

# Reaching Out: The Aurora Research Institute Outreach Program brings STEM learning to Northern Youth

Myrah Graham

## ABSTRACT

This short article introduces the Aurora Research Institute Outreach program, which aims to increase accessibility of learning science, technology, engineering and mathematics (STEM). Free programming for youth and educators is shared to engage and uplift students, so that local capacity can meet the growing northern job market in these fields.



*Daycare kids viewing a solar eclipse in Inuvik, NT. Photo Credit ARI.*

The school bell at East Three Elementary rings, and hundreds of students scatter. Even so, learning is still happening. School-age children constantly learn from their surroundings: At home, from knowledge holders, through play, at camp, online, and across their communities. There is a lot to learn for a young mind, so early support for students is essential. In turn, educators want to “[encourage] and [engage] students’ natural ability to wonder, question, and experiment, in order to improve their understanding of how the world works” (Barlow, 2015). The Inuuqatigiit and Dene Kede curricula support this mission, adding that “*an education should teach them about the best of both worlds that the north has to offer*” (Government of the Northwest Territories, 1996). At the Aurora Research Institute (ARI), outreach coordinator Annika Trimble is working with educators to reach these goals.

Starting in 2016, the ARI outreach program was launched collaboratively between Let’s Talk Science (a charitable organization focused on STEM education for youth), the Beaufort Delta Education Council (BDEC), and run by staff at ARI. As an outreach coordinator, Trimble serves educators and students across the Beaufort Delta, from Junior Kindergarten (JK) to grade 12. Since 2018, her counterpart Hilary Turko has been providing educational outreach in the South Slave region. An important component of the JK-12 education system is STEM, an acronym denoting science, technology, engineering and mathematics. From botany to robotics, there is no shortage of interesting topics for educators to explore with their students in these fields. However, learning about the latest advances in STEM can sometimes be limited due to the logistical challenges of being so remote. Equipment like drones, 3D printers and introductory tools for coding are often too expensive for teachers to order, especially in smaller communities. What’s more, teachers have less time and opportunities for professional development the farther they are from Yellowknife (Actua, 2020). Notwithstanding the costs of travel or shipping, learning about new scientific equipment and technology can seem daunting without any support.

This is where the ARI Outreach Program comes in. Through a free STEM kit loaning program and lesson consultations, teachers can receive training as well as equipment to bring hands-on science learning into the classroom. For example, grade five students across the Beaufort Delta learn about renewable energy. To add to this module, a teacher might ask Trimble for lesson plan ideas; Snap Circuits Green Energy kits would be suggested so that students can safely build their own electrical windmill. An activity guide and training session would also be provided for the teacher to feel confident in delivering this lesson. Alternative hands-on activities using common household materials might be recommended. Additionally, a visit from a role model in the field of renewable energy could be organized. Through these collaborations with local and visiting STEM professionals, memorable learning experiences are delivered for students to play and build on concepts learned in the classroom. On the Outreach program’s mission, Trimble says: “We want to connect with our youth early and often, and give them as many opportunities for hands-on scientific learning as possible through their education.” (Personal communication, September 20, 2021). By having a good time and learning something, confidence in STEM can help students make informed choices about what they want to strive to be.





*Career fair students in Tuktoyaktuk trying their hand at environmental monitoring activities. Increasing awareness of northern STEM careers helps students recognize the value of STEM education in their own communities. The hands-on experience fosters confidence and lets students envision themselves in those STEM professions. Photo Credit: ARI.*

We know students in the North to be brilliant, curious and industrious. Despite these qualities, we see lower graduation rates in the North compared to the rest of Canada. A 2016 report from the Government of the Northwest Territories (GNWT) showed that an average of 52% of Northwest Territories (NWT) students graduate, as opposed to the national average of 78% (NWT Bureau of Statistics, 2016). Subsequently, northern youth strive less for careers in STEM than their southern counterparts (GNWT, 2019). According to Trimble and Turko, this gap can be bridged. As more jobs in the North become centered in STEM fields, empowering youth to take on these skills will grow in importance. By 2030, over half of the 22,807 forecasted job openings will require a post-secondary education at a minimum (GNWT, 2019). Markedly, pursuing higher education in STEM fields can translate into jobs where northerners are the leaders and decision-makers in the expanding workforce and in their communities, even if they don't work directly in science. For instance, sustainability and resource management led the way in 2021 job postings (Fig 1). These specializations directly translate into taking care of communities and their surroundings. This past year alone saw the NWT leading Canada in the amount of STEM-related job postings (Fig. 2), with projections for more growth in the next decade (ECO Canada, 2021).



Figure 1: Job postings in 2021 broken down into specializations within environmental science. ECO Canada, 2021

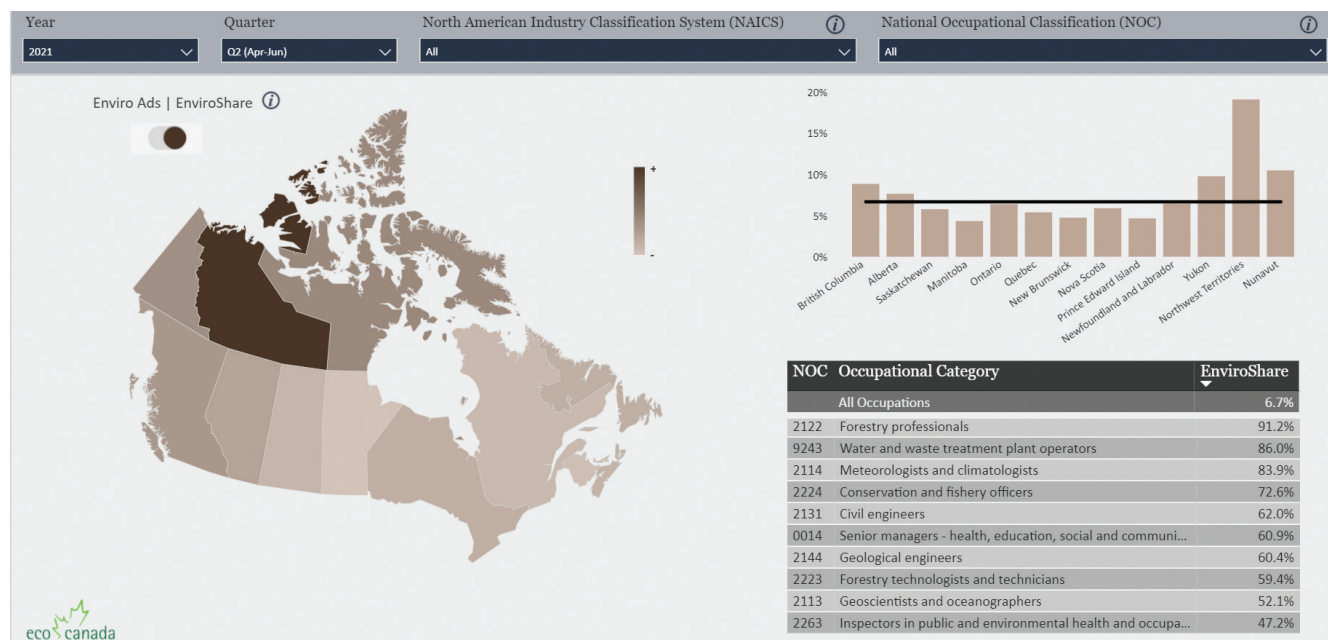


Figure 2: Share of environmental job postings relative to the rest of Canada, with a table specifying occupational category percentages and a chart showing percent of environmental job posting percentages at the provincial and territorial level. ECO Canada, 2021.



Concurrently, research into student attitudes on STEM revealed that “Canada’s teens want to make a difference, help people, make a contribution, solve problems, and build their own ventures. Yet students don’t always understand how STEM learning supports the roles and careers they value” (Let’s Talk Science, 2014). Echoing these findings, Trimble asserts:

“If they see how research is useful in our region they might feel confident in pursuing STEM education out of high school. Scientists fly up here to study fish and water and climate change all the time- who better to take on that research and land stewardship role than local youth?” (Personal communication, September 20, 2021).



*Fort McPherson students gather on the land to learn about the local impacts of climate change from Elders and researchers. Students conduct snow surveys and learn about the use of drones and remote sensing in collecting data and detecting changes in the land. Photo Credit: ARI.*

The Land is all around us, where learning is limitless. As a part of this Land, students already have inherent and learned knowledge from growing up on it. Within the communities, a wealth of information exists in our living treasures, Elders and knowledge holders. Knowledge holders are essential in passing on these lived lessons and hold a place of honor in the communities. What is known elsewhere as Traditional Ecological Knowledge, (TEK) is the gift of understanding the world from previous generations to the next. Whenever possible, inviting knowledge holders to share with the students enriches their learning beyond measure. Rather than looking at science and traditional knowledge as separate, ARI tends to see them as collaborative. Design, research and technology are all a part of what makes the iglu brilliant engineering, or a sunburst ruff the ideal feature on a parka (Cotel et. al, 2004). It is knowledge refined and passed down through time.

Through observations about the Land, be it wildlife, water, or weather, northerners are the best placed to notice changes and trends, because they live here and have generations of lived knowledge. Learning the TEK way can also happen alongside the science way, so that the best of both worlds can help youth know how to protect their surroundings and make decisions about the region. As much as STEM is part of the overall ecosystem of learning, local knowledge is part of the ecosystem of living in the North. Both can be given to students so that they may have all the tools at their disposal to succeed.



*Tsiigehtchic students make cyanotypes (sun prints) while at their land camp, learning about the seasons and the return of the sun. Photo credit: Let's Talk Science.*



As school lets out for the day, Trimble heads out the door towards the Children First Centre or the Youth Centre in Inuvik, to offer exploratory hands-on science activities in more relaxed settings for the children. In the South Slave, Turko is engaging youth in Fort Smith at the library and daycare. Looking towards the future, the ARI Outreach program is hoping to reach students in outlying communities on a more regular basis. A step in the right direction, Yellowknife Outreach Coordinator Chris Black has joined the team, effectively stretching their reach across the Tlicho Region. Thinking about the students, Trimble shares: “My heart is hopeful. Our students are awesome. I just want to see them come back to the North with the tools they need to flourish. We have the capacity in the North, we just need to foster it” (Personal communication, September 20, 2021).



*Exploring skulls and bones of NWT wildlife, and other spooky science activities during Halloween at the daycare.*

*Photo credit: ARI*

Are you an educator in the Beaufort Delta or South Slave region of the NWT? Visit [nwtstemkits.ca](http://nwtstemkits.ca) to bring hands-on STEM learning into your classroom or youth-friendly space or contact ARI for hands-on activities that can be done with everyday materials.

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**Myrah Graham** is a queer person of Caribbean descent existing in Inuvik, NT. She is grateful to the Inuvialuit and Gwich'in people whose land she lives on. The author previously held the temporary position of Outreach Assistant at ARI, specifically at the Western Arctic Research Center (WARC). Through that role, Myrah came to learn about the importance of sharing STEM programming and hands-on activities with youth.

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