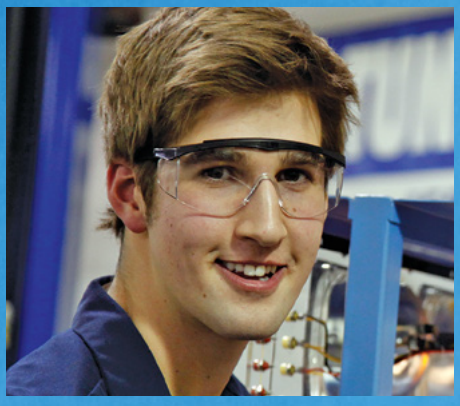

insidenr

NIAGARA RESEARCH

ANNUAL REPORT 2013-2014

Advanced Manufacturing

Agriculture & Environment

Business & Commercialization Solutions

Digital Media & Web Solutions

Food & Beverage Innovation

Niagara College Canada

APPLIED DREAMS.

INNOVATION HAPPENS HERE

Niagara Research, the Research & Innovation Division of Niagara College, provides real-world solutions for business, industry and the community through applied research and knowledge transfer activities.

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Associate Vice-President

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Senior Manager, Business Development

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Manager, Projects & Operations

RACHEL BROWN
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CAROLYN MULLIN
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Administrative Assistant

MICHELLE TOPOLINSKY
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KEVIN POULIN
Systems Administrator

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ASSOCIATE VP MESSAGE

Industry, faculty and students all reap benefits of a great year for Niagara Research

Hello, and welcome to InsideNR.

This third edition of the Niagara Research magazine takes us in a fresh direction as we present the annual report for 2013-14 for Niagara College's Research & Innovation Division. As you will see in these pages, we have had a fantastic year.

In partnership with government and industry, Niagara Research has involved 1,221 students and 33 faculty across 27 programs in 66 projects. That adds up to plenty of solutions for our industry partners, and a lot of great experience for our students, on real-life projects, with real-life deadlines, budgets and deliverables.

You will read about several interesting projects and people, and the main areas of excellence in applied research at Niagara College. Three sectors in particular have seen strong growth and activity during this past year:

- In Advanced Manufacturing, we celebrated the solidification of our Industry Innovation Centre, thanks to a brand-new continuing grant to support its activity, and support from the province of Ontario for a new building – an addition to the Rankin Technology Centre, on the Welland Campus. Construction starts Fall 2014 and should be done by late 2015.
- In Food & Beverage Innovation, we opened our new research labs at the Canadian Food & Wine Institute, at the Niagara-on-the-Lake Campus, hired a full-time Lab Technologist, and celebrated as the MADD Virgin Craft Lager won Gold in its debut at the 2014 US Open Beer Championships. This non-alcoholic beer was designed and developed through an applied research project at NC's Teaching Brewery.
- Agriculture & Environment is revving up in Precision Agriculture, with several key partnerships with agronomists and farmers to accelerate the adoption of this technology. This will not only improve the productivity of farms, but also reduce fertilizer run-offs into streams and lakes, increasing the health of our environment for all life depending on it.

But don't take my word for it, read on, and who knows, maybe you will see yourself in these pages next year!

DR. MARC NANTEL
Associate Vice-President
Niagara Research
Research & Innovation, Niagara College

insidenr
NIAGARA RESEARCH
ANNUAL REPORT 2013-2014

Advanced Manufacturing

Project Manager: **Gordon Koslowski**

22 PROJECTS

171 STUDENTS

5 RESEARCHERS

The Industry Innovation Centre houses Niagara Research's technology team specializing in engineering design, 3D digital scanning technology, lean manufacturing processes and additive manufacturing. Niagara Research works with Southern Ontario businesses to bring ideas to life, from concept through to the development of working prototypes. Our students and staff bring real-world experiences from a range of business areas, including automotive, agriculture, construction, and manufacturing. We also have access to cutting-edge technology, including equipment and software.

PROJECT SPOTLIGHT

Improving Efficiency in Greenhouse Construction

Industry Partner: GGS Structures Inc
Project Duration: October 2013 to March 2014
Project Type: Continuous Improvement Implementation
Funder: FedDev Ontario Prosperity Initiative and DTAPP

Research Team

Faculty: Rick Baldin
Senior Research Associate: Mike Holderney

CHALLENGE: GGS has been a world-class designer, manufacturer, and installer of commercial greenhouse structures since 1979, but the company recently identified inefficiencies in its current manufacturing production of greenhouses.

SOLUTION: The Niagara Research team therefore analyzed the current manufacturing practices to identify areas of improvement using digital and lean manufacturing principles. As a result of the work, the team was able to make recommendations for a 3.5 times reduction in time for one of the production modules.

Efficiency through Virtual Factory Design

Industry Partner: Kwik Mix
Project Duration: September 2013 to March 2014
Project Type: Digital Manufacturing/Virtual Factory Design
Funder: FedDev Ontario Prosperity Initiative

Research Team

Faculty: Costa Aza
Student: Benjamin Laurence

CHALLENGE: Kwik Mix is a manufacturer of high-quality premixed concrete products and related items, serving independent lumber dealers and specialty masonry yards. The company wants to relocate its production facility to a new space, with a desire to maximize the layout and functionality of the new plant design before starting the actual build.

SOLUTION: Prior to acquiring funding, Kwik Mix wanted a digital layout/plant design. The Niagara Research team used 3D imaging technology to digitally capture the existing shop floor and outdoor space. From this base line, a virtual representation of multiple shop layouts were detailed and designed according to proper code requirements. Research into the effective use of space and machinery utilization was also provided to Kwik Mix with potential viable solutions to help eliminate systemic waste in the current factory processes.

Paint Mixer Prototype

Industry Partner: Linetech Equipment Manufacturing Ltd.
Project Duration: March 2014
Project Type: Product Development
Funder: LineTech Equipment Manufacturing Limited *(as a technical service)*

Research Team

Faculty: Costa Aza
Student: Dave McKechnie

CHALLENGE: Linetech Equipment Manufacturing Limited is a local St. Catharines-based company specializing in road painting equipment. Vice-president Jordan Thornback discovered our strengths are in 3D scanning, modelling, and additive manufacturing, so he commissioned Niagara Research to create a nylon prototype of an intricate paint mixing component.

SOLUTION: The research team designed and manufactured a nylon prototype using its Fortus 400MC fused deposition 3D prototyping machine. By printing this component, Niagara Research was able to alleviate the traditional four- to five-week wait for a similar component to come from Europe. The company was also able to achieve a 50 per cent cost reduction and can pass that cost savings directly to its customers.

INDUSTRY PARTNERS

- Chocolate Products
- Corporate Chemicals and Equipment
- Decora Powder Coatings Limited
- Dilts Piston Hydraulics Inc.
- GGS Structures Inc.
- IdeaBeat
- Kwik Mix
- Maple Craft Doors
- Niagara Composites
- Niagara Patterns
- PaperNuts
- Talon Manufacturing Group Inc.
- W.S. Tyler

Bryan Mewhiney

RESEARCHER & INDUSTRY LIAISON, ELECTRONICS TECHNOLOGY

In his role as co-ordinator in the new Renewable Energies Technician program, Bryan Mewhiney makes sure he practices what he preaches, carving out time for research projects that are heavily integrated with local industry.

From developing the capacity to test the thermal resistance of insulating materials for the construction industry, to developing a new method of solar-power generation, Mewhiney devotes many of his waking hours to creating a greener future. As co-ordinator of the Renewable Energies Technician program – which saw its first graduates one year ago – he invests time in developing the curriculum, working with the lab trainers and delivering courses.

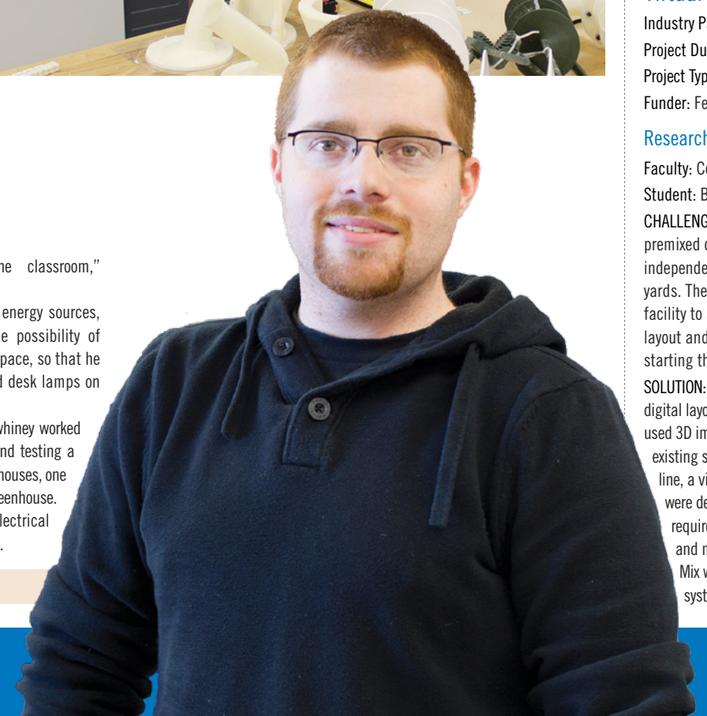
As part of the advanced manufacturing research team with Niagara Research, Mewhiney has worked with student research assistants to oversee the development of the electrical control systems for several projects. Recent industry partners have included Papernuts, for whom Niagara Research developed a dispensing machine prototype; Durham Foods, a hydroponics company that wanted to automate part of its harvest operations; and Ryan IT, a Grimsby-based machine fabricator which also came to Niagara Research for prototype development.

"Being involved on a practical level with our industry partners allows me to really engage our students inside the classroom, while also offering them exciting and rewarding employment opportunities outside the classroom," Mewhiney notes.

With his commitment to sustainable energy sources, Mewhiney is currently investigating the possibility of installing solar panels above his office space, so that he may run his computer, coffee maker and desk lamps on solar energy only.

Before coming to Niagara College, Mewhiney worked for a climate control company, building and testing a climate control automation panel for greenhouses, one of which is installed at the NC Teaching Greenhouse.

He is a graduate of Niagara College's Electrical Engineering Technology (Co-op) program.



RESEARCHERS: Costa Aza, Rick Baldin, Rob DeVries, Bryan Mewhiney, Alan Munro

Agriculture & Environment

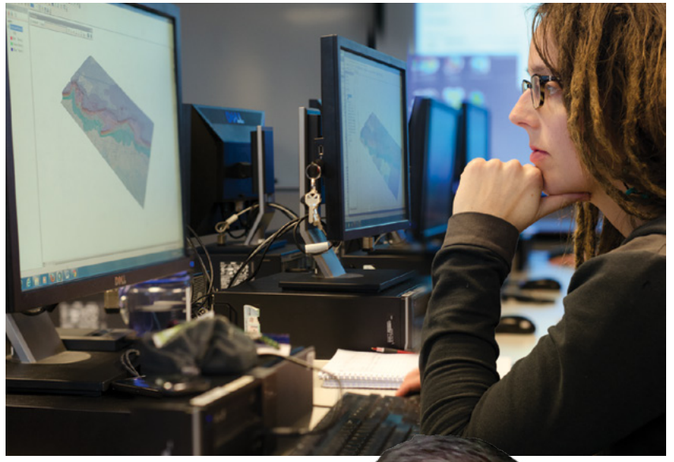
Project Manager: **Gregor MacLean**

11 PROJECTS

262 STUDENTS

8 RESEARCHERS

In light of growing environmental and ecological pressures, Niagara Research's Agriculture and Environment team works with local private and public sector partners to develop innovative environmental solutions to address today's challenges. Faculty and student research teams have expertise in the areas of precision agriculture, sustainable food, environmental management, ecosystem restoration, GIS, horticulture and greenhouse operations. Infrastructure at Niagara College includes a 20,000 square-foot greenhouse and environmental laboratories, while on-campus wetlands and lagoons provide the ideal setting to assist with applied research needs of industry partners.



Brendan Spearin

RESEARCH ASSOCIATE, AGRICULTURE & ENVIRONMENT

Brendan Spearin likes clean data.

The research associate with the precision agriculture team has been working part-time for the past year and a half at devising models to tidy up the reams and reams of data collected by modern agricultural machines.

"Farmers in Ontario have highly sophisticated equipment that collects awesome data, but they don't necessarily know how to take the next step," notes the recent graduate of the Geographic Information Systems (GIS) and Geospatial Management post-graduate program at Niagara College. "In its raw form this agricultural data tends to have inherent issues, so we have been working on a way to automate the cleaning by identifying systematic errors within it."

Spearin was introduced to the precision agriculture team while still a college student, through his contacts at the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). He used his programming knowledge (part taught, part self-taught) to help bring the system from manual processing into full automation. During the process, he has received feedback from Niagara Research's OMAFRA partners as to how to improve the cleaning method to best accommodate the needs of farmers.

Clean data allows farmers to better understand the agricultural yield of their fields, so they may optimize fertilizer production while lowering the potential for fertilizer runoff and environmental damage.

"It's great to see something I created being used on a daily basis, especially because the way it was done before required a large time investment and included too much potential for human error.

"In my field we don't always get the chance to work directly with programmers," he adds, noting that with the Niagara Research team he works side by side with programmers every day.

Before coming to Niagara College, the Hamilton native earned an Honours BSc in Earth Sciences, graduating from Brock University in 2012. He also recently worked as a GIS technician with Fisheries and Oceans Canada.

RESEARCHERS: Katie Altoft, Tanya Blankenburg, Evan DiValentino, Dr. Michael Duncan, Albert Grimm, Bill MacDonald, Ashley Marshall, Olga Piedrahita

PROJECT SPOTLIGHT

Bringing Biodiversity to Green Roofs

Industry Partner: St. Williams Nursery and Ecology Centre, Dramm Corporation, Gro-Bark

Project Duration: September 2012 to May 2014

Project Type: Best Practice Research

Funder: NSERC

Research Team

Faculty: Tanya Blankenburg, Bill MacDonald, Olga Piedrahita

Students: Joanna Dowbiggin, Sarah Fox, Leanna Kozak, Ruth Medemblik, Marek Paterski, Joshua Petzold, Luis Sanchez, Laura VanderPlas, Katrina Viske, & Daniel Welsh

CHALLENGE: Green roofs cut greenhouse gases and reduce the impact of urbanization, but they often include few native species.

SOLUTION: In a multi-year study, the team determined that irrigation is necessary for all tested native species to live a healthy life. Three species were identified in the second phase, while the third phase determined a soil mix from Gro-Bark provided the best green roof growing media.

Optimizing Online Tools for Precision Agriculture

Industry Partner: AgInfoSys, Schuyler Farms, Yellow Gold Farms

Project Duration: May 2014 to present

Project Type: Web Portal Development and Agricultural Management Zone Processing

Funder: NSERC

Research Team

Faculty: Dr. Mike Duncan

Senior Research Associate: Sarah Lepp

Students: Brett Didemus, Kyle Harrison, Thom Koole

CHALLENGE: Dr. Mike Duncan has developed a yield probability index (YPI) which uses a farm field's historical spatial yield data, elevation and GIS data to provide management zones, allowing a farmer to treat each zone independently for best growing results.

SOLUTION: The precision agriculture team developed data processing and cleaning algorithms to scale this and other solutions with a web-based portal. Specifically, funding has allowed work to progress, including bringing the web portal live, testing the algorithms and creating an integrated system.

Tailoring Farm Management

Industry Partner: Yellow Gold Farms

Project Duration: July 2012 to present

Project Type: Web Application Development

Funder: FedDev and NSERC

Research Team

Faculty: Dr. Mike Duncan

Graduate: Kyle Harrison

CHALLENGE: Increased fossil fuel costs are directly proportional with fertilizer costs, but in order to increase profits, farmers must maintain or decrease costs, including field inputs (fertilizers). Rick Willemse, owner of Yellow Gold farms, has created a web tool (Global Farm Manager) to optimize spatial yield for grain crops while controlling fertilizer expenses. More development will maximize the tool's potential.

SOLUTION: With further development from the Niagara Research team, the finished product will provide variable rate prescription (nutrient application) maps that will tailor fertilizer applications to field needs, which will make the application more precise, while saving costs and reducing wasted fertilizers.

INDUSTRY PARTNERS

- AgInfoSys
- Brock University
- Earthgen
- IBM
- Jeffery's Greenhouses Inc.
- Niagara Sustainability Initiative (NSI)
- Ontario Ministry of Agriculture and Food (OMAFRA)
- Schuyler Farms
- St. Williams
- Town of Fort Erie
- Umbrella Energy
- Village Harvest
- WineHawk Labs
- Yellow Gold Farms

Course-Based Research

Co-ordinator: **David DiPietro**

COURSE-BASED RESEARCH PROJECTS are part of a strategy implemented by faculty and Niagara Research to augment content from the classroom with real-life projects and scenarios. These projects typically involve students working with an industry partner to solve real-world challenges. Students are provided increased contact with a specific industry, presenting their fresh ideas to a client. In other words, everyone benefits from the collaboration.

PROJECT SPOTLIGHT

Market Plan for Social Service Event

Industry Partner: Big Brothers Big Sisters
Project Duration: 2 Months
Project Type: Course-Based Research
Area of Specialization: Public Relations

Research Team

Course: Public Relations Research Project (PREL9234)
Faculty: Emily McInerney
Students: Katie Beaucock, Morgan Branch, Asta Cronkite, Erin Haase, Heather Miller, Joanna Muratori, Jennifer Reeb

CHALLENGE: Thorold & District Big Brothers Big Sisters "Niagara College Bowls" is their newest student-run fundraiser for children and youth in the community. Everyone in the Niagara College community is invited to come out and raise pledges for a fun night of bowling. As a new event, Big Brothers Big Sisters required assistance with recruitment and campaigning to make sure the event would be a success. They wanted to ensure that they could meet their goal of $5,000 raised and get enough teams out to bowl.

SOLUTION: A group of students from the Public Relations Research Project course created a team recruitment campaign through media, social media, and innovative ideas that Niagara Colleges' Student Administrative Council used to promote the event. These methods were used in order to engage students and increase participation of the Niagara College Bowls event that took place on Feb. 11, 2014. After the event was over, research was conducted via the use of surveys to determine what worked well at the Niagara College Bowls Event and what can be improved upon for next year's bowlers. The group of students working on the project helped Big Brothers Big Sisters exceed the goal of $5,000 raised, with 103 registered bowlers and more than 25 teams.

Tuning into an Online Music Store

Industry Partner: Beamsville Music
Project Duration: 3 Months
Project Type: Course-Based Research
Area of Specialization: Web Development

Research Team

Course: Integrated Rich Media Projects (WEBD1113)
Faculty: Mark Hardwick
Students: Anooj Francis, So Young Hwang

CHALLENGE: Beamsville Music is a small music studio located in Beamsville, Ont., offering music lessons, sales and repairs of products. In the past few years, they have seen a decline in the purchase of instruments at their storefront. Beamsville Music approached Niagara College to assist them in creating a fully functioning online store, where they could list their products and reach a larger target market.

SOLUTION: A group of students in the Integrated Rich Media Projects course created a custom Wordpress website which was built to be easily managed by the industry partner. The project dealt largely with e-commerce integration to manage online sales. Other tasks completed by the students included: an interactive Beamsville Music blog, store management, content management, shipping management, payment integration and social media integration.

STUDENT SPOTLIGHT

Research Assistant turned grad knows recipe for success

By the time Becky Scott graduated from Niagara College's Culinary Innovation and Food Technology program this past spring, she had already experienced the thrill of seeing her first product on the store shelves, as the driving force behind the product development of MADD Virgin Craft Brewed Lager.

Soon after the company turned to Niagara Research to develop an alcohol-free lager, Scott began working on its product development and sensory testing, tweaking recipe formulations until its taste, colour, even the foam as it's poured, can rival any regular craft-brewed lager.

"It looks like a lager, and tastes like a lager, the only difference is that there is no alcohol," she says of the product, will soon be available at select Sobeys, Shoppers Drug Mart, and Metro stores in Canada, and is now available at Walgreens in the U.S.

Scott had the opportunity to lead the product development for MADD Virgin Drinks as a part-time research assistant with the Food and Beverage Innovation team. She enrolled in the Culinary Innovation program as a recent Chef Management graduate who was interested in expanding her skills into the food science field.

> "Most people don't get to do sensory analysis until they get their master's degree, but since I had hands-on experience at the College with MADD Virgin Craft Brewed Lager, that helped me land a competitive internship."
>
> **Becky Scott, pictured above**

She also gained real-world experience outside the classroom by completing an internship as a sensory technician at McCain Foods Limited in Toronto.

"Most people don't get to do sensory analysis until they get their master's degree, but since I had hands-on experience at the College with MADD Virgin Craft Brewed Lager, that helped me land a competitive internship," she says.

While she was offered a full-time position at McCain on graduating, she opted to continue her work at Niagara College and took on a full-time contract as a research associate for Niagara Research, where she now enjoys working on multiple projects with the help of student assistants. She looks forward to potentially seeing more products she is working on being sold in stores in the future.

"I would love to walk into a grocery store someday and be able to point out all the different products I helped to create," she says. "The more products I get on the shelves, the more rewarding it will be."

Project in Brazil impacts thousands of women in need

INTERNATIONAL SPOTLIGHT

Clockwise from above left: Salvador, Brazil; Graduates from the Mulheres Mil Program, specializing in welding, discuss their successes with the MMIA Research team and their professors at the Rio Grand do Sul Campus, Instituto Federal, Rio Grand do Sul, Brazil; Graduates receive gifts from Niagara College professors at the Rio Grand do Sul Campus, Instituto Federal, Rio Grand du Sol, Brazil; Two sisters share their pride in their accomplishments at Bento Goncalves Campus, Instituto Federal, Brazil.

> ''What started as a project has turned into a program with national reach. But to succeed on an ongoing basis, it needs to be consistent, and our Brazilian partners needed to be able to show the government (in Brazil) that it is successful.''
>
> **Marti Jurmain, Project Manager, and retired Niagara Research Director**

What started out as a pilot program to help hundreds of disadvantaged women in northern Brazil has turned into a national program reaching hundreds of thousands of women in need of social and economic assistance.

The Mulheres Mil program (meaning "1,000 strong women") began as a collaboration between Canada and Brazil to build the capacity of Brazilian colleges (Institutos Federal) to help marginalized women in Brazil access job-specific training and enter the formal workforce.

The program was meant to improve women's lives, enhance regional and national economic development and encourage greater participation from disadvantaged women in the political process. Students gain numeracy and literacy skills, learn about human rights, and develop skills based on the labour market in their locale.

Through its international connections and research capacity, Niagara Research has been involved since the infancy of the program, initially using a federal funding grant from the Canadian International Development Agency to send teacher-trainers to five pilot regions.

While the current Brazilian government endorsed the project, adopting Mulheres Mil into its much larger, nation-wide vocational training program for men and women, there still existed a need to develop a sustainable framework and methods of evaluating the impact of the program.

Therefore, another Niagara College research team has undertaken an impact assessment project to confirm what many see and believe to be a great success.

"What started as a project has turned into a program with national reach. But to succeed on an ongoing basis, it needs to be consistent, and our Brazilian partners needed to be able to show the government (in Brazil) that it is successful," says Marti Jurmain, Project Manager, and retired Niagara Research Director.

In this second phase, funded by the International Development Research Centre, teams from Canada and Brazil collaboratively developed the framework, tools and methodologies to allow Brazilian authorities to measure the influence of the Mulheres Mil program on various stakeholder groups.

The project is modelled on an impact assessment framework and tools developed by a research team to measure the impact of the Second Career "return-to-work" program for laid-off workers in Ontario. Holly Catalfamo, human resources program co-ordinator at Niagara College, led the Second Career study, so it was only natural for her to become lead researcher with the impact assessment project.

The project has provided several opportunities for Niagara College students as well.

"We identified a need for the development of training materials to support the roll-out of the data-gathering process throughout hundreds of sites in Brazil," notes Catalfamo.

Therefore, she enlisted the assistance of the students in her graduate human resources management class, to develop different training modules for the Brazilian data-gatherers.

Within a tight timeline (less than one term), her 38 students gained international experience without leaving the classroom as they designed the training manual components, including sensitivity training for gathering data from vulnerable populations and basics in collecting and analyzing quantitative and qualitative research data.

Throughout both projects, dozens of Niagara College students expanded their learning and real-world skills, most in Canada and some on location in Brazil. Their work was immediately embraced by the researchers in Brazil, Jurmain notes: "They couldn't download the manuals fast enough; they were excited to receive these materials designed by the HR graduate students."

Now that the funding has ended, Catalfamo and Jurmain have written a 25-page final project report – which is more than 500 pages with its appendices – and Catalfamo has made several presentations on the projects at both national and international scholarly conferences.

If a smaller pot of funding can be obtained, the researchers have been asked to return to Brazil one more time, to gauge the outcome of the training, and possibly assist the data-gatherers with any potential adjustments to the materials.

In light of the collaborative efforts, capacity-building and positive impact on students to date between the nations, the Brazil-Canada partnership in education continues as well, with more than 100 Brazilians expected to visit colleges in Canada over the next year, learning about the Canadian college system in general, and applied research in particular.

2013-2014 highlights

05/13

THE HONOURABLE GARY GOODYEAR VISITED *the Rankin Technology Centre to announce up to $990,000 in funding to establish the Industry Innovation Centre at Niagara.*

07/13

WHEN CANADA'S PREMIERS MET IN NIAGARA *we showcased two of the products resulting from our industry partner projects – NEOB botanical beverage and MADD Virgin Drinks non-alcoholic craft lager.*

08/13

DR. MARC NANTEL'S APPOINTMENT *to the Innovate Niagara board in the position of vice-chair helps further cement the close working relationship of Niagara Research, Niagara College and Niagara's SMEs.*

09/13

SUN MEDIA NEWS TEAM TOURED THE GREENHOUSE *to learn more about the "edible ecosystem that feeds itself." The aquaponics project received press online and in print, across the region.*

NIAGARA RESEARCH CREATED ITS OWN FACEBOOK PAGE *and Twitter identity, and upgraded its presence on LinkedIn, to enhance the channels of information distribution.*

10/13

ANDREA HORWATH, *leader of the Ontario New Democratic Party, toured Niagara College's NOTL Campus, including two Niagara Research areas. She learned about our aquaponics project, and toured the new CFWI Research Centre facilities.*

11/13

ONTARIO GOVERNMENT SUPPORTS RESEARCH *Local media outlets reported funding announcement to build a home for the Industry Innovation Centre.*

DR. MIKE DUNCAN'S RESEARCH *on weather alerts in real time takes the spotlight in time for first autumn frost.*

IN ITS INAUGURAL REPORT "TOP 50 RESEARCH COLLEGES," *Research Infosource Inc. announced the rank of 13 for Niagara College, based on total research funding numbers for 2012.*

12/13

RESEARCH AND INNOVATION MINISTER *Reza Moridi, Ontario's Minister of Research and Innovation, toured our Advanced Manufacturing labs.*

01/14

MIKE DUNCAN'S WORK ON PRECISION AGRICULTURE *is the focus of a feature story in the winter issue of Country Guide, a national publication of Farm Business Communications.*

02/14

THE SUCCESSFUL COLLABORATION *between Niagara Research and MADD Virgin Drinks to create an alcohol-free craft lager is highlighted in a Globe and Mail special feature on Canada's colleges.*

04/14

NIAGARA COLLEGE WILL CONTINUE TO EXPAND *its services and equipment for Niagara's manufacturers as a result of the announcement of $1.75 million over five years for the Industry Innovation Centre at Niagara.*

Business & Commercialization Solutions

Project Manager: **Neil Wilkinson**

12 PROJECTS

703 STUDENTS

7 RESEARCHERS

From initial market research to commercialization strategies, Niagara Research offers a full suite of solutions to assist industry partners in bringing products to market. Niagara Research pairs organizations with faculty, recent graduates, and students with the expertise and capabilities to meet applied research and innovation needs in many areas, including human resources, international business, operations management, and sales and marketing.

Holly Catalfamo

RESEARCHER & INDUSTRY LIAISON, HUMAN RESOURCES

As Co-ordinator of Niagara College's Human Resource programs, Holly Catalfamo brings both experience and enthusiasm to the Niagara Research table.

Catalfamo has made applied research and innovation a major focus during her time at the college, acting as a faculty lead on projects while involving students in the Business Administration – Human Resources (Co-op) and Human Resources Management Graduate programs in course-based research projects.

Ventures in which Catalfamo has played a lead role include a course-based project for her students that saw them participate in a partnership between Niagara College and the Mulheres Mil program in Brazil – a poverty alleviation program that assists socially disadvantaged women transition to formal employment. By designing training materials for Brazilian researchers, students designed learning solutions to support an impact assessment process.

"It is absolutely exciting to see how hard the students work and the quality of the output that they produce," Catalfamo says. "It is a win-win-win experience, for the industry partner, for the students and for the faculty members."

Catalfamo has also been a faculty lead on several standalone projects at Niagara Research, including "Applied Research in the Postsecondary Classroom," an evaluation of applied research, and "A Second Career and a Second Chance," an examination of Ontario's Second Career program.

She has presented findings from her research to the International Society for Educational Planners, the Organizational Behaviour Teaching Conference, the College Degree Operating Group and the Ministry of Training, Colleges and Universities. She has been published in the *Journal of the International Society for Education Planning* and various other publications.

Catalfamo's experience with research began while she was studying for her Doctorate of Education from the University of Toronto, which she received in 2009. She has taught at Niagara College since 2003.

RESEARCHERS: Holly Catalfamo, Terri Champion, Damien Goulbourne, Malcolm Howe, Pam Isaak, Mark Parker, Derek Spence

PROJECT SPOTLIGHT

360 Growers - Market Research

Industry Partner: 360 Growers Inc.
Project Duration: December 2013 to March 2014
Project Type: Market Research/Needs Analysis
Funder: NSERC

Research Team

Faculty: Malcolm Howe, Terri Champion
Graduates: Cameron Kyle, Josh Giancola

CHALLENGE: 360 Growers Inc., has developed a fully modularized and integrated winery-specific ERP (Enterprise Resource Planning) solution and wanted to gain a more in-depth understanding of its target market prior to releasing the product. The purpose of this collaboration was to provide primary market research on technology used in the Canadian wine industry.

SOLUTION: The Niagara Research team analyzed and interpreted primary Canadian wine industry market research with the addition of insightful conclusions and recommendations specific to SoftSystems' goal of bringing its product to market in an effective manner.

Finding the Market Gaps

Industry Partner: Lyngsoe Systems
Project Duration: September to December 2013
Project Type: Environmental Analysis
Funder: NSERC

Research Team

Faculty: Malcolm Howe, Terri Champion
Graduates: Cameron Kyle, Josh Giancola

CHALLENGE: Lyngsoe Systems has been designing, installing and maintaining control and track-and-trace systems for more than 40 years. The company turned to Niagara Research to provide an overview of the competitive environment and potential gaps in the market for North American traceability systems. The information in this report was compiled to assist Lyngsoe Systems in entering and competing within the North American market by identifying the activities of competitors and potential gaps in the market.

SOLUTION: Niagara Research determined the best methodology would be to utilize secondary research through online searches to determine specific competitors and trends within the Canadian poultry industry. Information was collected and compiled into an excel spreadsheet to compare the identified competitors, followed by a further analysis in report format.

Primecast Manufacturing - Content Marketing Plan

Industry Partner: Primecast Manufacturing
Project Duration: February to March 2014
Project Type: Marketing Plan
Funder: FedDev Prosperity Initiative

Research Team

Faculty: Malcolm Howe, Terri Champion
Graduate: Josh Giancola

CHALLENGE: Primecast Manufacturing's current marketing and sales efforts have not increased brand recognition or attracted new clients for its graphite casting services. The company has also experienced significant issues when trying to connect with the right individuals at targeted companies with which they would like to do business.

SOLUTION: The Niagara Research team put together a SWOT analysis that incorporated a client list and quote analysis covering the past two years of business for Primecast. Marketing and sales strategies were also provided with specific suggestions and insights to achieve the goal of increasing brand recognition and recruiting new high-quality clients. In addition to this, a collaborative working session was held with the industry partner to develop an individual LinkedIn page for the owner and one for the business.

INDUSTRY PARTNERS

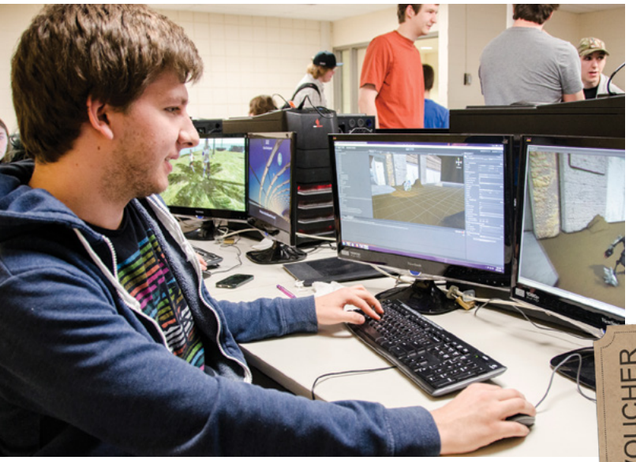
- 360 Growers Inc
- Colossus of Rhodes
- FoodiePages.ca
- Lyngsoe Systems
- MC Olives
- Niagara Parks Commission
- Niagara Precision Limited
- Niagara Recycling
- Primecast Manufacturing
- Soft Systems
- Turn 180 Custom Prototyping

Digital Media & Web Solutions

Project Manager *(until July 2014)*: **Gina Grossi**
Project Manager *(starting July 2014)*: **Neil Wilkinson**

17 PROJECTS
88 STUDENTS
3 RESEARCHERS

Niagara Research's Digital Media team works with small- and medium-sized businesses to assist with the design, creation and implementation of various technology applications. From PC, web and mobile applications to 3D visualization, video production, artificial intelligence and graphic design, Niagara Research has a wide range of expertise in the multimedia industry. At Niagara Research we strive to use the most up-to-date programming languages, platforms and software packages to meet the applied research needs of our industry partners.



Gina Grossi

RESEARCHER & INDUSTRY LIAISON, DIGITAL MEDIA & WEB SOLUTIONS

Gina Grossi spends many of her business hours thinking about playing games.

But far from discouraging it, her employers expect it.

That's because Grossi is a full-time professor with the Games Development program at Niagara College, and a relatively new researcher with Niagara Research.

Before coming to the College, she gained nearly 15 years' experience working in the video game industry, as a programmer, lead programmer, assistant project director, and director of technology. She has designed and implemented various software systems for games, focusing on 3D rendering, particle effects, menu/interface, memory and lighting.

Most recently, Grossi helped shepherd the Digital Media and Web Solutions team at Niagara Research. As its project manager between October 2012 and July 2014, she handled various project types, from simple web templates through a voucher program to complex apps, for a diverse group of industry partners.

"When I first joined the College as a part-time faculty member, I was excited to learn about the opportunities of Niagara Research," she recalls. "It has been a pleasure to be part of a team which offers benefits to so many – the college, the professors, the students, and the local businesses.

"Now as a full-time faculty member, I'm looking forward to working with this talented team."

Grossi is continuing that learning as well, having recently gone back to school to pursue her Master's of Science degree in Computer Science at Brock University. She holds an Honours Bachelor of Science Degree in Computer Science from Brock and a Visual Arts and Creative Design Diploma from Niagara College.

RESEARCHERS: Gina Grossi, Mark Hardwick, Linda Roote

PROJECT SPOTLIGHT

NSI Crowd Source Web Application

Industry Partner: Niagara Sustainability Initiative
Project Duration: August 2013 to March 2014
Project Type: Web Application
Funder: Ontario Trillium Fund

Research Team

Faculty: Gina Grossi
Senior Research Associate: Dave Natalie
Graduate: Bryce Snyder
Student: Chris Jacques

CHALLENGE: Niagara Sustainability Initiative is a not-for-profit organization dedicated to revitalizing the economic viability of the Niagara Region through assisting local organizations with their greenhouse gas emissions. NSI needed a web application for crowd-sourcing sustainability initiatives in the Region, but did not have the expertise in-house to accomplish this goal. The application would allow NSI partners to highlight their initiatives and gain recognition and benefits, while providing NSI with a value-added tool to attract new partners.

SOLUTION: The Niagara Research team created art concepts and layout, designed and implemented a database, designed the programming of the crowd sourcing application and the testing/debugging of the web application.

Navigating Niagara's Culinary Scene

Industry Partner: The Niagara Local
Project Duration: April 2013 to February 2014
Project Type: Mobile Applications
Funder: NSERC

Research Team

Faculty: Gina Grossi
Senior Research Associate: Dave Natalie
Graduate: Braunson Yager

CHALLENGE: The Niagara Local is an online food blog informing the public of "hidden gems" in the region. The blog is published without advertising, but the Niagara Research business team recently informed the owners of potential revenue streams. The bloggers also wanted to develop a mobile application with key features.

SOLUTION: The Digital Media team developed a mobile application that increases the ability to search for content, and includes responsive mobile design, GPS functions, a custom user interface for searching, and an itinerary listing.

Building a Better Online Presence

Industry Partner: Various SMEs
Project Duration: September 2013 to March 2014
Project Type: Web Development
Funder: Ontario Centre of Excellence Voucher for E-Business program

Research Team

Faculty: Gina Grossi
Senior Research Associate: Dave Natalie
Graduates: Jason Bond, Bryce Snyder

CHALLENGE: For any business in Ontario today, having a website is a key ingredient to market one's services. But in the competitive market of small- and medium-sized enterprises (SMEs), simply having an online presence isn't enough anymore. Local companies looking to enhance this service most often do not have the expertise or funding to address this challenge.

SOLUTION: The Niagara Research team, including students from the New Media Web Design program, worked with industry partners to develop solutions to create or improve an existing website. This collaboration was funded by the Ontario Centres of Excellence Voucher for E-Business program (OCE VEB). The work included search engine optimization, e-commerce components and updates in style and content.

INDUSTRY PARTNERS

- Applied Strobe Technology
- Dynamite Mobile Group
- GoSportNet
- Mahtay Cafe
- Niagara Parks Commission
- Niagara Sustainability Initiative
- Organic General Store
- Rider Mel (Mountain Bike Guide)
- The Niagara Local
- Ultimate Kiosk
- Vector Vault

VEB: Organic General Store, Foreign Affair Winery, FabTech, Delta1 Collision, Planet1 Consulting, CRI Fire Protection, CTAR Corp, Niagara Falls Rowing Club

Food & Beverage Innovation

Project Manager: **Nigel Corish**

15 PROJECTS

45 STUDENTS

9 RESEARCHERS

Niagara Research's Food and Beverage team offers a full suite of services to support industry innovation and commercialization of new products and processes, through the Canadian Food and Wine Institute Research Centre. From new recipe development, to shelf-life testing and nutritional labelling, to sensory analysis and consumer preference studies, Niagara Research pairs organizations with faculty, recent graduates, and students with the expertise and capabilities to meet applied research and innovation needs.

Jose Gabrie

LAB TECHNOLOGIST, CANADIAN FOOD AND WINE INSTITUTE RESEARCH CENTRE

A better life in Canada for his family and a chance to further his own education put Jose Gabrie on a path to Niagara College several years ago.

The new research lab technologist with the Canadian Food and Wine Institute (CFWI) Research Centre has a background in microbiology and chemistry, as well as many years working with food safety protocols in Central American countries, including his native Honduras.

He came to Canada in 2009 to pursue his master's degree in health biosciences, working on research involving parasitology – the study of parasites, their hosts and the relationship between them.

Gabrie fills a much-needed role with the recently opened CFWI Research Centre, as equipment is being added to the new labs and best practices implemented for food and beverage research projects involving students, faculty and industry partners.

While still in Honduras, he developed health and food safety programs for banana plantations for Chiquita Brands International, and for U.S.-based Fintrac Inc., a consultancy company that develops agricultural solutions to end hunger and poverty.

As a consultant, he worked with both the Honduran and the Panamanian governments to develop food safety guidelines and implement certification protocols in fruit and vegetable growers, packers and processors exporting to North America and Europe.

Since graduating from Brock in 2013, he has been assisting his supervisor with research projects and teaching duties, and preparing to pursue a PhD, also in parasitology.

Gabrie's experience in agriculture and food safety, combined with his background in microbiology and chemistry, have given him the ability to quickly identify gaps and order the necessary equipment to provide even more resources and capabilities in the centre.

RESEARCHERS: Jon Downing, Nate Ferguson, Ron Glesbrecht, Olaf Mertens, Amy Proulx, Gavin Robertson, Thomas Schulz, Terence Van Rooyen, Sunan Wang

PROJECT SPOTLIGHT

Validating New Beer Pasteurization Technology

Industry Partner: National Brewery, University of Waterloo
Project Duration: May 2013 to April 2014
Project Type: Process Validation
Funder: NSERC

Research Team

Faculty: Sunan Wang, Amy Proulx, Nate Ferguson
Students: Victoria Stroh *(lead research assistant)*, Aissa Thomas, Gaetano Pugliese, Genevieve Bisset, Oksana Sytchouk, Christopher Heagle, Kieran Evely, Jon Weber, Becky Scott, Michael Van Ninhuys

CHALLENGE: The Niagara Research team was asked to validate a novel beer pasteurization technology developed by researchers from the University of Waterloo.

SOLUTION: In a collaborative effort, the analysis was conducted to determine if the proper sensory points (taste, colour, aroma, mouth feel, head retention) could be maintained for the product. The research team conducted numerous microbiology tests, as well as a series of sensory panels. The results will dictate ways of improving the pasteurization technique developed by the UW researchers.

Spoon Sweets: Developing an Ontario Whole Fruit Preserve

Industry Partner: Colossus of Rhodes
Project Duration: May 2013 to April 2014
Project Type: New Product Development
Funder: NSERC

Research Team

Faculty: Amy Proulx, Olaf Mertens
Student: Michael Van Ninhuys *(lead research assistant)*, Genevieve Bisset, Adam Willinsky

CHALLENGE: Colossus, a company that produces authentic Greek dishes for customers around the world, wanted to develop a Canadian-made whole fruit preserve with the appropriate levels of texture, colour, flavour, and shelf-stability, using local Ontario ingredients, and without an existing recipe.

SOLUTION: Used as a yogurt accoutrement and generally known as a spoon sweet, the Food and Beverage team developed several new products, and conducted sensory testing to further refine the recipes, and settled on four flavours, including grape, cherry, blueberry, and strawberry. The development of a Canadian recipe saves the company money as it reduces the international import costs for the products.

Shelf-Stabilization of Ontario Crab-apple Blush Hard Cider

Industry Partner: Spirit Tree Estate Cidery
Project Duration: May 2013 to April 2014
Project Type: Product and Process Improvement
Funder: NSERC

Research Team

Faculty: Amy Proulx, Ron Giesbrecht, Terence Van Rooyen *(staff)*, Gavin Robertson *(staff)*
Students: Jessica Reese *(lead research assistant)*, Chris Canavan

CHALLENGE: Identify production improvements in the cider-making process to stabilize the blush colour of this Ontario craft crab-apple hard cider from turning to an orange hue once bottled.

SOLUTION: The team focused on determining the effect of maceration times; juice pressed prior to fermentation vs. on-the-skins fermentation; and the effect of different yeast strains. Niagara Research was able to provide several recommendations to the industry partner to stabilize the product.

INDUSTRY PARTNERS

- Black Angus Fine Meats & Game
- Brock University
- Cankosh Inc.
- Colossus Fine Greek Foods
- Food Processing Human Resources Council
- Kashruth Council of Canada
- MADD Virgin Drinks
- NEOB
- Niagara Specialty Foods
- Spirit Tree Estate Cidery
- Sweetie Pies Bakery
- Tersano
- University of Guelph
- University of Waterloo
- Vineland Research and Innovation Centre

nc

APPLIED REVERSE ENGINEERING *Process Improvement* SMEs *Mobile Applications* PRECISION AGRICULTURE RESEARCH MANUFACTURING

INNOVATION HAPPENS HERE

WEB *Initial Market Research* FACULTY & STUDENTS SUSTAINABLE GROWING TECHNIQUES *Product Redesign & Development* SENSORY & CONSUMER TESTING *Lean* *NEW RECIPE* DEVELOPMENT AUTOMATION

Niagara Research

Niagara Research, the Research & Innovation Division of Niagara College, provides real-world solutions for business, industry and the community through applied research and knowledge transfer activities. We conduct projects that provide solutions for small- and medium-sized businesses.

With funding support from various provincial and federal agencies, students and graduates are hired to work alongside faculty researchers to assist industry partners leap forward in the marketplace.

2013-2014 BY THE NUMBERS

1,269	27	77	32
STUDENTS	PROGRAMS	PROJECTS	RESEARCHERS

"We're delighted and proud to be working with Niagara College on this unique initiative, helping them showcase the scope and capabilities of their curriculum to a North American audience."

~ **Brian Bolshin, President & CEO of MADD Virgin Drinks**

AREAS OF SPECIALIZATION

	Advanced Manufacturing	Agriculture & Environment	Business & Commercialization Solutions	Digital Media & Web Solutions	Food & Beverage Innovation
PROJECTS	22	11	12	17	15
STUDENTS	171	262	703	88	45
RESEARCHERS	5	8	7	3	9

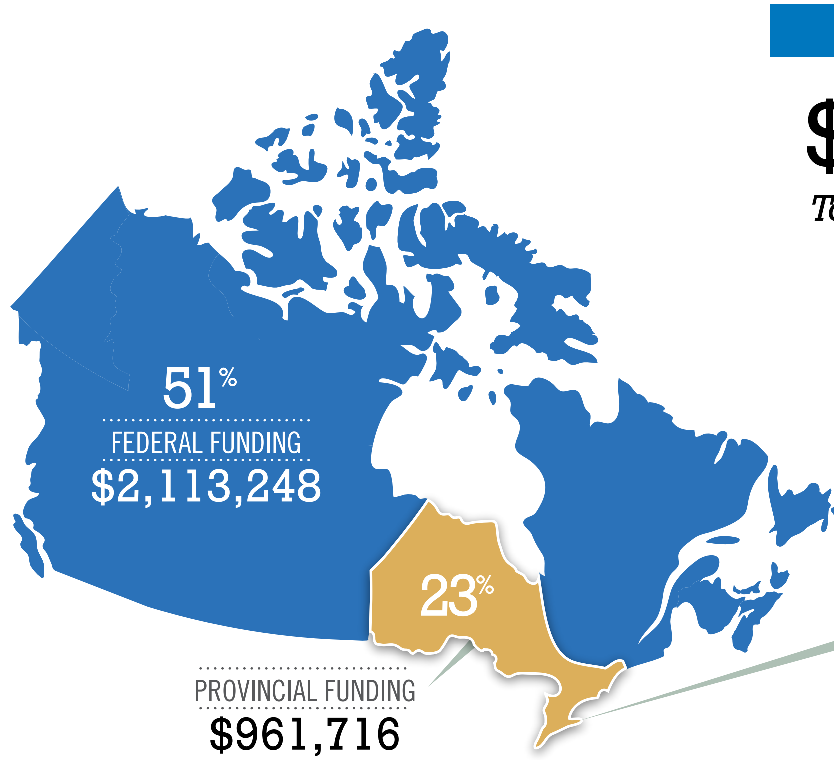
"There are many things that we cannot learn in the confines of a classroom. Having the opportunity to work with a real company has been amazing, as it has given our class a wealth of knowledge and experience that we would have never received without this project."

~ **Andrena Misener, Human Resources Student, Chocolate Concepts Project**

FUNDING FOR RESEARCH

$4,137,101

Total funding for 2013-2014



25%
INDUSTRY PARTNERS
$1,025,987

.3%
INTERNATIONAL FUNDING
$11,150

.7%
REGIONAL FUNDING
$25,000

WHERE THE FUNDING GOES

$1,613,649	$1,403,644	$594,885	$319,451	$119,321	$75,001	$11,150
ADVANCED MANUFACTURING	FOOD & BEVERAGE INNOVATION	AGRICULTURE & ENVIRONMENT	DIGITAL MEDIA & WEB SOLUTIONS	BUSINESS & COMMERCIALIZATION SOLUTIONS	VARIOUS	INTERNATIONAL

OUR FUNDERS

Niagara College Canada APPLIED DREAMS.
NSERC CRSNG
Federal Economic Development Agency for Southern Ontario / Agence fédérale de développement économique pour le Sud de l'Ontario
Canada
INNOVATION.CA Canada Foundation for Innovation | Fondation canadienne pour l'innovation
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CONII Colleges Ontario Network For Industry Innovation
Ontario
niagara industrial association
NRC-CNRC Canada NRC Industrial Research Assistance Program / Programme d'aide à la recherche industrielle du CNRC
IDRC CRDI

- Advanced Manufacturing
- Agriculture & Environment
- Business & Commercialization Solutions
- Digital Media & Web Solutions
- Food & Beverage Innovation

Niagara Research

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