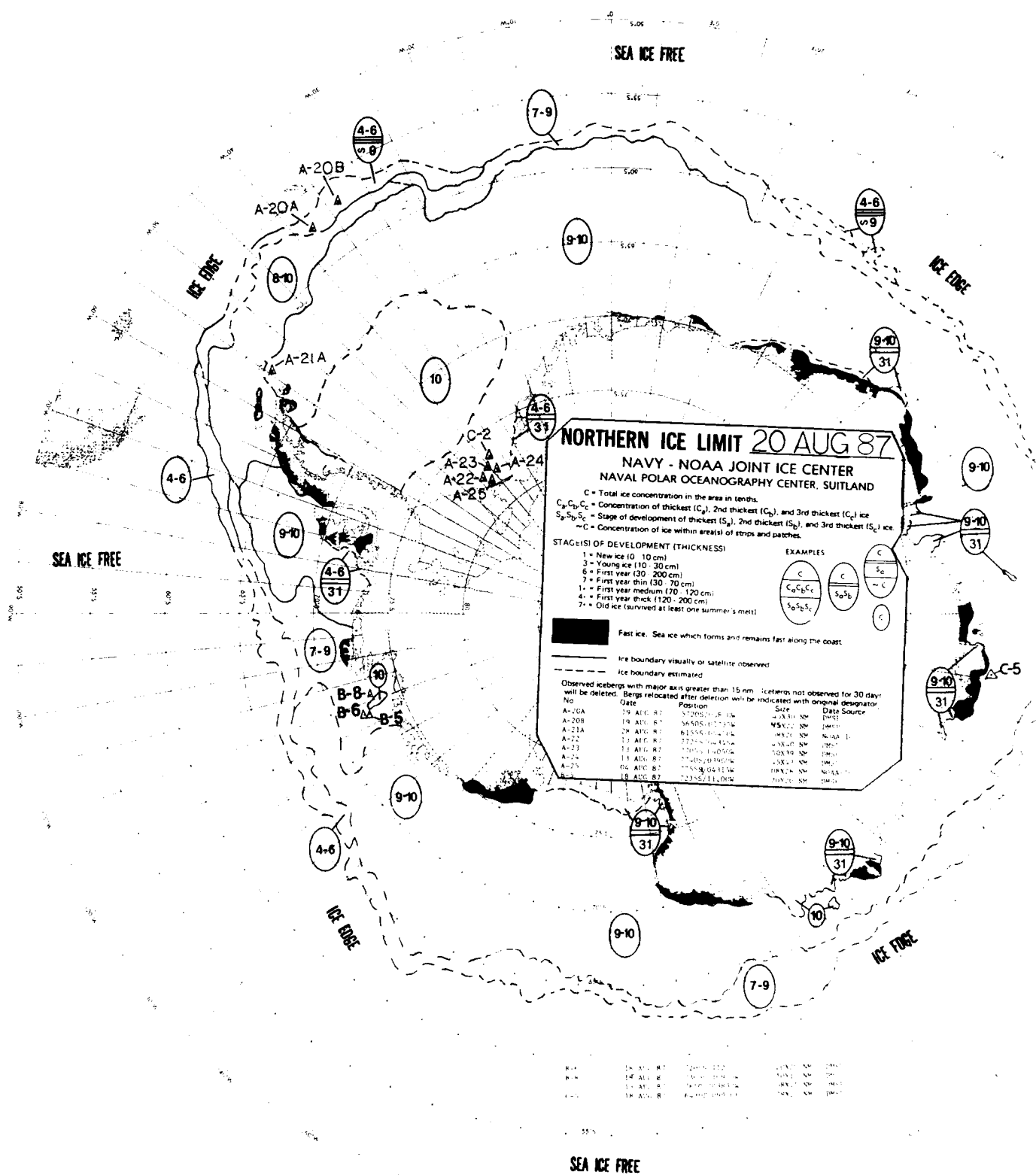


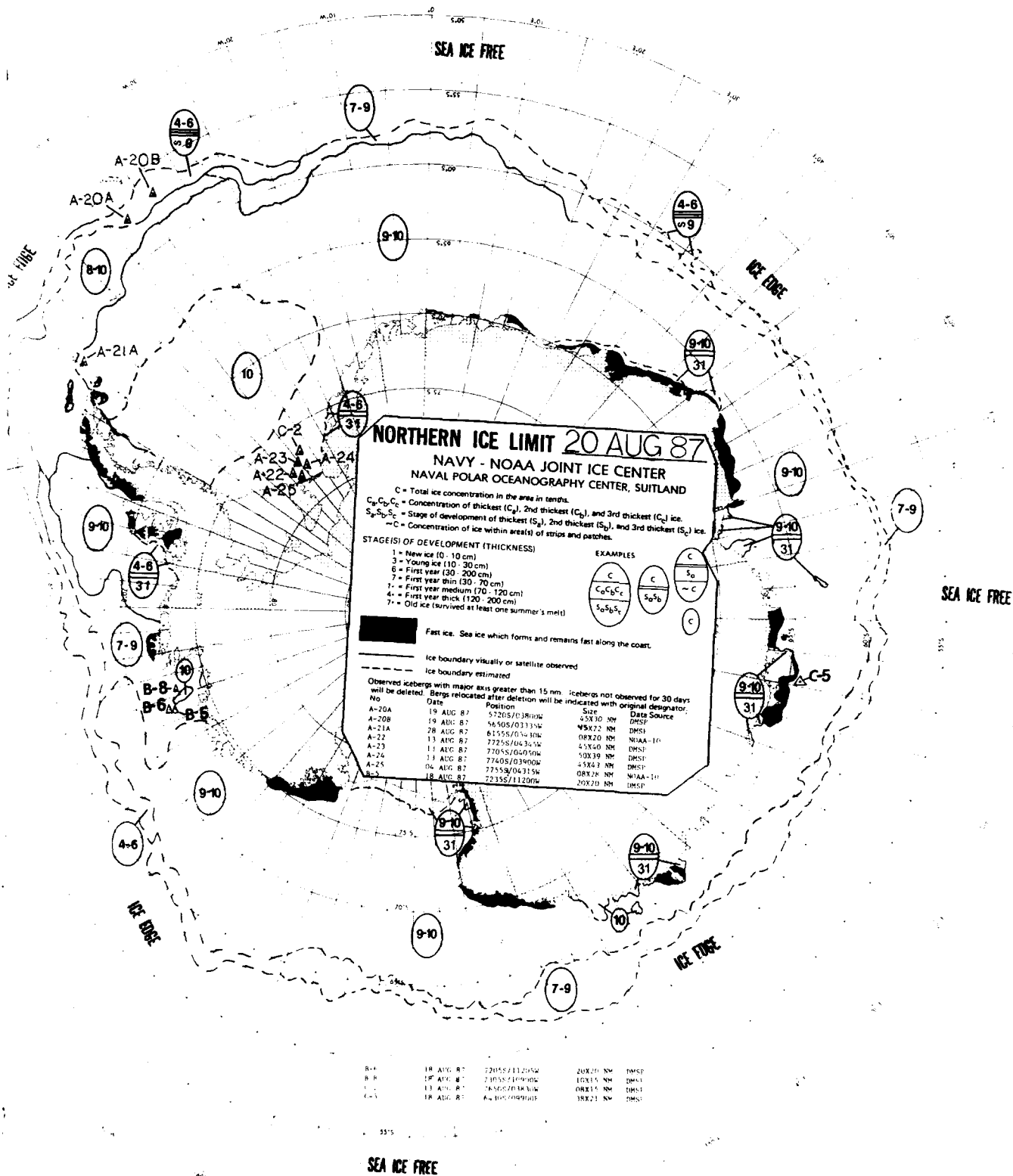


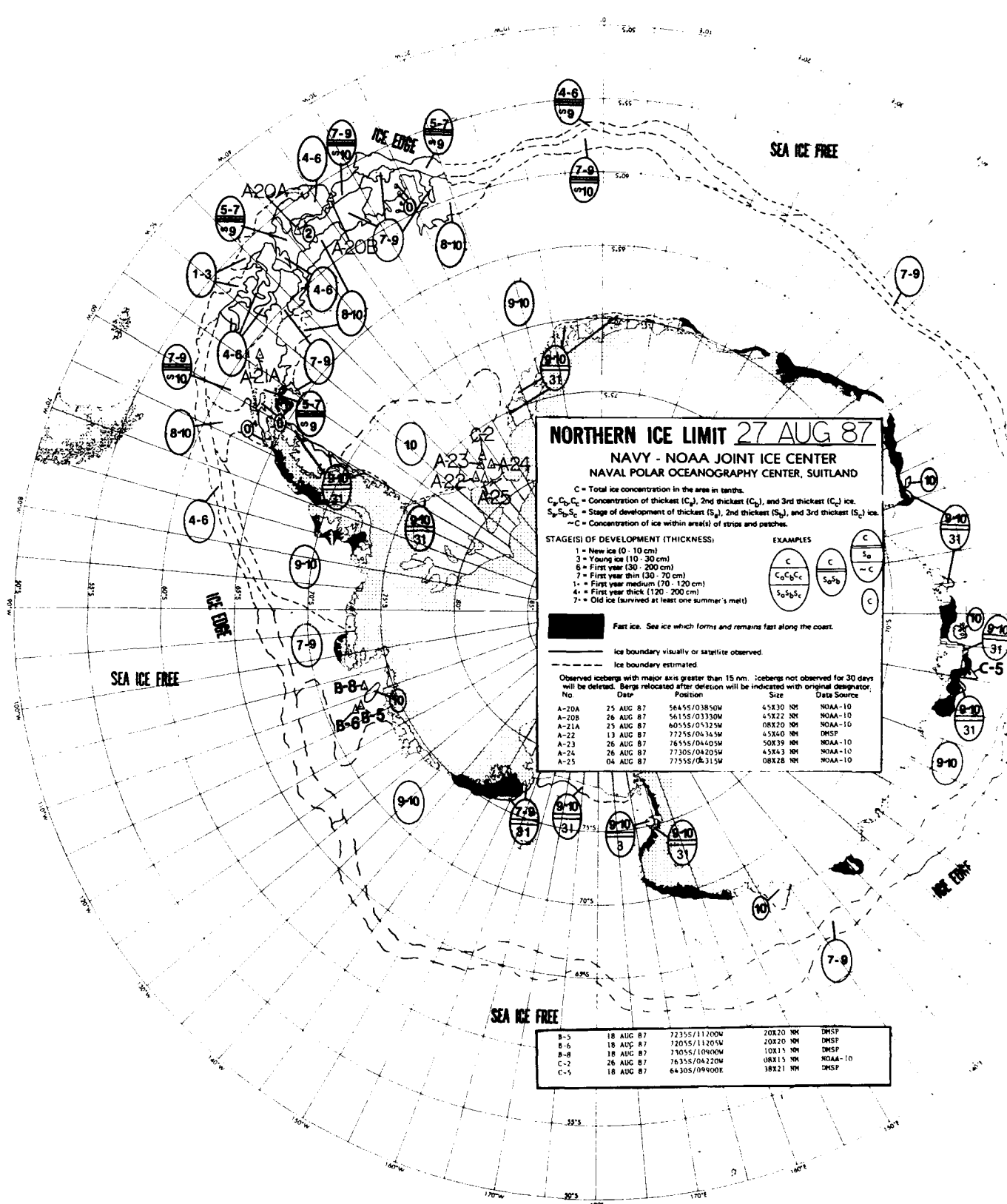












NORTHERN ICE LIMIT 27 AUG 87

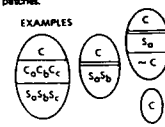
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
-C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS):

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



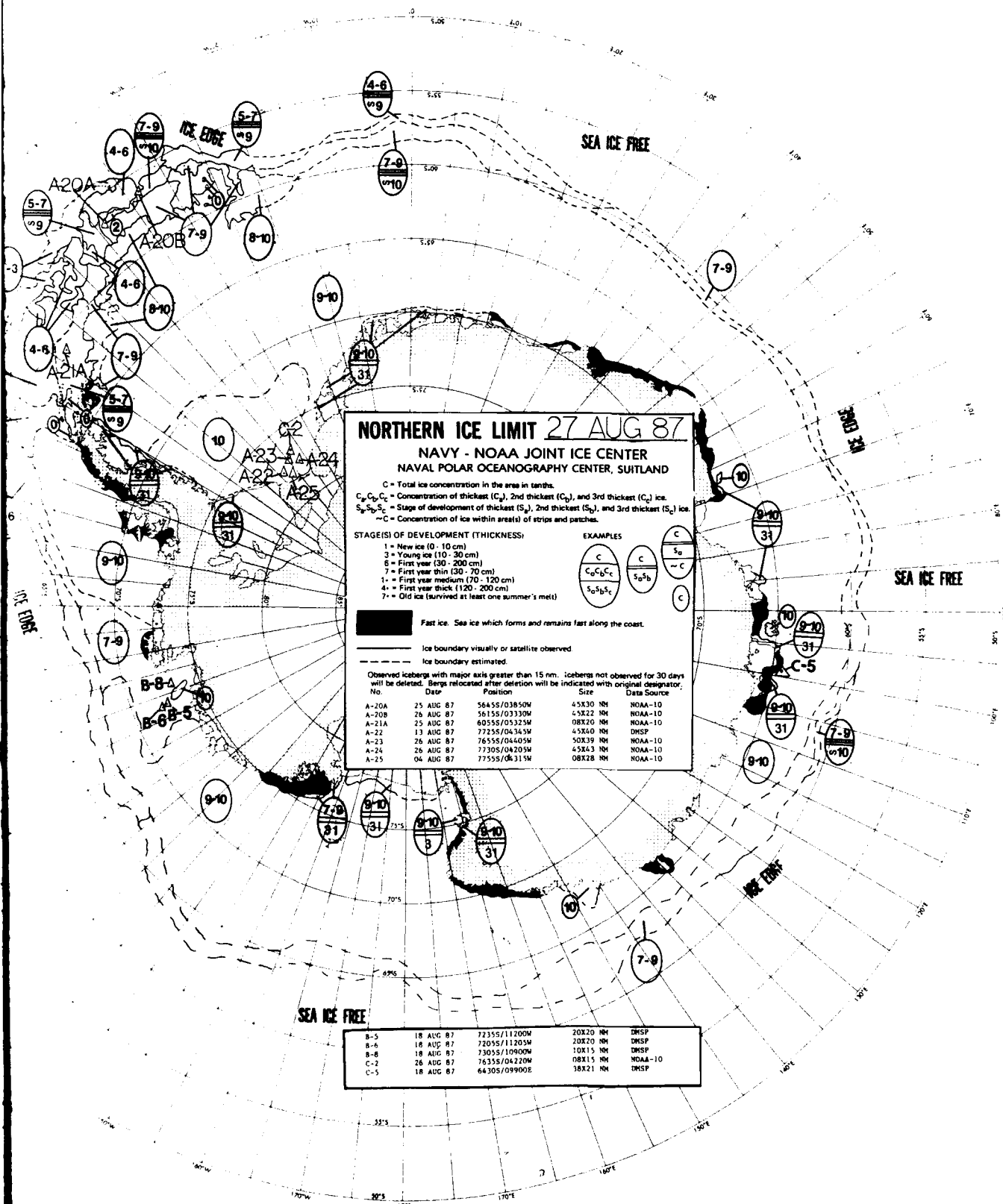
Fast ice. See ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	25 AUG 87	54455/03850W	45830 NM	NOAA-10
A-20B	26 AUG 87	56155/03330W	45822 NM	NOAA-10
A-21A	25 AUG 87	60555/05325W	08820 NM	NOAA-10
A-22	13 AUG 87	72255/04345W	45840 NM	DMSP
A-23	26 AUG 87	76555/04405W	50839 NM	NOAA-10
A-24	26 AUG 87	77305/04205W	45843 NM	NOAA-10
A-25	04 AUG 87	77555/04315W	08828 NM	NOAA-10

B-5	18 AUG 87	72355/11200W	20820 NM	DMSP
B-6	18 AUG 87	72055/11205W	20820 NM	DMSP
B-8	18 AUG 87	71055/10800W	10815 NM	DMSP
C-2	26 AUG 87	76355/04220W	08815 NM	NOAA-10
C-5	18 AUG 87	64305/09400E	18821 NM	DMSP



NORTHERN ICE LIMIT 27 AUG 87

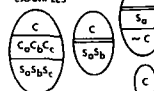
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
-C = Concentration of ice within area(s) of strips and patches.

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 70 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. Sea ice which forms and remains fast along the coast.

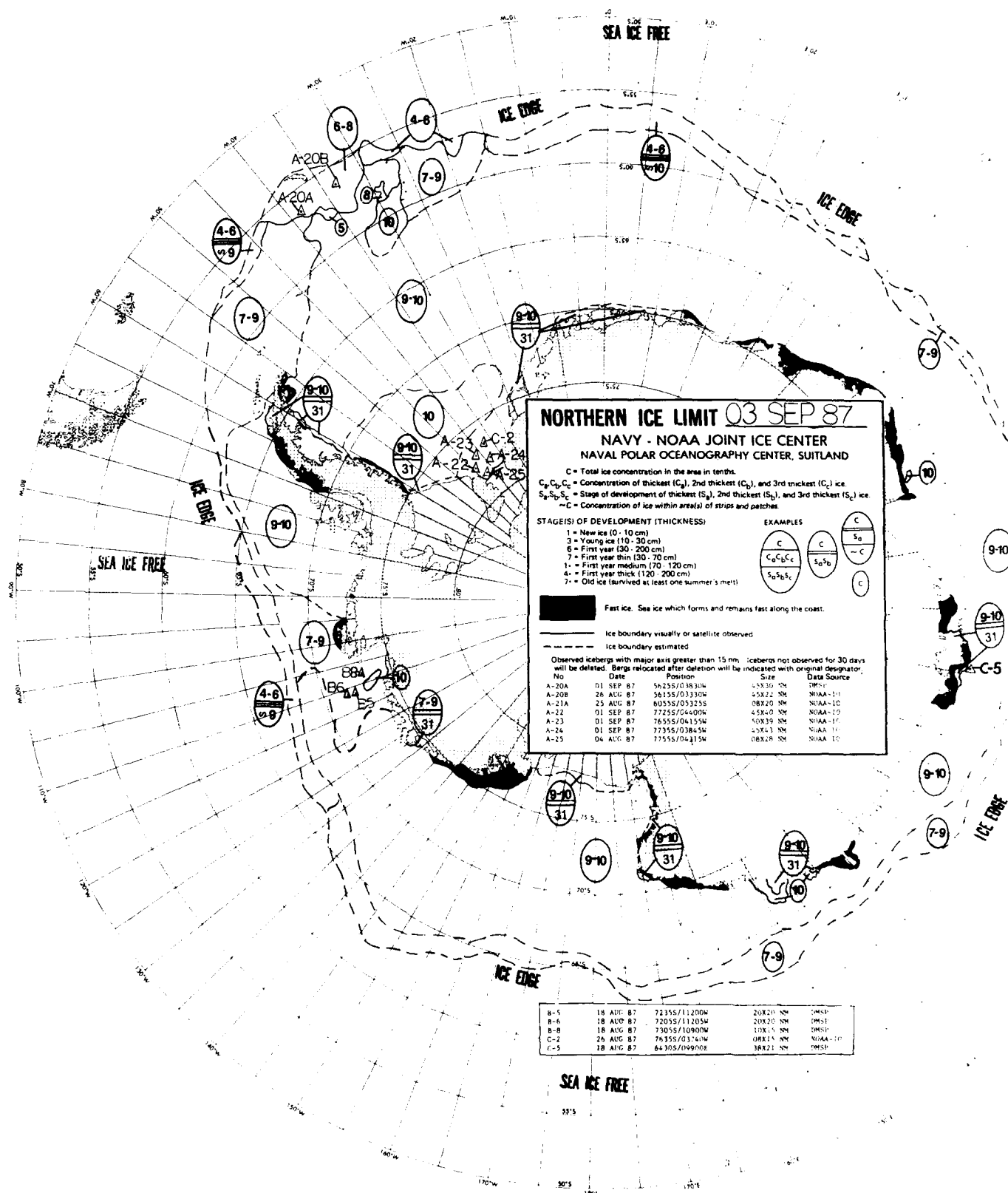
Ice boundary visually or satellite observed

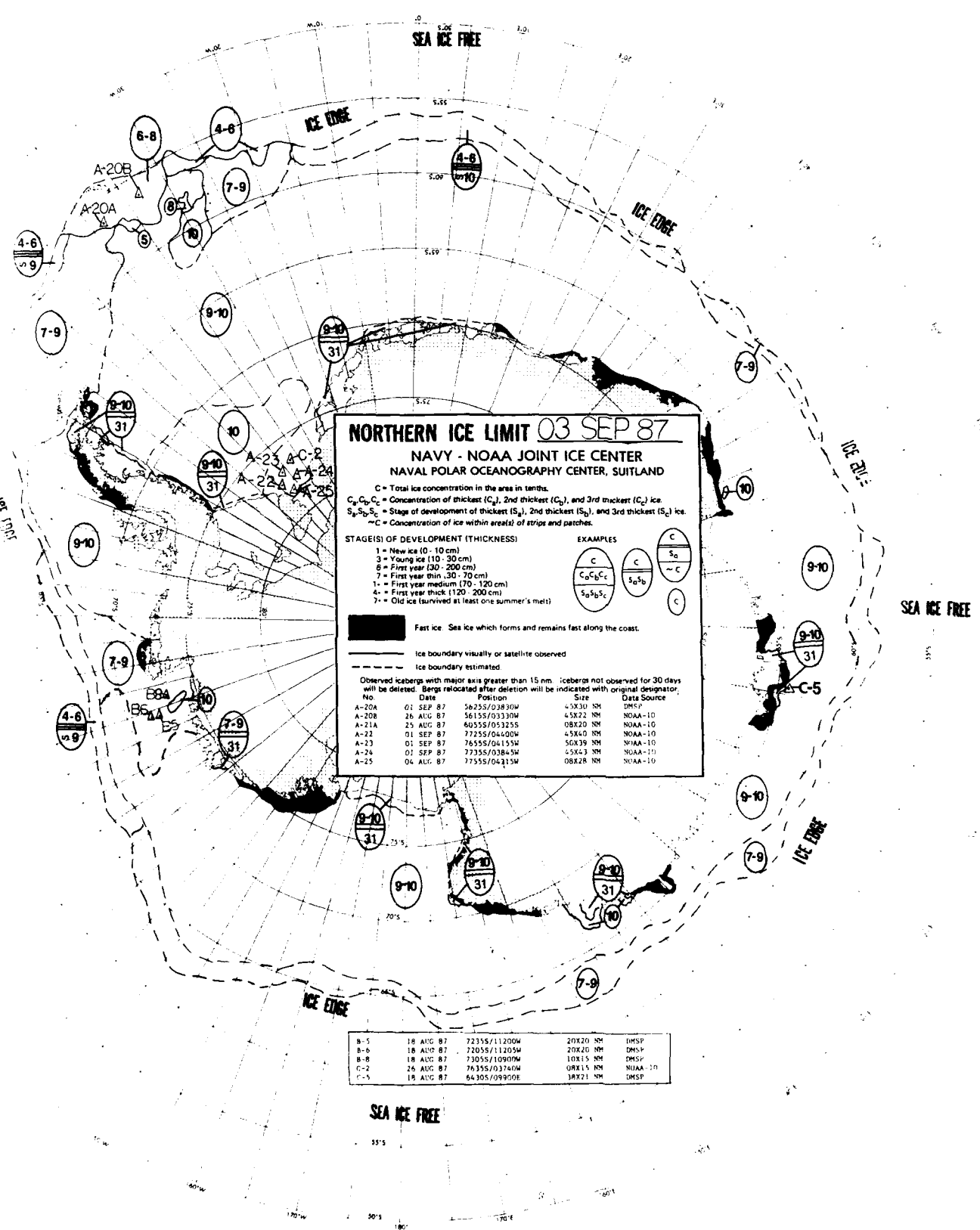
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	25 AUG 87	56455/03850W	45X30 NM	NOAA-10
A-20B	26 AUG 87	56155/03330W	45X22 NM	NOAA-10
A-21A	25 AUG 87	60555/05325W	08X20 NM	NOAA-10
A-22	13 AUG 87	72355/04345W	45X40 NM	DRSP
A-23	26 AUG 87	76555/04405W	50X39 NM	NOAA-10
A-24	26 AUG 87	77305/04205W	45X43 NM	NOAA-10
A-25	04 AUG 87	77555/06315W	08X28 NM	NOAA-10

B-5	18 AUG 87	72355/11200W	20X20 NM	DRSP
B-6	18 AUG 87	72055/11205W	20X20 NM	DRSP
B-8	18 AUG 87	73055/10900W	10X15 NM	DRSP
C-2	26 AUG 87	76355/04220W	08X15 NM	NOAA-10
C-5	18 AUG 87	64305/09900E	38X21 NM	DRSP





NORTHERN ICE LIMIT 03 SEP 87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 $\sim C$ = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
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- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES

$\frac{C}{C_1 C_2 C_3}$
 $\frac{S_1 S_2 S_3}{\sim C}$

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

$\frac{C}{S_1}$
 $\frac{C}{\sim C}$

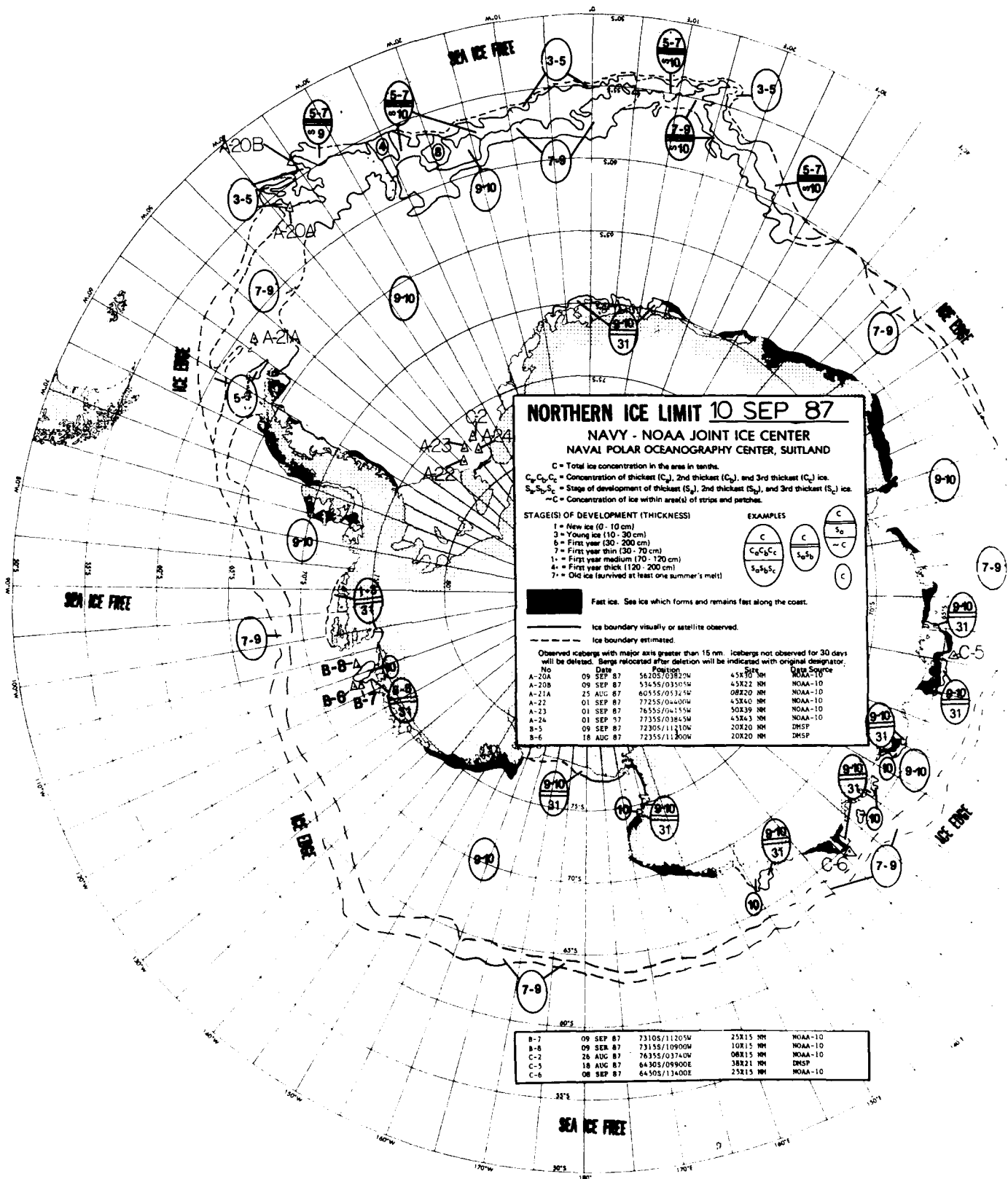
Legend:

- Fast ice - Sea ice which forms and remains fast along the coast.
- Ice boundary visually or satellite observed
- Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	01 SEP 87	56255/03830W	45X30 NM	DMSP
A-20B	26 AUG 87	56155/03330W	45X22 NM	NOAA-10
A-21A	25 AUG 87	60555/053255	08X20 NM	NOAA-10
A-22	01 SEP 87	72255/04600W	45X40 NM	NOAA-10
A-23	01 SEP 87	76555/04155W	50X39 NM	NOAA-10
A-24	01 SEP 87	77355/03845W	45X43 NM	NOAA-10
A-25	04 AUG 87	77555/04115W	08X28 NM	NOAA-10

B-5	18 AUG 87	72355/11200W	20X20 NM	DMSP
B-6	18 AUG 87	72055/11205W	20X20 NM	DMSP
B-8	18 AUG 87	73055/10900W	10X15 NM	DMSP
C-2	26 AUG 87	76355/03740W	08X15 NM	NOAA-10
C-5	18 AUG 87	64305/09900E	38X21 NM	DMSP



NORTHERN ICE LIMIT 10 SEP 87

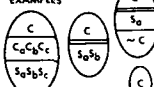
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
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S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
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STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
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- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. See ice which forms and remains fast along the coast.

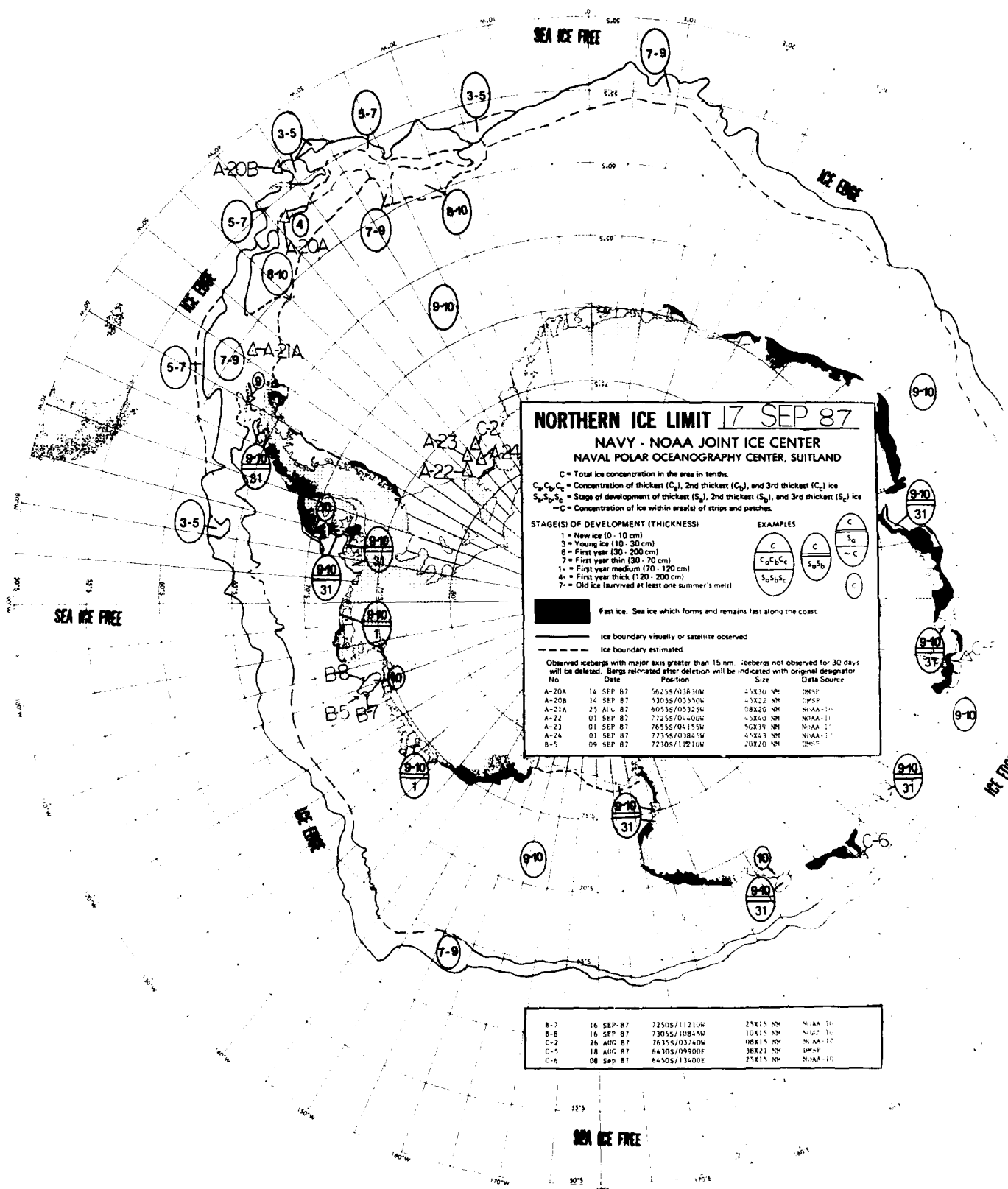
Ice boundary visually or satellite observed.

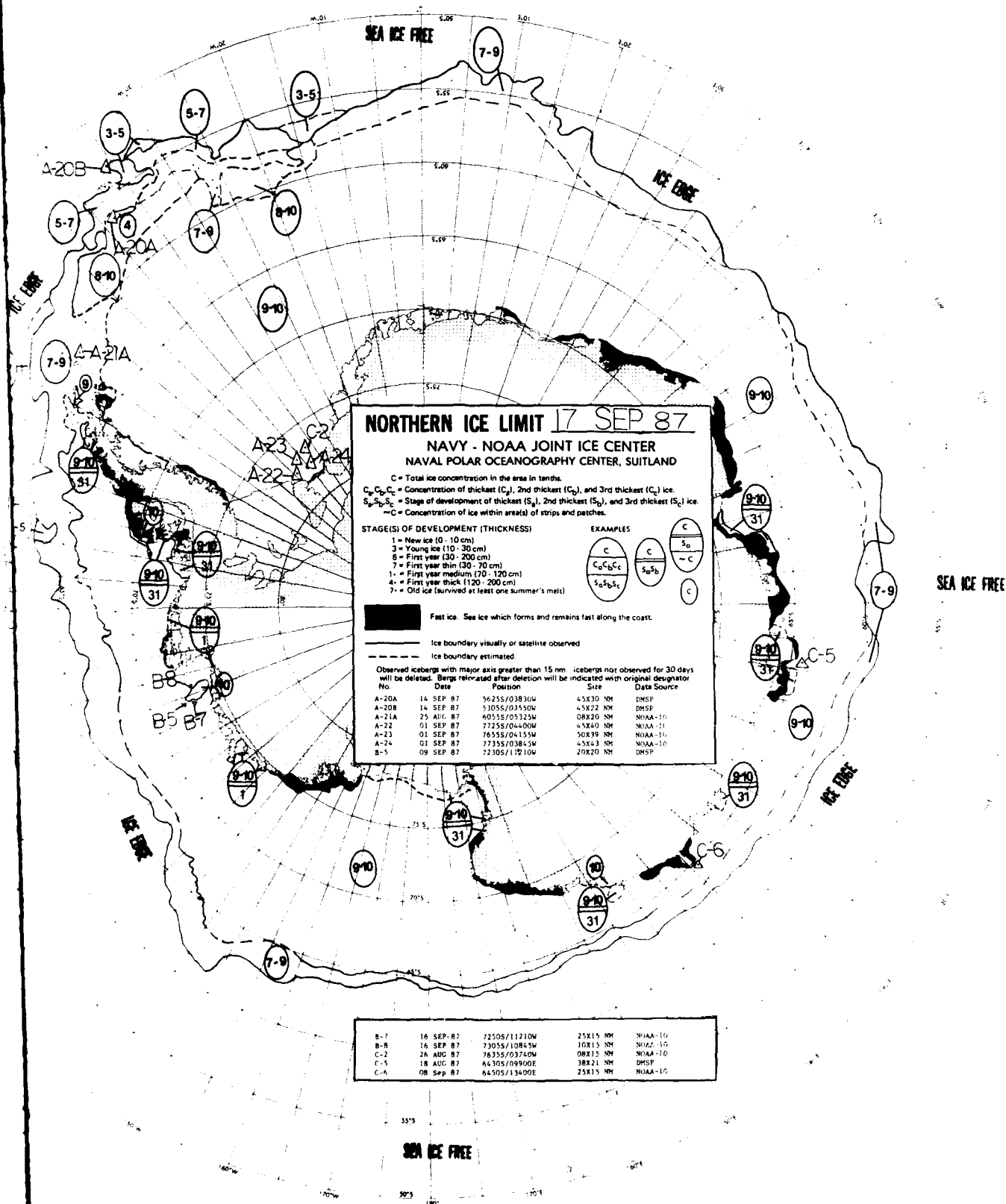
Ice boundary estimated.

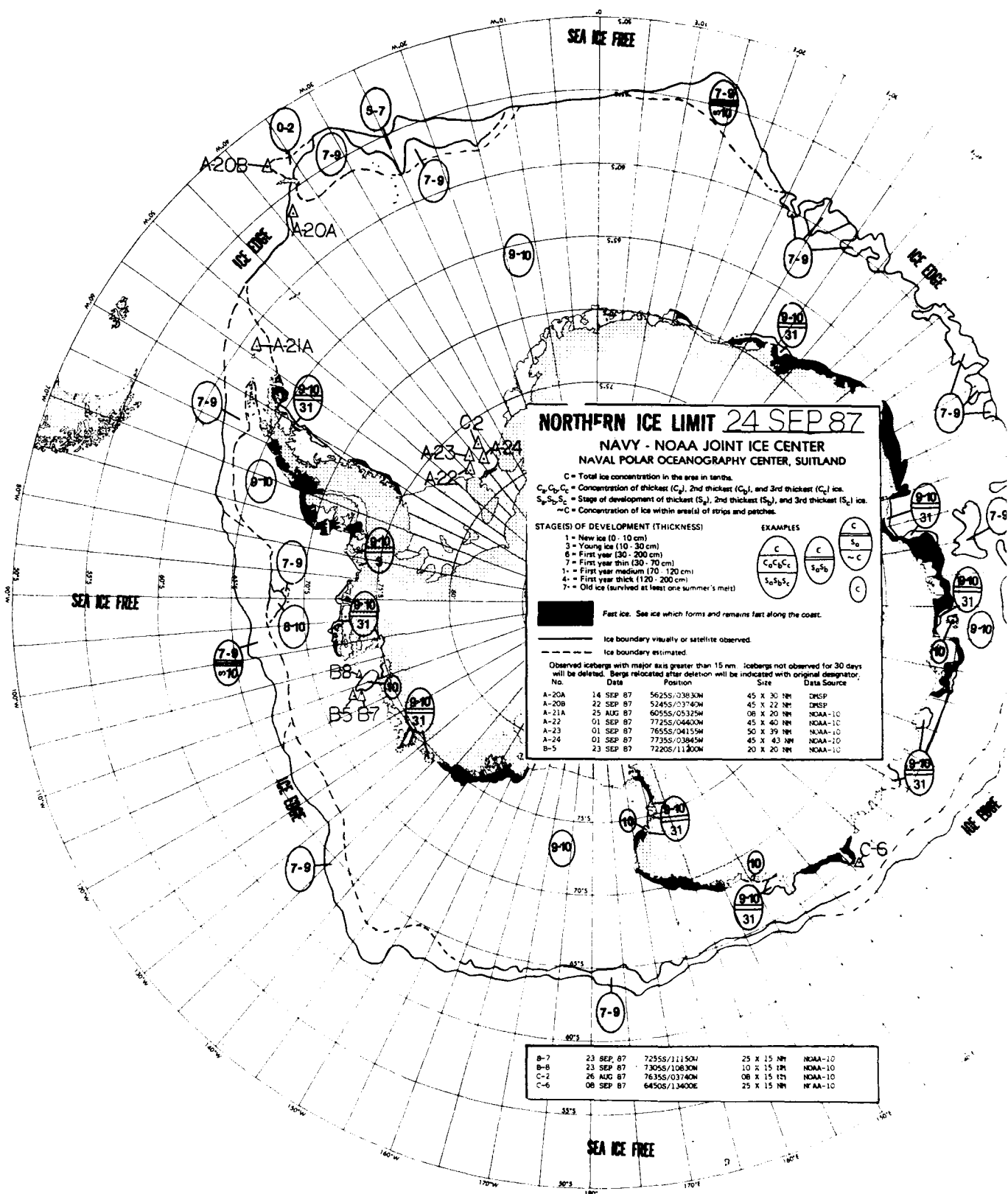
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

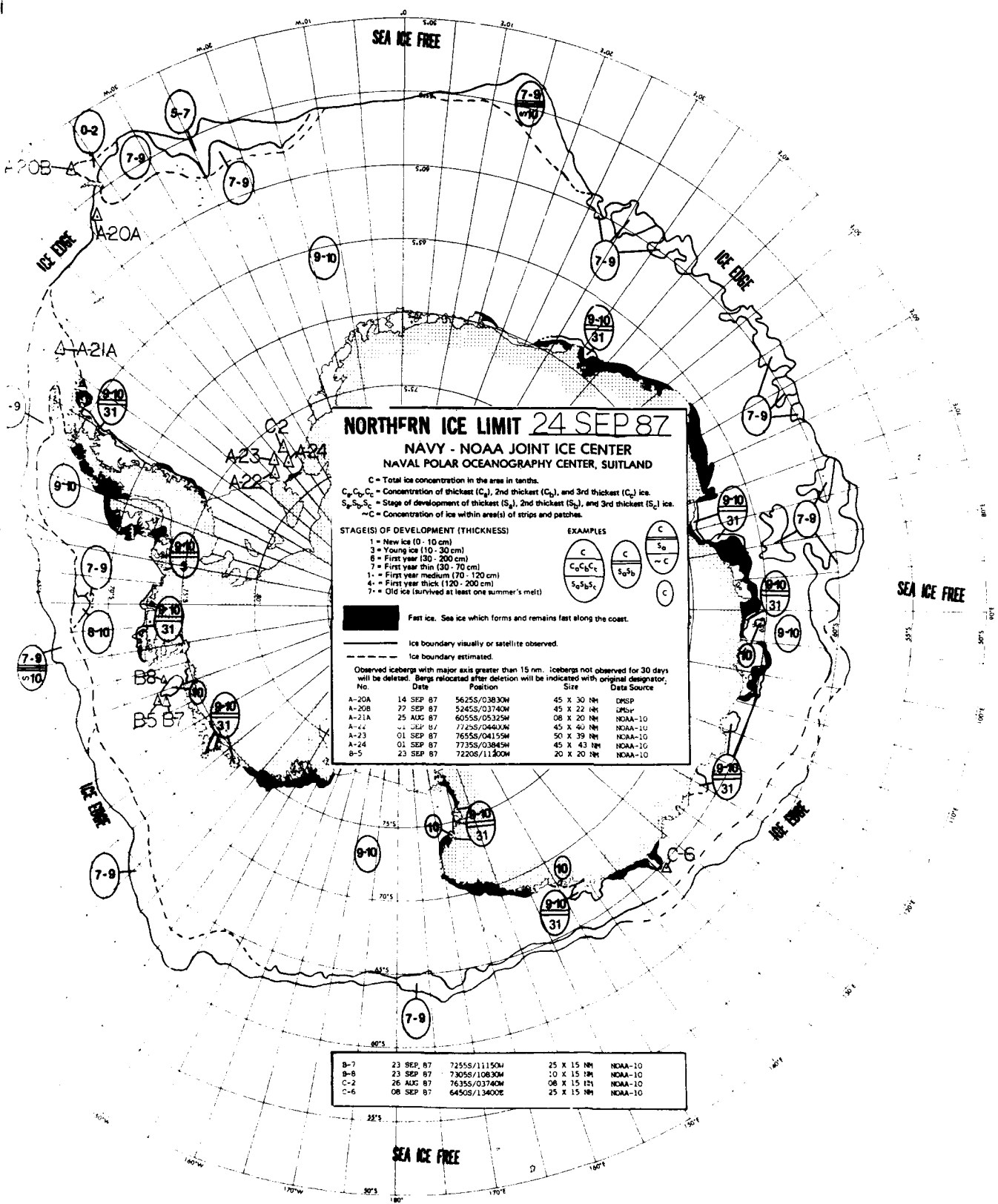
No.	Date	Position	Size	Origin Source
A-20A	09 SEP 87	5620S/03820W	45X30 NM	NOAA-10
A-20B	09 SEP 87	5345S/03505W	45X22 NM	NOAA-10
A-21A	25 AUG 87	6055S/03325W	08X20 NM	NOAA-10
A-22	01 SEP 87	7725S/04400W	45X40 NM	NOAA-10
A-23	01 SEP 87	7655S/04155W	50X39 NM	NOAA-10
A-24	01 SEP 87	7735S/03845W	45X43 NM	NOAA-10
B-5	09 SEP 87	7230S/11310W	20X20 NM	DMSP
B-6	18 AUG 87	7235S/11300W	20X20 NM	DMSP

B-7	09 SEP 87	7310S/11205W	25X15 NM	NOAA-10
B-8	09 SEP 87	7315S/10900W	10X15 NM	NOAA-10
C-2	26 AUG 87	7635S/03740W	08X15 NM	NOAA-10
C-5	18 AUG 87	6430S/09900E	38X21 NM	DMSP
C-6	08 SEP 87	6450S/13400E	25X15 NM	NOAA-10









NORTHERN ICE LIMIT 24 SEP 87

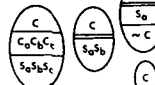
**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND**

C = Total ice concentration in the area in tenths.
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 ~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 10 cm)
- 3 = Young ice (110 - 30 cm)
- 6 = First year thin (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. Sea ice which forms and remains fast along the coast.

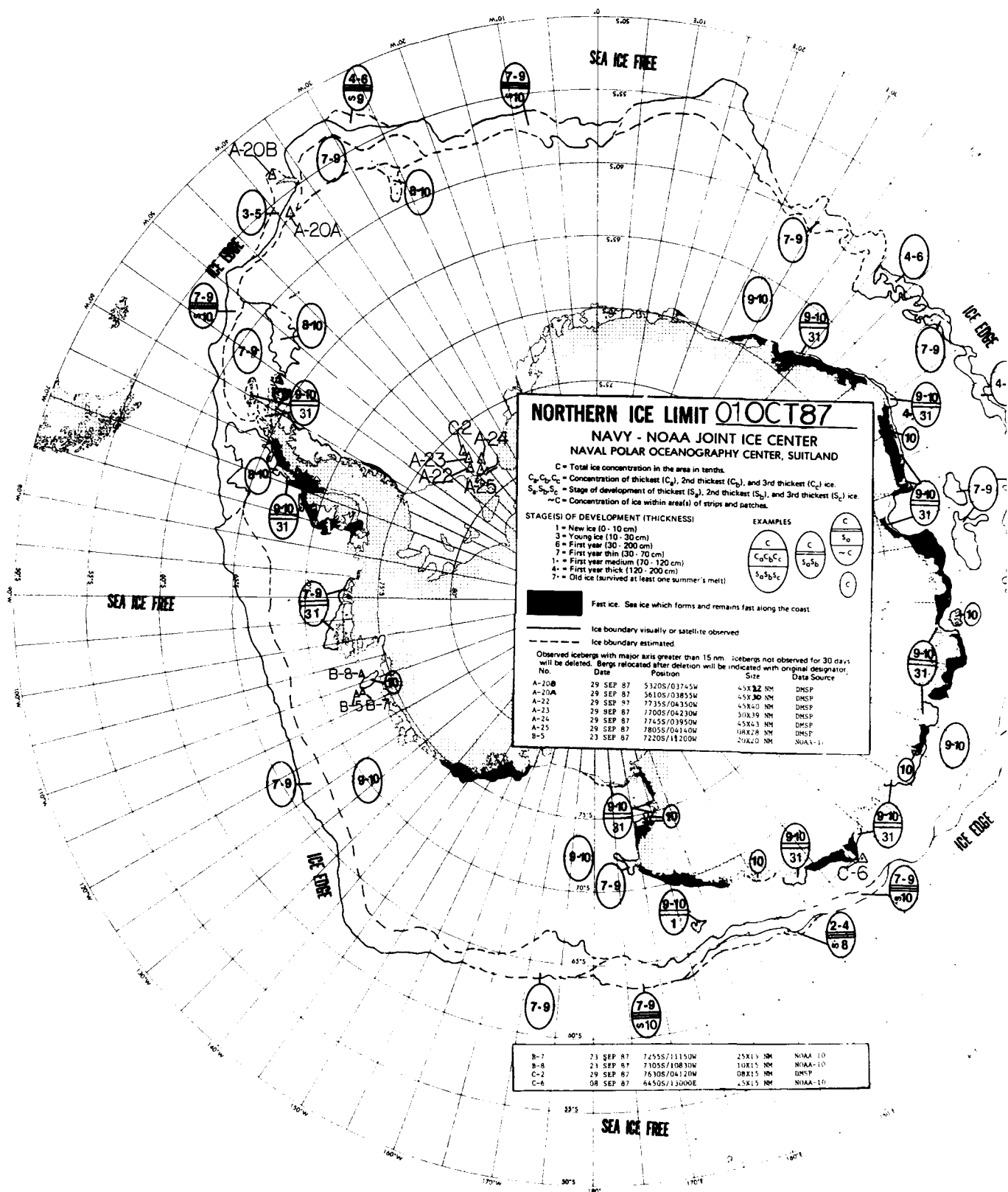
— Ice boundary visually or satellite observed.

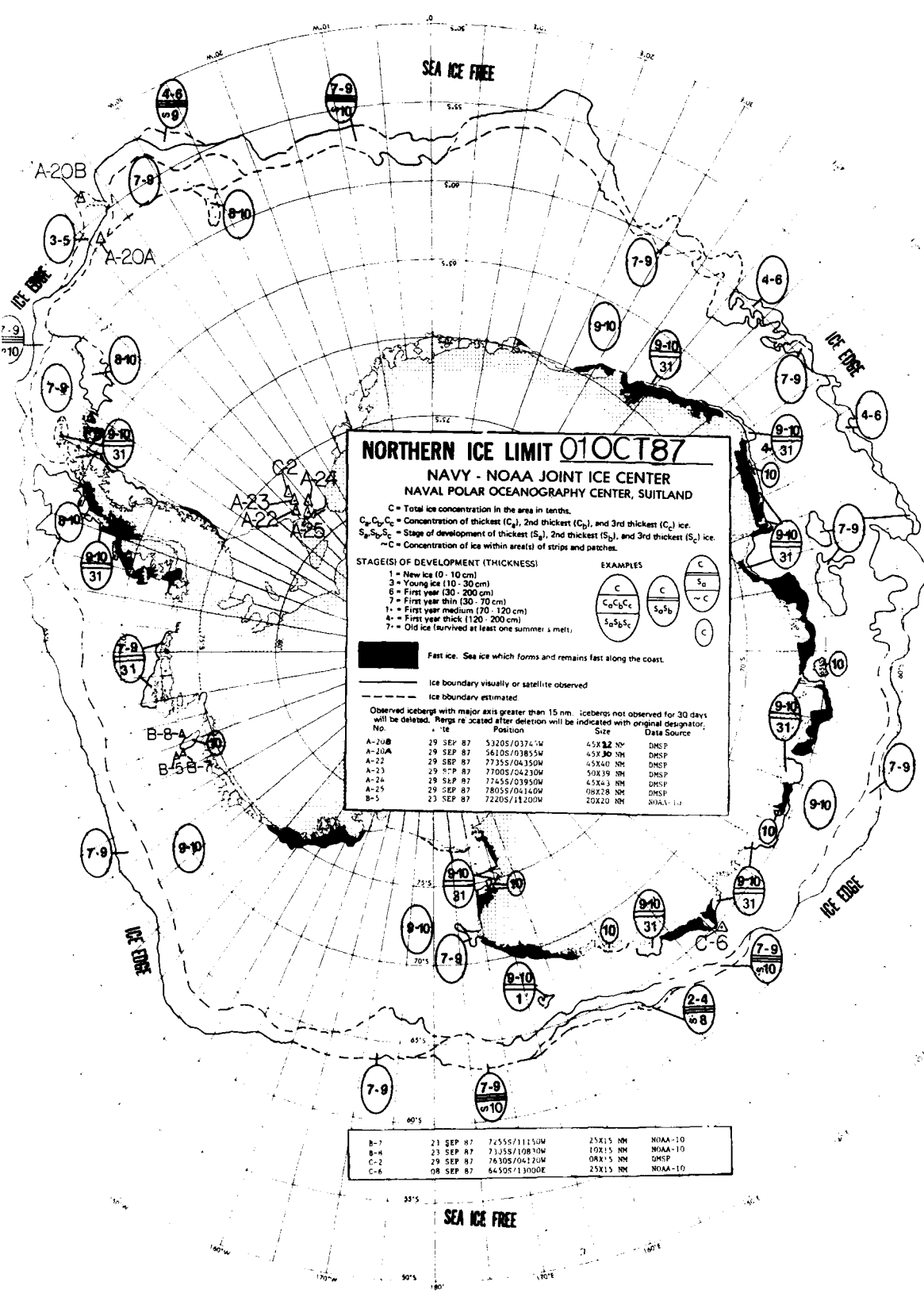
- - - Ice boundary estimated.

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	14 SEP 87	5625S/03830W	45 X 30 NM	DMSP
A-20B	27 SEP 87	5245S/03740W	45 X 22 NM	DMSP
A-21A	25 AUG 87	6055S/05325W	08 X 20 NM	NOAA-10
A-42	02 SEP 87	7225S/04600E	45 X 40 NM	NOAA-10
A-23	01 SEP 87	7655S/04155W	50 X 39 NM	NOAA-10
A-24	01 SEP 87	7735S/03845W	45 X 43 NM	NOAA-10
B-5	23 SEP 87	7220S/11300W	20 X 20 NM	NOAA-10

B-7	23 SEP 87	7255S/11150W	25 X 15 NM	NOAA-10
B-8	23 SEP 87	7305S/10830W	10 X 15 NM	NOAA-10
C-2	26 AUG 87	7635S/03740W	08 X 15 NM	NOAA-10
C-6	08 SEP 87	6450S/13400E	25 X 15 NM	NOAA-10





NORTHERN ICE LIMIT 01 OCT 87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
 ~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer melt)

EXAMPLES

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

Fast ice. Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs re-located after deletion will be indicated with original designator.

No.	Date	Position	Size	Source
A-20B	29 SEP 87	5320S/0174W	45X32 NM	DMSP
A-20A	29 SEP 87	5410S/0385W	45X30 NM	DMSP
A-22	29 SEP 87	7735S/0425W	45X40 NM	DMSP
A-23	29 SEP 87	7700S/0423W	50X39 NM	DMSP
A-24	29 SEP 87	7745S/0395W	45X43 NM	DMSP
A-25	29 SEP 87	7805S/0414W	08X28 NM	DMSP
B-5	23 SEP 87	7220S/1120W	20X20 NM	TOTAL-11

B-7	21 SEP 87	7255S/1115W	25X15 NM	NOAA-10
B-8	23 SEP 87	7325S/1081W	10X15 NM	NOAA-10
C-2	29 SEP 87	7630S/0412W	08X15 NM	DMSP
C-6	08 SEP 87	6450S/1300E	25X15 NM	NOAA-10

SEA ICE FREE

IMAGERY SEARCH HAS CONFIRMED NEW ICEBERG, A-26, TO HAVE CALVED FROM THE LARSEN ICE SHELF NEAR 64°25'N 99°14'W IN JUNE, 1987. IT REMAINS THE LARGEST OF MANY SMALLER BERGS APPARENTLY CALVED FROM THE SAME REGION.

NORTHERN ICE LIMIT 08 OCT 87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
-C = Concentration of ice within areas of strips 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 thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES

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

Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

Ice boundary estimated

Observed: Icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Source
A-27A	08 OCT 87	55°00'N 120°00'W	43X30 NM	DMSP
A-21B	08 OCT 87	73°00'N 140°00'W	45X22 NM	DMSP
A-21A	08 OCT 87	73°00'N 140°00'W	10X20 NM	DMSP
A-23	07 OCT 87	72°00'N 130°00'W	5X22 NM	DMSP
A-25	07 OCT 87	72°00'N 130°00'W	5X14 NM	DMSP
A-24	07 OCT 87	72°00'N 130°00'W	4X6 NM	DMSP
A-25	07 OCT 87	72°00'N 130°00'W	4X6 NM	DMSP
A-26	07 OCT 87	63°25'N 99°14'W	25X12 NM	NOAA

B-5	23 SEP 87	72°00'N 110°00'W	10X10 NM	NOAA
B-7	23 SEP 87	72°00'N 110°00'W	10X10 NM	NOAA
B-8	23 SEP 87	72°00'N 110°00'W	10X10 NM	NOAA
B-9	01 OCT 87	72°00'N 110°00'W	10X10 NM	DMSP
B-10	01 OCT 87	72°00'N 110°00'W	10X10 NM	NOAA

IMAGERY SEARCH HAS CONFIRMED NEW ICEBERG, A-26, TO HAVE CALVED FROM THE LARSEN ICE SHELF NEAR 64°25' / 59°54' IN JUNE, 1987. IT REMAINS THE LARGEST OF MANY SMALLER BERGS APPARENTLY CALVED FROM THE SAME REGION.

NORTHERN ICE LIMIT 08 OCT 87

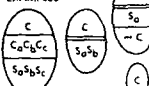
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
C = Concentration of ice within area(s) of rotas and patches.

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: See ice which forms and remains fast along the coast

Ice boundary virtually or satellite observed

Ice boundary estimated

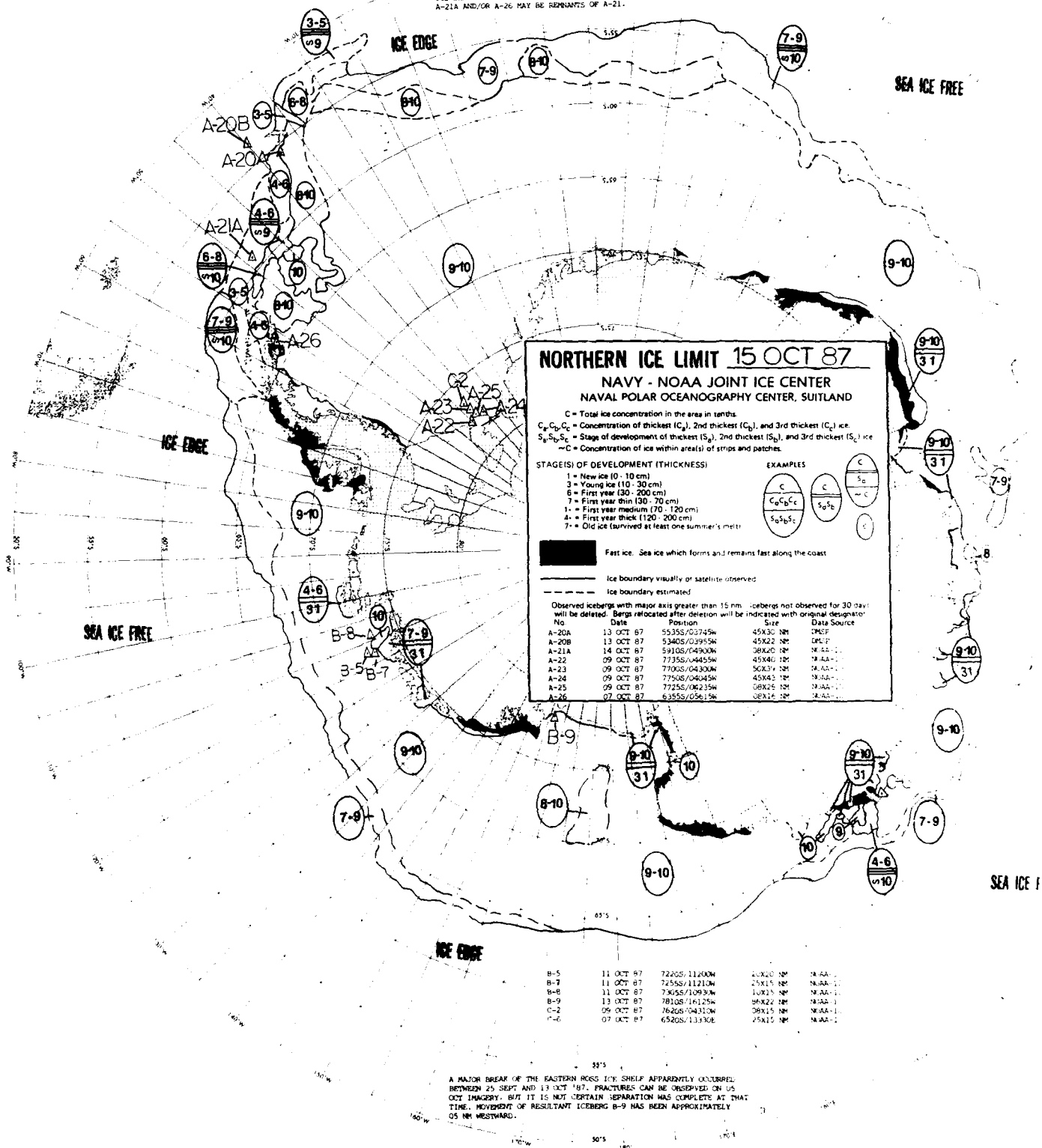
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No	Date	Position	Size	Data Source
A-20A	08 OCT 87	55505/03850W	45X30 NM	DNHP
A-20B	08 OCT 87	53505/03900W	65X22 NM	DNHP
A-21A	08 OCT 87	59505/04900W	08X20 NM	DNHP
A-22	07 OCT 87	77355/04455W	45X40 NM	NOAA-10
A-23	07 OCT 87	77005/04300W	50X30 NM	NOAA-10
A-24	07 OCT 87	77505/04045W	65X43 NM	NOAA-10
A-25	07 OCT 87	72255/04235W	08X20 NM	NOAA-10
A-26	07 OCT 87	63555/02815W	08X16 NM	NOAA-10

B-5	23 SEP 87	72205/1120W	20X20 NM	NOAA-10
B-7	13 SEP 87	72555/11150W	25X15 NM	NOAA-10
B-8	23 SEP 87	73055/10850W	10X15 NM	NOAA-10
C-2	07 OCT 87	76235/04310W	08X15 NM	DNHP
C-6	07 OCT 87	65205/11330E	25X15 NM	NOAA-10

SEA ICE FREE

AFTER FURTHER IMAGERY SEARCH, NON CONSIDER ORIGIN OF ICEBERGS A-21A AND A-26 AS UNCERTAIN. A-21, A 2225 NM ICEBERG CALVED FROM THE LARGEST ICE SHELF JULY '86 AND WAS LAST OBSERVED AT 6645S/05913W 16 DEC '87. A-21A AND/OR A-26 MAY BE REMNANTS OF A-21.



AFTER FURTHER IMAGERY SEARCH, NOW CONSIDER ORIGIN OF ICEBERGS A-21A AND A-26 AS UNCERTAIN. A-21, A 22X29 NM ICEBERG CALVED FROM THE LARGEST ICE SHELF JULY '86 AND WAS LAST OBSERVED AT 66455/059154N 16 DEC '86. A-21A AND/OR A-26 MAY BE REMNANTS OF A-21.

NORTHERN ICE LIMIT 15 OCT 87

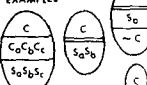
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
-C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 8 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice - Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

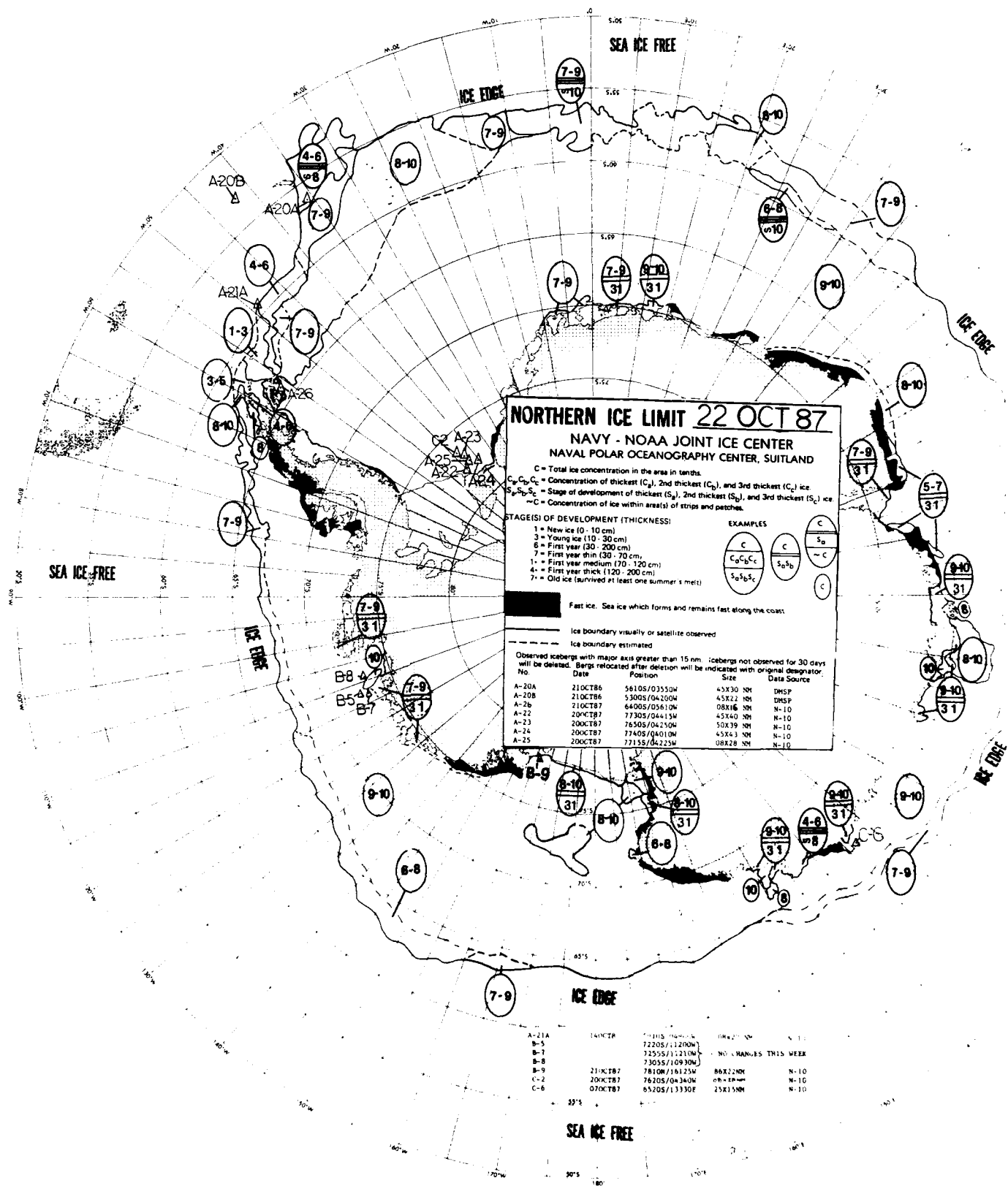
Ice boundary estimated

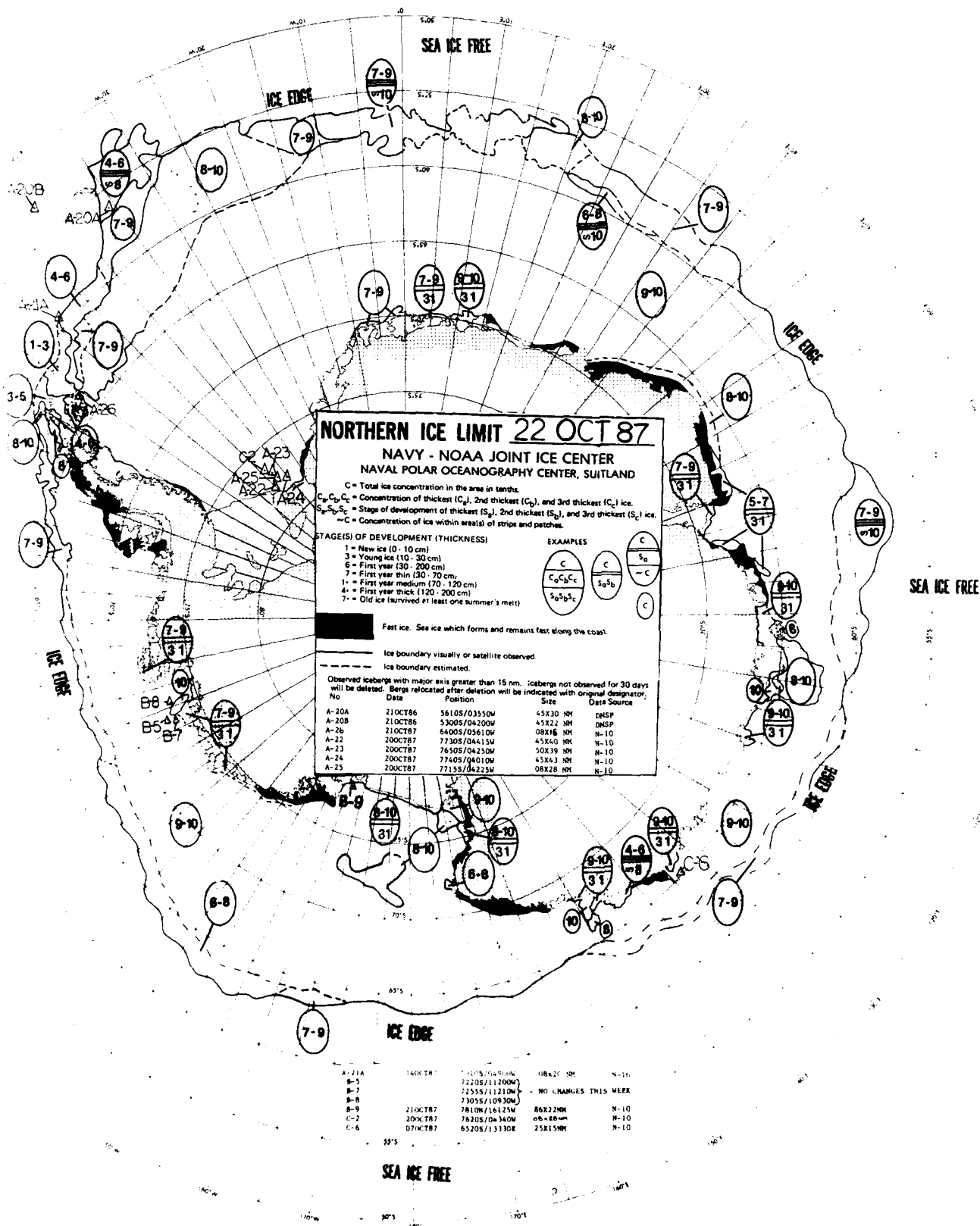
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

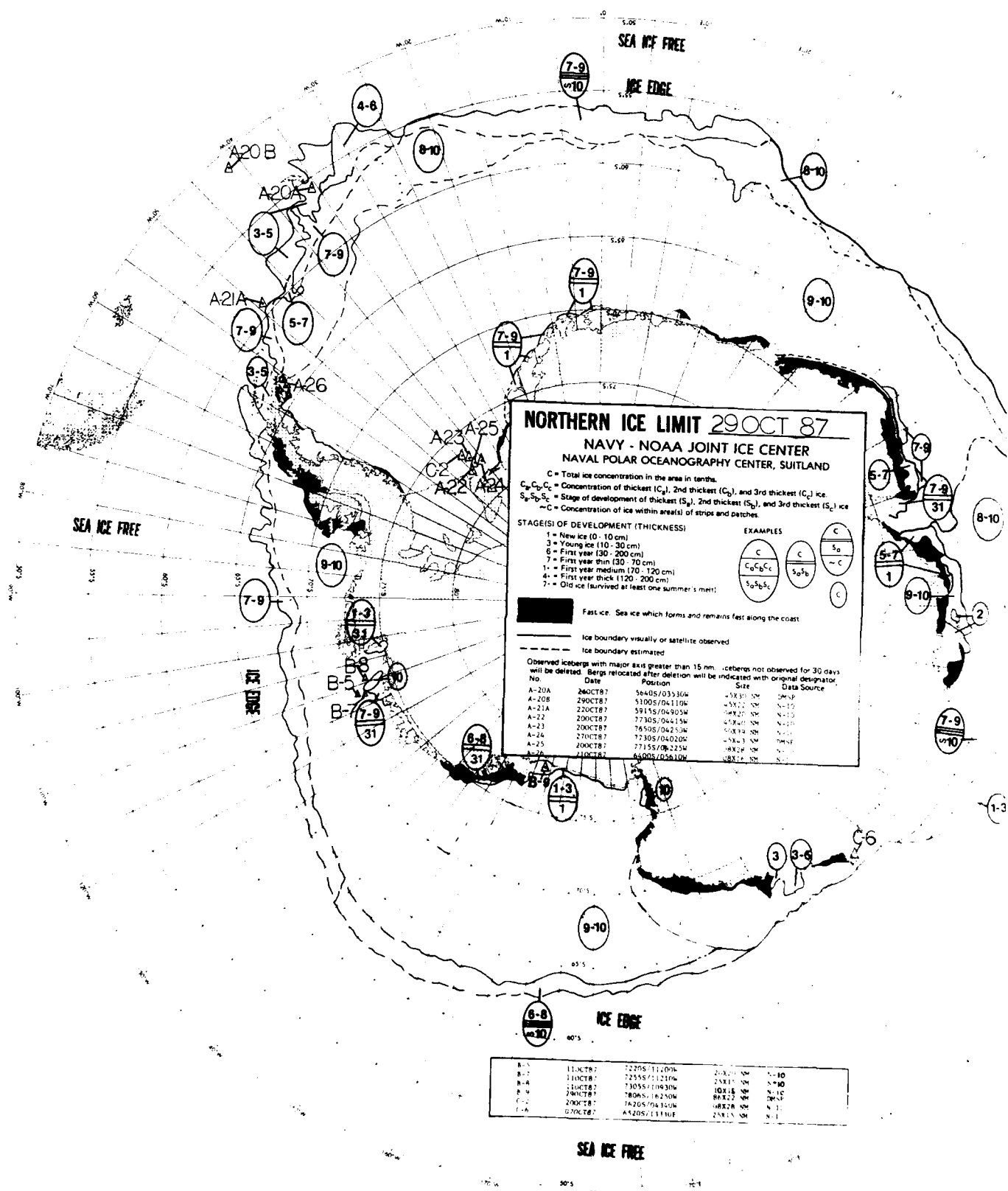
No.	Date	Position	Size	Data Source
A-20A	13 OCT 87	55355/03749N	45X30 NM	DMSP
A-20B	13 OCT 87	53405/03955N	45X22 NM	DMSP
A-21A	14 OCT 87	59105/04907N	08X20 NM	NKAA-10
A-22	09 OCT 87	77355/04455N	45X40 NM	NKAA-10
A-23	09 OCT 87	77005/04300N	50X39 NM	NKAA-10
A-24	09 OCT 87	77505/04045N	45X43 NM	NKAA-10
A-25	09 OCT 87	77255/04235N	08X08 NM	NKAA-10
A-26	07 OCT 87	61655/05615N	08X16 NM	NKAA-10

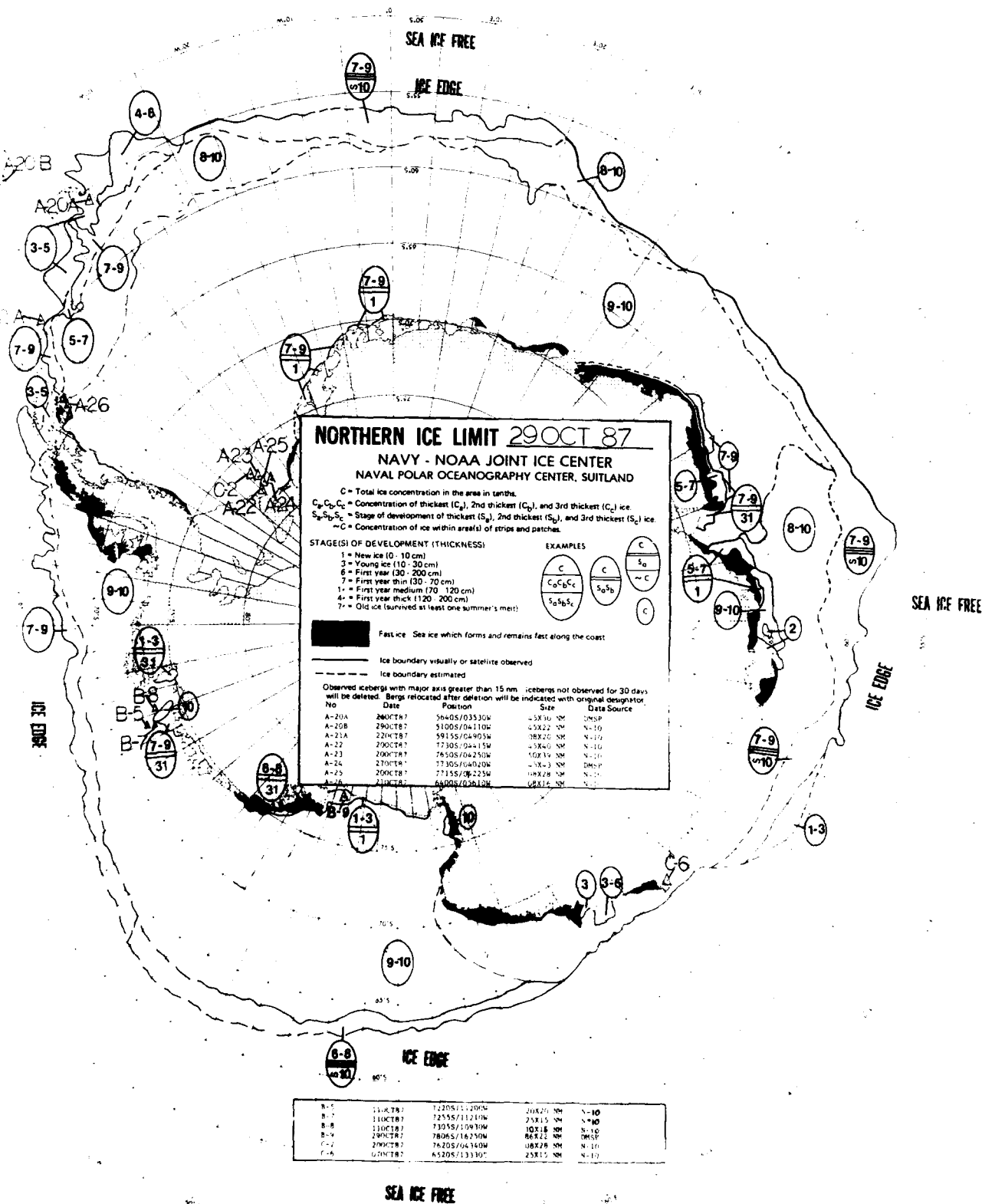
B-5	11 OCT 87	72205/11200N	20X20 NM	NKAA-10
B-7	11 OCT 87	72555/11210N	25X15 NM	NKAA-10
B-8	11 OCT 87	73055/10930N	10X15 NM	NKAA-10
B-9	11 OCT 87	78105/16125N	08X22 NM	NKAA-10
C-2	09 OCT 87	76205/04310N	28X15 NM	NKAA-10
C-6	17 OCT 87	65205/13330E	25X15 NM	NKAA-10

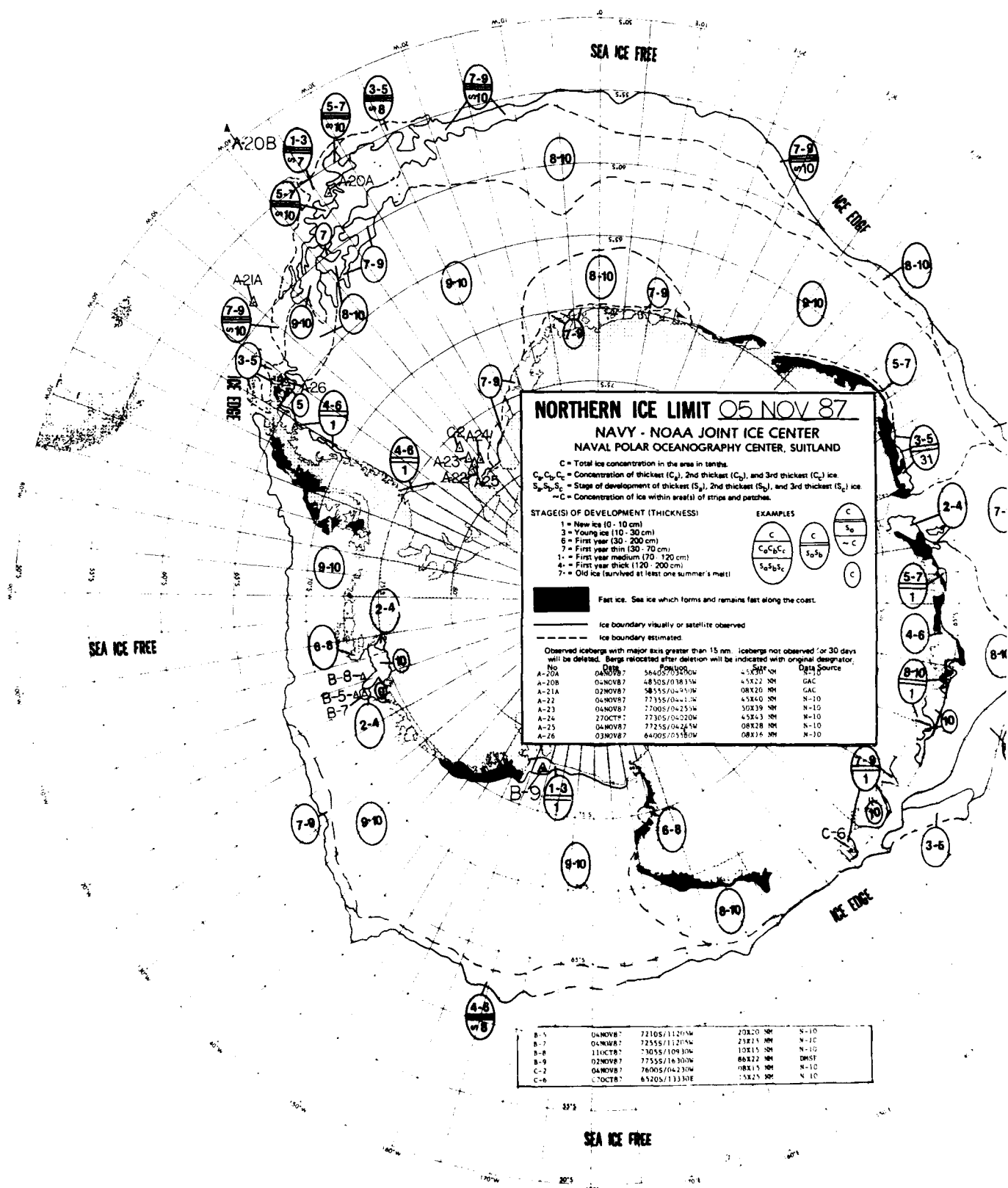
A MAJOR BREAK OF THE EASTERN RACK ICE SHELF APPARENTLY OCCURRED BETWEEN 25 SEP AND 13 OCT '87. FRACTURES CAN BE OBSERVED ON 25 OCT IMAGERY, BUT IT IS NOT CERTAIN SEPARATION WAS COMPLETE AT THAT TIME. MOVEMENT OF RESULTANT ICEBERG B-9 HAS BEEN APPROXIMATELY 05 NM WESTWARD.

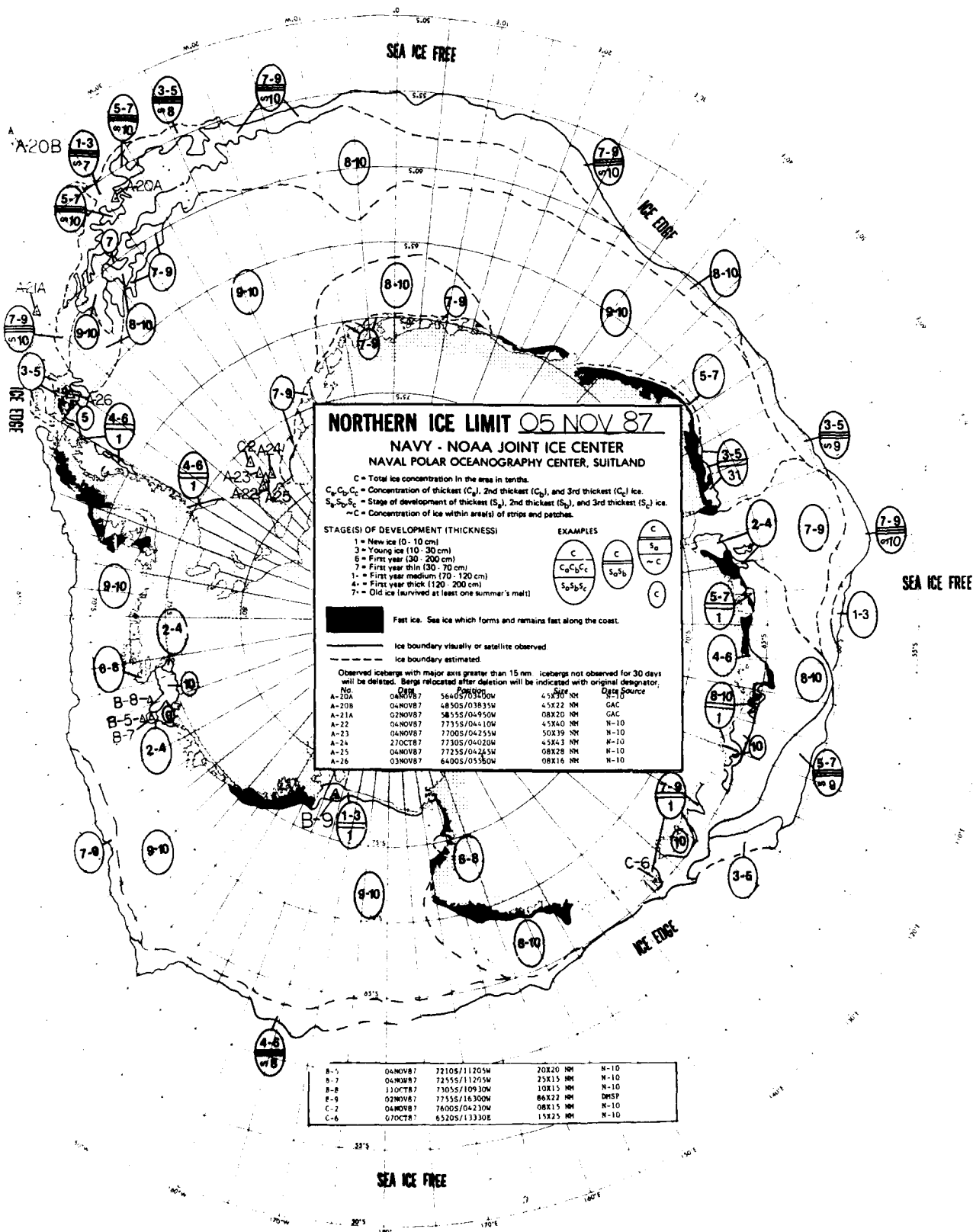


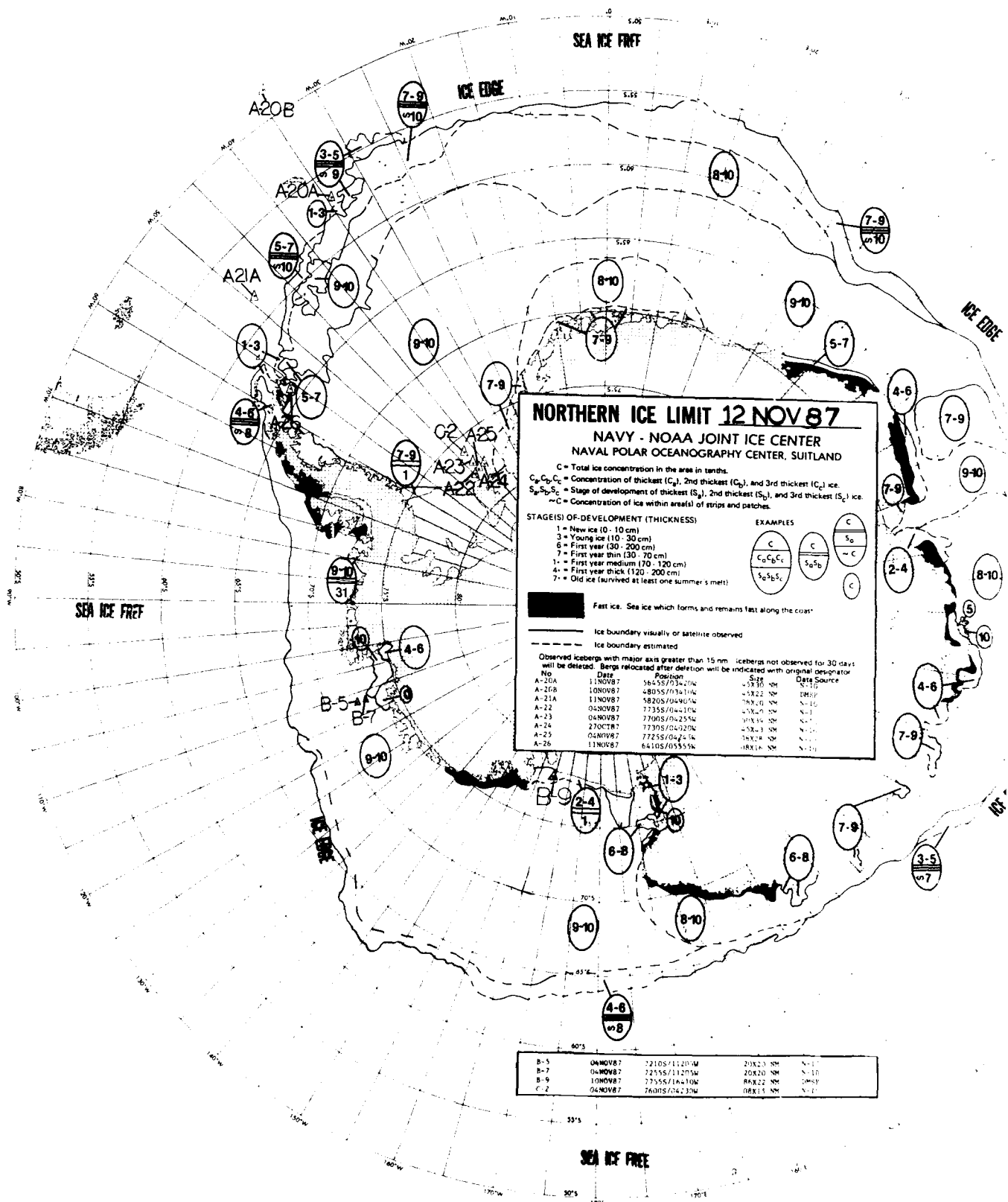


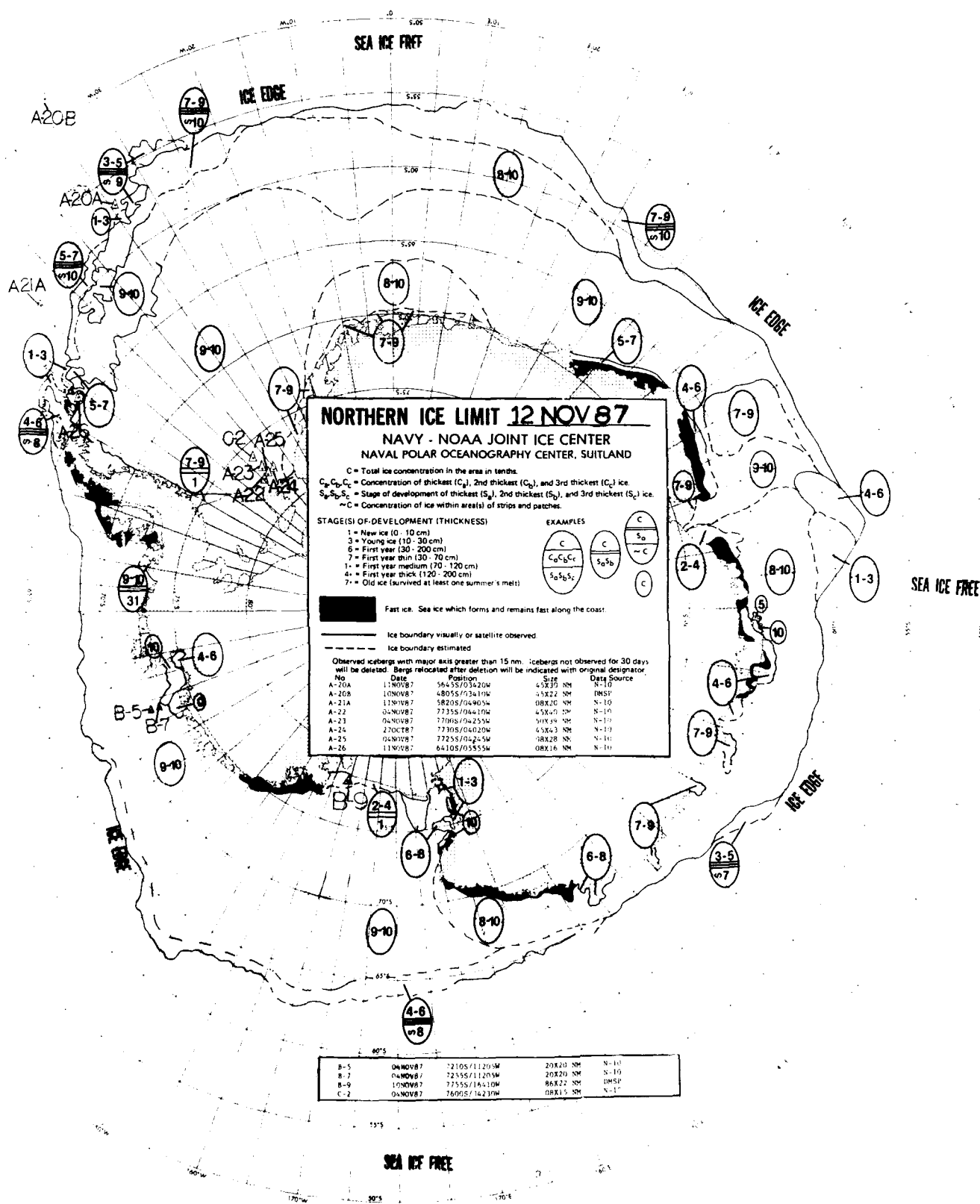


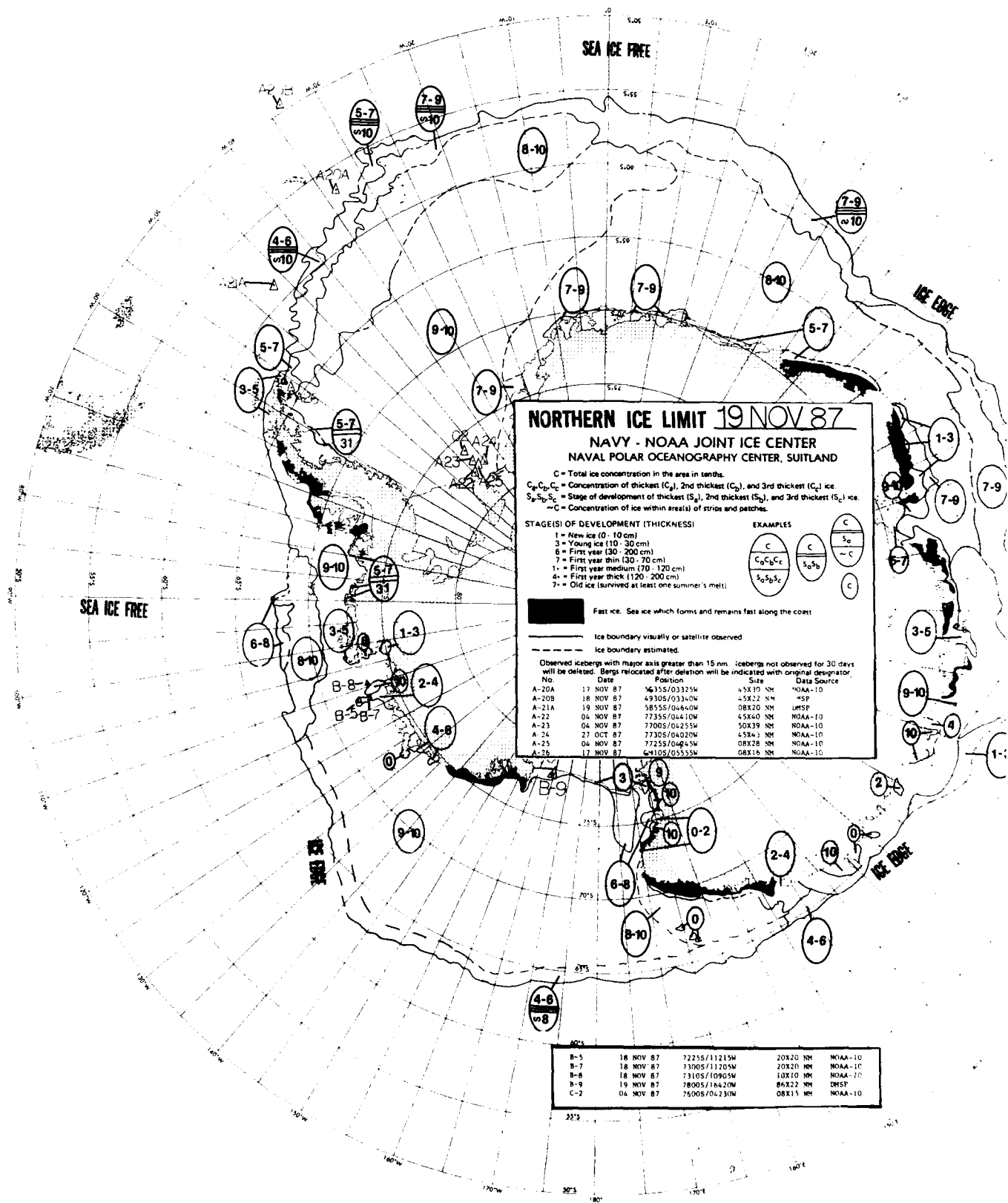


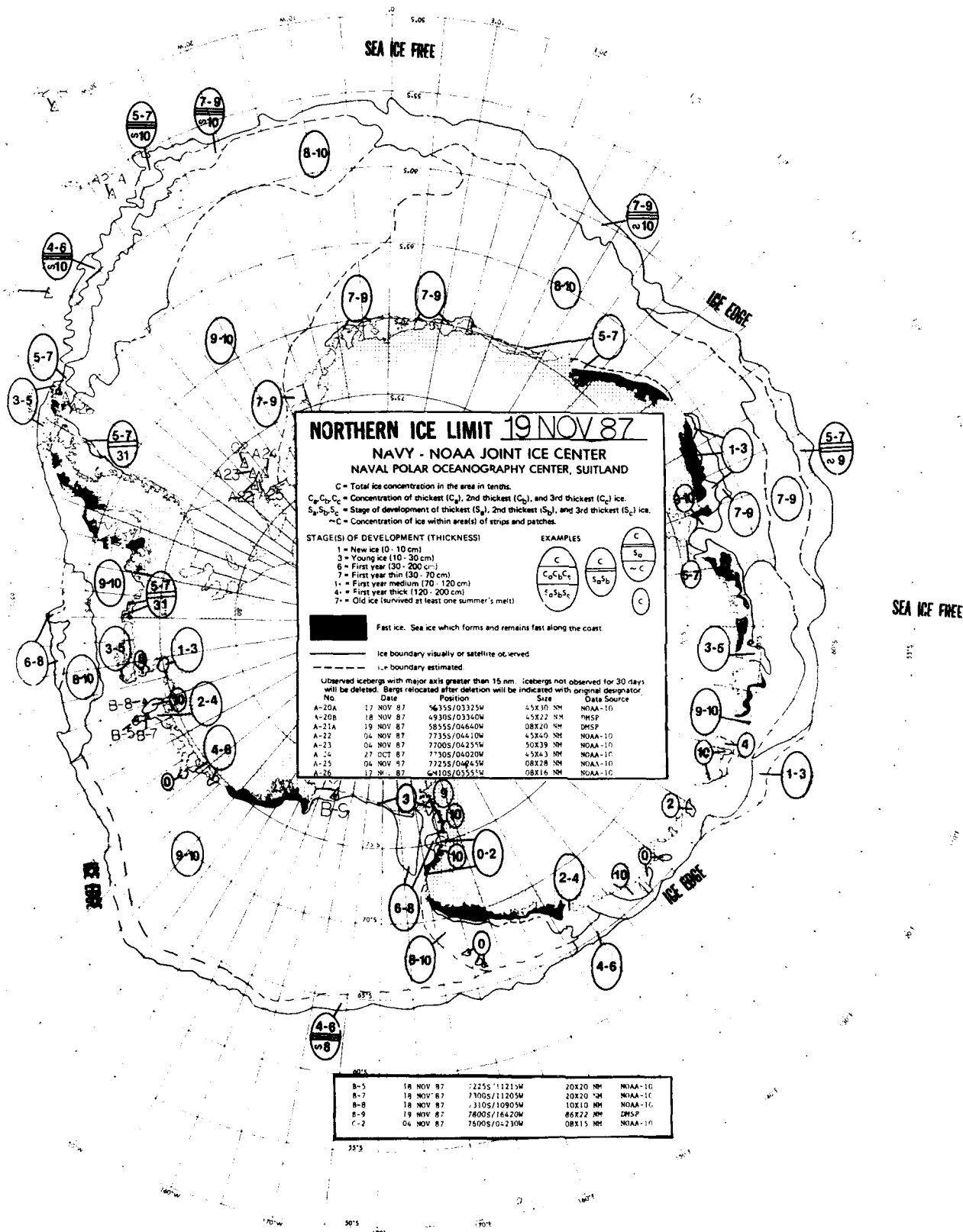


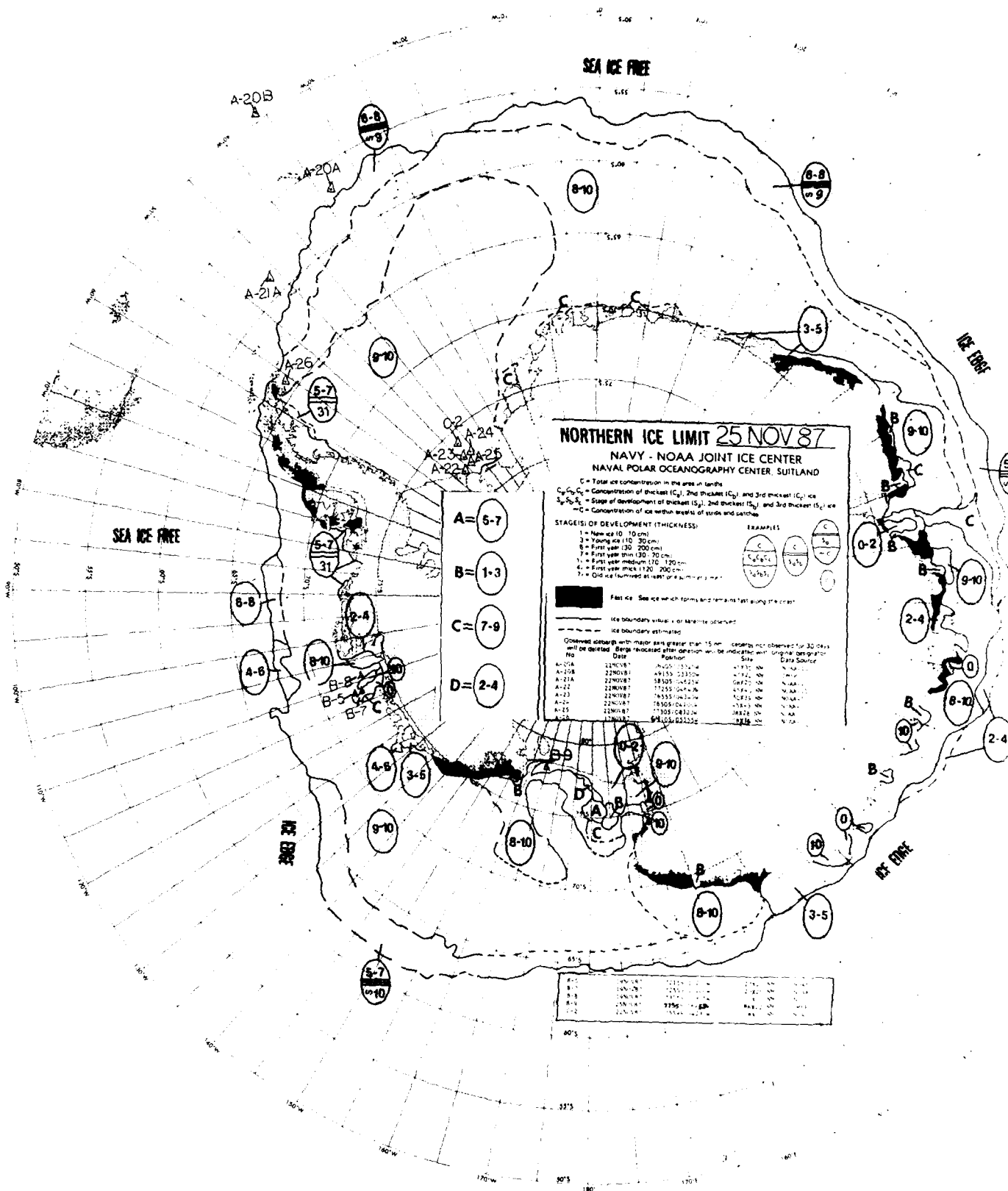


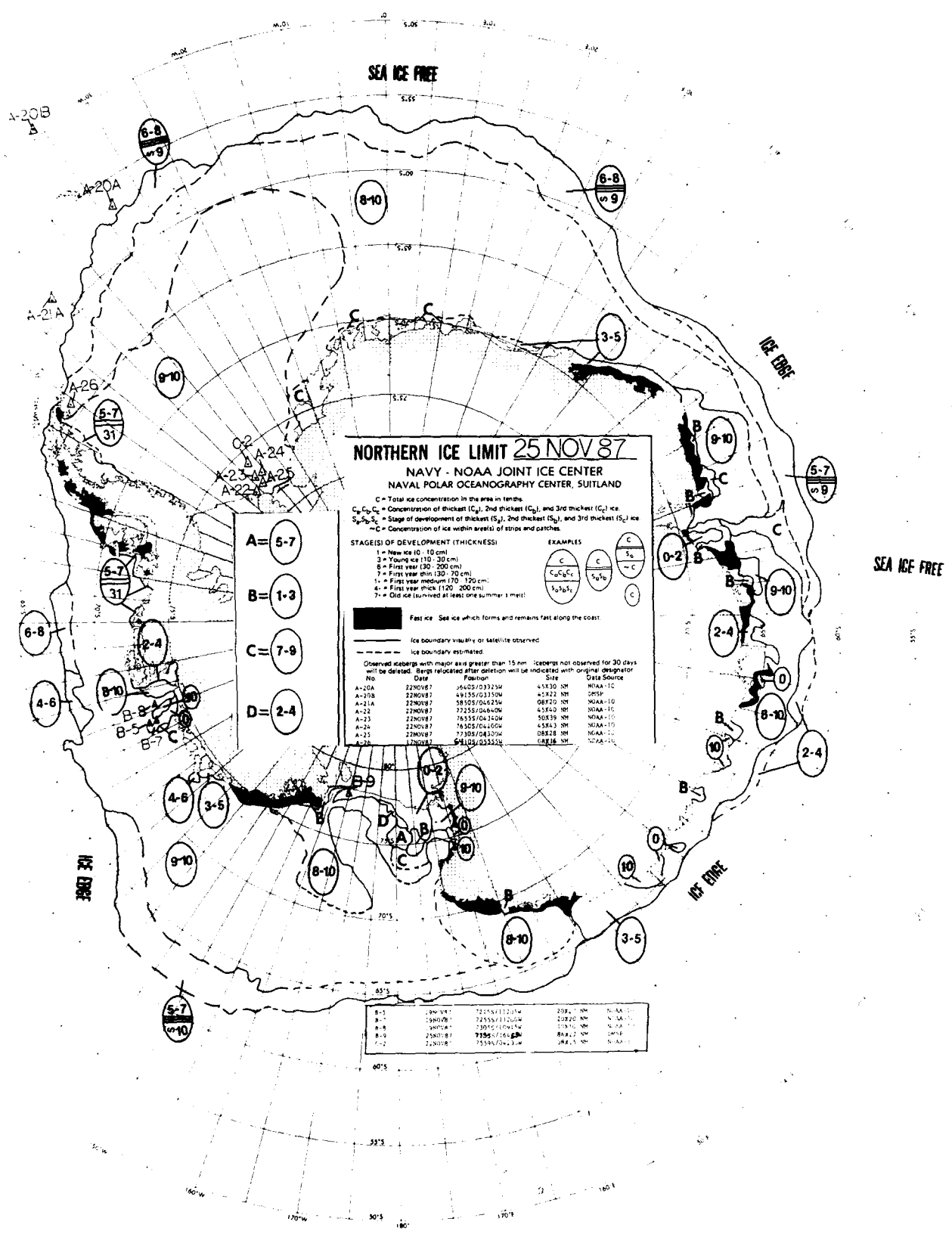


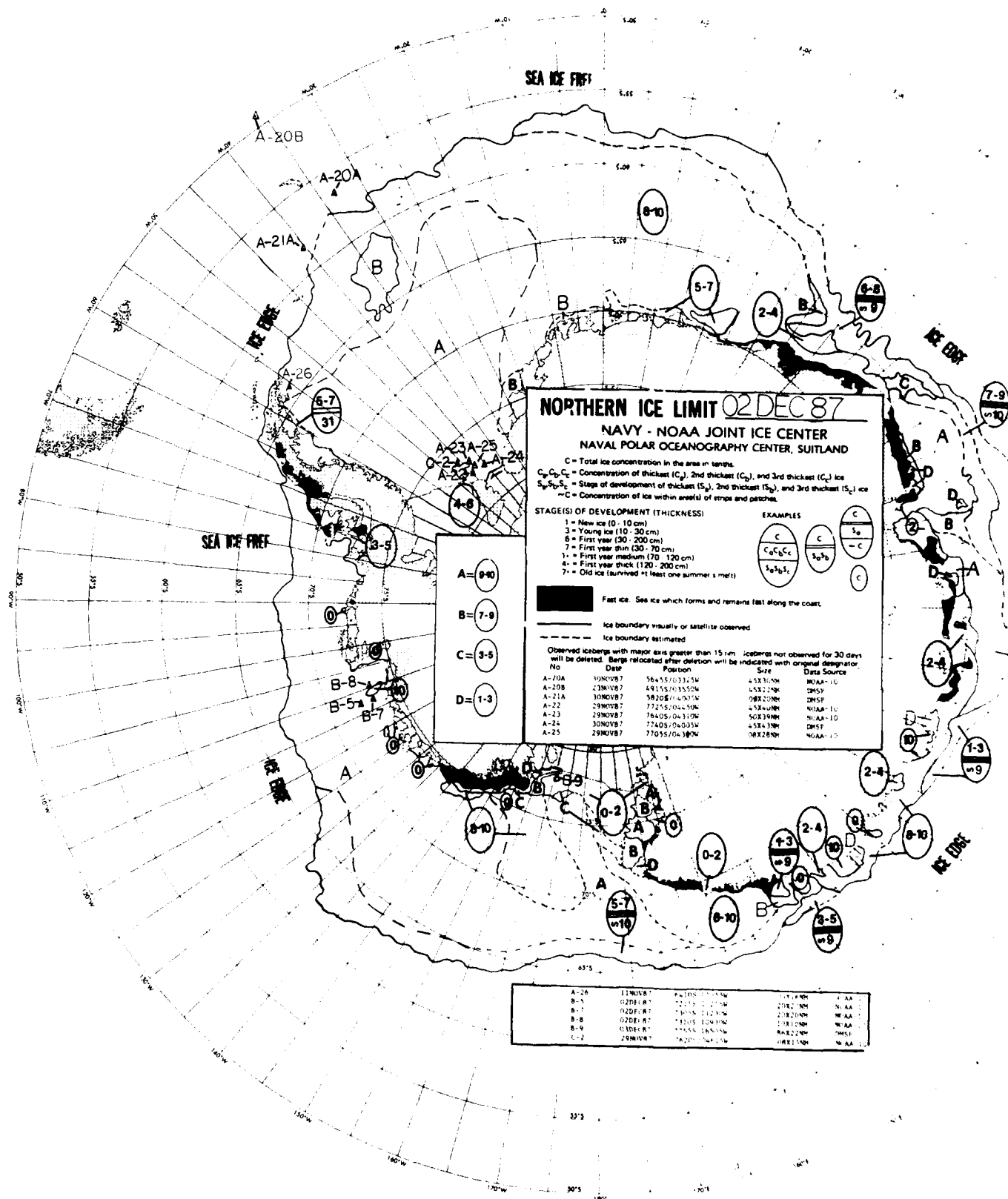


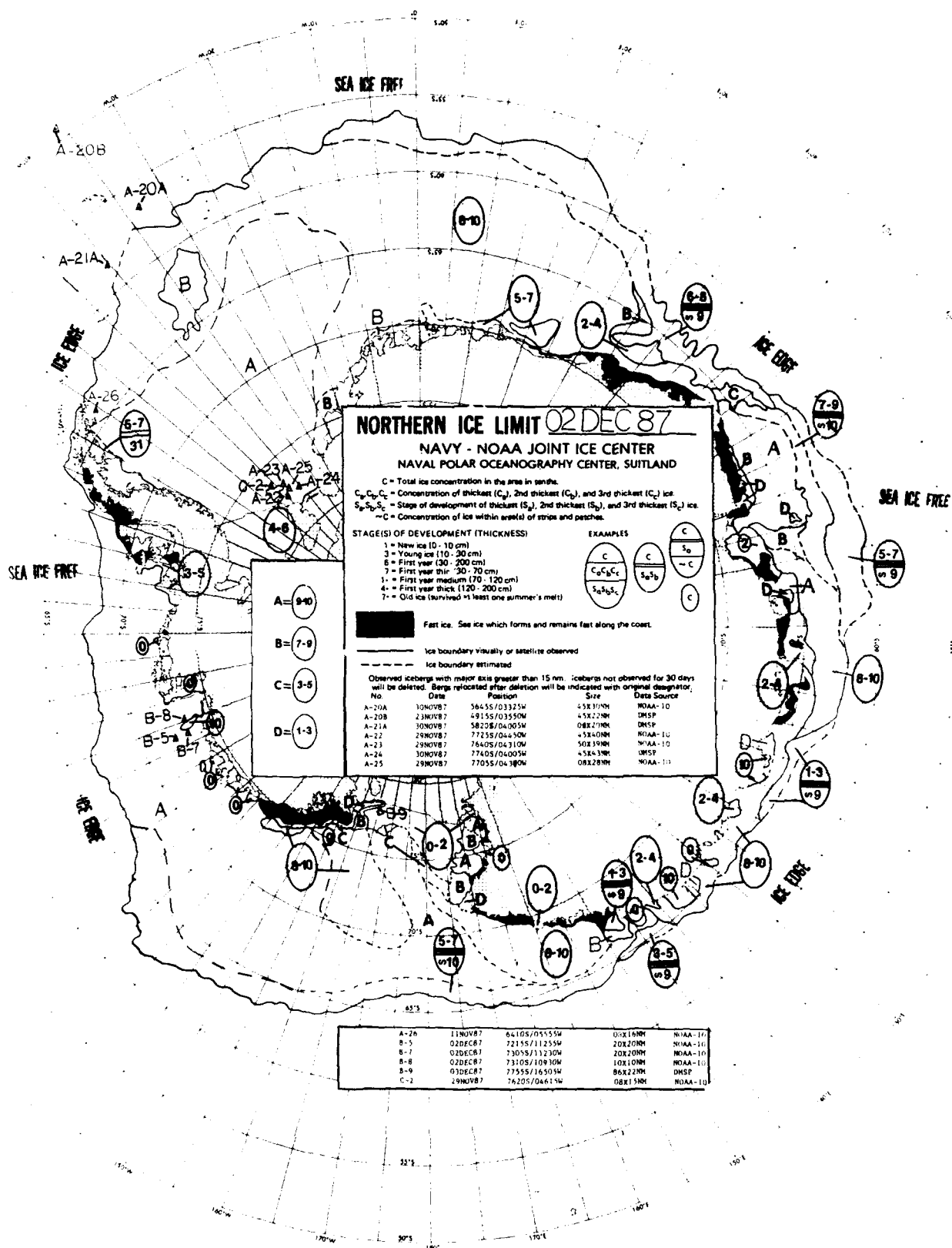


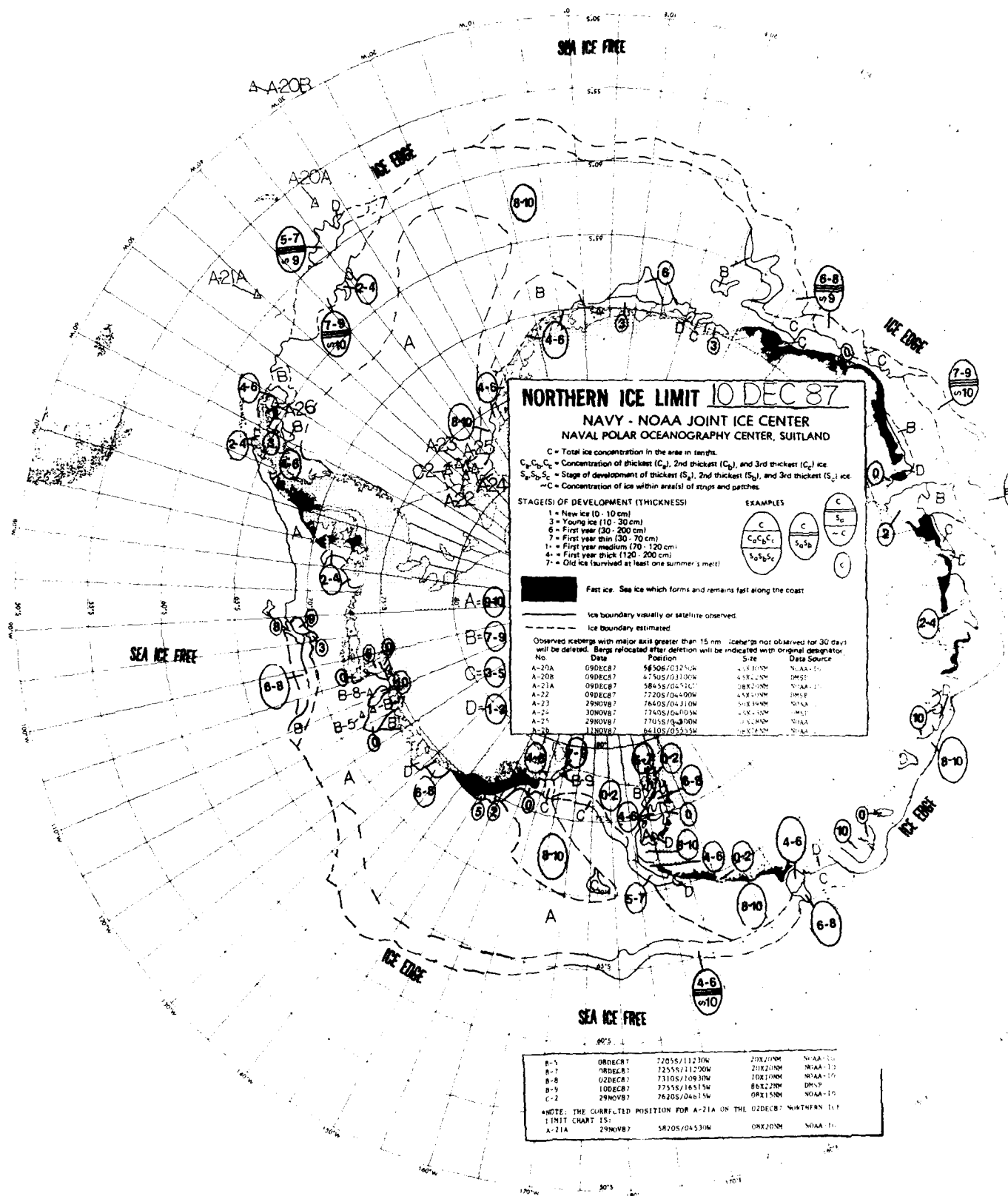


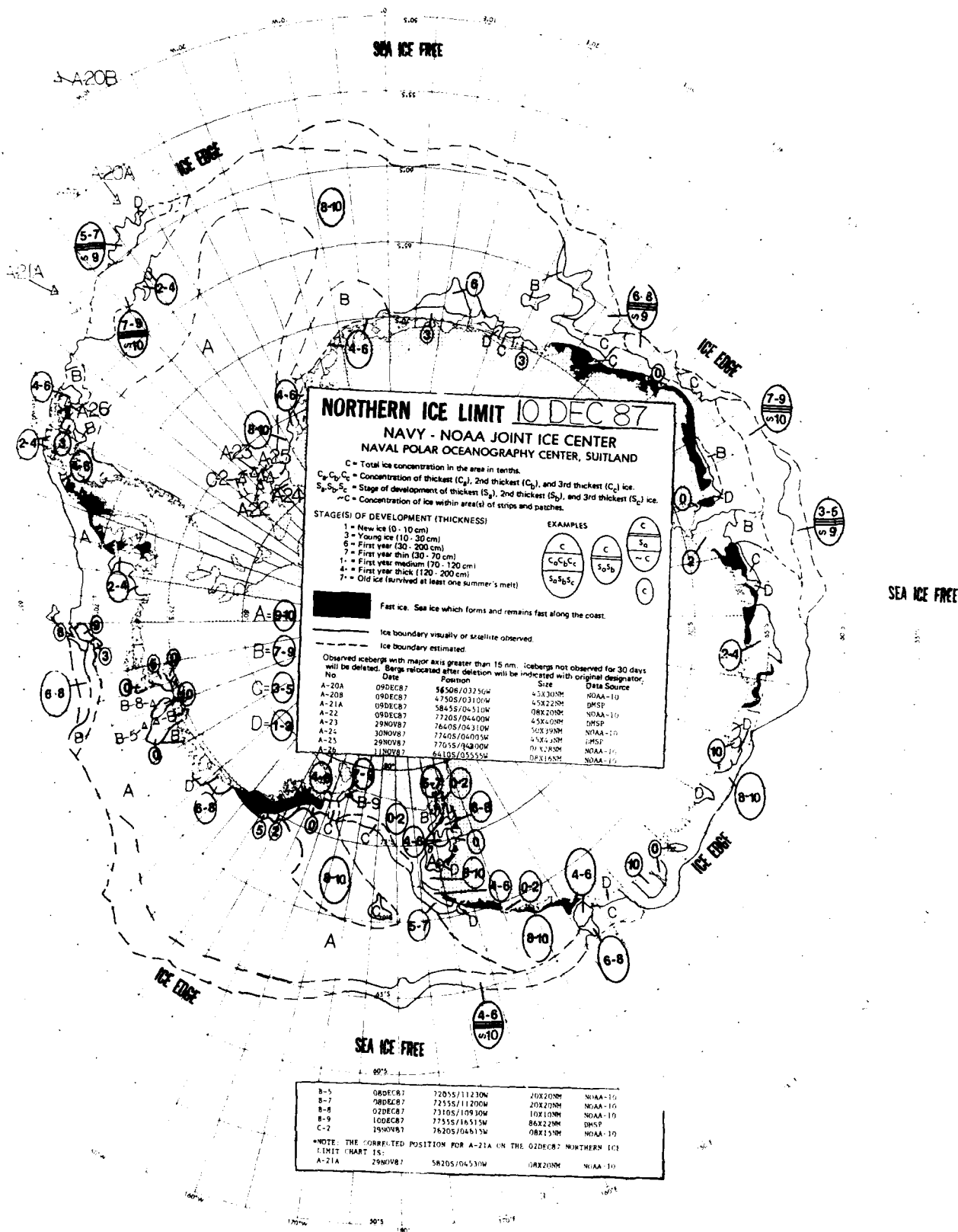


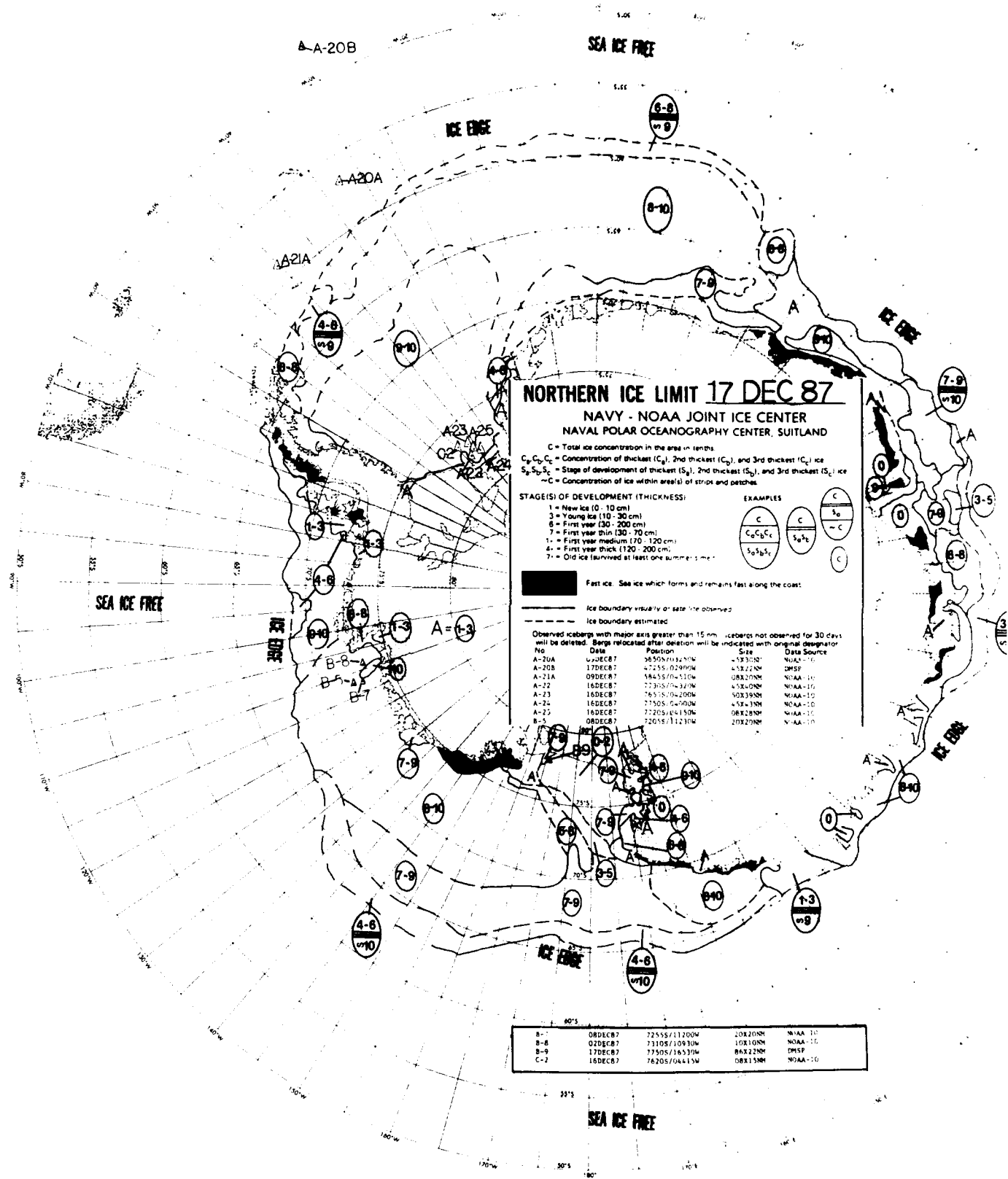












A-20B

SEA ICE FREE

ICE EDGE

A-20A

A-21A

NORTHERN ICE LIMIT 17 DEC 87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.

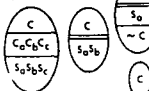
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice. S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.

~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice. Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

Ice boundary estimated.

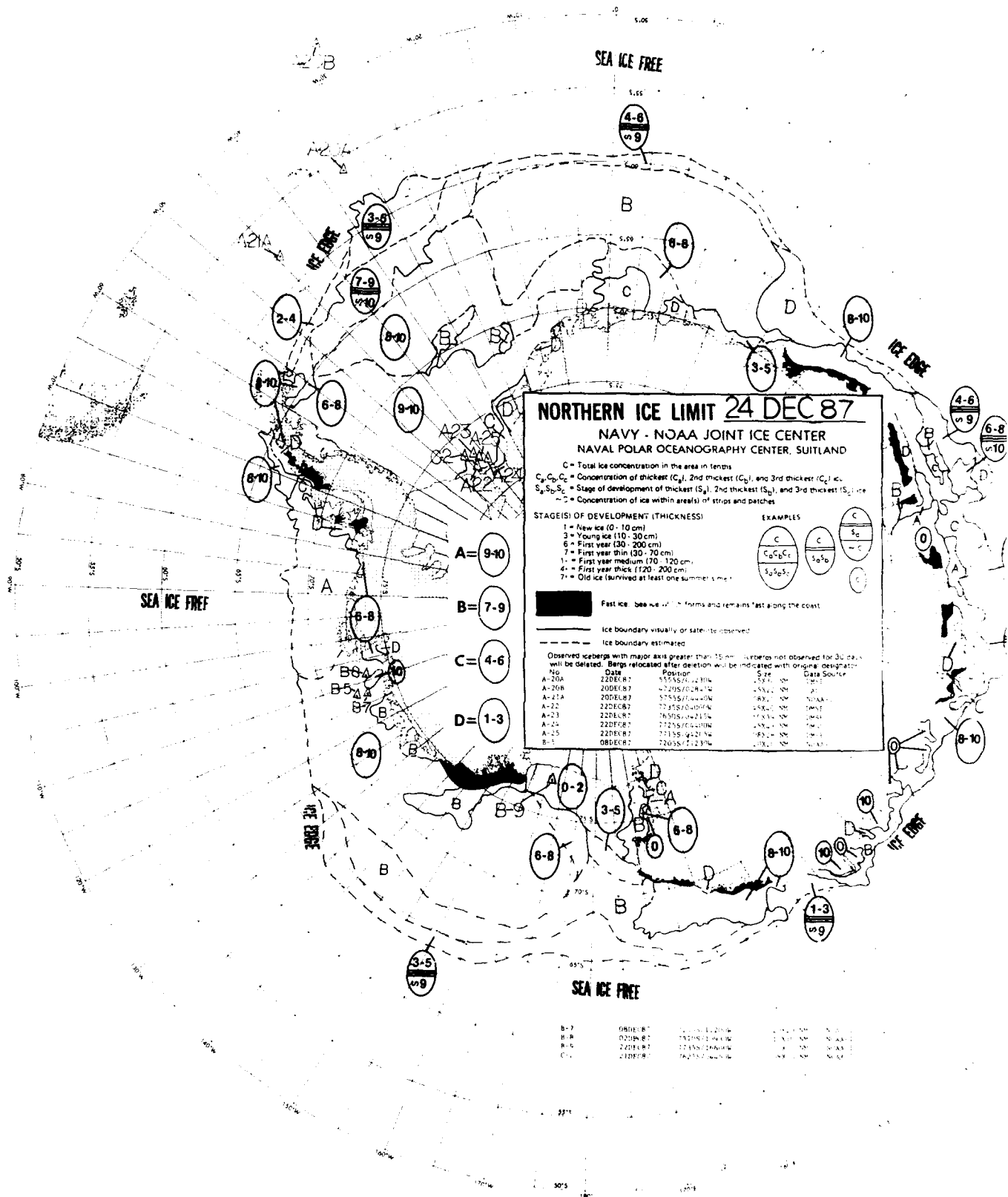
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	09DEC87	5650S/03250W	45X30NM	NOAA-10
A-20B	17DEC87	4725S/02900W	45X22NM	DMSP
A-21A	09DEC87	5845S/04510W	08X20NM	NOAA-10
A-22	14DEC87	7730S/04320W	45X40NM	NOAA-10
A-23	14DEC87	7655S/04200W	50X39NM	NOAA-10
A-24	16DEC87	7750S/04000W	45X43NM	NOAA-10
A-25	16DEC87	7720S/04150W	08X28NM	NOAA-10
B-5	08DEC87	7205S/11230W	20X20NM	NOAA-10

B-7	08DEC87	7255S/11200W	20X20NM	NOAA-10
B-8	02DEC87	7310S/10930W	10X10NM	NOAA-10
B-9	17DEC87	7750S/16530W	84X22NM	DMSP
C-2	14DEC87	7620S/04415W	08X15NM	NOAA-10

SEA ICE FREE

SEA ICE FREE



SEA ICE FREE

NORTHERN ICE LIMIT 24 DEC 87

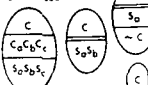
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within areas of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

Ice boundary estimated

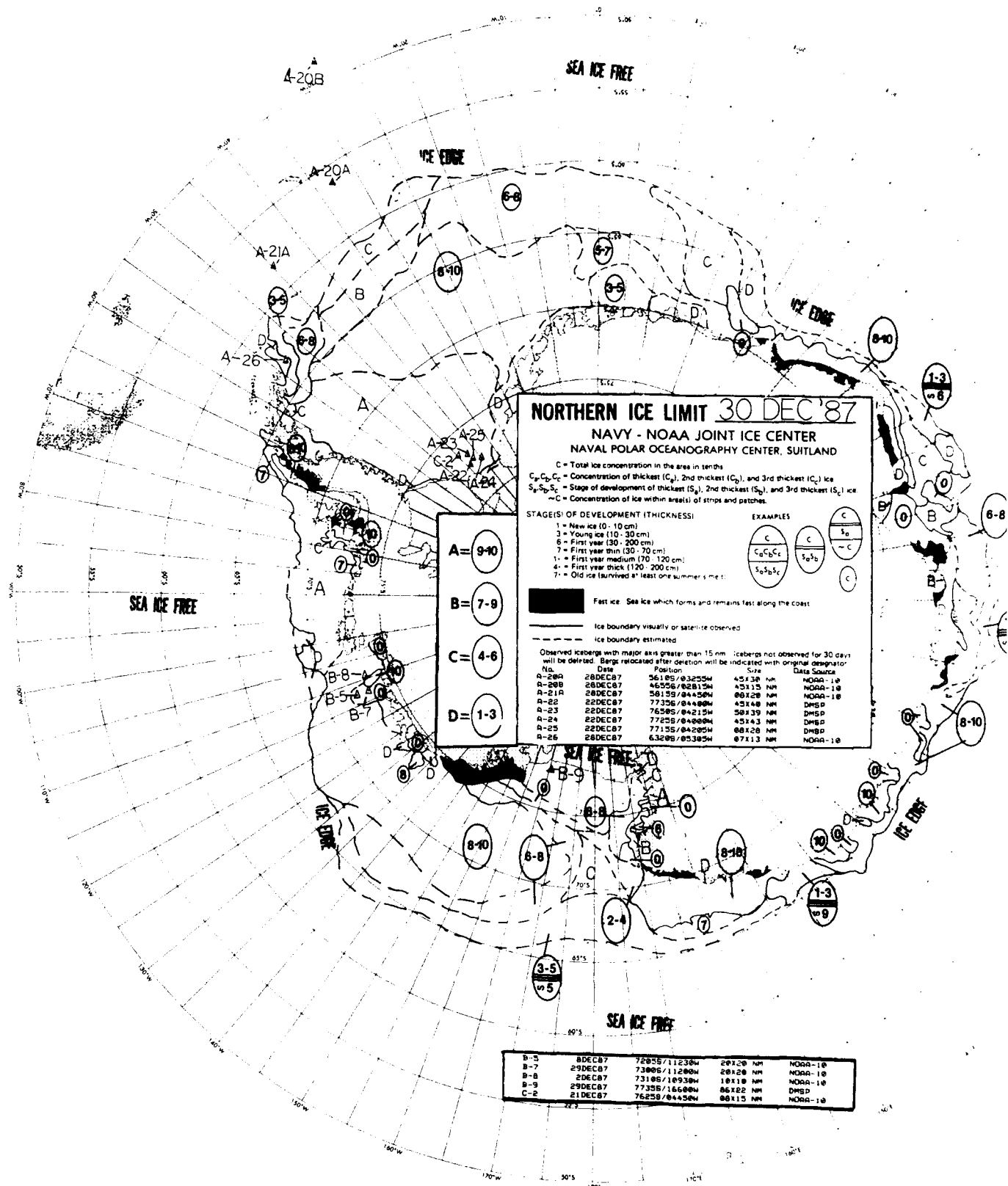
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	22DEC87	4555S/01230W	45X30 NM	DMSP
A-20B	20DEC87	4720S/02845W	45X22 NM	GAC
A-21A	20DEC87	5155S/04440W	08X20 NM	NOAA-11
A-22	22DEC87	7135S/04900W	45X40 NM	DMSP
A-23	22DEC87	7650S/04215W	50X19 NM	DMSP
A-24	22DEC87	7725S/04400W	45X11 NM	DMSP
A-25	22DEC87	7715S/04205W	08X18 NM	DMSP
B-5	08DEC87	7205S/11230W	20X20 NM	NOAA-11

SEA ICE FREE

B-7	08DEC87	7405S/11200W	40X20 NM	NOAA-11
B-8	02DEC87	7310S/10480W	10X10 NM	NOAA-11
B-9	22DEC87	7735S/14860W	4 NM	NOAA-11
C-2	21DEC87	7425S/04450W	08X15 NM	NOAA-11

SEA ICE FREE



NORTHERN ICE LIMIT 30 DEC '87

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
 C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
 S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
 -C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES

$\frac{C}{C_1 C_2 C_3}$	$\frac{C}{S_1 S_2 S_3}$	$\frac{C}{-C}$
$\frac{C}{S_1 S_2 S_3}$	$\frac{C}{-C}$	$\frac{C}{-C}$

Legend:

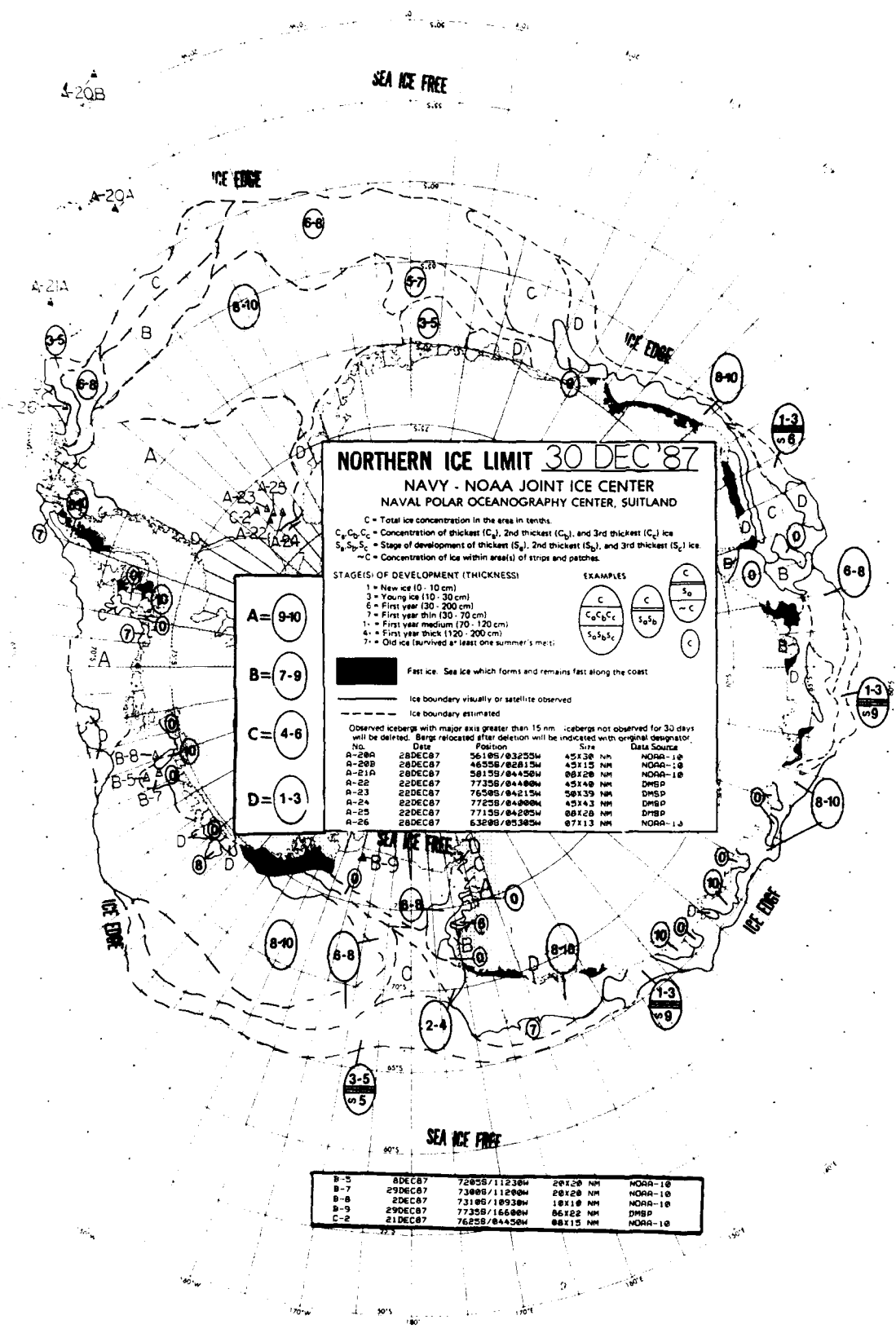
- Fast ice. See ice which forms and remains fast along the coast
- Ice boundary visually or satellite observed
- Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	28DEC87	5610S/03255W	45X38 NM	NORR-10
A-20B	28DEC87	4655S/02815W	45X15 NM	NORR-10
A-21A	28DEC87	5815S/04450W	80X20 NM	NORR-10
A-22	22DEC87	7735S/04400W	45X40 NM	DMSP
A-23	22DEC87	7650S/04215W	50X39 NM	DMSP
A-24	22DEC87	7725S/04000W	45X43 NM	DMSP
A-25	22DEC87	7715S/04205W	80X20 NM	DMSP
A-26	28DEC87	6320S/05385W	87X13 NM	NORR-13

- A = 9-10**
- B = 7-9**
- C = 4-6**
- D = 1-3**

B-5	8DEC87	7205S/11230W	20X20 NM	NORR-10
B-7	29DEC87	7300S/11200W	20X20 NM	NORR-10
B-8	20DEC87	7310S/10930W	18X18 NM	NORR-10
B-9	29DEC87	7735S/16500W	86X82 NM	DMSP
C-2	21DEC87	7625S/04450W	88X15 NM	NORR-10



SEA ICE FREE

A-20B

A-20A

ICE EDGE

SEA ICE FREE

A-21A

A-22

A-23

ICE EDGE

SEA ICE FREE

NORTHERN ICE LIMIT 07 JAN 88

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C = Concentration of ice within areas of ships and parties

STAGES OF DEVELOPMENT - THICKNESSES

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year (200 - 700 cm)
- 5 = First year (700 - 1200 cm)
- 6 = First year (1200 - 2200 cm)
- 7 = Old ice (survived at least one year)

Fast ice: Sea ice that is firmly attached to the shore or bottom
Ice boundary: where ice concentration changes abruptly
Ice boundary: where ice concentration changes gradually

No.	Date	Lat	Long	Time	Observer	Remarks
1	07 JAN 88	71° 15' N	156° 15' W	0800	USN	SEA ICE FREE
2	07 JAN 88	71° 15' N	156° 15' W	0900	USN	SEA ICE FREE
3	07 JAN 88	71° 15' N	156° 15' W	1000	USN	SEA ICE FREE
4	07 JAN 88	71° 15' N	156° 15' W	1100	USN	SEA ICE FREE
5	07 JAN 88	71° 15' N	156° 15' W	1200	USN	SEA ICE FREE
6	07 JAN 88	71° 15' N	156° 15' W	1300	USN	SEA ICE FREE
7	07 JAN 88	71° 15' N	156° 15' W	1400	USN	SEA ICE FREE
8	07 JAN 88	71° 15' N	156° 15' W	1500	USN	SEA ICE FREE
9	07 JAN 88	71° 15' N	156° 15' W	1600	USN	SEA ICE FREE
10	07 JAN 88	71° 15' N	156° 15' W	1700	USN	SEA ICE FREE
11	07 JAN 88	71° 15' N	156° 15' W	1800	USN	SEA ICE FREE
12	07 JAN 88	71° 15' N	156° 15' W	1900	USN	SEA ICE FREE
13	07 JAN 88	71° 15' N	156° 15' W	2000	USN	SEA ICE FREE
14	07 JAN 88	71° 15' N	156° 15' W	2100	USN	SEA ICE FREE
15	07 JAN 88	71° 15' N	156° 15' W	2200	USN	SEA ICE FREE
16	07 JAN 88	71° 15' N	156° 15' W	2300	USN	SEA ICE FREE
17	07 JAN 88	71° 15' N	156° 15' W	2400	USN	SEA ICE FREE
18	07 JAN 88	71° 15' N	156° 15' W	2500	USN	SEA ICE FREE
19	07 JAN 88	71° 15' N	156° 15' W	2600	USN	SEA ICE FREE
20	07 JAN 88	71° 15' N	156° 15' W	2700	USN	SEA ICE FREE
21	07 JAN 88	71° 15' N	156° 15' W	2800	USN	SEA ICE FREE
22	07 JAN 88	71° 15' N	156° 15' W	2900	USN	SEA ICE FREE
23	07 JAN 88	71° 15' N	156° 15' W	3000	USN	SEA ICE FREE
24	07 JAN 88	71° 15' N	156° 15' W	3100	USN	SEA ICE FREE
25	07 JAN 88	71° 15' N	156° 15' W	3200	USN	SEA ICE FREE
26	07 JAN 88	71° 15' N	156° 15' W	3300	USN	SEA ICE FREE
27	07 JAN 88	71° 15' N	156° 15' W	3400	USN	SEA ICE FREE
28	07 JAN 88	71° 15' N	156° 15' W	3500	USN	SEA ICE FREE
29	07 JAN 88	71° 15' N	156° 15' W	3600	USN	SEA ICE FREE
30	07 JAN 88	71° 15' N	156° 15' W	3700	USN	SEA ICE FREE
31	07 JAN 88	71° 15' N	156° 15' W	3800	USN	SEA ICE FREE
32	07 JAN 88	71° 15' N	156° 15' W	3900	USN	SEA ICE FREE
33	07 JAN 88	71° 15' N	156° 15' W	4000	USN	SEA ICE FREE
34	07 JAN 88	71° 15' N	156° 15' W	4100	USN	SEA ICE FREE
35	07 JAN 88	71° 15' N	156° 15' W	4200	USN	SEA ICE FREE
36	07 JAN 88	71° 15' N	156° 15' W	4300	USN	SEA ICE FREE
37	07 JAN 88	71° 15' N	156° 15' W	4400	USN	SEA ICE FREE
38	07 JAN 88	71° 15' N	156° 15' W	4500	USN	SEA ICE FREE
39	07 JAN 88	71° 15' N	156° 15' W	4600	USN	SEA ICE FREE
40	07 JAN 88	71° 15' N	156° 15' W	4700	USN	SEA ICE FREE
41	07 JAN 88	71° 15' N	156° 15' W	4800	USN	SEA ICE FREE
42	07 JAN 88	71° 15' N	156° 15' W	4900	USN	SEA ICE FREE
43	07 JAN 88	71° 15' N	156° 15' W	5000	USN	SEA ICE FREE
44	07 JAN 88	71° 15' N	156° 15' W	5100	USN	SEA ICE FREE
45	07 JAN 88	71° 15' N	156° 15' W	5200	USN	SEA ICE FREE
46	07 JAN 88	71° 15' N	156° 15' W	5300	USN	SEA ICE FREE
47	07 JAN 88	71° 15' N	156° 15' W	5400	USN	SEA ICE FREE
48	07 JAN 88	71° 15' N	156° 15' W	5500	USN	SEA ICE FREE
49	07 JAN 88	71° 15' N	156° 15' W	5600	USN	SEA ICE FREE
50	07 JAN 88	71° 15' N	156° 15' W	5700	USN	SEA ICE FREE
51	07 JAN 88	71° 15' N	156° 15' W	5800	USN	SEA ICE FREE
52	07 JAN 88	71° 15' N	156° 15' W	5900	USN	SEA ICE FREE
53	07 JAN 88	71° 15' N	156° 15' W	6000	USN	SEA ICE FREE
54	07 JAN 88	71° 15' N	156° 15' W	6100	USN	SEA ICE FREE
55	07 JAN 88	71° 15' N	156° 15' W	6200	USN	SEA ICE FREE
56	07 JAN 88	71° 15' N	156° 15' W	6300	USN	SEA ICE FREE
57	07 JAN 88	71° 15' N	156° 15' W	6400	USN	SEA ICE FREE
58	07 JAN 88	71° 15' N	156° 15' W	6500	USN	SEA ICE FREE
59	07 JAN 88	71° 15' N	156° 15' W	6600	USN	SEA ICE FREE
60	07 JAN 88	71° 15' N	156° 15' W	6700	USN	SEA ICE FREE
61	07 JAN 88	71° 15' N	156° 15' W	6800	USN	SEA ICE FREE
62	07 JAN 88	71° 15' N	156° 15' W	6900	USN	SEA ICE FREE
63	07 JAN 88	71° 15' N	156° 15' W	7000	USN	SEA ICE FREE
64	07 JAN 88	71° 15' N	156° 15' W	7100	USN	SEA ICE FREE
65	07 JAN 88	71° 15' N	156° 15' W	7200	USN	SEA ICE FREE
66	07 JAN 88	71° 15' N	156° 15' W	7300	USN	SEA ICE FREE
67	07 JAN 88	71° 15' N	156° 15' W	7400	USN	SEA ICE FREE
68	07 JAN 88	71° 15' N	156° 15' W	7500	USN	SEA ICE FREE
69	07 JAN 88	71° 15' N	156° 15' W	7600	USN	SEA ICE FREE
70	07 JAN 88	71° 15' N	156° 15' W	7700	USN	SEA ICE FREE
71	07 JAN 88	71° 15' N	156° 15' W	7800	USN	SEA ICE FREE
72	07 JAN 88	71° 15' N	156° 15' W	7900	USN	SEA ICE FREE
73	07 JAN 88	71° 15' N	156° 15' W	8000	USN	SEA ICE FREE
74	07 JAN 88	71° 15' N	156° 15' W	8100	USN	SEA ICE FREE
75	07 JAN 88	71° 15' N	156° 15' W	8200	USN	SEA ICE FREE
76	07 JAN 88	71° 15' N	156° 15' W	8300	USN	SEA ICE FREE
77	07 JAN 88	71° 15' N	156° 15' W	8400	USN	SEA ICE FREE
78	07 JAN 88	71° 15' N	156° 15' W	8500	USN	SEA ICE FREE
79	07 JAN 88	71° 15' N	156° 15' W	8600	USN	SEA ICE FREE
80	07 JAN 88	71° 15' N	156° 15' W	8700	USN	SEA ICE FREE
81	07 JAN 88	71° 15' N	156° 15' W	8800	USN	SEA ICE FREE
82	07 JAN 88	71° 15' N	156° 15' W	8900	USN	SEA ICE FREE
83	07 JAN 88	71° 15' N	156° 15' W	9000	USN	SEA ICE FREE
84	07 JAN 88	71° 15' N	156° 15' W	9100	USN	SEA ICE FREE
85	07 JAN 88	71° 15' N	156° 15' W	9200	USN	SEA ICE FREE
86	07 JAN 88	71° 15' N	156° 15' W	9300	USN	SEA ICE FREE
87	07 JAN 88	71° 15' N	156° 15' W	9400	USN	SEA ICE FREE
88	07 JAN 88	71° 15' N	156° 15' W	9500	USN	SEA ICE FREE
89	07 JAN 88	71° 15' N	156° 15' W	9600	USN	SEA ICE FREE
90	07 JAN 88	71° 15' N	156° 15' W	9700	USN	SEA ICE FREE
91	07 JAN 88	71° 15' N	156° 15' W	9800	USN	SEA ICE FREE
92	07 JAN 88	71° 15' N	156° 15' W	9900	USN	SEA ICE FREE
93	07 JAN 88	71° 15' N	156° 15' W	10000	USN	SEA ICE FREE

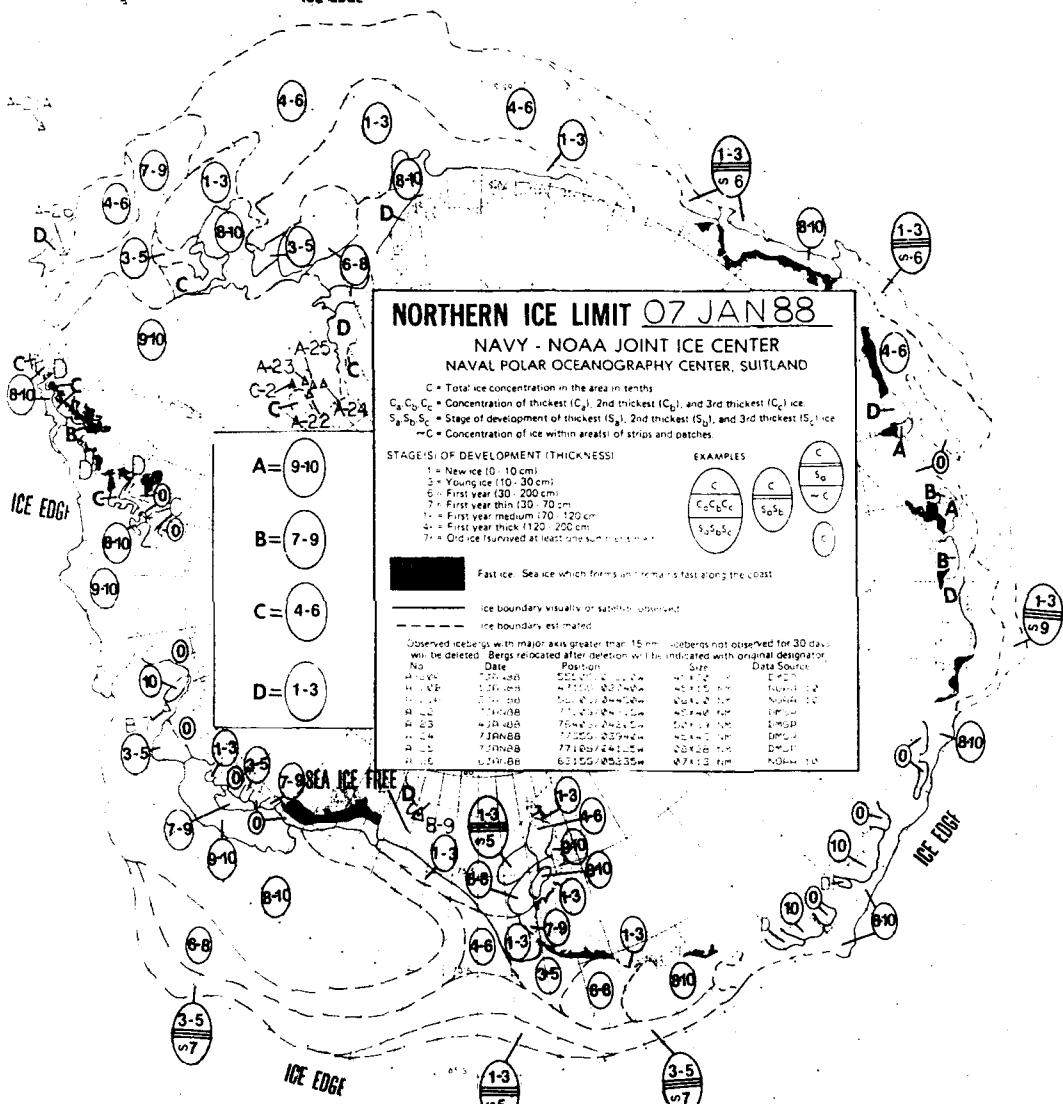
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A-20.5

A-20A

ICE EDGE

SEA ICE FREE



NORTHERN ICE LIMIT 07 JAN 88

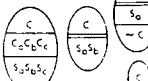
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
-C = Concentration of ice within areas of strips 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 thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 m. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
10-1	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-2	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-3	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-4	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-5	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-6	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-7	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-8	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-9	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12
10-10	7 JAN 88	55° 00' N 140° 00' W	45 x 15 km	NOAA-12

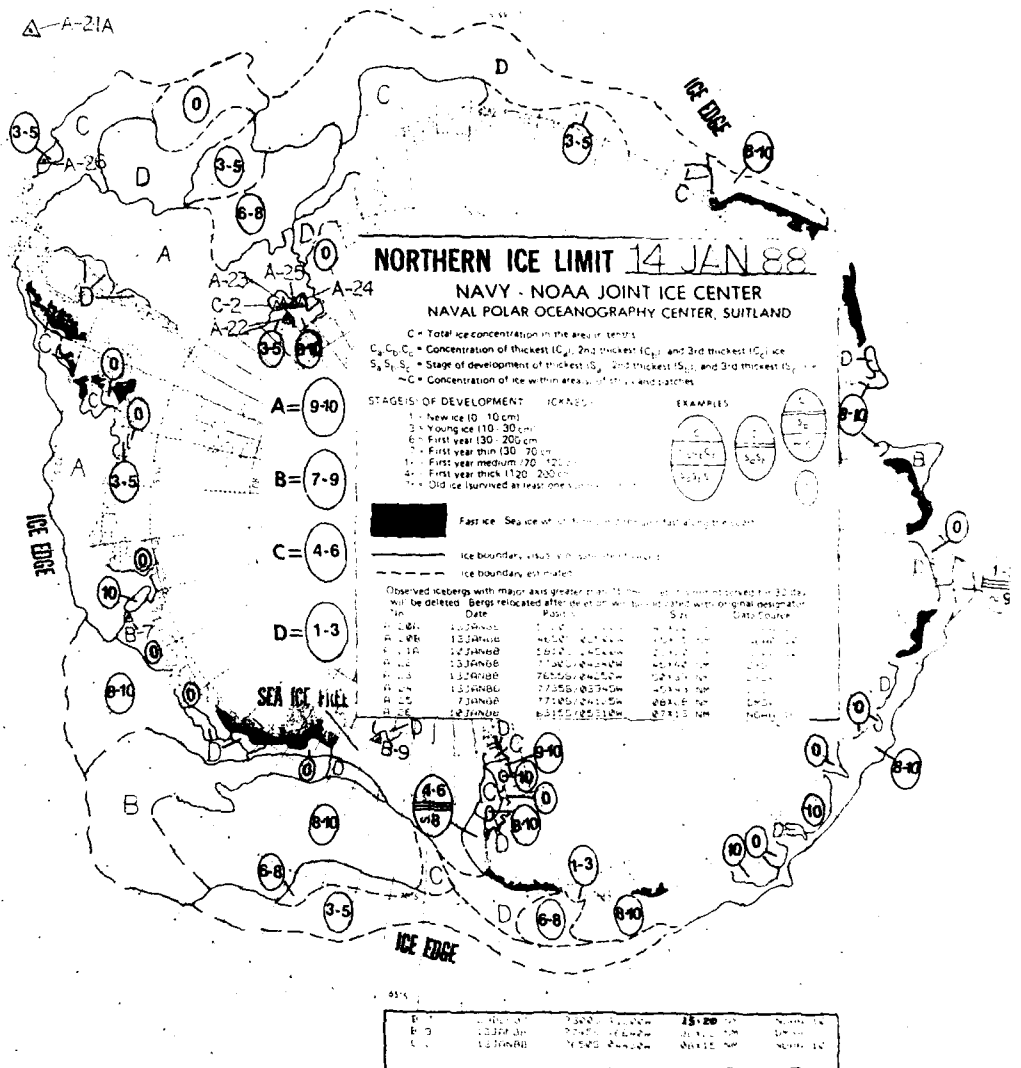
SEA ICE FREE

△-A-20B

△-A-20A

△-A-21A

SEA ICE FREE



SEA ICE FREE

Δ-A-20B

Δ-A-20A

SEA ICE FREE

Δ-A-21A

NORTHERN ICE LIMIT 14 JAN 88

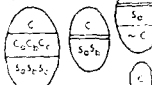
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C = Concentration of ice within area of strips and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year thin (30 - 70 cm)
- 4 = First year medium (70 - 120 cm)
- 5 = First year thick (120 - 200 cm)
- 6 = Old ice (survived at least one summer)

EXAMPLES



Fast ice - Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite formed
Ice boundary estimated

Observed icebergs with major axis greater than 15 m. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	13 JAN 88	70°00'N 150°00'W	15 x 10 NM	NOAA
A-20B	13 JAN 88	68°00'N 150°00'W	15 x 10 NM	NOAA
A-21A	13 JAN 88	66°00'N 150°00'W	15 x 10 NM	NOAA
A-21B	13 JAN 88	64°00'N 150°00'W	15 x 10 NM	NOAA
A-22	13 JAN 88	62°00'N 150°00'W	15 x 10 NM	NOAA
A-23	13 JAN 88	60°00'N 150°00'W	15 x 10 NM	NOAA
A-24	13 JAN 88	58°00'N 150°00'W	15 x 10 NM	NOAA
A-25	13 JAN 88	56°00'N 150°00'W	15 x 10 NM	NOAA
A-26	13 JAN 88	54°00'N 150°00'W	15 x 10 NM	NOAA

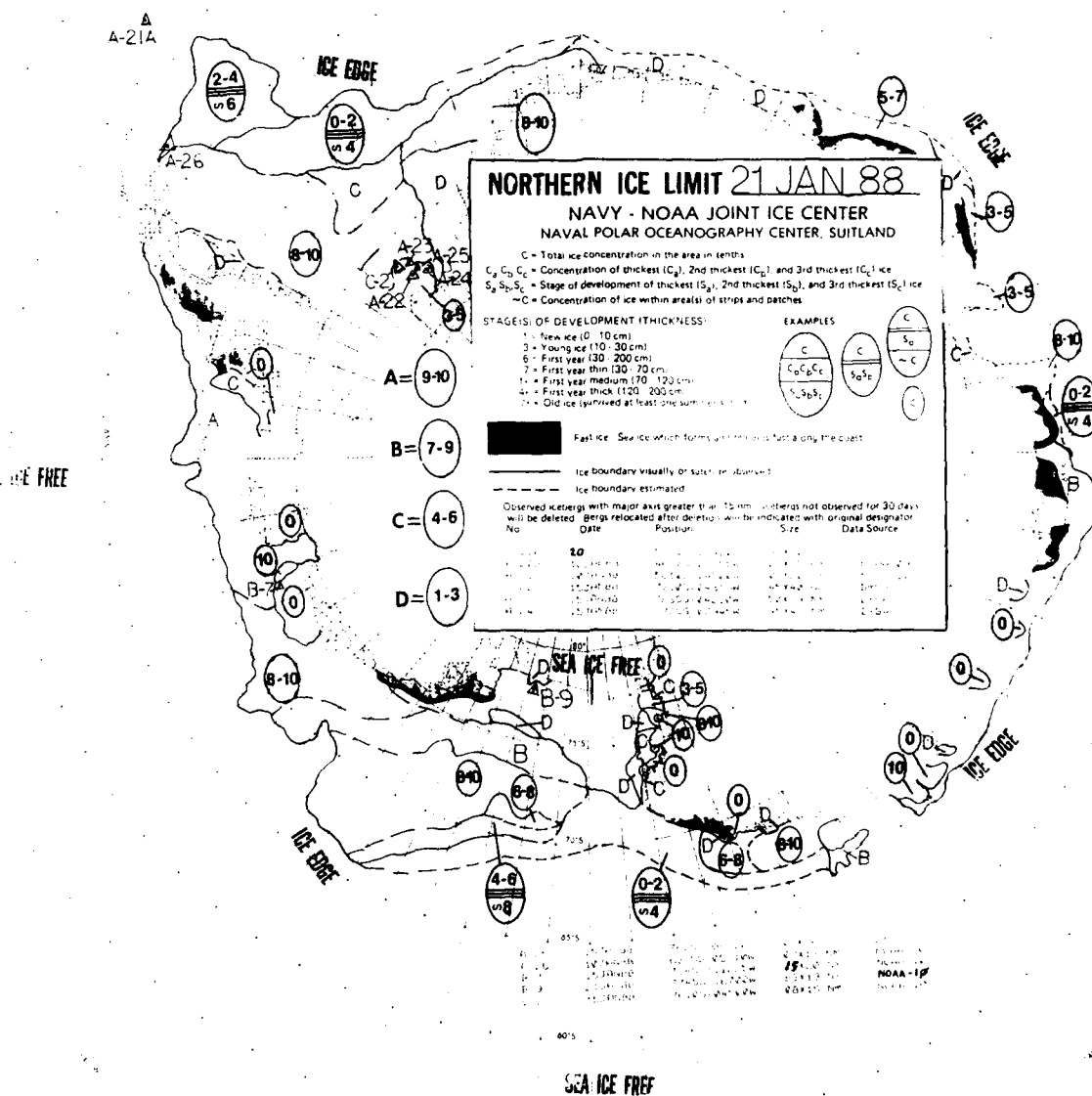
B-1	13 JAN 88	70°00'N 150°00'W	15 x 10 NM	NOAA
B-2	13 JAN 88	68°00'N 150°00'W	15 x 10 NM	NOAA
B-3	13 JAN 88	66°00'N 150°00'W	15 x 10 NM	NOAA

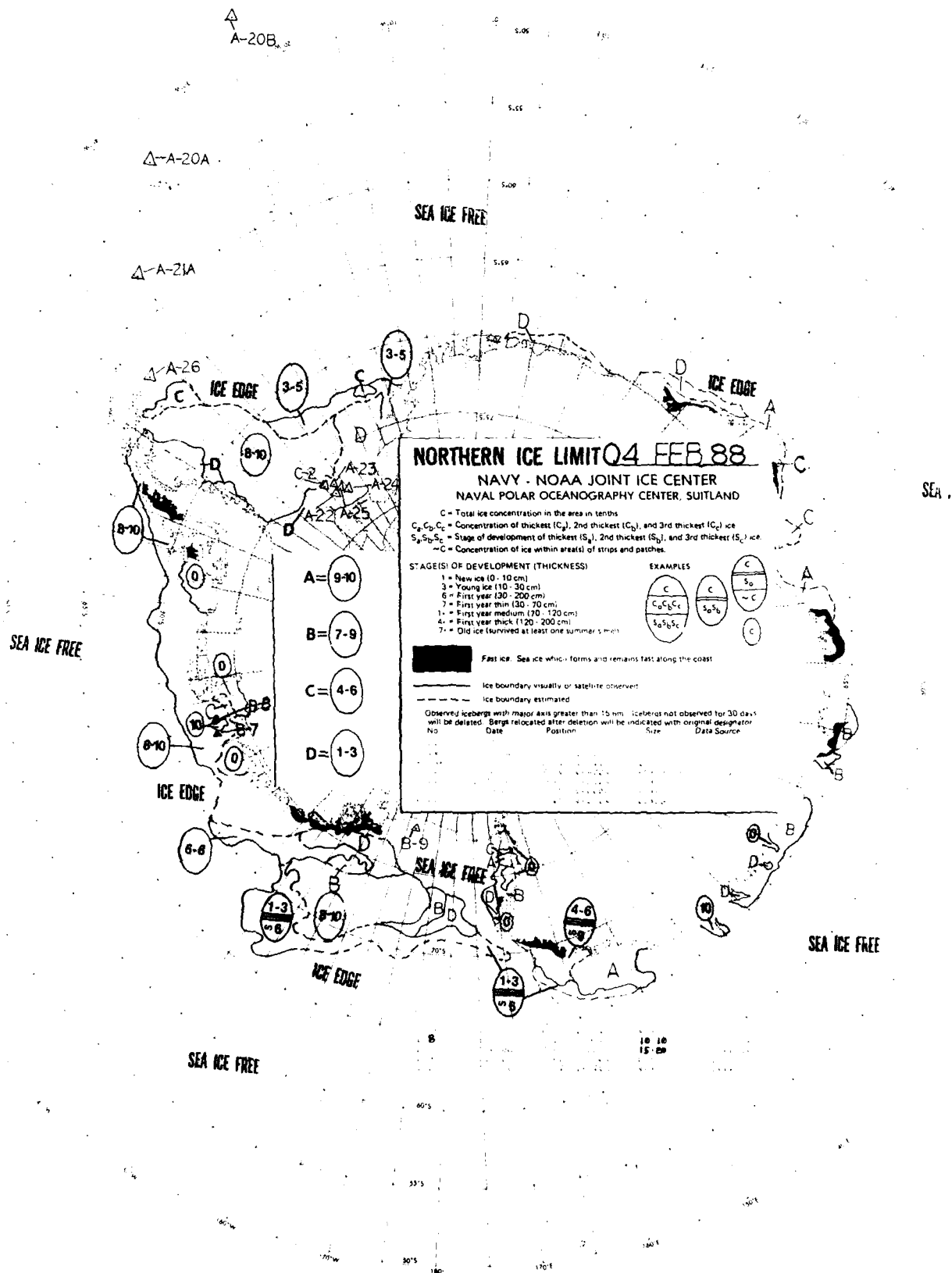
SEA ICE FREE

A-20A

SEA ICE FREE

A-21A





A-208

A-20A

SEA ICE FREE

NORTHERN ICE LIMIT 11 FEB '88

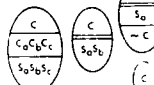
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
-C = Concentration of ice within areas of strips and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 70 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast
Ice boundary visually or satellite observed
Ice boundary estimated
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.
No Date Position Size Data Source

19 10
15 20

SEA ICE 1.

SEA ICE FREE

SEA ICE FREE

ICEBERG REPORTS FROM SHIP W/ SIGNED EXPRESS

ICEBERG LAST OBSERVED IN NAVY
LOCATION: 60° 07' N 150° 15' W
APPROXIMATELY 100 NM OFF SHORE
IN AN EAST OR EASTERLY DIRECTION
WAS ALSO APPARENTLY OBSERVED FROM
1978 TO 1982.

A-20B

A-20A

SEA ICE FREE

NORTHERN ICE LIMIT 18 FEB '88

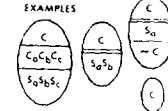
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
-C = Concentration of ice within areas of strips and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after detector will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-20A	17 FEB 88	5320S/03320W	45X10 NM	DMSP
A-20B	9 FEB 88	4620S/02220W	20X10 NM	NOAA-09
A-22	8 FEB 88	7720S/04410W	45X40 NM	DMSP
A-23	8 FEB 88	7650S/04230W	50X39 NM	DMSP
A-24	8 FEB 88	7710S/04000W	45X41 NM	DMSP
A-25	8 FEB 88	7705S/04200W	08X28 NM	DMSP

THESE DATA WERE OBTAINED FROM THE NAVY - NOAA JOINT ICE CENTER. THE DATA ARE PRESENTED AS IS. THE CENTER MAKES NO WARRANTY, EXPRESS OR IMPLIED, FOR THE ACCURACY, COMPLETENESS, OR TIMELINESS OF THE DATA. THE DATA ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE DATA ARE NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN PERMISSION OF THE NAVY - NOAA JOINT ICE CENTER.

B-7	17 FEB 88	7245S/11241W	15X20 NM	NOAA-09
B-8	24 JAN 88	7105S/10930W	10X10 NM	NOAA-10
B-9	17 FEB 88	7735S/16655W	8X19 NM	NOAA-09
C-6	27 JAN 88	6520S/13330E	25X15 NM	DMSP

SEA ICE FREE

A-20B

A-20A

A-21A

SEA ICE FREE

NORTHERN ICE LIMIT 25 FEB 88

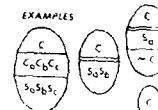
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
~C = Concentration of ice within areas of stress and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice survived at least one summer's melt

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designation.

No. Date Position Size Data Source

A = 9-10

B = 7-9

C = 4-6

D = 1-3

SEA ICE FREE

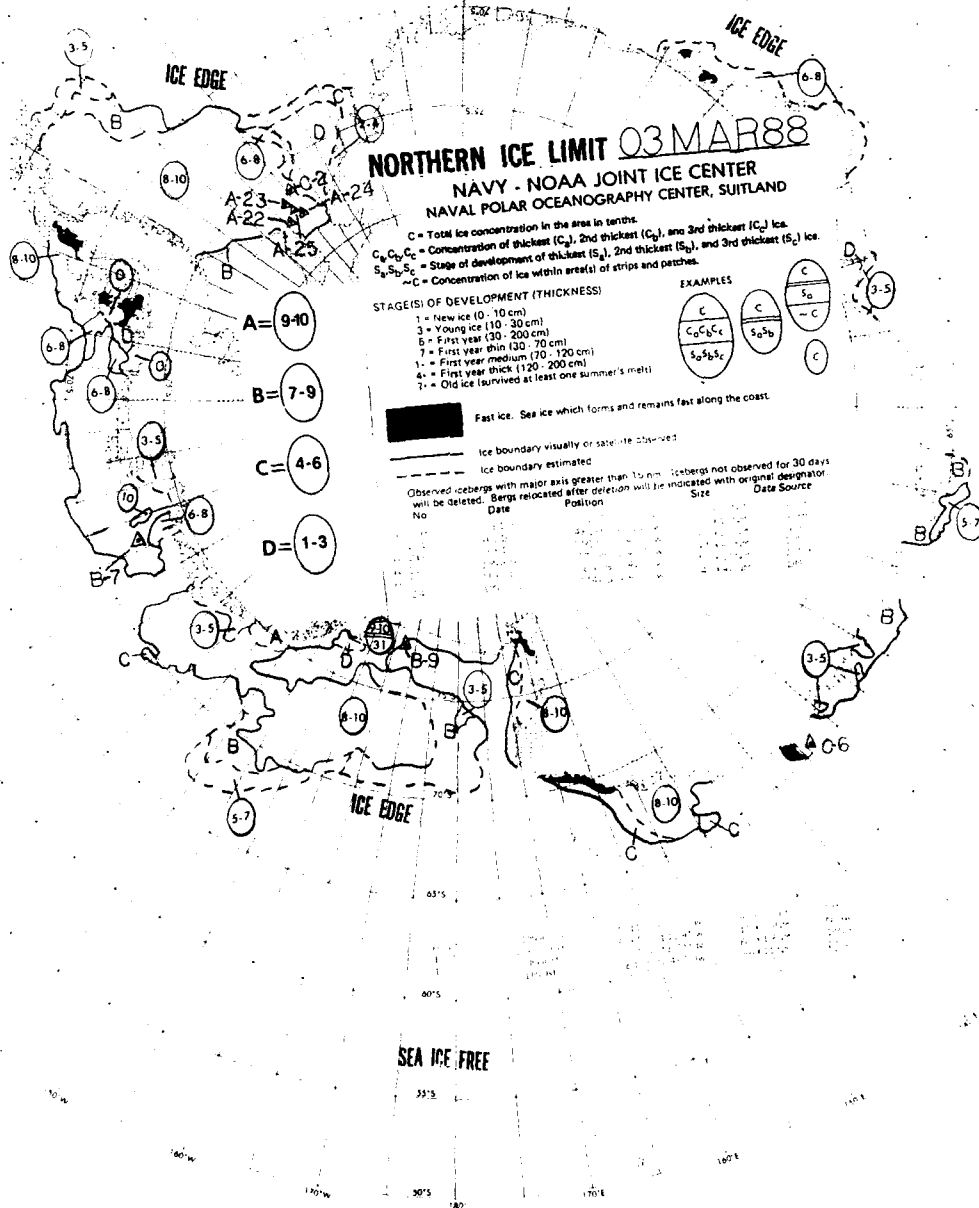
A-A-20B

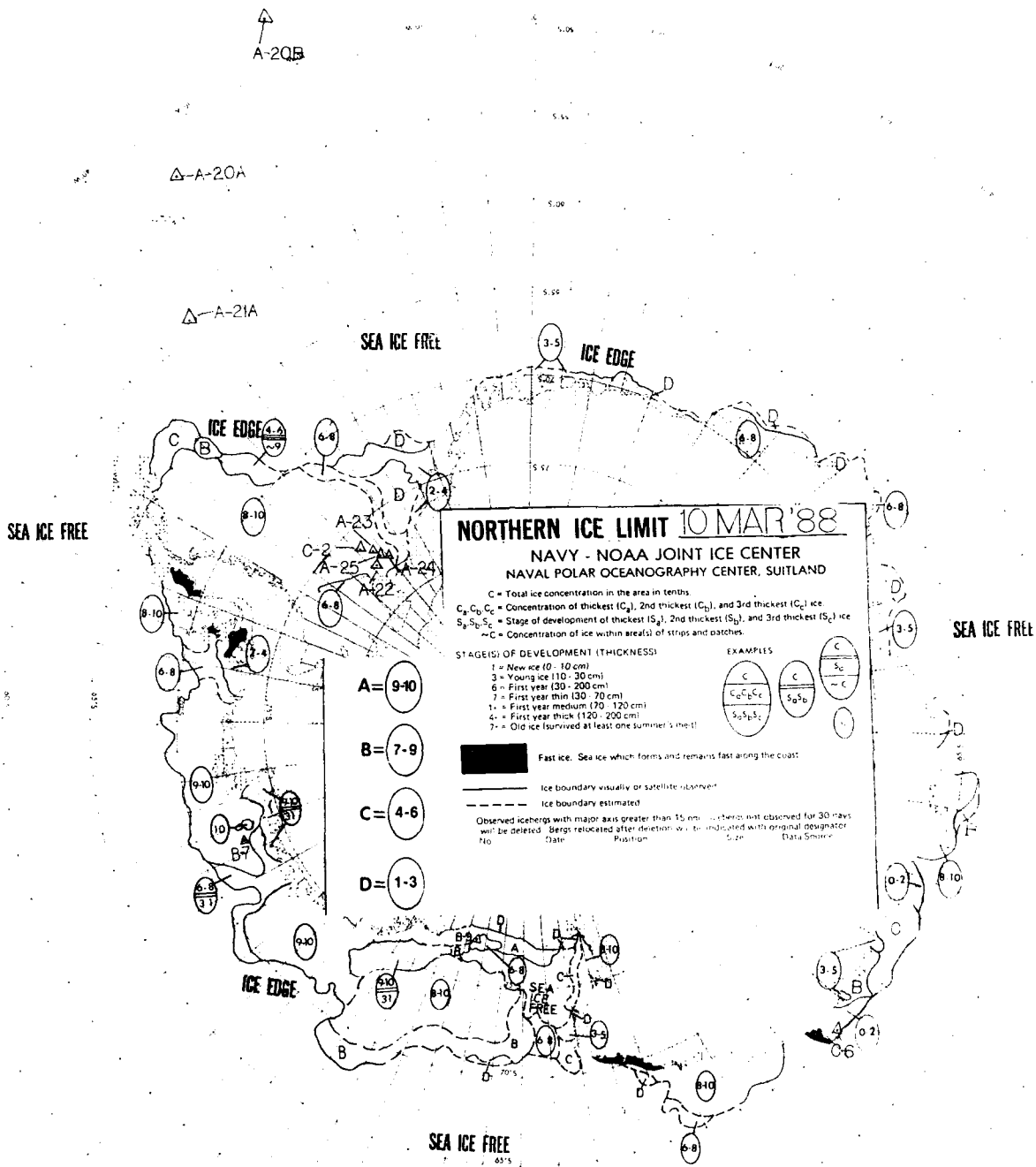
A-A-20A

SEA ICE FREE

A-A-21A

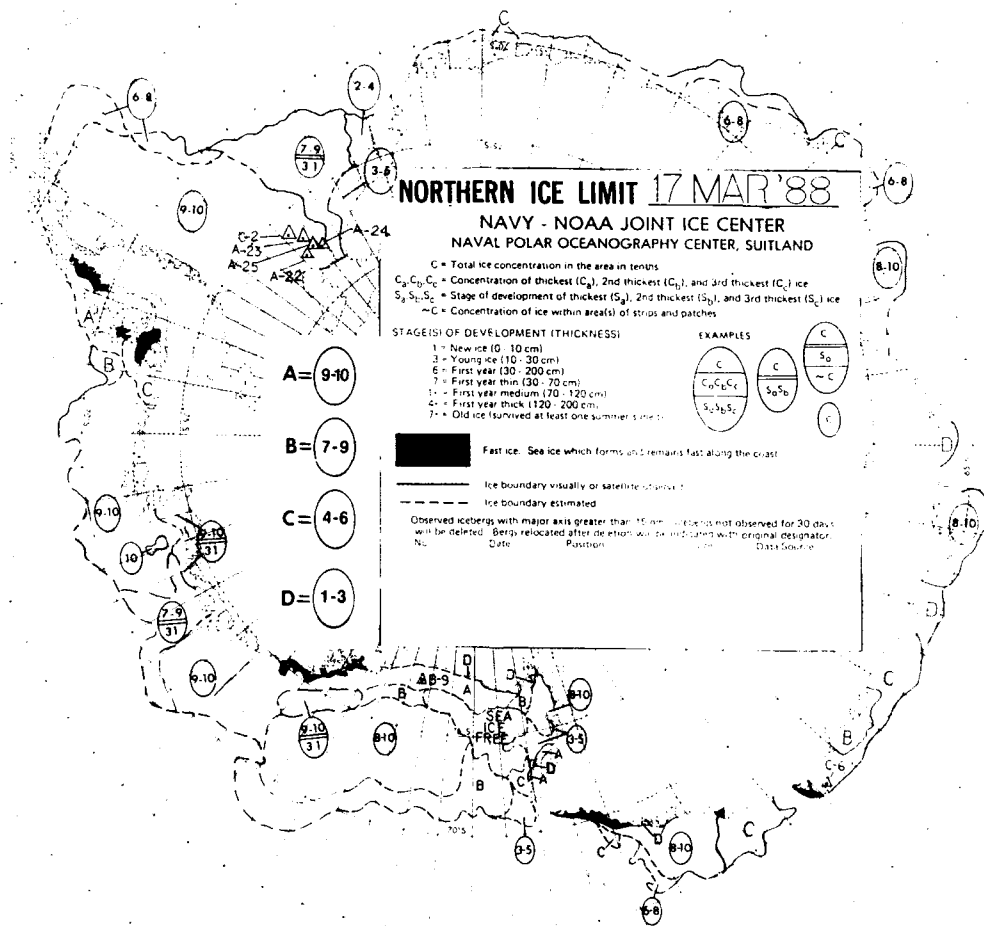
SEA ICE FREE





Δ-A-20A

Δ-A-21A



Δ-A-20A

Δ-A-21A

SEA ICE FREE

NORTHERN ICE LIMIT 24 MAR '88

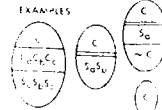
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C = Concentration of ice within areas of strips 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 thin (30 - 70 cm)
- 5 - First year medium (70 - 120 cm)
- 6 - First year thick (120 - 200 cm)
- 7 - Old ice (survived at least one summer)

EXAMPLES



Fast ice. Sea ice which forms in permanent fast along the coast.

Ice boundary visually or satellite observed.

Ice boundary estimated.

Observed icebergs with major axis greater than 15 nm, or estimated observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

Date	Position	Height	Data Source
A-20A	17MAR88	5535S/1430W	5X300 NM
A-21A	23FEB88	5555S/1440W	40X40 NM
A-22	23MAR88	7730S/1440W	40X40 NM
A-23	23MAR88	7650S/1440W	30X30 NM
A-24	23MAR88	7725S/14315W	40X40 NM
A-25	23MAR88	7710S/14350W	40X40 NM
B-9	23MAR88	7725S/16750W	65X15 NM
C-2	17MAR88	7610S/14430W	40X15 NM
C-6	24FEB88	5528S/13350E	25X15 NM

A= 9-10

B= 7-9

C= 4-6

D= 1-3

SEA ICE

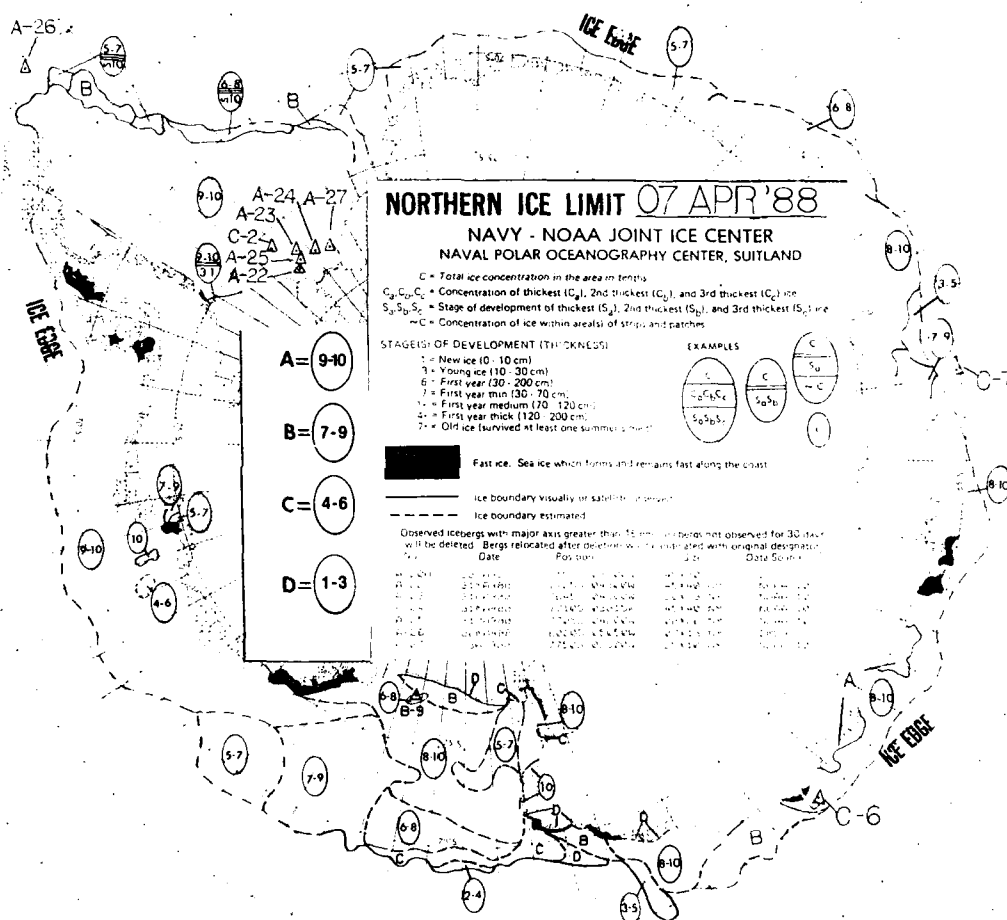
ICE EDGE

SEA ICE FREE

SEA ICE FREE



SEA ICE FREE

[illegible]

SEA ICE FREE

SEA INF AFF

NORTHERN ICE LIMIT 14 APR 88

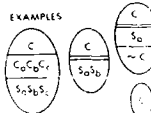
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 $\sim C$ = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 200 cm)
- 7 = First year thick (130 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 2 = First year thick (120 - 200 cm)
- 4 = Old ice (survived at least one summer's melt)

EXAMPLES



A = (9-10)

$$B = (7-9)$$

$C = (4-6)$

D= (1-3)

Fast ice. Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 m. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designation.

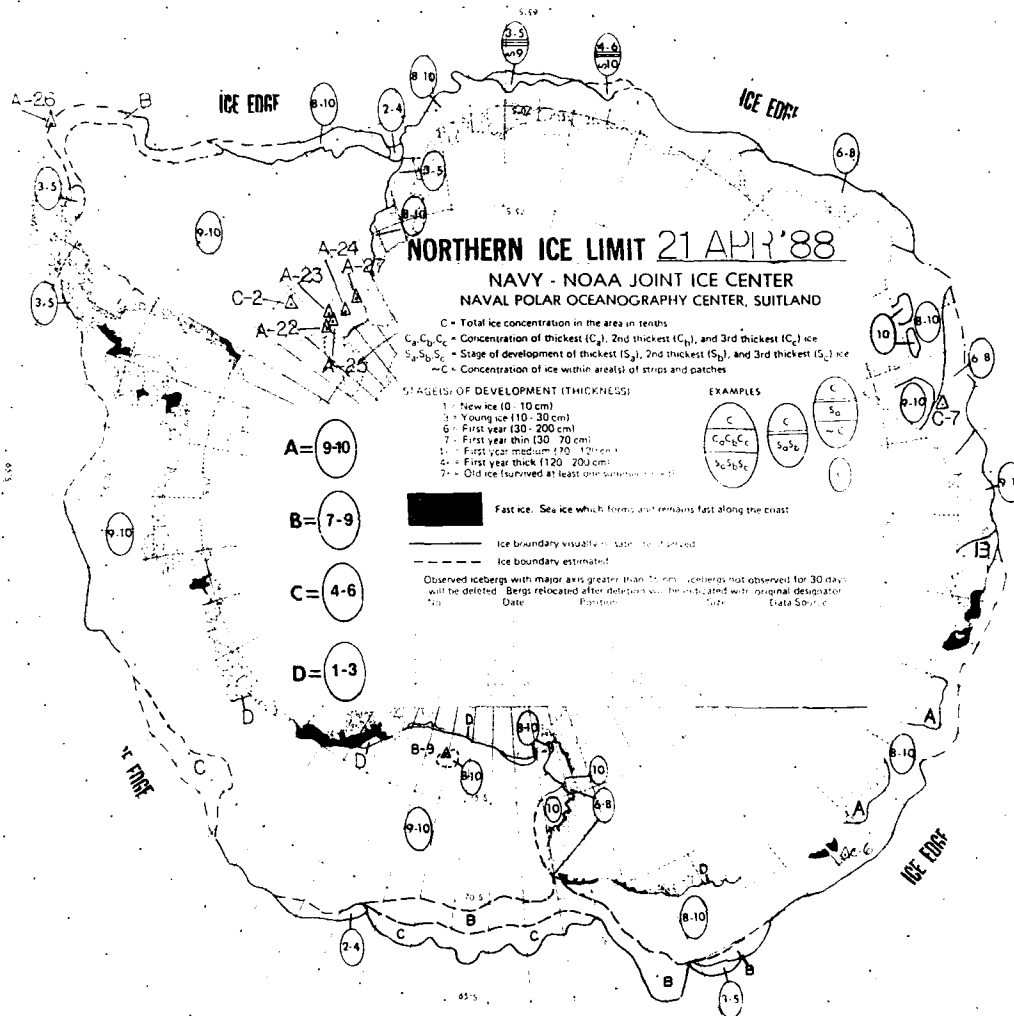
No.	Date	Position	Size	Data Source
1	1978-01-15	45°N, 150°W	150m x 200m	USCGC Healy
2	1978-02-01	48°N, 145°W	120m x 180m	USCGC Healy
3	1978-02-15	50°N, 140°W	100m x 150m	USCGC Healy
4	1978-03-01	52°N, 135°W	80m x 120m	USCGC Healy
5	1978-03-15	55°N, 130°W	60m x 100m	USCGC Healy
6	1978-04-01	58°N, 125°W	40m x 80m	USCGC Healy
7	1978-04-15	60°N, 120°W	30m x 60m	USCGC Healy
8	1978-05-01	62°N, 115°W	20m x 40m	USCGC Healy
9	1978-05-15	65°N, 110°W	15m x 30m	USCGC Healy
10	1978-06-01	68°N, 105°W	10m x 20m	USCGC Healy
11	1978-06-15	70°N, 100°W	8m x 15m	USCGC Healy
12	1978-07-01	72°N, 95°W	5m x 10m	USCGC Healy
13	1978-07-15	75°N, 90°W	3m x 8m	USCGC Healy
14	1978-08-01	78°N, 85°W	2m x 5m	USCGC Healy
15	1978-08-15	80°N, 80°W	1m x 4m	USCGC Healy
16	1978-09-01	82°N, 75°W	0.5m x 2m	USCGC Healy
17	1978-09-15	85°N, 70°W	0.2m x 1m	USCGC Healy
18	1978-10-01	88°N, 65°W	0.1m x 0.5m	USCGC Healy
19	1978-10-15	90°N, 60°W	0.05m x 0.2m	USCGC Healy
20	1978-11-01	92°N, 55°W	0.02m x 0.1m	USCGC Healy
21	1978-11-15	95°N, 50°W	0.01m x 0.05m	USCGC Healy
22	1978-12-01	98°N, 45°W	0.005m x 0.02m	USCGC Healy
23	1978-12-15	100°N, 40°W	0.002m x 0.01m	USCGC Healy
24	1979-01-01	102°N, 35°W	0.001m x 0.005m	USCGC Healy
25	1979-01-15	105°N, 30°W	0.0005m x 0.002m	USCGC Healy
26	1979-02-01	108°N, 25°W	0.0002m x 0.001m	USCGC Healy
27	1979-02-15	110°N, 20°W	0.0001m x 0.0005m	USCGC Healy
28	1979-03-01	112°N, 15°W	0.00005m x 0.0002m	USCGC Healy
29	1979-03-15	115°N, 10°W	0.00002m x 0.0001m	USCGC Healy
30	1979-04-01	118°N, 5°W	0.00001m x 0.00005m	USCGC Healy
31	1979-04-15	120°N, 0°W	0.000005m x 0.00002m	USCGC Healy
32	1979-05-01	122°N, 5°E	0.000002m x 0.00001m	USCGC Healy
33	1979-05-15	125°N, 10°E	0.000001m x 0.000005m	USCGC Healy
34	1979-06-01	128°N, 15°E	0.0000005m x 0.000002m	USCGC Healy
35	1979-06-15	130°N, 20°E	0.0000002m x 0.000001m	USCGC Healy
36	1979-07-01	132°N, 25°E	0.0000001m x 0.0000005m	USCGC Healy
37	1979-07-15	135°N, 30°E	0.00000005m x 0.0000002m	USCGC Healy
38	1979-08-01	138°N, 35°E	0.00000002m x 0.0000001m	USCGC Healy
39	1979-08-15	140°N, 40°E	0.00000001m x 0.00000005m	USCGC Healy
40	1979-09-01	142°N, 45°E	0.000000005m x 0.00000002m	USCGC Healy
41	1979-09-15	145°N, 50°E	0.000000002m x 0.00000001m	USCGC Healy
42	1979-10-01	148°N, 55°E	0.000000001m x 0.000000005m	USCGC Healy
43	1979-10-15	150°N, 60°E	0.0000000005m x 0.000000002m	USCGC Healy
44	1979-11-01	152°N, 65°E	0.0000000002m x 0.000000001m	USCGC Healy
45	1979-11-15	155°N, 70°E	0.0000000001m x 0.0000000005m	USCGC Healy
46	1979-12-01	158°N, 75°E	0.00000000005m x 0.0000000002m	USCGC Healy
47	1979-12-15	160°N, 80°E	0.00000000002m x 0.0000000001m	USCGC Healy
48	1980-01-01	162°N, 85°E	0.00000000001m x 0.00000000005m	USCGC Healy
49	1980-01-15	165°N, 90°E	0.000000000005m x 0.00000000002m	USCGC Healy
50	1980-02-01	168°N, 95°E		

will be Deleted	Berg Relocated after deletion w	to indicate* with original designator		
No	Date	Position	Size	Data Source

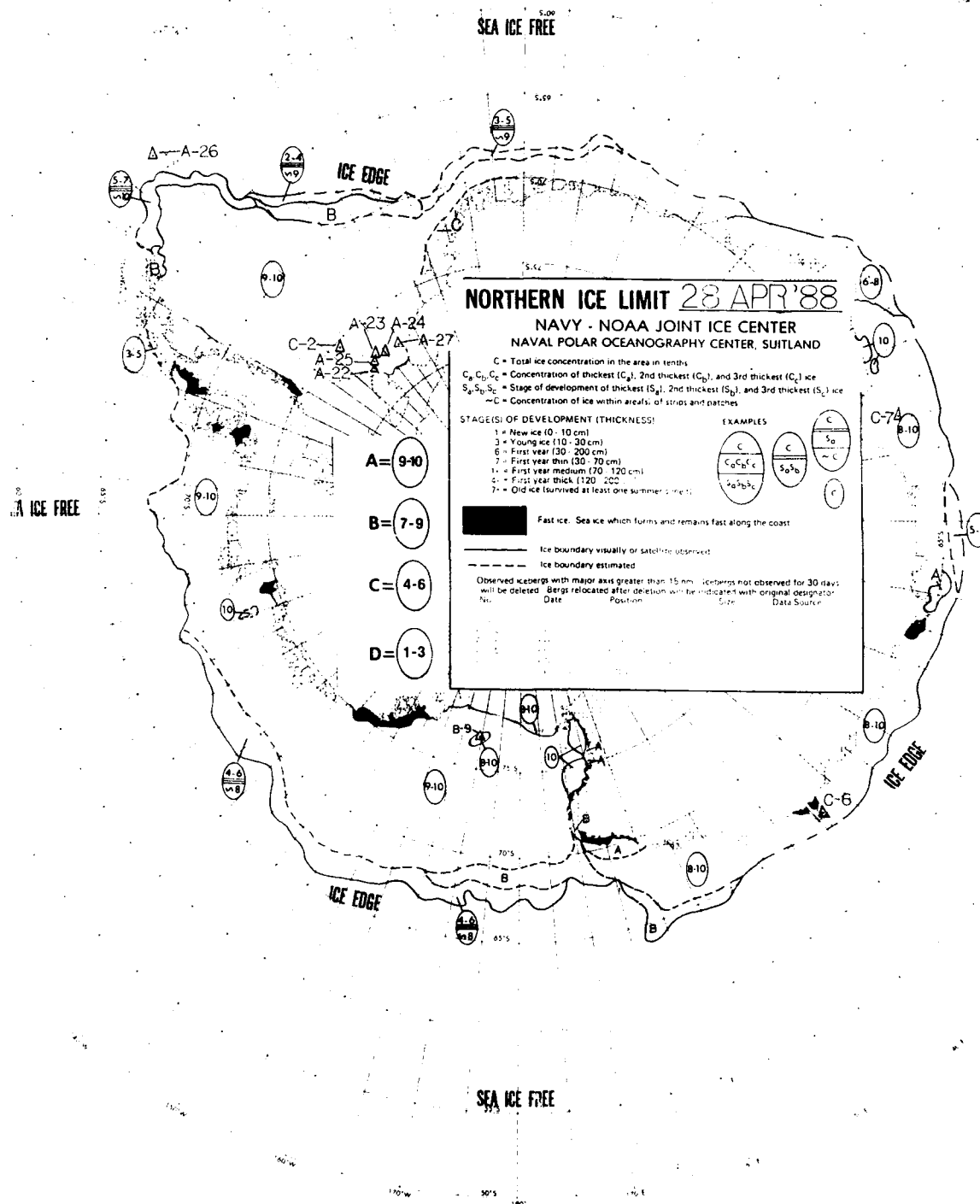
SEA ICE FREE

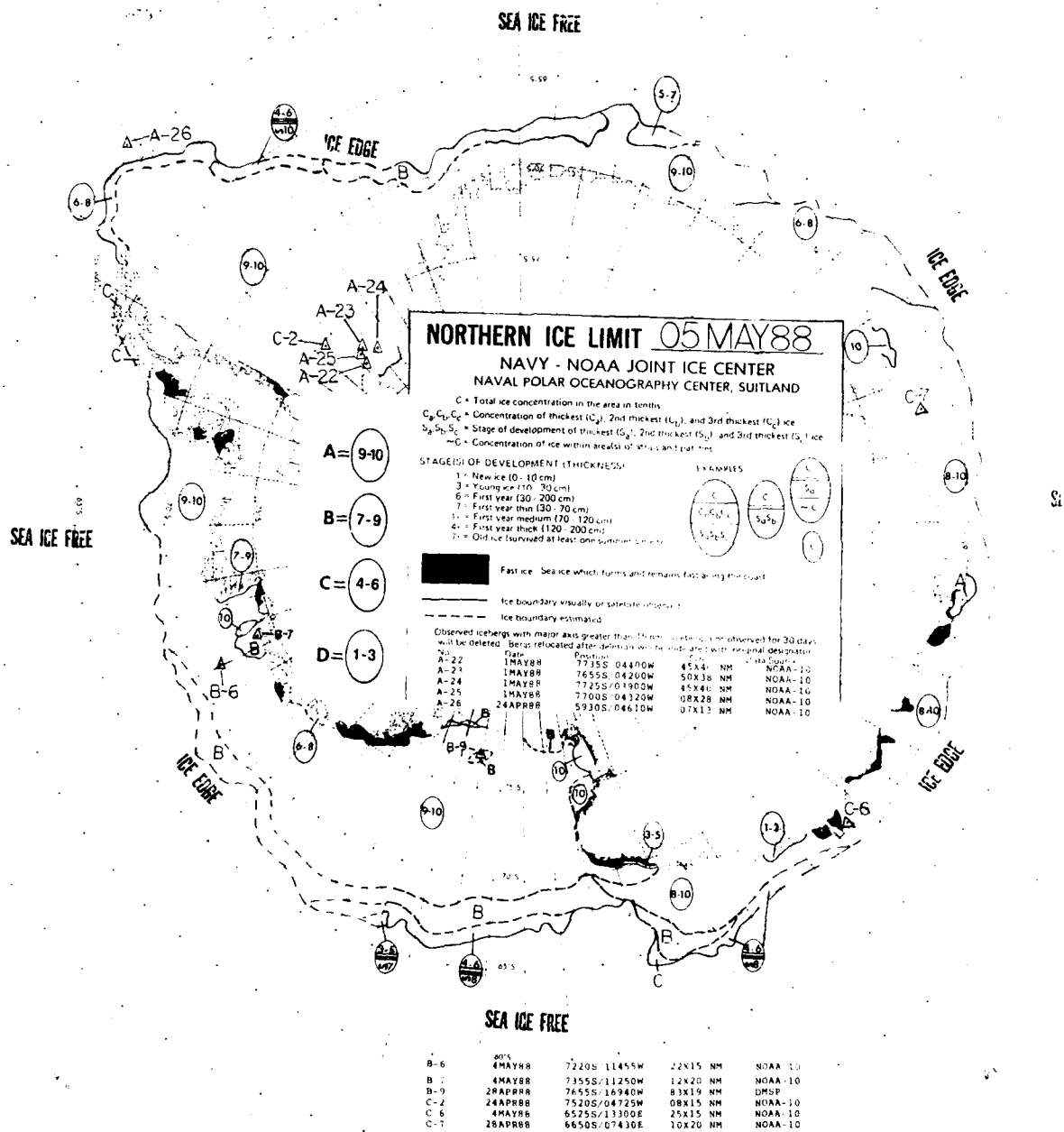
Δ-A-20A

SEA ICE FRONT



SEA ICE FRONT

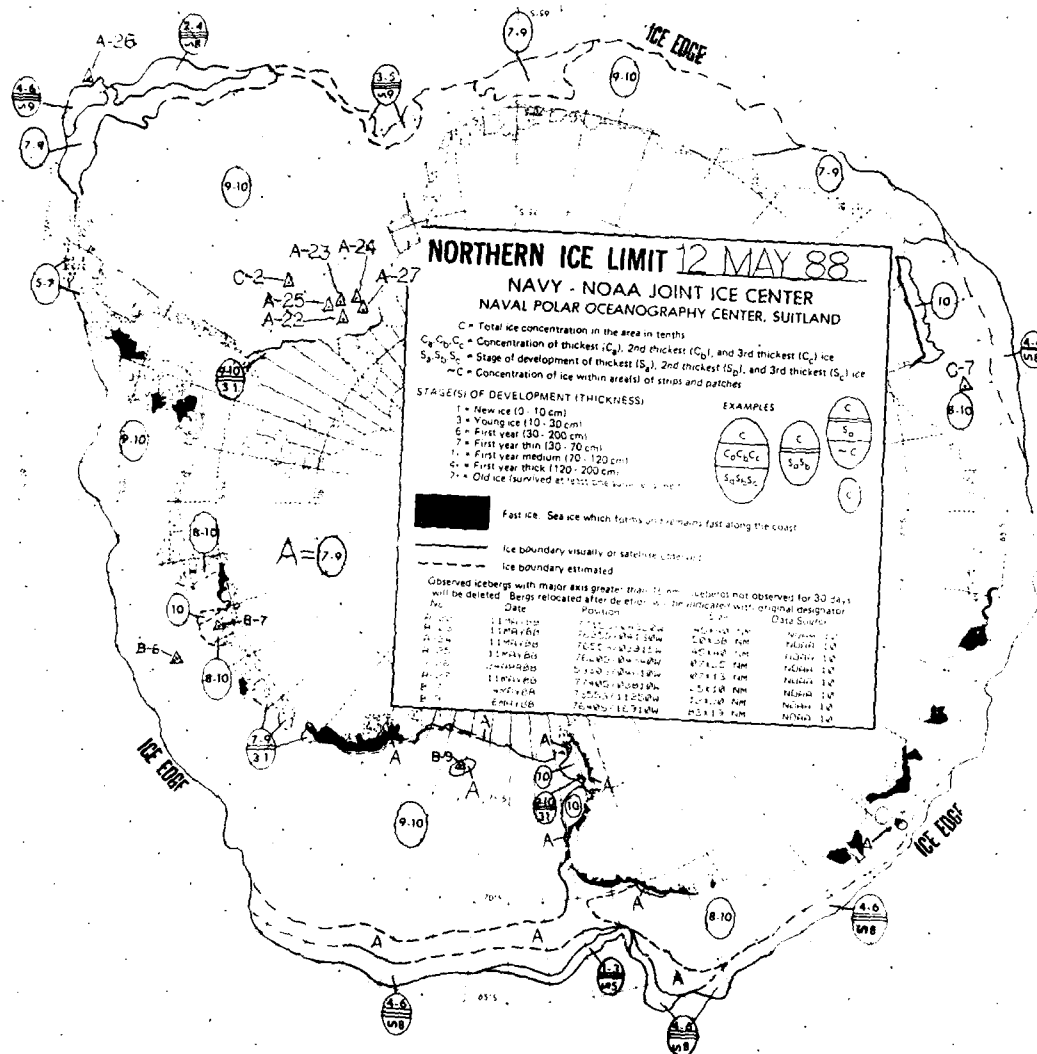




SEA ICE FREE

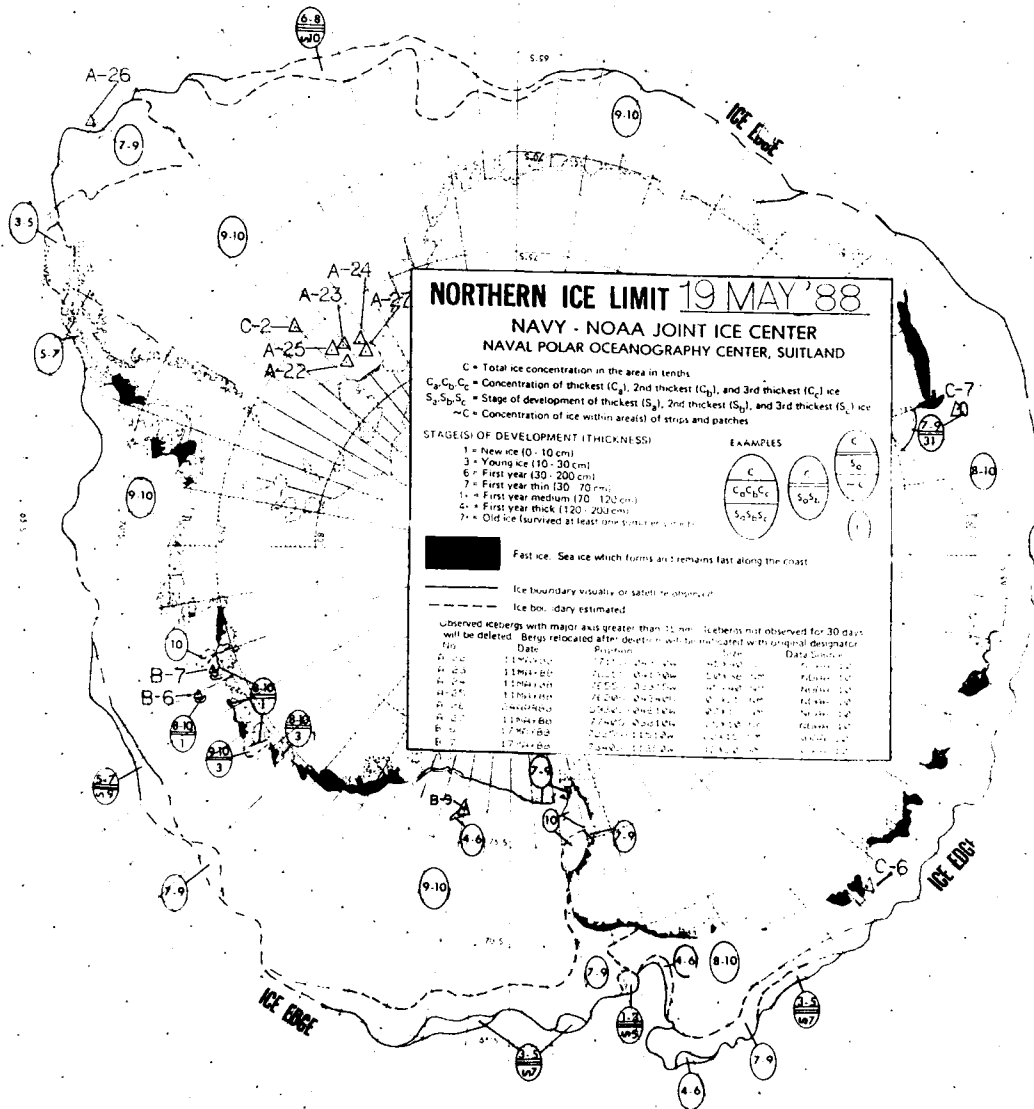
SEA ICE FREE

SEA ICE FREE



C	15 May 88	72°15'N 156°15'W	72°15'N 156°15'W	Relocated 1st
C	15 May 88	72°15'N 156°15'W	72°15'N 156°15'W	Relocated 1st
C	15 May 88	72°15'N 156°15'W	72°15'N 156°15'W	Relocated 1st
C	15 May 88	72°15'N 156°15'W	72°15'N 156°15'W	Relocated 1st

SEA ICE FREE



NORTHERN ICE LIMIT 19 MAY '88

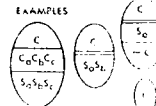
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
-C- = Concentration of ice within areas of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 2 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer cycle)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary: Visible or satellite observed

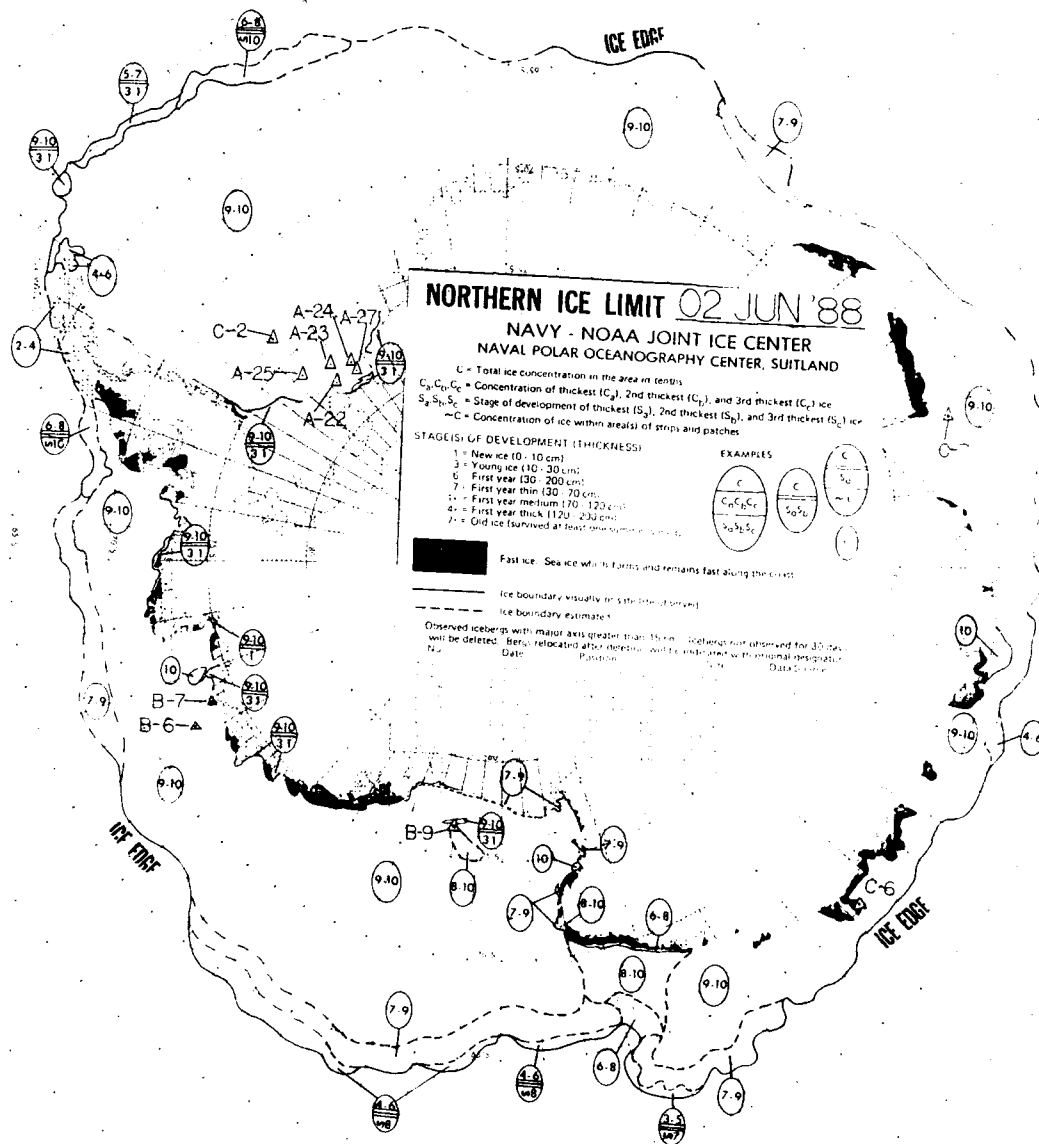
Ice box: Daily estimated

Observed icebergs with major axis greater than 11 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

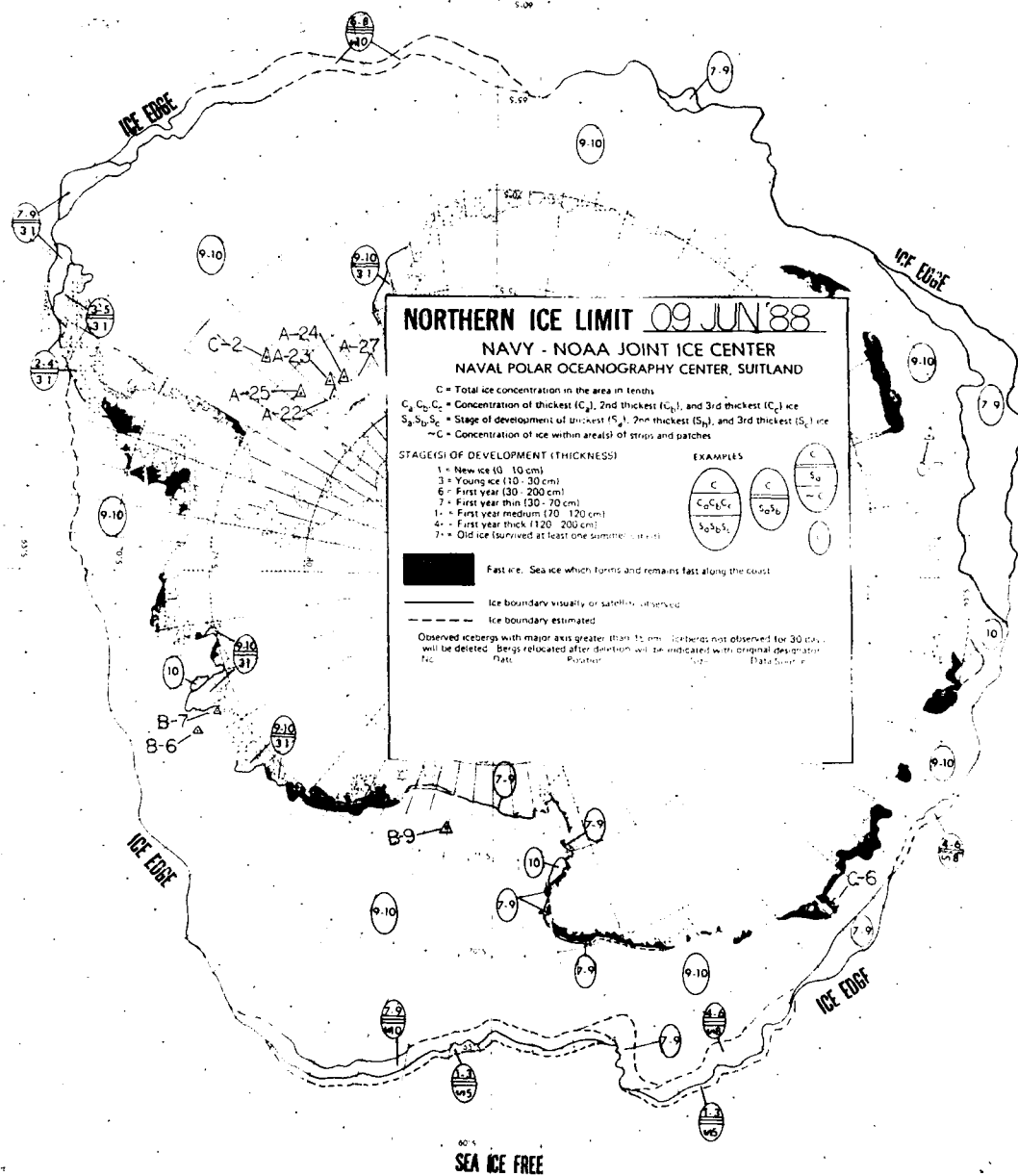
Date	Position	Size	Data Source
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO
11 May 88	72°N 15°W	100m x 100m	NAO

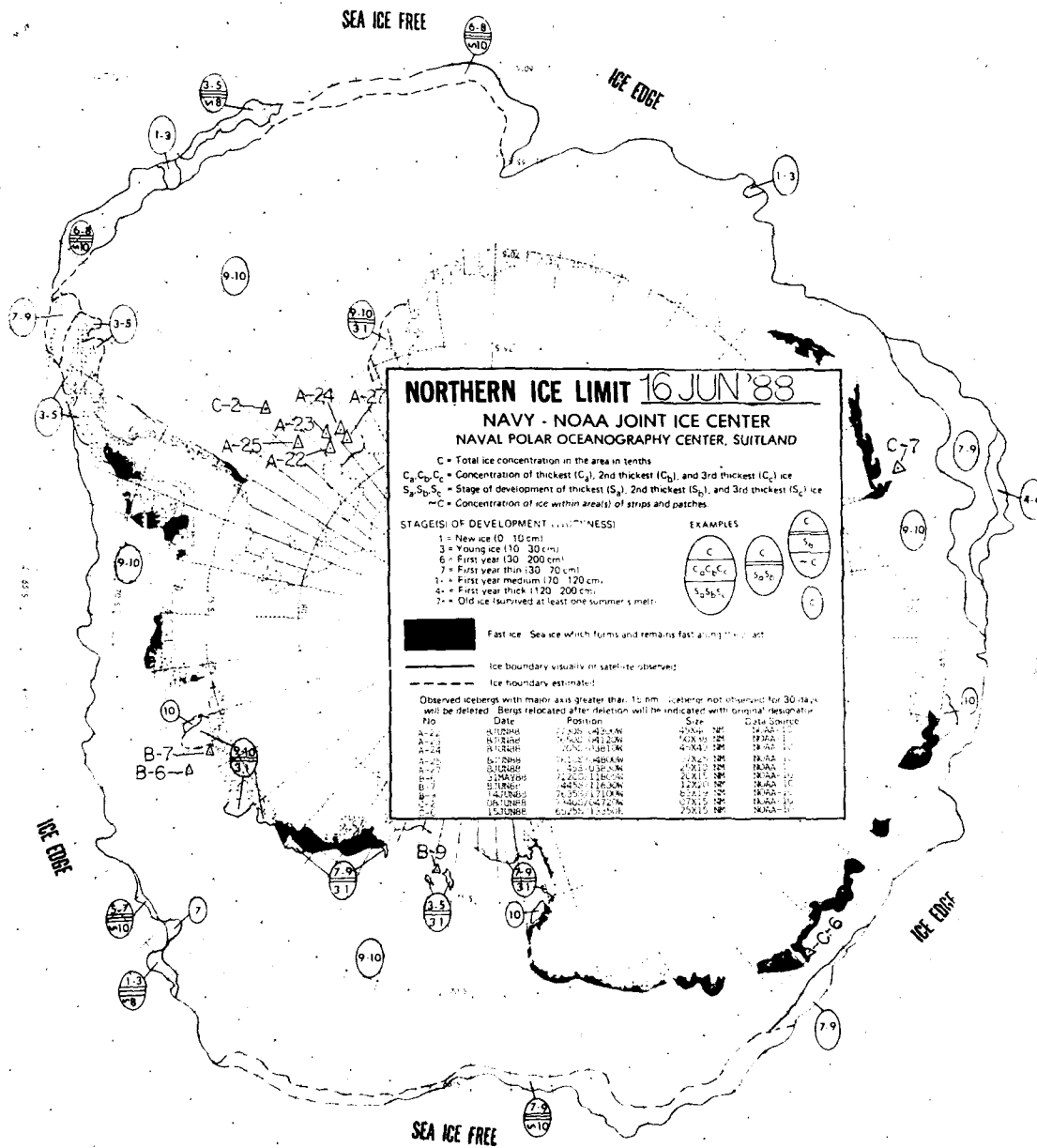
SEA ICE FREE

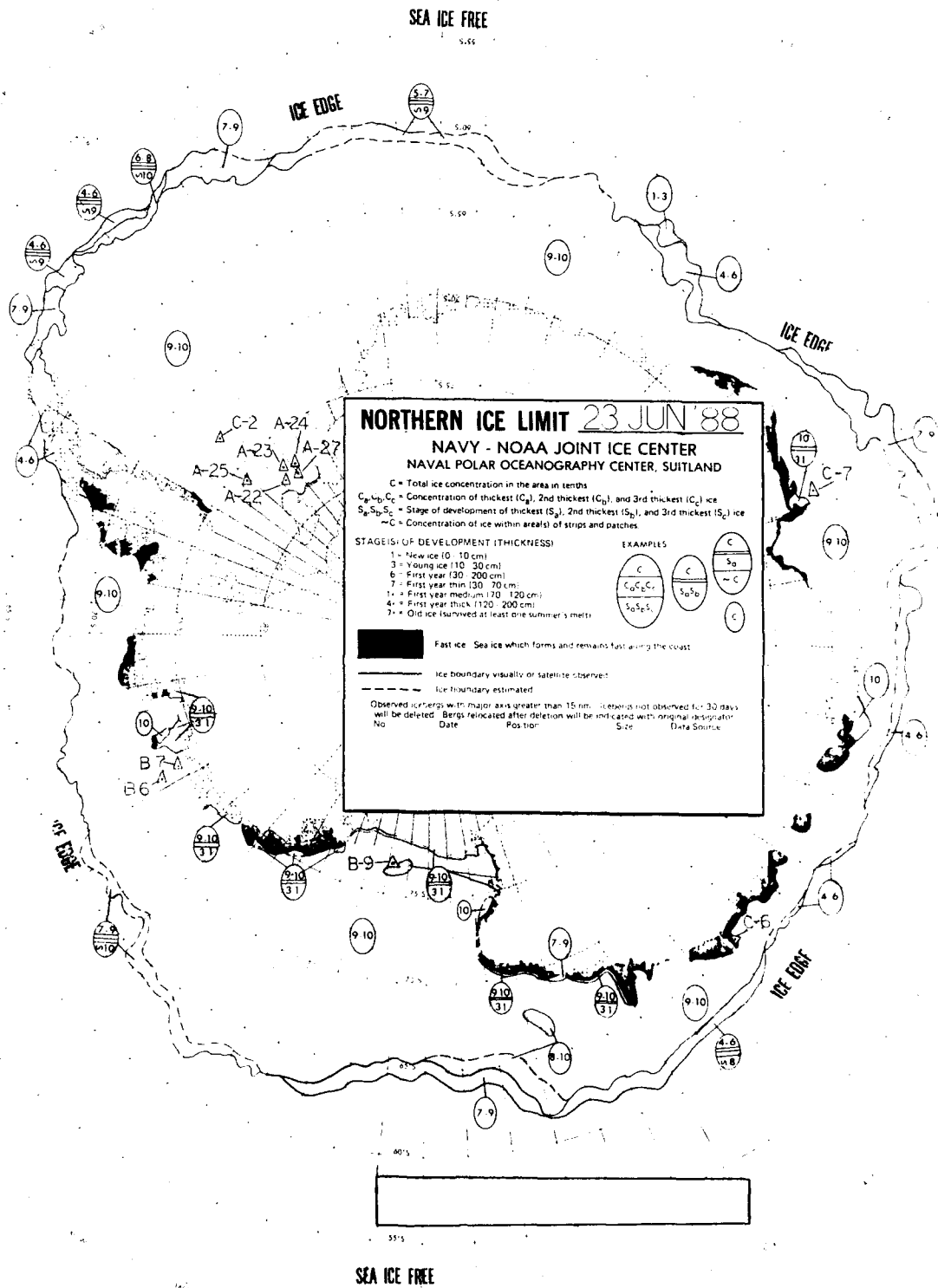
SEA ICE FREE



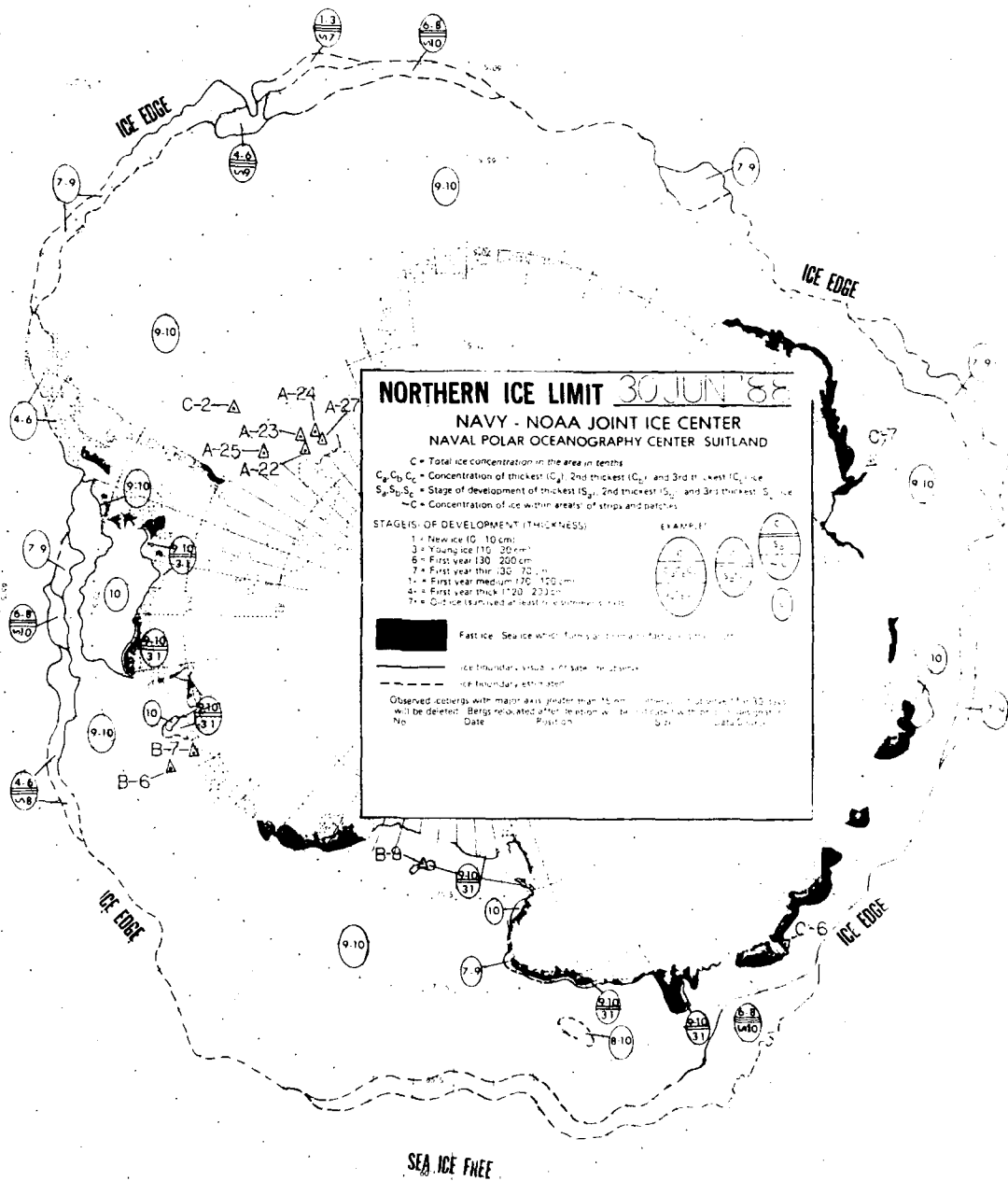
SEA ICE FREE

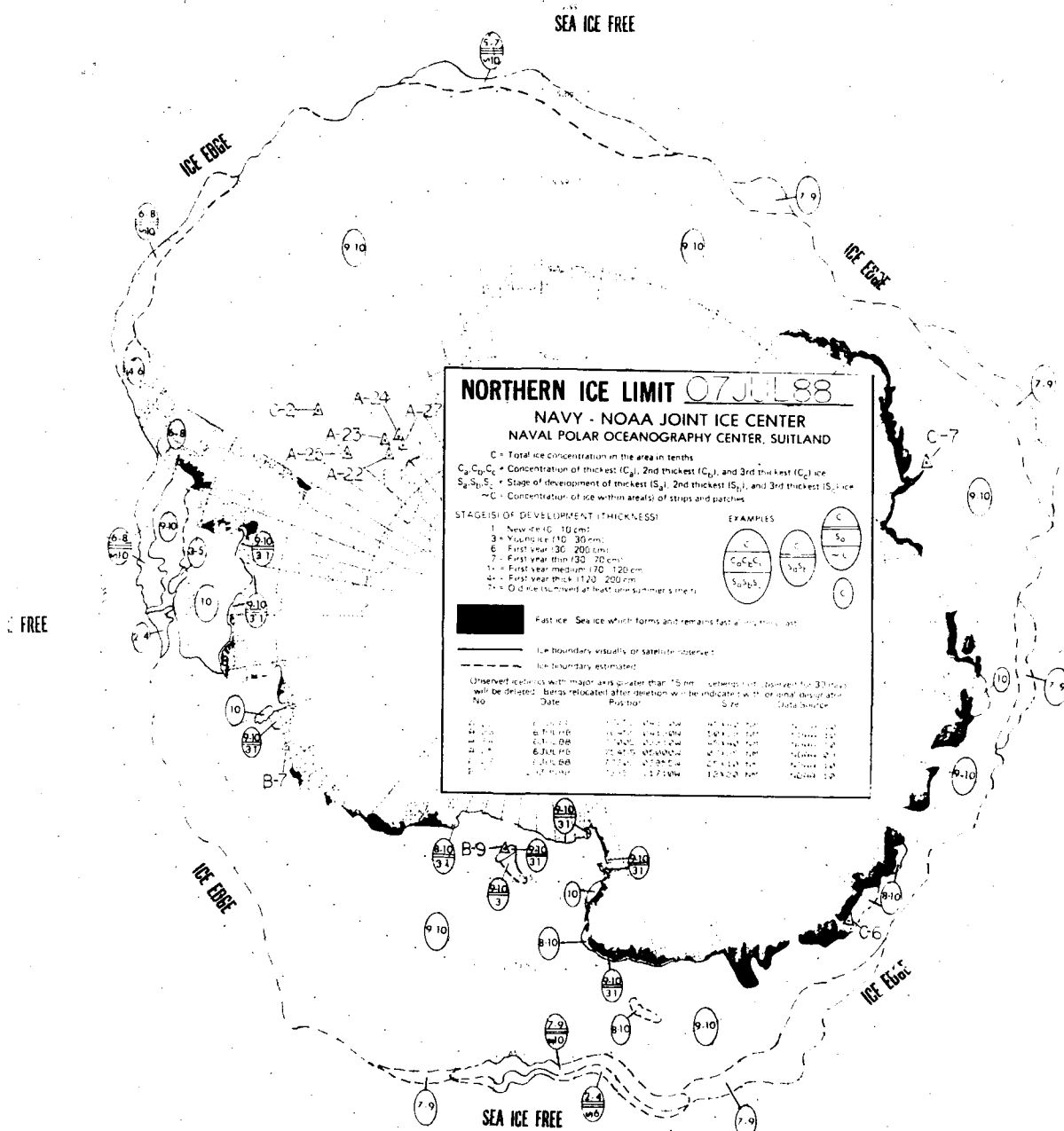




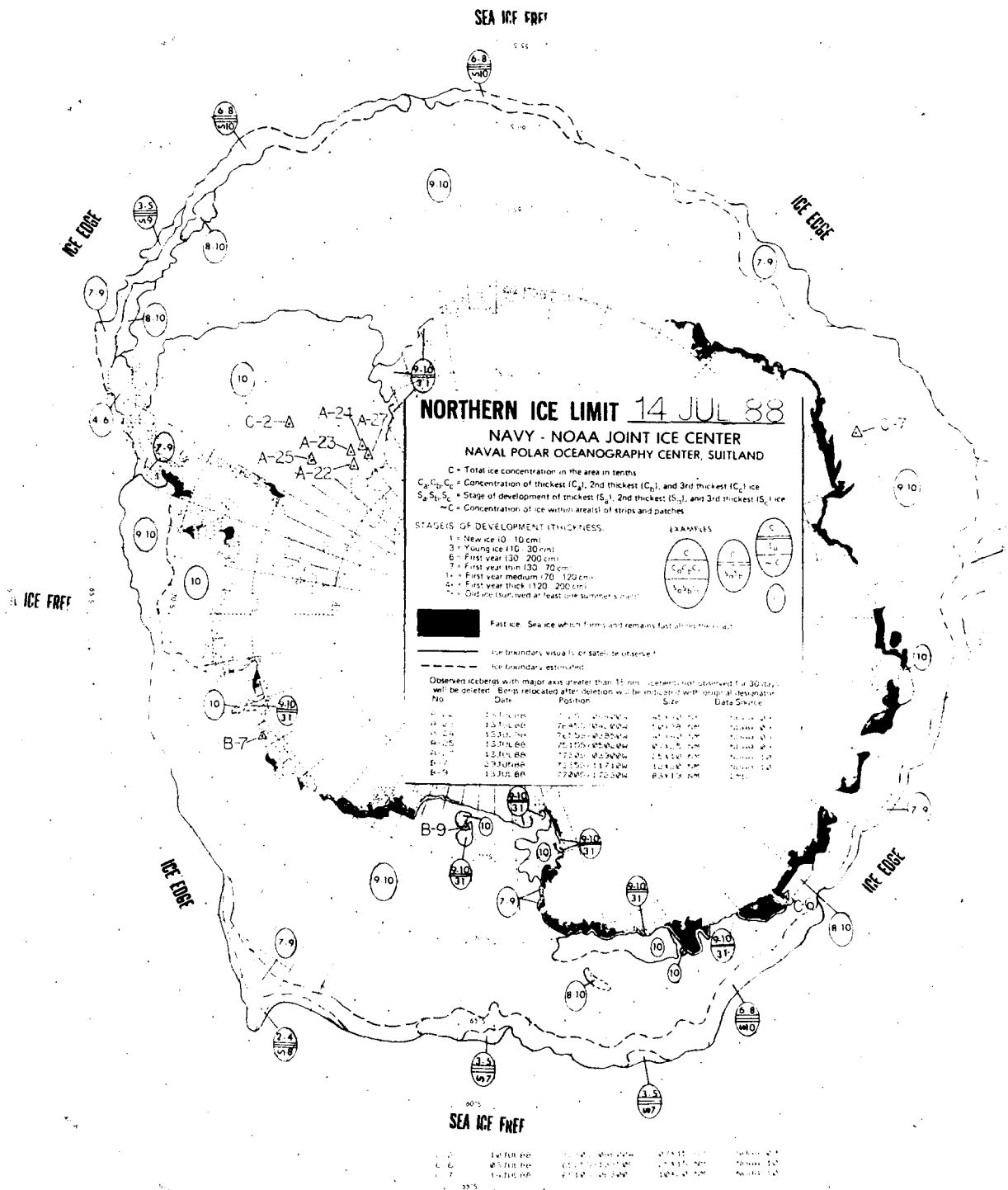


SEA ICE FREE

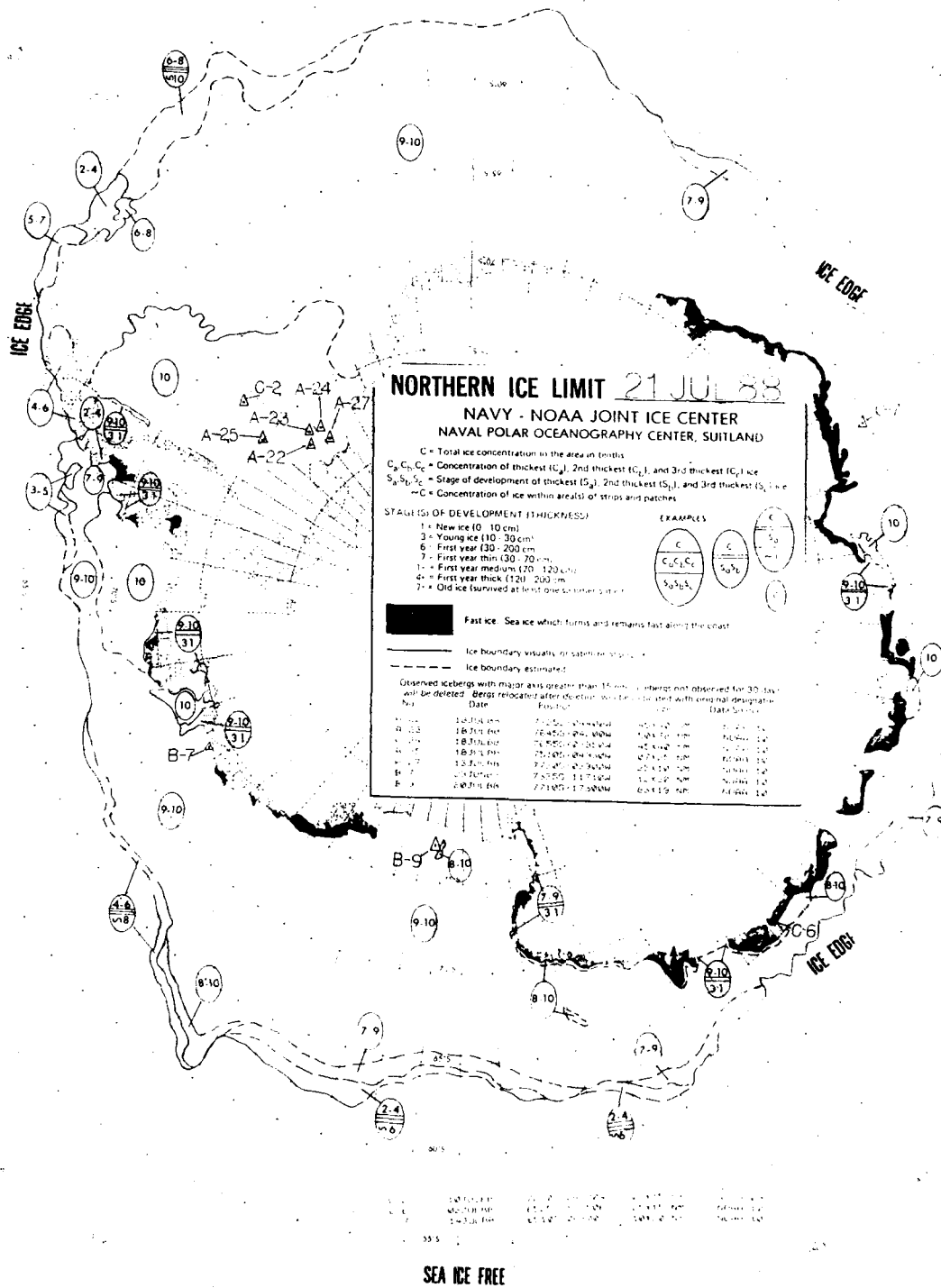




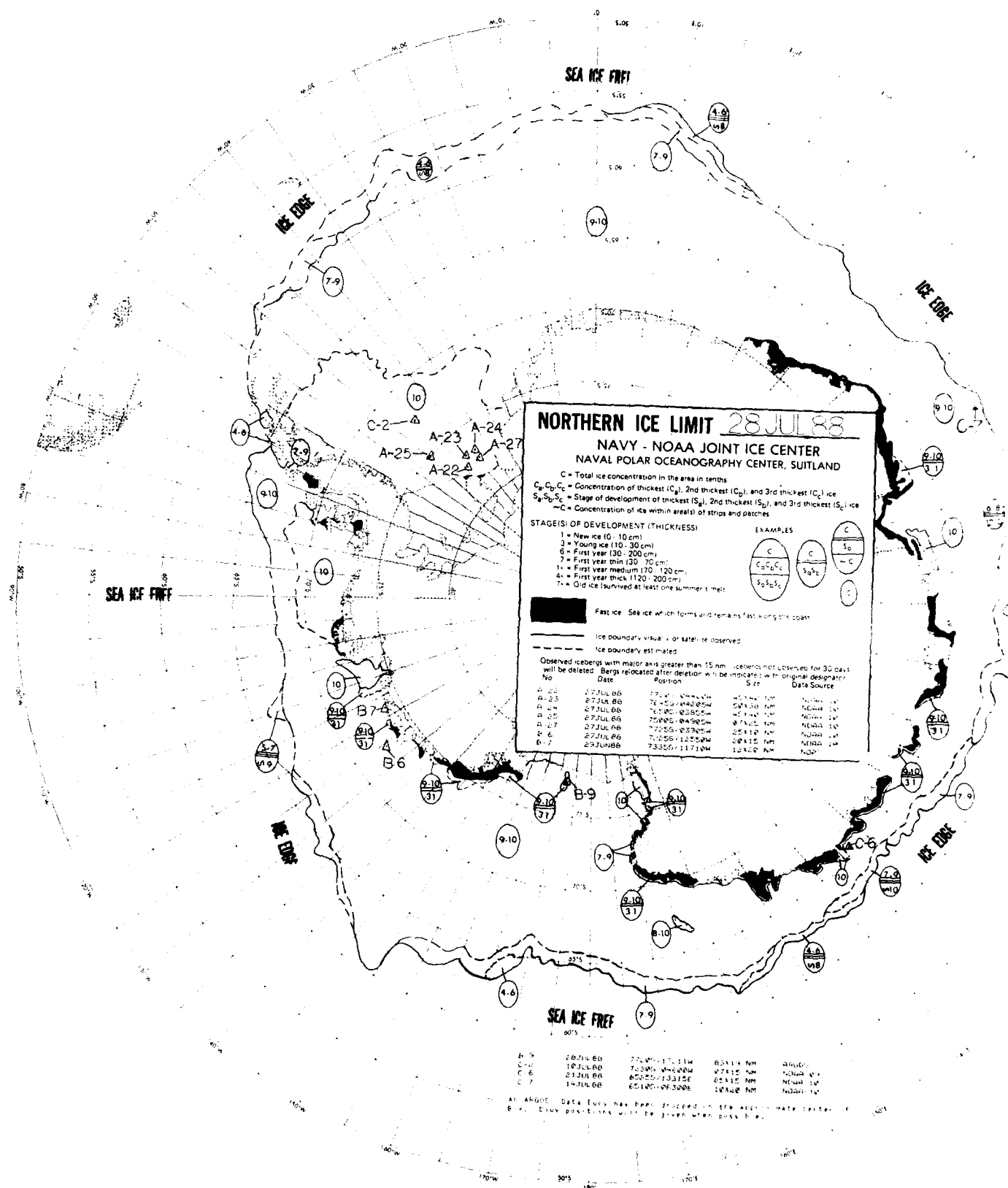
1. 10000 ft
 2. 10000 ft
 3. 10000 ft
 4. 10000 ft
 5. 10000 ft
 6. 10000 ft
 7. 10000 ft

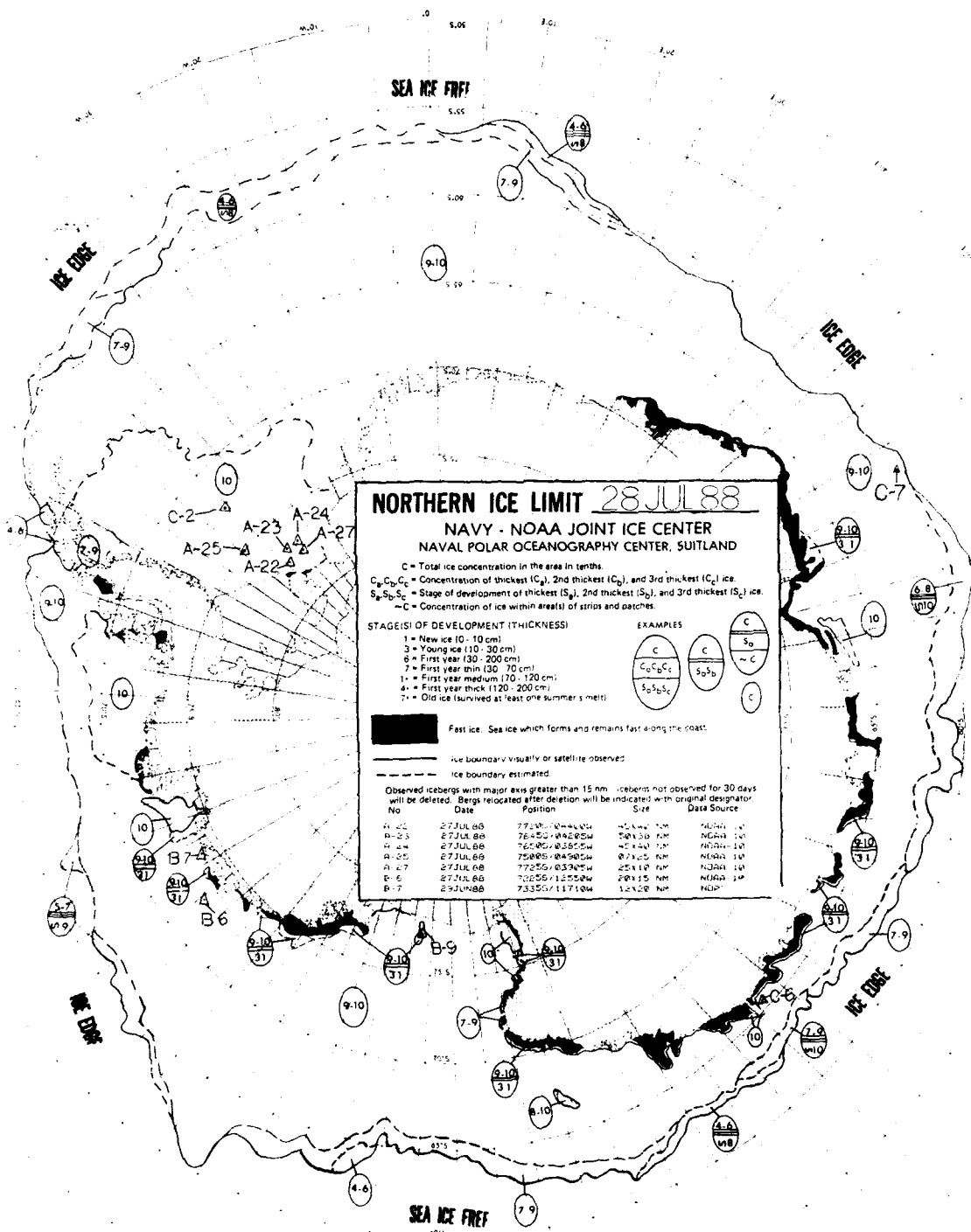


SEA ICE FREE



SEA ICE FREE

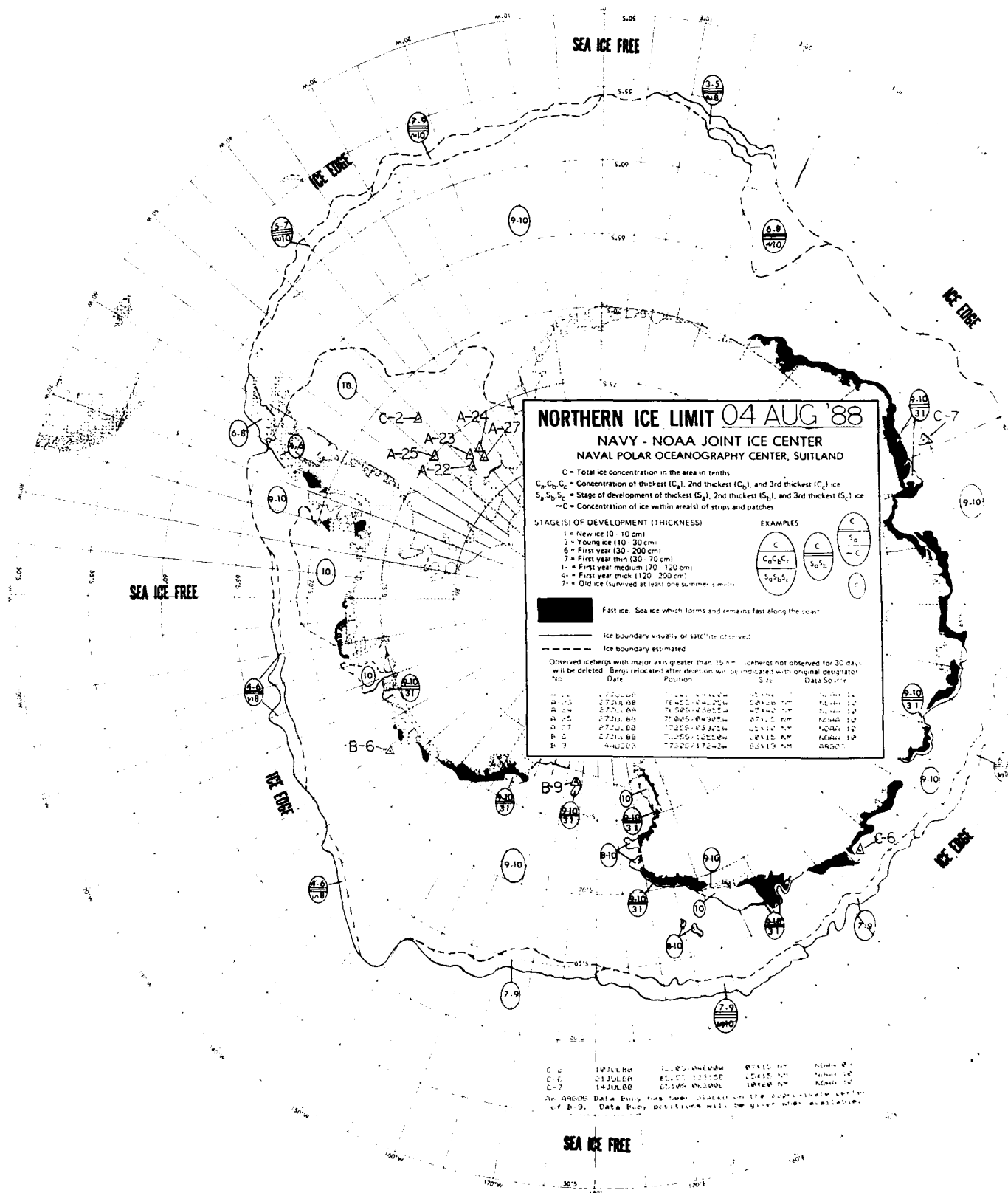


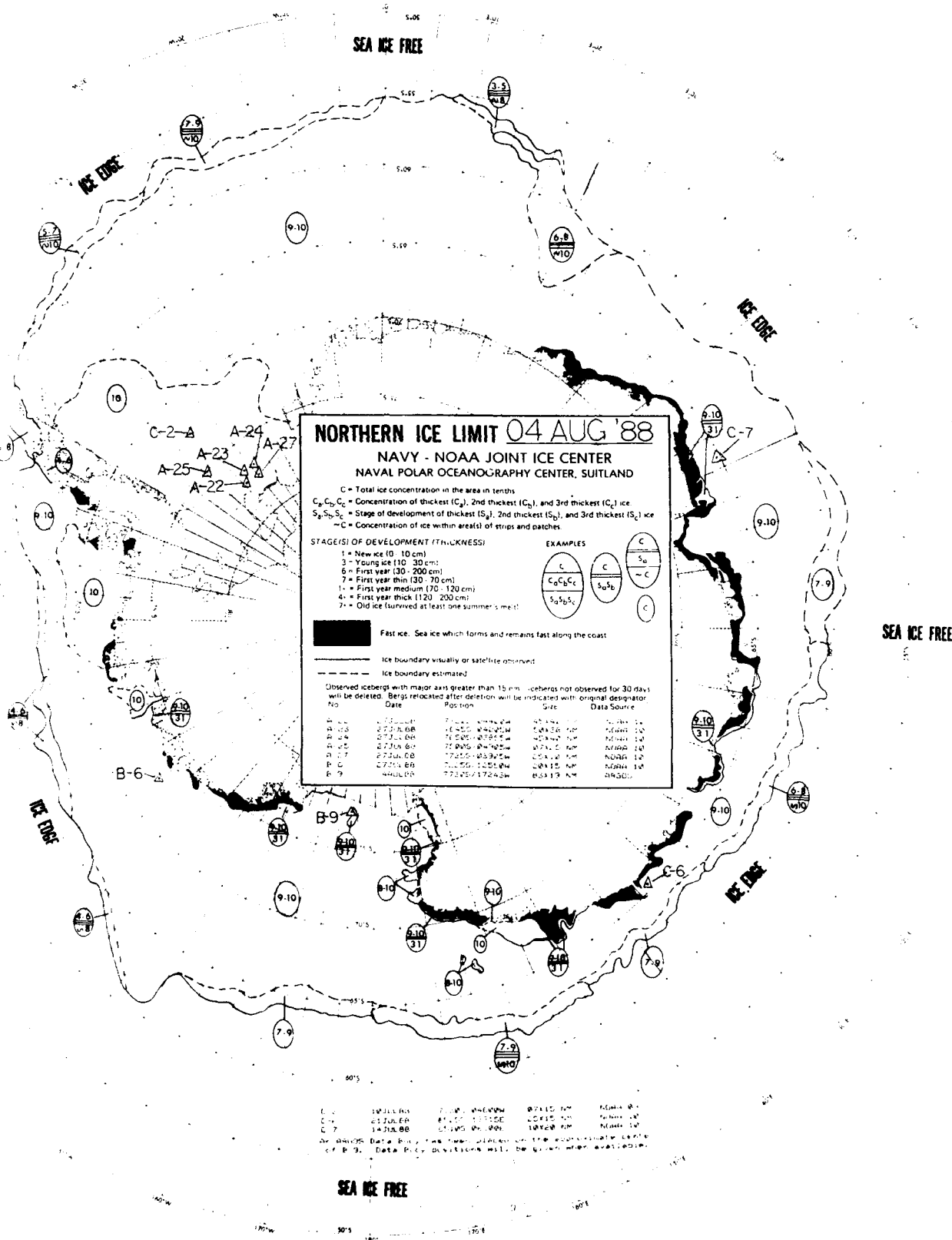


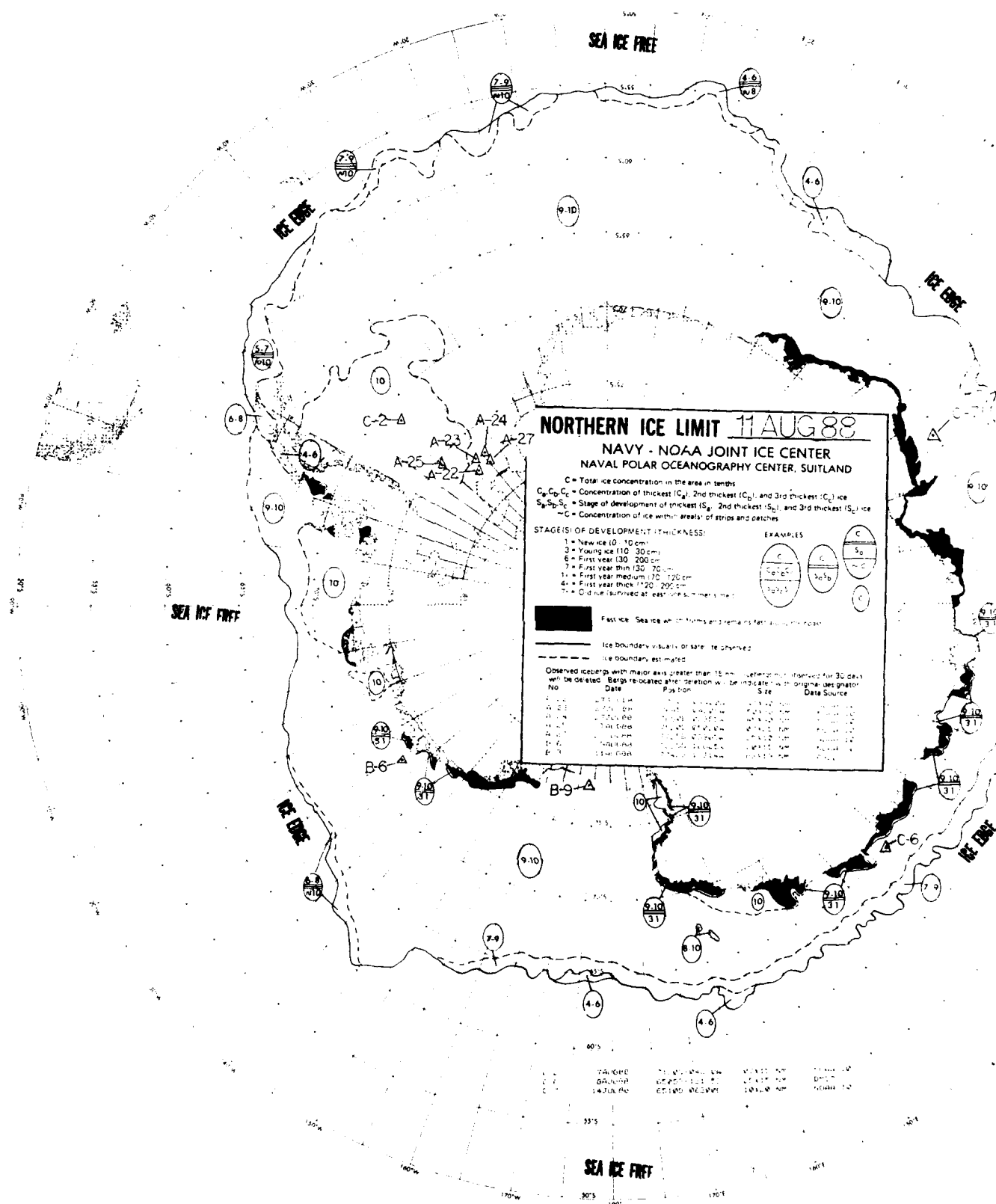
SEA ICE FREE

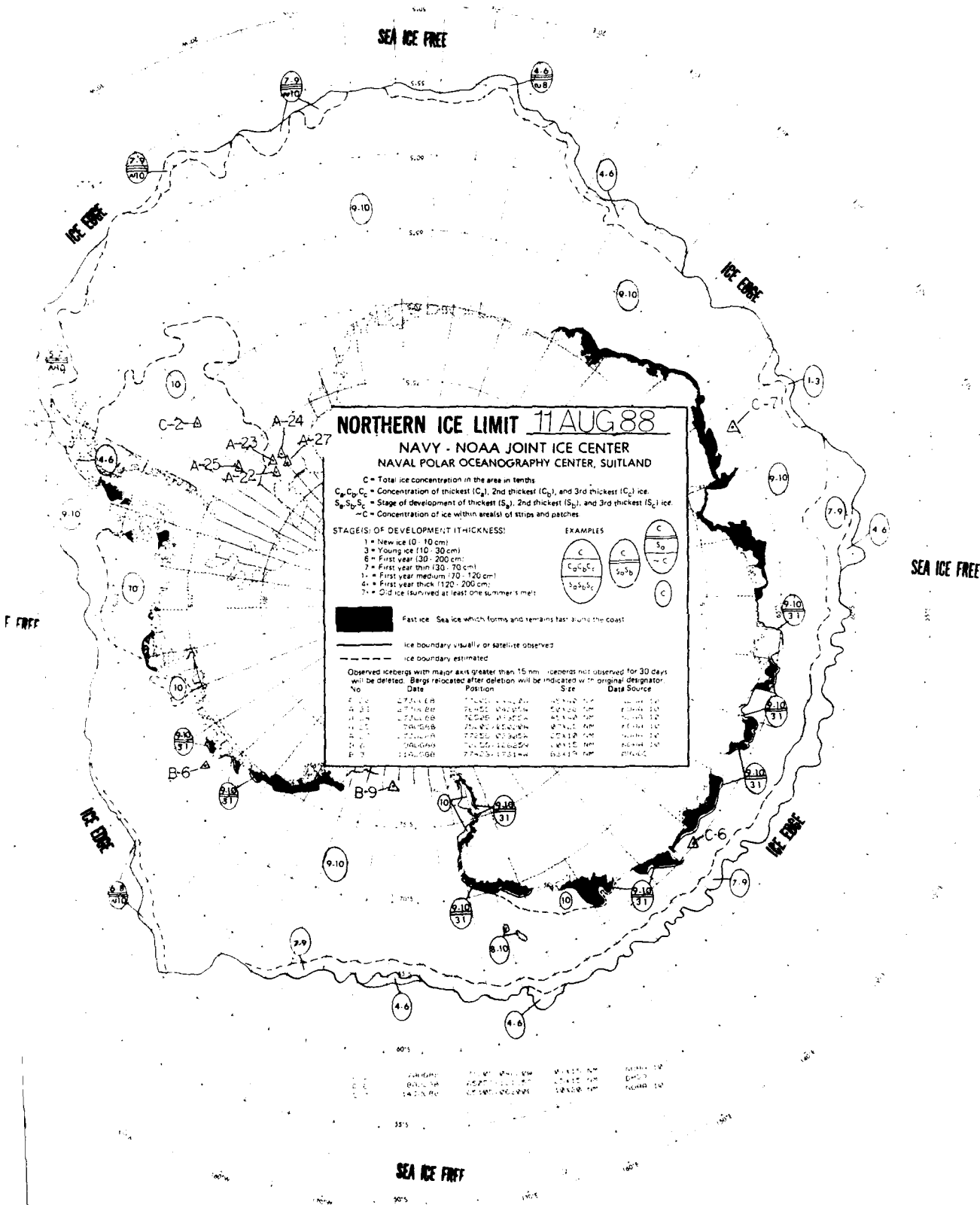
A-1	26 JUL 88	77°10'N 44°40'W	45x40 NM	NADP
A-2	27 JUL 88	76°55'N 44°20'W	50x30 NM	NADP
A-3	27 JUL 88	76°40'N 43°55'W	40x40 NM	NADP
A-4	27 JUL 88	75°05'N 44°50'W	87x25 NM	NADP

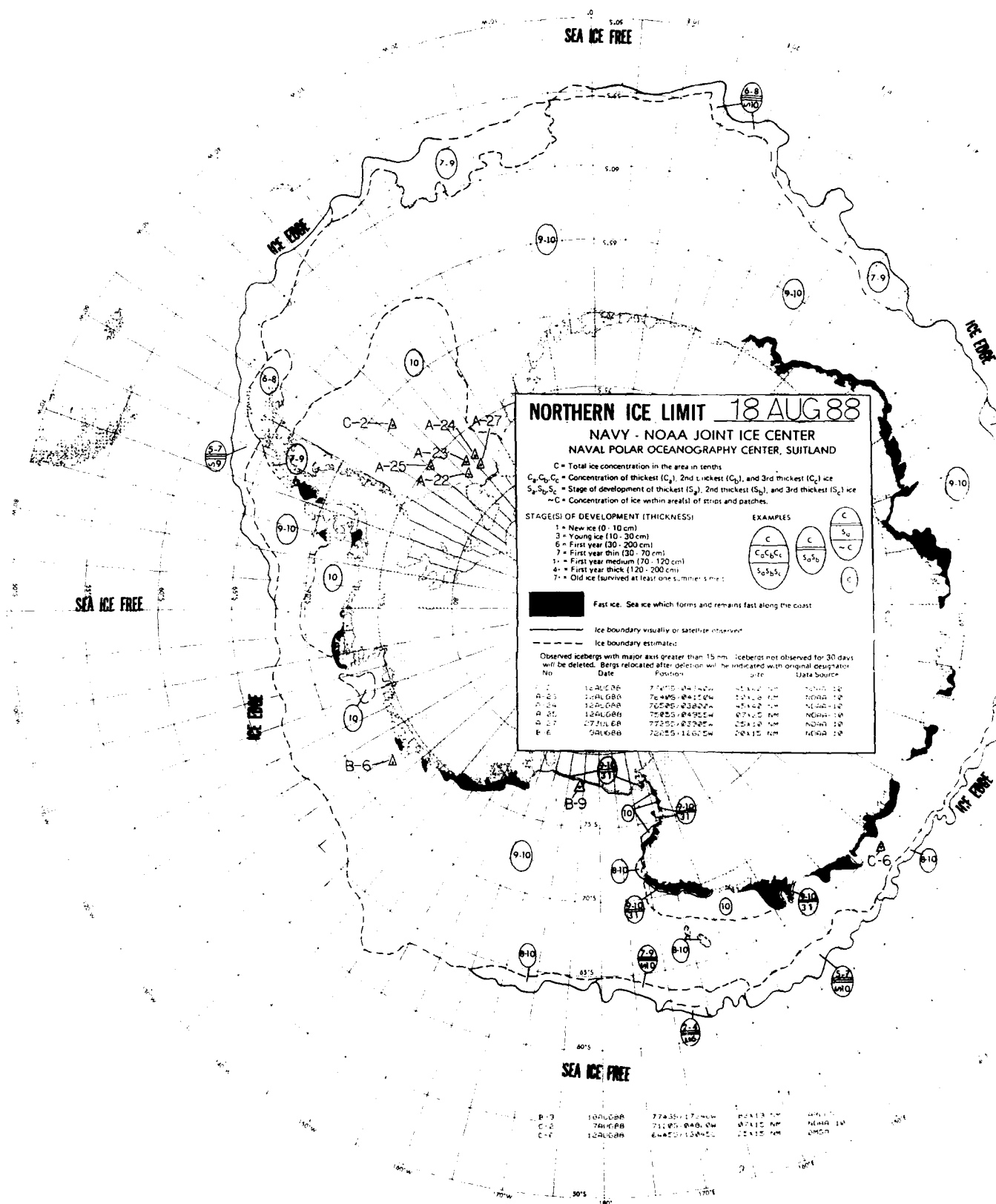
ALL DATA IS A TAXI COPY. STRIPPED IN THE APPROXIMATE CENTER OF THE ICEBERG. DATA IS NOT TO BE GIVEN WHEN POSSIBLE.

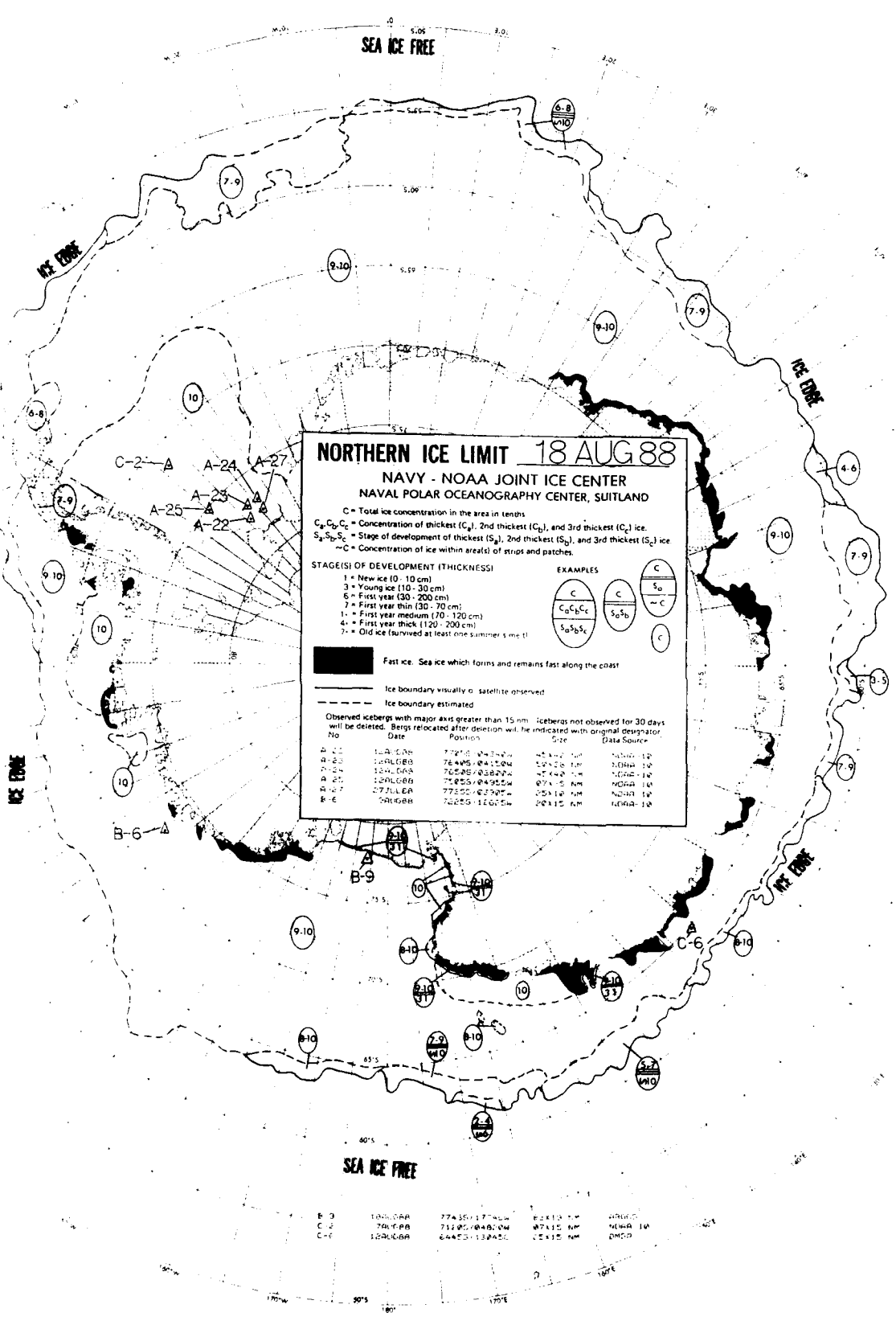












NORTHERN ICE LIMIT 18 AUG 88

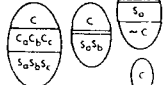
**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND**

C = Total ice concentration in the area in tenths
 C_1, C_2, C_3 = Concentration of thickest (C_1), 2nd thickest (C_2), and 3rd thickest (C_3) ice.
 S_1, S_2, S_3 = Stage of development of thickest (S_1), 2nd thickest (S_2), and 3rd thickest (S_3) ice.
 -C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year thin (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

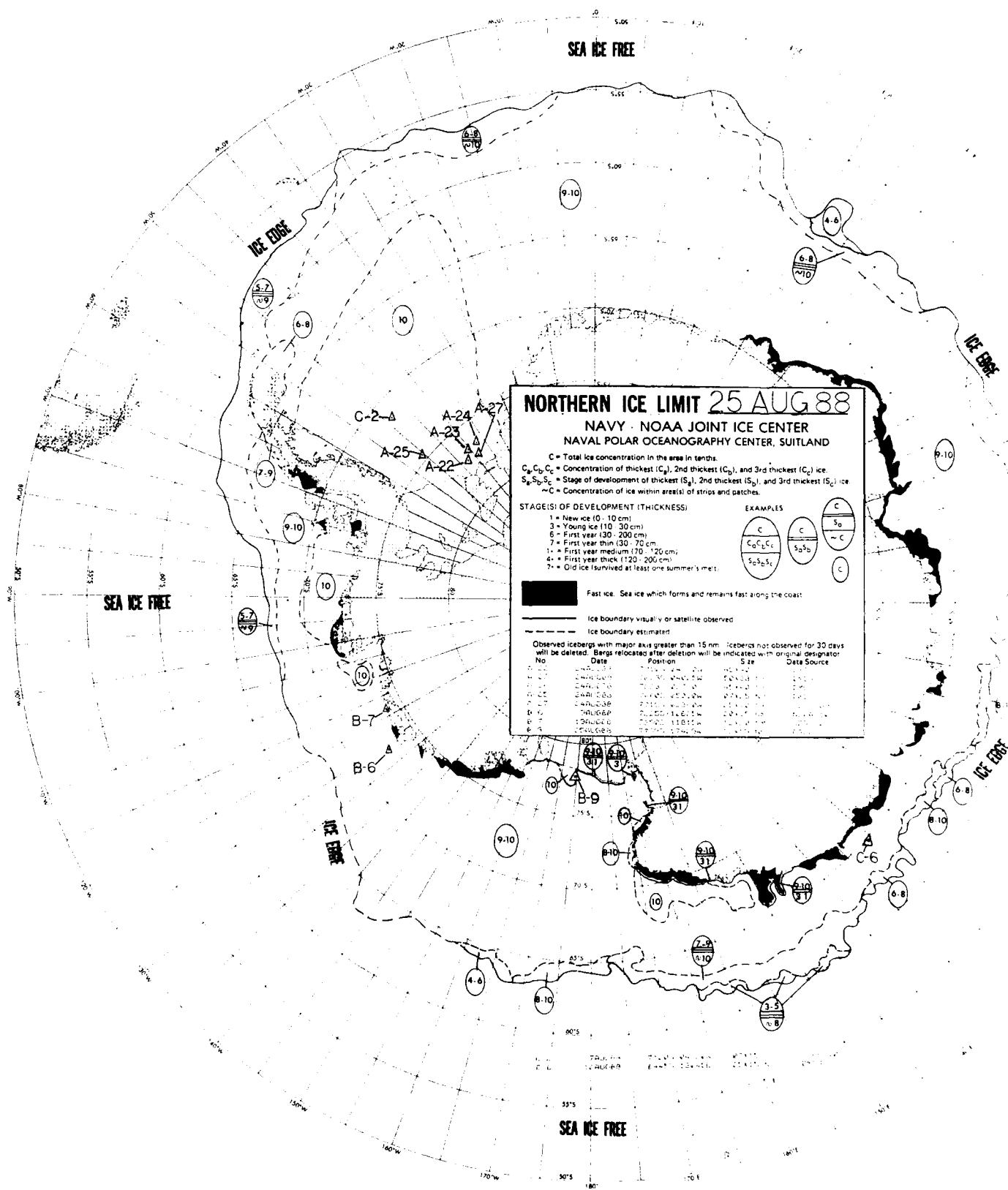
Ice boundary visually or satellite observed

Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-21	14 AUG 88	77°15'N 15°45'W	45 x 20 nm	NOAA-10
A-22	14 AUG 88	76°45'N 15°04'W	15 x 20 nm	NOAA-10
A-23	14 AUG 88	76°05'N 15°02'W	17 x 40 nm	NOAA-10
A-24	14 AUG 88	75°05'N 15°05'W	10 x 15 nm	NOAA-10
A-25	14 AUG 88	77°55'N 15°02'W	10 x 10 nm	NOAA-10
A-26	14 AUG 88	77°55'N 15°02'W	10 x 10 nm	NOAA-10
A-27	14 AUG 88	77°55'N 15°02'W	10 x 10 nm	NOAA-10

B-3	10 AUG 88	77°35'N 17°40'W	10 x 10 nm	NOAA-10
C-2	7 AUG 88	71°05'N 15°02'W	10 x 10 nm	NOAA-10
C-6	10 AUG 88	64°45'N 15°02'W	15 x 15 nm	NOAA-10



SEA ICE FREE

ICE EDGE

ICE EDGE

SEA ICE FREE

ICE EDGE

NORTHERN ICE LIMIT 25 AUG 88

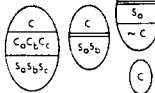
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within areas of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.

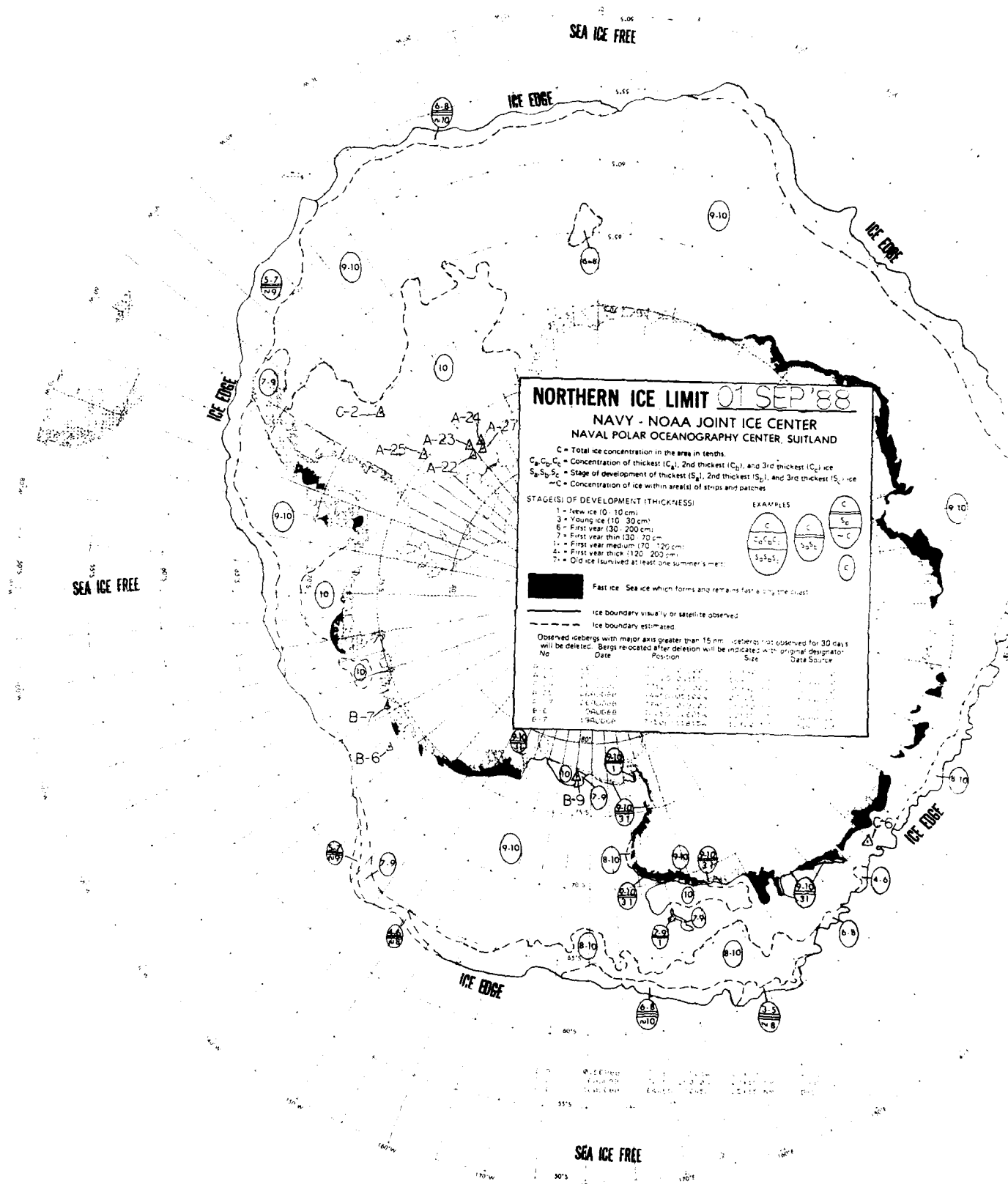
Ice boundary visually or satellite observed

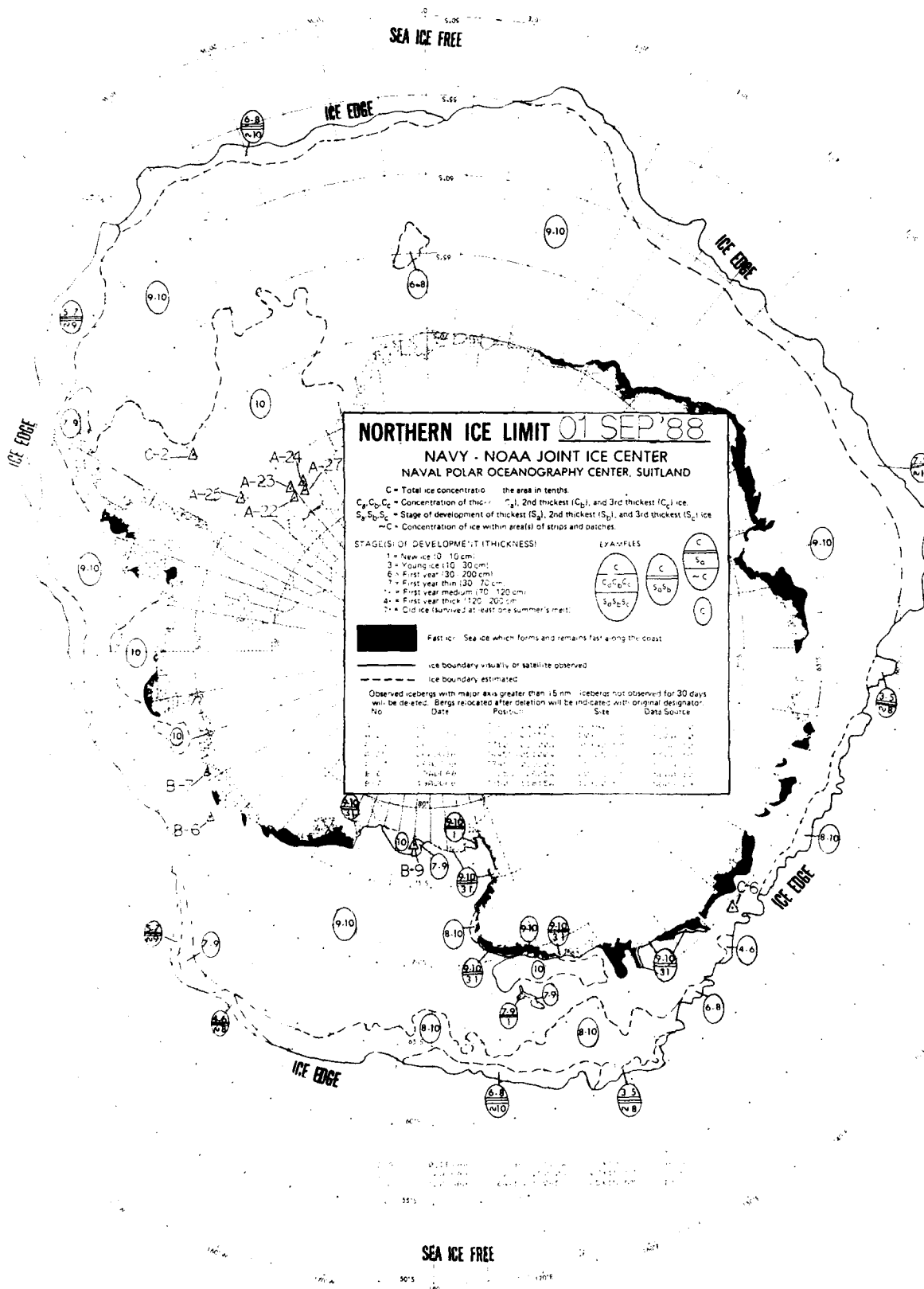
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

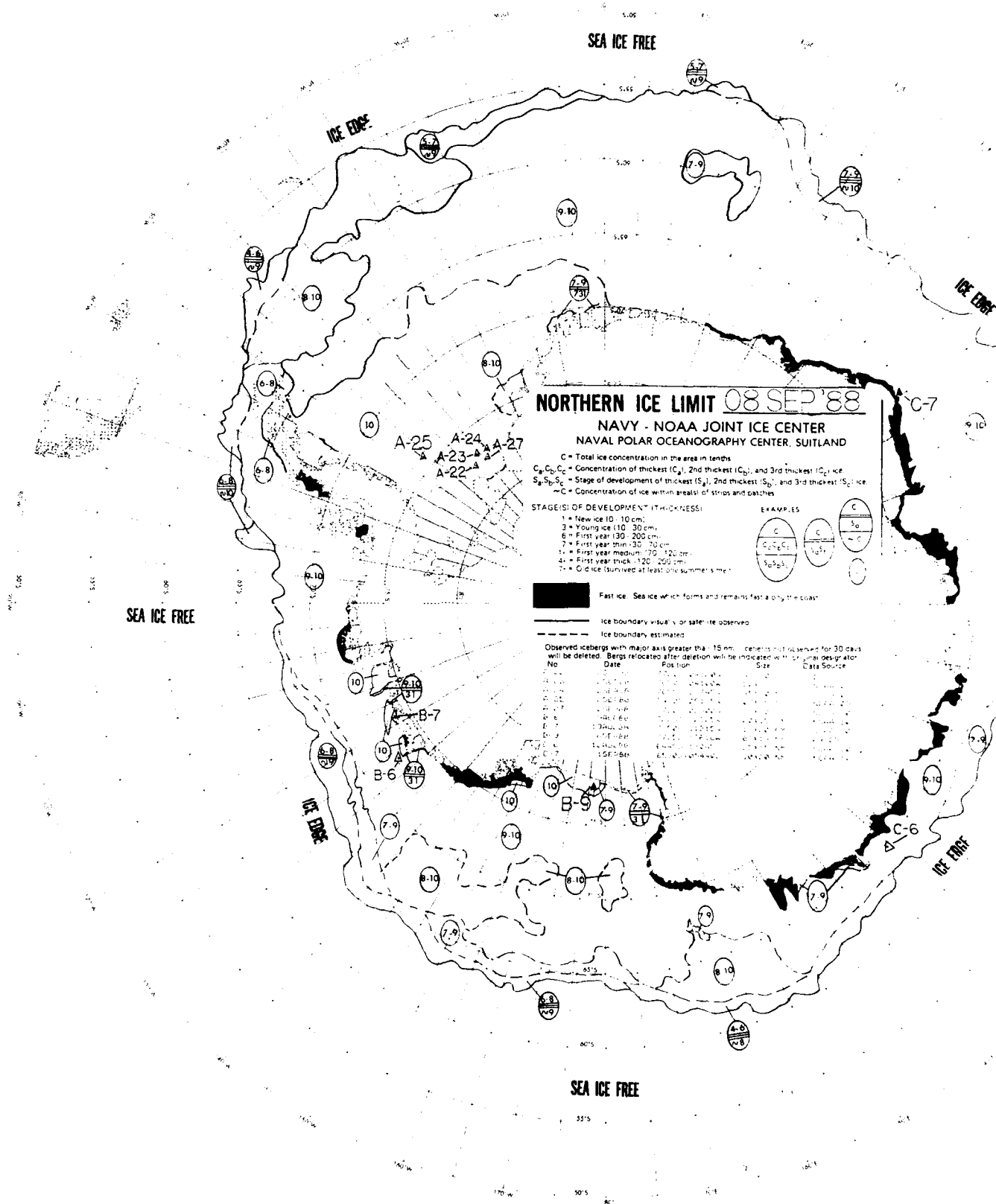
No.	Date	Position	Size	Date Source
1	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
2	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
3	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
4	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
5	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
6	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
7	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
8	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
9	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m
10	27 JUL 88	71°10'N 156°10'W	100m x 100m	100m

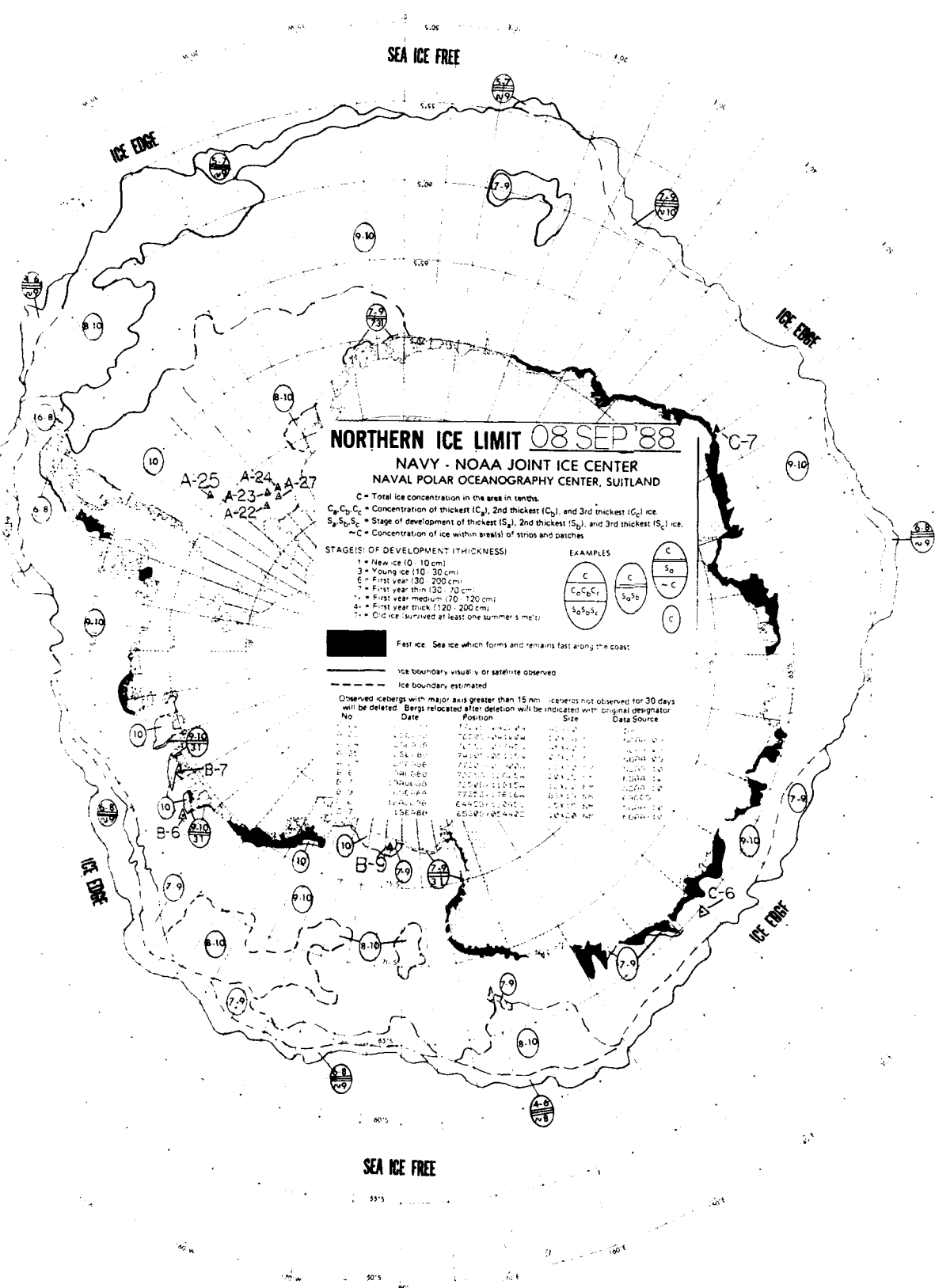
SEA ICE FREE

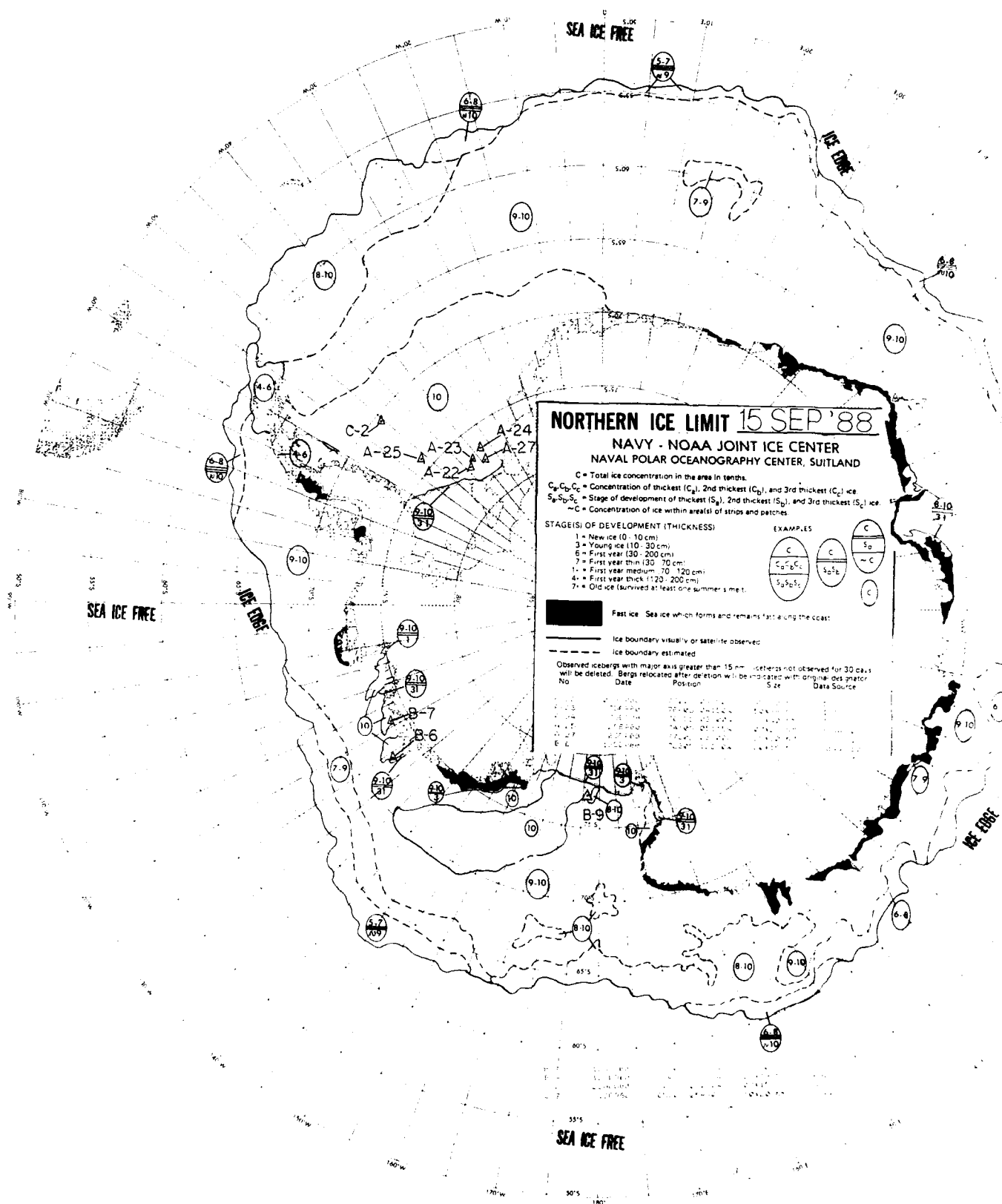




SEA ICE FREE







SEA ICE FREE

ICE EDGE

SEA ICE FREE

ICE EDGE

NORTHERN ICE LIMIT 15 SEP '88

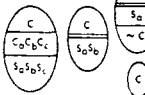
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths.
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice.
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice.
~C = Concentration of ice within area(s) of strips and patches.

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (10 - 10 cm)
- 2 = Young ice (10 - 30 cm)
- 3 = First year (30 - 200 cm)
- 4 = First year thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

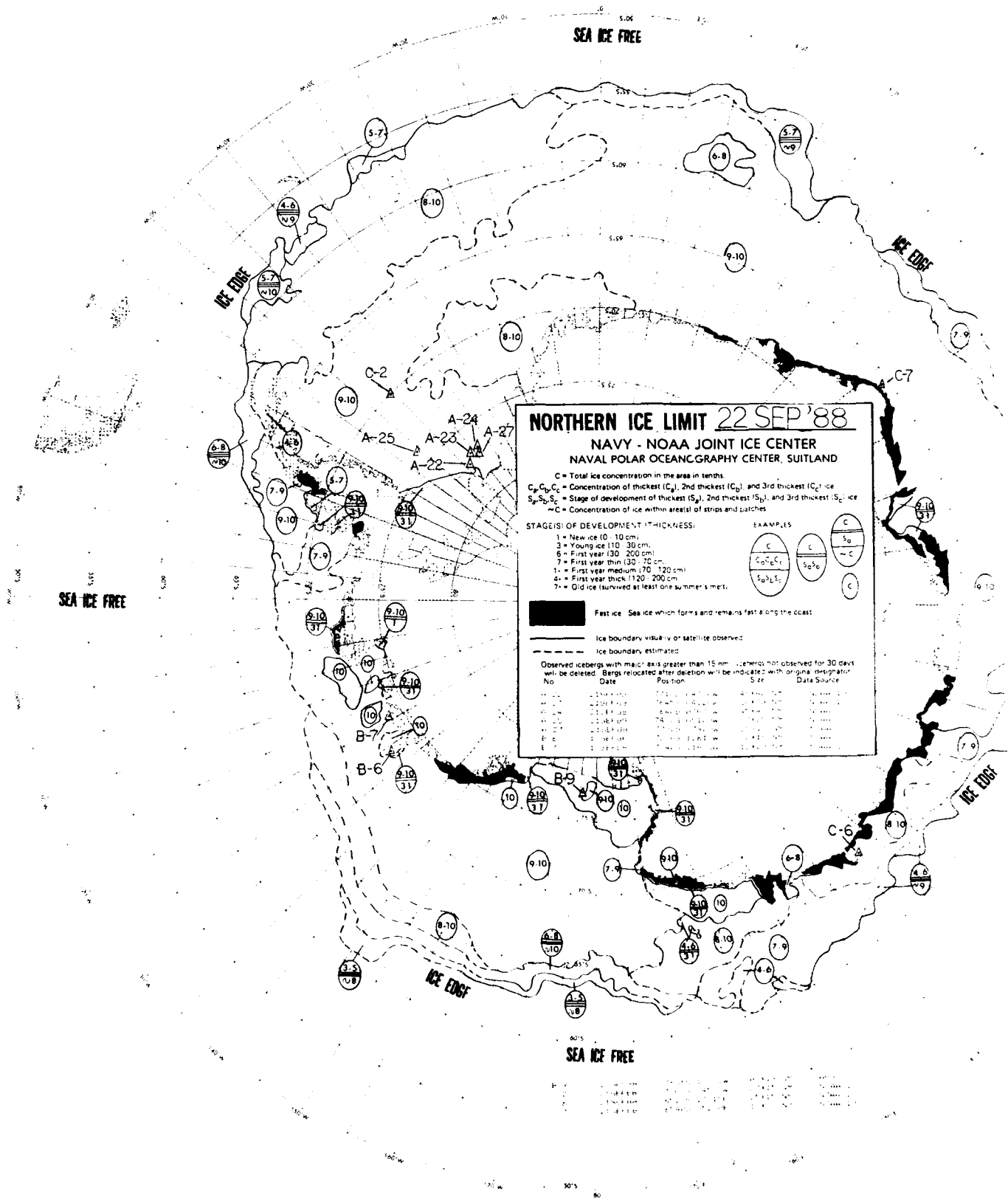
Ice boundary visually or satellite observed

Ice boundary estimated

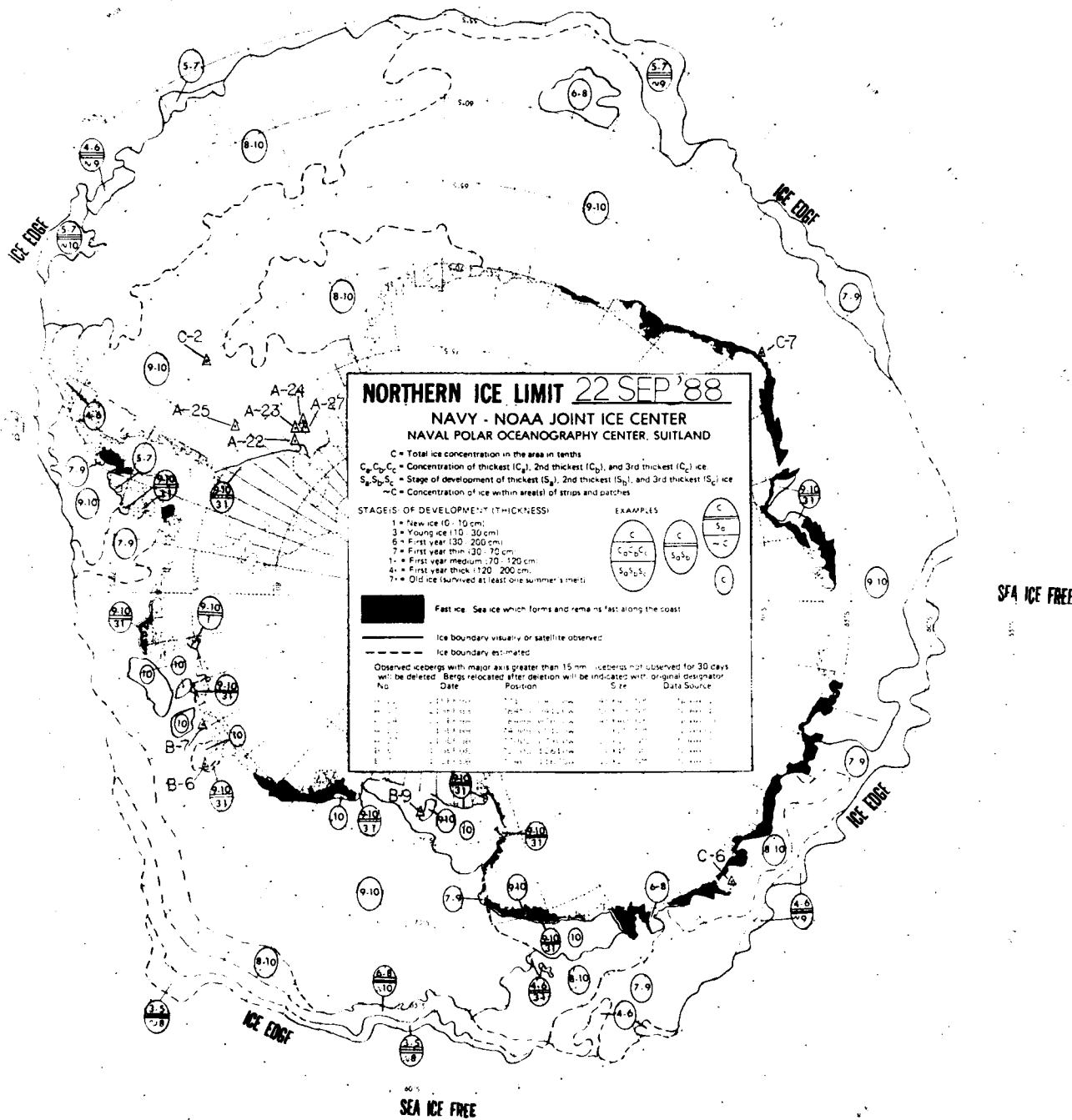
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

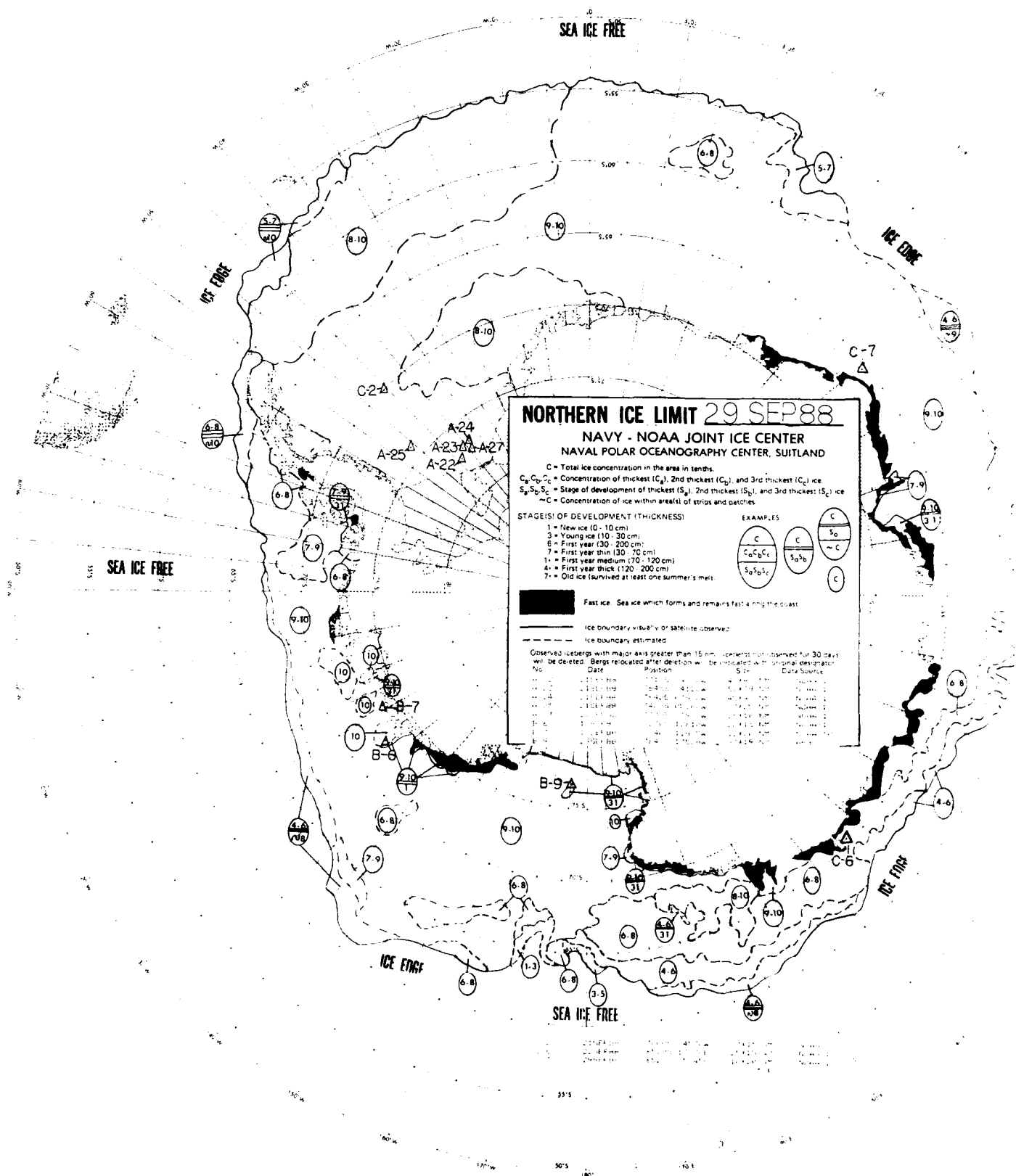
No.	Date	Position	Size	Data Source
1	15 SEP	74° 20' N 150° 10' W	1000 x 1000	NOAA
2	15 SEP	74° 10' N 150° 20' W	500 x 500	NOAA
3	15 SEP	74° 00' N 150° 30' W	200 x 200	NOAA
4	15 SEP	73° 50' N 150° 40' W	100 x 100	NOAA
5	15 SEP	73° 40' N 150° 50' W	50 x 50	NOAA
6	15 SEP	73° 30' N 151° 00' W	20 x 20	NOAA
7	15 SEP	73° 20' N 151° 10' W	10 x 10	NOAA
8	15 SEP	73° 10' N 151° 20' W	5 x 5	NOAA
9	15 SEP	73° 00' N 151° 30' W	2 x 2	NOAA
10	15 SEP	72° 50' N 151° 40' W	1 x 1	NOAA

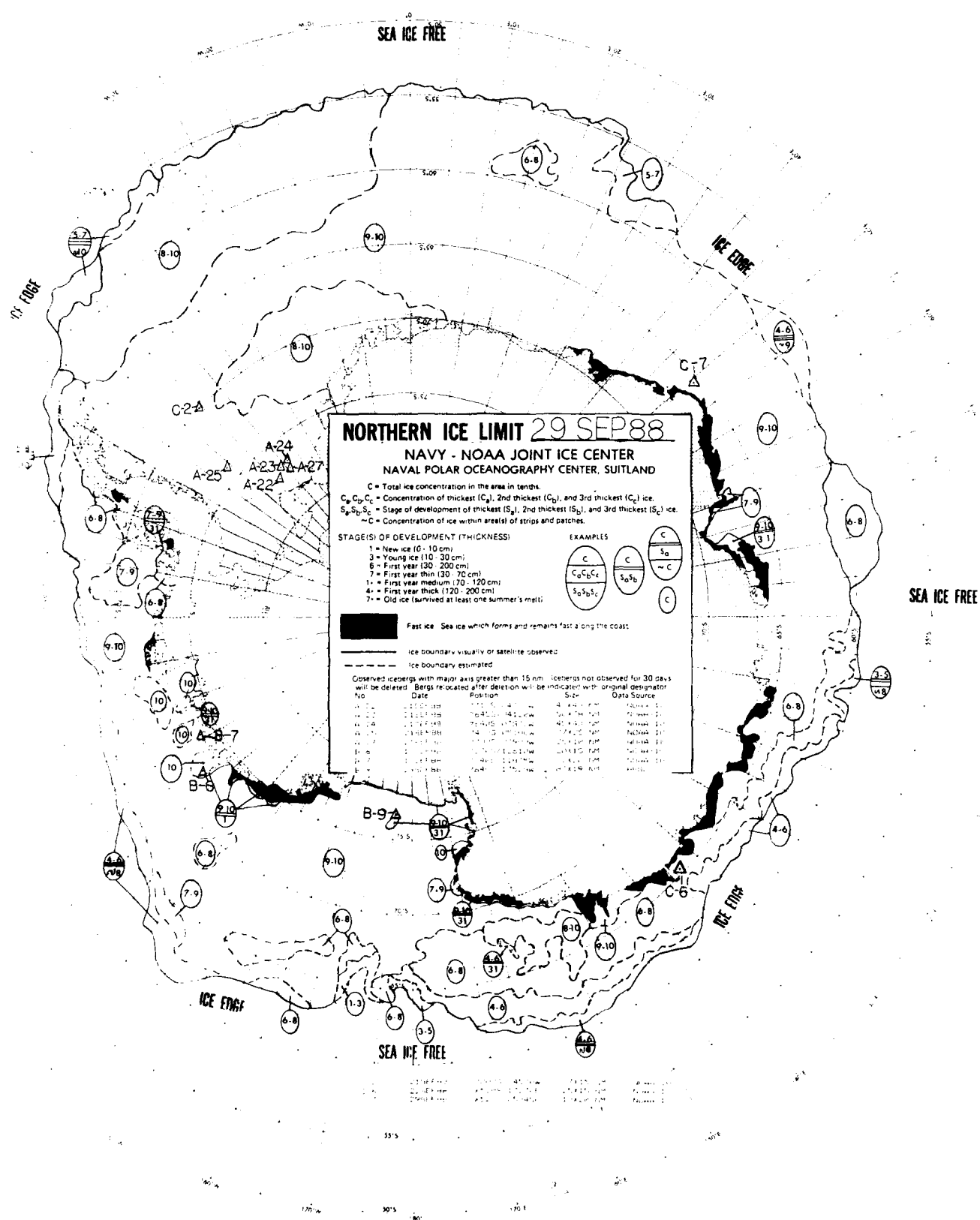
SEA ICE FREE

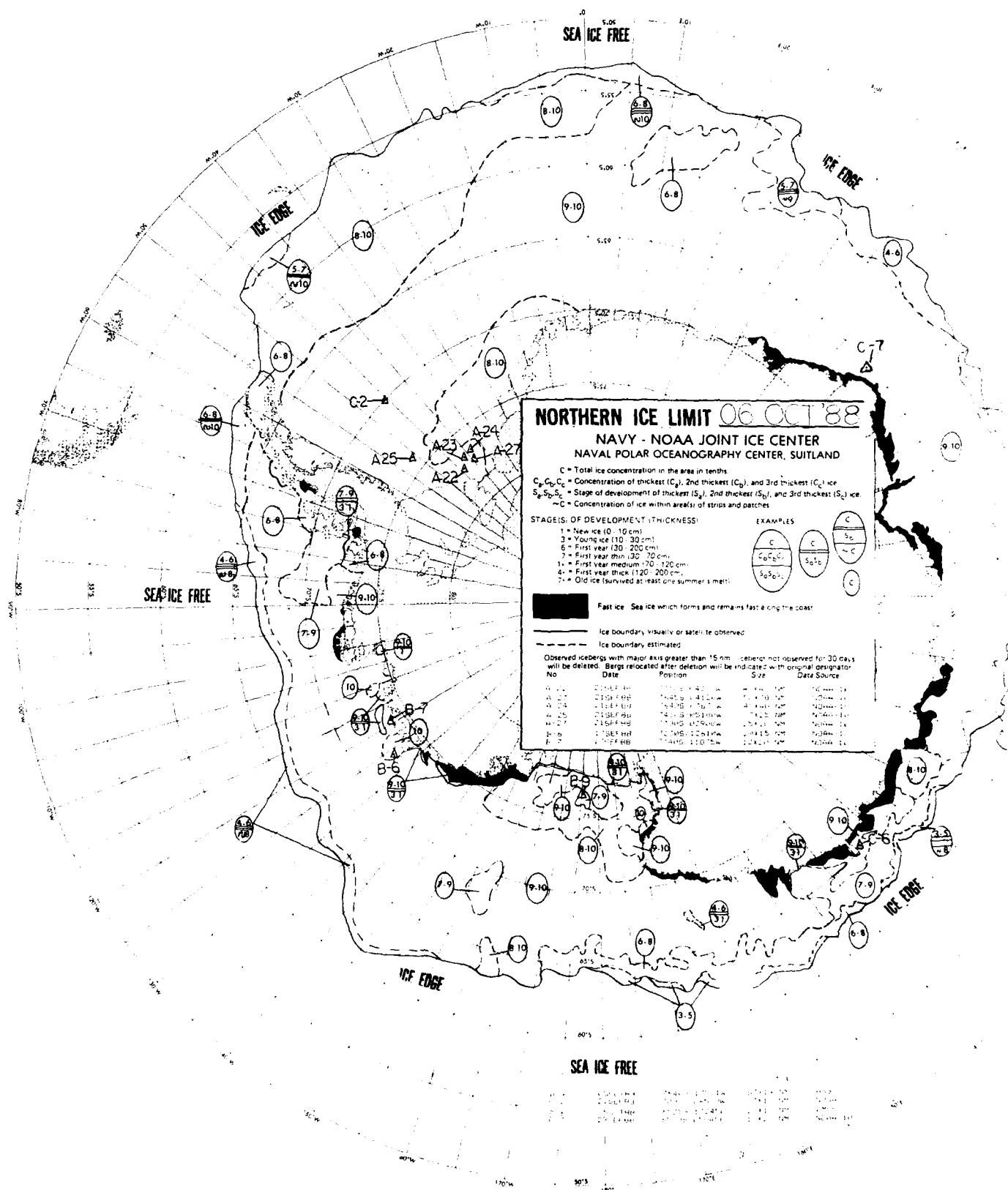


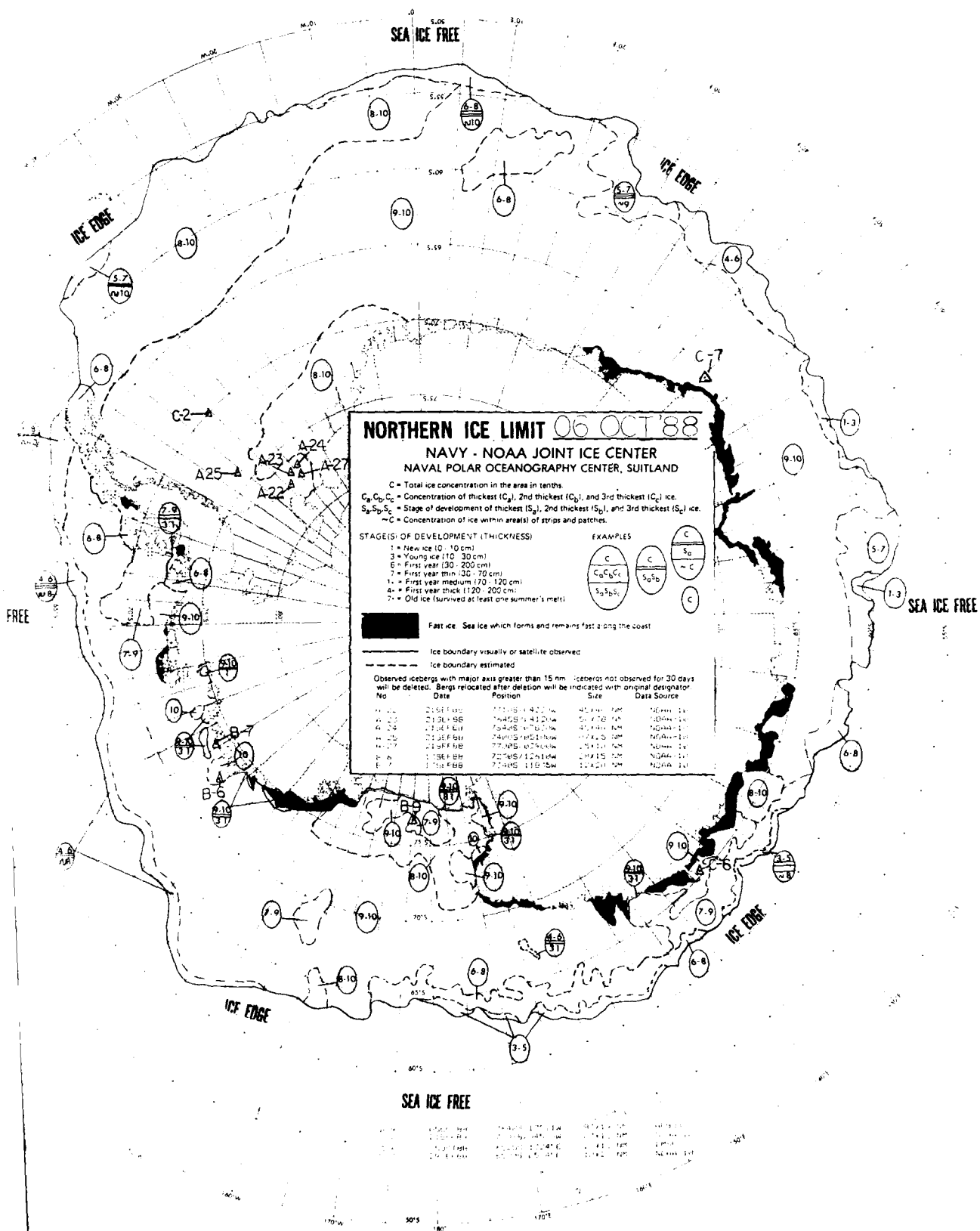
SEA ICE FREE

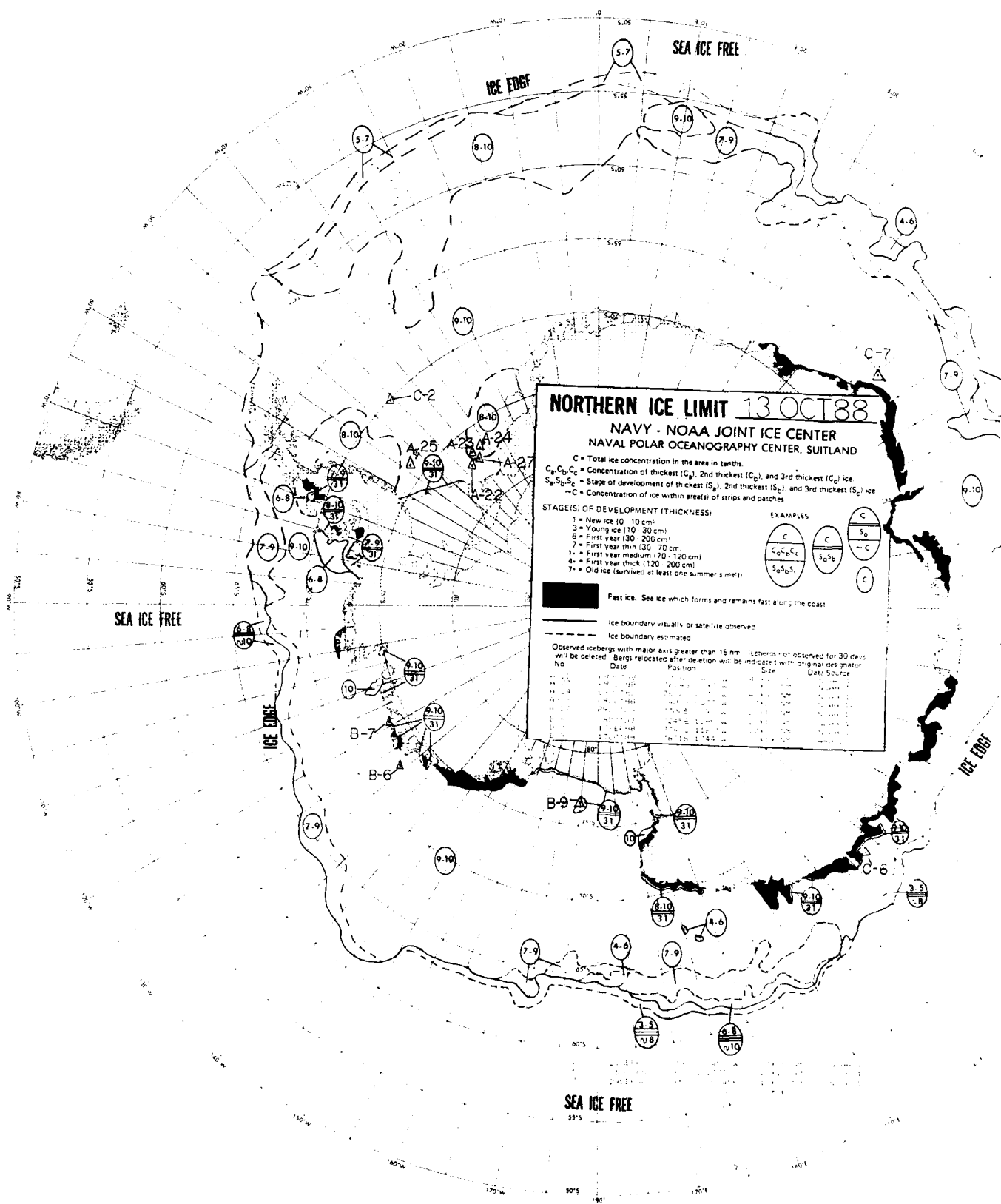


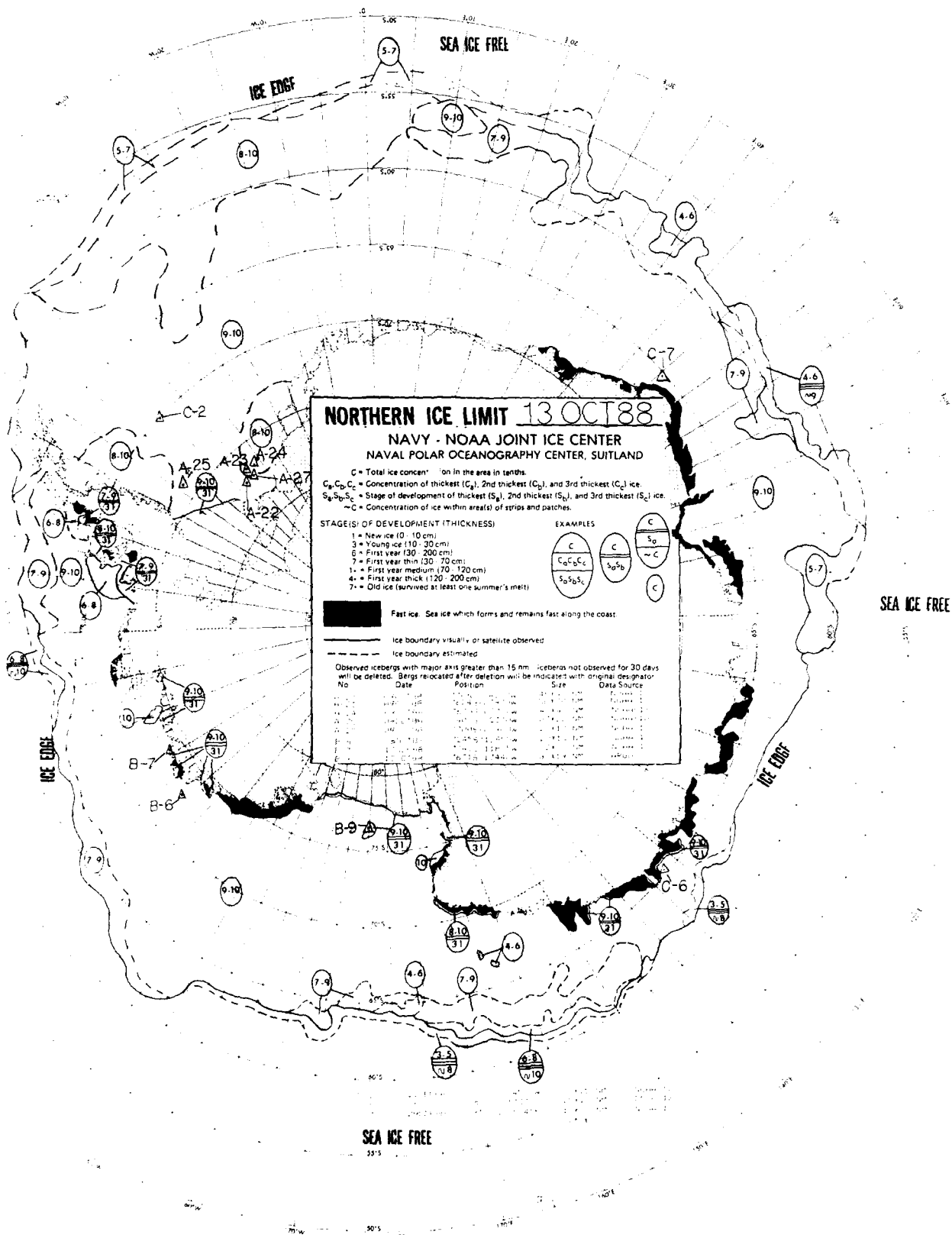


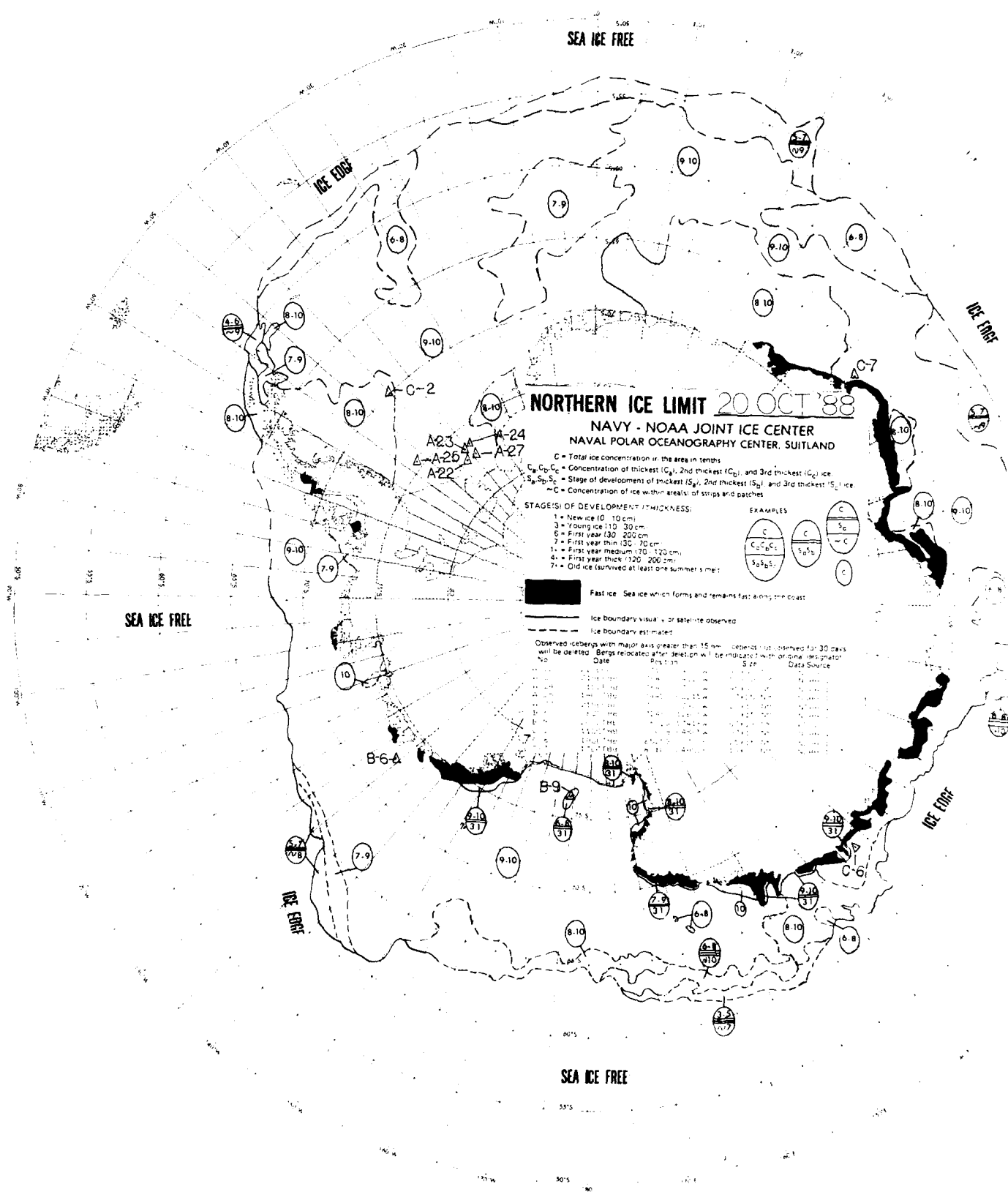












SEA ICE FREE

NORTHERN ICE LIMIT 20 OCT '88

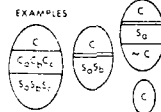
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁ C₂ C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁ S₂ S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
~C = Concentration of ice within areas of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice 10 - 10 cm
- 2 = Young ice 110 - 30 cm
- 3 = First year thin 30 - 200 cm
- 4 = First year medium 70 - 120 cm
- 5 = First year thick 120 - 200 cm
- 6 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary: Visual or satellite observed

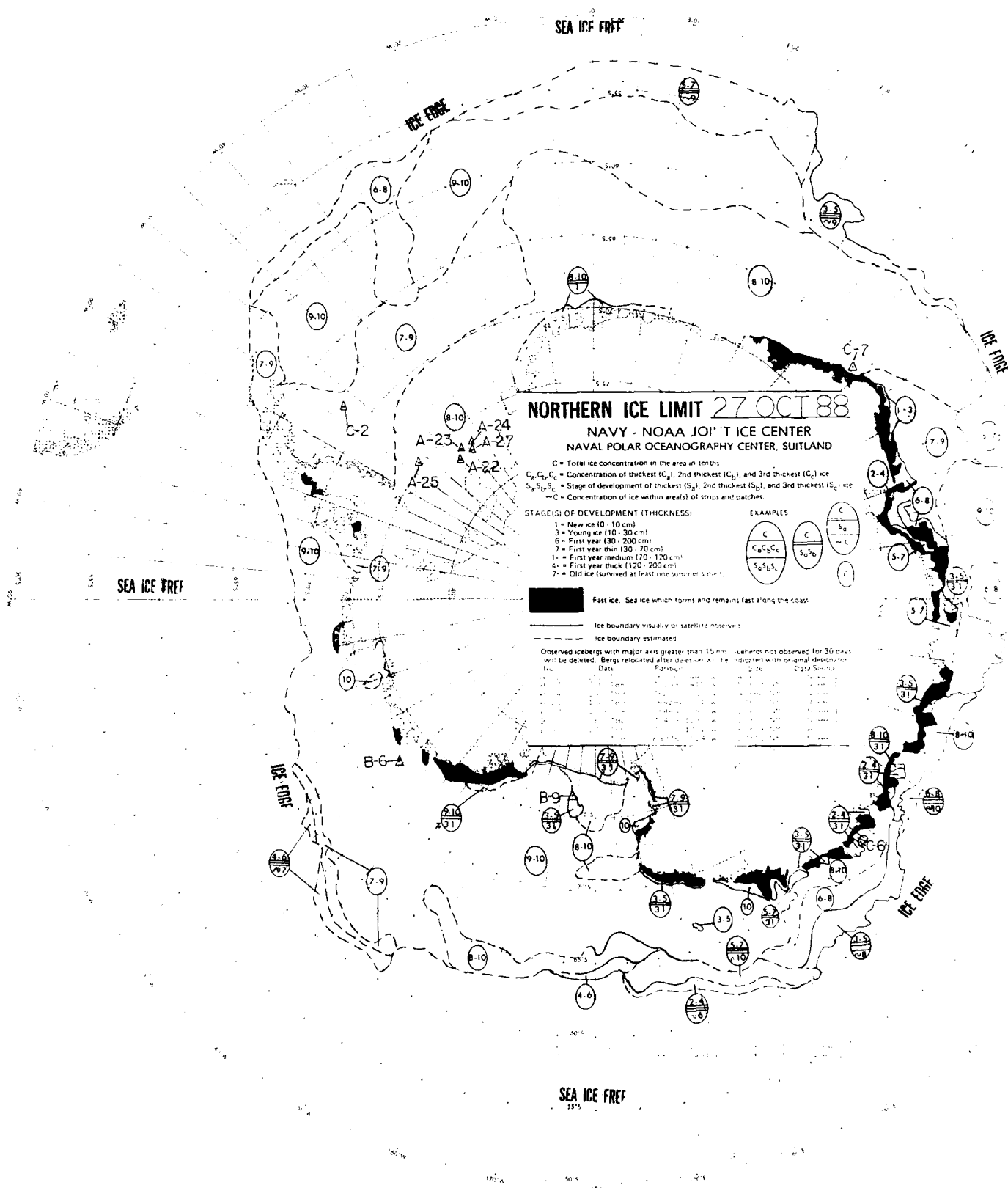
Ice boundary: Estimated

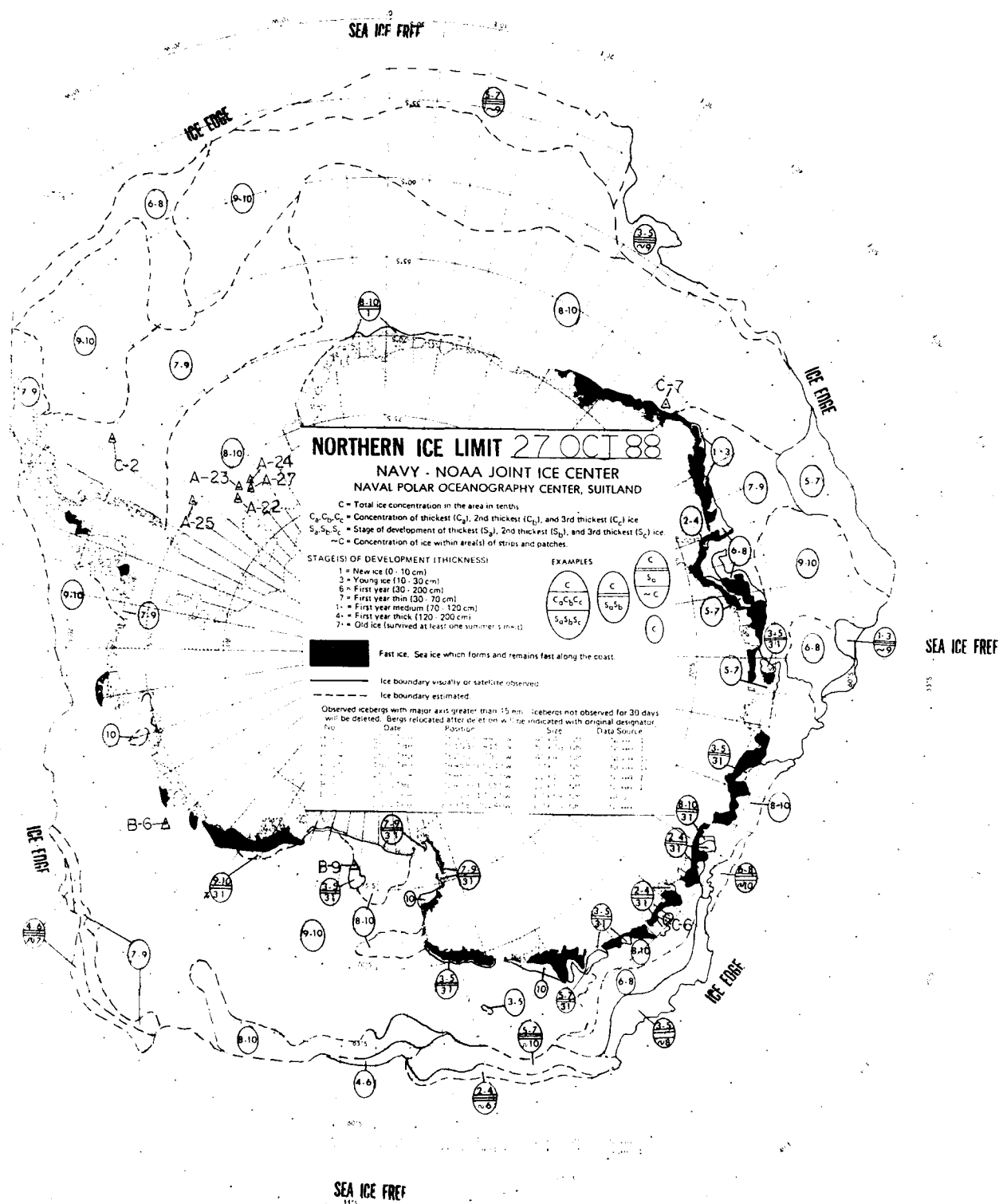
Observed icebergs with major axis greater than 5 m. Icebergs not observed for 30 days will be deleted. Bergs re-located after deletion will be indicated with original designator.

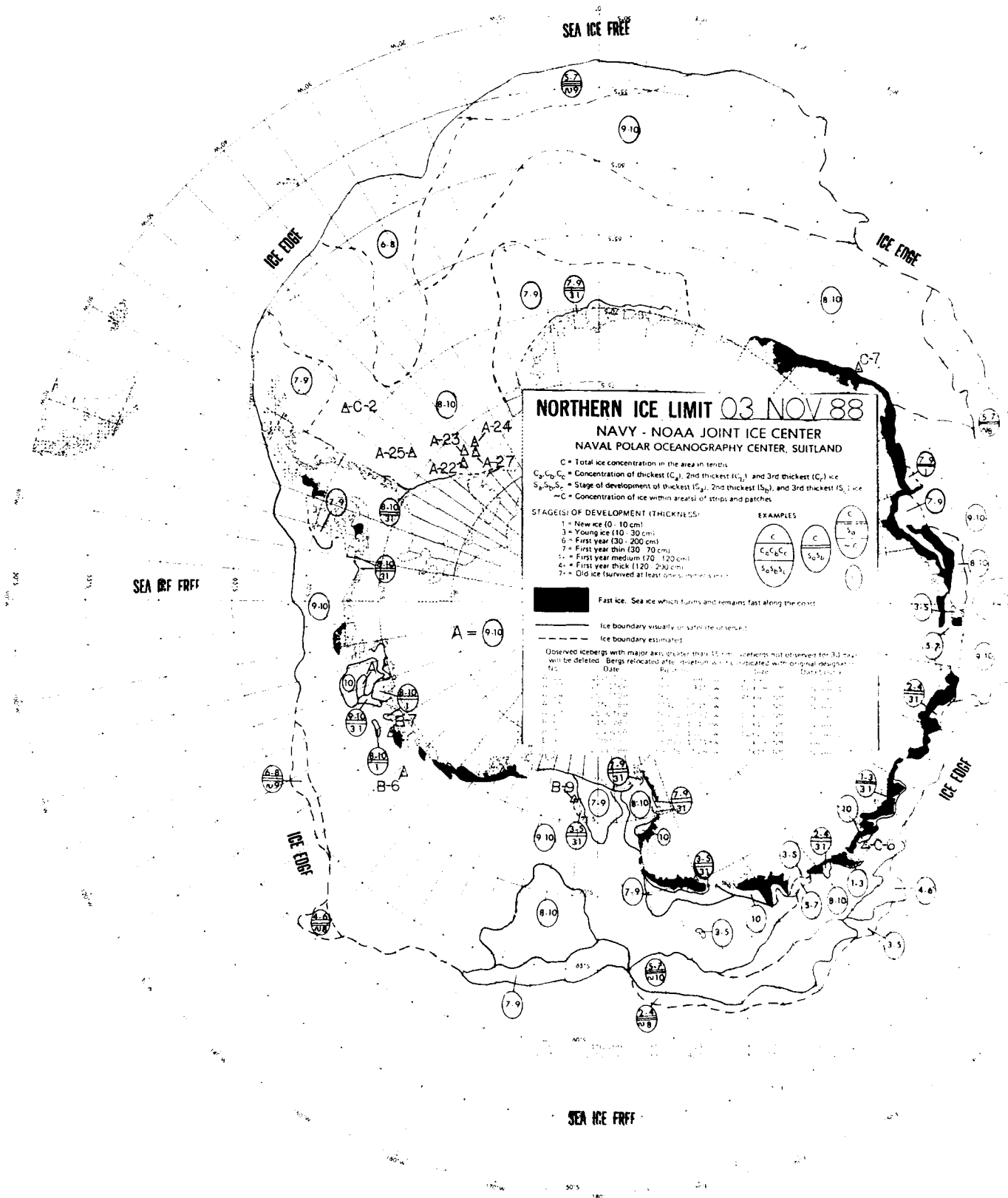
Date Post 177 Date Source

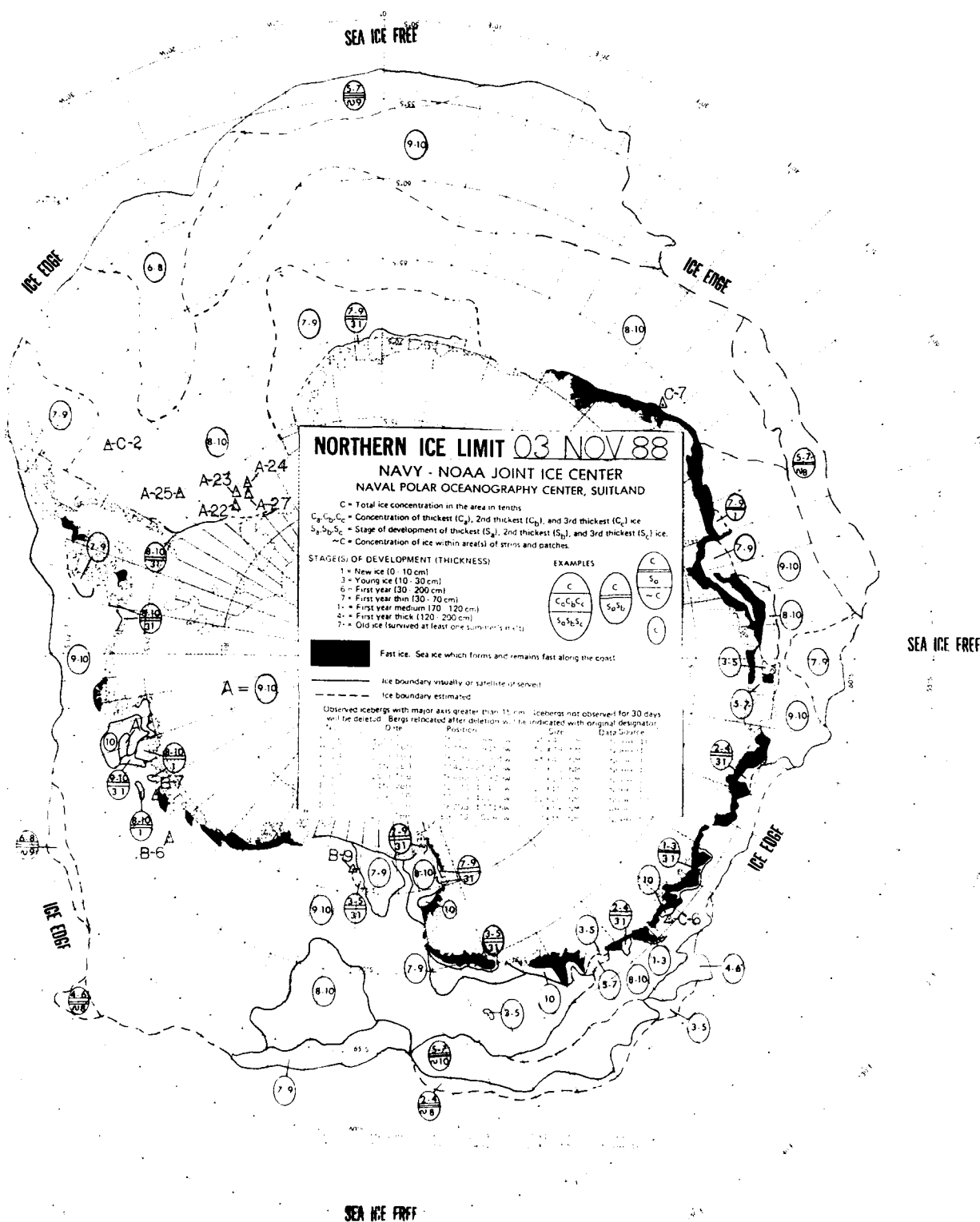
SEA ICE FREE

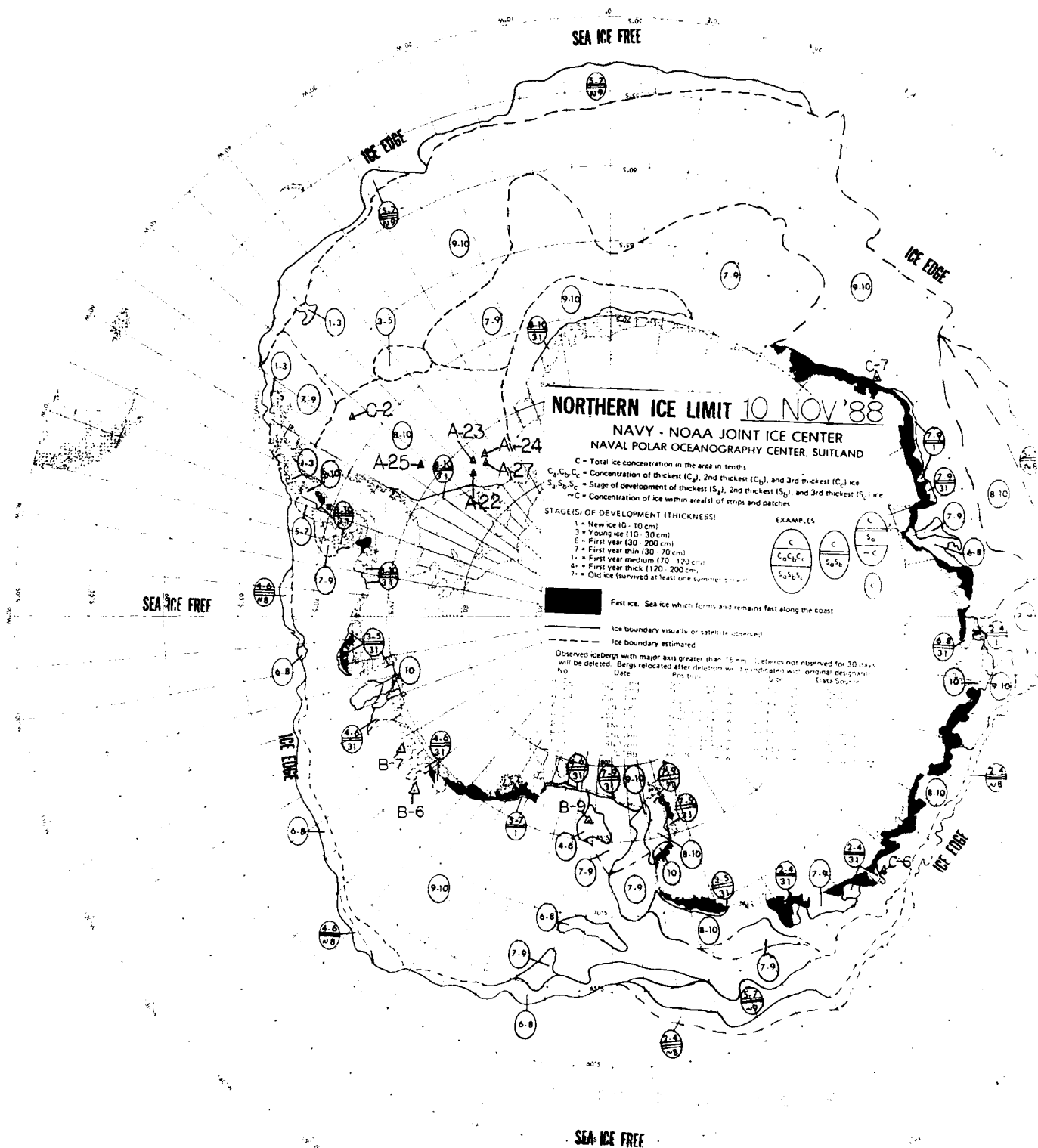
SEA ICE FREE











SEA ICE FREE

ICE EDGE

ICE EDGE

NORTHERN ICE LIMIT 10 NOV '88

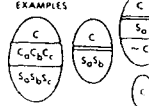
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C₁S₁, C₂S₂, C₃S₃ = Concentration of ice within areas (S₁, S₂, S₃) of strips 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 thin (30 - 70 cm)
- 5 = First year medium (70 - 120 cm)
- 6 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

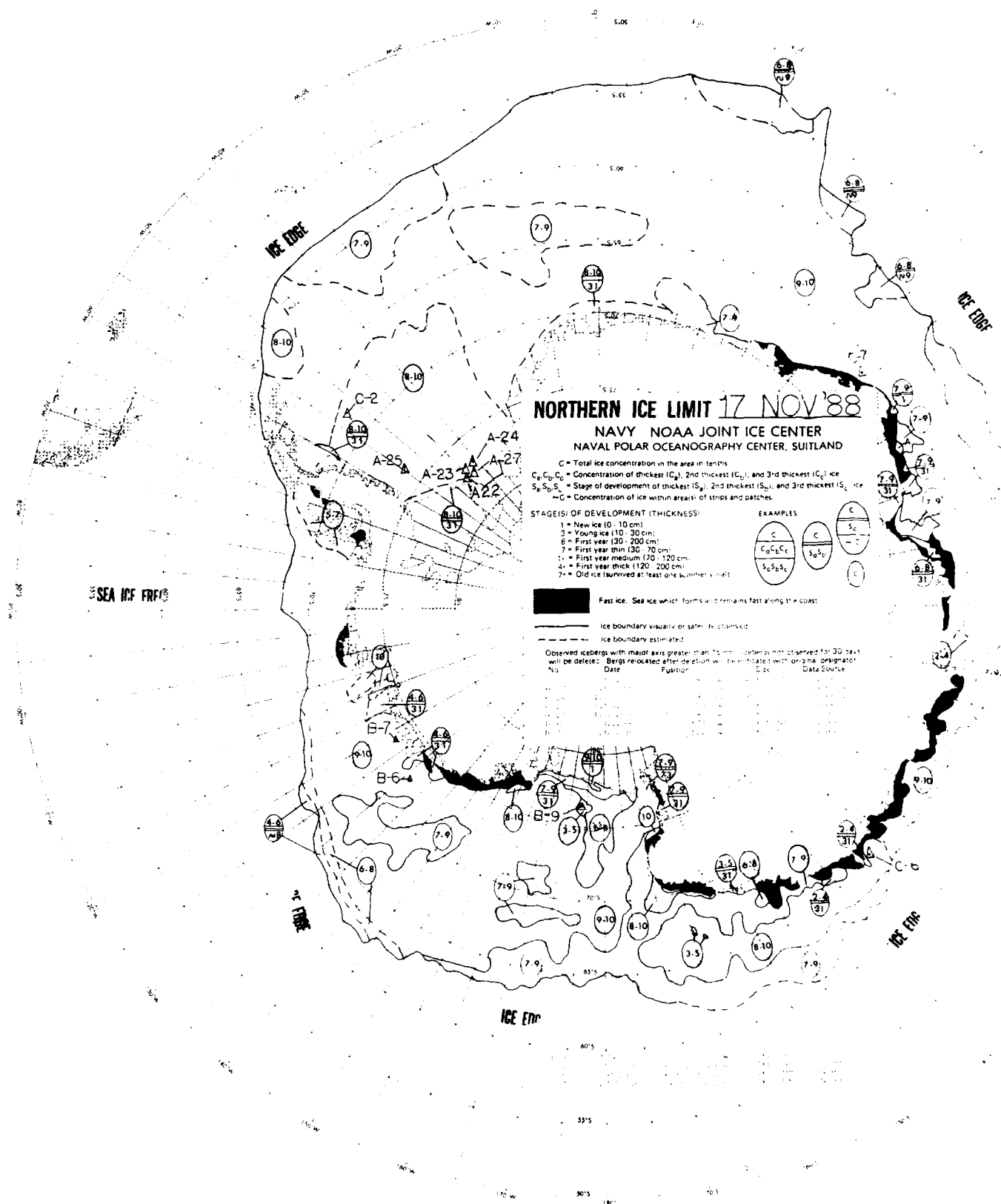
Ice boundary estimated

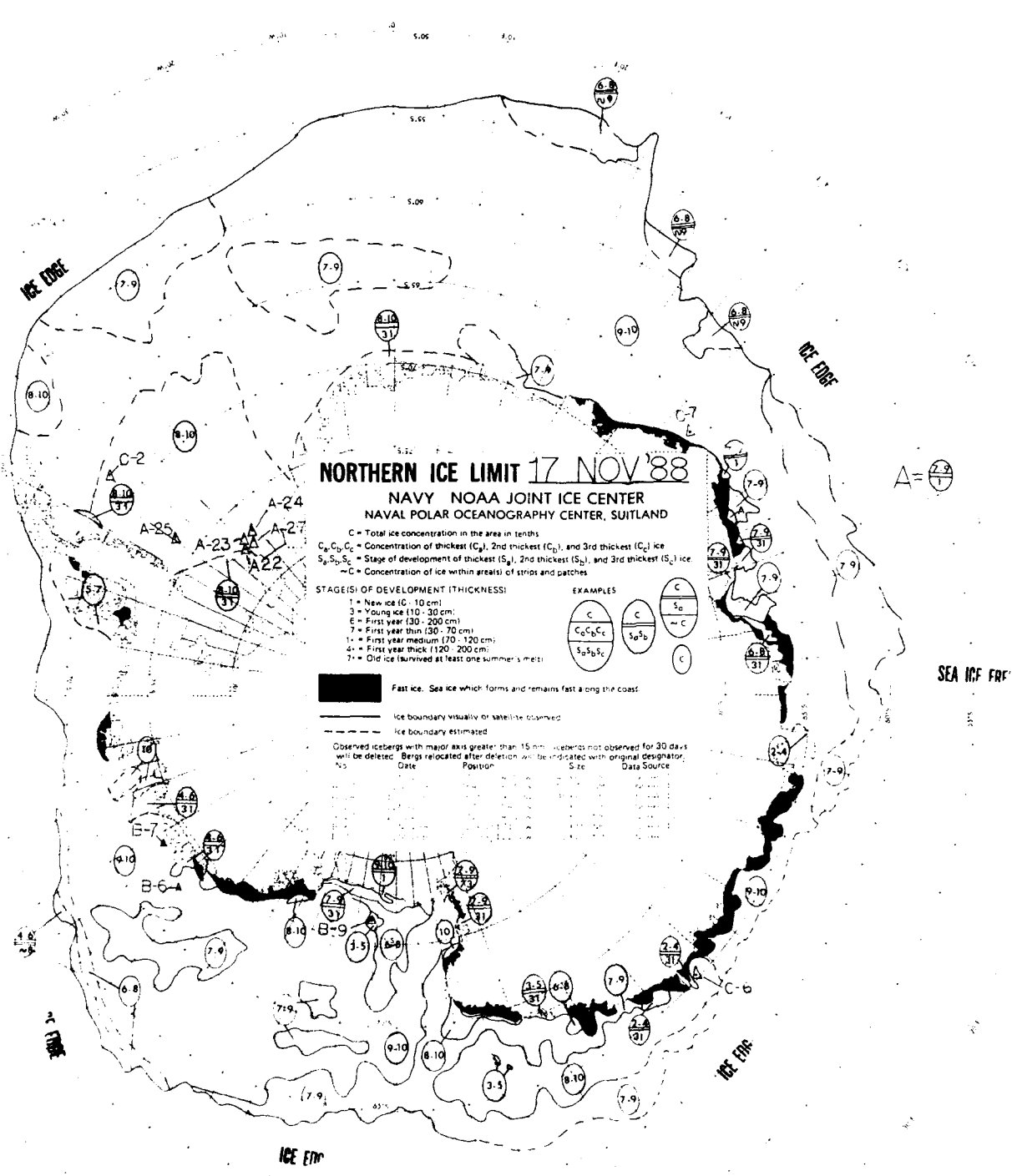
Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Berge relocated after deletion will be indicated with original designator.

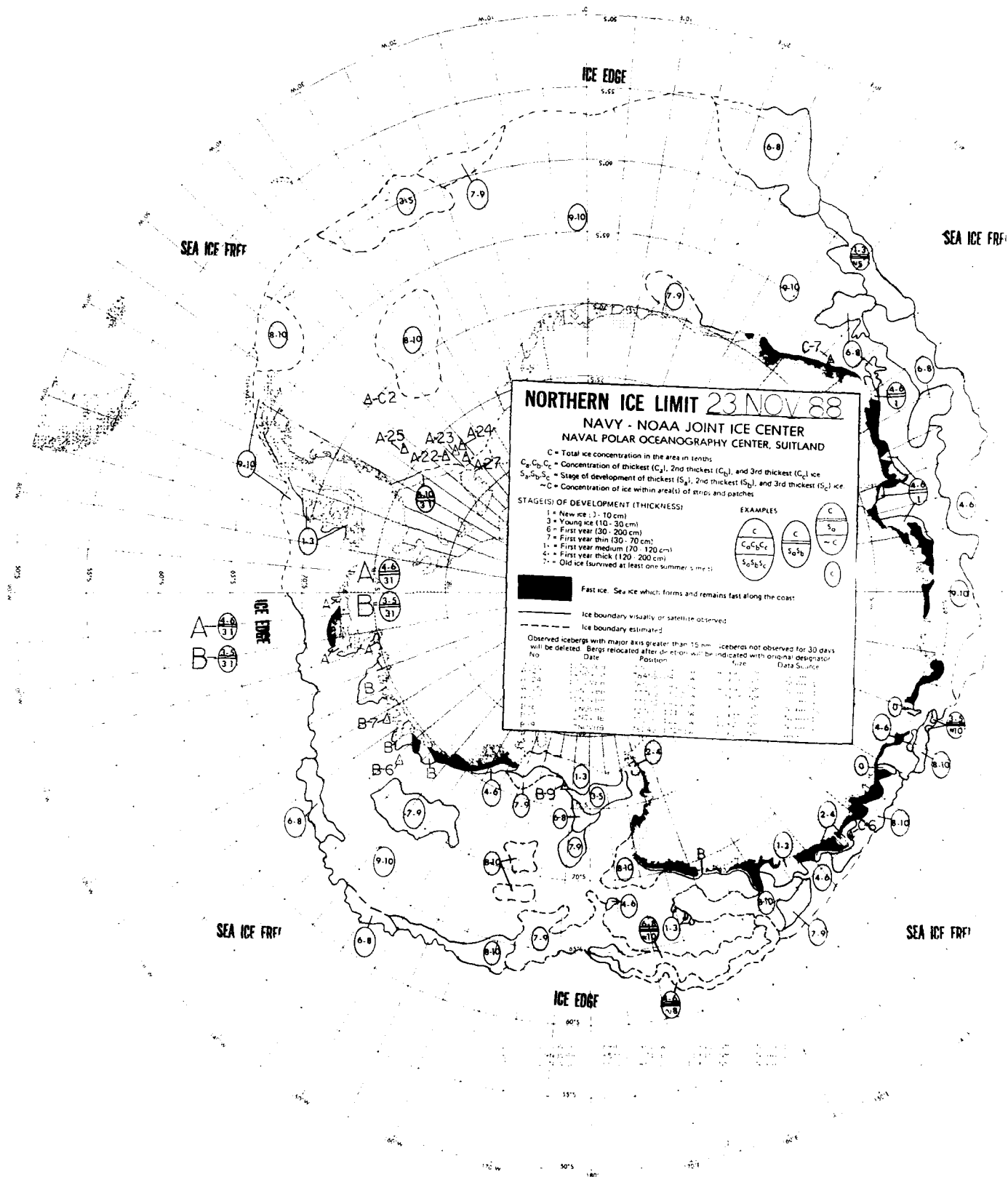
Date Position Size Data Source

SEA ICE FREE

SEA ICE FREE







ICE EDGE

SEA ICE FRFT

NORTHERN ICE LIMIT 23 NOV 88

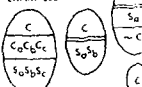
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

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S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
→ C = Concentration of ice within areas of strips and patches

STAGE(S) OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer's melt)

EXAMPLES



Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

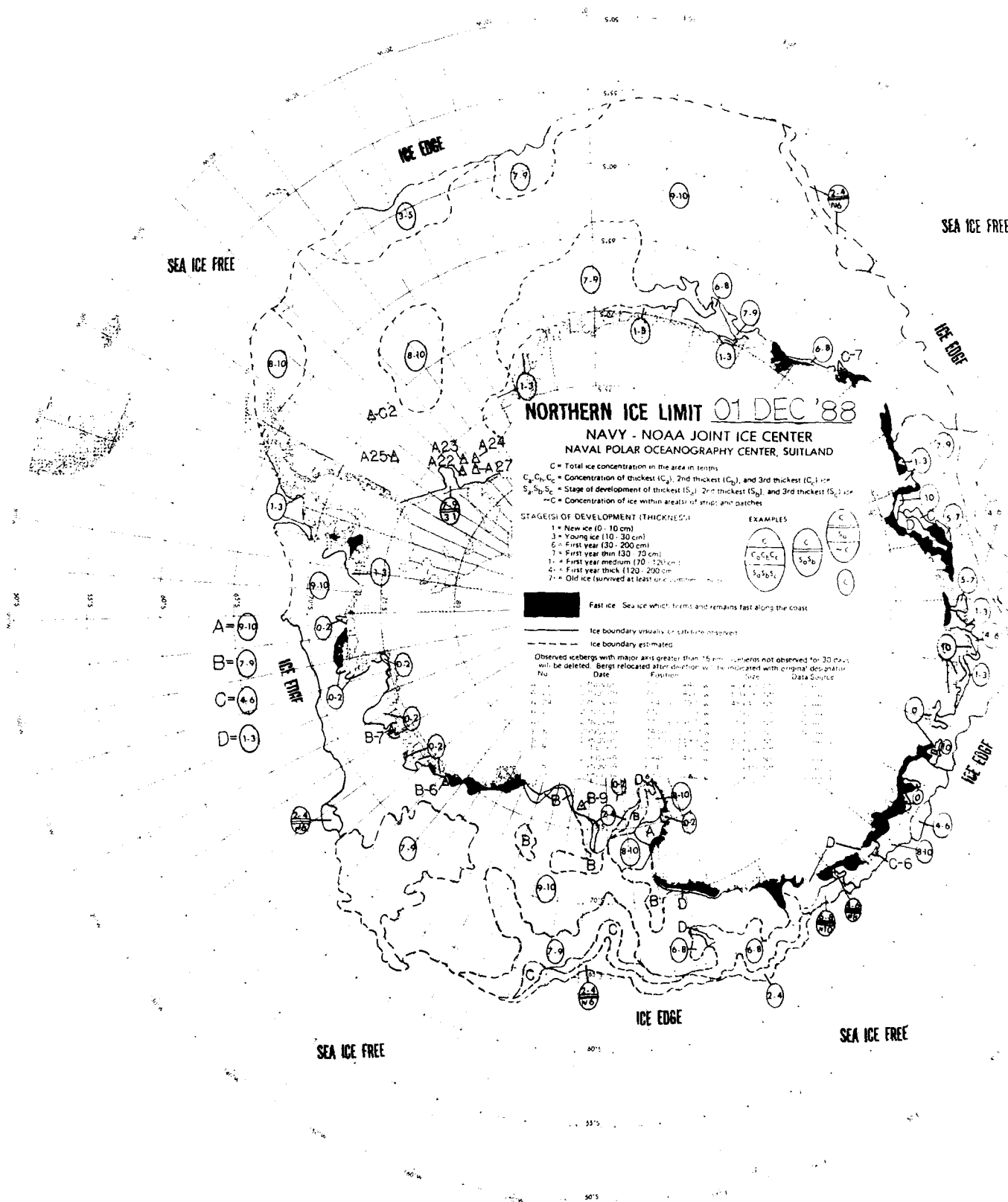
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
1	11/11/88	72°N 15°E	100 x 150 m	NAO
2	11/11/88	72°N 15°E	100 x 150 m	NAO
3	11/11/88	72°N 15°E	100 x 150 m	NAO
4	11/11/88	72°N 15°E	100 x 150 m	NAO
5	11/11/88	72°N 15°E	100 x 150 m	NAO
6	11/11/88	72°N 15°E	100 x 150 m	NAO
7	11/11/88	72°N 15°E	100 x 150 m	NAO
8	11/11/88	72°N 15°E	100 x 150 m	NAO
9	11/11/88	72°N 15°E	100 x 150 m	NAO
10	11/11/88	72°N 15°E	100 x 150 m	NAO

ICE EDGE

SEA ICE FRFT



SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

SEA ICE FREE

NORTHERN ICE LIMIT 01 DEC '88

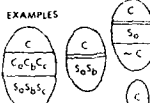
NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁C₂C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁S₂S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C = Concentration of ice within area(s) of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 3 = Young ice (10 - 30 cm)
- 6 = First year (30 - 200 cm)
- 1 = First year thin (30 - 70 cm)
- 1 = First year medium (70 - 120 cm)
- 4 = First year thick (120 - 200 cm)
- 7 = Old ice (survived at least one summer season)

EXAMPLES

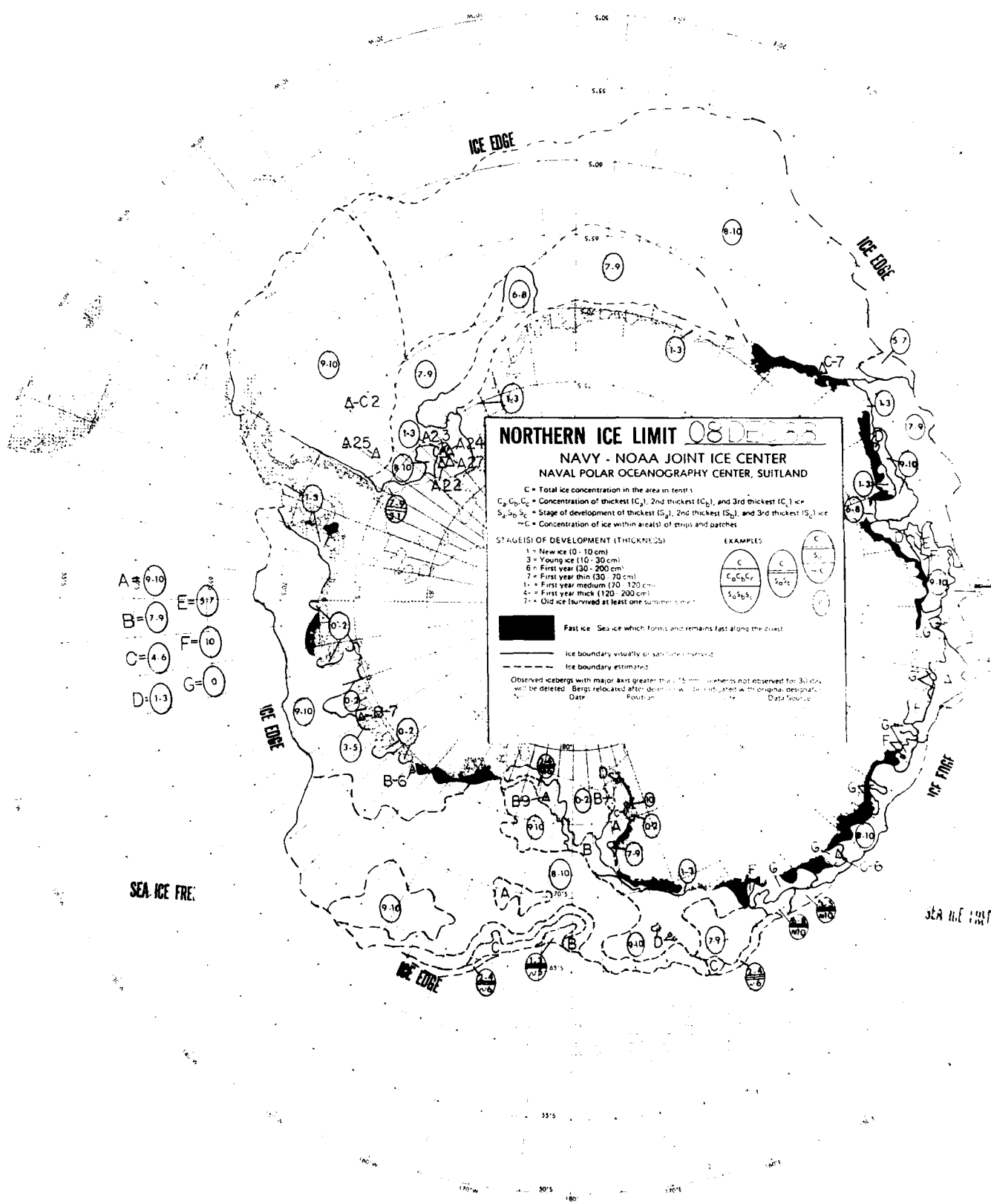


Fast ice: Sea ice which forms and remains fast along the coast

Ice boundary visually or satellite observed
Ice boundary estimated

Observed icebergs with major axis greater than 15 nm. Icebergs not observed for 30 days will be deleted. Bergs relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
1	12/1/88	75°N 150°W	100 x 200	NOAA
2	12/1/88	75°N 150°W	100 x 200	NOAA
3	12/1/88	75°N 150°W	100 x 200	NOAA
4	12/1/88	75°N 150°W	100 x 200	NOAA
5	12/1/88	75°N 150°W	100 x 200	NOAA
6	12/1/88	75°N 150°W	100 x 200	NOAA
7	12/1/88	75°N 150°W	100 x 200	NOAA
8	12/1/88	75°N 150°W	100 x 200	NOAA
9	12/1/88	75°N 150°W	100 x 200	NOAA
10	12/1/88	75°N 150°W	100 x 200	NOAA
11	12/1/88	75°N 150°W	100 x 200	NOAA
12	12/1/88	75°N 150°W	100 x 200	NOAA
13	12/1/88	75°N 150°W	100 x 200	NOAA
14	12/1/88	75°N 150°W	100 x 200	NOAA
15	12/1/88	75°N 150°W	100 x 200	NOAA
16	12/1/88	75°N 150°W	100 x 200	NOAA
17	12/1/88	75°N 150°W	100 x 200	NOAA
18	12/1/88	75°N 150°W	100 x 200	NOAA
19	12/1/88	75°N 150°W	100 x 200	NOAA
20	12/1/88	75°N 150°W	100 x 200	NOAA
21	12/1/88	75°N 150°W	100 x 200	NOAA
22	12/1/88	75°N 150°W	100 x 200	NOAA
23	12/1/88	75°N 150°W	100 x 200	NOAA
24	12/1/88	75°N 150°W	100 x 200	NOAA
25	12/1/88	75°N 150°W	100 x 200	NOAA
26	12/1/88	75°N 150°W	100 x 200	NOAA
27	12/1/88	75°N 150°W	100 x 200	NOAA
28	12/1/88	75°N 150°W	100 x 200	NOAA
29	12/1/88	75°N 150°W	100 x 200	NOAA
30	12/1/88	75°N 150°W	100 x 200	NOAA
31	12/1/88	75°N 150°W	100 x 200	NOAA
32	12/1/88	75°N 150°W	100 x 200	NOAA
33	12/1/88	75°N 150°W	100 x 200	NOAA
34	12/1/88	75°N 150°W	100 x 200	NOAA
35	12/1/88	75°N 150°W	100 x 200	NOAA
36	12/1/88	75°N 150°W	100 x 200	NOAA
37	12/1/88	75°N 150°W	100 x 200	NOAA
38	12/1/88	75°N 150°W	100 x 200	NOAA
39	12/1/88	75°N 150°W	100 x 200	NOAA
40	12/1/88	75°N 150°W	100 x 200	NOAA
41	12/1/88	75°N 150°W	100 x 200	NOAA
42	12/1/88	75°N 150°W	100 x 200	NOAA
43	12/1/88	75°N 150°W	100 x 200	NOAA
44	12/1/88	75°N 150°W	100 x 200	NOAA
45	12/1/88	75°N 150°W	100 x 200	NOAA
46	12/1/88	75°N 150°W	100 x 200	NOAA
47	12/1/88	75°N 150°W	100 x 200	NOAA
48	12/1/88	75°N 150°W	100 x 200	NOAA
49	12/1/88	75°N 150°W	100 x 200	NOAA
50	12/1/88	75°N 150°W	100 x 200	NOAA
51	12/1/88	75°N 150°W	100 x 200	NOAA
52	12/1/88	75°N 150°W	100 x 200	NOAA
53	12/1/88	75°N 150°W	100 x 200	NOAA
54	12/1/88	75°N 150°W	100 x 200	NOAA
55	12/1/88	75°N 150°W	100 x 200	NOAA
56	12/1/88	75°N 150°W	100 x 200	NOAA
57	12/1/88	75°N 150°W	100 x 200	NOAA
58	12/1/88	75°N 150°W	100 x 200	NOAA
59	12/1/88	75°N 150°W	100 x 200	NOAA
60	12/1/88	75°N 150°W	100 x 200	NOAA
61	12/1/88	75°N 150°W	100 x 200	NOAA
62	12/1/88	75°N 150°W	100 x 200	NOAA
63	12/1/88	75°N 150°W	100 x 200	NOAA
64	12/1/88	75°N 150°W	100 x 200	NOAA
65	12/1/88	75°N 150°W	100 x 200	NOAA
66	12/1/88	75°N 150°W	100 x 200	NOAA
67	12/1/88	75°N 150°W	100 x 200	NOAA
68	12/1/88	75°N 150°W	100 x 200	NOAA
69	12/1/88	75°N 150°W	100 x 200	NOAA
70	12/1/88	75°N 150°W	100 x 200	NOAA
71	12/1/88	75°N 150°W	100 x 200	NOAA
72	12/1/88	75°N 150°W	100 x 200	NOAA
73	12/1/88	75°N 150°W	100 x 200	NOAA
74	12/1/88	75°N 150°W	100 x 200	NOAA
75	12/1/88	75°N 150°W	100 x 200	NOAA
76	12/1/88	75°N 150°W	100 x 200	NOAA
77	12/1/88	75°N 150°W	100 x 200	NOAA
78	12/1/88	75°N 150°W	100 x 200	NOAA
79	12/1/88	75°N 150°W	100 x 200	NOAA
80	12/1/88	75°N 150°W	100 x 200	NOAA
81	12/1/88	75°N 150°W	100 x 200	NOAA
82	12/1/88	75°N 150°W	100 x 200	NOAA
83	12/1/88	75°N 150°W	100 x 200	NOAA
84	12/1/88	75°N 150°W	100 x 200	NOAA
85	12/1/88	75°N 150°W	100 x 200	NOAA
86	12/1/88	75°N 150°W	100 x 200	NOAA
87	12/1/88	75°N 150°W	100 x 200	NOAA
88	12/1/88	75°N 150°W	100 x 200	NOAA
89	12/1/88	75°N 150°W	100 x 200	NOAA
90	12/1/88	75°N 150°W	100 x 200	NOAA
91	12/1/88	75°N 150°W	100 x 200	NOAA
92	12/1/88	75°N 150°W	100 x 200	NOAA
93	12/1/88	75°N 150°W	100 x 200	NOAA
94	12/1/88	75°N 150°W	100 x 200	NOAA
95	12/1/88	75°N 150°W	100 x 200	NOAA
96	12/1/88	75°N 150°W	100 x 200	NOAA
97	12/1/88	75°N 150°W	100 x 200	NOAA
98	12/1/88	75°N 150°W	100 x 200	NOAA
99	12/1/88	75°N 150°W	100 x 200	NOAA
100	12/1/88	75°N 150°W	100 x 200	NOAA



A = 9.10
 B = 7.9
 C = 4.6
 D = 1.3
 E = 9.17
 F = 10
 G = 0

SEA ICE FREE

SEA ICE FREE

ICE EDGE

ICE EDGE

NORTHERN ICE LIMIT 08 DEC 66

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths;
 C_0, C_1, C_2 = Concentration of thickest (C_0), 2nd thickest (C_1), and 3rd thickest (C_2) ice;
 S_0, S_1, S_2 = Stage of development of thickest (S_0), 2nd thickest (S_1), and 3rd thickest (S_2) ice;
 S_0, S_1, S_2 = Concentration of ice within areas of strips and patches.

STAGE OF DEVELOPMENT (THICKNESS)

- 1 = New ice (0 - 10 cm)
- 2 = Young ice (10 - 20 cm)
- 3 = First year (20 - 30 cm)
- 4 = First year (30 - 200 cm)
- 5 = First year (30 - 200 cm)
- 6 = First year (30 - 200 cm)
- 7 = First year (30 - 200 cm)
- 8 = First year (30 - 200 cm)
- 9 = First year (30 - 200 cm)
- 10 = First year (30 - 200 cm)
- 11 = First year (30 - 200 cm)
- 12 = First year (30 - 200 cm)
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- 26 = First year (30 - 200 cm)
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- 42 = First year (30 - 200 cm)
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- 79 = First year (30 - 200 cm)
- 80 = First year (30 - 200 cm)
- 81 = First year (30 - 200 cm)
- 82 = First year (30 - 200 cm)
- 83 = First year (30 - 200 cm)
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- 86 = First year (30 - 200 cm)
- 87 = First year (30 - 200 cm)
- 88 = First year (30 - 200 cm)
- 89 = First year (30 - 200 cm)
- 90 = First year (30 - 200 cm)
- 91 = First year (30 - 200 cm)
- 92 = First year (30 - 200 cm)
- 93 = First year (30 - 200 cm)
- 94 = First year (30 - 200 cm)
- 95 = First year (30 - 200 cm)
- 96 = First year (30 - 200 cm)
- 97 = First year (30 - 200 cm)
- 98 = First year (30 - 200 cm)
- 99 = First year (30 - 200 cm)
- 100 = First year (30 - 200 cm)

EXAMPLES

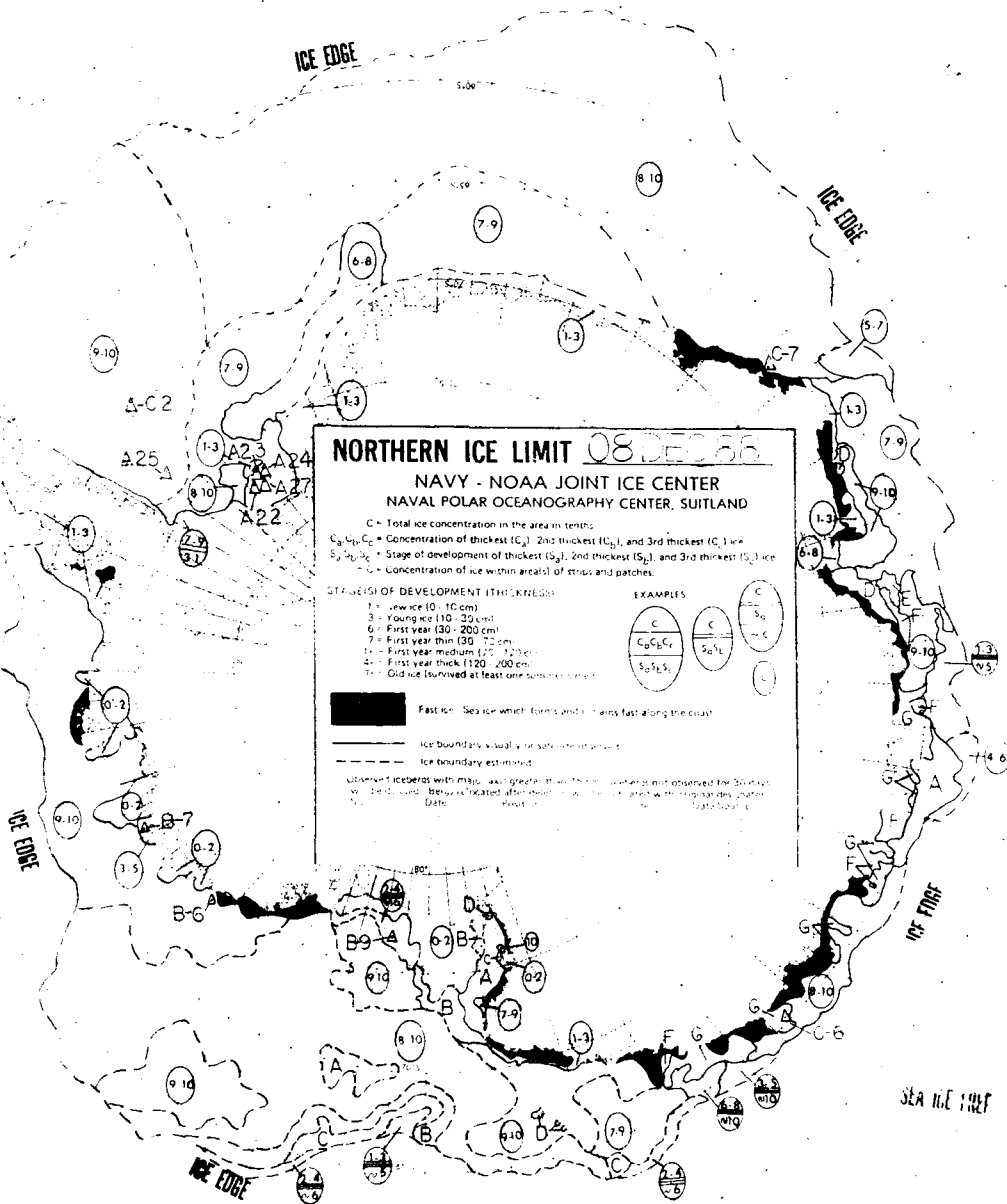
$\frac{C}{C_0 C_1 C_2}$	$\frac{C}{S_0 S_1 S_2}$	$\frac{C}{C_0 C_1 C_2 S_0 S_1 S_2}$
$\frac{C}{C_0 C_1 C_2}$	$\frac{C}{S_0 S_1 S_2}$	$\frac{C}{C_0 C_1 C_2 S_0 S_1 S_2}$

Fast ice: Sea ice which forms and remains fast along the coast.

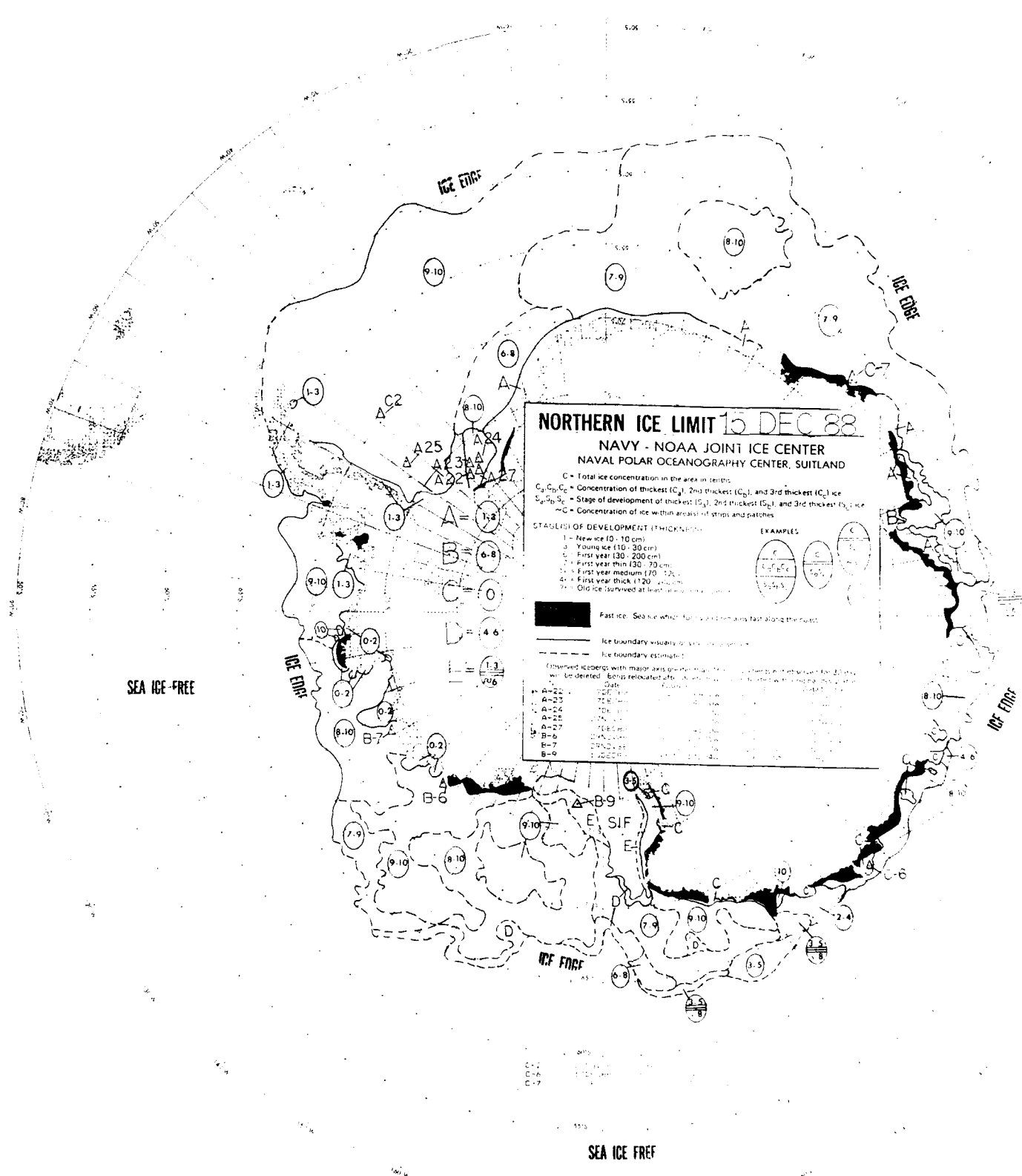
Ice boundary visual and satellite observed.

Ice boundary estimated.

Uncharted icebergs with major icebergs. If the ice is not observed for 30 days, it is considered to have melted. Below indicated after observation with ship or aircraft. Date.



SEA ICE LIMIT



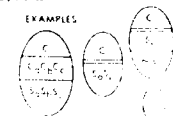
NORTHERN ICE LIMIT 15 DEC 88

**NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND**

- C = Total ice concentration in the area in tenths
- C₁, C₂, C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
- S₁, S₂, S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
- ~C = Concentration of ice within areas of strips and patches

STAGES OF DEVELOPMENT (THICKNESS)

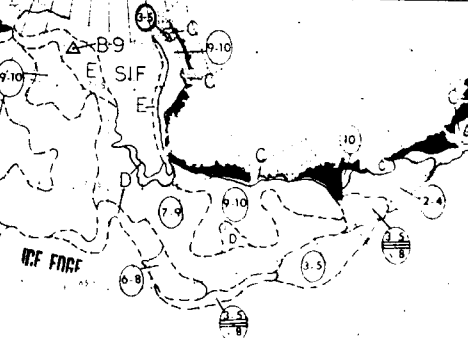
- 1 - New ice (10 - 10 cm)
- 2 - Young ice (10 - 30 cm)
- 3 - First year (30 - 200 cm)
- 4 - First year thin (30 - 70 cm)
- 5 - First year medium (70 - 120 cm)
- 6 - First year thick (120 - 200 cm)
- 7 - Old ice (survived at least one winter)



- Fast ice - Sea ice which has been anchored along the coast
- Ice boundary visually observed
- Ice boundary estimated

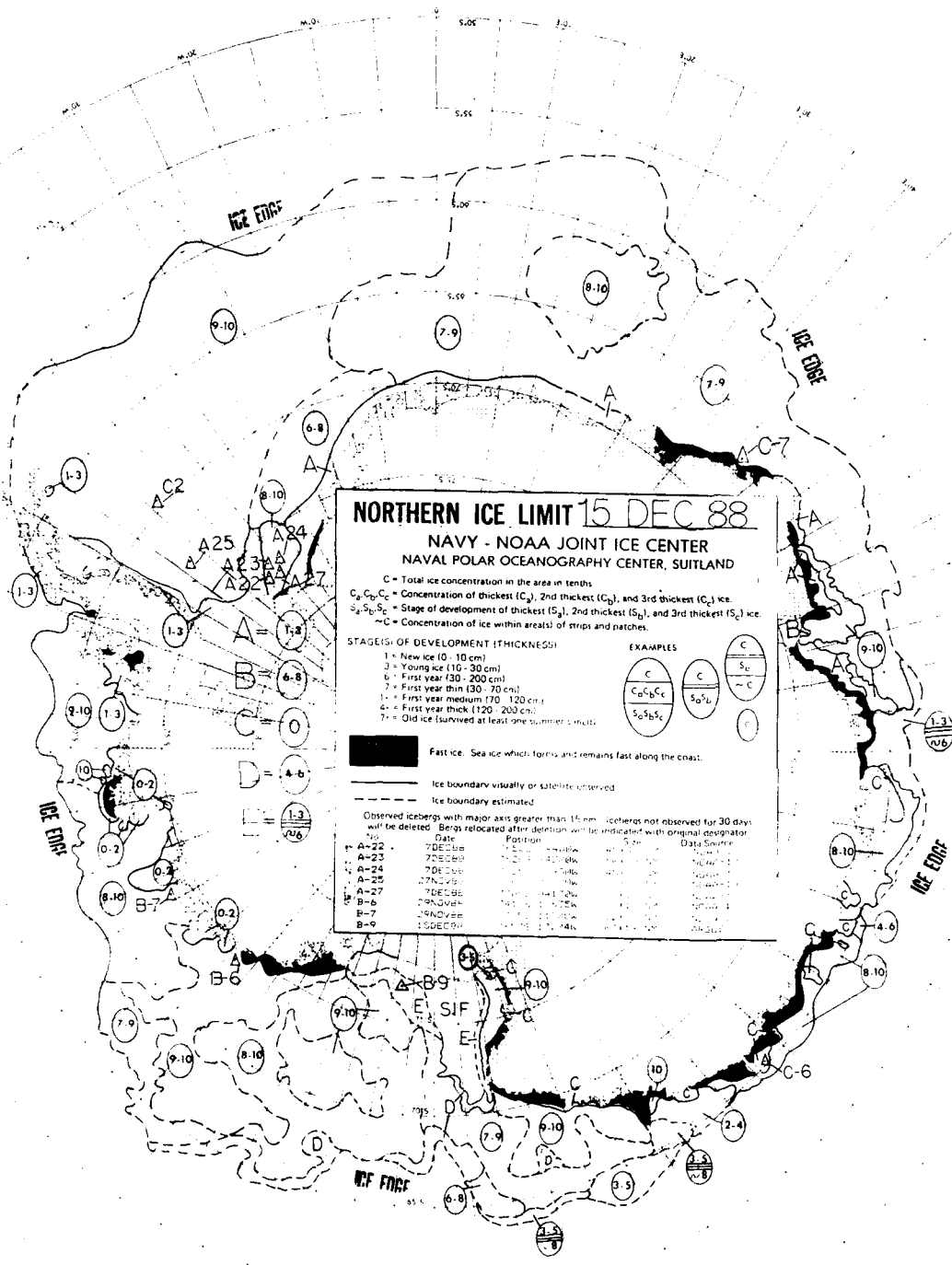
Observed icebergs with major axis greater than 100 m and minor axis greater than 50 m will be deleted. Bergs relocated after 1000 hours will be deleted with a note.

Code	Lat	Long	Height	Area	Volume	Notes
A-22	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
A-23	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
A-24	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
A-25	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
A-26	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
A-27	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
B-6	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
B-7	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
B-9	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³



SEA ICE FREE

Code	Lat	Long	Height	Area	Volume	Notes
C-1	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
C-6	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³
C-7	72° 15' N	156° 15' W	10 m	1000 m²	1000 m³	1000 m³

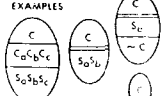


NORTHERN ICE LIMIT 15 DEC 88

NAVY - NOAA JOINT ICE CENTER
NAVAL POLAR OCEANOGRAPHY CENTER, SUITLAND

C = Total ice concentration in the area in tenths
C₁ C₂ C₃ = Concentration of thickest (C₁), 2nd thickest (C₂), and 3rd thickest (C₃) ice
S₁ S₂ S₃ = Stage of development of thickest (S₁), 2nd thickest (S₂), and 3rd thickest (S₃) ice
C = Concentration of ice within areas of strips and patches.

- STAGE(S) OF DEVELOPMENT (THICKNESS)
- 1 = New ice (0 - 10 cm)
 - 2 = Young ice (10 - 30 cm)
 - 3 = First year (30 - 200 cm)
 - 4 = First year thin (30 - 70 cm)
 - 5 = First year medium (70 - 120 cm)
 - 6 = First year thick (120 - 200 cm)
 - 7 = Old ice (survived at least one summer melt)



Fast ice: Sea ice which forms and remains fast along the coast.

Ice boundary visually or satellite observed

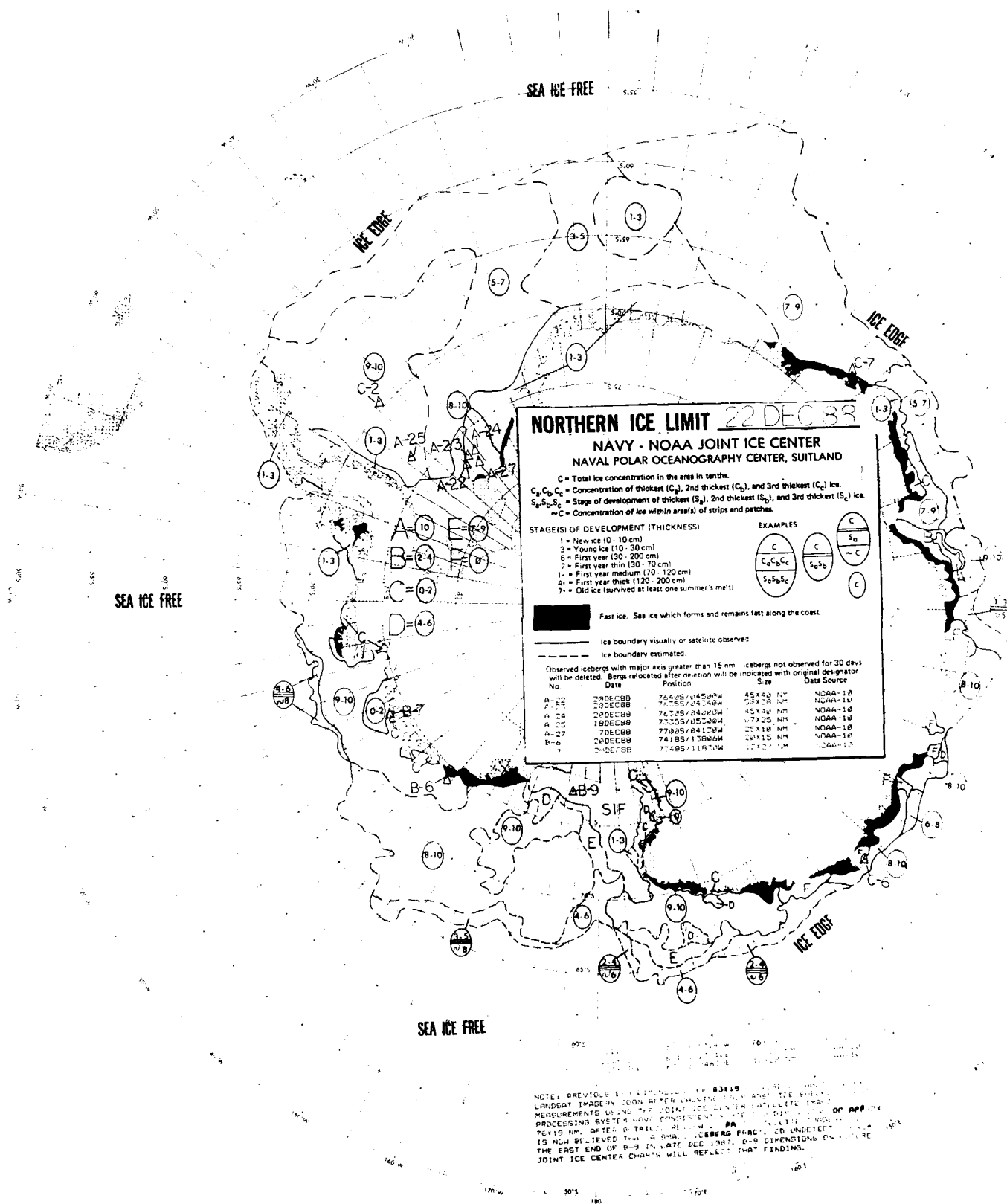
Ice boundary estimated

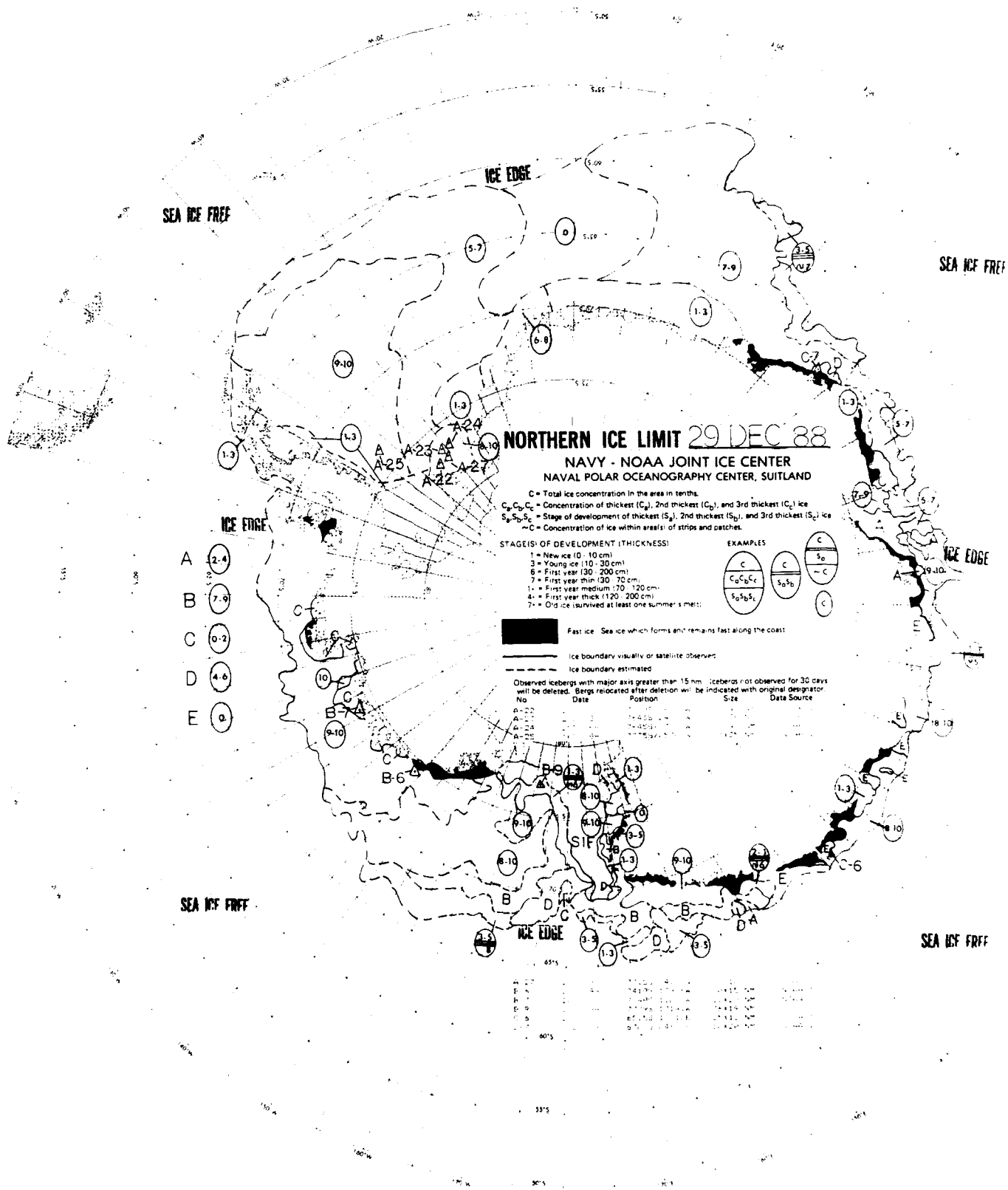
Observed icebergs with major axis greater than 15 m. Icebergs not observed for 30 days will be deleted. Beris relocated after deletion will be indicated with original designator.

No.	Date	Position	Size	Data Source
A-22	7 DEC 88	72° 15' N 157° 15' W	100m x 100m	NAO
A-23	7 DEC 88	72° 15' N 157° 15' W	100m x 100m	NAO
A-24	7 DEC 88	72° 15' N 157° 15' W	100m x 100m	NAO
A-25	7 DEC 88	72° 15' N 157° 15' W	100m x 100m	NAO
A-26	7 DEC 88	72° 15' N 157° 15' W	100m x 100m	NAO
A-27	7 DEC 88	72° 15' N 157° 15' W	100m x 100m	NAO
B-6	29 NOV 88	72° 15' N 157° 15' W	100m x 100m	NAO
B-7	29 NOV 88	72° 15' N 157° 15' W	100m x 100m	NAO
B-9	15 DEC 88	72° 15' N 157° 15' W	100m x 100m	NAO

SEA ICE FREE

SEA ICE FREE





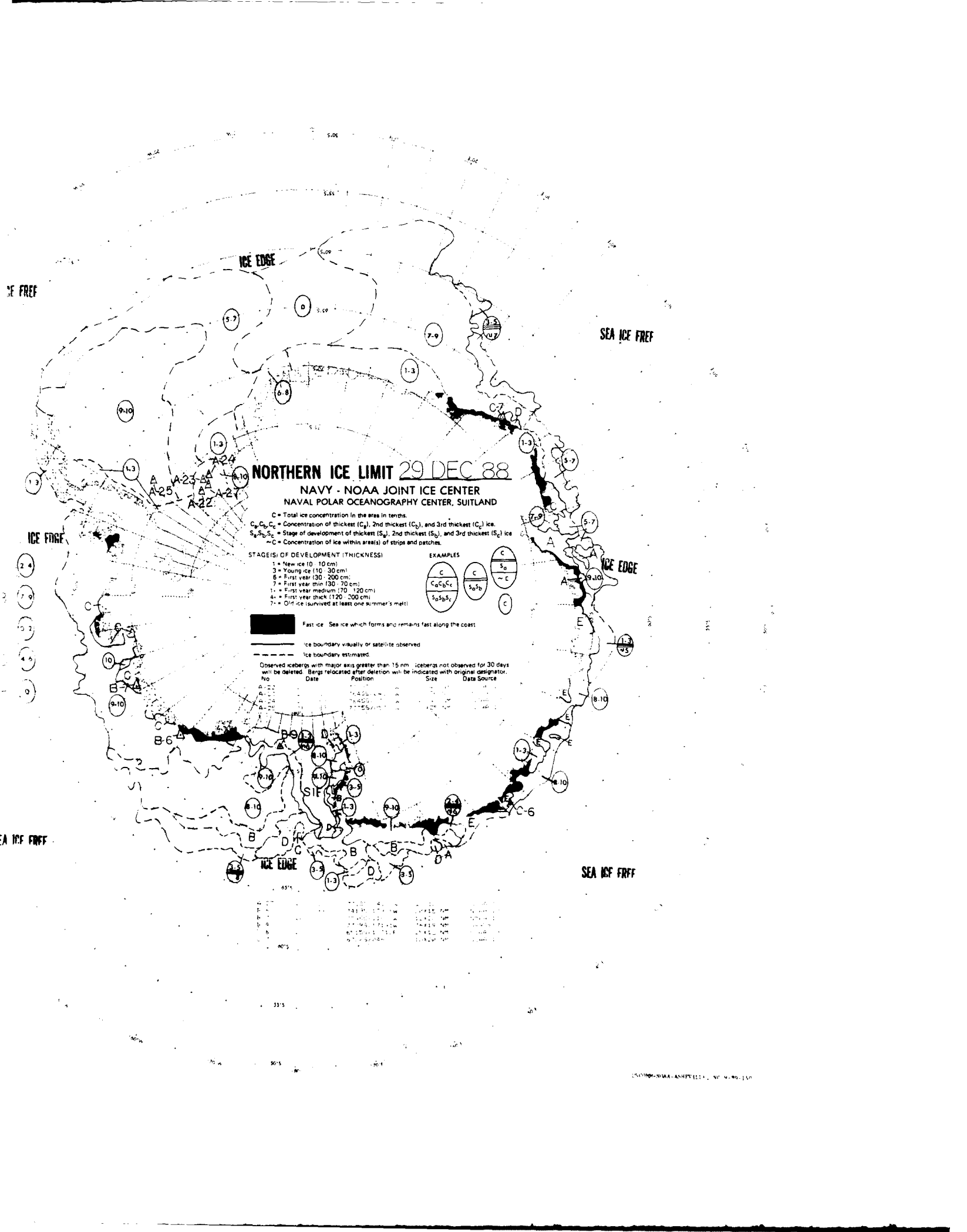


TABLE 1. SATELLITE DATA UTILIZED DURING 1978 AND 1988 (ANTARCTIC)

Time period		Satellite Remote Sensing				
From	To	Sensor Platform	Sensor Type	Spectral Region	Resolution	Coverage
1-87	3-87	NOAA-6	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.73-1.10 um		
			IR	10.5-11.5 um		
			GAC			
1-87	3-88	NOAA-9	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.73-1.10 um		
			IR	10.5-11.3 um		
			GAC			
1-87	12-88	NOAA-10	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.725-1.10 um		
			IR	10.5-11.5 um		
			GAC			
9-88	12-88	NOAA-11	AVHRR			
			HRPT/LAC			
			VIS	0.58-0.68 um	1 km	Regional
			NIR	0.725-1.10 um		
			IR	10.5-11.5 um		
			GAC			
1-78	10-87	NIMBUS-7	SMMR	0.81 cm	50 km	Global
				1.66 cm		
			VIS	0.4-1.1 um	3.7 km	Global
			IR	8.0-13.0 um	4.4 km	
			VIS	0.4-1.1 um	3.7 km	Global
			IR	10.2-12.8 um	4.4 km	
11-87	12-88	DMSP-F(8)	VIS	0.4-1.1 um	3.7 km	Global
			IR	10.2-12.8 um	4.4 km	
5-88	12-88	DMSP-F(9)	VIS	0.4-1.1 um	3.7 km	Global
			IR	10.2-12.8 um	4.4 km	
1-87	12-88	GEOSAT	Radar	Microwave	7 km	Regional
			Altimeter			

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