





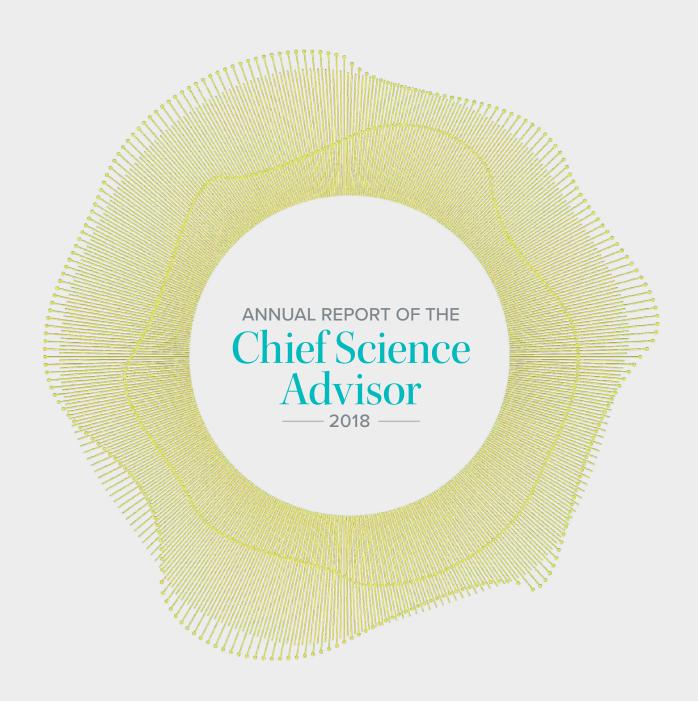
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On September 26, 2017, Dr. Nemer met with Prime Minister Justin Trudeau and Minister of Science Kirsty Duncan before being announced as Canada's new Chief Science Advisor.

January 28, 2019

The Right Honourable Justin Trudeau Prime Minister Government of Canada

The Honourable Kirsty Duncan Minister of Science and Sport Government of Canada

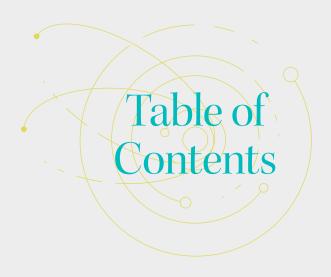
ANNUAL REPORT OF THE CHIEF SCIENCE ADVISOR 2018

Dear Prime Minister Trudeau and Minister Duncan,

I am very pleased to submit my first annual report as Chief Science Advisor. It has been my honour to serve science and serve Canada during that first year; I am grateful to you both for your trust and support. It is clear that the current social climate is an auspicious one for Canadian research and innovation: the public is curious and supportive, policy makers are attentive, and the science community is energized. There is no better time for us all to align our efforts and work together with purpose.

Sincerely,

Dr. Mona Nemer, C.M., C.Q., FRSC Chief Science Advisor Government of Canada



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The following report outlines the major activities of the Office of the Chief Science Advisor for Canada over the course of its first full year. These activities include, among others, developing the *Model Policy on Scientific Integrity*, providing principles and insights relevant to science-based decision-making across government, establishing a federal science advisory function, and advising on how to better support quality scientific research within the federal government.

The Report also identifies the Office's priority areas of action for the year ahead. In addition to ongoing support for activities begun in 2018, these areas include creating a roadmap for open science, reviewing the impact assessment process for the Canadian Environmental Assessment Agency, advising on how to expand the role of national academies in the Canadian science enterprise, and establishing a Youth Advisory

Committee to ensure good communications with the next generation of researchers.

The final section contains observations and recommendations on the state of federal government science. Despite recent federal efforts such as the creation of the Deputy Ministers Science Committee, the Deputy Ministers Group on Climate Change, and the Canada Research Coordinating Committee, there is still an acute need to better coordinate the various organizational mandates in support of science in Canada. The section also argues for enhanced participation of Canada in international research projects and science diplomacy, making the suggestion, among others, that the Canadian scientific diaspora could be mobilized to that end. The section concludes that better data are necessary to properly assess the state of the federal science workforce, as has been requested of the Office.



Healthy and prosperous societies depend on new knowledge, informed citizens, and sound governance. Science and research prepare us for the future by generating ideas, training tomorrow's leaders, supporting innovation and job creation, and providing the evidence needed for good decisions. They also provide a wellspring for collective pride and a platform for international cooperation.

"We promised we would do more to promote science and to let evidence guide the decisions we make as a government... Dr. Nemer will advise me, the Minister of Science, and other members of Cabinet as needed on scientific issues of national importance. She will provide advice to ensure that we have the evidence we need to make good decisions for all Canadians..."

 THE RIGHT HONOURABLE JUSTIN TRUDEAU, PARLIAMENT HILL, SEPTEMBER 26, 2017

Canadians have many reasons to share in this pride. In 2018, Canada saw several remarkable developments in its science enterprise: an historic budget for research, a hugely successful science-focussed G7 summit, a very inspiring Nobel win for one of our extraordinary women in science, and innumerable discoveries by our researchers.

2018 also represents the first full year of Canada's newly created Office of the Chief Science Advisor. In the report that follows, I highlight my office's major activities in 2018. These activities have been largely dictated by the following mandated functions of the position:

- to provide advice on the development and implementation of guidelines to ensure that government science is fully available to the public and that federal scientists are able to speak freely about their work;
- to provide advice on creating and implementing processes to ensure that scientific analyses are considered when the Government makes decision;
- to assess and recommend ways to improve the existing science advisory function within the federal government; and
- to assess and recommend ways for the Government to better support quality scientific research within the federal system.
- to provide and coordinate expert advice to the Minister of Science and members of Cabinet, as appropriate and requested, on key scientific issues, including the preparation of research and foresight papers for public dissemination.
- to promote a positive and productive dialogue between federal scientists and academia, both in Canada and abroad, and raise awareness of scientific issues relevant to the Canadian public.

Key 2018 Achievements

MODEL POLICY ON SCIENTIFIC INTEGRITY

Communication of science is vital to ensuring an informed citizenry and healthy and engaged society. It underpins our democratic processes. Yet moving science from the field or lab and into the public discourse requires considerable time, effort and resources. It is important that researchers understand their obligations to convey the results of their work and participate in public dissemination of their research.

This is important for a number of reasons, not least of which is to help clarify what science is and what it is not. It is critical that non-scientists understand the uncertainty of the scientific process, and it is incumbent on science communicators (whether researchers themselves or those who work alongside them) to help the public appreciate the probabilistic nature of scientific results.

A recent national public survey found that eight in ten respondents wanted to know more about science and how it affects our world, and roughly the same percentage of people are comfortable knowing that scientific answers may not be definitive. While this would seem to be a positive result, it may also suggest why some people mistrust science, believing that results are fluid

and can support several different positions. Again, this reveals the importance of effectively communicating science, not only to counter misinformation, but to inspire critical thinking and an appreciation for curiosity and discovery.

The Government of Canada has committed to prioritizing science and evidence in decision-making. Ensuring that principles become policy and that policy becomes action often requires the support of clear and specific behavioural guidelines. To that end, the Government requested the advice of the Office of the Chief Science Advisor on directives for responsibly conducting, communicating, and using federal research and science.

In response to this request, my office worked with the Treasury Board Secretariat (the employer for the largest contingent of federal scientists) and the Professional Institute of the Public Service of Canada (the union representing the largest contingent of federal scientists), to develop a model policy on scientific integrity. Consultations took place in spring 2018 with science-based departments and agencies, as well as others with an interest in science, contributing their knowledge and insight.

¹ Ontario Science Centre. Canadian Science Attitudes Research (July 6, 2018).



The result was the Model Policy on Scientific Integrity made public on July 30, 2018. It provides a clear statement to federal scientists on how they can speak openly about their work and a framework for employers and employees on the conduct of government science.

Following the publication of the Model Policy, my office worked with members of the federal science community to establish supporting guidelines for implementing these policies in federal departments and agencies. Adoption of this framework gives assurance that federal organizations are a credible source of scientific information. Appropriate processes will be in place to address any concerns of a breach with the principles of scientific integrity, and employees may contribute to the formulation of advice for decision-making based on the contributions of their science and research.

This is an important step forward for the Government of Canada in bringing principles and standards for federal science in line with practices in the broader scientific community; as such, the Model Policy will not only serve for the benefit of federal science, but will also help facilitate collaboration with the broader scientific community.

"In our modern technological age, when our very survival depends on discovery, innovation and science, it is critical, absolutely critical, that our scientists are free to undertake their work, free to collaborate with other scientists, free to speak to the media and free to speak to the public."

 THE HONOURABLE KIRSTY DUNCAN, TED2018, APRIL 2018 Throughout the year, my office was called upon to provide advice to decision-makers from across government on diverse topics ranging from climate change research to oceans, from health to the roll-out of funding and strategies for science and research announced in the 2018 federal budget.

We dedicated significant effort to the Independent Expert Panel on Aquaculture Science, which I chaired. The twelve-member panel, made up of domestic and international experts, was asked to provide advice and recommendations in three areas, namely:

- the consideration of scientific evidence in risk-based processes that affect aquaculture management;
- priority-setting for aquaculture science at Fisheries and Oceans Canada (DFO); and
- better public communication of how aquaculture science informs decisions.

The Panel presented its report to the Minister of Fisheries and Oceans and the Canadian Coast Guard and the Minister of Science and Sport in December 2018. The Panel's advice is specific to aquaculture and DFO, but embedded within it are principles and insights broadly relevant to science-based decision-making elsewhere in government.

Key recommendations for the use of science in management decisions

Awareness and communication of risks – have a transparent, inclusive, and credible process to establish acceptable thresholds for risk, make them known, then monitor and enforce compliance.

Priority-setting —
map activities, identify
information gaps, revisit
direction at regular junctures
to ensure alignment of
priorities against new
information, and involve
external experts at the
various stages of the
research plan development
and execution.

communication –
ensure decision-making
roles and responsibilities
are known, clearly separate
science for innovation and
science for regulation, and
proactively produce and
share the science that goes
into making decisions.



Science and scientific information permeate the work of the federal government, creating a continuous need for decision-makers to negotiate uncertainty in interpreting often variable and generally incomplete scientific evidence for policy making. With science and technology increasingly a part of daily life, the need for science advice will only intensify.

As such, my office has been asked to assess and recommend ways to improve the existing science advisory function within the federal government. To that end, we examined the science advisory systems in other countries, such as Australia, New Zealand, the United Kingdom, and the United States, as well as the European Union.

Strong national institutions are essential for supporting and sustaining a robust ecosystem of science advice and public engagement.

A key feature of all the systems was a network of department-level science advisors. These are subject matter experts who work closely with senior departmental officials and support the mandate of the chief science advisor. They stand apart from day-to-day operations and provide a neutral sounding board for senior officials and decision-makers evaluating various streams of

information. They also facilitate the incorporation of evidence in decision-making processes and act as a link between the department and external stakeholders.

However, strengthening a national science advisory system is no small feat. In addition to a federal government science advisor and a network of departmental and subnational science advisors, it must include science academies and associations. Each plays a distinct and complementary role in gathering evidence, convening experts, and communicating with the public, decision-makers, and stakeholders. Strong national institutions are essential for supporting and sustaining a robust ecosystem of science advice and public engagement.

I am pleased to report that our efforts to foster a Canadian science advisory network are already bearing fruit. Four organizations have so far moved to create a departmental science advisor position, and the first incumbents at the Canadian Space Agency and the National Research Council are now in place. I have every confidence that the network of departmental science advisors will play an important role in enhancing science advice and science activities planning, especially on cross-cutting issues.

The long-established U.K. science advisory system – after which the Australian and New Zealand systems are partially modelled – is characterized by a number of features in addition to a Government Chief Scientific Advisor who provides advice to the Prime Minister and members of Cabinet:

 a network of departmental and regional chief scientific advisors;

- support from a Government Office for Science;
- an external advisory
 Council for Science and
 Technology, co-chaired
 by the Chief Scientific
 Advisor and supported
 by the Government Office
 for Science; and
- close working relationships with the U.K.'s learned societies and National Academies.

Taken together, this system provides for coordination among organizations, creates a great depth of diverse subject-matter expertise, and fosters capacity within organizations and regions, including for science advice for national emergencies. It also provides ready access to capacity for scientific assessments on an as-needed basis.

ADVICE ON SUPPORTING FEDERAL SCIENCE INFRASTRUCTURE

The Budget 2018 commitment of \$2.8 billion to build multi-purpose, collaborative federal science and technology facilities presents a once-in-ageneration opportunity to establish a strong foundation for Canada's future federal science enterprise. Similarly momentous opportunities exist to create a Digital Research Infrastructure Strategy for extramural science and a strategic national approach to Major Research Facilities.

Over the past year, my office has participated in the discussion around these potentially transformative initiatives. We offered perspectives on the evidence needed to guide decisions regarding the kind of science infrastructure that can support the increasingly collaborative and multidisciplinary nature of science.

Among other things, I took an active part in the deliberations of the Deputy Ministers Science Committee (DMSC) and in the production of recommendations to Cabinet with respect to federal science infrastructure renewal. I have also analyzed the evolving nature and needs for national science facilities that support the Canadian science community.

Success in building the science infrastructure of the next 50 years and propelling Canadian science and research to new heights will require that the multiple decisions around these foundational initiatives dovetail based on a deep and integrated

Ultimately, these infrastructure investments will need to support a collective vision and strategy for science in Canada...

understanding of Canada's science system and commitment to maintaining a long-term vision.

Ultimately, these infrastructure investments will need to support a collective vision and strategy for science in Canada, including which functions federal science should perform, and which should be shared with or carried out separately by academic and private sector researchers, in Canada and abroad. These are some of the essential considerations that must guide questions of infrastructure and resource allocation.

Over the past two years, the Treasury Board Secretariat has worked with the federal science community to develop an inventory of federal science infrastructure.

The project was successful in creating a comprehensive list of federal science facilities and documenting their state of repair. It reveals that some 40 percent of facilities are more than

50 years old and another 40 percent are more than 25 years old. The problem is most acute in the National Capital Region.

A similar inventory of research equipment is now underway. This will allow for effective coordination of research activities across organizations and with external collaborators.

The Canada Foundation for Innovation, which provides

federal funding toward the costs of academic research infrastructure, has created a platform upon which this work will build.

When completed in 2019, this initiative will provide the most complete picture of Canada's major research equipment. The information will enable better planning and cooperation within and among research organizations.





In November 2018, the Chief Science Advisor participated in several panel discussions at the Canadian Science Policy Conference.

In this past year, my office has engaged with a variety of scholarly and public audiences to bring attention to Canadian science and be part of conversations around scientific and science policy issues important to Canadians.

These included events like the Let's Talk Science Canada 2067 STEM Talks and the Perimeter Institute's Inspiring Future Women in Science Conference that encouraged young people's curiosity in science and highlighted the rewards of a science career. Events like the Institute for Science, Society and Policy-Royal Canadian Institute for Science Lecture Series (featuring a

public discussion on the scientific and ethical dimensions of gene editing), and interviews with shows with broad audiences like the CBC's *Cross Country Check-Up* and Radio-Canada's *Le 21e*, provided us with an opportunity to help raise the profile of scientific issues in public discourse.

Additionally, appearances in science-focussed publications like *Québec Science* and the prestigious American journal, *Science*, helped our office highlight the ways science can inform decision-making on issues that affect the public, while also showcasing Canada's approach to science.





The Chief Science Advisor with French Minister of Higher Education, Research and Innovation Frédérique Vidal; Canadian Minister of Science Kirsty Duncan; and French Ambassador to Canada Kareen Rispal.

Canada's strength in science gives our country a platform to reinforce international ties and advance global cooperation. The themes for our 2018 G7 presidency are a case in point, ranging from climate change and ocean sustainability, to preparing for the jobs of the future while ensuring a peaceful and secure world. Addressing issues such as these, and objectives like the *United Nations Sustainable Development Goals*, requires decision-makers to grapple with huge amounts of scientific information. Generating the needed information and advice necessitates quality data, special infrastructure, and coherent multi-institutional and multi-national approaches from international partners.

Having a chief science advisor has amplified Canada's voice at international tables, notably those seeking to identify opportunities for strategic international research alignment and collaboration, especially as these relate to providing evidence for policy action on shared global challenges such as the United Nations Sustainable Development Goals. In 2018, my office had the opportunity to become involved with the International Network for Government Science Advice (INGSA), and to attend meetings of the new Commonwealth Science Advisory Network, the Foreign Ministries Science and Technology Advisory Network, and the European Commission's Science Advisory Mechanism. We also worked to support Canada's participation

in international scientific cooperation efforts, such as those at CERN – one of the world's most sophisticated science facilities focused on particle physics – and in specific research areas, like ocean micro-plastics and artificial intelligence.

In December 2018, I was the master of ceremonies of the G7 *Multi-Stakeholder Conference on Artificial Intelligence* in Montreal. Building upon the G7 *Innovation Ministers' Statement on Artificial Intelligence*, which was signed earlier in the year, this gathering focused on how to enable environments that foster societal trust and the responsible adoption of artificial intelligence, and was an excellent showcase for Canada's leadership in this field.

Throughout the year, my office also worked to advance scientific cooperation in support of international relations through interactions with the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Commission for Science and Technology for Development, the Organization for Economic Cooperation and Development (OECD), and the World Health Organization (WHO). Bilaterally, we have had exchanges with representatives of science advisory and support systems from France, Germany, New Zealand, the United Kingdom, and the United States of America, all of whom signalled interest in enhancing collaboration with Canada.



Science Diplomacy

"The concept of science diplomacy was given contemporary emphasis and currency by a meeting held in 2009 at Wilton House, United Kingdom, sponsored by the Royal Society (London) and the American Association for the Advancement of Science (AAAS), publisher of Science & Diplomacy...

The most influential outcome of that meeting was the development of a taxonomy for science diplomacy that has come to be widely used:

- Science in diplomacy: Science providing advice to inform and support foreign policy objectives
- **Diplomacy for science:** Diplomacy facilitating international scientific cooperation
- Science for diplomacy: Scientific cooperation improving international relations"
- Vaughan C. Turekian, Peter D. Gluckman, Teruo Kishi, and Robin W.
 Grimes, "Science Diplomacy: A Pragmatic Perspective from the Inside,"
 Science & Diplomacy (January 2018)



In September 2018, I travelled with Governor General Julie Payette, Minister of Science and Sport Kirsty Duncan, and a team of excellent researchers to the Hamlet of Pangnirtung, in Nunavut. We then boarded the Canadian research icebreaker CCGS Amundsen, in Qikiqtarjuaq, for a 36-hour scientific program to explore the Arctic Ocean. While there, I had the opportunity to speak with many of the Inuit and northerners who are at the forefront of the changes taking place in the Arctic.

I firmly believe that effective dialogue requires sensitivity to diversity among people, communities and knowledge systems.

I firmly believe that effective dialogue requires sensitivity to diversity among people,

communities and knowledge systems. My office fully supports the Government of Canada's efforts to make greater use of traditional, community-based and Indigenous knowledge in the scientific work of the federal government.





SCIENCE MEETS PARLIAMENT

The Office of the Chief Science Advisor, in partnership with the Canadian Science Policy Centre, has developed a new program to bring Canada's brightest young scientists to Parliament Hill in order to meet with Members of Parliament and Senators, attend House and Senate committee meetings, discuss scientific research, and gain familiarity with the political process. *Science Meets Parliament* was presented as a pilot project in November 2018, and we hope it will become an annual event.

The initiative promises to build an ongoing dialogue between scientists and politicians to foster close and resilient connections. Strengthening evidence-informed decision-making requires systematic connectivity between the scientific and legislative communities. This program will help to create an open and ongoing channel between the two communities.

TOP-LEFT:

In September 2018, Governor General Julie Payette, Minister of Science Kirsty Duncan and Dr. Nemer participated on an Arctic expedition on the Amundsen icebreaker.

Photo credit: MCpl Mathieu Gaudreault, Rideau Hall

BOTTOM-LEFT:

Meeting with the mayor and the councillor from the municipality of Pangnirtung on Baffin Island.

BELOW:

In November 2018, the Chief Science Advisor co-hosted the inaugural cohort of Science Meets Parliament participants.





ONGOING INITIATIVES

- To ensure effective use of the *Model Policy on Scientific Integrity*, my office will meet with the Treasury Board Secretariat and the Professional Institute of the Public Service of Canada to review progress and propose improvements as necessary.
- My office will remain engaged and support the leadership of science departments and agencies as they plan and build the science infrastructure of the future, including federal science infrastructure, national digital research infrastructure, and a strategic approach to major science facilities.
- I will continue working with the Chair of the Deputy
 Ministers Science Committee to help develop
 a comprehensive picture of the federal science
 workforce and to recommend enhancements.
- As the network of departmental science advisors grows, my office will convene monthly meetings to exchange information and plan joint efforts. I look forward to welcoming new members to the network, so that the Government may further embed science advice at the most senior levels of organizations.

Throughout the year, the Office of the Chief Science Advisor will also respond to specific government requests.

In early 2019, we will be supporting a roundtable to be hosted by the Institute on Governance, involving Indigenous and non-Indigenous leaders from across government, industry and academia. The discussion will explore traditional Indigenous knowledge and scientific knowledge, and how the two systems can be used to inform public policy and decision-making.

My office will be undertaking several new projects in addition to the ongoing initiatives.

Open Science

Increasing access to the reservoirs of knowledge generated by scientific work promises to build public trust and support a more informed public, while accelerating the process of discovery and innovation.

Open science has different facets that include making publications traditionally held behind paywalls accessible for free, storing data in repositories that can be freely and widely accessed, and expanding the process of scientific exploration to include engagement with citizens and keepers of traditional knowledge.

Progress can be seen with the Government's open data initiative, and the federal granting councils' 2015 Tri-Agency Open Access Policy on Publications, which requires that publications resulting from the research they fund be made freely available within 12 months. More recently, Canada also supported a G7 Science and Technology Ministers recommendation to establish an international working group on open science to support the sharing of approaches and best practices. This ongoing effort will no doubt include great interest in a September 2018 declaration spearheaded by Science Europe funders, which states that, as of 2020, publications emerging from publicly funded research must be made immediately available for free.

For its part, Canada needs a roadmap for open science, with a plan that moves beyond an incremental approach drawing on existing resources. In the coming year, my office will be working with senior leadership from federal science-based departments and agencies, in coordination with the federal granting agencies, to create a roadmap by July 2019. The aim is to make the results of federally funded research open and to help Canadian researchers keep pace with the global open science movement.

Impact Assessment Process

We will undertake a review of the methods and integrity of the science used in making decisions under Canada's new impact assessment regime. In 2019, my office will work with the Canadian Environmental Assessment Agency and other federal departments and agencies to identify the data and information required to conduct the review, as well as establish a set of review principles and an appropriate evaluation framework. The review itself will be conducted three years after the coming into force of Bill C-69.

Microplastics

My office will work with Chief Science Advisors (or equivalents) from G7 countries and will host a roundtable on microplastic pollution on February 13, 2019 in Washington D.C. in collaboration with the European Union's Group of Chief Science Advisors. The purpose of the roundtable is to deepen linkages among G7 members and share information to better advise policy measures and actions regarding microplastic pollution and its impacts.

Strengthening Science Advice for Government: Exploring the Role of National Academies

We will explore how Canada's national academies could play a greater role in providing scientific assessments, expert panels, and advice—and how Canada can build a sustainable ecosystem of science advice by tapping into all of the expertise and talent that it has helped develop.

Youth Advisory Committee

Diverse points of view are essential for forming good advice, and the perspective of the upand-coming generation of researchers must be brought to the table. At the request of prominent student representatives, and with support from the Prime Minister's Office, my office will set up a Youth Advisory Committee in 2019. This committee will provide a channel for the ideas and perspectives of Canada's science youth to be brought forward in the conversation about scientific issues that are important to the Canadian public.

The State of Government Science: Observations and Recommendations

ON COORDINATION

As scientific pursuits are increasingly converging and bringing together once disparate fields of inquiry, the need to coordinate among federal organizations, and between federal and academic science, is becoming all the more pressing. Issues where scientific information is critical to decision-making—such as climate science, oceans, energy, artificial intelligence and pandemics—cut across organizational mandates and require a coordinated and integrated approach.

Within the federal government, science and research is carried out or supported in dozens of different organizations with multifaceted relationships with one another and the external scientific community. It is natural for silos to develop over time in large organizations, which is why it is important to have effective governance structures and external expertise brought to bear in supporting a more collaborative effort.

I have participated actively in the recently formalized Deputy Ministers Science Committee (DMSC), in the new Deputy Minister Group on Climate Change, and in the new Canada Research Coordinating Committee (CRCC) announced by the Minister of Science and Minister of Health in October 2017. These fora seek to bridge organizational mandates and differing expertise that would otherwise risk siloing federal science and support for academic research. While such coordination mechanisms move advice and decision-making for Canadian science in the right direction, the system that supports the scientific enterprise in Canada remains problematically fragmented. Considerations should be given to the development of a long-term vision for federally supported research and innovation, and for its coordinated implementation.

If Canada is to succeed in making strategic investments to advance the place of Canadian science and scientists in the world, it is essential that organizational leadership move further in overcoming structural barriers and business-as-usual models to achieve coherence, and that they be supported in bringing about the changes needed to position Canada and its research enterprise for success in the coming decades. In the year ahead, my office will continue to work to achieve these goals.



ON INTERNATIONAL SCIENCE ENGAGEMENT

International science relationships provide a line-of-sight into developments abroad and allow Canada's strengths to be featured to foreign audiences. They also highlight the opportunity that exists for Canada to capitalize on its science base to support diplomatic efforts and to help build science capacity as part of its development support efforts.

High-level international gatherings could benefit from advance meetings of science advisors, to signal how science might be harnessed to help address shared challenges. As a country that has made science and innovation a priority, Canada is in a good position to convene and coordinate such efforts. More could be done to support Canadian participation in international research and networks. But the *New Frontiers in Research Fund* announced in Budget 2018 is a step in the right direction.

Canadian research support organizations, agencies and science-intensive federal departments need to work collaboratively to ensure a strong presence for Canadian science at key international science gatherings. In 2019, my office will help further a dialogue aimed at developing a more coherent approach to our international science engagement. Ultimately, Canada would benefit by having an international science and technology strategy aligned with its national science strategy and with the country's international priorities.

ON ENGAGING THE SCIENTIFIC DIASPORA

Scientists working abroad often have the ability to help negotiate foreign networks and systems, facilitating access to expertise and infrastructure in academia, industry and governments. Similarly, foreign scientists here in Canada can provide linkages to the Canadian science system that forge lasting connections with partners in their home countries.

While travelling abroad, I met with groups of Canadians working or studying in different countries; their enthusiasm and desire to help support Canadian research, and to bring Canadian science and Canada's role in the world to the fore through their work was a reminder of the resource that is our expatriate community.

Engaging the scientific diaspora represents a great, and largely untapped, opportunity for Canada to build lasting international ties from the ground up. My office encourages the development of formal mechanisms for structured, ongoing relationships with the scientific diaspora that would capitalize on their expertise and willingness to serve.



RIGHT: In May 2018, the Chief Science Advisor met with Canadian researchers working at CERN in Switzerland.



Federal scientists are involved in a host of activities that range from fundamental research to providing applied science services. They study stars and satellite communications, model climates and crops and species populations, test safety levels for our food and our environment, inform the care provided for people and animals, and much more. Ongoing recruitment and retention of excellent scientists, researchers and research support personnel are critically important to government operations and the well-being of Canadians.

As part of my activities during the first year, I engaged with federal scientists and their

The results of the 2017 Public
Service Employee Survey revealed areas for further analysis for the science group; while overall job fit and satisfaction was higher among employees in science jobs than the rest of the public service, the science community reports less of a sense of autonomy and confidence in senior management than do other public servants.

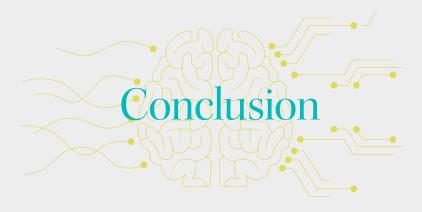
leadership through visits to various science facilities across the country. These visits allowed me to appreciate the wealth of talented and engaged scientists working in government labs.

However, to properly assess whether the federal science workforce is thriving—a request mandated to my office—a more systematic approach and consistent understanding of its composition is needed. Resources such as Statistics Canada's annual Survey of Federal Personnel Engaged in Science and Technological Activities, the annual Government of Canada Public Service Employee Survey, and the Deputy Ministers Science Committee's recent study of the demographics of the science workforce, while illustrative, cannot provide a complete picture.

As such, significant effort will be required to chart workforce dynamics, bring disparate information sources together, and collect new qualitative and quantitative information for developing effective strategies for workforce renewal, ensuring equity, and supporting career and continuous skills development.

A comprehensive understanding of the unique features of the federal science workforce, as well as its commonalities with the rest of the federal workforce and with the Canadian science workforce more broadly, will require a phased, multi-year analysis effort. For this endeavour to succeed, it needs the engagement and support of the organizations that employ federal scientists and the expertise of other federal organizations like those that study, support, and engage with functional communities.





A chief science advisor plays an important role in building consensus and supporting positive change to our national institutions. Having laid the foundation for the function of the Chief Science Advisor in year one, I look forward to furthering the work that has been started and responding to new requests from the Prime Minister, the Minister of Science and members of Cabinet in my second year. I intend to continue working closely with agency heads, deputy ministers and the science community to better position Canada for global leadership in science and innovation.