



Cape Breton University Annual Research Report 2022

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Introduction

Cape Breton University is pleased to provide its Annual Research Report as an update of internal and external investments in research at CBU. The Report examines the fiscal year as the reporting period, covering the period from **April 1, 2021 to March 31, 2022**.

As ORGS implements the [Strategic Research Plan 2020-2025](#), priorities related to collaborative networks, student opportunities, research infrastructure, and social impact are being achieved through CBU's research pursuits and knowledge translation and mobilization activities. These achievements include receipt of funding from the Canada Foundation for Innovation, Research Nova Scotia, and Canadian Tri-Agencies (CIHR, SSHRC, NSERC), among others. Researchers at CBU continue to impact global issues through local research, including studies on affordable housing, water quality and the environment, and innovative health research.

Research Highlights

This reporting period is one with significant developments in CBU's research enterprise. These developments include events leading to the establishment of [CBU's Centre of Excellence for Healthy Aging \(CEHA\)](#). Planning for CEHA began when Nova Scotia geriatrician, researcher, academic and anti-ageism campaigner, Dr. Kenneth Rockwood, was awarded the 2021 Ryman Prize. Dr. Rockwood contributed \$25,000 from the Ryman prize money to catalyze a research program at CBU and promote whole-patient care for people living with frailty and/or dementia. This money laid the foundation for a research centre, prompting a \$700,000 commitment from Research Nova Scotia and Nova Scotia Health. The Centre of Excellence for Healthy Aging was the outcome of these commitments.

Additionally, [Dr. Alana Pindar](#) joined Cape Breton University as the newly appointed Weston Family Visiting Professor in Ecosystem Health and Food Security. Dr. Pindar is working closely with Parks Canada, the Alexander Graham Bell Foundation, and Bell family members to monitor natural pollinator activity surrounding the reconstruction of Mabel Bell's gardens at the family property in Baddeck, NS. Dr. Pindar, an international expert in her field, will continue to study, manage, and mitigate ecosystem health challenges relating to pollination while promoting wellness in Atlantic Canada.

Turning to student opportunities, CBU dedicated funds to create an Undergraduate Student Scholar Award program in the fall of 2021. This funding provided 23 students with awards of \$2000 to support their work as assistants on faculty research projects. As well, CBU's Community-Research Connections Program (CSRCP) was in-development during this reporting period. This program led to significant growth in student research opportunities, with students receiving \$2000 to work with community groups and small businesses on projects that addressed a need or goal of the organization.

While the report's primary function is to outline funding by presenting numbers, it also provides an opportunity to feature people and partnerships that shape the research enterprise at CBU. This report offers insights to research mobilization at CBU, demonstrating the diverse and positive impacts CBU researchers are making within the communities they serve.

External Research Funding

Researchers at CBU attracted more than 1.2 million in tri-agency funds and over 1 million in other federal funds in the 2021-2022 fiscal year. While NSERC funds dipped by just over \$70,000 compared to last year, SSHRC funds grew by approximately \$70,000. CIHR remained on par with the previous year. Significantly, Canada Foundation for Innovation (CFI) contributions more than doubled, reaching \$318,000 for 2021-2022. These funds supported research infrastructure at CBU, including the Water Treatment and Environmental Remediation (WaTER) Research Laboratory, the Community-University Housing Research Lab (CUHRL), and the Sustainable Laboratory for Inhibition of Microbial Establishment (SLIME).

Researchers were also awarded over \$500,000 from provincial funding sources, much of which will be used toward projects that positively impact local communities. This includes contributions from Research Nova Scotia, matching awards from the Canada Foundation for Innovation. It's also includes small, community-engaged supports through Change Lab Action Research Initiative (CLARI).

Figure 1: CBU Research Funds by Source

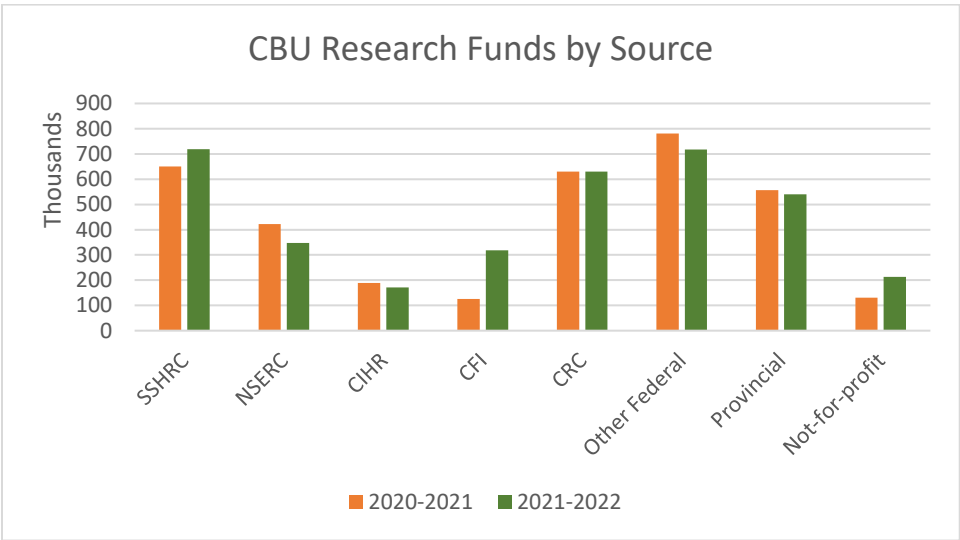


Table 2: Total amount awarded by source for 2021-2022 (rounded down to the nearest hundred)

| Source | Total Amount Awarded |
|----------------|----------------------|
| SSHRC | \$719,400 |
| NSERC | \$347,200 |
| CIHR | \$171,300 |
| CRC | \$630,000 |
| Other Federal | \$717,100 |
| Provincial | \$540,000 |
| Not-for-profit | \$212,500 |

While there are numerous success stories to demonstrate these numbers, we feature several examples of research across disciplines at CBU.

Researchers Develop Index of More than 6,000 Gaelic Songs Known in Nova Scotia with 'Language in Lyrics'

[Dr. Heather Sparling](#), Canada Research Chair in Musical Traditions and Professor of Ethnomusicology, together with co-applicants Roibeard ('Robby') Ó Maolalaigh, Professor of Gaelic and Celtic Studies at the University of Glasgow, and Lewis MacKinnon, Director of Nova Scotia Gaelic Affairs, worked with partner organizations and a team of community researchers to compile the [Nova Scotia Gaelic Song Index](#). This index of more than 6,000 Gaelic songs known in Nova Scotia was created by drawing from print media, archival recordings, and private collections. The goal of the [Language in Lyrics](#) project, of which the Index is one outcome, was to identify songs that could provide the foundations of a Nova Scotia Gaelic language corpus, which could be used for research, analysis, and possibly a future dictionary of Nova Scotia Gaelic. More than 30 fields of data were documented for each song, including composers, singers, song origins, song subjects, and song genres, making it possible to conduct detailed searches. Where possible, links are provided to song recordings or lyrics online, with over 1,000 song lyrics available. The Index will appeal to Gaelic language learners, teachers, singers, and researchers. The database underlying the index was developed by the Digital Archive of Scottish Gaelic (DASG) from the University of Glasgow, a project partner, where it is now hosted and maintained. Other project partners include Nova Scotia Gaelic Affairs, the Beaton Institute and the Highland Village Museum. This project was funded by a Partnership Development Grant from the Social Sciences and Humanities Research Council (SSHRC) of Canada.



CBU Studies Global Marine Challenge

[Dr. Shine \(Xu\) Zhang](#), Canada Research Chair in Healthy Environments and Communities and the Industrial Research Chair in Applied Nanotechnology, has extensive experience working with industry partners. In 2022, he received a Mitacs Accelerate award to collaborate with Aqua Production Services, a company that makes advanced holding tank systems that optimize the health of fish on fishing vessels and allows for transport over long distances. Dr. Zhang's work focused on how to reduce the buildup of ammonia in these holding tanks. Ammonia is a toxic metabolic waste product of organisms grown or stored in aquaculture tank systems. Typically, ammonia is managed using biological filtration media, however, growing these bacterial colonies can take weeks. This requires considerable planning before seasonal fisheries begin and reduces the agility of fishers and aquaculture companies to respond to changing market conditions. An alternative to biological filtration media is electrochemical treatment, however, this treatment can also generate extremely toxic biproducts. Dr. Zhang's work focused on developing a modified version of an electrochemical treatment system that prevents the release of toxic materials into the output water while retaining effective ammonia removal.

capacity. To achieve this, his team developed an in-line electrochemical filtration system that forces the water flow through porous electrodes to maximize electrode contact and efficiently oxidize ammonia while also reducing negative byproducts.

[CBU Research Represented at World Union of Wound Healing Societies in Abu Dhabi](#)

[Dr. Corrine McIsaac](#) is an Associate Professor of Nursing in CBU's School of Nursing with a focus on skin and wound care. Since arriving at CBU 22 years ago, Dr. McIsaac's research has focused on wound care, outcome measurement, data analytics and visualization, and sustainability of health systems. In March of 2022, she was invited to present at the [World Union of Wound Healing Societies \(WUWHS\) Congress](#). Dr. McIsaac delivered three presentations during the conference, including her research on the impacts of post-discharge surveillance, telehealth and technology, and the use of technology to accurately track and measure patient outcomes. Dr. McIsaac is also working very closely on a research project funded through the QEII Foundation titled Translating Research into Care (TRIC), with a team from Nova Scotia Health on reducing pressure injuries within their facilities in Cape Breton. She is also part of a research team working on Alternate Level of Care (ALC) patients in Nova Scotia and exploring how to use Artificial Intelligence (AI) to improve care for these patients. Dr. MacIsaac was recently appointed to the Canadian Pressure Injury Panel. Through her ongoing research, she has amassed the largest wound care data set in Canada and continues to collaborate with colleagues to build predictive models using AI.

[CBU Hosts Conference on Military and Social History](#)

[Dr. Lachlan MacKinnon](#), Canada Research Chair in Post-Industrial Communities, chaired a two-day academic conference held in conjunction with the 150th anniversary of the Cape Breton Highland unit. Hosted by CBU in the fall of 2021, conference sessions explored various topics related to the military in Canadian society. These include military history on Cape Breton Island; the contribution of military service and the experience of conflict to the development of Canadian national identity; Indigenous and racialized experiences of military service in Canada and warfare; and heritage and commemoration of Canada's armed forces. Dr. MacKinnon received funding from the Social Sciences and Humanities Research Council through a Connections Grant to host the conference, which was attended by 100 delegates, including CBU Communication Associate Professor and Major in the Armed Forces, Dr. Felix Odartey-Wellington.



Research Supporting Workplace Equity, Diversity, and Inclusion

In February 2023, CBU released its “[Better Together](#)” Workplace Equity, Diversity, and Inclusion (EDI) Action Plan. This Plan was produced by the Office of Research and Graduate Studies, following a series of employee engagement initiatives to gain insights from senior leaders, faculty, and staff. This action plan was supported by a Natural Science and Engineering Council of Canada EDI Capacity Building Grant.

This plan articulates CBU’s commitments to developing an equitable and inclusive workplace culture where employees feel valued and supported. The plan prioritizes actions that create opportunities for reconciliation and decolonization and received approval by CBU Senate Committee. As we begin implementation of the plan, it is expected to be a shared commitment across departments.

Internal Research Funding

The Office of Research and Graduate Studies (ORGS), through the Research Assistance Committee of Senate (RAC), awards internal grants to support various forms of research and scholarly activity. These internal research grants are the Start-Up Research Grant (SURG) and the Research Innovation Scholarship Exploration (RISE) grants.

Figure 2: Internal funding competitions.



RISE Spotlights

In the spring of 2021, Cape Breton University supported 25 researchers with internal funding awarded through a competitive process for RISE grants. Adjudicated by the Research Assistance Committee of Senate, RISE grants provide up to \$8000 to support research activities.

RISE recipient [Dr. Kristin O’Rourke](#), Assistant Professor in Education, says RISE funding may seem like a modest amount, with her project receiving just over \$2000, but emphasizes it will have a significant impact on her work. As a faculty researcher in the School of Health and Education, Dr. O’Rourke and co-applicant [Dr. Lynn LeVatte](#) were recognized for their project: *Exploring the intersection of inclusion and newcomer students in Cape Breton classrooms: A phenomenological study*. Their application was recognized as a Distinguished RISE

submission, receiving the highest score among submissions from the School of Education and Health.

[Dr. Bishakha Mazumdar](#) and research partner, [Dr. Stephanie Gilbert](#), were among 25 successful RISE applicants in 2022. Their research proposal: *Gendered Predictors of Leadership Aspirations in a Post-COVID Workforce*, received Distinguished RISE, with a SSHRC Institutional Explore Grant. Their research will build on evidence that women's workforce participation dropped to its lowest level in 30 years during April 2020, with women projected to face long term consequences with respect to earnings and promotions based on reduced work hours or temporarily leaving the workforce during the pandemic. Dr. Mazumdar hopes the results of this study will provide insight into the barriers to leadership for women in a post-COVID workforce and help mitigate these barriers to promote greater gender representation in leadership roles.

Start-Up Research Grant

[Dr. Dong Meng \(Raymond\) Ren](#) joined CBU in 2021 as an Assistant Professor of Finance. His research focuses on finance and macroeconomics. Building mathematical models to examine questions of dynamic asset allocation as well as optimal nonlinear taxation are among the challenges Dr. Ren's research aims to inform. CBU is supporting further development of Dr. Ren's research program with SURG funding. This internal grant is available to new, tenure-track faculty in their first two years after joining CBU. Dr. Ren is using this award to support collaboration with colleagues and contribute to international journals. He is also representing CBU at international conferences, supporting student employment, and establishing a foundation for research success, thanks to the support of internal SURG funding.

Supporting Student Research

In the last fiscal year, student research opportunities continued to be an important part of the research culture at CBU. Faculty researchers created over 200 undergraduate and graduate student research opportunities during this reporting period. This is an increase of over 30 percent from the previous year. CBU continues to provide exceptional opportunities for undergraduate student research.

Nearly \$700,000 of the total research funding allowed students to gain experience as research assistants.

CBU Presents Inaugural Undergraduate Student Scholar Awards

CBU has strengthened its support for student research with the creation of Undergraduate Student Scholar Awards (USSA). In 2022, USSAs were presented to 23 students across disciplines at CBU. Each student received \$2000 for their work as research assistants on CBU faculty projects. The following quotes from USSA recipients reflect the valuable experience they gained:

"The USSA experience was one for the books. This whole experience allowed me to grow and explore another side of being a university student. I was able to prove to myself that I can accomplish great things and contribute to the research community. It was my first time participating in a research assistantship and I am very much fortunate to be a part of this research group."

"It has been such a pleasure to work alongside two professors who are evidently passionate about food sustainability, human impacts on the environment, and everything in between. I have an increasingly new interest in research, and I look forward to future opportunities to work as a student research assistant during my studies at CBU."

"By having the opportunity to work on these projects, I was able to improve my laboratory skills and become more experienced with experimental design. Although I learned many of these skills through labs I have participated in as part of my degree at Cape Breton University, having the opportunity to further practice and apply them on projects that have real impacts on industries in Nova Scotia, and Cape Breton especially, is an experience I am grateful to have."

CBU Research Builds Indigenous Research Collaborations

Located in Unama'ki, the ancestral and unceded territory of the Mi'kmaq, CBU researchers continue to engage in meaningful research partnerships with Indigenous communities. This is often referred to as two-eyed seeing, which incorporates Indigenous knowledge and western science. Below we provide two examples of these collaborative initiatives.

Holistic Pathways in Indigenous Sport

CBU's Canada Research Chair in Sport Coaching and Adult Learning, [Dr. Bettina Callary](#), has been making waves on the shores of Point Michaud Beach on Cape Breton's east coast, where she has been working with the Unama'ki Surf program. Dr. Callary says she not only gained an appreciation for the sport of surfing, but she's conducted important research about Indigenous sports participation and leadership. *Two-Eyed Seeing when leading a Mi'kmaw surf camp* is a research project funded through an Insight Development Grant from the Social Sciences and Humanities Research Council. The purpose of this study is to explore Mi'kmaq ways of knowing about place-based cultural and spiritual sport participation, from the perspectives of coaches and youth involved in the Unama'ki Surf program.



Indigenous Storywork in Research

Dr. Eleanor Bernard, a member of CBU's Education Department, recently completed her PhD with a dissertation examining decolonizing education. In developing her research design, Dr.

Bernard determined that the best methodology to gather data for her project was presented by Q'um Q'um Xiim, also known as Dr. Jo-ann Archibald. Dr. Archibald's book, *Decolonizing Research: Indigenous Storywork as Methodology* (2019) offers the term storyWORK to signal that Indigenous stories are to be taken seriously. Using this approach Eleanor engaged teachers at Wagmatcookewey School in Wagmatcook, NS, in her research. She asked teachers how they included Indigenous ways of knowing in the classroom but discovered that her respondents had difficulty describing their teaching methods. "They were doing it," said Dr. Bernard, "They just didn't realize they were doing it." Dr. Bernard's study is an important example of the effective use of storywork methods. It identified strategies to greatly improve immersion programming and overall decolonization work, resulting in support by Heritage Canada and the Indigenous Language Commission. These strategies include creating resources for teachers, developing assessment strategies for immersion programs, and offering professional development for Indigenous educators.

Looking Ahead

CBU's research portfolio has grown significantly since this reporting period. This includes increased capacity in the Centre of Excellence for Healthy Aging, as well as progress towards a new Medical School at CBU. The Office of Research and Graduate Studies is excited to support and celebrate the research initiatives that are certain to result from these successes.