

SCIENCE ARTICLE: PREDATOR AVOIDANCE IN THE NORTH

It is widely acknowledged that the annual northern migration of birds results in a cost-benefit ratio that is beneficial for the reproductive success of individuals. The costs of migration include the energetic requirements of flight, high risk of mortality, and exposure to extreme weather events. On the other hand, benefits include access to vast territories and abundant food resources thanks to near continuous daylight, a reduction in pathogen exposure, and a decreased risk of predation. This said, the benefits do not all coincide with factors related to latitude. Using 1555 artificial nests, CEN PhD student Laura McKinnon, supervised by Joël Bêty, and her co-authors provide compelling evidence of a two-fold reduction in nest predation rates along a 3550 km south-north gradient across the Arctic. For a latitudinal increase of 1°, the relative risk of predation decreased by 3.6%. This equates to a decline in predation of 65% across the 29° transect under study (Fig. 1). Since its publication in January 2010 (McKinnon et al. 2010, *Science* 327:326-327), more than 30 different media releases have disseminated this notion of a "northern gradient of protection" against predation risks for migratory birds: CBC, Société Radio-Canada, Los Angeles Times, Ocean Conserve, Vancouver Sun, Ottawa citizen, Swiss Public Radio, RadioTaiga, CNRS, Science Magazine, Science-Blogs, National Public Radio USA-Washington, Christian Science Monitor, ArcticNet, LeSoleil, La se-

maine verte, UQAR-info, Science dessus dessous, and others.

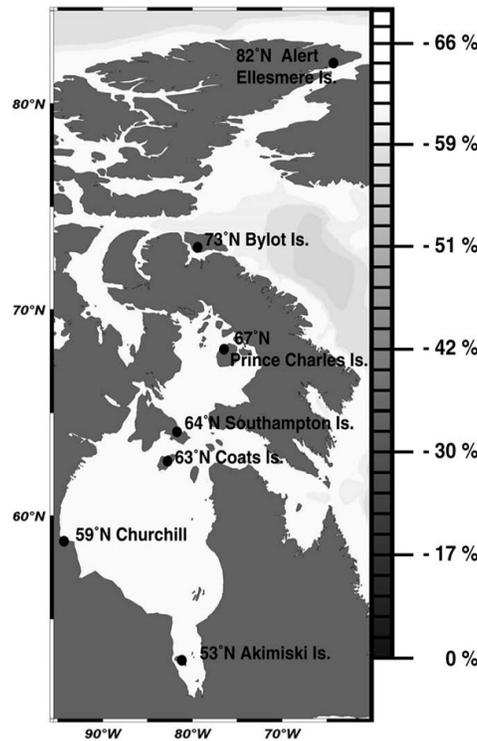


Fig. 1. Average latitudinal decrease in nest predation risk and map of the shorebird breeding sites where artificial nests were monitored. The decrease in predation risk is indicated at 5° intervals on the latitudinal scale at right.

ANNOUNCEMENTS

Visit our new web page for the CEN Network at <http://www.cen.ulaval.ca/station> to obtain information on all of our research stations. Each station now has a fact sheet and you can also view our reservation calendars for the stations of Radisson, Whapmagoostui-Kuujuarapik, and Umiujaq. Please let us know if you have any comments or suggestions: christine.barnard@cen.ulaval.ca.

Relative to UQAR's development of a research area in northern studies, UQAR recently signed a memorandum of understanding with the University of Tromsø. This memorandum aims to facilitate the exchange of students and professors and to establish joint research projects. Consequently, a Norwegian bursary program accessible to students from both institutions will be created to encourage student exchanges.

UQAR



MARK YOUR CALENDARS!

- The summer field season is fast approaching! Remote Area First Aid courses are offered and students heading out for the field must be certified. Other courses ensuring your security in the field are also offered such as Pleasure Craft Operator Card, Canadian firearms safety course, safety chainsaw manipulation, ATV rider course, and use of ASN (VHF-ASN) radios. For more information, contact catherine.leclerc@srh.ulaval.ca at ULaval, genevieve.allard@uqar.ca at UQAR, and stefane.premont@det.inrs.ca at INRS-ETE.
- Please contact Christine Barnard to reserve at one of our stations for the upcoming field season. A helicopter has been chartered from August 10th-29th for use in the Whapmagoostui-Kuujuarapik and Umiujaq areas. Reservations for helicopter time and station use are already well underway.



CENTRE D'ÉTUDES NORDIQUES
CEN Centre for Northern Studies

A WORD FROM YOUR STUDENT REPS

Dearest CEN students,

Do you smell that fresh scent of spring in the air? Your departures for the field are now eminent and your student committee would like to take this opportunity to wish a great field season to those who will be departing shortly. To celebrate the season's arrival, your devoted committee organised a guided tour of the CCGS Amundsen research vessel and icebreaker on May 8th. About 20 students enjoyed a privileged tour of the ship. The visit was followed by a memorable bowling match during which the suspense lasted until the very last throw...encouraged by a thunderous applause and hysterical cries.



A fast approaching event is the CEN's 50th anniversary, beginning early 2011. In commemoration of this event, we are awaiting your ideas and recruiting motivated people to put these ideas in place. If you are interested in joining a dynamic team, please let us know at etudiants@cen.ulaval.ca. During our upcoming general assembly (September 2010), we will discuss the organisation of this event in more detail. You will soon receive an invitation for the general assembly.

Lastly, we would like to remind you that your CEN student status gives you access to several prizes for the publication of manuscripts, presentations at conferences, exchange programs, etc. For more information, visit our new web page "Nouvelles étudiantes" accessible from the CEN homepage (menu on the right hand side) at www.cen.ulaval.ca.

Wishing you the best,

Your student committee (etudiants@cen.ulaval.ca):

Tania Gibéryen (UL-Geo), Pascale Ropars (UL-Bio), Yanick Gendreau (UQAR) et Frédéric Bouchard (INRS-ETE)

PRESENTATION OF GENEVIÈVE ALLARD ... OUR NEW CEN COORDINATOR AT UQAR



Geneviève obtained her B.Sc. in Geography at UQAR and her M.Sc. in Geography at UQAM. For her Master's thesis, she studied the dynamics of frazil ice formation in rivers. Winner of the contest on scientific popularization at the AC-FAS 2009, she successfully transfers scientific knowledge to her peers and co-citizens to increase awareness on the environmental changes affecting northern regions. As CEN coordinator at UQAR, she assists members in their research and in the logistics involved with work in the field, and transfers CEN information to members at UQAR. Geneviève is very enthusiastic about her new role at UQAR. "I invite all CEN members to come meet me at my office, B010 (extension 1968)".



CENTRE D'ÉTUDES NORDIQUES
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A FLORA FOR BRYOPHYTES

by Maude Létourneau-Baril

As part of the conference of the Peatland Ecology Research Group (PERG) that was held on February 16th, the Institut Hydro-Québec en environnement, développement et société (IHQEDS) gave the official kick-off for the year of biodiversity. In the presence of Léopold Gaudreau (Sous ministre adjoint au développement durable), a tribute was paid to Jean Faubert, an amateur botanist specializing in bryophytes (mosses) and his team at FloraQuebeca.

For the provinces of Québec and Labrador, these naturalists have worked relentlessly over the past five years to produce a flora specifically on bryophytes. A flora is a detailed list of existing plants, such as the well-known Flore Laurentienne by Marie-Victorin. Often forgotten in plant inventories, bryophytes (mosses, sphagnum, and liverworts) make up about 25% of the province's plant species.

The need for such a flora was clear seeing as no such synthesis exists in French for the bryophytes of Québec and Labrador. This work will not only be a detailed compilation of information collected over the years, but also an essential tool for botanists, such as PERG members. PERG members conduct research on the restoration of bogs dominated by brown mosses.

The publication of La Flore des bryophytes is planned for 2012. Excerpts from the book can be consulted on the FloraQuebeca website: www.floraquebeca.qc.ca.



Line Rochefort, NSERC Industrial Research Chairholder on Peatland Management, Léopold Gaudreau, sous-ministre adjoint au développement durable, Jean Faubert, amateur botanist, Martine Lapointe, vice president of FloraQuebeca, Kim Damboise, research professional of Louis-Marie Herbarium and Philippe Le Prestre, director of IHQEDS.

CONGRATULATIONS TO CEN STUDENTS!

- During the CANQUA-CGRG conference in Vancouver, CEN member **Benoit Vigneault** was awarded the prize for the best student talk. Congrats Benoit!
- During CEN's Symposium Nordique last February, several CEN students received prizes to underscore the excellence of their posters: **Delphine Rolland**, **Geneviève Philibert**, and **Joëlle Taillon**.
- CEN member **Arnaud Tarroux** received a prize for his poster at ArcticNet's 6th Scientific Meeting in Victoria.

CEN IN THE NEWS

After several years of research on mountain goats, Julien Mainguy, Steeve Côté, Marco Festa-Bianchet, and David Coltman showed that the weight of the billies (males) is closely linked to their reproductive success. Only 5 out of 57 potential fathers claim paternity of the 96 kids studied. The nannies (females) who mated with the bigger billies naturally gave birth to larger billies and thus ensured long term reproductive success: like father, like son. Au fil des événements, November 19, 2009 edition.

During an interview with LeSoleil, CEN researcher Gilles Gauthier discussed the state of snow geese populations in Québec. An overpopulation of geese can damage fields and marshes where they feed as well as Arctic ecosystems where they breed. According to Gauthier, the current population is about double the population that

these ecosystems can support. Le Soleil ; Cyberpresse ; Radio-Canada - December 3, 2009.

Further to requests by the Cree Band Council and regional Cree authorities and in association with the Northern Research Chair in Disturbance Ecology, CEN researcher Stéphane Boudreau and colleagues are working towards the revitalization of Whapmagoosui's sand dunes. The team conducted germination, survival, and growth experiments on three local species: Sea lyme grass, Spike trisetum, and Sea pea. Au fil des événements, January 21, 2010 edition.

Serge Payette (CEN researcher) and Simon Thibault measured the movement of the extent of permafrost by studying palsas, "low, often oval, frost heaves containing permanently frozen ice lenses and occurring in polar and subpolar regions". This spatio-temporal study of palsas in the James Bay area

revealed the eminent disappearance of palsas and consequently of permafrost in the region. Au fil des événements, February 18, 2010 edition; rue Frontenac and Améri-Québec - February, 2010.

Joëlle Taillon & Steeve Côté presented fascinating results at CEN's Symposium nordique and during a TV documentary. The Leaf River caribou herd seems to be struggling because it is already occupying the entire available area in Ungava Bay. This herd has been increasing in size since 1975 and may be running out of food resources. Compared to the George River herd, the weight of calves at birth is 16% lower and 20% lower during weaning. The research of Joëlle, Steeve & Marco Festa-Bianchet (CEN researcher) is part of Caribou Ungava - a project studying migratory caribou population dynamics in Québec and Labrador. Au fil des événements, March 4,

2010 edition; Émission Campus (canal Savoie), March 2010.

Since their beginning in 2003, Cutting Edge Lectures in Science facilitate knowledge transfer between researchers and the general public. On March 11th, CEN director Warwick Vincent was invited to give a lecture on Climate change, ecosystem collapse and cascading regime shifts in the Canadian Arctic. McGill University, Redpath Museum, 2010.

CEN researcher Patrick Lajeunesse and Guillaume St-Onge feature in a documentary film from the series Ancient Weather. Here, they discuss the drainage of the glacial Agassiz Lake and the subsequent impacts on global climate. The documentary can be viewed on www.history.ca. Ancient Weather, the Birth of Civilisation, S01, E02.

CEN STUDENTS HONoured

In the 2009-2010 fiscal year, CEN students had access to bursaries from FQRNT allowing them to study abroad. Three students were awarded these bursaries. Their projects are described below. Congratulations!



Noémie Boulanger-Lapointe (supervised by Esther Lévesque): From April to August, I will be studying with professor Forchammer and Dr. Schmidt at the National Environmental Research Institute, a research centre affiliated with Aarhus University in Denmark. During this study program, I will do a comparative study on data collected in the Canadian High Arctic and at the Zackenberg station in Greenland. I will compare the age structure of Arctic willow populations and the relative effect of environmental variables on their growth. The results will be presented in June at the International IPY conference in Oslo and the World Dendro conference to be held in Rovaniemi. Lastly, from July to August, I will continue collecting data for my thesis at the Zackenberg station.



Audrey Mercier Rémillard (supervised by Bernard Héту) – As part of my Master's thesis entitled Stratigraphie et sédimentologie du Quaternaire du secteur de l'Anse à la Cabane, île du Havre-Aubert, Iles-de-la-Madeleine, Québec, micromorphology techniques are essential to the analysis of the principal units of stratigraphy. More specifically, this method allows the interpretation of periglacial structures and of glaciotectonics present at the Magdalen Islands. With these perspectives in mind, I will be conducting my work program at Université de Bordeaux I in France in fall 2010. I will be working under the supervision of Pascal Bertran at the Unité Mixte de Recherche entitled De la Préhistoire à l'Actuel : Culture, Environnement, Anthropologie (PACEA).



Ursule Boyer-Villemaire (supervised by Pascal Bernatchez): My work will take place in Northern Ireland and in Spain and presents an opportunity to collect samples to complete a comparative analysis on coastal vulnerability to natural disturbances under various climate conditions. The datasets will range from high resolution data from the segmentation of a coastline, collections of historical data, surveys amongst coastal communities (on the roles of the landscape) to semi-directed interviews with key stakeholders pertaining to the management of coastal zones. This work experience will consolidate new international collaborations amongst my co-supervisors, Andrew Cooper (University of Ulster) and Javier Benavente (Universidad de Cádiz).

