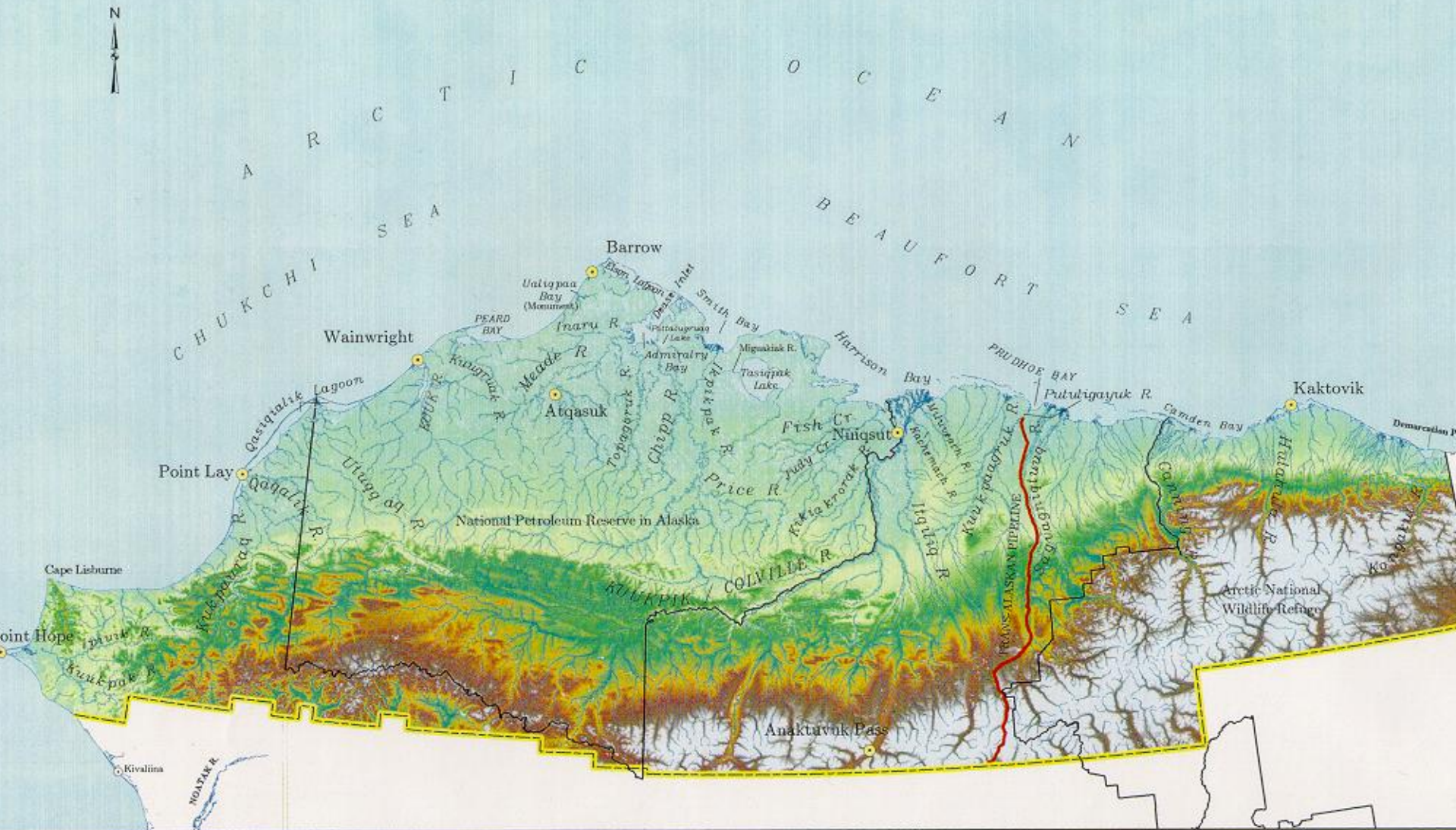


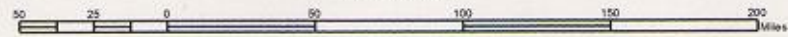
OBSERVATIONS ON CLIMATE CHANGE NEAR BARROW ALASKA: AN INUPIAT PERSPECTIVE

Eugene Brower
Barrow, Alaska
2009





SCALE 1 : 4,130,000



NSB G.I.S. 2002

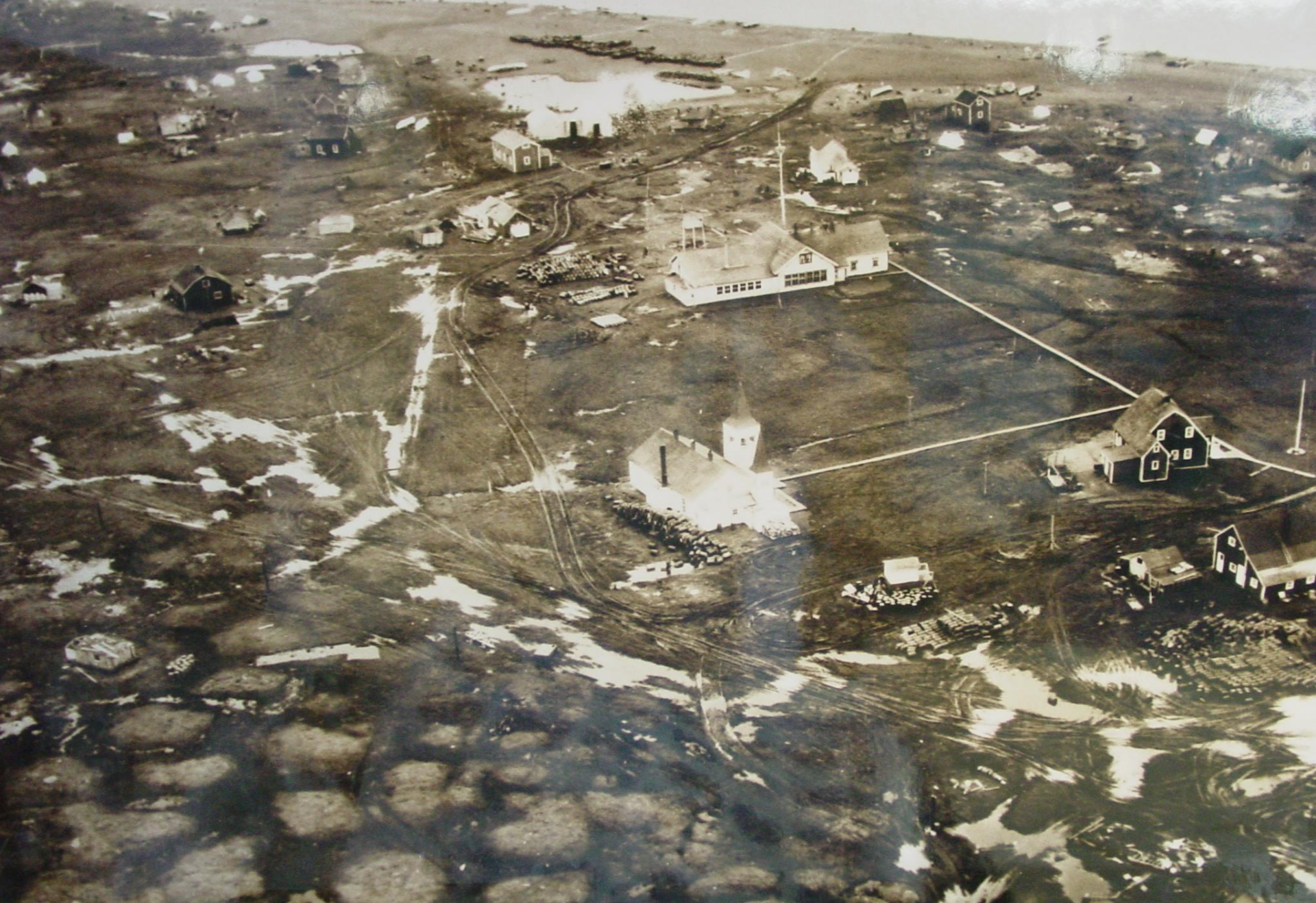


NORTH SLOPE BOROUGH



The North Slope Borough encompasses an area of approximately 90,000 square miles.

BARROW ~1930-1940





Discussion topics:

- Introduction to Inupiat Society
- Storms
- Sea ice
- Bears and Walrus
- Whaling
- Caribou
- Ice Cellars
- Invasive Species
- Offshore oil and gas
- Traditional Knowledge and science
- Adaptation & Policy

FALL STORMS





1986 Storm

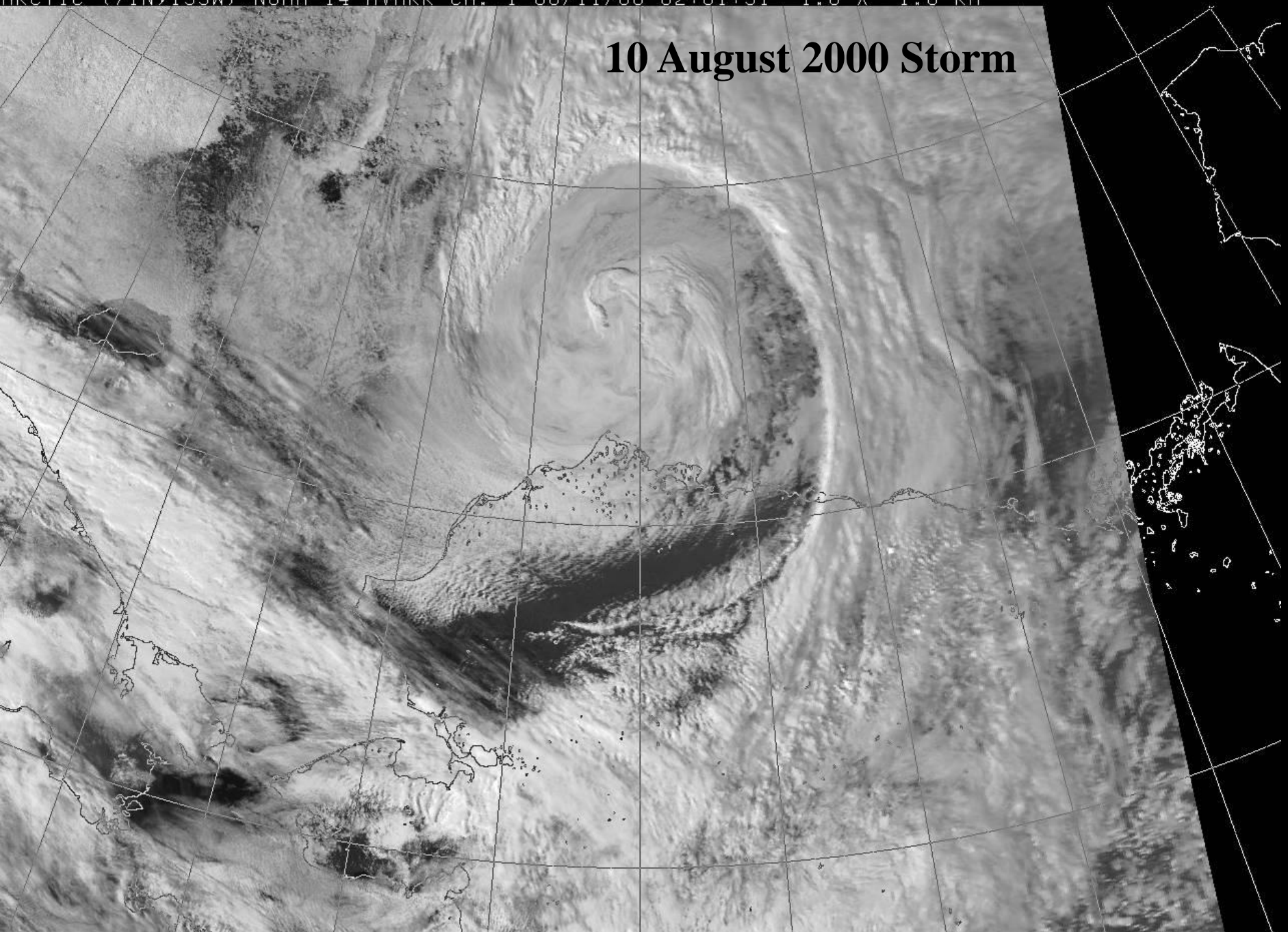


Bill Hess photo



ARCTIC (71N,155W) NOAA-14 AVHRR CH. 1 08/11/00 02:01:31 1.6 X 1.6 KM

10 August 2000 Storm





NSB Dredge 'sunk' by large
seas

July 31, 2008 Kaktovik



July 30, 2008 Wainwright

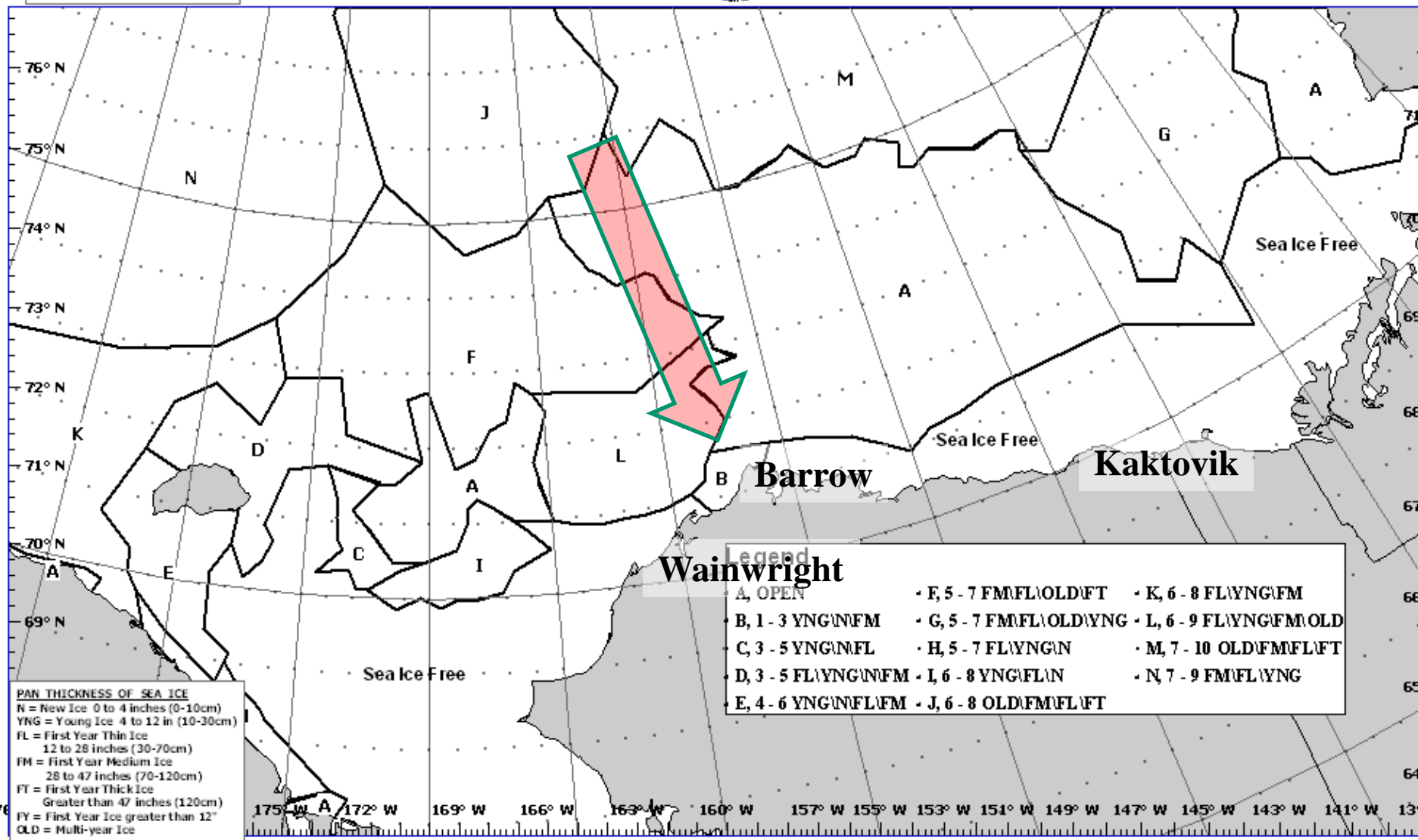


— Ice Edge
 EST = Estimated Ice Edge
 W/ = Shorefast Ice or Beach Ice
 5-7 = ice concentration in tenths
 Open Water = less than 1/10th ice concentration

ALASKA SEA ICE ANALYSIS
 NATIONAL WEATHER SERVICE
 ANCHORAGE, ALASKA



ISSUED: Friday 01 August 2008
 CONFIDENCE: Moderate



PAN THICKNESS OF SEA ICE
 N = New Ice 0 to 4 inches (0-10cm)
 YNG = Young Ice 4 to 12 in (10-30cm)
 FL = First Year Thin Ice
 12 to 28 inches (30-70cm)
 FM = First Year Medium Ice
 28 to 47 inches (70-120cm)
 FT = First Year Thick Ice
 Greater than 47 inches (120cm)
 FY = First Year Ice greater than 12"
 OLD = Multi-year Ice

Legend

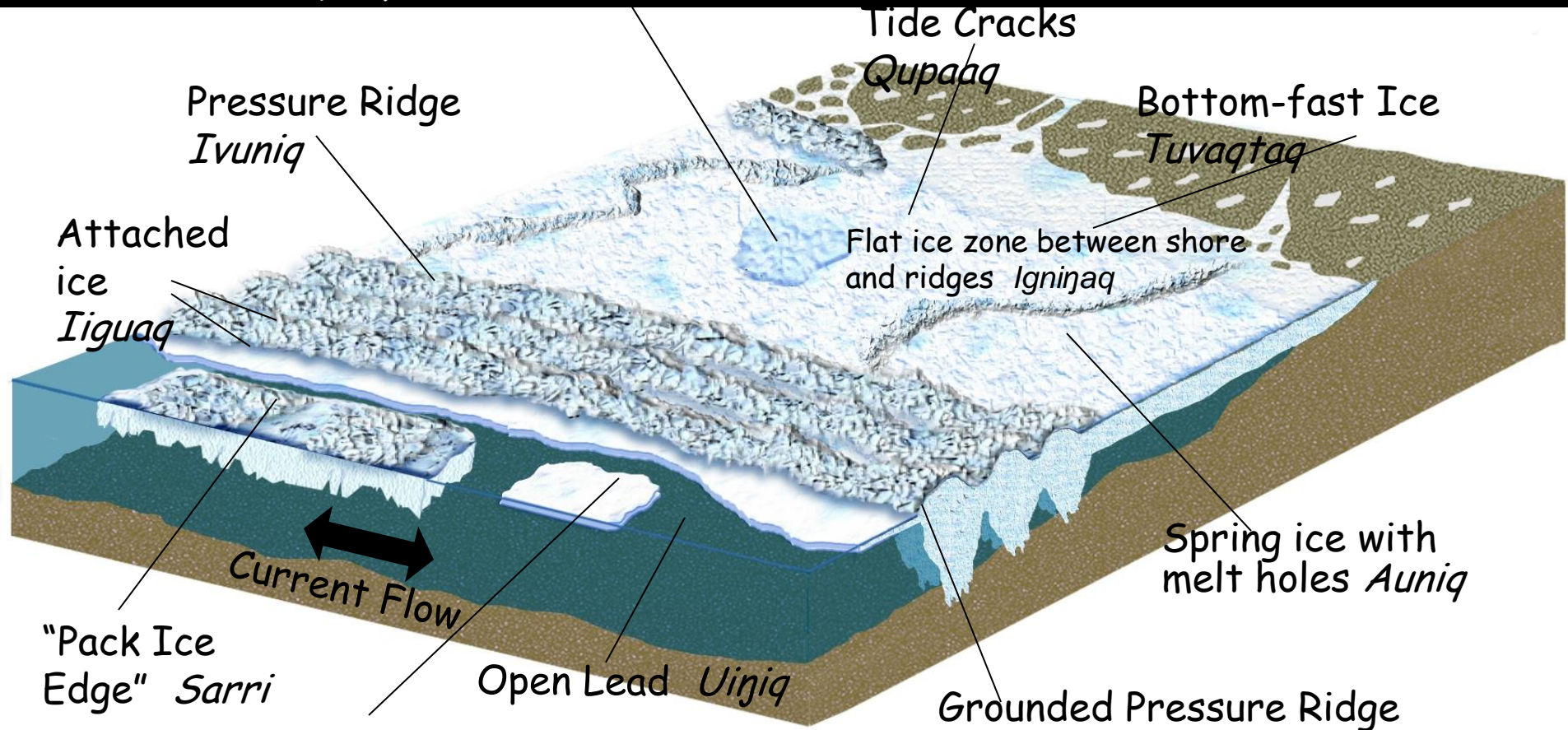
- A, OPEN
- B, 1-3 YNG\NFM
- C, 3-5 YNG\NFL
- D, 3-5 FL\YNG\NFM
- E, 4-6 YNG\NFL\FM
- F, 5-7 FM\FL\OLD\FT
- G, 5-7 FM\FL\OLD\YNG
- H, 5-7 FL\YNG\N
- I, 6-8 YNG\FL\N
- J, 6-8 OLD\FM\FL\FT
- K, 6-8 FL\YNG\FM
- L, 6-9 FL\YNG\FM\OLD
- M, 7-10 OLD\FM\FL\FT
- N, 7-9 FM\FL\YNG

Sea ice

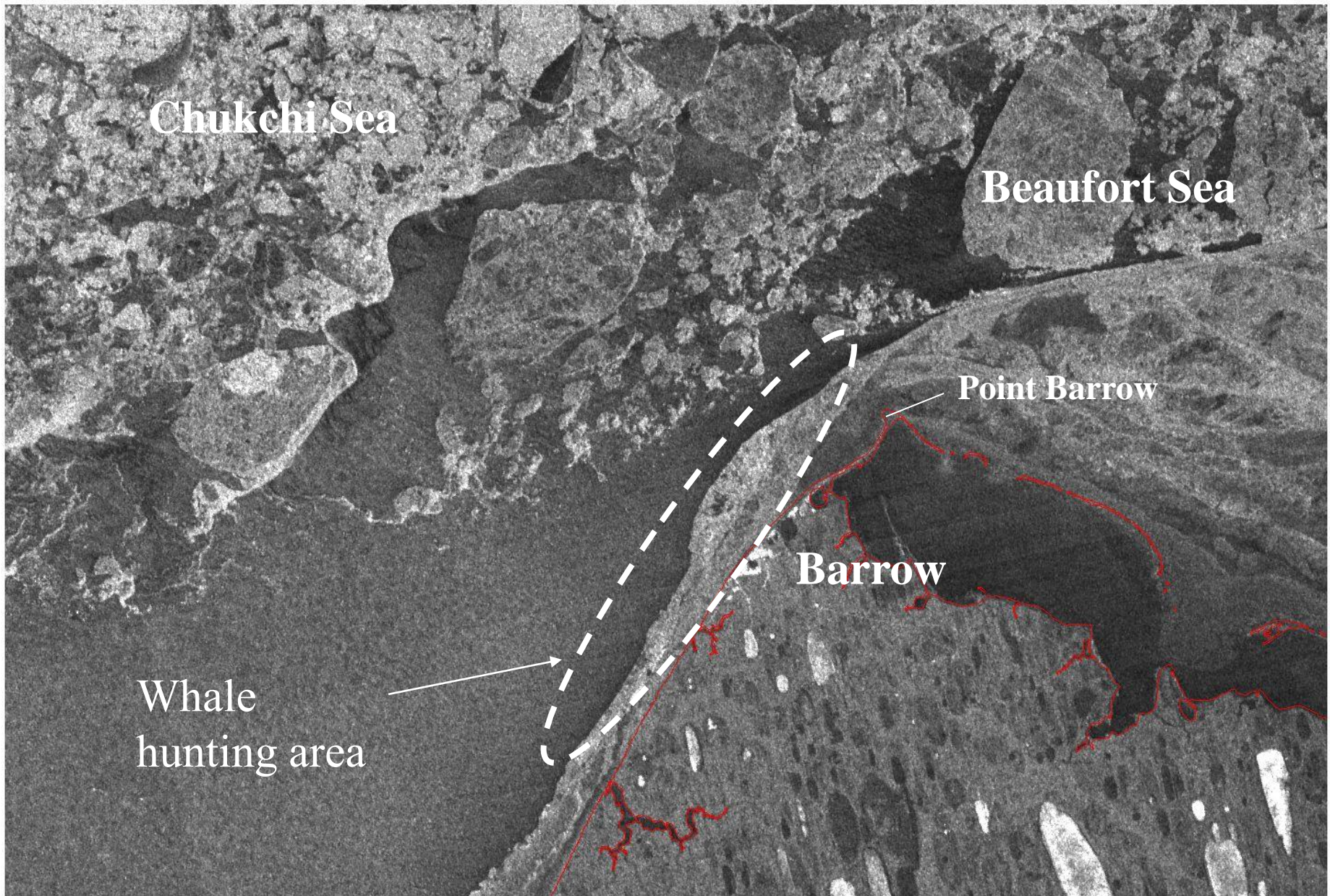


Shorefast ice or *Tuvaq*

Salt-free Multiyear sea ice
Piqaluyak



Young Ice
sikuliaq



RADARSAT (Scene ID: R1_28492_SWB_181)
20 April 2001, 03:59:28 (GMT)
Georeferenced to UTM Zone 4 Coast line shown in red
RADARSAT ScanSAR © Canadian Space Agency (2000)





*Pikaluyak or
multi-year ice*

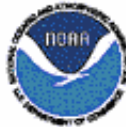
Ivu



"Frozen family"

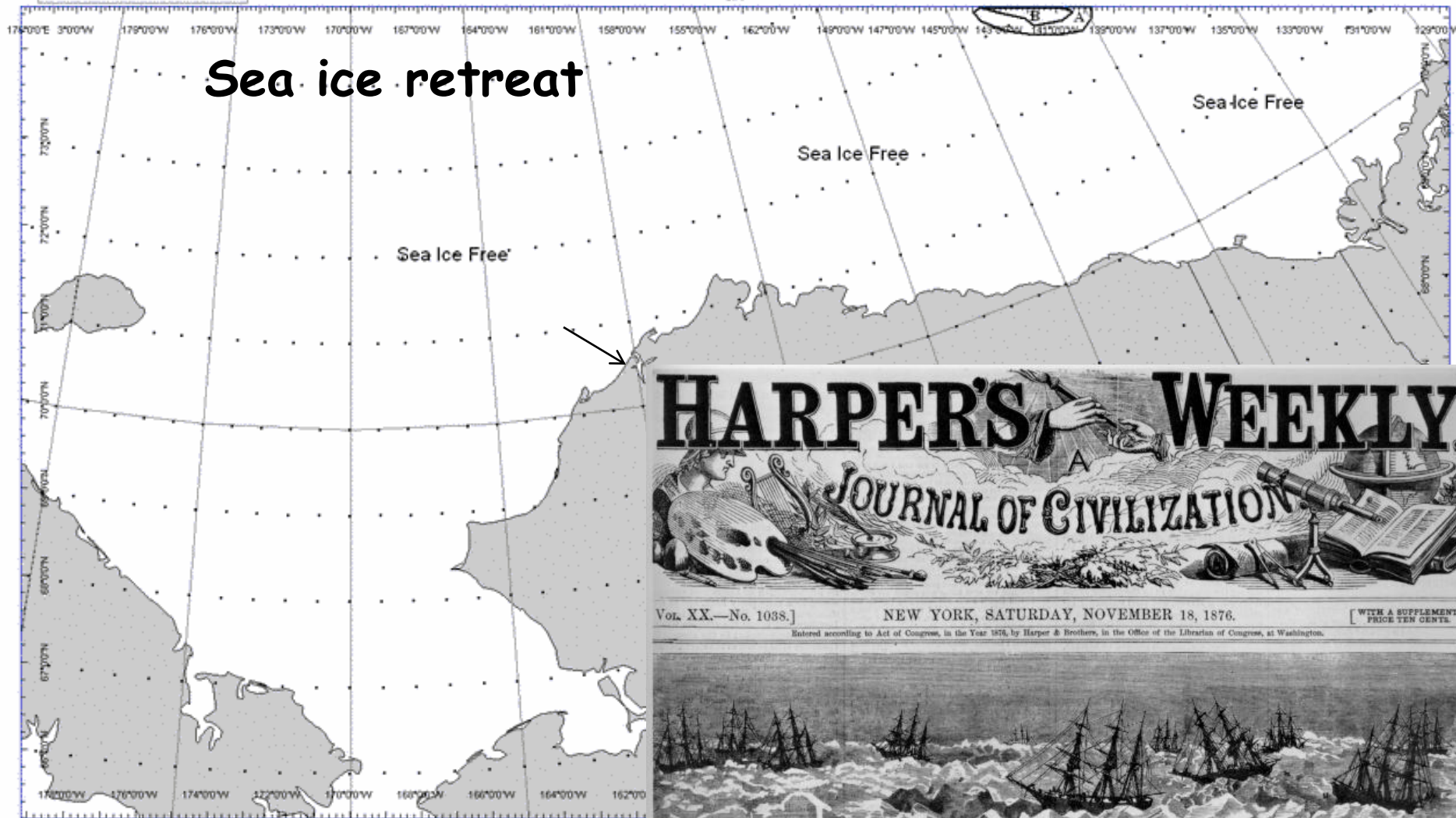
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**ALASKA SEA ICE ANALYSIS
 NATIONAL WEATHER SERVICE
 ANCHORAGE, ALASKA**



**ISSUED: Monday 24 September 2007
 CONFIDENCE: Moderate**

Sea ice retreat



Vol. XX.—No. 1038.]

NEW YORK, SATURDAY, NOVEMBER 18, 1876.

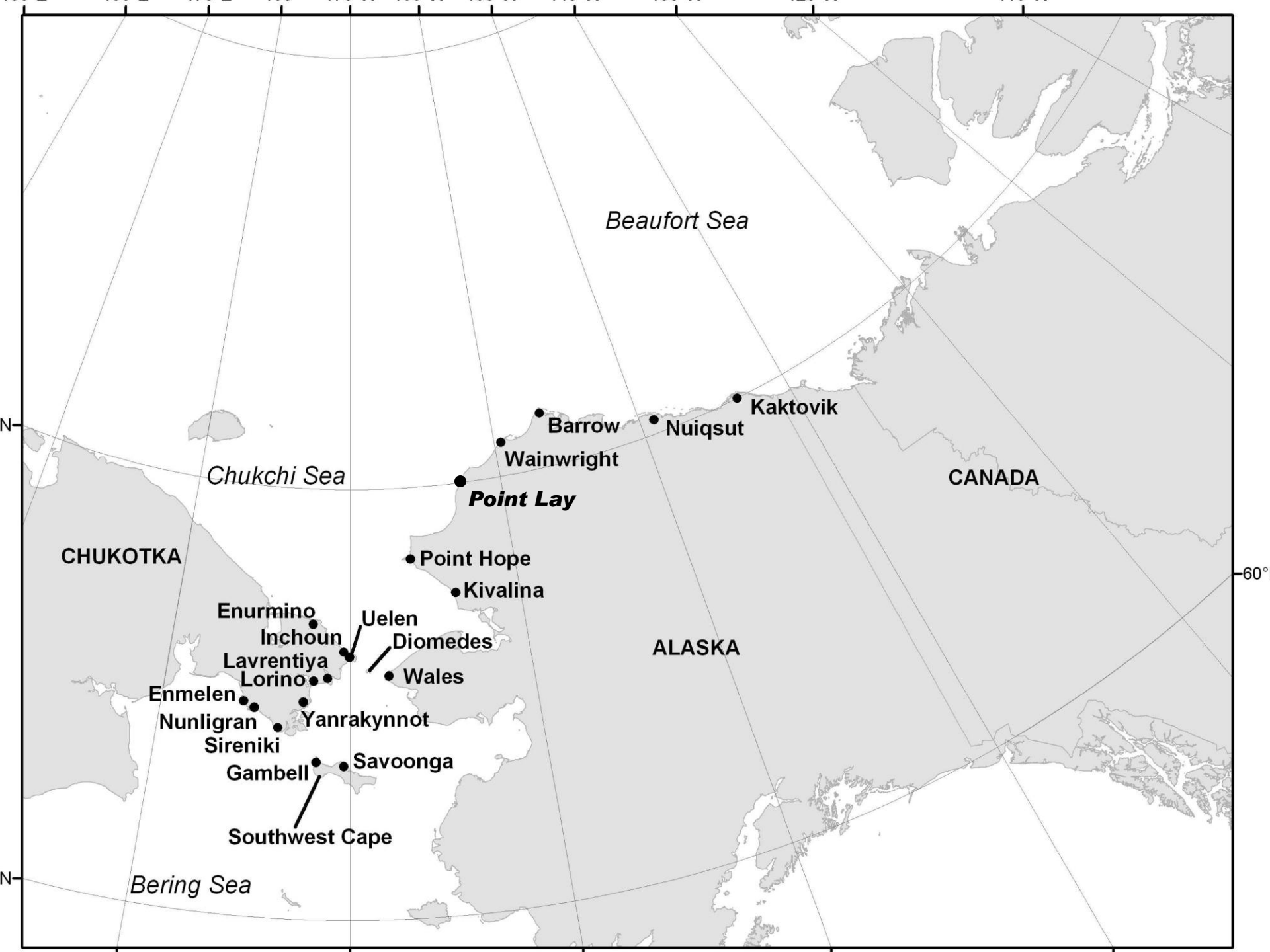
[WITH A SUPPLEMENT.
 PRICE TEN CENTS.

Entered according to Act of Congress, in the Year 1876, by Harper & Brothers, in the Office of the Librarian of Congress, at Washington.



WHALING



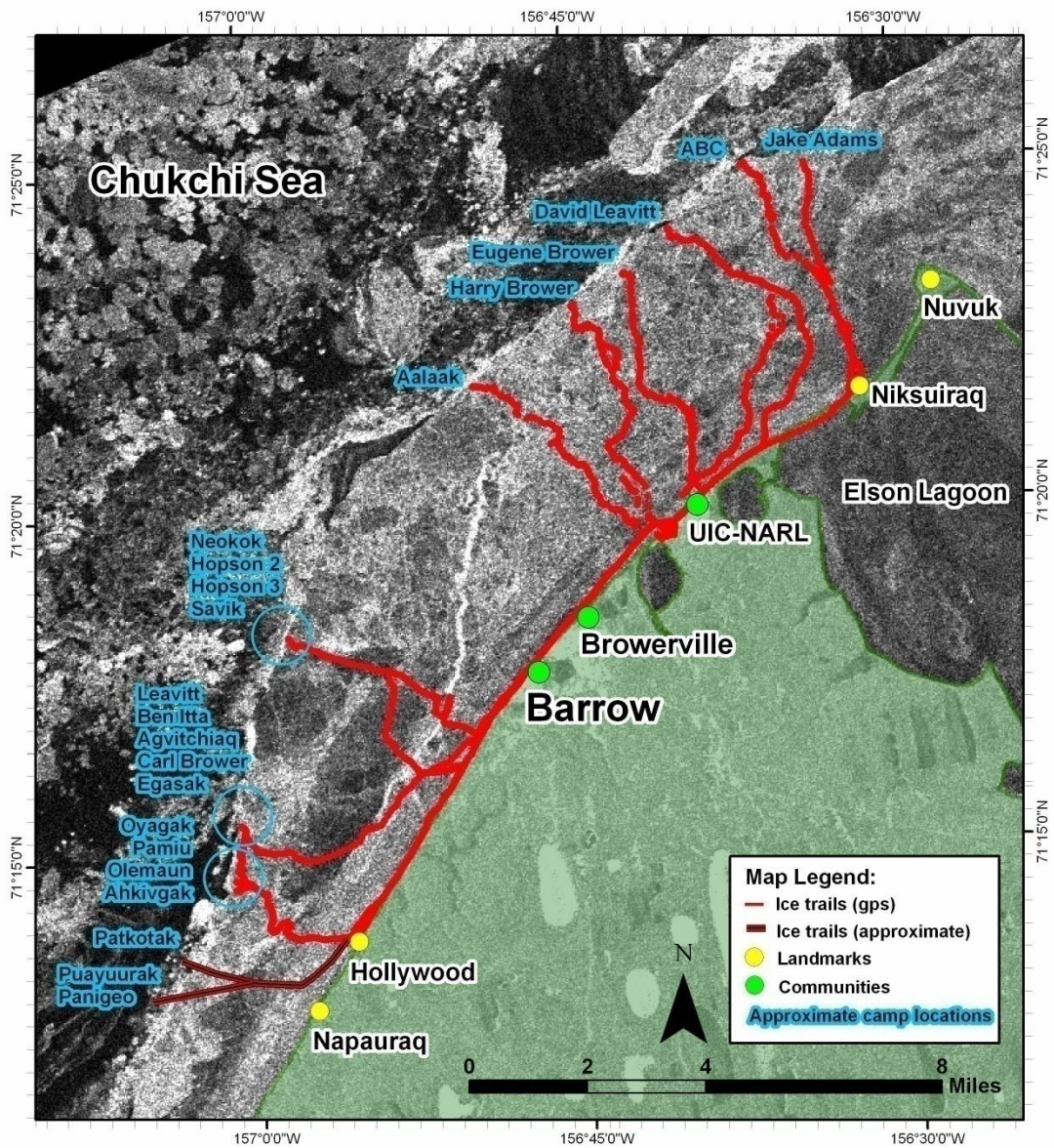






Spring 2007 Ice Trails - Barrow, Alaska

Produced by M.L. Druckenmiller (Univ. of Alaska Fairbanks) and J.C. George (NSB Dept. of Wildlife Management)



Satellite image date: April 21, 2007

Provided By: C.E. Tweedie, A.G. Gaylord, P.J. Webber, 2003. Barrow Area Information Database - Internet Map Server (BAID-IMS). El Paso, Texas USA: Digital Media. <http://www.baidims.org>
SAR data are made available to BAID-IMS through an agreement with the Alaska Satellite Facility and the European Space Agency. ERS-2 @ European Space Agency.







Photo: Bill Hess











Whaling Footage



Photo: Galen Rowell













1907RU







Bill Hess

WILDLIFE



New Records: red salmon, humpback whales, Hawk's, etc.



Swainson's hawk



Ivik or Walrus





Near Point Lay - 2007





Polar Bears





"swimmer"

Photo: T. Olemaun





The 2002 "situation"

Photo: Howie Garber

Caribou





Brian Person



Ice cellar failure





Offshore Oil and Gas





Exxon Valdez

Science and Traditional Knowledge









Kivgiq 2001

Kotzebue











Bowhead whales are
increasing!



Arctic Tourism and Shipping



Oil Exploration Vessels



Final Thoughts



Quyanakpuk!

