

Tłjcho Student Research Assistant Program

Final Report - October 2015

PROJECT TITLE:
Tłjcho Student Research Assistant Program
NAME OF SPONSORING ORGANIZATION:
Environment & Natural Resources, Government of the Northwest Territories Wek'èezhìi Renewable Resources Board
PROJECT DESCRIPTION:
<p>Tłjcho high school students from the North Slave Region were hired as research assistants to work alongside university researchers at the Tundra Ecosystem Research Station at Daring Lake, Northwest Territories. Students assisted researchers with fieldwork and in the laboratory at the research station. The Tundra Ecosystem Research Station is located 300 km north of Yellowknife. The Research Station facilitates long-term research and monitoring of the tundra ecosystem and supports conservation education programs and training opportunities for northern students. This is the third year of a project that will take place over a five-year period.</p> <p>Student Recruitment:</p> <p>Two Tłjcho high school students / youth will be hired each year for a total of 10 students participating in the program over a 5-year period. Each student will be hired for one month; one in July and one in August. Participants should have a minimum of Science 10. Recruitment targets students who have previously attended the Tundra Science and Culture Camp at Daring Lake and are familiar with the Research Station and its operations. The Student Research Assistant Program opportunity is advertised and applicants are required to submit a resume. Students are selected through a screening and interview process.</p> <p>a) Objectives:</p> <ul style="list-style-type: none">• To provide education and training experiences for Tłjcho students / youth• To provide valuable work experience for students• To introduce students to careers in science, particularly those related to the environment• To create awareness and interest in scientific research and fieldwork that may encourage future participation in initiatives such as community-based monitoring programs• To support efforts to engage Tłjcho citizens in the stewardship of land, wildlife and resources on Tłjcho lands and in co-management in Wek'èezhìi• To provide a mutually beneficial opportunity for students and researchers. Researchers will benefit from additional field and laboratory assistance, and students will benefit from the mentoring they receive <p>b) Deliverables:</p> <ul style="list-style-type: none">• Annual Final Report to summarize program activities

- Digital photographs of students engaged in program activities
- Signed photo release forms for each student
- Copy of poster advertising the program and employment opportunity. Posters were sent to Tłı̄cho community schools. They were also posted on the Wek'èezhìi Renewable Resources Board Facebook page and website, as well as on the Tłı̄cho Government's Facebook page and website. The Tłı̄cho Government also included the poster and program information in its newsletter.
- Copy of Wek'èezhìi Renewable Resources Board (WRRB) E-newsletter story publicizing the project. The story was distributed in the Summer 2015 issue and is posted on the WRRB website at www.wrrb.ca

PROJECT PARTICIPANTS SUMMER 2015

For Year 3 of this project, Trena Weyallon and Teya Wetrade were hired as Research Assistants for the months of July and August, respectively. Trena Weyallon was hired for a 28 day term, from July 2-August 3, 2015. To coordinate with this year's researchers' schedules, Teya Wetrade's work term also started in July; Teya was hired for a 28 day term, from July 17-August 15, 2015, but due to family circumstances, was unable to complete her full term. Teya's work term ended on August 3, 2015.

The Student Research Assistant employment opportunity was promoted on website and social media, as well as by poster distributed to schools. In addition, a Power Point presentation on the TSSRAP program was prepared and presented to high school students in Behchokò.

Six (6) applications were received and screened and interviews were held by telephone. Job duties and supervision were overseen by Environment & Natural Resources, Government of the Northwest Territories (GNWT).

WORK ACTIVITIES

Trena and Teya worked with university researchers engaged in climate change studies at Daring Lake, and assisted them with field work and in the lab at the Research Station. They assisted university researchers including Le Ge, PhD candidate, Trent University and Kristyn Foster, Honours Geography, Trent University.

Daring Lake is one location in a global network of research sites that scientists are monitoring to better understand any impacts climate changes might have on carbon cycle processes. Ultimately, the research is aimed at contributing to a greater understanding of the Arctic's overall response to a changing climate.

As part of a long-term study of tundra-atmosphere interactions at Daring Lake, university researchers are studying the exchange of important greenhouse gases (carbon dioxide and methane) between tundra surfaces and the atmosphere. They are measuring these exchanges over various tundra types (upland tundra, wet sedge fen, and shrub sites) and assessing carbon sink/source strength of the Daring Lake region.

For the 2015 field season, core projects addressed some of the ongoing questions about tundra carbon cycling and the effects of climate change on the tundra ecosystem. For example, one project is studying the effects of climate on the growth, reproduction and timing of events in different

tundra plant species. Other studies are investigating the relationship between permafrost and climate change. These projects focused on these areas of inquiry / investigation:

1. Whether there is any correlation between the normalized difference vegetation index and leaf area index, in order to reduce error in carbon exchange models.
2. The roles that Arctic ponds play in the Arctic carbon cycle, to better predict their contribution to the Arctic's overall response to a warming climate
3. Season and interannual variation in productivity over a series of Arctic tundra vegetation community types to better understand the effect of earlier snowmelt on growing season production.
4. The influence of increasing shrub coverage on the carbon cycle to improve understanding of the Arctic terrestrial carbon balance with current shrub expansion.

Le Ge is investigating shrub tundra controls on carbon dioxide exchange in low Arctic tundra. Krystin Foster assisted a graduate student researching the carbon balance of tundra ecosystems at Daring Lake. Krystin also conducted her own research project on the vegetation and soil controls on active layer depth in the low Arctic. The active layer is the top layer of permafrost soils that thaws during the summer. How deep the active layer is predominantly controlled by climatic conditions, but vegetation cover may also play a role. For example, plants may trap the sun's radiation and insulate the soil.

Summer students assisted researchers in the field by sampling vegetation and microbial communities and taking measurements of photosynthesis and respiration, and biomass. They also assisted in permafrost study fieldwork, measuring permafrost active layer depth; and in the lab by preparing samples for examination under microscopes and by drying plant samples for later analysis. They checked sensors, took water temperatures on tundra lakes, hauled equipment, recorded data, collected plant samples, assisted with vegetation point framing, and performed other field tasks.

A specific research project is investigating nutrient cycling in the Arctic. Trena describes picking 900 bags, 100g of birch shrub leaves in each, and placing them in the ground at three sites to allow decomposition to take place over the winter. Next summer, researchers will compare rates of decomposition at each site. Decomposition rates can vary with different environmental conditions, such as moisture, temperature and amount of permafrost.

Trena and Teya also assisted with camp duties at the Research Station. Their enthusiasm, interest and participation were appreciated by the researchers and staff at the Research Station. Trena took every opportunity to ask questions and help researchers with their fieldwork. Teya often picked up a biology textbook that was in the lab and read; her "dream is to study biology and chemistry", and she says that her experience at Daring Lake is making her high school biology course easier this fall.

In addition to their work terms, both Trena and Teya signed on to the 10-day annual Tundra Science and Culture Camp (TSCC), July 25-August 3, also at Daring Lake. Coordinated by Environment & Natural Resources, GNWT, the camp provides intensive courses in multiple field sciences and cross-cultural outdoor environmental education. This opportunity further enriched their work experience by providing interdisciplinary learning about the tundra ecosystem and hands-on exposure in field techniques. Both Trena and Teya were particularly interested in the area's prehistory and archaeological sites, and during the camp, Trena completed a project on the roles of men and women in post-contact Tłı̄cho society. Teya studied quartz scrapers and how they were used in the past. TSCC participants also complete a collection project for presentation. Trena collected bird

feathers, and Teya collected rocks and minerals. Both Trena and Teya took part in cultural activities such as drum-making, caribou hide preparation, and beading—learning from Tłı̄cho elders at the camp.

PRIMARY CONTACTS

ENR, GNWT: Karin Clark, Cumulative Effects Biologist (Karin_Clark@gov.nt.ca) (867-920-3014)

WRRB: Jody Pellissey, Executive Director, (jpellissey@wrrb.ca) (867-873-5740)

List of Attachments

- Digital photographs of students engaged in program activities
- Signed photo release forms for each student
- Copy of poster advertising the program and employment opportunity. Posters were sent to Tłı̄cho community schools. They were also posted on the Wek'èezhìi Renewable Resources Board Facebook page and website, as well as on the Tłı̄cho Government's Facebook page and website.
- Copy of Wek'èezhìi Renewable Resources Board (WRRB) E-newsletter story publicizing the project. The story was distributed in the Summer 2015 issue and is posted on the WRRB website: <http://wrrb.ca/news/tlichosummerstudentresearchassistantprogram2015>

Attachment 1 - Digital photographs of students engaged in program activities

Trena Weyallon

Trena Weyallon (Photo: Susan Beaumont, WRRB)



Trena Weyallon with her bird feather collection project for Tundra Science and Culture Camp (Photo: GNWT / S.Yuill)



Trena Weyallon preparing berries (Photo: GNWT / S.Yuill)



Trena Weyallon enjoying a beautiful tundra lake on the Barrenlands at Daring Lake, NWT (Photo: GNWT / S.Yuill)



Trena Weyallon at the Tundra Ecosystem Research Station (Photo: GNWT / S.Yuill)



Group shot – Tundra scavenger hunt at Daring Lake [Trena Weyallon at left] (Photo: GNWT / S. Yuill)





Teya Wetrade

Teya Wetrade (Photo: Susan Beaumont, WRRB)



Teya Wetrade with one of the four Lake Trout she caught at Daring Lake (Photo: GNWT / S. Yuill)



Teya Wetrade weighting one of the fish she caught at Daring Lake
(Photo: GNWT / S.Yuill)



Teya Wetrade displaying shaped quartz rock from the Barrenlands at Daring Lake (Photo: GNWT / S. Yuill)



Teya Wetrade weighing in on a wildlife management activity

(Photo: GNWT / S. Yuill)



Teya Wetrade displaying her collection project of rocks and minerals collected on the Barrenlands at Daring Lake, NWT (Photo: GNWT / S. Yuill)



Group shot – Tundra scavenger hunt [Teya Wetrade at left] (Photo: GNWT / S. Yuill)



Teya Wetrade learning from Tjicho elder Rita Wetrade at the Tundra Ecosystem Research Station, Daring Lake, NWT (Photo: GNWT / S. Yuill)

Attachment 2 – Signed photo release forms

Attachment 3 - Copy of poster advertising the Tłjcho Student Research Assistant program and employment opportunity.

Posters were sent to Tłjcho community schools. They were also posted on the Wek'èezhì Renewable Resources Board Facebook page and website, as well as on the Tłjcho Government's Facebook page and website

Attachment 4 - Copy of Wek'èezhì Renewable Resources Board (WRRB) E-newsletter story publicizing the Tłjcho Student Research Assistant project.

The story was distributed in the Summer 2015 issue and is posted on the WRRB website.