

The background of the entire page is a complex, low-poly geometric pattern in various shades of blue, creating a textured, crystalline effect.

CREATING a culture of **INNOVATION**

ANNUAL REPORT 2019
AS OF MARCH 31, 2019

NBIF NEW BRUNSWICK
INNOVATION FOUNDATION

INTRODUCTION TO NBIF

Innovation continues to be a necessity. To compete with companies and concepts from around the globe, business owners, researchers and entrepreneurs must be savvier, brighter and more ambitious than ever before. They also need to be actively supported in their communities.

NBIF is a private corporation that specializes in venture capital and applied research investments. It is our **mission** to create a culture of innovation in New Brunswick by actively supporting early stage start-up entrepreneurs and researchers, with the **vision** of being among Canada's most recognized investment partners.

We passionately support our province with an unwavering commitment to our core **values**: agility, accountability, diversity, integrity, and respect.

For over 16 years we have been nurturing growth and innovation in New Brunswick. We see potential where not everyone does. We take calculated risks, looking before we leap every time, but realize that greatness isn't possible without a little risk.

Success doesn't happen in isolation. We recognize that when a few succeed, it benefits many, in the form of jobs, growth, knowledge sharing, and more. We help our researchers expand their portfolios and our entrepreneurs grow their businesses, so we can grow New Brunswick. **That's the reason we do what we do.**



A MESSAGE FROM OUR CHAIR

NBIF has had a banner year and we couldn't be happier as we look into the future. It's not because of record investments or sales, although there have been some fantastic deals, investments, and progress made by the researchers and businesses we support. We've even won some awards, which is always reason to celebrate. We have clients that have raised new capital and we've formed new partnerships that are diversifying how we work in the region and what the company is supporting in its mandate. For us, what made last year phenomenal was our people and that's why we're excited about what's to come.

We brought on a new leader and many new team members in research, investment, and organizational support roles. If you walk into the office, or join us at one of our events, you will be met by many new faces who joined NBIF in the past 12 months. Quickly, collaboration occurred, and this team began rebuilding the organization, aligning the work we do and how we support our customers, and with the board members, a vision and plan for the future was crafted. That happens when people work together to imagine the impact an organization like ours can have on enabling innovation and the economy in New Brunswick.



In the next 12 months, I believe you'll see even more changes from our organization. We want to be that enabler in the economy that partner innovators look to when they are researching, exploring, piloting and problem-solving and need support. We are bringing new ideas and partners to the table and are enthusiastic for what more we can do.

On behalf of our board of directors, thank you for being a part of our past and we invite you to be with us in the future. We hope you can take time to learn about the stories that New Brunswickers are building and owning here in our province. Their work is taking them across the globe, and they are bringing their talent into New Brunswick communities because they want to live here, work here, and build their futures here.

At NBIF, we are proud to play a role in building this future economy and we have our sights set on even more.

Cathy Simpson
Board Chair

BOARD OF DIRECTORS

Our NBIF board members bring a wealth of experience and knowledge to our team. Beyond their professional qualifications, they also share the drive and grit of New Brunswick's entrepreneurs and researchers – qualities which undoubtedly attracted them to our organization. They're enthusiastic about innovation and growth, and true believers in New Brunswick's potential.

Our board oversees all NBIF business and affairs, guiding the organization along a steady, reliable path. Board members provide strategic counsel and valuable outside perspective, complementing the work of our team, who manage day-to-day operations.

Closing out 2019, we welcomed Sadie Perron, Deputy Minister of Post-Secondary Education, Training and Labour, to our board.



CATHY SIMPSON

Board Chair
CEO, TechImpact

COMMITTEES: 1, 4



ERIC COOK

Board Vice Chair
Executive Director
and CEO, RPC

COMMITTEES: 1, 3



GERRY VERNER

Board Secretary
Business Development
at Mariner Partners,
Inc.

COMMITTEES: 1, 4 (Chair)



ROB MILLER

Board Treasurer
President
CPA, CA,
Edgewater Consulting Ltd.

COMMITTEES: 1, 2 (Chair)



JILL GREEN

CEO,
Green Imaging
Technologies

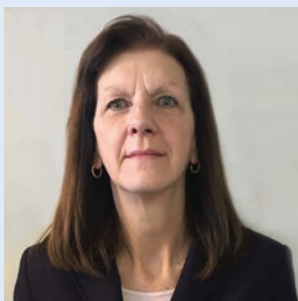
COMMITTEES: 3 (Chair)



DR. DAVID MAGEE

Vice President
Research, UNB

COMMITTEES: 2



SADIE PERRON

Deputy Minister,
Post-Secondary Education,
Training and Labour

COMMITTEES	
1	Executive
2	Audit & Finance
3	Governance
4	Human Resources

A MESSAGE FROM OUR CEO

Innovation is at the heart of what we do at NBIF.

We know that innovation is a continuous cycle of iteration and experimentation. It takes time, and resources, to get it right. But when you do, the impact can be significant, as we have seen repeatedly here in New Brunswick.

That commitment to innovation was on display at NBIF over the past year. We've added seven new positions to take us to a team of 13 strong professionals with world class experience. Today NBIF is stronger than ever, primed to continue our mission to help transform New Brunswick's economy.

In the past year, we've taken new steps to support start-ups, through collaborative venture capital investment strategies with investment partners Innovacorp, regional accelerators Propel ICT and Energia. These strategic partnerships will help us identify and support the strongest New Brunswick-based start-ups.



We also launched a Social Innovation Research pilot in partnership with the New Brunswick Social Policy Research Network, expanding our footprint in the province's research community. And we've continued to support leading-edge research at New Brunswick's universities, colleges and institutes.

Our ambitions are equally bold for the coming year. We'll work hard every single day to advance New Brunswick's innovation agenda. We will tell the NBIF story and the stories of the innovative entrepreneurs and researchers that are helping transform this place we call home.

Innovation is a team sport – we invite you to join us. Together, we can achieve great things for New Brunswick.

Jeff White, CPA, CA
CEO

OUR TEAM

Our team is our greatest asset – our work would simply not be possible without them. They're truly the backbone of the organization, intimately connected to all our partners while keeping things running smoothly every day. They're also individually passionate about New Brunswick innovation, bringing knowledge and experience to their roles while sharing a love for the daily hustle.

In the last year we've added several new team members who have helped to make us whole, bringing us to a complete team for the new fiscal year. As a full house, we have the minds and manpower needed to truly deliver on our mission of nurturing innovation in New Brunswick.



EXECUTIVE TEAM:



JEFF WHITE
CPA, CA
CEO



JOANNE JOHNSON
Executive Assistant



RAYMOND FITZPATRICK
CPA, CMA
Director of Investments



DR. LAURA RICHARD
D. Phil (Oxon)
Director of Research



THOMAS BIRD
EIT
Investment Associate



JEFF LINGLEY
Investment Analyst



HILARY LENIHAN
Research Development Officer



DR. JOHN CORMIER
Ph.D
Research Development Officer



MAGGIE EDWARDS
CPA
Controller



DANIEL HOYLES
CPA, CMA
Investment Analyst



ALEC MANLEY
Research Development Officer



ANGELA PYNE
Marketing Manager



DOMINIQUE SOFFEE
Marketing and Administrative
Assistant



OUR PERFORMANCE AT A GLANCE



**VENTURE
CAPITAL**

\$6.2M



**APPLIED
RESEARCH**

\$9.7M



**LEVERAGED
CAPITAL**

\$90M



**INNOVATION
VOUCHER**

\$1.7M

OUR 2019 IMPACT



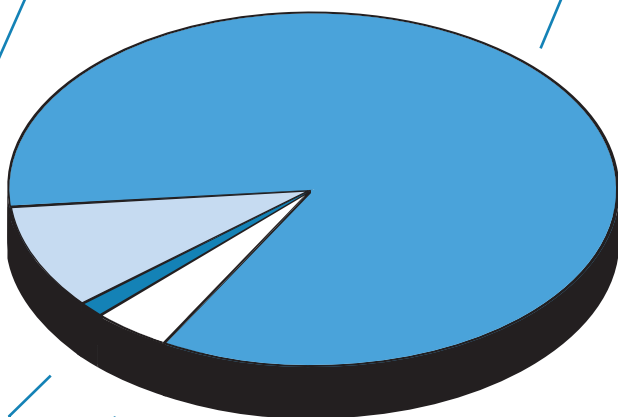
Applied Research

\$9,786,467



Leveraged Capital

\$90,057,225



Innovation Voucher

\$1,744,470



Venture Capital

\$4,462,155



TOTAL IMPACT

\$106,050,317

OUR SECTOR BREAKDOWN

BIOSCIENCES & HEALTH



\$ 2,971,136

BIOSCIENCES & BIOTECHNOLOGY **\$1,546,371**

HEALTH & MEDICINE **\$1,424,765**

ENVIRONMENT & AGRICULTURE



\$ 2,631,792

AGRICULTURE, FORESTRY, FOOD & BEVERAGE **\$1,437,121**

ENVIRONMENTAL TECHNOLOGY & RESOURCE MANAGEMENT **\$480,365**

FISHERIES & MARINE SCIENCES **\$714,306**

IT & PHYSICAL SCIENCE



\$ 8,521,707

AEROSPACE & DEFENCE **\$455,000**

ENERGY & ELECTRONICS **\$1,447,020**

ICT **\$4,895,440**

MANUFACTURING & MATERIALS **\$1,591,200**

PRECISION SCIENCES **\$133,047**

SOCIAL SCIENCES



\$ 120,500

SOCIAL SCIENCES & HUMANITIES, PSYCHOLOGY **\$120,500**

BUSINESS OPERATIONS



\$ 259,957

CONSUMER GOODS & SERVICES **\$179,957**

FINANCE, ECONOMIC & BUSINESS SCIENCE **\$80,000**

*PLEASE NOTE THAT THESE FIGURES DO NOT INCLUDE SCHOLARSHIP AWARDS.

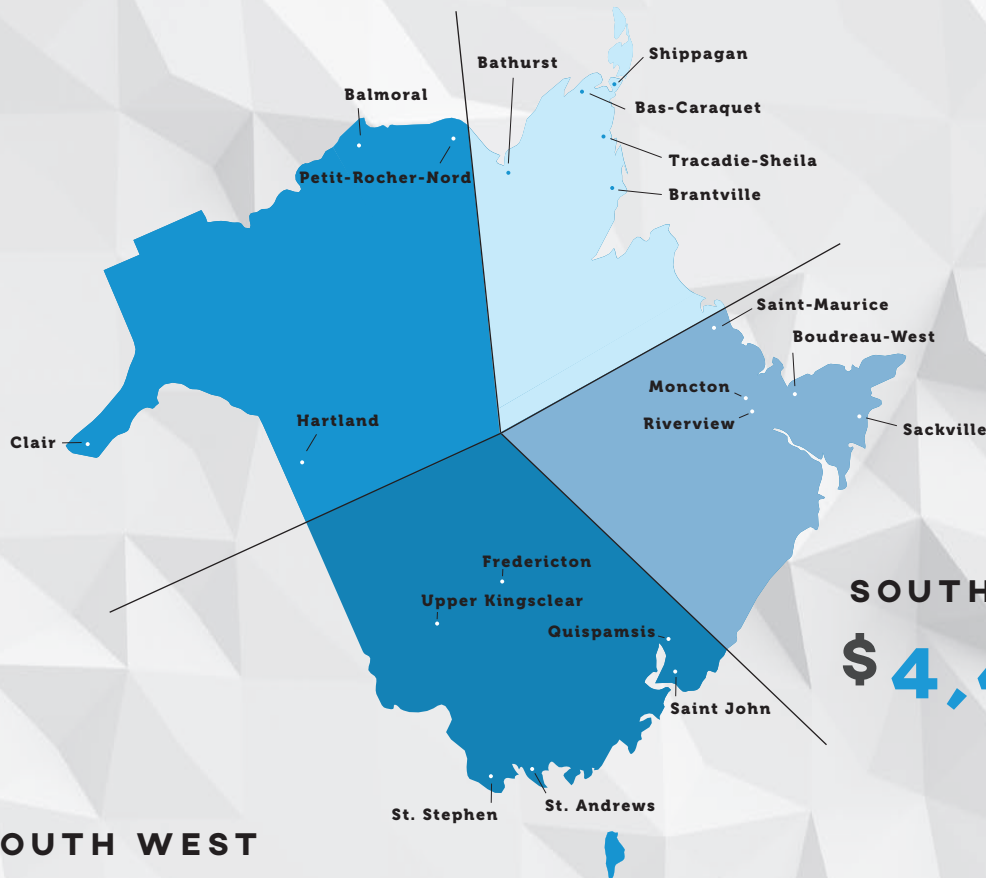
OUR 2019 GEOGRAPHICAL BREAKDOWN

NORTH WEST

\$299,160

NORTH EAST

\$1,047,798



SOUTH WEST

\$10,204,847

SOUTH EAST

\$4,441,287



TOTAL NBIF INVESTMENT

\$15,993,092

INTRODUCTION TO VENTURE CAPITAL

Venture capital investments support emerging start-ups with high growth potential. As these companies gain market traction, they need additional funding to maintain their growth. Capital invested from our venture capital fund is intended to fully support a business for 12 to 18 months.

All of our venture capital investments are funded in exchange for company equity,

or equity-like securities - this means we become a partial owner in the company. Our venture capital investments typically range from \$100,000 to \$1,000,000 per round/company.

We provide several different venture capital funds to serve companies of varying needs.

STARTUP INVESTMENT FUND

Our Startup Investment Fund provides early-stage start-up companies with a seed investment of up to \$200,000. This funding is intended to be used towards developing a new business in New Brunswick, with specific emphasis on the refinement and commercialization of an innovative product or service.

As an early-stage seed fund, our Startup Investment Fund has a higher risk tolerance than our other investment funds, though we do our best to ensure our risk is minimized. More established companies can apply to our Venture Capital Fund.

STARTUP INVESTMENT FUND	
Canum Nanomaterials	\$250,000
RIDDL	\$100,000
TurboPlay	\$200,000
	\$550,000

This year we invested a total of

\$550,000

in three companies through our Startup Investment Fund.



TURBOPLAY

This year, we invested \$200,000 in TurboPlay, as part of a seed round over \$700,000. Our investment represents a vote of confidence for the Fredericton company's growth potential in the expanding video game industry, which today is valued at US\$137 billion, more than the movie and music businesses combined. Despite the industry's size, the distribution of games is largely handled by a few key players – and that's where TurboPlay saw their opportunity. TurboPlay is building a personalized video game marketplace for "indie" gamers and game developers to sell their digital games and related downloadable content. The company's

platform uses a machine-learning algorithm to interpret user behavior, creating a better customer experience. TurboPlay also handles microtransactions within the games using innovative decentralized technology and supports the use of legitimate tokens for transactions as well as credit cards and PayPal.

TurboPlay is helmed by Vince McMullin, a former Microsoft game developer and veteran entrepreneur who led his previous company Stompy Bot Productions to public trade. The company has already secured prolific studios such as Bedtime Games, with almost 400,000 players.



JOHN NGUYEN AND VINCE MCMULLIN (PICTURED) OF TURBOPLAY HOPE THEIR COMPANY'S PERSONALIZED VIDEO GAME MARKETPLACE WILL SHAKE UP THE GAMING INDUSTRY.

VENTURE CAPITAL FUND

Our Venture Capital Fund is directed towards start-ups that have secured customers and have begun to gain market traction, to help them scale-up their operations. This fund provides an investment up to \$1 million, and is intended to be used for product development, marketing, hiring additional employees, acquiring additional IP protection, and other business operations.



VENTURE CAPITAL FUND	
Anessa	\$250,000
Avrij	\$250,000
Beauceron Security	\$750,000
EhEye	\$150,000
Gemba	\$250,000
Kognitiv Spark	\$500,000
Loft1	\$50,000
Populus	\$250,000
Porpoise	\$100,000
Repable	\$100,000
Resson Aerospace	\$227,368
Rise	\$250,000
Smart Skin	\$500,000
Sonrai Security	\$334,787
Soricimed	\$250,000
Stash Energy	\$250,000
TOTAL	\$4,462,155

**In 2019,
we invested**

\$4,462,155

**in 16 companies
through our
Venture Capital Fund.**

SONRAI SECURITY

In 2019, we participated in an investment round for Sonrai Security totalling over \$25 million, led by notable American investment firms Polaris Partners and TenEleven Ventures. Sonrai, founded in 2017, provides a Cloud Data Control (CDC) service that delivers a complete risk model of all identity and data relationships, including activity and movement across cloud accounts, cloud providers and third-party data stores. The Sonrai CDC service helps security and DevOps leaders stop data security threats, ensure compliance and increase DevOps efficiency. Led by

Sandy Bird, a founding member of Q1 Labs and former chief technology officer for IBM Security, the investment enhances New Brunswick's emerging reputation as a cyber security leader.

BASED IN FREDERICTON, SONRAI SECURITY HAS EXPERIENCED SIGNIFICANT GROWTH SINCE IT WAS FOUNDED IN 2017.



THE SONRAI SECURITY TEAM AT THEIR FREDERICTON OFFICE.

INNOVATION VOUCHER FUND

Our Innovation Voucher Fund provides small- and medium-sized enterprises with funding to access the scientific talent and facilities they need for research and development opportunities in our academic institutions. We contribute non-repayable funding up to \$80,000 and match participants with researchers to help them carry out the project. Any intellectual property created through

the project is owned by the company that receives the voucher. The Innovation Voucher Fund aims to help small- and medium-sized enterprises become more profitable and competitive through innovation.

This year we invested a total of \$1,744,470 in 30 companies through our Innovation Voucher Fund.

INNOVATION VOUCHER FUND		
COMPANY	RESEARCH INSTITUTION	AMOUNT
A. Landry Fabrication	CCNB	\$80,000
Assomption Vie	UdeM	\$80,000
Boreal Spirits	CCNB	\$20,373
Claritech	UdeM	\$80,000
Construction Navale Atlantique	CCNB	\$80,000
Co-op Forestiere	CCNB	\$8,160
Craig Mfg	CCNB	\$8,000
Cuisines Roi	CCNB	\$79,584
Envenio	UNB	\$80,000
Fireready	CCNB	\$80,000
Ganong Bros	RPC	\$80,000
GIS Gas Infusion	MTA	\$80,000
Go Deep International	CCNB	\$80,000
Greystone Energy	UdeM	\$80,000
Hotspot Parking	NBCC	\$56,368
Howell Ventures	UNB	\$79,164
L'Épaulard 1 ltée	IRZC	\$27,437
Lamtrac	CCNB	\$69,200
Leon Chouinard	CCNB	\$8,000
Night Puck (Amendment)	RPC	\$18,000
Night Puck II	RPC	\$48,800
Pecheries Thibodeau	CCNB	\$33,600
Pecheries Thibodeau	CCNB	\$24,400
Picford Apothecary	RPC	\$65,200
Principle Energy	RPC	\$43,056
SceneSharp	UNB	\$55,144
Smart Skin	CCNB	\$80,000
Sweat Academy	UdeM	\$80,000
ThermalWood	CCNB	\$80,000
Trevali Mining	RPC	\$59,984
TOTAL		\$ 1,744,470

CONSTRUCTION NAVALE ATLANTIQUE

Construction Navale Atlantique (CNA) was founded in 2010 by five companies from northern New Brunswick with a shared interest in boosting shipbuilding in their region. Now, CNA is working with CCNB to improve boat hull construction

using a new resin-infusion process, which will significantly reduce the time and cost of construction. The new process also requires less construction materials, helping to conserve valuable natural resources.

BASED IN BAS-CARAQUET, CONSTRUCTION NAVALE ATLANTIQUE HAS MADE A POSITIVE IMPACT ON THE LOCAL SHIPBUILDING INDUSTRY SINCE ITS FOUNDING IN 2010. SHOWN HERE IS THEIR BOAT MODEL ROBITAILE 45 C .08.



PORTFOLIO OVERVIEW

Over a period of time we have invested in 47 companies. The figures below represent the total active investments to date in our active portfolio company list.

Portfolio Overview at March 31, 2019				
Alongside	\$750,000		Patchell Brook	\$200,000
Anessa	\$300,000		Pfera	\$100,000
Avrij	\$500,000		Populus Global	\$1,571,600
AVSS	\$100,000		Porpoise	\$300,000
Beauceron Security	\$900,000		Quber	\$200,000
Black Arcs	\$100,000		Repable	\$350,000
Chinova Bioworks	\$100,000		Resson Aerospace	\$786,349
EhEye	\$300,000		Rise	\$350,000
Eigen	\$1,500,000		SceneSharp	\$250,000
Encore Interactive	\$500,000		Select Bidder	\$20,000
Envenio	\$512,698		Simptek	\$500,000
Eyes Over	\$200,000		Smart Pods	\$734,035
Fiddlehead	\$500,000		Smart Skin	\$1,501,454
Flixel	\$450,000		SomaDetect	\$250,000
Fundmetric	\$300,000		Sonrai Security	\$334,787
Gemba	\$1,300,000		Soricimed	\$500,000
HotSpot Parking	\$250,000		Stash Energy	\$450,000
Introhive	\$250,000		Total Pave	\$250,000
Inversa	\$1,475,381		TurboPlay	\$200,000
Itavio	\$517,375		Welltrack	\$450,005
Jaza Energy	\$20,000			\$21,898,684
Kognitiv Spark	\$750,000			
Legacy Lane	\$25,000		INVESTMENTS NOT CLOSED AT MARCH 31, 2019	
Loft1	\$250,000		Canum Nanomaterials	\$250,000
MyCodev	\$600,000	RIDDL	\$100,000	
NB Biomatrix	\$50,000	TurboPlay	\$200,000	
Newpy	\$100,000		\$550,000	

ENVENIO

When engineers want to test how a fluid – a liquid, gas or anything else that flows – will behave in specific conditions, Envenio is there. Envenio's Computational Fluid Dynamics (CFD) software helps engineers understand how fluids move. Founded using intellectual property by Prof. Andrew Gerber at the University of New Brunswick, the company's software allows users to simulate fluid flow, and process it 10 times faster than other options on the market. Users can also run multiple simulations in the same day; other software, by comparison, is often left to run overnight. The software uses Gaming Processor Units (GPUs) to process simulations, compared to industry standard CPU, which allows for more efficient processing. The software has been used by a wide variety of customers, from the Canadian military to electronic cigarette manufacturers.

Sensing Envenio's growth potential, we have invested \$513,000 in the company since their creation in 2014 and launch in 2016, and provided an Innovation Voucher to fund a project with UNB. Our investments with Envenio have been very profitable, and in 2019 we received the CVCA Private Capital Regional Impact Award for our deal with the company. The award recognized our role in helping Envenio to positively impact our local community through job creation – around 15 jobs have been created in Fredericton since we first invested in the company.

In November 2018, the company exited our portfolio when it was acquired by San Francisco-based JUUL. This sale represented an IRR of 95% for NBIF.



BREAKTHRU HIGHLIGHTS

Breakthru was created as a biennial, province-wide start-up competition – to encourage the creation and development of entrepreneurial, innovative business ventures in New Brunswick. We give participants a unique opportunity to access start-up capital, mentoring, and support from industry leaders and other successful entrepreneurs.

Our team had their hands full this year, as we received 36 business plan submissions by the initial deadline in November. After two “entrepreneurship bootcamps” that offered teams advice, mentoring and support from successful founders and operators of local and national businesses, the submissions were whittled down to five finalists.

The competition’s grand prize was valued at \$335,500 in investments and professional services, highlighted by cash investments of \$200,000 from NBIF and \$100,000 from Opportunities New Brunswick (ONB). Second prize had a value of \$175,500, with \$100,000 of that coming from NBIF and \$50,000 from ONB. The viewer’s choice winner took home \$75,000 in direct investment along with a “Golden Ticket” to a Dragons’ Den audition in Toronto.

The competition came to a triumphant end on March 21, 2019 at the Fredericton Convention Centre, with Canum Nanomaterials taking the top prize and RIDDL finishing in second place. Canum also won the CBC Viewer’s Choice Award for receiving the most votes on CBC New Brunswick’s Facebook page.



GRAND PRIZE AND CBC VIEWER'S CHOICE AWARD

CANUM NANOMATERIALS INC.

Canum Nanomaterials is led by President and CEO Kyle Woods, COO Alex Clarkin, CTO Francois Michaud and Director of Research Dr. Felipe Chibante, a professor at UNB. Canum is a carbon nanomaterials manufacturing company that produces high-quality fullerenes for use by manufacturers and researchers. Fullerenes are carbon allotropes that can be used in a wide variety of applications, including as antioxidants, antiviral solutions, solar cell components, hydrophobic drug deliverers and photosensitizers. Spun out of Prof. Chibante's innovative research at the University of New Brunswick, of which a significant portion was funded by NBIF through the Research Innovation

Fund in 2013, Canum's unique product processes allow for the affordable and environmentally friendly manufacture of these complex and versatile molecules.



RUNNER-UP

RIDDL

RIDDL has developed a cloud-based software platform that harnesses the power of advanced machine learning to provide investment managers and donors with actionable data about how they can use their investments to effect change in fields like climate change mitigation and poverty reduction. During development, RIDDL worked with Prof. Moulay Akhloufi at Université de Moncton who was funded with numerous grants from NBIF. Founded by Janelle Sobey, Vanessa Paesani and Jess Peters, RIDDL's pragmatic solution to



this real-world problem is an important contribution to the corporate social responsibility movement.

INTRODUCTION TO RESEARCH FUNDING

Research and innovation go hand-in-hand, which is why we're privileged to continue supporting New Brunswick's many dynamic researchers. Research – the ongoing search to learn, understand and discover – is foundational to innovation.

When we invest in our research professionals, we understand that results materialize at a different pace than our venture capital investments. Our research funding produces results over a longer-term, with the full economic impact of the support we provide only coming to fruition generally five to 10 years after the initial investment. With that in mind, we've been able to measure some initial outcomes from our investments in 2016 and 2017, which continue to evolve through the commercialization process. The following numbers illustrate some of the already realized impacts from previous investments, as well as those from the work we have just started to support in 2019.



JOB CREATION:

Through our research professionals and start-up initiatives, we created **27 NEW FULL-TIME JOBS** in applied research in the province in 2019.



STUDENT TRAINING:

Our research assistantships and funded projects supported the training of **573 STUDENTS** in applied research in 2016 and 2017, helping to build a skilled labour force for the jobs of the future. Additionally, our scholarships helped recruit approximately **200 STUDENTS** to study applied research at New Brunswick's universities in 2019.



LEVERAGING MONEY:

We've invested **\$10,125,420** in New Brunswick research in 2019, which unlocked an additional **\$31,303,630** in contributions from federal and private sources. Combined, we have driven more than **\$40,000,000** in research investments over the last year.



IP GENERATION:

The research we funded in 2016 and 2017 has already created valuable new intellectual property. We've recorded the generation of **20 NEW IP ACTIVITIES**, including patents, spinouts, prototypes, license agreements and contract research, and we expect more to come as these projects mature.



NETWORK BUILDING:

Through our network of companies and researchers, we create connections to help solve problems and transfer knowledge. In 2019 alone, we worked with over **102 PARTNERS**, and in 2016 and 2017 our funding facilitated the creation of **437 UNIQUE PARTNERSHIPS**.

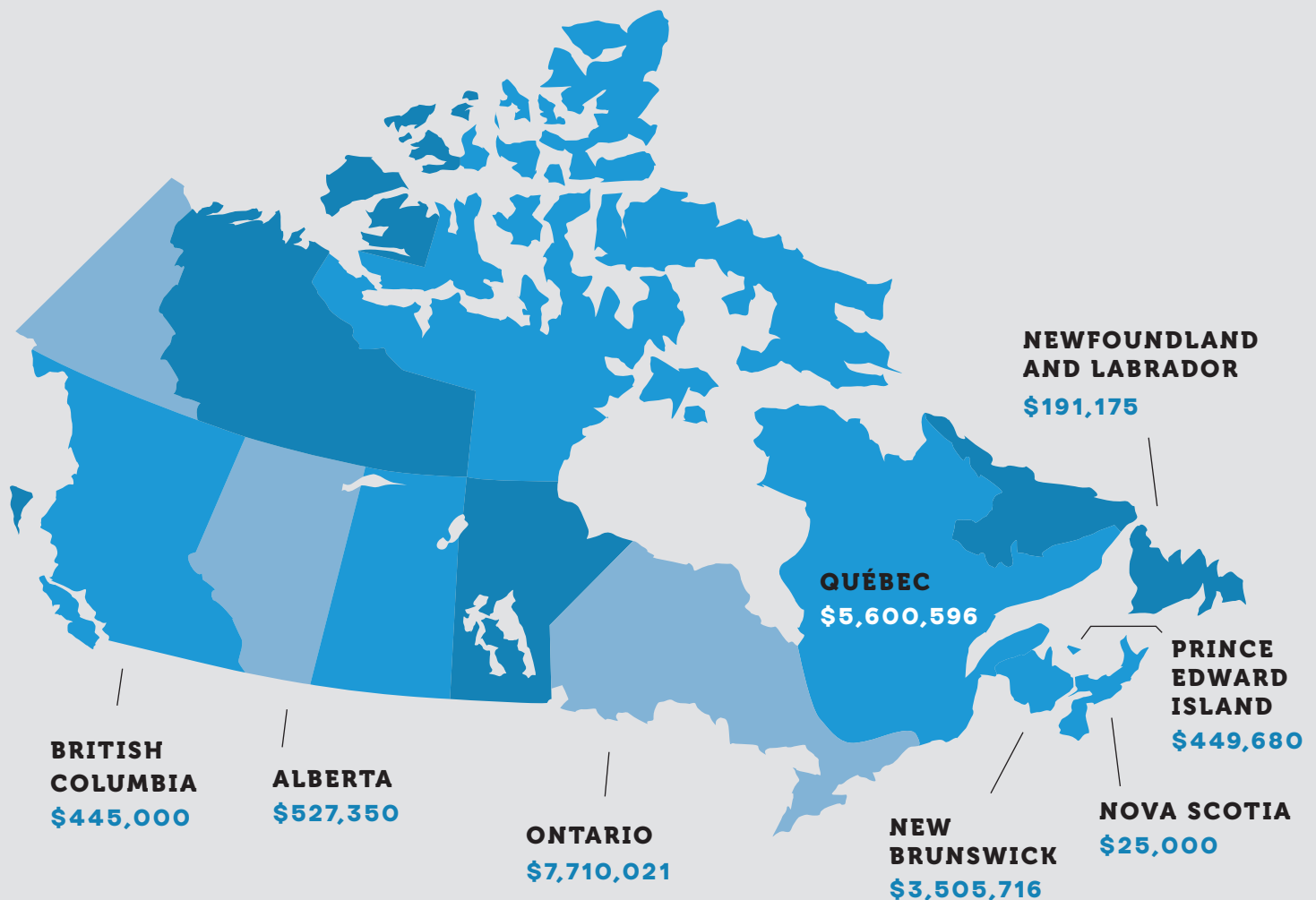


RESEARCH – THE ONGOING SEARCH TO LEARN, UNDERSTAND AND DISCOVER – IS WHAT DRIVES INNOVATION.

PRIVATE SECTOR PARTNERS

Our researchers are focused on knowledge transfer within industry and as such industrial partners from around the world are financially contributing to the projects that we are funding in New Brunswick. This map shows the distribution of where the

partners who contributed to projects in 2019 live. As you can see several partners are beyond the NB border, which is a massive statement to the reach and global impact of the research happening in our universities, colleges, and research institutions.



GLOBAL TOTALS

CANADA

\$18,454,538

FRANCE

\$936,000

ITALY

\$445,000

JAPAN

\$308,068

USA

\$9,207,042

GRAND TOTAL \$29,350,648



CANUM NANOMATERIALS INC.

Canum Nanomaterials took home the grand prize and CBC Viewer's Choice Award at this year's Breakthru awards. However, our history with the company goes back to 2013, when we contributed \$460,000 to Prof. Felipe Chibante's initial research through the Research Innovation Fund, in partnership with ACOA who contributed almost \$1.5 million. The company grew from this work, and now uses nanomaterial manufacturing technology to produce fullerenes, which are often used in flexible organic solar cells and as an antioxidant in health supplements, among many other applications. Canum's unique processes allow them to manufacture fullerenes more sustainably and affordably than their competitors; they've already attracted a substantial amount of interest.

We're particularly excited about Canum's growth due to the company's roots as an NBIF-funded research project.

FOR ALL OF OUR RESEARCH FUNDING, WE LOOK FOR PROJECTS WITH A STRONG POTENTIAL FOR COMMERCIALIZATION.


We see Canum's success as a prime example of a research project coming full circle, from their beginnings using funding from our Research Innovation Fund, to their current stage as a viable commercial company and Breakthru award recipient. We're truly looking forward to watching this company grow.

PROF. SIMON LAMARRE, UNIVERSITÉ DE MONCTON

Biologist Prof. Lamarre thinks he knows how to add millions of dollars of value to the New Brunswick snow crab fishery, and it doesn't involve fishing more crabs.

When stressed, snow crabs undergo autotomy, a defense mechanism in which they amputate one or more of their own legs. Crabs that have undergone autotomy frequently die before reaching market or must be processed into food products that command a much lower price per pound than live, whole crabs. The result is that the snow crab catch is valued far below its potential.

Prof. Lamarre used a \$30,000 award from us to modernize the refrigeration system in the salt water laboratory at the Université de Moncton. The controlled experiments he plans will allow him to observe and quantify biomarkers associated with stress in snow crabs. Through a partnership with the Valorès research institute in Shippagan, he hopes his findings will lead to improved fishing practices and a greater return for snow crab fishermen.



PROF. SIMON LAMARRE (PICTURED) HOPES HIS RESEARCH INTO BIOMARKERS ASSOCIATED WITH STRESS IN SNOW CRABS WILL LEAD TO GREATER PROFITABILITY FOR NEW BRUNSWICK'S SNOW CRAB INDUSTRY.

STARTUP AWARD FUND

Attracting the right talent is imperative for all organizations focused on innovation, and today, the competition for that talent is global. NBIF provides funding for hiring outstanding professors and researchers and investing in some of the resources they will need to succeed. Most grants go towards the purchase of infrastructure needed to kick-start the applied research program.

Below is a list of international researchers we helped support in New Brunswick in 2019.

STARTUP LIST OF AWARDEES		
INSTITUTION NAME	RECIPIENT	AMOUNT
Huntsman Marine Science Centre	Ehab Misk	\$35,500
Mount Allison University	Jesse Popp	\$50,000
New Brunswick Community College, Saint John	Baba Das	\$25,000
University of New Brunswick, Fredericton	Loic D'Orangeville	\$50,000
University of New Brunswick, Fredericton	Stijn De Baerdemacker	\$50,000
University of New Brunswick, Fredericton	Allison Enright	\$50,000
University of New Brunswick, Fredericton	Zhen Lei	\$50,000
University of New Brunswick, Fredericton	Othman Nasir	\$50,000
University of New Brunswick, Fredericton	Yang Qu	\$80,000
University of New Brunswick, Saint John	Cassidy D'Aloia	\$50,000
University of New Brunswick, Saint John	Anne Crémazy	\$50,000
Université de Moncton, Moncton	Michelle Cardoso	\$50,000
Université de Moncton, Moncton	Anne-Marie Dion-Côté	\$75,000
Université de Moncton, Moncton	Alexandre Melanson	\$50,000



TOTAL AMOUNT AWARDED

\$715,500

**PROF. YANG QU,
UNB CANNABIS HEALTH RESEARCH CHAIR**

Cannabis is considered a strategic priority of the province and the Cannabis Health Research Chair represents a tactical opportunity for the University of New Brunswick at a critical time considering the growing medical and industrial interest and the potential economic and social impacts.

The objectives of the chair position include: (1) to extend UNB's commitment to research and innovation in the field of natural products and biomedical, health, and life sciences; (2) to support the rapidly

developing commercial cannabis industry by providing research results that support sustainable long term economic growth; and (3) to attract, develop, and retain students and future researchers in order to have sufficient trained experts in the province to support this industry's growth.

We awarded UNB \$80,000 as a start-up grant to help recruit Prof. Qu to the province in September 2018. As cannabis research evolves, Prof. Qu will play a key role in developing UNB's expertise in this emerging field.

**DR. YANG QU (PICTURED) WILL
EXPLORE NEW OPPORTUNITIES
IN ADVANCING THE CANADIAN
CANNABIS INDUSTRY.**



RESEARCH ASSISTANTSHIPS INITIATIVE

The Research Assistantships Initiative (RAI) provides applied researchers with some of the funding they need to hire undergraduate and graduate student research assistants. These projects are designed to expose students to applied research, with most closely linked to industry. The details below highlight the awards granted to each university in 2019.

In 2019, we provided 216 students the opportunity to do applied research here in New Brunswick.

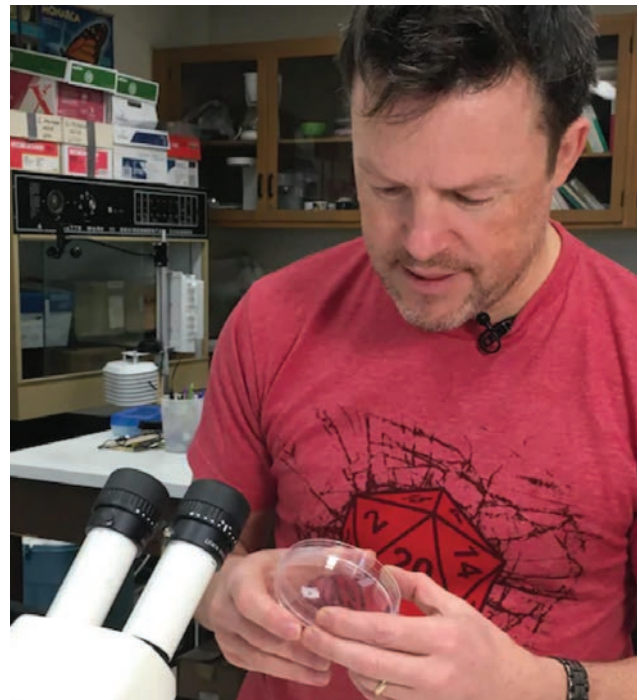
SUMMARY OF 2018-2019 RAI RESULTS BY INSTITUTION			
INSTITUTION	AMOUNT	# OF UNDERGRADUATE ASSISTANTS	# OF GRADUATE ASSISTANTS
Atlantic Cancer Research Institute	\$22,000	4	0
Mount Allison University	\$54,000	5	2
St. Thomas University	\$42,000	3	2
Université de Moncton	\$870,000	43	51
University of New Brunswick	\$1,068,000	34	72
TOTAL	\$2,056,000	89	127



PROF. GAETAN MOREAU, UNIVERSITÉ DE MONCTON

We awarded Prof. Moreau and four students at Université de Moncton a \$36,000 grant to study the pests that attack commercial cannabis crops in New Brunswick. Cannabis is emerging as a crop of increasing economic importance in the province, and as these insects damage or kill the plants it reduces production and potential revenue. Currently, little formal information is available about these pests.

At the request of industrial cannabis producers, Prof. Moreau and his students will develop a comprehensive description of cannabis crop pests, to document the damage they cause and determine contributing factors. They plan to share the results to a broad audience via a website so all growers can learn about their findings.



Prof. Gaetan Moreau

SPOTLIGHT

DR. MIKE DOUCETTE, COLLÈGE COMMUNAUTAIRE DU NOUVEAU-BRUNSWICK, GRAND FALLS

Maple syrup has been a booming business in New Brunswick for centuries. But most of New Brunswick's small maple syrup producers sell their product whole sale to Quebec. Despite the lower price they receive they do this in order to leverage the certified testing services there, as these tests are required for export. Unfortunately, it is then labeled a product of Quebec and New Brunswick producers lose market exposure, alongside a loss in potential revenue.

Fortunately, the researchers at the CCNB Grand Falls facility in bioprocessing have come up with a solution; building New Brunswick's first certified maple syrup testing lab. NBIF awarded Dr. Mike Doucette, an analytical chemistry expert, \$33,000 from our Research Investment Fund to make this lab a reality. This investment was made alongside ACOA and the New Brunswick Maple Syrup Association. Now that's a sweet deal.

GRADUATE SCHOLARSHIPS

The best students attract the best professors and vice versa. Our graduate scholarship initiative was designed to attract and retain the best graduate students to New Brunswick. Supporting students through a range of opportunities is critical to NBIF’s mandate as this young talent pool will fill the pipeline of future applied researchers.

SCHOLARSHIPS 2019	
INSTITUTION	TOTAL AWARDED VALUE
University of New Brunswick	\$1,123,000
Université de Moncton	\$331,000
Mount Allison University	\$34,000
TOTAL	\$1,488,000

SPOTLIGHT

DR. DAVID THEMENS, UNIVERSITY OF NEW BRUNSWICK

We initially awarded Dr. Themens a three-year graduate scholarship in 2014, and his resulting work was just completed in the last year. Dr. Themens, a Postdoctoral Research Fellow in the Physics Department at the University of New Brunswick, has received international recognition for his work modeling the disturbances and interferences that take place in the ionosphere, a high-altitude region of the Earth’s atmosphere. The ionosphere facilitates long-range communications, but disturbances in the ionosphere cause significant disruptions to high frequency radio transmissions, global positioning systems (GPS), and navigation technologies. Dr. Themens developed a new model of the ionosphere that will help Canada better monitor activity in the Arctic and increase the

reliability of communications in northern Canada. Improved communications and monitoring capabilities in the Arctic have become increasingly important as the region warms and experiences greater commercial and defense activity.



Dr. David Themens

RESEARCH PROFESSIONAL SUPPORT

A successful research group is so much more than a professor. At the core of every group are research professionals like technicians, post-docs and lab managers who take care of the day to day business of doing research.

This program provides direct salary support to hire these professionals and thus fast track these projects. In 2019 we funded the creation of 13 new, full-time research professional jobs.

RESEARCH PROFESSIONALS AWARDEES				
TITLE	INSTITUTION	AMOUNT	INDUSTRIAL PARTNER	RESEARCHER
Python on OMR	UNB Fredericton	\$90,000	IBM Canada Limited	David Bremner
Software development for visualization of the globe	UNB Fredericton	\$90,000	3D Planeta	Yun Zhang
Development of advanced wood products	UNB Fredericton	\$75,000	Great Northern Timber, William F. Tompkins & Sons Ltd	Meng Gong
UNB Magnetic Resonance Imaging Centre	UNB Fredericton	\$90,000	MR Solutions Ltd.	Bruce Balcom
Deciphering the molecular interplay between plants and their pathogens (cannabis and potato)	Université de Moncton	\$75,000	Organigram Inc.	David Joly
Artificial intelligence for defense and security applications	Université de Moncton, Moncton	\$90,000	Assumption Life, Wyverstone Capital	Moulay Akhloufi
Experimental & practical technology development in mobile computing	New Brunswick Community College Fredericton	\$90,000	Various start-ups including Kognitiv Spark	William McIver
Fundy salmon recovery (FSR), restoring the inner Bay of Fundy salmon	UNB Fredericton	\$84,000	Cooke Aquaculture Inc., and others	Kurt Samways
Recruitment of a highly specialized researcher in agronomy to increase the range and quality of services provided to industry and farmers	Collège communautaire du Nouveau-Brunswick Grand Falls	\$90,000	TBD	Leandro Passarini
Amplification of parametric fluorescence in cascade with an active cavity	Université de Moncton, Moncton	\$90,000	TBD	Deny Hamel
Alternative Verbal Communication Technologies for People with Speech Disorders	Université de Moncton, Shippagan	\$80,000	Stan Cassidy Centre	Sid Ahmed Selouani
High Efficiency Blue-Light Optical Filters for Display Devices	Université de Moncton, Moncton	\$90,000	Metamaterials Technology Inc.	Pandurang Ashrit
Drying of marine bi-products and other value-added ingredients	Valorès	\$90,000	Local fisheries & berry farmers	Jacques Gagnon
TOTAL		\$1,124,000		

RESEARCH INNOVATION FUND

Our Research Innovation Fund is designed to advance New Brunswick researchers' capacity to develop innovations that can be commercialized and have an economic impact on New Brunswick. Of the 37 companies in our investment portfolio, 20 were born from research

supported by NBIF in New Brunswick. The fund leverages contributions from other funding sources such as CFI, NSERC, CIHR and SSHRC. Investment by NBIF can be up to \$500,000 to a maximum of 33% of the total project cost.

RESEARCH INNOVATION FUND		
INSTITUTION NAME	AMOUNT	# OF PROJECTS
Atlantic Cancer Research Institute	\$279,572	1
CCNB Edmundston	\$113,000	2
Huntsman Marine Science Centre	\$150,000	1
Mount Allison University	\$157,735	2
University of New Brunswick - Fredericton	\$1,971,291	27
University of New Brunswick - Saint John	\$34,369	2
Université de Moncton, Moncton	\$1,173,407	12
Université de Moncton, Shippagan	\$250,000	1
Valorès (IRZC)	\$129,593	2
TOTAL	\$4,258,967	50

SPOTLIGHT

PROF. YASSINE BOUSLIMANI

In March 2019, NBIF awarded Prof. Bouslimani \$250,000 to establish an applied research laboratory for industrial robotics at Université de Moncton. In addition to the robotics equipment and related infrastructure, a key deliverable of the project is the development and deployment at UdeM of a hands-on curriculum and certification program in partnership with leading robotic equipment manufacturers KUKA (headquartered in Germany) and FANUC (headquartered in Japan). The project will also train engineering students and industrial workers alike in the use of robotics and equip them with the skills and knowledge to design and implement

automated robotic solutions in real-world manufacturing settings.

This laboratory represents an outstanding opportunity to establish a cutting-edge applied research and training center in New Brunswick. With the intention to be uniquely positioned as Canada's only bilingual training center for industrial robotics and the only KUKA training center east of Mississauga, it could have an important and lasting impact on the province's economy by helping traditional industries modernize through the adoption of robotic solutions so they remain viable and competitive in global markets.

RESEARCH CHAIRS

The purpose of our Research Chair Initiative (NBIRC) is to foster greater collaboration between the private sector and academia. Each of these chairs is exclusively focused on research to help private sector companies

develop new and improved products and technology. The five-year chair program is coming to an end; however, we continue to support these top-notch researchers through our other research funding programs.

NAME	CHAIR	INSTITUTION	START OF CHAIR	END OF CHAIR
PROF. ERIK SCHEME	Chair in Medical Devices and Technologies	University of New Brunswick	Oct. 1, 2014	Jul. 1, 2020
PROF. JOCELYN PARÉ	Chair in Medical Technologies	Atlantic Cancer Research Institute	Aug. 1, 2015	Aug. 1, 2020
PROF. MARC SURETTE	Chair in Biosciences	Université de Moncton	Jan. 1, 2015	Oct. 1, 2020
DR. EHAB MISK	Chair in Aquatic Biosciences	Huntsman Marine Science Center	Aug. 1, 2015	Aug. 1, 2020
PROF. MENG GONG	Chair in Value Added Wood Products	University of New Brunswick	Jul. 1, 2015	Jul. 1, 2020

SPOTLIGHT

PROF. ERIK SCHEME, UNIVERSITY OF NEW BRUNSWICK

Over the course of his term as NB Industrial Research Chair in Medical Devices and Technology at UNB, Prof. Scheme's research in machine learning has expanded to cover a wide range of disciplines to meet industry demands. Rehabilitation products, remote monitoring, aging, diagnostics, and predictive analytics are just a few of the areas he's touched on. Since the start of his Chair four and a half years ago, Prof. Scheme has made enormous strides: the Chair funding allowed him to build a research group of 25 highly skilled researchers from around the world, secure a faculty position at the Department of Electrical and Computer Engineering, leverage the NBIF money to attract substantial new funds, and create a significant network of industry partners. Critical to all of this has been the guaranteed, non-project-oriented support of \$200,000/year from NBIF. Prof. Scheme's results from this year alone speak to the success of the Chair program: in the last fiscal, he has attracted \$1.2 million in other research funding, disseminated knowledge to a range of audiences via 27 papers and 18 events,



Prof. Erik Scheme at his UNB lab.

trained 37 students and built 10 new industry partnerships. In addition, his research has led to two new product developments with strong commercialization potential.

Prof. Scheme's five-year Chair term will end in July 2020, but the future looks bright for this researcher and his group thanks to the critical early support we provided and the success this funding catalysed. We anticipate a continuing close collaboration to support his group's applied research projects and look forward to seeing the innovations they will generate.

The 2019 year was a time of significant growth for us. In addition to new start-ups and researchers added to the portfolio, we also welcomed one new board member and several new staff members.

We're excited for what's to come in the year ahead: more investments, more growth and more portfolio additions, to name a few highlights. We're also planning enhancements to our brand. These changes, we feel increase our profile and solidify how entrepreneurs and researchers perceive us, bringing

us closer to our goal of being one of the top investors in Canada.

Change is a guarantee in any business, but it's especially conspicuous in ours. As a result, we've grown comfortable with it. We embrace change, and we're looking forward to what's to come.

After all, change is at the heart of innovation.

NBIF NEW BRUNSWICK
INNOVATION FOUNDATION

