



# Sistering Indigenous and Western Science (SINEWS): A Briefing Package

# Introduction

## Context

The Sistering Indigenous and Western Science (SINEWS) project aimed to support early career development of Indigenous and non-Indigenous women - groups that are underrepresented in the Natural Resources sector in Canada. SINEWS brought together pairs of Indigenous and non-Indigenous female-identifying undergraduate students to design and complete a small research project over the course of four months during the summer. The research projects were required to align with the Natural Resources Canada (NRCan) mandate, and were designed to support reconciliation by addressing topics of Indigenous public interest and collaborating with Indigenous communities/groups.

This briefing package summarizes the experiences of each student team during the pilot project, in which eight pairs of students were funded from May-August of 2019. It is intended to provide NRCan upper management and stakeholders with an understanding of the diversity of student projects, the personal and professional impacts of SINEWS, and possible future directions and improvements to the project, should SINEWS be renewed or evolve. More broadly, this briefing package can provide any research organization wanting to carry out a project with similar goals to SINEWS (e.g., contributing to the advancement of underrepresented groups; contributing to reconciliation) with a foundation for understanding some key considerations when designing this type of project.

Throughout this briefing package, the four key goals of the SINEWS project are referenced as an anchor to discuss the outputs of the project and the experiences of each student team:

Female-focused	• Support the advancement and growth of women in the natural resources sector.
Reconciliation	• Contribute to reconciliation through personal relationships.
Early career opportunities	• Provide early career opportunities to Indigenous and non-Indigenous women in STEM in order to overcome known barriers.
Community and capacity building	• Build connections, relationships, and a community that can foster a better future for women and Indigenous peoples in the natural resources sector in Canada.

A common structure helped guide students through their projects and ensure adherence to NRCan guidelines. The key shared components of each project included:

- Assignment of one internal mentor from NRCan to help students navigate NRCan procedures and SINEWS project requirements, and provide scientific expertise if appropriate;
- Assignment of one external mentor (e.g., academic, subject matter expert) to help students frame research questions, design methodology, and analyze results if expertise was not available from NRCan; and
- Requirement to complete an NRCan-led ethics review process, and in some cases an additional university or college ethics review.

## Summary of key themes

Each student team encountered unique opportunities and challenges depending on the goals and contexts of their projects. However, a few themes were shared among the student teams, which are summarized below.

### *Project goals and subject matter*

Common themes included:

- Empowering Indigenous students by providing leadership opportunities;
- Creating written documentation of oral knowledge from Elders and Indigenous community members for the community;
- Creating resources for Indigenous communities to support them in leading stewardship and use of their lands; and
- Bringing together Western and Indigenous knowledge as complementary sources of information.

### *Project successes*

<b>Female-focused</b>	<ul style="list-style-type: none"><li>• All students felt there was a strong advantage to having an all-female (identified) program for partnering, mentoring, and support.</li><li>• Many students stated that the female focus of the program was their primary reason for applying.</li><li>• Multiple students stated they felt empowered by being seen in leadership roles, and by seeing examples of other women in leadership roles (e.g., SINEWS program team, mentors).</li></ul>
<b>Reconciliation</b>	<ul style="list-style-type: none"><li>• Projects created opportunities for several Indigenous students to begin making connections with communities and to reconnect with their culture.</li><li>• Projects allowed for development of personal and professional relationships between Indigenous and non-Indigenous women.</li><li>• Non-Indigenous participants developed a deeper understanding of the challenges faced by Indigenous people, and in particular Indigenous women.</li></ul>
<b>Early career opportunities</b>	<ul style="list-style-type: none"><li>• Networking opportunities afforded by SINEWS experience (e.g., working in federal government buildings, attending conferences) allowed students to make key professional connections.</li><li>• Students were able to speak with their mentors about career possibilities, helping them to choose their next steps.</li><li>• Students built a network of peers with their SINEWS cohort, planting the seeds for future potential collaborations/support to continue similar work.</li><li>• Students experienced their own potential and built confidence in their abilities.</li></ul>
<b>Community and capacity building</b>	<ul style="list-style-type: none"><li>• Embracing projects that integrated human dimensions of natural sciences (e.g., social and political factors) provided enhanced value and relevancy to Indigenous communities.</li><li>• Supporting Indigenous students to work in their communities allowed some projects to continue to grow after SINEWS concluded, facilitating longer-term efforts that can continue to support communities' needs.</li><li>• Flexibility in project output formats allowed students to create resources, tools, and reports of more direct benefit to Indigenous communities than traditional outputs (e.g., scientific articles).</li><li>• Multiple students stated they felt more empowered to pursue graduate studies as a result of SINEWS.</li></ul>

## **Project challenges**

- Administrative government processes caused discomfort with Indigenous communities (e.g., signing for honorariums, signing of consent forms) and did not integrate well with community protocols.
- The SINEWS team was advised that working with Indigenous communities and people required that an ethics review process be followed, but no federal government ethics review process was in place. The team developed their own process based on guidance from Indigenous advisors and social scientists. This process was un-tested, and the SINEWS team and students were challenged to satisfy expectations of both NRCan and communities when meeting ethics requirements.
- Project delivery and establishment of productive relationships with an Indigenous community were difficult for project teams to achieve within the limited timeframe.
- Delays in disbursement of payment to students caused financial hardship for some students that did not have other sources of income.
- The timing of disbursement of project funds did not align well with timelines for hiring of students.
- Some project teams struggled to access equipment and supplies to complete their projects when working in remote locations.
- The current NRCan reimbursement system does not accommodate students on low pay who are working in remote small communities, as it relies on students to front money for feasts, honorariums, cultural gifts and aspects of travel that create financial hardship, before paperwork can be processed for reimbursements.
- Intersectional challenges of women in the workplace, in STEM, and from Indigenous cultures were significant.

## **General recommendations for future work**

### **Program design and administration:**

- Having a female-focused program was very important to students and was encouraged to continue.
- Designing specific program components for Indigenous students without pre-existing community connections is key to supporting cultural re-engagement.
- Providing flexibility in project design, scheduling and management helps to support the inclusion of women with family, domestic, and cultural responsibilities.

### **Indigenous engagement:**

- Developing a collaborative ethics review process that is subject to continual improvement and respectful of unique cultural processes is critical. This process can help to ensure a culturally appropriate approach that considers Indigenous values and ethics requirements.
- Government administrative processes must be adjusted in order to work more effectively with Indigenous communities.
- Supporting Indigenous students to work in their communities is a key engagement strategy, as it builds capacity, allows students to be connected to their culture, and allows projects to have longer-term impacts.

## **To learn more:**

Media coverage of the SINEWS project can be found via Alberta Native News: <https://tinyurl.com/SINEWS-Media>.

For further information about the SINEWS student projects and outputs please contact Catherine McNalty at the Canadian Forest Service, Edmonton, Alberta: [catherine.mcnalty@canada.ca](mailto:catherine.mcnalty@canada.ca).



# Integrating Indigenous values in reclamation planting and seed collection in Alberta

Britni Gray and Andrea Wiebe  
University of Alberta

Reclamation planting on industrial landscapes can ensure that culturally important plants are maintained for Indigenous communities. This approach can be mutually beneficial for industry and Indigenous groups, as many species commonly used for reclamation are also culturally significant. To support re-establishment of these plants, Britni and Andrea developed a best practices guide for seed collection, focusing on six culturally significant boreal species. The guide drew on conversations and guidance from Elders and scientists, and publicly available datasets. To serve the interests expressed by Indigenous community members, the guide was supplemented with educational tools and experiential learning exercises to help youth learn about plant identification and cultural uses.

**“[I] found it very empowering to see other women leading in their positions and paving the way for more women to enter fields that used to be male dominated.”**

**Andrea Wiebe**

## Key Learnings

- Community members found the educational tools to transfer knowledge about plant identification and uses most helpful. Seed collection and reclamation planting were not widely accepted concepts in the communities engaged in this study.
- Embracing projects that integrate the human dimensions of natural sciences (e.g., socioeconomic, cultural, and legislative aspects) is beneficial to Indigenous communities.
- Incorporating Indigenous views into reclamation planning and practice might help bridge the current gap in communication and consultation between Indigenous communities and western science.
- Ethics review and paperwork-heavy government processes for disbursement of project funds impeded effective collaboration with Indigenous communities.



## Successes

Female-focused	<ul style="list-style-type: none"> <li>Both students enthusiastically endorsed this approach</li> <li>One student felt the female focused program supported reconciliation by allowing Indigenous women to re-enter leadership roles</li> </ul>
Reconciliation	<ul style="list-style-type: none"> <li>Students learned through sharing circles, teachings, and medicine picking in Janvier community</li> <li>Project created opportunity for reconnection with culture</li> </ul>
Early career opportunities	<ul style="list-style-type: none"> <li>Flexibility in work scheduling allowed one student to more effectively participate and gain benefits of the SINEWS opportunity</li> <li>Students were based at Northern Forestry Centre in Edmonton and were able to make valuable connections with government scientists</li> </ul>
Community and capacity building	<ul style="list-style-type: none"> <li>Educational tools and guide can help Indigenous communities to share plant knowledge with younger generations</li> </ul>

**“[The SINEWS] program was used to truly express the importance of Indigenous values; instead of just squeezing Indigenous values into a science-based approach, it used their values as the core or base for which science was applied as a support.”**

**Britni Gray**

## Challenges

- Seed collection for reclamation not viewed as important by Indigenous community members
- Ethics review process initiated after project began, compromising its integrity, and associated paperwork was considered unnecessary by Indigenous community members

## General recommendations for future work

### Program design and administration

- Designing specific program components for Indigenous students without pre-existing community connections is key to supporting cultural re-engagement.
- Short length of program (4 months) is important for undergraduate accessibility.

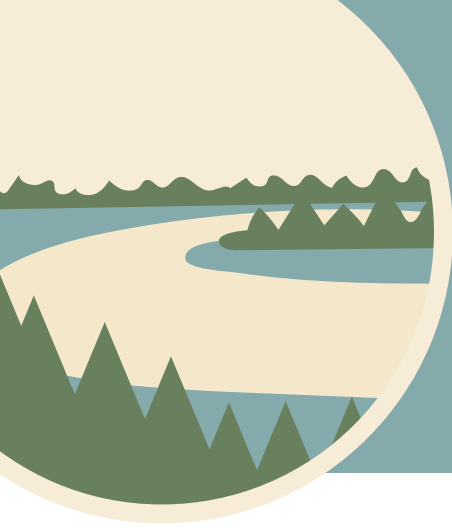
### Indigenous engagement

- A collaborative ethics review that is respectful of unique cultural processes, which may differ among communities, is important to ensure an appropriate approach that integrates Indigenous values.
- Embracing projects that integrate human dimensions of natural sciences (e.g., social and political factors) provides greater value and relevancy to Indigenous communities.

## Outputs

- Gray, B. & Wiebe, A. (2019). Seed Collection Guide for Six Boreal Plants Important to Indigenous Peoples. Internal report, Natural Resources Canada, Edmonton, AB.
- K - 6 Educational tools





# nistawinâkewin: A traditional land use study in Fort Vermilion, Alberta

Colby Lizotte and Kelsie McNeill  
University of Victoria

Land claim negotiations are an increasing reality in Alberta. As these negotiations proceed, new resources and tools may be needed by Indigenous communities to support their land claims. Without thorough documentation, oral histories and knowledge of land use may not be readily accepted by government during negotiations. To support the dominantly Indigenous community of Fort Vermilion in pursuing future land claim discussions, Colby and Kelsie interviewed members of the community to identify areas of traditional land use, produced documentation and maps of these areas, and will continue to work with the Fort Vermilion Metis Local.

**“[SINEWS] was a chance to bring a very pressing issue to light. Especially being where I’m from, [Fort Vermilion is] a small community and one of the most northern in Alberta. I think we get forgotten about and left out of a lot of conversations.”**

**Colby Lizotte**

## Key Learnings

- Community members expressed relief and fulfillment that they were finally being listened to.
- Paperwork-heavy government processes, like the lengthy process and forms required to secure reimbursements for interviewees, did not align with community norms and occasionally caused discomfort.
- This project represented a first step in engaging with rural Indigenous communities in Alberta; for the project to grow and have a long-lasting impact, long-term engagement and effort will be required.
- Research programs engaging with Indigenous communities require Indigenous voices in their administration to ensure awareness of challenges unique to Indigenous students and communities.



## Successes

### Female-focused

- Both students endorsed a female focus
- One student felt it was important to show females in a leadership role in communities

### Reconciliation

- Community members were able to share their truths
- Non-Indigenous student was exposed to different culture, lifestyle and realities by living in Fort Vermilion for the summer

### Early career opportunities

- Relationships were built with community members through conversations and sharing knowledge
- Connection made with Metis Local will support continuation of work into the future

### Community and capacity building

- Documentation and maps of traditional land use will support future discussions and strengthen land claims

**“We talk a lot about reconciliation. I hope people really think about what that means. I don’t think we are really there yet. They call it Truth and Reconciliation, and I think we are still at that Truth part. We need to hear people, hear their truths.”**

**Kelsie McNeill**

## Challenges

- Time diverted from project to provide disaster relief for the Chuckegg Creek wildfire
- Tensions and pushback received from rural non-Indigenous community members in the region (e.g., agricultural landowners)
- Paperwork and government processes caused some discomfort for community members
- Added element of work present for Indigenous student compared to non-Indigenous (e.g., establishing community connections, fulfilling cultural obligations, hosting)

## General recommendations for future work

### Program design and administration

- Ensure Indigenous voices are present in research program administration to increase awareness of challenges and considerations for Indigenous students and communities.

### Indigenous engagement

- Continue the process of engagement with Indigenous communities in rural Alberta, which is only in its infancy.
- Listen and build relationships as a first step of engagement with Indigenous communities.

## Outputs

- Lizotte, C. & K. McNeill. (2019). nistawinâkewin: A traditional land use study in Fort Vermilion, Alberta. Report including maps prepared for NRCan.





# Commitment to Community: Building sustainable relations through natural resource management

**Amanda Barlow and Tammy Lamouche**  
University of Alberta

Strong relationships between youth and Elders are critical in Indigenous communities. These relationships ensure cultural teachings are passed on and empower communities to be united in leading the stewardship, governance, and organization of their local natural resources. Tammy and Amanda collaborated with the Chief, Council, and Youth Resilience Project of Atikameg (Whitefish Lake First Nation #459) to host a three-day workshop focused on traditional land practices and teachings from Elders. Youth demonstrated leadership by filming the event, and an accompanying picture book was also produced. These community resources can be used by the people of Atikameg to support future learning. Atikameg community members shared strong positive responses to the initiative, indicating the project planted a seed with great potential to grow over the following years.

**“It was very rewarding to see Indigenous public interests take form throughout the summer. Leadership in the community expressed how they wanted to see this project evolve and we did our best to deliver.”**

**Tammy Lamouche**

## Key Learnings

- With appropriate opportunities and encouragement, youth made meaningful connections to the land and were empowered to lead in their communities.
- When Indigenous students are able to work in their own communities, they can deepen their connections and experience new cultural learnings.
- Allowing communities to lead the direction of capacity-building projects is essential to ensure that outcomes align with community objectives and needs.
- A collaborative ethics review that is respectful of unique cultural processes, which may differ among communities, is important to ensure an appropriate approach that integrates Indigenous values.



Tammy Lamouche (right) with mentor Kirsten Lindquist, Faculty of Native Studies, University of Alberta (left) (Amanda Barlow; no photo available).

## Successes

Female-focused	<ul style="list-style-type: none"> <li>One student enthusiastically endorsed this approach and emphasized the importance of maintaining the female focus in the future</li> </ul>
Reconciliation	<ul style="list-style-type: none"> <li>One student felt that the partnership between Indigenous and non-Indigenous people is a very important component in reconciliation</li> <li>One student felt that the project allowed them to reconnect to the land</li> <li>The project created the opportunity for deeper cultural connection and new cultural learnings</li> </ul>
Early career opportunities	<ul style="list-style-type: none"> <li>Students built strong working relationships with multiple stakeholders (e.g., Atikameg Chief and Council, NRCan, Youth Resilience Project)</li> </ul>
Community and capacity building	<ul style="list-style-type: none"> <li>Community of Atikameg expressed strong appreciation for the project and saw potential for the initiative to continue to grow and strengthen their community</li> <li>Students were invited to return to Atikameg to continue their learning</li> </ul>

**“I can see the faces of my ancestors in the trees.”**

**Atikameg youth**

## Challenges

- Ethics review process and government paperwork were challenging for community members and Elders to navigate, review, and sign
- Some challenges were experienced in keeping priority on Elders and youth while balancing the desires of multiple stakeholders (e.g., NRCan, Chief and Council, youth group leaders)
- Overall, students felt there were “more wins than challenges”

## General recommendations for future work

### Program design and administration

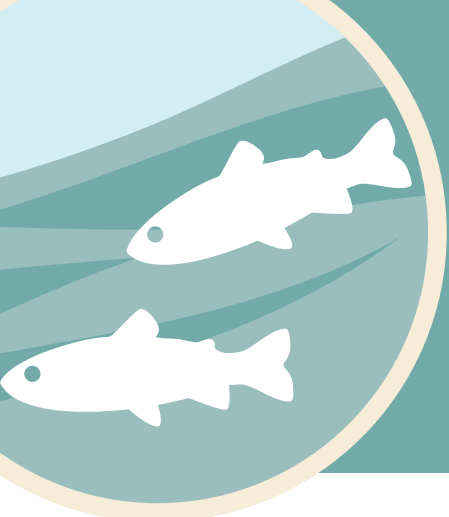
- Having a female-focused program was very important to students and was encouraged to continue.

### Indigenous engagement

- A collaborative ethics review that is respectful of unique cultural processes, which may differ among communities, is important to ensure an appropriate approach that integrates Indigenous values.
- Asking each individual Elder their preferred protocol(s) is important, as all Elders are unique and their preferences will differ.

## Outputs

- Video



# Assessing Western and Indigenous approaches to water quality in the Calgary area

Danielle Dusome and Hannah Grewal  
Mount Royal University

Water is a central feature of many Indigenous value systems and significant to women as keepers and protectors of water. As many Elders will attest, “water is life.” Over past centuries, Western and Indigenous peoples have developed different ways of assessing water quality, which have rarely been integrated in Alberta. Danielle and Hannah’s project worked to bring together these two sets of knowledge by working with an Indigenous community near Calgary to determine their needs and interests related to water quality. The pair also completed a literature review to deepen their understanding of the value of water for Indigenous peoples.

In the field, Danielle and Hannah assessed up- and down-stream baseline water quality values using various analytical techniques, including total organic halogens, total metals testing, and biological indicators. The resulting report will be shared with the Indigenous community, Natural Resources Canada, and university partners to serve as an important jumping-off point for future research. The students also attended Mni Ki Wakan (World Indigenous Peoples Decade of Water Summit), which was a key career-building experience.

**“We had to manage a lot of expectations, and the thing we had to respect the most was finding a balance between Indigenous and Western science. There are very few researchers who understand this balance. Hopefully my partner and I can become those scientists who understand both sides.”**

**Hannah Grewal**

## Key Learnings

- Making observations based on traditional knowledge during western science collection and analysis can enable a more holistic approach to water quality assessment.
- At Mni Ki Wakan, students learned that all nations agree water is not how it once was for their ancestors; students also gained insights into Indigenous indicators of water health based on interactions of water with surrounding plants and animals.
- Exposure to early career opportunities can provide critical confidence-building, motivate students to continue their education, and provide students with the key professional connections.
- Increased briefing and training in Indigenous ways of knowing and doing may be needed for non-Indigenous academics wishing to engage with Indigenous communities to ensure that community needs are met.
- Supporting Indigenous students that do not have community connections is important to help them reconnect with culture and build community relationships.



## Successes

Female-focused	<ul style="list-style-type: none"> <li>Both students strongly and enthusiastically supported this approach</li> <li>One student stated they were empowered through seeing representation of women in STEM and receiving realistic advice about potential challenges</li> </ul>
Reconciliation	<ul style="list-style-type: none"> <li>One student stated that they felt they actively participated in reconciliation through their project</li> <li>One student stated that they felt continued growth of SINEWS will work towards further reconciliation by providing good examples of Indigenous and non-Indigenous people working together</li> </ul>
Early career opportunities	<ul style="list-style-type: none"> <li>Students attended Mni Ki Wakan World Indigenous Peoples Decade of Water Summit, where one student made a key connection leading to securing a graduate school supervisor and project in Indigenous-focused water research</li> </ul>
Community and capacity building	<ul style="list-style-type: none"> <li>Contributed towards advancement of highly qualified personnel</li> <li>Students built confidence and certainty in their career goals</li> </ul>

**“I loved the flexibility, understanding and excitement that most of the SINEWS team had. I loved that we were responsible for most of the project, but had support when we needed it.”**

**Danielle Dusome**

## Challenges

- External mentor not consistently understanding of Indigenous-led direction, which presented a barrier to creating project outputs that would be most useful for Indigenous communities
- Time limitation of project did not allow for development of strong connections with local Indigenous communities

## General recommendations for future work

### Program design and administration

- Designing specific program components to support Indigenous students without community connections is key to facilitating cultural re-engagement.

### Indigenous engagement

- Briefing and training in Indigenous ways of knowing and doing for non-Indigenous academics may be needed to ensure research projects effectively support Indigenous community needs (e.g., pursue approaches and outputs not conventional to Western science).
- Creating roles for members of the Indigenous community to help with projects is important to provide an opportunity for engagement and facilitate transfer of knowledge between researchers and community members.

## Outputs

- Dusome, D., and Grewal, H. (2019). Sistering Indigenous Knowledge and Western Science: A Multidisciplinary Analysis on Treaty 7 River Water. Internal report for Natural Resources Canada, Edmonton, AB.
- Media Coverage: <https://tinyurl.com/SINEWSHannah-Danielle>



# Analyzing fire risk in Fort Smith, Northwest Territories

Jenni Watts and Alex James  
Aurora College

Understanding wildfire risk is important for Indigenous and Northern communities in Canada, because they are often located in high-risk, remote areas surrounded by forests. Accurate information on fire risk can help communities to protect their homes and infrastructure, prepare for evacuations, and plan future developments. Jenni and Alex's project focused on supporting the dominantly Indigenous community of Fort Smith by ground-truthing two measurements used by the Canadian Forest Service to evaluate fire risk: the Duff Moisture Code (DMC) and the Drought Code (DC). The pair also studied the relationship between hydrology (stream flow rate) and long-term moisture stress (DC), as fire risk can be influenced by water table fluctuations in the Wood Buffalo region. Jenni and Alex found that stream flow rate was negatively correlated with DC, but the relationship was not strong enough for stream flow rate to act as a robust direct indicator of landscape-level fuel moisture, as related to wildfire occurrence.

**"Everyone up there knew that I was working with them...It felt really nice that the community was excited about the project, and that they were excited we [Canadian Forestry Service] were involved."**

**Ellen Whitman (Northern Forestry Centre), project mentor**

## Key Learnings

- In the Fort Smith region, stream flow rate is not a robust substitute for Drought Code, although the two measures are negatively correlated. This finding supports previous observations that hydrology and fire risk are interrelated in the Wood Buffalo region.
- Focus of SINEWS on early career development was important to create opportunities for students to build their professional networks, both with local fire managers in Fort Smith and with researchers at the Northern Forestry Centre in Edmonton.
- Payment structures, timelines, and budgets designed based on southern contexts may not integrate smoothly for Northern projects due to remoteness (e.g., higher costs of living, increased travel costs/times, increased shipping costs/times).



## Successes

Female-focused	<ul style="list-style-type: none"> <li>Approach was beneficial and invigorating for students transitioning out of male-dominated fields, where they had encountered sexist responses</li> </ul>
Reconciliation	<ul style="list-style-type: none"> <li>Students appreciated learning more about Indigenous history and conflict in the south</li> </ul>
Early career opportunities	<ul style="list-style-type: none"> <li>Students had their first experience leading a research project and managing their own schedule, scope, and budget</li> <li>Students had the opportunity to discuss career interests and goals with Northern Forestry Centre researchers</li> </ul>
Community and capacity building	<ul style="list-style-type: none"> <li>Students deepened their community connections and built new connections with fire managers in Fort Smith</li> <li>Students developed connections with local band councils to communicate with about their project and obtain fieldwork permissions</li> </ul>

## Challenges

- Integration of Indigenous public interests or collaboration with a distinct Indigenous community was challenging to achieve, as Fort Smith is an integrated community. Students did not see Indigenous interests as being separate from or in conflict with general community interests in this region.
- Several challenges were experienced related to being in a remote Northern community:
  - Field equipment was delayed in shipping and difficult to access
  - NRCan payment/budgeting structures were not aligned with Northern realities
  - Students had limited face-to-face time with project mentors based in Edmonton

## General recommendations for future work

### Program design and administration

- When supporting Northern projects, it is important for southern-based programs to consider differences in contexts and challenges. In particular, southern-based programs should be aware of challenges related to remoteness (e.g., costs, travel times).
- Developing a program component that considers the unique contexts of Northern communities may be useful to strengthen support for participation of Northern students.

### Indigenous engagement

- Fort Smith is more culturally integrated (Indigenous and non-Indigenous) than many communities in the south. This context is important for southern programs to consider. Challenges such as remoteness from resources and expertise may be more important than challenges presumed in southern contexts (e.g., establishing contact with Indigenous communities, creating buy-in and formal agreements with Indigenous communities).

## Outputs

- James, A. & Watts, J. (2019). We Flame to Please [video]. Internal submission to Natural Resources Canada, Edmonton, AB.
- James, A. & Watts, J. (2019). Analyzing Fire Risk in Fort Smith, NT. Scientific poster prepared for Natural Resources Canada, Edmonton, AB.





# Documenting historic burning practices in Beaver First Nation

Andrea Rosenberger-Deleeuw (University of Calgary)  
and Emma Doerkson (Grande Prairie Regional College)

Controlled burning is an important cultural and ecological practice used by Indigenous peoples. Purposes of cultural burns include maintaining animal habitat, improving berry production, and reducing risk of larger fires. In many communities, knowledge and use of burning practices has been reduced or lost due to loss of access to traditional lands and government policies to suppress wildfire. To help document community knowledge of fire use and contribute to a potential revival of cultural burning practices, Andrea and Emma held interviews with several members of Beaver First Nation. The pair produced a report that synthesizes themes in the knowledge shared, which can support knowledge retention and transfer in the future.

**“I feel like this has been an incredible learning experience - and one that I would not have got from traditional undergrad training. I feel much more confident applying to grad school after participating in SINEWS.”**

**Andrea Rosenberger-Deleeuw**

## Key Learnings

- Community members were eager to share their knowledge, especially to help educate younger generations. Communication to youth provided interviewees hope for the revival of cultural burning and land management traditions.
- Community members expressed a need for a stronger relationship with forestry in their area to facilitate permitting for cultural burning.
- Ethics review processes should be led by Indigenous communities to ensure a culturally appropriate approach (e.g., replacing written agreements with oral agreements).
- Timely disbursement of funds and reimbursements are critical to support students without other sources of income/financial support over the summer.



## Successes

Female-focused	<ul style="list-style-type: none"> <li>Both students enthusiastically endorsed this approach and stated it was one of their main reasons for applying</li> </ul>
Reconciliation	<ul style="list-style-type: none"> <li>Community members were able to share their truths</li> <li>Project paved a potential path forward to help revive lost traditions</li> <li>One student felt SINEWS directly represents reconciliation</li> </ul>
Early career opportunities	<ul style="list-style-type: none"> <li>One student felt empowered from making connections with a network of like-minded peers</li> </ul>
Community and capacity building	<ul style="list-style-type: none"> <li>Report can support future initiatives to revive cultural burning practices and/or to build permitting relationships with forestry</li> <li>One student felt they built confidence to pursue graduate school</li> </ul>

**“I think the entire SINEWS organization IS reconciliation. You are providing the supports to allow reconciliation to happen and flourish. I think the students are going to continue to show that.”**

**Emma Doerkson**

## Challenges

- Time diverted from project due to Chuckegg Creek wildfire evacuation
- Delays in funding and reimbursement caused significant financial strain on one student
- Imposition of ethics review process on the community was not well received and impeded project progress at times
- “Reconciliation fatigue” was evident for the community members interviewed

## General recommendations for future work

### Program design and administration

- Ensure a timely reimbursement and pay system is in place to support students relying on the program as their primary source of income during the summer.

### Indigenous engagement

- Stronger relationships can be built when researchers are present in Indigenous communities over longer periods of time.
- To reduce/avoid fatiguing communities, ensure that they can see the benefits of research being conducted (i.e., clearly communicate research and its implications).

## Outputs

- Deleeuw, A. & Doerkson, E. (2019). Beaver First Nation Historic Burning Practices. Internal report, Natural Resources Canada, Edmonton, AB.
- Media Coverage: <https://tinyurl.com/SINEWSAndrea-Emma>

# Combining western science and Indigenous knowledge to document traditional uses of plants in Treaty 7 territory

Coral Williams (Northern Alberta Institute of Technology)  
and Michelle Gladue (Mount Royal University)

Learning about ceremonial and medicinal plants represents a key way that Indigenous youth are connecting or reconnecting with their cultural roots. To facilitate this learning process within communities, there is a need to increase the educational resources available for youth, and an opportunity to bring cultural teachings together with western science to create a larger set of knowledge. Coral and Michelle addressed these key gaps by partnering with Elders and with the Mount Royal University's Iniskim Centre to receive teachings through medicine walks. Cultural teachings about finding, harvesting, preparing and using plants were combined with western science to determine ecosite types where culturally significant plants may be found on Treaty 7 territory. Infographics will be developed to communicate the project's findings to youth and will be available at the Iniskim Centre to make the learnings accessible to local Indigenous peoples.

**"I feel like [SINEWS] has helped create a foundation for the future as proof that Truth and Reconciliation can be accomplished. The biggest barrier is what the government chooses to do with our research. This [work] must not fall on deaf ears!"**

**Michelle Gladue**

## Key Learnings

- Receiving traditional teachings from Elders requires time and sincere expression of commitment through honouring, experiencing, and developing a deeper understanding of protocols.
- Providing flexibility in how students designed and carried out their project helped create an inclusive experience for students with family and domestic responsibilities.
- Collaboration on a daily basis between Indigenous and non-Indigenous people can be challenging and difficult at times, but the rewards of success are immense.
- Steps towards Truth and Reconciliation can be made through strong personal relationships and working collaborations between Indigenous and non-Indigenous researchers.



Coral and Michelle sewed a quilt to document their partnership and journey. The quilt will be showcased in the Iniskim Centre at Mount Royal University.

## Successes

Female-focused	<ul style="list-style-type: none"> <li>Having a female focus enabled students to show what they can achieve</li> </ul>
Reconciliation	<ul style="list-style-type: none"> <li>One student felt empowered that Truth and Reconciliation can be accomplished</li> <li>One student felt the student partnership contributed to reconciliation through personal conversations and relationship building</li> </ul>
Early career opportunities	<ul style="list-style-type: none"> <li>One student felt the experience opened up new career opportunities for them</li> </ul>
Community and capacity building	<ul style="list-style-type: none"> <li>One student expressed a desire to mentor future SINEWS students</li> <li>Both students found strong value in the partnership, community and relationship building enabled through their project</li> </ul>

**“I learned how to slow down and listen and to not get too hung up on timelines when working with Elders[...]Relationships take time. You can’t expect to go from A-Z without going through the whole alphabet.”**

**Coral Williams**

## Challenges

- Ethics review process was not in line with cultural protocol for Elders
- Documentation and management of funds was challenging using government processes

## General recommendations for future work

### Program design and administration

- Male allies and advancement of women to leadership positions are critical in female-focused initiatives, as men currently occupy many leadership roles.
- Providing flexibility in project design, scheduling and management helps to support the inclusion of women with family and domestic responsibilities.
- Promoting program on social media is important to support undergraduate recruitment.

### Indigenous engagement

- A collaborative ethics review that is respectful of unique cultural processes, which may differ among communities, is important to ensure an appropriate approach that integrates Indigenous values.
- Reaching out to Elders in advance of starting projects is highly valuable to ensure strong relationships and to facilitate project delivery.

## Outputs

- Commemorative quilt representing Indigenous and non-Indigenous partnership in support of reconciliation. On display at Mount Royal University’s Iniskim Centre.
- Infographics
- Media Coverage: <https://tinyurl.com/SINEWSCoral-Michelle>



# Project HomeBuild: Addressing housing needs and housing sovereignty in Onion Lake Cree Nation

Lola Wolfe (Yellowhead Tribal College) and  
Michelle Lim (University of Alberta)

Indigenous peoples are the fastest-growing segment of the Canadian population, yet the rate of home construction has not kept pace with this increasing demand. Many Indigenous communities therefore face challenges related to poorly constructed and overcrowded homes. Lola and Michelle sought to help solve these challenges by combining their interests and skill sets to provide new home design for Onion Lake Cree Nation. The students aimed to create a design that would be culturally relevant while also contributing to the economic prosperity and environmental sustainability of the community. Lola and Michelle's design incorporated traditional Tipi Laws and a social enterprise model, which allows surpluses to be reinvested in the community to support housing sovereignty. The students identified a locally source-able building material that could support economic development (hemcrete) and defined a long-term development plan that would incorporate alternative energy (solar and geothermal). Lola and Michelle have applied for long-term support for Project HomeBuild through Impact Canada, a fund that supports solutions to big problems faced by Canadians.

**“Meeting different people with different backgrounds gave me a lot of insight and guidance in my career choice and journey.”**

**Michelle Lim**

## Key Learnings

- Hemcrete is a promising building material for Indigenous housing as it is rot-free, pest-free, highly insulative, fire resistant, quick to assemble, and (in the case of Onion Lake Cree Nation) can be sourced locally.
- Creative infrastructure development approaches, such as social enterprise models and sweat equity, can provide solutions for communities with limited resources to invest.
- Supporting Indigenous researchers to work in their communities can create an opportunity for projects to grow, continue, and fulfill a larger scope, providing greater long-term value to the community.
- Housing development initiatives can support Indigenous sovereignty by prioritizing Indigenous leadership and supporting revival of suppressed cultural approaches (e.g., Tipi Laws).



## Successes

Female-focused	<ul style="list-style-type: none"> <li>Both students enthusiastically endorsed this approach</li> </ul>
Reconciliation	<ul style="list-style-type: none"> <li>One student felt the project created an opportunity to learn about Indigenous culture, where this opportunity was not available through their school or news/media</li> <li>One student felt that SINEWS provided opportunity for urban band members living outside of their community to reconnect and get involved in their community issues to help solve problems</li> </ul>
Early career opportunities	<ul style="list-style-type: none"> <li>One student felt it was valuable to see firsthand what is involved in government- and research-based careers</li> <li>Students built a network of professional connections to support the project (e.g., architecture, construction, and energy businesses)</li> </ul>
Community and capacity building	<ul style="list-style-type: none"> <li>One student felt they were able to get involved in solving their community's issues</li> <li>Comprehensive housing plan developed to address community needs</li> <li>Application to Impact Canada may secure long-term funding for the development of 10 new homes in Onion Lake Cree Nation</li> </ul>

**“In my opinion, I feel that the idea of a sisterhood in a project is genius. The advantage was that there was less of a competitive atmosphere and we all shared ideas and encouraged each other.”**

**Lola Wolfe**

## Challenges

- Limited time to complete research due to late start and long ethics review process
- Limited time for meetings with Onion Lake Cree Nation leadership

## General recommendations for future work

### Program design and administration

- Building in an allotted timeframe for the ethics review process may help to ensure more time is available for research activities.

### Indigenous engagement

- Supporting Indigenous researchers to work in their communities can create an opportunity for projects to grow, continue in the long-term, and fulfill a larger scope.
- Prioritizing Indigenous leadership in the economic and cultural development of communities is essential to ensure that community needs are recognized and met.

## Outputs

- Impact Canada project proposal
- Wolfe, L., and Lim, M. (2019). Project HomeBuild. NRCan internal report, Edmonton, AB.



# Conclusion

The experiences of students and the project outputs described in this briefing package demonstrate that, in its first year, the SINEWS project has been successful in meeting its four key goals:

- **Female focused:** Support the advancement and growth of women in the natural resources sector.
- **Reconciliation:** Contribute to reconciliation through personal relationships.
- **Early career development:** Provide early career opportunities to Indigenous and non-Indigenous women in STEM in order to overcome known barriers.
- **Community and capacity building:** Build connections, relationships, and a community that can foster a better future for women and Indigenous peoples in the natural resources sector in Canada.

Throughout the SINEWS project, NRCan staff had the opportunity to deeply appreciate and internalize Indigenous cultures and challenges for women in the Natural Resources sector. Wherever possible, NRCan staff strove to apply these learnings to improve project delivery. These learnings can be summarized as four “pillars” of the SINEWS approach, which can help to guide the project in the future should it have the opportunity to continue:

## Embrace women’s leadership:

An all-female program created a welcoming environment for women where they felt comfortable to raise their concerns (e.g., accommodation for caregiving responsibilities). The female-focused program also increased comfort level through a shared communication style, removed barriers related to gendered power dynamics, and provided important examples of representation. In particular, representation of female leadership in the program’s administration and mentorship teams empowered students in their educational and career aspirations.

## Build personal relationships by working together:

Indigenous Elders and community members often speak of the concept of “walking together” in order to develop working relationships and friendships. These processes of spending time and sharing informal conversations were instrumental in creating supportive relationships with Indigenous collaborators, as well as helping NRCan staff to learn and be more effective in their roles. Going forward, SINEWS should continue to invest in developing and maintaining relationships with Indigenous peoples and communities. Projects like SINEWS need more time for student engagement with Indigenous communities (at least 8 months, rather than 4 months).

## Embrace Indigenous leadership:

Throughout the program, NRCan staff learned to avoid imposing Western science-oriented visions for student projects, to accept different metrics of success (e.g., outside of publications/presentations), and to work slower, allowing for learning through repetition, practice, and one-on-one time. These learnings represent a few shifts in mindset that are needed to truly support Indigenous public interests, by supporting the completion of projects using Indigenous ways of doing and knowing. In the future NRCan will need to have access to or develop a collaborative ethics review process that better considers unique cultural processes and integrates Indigenous values. Increased Indigenous leadership on project teams is critical and NRCan needs to increase Indigenous representation within its workforce.

## Accommodate work in small communities:

NRCan staff learned that there are many benefits to supporting Indigenous students to work in their own communities. Some of these include students remaining connected and involved in their culture, building local relationships, and (for non-Indigenous students) having critical learning experiences through exposure to new cultures and places. In the future, more flexibility is needed in NRCan procedures to support this type of work.

For further information about the SINEWS student projects and outputs please contact Catherine McNalty at the Canadian Forest Service, Edmonton, Alberta: [catherine.mcnalty@canada.ca](mailto:catherine.mcnalty@canada.ca).