

The Integration of Local and Scientific Weather Knowledge: Extending the Value of Weather Services in the Canadian Arctic

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BACKGROUND



- Hazardous weather

Weather that either poses an inconvenience or a threat to everyday activities in town and on the land

- Scientific weather knowledge

Forecasts and weather-related information produced and disseminated by weather services

- Local knowledge

Experiential knowledge of many long-term residents (indigenous & non-indigenous)

BACKGROUND

- Weather and climate change pose risks to Northern residents
- To be properly prepared while travelling/hunting, residents need access to local and scientific weather knowledge



RESEARCH OBJECTIVES

- Case study of Iqaluit, Nunavut
 - Demonstrate the need for weather services in the Canadian Arctic that integrate LK and SK
- Ways LK can help reduce vulnerability to hazardous weather
 - Provide residents with more information to help reduce risks related to travel and hunting



ORGANIZATION OF THE TALK



1. Environmental and socio-economic characteristics
2. Research methods
3. How LK is acquired
4. How residents incorporate LK with the weather forecasts
5. Why weather services should include LK and SK in their products
6. Recommendations

FROBISHER BAY

IQALUIT

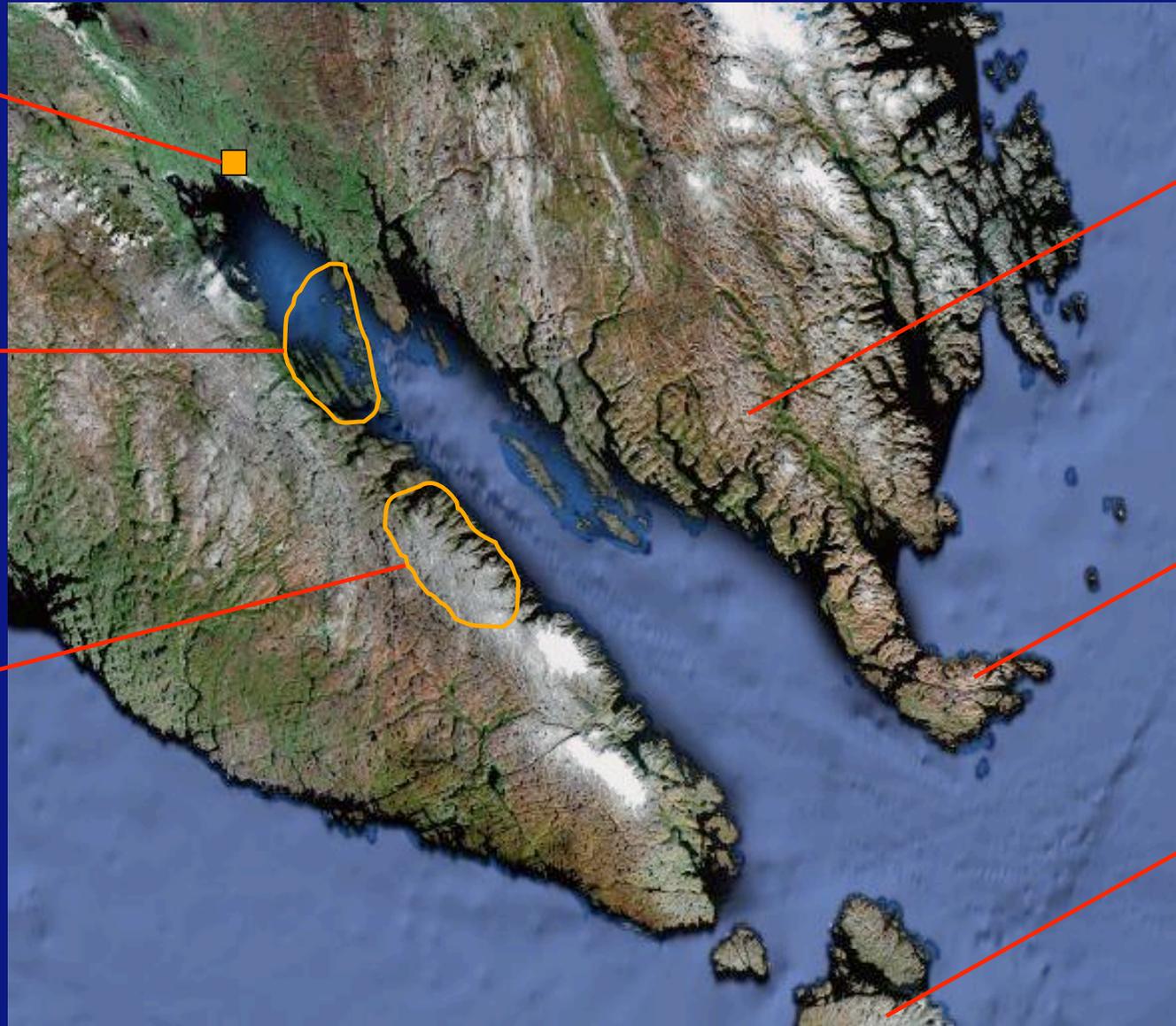
'The Islands'
(aka Barrier
Islands,
Chain of
Islands)

Everett
Mountains

Hall
Peninsula

Loks Land

Resolution
Island



Source: Google Earth

SOCIO-ECONOMIC CHARACTERISTICS

- Capital of Nunavut, largest community in the Territory
- Ethnic composition unique to the North (60% Inuit)
- Large population of youth
- Large transient population
- Significant population turnover rate
- Inuit, Anglophone, Francophone communities



DATA COLLECTION



- Community events/land-based activities
- 37 semi-structured interviews (long-term residents, 10+ years)
- Purposive sampling strategy
- Elders; hunters; outfitters; sealift workers; emergency response; government personnel (e.g. NRI, NTI, Parks Canada, Dept of Environment, Wildlife, Fisheries and Sealing)
- Correspondence with EC meteorologists

INTERVIEW QUESTIONS



- What do you consider to be dangerous weather in Iqaluit (e.g. in relation to different seasons, activities, types of work)?
- Has the weather this year created any difficulties for you getting out on the land/going to work/making money?
- How do you prepare for hazardous weather?
- What are your sources for daily, weekly, and seasonal weather information?
- Do you feel your sources of weather information are getting better/worse/staying the same at predicting the weather?
- Do you feel prepared to handle whatever weather conditions may occur?
- What can be done to make you feel safer/more prepared?

DATA ANALYSIS

- Transcription (interviews and fieldnotes)
- Qualitative content analysis
- Theme coding of hazardous weather data
 - Computer-assisted qualitative data analysis software



HOW LOCAL WEATHER KNOWLEDGE IS ACQUIRED



- Spending time on the land
- Training with experienced residents
- Passed on from family members
- Listening/sharing stories
- Sharing information (while traveling, visiting, via CB radios)
- Consulting with elders
- Observing people at work
- Formal courses

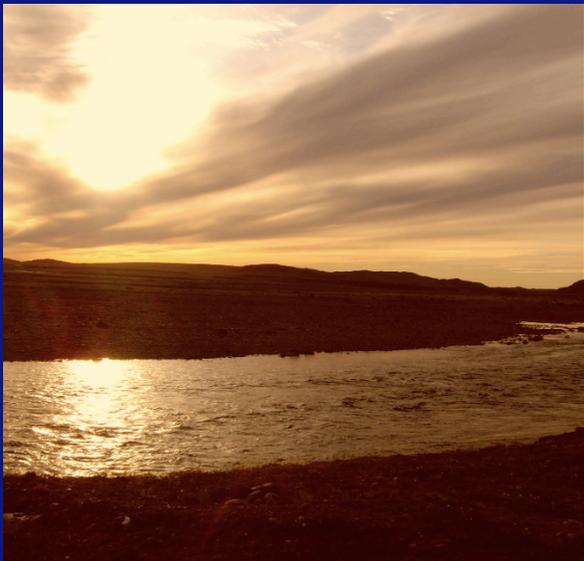
HOW RESIDENTS INCORPORATE LK WITH WEATHER FORECASTS

- LK provides framework for interpreting conditions (e.g. wind)
- LK used to determine severity and timing of hazardous weather events (e.g. wind + tide direction = hazardous conditions)



HOW RESIDENTS INCORPORATE LK WITH WEATHER FORECASTS

- Draw on past experiences with forecasts (conditions 12-24 hrs later than forecasts indicate)



“One of the real common ones we have here is that the forecasts are early. What they say it’s going to be like tomorrow morning, happens tomorrow night... about 12 hours off very consistently... it’s amazing because people have been known to just assume EC’s forecast is 12 hours off. It’s funny there a couple years ago... it was just consistently the same and people just got used to it. So whatever the weatherman said, they made their own adjustments. There must be something to that. It was, or it is, too common for it to be just a random event. I know some communities up here have similar concerns.” (14-year, non-Inuit resident, weekend hunter)

- Weather in nearby communities used as local forecasting tool

WHY LK SHOULD BE INCORPORATED INTO WEATHER SERVICE PRODUCTS

1) **Forecasts do not adequately prepare residents for travel away from the community**

- Weather station records not representative of areas residents travel

“The forecast for Iqaluit is for here. Even last week, it was windy right here in Iqaluit but you go out, just over to the next harbour and it’s calm. So they’re saying it’s windy here but calm over there. If you go up on the hill you can see across the Bay it’s all flat water. It’s very localized.” (lifetime Inuit resident, 40, active hunter)

- Forecast best used for general conditions and impending storms
- Weather usually changes within the course of the forecast period

WHY LK SHOULD BE INCORPORATED INTO WEATHER SERVICE PRODUCTS

2) Many residents have insufficient local weather knowledge and/or resources

- New residents are more vulnerable
 - No family roots or access to other knowledge networks
- Even long term residents have restricted access
 - Lack of training, cultural or linguistic barriers, absence of social networks, age, etc.
 - Weather is becoming more unpredictable



RECOMMENDATIONS

1. More formal and consistent documentation and dissemination of LK
2. Provide hazard Maps
 - e.g. Windy, protected, shallow, and rocky areas, strong currents, thin ice



RECOMMENDATIONS

3. More sharing of information across language groups
4. Mark hazardous locations with physical markers

“Long-time residents are quite aware where shallow areas are but there’s always new people and with the type of speed we have now these days, you could wreck your boat or wreck your outboard motor or even kill the occupant of the boat if you should happen to run across at high speed...” (30-year, Inuit resident, weekend hunter)



RECOMMENDATIONS

5. Share and disseminate information on wind-related hazards



CONCLUDING REMARKS

- Integration of LK and SK into weather service products
 - = Residents can make more informed decisions about risks associated with different activities on the land
 - = Improved access to local weather knowledge
 - = Reduce annual # of search and rescue operations, injuries, and deaths



NEXT STEPS

- Dissemination of findings
 - Publication in AMS journal *Weather, Climate and Society* (to be submitted)
 - Final community report
 - Public meeting in Iqaluit (~ end of August?)
- More webcams in the North?
 - Kimmirut webcam consulted regularly
 - Logistical issues (weather-related damage, vandalism, darkness)
 - Involve schools?



NEXT STEPS

- Outreach in the North
 - Education materials
 - Training/mentorship
 - Citizen scientists (e.g. EC's Ice Watch, Plant Watch, Sky Watcher programs)
 - Short list of long-term residents active on the land, willing to be the eyes on the ground



ACKNOWLEDGEMENTS



- Community of Iqaluit
- CFCAS
- ArcticNet and STAR networks
- Northern Scientific Training Program
- Amarak Hunters and Trappers Association
- Nunavut Research Institute
- EC meteorologists



THANK YOU!

QUESTIONS?

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