Canada Foundation for **Innovation**

Dr Gilles G Patry, President and CEO, explains why there is such a need for collaboration when it comes to research in the Arctic and our oceans, and how a collective international voice at the forthcoming Rome 2013 Symposium on Arctic and Marine Research Infrastructure will go a long way to developing key strategic priorities

ON NEW YEAR'S DAY this year, the temperature in Cambridge Bay, Nunavut, reached a bone-chilling low of -32.2 °C, not far off the monthly average of -29.7 °C. Home to the soon-to-be-built Canadian High Arctic Research Station, Cambridge Bay is on the southeast coast of Victoria Island in the Arctic Archipelago, a string of islands that extend farther north into the Arctic Ocean.

Although the hamlet of about 1,500 permanent residents is on the fabled Northwest Passage, visitors usually travel in and out by airplane. Between October and July, the bay is covered by up to two meters of sea ice, impenetrable to all but the most powerful icebreakers. There is a short window of ice-free ship passage most summers which has been happening more frequently of late. Although much has been said about the effects of a warming planet on the Arctic, the fact remains that it is a remote and hostile environment.

Conducting research in such conditions is a massive challenge requiring dedication, skill and significant resources, the cost of which is often far beyond the capacity of any one nation. However, research is essential if we expect to continue to live in the Arctic and mitigate the impacts of human activity on its unique environment.

We simply don't know how to conduct many of the activities that are routine in southern latitudes. Nor do we have a comprehensive understanding of the Arctic ecosystem and what is at risk. The knowledge we need to safely and efficiently conduct oil and gas extraction, mine for precious metals, sustainably harvest fish and other protein sources, undertake security operations, and support local social and economic development does not yet exist. And it will only be through the efforts of Canadian scientists, across a broad range of disciplines, that such expertise will be made available.

The Arctic environment is not the only constraint. In today's tough fiscal environment, funding the infrastructure necessary to conduct research in the Arctic – icebreakers, aircraft, remote-controlled submarines, satellite-linked sensor networks and research stations – is also a major challenge for all nations interested in both exploiting and protecting Arctic resources. Many countries, including Canada, are investing in such infrastructure, but it will only be through collaboration in the development and use of this expensive and often unique equipment that we can obtain the knowledge we seek.

To help stimulate and foster this collaboration, the Canada Foundation for Innovation is partnering with the European Commission and the US National Science Foundation to hold a symposium on the development and use of both Arctic and marine research infrastructure. To be held in Rome this September, the symposium will bring together many of the world's leading experts in Arctic and marine science, the managers of the large-scale infrastructures these experts need to conduct their work, and the senior funding agency decision makers who allocate the financial resources. Marine research is included for two reasons: Arctic and marine environments are both often hostile, remote and difficult working environments; and the infrastructure required to conduct research in both environments has a tendency to be large-scale and exceptionally expensive.

Ensuring that all nations involved can use the research infrastructure they fund to the maximum extent possible is the central goal of the symposium. The participants also hope to identify current trends in Arctic and marine research and the development of the associated infrastructure, as well as articulating the contributions that infrastructure can make to scientific research and innovation capacity, and sharing experiences, lessons learned and best practices.

The symposium will be a first step toward greater understanding of the priorities, pressures and scientific potential around research infrastructure. Ultimately, it will lead to recommendations that allow all nations to address the policy, programme, financial and operational barriers face by collaboration.

The symposium will also foster an ongoing exchange between Europe, Canada and the US on how best to support their researchers as they explore the oceans and the Arctic and develop the technologies we need to operate in such a remote and hostile environment. In taking this step, we will obtain the maximum amount of useful knowledge out of our investments.

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