



# CanICE Project

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BREA Results Forum  
Inuvik, NWT  
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UNIVERSITÉ  
**LAV**AL

**RYERSON UNIVERSITY**



# Background

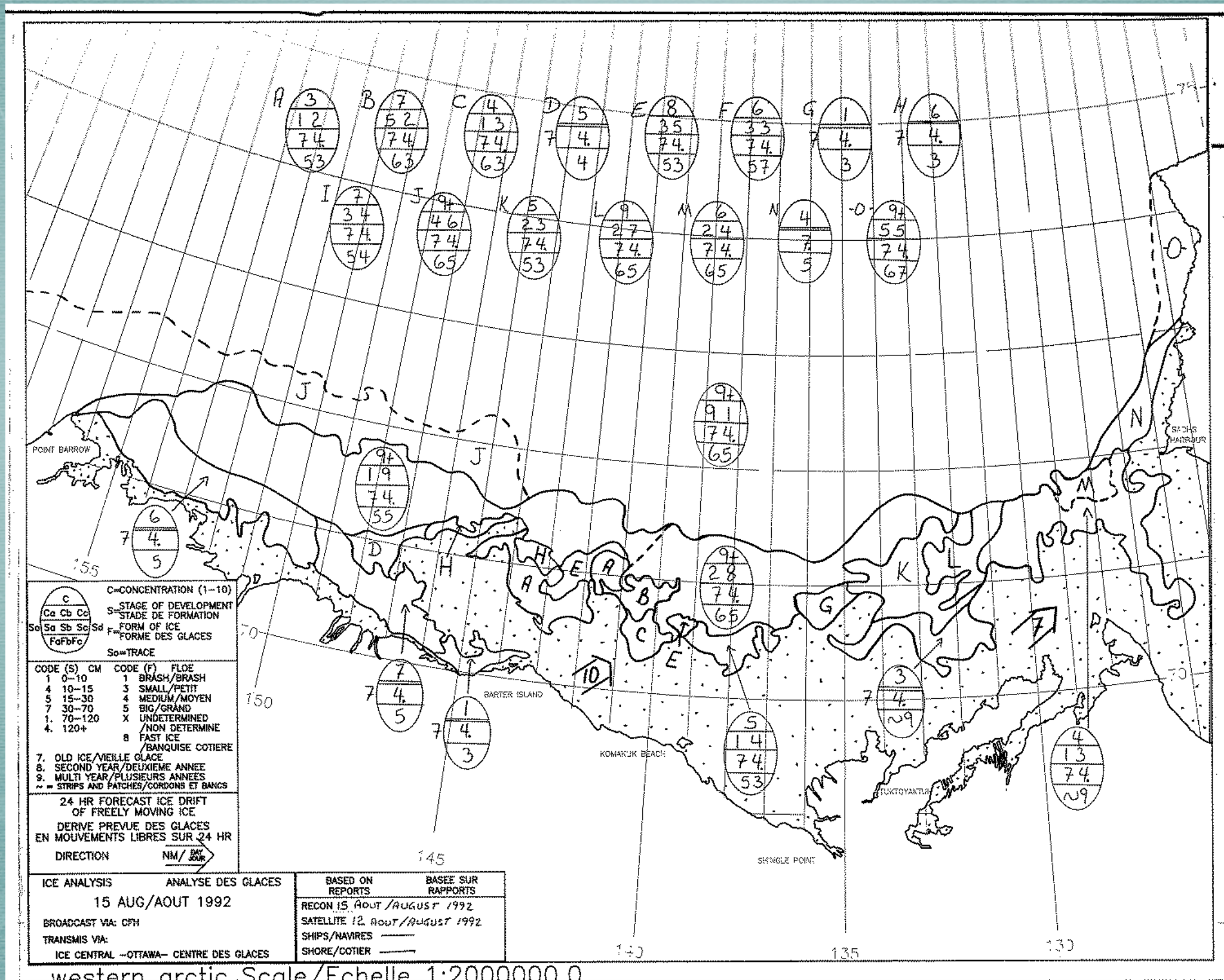
Canadian Ice Service has **over four decades** of ice information in its archive...

- ▶ Weekly sea ice charts
- ▶ Ship and airplane observations
- ▶ Satellite imagery
- ▶ Sea ice analysis
- ▶ Photos
- ▶ Daily sea ice charts - high resolution
- ▶ Lake ice data
- ▶ Information on ice ridging, ice floes, icebergs over the years

**...but a lot of it is not readily available!**

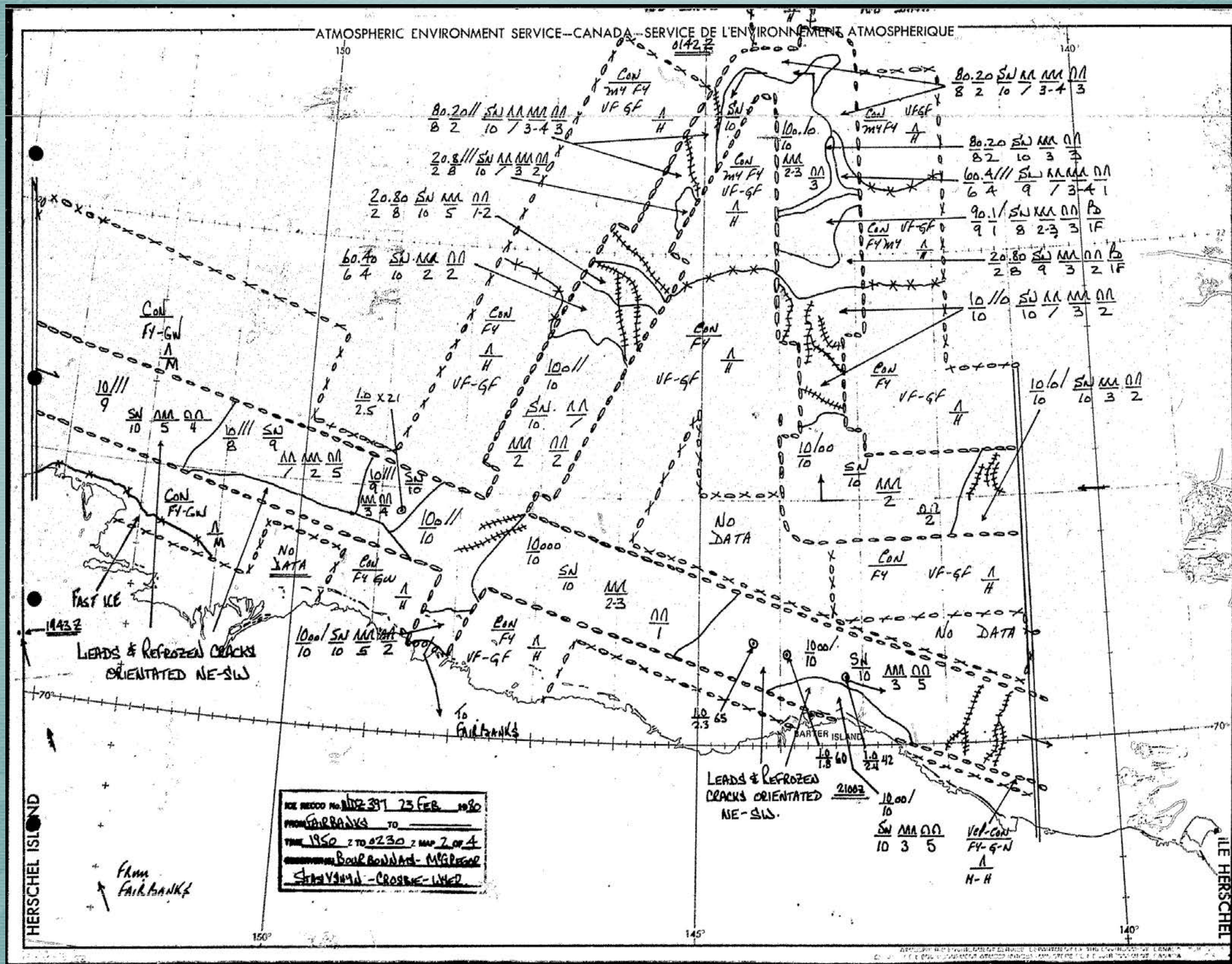


# Historical Ice Charts



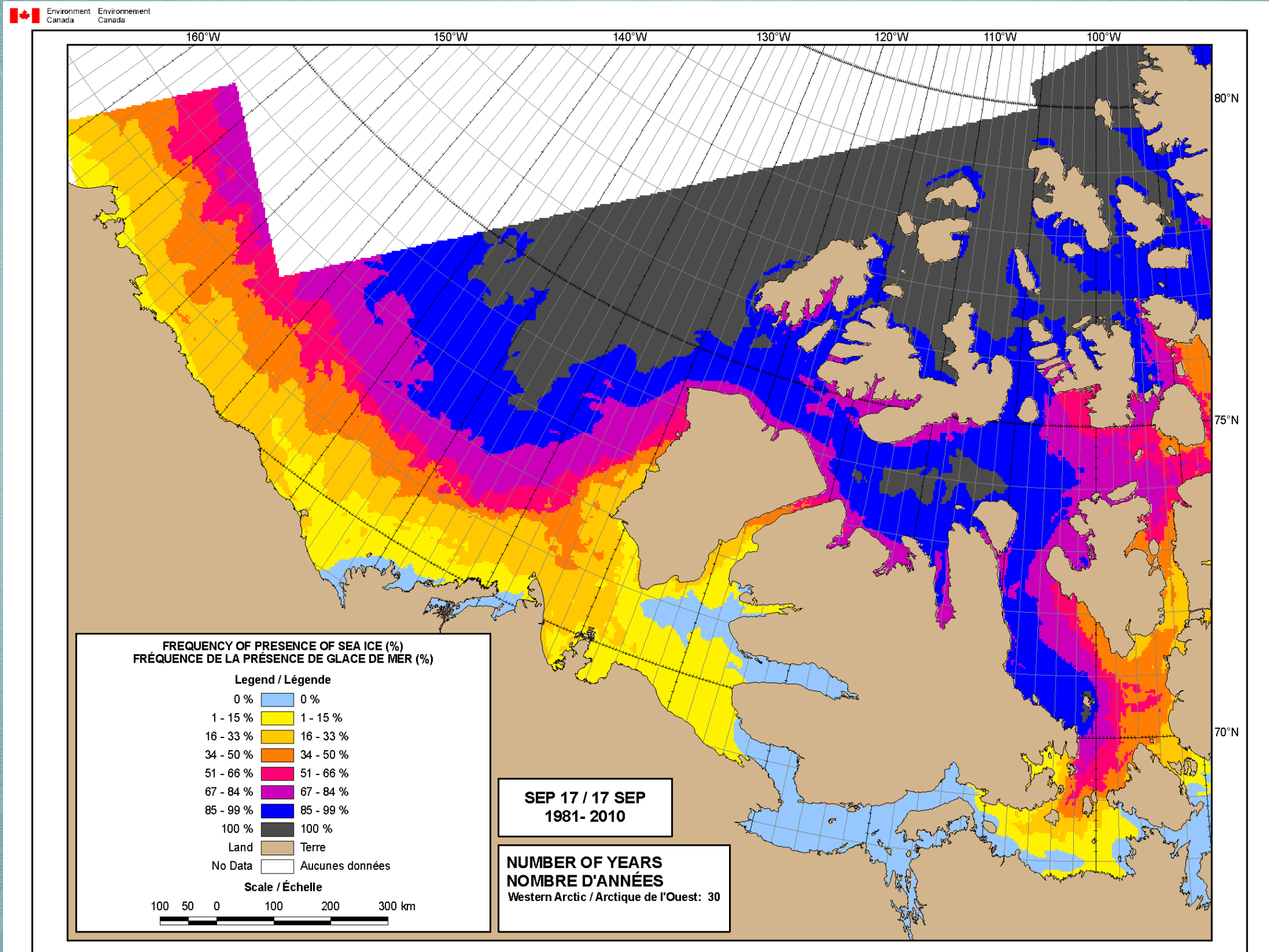


# Ice Ridges - 1980!



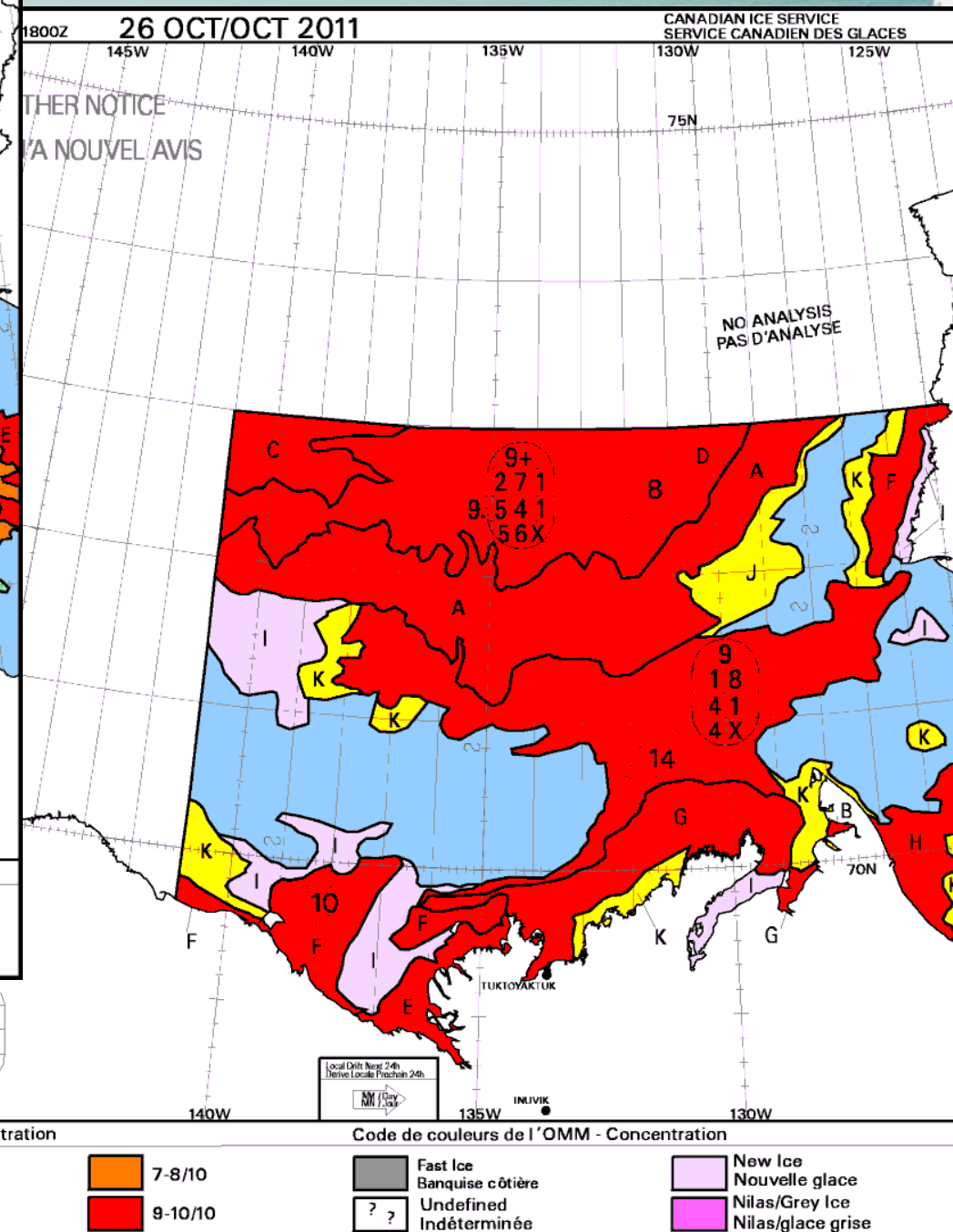
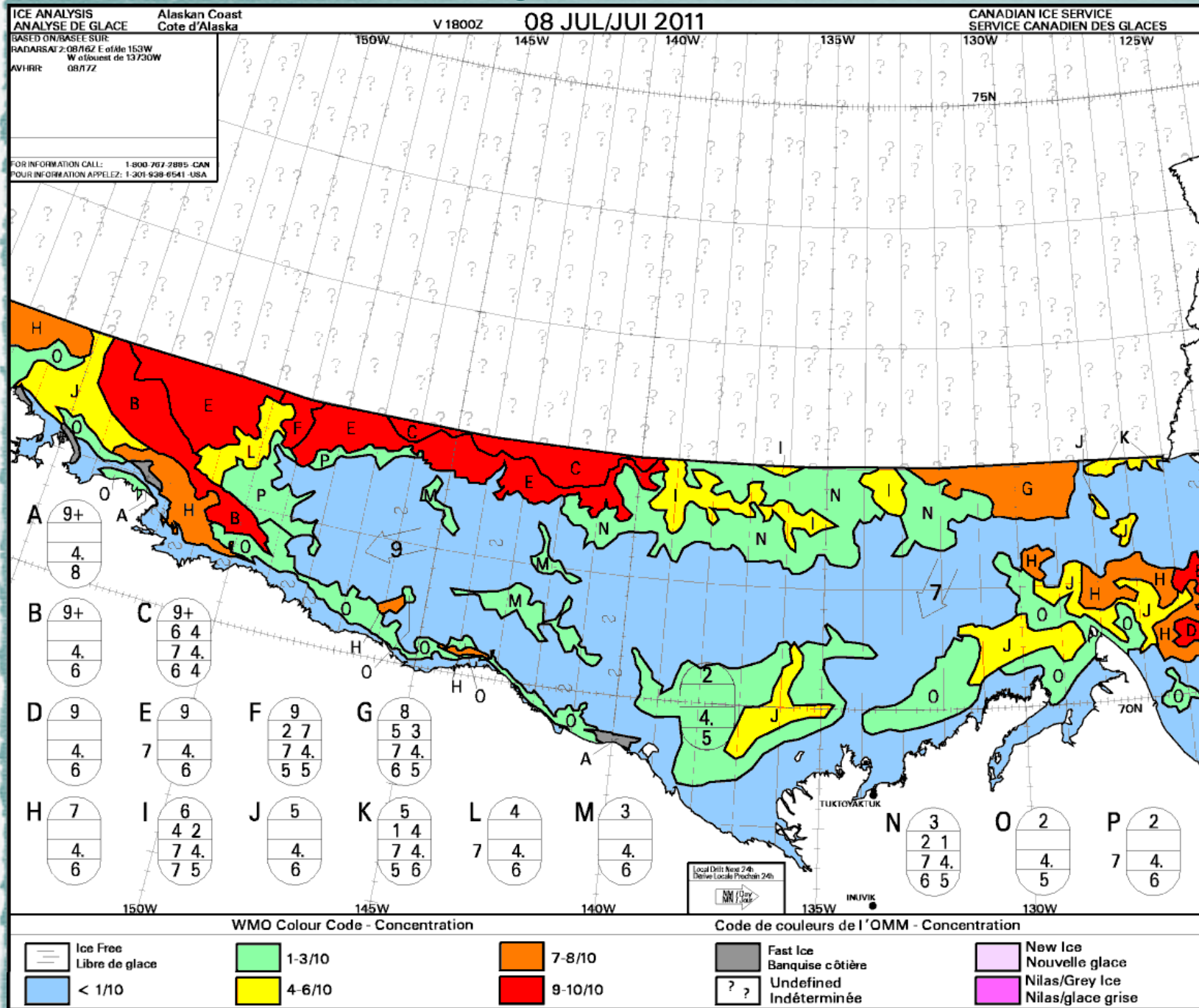


# Sea Ice Averages



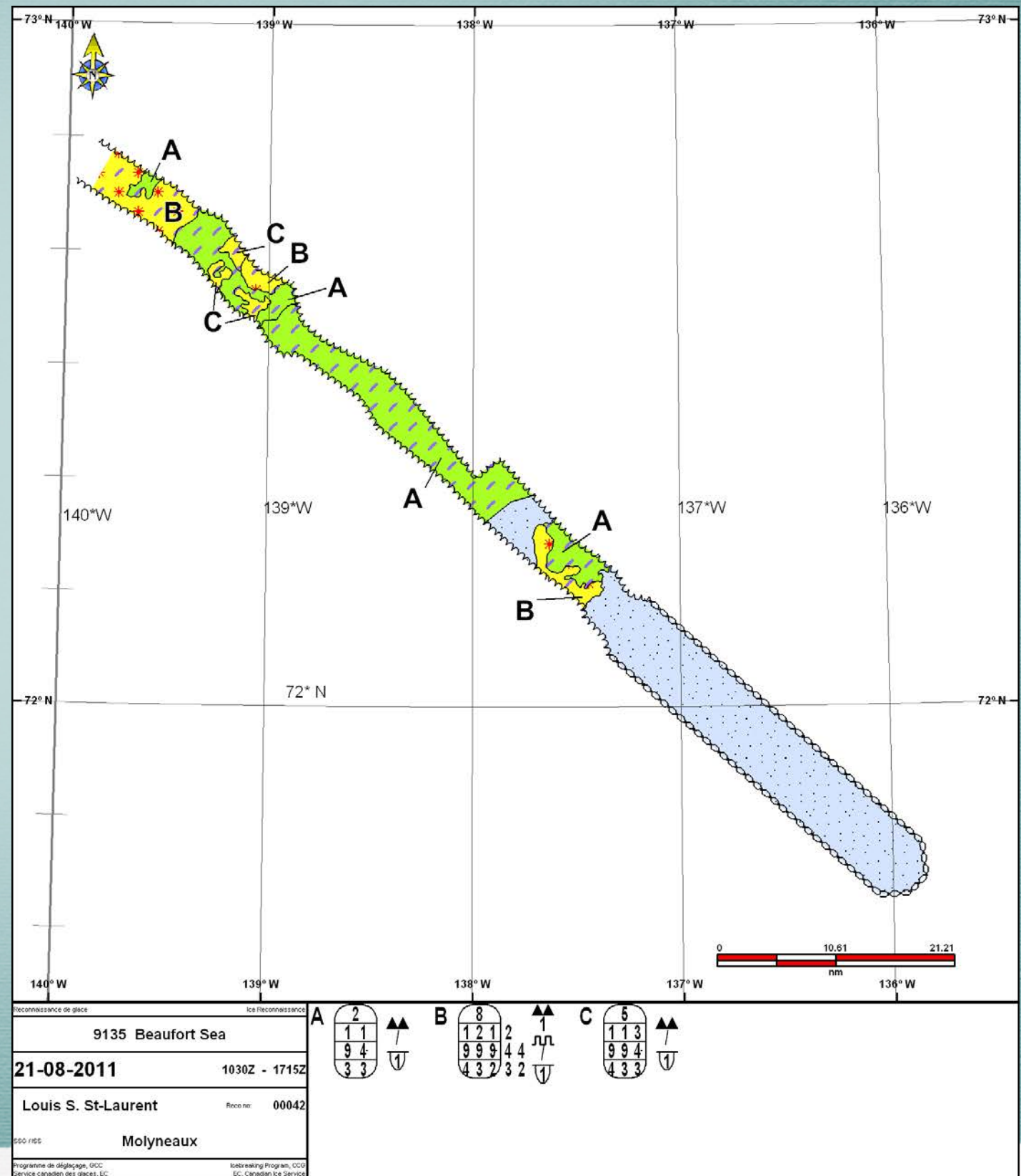
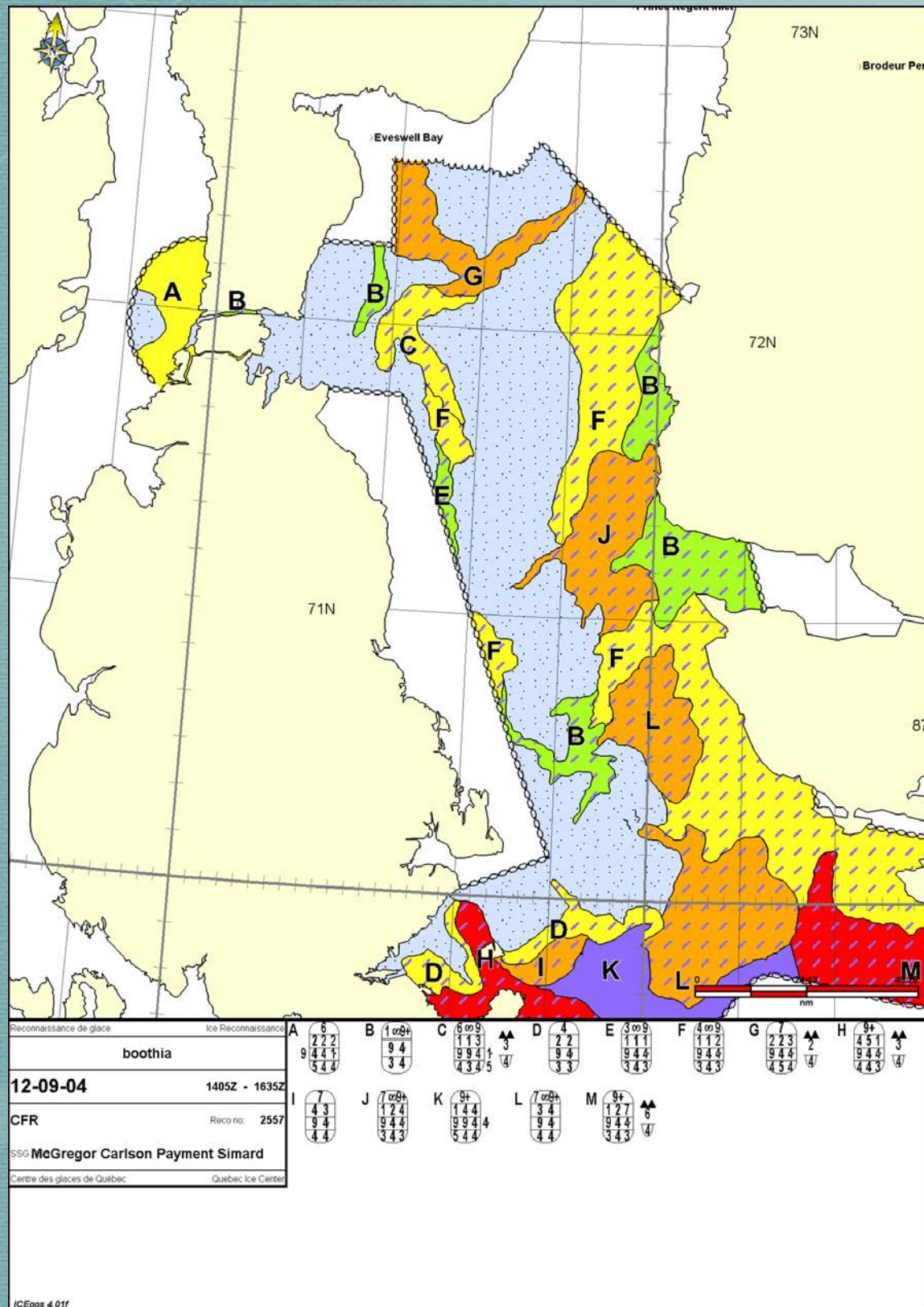


# Daily Sea Ice Charts



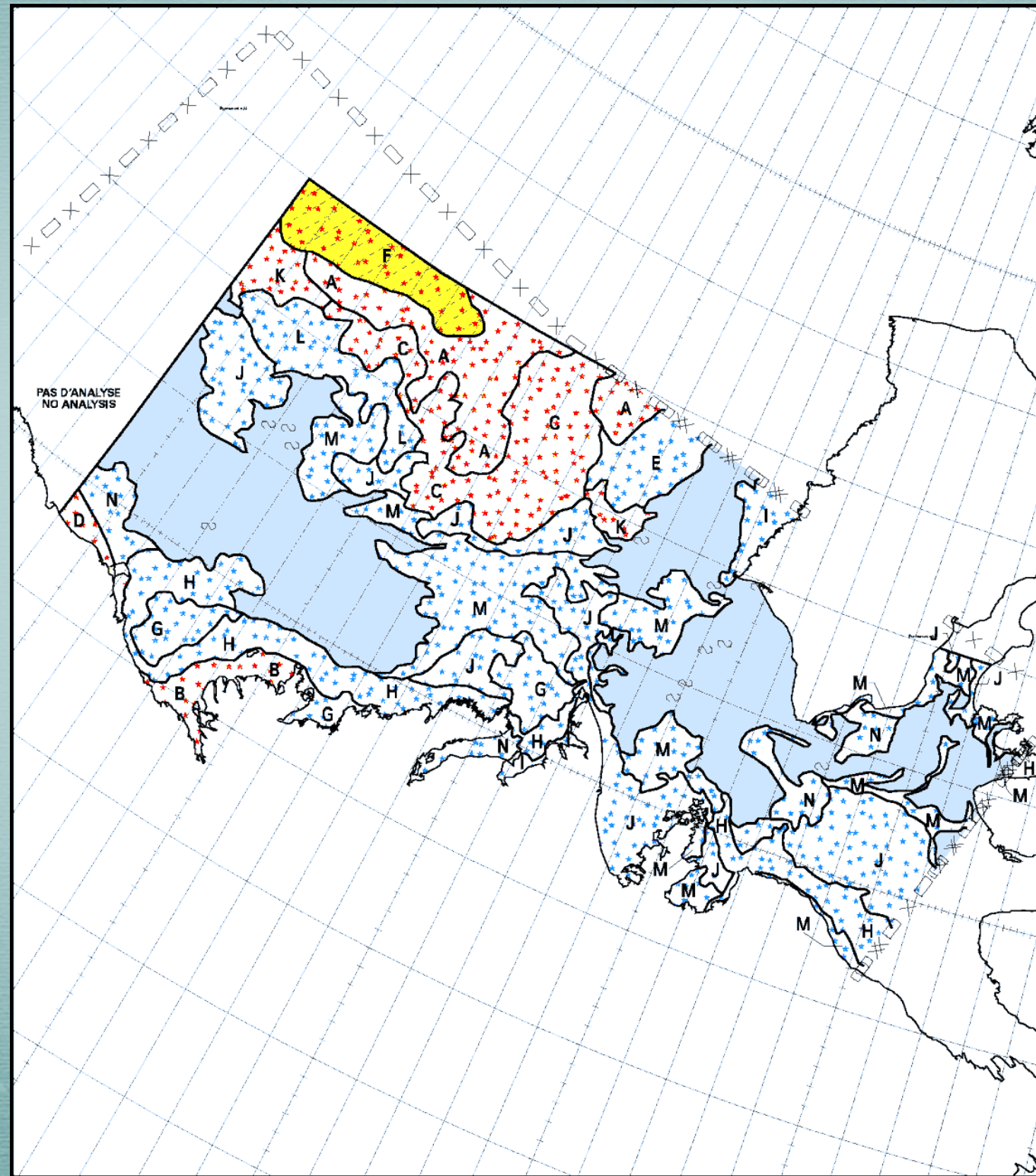


# Aircraft & Ship Charts





# Satellite Analysis



RADARSAT2  
V 1505 Z  
25 OCT/OCT 2011

A	B	C	D	E	F	G	H
9+	9+	9+	9+	9+	9+	9+	9
8 2	7 3	6 4	5 5	4 6	4 2 4	2 8	
9. 4 1	4 1	9. 4 1	4 1	4 1	9. 5 4 1	4 1	1
3 X	3 X	3 X	3 X	3 X	6 5 4	3 X	X



# CanICE

- ▶ Sea ice is changing in the Beaufort region, affecting people's lives
- ▶ Development, shipping, and tourism activities are becoming more common
- ▶ CanICE project aims to **get all the CIS sea ice information from the Beaufort Sea online** for:
  - ▶ Northern organizations
  - ▶ Northern residents
  - ▶ Industry
  - ▶ Regulators
  - ▶ Researchers, forecasters, modellers
  - ▶ Public



# CanICE

## CanICE project tasks

- ▶ **Build a database** at CIS to hold the sea ice data and information
- ▶ **Develop a web portal** (in the Polar Data Catalogue) to share the old and new data with the world
- ▶ **Create online tools** for analyzing and displaying the data and information

**...so that the old and new data may find new uses**





# Members



- ▶ **Canadian Ice Service**, Environment Canada - Leah Braithwaite, PI, Darlene Langlois, Dan Fequet, Richard Chagnon, Ziquang Ou
- ▶ **University of Waterloo**, Canadian Cryospheric Information Network/Polar Data Catalogue - Ellsworth LeDrew, Julie Friddell, Kumari Gurusamy, David Friddell, Frank Lauritzen
- ▶ **Université Laval**, Research Centre on Geomatics - Yvan Bédard, Sonia Rivest, Michelle Fortin, Elodie Djogbénuvè-Akpé, Eve Grenier
- ▶ **Ryerson University**, Geomatics Engineering - Songnian Li, Xintao Liu

...plus numerous other technical staff and students



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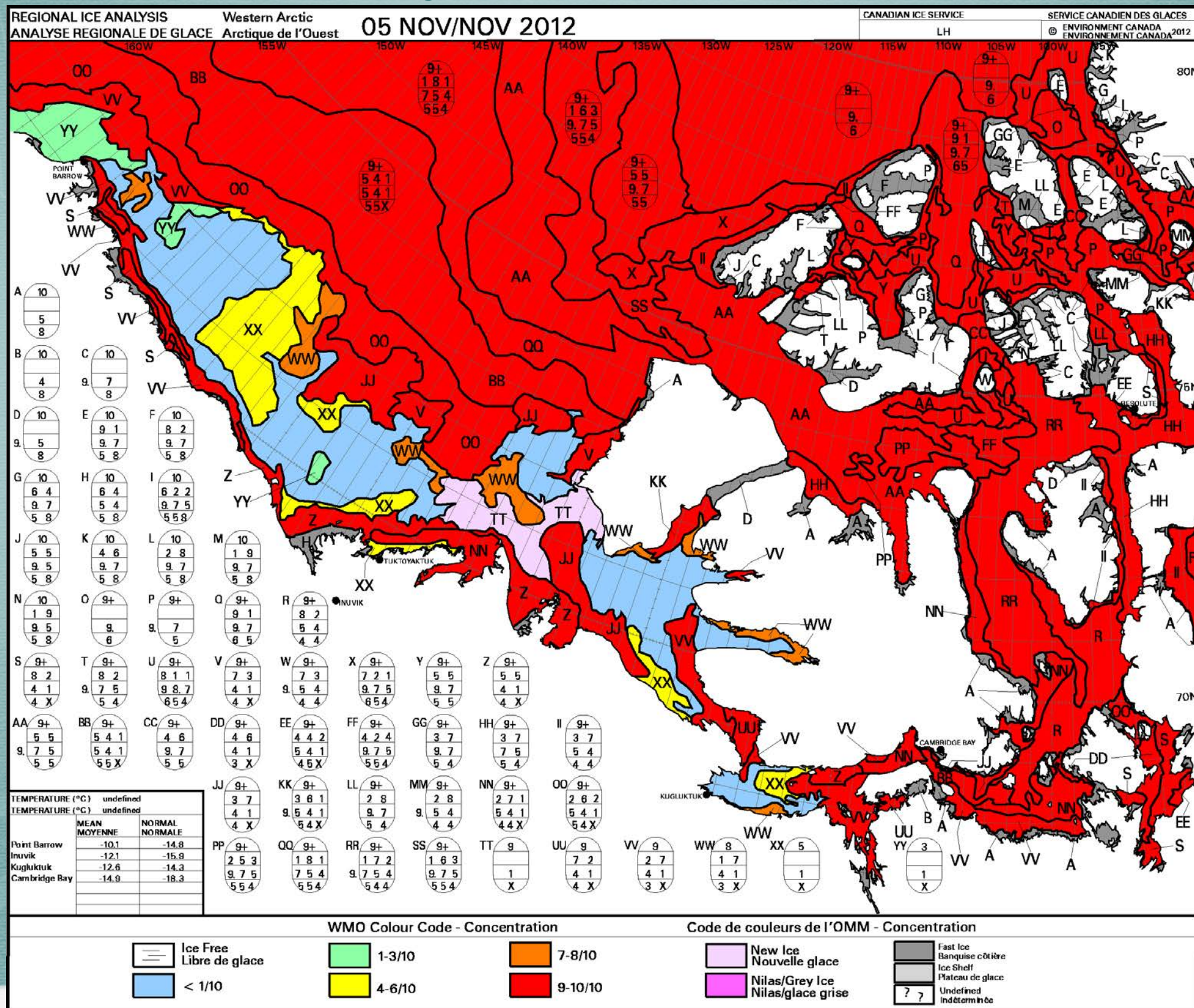
# Progress

## Canadian Ice Service

- ▶ New BREA sea ice database (for storing sea ice data and information) has been built
- ▶ Over 200,000 old paper and microfilm ice charts have been scanned and stored as pictures (jpeg format)
- ▶ As new scanned digital charts are made into maps (geo-referenced), they are added to the CIS database
- ▶ New CIS sea ice chart production system (for the entire Canadian Arctic) will be compatible with the BREA database



# Weekly Ice Charts





# Progress

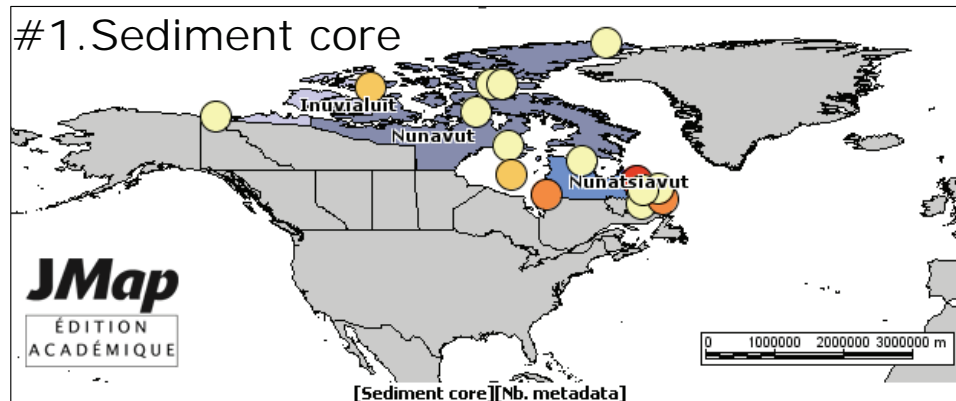
- ▶ **Laval** is developing web tools (SOLAP datacubes) for complex analysis of (1) the CanICE data and maps, (2) PDC metadata, (3) web traffic, and (4) CIS egg codes, using sample data from CIS and UWaterloo
- ▶ **Ryerson** has been making map (GIS) tools to display, analyze, and download the sea ice data and maps
- ▶ **CIS** and **UWaterloo** are setting up the connection from the CIS database to the Polar Data Catalogue
- ▶ **UWaterloo** is building a new server (computer) to host all the different web and map tools



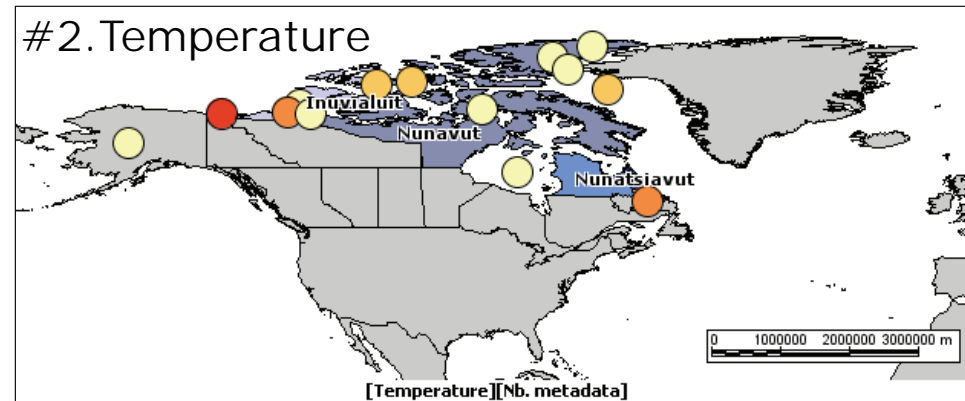
# PDC Metadata Tool

What are the 5 most commonly used keywords?

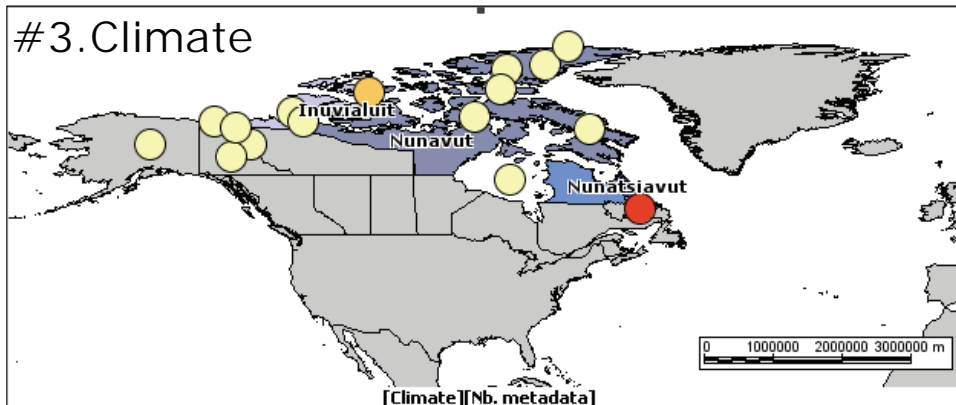
#1. Sediment core



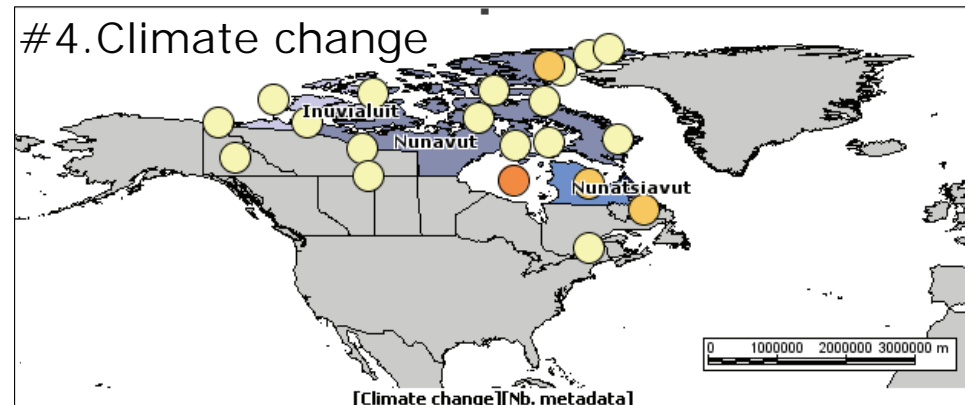
#2. Temperature



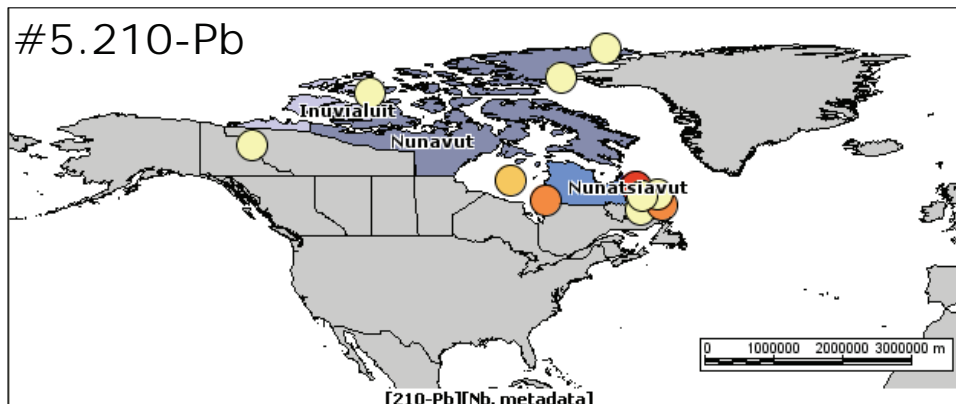
#3. Climate



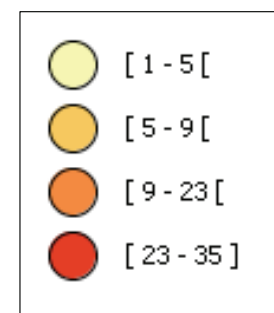
#4. Climate change



#5. 210-Pb



Number of metadata





# Next Steps

- ▶ Continue putting data into CIS database
- ▶ Connect with other sea ice projects in BREa
- ▶ Incorporate web and map tools into the Polar Data Catalogue
- ▶ Meet with stakeholders to receive feedback on the new web and map tools
  - ▶ What do people want?
    - ▶ Animations (movies) of the sea ice data?
    - ▶ Real-time maps/charts for the entire Beaufort?
    - ▶ Maps of changes in sea ice over the years?



# Thank you!

*Beaufort Sea*

Please contact me with  
questions or ideas!

Julie Friddell

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50 km

Image credit: <http://earthobservatory.nasa.gov/>