Written Submission for the Pre-Budget Consultations in Advance of the 2019 Budget

by the

Canadian Network of Northern Research Operators

Contact:

Leann Fishback (President) Tel: (204)-675-2307
E-mail: fishback@churchillscience.ca

James Drummond (Vice-President) Tel: (902)-4949-2324
E-mail: james.drummond@dal.ca

Recommendation 1: That the government should institute a competitive peer-reviewed Arctic Research Infrastructure Support Fund.

Recommendation 2: That the government provide funding in the amount of $10M per year for the Arctic Research Infrastructure Support Fund.

Background

The Canadian Arctic is:

- a vast and diverse region which is economically and socially important to Canada.
- the home to a significant number of Indigenous Peoples and other northern residents.
- a region with many unresolved research questions.
- undergoing significant and rapid change which has impacts on the society and economy of the region.

There is considerable interest both nationally and internationally in obtaining long-term, consistent datasets of many variables across the Arctic and this has been highlighted in many reports including the 3rd International Conference on Arctic Research Planning report 2016 (commonly known at ICARP III) under the auspices of the International Arctic Science Council of which Canada is a founding member. They recommended "*… a robust, sustained, co-designed and participatory observing system of systems relying on existing and new networks and infrastructure… to improve our ability to predict local, regional and global processes"* and for one specific area the US National Academy of Sciences report 2016 on The Future of Atmospheric Chemistry Research which notes "*the central importance of long-term research sites for comprehensive atmospheric chemistry research*". Many other reports relevant to specific research areas make similar recommendations and/or generally emphasise the importance of measurements in this data-sparse but highly significant area.

In addition to these global plans, there are many smaller-scale research needs that are specific to the many differing regions of the Arctic. These needs range in scale from local, regional, national and international and include a variety of subjects such as health, culture, social sciences, physical sciences, infrastructure and engineering and Arctic sovereignty.

The Current Situation

The Canadian Arctic research community operates a significant number of fixed research facilities in the Canadian Arctic. Some of these facilities have been in existence for many decades. These facilities have research foci across the spectrum including health, social and physical sciences. Many of these facilities have come together as the Canadian Network of Northern Research Operators.

Maintaining these facilities is a constant challenge because of the remoteness of the facilities, the difficulty of maintaining the equipment in the facilities, the difficulty of recruiting the necessary skilled staff and the necessity of planning on long timescales.

There is also significant difficulty in maintaining the facilities using the current funding structure since the orientation of most funding mechanisms are to research conducted in Southern Canada – often within a university environment – and to shorter timescales than are appropriate for the Arctic.

In 2009, the government of Canada implemented the one-time Arctic Research Infrastructure Fund in the amount of $85M to expand and upgrade Arctic research infrastructure and that funding was much appreciated and was well-used. However, the issue of maintaining and operating these facilities was neither addressed in that funding nor has it been in the decade following. This has left an evident gap in Arctic research infrastructure support. As a result, the full impact of the Arctic Research Infrastructure Fund has yet to be fulfilled as there is capacity in the current facilities which cannot be utilised for lack of funding.

The founding of the Canadian High Arctic Research Station (CHARS) and Polar knowledge Canada are welcome developments, but these apply to one locality around Cambridge Bay and do not satisfy the needs of the vast Canadian Arctic.

Proposal

The government should institute a competitive peer-reviewed Arctic Research Infrastructure Support Fund. **[R-1]** This fund will hep to ensure Canada's competitiveness in Arctic research and continue the significant work of the Arctic Research Infrastructure Fund by supplying the support for maintaining and operating our Arctic research infrastructure.

That the government provide funding in the amount of $10M per year for the Arctic Research Infrastructure Support Fund **[R-2]**

It is recognised that already many federal, provincial and territorial departments support their own or partner facilities in the Arctic that are relevant to their mandates. Some of these facilities are also members of

CNNRO. This funding is not intended to substitute for these activities. It is intended to fill significant funding gaps that exist because of the inadequacy of current funding mechanisms.

The current funding mechanisms are inadequate for this activity for a number of reasons:

- They do not cover the unusual requirements of these facilities. For example, facilities frequently have to deal with issues of utilities (power, water, sewage, internet) that in a more southerly environment would be assumed to be readily available;
- they assume support from a university campus which is not available in Northern locations;
- they require matching non-governmental funds which become progressively more difficult to acquire the further North the facility is located;
- they do not properly account for the high cost of research in the Arctic either through a lack of funds or not permitting the necessary expenditures to put together a complete research program; and
- the length of time of the funds is too limited resulting in a very uncertain research environment.

A quote from a report of the Natural Sciences and Engineering Research Council report “From Crisis to Opportunity”, 2000 reads “*Many question the wisdom of encouraging students to commence or continue a research career related to the North because of lack of funding, the length of time taken to publish research related to the North (in a funding environment that is linked to productivity), and the difficulties of mounting and sustaining expensive field programs in a region where unpredictable local conditions can adversely affect research outcomes.”* With some limited exceptions, the situation has not changed much in the nearly two decades since that report was written.

We need to make changes to make Arctic research a viable choice for students, senior researchers, senior researchers, and those living in Arctic communities and to do that we need a network of properly resourced fixed stations as well as mobile assets.

The theme of this budget is Ensuring Canada's Competitiveness. Canada has had a long and distinguished record of Arctic research and that is a practical necessity because of the fraction of the country that is in the Arctic, together with the northern society, culture, resources and land area. What we are seeing is that Canada is steadily slipping in international reputation as other countries including Korea, Japan, China and Russia ramp up their research and other activities in the area. For example: In the last decade, a period when the Polar Environment Atmospheric Research Laboratory (PEARL) at Eureka, Nunavut in the extremely High Arctic has repeatedly struggled to obtain funding for continued operation, Denmark has constructed and now operates the Villum Research Station, Station Nord in Greenland at a similar latitude. If we are to ensure Canada's competitiveness, we need to ensure that Canada's Arctic scientists have easy and affordable access within Canada to the Arctic facilities needed to conduct their research.
This fund would also be an opportunity to ensure Canada's Competitiveness in Arctic research by supporting research designed and conducted by northerners that addresses their needs. This will provide a different view of Arctic research and will assist the government in working towards its goals of Truth and Reconciliation.

It would also allow the opportunity for long-term research partnerships between academia/government/communities creating a more sustainable research environment in the Arctic.

Does the Canadian High Arctic Research Station (CHARS) satisfy the requirement? It is a part of the solution, but it is not the whole solution. The Canadian High Arctic Research Station is located in Cambridge Bay with an Experimental and Reference Area about 300km around the station, but the Arctic is so large that even if a truly comprehensive program of research were conducted there, it would not satisfy the needs of the entire Canadian Arctic. The Kluane Lake research station in the Yukon is 1,700km from Cambridge Bay, the Centre d'études nordique Kuujjuarapik research station is 2,057 km away, the PEARL station is 1,300km away and the Labrador Institute Research Station is 2,600km away. These various locations across Canada's North have entirely different conditions in almost all variables. A comparison in Southern Canada is that of the distance between Toronto, Ontario and Miami, Florida. These are about 2,000km apart and they have obviously very different environments and therefore very different research

needs. We would never consider that measurements made in Miami were typical of Toronto.

The Arctic is a vast and very diverse region and we need a properly-resourced network of Arctic stations across the entire Canadian Arctic to perform the necessary research.

Details

The Arctic Research Infrastructure Support Fund should be administered on a competitive peer-reviewed basis to ensure that the facilities funded conduct research to the highest international standard.

This fund should be accessible by all Arctic rights holders, allowing non-academic community and Indigenous organizations to opportunity to compete for funding.

The review process should give representation to all Arctic rights holders and should include disinterested experts in the field of Arctic science and/or Arctic infrastructure support.

The criteria for funding should encompass the operation, physical location and societal situation of the infrastructure in Canada. There are a wide variety of situations: some facilities are embedded in communities and some facilities are remote from any community. As a result, some facilities have heavy local involvement, and some have very little. Some facilities have many resources locally available, some have to be entirely self-reliant.

Funding term should be at least five years and should be renewable. Renewal applications should be entertained more than a year ahead of the renewal date to remove the “cliff-hanger” issues of whether a renewal is going to happen or not. The conditions in the Arctic mean that ramping a facility down takes significant time and effort.

Conclusion

The Arctic Research Infrastructure Support Fund, by providing support for Arctic research infrastructure will permit full operation of existing infrastructure and foster the further development of research partnerships

between academia/government/communities. This will contribute to Canada's competitiveness in this area for the future.

About the Canadian Network of Northern Research Operators

The CNNRO is a network of research support facilities providing specialized technical services to academic, government, private and international scientific research sectors. Our member facilities provide the know-how and infrastructure that make research possible in our nation's Arctic and sub-Arctic regions. Our network is at the cutting edge of knowledge creation in northern Canada.

CNNRO member facilities range from oceanographic research vessels and long-established research institutes and observatories, to seasonal field stations and un-staffed remote monitoring installations. We are widespread, representing every major ecological region in Canada's North.

CNNRO's mission is to advance the collective interests of Canada's northern research infrastructure operators through coordination, outreach and joint action in order to help them achieve excellence in technical and logistical support individually and as a network.