

NBIF : 2012-13

NEW BRUNSWICK INNOVATION FOUNDATION ANNUAL REPORT

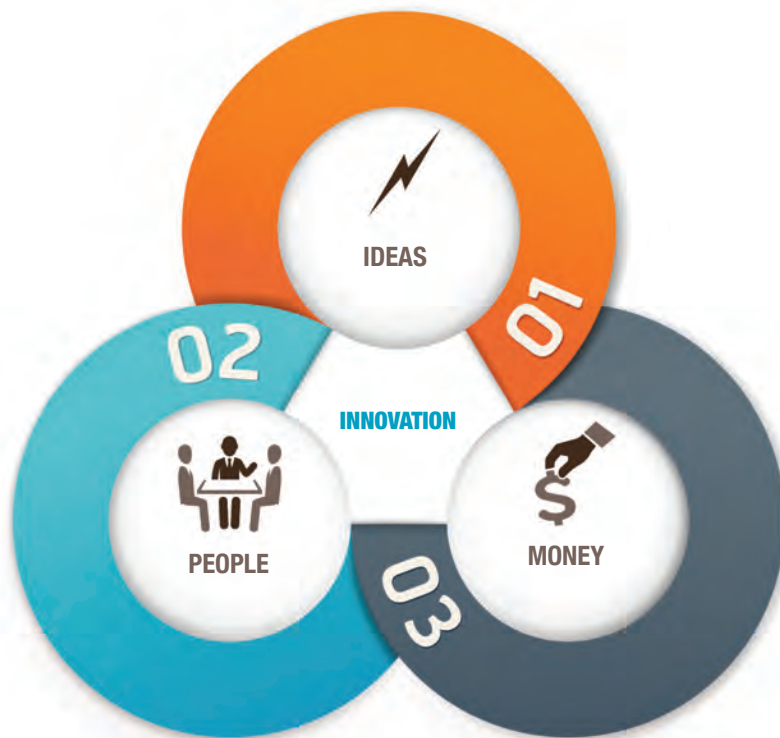
Celebrating 10 years of innovation.



01+02+03=INNOVATION

Innovation is best defined as the process of generating, developing and implementing ideas to produce new or improved products and processes from which economic value can be extracted. Simply put, it is the process of taking an idea to market in a way that creates value.

It is important to note that innovation is a process. This implies that innovation is an on-going, constant, and iterative activity. Further, for it to be true innovation, it must create real value, be it economic or social, and be put to use.



There are three basic ingredients of innovation: ideas, people, and money. It is when these three essential concepts intersect that true innovation emerges, and you need all three to be successful. Ideas, both novel ones and new ways of doing old things, are plentiful. Developing and implementing them requires people and access to resources they need to see it through, be it money, equipment, or mentors. When you have all three ingredients in proper proportions you get the kind of innovation that generates value and wealth that can significantly impact a business, its staff, the economy and ultimately, society.

Innovation is not easy. It requires sacrifices and demands passion and perseverance. But when it is done right, with the right people, and at the right time, the rewards can be great.

WHERE MONEY MATTERS MOST.

There are a number of capital sources available for innovators, but accessing them depends on where the innovation is along the time line from concept to market. There are a lot of funds available at the beginning.

Basic research generates new ideas, principles and theories, which may not be immediately utilized; though are the foundations of modern progress and development in different fields. Applied research is a form of systematic inquiry involving the practical application of basic research for a specific business or client purpose.

On the R&D side, we fund activities like concept validation, prototype creation, and bench testing. On the enterprise side, we work to get R&D into the hands of entrepreneurs, seeding new companies with venture capital. What about during that middle point or pre-revenue stage between R&D and enterprise? Very little. That's why it's called "the valley of death." Brilliant research ends up on the shelf and companies fall.

But not in New Brunswick. At NBIF, our venture capital and R&D funding bridges this financial gap so innovators, researchers and entrepreneurs have the best chance to make it to the other side. All investment returns go back into the Foundation to be re-invested in new start-up companies and applied research.





“After ten years in business, our investments in smart people, innovative ideas, and infrastructure will pave the way for more innovation for years to come.”

Dr Robert Hatheway

Innovation is the foundation of a growing economy, and a brighter future for New Brunswick. It is the key to increased productivity and competitiveness. As a province we must continue to invest in innovation, and at NBIF we are doing just that.

For ten years now, NBIF has been bringing ideas, people and money together to fuel innovation in our province. Today, more researchers are working with industry than ever before with some spinning companies out of their laboratories. We have witnessed many new innovative startups launch, led by entrepreneurs who are focused on growing globally. The success of these activities is the culture of innovation that is now flourishing in New Brunswick.

That culture is paramount to our success as a province in fostering innovation. We already benefit from some of the brightest minds and most innovative people in the world, right here in New Brunswick. A select few of them are featured in this year's annual report. It is our investments in smart people, innovative ideas, and critical infrastructure today that will pave the way for more innovation for years to come.

As we turn the page on the first ten years of business at NBIF, we look full face to the next chapter – our growth phase. Earlier this year the Government of New Brunswick made an \$80 million investment in innovation, and entrusted NBIF as the catalyst to help implement its new innovation strategy. Consequently, NBIF will expand its operations and increase its investment activities over the next fiscal year. We look forward to this challenge, and are excited by the prospects it presents for NBIF and our province.

I am confident that the Board of Directors and management team at NBIF will work tirelessly to continue to build innovation capacity and contribute to the economic well being of New Brunswick.

OUR BOARD COMPOSITION IS PART OF OUR SUCCESS.



As an independent, not-for-profit corporation, part of NBIF's success comes from its ability to engage directors with backgrounds that reflect the interests of our clients and stakeholders.

With executive experience in private and public companies, academia and government, each of our directors volunteer their time to support both the Foundation's and its clients' aspirations, goals, and business activities.

The experience and independence of NBIF's Board of Directors gives the organization the status it needs to syndicate with private and institutional investors, and the business community.

2012-13 board of directors NBIF.CA

DR ROBERT HATHEWAY
CHAIR
 President & CEO
 The Hatheway Group

MICHAEL JENNINGS
VICE-CHAIR
 President
 Fraser Speciality Products

BILL LEVESQUE
SEC. TREASURER
 Deputy Minister
 Economic Development

RODNEY OUELLETTE, MD, PhD
 CEO & Scientific Director
 Atlantic Cancer Research Institute

GERRY POND
 Chairman
 Mariner Partners

TOM MANN**
 Deputy Minister
 Post-Secondary Education, Training & Labour

BETH WEBSTER
 Vice President
 Populus Global Solutions

BYRON JAMES
 Clerk of the Executive Council
 Province of New Brunswick

ANNETTE COMEAU
 President & CEO
 LearnSphere Canada

DR EDDY CAMPBELL**
 President
 University of New Brunswick

DR LISE DUBOIS**
 VP Research
 Université de Moncton

JILL GREEN**
 CEO
 Green Imaging Technologies

GERRY VERNER**
 VP Business Development
 Innovatia

** New board members appointed during fiscal year 2012-13.



Our new 7.3 million dollar Innovation Voucher Fund aims to encourage partnerships between businesses and researchers.

Calvin Milbury

Innovation is flying high in New Brunswick! Now more than ever we are seeing more and more innovation emerge from our laboratories, more and more innovators stepping up to solve industrial challenges, and more and more business start-ups introducing innovative products to the world.

Fiscal year 2012-13 shows evidence of a blossoming innovation ecosystem in New Brunswick. In the past year, our tenth in business, NBIF set new heights for both its venture capital and research investments at a record \$5.35 million. Twelve venture capital deals were completed, and \$1.9 million was invested in a total of 27 applied research projects. Together, these investments will prime the pump for years to come.

NBIF also continues to make a significant investment in people. In 2012-13, \$1 million was awarded to support 118 student research assistantships, and another \$500,000 was invested in the creation of seven new, incremental research technician positions at New Brunswick research organizations. We cannot underestimate the value of investing in people and our next generation of innovators.

While NBIF continues to pave new ground, we are also excited by the prospects of doing more in 2013-14. To assist the provincial government with rolling out its new innovation strategy, NBIF will undergo an expansion in the coming year. New funding will shore up our current business, allowing us to better serve our market while enabling NBIF to expand into new areas with unique offerings.

Our newest is the Innovation Voucher Fund, announced earlier this year. This \$7.3 million initiative aims to encourage partnerships between businesses and researchers. The fund provides small-to-medium-sized businesses with a unique opportunity to access the scientific talent and facilities they need to develop and commercialize innovative new products and processes.

With ten years under our belt, and with the momentum that now exists, I am more confident than ever that NBIF is well positioned to continue making a positive impact on innovation and the economic prosperity of New Brunswick.

FROM \$5 TO \$20 MILLION: NBIF investments help New Brunswick innovators access millions more from other investors.

One of NBIF's major roles is to act as a capital market catalyst. To do this, NBIF consistently syndicates its investments with other venture capital firms, angel investors and networks. Even though NBIF can and does invest in some companies on its own, its aim is to mitigate financial risk by partnering with other investors.

In fiscal year 2012-13, eleven of NBIF's twelve venture capital investments were in conjunction with other investors including GrowthWorks Atlantic, Mantella Ventures, East Valley Ventures, BDC Venture Capital, and other private investors. In total, NBIF invested \$2 million through its Venture Capital Fund, leveraging another \$7 million from other investors to start up nine new companies, and expand three more from its existing portfolio.

2012-13 investment activities ALL FUNDS

Investment	2012-13	Since 2003
Applied research	\$ 1,894,333	\$ 16,728,202
Start-up & growth companies	1,950,000	11,519,246
Talent & recruitment	1,500,000	12,728,519
Total invested, NBIF	\$ 5,344,333	\$ 40,975,967
Leveraged capital	21,375,187	272,215,323
Total impact	\$ 26,719,520	\$ 313,191,290

Like the capital market, NBIF acts in a similar capacity for New Brunswick's applied research community. In fiscal 2012-13, NBIF invested \$1.9 million through its Research Innovation Fund in 27 applied research projects across the province. This allowed the researchers to leverage another \$14 million from other agencies such as the Canada Foundation for Innovation, the Natural Science and

Engineering Research Council, the Canadian Institute for Health Research, the National Research Council, and more.



Dr Felipe Chibante

SOLAR GETS NEW SECRET SAUCE

Fullerenes. It's an exotic and expensive form of carbon that's used in solar power generating cells and other materials. In his lab at the University of New Brunswick, Dr Chibante invented a method for condensing fullerenes that will see their price drop from \$15,000 to \$5,000 per kilogram. Now he's working on preparing the method for industrial manufacturing.

NBIF's investment of \$460,000 in his project helped him obtain another \$2 million from other private and public funders and industry. When complete, Dr Chibante's fullerenes could be used to make all sorts of power generating materials from the roof of your car to the curtains in your house.

Originally from Fredericton, New Brunswick, Dr Chibante developed his expertise at Rice University where he undertook his PhD with Dr Richard Smalley, whose team discovered and produced the very first fullerene. Consequently, Dr. Smalley won the Nobel Prize in Chemistry in 1985.

NBIF helped to recruit Dr Chibante back to New Brunswick with a \$75,000 start-up award. Since then, two companies have spun out of his lab, including one of our portfolio companies, Smart Skin Technologies.



OUR CORPORATE OBJECTIVES

To support sustained growth of New Brunswick's innovation-based economy, NBIF's investment strategy focuses on six activities that we consider critical when it comes to developing the next generation of entrepreneurs and applied researchers.

Growing Capital Markets

NBIF works to grow the province's capital markets by attracting investments by other capital and industrial partners, both inside and outside of New Brunswick and Canada.

Funding Applied Research

NBIF supports applied research by funding projects that show potential for commercialization and economic impact on the province, its universities, community colleges and research organizations.

Recruiting and Developing Talent

NBIF supports the recruitment and development of outstanding researchers and entrepreneurial leaders by providing them with the funding, expertise and recognition they need to succeed.

Leveraging R&D Funding

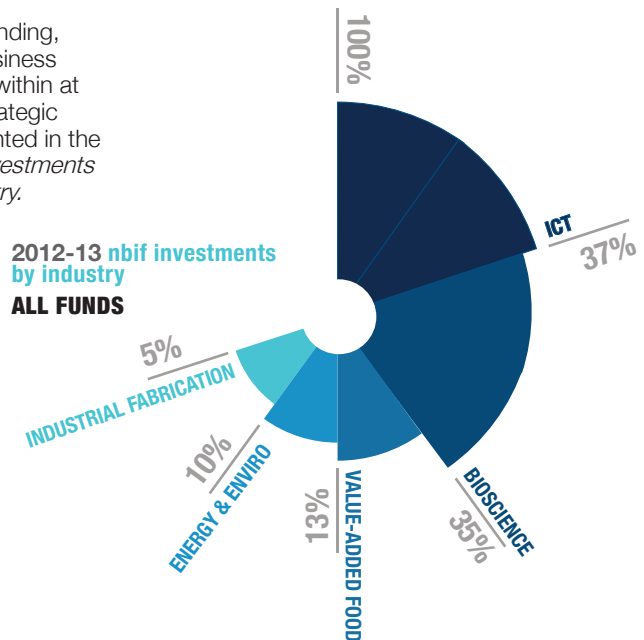
NBIF works to increase the total infusion of research funding by investing in projects that unlock contributions from industry and national agencies, like the Canada Foundation for Innovation, NSERC, CIHR, NRC and more.

Targeting Strategic Industries

To be eligible for funding, all projects and business proposals must fit within at least one of our strategic industries, represented in the figure opposite, *Investments By Strategic Industry*.

Creating New Ventures and Enterprises

NBIF supports the creation and development of new ventures by offering equity capital, professional support, and networking opportunities to entrepreneurs that focus on innovation.



NONE OF US ARE HERE

c. 1983
Saint John

That's thanks to an invention patented by Vincent Leblanc and Allan Cameron, right here in New Brunswick. A conference call system that allows multiple users to join by entering a participant code, plus a tone to let everybody know you're there.





THE BIG PICTURE
10 YEARS IN

As its companies generate and grow their revenues, the total impact of NBIF and its partners' investments is much larger.



NBIF CAPITAL
TAKING THE RISK

Traditional capital providers think start-ups are too risky, especially if it's not in their own backyard. NBIF investments help diversify that risk.



OTHER CAPITAL
ANGELS + VCS

NBIF works with other capital providers to help start-ups fully fund their enterprise and access more as they grow.



START-UPS
THEN AND NOW

NBIF has helped to launch and grow more than the 28 companies in its current portfolio.

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2013
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VENTURE CAPITAL

After NBIF's first 10 years, its \$12 million portfolio has generated almost \$10 million in investment returns, all of which go back into the Foundation to be re-invested.

OUR NEW VENTURE CAPITAL INVESTMENTS

For NBIF's venture capital division, 2012-13 was a record year for investing. This is encouraging news considering that deal flow, the lifeblood of venture capital investing, is rising and continues to rise. This indicates that entrepreneurial activity and innovation are having a come back after the latest economic slow down. In addition to its completed investments, NBIF ended the year with just as many quality opportunities already in the funnel.

In 2012-13, NBIF made 12 investments helping to create nine new companies, and expand three more from its existing portfolio. Total investments for the year were \$1.95 million, leveraging another \$7.1 million from other capital providers. This puts NBIF's portfolio to 28 companies, the most since its inception in 2003.

IT'S ABOUT WHO YOU KNOW

Introhive is an enterprise software company which has developed a proprietary software platform to help companies unlock the value hidden inside their employees' internal and external social networks. Basically a "who knows who and where" that allows



for more interdepartmental collaboration on a variety of business goals. For example, If a sales person on one side of the country is targeting a specific prospect, the system can tell if anyone else in the company already has a connection to them, and the relative strength of that connection. As CEO Jody Glidden says, the software helps replace cold calls with "warm" introductions that can solve problems or generate new business. Since its launch, Introhive has signed on dozens of major corporations, and has quickly grown to a staff of 32 people. They were awarded "Most Promising Start-up of the Year" at the 2013 KIRA Awards.

GETTING RID OF GETTING NOWHERE

UserEvent's innovative software as a service, CxEngage™, allows organizations to consistently deliver great customer experiences by monitoring a customer's journey, in real-time. When that journey veers towards an outcome that would impact customer retention or loyalty, for example, difficulty completing an online purchase, CxEngage™ alerts the organization and allows it to respond in the moment with a phone call, email or text message. Since starting up, the company, led by Jeff Thompson (right) has successfully filed its first patent application, which allowed it to launch its SaaS site and start selling. The company has already received serious interest from a variety of multinational corporations, and is preparing for significant growth in 2014.



Jeff Thompson, CEO

FINDING THE GOLDEN EGG

The largest investment of the year was in **Breviro Caviar** for \$500,000. The company first came to NBIF's attention after winning the R3 Innovation Challenge in 2012, receiving a \$50,000 voucher for applied research services. Breviro used the voucher to develop a process that determines the sex of their short nose sturgeon stock.

With NBIF's, plus \$2 million more from other investors, Breviro is expanding its land-based fish farm and embarking on a new stage of growth. The company is now shipping wholesale orders to customers here and abroad. Since the company has the one and only

BREVIRO CAVIAR



CITES license to produce short nose sturgeon caviar, it has been able to fetch up to \$4,500 per kilogram for the highly coveted delicacy. CITES stands for the United Nation's Convention on International Trade in Endangered Species of Wild Fauna and Flora.

EVERYONE WANTS CHEAP GAS

Enovex, one of NBIF's portfolio companies, received a follow-on investment from NBIF to expand its business in a new and exciting direction. Enovex came to life after CEO Scott Walton won second prize at NBIF's 2011 Breakthru Business Plan Competition. At the time, the aim of the company was to use its technology for capturing carbon dioxide from industrial flues. Since then, the company has discovered other valuable ways to apply its technology—making industrial gasses such as oxygen and nitrogen, which are used in extremely large quantities by countless industries. The opportunity lies in the fact that the process for producing industrial gasses of this type has not changed in forty years. With Enovex's technology, companies will be able to make three times more of the gasses they need using 20% less equipment and 75% less energy.



Scott Walton, CEO



Another new investment is **Xiplinx**. Its software solution, SiteFlo, helps track and influence the behavior of production floor personnel in manufacturing environments, ensuring compliance with operating procedures, repeatability in employee behavior, and reproducibility of product. Starting with the food and beverage industry, Xiplinx focusses on waste reduction, variance detection and recall prevention right on the production floor. Once installed, management can operate the software solution using any internet-enabled digital device. Just getting off the ground, the company is working with two major beverage companies beta testing the technology, with a number of companies waiting in its sales pipeline.

Tabture is a software company that has developed a patent pending technology that allows the sharing of web pages with other people in real time, replacing traditional methods of sharing links. Still in its infancy, the company is developing an early adopter strategy aimed at disrupting the email marketing industry through its browser-to-browser sharing tool. Sharing and delivering Web pages instead of emails and social media links is an entirely new way for sharing content on the Internet.

2012-13 new investments VENTURE CAPITAL FUND

Company	Product & Technology	Investment*
Breviro Caviar	Land-based shortnose sturgeon caviar production	\$ 500,000
Introhive	Solution that finds hidden relationships in a company to improve sales	250,000
UserEvents	Software for monitoring and managing customer experiences in real time	250,000
Enovex [†]	Energy saving industrial gas separation tech for heavy industry	200,000
Smart Skin [†]	A unique pressure sensitive system that translates touch into data	150,000
Zaptap [†]	On-demand mobile marketing services for retailer and brand clients	150,000
Xiplinx	Software for analyzing production worker activity & compliance	100,000
Flixel Cinemagraph	Smartphone and desktop app for making Cinemagraphs™	100,000
Total Pavé	Smart phone software solution for optimization of road construction	100,000
Store-It Squirrel	App connecting people who need storage space with people who have it	50,000
Black Magic	Non-toxic degreaser and cleanser for consumers and industry	50,000
Tabture	Tab-sharing solution for Internet browsers	50,000

Total invested, NBIF

\$ 1,950,000

* The amount reported for each investment represents its acquisition cost.

[†] Follow-on investment

LIVING PHOTOS

Flixel Cinemagraph's smartphone and desktop application for making cinemagraphs is set to take the fashion industry—and everyone else—by storm. A cinemagraph is a still photo with moving elements. First, you point your smart phone at a subject, for example, someone standing in the wind. After a few seconds, the app will display a still image. Then, using your finger, you can wipe across the screen to "reveal" the moving parts you want. For example, in the image below, which can be viewed online, the model's hair and dress will begin to move with the wind when that area is touched. When complete, the app makes a high definition cinemagraph. DSLR cameras can be used, and a pro version is available for mobile, and a desktop version is in the works. Since launching, the company has seen very promising results, including a fully-branded appearance on ten episodes of the hit CBS/Warner Brothers reality series *America's Next Top Model*. A viewer contest that



[View our online version to see this Flixel in motion!](#)

incorporates posting and sharing "fixels" is expected to lead to millions of downloads of the company's software. The company has also attracted the attention of U.S. retail giant Macy's, who is using "fixels" as a major component of their new Marilyn Monroe fashion line's promotional campaign.

TAPPING INTO YOU

Additional investment in **Zaptap** will help support its product and marketing efforts now that its technology is ready for the mass market. A second prizewinner at Breakthru 2011, the company manufactures near-field communication (NFC) enabled tags, and provides a content delivery and analysis platform for retailers. When a consumer waves their NFC-enabled smartphone near one of Zaptap's one-inch sticker tags, multimedia content about the product is immediately delivered without having to install any application. Since receiving the additional investment, Zaptap has successfully signed on Volkswagen and a network of electric vehicle chargers for Sun Country Highway, Canada's leader in electric vehicle products and services. The company is currently in talks with a number of international brands and is well positioned to continue its growth in 2014.



[Yan Simard, CEO](#)

GETTING THE RIGHT TOUCH

Smart Skin Technologies also received an additional investment by NBIF. Smart Skin was also borne from NBIF's biannual Breakthru Business Competition. The company won second prize in 2009 for its touch and pressure sensitive nano material. After three years of continuing development, the company is now poised to enter its first stage of significant growth. Although Smart Skin can be applied to a large variety of products, the company is about to complete its work on a new, groundbreaking golf grip for one of the world's leading golf products manufacturers.



[Kumaran Thillainadarajah, CEO](#)

NBIF 2012-13 PORTFOLIO OF COMPANIES

03-31-2013 portfolio of companies VENTURE CAPITAL FUND

Company	Product and Technology	Investment *
Atlantic Hydrogen	Removing carbon from natural gas before combustion	\$ 1,000,000
Inversa Systems	Proprietary diagnostic imaging system for industrial infrastructure	525,000
Breviro Caviar	Land-based shortnose sturgeon caviar production	500,000
Advanced Publishing	Digital publishing solution for online content providers	500,000
Encore Interactive	Live Everywhere™ Internet TV system for broadcasters	500,000
RtTech Software	Software that boosts industrial efficiency and productivity in real time	500,000
KnowCharge	Electro-conductive paper for protective packaging	350,000
Enovex	Energy saving industrial gas separation tech for heavy industry	250,000
Introhive	Solution that finds hidden relationships within a company to improve sales	250,000
Smart Skin Technologies	A unique pressure sensitive system that translates touch into data	250,000
Trumpet Behavioral Health	AutismPro online patient support system	250,000
UserEvents	Software for monitoring and managing customer experiences in real time	250,000
Zaptap	On-demand mobile marketing services for retailer and brand clients	250,000
Populus Global Solutions	National-level health services information system	225,000
CyberPsync Software Solutions	Virtual reality software for treatment of phobias	100,000
ChemGreen Innovations	Non-toxic plastic polymer production process	100,000
Flixel Cinemagraph	Smartphone and desktop app for making Cinemagraphs™	100,000
Medrunner Health Solutions	e-prescription delivery and drug information system	100,000
Scene Sharp Technologies	Motion sensing and object identifying camera technology	100,000
Spinzo	Online group buying marketplace using dynamic pricing	100,000
Total Pave	Smart phone software solution for optimization of road construction	100,000
Xiplinx	Software for analyzing production worker activity & compliance	100,000
Black Magic	Non-toxic degreaser and cleanser for consumers and industry	50,000
Store-It Squirrel	App connecting people who need storage space with people who have it	50,000
Tabture	Tab-sharing solution for Internet browsers	50,000
Trapster	Software for tracking and monitoring of lobster and fish catches	50,000
Trivnet Media Services	In table content delivery system for restaurants	50,000
Legacy Lane Fiber Mill	Micro fiber milling process and operation	25,000
Total invested, NBIF		\$ 7,175,025

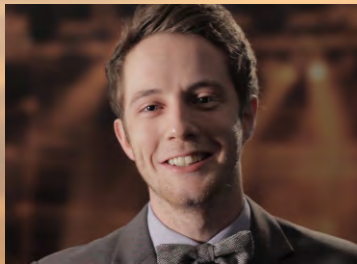
* The amount reported for each investment represents its acquisition cost

WITH PRIZES OVER \$400,000 BREAKTHRU IS THE LARGEST COMPETITION OF ITS KIND IN CANADA.

After a six-month competition, and high anticipation, Breakthru 2013 saw three entrepreneurial dreams come true before an audience of nearly 400 people. Hosted by NBIF and Cox & Palmer, Breakthru hit its biggest year ever with \$406,000 in cash and professional services to start-up three new companies. There were 46 entries.

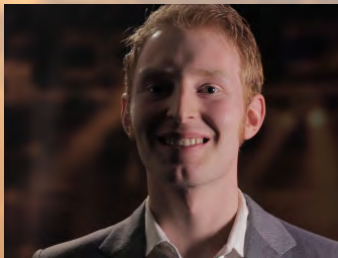
After opening remarks, and throughout the dinner, each of the five finalists pitched their businesses live on stage followed by a television feature story by CBC's Catherine Harrop. Each of the stories were broadcast in the days leading up to the event and posted online for viewers all over the province to vote for the Viewers' Choice Award.

The competition started with a one-minute video pitch and executive summary, followed by a boot camp. Then, a fully developed business plan is submitted. Six finalists are chosen to present before the Selection Committee.



GRAND PRIZE \$192,000

Total Pave, led by brothers Drew and Coady Cameron transforms the technology found inside smart phones into a highly sophisticated road conditions monitor. Their app, which uses the smartphone's GPS, accelerometer, motion sensor, etc., allows engineers to drive over roads, measure and report repair conditions with statistically similar accuracy of its \$800,000 alternative. Their technology presents a powerful example of how mobile devices are changing the way we do things beyond communicating, and at a much lower price.



1st RUNNER-UP \$137,000

Mikeal Abramoff, creator of **Store-it Squirrel** presented a very interesting software as a service platform (SaaS) that allows people to make money off of extra storage space they have in their house or on their property. A kind of "Kijiji" for self storage, people with and looking for a little bit of space or an entire garage can find the space they need, interact with the renter, and make a deal. It's a great way to turn that empty shed in your yard into a money maker, in turn saving money for the renter, who may otherwise have to pay up to three times as much for commercial storage.



2nd RUNNER-UP \$77,000

The **Black Magic** team, led by Greg Bailey (above), Stephen Likely and Garrett Nelson, pitched a novel degreaser and cleanser for hands that blew the leading product "fast orange" out of the water. It's so effective it will even remove dried spray paint using no grit, and leaves hands moisturized instead of dry and cracked. Winners of the CBC Viewers' Choice Award as well, the team traveled to Toronto to pitch on the set of the Dragons' Den. The episode is slated to air in the Fall of 2013. A great start for three of UNB's top chemical engineering students.

breakthru



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1. Breakthru co-host Harry Forestall from CBC News New Brunswick interviews keynote Peter Brown live.
2. Co-host Martine Blanchard from Radio-Canada Acadie greets the crowd *en français*.
3. Almost 400 people attended the Breakthru 2013 event.
4. Presenting partner Cox & Palmer's George Cooper addresses the audience.
5. Coady Cameron of Total Pave pitches live on stage.
6. Peter Brown, co-author of *The Power Of The Best* delivers his keynote address.
7. Mikeal Abramoff pitches Store-it Squirrel to the audience.
8. Greg Bailey of Black Magic demos with dried spray paint.
9. NBIF Chair Bob Hatheway (left) and George Cooper (right) present Black Magic with 2nd Runner-up.
10. Bob Hatheway and George Cooper with 1st Runner-up Mikeal Abramoff
11. Bob Hatheway congratulates Drew Cameron of Total Pave for their Grand Prize win.

NBIF'S NEW INNOVATION VOUCHER FUND

"The NBIF innovation voucher is a tremendous opportunity for all businesses in New Brunswick to access both the experts and facilities to help turn their ideas into reality. But first, you've got to find your innovation champion, that person inside your company who shows both a personal commitment to the idea, and the conviction and persistence to see it through. Sometimes it's the person with the idea, sometimes it's someone else. What's key is to pay attention to people's ideas and take action when you hear something that's worth pursuing."

Bob Hatherway at the launch of the Innovation Voucher Fund in Saint John



In 2012-2013 NBIF announced the creation of its new **Innovation Voucher Fund**. Since inception, NBIF has focused its everyday investing on new companies and applied research at New Brunswick post-secondary institutions.

For the first time in NBIF's history, established businesses can apply for funding from NBIF to develop new products or processes that make or save money. Up to \$80,000 or 80% of the cost of the project. The company puts in the rest.

The idea came to us in 2011 when we were preparing for our biannual R3 Gala, when we honour three of the province's top applied researchers. We said, "If researchers are required to have an industrial partner to receive funding from us, what if we turned that around so businesses could do the same thing?"

So we created the R3 Innovation Challenge to find out. That was the test, and it worked. Within just one month we received 25 applications. After a selection process, two companies each received \$50,000 worth of services from New Brunswick researchers.

At NBIF we are prepared to make that happen by putting up some of the money and providing a match making service. This is just one step towards creating greater awareness about how innovation can improve the competitiveness of our businesses and economy.



Everyone can benefit from the opportunities the innovation voucher creates. Help spread the word. Contact us for brochures and other digital materials. We'll send them to you to inspire your clients and stakeholders. Go to nbif.ca.



THE BIG PICTURE

10 YEARS IN

NBIF funding allows applied researchers to fully fund their projects.



**RESEARCH TO ENTERPRISE
BRIDGING THE GAP**

In total, 8 NBIF portfolio companies were borne from NBIF-backed research



**OTHER CAPITAL
INDUSTRY PARTNERS & AGENCIES**

With funding from NBIF, applied researchers can obtain much more from national granting agencies and industry.



**INCREASING CAPACITY
MAKING A DIFFERENCE**

The usefulness of NBIF investments go far beyond the life of a project as researchers use equipment and human resources acquired well into the future.

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APPLIED RESEARCH

In 2012-13, NBIF's investment of \$1.9 million from its Research Innovation Fund allowed New Brunswick researchers to obtain an additional \$14 million from other sources to create 27 new projects.

NBIF RESEARCH INNOVATION FUND INVESTMENTS

Sustaining an innovation-based economy requires a constant interest and investment in research and development. In fact, New Brunswick has some of the most brilliant researchers in the world, many of whom have invented products and processes that have found their way to industry, when R&D truly turns into innovation. After all, an innovation does not really exist until it is actually in use.

In 2012-13, NBIF invested \$1.85 million under the Research Innovation Fund to create 27 new projects. These investments allowed researchers to leverage an additional \$13.8 million from national granting agencies and industry, resulting in a leveraging ratio of 8:1. NBIF's corporate objective is 5:1. Researchers are required to have an industry partner and demonstrate potential for both commercialization and an economic impact on New Brunswick in order to obtain funding from NBIF. Their research must also fit within one of the Research Innovation Fund's four components.

In the subsequent pages, you will find tables detailing the 2012-13 Research Innovation Fund investments by component. **Innovation Capacity Development** is for equipment and to support funding applications for major infrastructure projects. **Emerging Projects** are in their earliest stage, when theory turns into practice, and typically before any prototyping. **Proof of Concept** involves a project that is being prepared for commercialization and includes activities such as prototyping and system optimization. The fourth component, **Start-up Grants** is now reported under Talent and Recruitment.



Dr André Dumas

"When I was a kid, a teacher who had a son the same age as me took me fishing for the first time," Dumas says, "after that I wanted to know everything about fish, what they eat, where they hide, and how they grow." That passion led to covering almost every base on a professional level.

After obtaining a CGEP technical diploma in wildlife management, he undertook a bachelors degree in biology. Then, to better understand their living environment, he undertook a masters degree in civil engineering focusing on wastewater treatment. Finally a PhD in fish nutrition. A scientific triple threat.



ADD ARCTIC CHARR TO YOUR CART

With a large and established industry for salmon fish farming, the aquaculture industry and food distributors are on the search for more alternative, locally sourced sustainable varieties for their customers. One of those varieties is the Arctic Charr, the demand for which has outstripped supply in recent years.

With \$300,000 from NBIF and \$5 million more from numerous provincial and federal agencies, and industry partners, Dr Dumas and a team of 12 other research scientists will develop a national breeding program for Arctic Charr.

Dr Dumas is currently the Scientific Director of the Coastal Zones Research Institute (IRZC) in Shippagan, NB. With a start-up from NBIF in 2009, the IRZC was able to hire Dr Dumas, then a nutrition scientist for Cargill in Idaho, who was looking to return to Canada.

Dr Dumas has had a passion for fish since his childhood in Shawinigan, Québec.



Dr Alain Simard

GOOD NICOTINE? REALLY?

Alain Simard is a professor of biochemistry at the Université de Moncton who is searching for ways to slow or cure neurological diseases like Multiple Sclerosis or Alzheimer’s disease with nicotine.

"There are many different nicotine receptors and we’re trying to establish which one is responsible for curing the disease. We will work with this receptor or see if we can develop new drugs that would be more specific than nicotine," says Dr Simard. "If so, it could lead to a drug that could treat Multiple Sclerosis and possibly other diseases, without the many side-effects of nicotine."

He is now testing to see which receptors react best to nicotine, and to see if the substance can be administered without adverse side effects, such as addiction or depression. This doesn't mean

that people who suffer from such diseases should start or continue to consume tobacco or nicotine replacement products. It just doesn't work that way.

"There are many different nicotine receptors and we’re trying to establish which one is responsible for curing the disease. We will work with this receptor or see if we can develop new drugs that would be more specific than nicotine," Dr Simard says, "with anything that’s inflammatory in the nervous system, there are no good drugs to treat these diseases, especially when they affect the brain."

Dr. Simard was also recruited to New Brunswick with start-up funding for his laboratory from NBIF.

2012-13 innovation capacity development RESEARCH INNOVATION FUND

Researcher	Org	Project	Investment
Andre Dumas	IRZC	Aquaculture development and commercialization of Arctic Char in Canada	\$ 300,000
Rémy Rochette	UNB	Stock structure and connectivity of American Lobster in Atlantic Canada	122,950
Du Weichang	UNB	Integrating business terms, rules, and process models for engineering systems	90,000
Céline Surette	UdeM	Metal exposure biomarkers and bioindicators for aquatic and human health	77,493
Jeffrey Waller	MTA	Algal enzymes and the cycling agent dimethylsulfoniopropionate	73,900
Jean-François Bisson	UdeM	Tools for monitoring the deposition of high value laser applied coatings	47,665
Nadia Tchoukanova	IRZC	Patent application for astaxanthin-rich shrimp oil preparation	10,000
Sandra Turcotte	UdeM	Targeting the loss of the von Hippel-Lindau cancer tumor suppressor gene	8,000
Ming Zhong	UNB	Transportation models with intelligent geospatial data and computing	8,000
Hany El Naggar	UNB	Analytical procedure for pulling loads in pipe bursting installations	8,000
Saleh Saleh	UNB	Giftal Multi-Relay Protection for Micro and Smart Grid Power Systems	8,000
Serge Gauvin	UdeM	Nonlinear optics and electroluminescence in light confinement structures	8,000
Omer Chouinard	UdeM	Current situation and incentives for sustainable lobster fishery	8,000
Jamel Ghouili	UdeM	Energy optimization for electric vehicle fuel cell supercapacitors	5,000
Mohamed Touaibia	UdeM	Phenolic acids molecular diversity for making fatty acid metabolism inhibitors	5,000
Total invested, NBIF			\$ 772,008
Contributions from other sources			\$ 7,285,376
Total impact			\$ 8,057,384

IMAGINE: TRUE 3D CAMERAS, CHEAP SOLAR POWER AND MORE...

In 2012-13, NBIF also made a number of investments in emerging and concept validation projects. An emerging project is one that is in the earliest stage, before concept validation (i.e. prototyping). With positive results, researchers can obtain much larger funding, as shown in the table, to validate their concept which is the final step before commercialization.

Felipe Chibante's project, our largest of the year, will see the price of fullerenes, the most expensive part of a solar cell, decline from \$15,000 to under \$5,000 per kilogram. **Ying Zheng's** work will see the development of chemical catalysts that will allow small and large biorefineries to ingest almost any kind of organic matter to produce fuel. Many biorefining systems are designed to process only one type of organic matter. **Yun Zhang's** project involves the development of a camera that films and captures true 3D images. Today's technology basically simulates and projects 3D images. **Yahia Djaoued's** work involves the development of a bathing technique for depositing nanoscopic coatings on various types of material. "Sol-gel" techniques are much simpler than traditional "sputtering" techniques that can only be done in vacuum—a process that is very difficult when dealing with large surface areas.

2012-13 emerging projects and concept validation RESEARCH INNOVATION FUND

EMERGING PROJECTS:

Researcher	Inst.	Specialization	Investment
Rickey Dubay	UNB	Intelligent control and predictability of plastic part quality	\$ 25,000
Adam Dyker	UNB	Organic redox flow batteries	25,000
Khashayar Ghandi	MTA	Green synthesis of magnetic polymers and composite materials	25,000
Sean McGrady	UNB	Metal organic frameworks for gas purification and separation	25,000
Mathieu Quenum	IRZC	Pre-commercialization of sphagnum fiber cultivated in NB	25,000
Kevin Shiell (1)	CCNB	Hydrolyzed amino acids for commercial foliar spray products	25,000
Kevin Shiell (2)	CCNB	Process improvement for the production of conductive paper	20,000
Alain Doucette	CCNB	30-metre shrimp boat sorting technology development	10,000

CONCEPT VALIDATION:

Researcher	Inst.	Specialization	Investment
Felipe Chibante	UNB	Fullerene manufacturing process for the solar energy market	\$ 460,000
Ying Zheng	UNB	Development of a biorefinery for biomass to green fuels	260,000
Yun Zhang	UNB	Native 3D cameras for surveillance and airborne mapping	125,000
Yahia Djaoued	UdeM	Sol-gel method for depositing inorganic nano thin films	52,425

Total invested, NBIF	\$ 1,077,425
Contributions from other sources	6,396,411
Total impact	\$ 7,473,836



MOVING THE REFINERY TO THE RESOURCE

Canada has more biomass resource per capita than any other nation and New Brunswick is rich in renewable resources. An abundant supply of many types of biomass is of great importance in the production of biofuels. However, biomass is often widely distributed and low in energy density. Harvesting, transporting and storing large volumes of low-energy-density biomass to a centralized biofuel processing plant are very costly.

Using an innovative catalytic thermo-chemical technology (CPLT) discovered by Dr. Ying Zheng, New Brunswick will see the development of its first mobile bio-refinery. The mobile biorefinery can easily be moved on location where the biomass is available and provide a more efficient and less costly access to low energy density biomass.



THE BIG PICTURE
SINCE 2003

In order for researchers to pay attention to the critical aspects of their work, NBIF and its partners help them hire the talent they need to succeed.



THE BEST PROFESSORS
ATTRACT THE BEST STUDENTS

NBIF's Start-up funding allows New Brunswick universities to compete with larger, wealthier institutions to recruit some of the best researchers in the world.



THE BEST STUDENTS
ATTRACT THE BEST PROFESSORS

NBIF's Research Assistantships allow top students to earn while they learn by working on NBIF-backed research projects in the lab.



EXPANDING TALENT BASE
HELPING RESEARCHERS DO MORE

Research technicians are most often PhD-trained researchers. They assist researchers by performing incredibly complex tasks and managing their laboratories.

2
2013

1
TALENT RECRUITMENT

2

In 2012-13, NBIF and the Department of Post-Secondary Education, Training & Labour provided \$1.5 million, leveraging \$500,000 more to New Brunswick colleges and universities to hire the talent they need to support their innovation activities.





Dr Sharwaite Ramsaywack

MAKING CANCER DRUGS STICK

Dr Ramsaywack comes to New Brunswick from Toronto after Mount Allison professor Stephen Westcott received funding from NBIF's Research Technicians Initiative. In 2013, it was Dr Ramsaywack that determined the chemical process to attach two well-known cancer drugs, Taxol and Cisplatin, to a new drug developed by New Brunswick-based company Soricimed Biopharma.

The work came to Dr Ramsaywack after Soricimed won NBIF's R3 Innovation Challenge in 2012. The competition gave two winning companies \$50,000 worth of research services at one of New Brunswick's research organizations. Soricimed chose Mount Allison University.

When Soricimed was undergoing laboratory tests in rats, it discovered that when they attached a fluorescent marker to the drug, (so they could see where it "landed" inside the rat,) it lit up very bright in the areas where cancer tumors had

been grown. That sprung the question whether or not the drug could be used as a delivery device for other cancer killing drugs. It was Dr Ramsaywack that determined how to bond their drug to Taxol and Cisplatin (separately), and in a manner that allowed the it to attach itself to the cancer cell first, followed by the cancer obliterating Taxol.

Laboratory tests conducted by Mount Allison researcher Dr Vett Lloyd confirmed that the combination had successfully killed cancer cells only, leaving healthy cells untouched. Considering modern regimens for chemotherapy treatment, which kills both cancerous and healthy cells, Dr Ramsaywack's work could contribute to a very promising new, targeted therapy for cancer patients.

FUNDING THE FUTURE

In 2012-13, NBIF's talent recruitment funding saw the hiring of one new professor, seven new research technicians, and assistantships for 118 undergraduate and graduate students.

Dr David Joly was recruited to the Université de Moncton, where he will continue his work on the development of new DNA sequencing technologies to develop disease resistant plants. His research could lead to potatoes that are resistant to mildew and other infections. Dr Joly comes to New Brunswick from Agriculture Canada's Pacific Agri-food Research Center at the University of British Columbia. NBIF contributed **\$45,000** to help Dr Joly set up his laboratories.

For **Research Technicians**, NBIF and the Department of Post-Secondary Education, Training & Labour (PETL) contributed **\$500,000** to support the hiring of seven new research technicians across the province. To obtain funding from NBIF, universities must create a permanent position, match the funds, and demonstrate how the position will be sustained beyond the three-year duration of the award.

NBIF's **Research Assistantships Initiative** is one of its most important activities when it comes to inspiring students to consider research and innovation as a valuable career path. Last year, NBIF and PETL provided **\$1,000,000** to applied researchers at New Brunswick colleges and universities to hire student research assistants. With an assistantship, students gain real world laboratory experience while they learn, and make some money along the way.

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©2013 New Brunswick Innovation Foundation Inc
Suite 602 King Tower
440 King Street
Fredericton, NB E3B 5H8 Canada
1-877-554-6668
nbif.ca

Twitter: @nb_innovation