

Cape Breton University
Annual Research Report
2014

Introduction

This is the second annual research report for Cape Breton University. As the fiscal year was chosen as the reporting period to coincide with the CAUBO annual financial reports, this report covers the period April 1, 2013 to March 31, 2014. Much of the data presented in this report is based on rolling three year averages in order to provide a more realistic picture of the research environment at Cape Breton University, as 1 or 2 grants individually can have a large impact on the figures by year.

Research activity taking place in the University setting is typically diverse and, therefore, difficult to quantify using one set of statistics or metrics in isolation from other sources of data and contextual description. As with last year's report, we have preferred to present a more holistic view of all research activity taking place in the University; the data reported here covers a range of activities including success in obtaining research funding, scholarly articles published, dissemination of research findings and commercialization and industry engagement. Whilst, these factors are important, we have also endeavoured to illustrate how the research that takes place here has an impact outside of CBU. We feel that this report provides a balanced account of the past year, celebrating our research successes and acknowledging the challenges that CBU is facing in relation to research funding and delivery.

Data sources used in the preparation of the report: Financial data were taken from the CAUBO website. Some data for academic publications was obtained from *Web of Knowledge*¹. Industry engagement metrics were taken from the annual Springboard Atlantic reports. In addition, CBU researchers were asked to self-report via a survey related to research activities to gather some of the other data².

1. Research Highlights

Research at Cape Breton University continues to be very active in 2013-14, with a wide variety of projects taking place across all disciplines. In addition, a number of new appointments have added to the diversity of research activity. Amongst those who have joined CBU is Dr. Pat Maher, Associate Professor of Community Studies, who was awarded a 2014 3M National Teaching Fellowship during the year. Apart from being the only academic from Nova Scotia to receive the award this year, Dr. Maher has also been granted life membership of the Society for Teaching and Learning in Higher Education (STLHE) as part of this notable external recognition.

David Mullan, Professor of History, 2014 President's Award for Excellence in Research Winner

Dr. David G Mullan, Professor of History and Religious Studies, is the 2014 winner of the Cape Breton University President's Award for Excellence in Research. His body of work, which is well regarded nationally and internationally, includes numerous books, edited collections, research articles and reviews. Dr. Mullan has received funding from the Social Sciences and Humanities Research Council for his work on Protestantism in early-modern Scotland. Most recently, he shifted his focus to nineteenth-century France to research how Protestantism was received.

¹ *Web of Knowledge* is a Thomson Reuters product that searches Science Citation Index Expanded 1989 – present, Social Sciences Citation Index 1989 – present, Arts & Humanities Citation Index 1989 – present, Conference Proceedings Citation Index- Science 1990 – present, and Conference Proceedings Citation Index- Social Science & Humanities 1990 – present.

² 80 responses were obtained

“Currently my research is focused upon the French historiography of John Calvin in the nineteenth century -- how did the French view this native Picard who spent most of his adult life in Geneva as one of the leading Protestant Reformers? Some praised him highly, while others thought his teaching was out-dated and no longer helpful. Many believed that Calvin had turned his back on the idea of freedom when he oversaw the execution of Michael Servetus for Trinitarian heresy in 1553, and thus he betrayed the Reformation.”

Dr. Mullan’s research promises to provide valuable insights into the development and evolution of Protestantism.

Corrine McIsaac, Associate Professor of Nursing

Corrine McIsaac, Associate Professor of Nursing, combines her passion for improving patient care and entrepreneurship with the creation and running of a successful business. After witnessing inefficiencies in routine patient wound care practice she recognized how they impacted negatively on quality and cost of patient healthcare, ultimately adding to the financial drain on the health care system. By researching evidence-based practice, Corrine developed and implemented a wound care protocol, in collaboration with her colleagues, which was adopted as standard practice across the Nova Scotia Province.

Building on her research interests, Professor McIsaac incorporated Health Outcomes Worldwide (HOW) in 2006, a company dedicated to creating innovative software solutions for wound care management. Following years of research and development, HOW has developed a suite of point of care documentation tools for patients and health care providers, launching the how2trak solution in 2010. Research has demonstrated that this web-based tool reduces complications in patients and improves wound healing time/closure time for patients by 70%, resulting in improved patient care, better quality of life and cost savings to the health service. In the classroom Professor McIsaac mentors nursing students and encourages them to consider entrepreneurial opportunities that can arise from their own research.

Kevin McKague, Assistant Professor of Entrepreneurship and Strategy

Dr. Kevin McKague is an Assistant Professor of Entrepreneurship and Strategy in the Shannon School of Business. An internationally experienced academic and researcher of market-based and social enterprise-led approaches to global poverty alleviation, Dr. McKague is involved in researching social enterprise approaches to improving the health of mothers and children in South Sudan. These novel social enterprise solutions allow networks of mobile community health workers to reach out to underserved communities with health messages and basic medicines. He is currently working with CBU nursing faculty, staff, students and local high schools to discuss opportunities for additional research and partnerships in South Sudan.

Dr. McKague’s research is truly international, spanning 12 African countries as well as Bangladesh, Canada, the US and India. His work has been published in numerous practitioner reports as well as in California Management Review, MIT/Sloan Management Review, Innovations, Stanford Social Innovation Review and the Social Enterprise Journal. He is also the author of “Making Markets More Inclusive” (Palgrave, 2014). A former member of the Board of Governors of York University, Dr. McKague also holds a Senior Research Fellowship at the Centre for Peace, Democracy and Development at the University of Massachusetts, Boston.

2. Research Funding

While the situation at every university is unique, this is especially true with regard to research and a direct comparison of research funding between universities is not always possible. However, it is still important to get a sense of where one stands in relation to similar institutions regionally and nationally. As a comparison group, we have chosen the following universities on the basis that they may be considered to be ‘peers’ of CBU because they provide a similar range of programs or else are of a similar size, in terms of overall student numbers: Acadia University, Bishop’s University, Brandon University, Mount Allison University, Mount Saint Vincent University, Nipissing University, Saint Francis Xavier University, Saint Mary’s University and Université de Moncton. The data for these individual universities is presented in anonymous form in the following tables and charts. The total research funding presented below was taken from Table 3.1 from the annual CAUBO reports³. The number of faculty at each university was taken from the Statistics Canada University College Academic Staff Survey⁴ in the absence of any current consistent sources of such information. It is noted that this data will need to be reviewed and updated in time for the 2014/15 Annual Report.

Table 2.1 and Chart 2.1 show the average funding per faculty member between 2008-10 and 2012-14. Overall, the funding for the group continues to decline. While from 2008 to 2013, the total research funding at Canadian universities increased by 12% from \$6.1 billion to over \$6.8 billion, the total research funding awarded to CBU and its peers has dropped from \$57 million to \$47 million, resulting in a decreased share of the research budget from 0.9% in 2008 to 0.7% in 2013. The three-year rolling figures also reflect this decrease, with CBU and its comparators receiving 2.5% less of the research budget in 2011-13, compared with 2008-10. More positively, CBU has increased its position in the group and is currently ranked fifth out of the 10 universities.

Table 2.1. Total Research Funding per Faculty Member^a

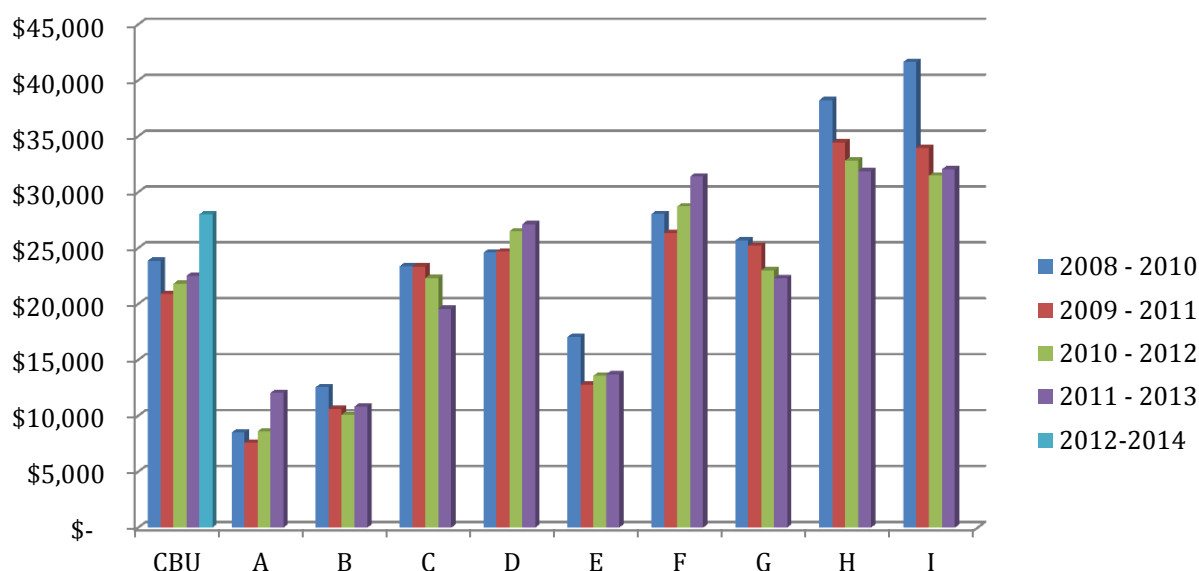
University	2008-2010	2009-2011	2010-2012	2011-2013	2012-14 ^b
CBU	\$23,878	\$20,902	\$21,832	\$22,528	\$28,033
A	\$8,513	\$7,596	\$8,602	\$12,058	
B	\$12,564	\$10,624	\$10,092	\$10,828	
C	\$23,387	\$23,375	\$22,331	\$19,579	
D	\$24,601	\$24,705	\$26,506	\$27,142	
E	\$17,069	\$12,804	\$13,588	\$13,721	
F	\$28,051	\$26,356	\$28,737	\$31,404	
G	\$25,699	\$25,211	\$23,020	\$22,309	
H	\$38,241	\$34,455	\$32,840	\$31,893	
I	\$41,653	\$33,965	\$31,485	\$32,063	
Average	\$26,361	\$23,824	\$23,331	\$23,626	
CBU Rank	6	7	7	5	

^a Average over the three year period indicated

^b 2013-14 Data for other universities will not be available until June 2015

³ There was a change in reporting practice for CBU in 2011. To enable an accurate comparison, the values for 2008 – 2010 were adjusted to use the current reporting practice. The unmodified values are reported in the 2013 Research Report.

⁴ The survey ended in 2010 and the data for 2011 & 2012 were assumed to be the same as the 2010 data. This may lead to slight inaccuracies in the comparisons. It is recognised that a more accurate data source needs to be identified for 2014/15, as this information continues to lose currency and value.

Chart 2.1 Total Research Funding per Faculty Member

In addition to looking at the total research funding, it is also informative to analyze the distribution of CBU research funding. Table 2.2 shows the breakdown of CBU research funding by source.

Table 2.2 CBU Research Funding^a

Funding Source	2008-2010	2009-2011	2010-2012	2011-2013	2012-2014
SSHRC	\$107,000	\$86,000	\$198,000	\$173,000	\$217,000
Health Canada	\$6,000	\$6,000	\$6,000		
NSERC	\$203,000	\$184,000	\$134,000	\$173,000	\$157,000
CIHR	\$12,000	\$14,000	\$13,000	\$14,000	\$13,000
CFI	\$156,000	\$32,000	\$183,000	\$289,000	\$284,000
CRC	\$490,000	\$457,000	\$419,000	\$350,000	\$291,000
Other Federal	\$471,000	\$475,000	\$482,000	\$462,000	\$760,000
Nova Scotia	\$291,000	\$196,000	\$321,000	\$340,000	\$891,000
Not-for-Profit	\$140,000	\$159,000	\$219,000	\$126,000	\$173,000
Business		\$63,000	\$246,000	\$395,000	\$385,000
Miscellaneous	\$985,000	\$900,000	\$465,000	\$450,000	\$276,000
Total	\$2,862,000	\$2,571,000	\$2,685,000	\$2,771,000	\$3,448,000

^a Average over the three year period indicated.

From 2008–2014, the Tri-Agency funding has shown an increase from \$322,000 to \$387,000, with the majority (ranging 88 – 100% over the 6 year period) coming from NSERC and SSHRC combined funding. The shift in distribution of funds from NSERC to SSHRC also continues to be noticeable; during the period covered by 2011-13, these funding sources had parity, whereas in 2012-14, SSHRC constitutes approximately 60% of these income streams. In reality, this reflects the impact of changes to the respective programs and the funding landscape.

CFI funding has increased since 2008-10 and has been relatively stable over the past three years. This is related to faculty hires in the previous year and the continued focus by the ORGS on ensuring that CBU's CFI allocation is used. We are conscious, that while the execution of several CFI projects is underway, the number of new CFI projects is going to decline over the next 3-4 years as our allocation becomes completely depleted. In addition, the CRC funding has declined

from \$490,000 in 2008-10 to \$291,000 in 2012-14. This is due to a reduction of CBU's chair allocation from 5 to 4 (in 2008) to 3 (2010)⁵. This reduction is directly due to a reduction in Tri-Agency funding (while CBU's Tri-Agency funding actually increased, it accounts for a smaller percentage of the total Tri-Agency funding). As the CBU allocation for CRC remains at 3 Tier II chairs, the CRC contribution should be stable at approximately \$300,000 for the next year or so. The funding received from the NS government through the NSRIT continues to increase and is currently at \$891,000 in 2012-14. NSRIT funding is directly linked to CFI funding and is therefore expected to decrease in line with CBU's CFI funding over the course of the next four years.

Business funding has continued to grow from a negligible base in 2008-10 to \$385,000 in 2012-14. The sustained growth in this area of funding reflects the work undertaken by the Industry Liaison Officer in generating this income. Research funding from other federal sources has remained steady around \$475,000, although an increase to \$760,000 has been noted over the period covering 2012-14. Miscellaneous research funding decreased over the last 4 years from \$985,000 to \$450,000.

Overall from 2008 to 2013, the total research funding has been stable around \$2.6 – 2.8 million during each three year period, although an increase has occurred over 2012-14 which may be in part explained by the increase in NSRIT funding. This is summarized for individual years in the Table below.

Table 2.3 CBU research funding by year

Funding Source	2008	2009	2010	2011	2012	2013	2014
SSHRC	\$ 118	\$ 47	\$157	\$53	\$384	\$ 81	\$187
Health Canada			\$17				
NSERC	\$244	\$303	\$62	\$186	\$153	\$179	\$138
CIHR		\$7	\$30	\$4	\$6	\$33	
CFI	\$403	\$65		\$31	\$517	\$320	\$16
CRC	\$500	\$513	\$458	\$400	\$400	\$250	\$223
Other Federal	\$447	\$379	\$586	\$459	\$402	\$525	\$1,353
NS	\$373	\$313	\$187	\$89	\$686	\$245	\$1,743
Not for Profit			\$420	\$56	\$181	\$140	\$199
Business				\$190	\$548	\$446	\$162
Misc	\$777	\$1,649	\$530	\$522	\$342	\$485	
Total	\$2,862	\$3,276	\$2,447	\$1,990	\$3,619	\$2,704	\$4,021

3. Highly Qualified Personnel (HQP) Training

Data on HQP were obtained primarily through the survey of faculty for the period April 1, 2013 to March 31, 2014. The results of this survey are presented in Tables 3.1 and 3.2. CBU has a limited number of graduate programs, however 21 faculty reported holding adjunct appointments at other universities giving them the opportunity to supervise or co-supervise graduate students. CBU is also in receipt of funding from NSHRF for a Scotia Scholarship in research at undergraduate level. Overall, in the past year there has been an increase in supervision/co-supervision activities for graduate level and above and for technicians. As many CFI funded projects have become operational in the past year, such as the establishment of specialist research laboratory facilities in

⁵ Total of Tier I and Tier II chairs with Tier I counting as two Tier II chairs.

a number of disciplines, these will have undoubtedly increased opportunities for faculty to engage in training and supervisory activities. Mentoring activities also increased, with the greatest increase in mentorship for non-CBU students which may also be related to new faculty appointments over the past 12 months.

Table 3.1. Research Assistants Supervised and Co-Supervised

Research Assistants	Supervision		Co-Supervision	
	2013	2014	2013	2014
Undergraduates	123	119	31	31
Graduates	40	50	25	35
Post-doctoral Fellows	2	7	2	0
Technicians	7	15	1	8
Other	15	28	7	9

Table 3.2. Mentoring Activities

Activity	2013	2014
Mentoring Colleague	24	25
CBU Students	135	143
Other Canadian University Students	31	41
International (non-CBU) Students	8	17

4. Industry Engagement

Industry engagement continued to grow this year due in part to the availability of increased funding specifically tailored towards providing assistance on small targeted research projects. Collaborations spanned a range of research and development areas including prototype development, product discovery and validation, applied research and feasibility studies which enabled companies to work with faculty from across the university. Our students continue to play an integral part in these collaborations performing key research activities under the direction of their professors.

Table 4.1. Industry Engagement Activities

Activity	2013	2014
NRC-IRAP Projects	2	14
Tri-Agency Industry Partnership Grants	2	3
Provincial Funded Industry Projects	3	4
Industry R&D Contracts (no sponsored funding)	-	14
ACOA AIF Projects (subcontract)	1	1
Industry Workshops	8	9

Projects initiated in one department have often expanded to create multi-disciplinary teams of experts within the university. For example, BW BioEnergy who began working with the CBU Verschuren Centre under an AIF has now expanded their CBU team by adding two post-doctoral fellows under the direction of two of our chemists. This collaboration has resulted in a joint discovery and patent application with others expected in the coming year.

In addition to government-funded collaborations, several organizations have initiated industry-funded projects allowing them to gain access to experts and specialized lab resources for time sensitive research and development. Outreach to the business community has continued through

a commitment to leading regular industry-university workshops, seminars and educational sessions which have been led by internal and external experts. These sessions continue to increase the expertise within the community while developing new opportunities for collaborations.

“Working with CBU and the Office of Research and Graduate Studies has been very rewarding and valuable to our business. In particular, we’ve found our collaborative projects with faculty to be fantastic; going beyond the call of duty by delivering ingenious solutions to our problems. We hope to continue and expand our collaborations with the office in the future.”

Gavin Andrews
Protocase

5. Knowledge Creation and Mobilization

Knowledge Creation and Mobilization activities were captured through the faculty survey and are reported for the period April 1, 2013 to March 31, 2014. Table 5.1 and Chart 5.1 present the results obtained from this survey.

Table 5.1. Knowledge Creation and Mobilization

Dissemination Method	2013	2014
Academic Articles	96	103
Books	14	9
Chapters	48	42
Introduction/Preface	9	5
Conference Presentations	234	227
Conference Organization	40	41
Journal Editor	30	35
Articles Reviewed	197	247
Community Events	120	135
Newspaper articles	39	43
Radio	96	83
Television	29	19
Expert advice	61	59
Policy	23	20
Blogs	56	37
Videos	31	21
Websites	27	31
Other media	5	14

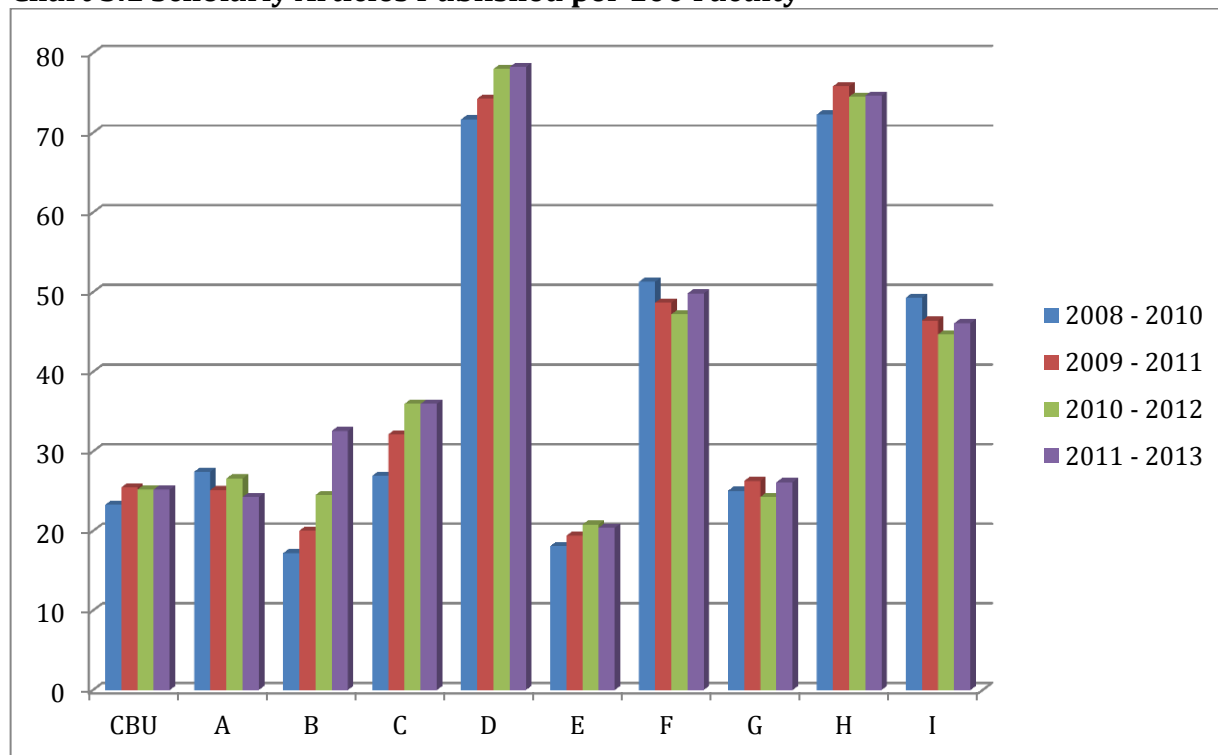
Chart 5.1 Scholarly Articles Published per 100 Faculty

Chart 5.1 shows the scholarly articles published per 100 faculty member per year for the comparison group. These data were obtained from *Web of Knowledge* and are for calendar year as opposed to fiscal year used for the rest of the data in this report. It is important to note that *Web of Knowledge* databases do not capture all publications and hence this data does not represent a complete picture of publication activity at CBU. Chart 5.1 shows that whilst the numbers of scholarly articles published annually maintains relative consistency in output, CBU continues to be ranked 7th or 8th in its comparison group and still falls well behind the top five. To achieve a position within the top five ranked universities would require an approximate doubling of the annual scholarly articles.

6. Research Collaborations - Internal, regional (Atlantic), national and/or international

Table 6.1. Collaborations

Collaboration	2013	2014
Internal to CBU	68	74
With Community	39	56
With Other University	92	97
With Industry	17	41
With Nongovernmental Organization	27	30
With Government Agency	30	28

Grand Challenge Canada project – led by CBU

CBU submitted a proposal for seed grant funding in late 2013/14 for an innovative project in South Sudan, providing opportunities for academic staff and students to work in partnership with African colleagues to learn and research together with the aim of implementing innovative healthcare solutions. If successful, it will aim to improve the health and save the lives of mothers,

newborns and children in the region. With just 124 doctors serving 10 million people, South Sudan has one of the world's worst child (135 in 1,000) and maternal (2,054 in 100,000) mortality rates. A public-private system of micro-franchised mobile health workers will be created by this project in partnership with the local government and South Sudanese-Canadian doctors to help extend healthcare throughout South Sudan.

Dr. McKague says that “This project takes an integrated systems perspective to create standardized training and management systems for mobile health workers to improve the health of women and children while simultaneously creating jobs and incentives for doctors and nurses to stay in their country and practice in the public system.”

7. Research Environment

The research environment within CBU during 2013/14 continues to thrive and build on the success of grant awards received in previous years. Some of these are now having a positive impact on the infrastructure and the research facilities that CBU can offer to its own research-engaged staff and students; however, they will also be attractive to scholars outside the Cape Breton region. As an example, the specialist audio-visual recording equipment in the CFI/NSRIT funded psycholinguistic laboratory (funding granted in FYE 2012) is now being used to support innovative research into communication, some of which engages with local parents and children.

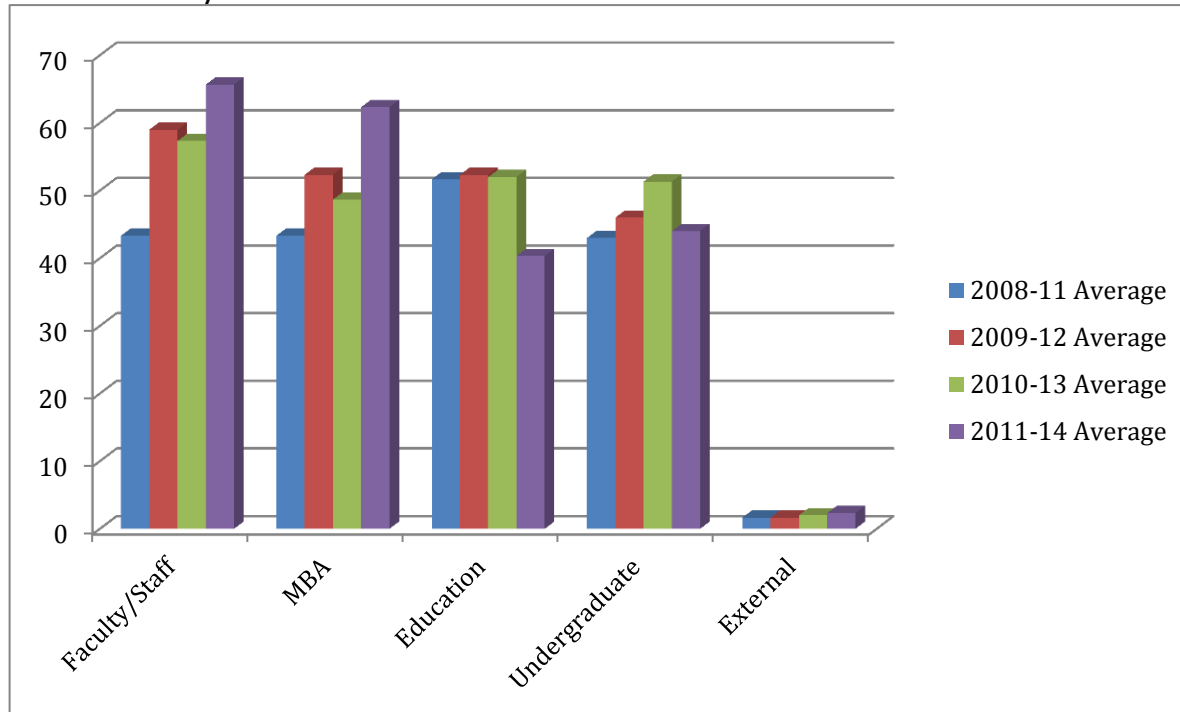
The following CFI/NSRIT funded projects are now also underway in association with new Tier II CRC appointments. Firstly, the Collaborative Music and Movement Laboratory (CoMM) (funding granted in FYE 2013), which is based in the CCBS, will promote collaboration and community-based research in music, dance, performance and other media and is the only research centre of its kind on the Canadian East Coast. Secondly, a technological upgrade of the Rotary Music Performance Room and Digitization Lab, including an affiliated research room will provide sustainable conservation of archival materials and generate more collaborative research with external research partners. Finally, the establishment of a Centre for Community-Engaged Health Research (CCEHR), with its focus on aboriginal engagement, is intended to collaboratively tackle complex health challenges by adopting a partnership approach. Its aspiration is to create innovative health programs and policies that ultimately have regional, national and global significance. Each of these CFI/NSRIT initiatives is being led by one of the three new Tier II CRCs who started their chair terms on July 1, 2013: Dr. Marcia Ostashewski, CRC in Communities and Cultures; Dr. Heather Sparling, CRC in Musical Traditions; and Dr. Ashlee Cunsolo-Wilcox, CRC in Determinants of Healthy Communities.

In partnership with the Nova Scotia Community College, Marconi Campus, CBU has also submitted a proposal in FYE 2013 for funding to the Nova Scotia Labour and Advanced Education and the Nova Scotia Economic and Rural Development Tourism. Termed the “Island Sandbox”, this initiative aims to draw together a number of key themes in order to develop innovative and collaborative strategies to support entrepreneurship in the Cape Breton region and will be based in the Verschuren Centre (post Annual Report note: this initiative was successfully awarded \$450,000 early in 2014/15).

The CBU research environment also provides support to researchers via its internal grant process which is overseen by the ORGS and provides funding for both Start-up and Research Policy (RP) Grants. Start-up grants, aimed at new tenure-track faculty, provide up to \$2,000 and during 2013/14, 8 projects were granted support. RP grants are managed in a calendar year, with

funding rounds held up to twice a year (Winter and Fall terms) to fund a maximum of \$8,000 per applicant. During 2013, the Winter and Fall rounds resulted in 44 projects being funded.

Chart 7.1. RE/AC submissions



As a measure of internal research activity, Chart 7.1 shows the Research Ethics Board and Animal Care Committee submissions over the period of 2008-11 to 2012-14. The submissions by faculty have increased by over 50% in that period now averaging 66 per year. A similar increase has been demonstrated in those from the MBA students which have increased by 44% to an average of over 60 per year. Submissions from the post-degree Education diploma and certificates for the first time are showing a slight decrease in numbers of submissions, as are undergraduate projects. This may reflect the fact that projects are more likely to be undertaken by groups rather than individuals. Overall, there is an increase of 17% in RE/AC activity which reflects the increasing trend in research activity in CBU. REB also continues to conduct reviews for a small number of external research projects.

8. Concluding remarks

Research activity continues to grow in CBU and it is likely that this is related to the investment of a number of externally funded grants that have allowed improvements and enhancements to the research environment which in turn have facilitated the delivery of research. In conjunction with this, the recent establishment of three new Tier II CRCs will undoubtedly have a positive influence on the research landscape within the University over the next 2 to 3 years. CBU also provides excellent opportunities for students to become directly involved in supporting research activity, through its policy of awarding internal grants to faculty and research staff. Table 8.1, which is based on summary data drawn from other sections of this report, demonstrates the growth in research activity across a number of areas:

Table 8.1. Growth of research activity in CBU between 2013 and 2014

Activity	% change since 2013
Dissemination (all categories)	3.8
Dissemination (publications, conferences, reviewing)	6.8
Collaborations (all)	17.3
Supervision (all)	19.4
Student employment (all)	15.5
Adjunct appointment	16.7
Colleague mentoring	4.2
Industry engagement activities (all)	181
RE/AC submissions (all)	17

All of the above factors serve to foster a culture of research; however, we have to recognize that there are many challenges ahead for CBU, particularly in relation to attracting further external funding from traditional sources, when the overall share appears to be decreasing for smaller Universities.

5. List of Abbreviations

AC	Animal Care
ACOA AIF	Atlantic Canada Opportunities Agency – Atlantic Innovation Fund
CAUBO	Canadian Association of University Business Officers
CCBS	Centre for Cape Breton Studies
CFI	Canada Foundation for Innovation
CIHR	Canadian Institutes of Health Research
CRC	Canada Research Chair
FYE	Fiscal Year Ending
HQP	Highly Qualified Personnel
NRC-IRAP	National Research Council – Industrial Research Assistance Program
NSERC	Natural Sciences and Engineering Research Council
NSRIT	Nova Scotia Research and Innovation Trust
ORGS	Office of Research & Graduate Studies
RE	Research Ethics
SSHRC	Social Sciences and Humanities Research Council