

Fonds de recherche du Québec

Société et Culture
Santé
Nature et Technologies





THE RELEVANCE OF RESEARCH

The progress of modern societies is closely linked to the advancement of science and research. Scientific and technological progress drives economic and social development and contributes to individual and collective wellbeing.

Public research plays a key role in research and innovation policies and strategies around the world. And for that reason, governments try to measure its impacts on society—the economic effects, of course, and the benefits from the social, environmental, medical, technological and numerous other perspectives. For several years, as agencies that fund public research, the Fonds de recherche du Québec (FRQ) have been focused on highlighting the positive impacts of research in Web and video clips and measuring them through a systematic approach. We know very well that, although the methodological approaches have improved, assessing the impacts of research remains a difficult task.

Over the past year, the FRQ developed a research impacts assessment grid that draws on the work carried out by the International School on Research Impact Assessment. To date, the efforts led by an in-house team have demonstrated the impacts of the research funded by the agencies in terms of knowledge advancement, research capacity and support for decision making, which tend to materialize in the longer term.

In addition, a second study conducted by an outside firm reveals that the total impact of public research on Québec's GDP was estimated at \$4.6 billion in 2015. Public research supports over 52,000 jobs through various means: research activities, employment for highly qualified personnel, the creation of new businesses, foreign investment and the hosting of major scientific conferences in Québec. Along with the economic impacts are the social, environmental, technological and other outcomes that are illustrated in case studies.

The study also reveals that public investment in research is a critical condition to creating an effective research and innovation system. This is a fact in Québec and abroad. But other facilitating conditions must be in place, such as access to data for research purposes. With the prevalence of big data, digital technology and artificial intelligence, the issue will become all the more pressing in the years to come, leading to questions pertaining to confidentiality, intellectual property and research development for the benefit of society. The Fonds intend to raise awareness among government authorities of the importance of their data for research purposes.



Rémi Quirion, OC, CQ, PhD, FRSC
Chief Scientist of Québec

Chief Scientist's Report

2015-2016



Scientific missions and agreements

Conferences and public affairs

Development of major intersectoral projects

Promoting research

Québec 

CONTEXT

The fifth year of my first mandate was marked by federal renewal with the coming into power of the Trudeau government and a provincial cabinet shuffle with Dominique Anglade's appointment as minister of economy, science and innovation. A wind of change also blew through Parliament Hill with the appointments of two ministers of scientific affairs (Kirsty Duncan and Navdeep Singh Bains) and reinvestment in public research. In this context, I organized meetings with political authorities and Canadian research funding agencies to ensure better coordination between the research and innovation strategies in Québec and Canada.

As part of this trend, Kirsty Duncan, federal minister of science, assembled an independent panel—of which I am a member—to lead a review of federal funding for fundamental science in an effort to examine public research funding in Canada and foster the competitiveness of Canadian researchers at the international level. The panel will submit its report in early 2017.

There were also major changes in Québec, including the consolidation of provincial science and innovation missions under the same department. Minister Anglade created a working group of which I am also a member to develop the upcoming strategy for research and innovation in Québec. A consultation got underway this fall, leading up to the launch in spring 2017. A digital strategy, as well as a life sciences strategy further to four related initiatives held in 2016, are expected to be released.

At the federal level, the reinvestments in granting councils were welcomed by the scientific community. Québec's public finances and the upcoming strategy provide a slightly more optimistic glimpse into the support that will be provided for research, researcher training and knowledge transfer.

In addition, the year was marked by a certain number of initiatives that are outlined in this report, including the creation of the Réseau Québec maritime in June. The Fonds played a key role in the project's development.

In recent years, the FRQ entered into partnerships with the Conseil national de la recherche scientifique (CNRS) in France to strengthen collaborations between Québec and the CNRS international joint units and new agreements were concluded in June 2016. As part of these initiatives, I will chair the international committee assembled to evaluate the CNRS, which met this summer.

I am about to begin the first year of my second mandate. It starts at a key time for public research funding at the federal and provincial levels and challenges to better position Québec on the world stage are great.



KEY ACHIEVEMENTS

◆ Scientific missions and agreements

Development of national and international partnerships

In light of his role in the development of research in Québec, the chief scientist was called upon to participate in several missions outside Québec and host foreign delegations. Here is an overview of some of his activities.

COP 21 and mission to Paris and Brussels

The chief scientist was part of a major delegation of Québec dignitaries who traveled to France for COP21, the Paris Climate Change Conference. There, he took the opportunity to discuss the progress and challenges for Future Earth, an international organization with hubs in five major cities: Paris, Stockholm, Boulder, Tokyo and Montréal, where its secretariat is located. In conjunction with the event, the chief scientist met with representatives from the *Délégation générale du Québec à Paris* to discuss a range of research and innovation issues and Québec-France partnerships in the sector, including an activity to promote Québec's international joint units in collaboration with the CNRS, which were concluded in June, the release of a special issue on France-Québec research collaborations in the June edition of *Science et Avenir* magazine and the completion of the project to develop a new France-Québec maritime research institute. Finally, in July, the chief scientist chaired the international committee tasked with evaluating the programs and activities of the CNRS.

The chief scientist also made his way to Brussels to discuss partnerships

with Véronique Halloin, secretary general of the Fund for Scientific Research – FNRS of Wallonia-Brussels. The meeting led to a five-year agreement signed in September 2016 to launch calls for projects on topics covering at least two FRQ research sectors. Finally, the chief scientist also had the opportunity to forge links with Carlos Moedas, European commissioner for research, science and innovation, at the 7th European Innovation Summit..

Mission to China

At the request of Christine St-Pierre, minister of international relations and the Francophonie, the chief scientist oversaw the academic component of the government mission to China, which was organized from March 20 to 24, 2016. During his brief stay, he met with officers from the National Natural Science Foundation of China (NSFC), which has been a partner of the FRQ for over 20 years. The discussions continued in Montréal, when the president and CEO of the

NSFC visited Montréal in August. The meetings served to lay the foundations for upcoming calls for proposals, specifically in the field of cardiology. Representatives also convened in Qingdao, where Québec opened a trade office, and in Shanghai with the senior researcher at the ChenSan Botanical Gardens and the general director of the Shanghai Office of Foreign Affairs.

Mission to Mexico

From October 11 to 14, 2015, the chief scientist accompanied Premier Philippe Couillard on a mission to Mexico. Along with provincial government representatives, including the minister of research and innovation, he took part in several meetings under the mission's academic and innovation component. A partnership agreement with the *Consejo Nacional de Ciencia y Tecnología* (Conacyt) was set out and signed in June during the Mexican president's visit to Québec. The initiative aims to foster scientific

Maryse Lassonde, Nicolas Chibaeff, Guy Breton, Rémi Quirion, Dominique Anglade, Luce Samoisette Alain Fuchs, Denis Brière and Jan Matas at the CNRS joint units conference.





Enrique Cabrero Mendoza, director general of Conacyt and Rémi Quirion signing the agreement between their two organizations.

collaborations on intersectoral projects. Calls for joint proposals and other scientific exchanges are planned, including training activities, missions and workshops on issues of common interest.

BIO International Convention in San Francisco

Along with ministers Gaétan Barrette and Dominique Anglade, the chief

scientist took part in the annual BIO International Convention, which was held in San Francisco from June 5 to 8, 2016. The BIO convention is the world's largest biotechnology exhibition and constitutes a prime showcase for Québec. The chief scientist met with international pharmaceutical representatives, stakeholders in Québec's biotechnologies sector and officers

from granting entities, including Merck Canada, Vertex, Abbvie, the Cuban delegation, Laboratoires Pierre Fabre (France), Q-CROC and Exactis. Discussions were focused on topics such as access to large government databases.

◆◆◆ Conferences and public affairs

CERCLE FINANCE DU QUÉBEC

On May 23, 2016, the chief scientist was invited by the Cercle finance du Québec to lead a conference on the importance of research and innovation for a strong economy, specifically in the Québec area. Representatives from the financial, insurance and management sector were in attendance to hear him discuss the economic and social benefits of research based on concrete examples of local successes. The chief scientist commended the city of Québec for its leadership in research and innovation.

BRIEF ON DATA ACCESS

On September 24, 2015, at a session of the National Assembly Committee on Institutions, the chief scientist presented the FRQ's position on

access to department and government agency data for research purposes. In brief that was released following the presentation, the FRQ provided a detailed account of the conditions to access government databases, which constitute a vast and critical source of information for researchers seeking to increase the wellbeing of Québécois. The chief scientist is working in close collaboration with Minister Anglade (science) and Minister De Santis (access to information) on the issue.

HOSTING THE CHIEF SCIENCE ADVISOR OF NEW ZEALAND AND THE EXECUTIVE DIRECTOR OF THE WORLD ACADEMY OF SCIENCES

Invited by the chief scientist and the Canadian Science Policy Conference,

Sir Peter Gluckman, New Zealand's chief science advisor, met with the highest authorities in research and innovation in Québec and Canada, as well as with several government and elected officials. The link between research and public policy was the main topic of discussion. Peter Gluckman is a founding member and organizer of the International Network of Science Advisors, which is dedicated to science diplomacy issues.

The chief scientist also hosted Romain Murenzi, executive director of the World Academy of Sciences. Mr. Murenzi spoke at a conference organized by the FRQ and discussed the importance of research training and international collaboration with countries in the global south.

CANADIAN SCIENCE POLICY CONFERENCE

In November 2015, the chief scientist took part in the 7th Canadian Science Policy Conference in Ottawa. He spoke at the keynote session on science advice to government, sharing his experience as a scientific advisor to ministers and deputy ministers since his appointment five years ago.

ENTRETIENS JACQUES CARTIER

As a member of the board of directors and the executive committee of the

Entretiens Jacques Cartier, the chief scientist took part in the organization's annual general meeting ahead of the Entretiens à Lyon, which were held in France in November 2015. The following day, the chief scientist participated in a roundtable on science and the media at the Matinée des recteurs. He then opened the 2015 Entretiens Jacques Cartier at the Musée des Confluences in Lyon, along with dignitaries from Québec and Lyon.

HEADS OF POSTS MEETING

In June, the chief scientist presented the position of Québec research at the international level and the role of the FRQ to the heads of posts of Québec's foreign delegations at their 21st meeting in Québec. He also took the opportunity to discuss the roles of heads of posts in promoting Québec science in their respective regions of the world and raising awareness of the chief scientist's role.

❖ Development of major intersectoral projects

Training event on leadership and entrepreneurship

In November, as a follow up to the discussion forum on entrepreneurship and creativity in April 2015, the chief scientist organized a training event on leadership and entrepreneurship for PhD and postdoctoral students and young researchers seeking to take up new leadership challenges. The pilot initiative confirmed the need for activities to foster the development of management and leadership skills among young scientists. The event will lead to concrete actions in collaboration with partners in the new year.

Launch of Québec-Flanders research projects

At the 10th World Biomaterials Conference held at Palais des congrès de Montréal in May, the FRQ and Research Foundation Flanders launched a call for intersectoral projects led by researchers in Québec and Flanders. At the launch, the five projects funded as part of the initiative's first competition were presented to the some fifty people in attendance. The research focused on infectious disease, infertility,

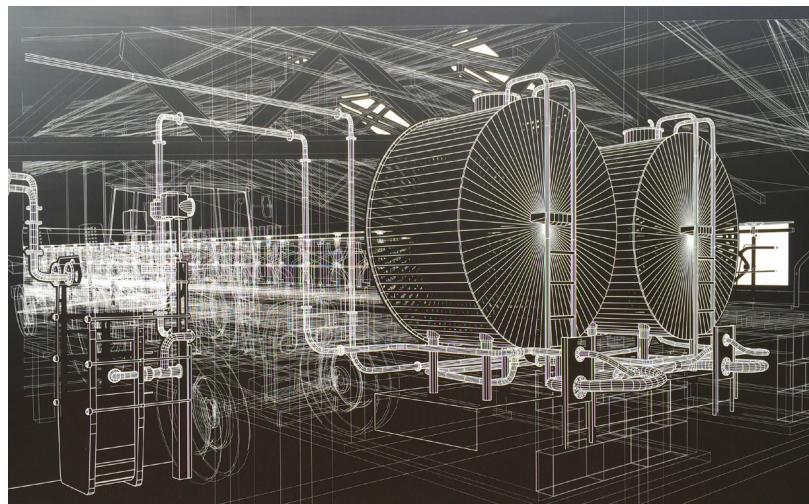
neuroscience, cardiovascular health and physician-patient communication.

Agricultural conference and exhibition

In May, a conference entitled *Entre campagnes et villes – cultures cherchent cultures : vers la conception d'un espace destiné au partage des connaissances et des expériences agriculturelles* was given at the annual congress of the Association francophone pour le savoir – Acfas.

Organized by UQAM and the chief scientist, the conference aimed to discuss urban-rural links. For two days, experts from different fields and sectors discussed issues ranging from food health to the development of entrepreneurial and ethical agriculture. Following the event, a coffee meeting was organized by UQAM, Space for Life, the FRQ and the Union des producteurs agricoles in May 2016.

A glimpse of the agricultural exhibition at the 19th Great Gardening Weekend at the Botanical Garden.



◆ Promoting research

NATIONAL ASSEMBLY OF QUÉBEC

This past year, the chief scientist hosted two scientific dissemination activities for members of the National Assembly in Québec. In November 2015, MNAs had the opportunity to exchange with researchers on a range of topic ranging from radicalisation to aquaculture and cognitive impairments associated with aging. In March 2016, the three researchers invited to a science breakfast at the National Assembly discussed the applications of the CRISPR-Cas9 genome editing technology and the ethical issues that have been raised. The meetings aim to get MNAs acquainted with science-based matters that may require a legal framework.

FORUM SCIENCE ET SOCIÉTÉ

On December 4, 2015, the chief scientist invited members of the research community, scientific dissemination organizations and representatives of civil society to the Grande Bibliothèque in Montréal to take part in a forum entitled *Les chercheurs dans la sphère publique* to discuss the role that researchers play in communications to non-academic audiences and the issues and challenges. Over 150 people took part in the Science et société event, which sought to identify concrete measures to encourage researchers and students to be more present in the public space and better recognize activities for the general public.

PUBLIC PRESENTATION ON THE INTERNATIONAL JOINT UNITS OF THE CNRS

As part of the 22nd Conference of Montréal, the chief scientist and the CNRS led a public presentation on the French agency's international joint units in Québec. The conference aimed to highlight the collaborations between teams in Québec and France in highly strategic areas from the scientific, economic and technological perspectives, including deep learning and artificial intelligence, nanotechnologies and the Arctic.

AWARDS AND RECOGNITION WORKSHOP

On March 18, 2016, following the release of the governor general of Canada's strategy to enhance global recognition for Canadian research excellence, the chief scientist invited Québec universities to a meeting to determine the approaches to develop to increase the number of applicants and winners of Canadian and international awards in science. The University of Toronto, McGill University, the University of Ottawa and Université de Montréal each presented their plans. The FRQ are current setting out a strategy.

FORUM ON MAJOR INTERNATIONAL CONFERENCES

In partnership with the Ambassadors' Club of the Palais des congrès de Montréal, the chief scientist organized a forum entitled *Rayonnement de la recherche au Québec : stratégies, enjeux et impacts*. Over 40 representatives from research centres and universities discussed the reasons why it is important for Québec researchers to become involved in the organization of major scientific conferences. A competition was announced at the close of the forum: three awards of \$10,000 will be handed out to recognize researcher involvement in large-scale events.

ÉTUDIANTS-CHERCHEURS ÉTOILES AWARDS

For a fourth consecutive year, the FRQ gave out their Étudiants-chercheurs étoiles awards to 36 winners. In addition to promoting research careers, the competition aims to recognize the excellence of initiatives carried out by students.

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