

ARCTIC RESEARCH INFRASTRUCTURE FUND

On February 20th, the department of Indian and Northern Affairs Canada (INAC) issued a call for proposals for the \$85 million Arctic Research Infrastructure Fund (ARIF). The call had a tight deadline and a team of us from the CEN worked at full speed to obtain letters of support and quotations and to write an \$8.3 million proposal to upgrade our SAON-CEN network. The hard work paid off: on April 3rd, INAC announced that the CEN has received almost complete funding to upgrade and expand this network of northern stations. The official letter of award grants the CEN up to \$M3.78 in 2009 and up to \$M4.50 in 2010. We will keep you posted as the work gets underway, and on the research and training opportunities that this infrastructure will provide.

OFFICIAL LAUNCH OF THE CARIBOU UNGAVA PROJECT

The Caribou Ungava project led by CEN researcher Steeve Côté was officially launched on March 26th at the Observatoire de la capitale. The goal of the research program is to study the migratory caribou herds of Northern Québec and Labrador. The research team and its numerous partners¹ aim to identify the factors affecting the variations in caribou abundance, to improve their management skills, and to better understand the impacts of industrial development on the herds. Caribou play a central role in Northern ecology and are at the heart of aboriginal traditions, culture and economy. Specifically, the project will identify the factors influencing population dynamics and land use in the context of climate change. Caribou sport hunting in Northern Québec generates annual revenues of over \$20 million and also constitutes a major subsistence resource for aboriginal communities. In the past, these herds have experienced substantial variations in abundance and the impacts of climate change on the populations are unknown. Our general lack of knowledge concerning caribou population dynamics and the impacts of industrial activities, such as hydro-electricity development and mining, hampers



our capacity to properly manage this important wildlife species. Consequently, this program will document the spatial structure of the two herds, their demography, and their genetic characteristics. Caribou Ungava will train over five graduate students, one post-doctoral fellow, and about twenty research assistants in wildlife management, a field which has a growing demand for highly qualified personnel. The knowledge generated by the project will lead to better caribou management practices and will shed light on the impacts of climate change and industrial development.



Photo: Joëlle Taillon

¹Partners participating in the Caribou Ungava project: CEN; Université Laval; NSERC; Ministère des Ressources naturelles et de la Faune; Québec Outfitters Federation Inc.; Fédération québécoise des chasseurs et pêcheurs; Hydro-Québec; XStrata Nickel -Raglan Mine; Makivik Corporation; Hunting, Fishing and Trapping Coordinating Committee

MARK YOUR CALENDARS!

- The CEN spring meeting will take place on April 30th at the Collège de Ste-Anne-de-la-Pocatière, room 172. The researchers' general meeting will begin at 9h00. The presentation of CEN research activities for new students will begin at 13h30 and the afternoon will end with a happy hour. A bus will be leaving Québec city from the Pavillon Abitibi-Price at 11h15. For those coming from Rimouski, minivans will be leaving from the main entrance of UQAR at 11h15.
- The summer field season is fast approaching! Remote Area First Aid courses

ANNOUNCEMENTS

The CEN has received results from the government of Canada program for the International Polar Year that our proposal submitted last fall for logistics, health and safety that has been partially funded. For Bylot Island, we were awarded \$102K (proposal submitted by Gilles Gauthier) and \$115K for the other stations of the SAON-CEN network.

This year, the committee of northern studies of Université Laval received \$96 799 from the Northern Scientific Training Program (NSTP) for its 35 applications, which exceeds last year's amount. We would like to congratulate CEN student Marie-Ève Larouche, who was awarded the George Hobson prize for the excellence of her work.

In March, the CEN distributed over \$10K in publication prizes to its students. Congratulations to all recipients! The next round of attributions will take place in March 2010.

Become a CEN student! For those who don't know it yet, becoming a member of CEN (which requires that your thesis director is a full member or associate member, and that you are not a member of other FQRNT strategic clusters) offers many advantages. Just to name a few, student members are eligible for a variety of prizes (for publications, travel grants to attend international conferences, etc.), and upon creating an account, they also have access to the CEN server to backup their data. Click here to fill out a membership form.

BREAKING NEWS! The CEN just received notice that it has been renewed for six years in the FQRNT Strategic Clusters Program!

es are offered by Université Laval. Click here to register for a course. Click here to visit the website on Remote Area First Aid (in French only). You can also consult this website for information on procedures to follow and for forms to fill out.



A WORD FROM YOUR STUDENT REPS

The new team of CEN student reps! In this edition of the CEN Bulletin, we would like to introduce the new members of the student committee. At Université Laval, Pascale Ropars, from the Biology Department, will represent students at the Master's level while Tania Gibéryen, from the Geography Department, will represent PhD students. Frédéric Bouchard, a PhD candidate in water sciences, will represent students at the INRS. The student rep from UQAR has yet to be appointed, and we will announce this person shortly.

We are pleased to take part in this experience and look forward to working with the CEN's dynamic new team, which is helping CEN develop its international profile. We are confident we will address and voice student concerns to the CEN directorate and look forward to hearing your suggestions.

Pascale, Tania, and Frédéric (pascale.ropars.1@ulaval.ca; tania.giberyen.1@ulaval.ca; frederic.bouchard@ete.inrs.ca)

CEN IN THE NEWS

Accelerated climate change is affecting trophic dynamics of migratory species in Northern Canada, reported Joël Bêty (CEN researcher). Researchers are noting that certain species, such as the Greater Snow Geese, have good adaptation capacities for their changing environment while other species are at risk because they cannot keep pace and adapt as rapidly. *Revue Découvrir - FQRNT* (January-February 2009).

An international research team, including CEN researcher Martin Lavoie, showed that as the climate warms, the occurrence of forest fires will increase. The team determined that in North America, periods of warming during the last glacial age were closely associated with the occurrence of wildfires. *Au fil des événements*, 05 February edition. See: Marlon, J.R. et al. 2009. Wildfire responses to abrupt climate change in North America. *Proceedings of the National Academy of Sciences U.S.A.* 106: 2519-2524.

CEN student Christiane Dupont wrote an article entitled: "La vie s'éveille dans les mares nordiques" for which she was awarded fourth place in the contest held by the Association francophone pour le savoir (Acfas). The article was published by the daily newspaper *LeSoleil*. *LeSoleil*, 08 February 2009.

A team led by CEN researcher Steeve Côté studied the question of why Bighorn Sheep and Mountain Goats reduce their food intake during the mating season. The answer is quite simple: males are too busy flirting and keeping other males away from their preferred females. This behaviour causes them to have less time to feed and rest. *Au fil des événements*, 19 February edition. Pelletier et al. 2009. Rut-Induced Hypophagia in Male Bighorn Sheep and Mountain Goats: Foraging Under Time Budget Constraints. *Ethology* (115) 2: 141-151.

During interviews with Reuters, CEN's director Warwick Vincent discussed the major transformations that Northern landscapes are undergoing. On the coast of northern Ellesmere Island, ancient ice shelves have collapsed and lost over 23% of their volume in summer 2008; e.g., *Vancouver Sun* - 6 and 11 March, *The Gazette* - 4 April, *The Washington Post* - 11 April.

The state of Nunavik roads and airstrips that were built on permafrost are collapsing due to thawing. CEN researchers Guy Doré and Michel Allard, with their students Emmanuel L'Hérault and Jean Verreault, are characterizing permafrost to target problem areas and develop management strategies. Eva Stéphani, under the supervision of CEN researcher Daniel Fortier, is also examining this problem for the Yukon-Alaska highway. *Au fil des événements*, 12 March edition.

Serge Payette, CEN researcher, and his students Catherine Plasse and Joannie Savard, featured in a TV documentary relating the features of frost hollows in the Boreal forest. These natural depressions that originated during the retreat of glaciers are hostile and impinge on the growth of spruce trees, but favour the growth of lichen. *Découverte*, 15 March, Radio-Canada.

CEN researchers Reinhard Pienitz and Nicolas Rolland developed a chironomid-based air temperature inference model to establish climatic conditions thousands of years ago in a region where climate data is scarce. To achieve this, they used chironomid fossils obtained from lake sediments. *Au fil des événements*, 19 March edition. Porinchu et al. 2009. Development of a chironomid-based air temperature inference model for the central Canadian Arctic. *Journal of Paleolimnology* 41 : 349-368.

Despite its long winters, Quebec has not yet developed many tools to understand the geomorphologic processes of rivers during the winter. Thomas Buffin-Bélanger, CEN researcher, is leading a research program studying fluvial dynamics and river geomorphology for ice-covered rivers. The aim is to model these dynamics and to evaluate the impacts of environmental change on lotic systems. *Revue Découvrir - FQRNT* (March-April 2009).

Gilles Gauthier and some of his CEN students, notably Jean-François Therrien, featured in two television documentaries this spring. The documentaries were filmed on Bylot Island and touched upon the impacts of melting permafrost and studies on wildlife population dynamics, specifically those of Snowy Owls and lemmings. *Découverte*, 22 March and 5 April, Radio-Canada.



ArcticWOLVES

Arctic Wildlife Observatories Linking Vulnerable EcoSystems

ArcticWOLVES is an international initiative led by Gilles Gauthier and Dominique Berteaux and was developed for the International Polar Year (IPY) 2007-2008. The project has established a network of circumpolar wildlife observatories (more than 40 PIs from 9 countries) to assess the current state of arctic terrestrial food webs over a large geographic range. The network provides baseline information to evaluate current and future population trends for a large number of species at several locations using standard protocols. Another aim of the project is to determine the relative importance of bottom-up (resources) and top-down (predators) forces in structuring arctic food webs, and how climate affects these trophic linkages. Participating CEN members:



Gilles Gauthier has been a professor in wildlife ecology in Université Laval's Biology Department since 1987 and a member of CEN since 1991. He obtained his Bachelor's degree from Université de Montréal (1979), his Master's from Université Laval (1982), and completed his PhD at the University of British Columbia (1985). His research focuses mainly on Arctic bird species, specifically waterfowl and birds of prey. His main research topics are population dynamics, reproductive strategies, trophic interactions, and the impacts of climate change on Arctic fauna. His research activities primarily take place on Bylot Island, Nunavut, where he has been in charge of the research station since 1989. Member of several research programs and networks, such as ArcticNet, he is currently leading the International Polar Year project of ArcticWOLVES.



Dominique Berteaux is a wildlife ecologist. He obtained his PhD at Université de Sherbrooke in 1996. Prior to becoming a professor at McGill University from 1999 to 2002, he was a postdoctoral fellow at Université Laval and at the University of Alberta. Chairholder of the Canada Research Chair in Northern Ecosystem Conservation at the Université du Québec à Rimouski (UQAR), he also leads the program BioNord and is a member of CEN. He plays a central role in several research projects examining the links between climate change and biodiversity, notably through his research activities with ArcticNet and the Ouranos Consortium.



Plant ecologist, **Esther Lévesque**, obtained her Bachelor's degree in 1989 at Université Laval and, in 1997, completed her PhD on the topic of polar deserts at University of Toronto (Department of Botany). She was a CEN postdoctoral fellow in 1997 and since 1998, is a professor at the Université du Québec à Trois-Rivières in the Department of Chemistry and Biology. Esther has been working in the Arctic since 1989 on several projects which study the links between the impacts of biotic interactions and climate change on vegetation. She is a member of several research networks (e.g. ITEX, IPY, ArcticNet). Her work with ArcticWOLVES involves evaluating the impacts of erosion on vegetation caused by ice wedges in wetlands and food quality for herbivores on Bylot Island.



Joël Bêty has been a professor at the Université du Québec à Rimouski since 2004 and he co-directs research activities of the Canada Research Chair in Northern Ecosystem Conservation. His research specializes on Arctic wildlife ecology and he works mainly in the Canadian North. Joël is interested in the ecology of wildlife communities, particularly their migration and the reproduction of avifauna. He is currently leading research activities on the impacts of climate change on Arctic avifauna, including geese, ducks, shorebirds, and birds of prey.



Marie-Christine Cadieux obtained her BSc in Biology from the UQAR and her MSc from Université Laval. Since 2002, she is the coordinator for the Ecological Studies and Environmental Monitoring Program at Bylot Island, Sirmilik National Park. She is responsible for the organisation and coordination of the various steps required for the successful completion of the numerous research projects. She coordinates the yearly field logistics for all research projects in this area, maintains and updates the database and research protocols, compiles and analyses data, writes reports...and much more! Since 2007, she is also the ArcticWOLVES coordinator where most of her time is spent entering data into the program's database.



Luc Cournoyer completed his BSc at Université Laval in Aménagement des ressources forestières. Under the supervision of Louise Fillion and Louis Parrot, he went on to complete his MSc in Sciences forestières at Université Laval. He specializes in dendrochronology. He has worked for the CEN as a research assistant since 1993. After having participated in several projects on dendrochronology, in 2000 he became in charge of developing and managing the CEN databases. Since October 2007, he is also the database programmer for ArcticWOLVES and creates data entry forms which allow ArcticWOLVES researchers to submit data. Luc is also creating a database which will permanently host data from the project.

