



YUKON RESEARCH CENTRE: EVALUATION REPORT



HCA

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Abbreviations

AVP	Associate Vice President
BM	Biodiversity Monitoring
CCI	Cold Climate Innovation
HCA	Harry Cummings and Associates
INAC	Indigenous and Northern Affairs Canada
IRAP	Industrial Research Assistance Program
IRC	Industrial Research Chair
MLC	Mine Life Cycle
NCE	Northern Climate ExChange
NEI	Northern Energy Innovation
NRI	Northern Research Institute
NSERC	Natural Sciences and Engineering Research Council
ReSDA	Resources and Sustainable Development in the Arctic
SSHRC	Social Sciences and Humanities Research Council
TI	Technology Innovation
YC	Yukon College
YRC	Yukon Research Centre

Cover photo source: YRC Website

Executive Summary

This report presents the findings of the evaluation of the Yukon Research Centre (YRC) for the period 2013-2017. YRC was established in 2009 to provide Yukon College (YC) the opportunity to grow its research activities to develop a knowledge economy for the benefit of Yukon.

YRC is home to the following research and outreach units: Research Services, Northern Climate Exchange (NCE), Northern Energy Innovation (NEI), Mine Life Cycle, Biodiversity Monitoring, and Resources and Sustainable Development in the Arctic (ReSDA).¹ Up until recently YRC also housed the Cold Climate Innovation (CCI)/Technology Innovation (TI) units. The CCI unit now operates independently from the YRC at Yukon College and was not a major focus of this evaluation as the unit recently underwent a separate evaluation.

YRC Research Services and NCE are the units directly funded from the transfer payment agreement with the Yukon Government Department of Education. Core funding for several administrative positions at YRC is provided by the Department of Education which requires a review/evaluation of services every five years. YRC completed its first evaluation in 2013 (covering the start-up period of the program 2010-2012) and in 2017, Harry Cummings and Associates (HCA) was engaged to complete the YRC evaluation for the period 2013-2017.

The scope of the evaluation covers issues related to rationale, efficiency, effectiveness, access/reach, and impact. The evaluation design used a mixed methodology approach consisting of document/data review and key informant interviews. Key informant interviews were conducted with 50 individuals representing ten different stakeholder groups including YRC staff and researchers, YC officials/faculty, YC students, government officials (Yukon government, First Nations officials, federal government, other government), non-profit organizations, academic institutions, and private sector businesses.

Conclusions and Recommendations for Further Development/Enhancement of YRC

YRC is broadly recognized by numerous stakeholder groups as an organization that focuses on doing northern research. It is viewed as the body that supports research at Yukon College and is known for its collaborative research with Yukon First Nations, local communities and industry groups. YRC's physical presence in the north is seen as a strategic strength that enables researchers to more directly engage with local stakeholder groups, establish trust and develop deeper and more meaningful connections/relations.

YRC has made considerable progress in advancing/achieving many of its Strategic Plan objectives under the 2013-2016 plan while some areas continue to be a work in progress.

YRC has established its niche as a northern centre of research expertise. It has garnered considerable appreciation and respect for the quality of its research and there is broad consensus that the YRC research and outreach units remain relevant and important areas of focus. YRC research is broad in scope including biophysical sciences, technological innovations, and social sciences. Climate change research is viewed as especially important for the Yukon and YRC is highly regarded for its research capacity in this area. Two research units, Biodiversity Monitoring and Mine Life Cycle, are generally viewed as having more limited human resource capacity at this time and in need of additional personnel while Social Sciences represent an area for significant growth and development.

Human resource planning at YRC can be challenging given that so much of the human resource need is contingent on year to year funding for project research. While YRC researchers are enthusiastic and passionate about their research, without core funding there is limited job security in many of these

¹ ReSDA funding ended in December 2017 and final reporting is being completed for the end of March 2018.

positions which poses a threat to the maintenance and continuity of the existing skills/expertise capacity at YRC.

Yukon College students represent an important source of temporary research support personnel for YRC but there continues to be some necessary reliance on external scientific expertise as the local capacity has not yet been sufficiently developed. This could progressively be resolved as the College transitions to a University and local capacity in scientific expertise is further advanced to fill some of these needs.

Recommendations

- *Continue to develop and build out research capacity in the Biodiversity Monitoring (e.g. planning for current/additional research personnel), Mine Life Cycle (e.g. fill the Research Chair position), and Northern Climate ExChange (e.g. climate change modelling expertise) units.*
- *Advance the establishment of a Social Science unit (e.g. create a lead social science position, create a dedicated lab space).*
- *Consider establishing an assistant coordinator position to support the AVPs and additional support staff for the office of research as these needs become crucial for supporting performance (e.g. granting officer, ethics review personnel, lab room coordinator).*
- *Promote / facilitate the use of interdisciplinary approaches in research at YRC.*

YRC has made a significant contribution to expanding the community of researchers by facilitating student involvement in research projects/activities, collaborating with different levels of government, establishing climate monitoring programs in Yukon communities, and advancing national and international research partnerships.

Recommendations

- *Improve consultation and advance opportunities for greater YC faculty and student involvement in YRC research projects / activities (e.g. promote more opportunities for faculty to pursue research activities alongside their teaching activities and for students to combine research with their academic pursuits).*
- *Promote and support the roll-out of the climate certificate in Climate Change Policy.*
- *Explore and expand YRC research initiatives/activities with all Yukon First Nations.*

YRC is collaborating with Yukon First Nations in identifying and implementing research that responds to their interests/priorities. YRC has successfully conducted joint research initiatives with some Yukon First Nations and has expanded its capacity to further facilitate and advance collaborative research initiatives through the creation of a full-time First Nations Engagement Advisor position.

Recommendations

- *Expand efforts to meet and work with Yukon First Nation communities and organizations to identify their research interests/priorities.*
- *Strengthen partnerships with Yukon First Nations to provide greater opportunities for engagement/input into research design and implementation as well as input into how updates/progress reports and final results are packaged / presented and shared.*
- *Support/encourage greater use of First Nations traditional knowledge in research.*
- *Support and encourage research capacity development in First Nation communities (e.g. skills development).*
- *Expand efforts to recruit Yukon First Nation researchers at YRC.*

- *Explore and pursue opportunities / approaches to facilitate enhanced First Nation engagement/ participation in research initiatives (e.g. formation of a First Nations research advisory committee).*

YRC has developed promotional materials for all of its programs and has promoted/communicated its services and research activities and findings through a variety of methods including reports/publications, workshops and presentations (local, national and international).

Recommendations

- *Host an annual open house highlighting YRC projects.*
- *Ensure that information on the YRC website is current and materials can be downloaded.*
- *Ensure that research findings are written/presented in a plain language to facilitate easier access.*
- *Ensure that YRC has sufficient resources to facilitate attendance at national/international conferences.*
- *Support and advance the use of electronic/social media resources for the purpose of sharing news and information.*
- *Support and advance publishing of YRC research in peer review journals and consider creating a journal of research out of the College.*

YRC is fulfilling its mandate to provide support services for researchers in the Yukon and as part of this process YRC is supporting and advancing the establishment and operation of a Yukon Ethics Review Panel and supporting and utilizing the First Nations Research Manual. With respect to the physical space, the existing office space is generally meeting the requirements of YRC staff/researchers, but improvements could be made to the lab space. A notable drawback with the present location of YRC offices is that YRC has very low visibility and connectivity on campus (i.e. being situated in the lower level of a residential building and physically separated from the main campus building that houses faculty) which impedes interaction between YRC researchers and YC faculty and students and limits opportunities for the sharing of information and news on research interests and activities.

Recommendations

- *Create a purpose built social science research lab and consider creating a dedicated permafrost research lab.*
- *Grant researchers access to enhanced capacity internet accounts (e.g. administrator accounts).*
- *Enhance access to research literature (e.g. peer review journal subscriptions).*
- *Continue the work on completing a YRC climate monitoring data repository and a database server that includes Yukon and northern social, economic, and environmental data.*
- *Continue to explore options around the creation of a Science Building where YRC researchers and YC faculty could be co-housed.*

With respect to the management of its operations, YRC recently adopted an Associate Vice President structure to facilitate a more strategic division of responsibility in overseeing and guiding research operations and research development. The new model is at a relatively early stage of development and implementation and will need to be monitored over a longer period of time to assess how well it performs and the extent to which it meets the needs of the YRC. There is some degree of optimism at this stage that the new structure will ultimately be an improvement over the previous management structure and that it aligns well with the emerging university model.

This is an opportune time for YRC to review its vision as it explores its future role and relationship with the emerging Yukon University and to formalize where the leadership will rest with driving and guiding the YRC team forward in realizing the vision.

Recommendations

- *Develop a vision for the YRC and assign leadership responsibility for driving and guiding the YRC team forward.*
- *Update the YRC mission statement to reflect the more limited and/or indirect role that YRC now plays in facilitating commercialization.*
- *If professional development for staff/researchers is deemed to be an important component for the future vision of YRC then more planning and resources should be put in place to facilitate participation.*

With respect to sustainability, YRC has experienced a progressive increase in research income over the last few years and currently appears to be outpacing many other comparably sized institutions in Canada in this capacity. YRC has achieved some success in diversifying its funding streams beyond the Yukon Government's allocation. Staff/researchers actively pursue funding both nationally and internationally and a substantial portion of research project funding is sourced from funding other than Yukon Government (e.g. SSHRC, NSERC, INAC etc.) as well as industry partners.

However, there are a number of factors that make it difficult to predict if/how this level of success will be maintained including changes in government and any associated changes in government research priorities and policies. Some elements of YRC funding are longer term and more secure than others but a significant portion of YRC funding is derived from shorter term, project-based funding. A substantial time commitment is needed to prepare quality project proposals and with no guarantee that every proposal will be successful, proposal writing becomes a constant activity of researchers to ensure that funds continue to come in to support research activity. While there is the potential for further growth in securing research funding through collaboration with industry partners, foundations and First Nation organizations it appears that some level of core funding from the Yukon Government will be required for the foreseeable future. Many of YRC stakeholders feel that this is not an unreasonable expectation considering that the region has a relatively small economy and that so much of the YRC research activity has benefits for broad segments of the Yukon population.

YRC stakeholders view the College transition to university as a key development that YRC needs to plan and prepare for. Discussions between YRC and Yukon College on the future level of YRC autonomy/integration with Yukon University will be important for informing funding strategies/priorities.

Recommendations

- *Confirm the role/relationship of YRC in relation to Yukon University and identify the implications for existing funding arrangements and future funding opportunities.*
- *Continue to explore core funding options for positions at YRC to promote long-term research capacity and continuity.*

1.0 Introduction and Background

This report presents the findings of the evaluation of the Yukon Research Centre (YRC) and its activities for the period of 2013-2017.

YRC was established in October 2009 to provide Yukon College the opportunity to grow its research activities to develop a knowledge economy for the benefit of Yukon.² The mission of the YRC is to facilitate research, outreach, innovation, and commercialization, through the application of a collaborative, multi-disciplinary approach that respects and utilizes First Nations' traditional knowledge.³

In its 2013-2016 Strategic Plan, the YRC identified the following six strategic directions which were interconnected with the key directions identified in Yukon College's 2013-2016 Strategic Plan:

- Expanding a community of researchers
- Collaborating with Yukon First Nations
- Conducting quality research and innovation
- Communicating research projects and findings
- Building and operating a research and service hub
- Operating an effective and sustainable organization

The YRC is home to the following research and outreach units:

- Research Services
 - Primary focus is research administration and seed funding of pilot projects.
- Northern Climate ExChange (NCE)
 - Primary focus is climate change adaptation research.
- Northern Energy Innovation (NEI)
 - Industrial Research Chair (IRC)
 - Partnering with industry leaders from all Canadian territories and focuses on increasing energy efficiency, cost-effectiveness and environmental stewardship within the northern energy industry.
- Mine Life Cycle
 - Industrial Research Chair (IRC)⁴
 - Partnering with representatives of the Yukon mining industry to determine and address northern specific industry-related challenges and opportunities.
- Biodiversity Monitoring
 - Long-term program tracks populations and key ecosystems across the Yukon and maintains databases on them.

² The YRC grew out of the Northern Research Institute (NRI), 1991-2009. A key role of the NRI was to administer the Northern Research Endowment Fund, which was established in 1989 by the Government of Yukon to support scholarly research in the humanities, social, pure, and applied sciences that is directly relevant to Yukon.

³ Yukon Research Centre Strategic Plan II - 2013 – 2016.

⁴ This IRC position was vacant at the time of this report.

- Resources and Sustainable Development in the Arctic (ReSDA)
 - YRC serves as the central coordination office for ReSDA⁵
 - Examines ways to ensure that a larger share of the benefits of resource development stay in the region with fewer costs to communities.⁶

Up until recently, YRC also housed the Cold Climate Innovation (CCI)/Technology Innovation (TI) units. CCI focuses on the development, commercialization and export of sustainable cold climate technologies and related solutions for subarctic regions around the world. The CCI unit now operates independently from the YRC at Yukon College and recently underwent a separate evaluation.⁷

Organization Structure

The organizational structure of the YRC has evolved over the last few years. In 2013, a single vice president position was responsible for overseeing YRC research operations and research development. Over the last two years the organizational structure has transitioned to two dedicated Associate Vice President positions to head up research operations and research development. Figures 1 and 2 present the core organizational structures for the two AVP positions.

Figure 1: Yukon Research Centre – Research Operations Organization Chart

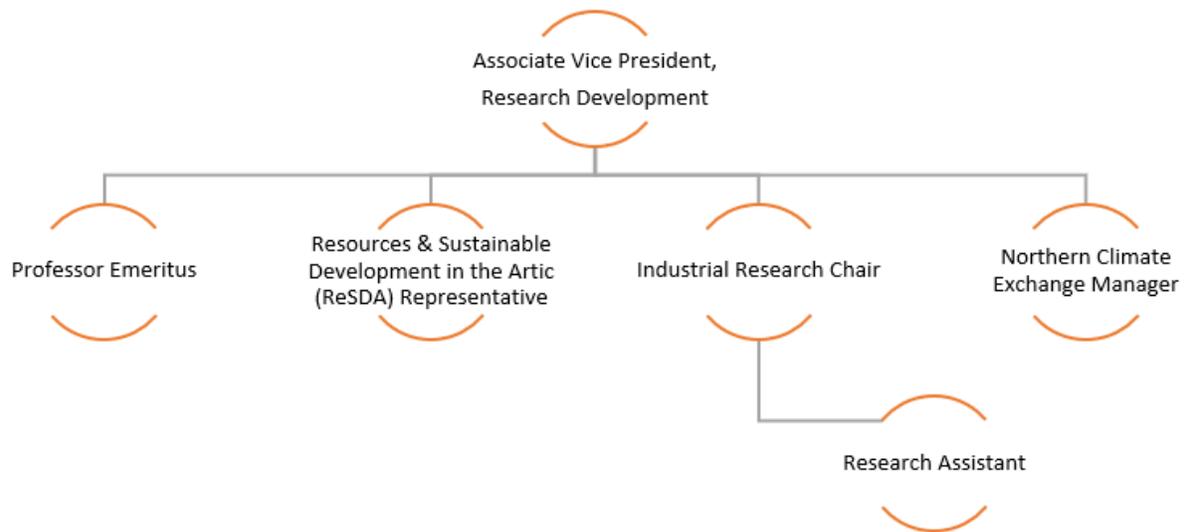


⁵ The Network is based at Lakehead University with a central coordination office at YRC at Yukon College and Territorial/regional coordination offices based at the Aurora Research Institute at Aurora College; Nunavut Research Institute at Nunavut Arctic College; Labrador Institute at Memorial University of Newfoundland and Makivik Corporation (Quebec).

⁶ ReSDA funding ended in December 2017 and some final reporting is being done until end of March 2018.

⁷ The movement of the Cold Climate Innovation unit outside the YRC is a rationale development given that the CCI primarily focuses on granting / distributing money to others (e.g. innovators / communities) to conduct research.

Figure 2: Yukon Research Centre – Research Development Organization Chart



Evaluation Background

YRC Research Services and NCE are the units directly funded from the transfer payment agreement with the Yukon Government Department of Education. Core funding for several administrative positions at YRC is provided by the Department of Education which requires a review/evaluation of services every five years. YRC completed its first evaluation in 2013 (covering the start-up period of the program 2010-2012) and in 2015, Harry Cummings and Associates (HCA) was engaged by YRC to prepare a comprehensive evaluation plan for YRC to be implemented in 2017/18 (covering the period 2013-2017).⁸

The following section provides a description of the evaluation design/methodology.

2.0 Evaluation Design & Methodology

YRC views evaluation as beneficial since evaluation supports the emerging need to demonstrate greater accountability to funders. Funders often require organizations to produce measurable data to demonstrate impact and the value of activities and programs. Evaluation fulfills a formative purpose, assisting the YRC in assessing progress and planning new directions.

In 2017, YRC engaged HCA to implement and complete the YRC evaluation for the period 2013-2017.

The scope of the evaluation covers issues related to rationale, efficiency, effectiveness, access/reach, and impact. Key questions to be addressed in the evaluation include:

Rationale

- What is the main role of the YRC?
- Do the current areas of research continue to be relevant/appropriate for YRC?

Efficiency

- Are human resources adequate to support performance?
- Is the physical infrastructure adequate to support performance?

⁸ The Evaluation Plan included a program logic model and evaluation matrix for the YRC, identified an evaluation design / methodology, and provided draft data collection tools (e.g. key informants interviews).

- Does YRC have sufficient financial support to keep its niche?
- How does YRC/YC compare to other small institutions?

Effectiveness

- What is the amount of funding received by the YRC?
- How diverse are YRC's funding sources and to what extent does the YRC receive repeat funding?
- What is the focus of YRC research activity?
- How have YRC services / products / research capacity changed in recent years?
- What are YRC strengths and unique attributes?
- What are the areas for improvement and what are the considerations for future planning / priorities?

Access/Reach

- What initiatives is YRC taking to promote its research activities and findings?

Impact

- What progress has YRC made in relation to its strategic directions:
- What are some of the significant contributions of YRC to the research community?

The evaluation design used a mixed methodology approach consisting of document/data review and key informant interviews.⁹

With respect to the document/file review we reviewed the following materials:

- Yukon Research Centre Strategic Plan II: 2013 – 2016
- Yukon College Strategic Plan: 2016 - 2021
- YRC Interim Activity Reports to Government of Yukon Department of Education, 2014-2018
- Evaluation of the Yukon Research Centre, 2010 – 2013, Final Report
- Briefings/publications/media announcements on major YRC initiatives
- YRC organizational chart
- YRC financial information

With respect to Internet based materials, we reviewed relevant information available through the Yukon College website (e.g. YRC unit descriptions and project profiles/reports) and where available we reviewed relevant online profiles and postings (e.g. LinkedIn, Research Gate, Open Scholar @ Yukon College) as well as relevant Twitter postings.

HCA collaborated with YRC officials in identifying the candidates for the key informant interviews. A total of 59 interview candidates were identified representing ten different stakeholder groups. A total of 50 key informants participated in interviews which represents an 85% response rate.¹⁰

Two different but related interview guides were developed and used: an interview guide for YRC staff/researchers and an interview guide for partners/stakeholders (see Appendix A and B). The interviews were initiated the week of January 29, 2018 when HCA conducted a site visit to YRC and conducted 10 in person interviews. The balance of the interviews were conducted by phone in January, February and

⁹ Combining different approaches is useful in triangulating results. The concept of triangulation is based on the assumption that any bias inherent in particular data sources, investigator, and method will be neutralized when used in conjunction with other data sources, investigators, and methods.

¹⁰ Non-respondents indicated that they were not available to participate or did not respond to the invitation to participate. Several attempts were made to engage the interview candidates.

March, 2018.¹¹ Overall a total of 19 YRC staff/researchers and 31 other stakeholders (e.g. partners/users) were interviewed.

Table 1: Distribution of Interviews Completed by Stakeholder Group

Stakeholder Group	Number of Individuals Invited to Participate	Number of Individuals Interviewed
Yukon Research Centre Staff/Researchers	21	19
Yukon College Officials / Faculty	10	9
Yukon College Students	9	5
Yukon Government Officials	6	5
First Nations Officials	2	2
Federal Government Officials	2	1
Other Government Officials	1	1
Not for Profit Sector Organizations	2	2
Other Academic Institutions	1	1
Private Sector Businesses	5	5
Total	59	50

3.0 Evaluation Results

The evaluation results are structured according to major evaluation themes of rationale, efficiency, effectiveness, access/reach, and impact.

To facilitate analysis and ensure confidentiality for the smaller response groups, the findings from the key informant interviews have been summarized under the following groupings:

- YRC staff/researchers
- Partner/user groups
 - YC officials/faculty
 - YC students
 - Government officials (Yukon government, First Nations officials, federal government, other government)
 - Non-profits (Organizations, institutions)
 - Private sector (businesses)

¹¹ One respondent was unavailable to conduct the interview by phone and provided a written response to the interview questions.

3.1 Rationale

Role of the YRC

Key informants across all stakeholder groups were asked to describe/define the main role of the YRC. Nearly all of the key informants associate conducting northern research as a primary function of the YRC.

YRC staff/researchers: Key informants generally cited the YRC's role in conducting northern research with the majority of respondents reporting that the main role of the YRC is to: support research in the college specifically and provide guidance on research in the territory more generally (14 of 19). Speaking to the specific role that the YRC has in the north, four respondents highlighted the role that YRC plays in research development, and its linkage with northern industries and First Nations, as a main function of the research centre. For others, the focus was on climate change, with two respondents observing that the YRC is the northern voice on climate change with a focus on developing applied research in the North. Two respondents commented on how the YRC helps the College to build relationships and provide support in the Yukon, while guiding and managing research projects. One respondent noted that the main role of the YRC is to provide office space and supplies for researchers – noting that researchers are required to find their own funding for their projects and that the YRC is not yet able to provide base funding for researchers.

YC officials/faculty: Key informants defined the main role of the YRC in two main areas: 1) as the research arm of Yukon College (4 of 8), and 2) to focus on research that serves the needs of Yukoners (4 of 8). Respondents noted the importance of the YRC as the research face of the College, particularly in the important role the YRC has in building research capacity in the north (in the Yukon and in the north more broadly). Another theme mentioned by respondents is the key role played by YRC in the promotion and collaboration of research with interested parties such as industry, government, First Nations, and local communities.

YC students: All five student respondents defined the YRC as a hub for conducting northern research. Within this definition the students identified several other key services that the YRC provides, including: acting as a liaison between researchers and the broader community, providing opportunities for YC students to be engaged in research activities, and providing opportunities for graduate students from other universities to conduct research in the north.

Government officials: Government officials strongly associate the YRC with its research expertise in the northern climate exchange (3 of 7). Additionally, respondents commonly reported that providing scientific and research expertise (i.e. providing consultancy services/capacity to government offices) was a key service of the YRC (4 of 7).

Non-profits: All three key informants defined the YRC as the research centre of Yukon College that focuses on conducting scientific studies in the north.

Private sector: All five key informants defined the YRC as the research arm of Yukon College that is advancing applied northern science in the Yukon. In addition to this broad definition, respondents also reported that the YRC serves to offer a knowledge base/research node for climate change research, and that it provides a specialized research service for companies that are interested in research that is specific to the Yukon.

Relevance of YRC Research

Key informants representing the partner and user groups were asked to share their views on how relevant they believe the current areas of research focus are for the YRC. Just over 70% of the key informants (22 of 31) reported that they feel the current areas of research focus remain relevant. One area of research

that participants from all of the partner/user groups identified as lacking was the social sciences. Respondents generally felt that the YRC was doing great work in conducting natural/physical science but that there was room to do more social science-based research. Increased First Nations engagement and integration of traditional knowledge were also mentioned as areas in need of further development.

The following subsections provide a summary of the views/observations provided by the partner and user groups.

YC officials/faculty: Key informants generally agreed that the current areas of YRC research focus remain relevant with some qualifications. One respondent commented that they saw value even in the areas that they were personally less familiar with, adding that although they were not personally involved in these areas, they would like to see more focus on biodiversity and mine life cycle management. A number of suggestions on how the YRC could be improved were mentioned under this question. Building up existing research areas was mentioned by one respondent, who talked about how the ecology and wildlife research was currently being conducted by just one researcher and that this area should be expanded. Similar comments were provided by other respondents who noted that there needs to be greater integration between research areas, more support of YC faculty who want to do research, and greater integration of traditional First Nation's knowledge into research. Respondents also pointed out the need to build up the social sciences and increase the use of social media to further promote the activities of YRC.

Students: All five students reported that the current areas of research continue to be relevant for the YRC. However, three of the students mentioned the need for more social science research at the YRC, with one student noting the need to incorporate more traditional knowledge in research projects.

Government Officials: There was a general consensus among government officials that the YRC areas of research continue to be relevant. However, there were also a number of suggestions that came from government officials on areas for improvement including: increasing research in the social sciences, improving knowledge mobilization, and increasing the number of principal researchers. Funders confirmed that there is strong interest in NCE research activities and work with First Nations and environmental issues. One respondent suggested that the NCE is the highest priority unit at YRC given the immediate and observable impact of climate change. While recognizing that many of the YRC applied research projects have a social aspect it was emphasized that YRC needs to ensure that social sciences are promoted and pursued. It was suggested that the integration of applied physical and social sciences can be very attractive to Yukon students, Canadian students and international students and more could be done to package and promote these opportunities for students. Several respondents also cautioned that YRC has to be careful in not overextending its resources as it grows. As noted by one interviewee, *"you can't be everything to all people"*.

Non-profits: Interviewees from the non-profit sector were generally pleased with YRCs research areas. However, all three interviewees stressed the need for more social science research with an emphasis on the need for research on the socioeconomic impact on health and food security in northern and First Nation communities.

Private Sector: All five of the private sector respondents agreed that the current areas of research are relevant. Areas to consider for future research development include: social sciences, automation and robotics (for Mine Life Cycle), and atmospheric science. One respondent observed that there is a need for climate change modelling expertise in the NCE unit, noting that because climate change is affecting the north faster than the south, many of the southern experts on climate change have possibly underestimated the speed of change and the north may need to respond more quickly to climate change than some southern researchers are estimating.

Rationale – Summary

All of the stakeholder groups engaged as part of this evaluation strongly associate the core role of YRC with doing northern research. The YRC is viewed as the body that supports research at Yukon College and is broadly recognized for its collaborative research with First Nations, Yukon communities and industry groups.

YRC partners/users generally view the current areas of YRC research focus to be relevant and the YRC is well praised for its work in the natural/physical sciences. Climate change research is regarded as very important for the Yukon and the YRC is broadly recognized for its specialized research capacity in this area. There is interest in seeing further development/expansion of research initiatives in the Biodiversity Monitoring and Mine Life Cycle units.

There is significant interest and desire among partners/users to see YRC take on an expanded research role in the social sciences. YRC staff/researchers also acknowledge that this is an area for development and growth.

Stakeholders emphasized the importance of continuing to expand efforts in the area of First Nations engagement and the integration of traditional knowledge in research activities.

An important aspect of YRCs role/function is sharing information and there is recognition that knowledge mobilization activities can be further improved (e.g. expanding the use of social media to promote YRC activities/research findings).

3.2 Efficiency

Adequacy of Human Resources to Support Performance

Human resource capacity at YRC has steadily grown from six staff in 2009/2010 to 30+ staff and researchers today which can climb to 50-60 people when summer students are factored in.

The core funding provided by the Yukon Government (Education Department) currently covers the following YRC staff/researcher positions:

- Administration
 - Associate Vice President, Research Operations
 - Associate Vice President, Research Development
 - Financial Officer
 - Administrative Assistants (2 part-time positions)
- Northern Climate Exchange
 - Manager
 - Research Project Coordinator, Climate Change
 - Permafrost Researcher
- First Nations Engagement Advisor
- Marketing and Communications Coordinator

The two Associate Vice President (AVP) positions were recently created by YRC (2017). Several staff noted that this new arrangement is working reasonably well and a fuller understanding of the utility of the new arrangement will be known as the division of roles and responsibilities are formalized and operationalized by the AVPs.

The First Nations Engagement Advisor position was created in 2015 to identify and support the research needs of Yukon First Nations.

YRC also recently hired a second part time Administrative Assistant (2017) to strengthen their support capacity for the YRC units.

There are an additional 20-25 research related positions supported by YRC and its activities depending on the specific projects in the different units.

YRC Staff/Researcher Observations on Human Resource Capacity

The large majority of YRC staff/researchers that were interviewed (15 of 19) feel that the YRC has sufficient human resource capacity at this time to support performance.^{12 13} Several staff/researchers described YRC as having a positive work environment.

Several staff/researchers qualified their responses noting that human resource needs can fluctuate greatly from year to year, especially in the NCE and NEI units depending on the funding that they bring in and/or the research requirements. For example, the NEI had 14 people involved with research projects last summer and currently have nine people involved.

Most of the researcher positions at YRC are year to year depending on the project grant money that can be brought in and in some cases a researcher will need to work on several projects concurrently to achieve a full time equivalent position. As noted by one respondent, the team of researchers has to be flexible as the projects come in and to date they have done well to manage the work load. However, several respondents emphasized that the nature of year to year funding makes the team vulnerable to turnover and they could easily lose key members if they encounter a year where a small amount of grant money is brought in. One respondent suggested that the ideal scenario is to have more large-grant, multi-year projects (e.g. \$500,000 over five years) to provide more job security and ensure team sustainability and continuity.

One researcher commented that managing the human resource element of a YRC research project can be similar to what private consulting firms encounter when they need to hire additional support/expertise as the project calls for. In some instances, this requires partnering with resources/expertise from southern institutions to address the skills gap in Yukon. It was suggested some reliance on external expertise is unavoidable until local expertise is developed in the Yukon but on the positive side, this approach still enables YRC to be the lead research group on the project. The staff member expressed optimism that with the YC transition to university status some of the local skills/expertise gaps will be addressed in the longer term.

Another researcher noted that it can be difficult at times to estimate the budget for the actual human resources needed for completing a project and as a result it is not uncommon to have to dedicate more work hours than projected in a project budget.

Several staff/researchers commented that Yukon College students represent an important and valuable source of temporary research support and enable YRC research projects to operate with a degree of hiring flexibility. It was noted that summer students are hired through the Yukon Government supplemented

¹² Two staff members felt that the YRC does not have sufficient human resource capacity and one member was undecided/unsure.

¹³ Although CCI now operates independently from the YRC, a representative with CCI confirmed that they are adequately staffed and currently have three full time equivalent (FTE) positions. CCI initially had two FTE positions with core funding from Yukon Government Economic Development and was able to secure funding from Industrial Research Assistance Program (IRAP - National Research Council) for one more FTE.

wage program - Student Training and Employment Program (STEP). The number of Yukon College students employed on YRC related projects over the last five years has increased progressively from 12 students in 2013 to 34 students in 2017.

Table 2: Number of Yukon College Students Employed on YRC Related Projects: 2013-2017

Year	Total Students
2013	12
2014	26
2015	26
2016	29
2017	34
Total	127

Human Resource Considerations

With respect to immediate human resource considerations, YRC administration is currently searching for someone to fill the recently vacated Mining Life Cycle Research Chair and they are searching for funding for establishing a Social Science Research Chair. YRC officials acknowledge that they are short on social science projects and recognize the importance of and need for principal investigators at YRC in this area, ideally supported by core funding to develop programming in this area.

With respect to future human resource considerations, at the moment the two AVPs do not have an assistant coordinator and it was suggested that a single FTE position could be created to support the two AVPs (e.g. writing, analyzing/reviewing material, preparing briefing materials, etc.).

It was further suggested that as the YRC proceeds with building the office of research there will be a need for additional positions such as a granting officer, ethics review personnel, and a lab room coordinator. It was suggested that the lab room coordinator position could be shared with the Yukon College and could work to ensure the utilization of the lab is maximized while also overseeing the ordering/restocking consumables, ensuring the regular scheduling of equipment maintenance, and training students in the use of the lab equipment.

Several staff members suggested that the YRC human resource model and capacity will need to be monitored/reviewed as Yukon College transitions to Yukon University (e.g. What degree of autonomy/integration will best serve the YRC in its role with the university?). YRC officials are currently examining models used elsewhere to better understand the options that could potentially be applied/adapted for Yukon University. It was further suggested that with the transition to a university status and the ongoing growth of YRC, the communication unit may need additional capacity in the future.

It was noted that some YRC staff are currently teaching at Yukon College and as the college transitions to a university status the interest in/and need for this kind of opportunity may increase. One staff member suggested that a future hiring policy for YRC could include encouraging personnel to pursue teaching opportunities at the university to further round out / develop their skills and to promote more interaction with students and facilitate their engagement in YRC research activities.

Adequacy of Physical Infrastructure to Support Performance

The large majority of YRC staff/researchers interviewed (14 of 19) feel that the YRC has sufficient physical infrastructure at this time to support performance.¹⁴ Many of the respondents elaborated on their views on this matter and some pointed out ongoing concerns/issues.

YRC Offices/Physical Space

With respect to the adequacy of the physical space, several staff/researchers noted that they are at or very close to full capacity in occupying all of the available space. Over the years, YRC has expanded from one wing of the basement complex to a second wing. As noted by one staff member, there are a couple of empty offices remaining, but these will be filled with the eventual hiring of a Mine Life Cycle Research Chair and a Social Science research position. Several staff/researchers noted that the YRC offices and science lab can be a very busy space in the summer with all of the active student researchers. With respect to the lab infrastructure, one respondent noted that although they are managing to work out of the cold storage building it would be preferable to have a lab dedicated to permafrost research. Another respondent emphasized that YRC has further expanded the role of its offices/lab space by making lab space available to high school students.

YRC is currently working on developing a social sciences lab. They have the necessary equipment for the lab (e.g. computers, transcribing equipment, video equipment) but a dedicated lab space is needed (e.g. sound proof rooms for private interviews, focus group sessions).

Being a basement tenant in a residential building has resulted in some inconveniences (e.g. noise and cooking odours from the upper floor) and water damages to materials (e.g. books, reports) and equipment (e.g. photocopy machine) from broken water/sewage pipes in the upper floors. The cost of repairing/replacing damaged equipment comes out of YRC funds even though the equipment becomes an asset of Yukon College once it was purchased through YRC funds.

YRC Equipment and Support Services

With respect to the adequacy of equipment/support services one staff member noted there are typically few challenges or limitations and special software and equipment needs can be purchased through their project budgets. However, it can be challenging to access very expensive equipment when there is a project budget schedule that limits the allocation of funding in each year of a multi-year project (e.g. if a three year project budget requires that the funds be dispensed by the funder equally across the three years it can be difficult to finance an expensive piece of equipment in the first year while maintaining funds in that year to cover staff wages). It was noted that, where needed, YRC has responded with creative/alternative ways to make the budgets work. Another staff member noted that in some instances when they don't have the equipment they need they can utilize simulation software.

A YRC staff member noted that it is great to have access to the GIS services at Yukon College but noted that it would be helpful to have greater internet capacity/access noting that the researchers basically have a student account for accessing the internet. Another potential area for improvement from a research resource standpoint is for Yukon College to pursue subscriptions to peer review journals. One researcher noted they sometimes ask friends/colleagues at other institutions to access journal articles as needed. It was suggested that this resource gap will need be addressed by Yukon College as part of the transition to a university in order to better compete with other universities.

¹⁴ Two staff members felt that the YRC does not have sufficient human resource capacity and one member was undecided/unsure.

YRC Presence/Visibility on YC Campus

Several of the concerns raised were related to the physical setting of the building where YRC is housed. As noted by one respondent, the basement location of YRC offices in a residential building provides the YRC with limited profile/visibility on campus. It was further emphasized by several respondents that although the physical distance between the YRC offices and faculty offices in the main campus building is small, it serves to create a barrier that limits/inhibits the ability of the two groups to more actively engage and discuss research interests and initiatives.

Several staff/researchers suggested that the next phase of growth at Yukon College should give consideration to locating YRC staff/researchers and Yukon College faculty in the same building (e.g. a dedicated science building). As noted by one respondent, the ideal scenario would be to have YRC staff/researchers and Yukon College faculty under the same roof where faculty and researchers would work along the same stretch of hallway and students would have greater opportunity to be introduced to research. Another respondent suggested instituting weekly seminars where faculty and YRC researchers could come together to provide presentations and discuss their research activities and interests. One staff member confirmed that YRC has developed a concept for a science building to integrate research and faculty.

Adequacy of Financial Support to Maintain YRC Niche

Just over half of the YRC staff/researchers interviewed (9 of 17) feel that the YRC has sufficient financial support to maintain its niche while three respondents suggested that the YRC does not have sufficient funds to do so and five were unsure about the ability of YRC to maintain its niche. Many of the respondents, regardless of their view on this question, identified a number of key factors that complicate the ability of YRC to maintain its niche.

Several staff/researchers noted that it is difficult to project how much budget will be available from year to year depending on how successful the researchers are with their grant proposals. One staff member emphasized that many of the NCE research staff are supported by year to year project funding and in order to sustain the pool of researchers a substantial portion of their time needs to be dedicated to writing quality proposals.

It was noted that the NCE team has done very well to bring in the projects they have but it continues to be very unpredictable from year to year and several respondents noted that without reliable funding there is greater job insecurity and higher risk that the skilled and motivated research personnel could leave YRC for more secure positions elsewhere (e.g. government jobs, southern institutions). Several staff/researchers spoke about the high level of passion, commitment and determination of researchers to do quality work at YRC which can sometimes require putting in additional time that is not compensated for.

With respect to the NEI unit, the IRC has a working budget of approximately \$2 million for five years with the expectation that core funding will be used to leverage additional federal government funds to boost research efforts. One respondent noted that more NEI related research could be done with additional funding (e.g. renewable energy research for automated/remotely operated wind and solar energy units). However, it was suggested that there are some technical limitations in this area with a lack of local consultants/experts and this baseline capacity will need to be developed.

One staff member noted that YRC is now well positioned with a good team of administrative personnel and can sustain core staff with a budget of a little over \$1 million per year. It was further suggested that YRC is now at a jump off point where it needs to fill the vacant Research Chair in the Mine Life Cycle unit

and secure funding for the Social Science research position. Several staff members noted that this is the ideal time to be moving to a principal investigator structure.

Additional observations provided by YRC staff/researchers:

- As First Nations become increasingly interested in research and collaborating in research ‘for the north’ this will represent another growth opportunity for securing funding.
- YRC needs to continue to pursue a diversified funding stream to ensure that that YRC does not become overly reliant on the Yukon Government and Federal Government.
- YRC needs to have the courage to say no to partners if the research will not deliver on other values of importance to the YRC (e.g. providing student opportunities, being focused on niches areas of strategic direction).

YRC/YC Compared to Other Institutions

A review of secondary data was conducted to examine how YRC compares against other institutions with respect to several indicators including total research income, staff funding, formal research partnerships, completed research projects, and paid student researchers. The most relevant comparator data available is for Yukon College as a whole compared to other small colleges with total income less than \$50 million (Research Info source Inc., 2012-2016). Highlights of the performance of Yukon College relative to other small colleges are provided below.

Yukon College saw an average research income of \$4.561 million between fiscal years 2014 and 2016. Income in each successive year saw an increase from \$4.184 million in 2014 to \$4.695 million in 2015 to \$4.803 million in 2016. This average was enough to be ranked 14th amongst Canadian colleges and represents 44% of the research income of Canada’s largest income earner George Brown College. It is also 1.23 times (23% larger than) the average research income for Canada’s top 50 colleges.

In 2012/13, the high ratio of research income per faculty member ranked Yukon College 2nd nationwide at \$427,900 per faculty member. Yukon College moved into the number one ranking on this measure with \$418,400/faculty member in 2013/14. However, the research income per faculty member measure showed signs of decline in 2014/15 as Yukon College was ranked 3rd at \$313,000/faculty member. Yukon College dropped further in 2015/16 to the 8th ranking among the top 50 colleges with \$154,900 per faculty member.

In 2012/13, Yukon College ranked 6th in the number of formal research partnerships with 13 and increased to the 5th ranking in 2013/14 with 19 partnerships. In 2014/15, Yukon College dropped to the 10th ranking with 9 partnerships and climbed to tie in the 9th ranking in 2015/16 with 17 partnerships. Over the 2012-2016 period, the number of formal research partnerships fluctuated up and down but in 2015/16 it ultimately surpassed the 2012/13 starting value. The average number of formal research partnerships across all colleges increased consistently from year to year starting at 32 partnerships in 2012/13 and reaching 53 partnerships in 2015/16.

Table 3: Formal Research Partnerships

Year	Rank	#	Avg. (all colleges)	Range (all colleges)	Total (all colleges)
2015-2016	9 th (tied)	17	53	4 to 103	695
2014-2015	10 th	9	45	6 to 99	500
2013-2014	5 th	19	43	11 to 125	391
2012-2013	6 th	13	32	7 to 109	320

In 2012/13, Yukon College ranked 5th in the number of completed research projects with 33 and dropped to the 7th ranking in the periods 2013/14 and 2014/15 with 26 and 14 projects completed respectively. In 2015/16, Yukon college dropped to the 8th ranking with 34 completed projects. Over the 2012-2016 period, the number of completed projects dropped by about half from the starting value in 2012/13 and then slightly surpassed this number in 2015/16. The average number of completed research projects across all colleges increased consistently from year to year starting at 33 projects in 2012/13 and reaching 77 projects in 2015/16.

Table 4: Completed Research Projects

Year	Rank	#	Avg. (all colleges)	Range (all colleges)	Total (all colleges)
2015-2016	8 th	34	77	5 to 225	997
2014-2015	7 th	14	61	6 to 204	674
2013-2014	7 th	26	57	4 to 173	510
2012-2013	5 th	33	43	3 to 147	430

In 2014/15, Yukon College ranked 4th in the number of paid student researchers with 16 and increased to the 2th ranking in 2015/16 with 30 paid student researchers (behind only Cégep de la Gaspésie et des Îles).

Table 5: Paid Student Researchers

Year	Rank	#	Avg. (all colleges)	Range (all colleges)	Total (all colleges)
2015-2016	2 nd	30	14	0 to 33	179
2014-2015	4 th	16	12	0 to 31	136

Efficiency – Summary

The governance/relationship structure between YRC and Yukon College is currently being reviewed as part of the transition to Yukon University and the role of YRC and its level of autonomy/integration in relation to the new institution is still being determined.

The two AVP structure is still in a formative stage and the formal division of roles/responsibilities is continuing to be worked out. It is too early at this stage to make any conclusions about the overall effectiveness of this new model and it will need to be monitored over the next couple of years to learn more about its utility and where possible refinements are needed.

YRC human resource capacity is generally sufficient but this status can be characterized as being temporal as human resource needs can fluctuate considerably from year to year, especially in the NCE and NEI units depending on the number of projects that are funded, and the number of support personnel needed for these projects. It can be difficult for YRC researchers to precisely estimate/project all the costs associated with a research initiative, and in some instances, researchers have needed to dedicate more time/effort than budgeted for to complete a project.

Human resource planning at YRC is problematic given that so much of the human resource need is contingent on year to year funding for project research. While the team of YRC researchers are enthusiastic and passionate about their research, job security in many of these positions is very limited which poses a threat to the maintenance and continuity of the existing skills/expertise capacity at YRC.

The nature of short term projects requires research coordinators to be flexible in responding to research opportunities and managing ongoing projects (e.g. hiring extra support/expertise as needed). Yukon

College students represent an important and valuable source of temporary research support personnel. On average, about 25 students have been hired for YRC projects in each of the last four years.

There continues to be some necessary reliance on external scientific expertise (e.g. from southern institutes) as the local capacity has not yet been sufficiently developed. This could progressively be resolved as the College transitions to a University and local capacity in scientific expertise is further advanced to fill some of these needs.

Other human resource considerations include the following:

- Mine Life Cycle capacity (e.g. fill the Research Chair position)
- Social Sciences capacity (e.g. establish a Research Chair position)
- Biodiversity Monitoring capacity (e.g. planning for current/additional research personnel)
- NCE capacity (e.g. climate change modelling expertise)
- Establish an assistant coordinator position to support the AVPs
- Establish additional support staff for the office of research (e.g. granting officer, ethics review personnel, lab room coordinator)

With respect to the physical space, the existing office space is meeting the minimum requirements of YRC staff/researchers. There is a small amount of surplus office space at this time, but the plan is for this space to be occupied by the Mine Life Cycle Research Chair position and a social science research position.

With respect to lab space, YRC has secured the necessary equipment to support a social science lab but a purpose-built lab space featuring sound proof private rooms for interviews and discussion groups still needs to be created. YRC is managing to utilize a shared space in the cold storage building for its permafrost research but the preferred scenario is to have a dedicated permafrost research lab.

Additional resources/services that would benefit YRC related research activity include granting researchers enhanced capacity internet accounts (e.g. administrator accounts) and enhancing access to research literature (e.g. peer review journal subscriptions).

Although the physical distance between the building that houses YRC staff/researchers and the main campus building that houses faculty is relatively small, it effectively impedes interaction between the two groups and limits opportunities for the sharing of information and news on research interests and activities.

With respect to funding, the current funding structure of the YRC is not wholly conducive to supporting its long-term sustainability. Some elements of YRC funding are longer term and more secure than others but a significant portion of YRC funding is derived from shorter term, project-based funding. A substantial time commitment is needed to prepare quality project proposals and with no guarantee that every proposal will be successful, proposal writing becomes a constant activity of researchers to ensure that funds continue to come in to support research activity.

YRC has been fairly successful with its project proposals and YRC/YC has experienced a progressive year to year increase in research income over the last few years and currently appears to be outpacing many other comparably sized institutions in Canada in this capacity. However, there are a number of factors that make it difficult to predict if/how this level of success will be maintained if there are disruptions such as changes in government research priorities and policies and/or the different bracket of competition that YRC and Yukon University could soon face in competing for project funding.

3.3 Effectiveness

YRC Funding

Total funding for the YRC, across all units, amounts to \$26.6 million for the period 2012 to 2017. This figure encompasses a number of funding elements that were initiated in 2012 or 2013 and carried over into the 2014-2017 period as well as a number of funding elements that were initiated in 2014-2017 and are scheduled to continue into 2018 or beyond. Approximately 22% of the total funding amount (\$5.9 million) was initiated in 2012 and 2013 and 78% (\$20.7 million) was initiated in the 2014-2017 period (see Table 6 below).

Table 6: Distribution of Funding by Unit, 2012-2017

Unit	Initiated in 2012 or 2013	Initiated in 2014 - 2017	Total	%
Yukon Research Centre (YRC)	\$387,607	\$7,405,985	\$7,793,592	29%
Northern Climate Exchange (NCE)	\$1,730,749	\$4,541,686	\$6,272,435	24%
Industrial Research Chair (IRC)	\$624,500	\$2,633,351	\$3,257,851	12%
Resources and Sustainable Development in the Arctic (ReSDA)	\$394,316	\$69,483	\$463,799	2%
Cold Climate Innovation (CCI)	\$2,773,977	\$6,098,391	\$8,872,368	33%
Total	\$5,911,149	\$20,748,896	\$26,660,045	100%

Approximately half of the total YRC funding was provided by the Yukon Government over the 2012-2017 period while the Government of Canada provided approximately a third of the total funding over this period. The balance of the YRC funding was derived from a mix of public sector corporations, private sector companies, academic institutions, First Nations, not for profit organizations, and other government funding.¹⁵

Table 7: Distribution of Funding by Funding Source, 2012-2017

Funding Source	All Units		All Units Excluding CCI	
	Amount	%	Amount	%
Government of Yukon	\$13,854,090	52%	\$8,436,222	47%
First Nations	\$480,901	2%	\$180,901	1%
Government of Canada	\$8,764,900	33%	\$5,774,937	32%
Other government funding ^a	\$453,672	2%	\$302,259	2%
Academic institutions	\$850,990	3%	\$850,990	5%
Not for profit organizations	\$145,367	1%	\$145,367	1%
Private sector companies	\$629,857	2%	\$616,732	3%
Public sector corporations	\$1,480,270	6%	\$1,480,270	8%
Total	\$26,660,046	100%	\$17,787,678	100%

^a Includes territorial and municipal governments.

As noted above, the duration of funding provided by the various funding partners varies considerably.

Of the total funds provided over the 2012-17 period, 16% of the funds extended over a period of less than 12 months and a further 18% fell within a two-year timeframe. Approximately 31% of the funds extended over a period of 24 to 47 months and 35% extended over a period of four years or more.

¹⁵ YRC includes 15% administration budget cost in every research proposal of which approximately 6% goes to Yukon College and the balance can be directed to YRC administration expenses including supplies and office equipment.

Table 8: Distribution of Funding by Duration of Funding, 2012-2017

Duration of Funding	Units Represented	# of Projects / Activities	Total Funding	% of \$	All Units Excluding CCI		
					# of Projects / Activities	Total Funding	% of \$
Less than 12 months	YRC, NCE, IRC, ReSDA, CCI	68	\$4,247,607	16%	50	\$2,888,168	16%
12 to 23 months	YRC, NCE, IRC, CCI	22	\$4,771,239	18%	16	\$1,926,562	11%
24 to 35 months	YRC, NCE, IRC, ReSDA, CCI	17	\$7,005,683	26%	12	\$2,372,431	13%
36 to 47 months	YRC, NCE	3	\$1,202,146	5%	3	\$1,202,146	7%
48 to 59 months	IRC, ReSDA, CCI	3	\$2,979,316	11%	2	\$2,944,316	17%
60 months or more	YRC	2	\$6,454,055	24%	2	\$6,454,055	36%
Total		115	\$26,660,045	100%	85	\$17,787,678	100%

Diversity of YRC Funding

One of the long-term goals of the YRC as identified in the 2013-2016 Strategic Plan is to increase and diversify funding of the YRC beyond Yukon Government's allocation. Several YRC staff/researchers confirmed that Yukon Government and federal government continue to be the main streams of funding and they also confirmed that additional funding is derived from a broad range of different stakeholder groups.

The following table illustrates the diversity of different funding sources that the YRC units draw from. The core administrative and services unit of the YRC draws funding from 12 different sources across a body of Yukon and federal government departments, First Nations, other governments, academic institutions and public-sector corporations. Both the NCE and the CCI draw their funding from over a dozen different funding sources. The IRC has substantial funding support from the federal government and a collection of private sector companies and public-sector corporations as well as First Nations. The ReSDA unit has the least diversified funding profile with only two funding streams (Yukon Government and academic institutions).¹⁶

The number of government agencies and departments and other organizations providing repeat funding to YRC and its units is significant.

- Six of the seven Yukon government agencies and departments that provided funding to the YRC and its units over the 2012-2018 period provided funding on two or more occasions (funding agreements/contracts).
- Four of the five First Nations that provided funding to the YRC and its units over the 2012-2018 period provided funding on two or more occasions (funding agreements/contracts).

¹⁶ YRC applied to SSHRC for ReSDA funding renewal but was not successful. YRC is currently making an annual submission to SSHRC for funding which is now under consideration. The ReSDA unit is on hold for the time being. The Research Director for ReSDA is currently preparing two books to summarize all of the ReSDA research completed over last seven years.

- Nine of the thirteen federal government agencies and departments that provided funding to the YRC and its units over the 2012-2018 period provided funding on two or more occasions (funding agreements/contracts).
- All three of the other government organizations that provided funding to the YRC and its units over the 2012-2018 period provided funding on two or more occasions (funding agreements/contracts).
- A select number of academic institutions, not for profit organizations, private sector companies and public-sector corporations have all provided funding to the YRC and its units over the 2012-2018 period provided funding on two or more occasions (funding agreements/contracts).

Table 9: Frequency of Funding provided by Different Funding Source for each Unit, 2012-2018

	Funding Source	Unit				
		NCE	IRC	ReSDA	YRC	CCI
Yukon Govt.	Economic Development			2		8
	Education				1	
	Emergency Measures	1				
	Energy, Mines and Resources					7
	Environment	2			7	
	Highways and Public Works	6				
	Yukon Geological Survey	1				1
First Nations	Champagne and Aishihik First Nations	2				
	Jean Marie First Nation	2				
	Kluane First Nation				2	
	Trondek Hwechin First Nation					1
	Vuntut Gwitchin Govt.		1		1	
Federal Govt.	Aboriginal Affairs and Northern Development	7			2	2
	Canada Mortgage and Housing Corp.					1
	Canadian Northern Economic Development Agency	2	1			2
	Canadian Polar Commission					1
	CANARIE					1
	Environment Canada				1	
	National Research Council Canada					2
	Natural Resources Canada	3				
	Natural Sciences and Engineering Research Council	3	7		4	3
	Parks Canada				2	
	Polar Knowledge Canada	2				2
	Social Sciences and Humanities Research Council	2			5	
	Transport Canada	3				1
	Other Govt.	Govt. of Nunavut	4			
Govt. of Northwest Territories					3	
Municipal Govt.						2
Other Funders	Academic institutions ^a	4(1)		2(1)	2(1)	
	Not for profit organizations ^b	4(1)	1(0)			
	Private sector companies ^c	3(0)	8(3)			1(0)
	Public sector corporations ^d	1(1)	3(0)		1(0)	

^a Six different University institutions represented across all units. By unit = # institutions (# of repeat institutions)

^b Four different not for profit organizations represented across all units. By unit = # institutions (# of repeat institutions)

^c Twelve different private sector companies represented across all units. By unit = # institutions (# of repeat institutions)

^d Three different public sector corporations represented across all units. By unit = # institutions (# of repeat institutions)

As described by one YRC staff member, funding from the Yukon Government Department of Education remains crucial at this time and YRC is presently in the last year of a five-year grant which provides approximately \$1.2 to \$1.3 million per year for core staff and some travel related costs. It was emphasized that an ideal scenario would see the funding expanded to cover the costs for the Research Chairs.

Several staff/researchers commented that some level of Yukon Government funding will need to continue to provide core funding for YRC. As noted by one respondent, it is not a realistic goal for YRC to become completely self-reliant on other external funding sources given the relatively small population base of Yukon and the associated economy. Furthermore, it was suggested that it is appropriate for the Yukon Government to remain a YRC funder in some capacity given that YRC research is being done for the benefit of all Yukoners. It was also emphasized that YRC is doing important and needed research that the Yukon Government would ultimately have to do on its own were it not for the YRC taking on this role. It was suggested that the YRC has provided a significant return on investment through applied research that local communities are using (e.g. research on permafrost and highways).

Several staff/researchers suggested that it is also appropriate for the federal government to be a significant funder of the YRC given that the research is relevant across northern Canada and timely for understanding and planning for climate change events that are occurring in regions / communities across the north. One staff member noted that the Tri-Council granting agencies (NSERC and SSHRC) and federal government departments have become more responsive to hearing about the research needs and interests of the north and are gaining an appreciation that things need to be done differently in the north. It was suggested that these agencies are increasingly looking to YRC to provide guidance on how to approach and conduct research in the north and a key aspect of this is the importance of building relations with First Nations in research.

Several staff/researchers believe that with the transition to a university status the institution will face greater competition in going after NSERC and SSHRC grants and a new strategy may need to be formulated/adopted to ensure that the grant applications submitted from Yukon University present the strongest case possible. It was suggested that greater collaboration between YRC researchers and Yukon College faculty will need to be encouraged and facilitated to ensure that research proposals represent the strongest possible grant application for submission.

Deployment of Resources Across YRC Units

Approximately half of the YRC staff/researchers interviewed (9 of 19) feel that the YRC resources are well deployed across YRC's different research areas while one respondent suggested that the YRC resources are not sufficiently deployed and eight were unsure. Many of the respondents, regardless of their view on this question, qualified their response with additional feedback.

There is considerable recognition that more needs to be done in the social sciences field. YRC administration is currently working to recruit someone into a Social Sciences research administrator position along with a research assistant with the aim of eventually moving to a Research Chair position. There is also recognition of the need for a dedicated social science lab. YRC has made progress with the development of an ethics protocol (e.g. tests on animals and humans).

Several staff/researchers emphasized that much of their physical science work being done though YRC has a social element and some initiatives, particularly the work completed through ReSDA, has had a strong social science focus (e.g. *Labour Mobility & Community Participation in Extractive Industries*).

Another area where staff and researchers identified a need for additional support is biodiversity monitoring. As noted by one respondent, this is an area of research that is highly regarded internationally and gains considerable interest when promoted / communicated. It was further noted that the program has a rich body of 40 years of data and more planning is needed to strengthen support and capacity in this unit and ensure its continuity.

With respect to future funding, one funder suggested that YRC needs to do more work in attracting partnerships and building direct relationships with other universities including international institutions and organizations and use this as a platform for pulling in more funds. Another funder observed that YRC needs to continue to look for alternative third-party funding and reduce its reliance on the Yukon Government with the main concern being that Yukon Government priorities can change and the YRC needs a more sustainable model for funding the future of the YRC. It was noted that the Yukon Government has submitted a large proposal (letter of interest) to federal government to support the development of a Centre of Excellence in Yukon and if successful Yukon College could be approached to take on the management role.

YRC Research Activity

Based on a review of YRC quarterly reports and financial details, YRC completed 23 projects in its most recent complete fiscal year (2016-2017) while initiating 29 projects in the same period. Over the last few years, the NCE unit has accounted for the largest number of new projects.

Table 10: YRC Projects Started and Completed by Fiscal Year

Project type	2014-2015	2015-2016	2016-2017	2017-2018 ^a
New projects	38	40	29	19 ^b
Projects completed	42	31	23	37 ^c
New projects below \$50,000	27	21	18	10
New projects \$50,000+	11	19	11	9

^a 19 projects are targeted for completion following the 2017-2018 fiscal year.

^b New projects as of December 2017.

^c Projects targeted for completion in the 2017-2018 fiscal year

Table 11: YRC New Projects by Year and by Unit

Unit	2014-2015	2015-2016	2016-2017	2017-2018 ^a
Yukon Research Centre	11	8	5	2
Cold Climate Innovation	9	10	9	2
Northern Climate Exchange	7	15	15	12
Industrial Research Chair	10	7	0	1
Resources and Sustainable Development in the Arctic	1	0	0	2

^a Targeted for completion following the 2017-2018 fiscal year.

Over the 2012-2017 period, YRC projects have covered a broad range of research interest areas. The following table reflects a categorization of projects by domains of research focus/interest (e.g. environment/habitat, indigenous communities, economic development, mining sector, innovation, etc.). The tabulations reflect the number of projects from year to year by research domain. It is important to note that at least 40 of the YRC projects initiated in the 2012-2017 period have two or more areas of interest and this accounts for the total figure of 156. Based on frequency counts, the leading area of YRC research is the environment/habitat where a total of 78 projects have a principal or partial focus. The next

leading area of research is indigenous communities where a total of 24 projects have a principal or partial focus.

Table 12: Number of Projects by Research Interest Area, 2012-2017

Project Focus		2012	2013	2014	2015	2016	2017	Total
Indigenous communities	#	1	0	7	6	5	5	24
	Annual %	14.3%	0.0%	17.5%	15.4%	16.7%	18.5%	15.4%
Economic development	#	0	3	2	3	1	2	11
	Annual %	0.0%	23.1%	5.0%	7.7%	3.3%	7.4%	7.1%
Environment/habitat	#	3	6	22	19	18	10	78
	Annual %	42.9%	46.2%	55.0%	48.7%	60.0%	37.0%	50.0%
Mining sector	#	1	2	5	3	1	1	13
	Annual %	14.3%	15.4%	12.5%	7.7%	3.3%	3.7%	8.3%
Energy sector	#	1	1	3	2	3	4	14
	Annual %	14.3%	7.7%	7.5%	5.1%	10.0%	14.8%	9.0%
Immigration	#	0	0	0	1	0	0	1
	Annual %	0.0%	0.0%	0.0%	2.6%	0.0%	0.0%	0.6%
Innovation	#	1	1	1	5	2	5	15
	Annual %	14.3%	7.7%	2.5%	12.8%	6.7%	18.5%	9.6%
Total	#	7	13	40	39	30	27	156 ^a
	Annual %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

^a At least 40 of the projects have two more areas of interest which accounts for the total figure of 156.

Developments in YRC Services / Products / Research Capacity

There have been a number of developments in YRC services/products/research capacity over the last few years. Key developments since 2013 include the following:

- The establishment of the two AVP positions – Research Operations and Research Development
- The establishment of the new IRC position in the NEI unit
- The establishment of the First Nations Engagement Advisor position
- Expanded team of researchers and student positions.
- Although the ReSDA program recently wrapped up, YRC is actively looking to secure funding to fill a Social Sciences research position with the long-term goal of establishing a Social Sciences Research Chair. This could potentially be a post doc research chair with a key focus on identifying the key social science research topics/priorities and an agenda for research.
- CCI branched off onto its own program in 2017 and is no longer part of YRC. CCI is funded by the Yukon Government Department of Economic Development and has three areas of focus – support research, innovation and commercialization of sustainable cold climate technologies. CCI has built its capacity over the years and this remains an active process. The mandate of CCI is a somewhat different from that of YRC in that CCI supports applied research with the purpose of trying to stimulate economic activity.

A key change in the YRC since the initial years of its formation is the movement from a role that largely focused on coordinating research and relying on other outside institutions/partners to a role of leading the research with locally based researchers and connecting with partners to assist with research as needed. As described by one respondent, YRC has taken on a much greater role in leading its NCE research projects and working with and utilizing partners to fill gaps in expertise and support where needed. Additional leadership growth and capacity has occurred with the establishment of the Research Chairs who are now running their own programs. A common observation from many of the staff/researchers is

that YRC has progressively taken on more research projects and expanded its team of researchers in the process.

YRC staff and researchers emphasized the importance of YRC pursuing research that is driven by community needs/interests including the long term needs of First Nations. It was stressed that YRC needs to continue to search for and secure funding that aligns with local needs/interests and where applicable dialogue with funders to adapt funding criteria to better accommodate and respond to local needs/interests. As noted by one respondent, Yukon College and YRC need to use their reputation and influence to advocate for research funding priorities in local/northern context with a strong emphasis on linking research to applications in the community.

Several staff/researchers noted that YRC has progressively improved and enhanced its approach in engaging and collaborating with Yukon First Nations. As described by one respondent, YRC is promoting open communication and dialogue with First Nations and with the larger national level discussion taking place on truth and reconciliation there is growing interest and enthusiasm for partnering with YRC with an understanding that research will be meaningful, collaborative and accessible at a community level. Since 2013, YRC has developed protocols, procedures, and best practices on how to involve and engage with First Nations people and one respondent described this change as a real evolution in working with First Nation communities.

Another positive development has been the increased interest on the part of researchers to promote and communicate their research activities and findings beyond the minimum requirements of producing reports for funders. As observed by one respondent, there was little focus or expectation for research marketing/communication in the initial years of the YRC but over the last 5-6 years there has been a significant change related to this aspect of the research culture. It was emphasized that researchers have become increasingly proactive in reaching out and working with the marketing/communications staff to plan ahead and to even engage in marketing/communication discussions and planning during the project design stage. One respondent stressed the importance of having researchers and marketing/communications staff working in close physical proximity to each other as this is very helpful in reinforcing the communication aspect of research and facilitating information sharing between researchers and marketing/communication staff.

Staff and researchers noted that the YRC is increasingly producing information that has greater utility beyond a technical report. As described by one respondent, YRC is actively working to improve access to information coming out of the research projects and producing materials that can be better/more fully utilized by communities (e.g. in person presentations, pamphlets, online tools, videos). It was further noted that NCE has done very well in combining First Nations information sources with government information sources to provide an overall assessment (e.g. development of a Flood Risk Assessment Tool for Yukon Communities).

Several researchers commented on their personal growth and development of expertise in their areas of research focus. As noted by one respondent, YRC researchers are becoming the experts in their field of research with their growth and expansion of capabilities. Another respondent commented on his progressive development of expertise in permafrost research through YRC projects and through networking globally with others in this field of research. It was further observed that YRC projects have evolved from localized community projects (e.g. hazard mapping related to climate change) to regional hazard assessment for highways. Several staff/researchers noted that with the transition to university

status there will be a greater need to build out from the focus on applied research to include theoretical research. It was suggested by several respondents that this expanded role of the YRC will need to be done with consideration to not inadvertently undermine the strong reputation/connection that YRC has established with the communities.

YRC has made progress in collaborating with industry in leading/supporting research and development.

The IRC in the NEI unit works with the with the Northern Energy Consortium who represent the energy industry across the northern territories (ATCO Electric Ltd., Northwest Territories Power Corporation, Qulliq Energy Corporation, and Yukon Energy Corporation). The consortium is structured to facilitate and support the sharing of knowledge and resources for the purpose of carrying out research to find solutions to industry related challenges. The applied research will focus around finding innovative solutions to industry related challenges as determined by the Consortium (e.g. integration of renewable energy into isolated community grids, energy storage, improving efficiency of diesel systems). Recent consortium directed projects include:

- Finalized Phase I report for the “Small Scale Distributed Energy Resource Technologies within the Northern Context” project
- Launching of the “Northern Energy Work Space” (NEWS) platform with INAC
- Alternative energy projects - ongoing

The Mine Life Cycle unit has worked with/for the Yukon Mining Research Consortium that consists of Casino Mining Corporation, Alexco Resource Corp., Capstone Mining Corporation, Selwyn Chihong Mining Ltd., and Victoria Gold Corporation. The consortium is structured to provide guidance to the direction of the program by identifying industry-related challenges that would benefit from applied research solutions. Recent consortium directed projects include:

- Learning with constructed wetlands
- Bioremediation in cold climate
- Fish otolith chemistry for environmental assessments
- Metal uptake in northern constructed wetlands
- Mine site sequestration with leonardite

Staff/researchers confirmed that there is generally very limited industry involvement in the other YRC units. As noted by one respondent, within the NEC unit there is limited partnering with private industries and the focus is mostly on communities. It was suggested that there is the potential for expanded collaboration with industry in the future as well with other academic institutions through the supervision of students.

Industry involvement/engagement in the Biodiversity and ReSDA units appears to be very limited. ReSDA has indirectly been engaged with the mining industry through its research of mining sector labour mobility issues and trends from perspective of mine sector workers.

Several staff/researchers observed that there is opportunity for the YRC to expand its engagement and collaboration with industry on research projects. A key qualification provided by some respondents is that the research needs to be relevant to First Nations needs/interests and not just corporate interests – especially if a multinational interest is involved.

As observed by one respondent, the mining industry needs to work with First Nations as early and as often as possible to facilitate relationship building. It was noted that the YRC has developed a good reputation with different First Nations and YRC researchers can play an important role in assisting the development of relationships. For example, a key interest of First Nations is knowledge sharing and having access to

research findings and YRC could support industry partners in ensuring that data/information is returned to First Nation communities in a structure and format that offers the greatest utility. One respondent observed that the ideal outcome is for industry to show leadership in providing jobs for First Nations that allow for promotion through the ranks (e.g. allow for and encourage and support a heavy equipment operator to move into a management position).

Stakeholder Observations on YRC Strengths

Key informants across all stakeholder groups were asked to identify the major strengths of the YRC.

YRC staff/researchers: A key strength identified by key informants was the excellent working environment of the YRC – which was mentioned by over half of the interviewees (11 of 19). Respondents commented on the strength of the YRC team and their ability to adapt to changes during research. The research expertise in the YRC was also mentioned frequently by staff who commented on the wealth of knowledge and expertise of their fellow researchers (e.g. expertise in climate change research). Similarly, the key informants commented on the YRC's ability to meet local needs as a northern based research centre. Respondents encapsulating this attribute with the phrase 'Research in the North, by the North, for the North' (6 of 19). Many of the respondents (7 of 19) commented on the quality and strength of trusting relationships that YRC has built with local communities – particularly First Nation communities. Other strengths that were identified include: strong partnerships with industry, academia, and Arctic stakeholders; the ability of YRC to apply research knowledge (i.e. industry, education, and jobs); and the trust that YRC has built with industry and government partners.

YC officials/faculty: The strength identified most often by this group of key informants was YRC's engagement with First Nation communities (4 of 8), followed closely by comments around YRC's northern focus (i.e. Research in the North, by the North, for the North) (3 of 8). Other strengths that were mentioned by more than one interviewee include: YRC's ability to engage with Yukoners, student engagement, quality staff/researchers, YRC's success in securing project funding, and the value that YRC has added to Yukon college. The key informants associate a high value with the range and quality of research being conducted through YRC. Additional strengths noted by some interviewees include: YRC collaboration with southern universities, the ability of YRC to draw young researchers to the north, and YRCs open mindedness about what innovation means in the northern context.

Students: Most of the students (4 of 5) identified the quality of YRC staff/researchers as a major strength and several students (3 of 5) also emphasized that YRC is strong in the area of community engagement. Two students mentioned the importance of YRC conducting relevant research (i.e. research that is relevant to the priorities and values of Yukoners). Other strengths mentioned by students include: YRC is located in the north, the body of YRC staff/researchers have institutional memory, YRC supports student involvement in research, and YRC research incorporates flexibility and two-eyed seeing (i.e. use of both First Nation's traditional knowledge and scientific knowledge in their research).

Government Officials: The main strengths identified by government officials were YRC's connectivity to other institutions and organizations (4 of 7) and passionate researchers and staff (3 of 7). Key informants also talked in length about the location of the YRC in the circumpolar north, citing northern specific expertise and studying areas that are relevant to the north as strengths along with community engagement. Other strengths identified by government officials included: the accessibility of YRC staff/researchers (i.e. they are easy to contact and work with), the diversity of skills and experience held by YRC staff/researchers, and the success of YRC in securing research grants and funding.

Non-profits: Key informants identified the technical expertise of YRC staff/researchers as a key strength of the YRC (2 of 3). Interviewees talked about the quality of staff and researchers at the YRC with one

specifically highlighting YRCs ability to communicate and engage with the public. Other strengths identified by interviewees included YRC's ability to identify relevant areas of study and its ability to secure research grants and base funding.

Private sector: Key informants from the private sector had a diverse list of strengths based on their personal experience working with the YRC. All five key informants noted that a key strength of the YRC is its ability to conduct high quality, relevant research in the north. Other strengths identified by the key informants include YRCs commitment to community engagement, its interdisciplinary approach to research, and its ability to develop solid industry partnerships. One respondent noted that YRC is doing a good job in communicating/disseminating research to the public. It was also noted that YRC is serving an important role in developing talent (e.g. through student engagement) and increasing the knowledge base of the Yukon.

Stakeholder Observations on the Unique Attributes of YRC

Key informants representing the partner and user groups were asked to share their views on the attributes that make the YRC unique/exceptional.

YC officials/faculty: A variety of observations were made regarding what makes the YRC different from other research institutions. The most common themes mentioned include: the YRC's northern focus in research activity that is aimed at northern issues/needs (4 of 8), the YRC has established good relationships with Yukon First Nation communities (4 of 8), and the YRC has good working partnerships with local northern communities (4 of 8). Other characteristics of the YRC that are seen as being unique include YRC's focus on climate change research, the high level of student engagement, and their high degree of service orientation – a quality that is attributed to the fact that the YRC remains largely soft funded. Respondents noted that there is nothing else like the YRC in the north and that its location and focus on northern research in and of itself makes it unique in the circumpolar north.

Students: Students identified YRC's location and focus on northern science as key features that set it apart from other institutions (3 of 5). As noted by one student, YRC provides *"a unique ability for the researchers here to be physically present doing research in the north as opposed to being based in southern institutions doing similar research."* Another student pointed out that the YRC understands the issues and challenges that are specific to the northern context. The importance of being physically present to do ground research was echoed by one student who stated that YRC provides a necessary link for southern researchers to conduct research in the north. Other unique features associated with YRC include the strong connection the institution has with First Nation communities, the strong focus on conducting field research, and the small size of the YRC which makes it easy for students to connect with faculty and staff.

Government officials: Government officials reported that YRC's northern presence or perspective (i.e. ability to understand northern issues) makes it unique (3 of 7), along with the YRC's ability to work with outside agencies (2 of 7). One official commented on the importance of the YRC's physical presence in the north, emphasizing that it allows for more direct and frequent engagement and communication with YRC staff/researchers and this facilitates a deeper connection to the research activity than is possible with researchers based in the south. Two key informants described the YRC as only centre of its kind in the North and highlighted the quality of YRC staff/researchers and the level of community involvement in research activities as standout features. As noted by one key informant, the YRC is interested in working with the community and other relevant organizations and not just isolated academics. One interviewee concluded their interview by saying how impressed they were with all the work that the YRC does and commending the team on the leadership they have shown in their research areas, noting that *"for a small place they do quite a lot."*

Non-profits: There was a general consensus among the three key informants that the YRC is valuable as a local research institute in the north. As observed by one respondent, “the YRC is meeting the needs of the Yukon, which is different than the needs of the NWT or Nunavut.” While one respondent referred to the YRC as the lead research institution in the north another respondent indicated that the YRC is unique simply in the fact that there is nothing else like it in all of northern Canada. One respondent emphasized YRCs strong link to communities as a key feature.

Private sector: The majority of key informants (4 of 5) identified YRCs location (i.e. studying relevant northern issues in the north) and community engagement as the main things that sets the institution apart from other research institutions. Studying topics that are relevant to the northern context (e.g. permafrost research) was identified as important for northern partners. It was also noted that Yukoners have a high level of trust in the YRC and feel that they can rely on the research. Private sector representatives emphasized the important role of the YRC in helping others including private businesses further advance their own research.

YRC staff/researchers: Although YRC staff/researchers were not directly asked for their views on what makes the institution unique, several key informants provided comments that touched on this topic. One respondent talked about how the research projects are being used to provide opportunities for student researchers and how they hope that this continues, noting that they would like to see the YRC continue to grow for the young people. Another respondent commented on the quality of the staff/researchers and how much people enjoy working at the YRC and further observed that the interest and commitment exhibited by the researchers in working year to year with short term funding is a demonstration of how passionate they are about their work and contributing to the success of the YRC.

Stakeholder Observations on YRC Success

Key informants representing the partner and user groups were asked to comment on how successful the YRC has been in each of the different research areas. Key informants were encouraged to focus only on the research areas they were directly engaged with or reasonably familiar with.

The large majority of respondents (70%+) gauged the Northern Climate Exchange unit, the Mine Life Cycle unit, and the Northern Energy Innovation unit to be very or moderately successful in their operations/activities. A smaller proportion of respondents felt that the Biodiversity Monitoring, ReSDA and Technology Innovation units were similarly successful. However, it is important to note that a substantial proportion of the total respondents for the ReSDA and TI units were unsure.

Table 13: Success of YRC Units: Partner/user Observations

Research Area	Very-Moderately Successful		Minimally-Not at all Successful		Don't Know/Unsure		Total
	#	%	#	%	#	%	
Northern Climate Exchange	21	87.5%	0	0.0%	3	12.5%	24
Northern Energy Innovation	8	72.7%	0	0.0%	3	27.3%	11
Biodiversity Monitoring	5	55.6%	2	22.2%	2	22.2%	9
Mine Life Cycle	8	80.0%	0	0.0%	2	20.0%	10
ReSDA	3	33.3%	1	11.1%	5	55.6%	9
Technology Innovation	5	50.0%	0	0.0%	5	50.0%	10

YC officials/faculty: At least one YC official/faculty member provided a ranking for each of the six research areas. Northern Climate Exchange, Mine Life Cycle, and Technology Innovation were all reported as ‘very’ to ‘moderately’ successful while Northern Energy Innovation was reported as ‘moderately’ successful.

Biodiversity Monitoring and ReSDA were considered to be ‘moderately’ to ‘minimally’ successful by YC officials/faculty.

Students: Students reported that the Northern Climate Exchange was ‘very’ successful. ReSDA and Technology Innovation were reported as ‘moderately’ successful.

Government officials: Government officials reported on the Northern Climate Exchange, Northern Energy Innovation, Biodiversity Monitoring, Mine Life Cycle, and ReSDA. Interviewees reported all of these research areas as ‘very’ to ‘moderately’ successful.

Non-profits: Interviewees reported that the Northern Climate Exchange was ‘very’ to ‘moderately’ successful.

Private sector: The research areas reported on by private sector respondents were Northern Climate Exchange, Northern Energy Innovation, Mine Life Cycle, and Technology Innovation. Interviewees reported all of these research areas to be ‘very’ to ‘moderately’ successful.

YRC staff/researchers: Although staff/researchers were not asked to report on the level of success for each unit, they were asked to report on whether they felt the YRC was meeting stakeholder expectations. All of the key informants that responded to this question agreed to some extent that the YRC was meeting stakeholder expectations (14 of 16 respondents ‘agreed’ or ‘strongly’ agreed and two respondents ‘slightly agreed’). One respondent elaborated that some projects have multiple partners and some partners may feel or experience a greater benefit than others depending on their interests in the research and the results. Another respondent noted that the YRC has more work to do in reaching out to and working with some of the First Nations that have greater capacity challenges.

Stakeholder Observations on Areas for Improvement for YRC

Key informants across all stakeholder groups were asked to identify areas of improvement for the YRC. The following subsections outline the areas for improvement that were identified by each stakeholder group.

YRC staff/researchers: The key area for improvement noted by interviewees involves strengthening YRC’s research capacity (9 of 19). Interviewees specifically noted the need for greater research capacity in the social science area. Interviewees also talked about the need for securing sustainable funding streams (8 of 19), noting that the majority of funding currently comes from short-term government contracts which makes it difficult to plan long-term research studies. The challenge around sustainable funding was also said to be a potential deterrent for young researchers who are thinking about settling down. Staff would like to see their researchers stay in the North for the long-term and there was some concern about researchers leaving after a few years without better job security.

Strengthening the link between the College and the YRC was also mentioned by a number of interviewees as an area for improvement. The need for encouraging/supporting greater YC faculty involvement in research and bringing more YRC researchers into the classroom was mentioned by at least six key informants. Other suggested areas for improvement include: working with local communities to develop their research capacity, continuing to expand/increase First Nations involvement (i.e. use of traditional knowledge in research), increased/improved research communication in publication in peer review journals, continuing to expand/improve student engagement, and continuing to ensure that research projects maintain a focus on needs that are responsive to Yukon communities (e.g. food security, housing, and energy).

YC officials/faculty: The main areas for improvement identified by key informants include preparing for the transition to Yukon University (specifically in furthering the relationship with the academic side of the

college) (4 of 8) and strengthening the social sciences component of YRC (4 of 8). Key informants are particularly interested in increasing community engagement in the research process. Other suggested areas for improvement include: developing/promoting greater staff retention through greater job security, increasing the number of peer-reviewed scientific publications coming out of YRC, continuing to increase/enhance student engagement, strengthening the relationship between YRC and Yukon Government, developing and implementing more YRC promotional activities/events, and developing a shared/collaborative vision between the College and the YRC.

Students: Most of the students (3 of 5) suggested that more community involvement and collaboration with First Nations community is needed. Specifically, students noted that the YRC should help First Nation communities build/develop their research capacity and help to train people in research to ensure that they have a more active role in research projects going forward.

Other areas for improvement suggested by students include: increasing the level of student engagement, increasing the level of engagement between the College and the YRC, increasing the number of research projects focuses on social science, improving the process for disseminating research results to the general public, and increasing partnerships with outside research institutions. One student suggested that a more formalized approach is needed to assist/support outside researchers as they arrive at the YRC (e.g. orientation to available space and services).

Government officials: Respondents are generally pleased with the research work being done by the YRC and want to continue to see the YRC conducting research for the long term. Their main suggestions for improvement included diversifying the areas of research (i.e. increasing social science research) (3 of 7) and diversifying the YRC funding streams and reducing reliance on Yukon Government funding (2 of 7). Another suggested area for improvement is for the YRC to work with other northern research centres to further develop research capacity across northern Canada (e.g. develop stronger research partnerships with other northern institutions).

Other areas for improvement mentioned by government officials include: continuing to build/develop YRC capacity and in-house expertise, linking YRC research to YC education programs/courses, and increasing promotions/communications on YRC research activities and findings including greater involvement in peer-reviewed publications.

Non-profits: A key area of improvement mentioned by interviewees is YRC's relationship and collaboration with local communities and agencies. Increased community and first nations engagement was mentioned by two key informants with one suggesting that the YRC create more opportunities for young people to get involved in research (i.e. high school students). Another respondent noted that they had been disappointed with YRC in the past because the YRC representative did not engage with them or share research findings as much as they would have liked. While the respondent noted that the relationship with YRC has recently improved, they would like to build upon their partnership and become more of a 'true' partner in research. Other suggested areas for improvement mentioned by respondents include improving the YRC funding streams (i.e. more diversified funding or fully based funded) and increasing the integration between research and teaching.

Private sector: Key informants identified a need for change in the way that YRC collaborates with their partners. Improved communication with industry and First Nations partners was mentioned by all three respondents. One respondent noted that YRC needs to be mindful/attentive about ensuring that partners are properly given credit in collaborative projects. Increased/improved connection with the College was another area of improvement noted by an interviewee who suggested that the YRC might not be utilizing College resources to their fullest.

Other suggested areas for improvement include improving communication links between Cold Climate Innovation and Technology Innovation, securing long term funding for YRC, advancing knowledge sharing, ensuring continuity in research, and developing realistic workloads (i.e. not overcommitting on projects).

Stakeholder Observations on YRC Future Planning/Priorities

Key informants representing the partner and user groups were asked to share their views where they feel YRC should be prioritizing its efforts/activities. In general, it appears that engagement with entities outside of YRC is a key priority area and this appears to be especially true for engagement with students and First Nation communities, while engagement with industry and government also remain key important priorities (especially in terms of sustainable funding interests).

All of the respondents identified engagement with Yukon First Nations as a moderate to high priority and close to 90% of the respondents identified student engagement, industry partnerships, and innovation as moderate to high priorities. Over 80% of the respondents identified research publication as a moderate to high priority and over 70% identified mine and resource development as a moderate to high priority. Only about half of the respondents identified commercialization of innovation as a priority for the YRC (this view is likely a reflection of the movement of CCI outside the YRC).

Table 14: Prioritising YRC Activities: YRC Partners/Users

Activity	High-Moderate Priority		Minimal-Not a Priority		Don't Know/Unsure		Total
	#	%	#	%	#	%	
Student engagement	25	89.3%	2	7.1%	1	3.6%	28
Industry partnerships	23	88.5%	2	7.7%	1	3.8%	26
Innovation	17	89.5%	1	5.3%	1	5.3%	19
Commercialization of innovation	12	52.2%	8	34.8%	3	13.0%	23
Mining and Resource Development	18	72.0%	5	20.0%	2	8.0%	25
Yukon First Nations engagement	28	100.0%	0	0.0%	0	0.0%	28
Publication	23	85.2%	4	14.8%	0	0.0%	27

Key informants representing the partner and user groups were also asked to share their views on what they believe the YRC needs to plan for. Over half of the respondents cited the College's transition to a university as a key development that the YRC needs to plan/prepare for (15 of 28).

YC officials/faculty: Half of the key informants (4 of 8) reported that the transition to a university was the main thing that the YRC needs to plan for in the next few years, with one respondent highlighting that College officials will need work with YC faculty and the YRC to identify and promote research opportunities between the YRC and the university. As observed by one respondent, this will include the development of a collective of activities to promote engagement and service support for researchers and students.

Another suggestion for future planning consideration is continuing engagement with First Nations under the umbrella agreement. As noted by one respondent, YRC will need to determine the best way to support Yukoners and industry partners under the new umbrella agreement and that YRC should explore what other indigenous governments are doing across the circumpolar north

Key informants also noted that the growth/expansion of mining activity in the Yukon will present new research opportunities for the YRC.

Students: Students were generally less certain about the future planning needs of YRC compared to other stakeholder groups. Two students noted that the YRC will need to plan for the transition of YC into a university while one student suggested that more emphasis is needed on examining food security issues in the north and the related challenges/opportunities emerging alongside ongoing climate change.

Government officials: Key informants cited changes in government funding as a main area that the YRC needs to plan for (4 of 7). One respondent commented that there is considerable federal government funding committed for climate change research and YRC needs to remain informed/aware of these opportunities for securing more funding. Conversely, one key informant cautioned that government elections can sometimes intervene and result in sudden changes in funding support which highlights the need for YRC diversifying their funding streams.

Funders recognize that the YRC has made great progress in several areas of research and developing their capacity. One respondent emphasized that the YRC is still a relatively young institution and has faced some challenges in finding the right management structure. The respondent is hopeful that the new management structure with the two AVPs will help in providing more leadership to guide the YRC forward. It was stressed that the two AVPs will need to collaborate and form a good working relationship where they can establish distinct areas of responsibility and proceed to focus on those areas to move forward in a more strategic way.

Non-profits: Key informants identified two areas for future planning. One respondent mentioned the importance of YRC planning for the College's transition to the university and one respondent commented on climate change as a broader issue that will continue to affect northerners long-term, and therefore research in this area will remain important.

Private sector: Responses to this question were broad across the key informants. One respondent suggested that the YRC needs to continue to diversify its funding streams as a form of insurance against changes in government and shifts in policy priorities. Several respondents see potential for research growth in the Yukon with additional opportunities to be explored in automation and robotics for northern industries. The College's transition to a university was mentioned by one respondent as an area for preparation. Key informants also noted the need for more social science research and the need for exploring/improving ways to more creatively communicate and interact with First Nation communities.

Effectiveness – Summary

The YRC generated a total of \$26.6 million in funding income for the 2012-2017 period of which the large majority (78% or \$20.7 million) was generated in the 2014-2017 period. YRC funding is derived from three major groups of funding sources. The Yukon Government accounts for about half of the total YRC funding while the federal government accounts for about a third of the total funding and the balance of funding is derived from other sources. It is important to emphasize that the funding is derived from multiple sources within each of these groups. In the case of the Yukon Government, a total of seven different agencies/departments have provided funding to YRC while a total of 13 different federal government agencies/departments have provided funding to YRC. The remaining funding was derived from at least 18 different sources representing a broad range of First Nations groups, other governments, academic institutions, not for profit organizations, public sector organizations, and private sector businesses.

The large majority of YRC funders have provided funding on two or more occasions which serves to illustrate that YRC has become a reliable and trusted research institute in the eyes of its partners/users. At least six different Yukon Government agencies/departments, nine different federal government agencies/departments, four different First Nations groups, three other governments and numerous other organizations including academic institutions, not for profit organizations, public sector organizations, and private sector businesses have provided funding to YRC on more than one occasion.

While the YRC continues to rely on the Yukon Government for a substantial proportion of its funding, this can be justified from the standpoint that YRC research is being done for the direct or indirect benefit of

Yukoners. The same justification can be made for continued support from the federal government in that many aspects of YRC research has strong relevance for all of northern Canada. That being said, a continued effort can be made by YRC to locate alternative funding (e.g. partnerships with other academic institutions including international institutions, partnerships with private sector interests).

With respect to research project activity, the last few years have been a very busy period for YRC. There were 29 new projects in the most recent complete fiscal year (2016-2017) and this number reached a high of 40 projects in 2015-2016. Over the last few years the NCE unit has accounted for the highest number of new projects.

YRC services, products and research capacity have developed over the last few years. Key developments include the establishment of the two AVP positions, the establishment of the Research Chair in the NEI unit, the establishment of the First Nations Engagement Advisor position, and a general expansion of researchers and student participation. Although the ReSDA program recently came to an end, YRC officials are actively looking to secure funding to secure a social science research position. One other recent development is the separation of the CCI unit from the YRC.

A key overarching development in research activity at YRC is the advancement of its leadership role in progressively taking on more projects and being the lead agency (vs. being a coordinating agency) and the establishment of the Research Chairs who run their own programs. Staff and researchers continue to have a strong commitment to pursuing research that is driven/informed by community needs and interests including the long term needs of First Nations.

YRC is progressively expanding its collaboration with industry, particularly in the NEI unit under the Research Chair and also within the Mine Life Cycle where energy and mining sector consortiums are playing a guiding role in supporting applied research to find solutions to industry related challenges. YRC staff/researchers view industry related research as a potential growth area, especially in the context of facilitating broader collaboration with First Nations on resource development opportunities.

Staff and researcher interest and time investment in research promotion/communication has progressed in recent years with researchers taking a more active role in reaching out to and working with marketing/communications staff to plan ahead for the development of promotional and marketing materials and activities. Having researchers and marketing/communications staff in close proximity is important for reinforcing the communication aspect of research and facilitating timely information sharing between researchers and marketing/communications staff. YRC is progressively working to make research news and findings more accessible through the use of different formats (e.g. presentations, pamphlets, online resources, videos, etc.). There is recognition that with the transition to a university, YRC researchers will need to build out from its applied research focus to include theoretical research and there is strong interest in maintaining efforts to provide research findings that are highly accessible for local communities.

YRC has developed a number of strong characteristics/attributes that could be featured as part of ongoing promotional/marketing campaigns. For example:

- YRCs physical presence in the north is seen as a strategic strength in enabling researchers to more directly engage with local stakeholder groups, establish trust and develop deeper and more meaningful connections/relations.

- YRC researchers are broadly viewed as being highly qualified and passionate about northern based research.
- YRC research is broadly viewed as being high quality and relevant to the lives of Yukoners.
- YRC is broadly recognized as being highly committed to developing strong collaborative relationships with local communities and First Nations.
- YRC is broadly recognized as being highly committed to providing opportunities for student involvement in research activities.

Some YRC units appear to have a higher profile (visibility) and a greater level of stakeholder awareness than others. The NCE unit for example has a longer history that predates the formation of the YRC and it is well known among stakeholder groups. With respect to partner/user perceptions of general success, a higher proportion of partners/users perceive the NCE unit, Mine Life Cycle unit, and NEI unit to be successful compared to the Biodiversity unit, Technology Innovation unit, and ReSDA unit. Lack of awareness appears to be a contributing factor in the lower ranked units.

With respect to areas for improvement, the following themes emerged from the analysis:

- Identify/secure long term sustainable funding to support researchers (i.e. secure long-term researcher capacity and continuity).
- Strengthen connections between YRC and Yukon College (e.g. develop a shared/collaborative vision between YRC and YC, support/encourage YRC researcher and YC faculty engagement, support integration/linkage of YRC research and YC education programs).
- Strengthen partnerships with research partners to provide greater opportunities for engagement/input into research design and implementation as well as input how updates/progress reports and final results are packaged/presented and shared.
- Support/encourage YRC researcher involvement in producing articles for peer review journals.
- Support research capacity development in communities/First Nations.
- Support/encourage greater use of First Nations traditional knowledge in research.
- Support/facilitate improved communications with First Nations and industry.
- Expand YRC research capacity in the social sciences

Areas of high priority for the YRC as viewed by partners/users include Yukon First Nations engagement, student engagement, industry partnerships, innovation and research publication. Partners/users view the College transition to university as a key development that YRC needs to plan and prepare for.

3.4 Access/Reach

YRC Research Promotion/Information Sharing

A review of YRC publications and presentations as detailed in YRC reports and YRC web-based resources reveals that YRC staff/researchers participated in at least 14 different oral presentations, 13 different poster presentations, and prepared over 40 research related reports/publications over the 2014-2016 period (see Appendix C).

YRC staff/researchers confirmed that a variety of techniques are used to share and disseminate YRC project results. Apart from simply producing technical reports as part of their funding agreement, respondents mentioned that multiple techniques were used to share information including posting reports on the YRC website (7 of 19), attending and presenting at conferences (6 of 19), and sharing project results with local news outlets and on social media (4 of 19). Researchers also reported being

active in sharing project results with community stakeholders using a variety of techniques to disseminate information including producing maps and posters, presenting at schools, and presenting to government officials. One respondent commented on the creativity of some of the researchers noting that they have used anything from a community bingo night, to podcasts, to one instance where they created a comic on permafrost featuring the researchers as superheroes.

YRC currently has a marketing and communications coordinator that supports researchers in their communications. During the interviews it was clear that many of the staff/researchers rely on the communications coordinator to market/communicate the work that the YRC is doing.

YRC staff/researchers were asked to provide information on the types of personal electronic media sources that they use to share YRC project information / news. As shown in the following table, there does not appear to be a high number of staff/researchers using electronic media sources (e.g. LinkedIn, Research Gate, Yukon College’s OpenScholar account).¹⁷ While some staff/researchers have been engaged in using electronic media for sharing information/resources, most reported little to no online engagement.

Table 15: Electronic media used by YRC staff/researchers to share YRC related news/information

Electronic Media Type	#	%	Total
LinkedIn – posting / publishing	3	15.8%	19
Research Gate	5	26.3%	19
OpenScholar @ Yukon College	1	5.3%	19
None/NA/no response	9	47.4%	19
Other, please specify: Social media (i.e. Facebook, Instagram, Twitter, YouTube)	2	10.5%	19

Although efforts to promote research have been improving (particularly in the development of a communications plan during the project planning stage), YRC staff/researchers are aware of some areas for improvement. A key area for improvement as noted by staff and researchers is to increase YRC activity in publications. Interviewees pointed out that the YRC is not currently publishing in peer-reviewed journals with time constraints being cited as a key limiting factor. One interviewee suggested that it would be beneficial to have a journal out of the College while another interview suggested that researchers should be more active publishing in non-academic articles (e.g. Northern Public Affairs magazine).

Another recommendation put forward by an interviewee is to encourage more community involvement and capacity building, particularly in the area of including local representatives as part of the project presentation team. While acknowledging that some communities have greater capacity and individuals who are able to take on a presentation role, it was emphasized that YRC should strive to support and enable local residents to participate in this role.

Over half of the YTC staff/researchers interviewed reported that they have attended and/or presented at conferences in the last four years (11 of 19). YRC quarterly reports show that staff/researchers have participated in 1-4 conferences a year, and that YRC staff have been present at the Artic Net Change conference three years in a row (see Table 16 below).

¹⁷ A small number of YRC staff/researchers were pilot testing OpenScholar at the time of the evaluation. YRC has a twitter account and some staff / researchers periodically post to the account.

Table 16: YRC Staff Conference Presence ^a

Year	2014-2015	2015-2016	2016-2017	2017-Present ^b
Conference Name ^c	ArticNet Conference, Ottawa, ON	ArticNet Conference, Vancouver, BC	ArticNet Conference, Vancouver, BC	CICan Conference 2018, Victoria, BC (Upcoming)
	Arctic Social Science Conference, Prince George, BC	American Geophysical Union (AGU) Conference		Polar Conference 2018, Davos, Switzerland (Upcoming)
	European Conference on Permafrost, Evora, Portugal			
	Annual Conference of the Center for Nordic Studies, Quebec, QC			

^a Data Source: YRC Quarterly Reports (2014-2018)

^b Data Source: Staff Interviews

^c This table reflects conferences noted by key informants and/or identified in YRC quarterly reports. It is not intended to be comprehensive.

In addition to the above conferences, YRC staff/researchers reported involvement in a variety of different workshops, councils, panels, and summits that they have personally been involved with over the years. The following is a list compiled from staff/researcher interviews:

- Annual ReSDA Workshops
- Expert Panel on Climate Change Adaption and Resilience
- NA'TSA'MAHT conference
- Yukon River Intertribal Council (11th Biennial Summit, August 2017)
- Science Community of Practice (SCOPE)
- Canadian Geotechnical Conference
- Arctic Energy Summit
- Raptor Research Conference
- UBC Mining Conference

YRC staff/researchers were asked to indicate their level of satisfaction with the effort being made to produce and share project reports and information. A total of 14 staff/researchers responded to this question with 12 saying that they were generally satisfied with the effort being made by the YRC to produce and share reports, however all interviewees felt that there was more that they could be doing to share/disseminate information. Although several interviewees noted that the YRC team is producing quality reports, at least four respondents mentioned the need for YRC researchers to become more active in getting published in peer review journals. Several staff also identified the need for the College/YRC website to be updated (e.g. ensuring research project profiles are up to date and web links are operational).

One respondent emphasized the importance of planning out the research communication strategy from the beginning noting that developing a communications plan early on will help to ensure that researchers communicate results effectively. Another interviewee acknowledged that the researchers are aware of this and that some have started to include a communication plan in the project life cycle, however this is something that all researchers need to be doing.

Other suggestions for improving communications/marketing include ensuring that research reports are written in plain language to make the results more accessible to community stakeholders, increasing the

available funding for conferences (i.e. building this into the YRC funding model), improving internal communications and information sharing (i.e. information sharing on campus to reach faculty), and increasing the use of social media platforms.

Access/Reach – Summary

As noted elsewhere in this report, YRC engages with a broad range of stakeholder groups in its research activities. While it is recognized that YRC has successfully developed positive relationships with local communities and First Nations it is also recognized that YRC could potentially do more to facilitate deeper levels collaboration where partners are provided with expanded opportunities for engagement in the research design and implementation phases as well as the reporting/communication phase.

It is generally acknowledged that efforts to promote/communicate YRC activities and research have been improving and marketing/communication staff have been helpful in supporting researchers. With respect to information sharing, YRC research reports and publication materials are accessible for downloading from the YRC website. It is important that the website be routinely monitored to ensure that embedded web links are operational and that project profiles are reasonably up to date. With respect written materials produced for a general audience, it is important that these be produced in a plain language to make the information/research results more accessible.

YRC staff/researchers actively promote research initiatives through a variety of methods including attending and presenting at national and international conferences. There is interest among this group to see an expansion in the amount of funding made available for conferences (i.e. build this into the YRC funding model).

Presentations, workshops, maps, and posters have been used by YRC for direct engagement with communities. Collectively, YRC staff/researchers have made limited use of electronic/social media platforms for sharing news and information. The use of electronic/social media is an area for potential development with the support of marketing/communication staff to provide guidance in branding the YRC messaging. Another area for potential development is advancing the presence of YRC research in peer review journals and/or the creation of journal out of the College.

As noted elsewhere in this report, more needs to be done to improve the level of communication and interaction between YRC researchers and College faculty.

3.5 Impact

Impact in the context of evaluation typically refers to the long-term and sustainable changes experienced as a result of the program. For the purpose of this evaluation a select group of goals/objectives from the 2013-2016 YRC Strategic Plan were identified and reviewed to assess the amount of progress made toward their achievement/completion.

Progress in Relation to YRC Strategic Directions

YRC staff/researchers were asked to share their observations on the progress made toward the achievement/completion of a select group of goals and objectives in the 2013-2016 YRC Strategic Plan.¹⁸ These goals and objectives fall under the following strategic directions identified in the Plan:

- Expanding a community of researchers
- Collaborating with Yukon First Nations
- Conducting quality research and innovation
- Communicating research projects and findings
- Building and operating a research and service hub
- Operating an effective and sustainable organization

Expanding a Community of Researchers

One of the strategic directions of the YRC is to promote an expanding community of researchers. This involves fostering a research environment that encourages more student, community, and government engagement.

YRC staff/researchers and partner/user groups were presented with a select group of goal statements corresponding with this strategic direction and asked to affirm whether or not the YRC is adhering to/achieving the goal. The feedback from YRC staff/researchers and partners/users reveals a generally positive view that YRC is adhering to/achieving the following goals:

- Thirteen staff/researchers agreed that YRC projects/activities have allowed students and faculty to become more engaged and experienced in research. Only one key informant disagreed with this position.
 - Fifteen partners/users agreed that YRC projects/activities have allowed students and faculty to become more engaged and experienced in research. Only two key informants disagreed with this position.
- Fifteen staff/researchers agreed that YRC projects/activities have expanded the capacity (knowledge, skills and abilities) of Yukoners to conduct meaningful research. No key informants were in disagreement with this position.
 - Twenty-three partners/users agreed that YRC projects/activities have expanded the capacity (knowledge, skills and abilities) of Yukoners to conduct meaningful research. No key informants were in disagreement with this position.
- Fourteen staff/researchers agreed that YRC projects/activities have increased student involvement with the Yukon Research Centre.¹⁹ Only one key informant disagreed with this position.

¹⁸ The number of key informants that provided feedback in relation to the YRC goals and objectives varied depending on the respondent familiarity/engagement with the different YRC activities/initiatives.

¹⁹ On average, approximately 25 Yukon College students were employed on YRC related projects each year over the 2013-2017 period. The number of students employed on YRC projects over the last five years has increased progressively from 12 students in 2013 to 34 students in 2017. Many of the key informants confirmed that student involvement has increased over the years and some respondents added qualifying statements noting that they believe more can be done to further increase student engagement at the YRC.

- Fourteen partners/users agreed that YRC projects/activities have increased student involvement with the Yukon Research Centre. Only two key informants disagreed with this position.
- Twelve staff/researchers agreed that YRC projects/activities were collaborated and integrated with all levels of government. Only two key informants were in disagreement with this position.²⁰
 - Fourteen partners/users agreed that YRC projects/activities were collaborated and integrated with all levels of government. Only two key informants were in disagreement with this position.

YRC staff/researchers were asked to gauge the extent to which a select group of “success indicators” corresponding with the overall goal of expanding a community of researchers were completed/achieved over the last few years. The feedback from the key informants that were familiar with the relevant YRC initiatives/activities indicates that the YRC has had considerable success in achieving most of the following objectives:

- Seven key informants reported that the objective of creating at least three new national research partnerships has been mostly or fully achieved.
- Eight key informants reported that the objective of creating at least one international partnership with a university or research institution has been mostly or fully achieved.
- Four key informants reported that the objective of establishing at least three climate monitoring programs within Yukon communities, agencies, governments and or industries has been fully achieved.
- Seven key informants reported that the objective of engaging at least five college students in projects at the YRC annually has been fully achieved while four other key informants indicated that this has been mostly or partially achieved.
- Five key informants reported that the objective of conducting YRC presentations/tours in College classes and other settings has been mostly achieved while five other key informants indicated that this has only been partially achieved.

One target area where initial progress was made but has since stalled is the creation of a climate change graduate program. In 2017, the NCE unit contributed to the development of the post graduate certificate in Climate Change Policy at Yukon College. A coordinator in the Applied Arts Division contributed to developing course content and the certificate program was launched in September 2017. A total of four students started the program but all four students have now left the program before completion. It appears that the students left the program for personal reasons (e.g. work/life commitments). There are no courses running at this time and the future of the certificate program is uncertain. However, one respondent suggested that it might be helpful to promote/market the program further to determine if there is interest. With respect to the relevance of the program, the respondent feels that there is value in supporting people working at the interface between science and policy but it remains challenging to recruit students and it was suggested that part time students might prefer investing their limited time in a Masters program rather than a certificate program.

²⁰ Some key informants noted that they have been involved with ‘many’ levels of government and those working relationships were collaborative in nature – noting however that it would be difficult for any institution to work with ‘all’ levels of government.

Several YRC staff/researchers provided additional feedback on areas where the YRC could make improvements to further advance the goal of promoting an expanding network of researchers. Starting at the campus network level, respondents suggested that the YRC continue to create more opportunities for College faculty and students to engage in YRC research projects and examine ways to gain more core funding to employ more researchers and/or provide financial stability for current staff/researchers.

Within the YRC's current research areas, staff/researchers suggested expanding the social science research capacity. Another suggestion was to place greater focus on the natural history specimen collection that has been developed over the years. One respondent observed that many of the YRC programs could be built out more including topic areas related to ecology/ecosystem responses to human disruption, physical hydrology and hydrogeology, and political science/governance.

Several respondents noted that YRC has made working with First Nation communities a priority and emphasized that YRC could be even more of a leader in this area collaborating with First Nations groups in identifying research needs/interests. Another respondent suggested that YRC has an opportunity to use technology as a tool and develop a Yukon First Nation's knowledge network.

Respondents commented on the importance of strengthening YRCs domestic and international research partners and further developing and promoting the role of YRC as a leader in northern science (particularly in the area of climate change research). One respondent suggested that YRC should explore creating and sponsoring a Yukon Research Journal while another respondent suggested that the YRC could hold an annual research forum.

Collaborating with Yukon First Nations

One of the strategic directions of the YRC is to collaborate with Yukon First Nations. This involves meeting with Yukon First Nation communities to explain the role and direction of the YRC and developing collaborative working relationships on research initiatives.

YRC staff/researchers and partner/user groups were presented with the goal statement corresponding with this strategic direction and asked to affirm whether or not the YRC is adhering to/achieving the goal. The feedback from YRC staff/researchers and partners/users reveals a generally positive view that YRC is adhering to/achieving the following goal:

- Twelve staff/researchers agreed that YRC has collaborated with First Nations in identifying and implementing their research priorities. Although none of the key informants were in disagreement with this position, several feel that there is room for the collaborations to be strengthened.
 - Nineteen partners/users agreed that YRC has collaborated with First Nations in identifying and implementing their research priorities. Three key informants disagreed with this position.

YRC staff/researchers were asked to gauge the extent to which a select group of "success indicators" corresponding with the overall goal of collaborating with Yukon First Nations were completed/achieved over the last few years. The feedback from the key informants that were familiar with the relevant YRC initiatives/activities indicates that the YRC has had mixed success in achieving these objectives:

- Eleven key informants reported that the objective of conducting three successful joint research initiatives with Yukon First Nations has been mostly or fully achieved.
- Only two key informants reported that the objective of recruiting First Nations researchers at the YRC has been mostly achieved while eight key informants reported that this objective has not yet been initiated or has only been partially achieved.

Another objective that was successfully achieved under this goal is the hiring of a First Nations Engagement Advisor. This position was created in 2015 to identify and support the research needs of Yukon First Nations.

Several YRC staff/researchers provided additional feedback on areas where the YRC could make improvements to further advance the goal of collaborating with Yukon First Nations. Respondents suggested a need for increased engagement and communication with First Nations that allows the needs and interests of First Nations to be heard and addressed. Two respondents indicated that there is value in linking YRC with existing campus groups within Yukon College. One respondent specified that a First Nations Advisory Committee on Research could be established for YRC with a dedicated focus on identifying research needs/priorities for Yukon First Nation communities while also serving as a recipient of comments and concerns from communities with respect to the research being carried out by YRC. It was noted that the committee could be similar in structure to the President's Advisory Council on First Nations Initiatives (PACFNI) but with a dedicated emphasis on research. Another respondent noted that YRC had previously looked into creating a separate First Nations advisory committee to help drive the research agenda and provide ideas, but it did not work out. More recently the AVP of Research Operations met with the 14 First Nations to discuss being in a larger network and discussions are ongoing.

More broadly, it was suggested that leadership is needed to strengthen collaboration. Respondents highlighted that it is important that First Nations are included in the research planning phases and that research results are disseminated back to communities. However, respondents further observed that there are some challenges including a lack of capacity and/or interest in some First Nation communities to become more engaged in research activity. It was suggested that YRC needs to continue its research work in communities where they have existing relationships and remain committed to reaching out to additional communities and where possible enabling these communities to overcome their capacity issues. Lastly, the key to engaging with First Nation communities as suggested by one respondent is to ensure that research activities recognize the diverse needs of communities at the local level and to ensure that research initiatives both identify and meet the needs and interests of the individual First Nations partner communities.

Conducting Quality Research and Innovation

Another strategic direction of the YRC is to conduct quality research and innovation. This involves developing research activities that are broad in scope, developing and commercializing technology innovations, and researching the changing diversity of Yukon's natural species.

YRC staff/researchers and partner/user groups were presented with a goal statement corresponding with this strategic direction and asked to affirm whether or not the YRC is adhering to/achieving the goal. The feedback from YRC staff/researchers and partners/users reveals a generally positive view that YRC is adhering to/achieving the following goal:

- Twelve staff/researchers agreed that YRC projects/activities are broad in scope (e.g. biophysical sciences, technological innovations, social sciences). Although none of the key informants were in disagreement with this position, many feel that more needs to be done to advance social sciences at YRC.
 - Sixteen partners/users agreed that YRC projects/activities are broad in scope. Two key informants disagreed with this position and several respondents generally recognize that YRC needs to be more active in the social sciences.

YRC staff/researchers noted that some challenges have been encountered with other goals under this strategic direction. For example, there is very limited human resource capacity in biodiversity monitoring which has implications for the level of research intensity in this area (e.g. natural species monitoring).

At the time the CCI unit was part of YRC, there was an objective to commercialize technology innovations and export them within and beyond Yukon. In the initial years of CCI, the unit worked with approximately four projects per year and this has been expanded considerably over the years to the point where CCI has handled about 40 projects per year over the last three years. Some of these projects have involved significant collaborations.²¹ One respondent observed that while the YRC has successfully fostered research and innovation, there has been very little progress on commercialization. Of the approximate 150 CCI projects over last seven years only about 2-3 have truly been commercialized.²²

YRC staff/researchers were asked to gauge the extent to which a select group of “success indicators” corresponding with the overall goal of conducting quality research and innovation were completed/achieved over the last few years. The feedback from the key informants that were familiar with the relevant YRC initiatives/activities indicates that the YRC has had considerable success in achieving most of the following objectives:

- Ten key informants reported that the objective of completing five community-based landscape hazards mapping projects has been mostly or fully achieved.
- Five key informants reported that the objective of creating a qualitative social science research lab has been only partially achieved while five other key informants reported that this objective has not yet been initiated. Respondents noted that a dedicated space is still required for a social science research lab.
- Two key informants reported that the objective of completing up to five alternative energy research and development projects has been mostly or fully achieved.

Several YRC staff/researchers provided additional feedback on areas where the YRC could make improvements to further promote quality research and innovation. A key area of interest is the advancement of YRC activity in social science research and it was noted that a dedicated social science lab is needed. Respondents also noted the need for greater YRC activity in the area of wildlife research – namely in helping to build up the natural specimen collection and by developing an animal care committee. Currently there is only one researcher who is studying this field and some concern was expressed around the sustainability of this research without longer term planning and more dedicated resources.

Several respondents pointed to the need for a leadership structure at the YRC to develop and drive the YRC research vision. It was noted that the recently adopted AVP structure is still going through a formative process which has created a leadership vacuum.

Lastly, respondents expressed interest in seeing a greater application/use of interdisciplinary approaches to research in the YRC. As noted by one respondent, physical and social sciences have been studied separately for the most part but there could be value in looking at northern issues using a more holistic

²¹ For example, as part of an Northern Energy Consortium research initiative to examine snow and ice thickness on glaciers, CCI located expertise in the private sector to assist researchers in building the technology they needed to conduct this research.

²² A key example, is the development of greenhouse kits that were specially designed to function in a northern setting. The greenhouse design factors in insulation and heat management systems to perform effectively in a cold climate. The greenhouse project ultimately led to the development of a greenhouse that can be produced and sold as a kit to be assembled by the customer (the kits can also be disassembled and relocated as needed). The greenhouse kits are now being sold through a private business, Solar Growing.

approach going forward. As described by one respondent, there has been considerable focus on planning to establish physical and social science programs but very limited focus on mixed methods or interdisciplinary approaches. It was suggested that social science and physical science are part of the same thing “if you zoom out” and academic institutions are increasingly appreciating this.

Communicating Research Projects and Findings

One of the strategic directions of the YRC is to communicate research projects and findings. This involves developing communication tools and products that promote YRC and inform decision makers.

YRC staff/researchers and partner/user groups were presented with the goal statement corresponding with this strategic direction and asked to affirm whether or not the YRC is adhering to/achieving the goal. The feedback from YRC staff/researchers and partners/users reveals a generally positive view that YRC is adhering to/achieving the following goal:

- Fifteen staff/researchers agreed that YRC has become well known for its research, activities and services through its communication and promotional efforts. Although none of the key informants were in disagreement with this position, several respondents feel that there is room for improvement in this area.
 - Twenty partners/users agreed that YRC has become well known for its research, activities and services through its communication and promotional efforts. Two key informants disagreed with this position.

YRC staff/researchers were asked to gauge the extent to which a select group of “success indicators” corresponding with the overall goal of communicating research projects and findings were completed/achieved over the last few years. The feedback from the key informants that were familiar with the relevant YRC initiatives/activities indicates that the YRC has had considerable success in most of the following objectives:

- Eleven key informants reported that the objective of creating promotional tools for all YRC programs has been mostly or fully achieved. One respondent suggested that this objective has only been partially achieved.
- Nine key informants reported that the objective of participating in/having a presence at two conferences per year that focus on the Arctic and circumpolar world has been mostly or fully achieved. One respondent suggested that this objective has only been partially achieved.
- Five key informants reported that the objective of hosting an annual open house highlighting YRC projects has been partially achieved while five other respondents reported that this objective has not yet been initiated.

YRC has a dedicated marketing and communications coordinator responsible for sharing YRC activities by working with researchers on their communications plan and through managing YRC’s social media pages (i.e. Twitter, Facebook). The coordinator also works with staff to help them develop a communications strategy – a program element that wasn’t always included in the past, but interviewees reported that researchers have become more conscious about planning their communication strategy early in the project life cycle. Each communication plan is tailored to the project, but a typical communication plan can involve some or all of the following elements: 1) Announcing a project through media releases (i.e. Twitter and Facebook); 2) Publishing results – research report; 3) Sharing results to local media and sometimes national and international newspapers (when relevant); 4) Disseminating the project to local community stakeholders; and 5) Presenting results at conferences.

Building and Operating a Research and Service Hub

Another key strategic direction of the YRC is to operate as a research and service hub. This involves providing support to researchers through research-related administrative, information and logistical services.

YRC staff/researchers were presented with the goal statements corresponding with this strategic direction and asked to affirm whether or not the YRC is adhering to/achieving the goals. The feedback from YRC staff/researchers and partners/users reveals that YRC is fulfilling its role in providing support services for researchers but the creation of a data base server continues to be a work in progress:

- Eleven staff/researchers agreed that YRC provides a comprehensive support service for researchers in the Yukon. Although only one key informant was in disagreement with this position, several respondents feel that there is room for improvement in this area.
- Six staff/researchers agreed that YRC operates a database server that includes Yukon and Northern social, economic, and environmental data and makes it available to interested parties. Three key informants were in disagreement with this position and several respondents feel that there is room for improvement in this area (e.g. the server is not used to its fullest capacity).

YRC staff/researchers were asked to gauge the extent to which a select group of “success indicators” corresponding with the overall goal of operating a research and service hub were completed/achieved over the last few years. The feedback from the key informants that were familiar with the relevant YRC initiatives/activities indicates that the YRC has had considerable success in achieving most of the following objectives:

- Ten key informants reported that the objective of establishing and operating a Yukon Ethics Review Panel (including providing training, terms of reference, policies and procedures for the Panel) has been mostly or fully achieved. One respondent suggested that this objective has only been partially achieved.
- Two key informants reported that the objective of completing a YRC climate monitoring data repository (including data acquisition, storage and management) has been mostly achieved while three respondents suggested that this objective has only been partially achieved and two respondents reported that the objective has not yet been initiated.
- Two key informants reported that the objective of updating, maintaining and following the First Nations Research Manual has been mostly or fully achieved.

Operating an Effective and Sustainable Organization

YRC staff/researchers were asked for their views on whether they felt YRC’s operating structure was effective. Of the 16 staff/researchers that commented on this topic, the large majority (12) confirmed that they felt the YRC operating structure was effective while the balance reported that they were unsure or felt it was not effective. Many of the respondents emphasized that the new AVP structure is new and staff and researchers are still adapting to the structure and learning together. Several respondents suggested that the benefits of the two AVP arrangement have yet to be determined as the model is in an early stage of development and still evolving.

One respondent observed that the YRC operating structure has improved with the recent transition to two Associate Vice President (AVP) positions – Research Operations and Research Development. It was noted that the process for moving to this structure was well thought out and the respondent believes that it will result in a more efficient and productive structure where the two positions can dedicate their attention to being more focused on a narrower range of responsibilities for each position. Another

respondent noted that the two AVP positions sends a strong signal to the College that YRC is supportive of integrating into the university model.

Several respondents noted that the personnel in the AVP positions are still working through the process of defining and determining the allocation/division of roles and responsibilities. One respondent commented that a key initiative for the two AVPs to undertake is to conduct more meetings with YC faculty to further facilitate the integration process and make the most of opportunities to collaborate.

One respondent observed that the AVP structure is unique and will need to be monitored and assessed over a longer period of time to make sure that it ultimately performs well and meets the needs of YRC.

Several respondents emphasized that some form of senior leadership is still missing from the operational structure. One respondent noted that YRC has undergone several changes in leadership over the past few years and it seems that the YRC does not have a vision. Another respondent suggested that some form of leadership is needed to provide firmer guidance on where the YRC is going in terms of direction and priorities. It was suggested that having a clear vision for the YRC is important for staff moral and needs to be addressed. Despite these concerns, this respondent emphasized that in general, people are excited to be at YRC and observed that there is a broad feeling that important/meaningful work is being done at YRC.

Respondents suggested that this is an especially opportune time to define the vision for YRC as part of the College transition to university status. It was further emphasized, that once formulated, YRC administration (i.e. executive positions) needs to provide ongoing leadership in supporting and guiding the YRC team in realizing the vision.

YRC staff/researchers confirmed that YRC has achieved or partially achieved several markers of success in relation to the goal of operating an effective and sustainable organization.

- The evaluation confirmed that YRC has partnered with a minimum of four companies or institutions for project funding.
 - This finding was confirmed through a review of the YRC financial records and other relevant files (e.g. project research reports) and was directly confirmed by at least ten YRC staff/researchers.
- The evaluation confirmed that YRC staff/researchers are involved in professional development activities but participation is generally not continuous or formally structured.
 - As observed by one staff member, professional development is driven by each individual staff member and not by the YRC. It was noted that there is no specific professional development policy for staff/researchers to follow but procedures for promoting/supporting professional development emerge as needed. Another respondent suggested that the level of support for professional development seems to have declined over the years. Of the 11 staff/researchers that commented on the topic of professional development, over half felt that this is an area where there is room for improvement.
- The evaluation confirmed that YRC has made some progress with developing research policy and procedure manuals that complement College manuals but not all staff/researchers have the same level of awareness of what has been achieved to date.
 - Of the 12 staff/researchers that commented on this topic, half of respondents reported that some progress has been made in this area while the other half reported that they were uncertain of how much progress has been made.

Two of the respondents commented on the positive role of YRC researchers as course instructors at Yukon College. As noted by one respondent, this is an important/valuable role for researchers as it connects the YRC with students and provides opportunities for the researchers to share their applied research findings with students. Another respondent suggested that facilitating greater communication and interaction with students is an area that YRC needs to continue to develop.

One respondent suggested that some administrative procedures between the YRC and the College could be improved. For example, it was noted that YRC sometimes requires customized tools and the College ordering procedure is not very effective. It was also suggested that it would be helpful for YRC researchers to be given administrator status on their computers (rather than student status) to more fully utilize the information technology.

At a broader level of analysis, one respondent noted that the current hierarchy of positions within the YRC is not ideal for supporting promotion and can limit upward mobility which could serve as a disincentive for maintaining/attracting skilled staff. For example, it was noted that there are no director positions that project managers can grow/advance into.

YRC staff/researchers were asked for their views on whether they felt YRC's advisory council was effective. Of the 14 staff/researchers that commented on this topic, the large majority (12) reported that they were unsure about the effectiveness of the advisory council and two respondents reported that the council is not effective. It was confirmed that the advisory council is not active at this time. One respondent suggested that the role of the council was not well defined and although this group received information they did not really have an opportunity to provide guidance. It was suggested that the role of the council needs to be revisited and possibly redefined if a decision is made to initiate the council again. One respondent proposed that the council be redeveloped as a national advisory group that could be tasked with thinking about and providing inputs on strategies for growth in expertise (e.g. pursuing international partners in research). Another respondent proposed that the revived council could be tasked with helping the YRC develop capacity where it is weak and identifying the needs of the region/communities.

YRC staff and researchers were asked to comment on the extent to which YRC has sought to increase and diversify funding beyond the Yukon Government's allocation. Of the 14 staff/researchers that responded to this question, 13 indicated that the YRC has been reasonably active in this area of focus and only one respondent indicated that the YRC has not been sufficiently active in this area.

Staff/researchers confirmed that the YRC is continually looking for funding both nationally and internationally and that YRC has had success in obtaining funding from a broad range of sources beyond the Yukon Government. Several researchers emphasized that a significant portion of the project funding is sourced from funding other than Yukon Government allocation (e.g. SSHRC, NSERC, INAC etc.) and industry partners. Several staff/researchers noted that it will be difficult and perhaps even unrealistic to move entirely away from Yukon Government funding as a major component of total funding. One staff member suggested that it would be reasonable for the federal government to provide a larger funding commitment/contribution to YRC given that the research conducted through YRC has value for all of the north. A researcher observed, that while it remains a challenge to fully diversify YRC funding sources there are areas for improvement and growth such as further collaboration with industry and foundations.

Staff and researchers were asked to comment on the challenges faced by the YRC in terms of programming and operational areas and what they feel needs to be addressed to ensure that the YRC operates as an effective and sustainable organization.

From a funding perspective, several staff/researchers suggested that sustainability of the YRC will remain problematic under the current funding model. As noted by one respondent, the YRC team has been successful to date in writing quality proposals and bringing in project funding but they could quickly lose a lot of their talent (i.e. research personnel) if the funding suddenly drops off. For example, a change in the federal government and alteration of its research and funding priorities could result in defunding for YRC areas of interest and specialization. Another respondent commented that year to year project funding makes it difficult to provide job security for researchers and this makes the organization vulnerable to turnover as skilled researchers may look elsewhere when the work slows down.

Several respondents observed that funding projects and salaries can be challenging and it was suggested that greater flexibility in funding is needed. As described by one respondent, the current funding agreements typically require that full budget allocations be used by the end of fiscal year and no funds can be carried over into the next year for ongoing or new research initiatives. As noted by another respondent, greater flexibility in the application/use of funding at the YRC will help to ensure that positions can be more easily adapted as the organization grows.

Additional core funding would also be beneficial from the standpoint of allowing researchers to dedicate time to building their own research programs and publishing more of their research results. As described by one respondent, YRC researchers are preoccupied with taking on as many projects as they can to secure funding and this can result in researchers serving as quasi consultants pursuing whatever research activities funders are looking for.

From an operations perspective, several respondents noted that the relationship between YRC and the College needs to be further developed/defined. One respondent suggested that with the transition to a university there are likely to be some hiccups along the way as the operating arrangement between YRC and the university is formalized. It was noted that the YRC has been trying hard not to be an ancillary department of the College but the reality is the YRC has to function somewhat differently than the College because it relies on third party funding and a lot of effort is focused on getting grant money in the door. The respondent is unsure how or if this model can change under the university model but suggested that it will likely involve one of two outcomes for YRC – complete autonomy from the university or complete integration with the university.

Several respondents noted that more work needs to be done to strengthen connections to the College especially as it relates to faculty and students. As observed by one respondent, with the transition to a university and the development of more university level programs, YRC should be promoting more opportunities for faculty to pursue research activities alongside their teaching activities and for students to combine research with their academic pursuits. Another respondent suggested that YRC has great potential for pulling/attracting more students to the emerging university but noted that the current research agenda is not well aligned to students and going forward YRC research programming will need to be more responsive to students.

With respect to internal capacity, staff and researchers alike observed that there is ongoing work to be done in the development of the office of research and continued staffing. Of particular interest is re-establishing the Mine Life Cycle Research Chair and establishing other research chairs (e.g. Social Sciences). Several respondents observed that it is crucial for the research chair positions to be adequately supported to facilitate their sustainability and reduce the risk of turnover.

While acknowledging that YRC has made great strides in reaching out to and engaging with First Nations, several respondents emphasized that YRC needs to ensure that it continues to support the capacity development of First Nation communities to do their own research.

YRC Contributions to the Research Community

YRC staff/researchers were asked to identify what they feel are the most significant contributions of the YRC to the research community/industry. The most frequently identified contribution is the practical and high-quality research that is being conducted by YRC researchers. In all, 11 staff/researchers discussed how high quality, relevant research of the YRC is its greatest contribution. The most frequently mentioned areas of research specialization highlighted by respondents include: geology, road hazards studies, climate change, energy, and the environment.

The next most frequently discussed contribution made by YRC as identified by staff/researchers is the Centre's engagement with First Nations and northern communities in their work. The relationships YRC has developed with northern communities were discussed by seven respondents. Interviewees highlighted how trusting relationships and good communication with Yukon communities (especially with First Nations) was among the most important contribution made by the YRC.

Related to establishing strong relationships with northern communities is the reported significance by staff/researchers regarding the relevance of the research to Yukoners and northern Canada. Staff reflected upon the importance of addressing the needs of northerners by researchers in the north, who understand the north. The significance of YRC's important position in northern research was discussed by six interviewees. One respondent highlighted that the YRC is an important conduit for funds earmarked for northern-based research.

The establishment of partnerships with industry and northern communities was highlighted by six interviewees. As noted by one interviewee, YRC's most significant contribution is its involvement with industry and providing a third party/non-biased technical role. Another respondent highlighted how YRC provides a crucial link between industry and the political and environmental realities of the north.

Another significant contribution identified by many of the staff/researchers is that YRC's work complements work done by other research institutes. It was further noted that YRC is increasingly being approached by southern partners whereas in the past the YRC had to do all of the outreach to connect with these institutions. It was emphasized that the YRC has clearly become a leader in some research initiatives (e.g. permafrost).

Many of the staff/researchers reported that YRC has established its niche in the world. The growing reputation of YRC is reflected in the invitation to the AVP of Research Development to sit on the Expert Panel on Climate Change Adaptation and Resilience Results (launched by the federal government in 2017). The YRC is also involved in a number of large Network Center of Excellence discussions. As observed by one respondent, the YRC is being recognized nationally, and especially among northern organizations and YRC representatives are increasingly being invited to speak and participate in national and international events. Another respondent noted that although YRC is a small institution, the quality of research in the respective domains has given the institution a reputable distinction. One respondent elaborated that YRC stands out from other northern institutions in their capacity/capability to conduct research, and it stands out from southern institutions due to its northern focus and ability to understanding the north, northern issues, and northerners in general.

Impact – Summary

Impact in the context of evaluation typically refers to the long-term and sustainable changes experienced as a result of the program. For the purpose of this evaluation a select group of goals/objectives from the 2013-2016 YRC Strategic Plan were identified and reviewed to assess the amount of progress made toward their achievement / completion.

YRC has made considerable progress in advancing/achieving many of its Strategic Plan objectives while some areas continue to be a work in progress.

The YRC has promoted an expanded community of researchers by facilitating and expanding student involvement in research projects/activities, collaborating with different levels of government, establishing climate monitoring programs in Yukon communities, and advancing national and international research partnerships. Areas for further development under this strategic direction include improving consultation and advancing opportunities for faculty involvement in research projects/activities, promoting and supporting the roll-out of the climate certificate in Climate Change Policy, expanding research initiatives into additional Yukon First Nations and supporting research capacity development in Yukon First Nation communities.

YRC has promoted collaboration with Yukon First Nations by engaging in relationship building with First Nation communities, working with First Nation communities to identify research interests/priorities, conducting joint research initiatives, and creating a First Nations Engagement Advisor at YRC. Areas for further development under this strategic direction include expanding efforts to meet and work with Yukon First Nation communities and organizations to identify and implement their research interests/priorities, recruiting Yukon First Nation researchers at YRC, and exploring and pursuing opportunities/mechanisms to facilitate enhanced First Nation engagement/participation in research initiatives (e.g. formation of a First Nations research advisory committee).

There is considerable appreciation and respect for the quality and relevance of research being conducted at YRC and a strong sense that YRC has established its niche in the world as northern centre of research expertise. The research is broad in scope including biophysical sciences, technological innovations, and social sciences. Areas for further development under this strategic direction include expanding research capacity and activity in the social sciences (i.e. human resource capacity and creation of social sciences lab) and biophysical sciences (e.g. human resource capacity in the Biodiversity Monitoring and Mine Life Cycle units) and promoting/facilitating the use of interdisciplinary approaches in research at YRC.

YRC has developed promotional materials for all of its programs and it has promoted/communicated its services and research activities and findings through a variety of mechanisms including presentations (local, national and international), workshops and publications (reports, maps, posters, etc.). Areas for further development under this strategic direction include hosting an annual open house highlighting YRC projects, ensuring that the information on the YRC website is current and materials can be downloaded, ensuring that research findings are written/presented in a plain language to facilitate easier access, ensuring that YRC has sufficient resources to facilitate attendance at national/international conferences, expanding the use of electronic/social media resources for the purpose of sharing news and information, and publishing YRC research in peer review journals and/or creating a journal of research out of the College.

YRC is providing support services for researchers in the Yukon (e.g. administrative and logistic support, access to desk/lab space, office services, etc.) and is supporting the establishment and operation of a

Yukon Ethics Review Panel (including providing training, terms of reference, policies and procedures). YRC is also supporting the updating, maintenance and use of the First Nations Research Manual. Areas for further development under this strategic direction include completing a YRC climate monitoring data repository and a database server that includes Yukon and northern social, economic, and environmental data.

YRC recently adopted the new AVP structure for the management of research operations and research development and staff and researchers are still adapting to the structure. The new model is at a relatively early stage of development and will need to be monitored over a longer period of time to assess how well it performs and meets the needs of the YRC. There is some degree of optimism at this stage that the new structure will ultimately be an improvement over the previous management structure and that it aligns well with the emerging university model. This is an opportune time for the YRC to review its vision as it explores its future role and relationship with the emerging Yukon University and formalizing where the leadership will rest with driving and guiding the YRC team forward in realizing the vision.

There is strong sense among stakeholders that the level of consultation between YRC and the College needs to be improved, especially as it relates to faculty and students and promoting more opportunities for faculty to pursue research activities alongside their teaching activities and for students to combine research with their academic pursuits.

Although YRC staff/researchers are involved in professional development activities, participation is generally self-driven/guided, informally structured, and sporadic. If professional development for staff/researchers is deemed to be an importance component for the future vision of YRC then more planning and resources will need to be put in place to facilitate participation.

YRC has made progress with developing research policy and procedure manuals that complement College manuals but not all staff/researchers have the same level of awareness of what has been achieved to date.

With respect to sustainability, YRC has achieved some success in diversifying its funding streams beyond the Yukon Government's allocation. Staff/researchers actively pursue funding both nationally and internationally and a substantial portion of research project funding is sourced from funding other than Yukon Government (e.g. SSHRC, NSERC, INAC etc.) as well as industry partners. While it was suggested that there is further growth potential for securing research funding through collaboration with industry partners, foundations and First Nation organizations it appears that some level of core funding from the Yukon Government will be required for the foreseeable future. Many of YRC stakeholders feel that this is not an unreasonable expectation considering that the region has a relatively small economy and that so much of the YRC research activity has benefits for broad segments of the Yukon population.

4.0 Conclusions and Recommendations

YRC is broadly recognized by numerous stakeholder groups as an organization that focuses on doing northern research. It is viewed as the body that supports research at Yukon College and is known for its collaborative research with Yukon First Nations, local communities and industry groups. YRC's physical presence in the north is seen as a strategic strength that enables researchers to more directly engage with local stakeholder groups, establish trust and develop deeper and more meaningful connections/relations.

YRC has made considerable progress in advancing/achieving many of its Strategic Plan objectives under the 2013-2016 plan while some areas continue to be a work in progress.

YRC has established its niche as a northern centre of research expertise. It has garnered considerable appreciation and respect for the quality of its research and there is broad consensus that the YRC research and outreach units remain relevant and important areas of focus. YRC research is broad in scope including biophysical sciences, technological innovations, and social sciences. Climate change research is viewed as especially important for the Yukon and YRC is highly regarded for its research capacity in this area. Two research units, Biodiversity Monitoring and Mine Life Cycle, are generally viewed as having more limited human resource capacity at this time and in need of additional personnel while Social Sciences represent an area for significant growth and development.

Human resource planning at YRC can be challenging given that so much of the human resource need is contingent on year to year funding for project research. While YRC researchers are enthusiastic and passionate about their research, without core funding there is limited job security in many of these positions which poses a threat to the maintenance and continuity of the existing skills/expertise capacity at YRC.

Yukon College students represent an important source of temporary research support personnel for YRC but there continues to be some necessary reliance on external scientific expertise as the local capacity has not yet been sufficiently developed. This could progressively be resolved as the College transitions to a University and local capacity in scientific expertise is further advanced to fill some of these needs.

Recommendations

- *Continue to develop and build out research capacity in the Biodiversity Monitoring (e.g. planning for current/additional research personnel), Mine Life Cycle (e.g. fill the Research Chair position), and Northern Climate ExChange (e.g. climate change modelling expertise) units.*
- *Advance the establishment of a Social Science unit (e.g. create a lead social science position, create a dedicated lab space).*
- *Consider establishing an assistant coordinator position to support the AVPs and additional support staff for the office of research as these needs become crucial for supporting performance (e.g. granting officer, ethics review personnel, lab room coordinator).*
- *Promote/facilitate the use of interdisciplinary approaches in research at YRC.*

YRC has made a significant contribution to expanding the community of researchers by facilitating student involvement in research projects/activities, collaborating with different levels of government, establishing climate monitoring programs in Yukon communities, and advancing national and international research partnerships.

Recommendations

- *Improve consultation and advance opportunities for greater YC faculty and student involvement in YRC research projects/ activities (e.g. promote more opportunities for faculty to pursue research activities alongside their teaching activities and for students to combine research with their academic pursuits).*
- *Promote and support the roll-out of the climate certificate in Climate Change Policy.*
- *Explore and expand YRC research initiatives/activities with all Yukon First Nations.*

YRC is collaborating with Yukon First Nations in identifying and implementing research that responds to their interests/priorities. YRC has successfully conducted joint research initiatives with some Yukon First Nations and has expanded its capacity to further facilitate and advance collaborative research initiatives through the creation of a full-time First Nations Engagement Advisor position.

Recommendations

- *Expand efforts to meet and work with Yukon First Nation communities and organizations to identify their research interests/priorities.*
- *Strengthen partnerships with Yukon First Nations to provide greater opportunities for engagement/input into research design and implementation as well as input into how updates/ progress reports and final results are packaged/presented and shared.*
- *Support/encourage greater use of First Nations traditional knowledge in research.*
- *Support and encourage research capacity development in First Nation communities (e.g. skills development).*
- *Expand efforts to recruit Yukon First Nation researchers at YRC.*
- *Explore and pursue opportunities/approaches to facilitate enhanced First Nation engagement/ participation in research initiatives (e.g. formation of a First Nations research advisory committee).*

YRC has developed promotional materials for all of its programs and has promoted/communicated its services and research activities and findings through a variety of methods including reports/publications, workshops and presentations (local, national and international).

Recommendations

- *Host an annual open house highlighting YRC projects.*
- *Ensure that information on the YRC website is current and materials can be downloaded.*
- *Ensure that research findings are written/presented in a plain language to facilitate easier access.*
- *Ensure that YRC has sufficient resources to facilitate attendance at national/international conferences.*
- *Support and advance the use of electronic/social media resources for the purpose of sharing news and information.*
- *Support and advance publishing of YRC research in peer review journals and consider creating a journal of research out of the College.*

YRC is fulfilling its mandate to provide support services for researchers in the Yukon and as part of this process YRC is supporting and advancing the establishment and operation of a Yukon Ethics Review Panel and supporting and utilizing the First Nations Research Manual. With respect to the physical space, the existing office space is generally meeting the requirements of YRC staff/researchers but improvements could be made to the lab space. A notable drawback with the present location of YRC offices is that YRC has very low visibility and connectivity on campus (i.e. being situated in the lower level of a residential

building and physically separated from the main campus building that houses faculty) which impedes interaction between YRC researchers and YC faculty and students and limits opportunities for the sharing of information and news on research interests and activities.

Recommendations

- *Create a purpose built social science research lab and consider creating a dedicated permafrost research lab.*
- *Grant researchers access to enhanced capacity internet accounts (e.g. administrator accounts).*
- *Enhance access to research literature (e.g. peer review journal subscriptions).*
- *Continue the work on completing a YRC climate monitoring data repository and a database server that includes Yukon and northern social, economic, and environmental data.*
- *Continue to explore options around the creation of a Science Building where YRC researchers and YC faculty could be co-housed.*

With respect to the management of its operations, YRC recently adopted an Associate Vice President structure to facilitate a more strategic division of responsibility in overseeing and guiding research operations and research development. The new model is at a relatively early stage of development and implementation and will need to be monitored over a longer period of time to assess how well it performs and the extent to which it meets the needs of the YRC. There is some degree of optimism at this stage that the new structure will ultimately be an improvement over the previous management structure and that it aligns well with the emerging university model.

This is an opportune time for YRC to review its vision as it explores its future role and relationship with the emerging Yukon University and to formalize where the leadership will rest with driving and guiding the YRC team forward in realizing the vision.

Recommendations

- *Develop a vision for the YRC and assign leadership responsibility for driving and guiding the YRC team forward.*
- *Update the YRC mission statement to reflect the more limited and/or indirect role that YRC now plays in facilitating commercialization.*
- *If professional development for staff/researchers is deemed to be an important component for the future vision of YRC then more planning and resources should be put in place to facilitate participation.*

With respect to sustainability, YRC has experienced a progressive increase in research income over the last few years and currently appears to be outpacing many other comparably sized institutions in Canada in this capacity. YRC has achieved some success in diversifying its funding streams beyond the Yukon Government's allocation. Staff/researchers actively pursue funding both nationally and internationally and a substantial portion of research project funding is sourced from funding other than Yukon Government (e.g. SSHRC, NSERC, INAC etc.) as well as industry partners.

However, there are a number of factors that make it difficult to predict if/how this level of success will be maintained including changes in government and any associated changes in government research priorities and policies. Some elements of YRC funding are longer term and more secure than others but a significant portion of YRC funding is derived from shorter term, project-based funding. A substantial time commitment is needed to prepare quality project proposals and with no guarantee that every proposal will be successful, proposal writing becomes a constant activity of researchers to ensure that funds

continue to come in to support research activity. While there is the potential for further growth in securing research funding through collaboration with industry partners, foundations and First Nation organizations it appears that some level of core funding from the Yukon Government will be required for the foreseeable future. Many of YRC stakeholders feel that this is not an unreasonable expectation considering that the region has a relatively small economy and that so much of the YRC research activity has benefits for broad segments of the Yukon population.

YRC stakeholders view the College transition to university as a key development that YRC needs to plan and prepare for. Discussions between YRC and Yukon College on the future level of YRC autonomy/integration with Yukon University will be important for informing funding strategies/priorities.

Recommendations

- *Confirm the role/relationship of YRC in relation to Yukon University and identify the implications for existing funding arrangements and future funding opportunities.*
- *Continue to explore core funding options for positions at YRC to promote long-term research capacity and continuity.*

Appendices

Appendix A: Interview Guide – YRC Staff / Researchers

Yukon Research Centre Staff / Researchers Key Informant Interview Guide

Introduction

Harry Cummings and Associates has been engaged by Yukon College to evaluate the Yukon Research Centre (YRC) and its work over the period 2014-2017.

The evaluation will provide insights on how well the YRC is functioning and meeting the needs / interests of different stakeholder groups over the past four years. The evaluation will also assist with identifying areas for improvement.

As part of the evaluation process, we are inviting a variety of stakeholders involved with YRC and its initiatives to participate in key informant interviews.

YRC staff and researchers have a unique and important perspective on YRC operations and activities and we would like to invite you to participate in an interview. Participation in the interview is completely voluntary, but we hope that you see the benefit of participating.

The information you share through the interview will remain completely anonymous; this means that no identifying information, such as your name or position, will be reported on. Responses from all of the interview participants will be presented together in summary form.

All information collected will be maintained in an electronic file on a password protected encrypted device, and only designated members of the HCA team will have access to this file. We will keep your information on file until the end of the evaluation in March 2018 and then securely destroy it.

Do you have any questions about the evaluation?

General questions about the evaluation can be directed to:

Clint Sawicki, Associate Vice President, Research Operations, Yukon Research Centre

Ph. [867-668-8772](tel:867-668-8772)

csawicki@yukoncollege.yk.ca

Before we begin the interview, I would like to confirm that you agree to participate in this evaluation?

Yes – proceed with the interview

No – thank the respondent for their time and terminate the interview

Please note, we recognize that some of the questions contained in this interview may not be applicable for certain stakeholders depending on their role/relationship with the YRC.

If there is a question that is not applicable to you, please ask to skip to the next question.

1. To begin with, can you briefly describe how long you've been involved with the YRC (number of years)?
 - What is your current role and what are your primary responsibilities in this role?

2. Are there specific research areas/units of the YRC that you're involved with?
 (*Read the list if needed*)

<input type="checkbox"/> Northern Climate Exchange <input type="checkbox"/> Northern Energy Innovation <input type="checkbox"/> Biodiversity Monitoring <input type="checkbox"/> Mine Life Cycle	<input type="checkbox"/> Resources and Sustainable Development in the Arctic (ReSDA) <input type="checkbox"/> Technology Innovation <input type="checkbox"/> Other, please specify: _____ <input type="checkbox"/> Other, please specify: _____
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3. How would you summarize the main role of the YRC in those areas where you are active?

4. In what ways, if any, have the services / products provided by the YRC in those areas where you are active changed over the last four years?

5. Have there been developments / changes in the way YRC collaborates with industry in leading / supporting Research and Development? Please elaborate on the number and type of collaborations.
 - Have any of these YRC/industry collaborations expanded beyond research and development in the last four years? Please elaborate.

6. Do you feel the YRC human resources in your unit/area of involvement are adequate / sufficient to support performance? Please explain why or why not.

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't Know / Unsure	<input type="checkbox"/> Not applicable
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7. Do you feel the YRC physical infrastructure in your unit/area of involvement is adequate / sufficient to support performance? Please explain why or why not.

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't Know / Unsure	<input type="checkbox"/> Not applicable
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8. What do you view as the key funding streams for YRC and how have these streams changed over time?

9. Do you feel that the YRC has sufficient financial support to maintain its niche? Please explain why or why not.

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't Know / Unsure
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10. Do you feel YRC resources (financial, human, physical) are deployed appropriately across YRC's research areas? Please explain why or why not.

<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't Know / Unsure
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I'd now like to discuss the YRC projects/activities that you're involved with and how they've been promoted.

11. Can you briefly describe some of the key projects that you worked on / supported over the last four years?
12. What techniques are being used to share / disseminate YRC project results / information and do you view some techniques as being more effective than others?
13. Have you/YRC used any of the following electronic media sources to distribute / share YRC related project results?
 - LinkedIn – posting / publishing
 - LinkedIn – Slide Share
 - Research Gate
 - OpenScholar @ Yukon College
 - Other, please specify: _____
14. In the last four years have you presented information on YRC related projects / activities at conferences and/or conventions and/or other events?
 - If so, please elaborate on the conferences / conventions that you presented at.
15. In general, how satisfied are you with the effort being made by YRC to produce and share project reports / information? Please elaborate?
 - Is information being shared in a strategic manner (e.g. targeted audience)?
 - Is information being shared / released in a timely manner?

As part of this evaluation we'd like to learn more about how well the YRC is progressing in relation to the strategic directions and success markers that were established in the 2013-2016 strategic plan. The following six strategic directions are included in the current strategic Plan:

- **promote an expanding community of researchers**
- **collaborate with Yukon First Nations**
- **conduct quality research and innovation**
- **communicate research projects and findings**
- **build and operate a research and service hub**
- **operate an effective and sustainable organization**

For the next series of questions, I'd like to review these directions/goals with you and ask you for your observations/views on the progress being made.

16. Starting with the YRC goal to promote an expanding community of researchers.

Using a 7 point scale where 1= strongly agree; 2 = agree; 3 = slightly agree; 4 = neutral / unsure; 5 = slightly disagree; 6 = disagree; and 7 = strongly disagree, please rate the degree to which you agree with each of the following statements. Note - you may also indicate 'not applicable' if you feel this response is appropriate in your case.

	Strongly agree	Agree	Slightly agree	Neutral / unsure	Slightly disagree	Disagree	Strongly disagree	Not applicable
YRC projects/activities have allowed students and faculty to become more engaged and experienced in research.	1	2	3	4	5	6	7	99
YRC projects/activities have expanded the capacity (knowledge, skills and	1	2	3	4	5	6	7	99

abilities) of Yukoners to conduct meaningful research.								
YRC projects/activities have increased student involvement with the Yukon Research Centre.	1	2	3	4	5	6	7	99
YRC projects/activities were collaborated and integrated with all levels of government.	1	2	3	4	5	6	7	99

Please expand / elaborate on any of your rankings if you feel necessary.

17. YRC has identified several markers of success in relation to the goal of expanding a community of researchers. Can you identify the extent to which the following initiatives have been achieved using a 4 point scale where 1 = fully achieved, 2 = mostly achieved, 3 = partially achieved, and 4 = not yet initiated?

	Fully achieved	Mostly achieved	Partially achieved	Not yet initiated	Don't know / unsure	Not applicable
YRC presentations/tours are conducted with College classes, others	1	2	3	4	98	99
At least three new national research partnerships have been created.	1	2	3	4	98	99
At least one international partnership with a university or research institution has been created.	1	2	3	4	98	99
At least three climate monitoring programs within Yukon communities, agencies, governments and or industries have been established.	1	2	3	4	98	99
At least 5 college students have been engaged in projects at the YRC annually.	1	2	3	4	98	99
Develop a climate change graduate program.	1	2	3	4	98	99

Please expand / elaborate on any of your rankings if you feel necessary.

Please identify any areas where you feel you surpassed the target.

18. Are there any specific areas / initiatives that you feel need to be addressed by the YRC to further promote an expanding community of researchers? If so, please elaborate.

19. Another goal of the YRC is to collaborate with Yukon First Nations.

Using a 7 point scale where 1= strongly agree and 7= strongly disagree, please rate the degree to which you agree with the following statement as it relates to YRC projects/activities.

	Strongly agree	Agree	Slightly agree	Neutral / unsure	Slightly disagree	Disagree	Strongly disagree	Not applicable
YRC collaborated with First Nations in identifying and implementing their research priorities.	1	2	3	4	5	6	7	99

Please expand / elaborate on your ranking if you feel necessary.

20. YRC has identified several markers of success in relation to the goal of collaborating with Yukon First Nations. Can you identify the extent to which the following initiatives have been achieved using a 4 point scale where 1 = fully achieved, 2 = mostly achieved, 3 = partially achieved, and 4 = not yet initiated?

	Fully achieved	Mostly achieved	Partially achieved	Not yet initiated	Don't know / unsure	Not applicable
Conduct three successful joint research initiatives Yukon First Nations.	1	2	3	4	98	99
Establish a First Nations Engagement Advisor position at the YRC.	1	2	3	4	98	99
Recruit First Nations researchers at the YRC.	1	2	3	4	98	99

Please expand / elaborate on any of your rankings if you feel necessary.

Please identify any areas where you feel you surpassed the target.

21. Are there any specific areas / initiatives that you feel need to be addressed by the YRC to further promote collaboration with Yukon First Nations? If so, please elaborate.

22. A key goal of YRC is to conduct quality research and innovation.

Using a 7 point scale where 1= strongly agree and 7= strongly disagree, please rate the degree to which you agree with each of the following statements as they relate to YRC projects/activities.

	Strongly agree	Agree	Slightly agree	Neutral / unsure	Slightly disagree	Disagree	Strongly disagree	Not applicable
YRC projects/activities are broad in scope (e.g. social sciences, biophysical sciences, technological innovations).	1	2	3	4	5	6	7	99
YRC projects/activities had a focus on developing and commercializing technology innovations and exporting them within and beyond Yukon.	1	2	3	4	5	6	7	99
YRC projects/activities helped document, monitor and report on the changing diversity of Yukon's natural species, environment, or other research areas	1	2	3	4	5	6	7	99

Please expand / elaborate on any of your rankings if you feel necessary.

23. YRC has identified several markers of success in relation to the goal of conducting quality research and innovation. Can you identify the extent to which the following initiatives have been achieved using a 4 point scale where 1 = fully achieved, 2 = mostly achieved, 3 = partially achieved, and 4 = not yet initiated?

	Fully achieved	Mostly achieved	Partially achieved	Not yet initiated	Don't know / unsure	Not applicable
Complete five community based landscape hazards mapping projects.	1	2	3	4	98	99
Involve two industrial partners annually in the completion of remediation projects.	1	2	3	4	98	99
Create a qualitative social science research lab.	1	2	3	4	98	99

Complete up to five alternative energy research and development projects.	1	2	3	4	98	99
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Please expand / elaborate on any of your rankings if you feel necessary.
Please identify any areas where you feel you surpassed the target.

24. Are there any specific areas / initiatives that you feel need to be addressed by the YRC to further promote quality research and innovation? If so, please elaborate.

25. Another goal of YRC is to communicate research projects and findings.

Using a 7 point scale where 1= strongly agree and 7= strongly disagree, please rate the degree to which you agree with the following statement as it related to the YRC.

	Strongly agree	Agree	Slightly agree	Neutral / unsure	Slightly disagree	Disagree	Strongly disagree	Not applicable
YRC has become well known for its research, activities and services through its communication and promotional efforts.	1	2	3	4	5	6	7	99

Please expand / elaborate on your ranking if you feel necessary.

26. YRC has identified several markers of success in relation to the goal of communicating research projects and findings. Can you identify the extent to which the following initiatives have been achieved using a 4 point scale where 1 = fully achieved, 2 = mostly achieved, 3 = partially achieved, and 4 = not yet initiated?

	Fully achieved	Mostly achieved	Partially achieved	Not yet initiated	Don't know / unsure	Not applicable
Create promotional tools for all YRC programs.	1	2	3	4	98	99
Host an annual open house highlighting YRC projects.	1	2	3	4	98	99
Participate in / have a presence at two conferences per year that focus on the Arctic and circumpolar world.	1	2	3	4	98	99

Please expand / elaborate on any of your rankings if you feel necessary.
Please identify any areas where you feel you surpassed the target.

27. Are there any specific areas / initiatives that you feel need to be addressed by the YRC to further promote / communicate research projects and findings? If so, please elaborate.

28. A key strategic direction of the YRC is to build and operate a research and service hub.

Using a 7 point scale where 1= strongly agree and 7= strongly disagree, please rate the degree to which you agree with the following statements as they relate to the YRC.

	Strongly agree	Agree	Slightly agree	Neutral / unsure	Slightly disagree	Disagree	Strongly disagree	Not applicable
YRC provides a comprehensive support service for researchers in the Yukon.	1	2	3	4	5	6	7	99
YRC operates a database server that includes Yukon and Northern social, economic, and environmental data and makes it available to interested parties.	1	2	3	4	5	6	7	99

Please expand / elaborate on any of your rankings if you feel necessary.

29. YRC has identified several markers of success in relation to the goal of operating a research and service hub. Can you identify the extent to which the following initiatives have been achieved using a 4 point scale where 1 = fully achieved, 2 = mostly achieved, 3 = partially achieved, and 4 = not yet initiated?

	Fully achieved	Mostly achieved	Partially achieved	Not yet initiated	Don't know / unsure	Not applicable
Update, maintain and follow the First Nations Research Manual developed by First Nations Initiatives.	1	2	3	4	98	99
Establish and operate a Yukon Ethics Review Panel and provide training, terms of reference, policies and procedures for the Panel.	1	2	3	4	98	99
Complete a YRC climate monitoring data repository, including data acquisition, storage and management.	1	2	3	4	98	99

Please expand / elaborate on any of your rankings if you feel necessary.
Please identify any areas where you feel you surpassed the target.

30. Are there any specific areas / initiatives that you feel need to be addressed by the YRC to further promote it operations as a research and service hub? If so, please elaborate.

31. The final key goal of the YRC is to operate an effective and sustainable organization.

Using a 7 point scale where 1= strongly agree and 7= strongly disagree, please rate the degree to which you agree with the following statements as they relate to the YRC.

	Strongly agree	Agree	Slightly agree	Neutral / unsure	Slightly disagree	Disagree	Strongly disagree	Not applicable
YRC actively seeks to increase and diversify funding beyond the Yukon Government's allocation.	1	2	3	4	5	6	7	99

Please expand / elaborate on any of your rankings if you feel necessary.

32. YRC has identified several markers of success in relation to the goal of operating an effective and sustainable organization. Can you identify the extent to which the following initiatives have been achieved using a 4 point scale where 1 = fully achieved, 2 = mostly achieved, 3 = partially achieved, and 4 = not yet initiated?

	Fully achieved	Mostly achieved	Partially achieved	Not yet initiated	Don't know / unsure	Not applicable
Partner with a minimum of four companies or institutions for project funding.	1	2	3	4	98	99
Involve all YRC staff in continuous professional development.	1	2	3	4	98	99
Develop research policy and procedure manuals the complement College manuals.	1	2	3	4	98	99

Please expand / elaborate on any of your rankings if you feel necessary.
Please identify any areas where you feel you surpassed the target.

33. In general, do you believe YRC’s operating structure is effective? Please explain why or why not.
 Yes No Don’t Know / Unsure

34. In general, do you believe YRC’s advisory council is effective? Please explain why or why not.
 Yes No Don’t Know / Unsure

35. What challenges did YRC programming encounter in the last three years and are there any specific operational areas / initiatives that you feel need to be addressed by the YRC to ensure that it operates as an effective and sustainable organization? If so, please elaborate.

For the final series of questions, I’d like talk about your views / observations on the overall achievements of the YRC.

36. What would you identify as three major strengths of YRC?
 a.
 b.
 c.

37. Using a 7 point scale where 1= strongly agree and 7= strongly disagree, please rate the degree to which you agree with the following statements.

	Strongly agree	Agree	Slightly agree	Neutral / unsure	Slightly disagree	Disagree	Strongly disagree	Not applicable
YRC is meeting stakeholder expectations.	1	2	3	4	5	6	7	99
YRC has fostered innovation and commercialization in the North.	1	2	3	4	5	6	7	99
YRC has established its niche in the world of research institutions.	1	2	3	4	5	6	7	99
YRC’s work complements work done by other research institutes.	1	2	3	4	5	6	7	99

Please expand / elaborate on any of your rankings if you feel necessary.

38. In your opinion, what are the three most significant contributions of the YRC to the research community/ industry?
 a.
 b.
 c.

39. To what extent has the YRC contributed to innovations being patented and commercialized?
 • Can you describe an innovation or innovations fostered by YRC that has been patented and commercialized?

40. In your opinion, what are three key areas for improvement for the YRC?
 a.
 b.
 c.

The final questions will assist us in understanding and describing the makeup of all the key informants we’re interviewing as part of the evaluation.

41. Have you received a post secondary diploma and/or degree?
- If so, what institution did you receive your last diploma/degree from?
 - What was the degree obtained?
42. What other relevant organizations are you involved in?
43. In what year were you born?
44. Which gender do you identify with?
- Male Female Other
45. Do you have any final comments that you would like to provide with respect to your experience / observations on the YRC?

Thank you for participating in this interview.

Appendix B: Interview Guide – YRC Users / Stakeholders

Yukon Research Centre Stakeholder / user Key Informant Interview Guide

Introduction

Harry Cummings and Associates has been engaged by Yukon College to evaluate the Yukon Research Centre (YRC) and its work over the period 2014-2017.

The evaluation will provide insights on how well the YRC is functioning and meeting the needs / interests of different stakeholder groups over the past 4 years. The evaluation will also assist with identifying areas for improvement.

As part of the evaluation process, we are inviting a variety of stakeholders involved with YRC and its initiatives to participate in key informant interviews.

YRC stakeholders / users have a unique and important perspective on YRC operations and activities and we would like to invite you to participate in an interview. Participation in the interview is completely voluntary, but we hope that you see the benefit of participating.

The information you share through the interview will remain completely anonymous; this means that no identifying information, such as your name or position, will be reported on. Responses from all of the interview participants will be presented together in summary form.

All information collected will be maintained in an electronic file on a password protected encrypted device, and only designated members of the HCA team will have access to this file. We will keep your information on file until the end of the evaluation in March 2018 and then securely destroy it.

Do you have any questions about the evaluation?

General questions about the evaluation can be directed to:

Clint Sawicki, Associate Vice President, Research Operations, Yukon Research Centre

Ph. 867-668-8772

csawicki@yukoncollege.yk.ca

Before we begin the interview, I would like to confirm that you agree to participate in this evaluation?

Yes – proceed with the interview

No – thank the respondent for their time and terminate the interview

Please note, we recognize that some of the questions contained in this interview may not be applicable for certain stakeholders depending on their role/relationship with the YRC.

If there is a question that is not applicable to you, please ask to skip to the next question.

1. To begin with, can you briefly describe how you / your department or organization is involved with the YRC and how long you've has an association with YRC (number of years)?
 - What is your current role and what are your primary responsibilities in relation to the YRC?
2. How would you summarize the main role of the YRC in terms of its services and products?
3. What are the specific research areas of the YRC that you're involved with? *(Read the list if needed)*

<input type="checkbox"/> Northern Climate Exchange	<input type="checkbox"/> Resources and Sustainable Development in the Arctic (ReSDA)
<input type="checkbox"/> Northern Energy Innovation	<input type="checkbox"/> Technology Innovation
<input type="checkbox"/> Biodiversity Monitoring	<input type="checkbox"/> Other, please specify: _____
<input type="checkbox"/> Mine Life Cycle	<input type="checkbox"/> Other, please specify: _____

Can you briefly describe your involvement in the above areas?

4. Using a 4 point scale where 1 = very successful, 2 = moderately successful, 3 = minimally successful, and 4 = not at all successful, -- In your view, how successful has YRC been in the research areas that you're familiar with? You may also indicate 'don't know' or 'not applicable'.

	Very successful	Moderately successful	Minimally successful	Not at all successful	Don't know / unsure	Not applicable
Northern Climate Exchange	<input type="checkbox"/>					
Northern Energy Innovation	<input type="checkbox"/>					
Biodiversity Monitoring	<input type="checkbox"/>					
Mine Life Cycle	<input type="checkbox"/>					
ReSDA	<input type="checkbox"/>					
Technology Innovation	<input type="checkbox"/>					
Other, specify:	<input type="checkbox"/>					
Other, specify:	<input type="checkbox"/>					

How do you judge success?

How should we judge success in the future?

5. Do you feel that these areas of research focus continue to be relevant/appropriate for YRC? Please explain why or why not.
 - Are there other areas of research focus that the YRC should be considering? Please elaborate

As part of this evaluation we'd like to learn more about how well the YRC is progressing in relation to some of the objectives that were established in the 2013-2016 strategic plan.

6. Using a 7 point scale where 1= strongly agree; 2 = agree; 3 = slightly agree; 4 = neutral / unsure; 5 = slightly disagree; 6 = disagree; and 7 = strongly disagree, please rate the degree to which you agree with each of the following statements. Note - you may also indicate 'not applicable' where you feel it's appropriate.

	Strongly agree	Agree	Slightly agree	Neutral / unsure	Slightly disagree	Disagree	Strongly disagree	Not applicable
YRC projects have allowed students and faculty to become more engaged and experienced in research.	<input type="checkbox"/>							
YRC projects have expanded the capacity (knowledge, skills and abilities) of Yukoners to conduct meaningful research.	<input type="checkbox"/>							
YRC projects have increased student involvement with the Yukon Research Centre.	<input type="checkbox"/>							
YRC projects were collaborated and integrated with all levels of government.	<input type="checkbox"/>							
YRC projects were collaborated with First Nations in identifying and implementing their research priorities.	<input type="checkbox"/>							
YRC projects/activities are broad in scope (e.g. social sciences, biophysical sciences, technological innovations).	<input type="checkbox"/>							
YRC projects helped the YRC become well known for its research, activities and services.	<input type="checkbox"/>							

Please expand / elaborate on any of your rankings if you feel necessary.

7. Following up on our discussion above, please indicate how much of a priority YRC's work in the future should be with respect to the following factors. Please use the following 4 point scale: 1 = high priority, 2 = moderate priority, 3 = minimal priority, and 4 = not a priority. You may also indicate 'don't know' or 'not applicable'.

	High priority	Moderate priority	Minimal priority	Not a priority	Don't know / unsure	Not applicable
Student engagement	<input type="checkbox"/>					
Industry partnerships	<input type="checkbox"/>					
Innovation	<input type="checkbox"/>					
Commercialization of innovation	<input type="checkbox"/>					
Mining and Resource Development	<input type="checkbox"/>					
Yukon First Nations engagement	<input type="checkbox"/>					
Publication	<input type="checkbox"/>					
Other, specify:	<input type="checkbox"/>					
Other, specify:	<input type="checkbox"/>					

Please expand / elaborate on any of your rankings if you feel necessary.

8. What do you think sets the YRC and its projects apart from programming/projects at similar research institutions? What makes YRC unique in your opinion?
9. What would you identify as three major strengths of YRC?
 - a.
 - b.
 - c.
10. In your opinion, what are three key areas for improvement for the YRC?
 - a.
 - b.
 - c.
11. Are there any significant developments / changes coming in the next three years that you feel the YRC needs to plan for? Please elaborate.

The final questions will assist us in understanding and describing the makeup of all the key informants we're interviewing as part of the evaluation.

12. Have you received a post secondary diploma and/or degree?
 - If so, what institution did you receive your last diploma/degree from?
 - What was the degree obtained?
13. What other relevant organizations are you involved in?
14. In what year were you born?
15. Which gender do you identify with?
 Male Female Other
16. Do you have any final comments that you would like to provide with respect to your experience / observations on the YRC?

Thank you for participating in this interview.

Appendix C: YRC Project Presentations and Reports, 2014-2016

Note: the following lists are based on a desk review of YRC publications and presentations as detailed in YRC reports and YRC web based resources. The lists may not be exhaustive.

Oral presentations:

- Benkert B.E., Kennedy K., Fortier D., Lewkowicz A., Doré G. and Grandmont K. (2014). *Cartographie des risques et capacité d'adaptation des communautés du Yukon, Canada*. Colloque annuel du Centre d'études nordiques, 12-13 février, Centre Eau Terre Environnement de l'INRS, Québec, QC, Canada.
- Stewart, K.J. and Janin, A. (2014). *Leonardite and biochar for mine impacted water and soils*. British Columbia Technical and Research Committee on Reclamation, Mine Reclamation Symposium. September 22-25th, Prince George, British Columbia.
- Stewart, K.J. and Siciliano, S. (2014). *Reducing Zinc phytotoxicity and promoting revegetation in sub-arctic Canada*. Society for Ecology Restoration, 5th World Conference on Ecological Restoration. October 6-11th, Madison, Wisconsin.
- Christensen, L. (2014). *Community-Based Research Towards Baseline Data Collection*. Yukon Environmental and Socioeconomic Assessment Act Forum on Socioeconomic Effects Assessment. High Country Inn, October 15, 2014.
- Christensen, L. (2014). *Undertaking Energy and Emissions Inventories in Yukon and Nunavut*. Presented to Dr. Fiona Schmiegelow's class, Topics in Northern Resource Management Class, BSc Program in Environmental and Conservation Sciences, November 25th, University of Alberta.
- Benkert, B.E. (2014). *Geoscience for climate change adaptation planning in Yukon communities*. Environmental Management Planning Workshop, Aboriginal Affairs and Northern Development Canada. Whitehorse, YT. Invited speaker.
- Benkert B.E. (2014). *Perma-what? Thoughts on outreach for applied research*. Mountain Permafrost Workshop, Whistler, BC. NSERC-funded. Invited speaker.
- Benkert B.E. (2014.) *Standing on unstable ground: Geoscience mapping for climate change adaptation planning in the Yukon*. Brown Bag Lunch Series, Yukon Geological Survey, Whitehorse, YT. Guest lecture.
- Benkert B.E. and Calmels F.C. (2014). *Cores, comics and communities: Bringing permafrost research to decision-makers in Yukon, Canada*. 4th European Conference on Permafrost, Evora, Portugal.
- Guest presenter. (2014). *"Growing Yukon's research capacity, together"*. Elder meeting of the First Nation of Na-Cho Nyak Dun, December 11, 2014, Mayo, YT.
- Joined talk with Martin Haefele (2014). *"Together toward common goals: the development of passive water treatment in Yukon"*. Geoscience Forum, November 19, 2014, Whitehorse, YT
- Speaker (2014). *"Bioremediation"*. Brown Bag Lunch, March 25 2014, Yukon College, Whitehorse, YT.
- Joined talk with David Petkovich (2014). *"Industry-Focused Research"*. Yukon Government SCOPE event, March 5, 2014, Whitehorse, YT
- Speaker (2014). CERBA event, January 26, 2014, Vancouver, BC.

Poster presentations:

- Smith, M. (2014). *Cambridge Bay Energy and Emission*. Presented at the International Arctic Social Sciences Conference, May 22-26, Prince George, Canada.

- Horton, B., Jos, S., Kavanaugh, J., Laxton, S., Benkert, B., and Samolczyk, M. (no date). *Hydrosecurity of the Yukon River Watershed – A collaborative research project with Yukon Energy Corporation.*
- Perrin, A. (no date). *Mainstreaming: Incorporating Climate Change into Northern Decisions.*
- Benkert B.E., Donohoe M, Davey T. (2014) *Comics, communities and geoscience: Creative science communication.* ArcticNet Arctic Change 2014. Ottawa, Ontario.
- Grandmont K, Roy L-P, de Grandpre I, Benkert BE, Lewkowicz A, Fortier D. (2014) *Landscape hazards mapping for climate change adaptation planning: Impacts of land cover disturbances on permafrost landscapes.* ArcticNet Arctic Change 2014. Ottawa, Ontario.
- Roy L-P, Grandmont K, Benkert BE, Fortier D, Lewkowicz A. (2014) *Landscape hazards mapping for climate change adaptation planning in Yukon: Approach and methods.* ArcticNet Arctic Change 2014. Ottawa, Ontario.
- Kennedy KE, Lipovsky P, Benkert BE. (2014) *Geoscience Mapping for Climate Change Adaptation Planning: Landscape hazards maps as a tool for communities in Yukon, Canada.* Yukon Geoscience Forum, Whitehorse, YT.
- Kennedy KE, Lipovsky P, Benkert BE. (2014) *Geoscience Mapping for Climate Change Adaptation Planning: Landscape hazards maps as a tool for communities in Yukon, Canada.* Geological Society of America Annual Meeting, Vancouver, BC.
- Handley, J. (2014). *Elemental Analysis of Basaltic Materials from the Little John Site (KdV06), Yukon Territory, Canada.*, University of British Columbia, Vancouver, British Columbia.
- Duerden, F., Hennessey, R., and Kinnear, L. (2015). *Yukon Community Adaptation Program: A Review of 5 Years of Planning for Climate Change.* Northern Climate ExChange, Yukon Research Centre.
- Perrin, A., Dion, J., Eng, S., Sawyer, D., Nodelman, J.R., Comer, N., Auld, H., Sparling, E., Harris, M., Nodelman, J.Y.H., and Kinnear, L. (2015). *Economic Implications of Climate Change Adaptations for Mine Access Roads in Northern Canada.* Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Horton, B., Calmels, F. Roy, L.P, and Perrin, A. (2016). *Permafrost, buildings and climate change: Managing Ross River infrastructure in a moving landscape.* Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Perrin, A. (no date). *Mining and Transportation Sectors Adapting to Climate Change.* Northern Climate ExChange. Yukon Research Centre, Yukon College, Whitehorse, Yukon.

Reports/publications:

- Christensen, L. and the Community of Cambridge Bay. (2014). *Cambridge Bay Energy and Emissions Inventory: A Partnership Project by the Yukon Research Centre, the Hamlet of Cambridge Bay, and the Canadian High Arctic Research Station.*
- North Slope focal species monitoring (2014). *Yukon North Slope Gyrfalcon survey 2014.* Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- North Slope focal species monitoring (2014). *North Slope Ptarmigan survey 2014.* Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Mossop, D.H. (2014). *Biodiversity Assessment and Monitoring Research: Summary report of activities.* Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Yukon-Stikine ecoregion species monitoring (2014). *Gyrfalcon 2014, the Yukon-Stikine.* Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Coast range focal species monitoring (2014). *Coast Range Willow Ptarmigan 2014.* Yukon Research Centre, Yukon College, Whitehorse, Yukon.

- Yukon Territory, Canada (2014). *Breeding status of the American Kestrel*. Yukon Research Centre.
- Lamb, E.G., Mengersen, K.L., Stewart, K.J., Attanayake, U. and Siciliano, S.D. (2014). Spatially explicit structural equation modeling. *Ecology*, 95: 2434-2442.
- Stewart, K.J., Grogan, P., Coxson, D.S. and Siciliano, S.D. (2014). Topography as a key factor driving atmospheric nitrogen exchanges in arctic terrestrial ecosystems. *Soil Biology and Biochemistry*, 70: 96-112.
- Stewart, K.J. and Janin, A.J. (2014). *Leonardite and biochar for mining impacted water and soils*. Technical Report prepared for Wapaw Bay Resources Ltd. Yukon Research Centre, Yukon College. November 2014.
- Ness, I., Janin, A. and Stewart, K. (2014). *Passive treatment of mine impacted water in cold climates: A review*. Technical Report prepared in collaboration with Casino Mining Corporation and Clear Coast Consulting. Yukon Research Centre, Yukon College. November 2014.
- Stewart, K.J. (2014). *Vegetation community structure and contaminant uptake in mining impacted sites*. Technical Report prepared for Access Consulting Group a subsidiary of Alexco Resources Corp. March 2014.
- Ness, I., Janin, A. and Stewart, K. (2014). *Passive treatment of mine impacted water in cold climates: a review, technical report*.
- Janin, A., Haefele, M., Truelson, B. (2014). *Yukon Passive Water Treatment workshop – Event summary report*.
- Janin A. (2014). *C1-C4 reactor monitoring – Progress report, technical report*.
- Janin A. (2014). *C5-C8 reactor monitoring – Progress report, technical report*.
- Janin A. (2014). *Bioremediation research project – 2013 results, technical report*.
- Northern Climate ExChange. (2014). *Compendium of Yukon Climate Change Science 2003-2013*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Northern Climate ExChange. (2014). *Compendium of Yukon Climate Change Science: 2014 Supplement*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Mossop, D.H. (2015). *Biodiversity Assessment and Monitoring Research: Summary report of activities*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Northern Climate ExChange. (2015). *Compendium of Yukon Climate Change Science: 2015 Supplement*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Perrin, A., Eng, S., Sparling, E., Auld, H., Comer, N., Bevington, A., and Kinnear, L., (2015). *Enhancing Knowledge Transfer to Decision-Makers with Respect to Climate Change Impacts on the Cryosphere*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Easton, N.A. (2015). *Archaeological Excavations at the Little John Site (KdVo-6), Southwest Yukon Territory, Canada*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Easton, N.A. (2015). *New Radiocarbon Dates from The Little John Site (Kdvo-6) Obtained with the Support of the Yukon College Research Fund*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Easton, N.A. (2015). *Scottie Creek Borderlands Culture History Project Summary of Activities*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Yukon Research Centre. (2014). *Biodiversity Forum Presentation Abstracts 2014*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Yukon Research Centre. (2015). *Biodiversity Forum: List of Abstracts - 2015*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.

- D.H. Mossop, (2015). *2015 Population Status of the Peregrine Falcon in the Yukon Territory*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Perrin, A., Dion, J., Eng, S., Sawyer, D., Nodelman, J.R., Comer, N., Auld, H., Sparling, E., Harris, M., Nodelman, J.Y.H., and Kinnear, L. (2015). *Economic Implications of Climate Change Adaptations for Mine Access Roads in Northern Canada*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Benkert, B.E., Fortier, D., Lipovsky, P., Lewkowicz, A., Roy, L.-P., de Grandpré, I., Grandmont, K., Turner, D., Laxton, S., and Moote, K. (2015). *Faro Landscape Hazards: Geoscience Mapping for Climate Change Adaptation Planning*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Benkert, B.E., Kennedy, K., Fortier, D., Lewkowicz, A., Roy, L.-P., Grandmont, K., de Grandpré, I., Laxton, S., McKenna, K., and Moote, K., 2015. *Dawson City Landscape Hazards: Geoscience Mapping for Climate Change Adaptation Planning*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Benkert, B.E., Fortier, D., Lipovsky, P., Lewkowicz, A., de Grandpré, I., Grandmont, K., Turner, D., Laxton, S., Moote, K., and Roy, L.-P. (2015). *Ross River Landscape Hazards: Geoscience Mapping for Climate Change Adaptation Planning*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Calmels, F., Roy, L.P., Laurent, C., Pelletier, M., Kinnear, L., Benkert, B., Horton, B. and Pumple, J. (2015). *Vulnerability of the North Alaska Highway to Permafrost Thaw: A Field Guide and Data Synthesis*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Calmels, F., Doré, G., Kong, X., Roy, L., Lemieux, C., and Horton, B. (2016). *Vulnerability of the north Alaska Highway to permafrost thaw: Design options and climate change adaptation*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Mossop, D.H. (2015). *The Changing Ecology of the Old Crow Flats*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Northern Climate ExChange. (2015). *Yukon River Water Isotope Data: Interpretation of Canadian Indigenous Observation Network Results*. Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Hobbs J., and Canary L. (2016). *Assessing eDNA as a Tool to Evaluate Chinook Salmon Distribution in Yukon Territory*. Technology Innovation, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Streicker, J. (2016). *Yukon Climate Change Indicators and Key Findings 2015*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Benkert, B.E., Kennedy, K., Fortier, D., Lewkowicz, A., Roy, L.-P., de Grandpré, I., Grandmont, K., Drukis, S., Colpron, M., Light, E., Williams, T. (2016). *Old Crow landscape hazards: Geoscience mapping for climate change adaptation planning*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.
- Grabowski, M. and Clark, D. (2016). *Factors Influencing Climate Change Adaptation Research Uptake by Yukon Communities: Using adaptation planning to evaluate mechanisms for research uptake*. Northern Climate ExChange, Yukon Research Centre, Yukon College, and School of Environment & Sustainability, University of Saskatchewan.
- Calmels, F., Horton, B., Roy, L.P., Lipovsky, P., and Benkert, B. (2016). *Assessment of Infrastructure from Permafrost Degradation and a Changing Climate, Ross River*. Northern Climate ExChange, Yukon Research Centre, Yukon College, Whitehorse, Yukon.