

Evidence for Democracy's Feedback to the Department of Finance in Advance of Budget 2019

Executive Summary:

Science and technology is fundamentally important for Canada and Canadians. Scientific research advances our understanding of the world, betters our economy and improves our health, safety, and security. It generates new and innovative ideas, provides job opportunities for our children and grandchildren, and enhances the well-being of Canadians. Investments in scientific research are truly investments in Canada.

Budget 2018 made an historic investment in fundamental research. Moving forward, Budget 2019 provides additional opportunities for the government to continue supporting science and research both intramurally and extramurally. We believe that the following four recommendations will help Canada be more competitive internationally, successfully prepare for the jobs of tomorrow, support our growing middle class, and improve the health and well-being of Canadians:

1. **Increase and harmonize post-secondary scholarships and support for students and post-doctoral fellowships by increasing base support to \$140 million over four years**
2. **Ensure support for the full costs of academic research by increasing the Research Support Fund**
3. **Strengthen federal government science through increased capacity, more mechanisms for science advice, and resources to support implementation of science integrity policies**
4. **Investment of \$10-15 million over 5 years in partnership-based climate and atmospheric research, especially in the Arctic**

Introduction

Budget 2018 provided a historical boost to research funding in Canada. In 2019, the government should build on this investment to ensure this funding reaches the programs, areas, and personnel that need it most.

Investments in science means investment in people. Labs and research facilities across the country employ and train thousands of students, equipping them with the necessary qualifications and skills needed for the jobs of tomorrow.

The federal government employs thousands of scientists and researchers who carry out the public science that keeps us all safe and prosperous, and allows us to address future challenges. By continuing to invest in intramural science done within government, extramural science done outside of government, and partnerships between these two, Canada will continue to be economically

competitive, and our health, safety, and environment, will benefit. This means better jobs for Canadians, better outcomes for our Canadian middle class, and a healthier Canada.

Our Budget 2019 recommendations are split into two groups: **Better Jobs, Today and Tomorrow** and; **Standing Up for the Middle Class, and A Healthier Canada**.

[Better Jobs, Today and Tomorrow](#)

Support for Extramural Science

As the economy changes, and new technologies and opportunities arise, it is important that Canadians have the skills required to succeed and be competitive in the changing job market. Training in STEM fields is becoming increasingly important to secure good jobs for Canadians of the future. Young people of today will make up the workforce of tomorrow, and it is important that the federal government provide new opportunities for training in these important fields.

In 2016, the government undertook a review of the federal funding and support landscape for Canadian academic research and science. The “Fundamental Science Review,” published in 2017, was a comprehensive roadmap for the government to rebuild research in Canada over stages and years. The government responded to this review with an historic investment in research in Budget 2018. Of note, we were thrilled to see new investment of \$925M for the Tri-Council Agencies, and support for early career researchers.

However, there are still gaps that should be addressed with regard to direct funding for scientific trainees. Further investment in scholarships and fellowships will be a key contributor to training Canada’s next generation of scientists, and preparing for jobs of tomorrow. As such, the government should build on their Budget 2018 investment by undertaking two additional actions:

Recommendation: Increase and harmonize post-secondary scholarships and support for students and post-doctoral fellowships by increasing base support to \$140 million over four years.

Focusing on highly-qualified personnel (HQP) will make Canada more competitive, prepared to address the future of work, and will put Canada on the path to becoming a leader in cutting edge fields. Students, trainees, and post-doctoral fellows present Canada’s best opportunity to invest in HQP.

Canada should increase investments in scholarships and supports for students both by increasing the amount of funds available, and increasing the number of scholarships and support mechanisms for students and post-doctoral fellowships. This can happen through an investment of \$140 million over 4 years, as is suggested in the government-initiated Fundamental Science Review. The government should also consider removing the restrictions

on international portability of scholarships so Canadian students can be supported in studying abroad, and return home with new and international skills.

Building on commitments to science, and to reconciliation, Canada should also increase support for Indigenous researchers and students, through specific programs and funding aimed to increase support mechanisms for Indigenous students and researchers at all career stages. In addition, the government should consider this specifically when crafting diversity, equity, and inclusion commitments in science and research. When international programs like Athena-SWAN (Scientific Women's Academic Network) are brought into Canada to increase diversity, equity and inclusion, they must address and consider the inclusion of Indigenous people in Canada. This means a made-in-Canada approach to diversity, equity, and inclusion is necessary to address our commitments to reconciliation.

Recommendation: Ensure support for the full costs of research through the Research Support Fund.

Building on investments made in Budget 2018, the government should consider increasing investments in the Research Support Fund (RSF), in line with suggested amounts in the Fundamental Science Review.

Increasing the RSF helps to ensure the full costs of research are not put solely on universities and institutions, which in turn often have to raise tuition fees and demands on student payments. Not only will it help support cutting edge research, but investments in the RSF can help ensure financial demands on students and trainees are not deepened in the future.

[Standing Up for the Middle Class and A Healthier Canada](#)

Budget 2018 built on historic investments to strengthen the economy, encourage job creation, and grow the middle class. One way in which the Government can continue to ensure that middle class Canadians benefit from economic growth and achieve improved quality of life is through **investments in science and innovation**. In the long term, these investments can also help to improve the health and safety of Canadians.

Support for Intramural Science

The government is addressing its promises to strengthen government science, and ensure federal scientists are provided safeguards for communicating science, and carrying out their work free from undue political interference. The recent adoption of model scientific integrity policy is a great example of positive steps forward. However, scientific integrity also relies on capacity. Without sufficient capacity and resources, federal scientists cannot carry out the mandate of their departments to keep Canadians safe, healthy, and prosperous.

Recommendation: Strengthen federal government science through increased capacity, more mechanisms for science advice and resources to support implementation of science integrity policies.

E4D recommends increasing federal government support for the resourcing of federal research and development. While the government previously hired new scientists to recover from downward trends over many years, the number of personnel engaged in science and technology is projected to fall in 2018/19.

Between 2012 and 2014, \$223 million in government funding for intramural science was eliminated. While Budget 2018 made significant investments in federal science, funding levels have still not reached levels previously achieved in 2011. A recent public opinion study by PIPSC indicates that 72% of Canadians would like to see federal science funding restored to 2011 levels in the next federal budget.

Capacity is also reflected in the resources available to scientists to carry out their departments' mandates, not just in numbers of scientists employed within a given department. A 2017 survey of federal scientists indicates that 58% "believe that their department does not have sufficient resources to meet its mandate". Investments in training, skills, and education programs for federal scientists and staff, as well as additional mechanisms to ensure federal research is incorporated into policy and decisions, as described in the model scientific integrity policy will be key to ensuring federal scientists have the capacity to do their jobs. A particular focus should be given to ensuring resources for scientists to actively participate in, and travel to, scientific conferences and be involved in international collaboration. In addition, ensuring every science-based department has a departmental chief scientist will help increase scientific integrity and capacity across government, and ensure a whole-of-government approach to science advice and evidence-informed decision-making. While many departments do have a chief scientist, the government should ensure that this is true of every science-based department and agency.

The government should invest additional resources directly in the research and development activities that support Canadians' well-being, economic growth, environmental health, and our futures. A deeper look into federal science capacity is warranted. Investigation and recommendations from the Chief Science Advisor, as well as departmental chief scientists, on methods of rebuilding the public service's scientific capacity should be undertaken and welcomed by this government. Establishing both baseline measurements as well as objectives and a coherent federal science strategy would benefit Canadian scientific capacity.

Investment in Climate Science

Recommendation: Investment of \$10-15 million over 5 years in partnership-based climate and atmospheric research, especially in the Arctic.

Canadians and Canadian businesses depend on high quality scientific information about weather, climate, and air quality to plan everyday activities, make informed financial and business decisions, and develop effective infrastructure designs for their communities. Beyond this, Canadians turn to

scientific experts in these areas to understand extreme events, variations and changes in climate, and related impacts. There is a strong business case, and a strong case in terms of the public interest and value to society, for ongoing investments to support these services and expertise.

However, a number of high-profile climate, atmospheric, and Arctic research programs have closed or faced funding challenges over the past year. While our climate is rapidly changing, and Canada, with its geography, human talent, knowledge base, and infrastructure, is uniquely positioned to address this challenge, it is not fully utilizing its capacities in this area. Canada could, and should, be leading the way in climate and atmospheric research, particularly in the Arctic, but unfortunately funding and support for this research has been cut. Research capacity that has taken years to build has been diminished, along with the ability to respond to emerging challenges.

Given the Government's commitment to addressing climate change, atmospheric and climate science should be at the forefront of funding priorities. This research not only ensures that our measurements, models, and predictions for our changing climate are up-to-date, it ensures that we retain our uniquely trained students, postdoctoral fellows, and junior faculty and maintain diversity in research capacity in Canada. Realization of a thriving research environment that enables both discovery and application requires excellence in fundamental research ("discovery research") as well as partnerships between academic institutions and government departments, industry, and local and Indigenous communities to enable application-to-discovery and discovery-to-application.

Canada is an Arctic nation. To reach its potential as a world-leader in Arctic and climate research, it needs to invest in long-term research programs. For example, while the Canadian High Arctic Research Station (CHARS) is a valuable asset to Canadian stewardship of polar science, facilities like the Polar Environment Atmospheric Research Laboratory (PEARL) and others in the Canadian Network of Northern Research Operators (CNNRO) are unique platforms for Canadian atmospheric and climate science with strengths and capabilities that CHARS lacks. Of note, while the government recently announced temporary bridge funding for PEARL, without a comprehensive, long-term solution, PEARL and other climate and atmospheric research projects will end in 2019.

Many scientific issues need to be studied to assess the multiform impacts of climate change across all of Canada, including hydrology, the occurrence of high impact weather events, and air quality.

The proposed investment of \$10-15 million/year in university-led, fundamental and partnership-based climate and atmospheric research (including collaborative projects with government researchers, industry, and international partners) would provide a stable funding environment for the science that Canada needs to monitor, model, and plan for climate change.

Conclusion

Through smart contributions towards government science and academia, Canada will be investing in the highly-qualified personnel we rely on to keep us competitive. These are the government scientists, academics, students and early-career researchers who carry out the



science that keeps us at the cutting edge of discovery, innovation, and protections for the environment and our health.

A particular focus on building upon Canada's response to the Fundamental Science Review will help ensure investments made in Budget 2018 are impactful. An increase to scholarships and supports for students and post-doctoral fellows will not only support hard-working youth in Canada, but support the research, and researchers, who will prepare us for the jobs of tomorrow.

Investing in science that builds connections between academia, government science, and business, will prove to be beneficial for the Canadian economy and environment. By investing in academic, partnership-based atmospheric and climate science, we can leverage our advantage as an Arctic nation, and ensure we are making climate policy based on the best available evidence.

Programs and resources to ensure government scientists have the capacity to do the research that informs our health, economic, and environmental policy is integral to scientific integrity, the future of public science, and our democracy.



Evidence for Democracy (E4D) is the leading fact-driven, non-partisan, not-for-profit organization promoting the transparent use of evidence in government decision-making in Canada.

Through research, education and issue campaigns, we engage and empower the science community while cultivating public and political demand for evidence-based decision-making.

Contact: **Kimberly Girling**

E. kimberly@evidencefordemocracy.ca

O. 613-909-8870 C. 613-866-7787

Evidence for Democracy

123 Slater St, 6th Floor

Ottawa ON K1P 5H2

E4D would like to thank the CMOS ARRCU-SIG (Canadian Meteorological and Oceanographic Society's Special Interest Group on Atmosphere Related Research in Canadian Universities) and the Professional Institute for the Public Service of Canada (PIPSC) for their help and assistance in researching this budget feedback.