CURRENT STATE OF WOMEN IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM) IN YUKON

November 30, 2018

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We acknowledge that we live and work in the traditional territory of the Kwanlin Dün First Nation and the Ta'an Kwäch'än Council. We also acknowledge that additional work done on this report took place on the unceded traditional territories of the Coast Salish peoples of the xʷməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Səl̓ílwətaɬ (Tsleil-Waututh) Nations.

Although this report is based on data from a variety of external sources, the analysis and opinions expressed in this report do not represent the views of any of these external institutions, including the views held by Yukon College, Yukon Government, and Simon Fraser University.

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CITATIONS

Conference Board of Canada. (2013). Percentage of Graduates in Science, Math, Computer Science, and Engineering. Retrieved from https://www.conferenceboard.ca/hcp/Details/education/graduates-science-math-computer-science-engineerin.aspx?AspxAutoDetectCookieSupport=1

Department of Education – Government of Yukon. (n.d.). Yukon Grant. Retrieved from http://www.education.gov.yk.ca/yukon-grant.html

Ministry of Education – British Columbia. (n.d.). Foundation Skills Assessment Writers Only. Retrieved from http://www.bced.gov.bc.ca/reporting/province.php

Natural Sciences and Engineering Research Council of Canada (2014, May 20). Chairholder Profile Lesley Shannon. Retrieved from http://www.nserc-crsng.gc.ca/Chairholders-TitulairesDeChaire/Chairholder-Titulaire_eng.asp?pid=914

Natural Sciences and Engineering Research Council of Canada. (2017, December 01). NSERC – Chairs for Women in Science and Engineering Program. Retrieved from http://www.nserc-crsng.gc.ca/Professors-Professeurs/CFS-PCP/CWSE-CFSG_eng.asp

Parker, R., Pelletier, J., & Croft. E. (2015). *WWEST's Gender Diversity in STEM: A Briefing on women in science and engineering.* "Stereotype Threat". San Francisco, CA: Blurb. Retrieved from https://www.sfu.ca/content/dam/sfu/wwest/Documents/Stereotype%20Threat.pdf

Parker, R., Pelletier, J., & Croft. E. (2015). *WWEST's Gender Diversity in STEM: A Briefing on women in science and engineering.* "Unconscious Bias". San Francisco, CA: Blurb. Retrieved from https://www.sfu.ca/content/dam/ sfu/wwest /Documents/Unconscious%20Bias.pdf

Parker, R., Pelletier, J., & Croft. E. (2015). *WWEST's Gender Diversity in STEM: A Briefing on women in science and engineering* "Why STEM? For Parents & Guardians". San Francisco, CA: Blurb. Retrieved from https://www.sfu.ca/content/dam/sfu/wwest/Documents/Why%20STEM%20for%20 parents% 20and%20guardians.pdf

Statistics Canada. (2015, November 27). Gender differences in science, technology, engineering, mathematics and computer science (STEM) programs at university. Retrieved from https://www150.statcan.gc.ca/n1/pub/75-006-x/2013001/article/11874-eng.htm

Statistics Canada. (2017, November 29). Education in Canada: Key results from the 2016 Census. Retrieved from https://www150.statcan.gc.ca/n1/daily-quotidien/171129/dq171129a-eng.htm

EXECUTIVE SUMMARY

Current State of Women in Science, Technology, Engineering and Mathematics (STEM) in Yukon examines the participation of women and girls in STEM through educational endeavours and professional employment. This report was prepared by the Westcoast Women in Engineering, Science and Technology (WWEST) Associate Chair at Yukon College. The purpose of this report is to provide a current snapshot of the state of women and girls in STEM in Yukon with the aim of analyzing gaps and noting key indicators for success in STEM.

At an elementary school level, this work included examining Foundational Skills Assessment (FSA) standardized testing results for Grade 4 and 7 girls and boys in regards to numeracy, reading, and writing. This work also included analyzing enrollment in STEM-based weekly Kids' Camps offered by Yukon College. At a secondary school level, the application rates of young girls and boys for the Wood Street Centre ES11 elective course were analyzed.

At a post-secondary level, rates of program application success, enrollment, persistence, and graduation at Yukon College were examined along with applications for scholarships and bursaries from various organizations. The educational levels of Yukon residents with STEM degrees were also examined. The levels studied included college, CEGEP (Collège d'Enseignement Général et Professionnel) or other non-university certificate; university certificate, diploma, or degree at bachelor level; bachelor's degree; master's degree; and doctorate's degree. These education levels were further divided into fields, including Yukon residents with science and science technology; engineering and engineering technology; mathematics and computer science; and health science degrees.

At a professional level, the employment and unemployment rates of Yukon residents in STEM and BHASE (business, humanities, health, arts, social science, and education) fields were analyzed. The data pertaining to STEM employment and unemployment were further broken down into fields, including science and science technology; engineering and engineering technology; mathematics and computer science; and health care. The skill levels of individuals in STEM and BHASE fields were also examined. Individuals registered with Engineers Yukon and the Association of Professional Engineers and Geoscientists of Alberta (APEGA) who self-declared Yukon addresses were included as well as academics employed by Yukon College, including those in STEM-related positions. STEM research by women at the Yukon Research Centre (YRC) were also examined along with the Natural Sciences and Engineering Research Council (NSERC) funding by gender of project leads.

Overall, women and girls show high interest in STEM fields at all levels, but this interest was not always reflected in successful post-secondary program acceptance or scholarships. Levels of research funding were also usually lower for women than men. There was a high level of employment for women in STEM fields in Yukon after post-secondary graduation, but this was not reflected in higher numbers of management positions for women in STEM. Key indicators to watch for include numeracy versus reading and writing results, post-secondary acceptance rates, promotion in the workplace, and research funding levels.

SECTION 1 – INTRODUCTION

1.1 NSERC CHAIRS FOR WOMEN IN SCIENCE AND ENGINEERING

The Natural Sciences and Engineering Research Council's (NSERC) Chairs for Women in Science and Engineering (CWSE) program was launched in 1996 with the primary objective to "increase the participation of women in science and engineering, and to provide role models for women active in, and considering, careers in these fields" according to the description on the NSERC Chair Program application webpage. The description further elaborates that the program is regionally based, with one Chair for each of the Atlantic, Quebec, Ontario, Prairie, and British Columbia/Yukon regions. The NSERC Chair for Women in Science and Engineering for the BC/Yukon Region operates under the name Westcoast Women in Engineering, Science, and Technology (WWEST).

The current Chairholder in the British Columbia/Yukon region is Dr. Lesley Shannon of Simon Fraser University's School of Engineering Science. She has held the position since 2015. According to her NSERC Chairholder profile, Dr. Shannon's primary focus as Chair is "to promote science and to engage students, industry, and the community to increase the awareness and participation of women and other under-represented groups in science, technology, engineering, and mathematics (STEM). The goal is to empower these groups to pursue science and engineering as pathways to exciting careers. A particular emphasis will be placed on increasing enrollment of women in the applied sciences (computing and engineering)."

1.2 WWEST ASSOCIATE CHAIR AT YUKON COLLEGE

Westcoast Women in Engineering, Science and Technology (WWEST) created the Associate Chairs program to expand its impact beyond the lower mainland of British Columbia, where the WWEST Chairholder is located. The WWEST Associate Chair at Yukon College was announced in January 2018 with Alison Anderson as the WWEST Associate Chair and the program is operating out of Yukon College in Whitehorse, Yukon. The WWEST Associate Chair term is one-year and provides the program with support and $10,000 in funding from the WWEST program at Simon Fraser University. In addition to in-kind support from Yukon College and report funding from the Government of Yukon Office of the Science Advisor, nine other Yukon organizations invested funds and in-kind support to further the activities of the WWEST Associate Chair at Yukon College.

1.3 DEFINITIONS – STEM VERSUS NON-STEM

The definitions of STEM (Science, Technology, Engineering and Mathematics) and non-STEM or BHASE (Business, Humanities, Health, Arts, Social Science, and Education) used throughout this report are consistent with the Statistics Canada Classification of Instructional Programs (CIP) conventions established on January 18, 2016. CIP 2016 establishes that the STEM grouping is comprised of the following major fields of study: science and science technology (physical and chemical science, biological science, general and integrated science), engineering and engineering technology, mathematics and computer and information science. The BHASE grouping consists of: business and administration, arts and humanities, social and behavioral science, legal professions and studies, health care (medicine, dentistry, optometry, veterinary medicine, nursing, pharmacy, and other related programs), education and teaching, trades, services, natural resources and conservation; and social work.

With some of the data sources provided, the health science fields (including medicine and nursing) were presented independently of other BHASE fields. In other cases, health sciences were grouped with biological science as a STEM field. As such, the report seeks to present health science as its own unique entity in order to eliminate any ambiguity regarding its classification as STEM or non-STEM. For the

purposes of this report, the health sciences are kept separate from the other BHASE fields. Note that the Statistics Canada definition of BHASE includes health data.

Social sciences were not included as part of the STEM category. There were multiple factors that led to the omission of social science as a STEM field. First, the Statistics Canada Classification of Instructional Programs considers the BHASE (non-STEM) grouping to include social science. Second, the degree received upon completion of university-level education in a social science discipline is delineated as an arts degree – Bachelor, Master or Doctor of Arts - as opposed to a science or engineering degree. Finally, there was not an adequate amount of distinction between the humanities and the social sciences to classify them as their own grouping or include them as sciences within the larger STEM grouping.

1.4 UNDERSTANDING OF GENDER VERSUS SEX AND USE OF EQUIVALENT TERMS

There is a difference between gender identity and biological sex (biological sex is assigned at birth and includes female, intersex, and male). It is acknowledged that gender identity exists on a spectrum. For the sake of this report, the data are divided into the binary terms of "women/girls/female" and "men/boys/male" based on the current statistical information as collected by the sources used in this report. It does not in any way seek to ignore or deny the lived experiences of individuals across the gender spectrum including (but not limited to) Two-Spirit, Transgender and Non-Binary identities. This report was created to highlight the need for greater diversity in STEM fields and that includes all individuals across the gender spectrum.

Throughout the body of this report, the terms "women/girls" and "men/boys" will be used whenever possible instead of "female" and "male" in order to be more inclusive.

1.5 GOALS AND RATIONALE

The Statistics Canada 2015 report, *Gender differences in science, technology, engineering, mathematics and computer science (STEM) programs at university* stated that "students who chose a STEM university program had higher PISA (Programme for International Student Assessment) mathematics scores at age 15, higher mathematics marks in high school, and had a more positive perception of their mathematical ability than those who opted for other fields of study". The same Statistics Canada 2015 report noted that STEM fields at Canadian Universities remain largely male-dominated - particularly in engineering, mathematics and computer science programs. According to the Conference Board of Canada 2013 report, *Percentage of Graduates in Science, Math, Computer Science, and Engineering*, STEM degrees lead to improved labour market conditions and more lucrative earnings than non-STEM degrees.

This report, *Current State of Women in Science, Technology, Engineering, and Mathematics (STEM) in Yukon*, is intended to provide a comprehensive, current snapshot of the conditions and distributions of both genders in STEM fields in Yukon, based on existing data sources. Moreover, it was produced with the objective of identifying any discrepancies that may exist between the genders in STEM fields in Yukon from elementary school to professional levels. This report will attempt to fill the gap in territorial data and analyze the current status of women in STEM fields in Yukon specifically. It will then seek to determine if Yukon trends parallel those in the rest of Canada.

Throughout this report, any data with results of less than 10 individuals will not be reported on numerically in order to ensure reportable values and to maintain the privacy of those individuals. The only exceptions to this rule are in sections pertaining to engineering and geoscience regulating bodies (Engineers Yukon and APEGA) and STEM research in Yukon including project funding (Yukon Research Centre and NSERC), as data regarding registered professionals, project leads, and funding recipients can be analyzed from publicly available sources. In some cases as indicated, similar programs offered at Yukon

College were combined into one program to help ensure values were above reportable minimums and to maintain anonymity.

1.6 TIME PERIOD JUSTIFICATION

As the title suggests, this report seeks to present a statement of the position of Yukon women in STEM at a point in time. As such, the time period of interest were all data from the past five years (2013 – 2017). In some cases, data were only available and included for a single year. Examining five consecutive years serves to show general trends, identify changes as a function of time, and mitigate the risk of data misrepresentation due to small sample size and other uncontrollable variables. Not all data presented precisely corresponds to the years 2013 through 2017. There are slight variations in the time periods shown based on the information available at the time of writing this report. Note that this is a cross sectional and not a longitudinal study; the report does not follow a cohort over a period of time, instead it gathers data from a variety of sources and populations at a particular point in time.

1.7 ACRONYMS AND EXPANSIONS

ACRONYMS	EXPANDED
APEGA	Association of Professional Engineers and Geoscientists of Alberta
BHASE (Non-STEM)	Business, humanities, health, arts, social science, and education
CEGEP	Collège d'Enseignement Général et Professionnel
CIP	Statistics Canada Classification of Instructional Programs
CS/CST/IT	Computer Studies, Computer Support Technology and Information Technology
CWSE	Chairs for Women in Science and Engineering
ENCS	Northern Environmental and Conservation Sciences
EIT	Engineer in Training
ES11	Experiential Science Grade 11 Program
FSA	Foundational Skills Assessment
GIT	Geoscientist in Training
L.L.Eng	Limited License Engineer
NSERC	Natural Sciences and Engineering Research Council
P.Eng	Professional Engineer
P.Geo	Professional Geoscientist
PISA	Programme for International Student Assessment
RRM	Renewable Resource Management
STEM	Science, technology, engineering, and mathematics
WWEST	Westcoast Women in Engineering, Science, and Technology
YAT	Yukon Achievement Test
YC	Yukon College
YFSA	Yukon Foundational Skills Assessment
YRC	Yukon Research Centre

SECTION 2 – EDUCATION

The population of interest included students enrolled in a public elementary school, secondary school, or a post-secondary institution in Yukon. The report focused on data from the past five years (when available). This time period provides a view of current conditions as well as insight into changes occurring over time. Secondary school elective enrollment and post-secondary data, including graduation rates and scholarships applications, as well as degree levels of Yukon residents were included. Additional information on elementary level students included Grades 4 and 7 standardized numeracy testing as well as children enrolled in Yukon College's (YC) Kids' Camps in 2017. These data were included since standardized test outcomes as well as participation in STEM-related (Science, Technology, Engineering and Mathematics) extracurricular activities are early indicators of a potential interest in STEM. It is also important to track perception of success in mathematics in young girls and not simply note marks.

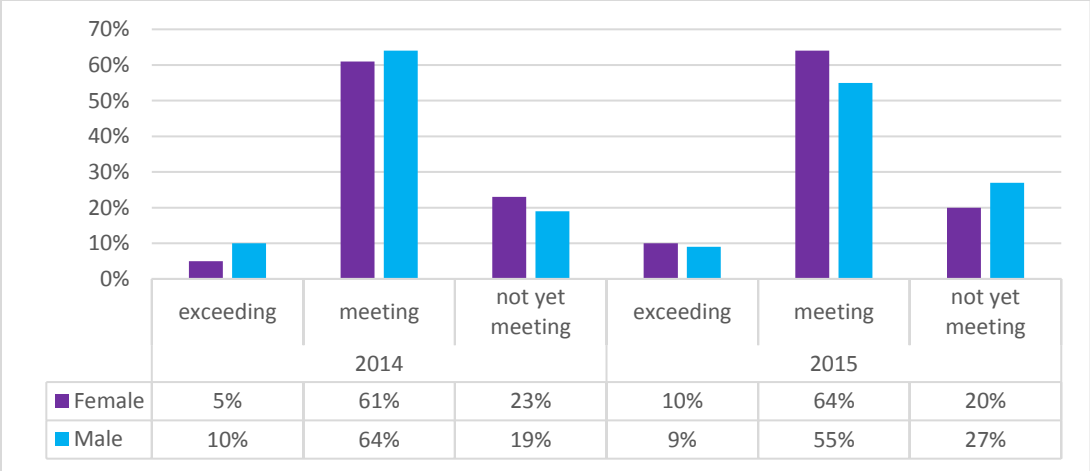
2.1 ELEMENTARY SCHOOL LEVEL ANALYSIS

The performance of Grade 4 and 7 students is compared to an accepted standard in the Yukon Foundational Skills Assessment (YFSA). These assessments occur annually across elementary schools in the territory. Students were categorized by test results and gender into the following: not meeting expectations, meeting expectations, or exceeding expectations. Comparisons to British Columbia's Foundational Skills Assessment (FSA) results were included. Enrollment data for Yukon College's STEM Kids Camps in 2017 was also collected.

2.1.1 GRADES 4 AND 7 STANDARDIZED NUMERACY TESTING

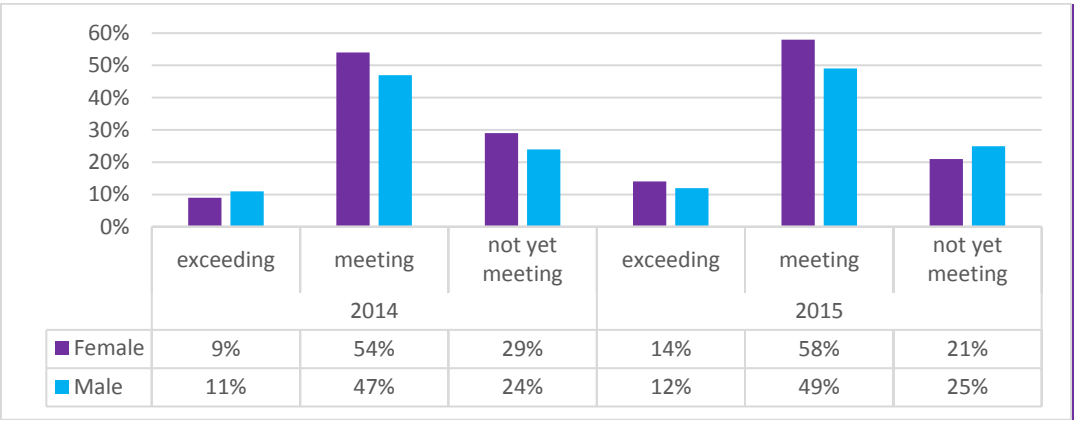
Yukon students in Grades 4 and 7 are assessed using the Yukon Foundational Skills Assessments (YFSA) - standardized numeracy (math), reading, and writing tests developed by the government of British Columbia. These tests replaced the Yukon Achievement Test (YAT) after the 2012-2013 academic year. The YFSA consists of an online multiple-choice section and a written response for reading comprehension and numeracy as well as an online writing assessment. The entire assessment takes approximately four hours in total. The multiple-choice sections are marked in British Columbia while the written sections are marked in Whitehorse by Yukon teachers. Values are shown as percentages of the whole sample for each gender. Note that results from 2014-2015 are the most recent publicly available data sets and included unknown performance level data that were not included in this analysis.

Figure 2.1.1.a - Grade 4 Numeracy Test Results by Year for 2014-2015



Source: Yukon Government Technology and Student Information 2014-2015

Figure 2.1.1.b - Grade 7 Numeracy Test Results by Year for 2014-2015



Source: Yukon Government Technology and Student Information 2014-2015

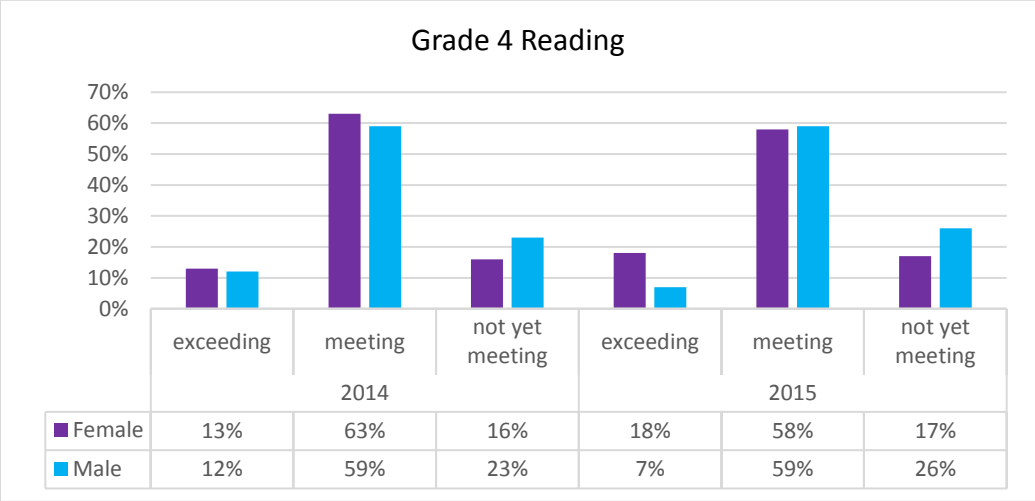
At both the Grade 4 and 7 levels, there was a higher percentage of girls meeting expectations in the standardized numeracy test than boys (Figure 2.1.1.a and Figure 2.1.1.b). The exception was students in Grade 4 during 2014, where 3% more boys than girls met the accepted standard (Figure 2.1.1.a).

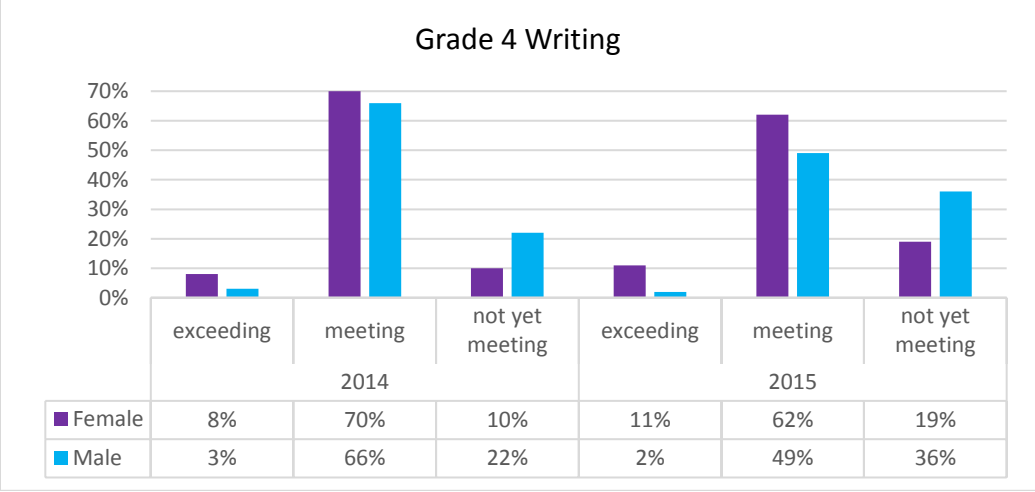
In 2014, the Grade 4 boys collectively achieved a better result relative to the girls (Figure 2.1.1.a). Of the total Grade 4 male population, 10% exceeded, 64% met, and 19% had not yet met expectations in 2014. These data can be compared to the 2014 female student population in which 5% exceeded, 61% met and 23% did not yet meet expectations (Figure 2.1.1.a). A contrasting outcome was observed in the 2015 sample where the girl cohort outperformed the boy cohort. The 2015 male distribution was 9% exceeding, 55% meeting, and 27% not yet meeting expectations. Comparably, the female distribution was 10% exceeding, 64% meeting, and 20% not yet meeting expectations (Figure 2.1.1.a).

For Grade 7, the results were more mixed across the two years analyzed. In 2014, Grade 7 girls had a higher percentage of meeting expectations then the boys at 54% as well as a higher percentage of not yet meeting expectations at 29%. A fewer percentage of girls exceeded expectations then boys with 9% exceeding. For Grade 7 boys in 2014, the results were 47% meeting expectations, 24% not yet meeting expectations, and 11% exceeding expectations (Figure 2.1.1.b). A similar outcome as observed for the Grade 4 girls in 2015 was also seen for the Grade 7 girls the same year, where the girl cohort collectively achieved a better result than the boy cohort. For the girls, 14% exceeded expectations, 58% percent met expectations, and 21% had not yet met expectations. For the boys, 12% exceeded expectations, 49% met expectations, and 25% had not yet met expectations (Figure 2.1.1.b).

According to the British Columbia Ministry of Education report *Foundational Skills Assessment – Writers Only*, the female BC FSA results for Grade 4 numeracy in the 2014/15 academic year were 23% not yet meeting, 66% meeting, and 10% exceeding expectations. The male results for the same grade and academic year were 20% not yet meeting, 66% meeting, and 13% exceeding expectations. The BC FSA female results for Grade 7 numeracy in the 2014/15 academic year were 27% not yet meeting, 61% meeting, and 11% exceeding expectations. The male results for the same grade and academic year were 27% not yet meeting, 59% meeting, and 14% exceeding expectations. The results for Yukon and BC girls in both Grade 4 and 7 were quite similar overall, with Yukon girls in 2015 having equal or higher percentages exceeding, a lower percentage not meeting, and slightly less meeting expectations compared with BC. Considering that Yukon percentages are based on known performance values and do not add up to 100%, it is possible that percentages of students not meeting, meeting, or exceeding expectations could be even closer.

Figure 2.1.1.c - Grade 4 Reading and Writing Test Results by Year for 2014-2015



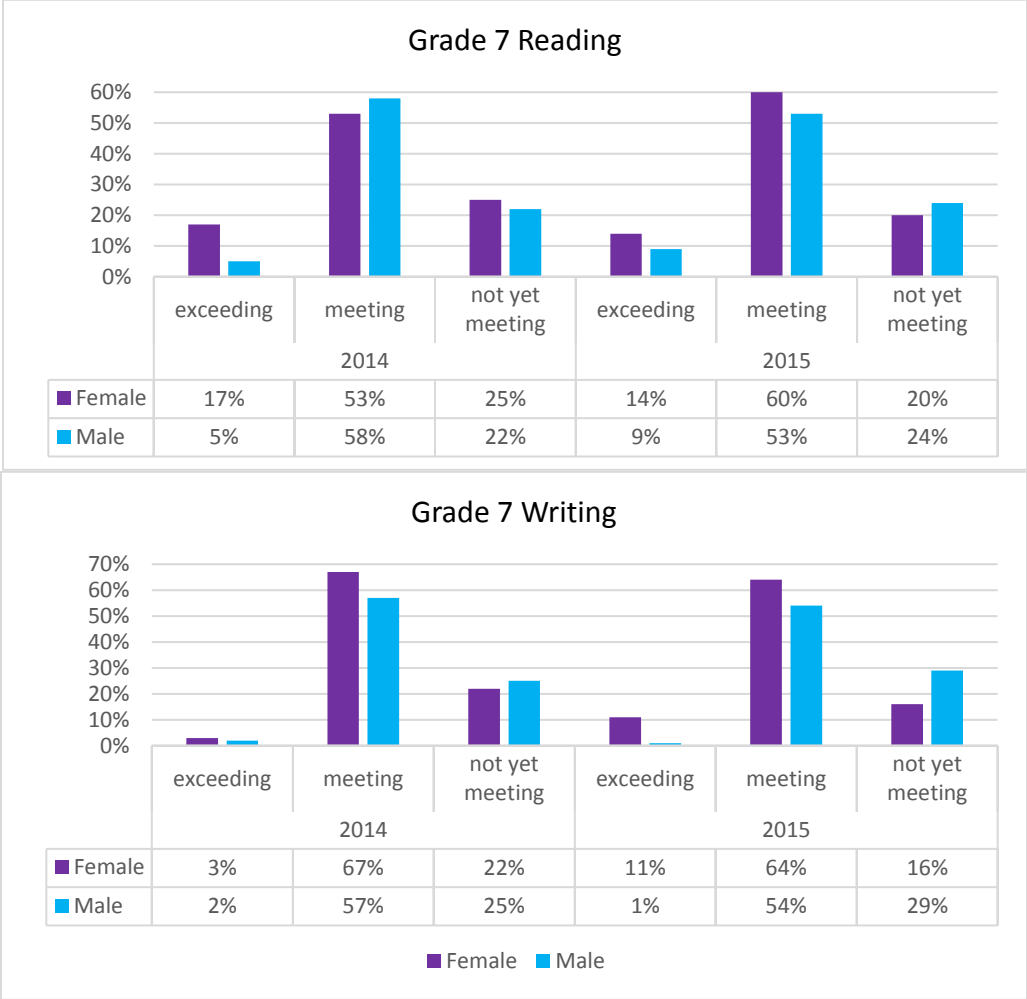


Source: Yukon Government Technology and Student Information 2014-2015

A higher percentage of Grade 4 girls exceeded expectations in reading and a lower percentage of girls did not meet expectations for both 2014 and 2015 when compared with Grade 4 boys. A higher percentage of girls met reading expectations in 2014 and a higher percentage of boys met expectations in 2015. This shift was due in part to higher percentage of girls exceeding expectations from the previous year; the percentage of boys meeting expectations did not change between 2014 and 2015. A higher percentage of girls met and exceeded expectations in writing for both years analyzed. A higher percentage of Grade 4 boys did not meet expectations for writing (Figure 2.1.1.c).

According to the British Columbia Ministry of Education report *Foundational Skills Assessment – Writers Only*, the female BC FSA results for Grade 4 reading and writing in the 2014/15 academic year were 16% and 10% not yet meeting, 67% and 78% meeting, as well as 17% and 12% exceeding expectations respectively. The male results for the same grade and academic year were 20% and 18% not yet meeting, 68% and 76% meeting, as well as 12% and 6% exceeding expectations respectively. Overall, Grade 4 girls in BC had a better reading and writing average based on known performance values in Yukon for 2015, with the exception of the percentage of Grade 4 girls exceeding expectations in reading in Yukon, which was 1% higher than BC.

Figure 2.1.1.d - Grade 7 Reading and Writing Test Results by Year for 2014-2015



Source: Yukon Government Technology and Student Information 2014-2015

A higher percentage of Grade 7 girls exceeded expectations in reading and writing for both 2014 and 2015 when compared to boys. A lower percentage of girls did not meet expectations for reading and writing, with the exception of 2014 reading, when 25% of girls did not meet expectations compared with 22% of boys. A higher percentage of girls met expectations in reading and writing with the exception of 2014, when 53% of girls met expectations and 58% of boys met expectations. It should be noted that in that year, 17% of girls exceeded expectations compared with 5% of boys. (Figure 2.1.1.d).

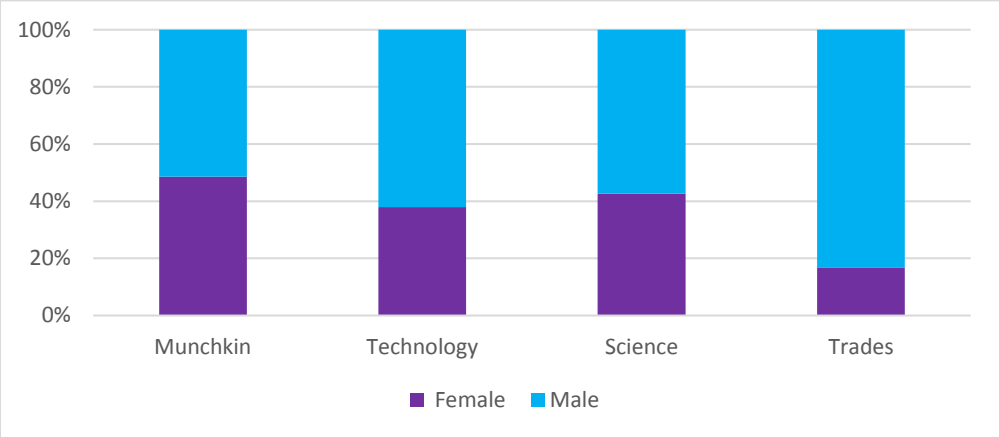
The BC FSA female results for Grade 7 reading and writing in the 2014/15 academic year were 19% and 7% not yet meeting, 66% and 83% meeting, and 15% and 10% exceeding expectations respectively. The male results for the same grade and academic year were 23% and 16% not yet meeting, 64% and 79% meeting, and 13% and 5% exceeding expectations. Overall, Grade 7 girls in BC had a better reading and writing average based on known performance values in Yukon for 2015, with the exception of the percentage of Grade 7 girls exceeding expectations writing in Yukon, which was 1% higher than BC.

It is important to compare numeracy with reading and writing to indicate where gaps remain and where improvements are being made in bringing about gender parity in all categories. A wider range of years being reported on would help to establish patterns over time. Also, publicly reporting known performance values that add up to 100% would allow for more accurate comparison to other data sources.

2.1.2 YUKON COLLEGE STEM KIDS' CAMPS

Yukon College, in partnership with Actua, organizes Yukon College (YC) Kids' Camps offered over nine consecutive weeks during the summer months. Each week consists of a new cohort of children and explores the areas of science, technology and trades. Trades camp data were excluded from this report with the exception of Week 8 data which were included, as that week of camp focused on STEM (Figure 2.1.2.a). The population of interest consists of elementary school age students enrolled in each camp per week. The Munchkins Camp consists of children aged five and six and was offered over eight week-long sessions. The Technology and Science Camps accepted age ranges varying from seven to thirteen and were both offered for eight and seven sessions respectively spread out over the nine weeks. All data presented were gathered from June to August 2017 and was divided based on the topic that session pertained to.

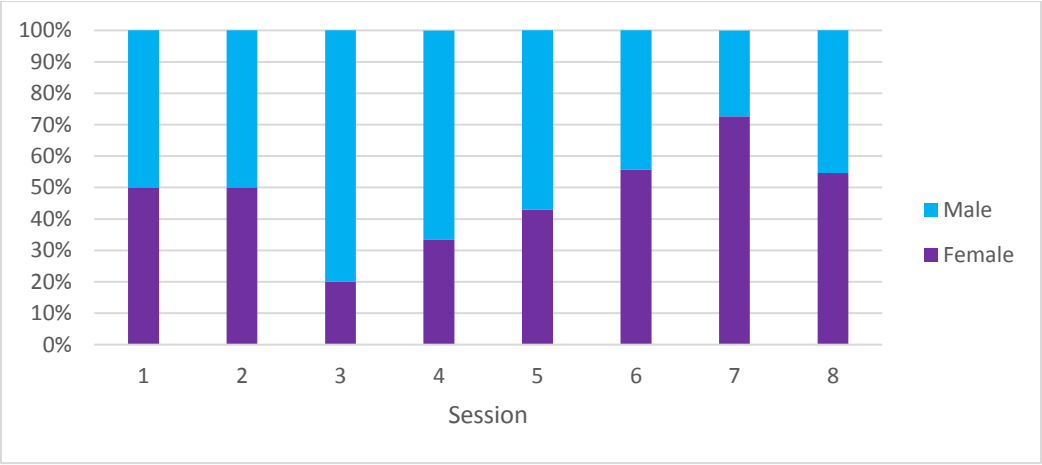
Figure 2.1.2.a – Yukon College Kids' Camps Participation by Gender for 2017



Source: Yukon College Kids' Camps 2017

Across all nine weeks and in all camp categories, the majority of campers were boys. The camp with the closest gender parity was the Munchkins Camp with 48.5% girls and 51.5% boys. Science Camp came in second with 42.7% girls and 57.3% boys, however, this number is higher due to the fact that there was one week with 100% girls. Technology Camp followed with 37.9% girls and 62.1% boys. Week 8 of Trades Camp focused on STEM with 16.7% girls and 83.3% boys participating.

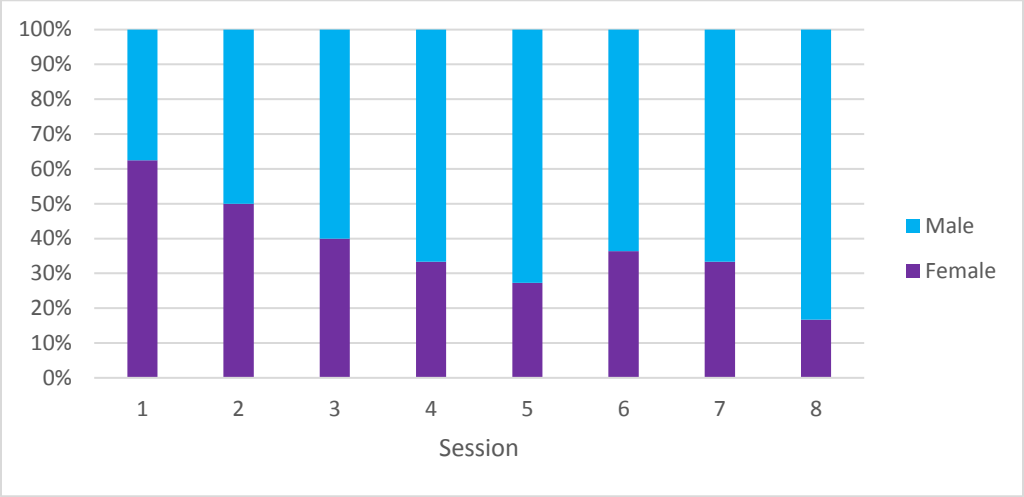
Figure 2.1.2.b – Munchkins Camp Participation by Gender for 2017



Source: Yukon College Kids' Camps 2017

The Munchkins camp introduces children aged five and six to interactive science and technology materials. The gender distribution varied greatly from week to week, with 20% girls in Session 3 to 73% girls in Session 7 (Figure 2.1.2.b).

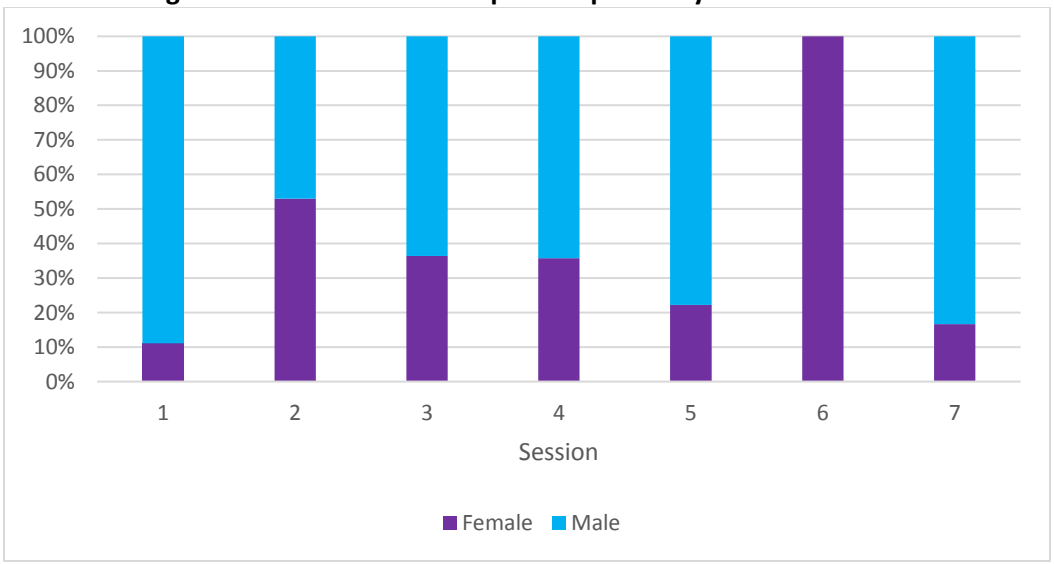
Figure 2.1.2.c – Technology Camp Participation by Gender for 2017



Source: Yukon College Kids' Camps 2017

The Technology Camps were offered to age ranges of either seven and eight or nine and ten for a total of eight sessions. Content included coding, robotics, video gaming, and electronics. Similar to the Munchkins Camps, there was variation in the Technology Camp gender distribution from week to week. The highest level of girl enrollment was observed in Session 1 at 63% and the lowest girl enrollment was seen in Session 8 at 17% (Figure 2.1.2.c). Both of these sessions were for the seven and eight year old age range.

Figure 2.1.2.d – Science Camp Participation by Gender for 2017



Source: Yukon College Kids' Camps 2017

Comparable to the Technology Camps, the Science Kids' Camps were offered to age ranges of either seven and eight or nine and ten each week for seven sessions. Topics of climate change, biology, geology,

chemistry, and aviation were explored. Contrasting the trends displayed in the Munchkins and Technology Camps, the Science Camp gender distribution was primarily boys. Session 6 data exists as an outlier with all of the registrants being girls in the seven and eight year old range (Figure 2.1.2.d). Girl participation was at its lowest at 11% in Session 1 with the nine and ten year old range (Figure 2.1.2.d). Since participation in Yukon College's Kid's Camps by girls is lower than boys consistently, this indicates an early gender gap in participation in STEM extracurricular activities. Increasing participation of girls in this program would be recommended to help increase diversity in the future.

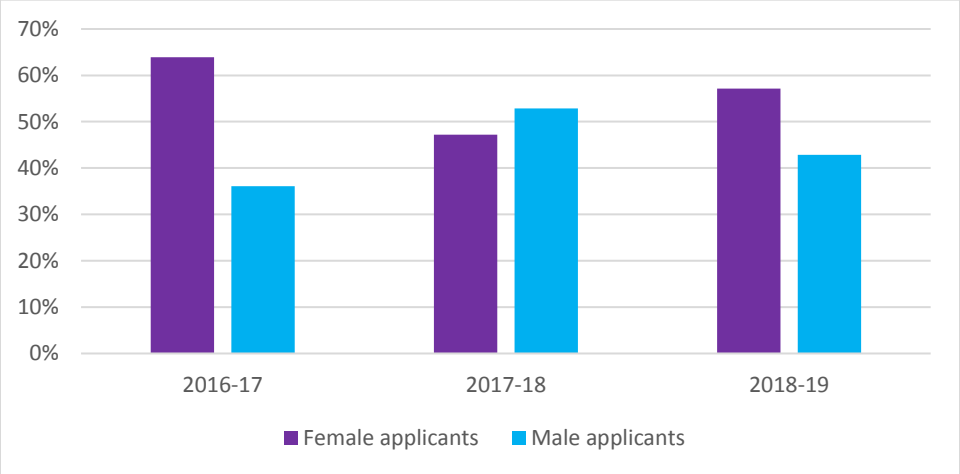
2.2 SECONDARY SCHOOL LEVEL ANALYSIS

The population of interest was all students enrolled in STEM field programming and courses at the secondary school level in Yukon. Data sources were extremely limited as only one available source tracked gender enrollment rates in science, math or computer science elective classes. Completion of secondary level math and science courses is necessary to pursue STEM careers, including engineering, according to "Why STEM? For Parents & Guardians" in Parker, Pelletier, and Croft's *WWEST's gender diversity in STEM: A briefing on women in science and engineering*. Tracking secondary school student enrollment in math and science courses, as well as perception of mathematical ability, can serve as key indicators of future STEM post-secondary and career opportunities.

2.2.1 GRADE 11 EXPERIENTIAL SCIENCE COURSE ENROLLMENT

The sole source of usable data was collected from Wood Street Centre's Grade 11 Experiential Science Program (ES11). ES11 is offered in both Semesters 1 and 2. It integrates biology, chemistry, geography and physical education in an interactive learning environment centered on a singular three-week long field trip to Vancouver Island and Southeast Alaska. According to the ES11 online application form, the program attempts to select 16 young women and 16 young men residing in Yukon for a maximum total of 32 students per year. Because of this, tracking gender of applicants is the clearest way to show interest.

Figure 2.2.1.a - Experiential Science 11 Applicants by Gender and Year for 2016-2019



Source: Wood Street Centre 2016-2019

As seen in Figure 2.2.1.b, there was a fluctuation in the ES11 applicant pool gender distribution over the past three years. There was only year in the past three for which there was a greater proportion of young male applicants than young women, which was the 2017-2018 academic year with 47% young women and 53% young men applying (Figure 2.2.1.b). In the 2016-2017 and 2018-2019 application cycles, there were at least 10% more applications from young women than young men. On average, the distribution of applications was 56% young women and 44% young men (Figure 2.2.1.b). Note that young women

attending Wood Street Centre showed a consistent level of interest in pursuing a STEM-based elective over the three year period that was analyzed.

2.3 POST-SECONDARY LEVEL ANALYSIS

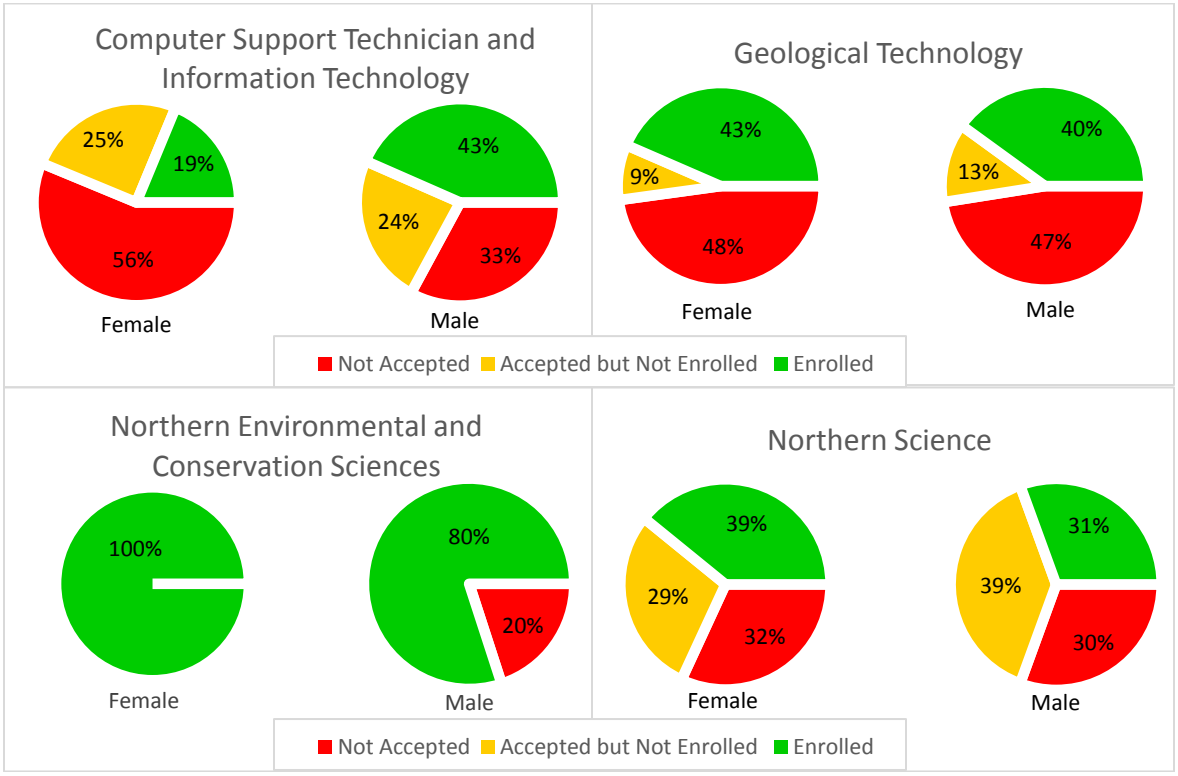
The population of interest was Yukon residents attending Canadian public post-secondary institutions, specifically those enrolled at Yukon College. Acceptance, persistence, and graduation rates were also examined. In addition, data were collected on applicants and recipients of STEM field scholarships and health education bursaries offered to Yukon residents.

For situations when less than 10 individuals were enrolled in a program or were awarded a scholarship or bursary, these data were either combined as indicated or not reported on. Note that some programs may not have been offered every year during the examined period or may have been discontinued.

2.3.1 YUKON COLLEGE STEM AND HEALTH SCIENCE PROGRAM APPLICATION OUTCOMES

Data were collected on the gender and application outcome of all applicants to the following programs of interest at Yukon College. The following figures were produced using data compiled on all applicants in years 2013 to 2017. Proportions shown are of the entire applicant pool over the five years in question.

Figure 2.3.1.a – Admission Outcomes for Yukon College STEM Applicants for 2013-2017



Source: Yukon College

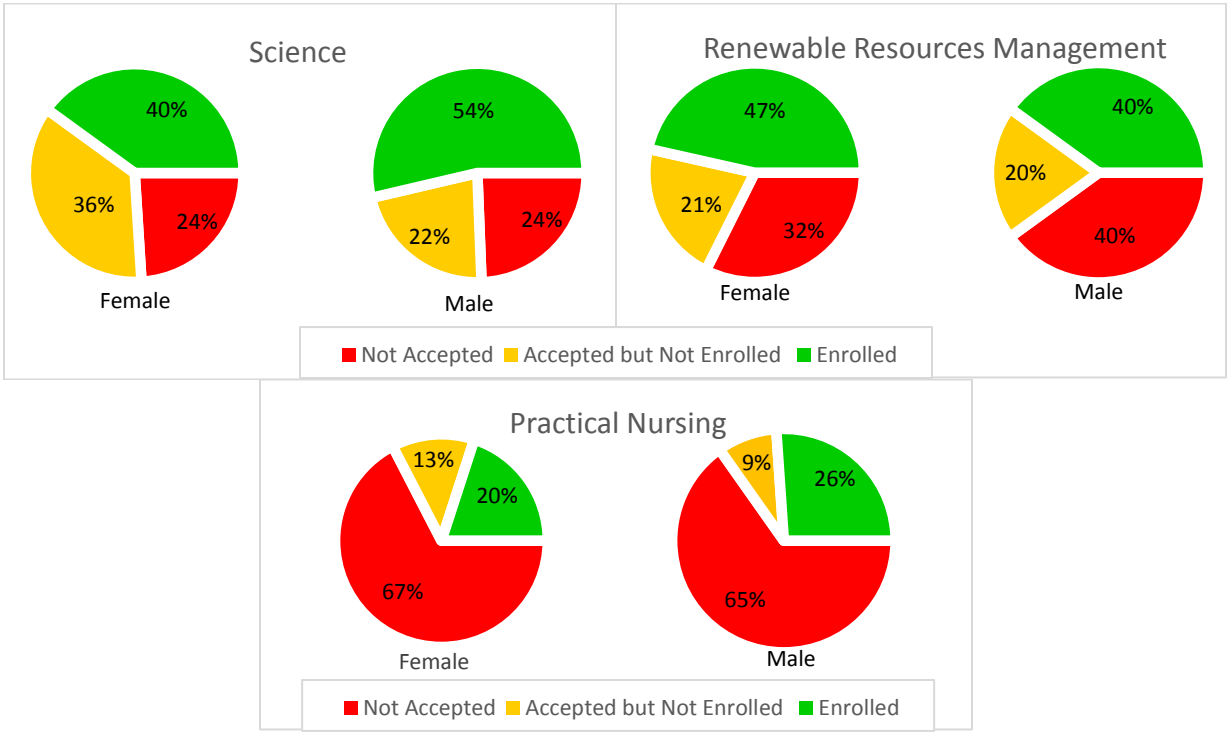
The largest gender gap among students not accepted into a program was seen in Computer Support Technician and Information Technology (CST/IT), where 56% of women were not accepted while only 33% of men were not admitted. Of the 44% of women accepted into CST/IT, only 19% enrolled. Only 33% of male applicants to CST/IT were not offered admission and 43% of total male applicants enrolled in the program (Figure 2.3.1.a). This program shows the greatest disparity between women and men in the area of unsuccessful application and could be a result of unconscious bias in the application review process.

Parker, Pelletier, and Croft's *WWEST's gender diversity in STEM: A briefing on women in science and engineering* infographic chapter on "Unconscious Bias" defined it as "assumptions and conclusions we jump to without thinking" and showed the effect it had on the hiring process. A significant difference in initial acceptance rates should be looked at as a potential indicator of unconscious bias affecting the perception of women and men seeking enrollment in technology and other STEM programs. The proportion of applications to this program by gender was 17.39% women to 82.61% men and the final enrollment proportion was 8.33% women and 91.67% men. Not accepting women into programs to begin with can result in an imbalance in classroom ratios, which in turn can lead to feelings of stereotype threat in women. Stereotype threat is defined "the concern with being viewed through the lens of a stereotype" and can affect academic performance according to the infographic chapter "Stereotype Threat" by Parker et al. By accepting more women into STEM programs, it helps to reinforce that they belong and that their success is earned.

Unsuccessful application rates in Geological Technology were 48% for women and 47% for men who applied. A small proportion of admission offer recipients (9% women and 13% men) did not enroll in the program. 43% and 40% of female and male applicants respectively enrolled in the Geological Technology at Yukon College (Figure 2.3.1.a).

100% of women and 80% of men that applied to Northern Environmental and Conservation Sciences (ENCS) from 2013-2017 enrolled in the program, with 20% of male applications being unsuccessful. The application outcomes for women and men did not differ considerably in Northern Science - 32% of female and 30% of male applicants were not accepted. 29% of women and 39% of men who were offered admission did not enroll. A total of 39% of female and 31% of male applicants enrolled in Northern Science (Figure 2.3.1.a).

Figure 2.3.1.b – Admission Outcomes for Yukon College STEM and Health Science Applicants for 2013-2017



Source: Yukon College 2013-2017

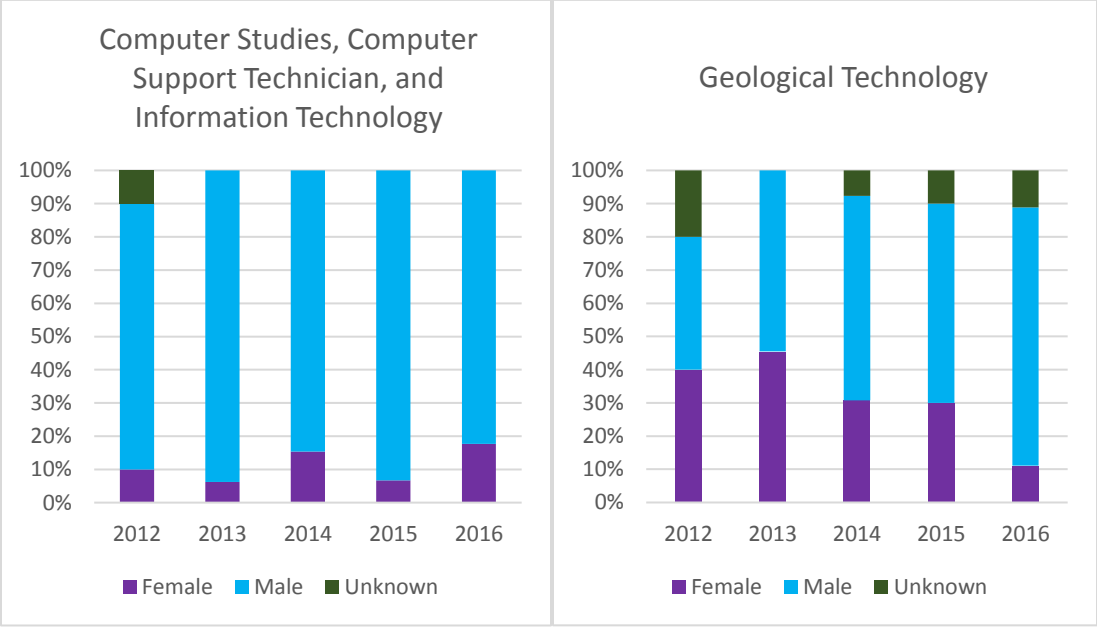
Results were similar for male and female applicants in the Science program. 24% of both female and male applicants were not accepted, 36% of women and 22% of men offered admission did not enroll, while 40% of female applicants and 54% of male applicants enrolled in the program (Figure 2.3.1.b). Although the same percentage of women and men were offered enrollment (76%), the fact that 14% less women who were admitted actually enrolled compared to men shows a gendered gap starting to form from the beginning of the enrollment process in the Science program. In Renewable Resources Management (RRM), 32% of women and 40% of men who applied were not offered admission. Small proportions of individuals offered admission did not enroll in the RRM program, with 21% of female offer recipients and 20% of male offer recipients not enrolling. Similar proportions of female and male applicants enrolled in the RRM program at 47% and 40% respectively (Figure 2.3.1.b).

The only health science program analyzed, Practical Nursing, was the most competitive program analyzed with the large majority of applicants (67% of women and 65% of men) not offered admission (Figure 2.3.1.b). A very small proportion of individuals offered admission did not enroll in the Practical Nursing Program, with 13% of women and 9% of men not enrolling. Enrollment rates in Practical Nursing were 20% of total female applicants and 26% of total male applicants.

2.3.2 STUDENT ENROLLMENT AT YUKON COLLEGE

The population of interest were all students registered in STEM programs at Yukon College regardless of full or part-time status. Data were collected from 2012-2016. Computer Support, Computer Studies, Information Technology, Northern Environmental and Conservation Sciences, Geological Technology, Northern Science, General Science, Renewable Resource Management, and Practical Nursing programs were explored.

Figure 2.3.2.a – Yukon College Technology Program Enrollment by Gender for 2012-2016



Source: Yukon College 2012-2016

Enrollment values were expressed in terms of female, male, and unknown. Unknown values were included as they affect the final data percentages, especially in Geological Technology. The distribution of women across technology programs was lower than men for the computer based technology programs: Computer Studies, Computer Support Technician, and Information Technology (CS/CST/IT) as well as Geological

Technology. In the three computer-related programs (CS/CST/IT), the combined female distribution did not rise above 17.6% of known values. This is not a surprising outcome given the gender gap in acceptance rates seen in Figure 2.3.1.a. The highest proportion of women was seen in the Geological Technology program in 2013 at 45.5%. The distribution fell from to 11.1% in 2016 (Figure 2.3.2.a).

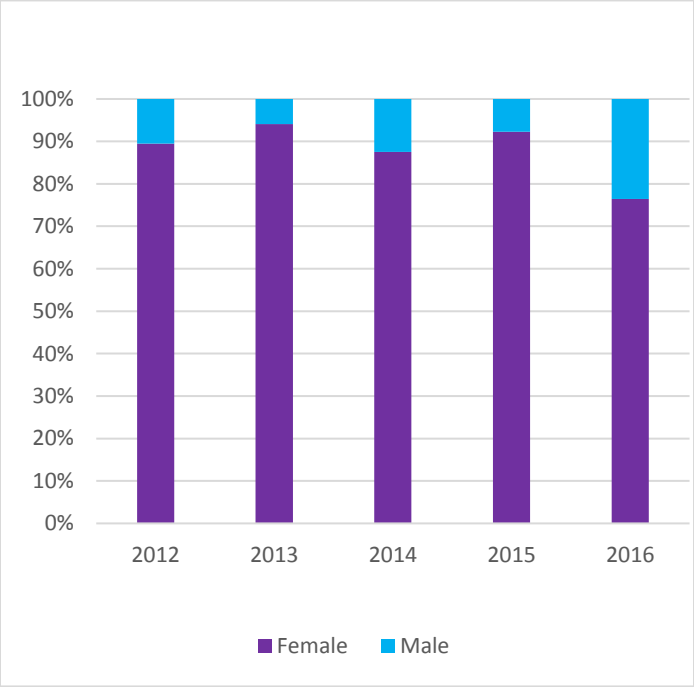
Figure 2.3.2.b –Yukon College Science Program Enrollment by Gender for 2012-2016

Source: Yukon College 2012-2016

Enrollment values were expressed in terms of female, male, and unknown. Unknown values were included as with some courses, like Northern and Environmental Conservation Sciences, these values had a greater impact on final percentages. In all science programs, with the exception of Northern Environmental and Conservation Sciences, the total female enrollment in each year was at least 43.8% of the known gender

values (Figure 2.3.2.b). Female enrollment in the Northern Science program reached a maximum of 100% in 2013 and a minimum of 44.4% in 2014. The distribution of women in General Science remained relatively constant over the period examined with a low of 50% of known values and a high of 65.4%. Renewable Resources Management female enrollment also remained fairly constant with the greatest variance being 7.9%, with a high of 51.7% women and a low of 43.8% of known gender values. The lowest enrollment of women was seen in Northern Environmental and Conservation Science, as it did not exceed 44.4% of known values between 2012 and 2016 and dropped as low as 27.9% in 2016 (Figure 2.3.2.b). These figures show a fairly consistent enrollment level in sciences by women at Yukon College over the 5 years analyzed, with a higher interest in Northern Science than Northern Environmental and Conservation Sciences.

Figure 2.3.2.c –Yukon College Practical Nursing Program Enrollment by Gender for 2012-2016



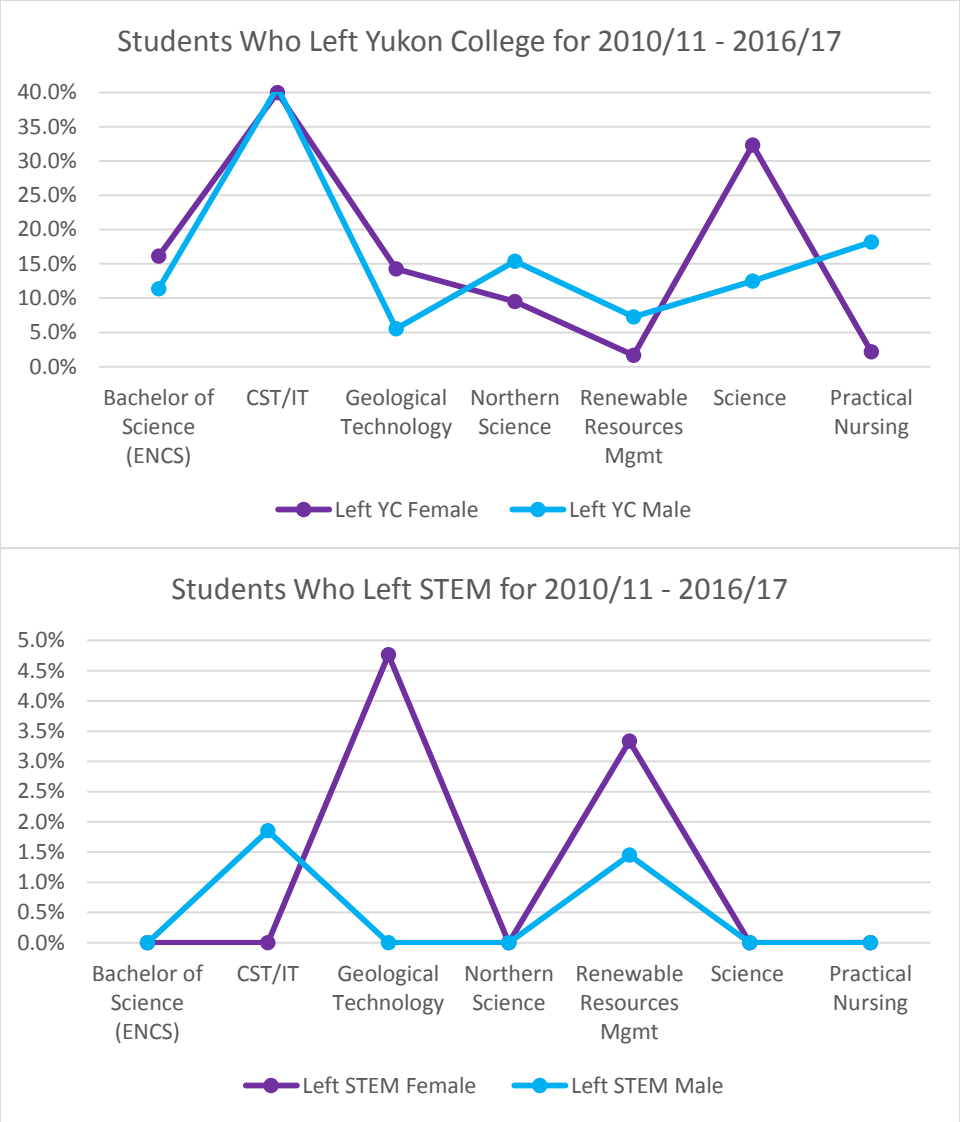
Source: Yukon College 2012-2016

Enrollees in Practical Nursing were primarily women from 2012-2016. The lowest female enrollment was observed in 2016 at 76.47%. The highest enrollment of women was seen in 2013 at 94.12%. Male enrollment did not surpass 24% during the time period analyzed (Figure 2.3.2.c).

2.3.3 YUKON COLLEGE STEM AND HEALTH SCIENCE PROGRAM PERSISTANCE

Continuation rates in Yukon College STEM programs were tracked from 2010-2017. Data were collected for all students registered in Northern Environmental and Conservation Sciences BSc (ENCS), Computer Support Technology (CST), Information Technology (IT), Geological Technology, Northern Science, Renewable Resources Management (RRM), General Science, and Practical Nursing programs for any academic year from 2010 to 2017. Individuals were grouped according to whether or not they persisted (continued to study) in the same program, transferred to a different STEM and health science field program or left Yukon College all together. Some programs have been combined into one chart to help ensure reportable values as well as maintain privacy.

Figure 2.3.3.a – Students Leaving STEM and Health Science Programs or Leaving Yukon College Entirely by Gender for 2010/11 - 2016/17



Source: Yukon College 2010-2017

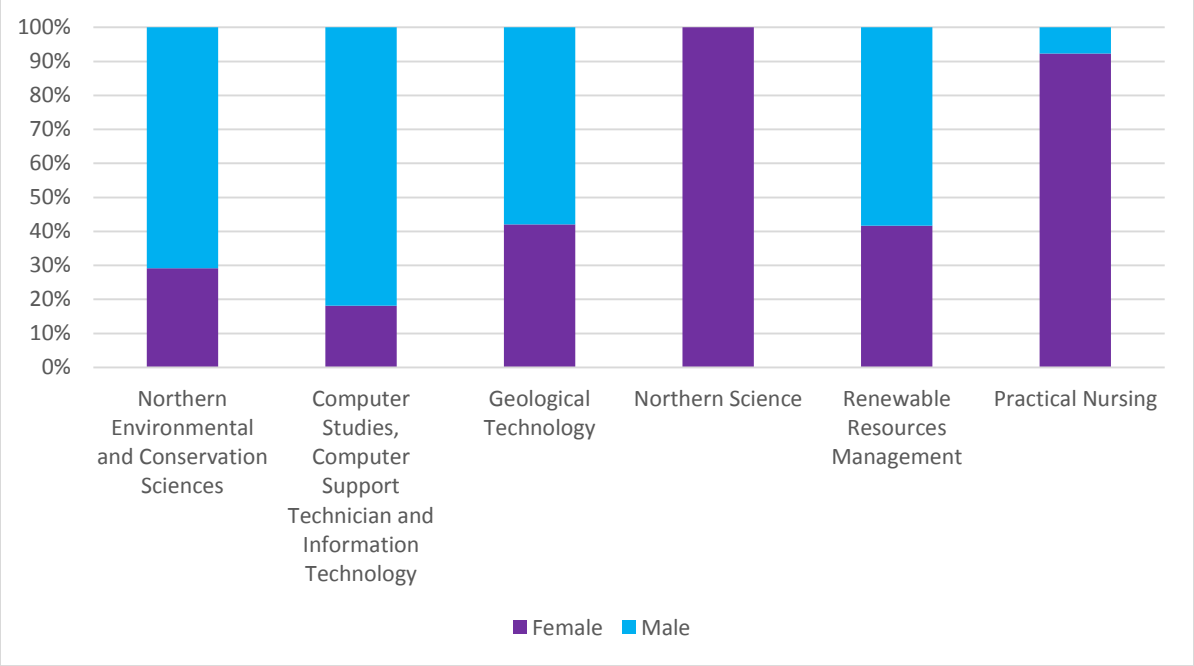
Of all programs analyzed, women had the highest continuation rates in Practical Nursing and Renewable Resources Management (RRM) with 97.8% and 95% respectively continuing in these programs from one year to the next (Figure 2.3.3.a). 2.2% of women left the Practical Nursing program at Yukon College (YC), while 1.7% of RRM students left YC and 3.3% left STEM entirely. Women had the lowest persistence rate in Computer Support Technology and Information Technology (CST/IT) with an average of 60% remaining in these programs and 40% leaving Yukon College. The male continuation rate was also the lowest in CST/IT at 57.4% continuing at Yukon College with 40.7% leaving YC and 1.9% leaving STEM. 3.6% less men than women continued in computer-related programs at Yukon College (Figure 2.3.3.a). This difference is worth noting due to the vast difference of enrollment rates between women and men in computer programs at YC. The majority of students that left their respective STEM program also left Yukon College. Only a small portion of students transferred to a non-STEM program but continued their studies at the

college. Note that students who left Yukon College could have continued studying STEM fields, but there is little way to track this.

2.3.4 YUKON COLLEGE STEM AND HEALTH SCIENCE PROGRAM GRADUATION RATES

The population of interest was all individuals who completed their respective STEM program requirements at the Yukon College between 2012 and 2017. This analysis consisted of certificate, diploma, and degree programs. The Northern Environmental and Conservation Science program leads to a Bachelor of Science, while completing the Geological Technology, Northern Science, and Renewable Resources Management programs lead to diplomas. All of the Computer-related courses (Computer Studies, Computer Support Technician, and Information Technology) as well as Geological Technology and Practical Nursing are all certificate granting programs. Not all programs had graduates every year from 2012 to 2017.

Figure 2.3.4.a – Yukon College STEM and Health Science Graduates by Gender for 2012-2017



Source: Yukon College 2012-2017

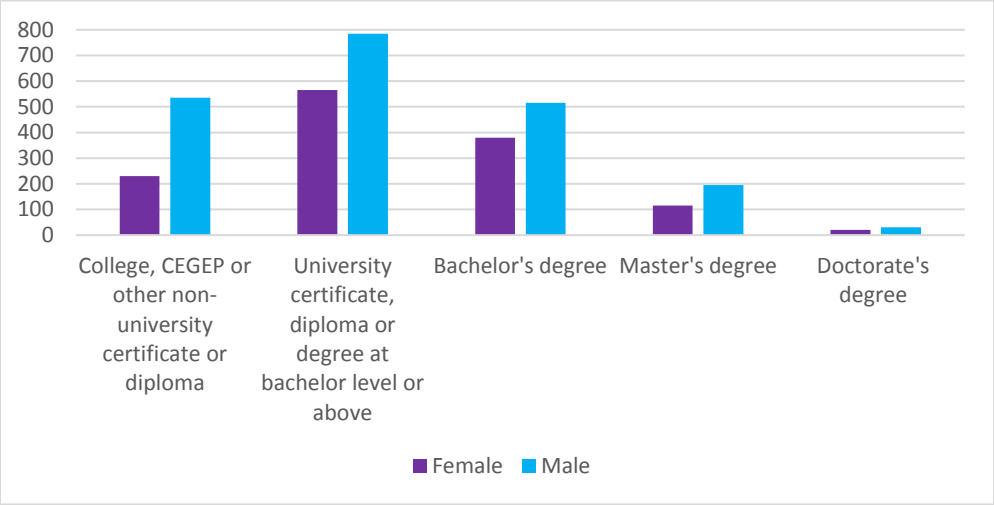
Overall, there were approximately equal numbers of male and female graduates. From 2012 to 2017 there were 60 male graduates and 61 female graduates. The gender distribution in each program, if taken individually, was primarily male with the exceptions of Northern Science and Practical Nursing. These two programs were the only ones that saw more women graduate than men (Figure 2.3.4.a).

2.3.5 EDUCATION LEVEL OF YUKON RESIDENTS

The following data were collected from the Statistics Canada 2016 Census of Population for Yukon residents aged 15 and over with additional comparison to national rates. The distribution of degrees awarded across the following types of degrees is explored: college, CEGEP (Collège d'Enseignement Général et Professionnel), or non-university certificate; university certificate, diploma, or degree (note that this category includes bachelor, master, and doctorate degrees and should not be compared against their individual sections); as well as separate analysis for bachelors, masters, and doctorates individually. Those who reported their degree of study as one of the following STEM fields were included in this analysis: science or science technology, engineering or engineering technology, mathematics, computer

science, or health science. Values are displayed numerically to provide insight into overall numbers of individuals with each level of education.

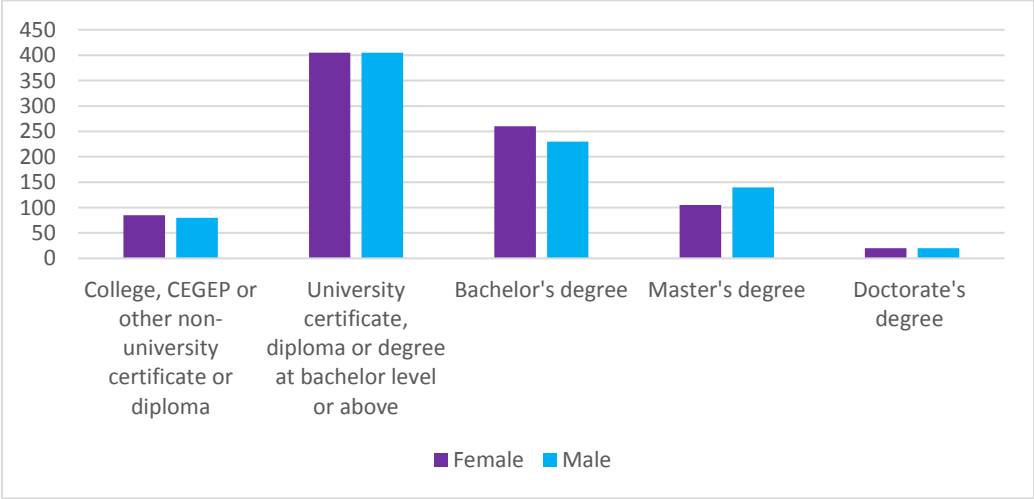
Figure 2.3.5.a – STEM Education Level of Yukon Residents by Gender for 2016



Source: Statistics Canada Census 2016

The number of women with degrees in STEM fields was lower than men across all analyzed degree types. 565 women held a university certificate, diploma, or degree at bachelor level or above which was far more than the 230 women who held a college, CEGEP or other non-university certificate or diploma. The 380 women who earned bachelor's degrees in STEM fields was highest distribution among the higher level degrees. 115 women held a master's degree and 20 women held a doctorate's degree in STEM (Figure 2.3.5.a). This is mirrored on a national level, with fewer women than men having degrees at every educational level analyzed. The following figures show the breakdown of this overall STEM data into specific fields and groups of degrees so that gender gaps are apparent.

Figure 2.3.5.b – Science and Science Technology Education Degrees of Yukon Residents by Gender for 2016

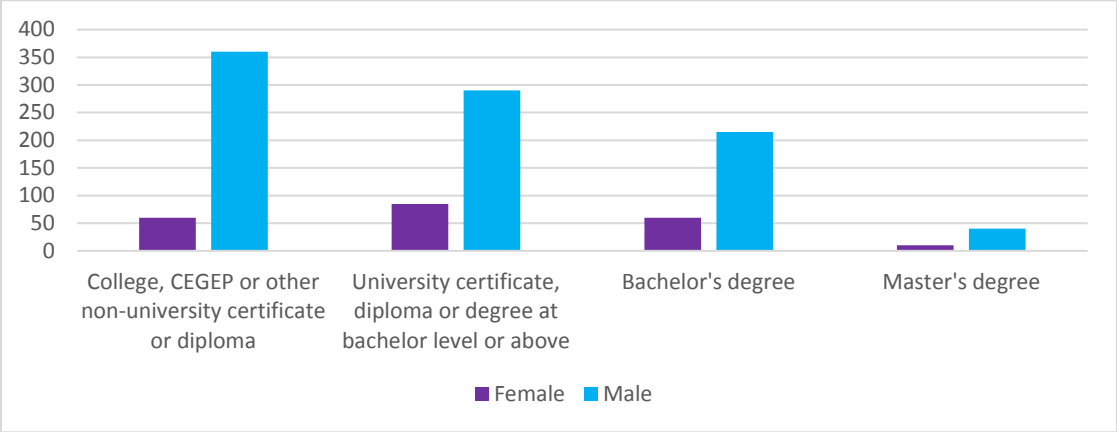


Source: Statistics Canada Census 2016

In the Science and Science Technology field there were more women than men holding college, CEGEP or other non-university diplomas and bachelor's degrees, with 85 women and 80 men in total. There was an

equal number of women and men with a university certificate, diploma, or degree at a bachelor level or above in the Science and Science Technology field with 405 women and 405 men. There were also equal numbers of women and men holding doctorates degrees at 20 women and 20 men (Figure 2.3.5.b). National averages followed a similar trend overall, with the only changes being women holding slightly more masters degrees than men, women holding slightly less university certificate diplomas or degrees at bachelor level or above than men, and men holding more doctorate degrees than women with 53,165 compared to 27,445.

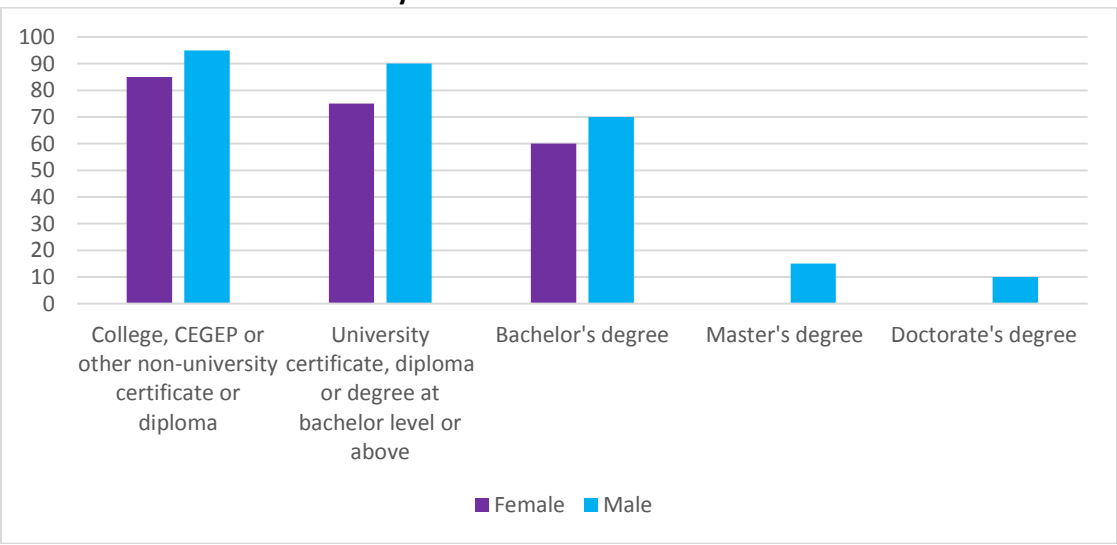
Figure 2.3.5.c – Engineering and Engineering Technology Education Degrees of Yukon Residents by Gender and Level for 2016



Source: Statistics Canada Census 2016

The most profound difference in gender proportions was seen in the Engineering and Engineering Technology field. More men than women held degrees at every level analyzed. Within this field, the largest female distribution was seen in individuals holding a university certificate, diploma, or degree at a bachelor level or above with 85 total. This is compared to the 290 men with the same educational level (Figure 2.3.5.c). These results are mirrored nationally with men having more degrees at every level. 4,305 women earned doctorates compared to 24,700 men nationally.

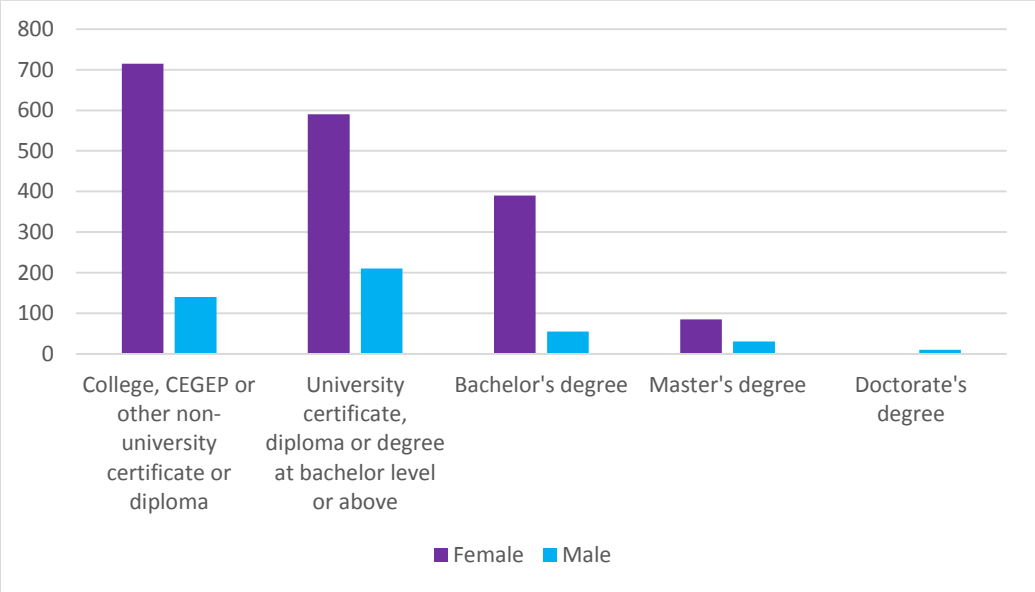
Figure 2.3.5.d – Mathematics and Computer Science Education Degrees of Yukon Residents by Gender and Level for 2016



Source: Statistics Canada Census 2016

In Mathematics and Computer Science, there were more men than women holding degrees at every level. Notably, there were no women with masters or doctorate degrees in Mathematics and Computer Science who were Yukon residents in 2016 (Figure 2.3.5.d). National results are similar with more men than women holding degrees at every level. 24,505 women earned masters degrees compared with 46,900 men as well as 2,790 women who earned doctorates degrees compared with 9,475 men.

Figure 2.3.5.e – Health Science Education Degrees of Yukon Residents by Gender for 2016



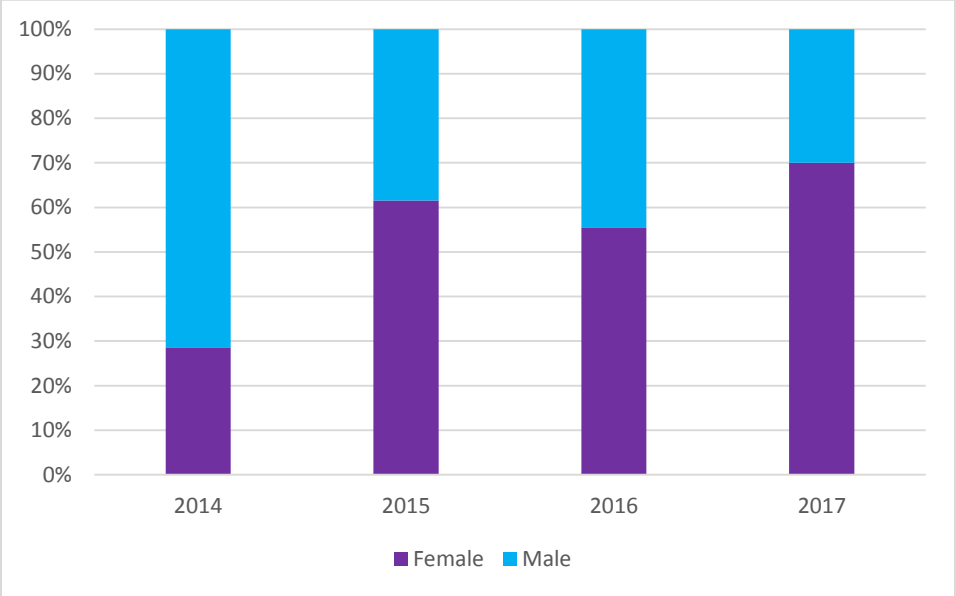
Source: Statistics Canada Census 2016

Female distribution in Health Sciences was much larger than men at every educational level, with the exception of doctorate degrees (Figure 2.3.5.e). This trend of women holding more degrees then men is unique to the health sciences. 715 women held college, CEGEP or other non-university certificates in health science compared to 140 men. For bachelor's degrees, female held 390 compared to men with 55. There were no women who were Yukon residents in 2016 holding doctorate degrees in Health Science, but there were 10 men with doctorate-level (PhD) education in this field during the same time period (Figure 2.3.5.e). It is important to note that medical doctors (MDs) were not included in this figure, as degree level distinctions vary across Canadian medical schools. On a national level, women held more degrees than men at every level, including doctorate degrees. 7,740 women earned doctorates compared with 5,545 men and was the closest degree category.

2.3.6 POST-SECONDARY STEM SCHOLARSHIPS

The population of interest were the applicants and awardees for three post-secondary STEM field scholarships available to Yukon residents only. Data were collected for three scholarships: the NorthwesTel Northern Futures Scholarship, the Yukon Energy Premier Scholarship, and the Yukon Conservation Society's Ted Parnell Scholarship. The data used in this section were collected over a five year period for the Yukon Energy Premier Scholarship and the Yukon Conservation Society's Ted Parnell Scholarship (2013-2017). The data used for the NorthwesTel Northern Futures Scholarship was collected over a four year period (2014-2017). Note that awardees data were not listed as there were less than 10 recipients per award; instead of awardees, the analysis is based on applicants to these awards.

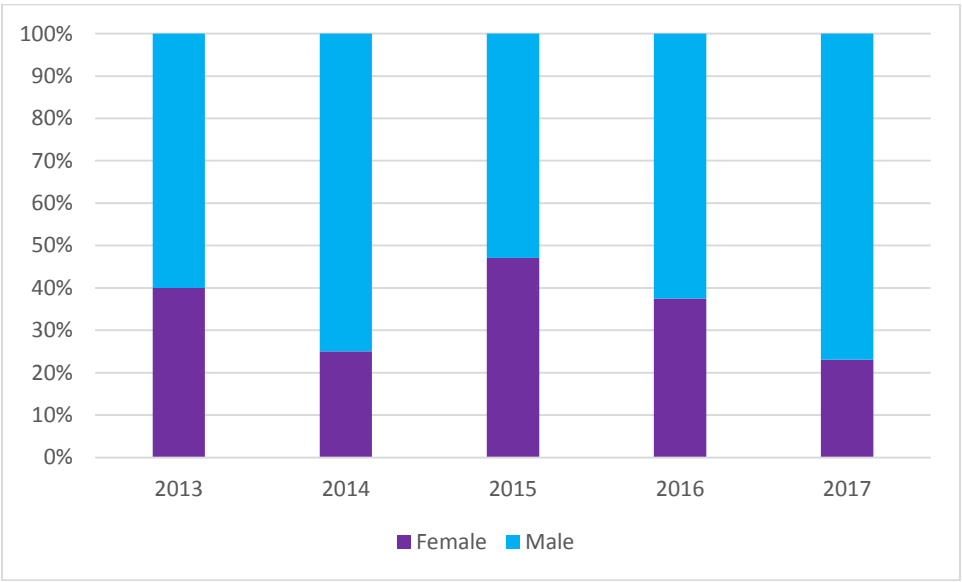
Figure 2.3.6.a – NorthwesTel Northern Futures Scholarship Applicants by Gender for 2014-2017



Source: NorthwesTel 2014-2017

The NorthwesTel Northern Futures Scholarship is valued at $4000 per scholarship and is awarded annually to a maximum of six individuals. Applicants must be enrolled full-time in an accredited post-secondary institution in the fields of engineering, telecommunications, computer science or commerce. Applicants and awardees in commerce fields were excluded from this analysis. Female applicants increased from 28.6% in 2014 to 70% in 2017 (Figure 2.3.6.a). Slightly more men than women received the scholarship over the time period analyzed.

Figure 2.3.6.b – Yukon Energy Premier Scholarship Applicants by Gender for 2013-2017

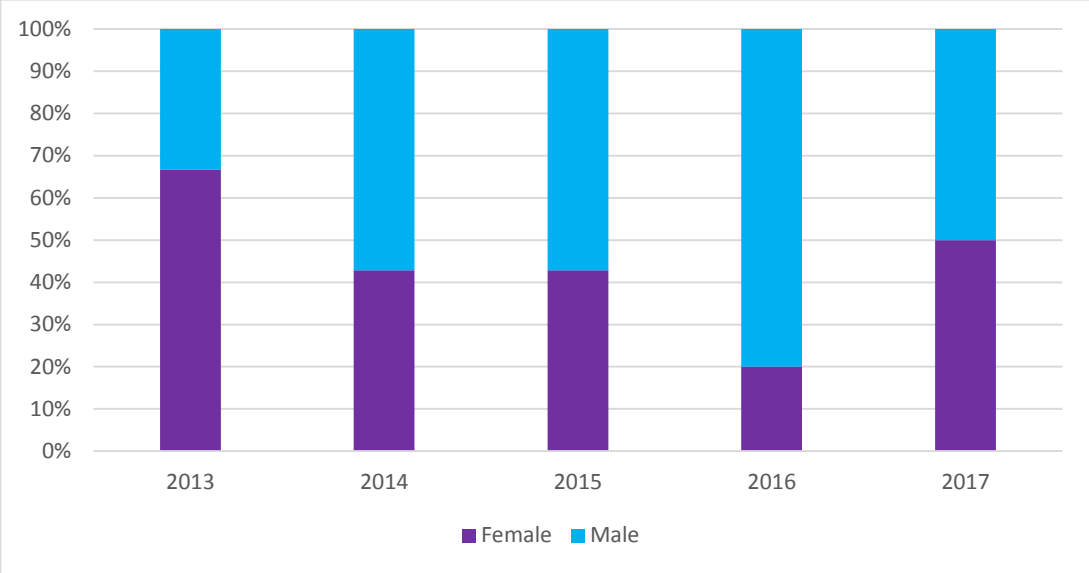


Source: Yukon Energy 2013-2017

The Yukon Energy Premier Scholarship is awarded to a maximum of six post-secondary students studying mechanical, electrical, environmental, or civil engineering. There is one lump sum of $3000 awarded to a

first-year student as well as up to three multiyear awards valued at $3000 per year totaling $9000 for second to fourth year students. The number of female applicants fluctuated from 2013 to 2015 and then declined from 2015 (47.1%) to 2017 (23.1%). The overall proportion of female applicants is lower than men for all years in question. The number of female awardees was also significantly lower than men over the time period analyzed, with 80.95% of awards going to men (Figure 2.3.6.b). Note that the number of scholarships awarded was not consistent over the five-year time period.

Figure 2.3.6.c – Ted Parnell Scholarship Applicants by Gender for 2013-2017



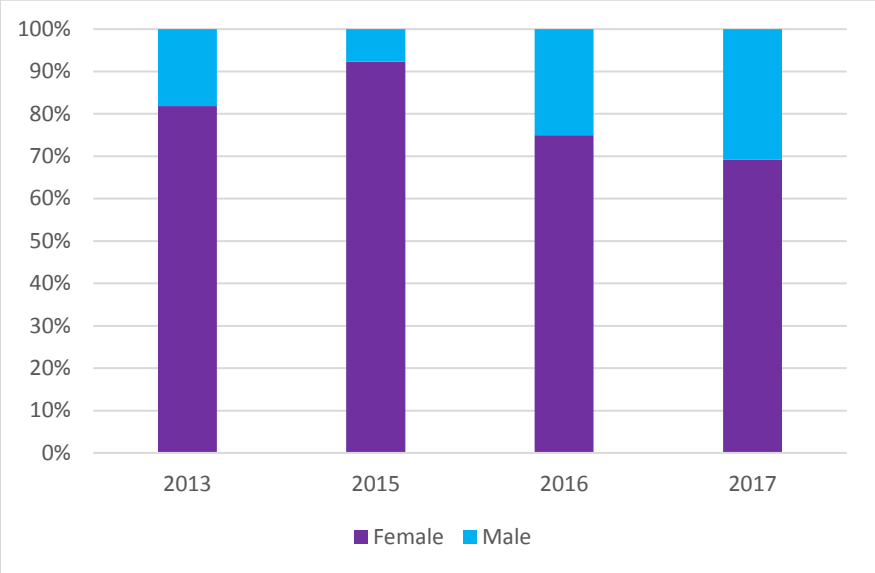
Source: Yukon Conservation Society 2013-2017

The Yukon Conservation Society's Ted Parnell Scholarship is valued at $500 awarded annually to one student pursuing environmental studies. Female applicant distribution decreased during the period of 2013 (66.7%) to 2014 (42.9%) and remained constant at 42.9% in 2015. Female application hit a minimum in 2016 at 20% and increased in 2017 to 50% (Figure 2.3.6.c).

2.3.7 YUKON GOVERNMENT HEALTH SCIENCE BURSARIES

Data on three bursaries offered by the Yukon Government (YG) Department of Health and Social Services were collected. These bursaries are awarded to students in health sciences (BSc, MSc, or PhD), nursing and medical education fields with maximum total of 16 bursaries per year being awarded. The Health Education and Nursing bursaries are awarded to 6 students each per year (for a total of 12 students between the two) and up to 4 students are awarded Medical Education bursaries. Data were collected on applicants and awardees of these three bursaries over the past five years (2013-2017). Note that the exact number of awardees has not been listed as it is less than 10 each year per award.

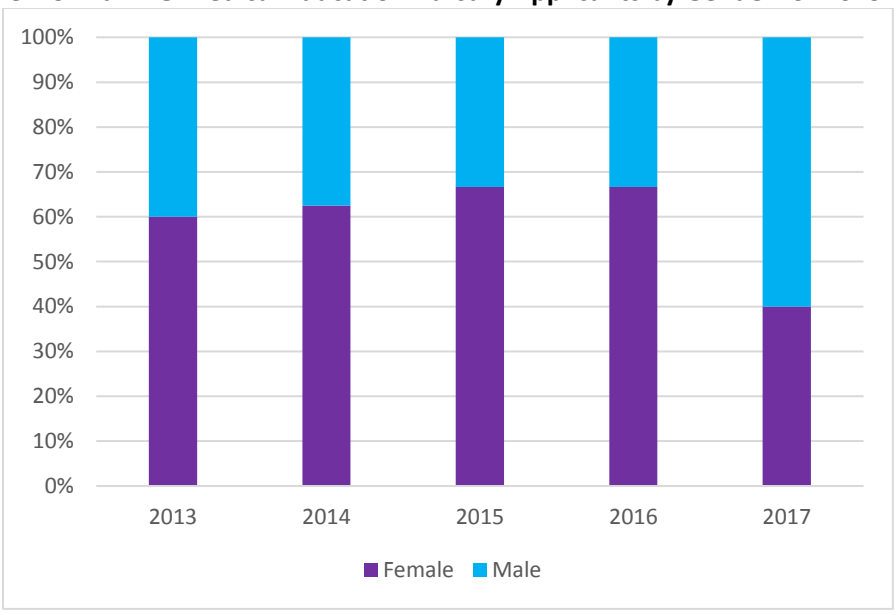
Figure 2.3.7.a – YG Health Education Bursary Applicants by Gender for 2013-2017



Source: Yukon Government Health and Social Services 2013-2017

Two Health Education bursaries are awarded to the two top-scoring students worth $5000 per year for a maximum of four years of study in a health education program. Four bursaries will be awarded of $2500 per year to each of the remaining four-year applicants enrolled in a health education program. Female application levels were consistently higher than men with a minimum female application of 69.2% in 2017. Applications by women hit a maximum of 92.3% in 2015 (Figure 2.3.7.a). The percentage of male applicants increased from 2015 (7.7%) to 2017 (30.8%). The Health Education Bursary was repealed in 2014 and no applications were accepted. The percentage of female awardees over the time period analyzed was 75%. In 2016 the total number of bursaries available was increased from 4 to 6.

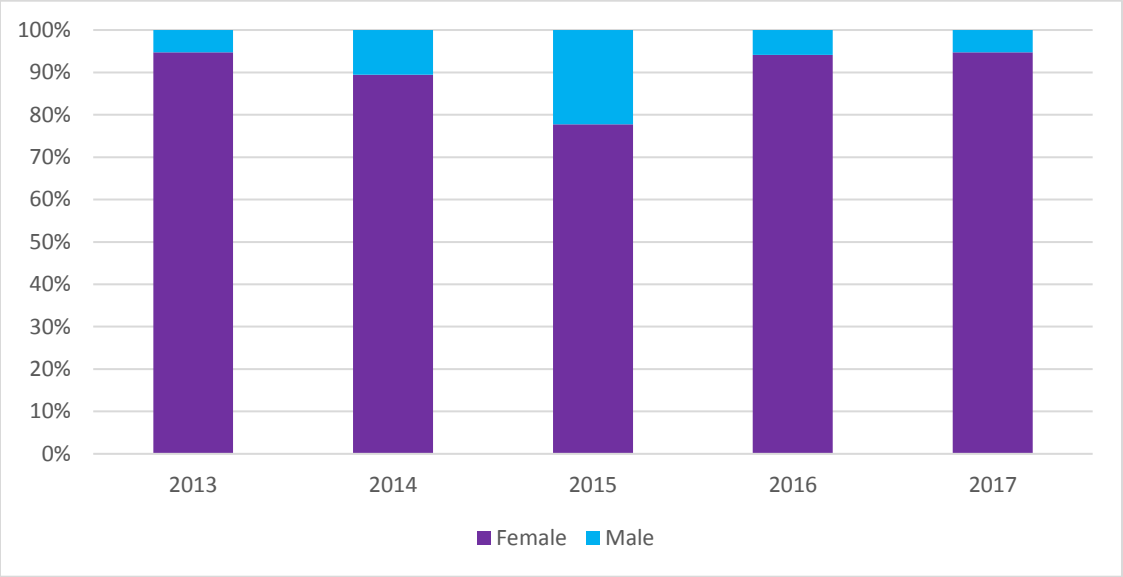
Figure 2.3.7.b – YG Medical Education Bursary Applicants by Gender for 2013-2017



Source: Yukon Government Health and Social Services 2013-2017

The Yukon Medical Education Bursary is made available to four new students each year and is valued at $5000 per year for up to four years of medical school and $7500 per year for up to 2 years during medical residency. The proportion of female applicants remained relatively constant from 2013 to 2016 at 60.0% to 66.7%. In 2017, the distribution of men was greater than women, with 40% total female applicants. The percentage of female awardees over the time period analyzed was 62.5% (Figure 2.3.7.b). Note that in 2015 the number of bursaries available for award was increased from 2 to 4.

Figure 2.3.7.c – YG Nursing Education Bursary Applicants by Gender for 2013-2017



Source: Yukon Government Health and Social Services 2013-2017

Female application for the YG Nursing Education Bursary was much larger than male distribution every year over the five-year period analyzed. On average, the applicant pool was 90.2% women (Figure 2.3.7.c). The percentage of male applicants hit a high of 22.2% in 2015. Awardees over the 5 years analyzed was 91.6% women. In 2016 the number of bursaries available was increased from 4 to 6.

SECTION 3 – PROFESSIONS

The population of interest was all individuals with academic STEM (science, technology, engineering, mathematics) and health science backgrounds who are currently Yukon residents - particularly those with qualifications in engineering, engineering technology, science, science technology, mathematics, computer science, information technology, and health science. Yukon population data on employment, unemployment and relative skill levels by field were collected from Statistics Canada's National Household survey on employment. Data on Yukon resident professionals registered with engineering and geoscience regulatory bodies in Yukon and Alberta, research projects conducted in Yukon with Yukon College and NSERC, and women working in academia at Yukon College were also collected. Note that the data pertaining to research projects and women in academia is subject to human error, as genders were inferred from names and/or online search and no computerized algorithm utilized. Exact gender breakdowns are not publicly reported by either institution.

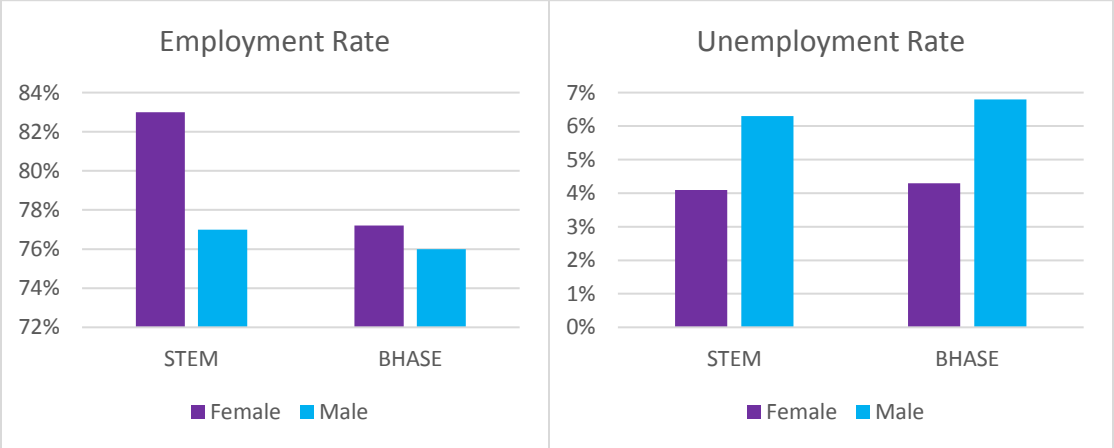
3.1 STEM AND HEALTH SCIENCE JOBS

The 2016 Statistics Canada National Household Survey collected data on Yukon territorial employment and unemployment rates by field of education. These data are broken down into STEM and BHASE (business, humanities, health, arts, social science and education). STEM and BHASE categorization only applied to individuals with post-secondary certificates, diplomas, or degrees. Each category was comprised of all individuals with varying education levels in a given field. The STEM category data were then further divided into individual fields. Employment rates for individuals in health care fields were also included. Educational categories are based on the Classification of Instructional Programs Canada (CIP) 2016 as described by Statistics Canada. Numbers and genders of individuals obtaining certain skill levels in STEM and BHASE fields were included in this analysis.

3.1.1 STATISTICS CANADA CENSUS EMPLOYMENT AND UNEMPLOYMENT RATES

The labour force status referred to whether a person aged 15 and over was employed, unemployed or not in the labour force during the week of Sunday, May 1 to Saturday May 7, 2016. "Employed labour force" was defined as working full time for the full year and reporting income employment during 2016. The following information is for individuals living in Yukon with additional comparison to national rates.

Figure 3.1.1.a – STEM and BHASE Field Employment and Unemployment Rates by Gender for 2016



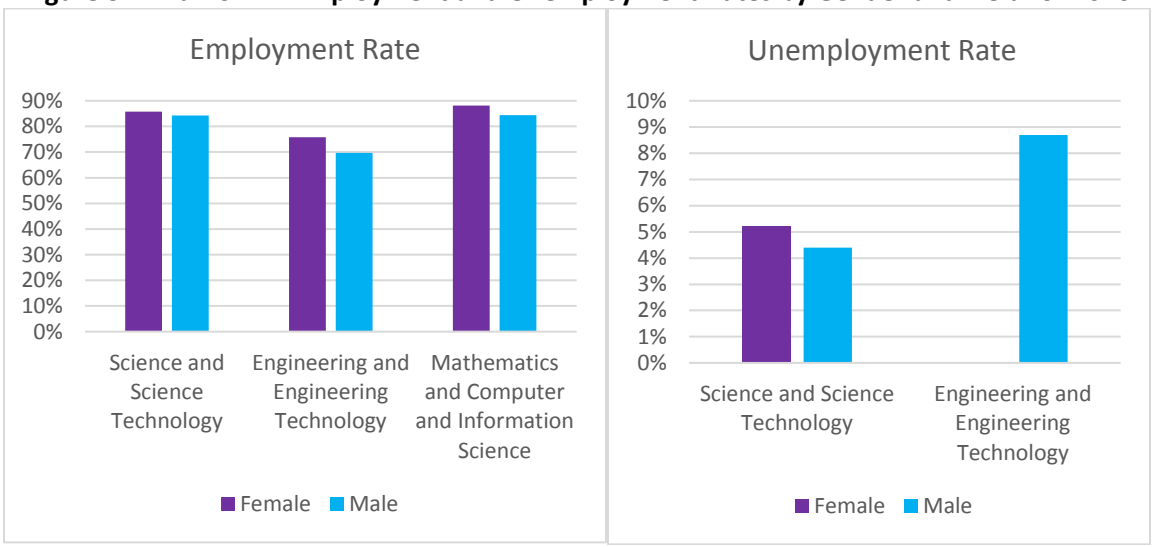
Source: Statistics Canada Census of Population 2016

Unemployed men made up a larger percentage of the work force than unemployed women in 2016, with 6.3% and 6.8% of the work force being unemployed men in STEM and BHASE fields respectively. Female

distribution of unemployed workers was 4.1% of the total STEM workforce and 4.3% of the total BHASE workforce in 2016 (Figure 3.1.1.a). The proportion of STEM field employed women was greater than STEM field employed men, with an 83% employment rate for women in STEM and a 77% employment rate for men in STEM. The difference in employment rates between genders was smaller in BHASE fields, at 77% of the total female BHASE labour force and 76% of the total male BHASE labour force being employed in 2016 (Figure 3.1.1.a).

National levels for female employment and unemployment in STEM fields were 69.9% and 7.4% respectively. Male employment and unemployment in STEM fields were 73.6% and 6.4% respectively. In BHASE fields, employment and unemployment levels for women were 68.5% and 5.4% respectively. BHASE employment and unemployment rates for men were 71.6% and 6.5% respectively. While unemployment rates for men in both STEM and BHASE were similar territorially and nationally, employment rates for both men and women were higher in STEM and BHASE in Yukon and women also saw lower unemployment rates in both fields.

Figure 3.1.1.b – STEM Employment and Unemployment Rates by Gender and Field for 2016



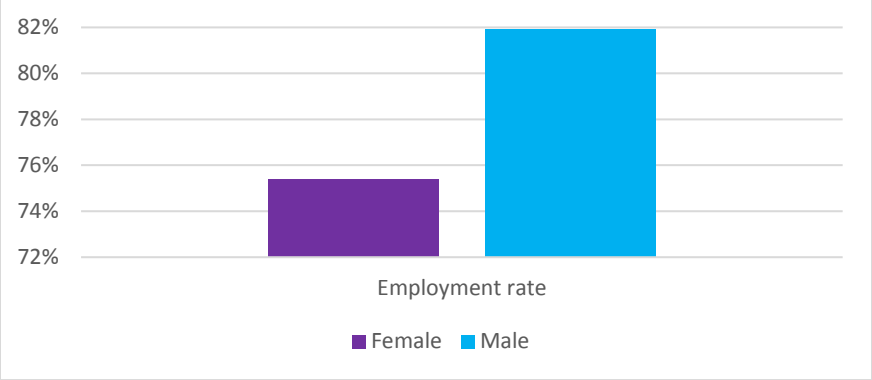
Source: Statistics Canada Census of Population 2016

The distribution of employed women was higher than employed men across all STEM disciplines. In the science and science technology category, 85.8% of the female labour force and 84.3% of the male labour force were employed in 2016. In the engineering sector, 75.8% of the female labour force and 69.7% of the male labour force were employed. In the combined math, computer science, and information technology sectors, 88.1% of women and 84.4% of men held jobs in 2016 (Figure 3.1.1.b). Opposing the trend shown by employment rates in scientific fields, female unemployment distribution was higher than men in 2016, at 5.2% of the female population and 4.4% of the male population being unemployed in 2016. Female and male unemployment was reported at 0% and 8.7%, respectively in engineering fields – no women in the Yukon engineering labour force were unemployed in 2016 (Figure 3.1.1.b). Unemployment rates for both genders in math, computer science and information technology were 0%. Therefore, they were not included in the analysis. These figures show the high demand for people in these fields in Yukon, especially women. Territorial employment rates were higher for women and men for almost all fields analyzed when compared to national averages.

Nationally, science and science technology saw 69.6% employment for both women and men with similar unemployment rates of 6.7% and 6.8% respectively. More men were employed than women in

engineering and engineering technology at 72.3% and 70.6% and these fields saw unemployment rates of 6.5% for men and 8.9% for women. 80.8% of men were employed in mathematics and computer and information science compared to 69.9% of women. 7.1% of women were unemployed in this field nationally compared with 5.8% of men.

Figure 3.1.1.c – Healthcare Field Employment Rates by Gender for 2016



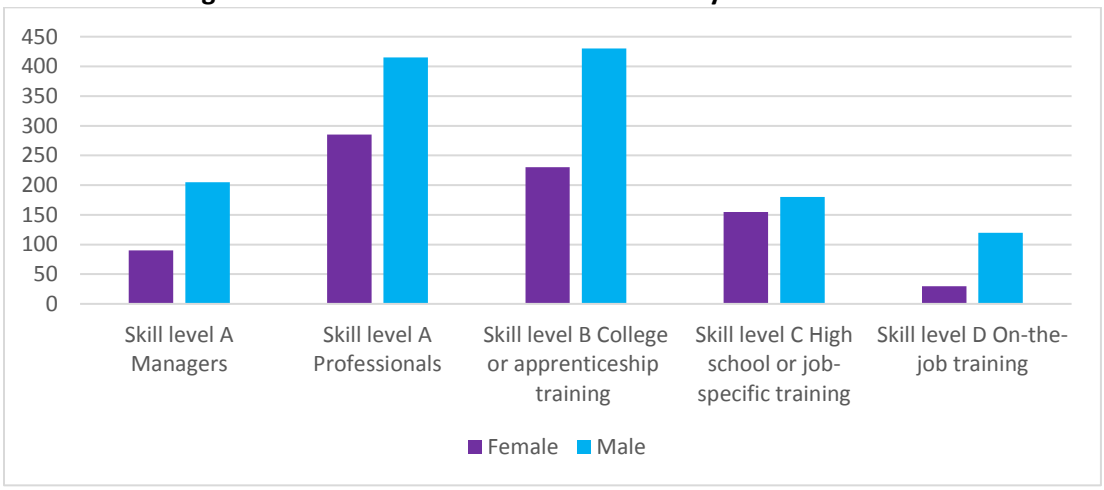
Source: Statistics Canada Census of Population 2016

Employment rates for healthcare professionals in Yukon showed that in a larger proportion of the male workforce relative to the female workforce was employed in 2016, as 81.9% men and 75.4% women were employed (Figure 3.1.1.c). Unemployment rates for women and men were equal in Yukon at 4.2%. National unemployment rates were similar with 4.4% of women and 4.1% of men being unemployed respectively. 68.0% of women were employed nationally compared with 75.4% of men.

3.1.2 SKILL LEVELS IN STEM AND NON-STEM FIELDS

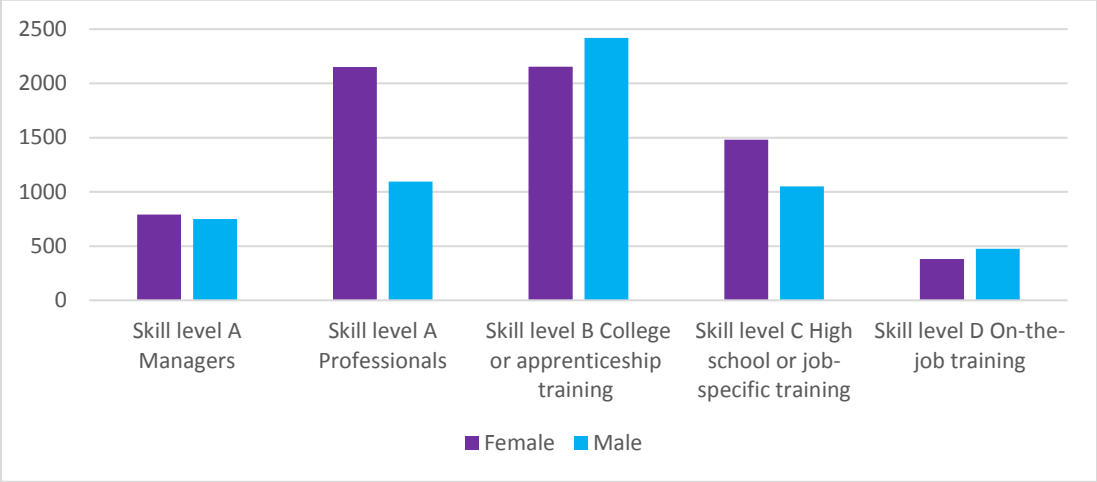
The skill levels obtained by individuals in STEM and non-STEM (BHASE) sectors in Yukon were also analyzed. STEM fields included science, technology, engineering, and mathematics. BHASE included business, humanities, arts, social science and education. This analysis only applied to individuals aged 15 and over who were living and working in Yukon during 2016 with additional comparison to national rates. Skill level requirements were based on the level of training usually required by a certain occupation and ranged from on the job training to managerial positions. All data were obtained from the Statistics Canada National Census for 2016.

Figure 3.1.2.a – Skill Levels in STEM Fields by Gender for 2016



Source: Statistics Canada National Household Survey 2016

Figure 3.1.2.b – Skill Levels in Non-STEM Fields by Gender for 2016



Source: Statistics Canada National Household Survey 2016

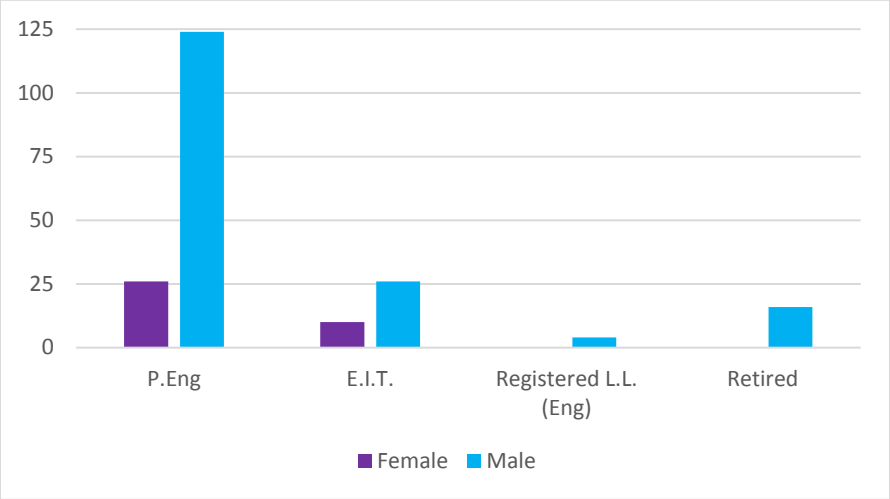
It is first important to note that the total population of non-STEM workers (14,730) was much larger than the total STEM population (2,405). The majority of the non-STEM population were female – 8,030 women to 6,695 men. The inverse was true in the STEM population in which there were 855 women and 1,545 men. The biggest discrepancy between genders of workers in STEM and non-STEM fields was observed in the Skill Level A Professionals category – there were approximately twice as many women as men in professional positions in non-STEM fields (Figure 3.1.2.b), however there were almost 1.5 times as many men as women in STEM field professional positions (Figure 3.1.2.a). There were over two times as many men as women in STEM field managerial positions (Figure 3.1.2.a). There was not a substantial difference in numbers between genders in non-STEM management positions (Figure 3.1.2.b).

Nationally, more men than women hold higher skill training at all STEM levels analyzed. There are some fluctuations seen when comparing territorial and national skill levels in non-STEM fields. Nationally, there are more women than men in the following skill levels: Level A – Professionals, Level C, and Level D. More men than women held the following skill levels: Level A – Managers and Level B. It would be worth analyzing why lower numbers of women have managerial positions in STEM fields as opposed to non-STEM fields and if biases play a role in these hiring and promotion discrepancies.

3.2 ENGINEERING AND GEOSCIENCE REGULATING BODIES

The population of interest was all individuals registered with the engineering regulatory body in Yukon (Engineers Yukon) as well as those registered with the engineering and geoscience regulatory bodies in Alberta with permanent addresses in Yukon. The following member types were included in the data collection: Professional Engineers (P.Eng), Engineers in Training (E.I.T.), Limited License Engineers (L.L. Eng), Retired Engineers, Professional Geoscientists, and Geoscientists in Training (GIT). Out of territory data were received from the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and is current to June 22, 2018. Note that APEGA addresses are self-reported and unverified. Territorial data received from Engineers Yukon are current to December 31, 2017. Note that Engineers Yukon does not regulate Geoscientists. APEGA regulates both Geoscientists and Engineers, however, engineers registered in Alberta were not included in this analysis in order to eliminate the possibility of data overlap. Since names as well as professions or designations of Engineers and Geoscientists at all levels are publicly listed on the websites of Engineers Yukon and APEGA, whole numbers have been used rather than percentages for the analysis below.

Figure 3.2.a – Registered Engineers by Gender and Title for 2017



Source: Engineers Yukon 2017

There were nearly five times more male Professional Engineers as female Professional Engineers registered with Engineers Yukon in 2017, at 124 men and 26 women (Figure 3.2.a). There were 10 women and 26 men registered as Engineers in Training. There were no female limited license or retired engineers in 2017.

Figure 3.2.b – APEGA Geoscientist Members by Gender and Title for 2018

Source: APEGA 2018

In 2018, there was 1 woman and 8 men who were Professional Geoscientists registered with APEGA in Alberta and living in Yukon. Markedly, there were 4 female and 2 male APEGA Geoscientists in Training (GIT) with addresses in Yukon in 2018 (Figure 3.2.b).

3.3 STEM RESEARCH CONDUCTED BY WOMEN IN YUKON

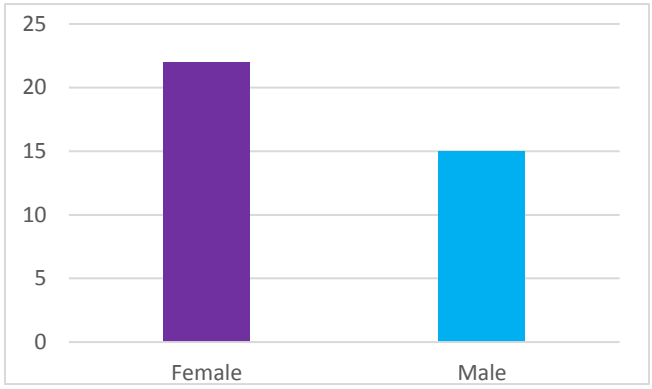
The population of interest was all individuals leading and/or conducting STEM field research within Yukon in the past five years. 2018 data were pulled from the Yukon Research Centre (YRC) project licensing database and the Natural Science and Engineering Research Council of Canada (NSERC) project funding database. All current projects listed in the YRC database were included in this analysis. Only NSERC funded

projects being conducted in Yukon and/or in affiliation with Yukon College from the 2012/13 to 2016/17 fiscal years were included. Note that these data are subject to human error, as genders were inferred from names and/or online search and no computerized algorithm utilized. Exact gender breakdowns are not publicly reported by either institution. As names of project leads and field of study for research projects are publicly listed on the websites of YRC and NSERC, whole numbers have been used rather than percentages for the analysis below.

3.3.1 YUKON RESEARCH CENTRE LICENSING DATABASE

Data were collected from the Yukon Research Centre (YRC) online database of current projects. Gender was inferred from the names of project leads. All current listed projects were included and field of study was taken directly from the YRC webpage. These data are current as of June 2018.

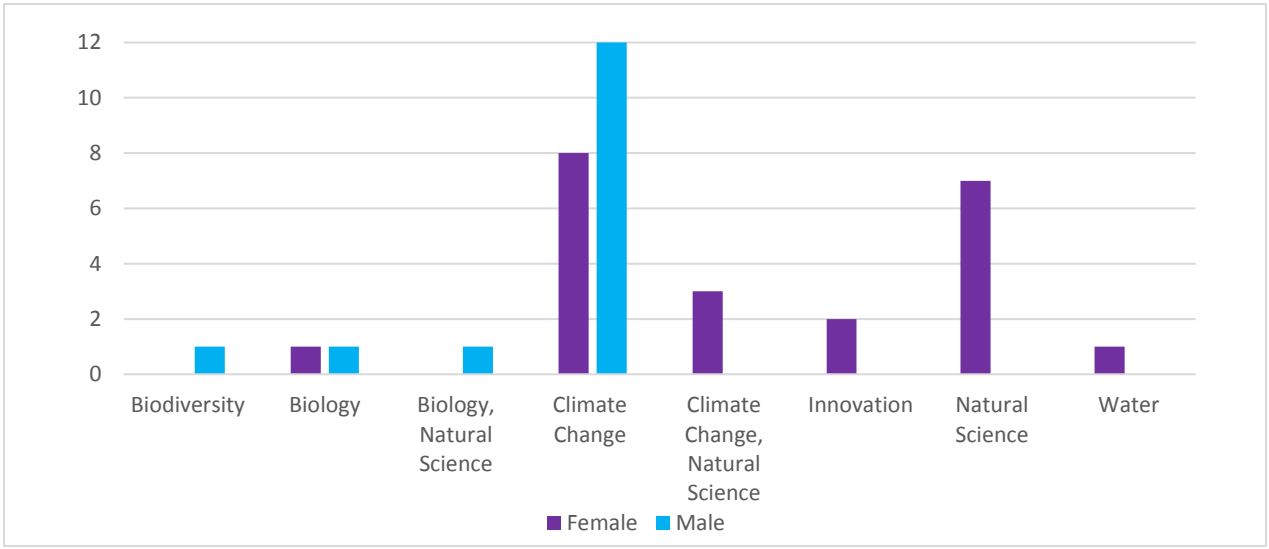
Figure 3.3.1.a Overall Yukon Research Centre Projects Leads by Gender for 2018



Source: Yukon Research Centre 2018

Overall, women have greater representation (59.5%) in the Yukon Research Centre than men. There was a total of 37 open research projects in 2018 with 22 female-led projects and 15 male-led projects (Figure 3.3.1.a).

Figure 3.3.1.b Current Yukon Research Projects by Gender and Field for 2018



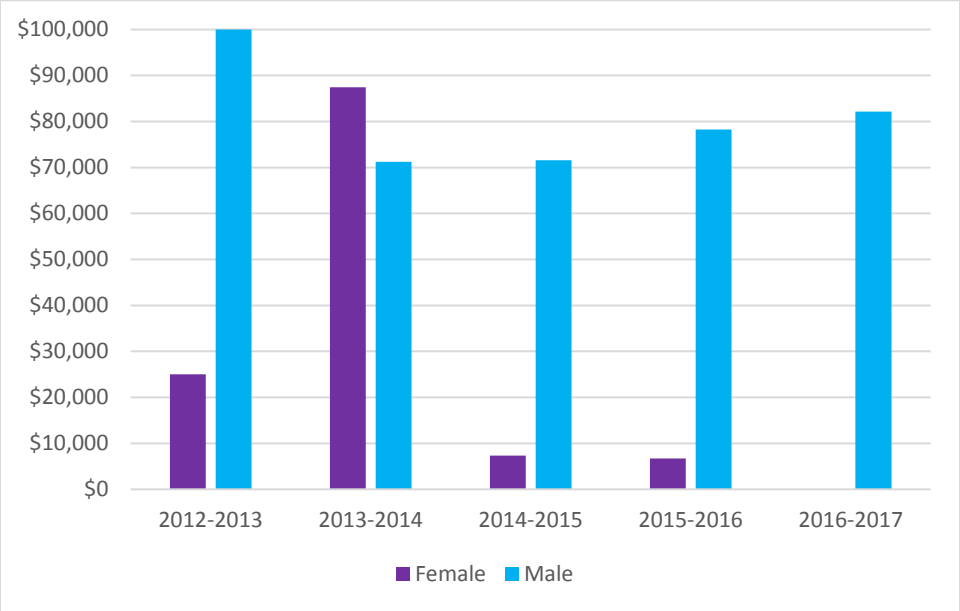
Source: Yukon Research Centre 2018

Female distribution varied within individual research categories. There was only one project in each of the fields of Biodiversity and "Biology, Natural Science" and both were male-led. There were two "Biology" field projects – one female-led and one male-led. "Climate Change" had the most projects of all areas of study reported on with 8 being led by women and 12 by men. The remaining 13 projects in the fields of "Climate Change, Natural Science", "Innovation", "Natural Science", and "Water" research were all led by women (Figure 3.3.1.b).

3.3.2 NSERC PROJECT FUNDING

Data were taken from the Natural Science and Engineering Research Council (NSERC) project funding database online. All projects conducted in Yukon or by Yukon College over the past five years were included in this analysis. Funding awarded per project and the gender of each research lead was recorded. Figure 3.2.2.a was generated by separating male and female led projects, taking the sum total monetary value awarded to each gendered category, and then dividing the total funding by the total number of projects led by each gender to determine average funding per project by gender in a given year. Gender was inferred from the names of project leads. All values are given in Canadian dollars.

Figure 3.3.2.a – Average NSERC Project Funding of Lead Researchers by Gender for 2012-2017



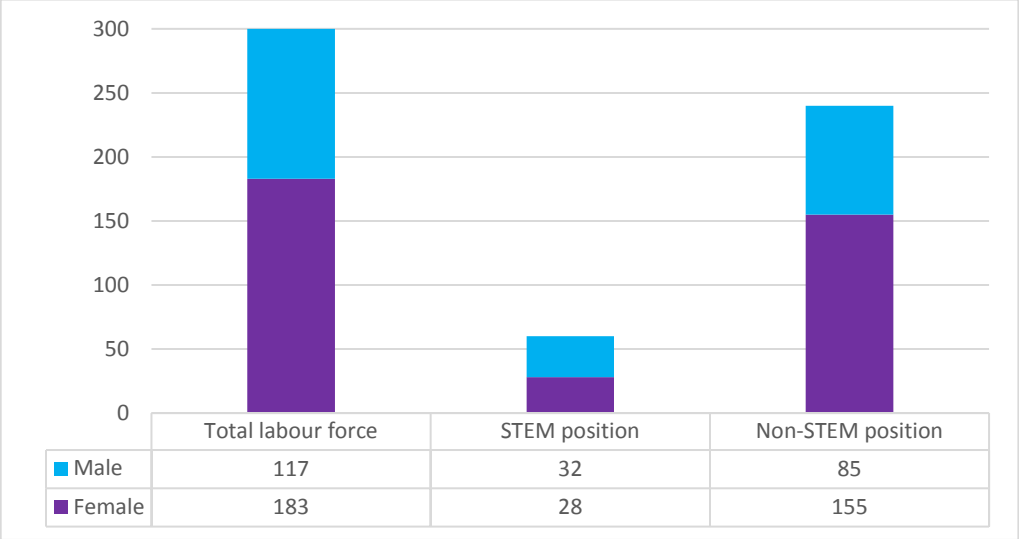
Source: NSERC Research Archives 2012-2017

With the exception of the 2013-14 fiscal year, female researchers received a lower average funding amount per project compared to their male counterparts. The highest average funding allotment to projects led by women was observed in the 2013/14 fiscal year, at $87,412.00 per project (Figure 3.3.2.a). In each of the remaining four years surveyed, each female-led project received $25,000.00 or less in funding, with the lowest amount being $6705.00 in the 2015-2016 fiscal year. Average NSERC funding for male-led projects remained fairly constant over the five-year time period with an average value $80,640.00 per project over all five years surveyed. The average funding awarded per female led project from 2012-2017 was $25,294.60. There were no female-led projects during the 2016-2017 fiscal year (Figure 3.3.2.a).

3.5 WOMEN IN ACADEMIA

Yukon College is the sole post-secondary institution in Yukon Territory, and thus was the only data source pertaining to academia available. Information was gathered from Yukon College's Human Resources Organization Charts and employees were categorized based on their department of employment rather than their educational or research expertise. The STEM category was comprised of all positions relating to science, technology, engineering, or mathematics by way of research, academic instruction, and analysis. All other positions were considered to be BHASE. Note that these data are subject to human error, as genders were inferred from names and/or online search and no computerized algorithm utilized. Exact gender breakdowns are not publicly reported by the institution. The organization charts are living documents and constantly change due to fluctuations in Yukon College employee composition. Data are current as of June 2018.

Figure 3.5.a - Yukon College Labour Force by Gender and Field for 2018



Source: Yukon College Human Resources Organization Charts 2018

The total labour force at Yukon College was 61% women with 183 out 300 workers being women as of June 2018 (Figure 3.5.a). 28 workers at Yukon College were women in STEM field positions and 32 workers were men in STEM positions. 15.3% of all women working at Yukon College are in STEM positions (28 out of 183). The proportion of men working in STEM positions when averaged with all male employees was 27.4% (32 out of 117). STEM position distribution was reported at 46.7% women and 53.3% men. Non-STEM position distribution was reported at 64.6% women and 35.4% men (Figure 3.5.a). Note that while men hold fewer non-STEM positions overall, they still hold a slim majority of STEM positions.

SECTION 4 – GAPS AND CONCLUSIONS

4.1 GAPS

There were several areas where gaps presented themselves and impacted data analysis in regards to the status of women in STEM (science, technology, engineering, and mathematics) in Yukon. These data gaps stem from one of the following sources: limitations with statistical analysis of low populations, low availability of data sources in Yukon, and variation around the definition of STEM versus BHASE (business, humanities, health, arts, social science, and education) fields. Specific reasons for each informational gap, potential outcomes of each, and suggestions to mitigate these gaps and improve continuity in future research of women in STEM in Yukon are outlined below.

4.1.1 LIMITATIONS WITH STATISTICAL ANALYSIS OF LOW POPULATION

The low population of Yukon presented issues consistent with having small sample sizes. In keeping with a policy of not reporting numbers less than 10, there were situations where sample sizes were too small to be reported on. In some cases, data were not provided or could not be commented on in detail.

This affected reporting for grants, bursaries, and scholarships as well as post-secondary enrollment and graduation data. Awardees of scholarships and bursaries could not be included, as numbers were always less than 10.

It is unknown if expanding the years analyzed to more than five would have been a helpful way to examine trends with a boosted number total or if expanding the years analyzed would have resulted in similar limitations with a false sense of trends over time. Due to the low population of Yukon, the challenges posed by small sample sizes is unlikely to change and is a unique challenge of creating reports in Yukon.

4.1.2 LOW AVAILABILITY OF SOURCES

A second source of limited data analysis resulted from low overall availability of information sources in Yukon. This issue of low data availability was most prevalent in regards to elementary schools, secondary schools, and post-secondary students studying outside of the territory.

With the Grades 4 and 7 Foundational Skills Assessments, only two years of data were available (2014 and 2015), and were a percentage of known performance values. The most recent reports were not yet publicly available for assessments conducted in 2016 or 2017. It was not possible to accurately draw any conclusions on trends with respect to time between the years 2014 and 2015. It might have been possible to present changes in student achievements rates over time if data pertaining to the last five academic years had been available for analysis.

The only accessible data for secondary schools was from the Experiential Science Grade 11 program at Wood Street Centre. These data were limited to the past three school years (2016/17, 2017/18, & 2018/19). Only the applications portion was useable for this report, as acceptance numbers remained fixed from year to year. Applicant trends over time could have been presented if data from the past five schools years was available.

If there had been more data pertaining to secondary schools available (including Yukon high school graduation rates over time, additional information regarding STEM electives or courses, standardized testing outcomes, etc.) it would have helped to show trends over time. Having access to further data from multiple secondary schools would have allowed for a more complete picture of success rates of young women in Yukon.

Further, information on recipients of the Yukon Grant and their program continuation rates would have been a useful source of information regarding post-secondary students not enrolled at Yukon College. According to the Government of Yukon's Department of Education online description of the Yukon Grant, "to receive the Yukon Grant, you must be a Canadian citizen or Permanent Resident, be enrolled or registered as a full-time student at a designated institution, not be eligible to apply for student financial assistance from another jurisdiction outside of Yukon, and be resident in Yukon for the two years right before your classes start". As it is available to a high number of Yukon residents, data pertaining to the Yukon Grant could have been used to study enrollment rates of post-secondary students enrolled in STEM outside of Yukon. Data regarding recipients of the Yukon Grant could not be used during the time of writing.

4.1.3 VARIATION OF DEFINITION OF STEM VERSUS BHASE

There is not a commonly agreed upon definition of STEM and BHASE (non-STEM). This ambiguity leads to some discrepancy in the data. Sources that were impacted by this lack of a clear definition included Yukon College Kids' Camps and Statistics Canada, and post-secondary schools. The report classified health science as its own unique entity to eliminate any ambiguity.

Yukon College did not clearly define the content and field of study for each camp. As such, classification of particular STEM fields within each camp may differ based on personal opinion. Detailed revision of camp curriculums based on agreed definitions of STEM and base could help mitigate this source of potential error.

Although Statistics Canada very clearly defines their criteria for STEM disciplines, uncertainty and contradiction continues to exist in the classification of health science and health care fields. Further clarification of STEM versus BHASE could help to eliminate confusion when self-reporting.

Post-secondary data sources utilized in this report included heath science and health care programs in the STEM grouping. If the post-secondary institutions used an agreed upon definition of STEM versus BHASE, this would not only help them with reporting, but also with analyzing their own educational outcomes.

4.2 CONCLUSIONS

According to Statistics Canada 2017, Canadian women have made recent, substantial progressions in university-level participation; in 2016 over 40 percent of young women had "a bachelor's degree or higher" and for the first time over half of young Canadians with doctorate degrees were women, accounting for the "majority" of doctorates in various BHASE fields. Statistics Canada 2017 also pointed out that despite these progressions, "women still made up less than half of young graduates with an earned doctorate in fields such as architecture, engineering, and related technologies, mathematics, computer and information sciences, and physical and life sciences and technologies".

These nationwide results are paralleled in Yukon and there continues to be more men than women obtaining STEM degrees of all levels and specializations. As observed in Yukon College enrollment rates, most women that choose to pursue a STEM degree do so in a science field. Women and men fared approximately equally in terms of program acceptance and scholarships in science-related programs in Yukon. However, women did not fare as well in applying for engineering, technology, computer science, or mathematics programs. Women persisted and graduated in lower rates than men in post-secondary STEM programs within the territory. Further, there were twice as many men as women in STEM field managerial positions in 2016. This is particularity profound, as there were approximately equal numbers of women and men managing non-STEM positions in Yukon in 2016.

Areas within STEM fields that remain particularly predominantly male-dominated are engineering, computer science, and mathematics. The greatest education and skill-level discrepancies between men and women in Yukon were seen in mathematics and computer-related programs. There were more men than women with math and computer science educations across all degree levels. There were no women with masters or doctorate degrees in math or computer science in Yukon as of 2016.

Women who pursued and successfully obtained post-secondary degrees in STEM fields were rewarded for their efforts in regard to labour conditions. The territorial unemployment rates were lower and the employment rates were higher for women in STEM fields, compared to men in the same fields of work.

Although the magnitudes of gender imbalances were most clearly illustrated at the post-secondary and professional level, there is evidence that these disparities may begin in young girls and boys at the elementary school level. In the Grades 4 and 7 Yukon Foundational Skill Assessments, girls and boys performed comparably in the numeracy tests, however, girls outperformed boys in the reading and writing tests. At the Yukon College STEM-related Kids' Camps, only 37% of participants were girls. Taken together, these markers suggest that upper-level academic program choices may be influenced by interest as well as by lower self-perceived mathematic abilities when compared to one's relative abilities in the humanities.

Gender disparities in STEM disciplines exist in Yukon for students from elementary to post-secondary school. However, it remains unclear to what extent students' choices are related to interest, motivation, opportunity, and other factors. This can be exacerbated by a lack of visible local female role models with successful careers in STEM. Even though women are succeeding in STEM, these numbers will only continue to grow as their success is seen as normal and attainable by the next generation of girls and young women.

SECTION 5 – RECOMMENDATIONS

5.1 RECOMMENDATIONS – YUKON TERRITORIAL GOVERNMENT

To address the lack of data on Yukon high school students, it is recommended that the Yukon Government Department of Education encourage secondary schools to track enrollment and success rates of their students' elective course selections, including perceived mathematical success, as well as the genders of these students. Information on mathematics and science-based electives could provide useful insight into interest and academic success of Yukon high school students in STEM fields. This is a good indicator to track, as it is impossible to pursue a STEM career without completing the correct math and sciences courses at a secondary school level.

Another area in which additional information could add comprehensive understanding of the state of women in STEM in Yukon involves data available on the Yukon Grant. No data were able to be used due to a recording issue. It would be useful to have such information available in order to build a picture of Yukon residents in STEM post-secondary studies outside of Yukon College. It would also be helpful if data gathered by the Yukon Government included additional tracking of student identification numbers, as they could be utilized to determine if students completed their respective STEM or health science programs, transferred to different STEM programs, transferred to BHASE field programs, or did not continue their post-secondary education. An alternative would be for the Yukon Grant to publish how many of their grant recipients graduate each year by field.

Information on genders and numbers of medical professionals in the territory would have also been useful to include in this report. There are no public records reporting these data. Numbers of registered medical professionals, without including genders, was insufficient for meaningful analysis of trends and the current state of medical professional employment in Yukon.

5.2 RECOMMENDATIONS – FEDERAL GOVERNMENT

Gender of lead researchers who received federal (NSERC) funding for natural science and engineering research projects was inferred by first names. The total funding amount awarded to each project was then categorized by assumed gender, resulting in a margin of error. If NSERC publicly reported the total funding distributed to projects divided in terms of how much funding went to women project leads and how much funding went to male project leads, this would allow for more accurate analysis of trends over time regarding funding and would remove the margin of error that can result by inferring gender. If the public report further disclosed the gender makeup of all researchers involved, rather than just the project lead, it would offer a clearer picture of women working as part of a team of researchers.

5.3 RECOMMENDATIONS – YUKON COLLEGE

Tracking underlying reasons for post-secondary students' program choices would offer insight into whether fields of study are primarily chosen based on interest, opportunity, or for other reasons. It is recommended that these data be included in Yukon College's annual student survey. WWEST could be utilized to serve as a partner implementing these survey additions.

Tracking distinct job classifications as STEM or BHASE along with the genders of employees at Yukon College and the Yukon Research Centre would also add depth to the understanding of the current state of women STEM.

APPENDIX A – EDUCATIONAL DATA TABLES

Table A.1 Grade 4 and 7 Numeracy Results for 2014-2015

Grade 4 Numeracy Test Results by Year for 2014-2015	Result	Female	Male
2014	Exceeding	5%	10%
	Meeting	61%	64%
	Not Yet Meeting	23%	19%
2015	Exceeding	10%	9%
	Meeting	64%	55%
	Not Yet Meeting	20%	27%

Grade 7 Numeracy Test Results by Year for 2014-2015	Result	Female	Male
2014	Exceeding	9%	11%
	Meeting	54%	47%
	Not Yet Meeting	29%	24%
2015	Exceeding	14%	12%
	Meeting	58%	49%
	Not Yet Meeting	21%	25%

Table A.2 - Grade 4 and 7 Reading and Writing Test Results for 2014-2015

Grade 4 Reading Test Results by Year for 2014-2015	Result	Female	Male
2014	Exceeding	13%	12%
	Meeting	63%	59%
	Not Yet Meeting	16%	23%
2015	Exceeding	18%	7%
	Meeting	58%	59%
	Not Yet Meeting	17%	26%

Grade 4 Writing Test Results by Year for 2014-2015	Result	Female	Male
2014	Exceeding	8%	3%
	Meeting	70%	66%
	Not Yet Meeting	10%	22%
2015	Exceeding	11%	2%
	Meeting	62%	49%
	Not Yet Meeting	19%	36%

Grade 7 Reading Test Results by Year for 2014-2015	Result	Female	Male
2014	Exceeding	17%	5%
	Meeting	53%	58%
	Not Yet Meeting	25%	22%
2015	Exceeding	14%	9%
	Meeting	60%	53%
	Not Yet Meeting	20%	24%

Grade 7 Writing Test Results by Year for 2014-2015	Result	Female	Male
2014	Exceeding	3%	2%
	Meeting	67%	57%
	Not Yet Meeting	22%	25%
2015	Exceeding	11%	1%
	Meeting	64%	54%
	Not Yet Meeting	16%	29%

Table A.3 – Yukon College Kids' Camps Participation by Gender for 2017

Kids' Camps	Total Attendees	Female	Male
Munchkin	68	33	35
Technology	116	44	72
Science	82	35	47
Trades	69	25	44
Total	335	137	198

Table A.4 - Experiential Science 11 Applicants by Gender and Year for 2016-2019

ES 11 Applicants by Gender for 2016-2019		
Academic Year	**Female Applicants**	**Male Applicants**
2016-17	63.93%	36.07%
2017-18	47.17%	52.83%
2018-19	57.14%	42.86%

Table A.5 – Admission Outcomes for Yukon College STEM and Health Science Applicants for 2013-2017

Yukon College Admission Outcomes by Program	Not Accepted		Accepted Not Enrolled		Enrolled		Year Range
	Female	Male	Female	Male	Female	Male	
Northern Environmental and Conservation Sciences	0%	20%	0%	0%	100%	80%	2014 - 2016
Computer Support Technician and Information Technology	56%	33%	25%	24%	19%	43%	2013 - 2017
Geological Technology	48%	47%	9%	13%	43%	40%	2013 - 2017
Northern Science	32%	30%	29%	39%	39%	31%	2013 - 2017
Renewable Resources Management	32%	40%	21%	20%	47%	40%	2013 - 2017
Science	24%	24%	36%	22%	40%	54%	2013 - 2017
Practical Nursing	67%	65%	13%	9%	20%	26%	2013 - 2017

Table A.6 – Yukon College Technology Program Enrollment by Gender for 2012-2016

Computer Studies, Computer Support Technician, and Information Technology Enrollment			
Year	Female	Male	Unknown
2012	10.0%	80.0%	10.0%
2013	6.3%	93.8%	0.0%
2014	15.4%	84.6%	0.0%
2015	6.7%	93.3%	0.0%
2016	17.6%	82.4%	0.0%

Geological Technology			
Year	Female	Male	Unknown
2012	40.0%	40.0%	20.0%
2013	45.5%	54.5%	0.0%
2014	30.8%	61.5%	7.7%
2015	30.0%	60.0%	10.0%
2016	11.1%	77.8%	11.1%

Table A.7 –Yukon College Science Program Enrollment by Gender for 2012-2016

Northern and Conservation Sciences Enrollment			
Year	Female	Male	Unknown
2012	36.4%	63.6%	0.0%
2013	44.4%	47.2%	8.3%
2014	31.6%	39.5%	28.9%
2015	32.5%	40.0%	27.5%
2016	27.9%	31.1%	41.0%

Northern Science Enrollment			
Year	Female	Male	Unknown
2012	66.7%	33.3%	0.0%
2013	100%	0.0%	0.0%
2014	44.4%	55.6%	0.0%
2015	78.6%	21.4%	0.0%
2016	65.0%	35.0%	0.0%

Science Enrollment			
Year	Female	Male	Unknown
2012	51.9%	48.1%	0.0.%
2013	57.1%	38.1%	4.8%
2014	50.0%	38.9%	11.1%
2015	57.7%	30.8%	11.5%
2016	65.4%	23.1%	11.5%

Renewable Resources Management			
Year	Female	Male	Unknown
2012	43.8%	53.1%	3.1%
2013	51.5%	48.5%	0.0%
2014	46.7%	53.3%	0.0%
2015	47.4%	47.4%	5.3%
2016	51.7%	48.3%	0.0%

Table A.8 –Yukon College Practical Nursing Program Enrollment by Gender for 2012-2016

Practical Nursing Enrollment			
Year	Female	Male	Unknown
2012	89.47%	10.53%	0.0%
2013	94.12%	5.88%	0.0%
2014	87.50%	12.50%	0.0%
2015	92.31%	7.69%	0.0%
2016	76.47%	23.53%	0.0%

Table A.9 – Students Leaving STEM and Health Science Programs or Leaving Yukon College Entirely by Gender for 2010/11 - 2016/17

Yukon College Program	Gender	Continued STEM	Left STEM	Left YC
Bachelor of Science (ENCS)	**Female**	83.90%	0.00%	16.10%
	Male	88.60%	0.00%	11.40%
CST/IT	**Female**	60.00%	0.00%	40.00%
	Male	57.40%	1.90%	40.70%
Geological Technology	**Female**	81.00%	4.80%	14.30%
	Male	94.40%	0.00%	5.60%
Northern Science	**Female**	90.50%	0.00%	9.50%
	Male	84.60%	0.00%	15.40%
Renewable Resources Management	**Female**	95.00%	3.30%	1.70%
	Male	91.30%	1.40%	7.20%
Science	**Female**	67.60%	0.00%	32.40%
	Male	87.50%	0.00%	12.50%
Practical Nursing	**Female**	97.80%	0.00%	2.20%
	Male	81.80%	0.00%	18.20%

Table A.10 – Yukon College STEM and Health Science Graduates by Gender for 2012-2017

Yukon College Graduation Rates by Program	Female	Male	Year Range
Northern Environmental and Conservation Sciences	29.17%	70.83%	2013/14 - 2016/17
Computer Studies/Computer Support Technician/Information Technology	18.18%	81.82%	2013/14-2016/17
Geological Technology	42.11%	57.89%	2012/13 - 2016/17
Northern Science	100.00%	0.00%	2013/14, 2015/16 - 2016/17
Renewable Resources Management	41.67%	58.33%	2012/13, 2014/15 - 2016/17
Practical Nursing	92.31%	7.69%	2013/14, 2015/16

Table A.11 – STEM Education Level of Yukon Residents by Gender for 2016

Yukon Residents with STEM Degrees by Gender, Level, and Field								
Education Level	Female	Male	Female	Male	Female	Male	Female	Male
	Total - All Degrees	Total - All Degrees	Science & Science Technology		Engineering & Engineering Technology		Mathematics & Computer Science	
College, CEGEP or other Non-University Certificate or Diploma	230	535	85	80	60	360	85	95
University Certificate, Diploma or Degree at Bachelor Level or Above	565	785	405	405	85	290	75	90
Bachelor's Degree	380	515	260	230	60	215	60	70
Master's Degree	115	195	105	140	10	40	0	15
Doctorate Degree	20	30	20	20	0	0	0	10

Table A.12 - Health Science Education Degrees of Yukon Residents by Gender for 2016

Yukon Residents with Health Science Degrees		
Education Level	Female	Male
	Health Science	
College, CEGEP or other Non-University Certificate or Diploma	715	140
University Certificate, Diploma or Degree at Bachelor Level or Above	590	210
Bachelor's Degree	390	55
Master's Degree	85	30
Doctorate Degree	0	10

Table A.13 – NorthwesTel Northern Futures Scholarship, Yukon Energy Premier Scholarship, & Ted Parnell Scholarship Applicants by Gender for 2013-2017

NorthwesTel Northern Futures Scholarship Applicants		
Year	Female	Male
2013	N/A	N/A
2014	28.6%	71.4%
2015	61.5%	38.5%
2016	55.6%	44.4%
2017	70.0%	30.0%

Yukon Energy Premier Scholarship Applicants		
Year	Female	Male
2013	40.0%	60.0%
2014	25.0%	75.0%
2015	47.1%	52.9%
2016	37.5%	62.5%
2017	23.1%	76.9%

Ted Parnell Scholarship Applicants		
Year	Female	Male
2013	66.7%	33.3%
2014	42.9%	57.1%
2015	42.9%	57.1%
2016	20.0%	80.0%
2017	50.0%	50.0%

Table A.14 – YG Health, Medical, and Nursing Education Bursaries Applicants by Gender for 2013-2017

YG Health Education Bursary Applicants		
Year	**Female**	**Male**
2013	81.8%	18.2%
2014	N/A	N/A
2015	92.3%	7.7%
2016	75.0%	25.0%
2017	69.2%	30.8%

YG Medical Education Bursary Applicants		
Year	**Female**	**Male**
2013	60.0%	40.0%
2014	62.5%	37.5%
2015	66.7%	33.3%
2016	66.7%	33.3%
2017	40.0%	60.0%

YG Nursing Education Bursary Applicants		
Year	**Female**	**Male**
2013	94.7%	5.3%
2014	89.5%	10.5%
2015	77.8%	22.2%
2016	94.1%	5.9%
2017	94.7%	5.3%

APPENDIX B – PROFESSIONAL DATA TABLES

Table B.1 – STEM and BHASE Field Employment and Unemployment Rates by Gender for 2016

Employment and Unemployment Rates	Female		Male	
	STEM	BHASE	STEM	BHASE
Employment Rate	83.0%	77.2%	77.0%	76.0%
Unemployment Rate	4.1%	4.3%	6.3%	6.8%

Table B.2 – STEM & Healthcare Employment and Unemployment Rates by Gender and Field for 2016

Employment and Unemployment Rates by STEM & Health Care Fields	Female		Male	
	Employment	Unemployment	Employment	Unemployment
Science & Science Technology	85.8%	5.2%	84.3%	4.4%
Engineering & Engineering Technology	75.8%	0.0%	69.7%	8.7%
Mathematics & Computer & Information Science	88.1%	0.0%	84.4%	0.0%
Healthcare	75.4%	4.2%	81.9%	4.2%

Table B.3 – Skill Levels in STEM and Non-STEM (BHASE) Fields by Gender for 2016

Skill Levels for STEM and Non-STEM (BHASE) Fields	Female		Male	
	STEM	BHASE	STEM	BHASE
All Skill Levels	800	6945	1350	5790
Skill Level A Managers	90	790	205	750
Skill Level A Professionals	285	2150	415	1095
Skill Level B College or Apprenticeship Training	230	2155	430	2420
Skill Level C High School or Job-Specific Training	155	1480	180	1050
Skill Level D On-The-Job Training	30	380	120	475

Table B.4 – Registered Engineers by Gender and Title for 2017

Engineers Yukon		
Engineers	Female	Male
P. Eng	26	124
E.I.T.	10	26
Registered L.L. (Eng)	0	4
Retired	0	16

Table B.5 – APEGA Geoscientist Members by Gender and Title for 2018

APEGA		
Geoscientists	**Female**	**Male**
Professional Member	1	8
Member-In-Training	4	2

Table B.6 Yukon Research Centre Projects by Field and Gender of Project Lead for 2018

Yukon Research Centre Fields and Project Leads by Gender		
Field	**Female**	**Male**
Biodiversity	0	1
Biology	1	1
Biology, Natural Science	0	1
Climate Change	8	12
Climate Change, Natural Science	3	0
Innovation	2	0
Natural Science	7	0
Water	1	0
Overall Total	22	15

Table B.7 – NSERC Project Funding of Lead Researchers by Gender for 2012-2017

NSERC Funding By Gender						
Fiscal Year	**Number of Project Leads by Gender**		**Total Funding by Gender**		**Average Funding by Gender (Rounded to Nearest Dollar)**	
	Female	**Male**	**Female**	**Male**	**Female**	**Male**
2012-2013	1	2	25,000	200,000	25,000	100,000
2013-2014	2	4	174,824	285,000	87,412	71,250
2014-2015	1	7	7,356	500,929	7,356	71,561
2015-2016	1	6	6,705	469,508	6,705	78,251
2016-2017	0	4	0	328,548	0	82,137

Table B.8 - Yukon College Labour Force by Gender and Field for 2018

Yukon College Staff Positons	Female	Male
Total Labour Force	183	117
Stem Positons	28	32
Non-STEM Positions	155	85


WWEST
Westcoast Women in Engineering,
Science and Technology
YukonCollege