Thank you for the opportunity to testify before you this evening. It is a pleasure to be able to share insights gained from our research with you.

The Climate Change Adaptation Research Group, led by Dr. James Ford, has been researching climate change impacts on Inuit communities for the past 15 years. Over the past 4 years, I have been managing research projects that focus on search and rescue in the Arctic.

Our research projects have explored: why search and rescues are occurring across the Canadian Arctic; what communities can do to adapt and further promote safety; and vulnerabilities of emergency response systems and critical infrastructure. We have conducted over 60 interviews with community members, Elders, hunters and fishers, and emergency management officials over the past three years. During our research, I have spent over 15 weeks in ten communities across the Canadian Arctic, and I have participated in 3 Canadian Air Force SAR training missions in Nunavut. We have also analyzed available search and rescue data and infrastructure and transportation data from across the Canadian Arctic.

Over the past decade, the search and rescue rates across Nunavut have more than doubled. While recent attention has focused on increasing marine traffic through the region, the majority of search and rescues has been, and continues to be, for Inuit subsistent harvesters and travelers. In fact, we estimate that in 2014, the 543 reported SAR incidents above 55^{o}N represents roughly 1000 individuals[1]. Of those individuals, roughly 20% were in serious danger.

I would like to reiterate that across the Canadian Arctic, SAR response is provided by numerous actors and agencies.

- The Canadian Armed Forces are responsible for aeronautical incidents;
- The Canadian Coast Guard is responsible for marine incidents;
- Parks Canada is responsible within national parks;
- and Provincial and territorial governments are responsible for searches for missing persons including those who are lost or overdue on land or inland waters - commonly known as Ground Search and Rescue (GSAR)

GSAR events may also use resources of RCAF and CCG, based on the territorial Emergency Management Office's discretion and RCAF or CCG availability.

[1] Ratio of 1.84 people per SAR reported by Nunavut Emergency Services records

Our research has demonstrated that the increasing rate of search and rescue is due to both social and environmental factors. Factors include:

- climate change impacting traditional travel routes and routines;
- several environmental changes have made hazard and weather observation more difficult;
- cost of quality equipment and safety gear is prohibitive for many;
- changing local demographics and economies are impacting how people hunt and fish;
- and colonial histories and policies continue to influence knowledge systems and harvesting routines in some communities.

Many communities are responding to increasing search and rescue incidents with prevention programs that emphasize providing avenues for youth to learn from Elders and learn on the land. Communities and territories are also promoting safety by lending out satellite beacons and also subsidizing equipment and gasoline costs through hunter support programs. Our research has indicated, however, that additional efforts are needed and may lead to significant cost savings.

In terms of search and rescue response and capacity across the Canadian Arctic, we have found that most communities across Inuit Nunangat are minimally prepared and resourced for the current SAR demands. The system is largely dependent on volunteers with high rates of burnout - often community SAR leadership positions turn over at least once a year. While the system benefits from the strong land knowledge and skills of volunteers, volunteers often have to use their own boat or snowmobile for SAR missions with only gas and oil reimbursements. While the push for more Canadian Coast Guard Auxiliary units has increased resources and tools, training available to most communities remains minimal. Training that individuals have observed as lacking includes first aid training, emergency management training, training on how to work with RCMP, and practice conducting multi-agency responses.

Across the Canadian Arctic, there are numerous threats of larger scale emergencies with varying probabilities. Along with increases in marine transit, since 2003 there has been an increase by over 1100% in flights over the Canadian Arctic. Further, communities face their own risks ranging from prolonged power outages to floods. While there are contingency plans and exercises to practice response to some scenarios, across much of the Canadian Arctic communities will be the first responders and have to manage the situation for an estimated 4 to 12 hours. Despite strong knowledge of the land, regional navigation, and traditional knowledge about survival, we have found that the capacity of communities to respond to a large disaster is lacking and could lead to loss of life by rescuers or patients.

As some tangible examples of these gaps: numerous communities we have worked with across the region have been unable to find their emergency response or management

plans that were developed by the territorial government. There is wide concerns that during a large incident health centre and town communication lines would be tied up with calls inhibiting emergency management communication. The vast majority of communities have no prehospital medical providers. Further, evacuation of patients is dependent on a limited number of aeromedical resources and the ability to land at airports.

We have determined that it is highly likely that SAR rates will continue to increase. SAR and disaster risks will also likely become more complex and heterogeneous in the coming decades.

More research is needed to better understand response system weaknesses and the costs and benefits of potential policy changes. Further, it is essential that SAR data continue to be collected and aggregated from all SAR agencies. However, with present knowledge, territories and federal parties can continue to improve prevention and response practices across the region. Our research supports recommendations made by Senator Patterson at the Defense Policy Review Nunavut Roundtable in 2016 for RCAF to station CC-130 in Yellowknife or Cambridge Bay. Air SAR deficiencies and coverage will become an increasing issue when the C-295 is operational, as we estimate that response times will increase by at least 5% and remaining fuel when aircraft arrive on scene will be ¼ of the CC-130. It is also essential that communities are better equipped with resources to deliver quality GSAR and act as first responders to larger disasters across the Canadian Arctic.