

Glaciologist Dr. Gwenn Flowers assists student Nicolas Roux in assembling an aluminum tripod mounted with a GPS device that will measure the changing surface of the glacier. Roux is one of many young scientists based out of Kluane Lake Research Station, which in recent years has become a popular spot for students conducting graduate studies.





# YOUNG EINSTEINS

How groundbreaking work at Kluane Lake Research Station is drawing in talented young minds from all over the world.

|| By Jerome Stueart ||

**T**he researchers at Pika Camp wake to the sounds of ground squirrels nosing around their tents. Today, they will check willow growth or set traps for collecting ground squirrels, just beyond the bear fence that surrounds their campsite, a four-hour hike from the Kluane Lake Research Station and the nearest sign of civilization.

These researchers keep meticulous notes on mountain-dwelling, chinchilla-like mammals called pika, and on willow and ground squirrels. They'll spend hours hunched over willows, snipping selected leaves, collecting and recording data in small waterproof notebooks, and analyzing samples back at camp.

They've purchased a summer's worth of food, packed it themselves, and arranged to have it flown by helicopter to their camp. At least two of them have brought along guitars. And Frisbees.

Meet the scientists collecting the hard data for multiple studies in the Yukon. Most are in their twenties. They have complete responsibility for their work, and their survival, for four months.

"Who's brought their iPod?" I ask them. Every one of them raises a hand.

While the first thing that might pop into mind when hearing the word scientist is an older guy in a lab coat, these Yukon field researchers certainly challenge that stereotype.

Dave Hik, professor and Canada research chair of Northern Ecology at University of Alberta, explains it's not unusual for the bulk of science research to be done by undergraduates, with a graduate student leading the team. They usually have fewer family commitments, are more flexible on their employment, and are healthy enough to make daily hikes into the high mountains. And field research—even the cutting-edge research—is also just good training. Running a camp yourself? *Great training.*

Photo: Courtesy Kluane Lake Research Station

“Students bring their enthusiasm and skills to all aspects of the project,” Hik says, “from forming research questions, to helping to hire their assistants, to the operational and logistical aspects of fieldwork. So, at the end of their program they are independent researchers in the fullest sense—not just capable of asking good research questions, but also capable of conducting the research in remote places. There is more to field research than just the science; all of the operational practicalities are just as important.”

**A** week before they head out into the wilderness, Amber Briggs, from Australia, is packing supplies for the summer-long camp. She is sitting on the floor filling a box—plastic bags all around her—while John Allsop and Oliver Moore, both from Leeds University and self-proclaimed Yorkshire lads, are rummaging through a plastic tub. Tammie Lynn Elliott marks off a checklist. A local radio station plays in the background.

Briggs calls out, “I’ve got a bag of white navy beans.”

“Well, are they white or are they navy?” Allsop asks.

The pile of grub grows. Lima beans, four bags of mixed beans, soya beans. Large barrels of dry goods that look like oversized grenades. (They’ll survive the helicopter sling.) There’s room for desserts and baking goods, a tub of rice, and a tub of pasta.

They uncover a tub from the previous year. “Is that a rogue box?” someone asks.

They open it and Moore calls out his discovery. “One bag of desiccated coconut. One bag of mould-covered almonds,” he says.

They’re tossed.

Allsop says, “It’s good to be part of the packing. You know what you have to work with. You know your limits and what’s worked for people in the past.”

Helen Wheeler and Isla Myers-Smith both have three years’ experience at Pika Camp. They will lead two teams this year: Team Shrub and Team Squirrel.

Team Shrub will examine the way the willow is invading the tundra at higher altitudes. The researchers want to see the impact of that movement on soil nutrients. Team Squirrel is examining the invasive willow, too, but they’re looking at how the thickening willow patches are affecting the squirrels’ ability to see its enemies.

“We’re actually trying to measure fear in the landscape,” Wheeler tells me.

When assembling the teams, Myers-Smith and Wheeler looked for people who had experience camping for long periods of time and who enjoyed it. They looked for people who could physically withstand the multiple hikes, the lack of facilities, and the remote nature of the work.

“I’d already made the decision to come to Canada,” Allsop tells me. “These are great landscapes. It gives me a chance to start my career proper in the field. I want to live abroad while I’m young.”

The attraction of “adventure” research is a main selling point in recruiting college-aged researchers. And the Yukon certainly has an impressive array of adventures. Kluane National Park contains some of the nation’s highest peaks and most breathtaking views. Grizzly bears roaming around, dall’s sheep hanging out on the cliffs, foxes and marmots, and those friendly Arctic ground squirrels, all in abundance, make the area an incredible lure.

But the research station itself has an impressive resumé.

For decades, groundbreaking studies have been core to the mission of this branch of the Arctic Institute of North America. This small research station started in the early ’50s as a place to test high-altitude physiological effects on soldiers, scientists, pilots, and explorers. Later, for ten years, Kluane Lake Research Station (KLRS) and its boreal forest were the subjects of an intensive, multi-disciplinary scientific study, the implications of which have helped alpine and boreal studies around the globe.

With that kind of reach, it’s no wonder students are attracted to the area. But some young researchers coming to KLRS are bringing a different perspective of the scientist’s role.

**J**ennie McLaren, a 31-year-old Ph.D. candidate at the University of British Columbia, hikes with me to her office—a stretch of hillside meadow overlooking Christmas Bay on Kluane Lake. The view is stunning. The mountains of Kluane National Park lie beyond the lake behind a veil of mist.

McLaren guides me past the electrical fence that wards off wandering pack horses and leads me to her small patches of experimental ground dotted with purple flowers.

**Below: A research team jumps into action at Pika Camp, east of Kluane Lake, where they are studying the movement of willow to higher altitudes. Right: Derek Turner, a Ph.D. candidate in the Department of Earth Sciences at Simon Fraser University, looks for evidence of ancient glaciers near Silver Creek. Page 39, left: Students from Glacier Camp, led by Dr. Gwenn Flowers (second from left), take time away from work for a quick photo-op. Right: Kluane Lake Research Station looks small and quiet from the outside, but inside there's big excitement happening.**



Many students aren't just supporting long-term studies started by other researchers, but have the opportunity to conduct their own individual inquiries.

"I'm doing a knock-out experiment. Just like you'd knock out a gene in a mouse to see what that gene does, I'm taking a small patch of grass and taking out one kind of vegetation," she says.

McLaren has painstakingly painted weed killer on one of three kinds of plants in these small squares. She wants to see what the other plants will do when one has been taken away. Her theories aren't just for curiosity, though.

"We're looking at climate change in the future," she explains. "We know that climate change will affect vegetation, but we'd like to know which plants we can't lose."

She's been doing this for six summers now. She's determined that grasses are the most influential plant in these northern meadows.

Scott Donker and Chris Baird are also using their time in the bush to support their unique studies. The two were approached by the Kluane First Nation (KFN) with a dilemma, ground squirrels, or gophers as they were called, were an important part of KFN tradition, but the First Nations people had noticed that traditional hunting grounds had fewer and fewer gophers. "They asked us how they could move a population from one area to their hunting grounds," says Donker. "They wanted to know what they could do to regulate and monitor that new population, and they wanted some advice on how to relocate them effectively."

Working with KFN, Donker and Baird combined their book smarts with the traditional knowledge of the Kluane people. Liz Hofer, a professor of zoology at UBC, believes, as does Donker, that this is the new direction science research may be taking—this practical application for the needs of the community. She welcomes the new approach and sees Donker and other young researchers as bridges. "They're doing community-based questioning. It's like asking the community, 'Okay, what should we look at that we haven't done? What is of interest at the community level?'"

For her this means that science and the community are working together, respecting each other, celebrating each other's knowledge.

**K**luane Lake Research Station sits like a fort in the wilderness. Two flags, Canadian and Yukon, fly over a giant tractor tire that serves as an impromptu meeting place. An airstrip connects workers at the station to the outside world,

but while they are here it is the facility's kitchen that keeps the researchers connected to each other.

Early in the morning, two geology teams make sandwiches here for their daylong hikes. One group will map the edge of continental shelves, helping locate mining opportunities for the First Nations who own the land; the other gang searches permafrosted peat beds to find where ancient glaciers used to be. They both use Google Earth's mapping technology to make a preliminary check of the landscape, and both swipe the last of the sliced lunch meat and cheese.

As the morning's breakfast ritual gets underway, KLRS veteran Ryan Danby explains the sense of legacy and community that come with working at the station, "You come here as a graduate student, but then you're eventually sending your own graduate students here."

Now a professor at Queen's University, Danby started at the station working under Charlie Krebs, conducting the first integrated study of four parks spanning the U.S.-Canada border: Wrangell-St. Elias and Kluane national parks on the Canadian side, and Glacier Bay and Tassenshini River-Elsek national parks in the U.S. "You can actually trace out a research family tree," he adds.

That's not to say the KLRS is exclusive or a club. The station is open to everyone who wants to conduct research. The more the merrier.

"Diversity is what's so great about the station—the mixing of people and ideas over dinner," he says.

Dinner is definitely the high point of every night, when everyone tracks in whatever soil they've been (carefully) disturbing, bringing their stories with them.

The ground squirrel relocators have been dodging grizzlies for hours, they say. The peat-bed duo come in caked head-to-foot with sediment that's a thousand years old. The mineral hunters leave their newly marked maps rolled up in a corner of the room. The botany team has been drying plants all day here at camp. A few Pika Camp members have come down from the mountain looking for civilization, company, and a hot shower. Some of the red squirrel team have wandered through, with plans of getting together on the beach. Someone mentions a rugby game.

Some nights it's rugby, and on other nights they break out those guitars on the beach—the guitars they heaved up and down the trail for four hours. Accompanied by fiddles and a bongo drum—and not a single iPod—these young scientists sing. **Y**



Photos: Courtesy Kluane Lake Research Station