



Environment
Canada

Environnement
Canada

Canada



Arctic Science – Can we make it work for Northerners?



STAR WORKSHOP - Winnipeg

Yvonne Bilan-Wallace

Warning Preparedness Meteorologist

**Environment Canada, Meteorological
Services**

Yvonne.Bilan-Wallace@ec.gc.ca

June 14-15, 2010

Presentation Overview:

1. Northern weather program? I want you to get to know MSC!
2. MSC organizational priorities ...”signature projects”
3. Some of the things I have learned...
4. Collaboration?... from science to service. How can we collaborate more effectively?



Page 2 – March



Environment
Canada

Environnement
Canada

Part 1: MSC Weather Program



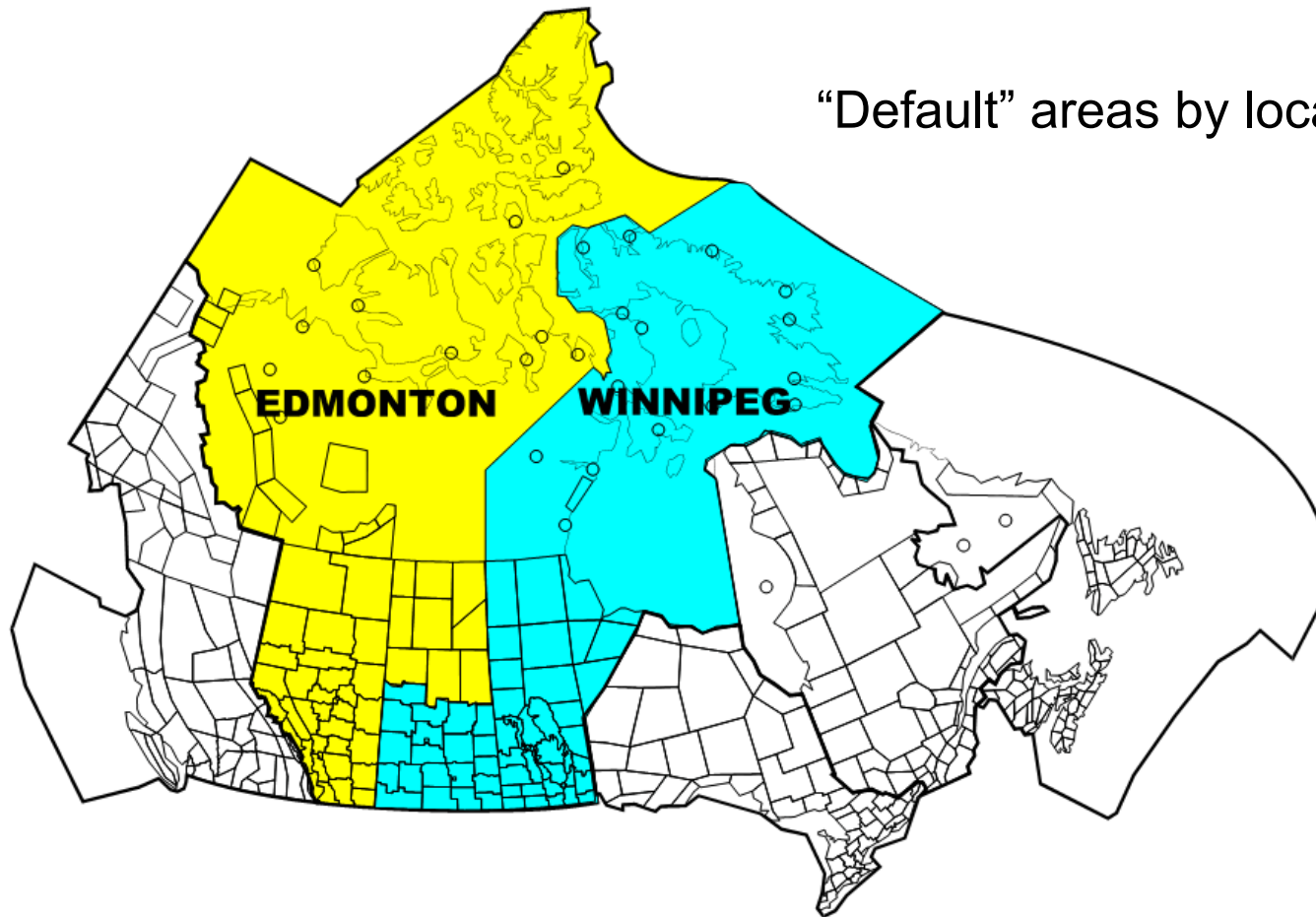
Arctic Weather & Ice

"We have always had extreme weather, what is extreme now is there is no predictability.

Rosemarie Kuptana (Sachs Harbour)



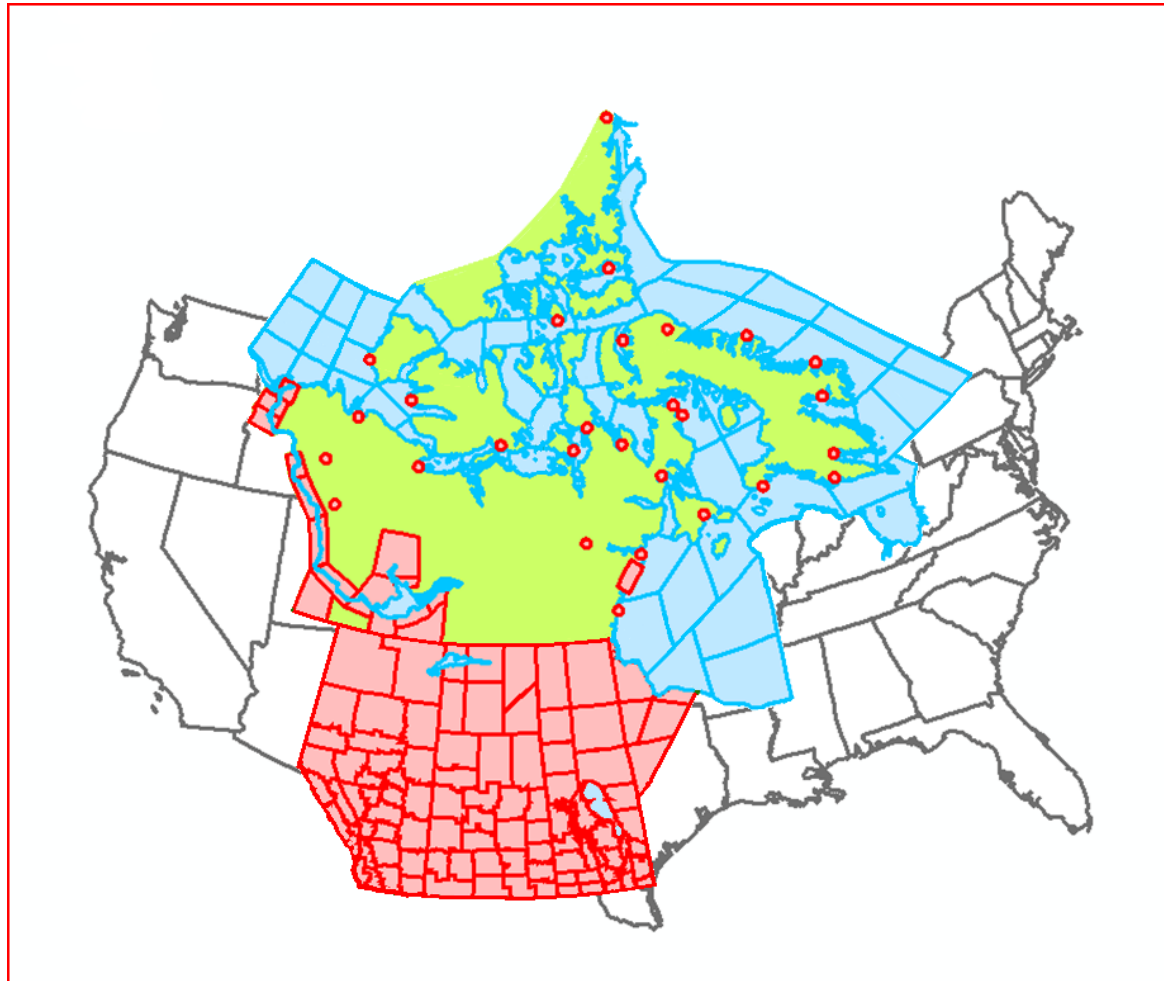
Our Work – Area of Responsibility



“Default” areas by location



Amazing but true..



Page 5 – March 14, 2011



Environment
Canada

Environnement
Canada

Canada

Prairie and Arctic Storm Prediction Centre(s) – Edmonton and Winnipeg



Public forecast
regions (NU & NT)

Warnings

Seasonal marine
forecasts

monitoring 24/7

... Yukon (Vancouver)

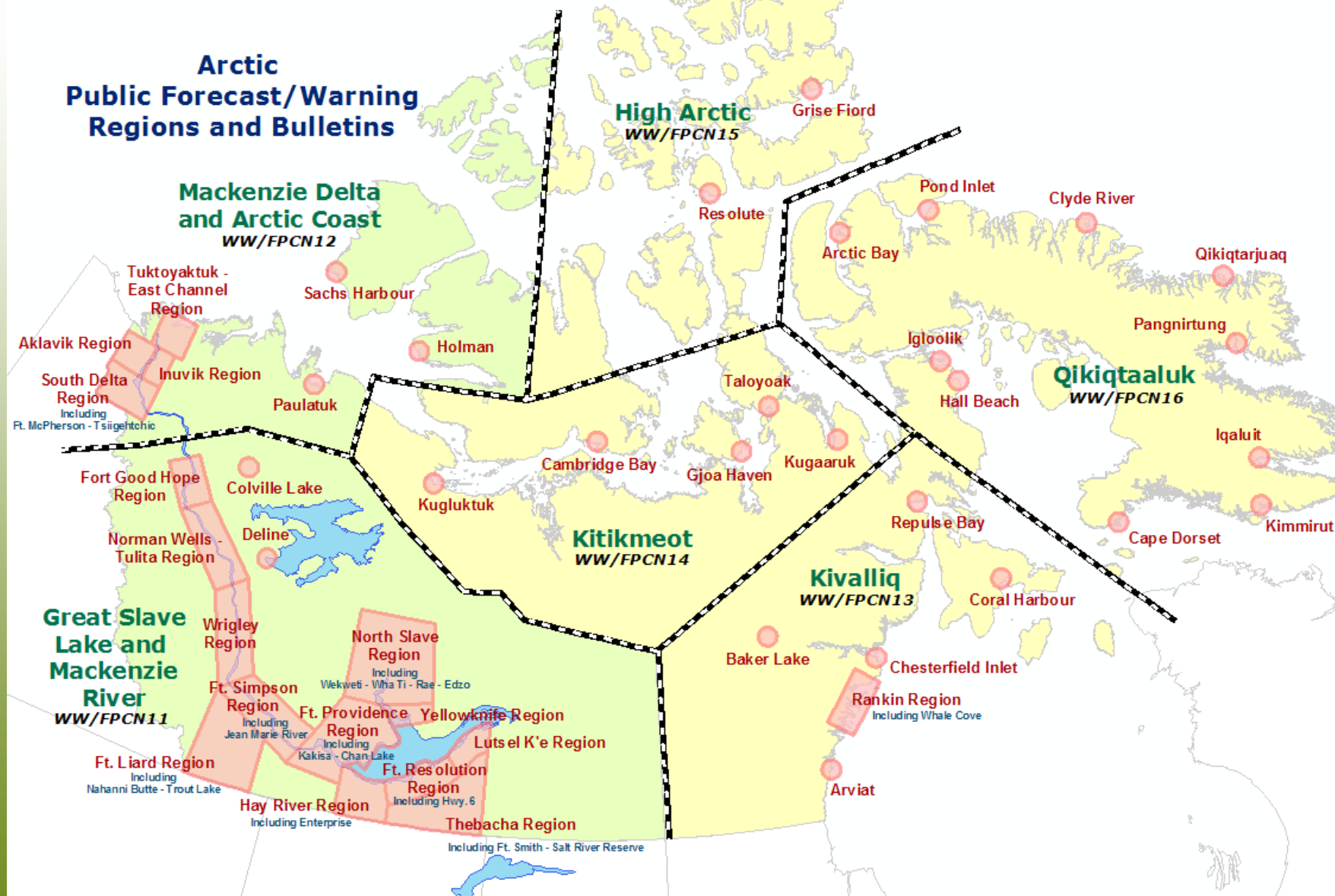
...Nunavik (Quebec)



Environment
Canada

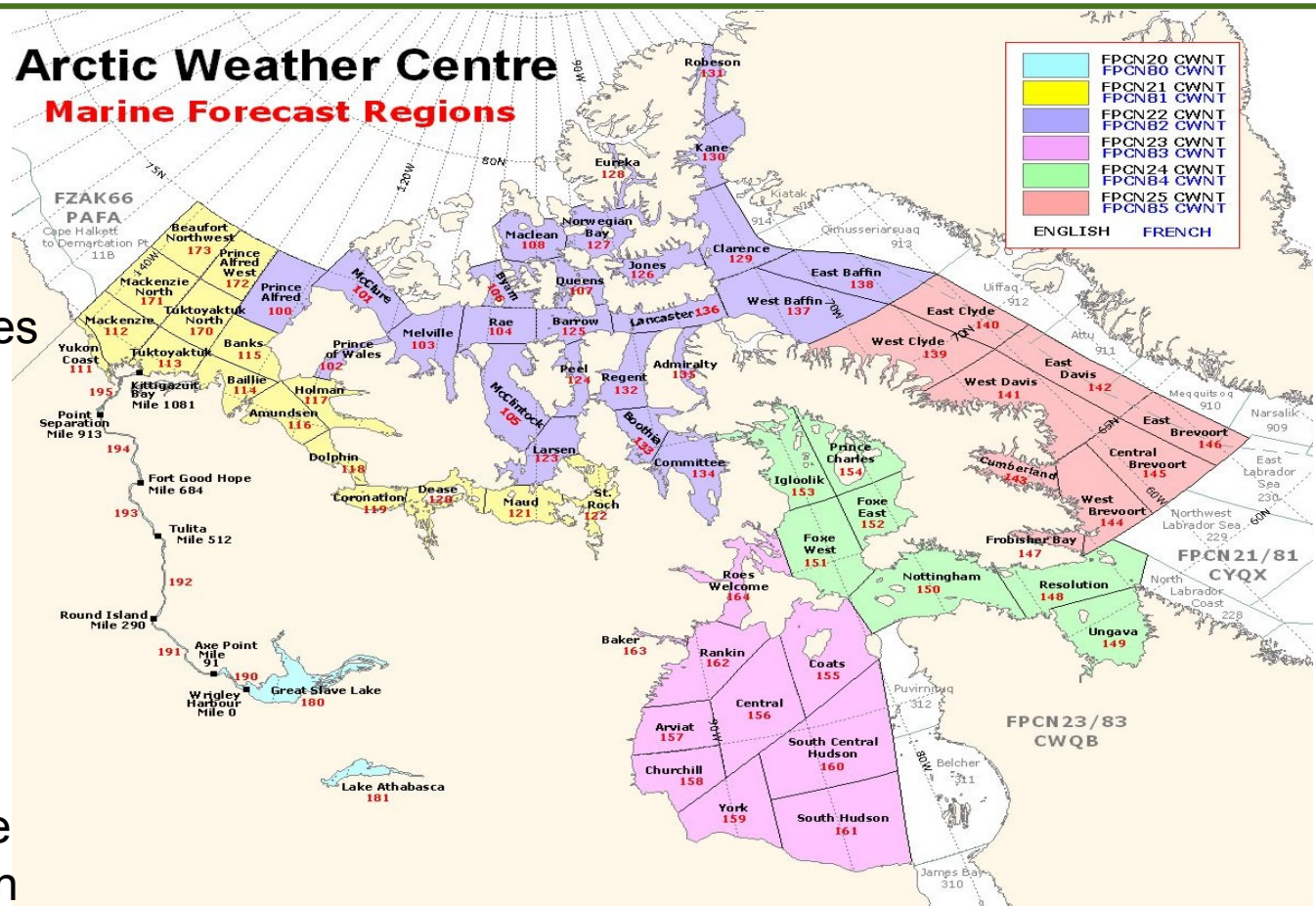
Environnement
Canada

1. Improved knowledge and information on weather and environmental conditions influences decision-making
2. Canadians are informed of, and respond appropriately to, current and predicted environmental conditions

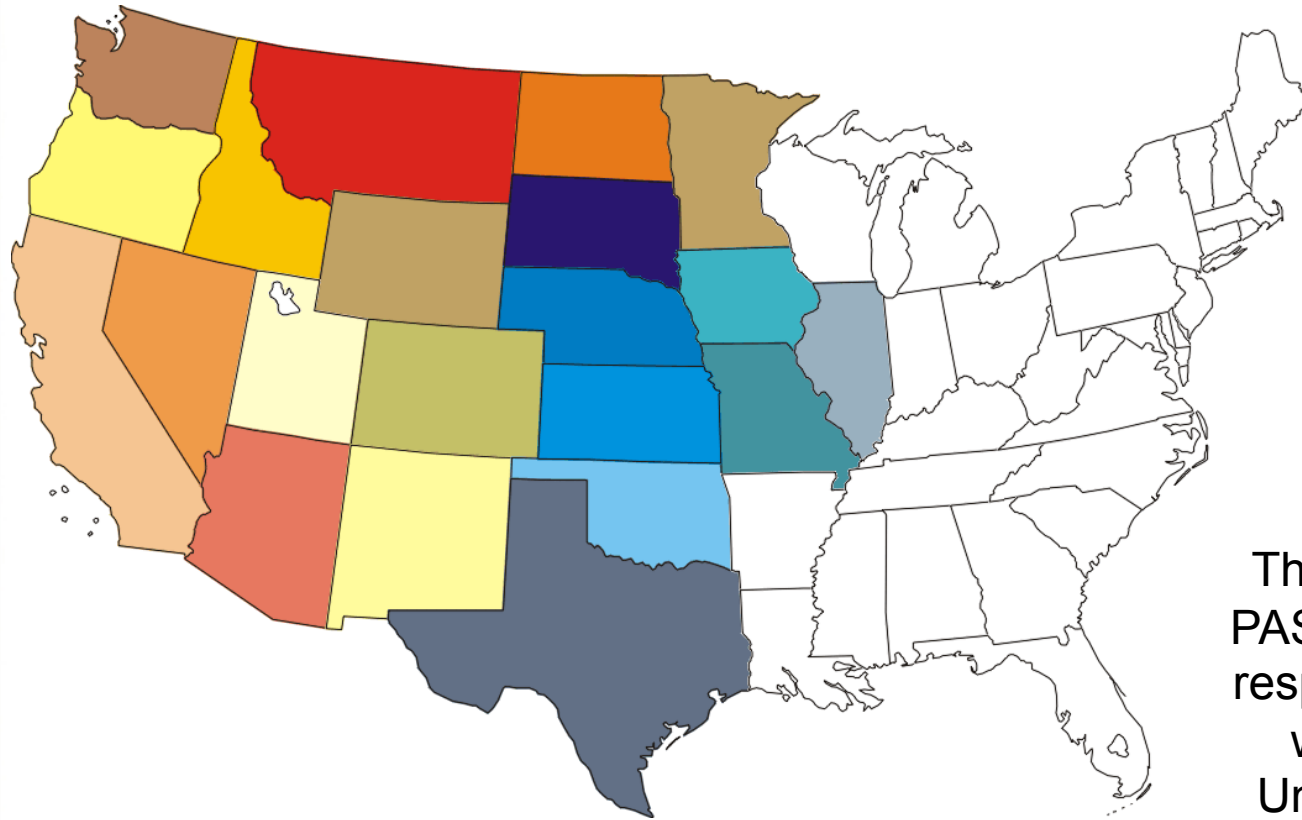


Marine – 82 regions + river (core & on request)

- Detailed 1-2 day forecast (wind, precipitation/visibility, temperature ≤ 0 , waves – pending)
- Automated 3-5 day winds
- No separate WW's (mostly)
- only seasonal
- Targets CCG & large vessel activity in open waters



Amazing but true..



We cover it with 6 people (4 on nights)!

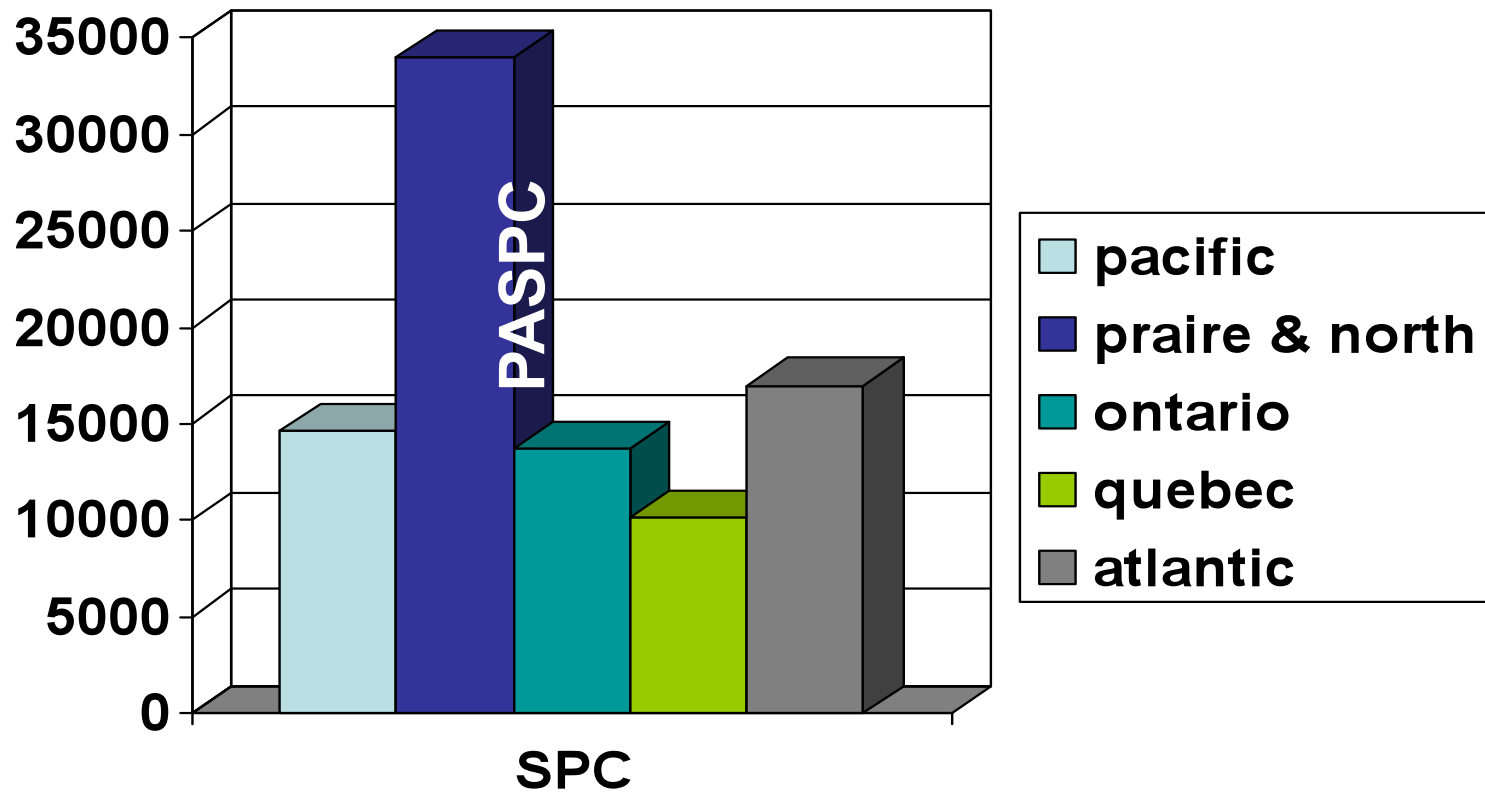
The size of the PASPC's area of responsibility if it were in the United States.
(equal to that of about 65-70 U.S. weather offices)



Environment
Canada

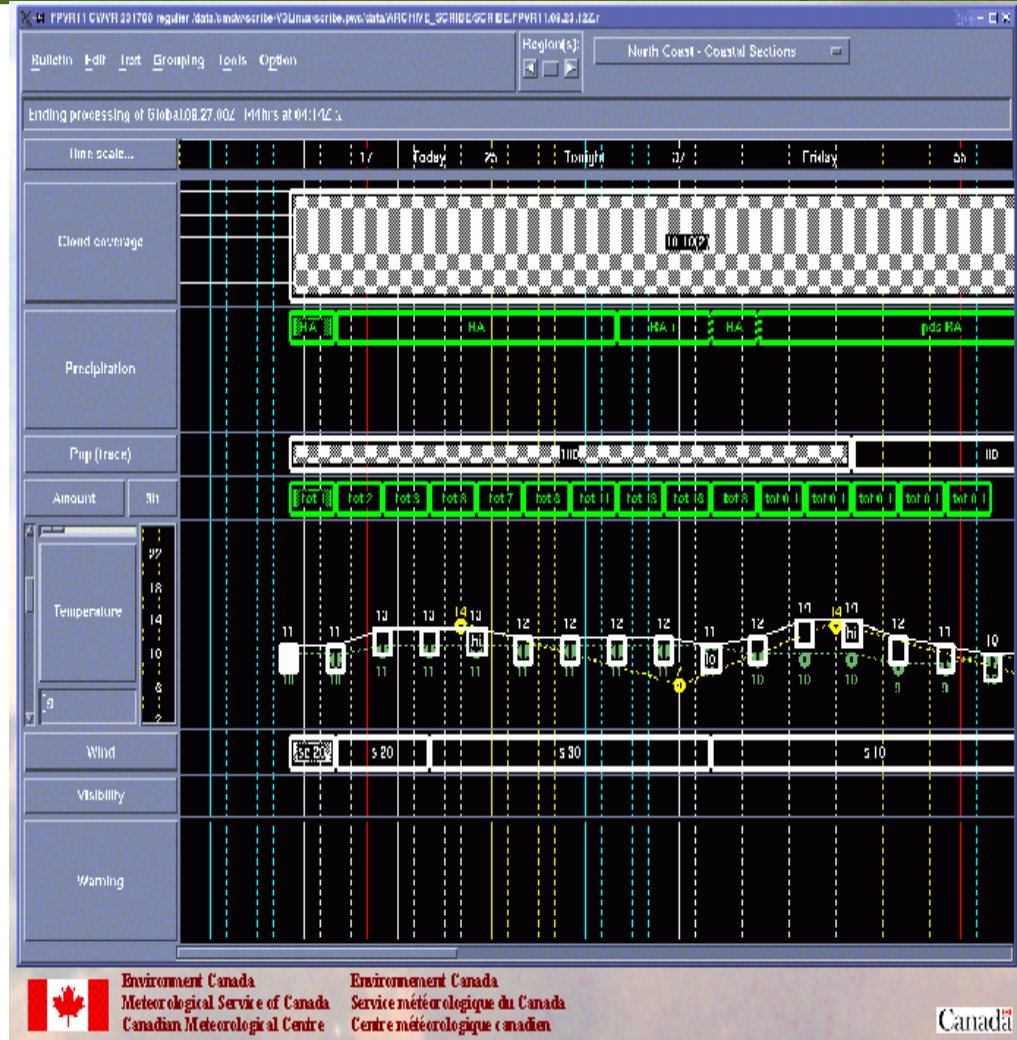
Environnement
Canada

Bulletins issued by each region storm prediction centre– 2006*



*based on 2007 products

Worded forecast...Scribe (Meteo code)



Data scarcity Challenges

Northern Observing Network



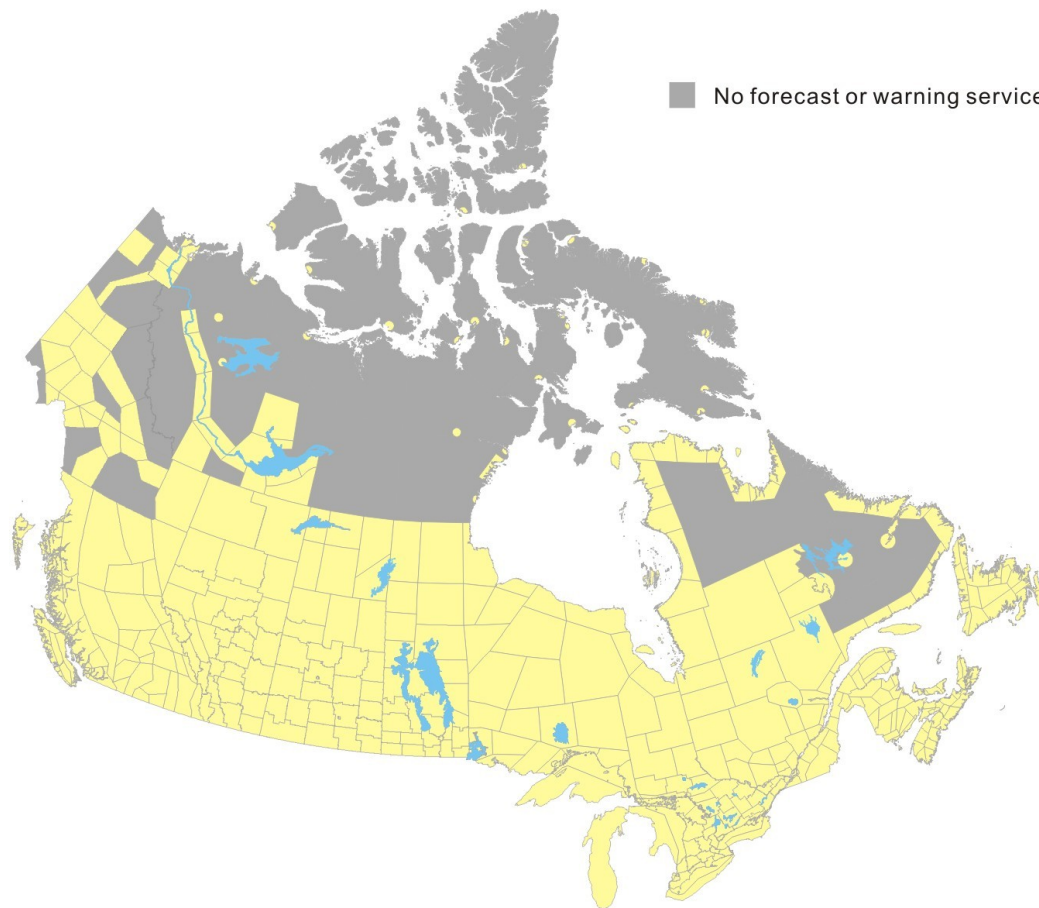
Environment
Canada

Environment
Canada

Canada

Coverage Challenges

Warning Coverage



Page 13 – March 14, 2011



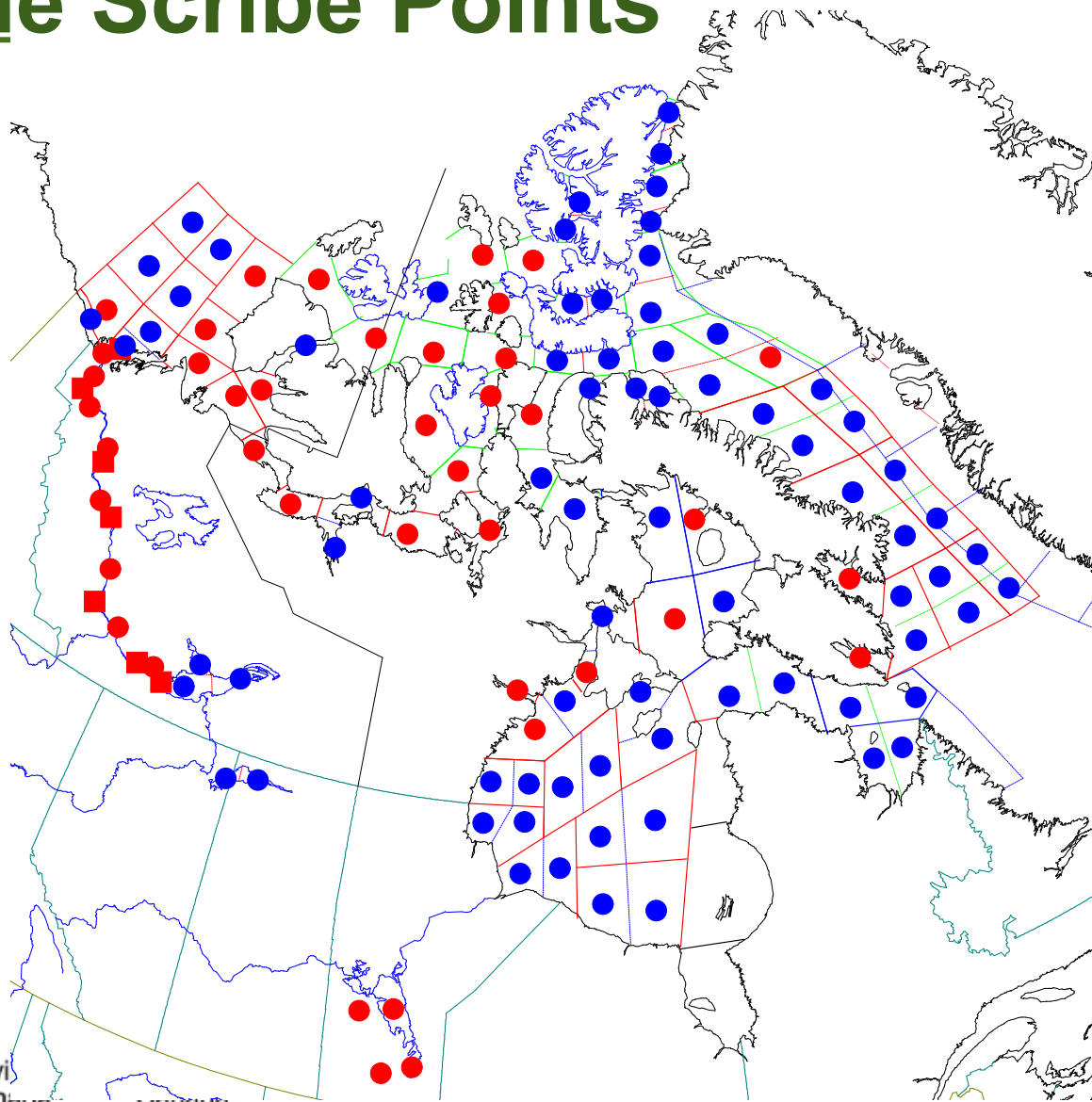
Environment
Canada

Environnement
Canada

Canada

Usability Challenges

Marine Scribe Points



Envi
Canada

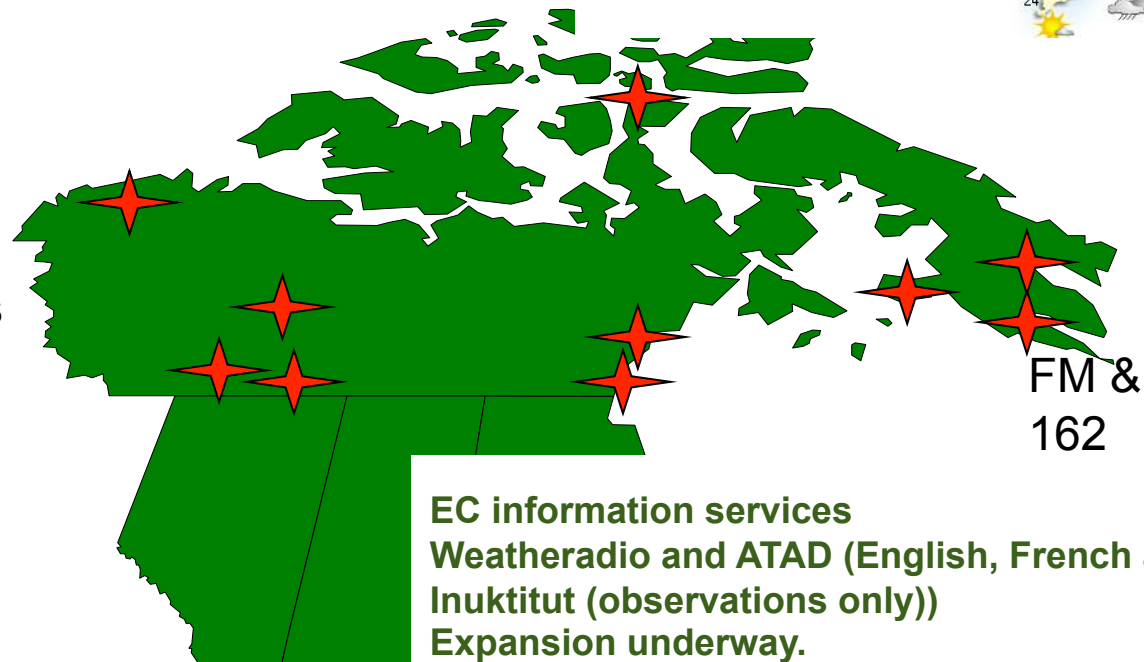
Canada

Canada

Communication Challenges

MSC northern communication of Current conditions, weather and warnings

- Weather link – for your web page
- Wireless portal – for web enabled cell phones
- RSS (really simple syndication) future ??
- 511
- i-Alert (replace e-alerts)
- Postal code forecasts



Communication Challenges

Static Content on the WEB

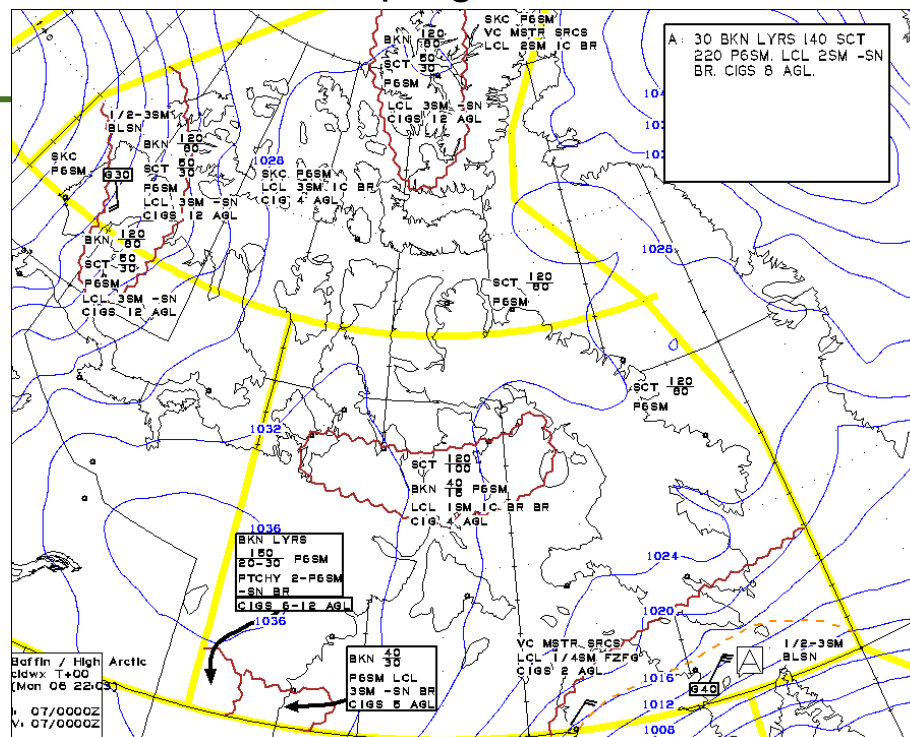
- Weather and Meteorology
 - Get Your Weather
 - How to Use Our Forecasts
 - Hazardous Weather
 - Weather Tools
 - Climate & Historical Weather
 - Meteorological Research
 - **Resource Centre**
 - Publications
- ****** Contact Your Weather Service ******



Other resources

Also...via NAVCAN ...aviation weather program – TAF, GFA forecasts

GFA (Graphical Area Forecast)



TAF CYFB 011138Z 0112/0212 VRB03KT P6SM SCT006
BKN030 TEMPO 0112/0115
2SM -SN BR BKN006 OVC015
FM011500 14005KT P6SM BKN030 TEMPO 0115/0203
3SM -DZ BR BKN015
FM020300 14010KT P6SM OVC025 TEMPO 0203/0212
2SM -SN BR OVC006
RMK NXT FCST BY 011800Z



Part 2: Weather service plans... *signature projects*

- Modernizing the Weather Warning and Service Delivery System
- Implementing network of networks approach – a modern day monitoring strategy
- Enabling a High Performance Computing to meet needs of EC in the future
- Implementing Next Generation Weather Forecasting System
- Leveraging the advances of science through an integrated environmental prediction strategy
- Developing a Climate Services Strategy for Canada
- Predicting changes in water availability now and in the future – water (cycle) prediction service
- Meteorological and Navigational Areas - for the dissemination of meteorological information and the broadcasting of navigational warnings in the North (Announced in Budget 2010)



Part 3:

Some of the things I have learned over the years....

Short introduction to some service issues in the north

Expect the unexpected in the North!
It is increasingly becoming the norm

Plan for the worst and the weather will never disappoint you

Patience is a virtue... you can't rush
the process.

..... But don't forget to repeat
yourself. No one hears a suggestion
the 1st time 😊

Don't be shy! Have friends.



Page 19 – March 14, 2011



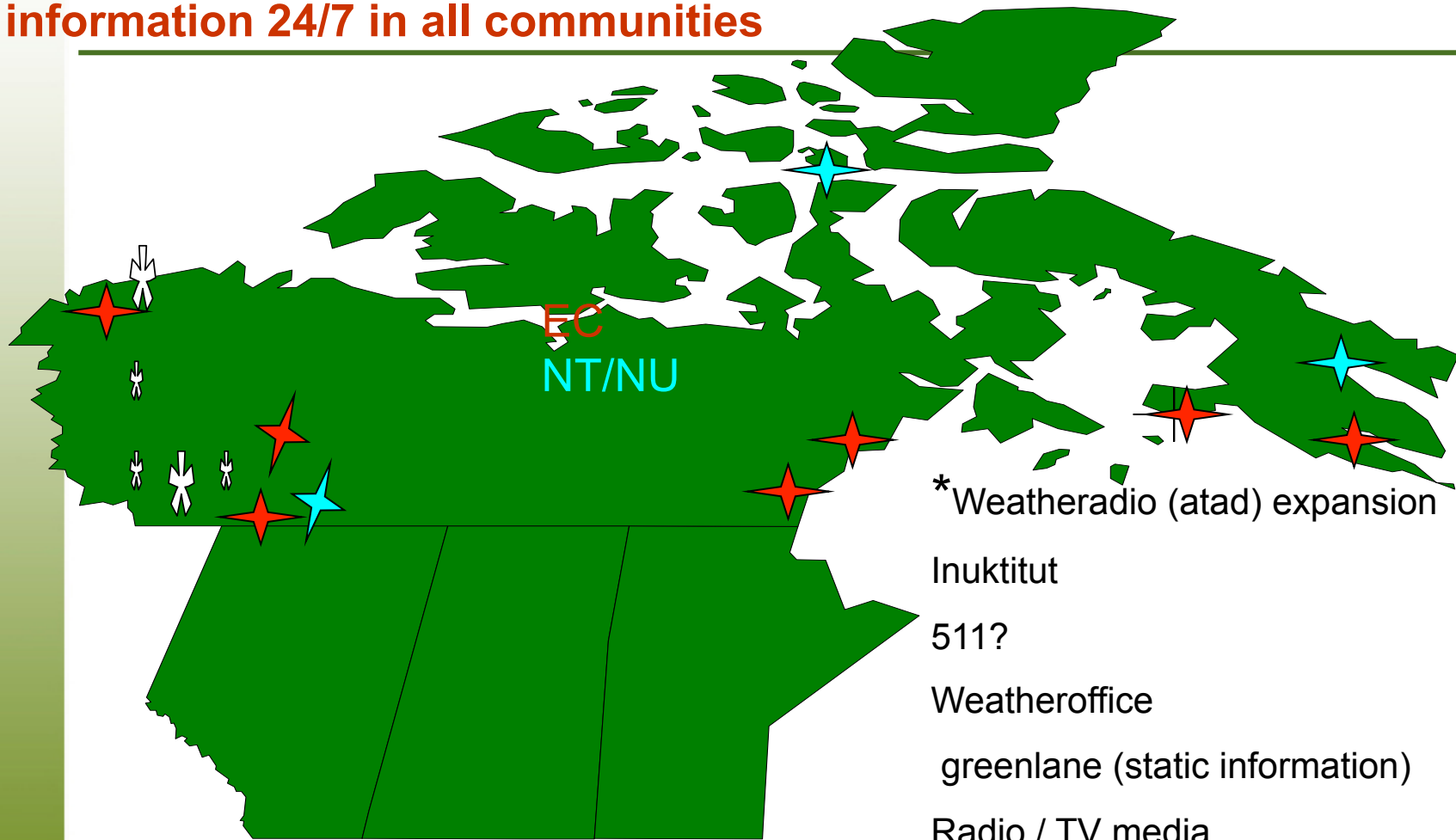
Environment
Canada

Environnement
Canada

Canada

Need to ...Improve how we communicate.....

Currently the internet is the only means to received weather information 24/7 in all communities



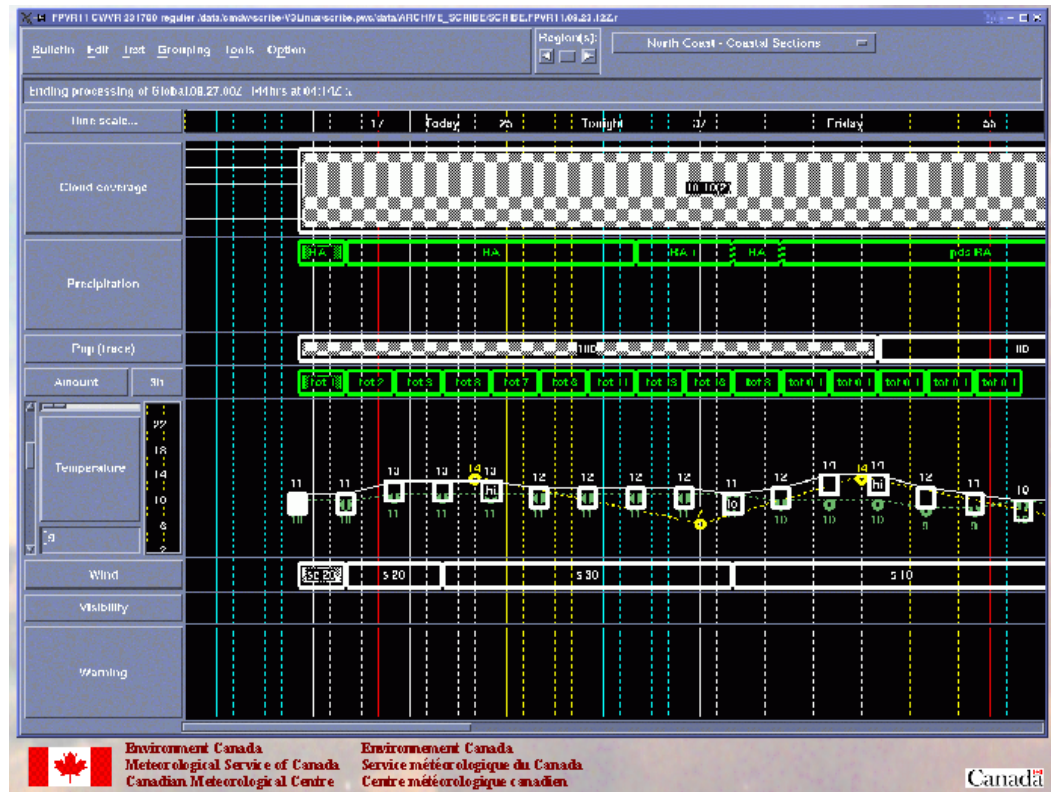
Never assume because the information is out there that it is used appropriately... or you are providing the most useful information! Always room for improvement.

Need to ...Improve what we say

.....real and perceived accuracy issues lead to loss of credibility

Forecast algorithms for clear sky blizzards

Blizzards in the Kivalliq have lasted for a week ... but not by the 3rd day forecast



Need to ...Improve what we say....

Weatheroffice icons need to better reflect hazardous conditions

TODAY



-13C

-28C

Blizzard warning in effect.

Today: Periods of light snow. Blizzard developing this afternoon. Wind becoming northwest 20 km/h then increasing to 60 gusting to 80 this afternoon. High minus 13. Wind chill minus 32.

Tonight: Blizzard ending overnight then a few clouds. Wind northwest 60 km/h gusting to 80 diminishing to 40 gusting to 60 near midnight. Low minus 28. Wind chill minus 43.



-19°C

-19°C

Today (random forecast)

Day: Periods of snow. Amount 2 to 4 cm. Blowing snow giving poor visibility at times. Wind northwest 30 km/h gusting to 50. High minus 19. Wind chill minus 36.

Night: Snow. Amount 2 to 4 cm. Blowing snow giving poor visibility at times early this evening. Wind northwest 30 km/h gusting to 50 becoming light near midnight. Temperature rising to minus 16 by morning. Wind chill minus 33.



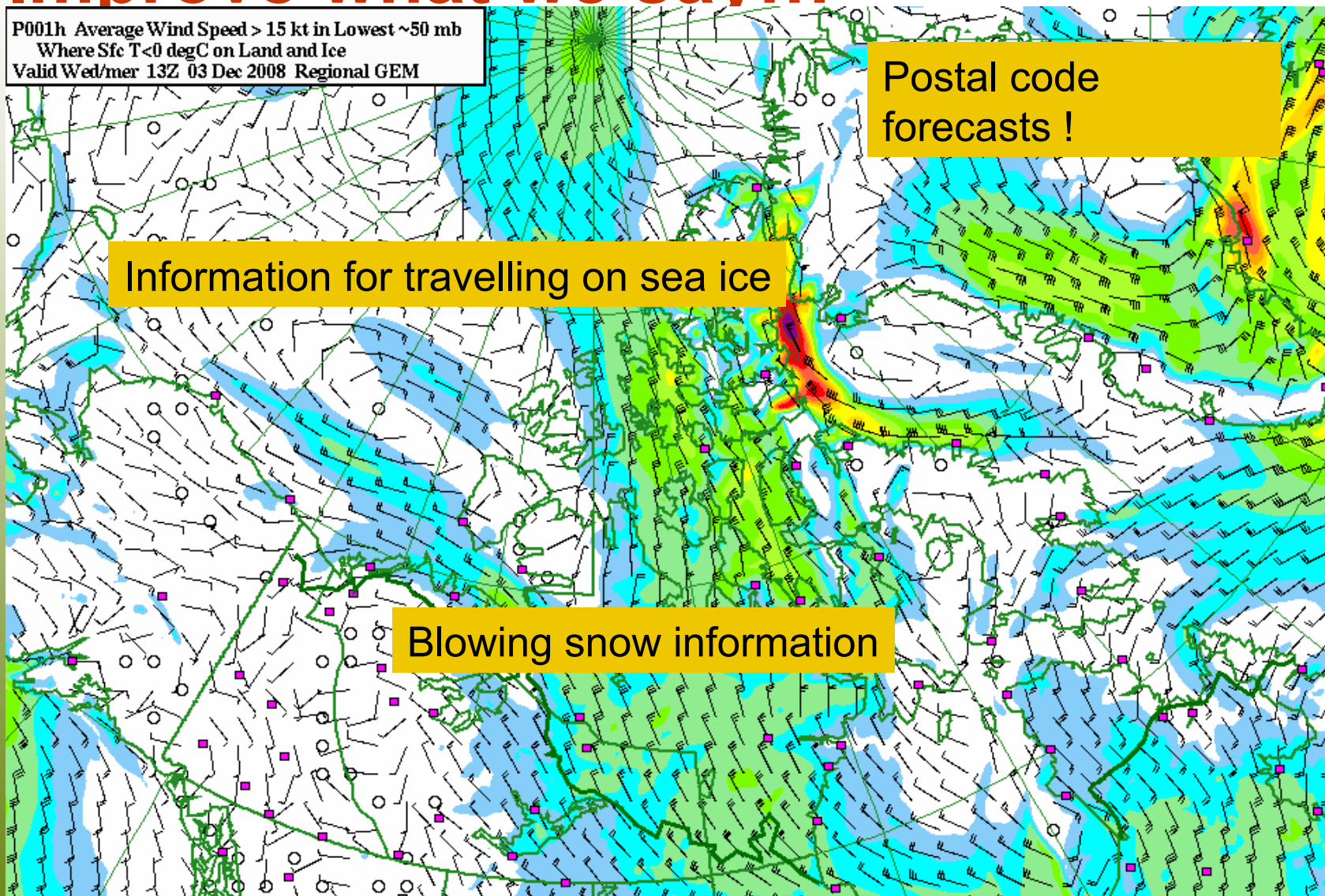
Improve what we say...

P001h Average Wind Speed > 15 kt in Lowest ~50 mb
Where Sfc T < 0 degC on Land and Ice
Valid Wed/mer 13Z 03 Dec 2008 Regional GEM

Postal code forecasts !

Information for travelling on sea ice

Blowing snow information



Environment
Canada

Environnement
Canada

Canada

Improve what we say... NEED NORTHERN VOICES!

Forecast coverageMarine forecasts all year?
(automated scribe, graphical products on weatheroffice)

“Why have the marine forecasts for the Dophin &
Union Strait,Amudson,and Coronation Gulf no
longer available for the Boaters of Kugluktuk
Nunavut?

WE ARE STILL BOATING AND TRAVELING THE
ABOVE WATER AREAS!!!!”

use “CONTACT US” button



Environment
Canada

Environnement
Canada

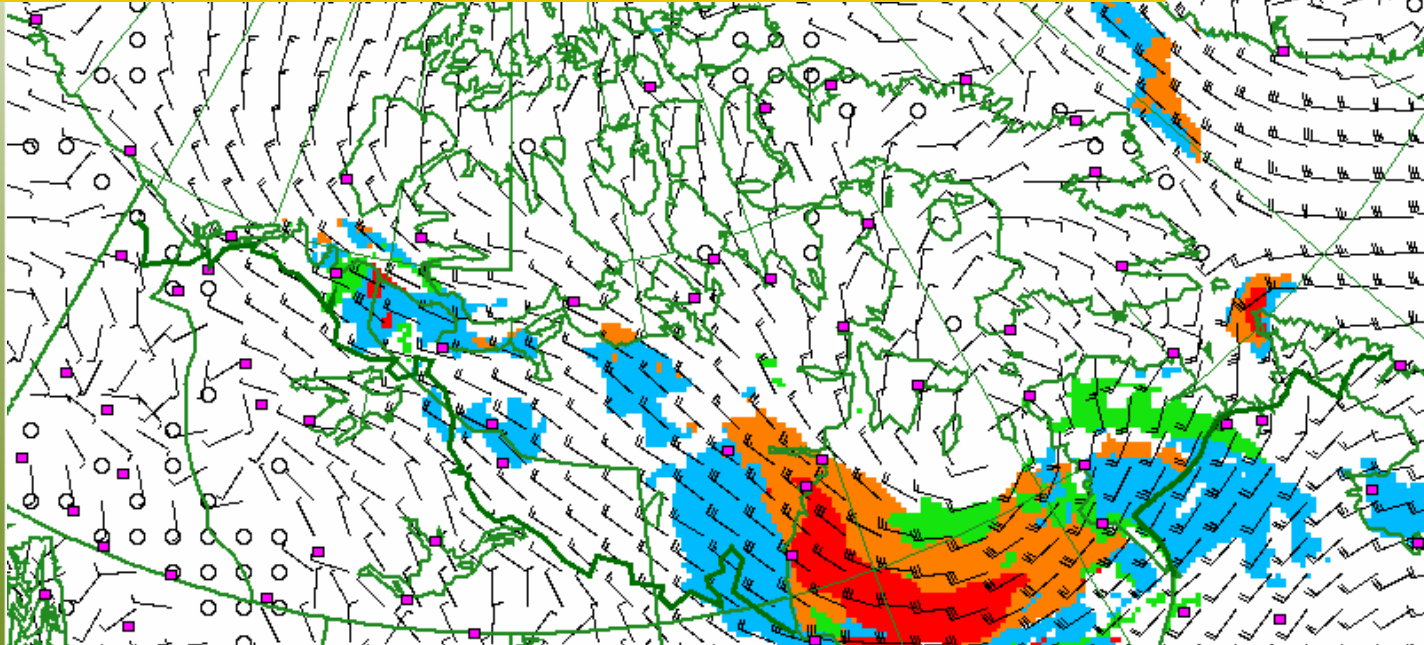
Take part in / be part of / the north...

Test experimental products with users....

Be visible virtually and physically.....



Do we care?.... “Environment Canada doesn't care anymore, because they just forecast.” (on-line comment related to AG's northern review)



Fog
Blizzards
Local winds
Lightning
SWED



Environment
Canada

Environnement
Canada

Nothing is more popular than the topic of weather weather



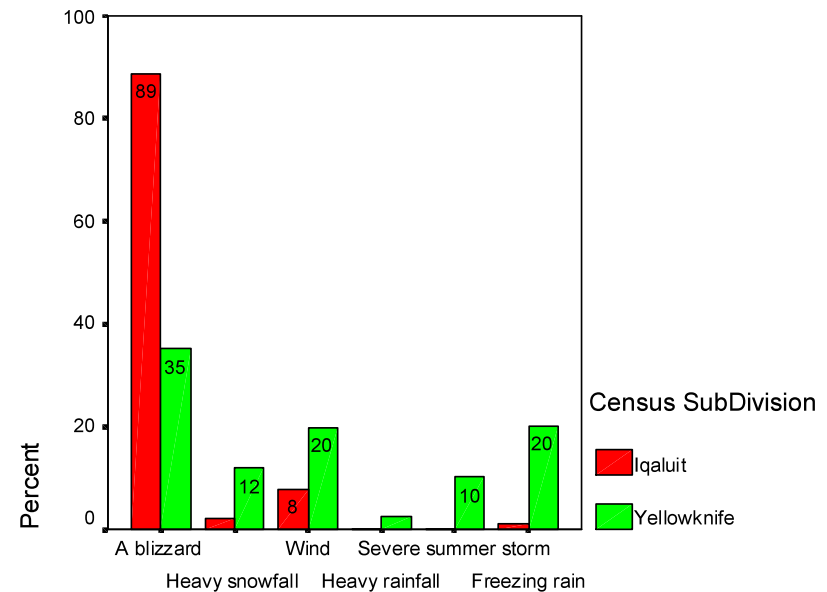
Provide weather comments:
Call 1-800-440-4434 or e-mail
Nunavut.Weather@ec.gc.ca
Learn more about STAR at
www.starnetwork.ca

But you still need to invest in a personal relationship to get them to talk about it!

And even if they are willing to talk about it, there are a lot of opinions!

Severe Weather Concerns Iqaluit vs. Yellowknife

- Iqaluit respondents were much more concerned with blizzards (89%) than Yellowknife respondents (35%).

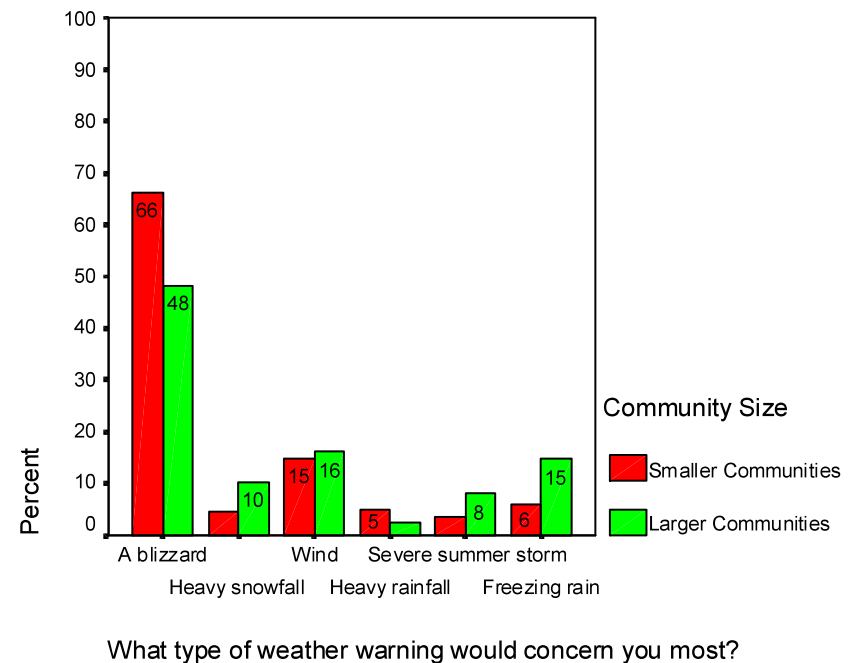


What type of weather warning would concern you most?

Level of concern is proportional to the frequency a weather event occurs ... all Baffin communities are different!

Severe Weather Concerns Large vs. Small Communities

- Smaller communities were less concerned with freezing rain (6% compared to 15%), heavy snowfalls (4% compared to 10%) and severe summer storms (3% compared to 8%) than larger communities.

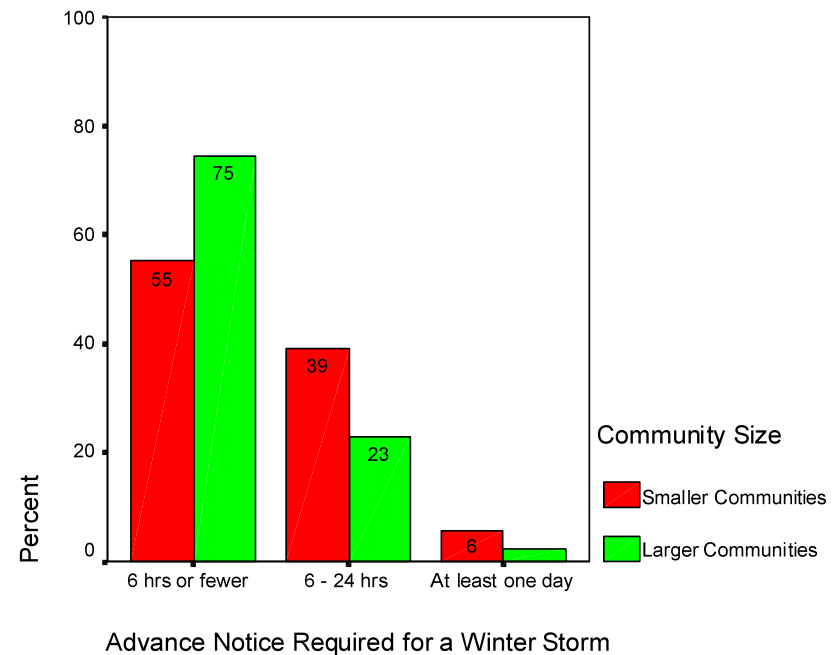


Snow may be great for skidoos.... But too much stops the water and fuel delivery

...

Advance Notice Required Large vs. Small Communities

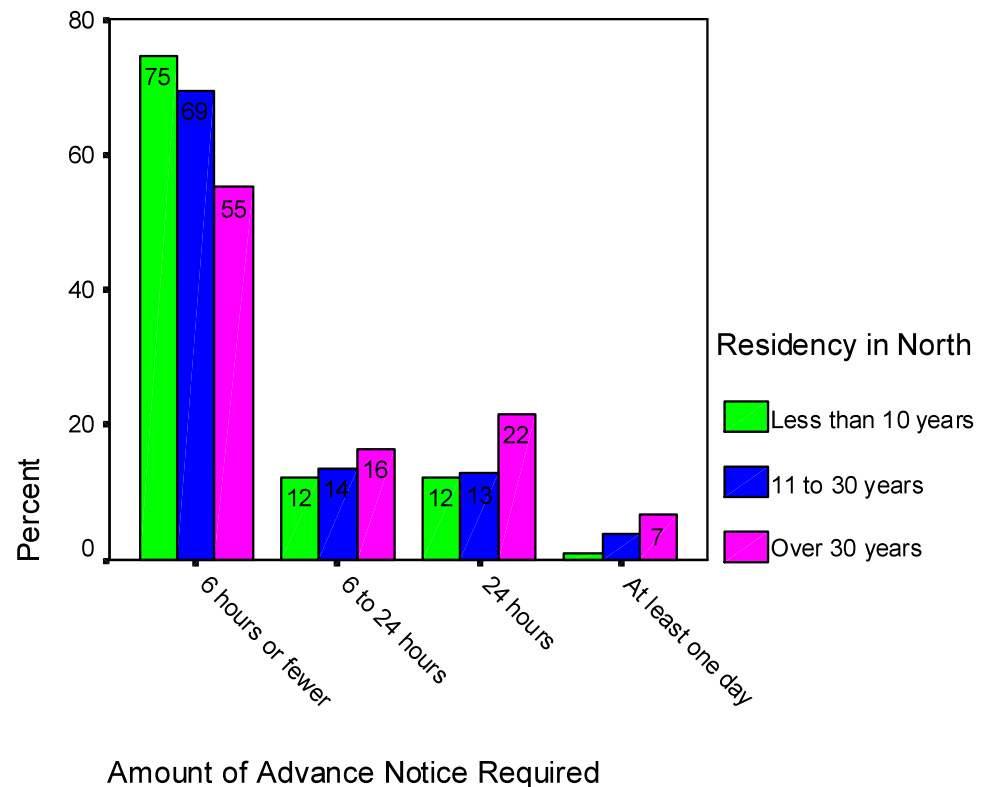
- Smaller communities were more likely to need over 6 hours notice of a winter storm (45%) than larger communities (25%).



People love to go out on the land..... so give those potentially long lasting storms or quick succession of storms a second look.

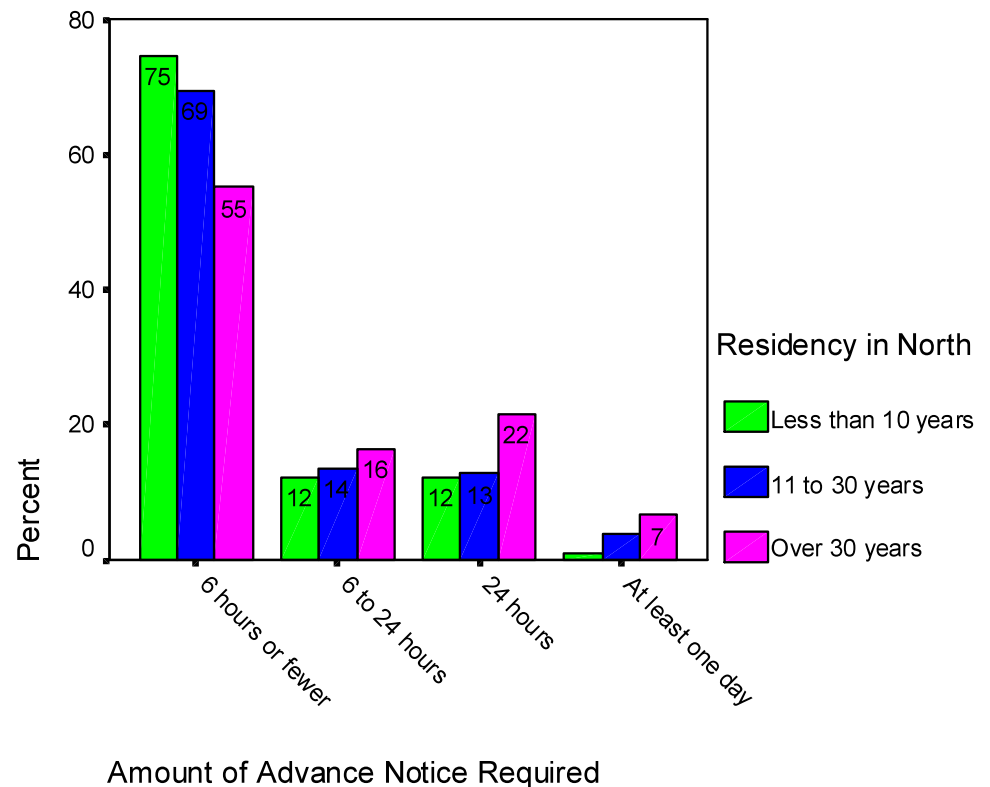
Amount of Notice Required Residency Profile

- And those who have lived in the North for a shorter period of time tend to need less advance notice of severe weather.

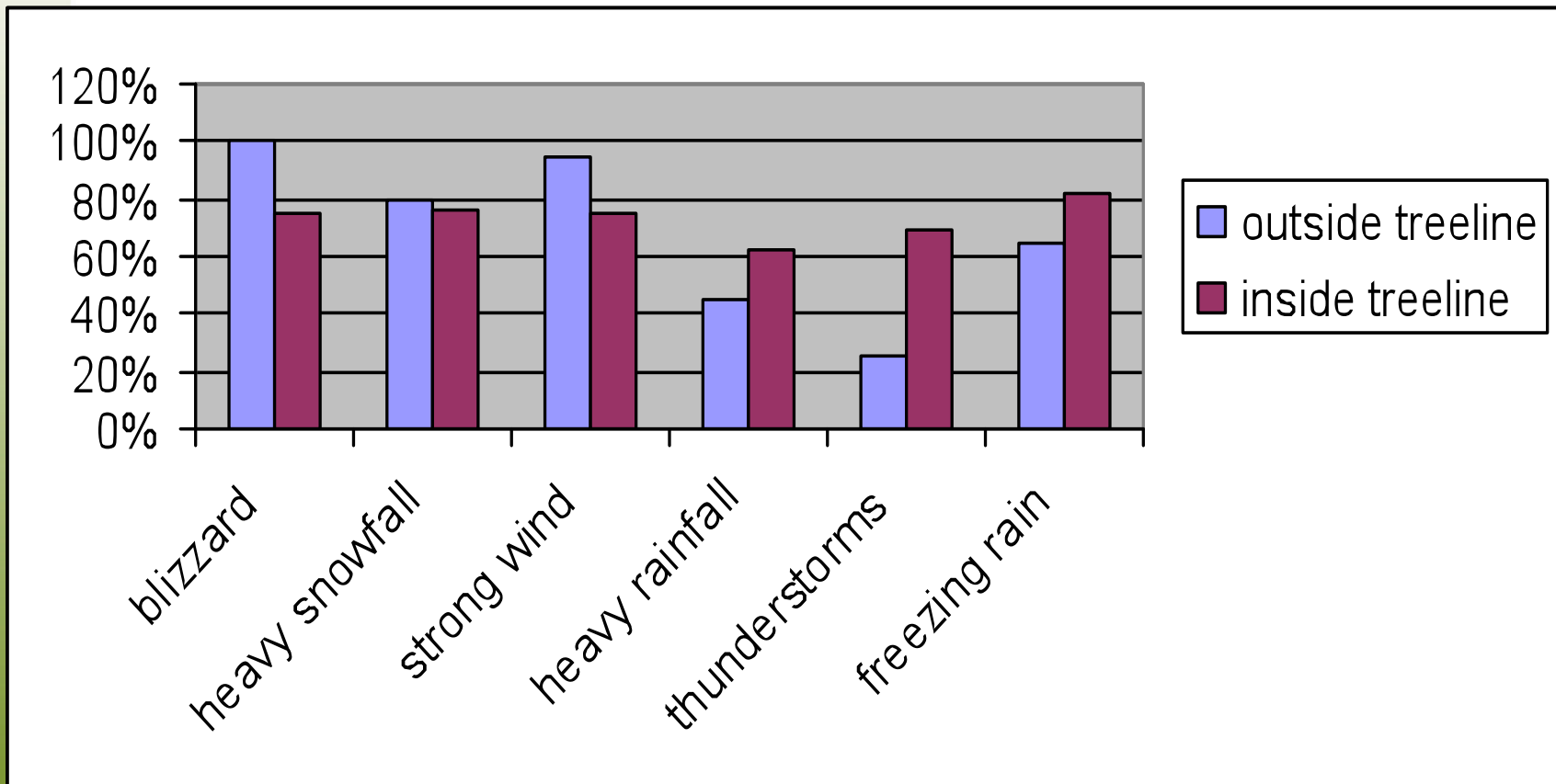


Amount of Notice Required Residency Profile

- And those who have lived in the North for a shorter period of time tend to need less advance notice of severe weather.



Concern with Weather Events



What is a Blizzard.... ??

Blizzard Criteria: Duration (%)

		Outside Treeline	Inside Treeline
Blizzard Duration	2 hours	30	25
	4 hours	25	42
	6 hours	20	0
	8 hours	15	8
	10 hours	0	17
	Other	10	8

Blizzard Criteria: Visibility (%)

		Outside Treeline	Inside Treeline
Blizzard Visibility	2 km	20	26
	1.5 km	5	0
	1 km	35	17
	0.5 km	10	8
	0.25 km	20	33
	Don't Know	10	8
	Other	0	8



Need to understand better....

- How people live and what they do (social aspects)
- How critical elements supporting northern activities are changing.
- What are key gaps in our weather program ... what changes are needed
- What are the barriers to using our information effectively

..... Help us to understand what we are overlooking in our decision making process. We can't do everything... need to set priorities?

Is there a way to link science to service, for communities?

What are the impacts on the critical infrastructure of a community?

9 Critical Infrastructure model sector groups:

- **Food and Water**
- **Electricity**
- **Transportation**
- **Oil and Gas**
- **Financial Institutions**
- **Telecommunication Systems**
- **Public Safety and Security**
- **Health**
- **Continuity of Government**

Identifying risk and vulnerabilities... that supports northern decision making

- MSC needs new ways to approach the problem of effective weather service for the north.
- We must integrate our collective knowledge better.
- Can research find a way to improve stakeholder (such as forecasting & prediction, policy etc) involvement earlier in the process?
- How can the physical scientist and social scientist find a common ground for collaboration.



We were there for IPY.. Will there be an ongoing legacy for all northerners?



Canada

Canada

Canada

Addressing northern needs.... What can we do to...

1. Improve what we know and act on it – user needs & science (weather& ice service development specialized products)
2. Improve observational coverage and quality (we need service validation)
3. Improve dissemination of what we know (key issue!)
4. Improve what we say (forecasts, warnings, including climate (water) information)
5. Take part in & be part of / the north

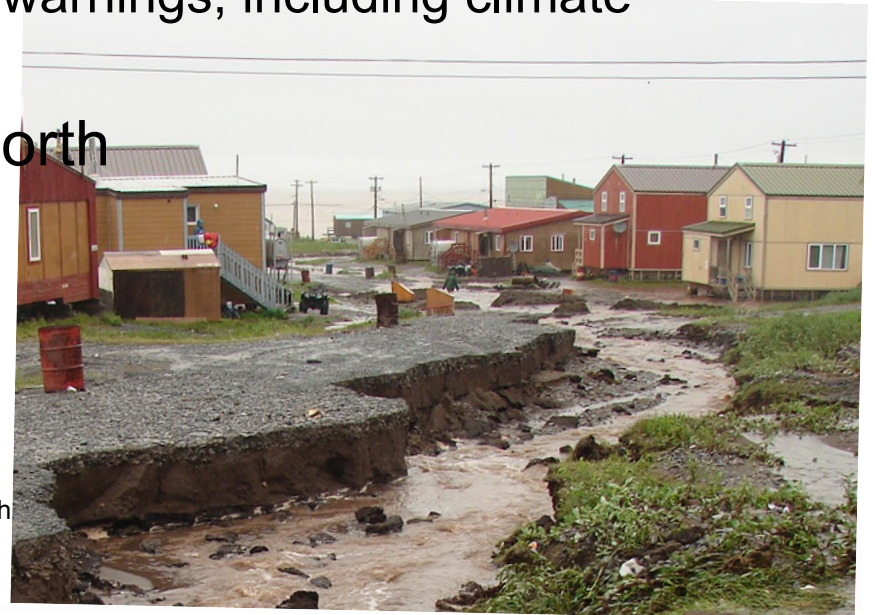
Kuglutuk extreme rain event
Nunatsiaq News, July 2007

Page 40 – March



Environment
Canada

Environnement
Canada



Comments? Suggestions?



Page 41 - March 14, 2011



Environment
Canada

Environnement
Canada

Canada