Natural Sciences and **Engineering Research** Council of Canada 2022-23 Departmental Results Report

The Honourable François-Philippe Champagne, P.C., M.P. Minister of Innovation, Science and Industry



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From the Minister

It is our pleasure to present the 2022–23 Departmental Results Report for the Natural Sciences and Engineering Research Council of Canada (NSERC).

Over the past year, the Innovation, Science and Economic Development Canada (ISED) Portfolio worked closely with other Government departments and agencies following the pandemic to build a more resilient, sustainable and inclusive economy that benefits all Canadians.

In 2022–23, NSERC continued to invest in knowledge production and mobilization in the fields of natural sciences and engineering and provide Canadian researchers and highly qualified personnel with the resources they needed to address global challenges and contribute to our country's prosperity. The agency continued to integrate equity, diversity and inclusion considerations in its programming and implement measures to counter the impact of the COVID-19 pandemic on the research enterprise.



The Honourable François-Philippe Champagne
Minister of Innovation, Science and Industry

We invite you to read this report to learn more about how the ISED Portfolio is working together with Canadians of all backgrounds and in all regions—urban and rural—to position Canada as a leader in the global economy.

From the President

As Canada's leading supporter of excellence in discovery and innovation, the Natural Sciences and Engineering Research Council of Canada (NSERC) enables the success of thousands of researchers, students, and postdoctoral fellows from coast to coast to coast. Our funding provides critical support to the talented individuals capable of solving today's challenges and training the young scientists and engineers who will build on their success. NSERC's programs give researchers the freedom to make breakthroughs and the means to connect with partners who can turn their discoveries into benefits for Canadians.

NSERC's Departmental Results Report presents the accomplishments of a research funding agency committed to supporting the strengths of its community. In 2022–23, we took steps to modernize our flagship Discovery Grants program to reflect the fast-paced realities of research and utilized our Alliance partnership program to support research priorities like



Prof. Alejandro Adem, FRSC President Natural Sciences and Engineering Research Council

Canada's National Quantum Strategy. We created space for more talent by reinforcing the importance of equity, diversity, and inclusion within our programs and introducing new funding for underrepresented groups. As the future of research will always depend on curious minds, NSERC continued to support young Canadians exploring science, technology, engineering, and mathematics through celebrations, including Science Odyssey and Science Literacy Week, and through educational outreach supported by NSERC's PromoScience program.

NSERC's workforce has embraced a modern, healthy and inclusive culture at our new offices in downtown Ottawa. Our new net-zero Ottawa headquarters is located in one of Canada's most sustainable communities and features a technology-enabled hybrid work model that puts our employees' productivity and work-life balance at the forefront. NSERC also launched its Accessibility Plan, largely based on recommendations received from members of the research community and of our Persons with Disabilities Network. This Plan addresses barriers to accessibility for both staff and the research community and aims to chart a path forward to remove and prevent barriers at NSERC, especially for persons with disabilities, by 2040.

Over the past year, NSERC also worked closely with partners at the Social Sciences and Humanities Research Council (SSHRC), the Canadian Institutes of Health Research (CIHR), the Canada Foundation for Innovation (CFI) and other organizations to align practices, combine resources, strengthen research security, and enhance collaboration across Canada's entire research ecosystem. To ensure Canadian research has an impact beyond our borders, NSERC launched international joint initiatives targeting global challenges and established new collaborative agreements with research funding agencies.

It is the effort of NSERC's incredible staff who keep our organization moving forward, adapting to the times, and always striving to deliver the best service possible to ensure Canadians are

getting the most impact from the investments we make. Looking ahead, NSERC is focused on building on the successes of its programs, developing new collaborative opportunities, and continuing to promote and support excellence in Canadian research to the benefit of us all.

Results at a glance

In 2022–23, NSERC supported more than 12,900 researchers and awarded more than 7,100 scholarships and fellowships to trainees at post-secondary institutions across Canada through its funding opportunities under the Discovery Research, Research Training and Talent Development, and Research Partnerships Programs. The COVID-19 measures introduced in 2020-21 continued into 2022–23, providing support for researchers and highly qualified personnel.

NSERC continued to advance the international competitiveness of Canada's sciences and engineering research. Highlights include:

- Provided targeted support for early career researchers (ECRs), with \$96.7 million being committed over 6 years for new awards.
- Through a multi-year project to modernize Discovery Research, Discovery Grantⁱ values increased, on average, by 20% and Discovery Development Grantⁱⁱ values by 30%.
 Application eligibility modification of the Research Tools and Instruments grantsⁱⁱⁱ resulted in a significant increase in the success rate and award value for small institutions.
- Advanced Indigenous research and reconciliation through the implementation of the strategic plan Setting New Directions to Support Indigenous Research and Research Training in Canada, iv engagement with the newly formed Indigenous Leadership Circle in Research, and targeted funding opportunities.

NSERC continued to support the growth and development of a pool of diverse and highly skilled people in the natural sciences and engineering (NSE). Highlights include:

- Continued to modernize the Undergraduate Student Research Awards Program^{vi} (USRA)
 with the development of a new tri-agency initiative to support Black scholars through
 targeted scholarships and fellowships.
- Continued to deliver the Collaborative Research and Training Experience^{vii} (CREATE) funding opportunity to support trainees' professional skills development, with an investment of \$29.9 million.
- Promoted science, technology, engineering and mathematics (STEM) among Canadian youth through the delivery of the PromoScience^{viii} program, Science Odyssey^{ix} and Science Literary Week.^x In 2022–23, NSERC's science awareness and celebration campaigns reached more than 1 million Canadians.
- Continued to develop the Tri-agency Training Strategy in collaboration with CIHR and SSHRC, under the leadership of the Canada Research Coordinating Committee (CRCC).xi

Through its Research Partnerships, NSERC continued to mobilize knowledge generated through the transformation of Canada's NSE research into results for the benefit of all Canadians. NSERC nurtured connections with vital partners in the research ecosystem, including CIHR, SSHRC, CFI, Mitacs, other government departments and agencies, colleges and universities, industry, not-for-profit organizations, Indigenous communities and provincial funders. Key highlights include:

- Continued to build and strengthen provincial, federal and international partnerships through the modernized and enhanced Alliance^{xii} programming.
- Strengthened partnership opportunities for Canadian researchers in Europe and the Unites States through Alliance and Alliance International grants. xiii
- Awarded Alliance Missions^{xiv} grants in collaboration with Environment and Climate Change Canada (ECCC), for a total value of \$63 million in research support.
- Awarded Alliance Quantum, Alliance Consortia Quantum, Alliance International Quantum, and CREATE-Quantum grants in support of Canada's National Quantum Strategy to secure Canada's leadership in quantum science and technologies.
- Simplified and streamlined the Tri-agency College and Community Innovation (CCI)^{xv} program to address the changing dynamics of applied research in colleges and communities across Canada.

For more information on NSERC's plans, priorities and results achieved, see the "Results: what we achieved" section of this report.

Results: what we achieved

Core responsibilities

Funding natural sciences and engineering research and training

Description

The Natural Sciences and Engineering Research Council of Canada (NSERC), through grants, fellowships and scholarships, promotes and supports research and research training in the natural sciences and engineering to develop talent, generate discoveries, and support innovation in pursuit of economic and social outcomes for Canadians. In 2022–23, NSERC supported more than 12,900 researchers and awarded more than 7,100 scholarships and fellowships to trainees at post-secondary institutions across Canada through its funding opportunities under the Discovery Research, Research Training and Talent Development, and Research Partnerships Programs.

Results

Departmental Result: Canada's natural sciences and engineering research is internationally competitive.

In 2022–23, NSERC continued to support the Minister of Innovation, Science and Industry in his mandate to improve economic growth, ensure pandemic readiness for the future and safeguard Canada's world-leading research ecosystem. NSERC supported the whole-of-government effort to reduce emissions, create clean jobs and address climate-related challenges.

In collaboration with CIHR and SSHRC, NSERC supported the CRCC's commitment to strengthening Canada's response to and recovery from the pandemic to help sustain the research community. In 2022–23, NSERC continued to support applicants, grant holders and reviewers, adapt its operations as needed and ensure equitable funding outcomes. Some grant recipients could request a 12-month extension due to pandemic-related delays. To lessen the impacts of the pandemic and support researchers and highly qualified personnel, more than 1,950 recipients of active Discovery Research grants received one-time additional funds, totalling \$74.7 million.

NSERC acknowledges that ECRs inspire and drive some of Canada's most innovative, forward-looking research. By supporting ECRs, NSERC contributes to strengthening Canada's position as a world leader in research. In 2022–23, the agency continued to provide targeted support for ECRs and committed \$96.7 million over 6 years for new awards to such researchers. Moreover, in the 2022 Discovery Grants competition, 529 supplements, valued at \$12,500 each, provided timely resources to support ECRs as they established their research programs and hired students.

NSERC initiated a multi-year project to modernize its support for Discovery Research to ensure that NSE research in Canada remains internationally competitive. An External Advisory Committee was established and provided advice on priorities and directions. Discovery Grant values have, on average, increased by 20% and values for small institutions, through the Discovery Development Grants, by 30%. Early improvements have resulted in competition results being provided 2 weeks earlier and processes being adapted for future reduction of administrative burden to the research community.

NSERC continued to carry out program design improvements in response to the Evaluation of the Discovery Research Program^{xvi} and Gender-Based Analysis Plus (GBA Plus) reports on the Research Tools and Instruments (RTI)^{xvii} and the Discovery Institutes Support (DIS)^{xviii} funding opportunities. The RTI eligibility was modified to increase access. As a result, the success and funding rates of small institutions increased significantly, surpassing those of large institutions for the first time. In the DIS competition, 7 institutions were awarded a total of \$35.7 million over 5 years. A new annual report was developed for this funding opportunity to allow NSERC to better capture the program's impacts and improve the consistency of reported data and outcomes.

The Chairs for Inclusion in Science and Engineering (CISE)^{xix} was launched as a 2-year pilot in the Atlantic region. The CISE program builds on the successful Chairs for Women in Science and Engineering (CWSE)^{xx} program, which promotes the participation and retention of women in science and engineering. NSERC has increased its support to fund a team of 3 CISE chairs to enhance the impact of the program in the region and to celebrate diverse role models while continuing to support the existing 4 CWSE chairholders in the other regions.

NSERC continued to support Canada's best researchers to enhance the country's world-class academic research capacity and enable Canadian scholars to be internationally competitive in their fields. In 2022–23, 51% of NSERC-funded research involved international collaboration. The publication of NSERC-funded research results in peer-reviewed journals contributes to measuring discovery and knowledge generated in the NSE in Canada. The citation of publications, including those arising from agency-funded projects, is an indicator of Canada's internationally competitive strength in NSE research. In 2022–23, Canada ranked 18th among the 38 Organisation for Economic Co-operation and Development (OECD) countries, with an Average Relative Citation (ARC) score of 1.33. NSERC also supported the Belmont Forum Secretariat and continued to provide input into the newly proposed Belmont Forum Collaborative Research Actions^{xxi} to increase alignment with Canadian research strengths.

NSERC celebrates exceptional examples of research excellence with a wide range of prizes. These also act as an inspiration for Canadian research as we continue to push the frontiers of knowledge. In 2022–23, NSERC awarded the second round of 2 new prizes to honour recent

Canadian Nobel laureates, the NSERC Donna Strickland Prize^{xxii} for Societal Impact of Natural Sciences and Engineering Research and the Arthur B. McDonald Fellowships.^{xxiii}

Highlight box: Exceptional NSE researchers

NSERC recognizes and rewards the talent, potential and accomplishments of the members of the Canadian NSE research community. Join NSERC in congratulating these 2022–23 prize recipients:

- **Kerry Rowe** from the Department of Civil and Resource Engineering at Queen's University is the 2022 winner of the Donna Strickland Prize for Societal Impact of Natural Sciences and Engineering Research for his pioneering research in geo-environmental engineering. Dr. Rowe's research and experimentation identified new engineering criteria for landfill design that could prevent significant groundwater problems, leading to 2 commercialized computer-modelling tools that are widely used to guide the safe development of waste containment sites globally.
- Lenore Fahrig from the Department of Biology at Carleton University is the 2022 winner of the Gerhard Herzberg Canada Gold Medal for Science and Engineering^{xxiv} for her important research in landscape ecology and conservation biology. Dr. Fahrig's research and career have had transformative impacts for wildlife conservation around the world, inspiring a vast shift in perspective not just in how efforts should be focused, but also in how much impact relatively small actions can have on wildlife preservation.
- Tomisval Friščić from the Department of Chemistry at McGill University is the 2022 winner of the NSERC John C. Polanyi Award^{xxv} for his revolutionary research in the field of mechanochemistry. Dr. Friščić's research has transformed mechanochemistry into a viable technique that is not only replacing traditional manufacturing processes, but enabling chemical reactions that were once thought impossible.

Departmental Result: Canada has a pool of highly skilled people in the natural sciences and engineering.

In 2022–23, NSERC supported students and postdoctoral fellows through more than 7,100 scholarships and fellowships and invested more than \$526 million in domestic and international student training through grants. Informed by the results of the GBA Plus analysis, NSERC continued to modernize the Undergraduate Student Research Awards Program^{xxvi} (USRA) and implemented an award value increase (to \$6,000 from \$4,000). Budget 2022 announced \$40.9 million over 5 years and \$9.7 million ongoing for the Tri-agency to address the disproportionate underfunding of Black scholars at all stages of their careers.

The Collaborative Research and Training Experience^{xxvii} (CREATE) grants help trainees develop technical and professional skills. In 2022–23, 94 CREATE awardees received \$29.9 million. 90% of CREATE initiatives offered trainees the opportunity to gain experience in enriched and varied research environments beyond their home institution, including 74% of initiatives that offered internships in industrial, government, non-profit or other settings.

In 2022–23, the PromoScience^{xxviii} funding opportunity awarded \$10.3 million over 3 years: 84% of the grants included programming for Indigenous youth, while 40% included programing for girls. This funding gave Canadian youth access to innovative STEM initiatives that exposed them to new skills and provided hands-on experiences to inspire them to become the next generation of scientists and engineers. The year 2022–23 was a special one for the 2 national science awareness and celebration campaigns, Science Odyssey^{xxix} and Science Literacy

Week, xxx as more events returned to their normal courses following the restrictions imposed by the COVID-19 pandemic in previous years. Combined, both campaigns brought together close to 500 organizations to present almost 1,000 in-person and online or hybrid events. Through these campaigns, NSERC has carved a relevant niche in the creation of a strong science culture in Canada that values science and engineering, reaching more than 1 million Canadians in 2022.

NSERC is committed to integrating the San Francisco Declaration on Research Assessment (DORA)^{xxxi} principles into its programs and processes by considering and valuing a broad range of contributions to research, training and mentoring in the evaluation of research excellence, and by focusing on the quality and impact of each contribution. In 2022–23, NSERC published revised Guidelines on assessment of contributions to research, training, and mentoring,^{xxxii} which better align with the DORA recommendations and promote a comprehensive and inclusive assessment of research. In addition, NSERC translated the DORA and Luxembourg National Research Foundation's video, titled Broad, balanced and responsible: a practical guide for research evaluators,^{xxxiii} into French. The video contains 6 practical tips for fostering a more holistic evaluation process, which will provide support to NSE researchers and peer reviewers incorporating DORA principles into their NSERC application and peer review process.

NSERC continued to support interdisciplinary research through the Tri-Agency Interdisciplinary Peer Review (TAIPR) pilot. **xxxiv** The Discovery Horizons**xxxv** pilot is NSERC's entry point to the TAIPR committee. In 2022–23, the pilot funding opportunity received 410 letters of intent submitted with projects spanning the full NSE spectrum, integrating health, social sciences, humanities and Indigenous research. The TAIPR committee identified 16 Discovery Horizons grants that will start in 2023–24.

In 2022–23, NSERC, along with SSHRC and CIHR, launched the Indigenous Leadership Circle in Research, xxxvi composed exclusively of First Nations, Inuit and Métis scholars and community members, to help guide the implementation of CRCC's strategic plan, Setting New Directions to Support Indigenous Research and Research Training in Canada. xxxvii In collaboration with its triagency counterparts, NSERC also launched an internal working group to analyze and understand different ways to affirm Indigenous citizenship and membership within the context of tri-agency programs and funding opportunities. Substantive engagement was undertaken with Indigenous leadership across the country, including Indigenous senior administrators in post-secondary institutions. In support of the same goals, tri-agency funding was provided for the 2023 National Indigenous Citizenship Forum (hosted by the First Nations University of Canada, in partnership with the National Indigenous University Senior Leaders' Association)—an Indigenous-only gathering for university campus members to discuss Indigenous citizenship within the Canadian post-secondary context.

With a view to bringing Indigenous-led research to the forefront of NSE research, NSERC continued to advance Indigenous research priorities through activities aimed at improving access to its programs and enhancing engagement with Indigenous communities. As a result, a new definition of Indigenous research was developed that allows applicants to better articulate research that supports Indigenous knowledge and approaches. The definition was endorsed by the Reference Group for the Appropriate Review of Indigenous Research. Additionally, in 2022–23, the percentage of new awardees who self-identified as a First Nations, Métis, or Inuit person reached 2.4%, which is above the set target. NSERC also continued to engage Indigenous youth through the NSERC Indigenous Student Ambassadors program with the number of awards more than doubling in 2022–23. 7 grants were awarded to Indigenous students and fellows to promote interest and participation in the NSE by visiting Canada's Indigenous communities and schools and sharing their research and education experiences.

Finally, to support, inspire and empower the next generation of research leaders, NSERC developed the CRCC Tri-agency Training Strategy in collaboration with CIHR and SSHRC. In drafting the strategy, an External Advisory Committee of students, postdoctoral fellows, ECRs, and established researchers was created.

Departmental Result: Canada's natural sciences and engineering research knowledge is used.

In 2022–23, NSERC continued to mobilize knowledge generated by NSE research by enhancing partnership opportunities for Canadian researchers and strengthening partnerships with other funding organizations. The effects of the COVID-19 pandemic were still felt within the research community and among non-academic partners, representing a possible limiting factor toward their engagement in new partnerships. Nevertheless, 2022–23 saw a significant growth in the amount of partner contributions since last year, with \$323 million cash and in-kind support.

NSERC continued to modernize, enhance and expand the reach of Alliance^{xl} programming, which supports collaboration between university researchers and a broad range of partner organizations (private, public, and not-for-profit sectors). As of March 31, 2023, 1,359 grants totalling \$442 million had been awarded, with \$232.8 million of matching contributions from 3,987 partners. Alliance is an important collaborative tool to work with provincial and federal partners. Together with the Fonds de recherche du Québec – Nature et technologies (FRQNT), NSERC funds the NOVA grants. xli In 2022–23, 33 grants were awarded for a total of \$4.45 million over 3 years. NSERC partners with Alberta Innovates xlii and the Ontario Centre of Innovation poportunities. A second round of Alliance Missions grants was concluded in 2022 on the theme of "Anthropogenic greenhouse gas research", in collaboration with ECCC, and 62 grants were funded at a total value of \$63 million.

In 2022–23, NSERC and the German Research Foundation (DFG) collaborated to fund projects that generate new knowledge on environmental sustainability. In winter 2023, 52 research groups were invited to proceed to the next stage of the competition. NSERC also launched a call for proposals with the National Science Foundation in the US to support Global Centres. NSERC also partnered with the Canadian Nuclear Safety Commission (CNSC) to fund research which will support the effective regulation and regulatory oversight of small modular reactors. 29 research projects were funded at a total value of \$9.4 million over 3 years through the first phase of the NSERC-CNSC Small Modular Reactors Research Grant Initiative. NIVI

NSERC continued to enable Canadian researchers to build partnerships with leading international researchers from the academic sector abroad via Alliance International. In 2022–23, 13 Collaboration grants and 182 Catalyst grants were awarded. The latter include the 56 Catalyst Quantum grants (\$1.4 million) awarded to support 63 academic researchers across 24 Canadian post-secondary institutions through the Alliance International Quantum grants. These researchers are collaborating with 61 researchers from 55 international academic institutions in 16 countries on projects that will strengthen research excellence in quantum science and technology.

In addition to the Alliance International Quantum grants, NSERC offers a variety of funding opportunities in support of Canada's National Quantum Strategy. The 2022 call for proposals to the Alliance Consortia Quantum grants^{xlix} resulted in more than \$38 million being awarded to 8 consortia. The Alliance Quantum grants, designed to reinforce, coordinate and scale up Canada's domestic research capabilities in quantum science and technology, resulted in 8 grants and a total value of more than \$6 million. 3 CREATE-Quantum grants were funded, with an additional commitment of \$4.9 million.

In 2022–23, NSERC continued its efforts to simplify and streamline the College and Community Innovation (CCI)^{li} program, better enabling it to address the changing dynamics of applied research in colleges and communities across Canada. The second instalments of the CCI-Applied Research and Technology Partnership grants were released, thus completing the 2-year support for the 74 grants awarded in 2021–22 through this funding opportunity. Through the first CCI-Mobilize grants^{lii} competition, NSERC awarded 50 grants for a total value of \$76.1 million over 5 years. A new partnership between the CCI-College and Community Social Innovation Fund^{liii} and the Canada Council for the Arts led to the funding of 5 projects that will promote social innovation in Canada's artistic community.

NSERC continued to support projects that accelerate the pre-competitive development of promising technology through the Idea to Innovation^{liv} (I2I) grants. The I2I program completed 3 rounds of a pilot initiative in collaboration with the Lab2Market (L2M) program allowing

researchers to assess the commercial potential for their technology. A total of 112 teams have received \$2.24 million through this initiative.

NSERC's funding to the Networks of Centres of Excellence^{lv} will be transferred to the New Frontiers in Research Fund^{lvi} by 2024-25. The Centres of Excellence for Commercialization and Research^{lvii} and the Business-led Networks of Centres of Excellence^{lviii} programs continued to help connect businesses to Canada's world-class research enterprise. They will be supported until the end of the existing centres and networks funding agreements and will be gradually transferred to ISED's Strategic Innovation Fund.

NSERC continued to build Canada's research security capacity through its support for the development and promotion of national and international best practices and tools for research security, such as those on the Safeguarding Your Research portal, and through its leadership in implementing the new National Security Guidelines for Research Partnerships. Following the statement from the Government of Canada in February 2023 on protecting Canada's research, NSERC continued to collaborate with federal partners and the research community to develop new measures towards ensuring that the open and collaborative research that it funds does not contribute to advancements in military, security, or intelligence capabilities of foreign state actors that pose a threat to Canada.

Gender-based analysis plus

In 2022–23, in collaboration with CIHR and SSHRC, NSERC continued to implement the Tri-Agency Equity, Diversity and Inclusion (EDI) Action Plan for 2018–2025^{lxii} and various measures were implemented throughout the year. NSERC collected data on applicants to agency funding programs, peer reviewers and selection committee members, and advisory and governance board members. Disaggregated data by EDI designated groups about program participation and award rates were monitored and reported through CRCC Annual Reports^{lxiii} and through Dashboards. lxiv

To enhance diverse participation in peer review and advisory and governance committee decision-making, NSERC implemented inclusive and accessible processes for the selection of the Dimensions Review Committee members and the appointment of the new members to the Standing Committee on Equity, Diversity and Inclusion (CEDI). lxv

In 2022–23, NSERC also recruited its first EDI Scholar in Residence. Ixvi The scholar provides a researcher's perspective on the integration of EDI principles in NSERC's core programming and delivery.

A flagship initiative of the Tri-Agency EDI Action Plan, the Dimensions^{lxvii} pilot program invited post-secondary institutions to take part in a transformation of the research ecosystem by increasing EDI and helping drive deeper cultural change by

identifying and eliminating obstacles and inequities. Dimensions included 4 stages of recognition intended to reflect the journey of carrying out EDI work in the research environment and achieving success. A cohort of 17 Canadian institutions in co-developed the Dimensions recognition program to make it uniquely adapted to Canadian realities. The pilot program terminated on March 31, 2023 and a formal evaluation will be available in 2023–24.

United Nations 2030 Agenda for Sustainable Development and the Sustainable Development Goals

In support of the United Nations 2030 Agenda for Sustainable Development^{lxx} and in accordance with the legislative requirements set out by the *Federal Sustainable Development Act*, NSERC contributes to and champions sustainable development through its programs and related activities.

In 2022–23, NSERC began developing its first Departmental Sustainable Development Strategy (2023 to 2027), which contextualizes NSERC's efforts to advance sustainability within its specific mandate and describes specific actions that the agency has taken in support of the 2022 to 2026 Federal Sustainable Development Strategy. lxxi

The agency continued to support research, talent development and knowledge mobilization, including Indigenous research and research training, across all its funding opportunities to help advance the following United Nations' Sustainable Development Goals (SDGs): SDG 4 – Quality Education, and SDG 10 – Reduced Inequalities. Additionally, in support of SDG 12: Responsible Consumption and Production and SDG 13: Climate Action, NSERC integrated environmental considerations into its operations and internal services. For instance, NSERC uses environmentally sensitive procurement processes and adopted a hybrid work model aimed at reducing the greenhouse gas emissions associated with commuting and travel.

Innovation

NSERC continued to experiment with innovative ideas related to grants management. As an example, as part of the Tri-agency grants management solution (TGMS)^{lxxiii} project, NSERC piloted a narrative CV in their Discovery Horizons^{lxxiv} program. Narrative CVs can lead to more equitable assessments, improving research culture. Although additional data are still being sought, the initial results of the experiment were promising, and a next iteration is planned.

Results achieved

The following table shows, for Funding natural sciences and engineering research and training, the results achieved, the performance indicators, the targets and the target dates for 2022–23, and the actual results for the three most recent fiscal years for which actual results are available.

Departmental results	Performance indicators	Target	Date to achieve target	2020–21 actual results	2021–22 actual results	2022–23 actual results
Canada's natural sciences and engineering research is internationally	Canada's rank among OECD nations on the citation score of natural sciences and engineering research publications	At most 18	March 31, 2023	17	17	18
competitive	Percentage of funded research involving international collaboration	At least 47%	March 31, 2023	48%	47%	51%
Canada has a pool of diverse and highly skilled people in the natural sciences	Number of research trainees supported by NSERC through scholarships and fellowships	At least 7,000	March 31, 2023	7,467	7,204	7,163
and engineering	Funding allocated to support research trainees through grants	At least \$400M	March 31, 2023	\$440M	\$513M	\$526M
	Percentage of newly funded recipients who self-identify as women	At least 33%	March 31, 2023	35.2%	38.9%	37.5%
	Percentage of newly funded recipients who self-identify as visible minorities	At least 28%	March 31, 2023	28.5%	32%	35%
	Percentage of newly funded recipients who self-identify as Indigenous peoples	At least 1.4%	March 31, 2023	1.4%	2.1%	2.4%
	Percentage of newly funded recipients who self-identify as persons with disabilities	At least 1.9%	March 31, 2023	2%	3.5%	4.2%
	Percentage of previously funded graduate students and postdoctoral fellows that list Research and Development as the main	At least 80%	March 31, 2023	82%	n/a	83%

Departmental results	Performance indicators	Target	Date to achieve target	2020-21 actual results	2021-22 actual results	2022–23 actual results
	activity in their current position					
Canada's natural sciences and engineering	Number of non-academic partners on research projects	At least 3,600	March 31, 2023	3,348	2,677	2,644
research knowledge is used	Percentage of funded projects reporting social and/or environmental outcomes for Canadians	At least 74%	March 31, 2023	77%	70%	62%
	Percentage of funded projects reporting economic outcomes for Canadians	At least 50%	March 31, 2023	52%	52%	64%
	Non-academic partner funding for research projects	At least \$320M	March 31, 2023	\$352M	\$277M	\$323M

Financial, human resources and performance information for NSERC's program inventory is available in GC InfoBase. lxxv

Budgetary financial resources (dollars)

The following table shows, for Funding natural sciences and engineering research and training, budgetary spending for 2022–23, as well as actual spending for that year.

	spending	authorities	spending (authorities used)	2022–23 difference (actual spending minus planned spending)
1,334,829,363	1,334,829,363	1,361,765,151	1,358,206,400	23,377,037

^{*} The difference in actual versus planned spending is attributable to additional funding received from Budget 2014 for the 2022 Canada First Research Excellence Fund competition, and from Budget 2022 for the initiative in support of Black students and postdoctoral researchers and for Research Security.

Financial, human resources and performance information for NSERC's program inventory is available in GC InfoBase. lxxvi

Human resources (full-time equivalents)

The following table shows, in full-time equivalents, the human resources the department needed to fulfill this core responsibility for 2022–23.

	equivalents	2022–23 difference (actual full-time equivalents minus planned full-time equivalents)
323	350	27

^{*} There was an increase in full-time equivalents as a result of reallocation of costs from internal services to better align with the program inventory actual usage, from Budget 2014 for the 2022 Canada First Research Excellence Fund competition, and from Budget 2022 for the initiative in support of Black students and postdoctoral researchers and for Research Security.

Financial, human resources and performance information for NSERC's program inventory is available in GC InfoBase. lxxvii

Internal services

Description

Internal services are those groups of related activities and resources that the federal government considers to be services in support of programs and/or required to meet corporate obligations of an organization. Internal services refers to the activities and resources of the 10 distinct service categories that support program delivery in the organization, regardless of the internal services delivery model in a department. The 10 service categories are:

- acquisition management services
- communication services
- financial management services
- human resources management services
- information management services
- information technology services
- legal services
- material management services
- management and oversight services
- real property management services

To effectively and efficiently execute its mandate, NSERC must remain a nimble, responsive and adaptive organization, one that ensures the well-being and productivity of its employees in a changing work environment. In 2022–23, NSERC's focus has been on the following activities:

NSERC moved into its new, state-of-the-art office headquarters on Zibi island. During the return to in-person work, the health and safety of staff were prioritized based on all COVID-19 protocols and vaccination requirements (that have now been suspended). NSERC has implemented a clear direction for a flexible hybrid work model. The hybrid model of work promotes a workforce that is diverse, mobile, and focuses on excellence in a modern, inclusive and healthy workplace. New management practices were deployed to respond to employees evolving needs in interacting with the new GCworkplace environment, optimizing hybrid work, learning to work in open-concept and shared workspaces, and working with Shared Services Canada to resolve issues with technology readiness. Through its hybrid work model, and by leveraging technology, NSERC continues to modernize its operations to better meet the needs of employees, managers and the agency.

In 2022–23, NSERC continued to implement actions to support the key priorities for its People Strategy. To support building a workforce for future success, a Recruitment and Staffing plan was developed to leverage opportunities to modernize and enhance practices that attract top and diverse talent. To promote a safe, respectful and healthy work environment, the Office of the Ombuds supported employees and management throughout the year and ensured that Mental Health First Aiders were trained and deployed. To support diversity and inclusion, upon receipt of the final report of the Employment Systems Review and Culture Review, an engagement strategy was developed that involves staff in the prioritization of actions required to remove identified barriers to diversity and inclusion.

NSERC participated in the Government of Canada IT Apprenticeship Program for Indigenous Peoples. Ixxviii NSERC also developed and published its first Accessibility Plan Ixxix and has renewed its accommodation policy and process.

NSERC continued to participate in the governance of major tri-agency programs and initiatives, including the new Canada Biomedical Research Fund (CBRF). lxxx In 2022–23, the Tri-agency worked to deliver Stage 1 of the CBRF competition, with the creation of 5 research hubs. Each hub is led by a post-secondary institution and is a coalition of research partners from the institutional, not-for-profit, private and/or public sectors. These multidisciplinary research hubs accelerate the research and development of next-generation vaccines, therapeutics and diagnostics, while supporting training and development to expand the pipeline of skilled talent.

Over the past few years, the rate of change in the Canadian research context has increased. In 2022–23, NSERC continued to focus on building its own flexibility and agility to respond to these changes. This included improving processes for allocation (and rapid reallocation) of resources and upgrading its information management and information technology infrastructure.

NSERC continued to work with CIHR, SSHRC and internal and external stakeholders to codevelop the Tri-agency grants management solution (TGMS). lxxxi The project aims to replace the Tri-agency's existing grants management systems which operate using dated technology and are limiting the agencies and the research community in their ability to adapt to the changing needs of the research ecosystem in Canada. In 2022–23, the TGMS team launched and completed a competitive process to select a system provider to assist with the configuration of the platform (i.e., Microsoft Power Platform) in collaboration with Public Services and Procurement Canada. In addition, the team obtained approval from the Government of Canada Enterprise Architecture Review Board for the proposed set of guidelines and principles to build the new solution. Finally, the TGMS team completed most key project deliverables required to obtain the proper authorities from the Treasury Board to start the implementation phase.

Contracts awarded to Indigenous businesses

NSERC is a Phase 2 organization and is aiming to achieve the minimum 5% target by the end of 2023–24.

Some of the measures NSERC has taken to ensure it achieves the 5% target include:

- Delivering information sessions to internal stakeholders
- ▶ Educating procurement officers on the benefits of and obligations to increase Indigenous procurement
- Updating internal templates to include the Procurement Strategy for Indigenous Business (PSIB) considerations
- Making reference materials available to employees on the intranet
- Including PSIB criteria in requests for proposals, when appropriate
- Promoting the lists of Indigenous suppliers who are pre-qualified under supply arrangements and standing offers
- Encouraging business owners to consider Indigenous set-asides when planning a requirement
- Promoting early engagement; that is, at the onset of a procurement, encouraging business owners to consider the various PSIB options

The following measures also support achieving the 5% minimum target:

- ▶ 100% of procurement officers have completed the mandatory course "Indigenous Considerations in Procurement (COR409)" from the Canada School of Public Service
- ▶ 30% of procurement officers have completed the course "Procurement in the Nunavut Settlement Area (COR410)" from the Canada School of Public Service
- NSERC migrated to the Systems, Applications and Products (SAP) financial system on April 1, 2023, which allows for better, more accurate PSIB reporting

Budgetary financial resources (dollars)

The following table shows, for internal services, budgetary spending for 2022–23, as well as spending for that year.

2022–23 Main Estimates	spending	authorities	spending	2022–23 difference (actual spending minus planned spending)
21,248,014	21,248,014	25,770,209	23,322,234	2,074,220

^{*} Savings generated by transferring more full-time equivalents from internal services to programs were offset by the increase of one-time expenses incurred by internal services due to the move to the new Zibi headquarters and the transition to SAP.

Human resources (full-time equivalents)

The following table shows, in full-time equivalents, the human resources the department needed to carry out its internal services for 2022–23.

	equivalents	2022–23 difference (actual full-time equivalents minus planned full-time equivalents)
174	152	(22)

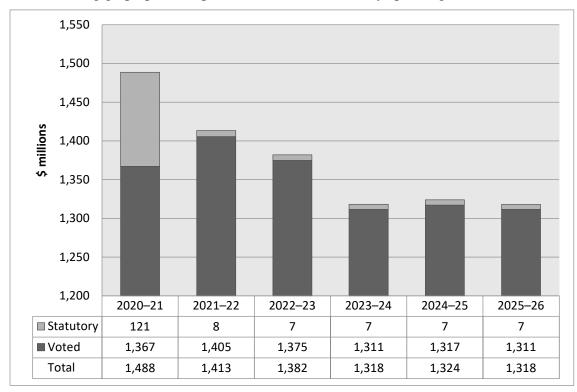
^{*} The variance is primarily a result of NSERC revising the allocation of costs. The adjustment was made to better align the program inventory with actual usage, leading to a transfer of full-time equivalents between internal services and the core responsibility.

Spending and human resources

Spending

Spending 2020-21 to 2025-26

The following graph presents planned (voted and statutory spending) over time.



^{*} The decrease in planned spending from 2022–23 to 2023–24 is mainly due to the reduction of funding allocated to the Canada First Research Excellence Fund. The announcement regarding the funding renewal was made in spring 2023, based on the results of the 2022–23 competition.

Budgetary performance summary for core responsibilities and internal services (dollars)

The "Budgetary performance summary for core responsibilities and internal services" table presents the budgetary financial resources allocated for NSERC's core responsibilities and for internal services.

Core responsibilities and internal services	2022–23 Main Estimates	planned	planned	planned spending	2022–23 total authorities available for use	2020–21 actual spending (authorities used)	actual	2022–23 actual spending (authorities used)
Funding natural sciences and engineering research and training	1,334,829,363	1,334,829,363	1,296,546,164	1,302,048,148	1,361,765,151	1,386,588,431	1,459,503,049	1,358,206,400
Subtotal	1,334,829,363	1,334,829,363	1,296,546,164	1,302,048,148	1,361,765,151	1,386,588,431	1,459,503,049	1,358,206,400
Internal services	21,248,014	21,248,014	21,520,448	21,121,166	25,770,209	26,686,490	28,972,205	23,322,234
Total	1,356,077,377	1,356,077,377	1,318,066,612	1,323,169,314	1,387,535,360	1,413,274,921	1,488,475,254	1,381,528,634

^{*} The difference between actual versus planned spending is attributable to the additional funding received from Budget 2014 for the 2022 Canada First Research Excellence Fund competition and from Budget 2022 for the initiative in support of Black students and postdoctoral fellows and for Research Security.

Human resources

The "Human resources summary for core responsibilities and internal services" table presents the full-time equivalents (FTEs) allocated to each of NSERC's core responsibilities and to internal services.

Human resources summary for core responsibilities and internal services

Core responsibilities and internal services	2020–21 actual full-time equivalents	2021–22 actual full-time equivalents	planned full-time	2022–23 actual full-time equivalents	2023–24 planned full-time equivalents	2024–25 planned full-time equivalents
Funding natural sciences and engineering research and training	315	351	323	350	336	326
Subtotal	315	351	323	350	336	326
Internal services	181	152	174	152	168	166
Total	496	503	497	502	504	492

Expenditures by vote

For information on NSERC's organizational voted and statutory expenditures, consult the Public Accounts of Canada. lxxxii

Government of Canada spending and activities

Information on the alignment of NSERC's spending with Government of Canada's spending and activities is available in GC InfoBase. lxxxiii

Financial statements and financial statements highlights

Financial statements

NSERC's financial statements (unaudited) for the year ended March 31, 2023, are available on the department's website. lxxxiv

Financial statement highlights

Condensed Statement of Operations (unaudited) for the year ended March 31, 2023 (dollars)

Financial information		2022–23 actual results	2021–22 actual results	minus 2022–23	Difference (2022–23 actual results minus 2021–22 actual results)
Total expenses	1,360,515,000	1,381,377,002	1,412,927,527	20,862,002	(31,550,525)
Total revenues	203,000	164,555	185,205	(38,445)	(20,650)
Net cost of operations before government funding and transfers	1,360,312,000	1,381,212,447	1,412,742,322	20,900,447	(31,529,875)

^{*} The decrease in total expenses over the previous year is mainly attributed to the decrease in funding for the Canada First Research Excellence Fund (CFREF) and the gradual transfer of the Networks of Centres of Excellence program to ISED under the Strategic Innovation Fund. Funding renewal for CFREF was obtained in April 2023. The decrease in total revenues over the previous year is mainly due to a decrease in SharePoint hosting revenues from other government departments.

The 2022–23 planned results information is provided in NSERC's Future-Oriented Statement of Operations and Notes 2022–23. lxxxv

Condensed Statement of Financial Position (unaudited) as of March 31, 2023 (dollars)

Financial information	2022–23	2021–22	Difference (2022–23 minus 2021–22)
Total net liabilities	11,689,814	59,871,658	(48,181,844)
Total net financial assets	7,881,789	56,195,044	(48,313,255)
Departmental net debt	3,808,025	3,676,614	131,411
Total non-financial assets	4,669,139	4,643,539	25,600
Departmental net financial position	861,114	966,925	(105,811)

^{*}The decrease in net liabilities and net financial assets is mainly due to a lower volume of payables at the end of March 2023 compared to March 2022, as a result of a concerted effort intended to settle existing payables in the context of the transitional processes of the financial system migration to the new SAP system. The increase in non-financial assets is mainly due to

the increase in NSERC's tangible capital assets resulting from investment in the organization computer network.

The 2022–23 planned results information is provided in NSERC's Future-Oriented Statement of Operations and Notes 2022–23. lxxxvi

Corporate information

Organizational profile

Appropriate minister: Minister of Innovation, Science and Industry

The Honourable François-Philippe Champagne, P.C., M.P

Institutional head: Prof. Alejandro Adem, FRSC (President)

Ministerial portfolio: Innovation, Science and Economic Development

Enabling instrument: Natural Sciences and Engineering Research Council Act^{lxxxvii}

Year of incorporation / commencement: May 1, 1978

Raison d'être, mandate and role: who we are and what we do

"Raison d'être, mandate and role: who we are and what we do" is available on NSERC's website. lxxxviii

For more information on the department's organizational mandate letter commitments, see the Minister's mandate letter. lxxxix

Operating context

Information on the operating context is available on NSERC's website.xc

Reporting framework

NSERC's departmental results framework and program inventory of record for 2022–23 are shown below.

Core Responsibility: Funding natural sciences and engineering research and training Indicator: Canada's rank among OECD nations on the **Departmental Result:** citation score of natural sciences and engineering Canada's natural sciences research publications and engineering research is internationally **Indicator:** Percentage of funded research involving competitive international collaborations **Indicator:** Percentage of newly funded recipients who self-identify as women **Departmental Results Framework** Indicator: Percentage of newly funded recipients who **Departmental Result:** self-identify as visible minorities Canada has a pool of **Indicator:** Percentage of newly funded recipients who diverse and highly skilled self-identify as Indigenous peoples people in the natural sciences and engineering **Indicator:** Percentage of newly funded recipients who self-identify as persons with disabilities Internal Services **Indicator:** Funding allocated to support research trainees through grants **Indicator:** Number of research trainees supported by NSERC through scholarships and fellowships **Indicator:** Percentage of previously funded graduate students and postdoctoral fellows that list Research and Development as the main activity in their current position Indicator: Non-academic partner funding for research projects **Departmental Result:** Canada's natural sciences **Indicator:** Number of partners on research projects and engineering research knowledge is used **Indicator:** Percentage of funded projects reporting social and/or environmental outcomes for Canadians Indicator: Percentage of funded projects reporting economic outcomes for Canadians **Program: Discovery Research** Program **Inventory Program: Research Training and Talent Development**

Program: Research Partnerships

Supporting information on the program inventory

Financial, human resources and performance information for NSERC's program inventory is available in GC InfoBase. xci

Supplementary information tables

The following supplementary information tables are available on NSERC's website: xcii

- ▶ Reporting on Green Procurement
- ▶ Details on transfer payment programs
- ▶ Gender-based analysis plus

Federal tax expenditures

The tax system can be used to achieve public policy objectives through the application of special measures such as low tax rates, exemptions, deductions, deferrals and credits. The Department of Finance Canada publishes cost estimates and projections for these measures each year in the Report on Federal Tax Expenditures. This report also provides detailed background information on tax expenditures, including descriptions, objectives, historical information and references to related federal spending programs as well as evaluations and GBA Plus of tax expenditures.

Organizational contact information

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Appendix: definitions

appropriation (crédit)

Any authority of Parliament to pay money out of the Consolidated Revenue Fund.

budgetary expenditures (dépenses budgétaires)

Operating and capital expenditures; transfer payments to other levels of government, organizations or individuals; and payments to Crown corporations.

core responsibility (responsabilité essentielle)

An enduring function or role performed by a department. The intentions of the department with respect to a core responsibility are reflected in one or more related departmental results that the department seeks to contribute to or influence.

Departmental Plan (plan ministériel)

A report on the plans and expected performance of an appropriated department over a 3-year period. Departmental Plans are usually tabled in Parliament each spring.

departmental priority (priorité)

A plan or project that a department has chosen to focus and report on during the planning period. Priorities represent the things that are most important or what must be done first to support the achievement of the desired departmental results.

departmental result (résultat ministériel)

A consequence or outcome that a department seeks to achieve. A departmental result is often outside departments' immediate control, but it should be influenced by program-level outcomes.

departmental result indicator (indicateur de résultat ministériel)

A quantitative measure of progress on a departmental result.

departmental results framework (cadre ministériel des résultats)

A framework that connects the department's core responsibilities to its departmental results and departmental result indicators.

Departmental Results Report (rapport sur les résultats ministériels)

A report on a department's actual accomplishments against the plans, priorities and expected results set out in the corresponding Departmental Plan.

full-time equivalent (équivalent temps plein)

A measure of the extent to which an employee represents a full person-year charge against a departmental budget. For a particular position, the full-time equivalent figure is the ratio of

number of hours the person actually works divided by the standard number of hours set out in the person's collective agreement.

gender-based analysis plus (GBA Plus) (analyse comparative entre les sexes plus [ACS Plus])

An analytical tool used to support the development of responsive and inclusive policies, programs and other initiatives; and understand how factors such as sex, race, national and ethnic origin, Indigenous origin or identity, age, sexual orientation, socio-economic conditions, geography, culture and disability, impact experiences and outcomes, and can affect access to and experience of government programs.

government-wide priorities (priorités pangouvernementales)

For the purpose of the 2022–23 Departmental Results Report, government-wide priorities are the high-level themes outlining the government's agenda in the November 23, 2021, Speech from the Throne: building a healthier today and tomorrow; growing a more resilient economy; bolder climate action; fighter harder for safer communities; standing up for diversity and inclusion; moving faster on the path to reconciliation; and fighting for a secure, just and equitable world.

horizontal initiative (initiative horizontale)

An initiative where two or more federal organizations are given funding to pursue a shared outcome, often linked to a government priority.

non-budgetary expenditures (dépenses non budgétaires)

Net outlays and receipts related to loans, investments and advances, which change the composition of the financial assets of the Government of Canada.

performance (rendement)

What an organization did with its resources to achieve its results, how well those results compare to what the organization intended to achieve, and how well lessons learned have been identified.

performance indicator (indicateur de rendement)

A qualitative or quantitative means of measuring an output or outcome, with the intention of gauging the performance of an organization, program, policy or initiative respecting expected results.

performance reporting (production de rapports sur le rendement)

The process of communicating evidence-based performance information. Performance reporting supports decision making, accountability and transparency.

plan (plan)

The articulation of strategic choices, which provides information on how an organization intends to achieve its priorities and associated results. Generally, a plan will explain the logic behind the strategies chosen and tend to focus on actions that lead to the expected result.

planned spending (dépenses prévues)

For Departmental Plans and Departmental Results Reports, planned spending refers to those amounts presented in Main Estimates.

A department is expected to be aware of the authorities that it has sought and received. The determination of planned spending is a departmental responsibility, and departments must be able to defend the expenditure and accrual numbers presented in their Departmental Plans and Departmental Results Reports.

program (programme)

Individual or groups of services, activities or combinations thereof that are managed together within the department and focus on a specific set of outputs, outcomes or service levels.

program inventory (répertoire des programmes)

Identifies all the department's programs and describes how resources are organized to contribute to the department's core responsibilities and results.

result (résultat)

A consequence attributed, in part, to an organization, policy, program or initiative. Results are not within the control of a single organization, policy, program or initiative; instead they are within the area of the organization's influence.

Indigenous business (enterprise autochtones)

For the purpose of the *Directive on the Management of Procurement Appendix E: Mandatory Procedures for Contracts Awarded to Indigenous Businesses* and the Government of Canada's commitment that a mandatory minimum target of 5% of the total value of contracts is awarded to Indigenous businesses, an organization that meets the definition and requirements as defined by the Indigenous Business Directory.

statutory expenditures (dépenses législatives)

Expenditures that Parliament has approved through legislation other than appropriation acts. The legislation sets out the purpose of the expenditures and the terms and conditions under which they may be made.

target (cible)

A measurable performance or success level that an organization, program or initiative plans to achieve within a specified time period. Targets can be either quantitative or qualitative.

voted expenditures (dépenses votées)

Expenditures that Parliament approves annually through an appropriation act. The vote wording becomes the governing conditions under which these expenditures may be made.

Endnotes

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- ii. Discovery Development Grant, https://www.nserc-crsng.gc.ca/Professors-Professeurs/Grants-Subs/DiscoveryPilot-DecouvertePilote_eng.asp
- iii. Research Tools and Instruments grants, https://www.nserc-crsng.gc.ca/professors-professeurs/rtii-oiri/rti-oir_eng.asp
- iv. Setting New Directions to Support Indigenous Research and Research Training in Canada, https://www.canada.ca/en/research-coordinating-committee/priorities/indigenous-research/strategic-plan-2019-2022.html
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