



churchillnorthernstudiescentre

THE BIRDFISH

FALL 2015

Churchill Northern Studies Centre
Newsletter

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RESEARCHER PROFILES

EACH YEAR, THE CNSC PROVIDES HUNDREDS OF DAYS OF ACCOMMODATIONS AND VEHICLE USE, AS WELL AS DIRECT FINANCIAL SUPPORT TO RESEARCH IN THE CHURCHILL REGION THROUGH THE NORTHERN RESEARCH FUND. WE TOOK SOME TIME TO SPEAK WITH TWO OF THE RESEARCHERS WHO CONDUCT RESEARCH IN THE AREA TO LEARN ABOUT THEIR WORK, AND WHAT THE CNSC MEANS TO THEM!

Erica Nol

Who are you?

I'm Dr. Erica Nol, a professor of biology at Trent University, and my area of speciality is the ecology and conservation of arctic breeding birds.

What is the nature of your research at the CNSC?

Over the years, I've been working on between 1 and 4 species of breeding shorebirds. These are birds that are associated with water, usually during migration or during the non-breeding season, but during the breeding season they nest in the Arctic on tundra, or coastal gravel ridges. I've been working on the Semipalmated Plover for over 20 years now, and I started at the CNSC because I wanted a site for long term study on the species, which was all of the rage when I started my work. In retrospect it's very useful that I have been studying this species for this long because of the effect of climate change on the species. I have one of the longest running studies on arctic breeding shorebirds on earth! I have also had the opportunity for collaborations at the CNSC. I worked with the arctic shorebird demographic network for 5 years, where I got funding to supplement my fieldwork, which allowed my students and me to begin work on several other species in the Churchill region.



What would you say is the significance of your work?

Tracking individual birds through their lifetime, and how successful they are in any given year, and whether they raise young, or they don't raise young, is very important. Being able to track the interannual variability is crucial. For example, during the last few years shorebirds in the Churchill region have not bred very successfully, whereas in other years they do quite well. Documenting that variation and the causes of it, and being able to put that information into demographic models to determine if that species is going to persist into the future is really important.

What has been the advantage to you for having a place like the Churchill Northern Studies Centre to conduct your work?

It has absolutely been an advantage to have the CNSC for my work. I have collaborations with some researchers who have field camps and it's so much more logistically challenging. You have to apply for additional funding for aircraft to get in there, all the field equipment, all the camping equipment and on the open tundra there is always the risk of polar bears. Thus, having a safe environment to work in great, it's a luxury, it's phenomenal. But also having access to the infrastructure, like vehicles to rent is great! And having someone who can give instruction on polar bear safety is very valuable. Finally, being able to have my students trained in firearm use and the hands-on training has been valuable. Collecting data is much easier when you have a place that has cover, and you're not battling weather, or

trying to work in a tent. In some sites, you can wait 4 or 5 days because of weather to even get in the field. At the CNSC, even if it's raining, you can work in the building, and go out when the weather improves, whereas at some camps, you're just trying to stay warm, and you might not have the opportunity to do any work on a bad weather day!

What has been the benefit to you having been able to access the Northern Research Fund at the CNSC?

This year I had very limited funding, whereas in previous years I had some additional funds to supplement the cost of research, which is very expensive. Therefore this year the NRF allowed me to extend the time my students were in the field at the CNSC. If I hadn't had access to the NRF, I would have only been able to conduct a month of research on Dunlin and would have had to cut back quite a bit. Being in the field for only part of the breeding season isn't really that useful. The NRF has been very helpful over the years, to let me have the students be there throughout the breeding season. Unfortunately, that is what many researchers have to do, just drop in for a week or two, see how many birds are nesting, and that's it. You find out so much more when you have continuous coverage throughout the breeding season. Due to the NRF, I had 4 students in the field for over 200 days total during this past field season, which was a good length of time!



What would you say to someone who is considering supporting the NRF or the CNSC?

I would say, you're basically getting the best facility in the Arctic for doing research. There are lab facilities there, and it's so convenient, with many safety features. You can do that in a tenting situation, but it's never quite the same. And then there's the food! You can go to get your meals, and not have to worry about that sort of thing. And the accommodations are very comfortable. So all of that together just means it's a really great facility! And it's a great opportunity for students who haven't done research before to meet students who are totally immersed in research, and also to meet other researchers working on other aspects of arctic science! To just sit around the dinner table and discuss science, and to meet people from the community, has been useful and very enlightening for my students.

Any final thoughts?

I think you understand why I keep coming back, I'm very positive about the CNSC! I appreciate the NRF money, and those people who support it very much! I appreciate having a professional, courteous staff at the CNSC to work with. The whole thing is really seamless for a university researcher and I'm thankful for that!



Jackie Verstege

Who are you?

I'm a Master student in Dr. Jim Roth's lab in the Department of Biological Sciences at the University of Manitoba. I also used to work at the Churchill Northern Studies Centre as a Seasonal Research Technician.

What is the nature of your research at the CNSC?

I'm looking at arctic fox dens in the Churchill area. On a lot of these dens, you find different vegetation than on the surrounding tundra. We believe that these differences are due to small scale disturbances caused by the deposition of nutrients through the scat, urine, as well as the digging of burrows of arctic foxes. These disturbances generally lead to taller vegetation than on the rest of the tundra. This causes snow to accumulate on the windward side of the burrows, which is a good insulator for small mammals that live beneath the snow. On these dens we're actually finding lemming winter nests, which is a little counter intuitive, because foxes eat lemmings. We think that the increased insulation caused by the accumulation of snow may be the mechanism that is drawing the lemmings to these fox dens. My research involves sampling the snow both on and off the fox dens, measuring the vegetation height, and once snow melts in spring, counting the lemming winter nests on and off the fox dens, to see if the abundance of lemming winter nests is related to snow depth. Another part of my research is looking at the long term arctic fox harvest. Since there is a relationship between arctic fox den success, and the density of rodents, we can use the arctic fox harvest to infer what the lemming population is in any given year. I'm looking at the long-term scale and seeing if there is a relationship between the snow pack and the arctic fox harvest. It seems that

generally, there is a decline in the arctic fox harvest. This year I was at the CNSC in April, June and August. That gave me a preliminary data set which helped refine my methodologies, which is helping to prepare me for my field work next year. I'm still in the preliminary stages of the research, but the time in the field is really helping to refine my research protocols!

What is the importance of your work?

Lemmings are an important prey source for many predators in the arctic, including foxes, owls and weasels, and when lemming numbers are low, these predators start to prey upon other animals, such as geese and shore birds. Lemming abundance can influence other species, since all of these species are interrelated by food webs, they have the ability to impact the abundance of the predators and other prey species. By understanding this one species, we can learn lots about the state of the entire ecosystem!

How does the CNSC help your research?

Working at the CNSC is a great help. While I was working as a seasonal research tech, I actually met my supervisor.

It's a great place to network and see what research projects are going on. Without the CNSC I wouldn't have started my Master's project! The study centre staff add a lot of logistical support, and that's been very helpful. I've been working with LeeAnn to plan for my next field season, and learn what supports are available to help me with my work!

What has been the benefit to you having been able to access the Northern Research Fund at the CNSC?

It allowed me make my research more affordable, since my project requires me to go to Churchill multiple times throughout the year. When I am going to Churchill, I'm often going with my supervisor, who has different objectives with each trip, and I need to bring a field assistant with me, and having those funds allows me to do that. It also allows me more flexibility. For example, this April we had a snowmobile break down. We were able to use some of the vehicle days we were awarded to rent another snowmobile, and allow us to continue our work with minimal cost and without cutting into our time in the field. ❄️

These projects, and many more, are supported by the Northern Research Fund, a fund established to directly support research in the Churchill Region. Every dollar you donate goes directly to supporting researchers and their critical research.

On December 15, we release the call for applicants for the NRF. **Every dollar donated to the NRF before December 30, 2015 will be given to researchers to support their fieldwork in 2016.**

- \$60 gives a researcher lab space, accommodations for one night, and 3 hot meals to support their fieldwork
- \$75 allows a researcher to use a vehicle.



Team of researchers from
Trent University

HEAVY METAL

In May of 2014, water and algae samples from a variety of estuary and river sites were collected in Churchill, Manitoba by a team of researchers from Trent University in Peterborough, ON. The samples were then processed in Dr. Celine Guéguen's lab in the Chemistry Department at Trent University for a variety of different experiments to determine various water contaminants such as cadmium and vanadium as well as understanding optical and molecular weight properties of dissolved organic matter (DOM). Samples of algae from the water samples were digested in the lab and used to determine intracellular (inside the cell) cadmium and vanadium concentrations and compared to extracellular (outside of the cell) concentrations for the PhD research of Vaughn Mangal. Other students in the lab, Yu Zhu and Yong-Xiang Shi, also deployed diffusive gradient in thin films (DGT) samplers to assess the biologically available fraction of metal. The preliminary results suggest that there is decreasing cadmium and vanadium concentrations extracellularly moving inland from the coast (estuary sites to river sites) in Churchill, Manitoba. A research team returned in the spring of 2015 to continue the DGT sampling and CNSC research staff continue to deploy the DGT samplers in Goose Creek through the fall and winter season to further explore the importance of metals levels in the Churchill River area throughout the year.

In addition to this work, specialized titrations using a fluorescent tag were conducted to determine thiol concentrations (thiols are organosulfur compounds that are present in natural systems). These tags can be quantified and help differentiate thiols from other DOM in natural samples. This results of this work were published in a recent February 2015 article in the *Journal of Analytical and Bioanalytical Chemistry* by Vaughn Mangal and Celine Guéguen – "Examining concentrations and molecular weights of thiols in microorganism cultures and in Churchill River (Manitoba) using a fluorescent-labeling method coupled to asymmetrical flow field-flow fractionation" (DOI 10.1007/s00216-015-8599-0).

Reliable interpretation of metal levels measured by diffusive gradients in thin film (DGT) requires a sound understanding of the diffusion properties of dissolved organic matter (DOM), the main ligand of metals in natural waters. The present study

determined that the molecular weight of DOM and conductivity are the main factors controlling the diffusion of freshly collected estuarine DOM across the DGT diffusive gel. For more info you can also take a look at the recent paper from Balch and Guéguen (2015) – "Determination of diffusion coefficients of dissolved organic matter in the Churchill River estuary system, Hudson Bay (Canada)" in *Environmental Chemistry* (DOI 10.1071/EN14182). *

Visit Dr. Guéguen's webpage at
<http://people.trentu.ca/~celinegueguen/index.html>



Assiniboine Park Zoo – Journey to Churchill

Visit the Churchill Northern Studies Centre shelter at the Assiniboine Park Zoo and see the polar bears and learn more about research in the greater Churchill area. The new Journey to Churchill exhibit at the Assiniboine Park Zoo highlights the many aspects of northern species and their natural habitat. The interactive displays and naturalistic landscapes and animal viewing areas allow visitors to learn more about biodiversity, climate change and conservation. In the CNSC shelter you can view the polar bears in an outdoor exhibit or you can read more about research in the Churchill area from the posters and panels in the shelter.



CNSC DAY!



churchillnorthernstudiescentre

Photos: Jenafor Azure

On August 30 we hosted our 1st Annual CNSC Day! In recognition of our birthday (September 6!) we wanted to celebrate the CNSC and how far we've come in the 39 years that we have been working "to understand and sustain the north". More importantly, the board and staff of the centre wanted to say "Thank You" to the community of Churchill. Since 1976, the community of Churchill has been a constant supporter, and we wanted to show just how much we appreciate it!

We offered a shuttle between town and the centre, and once we arrived, activities included a microscope session, a marine

education program, featuring our new aquarium, building tours, and "Science or Snack?" - an activity which allowed visitors to try some of the tasty and not-so-tasty things that grow around the study centre. In case you were still hungry after that, we had lunch, and of course, birthday cake!

We had a great day and enjoyed seeing so many people at the centre! We look forward to seeing you all next year for the 2nd Annual CNSC Day! ❄️

featured courses

When you think of Churchill what is the first thing that comes to mind? Polar bears on the frozen tundra? The Aurora Borealis dancing over the ice covered Hudson Bay? Researchers on snow mobiles driving out into the field?

While all of those things may be common sights each year, the Subarctic in the summer offers a huge opportunity for research and education. Although you might not believe it if you've ever been at the CNSC in "Bear Season", but the busiest time of year is actually the summer! Researchers bustle around, making the most of their time in the field, youth groups make the summer an opportunity have a trip of a lifetime, and university students participate in totally unique courses! Along with all that, our learning vacation participants get to experience an active research station during its peak season. Chatting with researchers in the cafeteria, unwinding in the evenings after an active day in the field, and watching new life blossom on the ever changing landscape are just some of the rewards for visiting Churchill in the summer. Here are just a few of our summer learning vacations.

Belugas in the Bay Through the Camera Lens

June 23-28, 2016

Instructors: Kristin Westdal & Christopher Paetkau



In this special program we explore Churchill's wildlife and landscapes through the camera lens. Your co-instructors, Kristin and Chris, are a biologist and filmmaker respectively, and will bring their years of expertise in their fields for a truly unique program. Learn about the ecology and life of belugas and how to capture these amazing animals in their natural habitat!

Into the Wildflowers Flora of the Subarctic

July 7-12, 2016

Instructor: Karen Johnson



Discover the beauty and diversity of the northern plant work on this botanical tour of the subarctic. This learning vacation will challenge and intrigue any botanist or flower enthusiast, amateur and veteran alike. Taught by Karen Johnson, an experienced botanist who wrote the book on the wildflowers of Churchill (literally!), participants gain the opportunity to hone their plant identification skills in our in-house herbarium.

Upcoming CNSC Learning Vacations:

Into the Winter Skies I: February 4-9, 2016

North of 58°: February 23-27, 2016

Into the Winter Skies II: March 3-8, 2016

Spring's Wings: Birding in Churchill June 9-14, 2016

Belugas in the Bay: Through the Camera Lens: June 23-28, 2016 **NEW SPECIAL SESSION**

Into the Wildflowers: Flora of the Subarctic July 7-12, 2016

~~**Belugas in the Bay:** The White Whales of Churchill July 14-19, 2016~~ **SOLD OUT!**

Wild Planet: The Subarctic in Summer: August 18-23, 2016

Lords of the Arctic I: The Ecology of Hudson Bay's Polar Bears: November 3-10, 2016

Lords of the Arctic II: The Ecology of Hudson Bay's Polar Bears: November 10-17, 2016

Into the Winter Skies I: January 19-24, 2017

Into the Winter Skies II: February 16-21, 2017

North of 58°: March 7-11, 2017

For more information on these and other exciting course offerings at the Churchill Northern Studies Centre, please visit www.churchillscience.ca and download our course brochure today or call (204) 675-2307 to register! Well, what are you waiting for?

Wild Planet The Subarctic in Summer

August 18-23, 2016

Instructor: James Kushny



This is our most active program, with 5 days of walking over the diverse landscapes that make the Churchill region so unique. Explore the tundra, boreal forest, inter-tidal zone, fen, beach dune and coastal ponds of the area. On the excursions you may see some of the local wildlife, and your guide James will always have a sharp eye for any polar bear that might around! We also explore the exciting human history of the area with a visit to Prince of Wales Fort National Historic Site, and a presentation from a local elder.

Upcoming Road Scholar Programs:

Into the Arctic Skies I: February 10-15, 2016

Into the Arctic Skies II: March 9-14, 2016

Summer in the Subarctic: July 28-August 2, 2016

Lords of the North I: October 14-19, 2016

Lords of the North II: October 19-24, 2016

Lords of the North III: October 24-29, 2016

Lords of the North IV: October 29-November 3, 2016

For more information on Road Scholar programs visit www.road scholar.org



FOR RESERVATIONS CONTACT:

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Churchill, Manitoba, Canada R0B 0E0

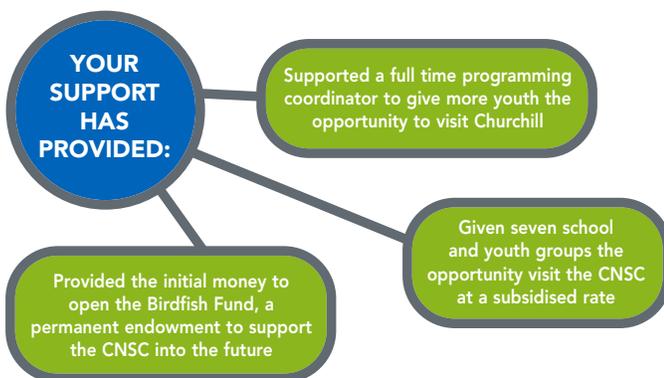
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4 for 40 Campaign Update

Next year the Churchill Northern Studies Centre turns 40. It's an incredible time to be a part of this organization. For almost four decades we have welcomed up to 200 researchers per year, facilitated cutting-edge scientific studies that catalyze change, hosted the public in hands-on education opportunities, been a hub for culture and heritage and supported Churchill's economy. We even moved into a beautiful new facility. The board and staff of the CNSC are grateful to everyone who has contributed to the success of the Centre over the past 39 years. We are leaps and bounds from where we began, and we're excited for the future.

In July we launched a campaign to raise \$4 Million to celebrate 40 years of leading research and education in the Western Hudson Bay Region! We know that the goal is lofty, but we were confident that our supporters would see the importance of growing the *Northern Research Fund*, expanding youth programming, and establishing the *Birdfish Fund*. We're proud to say that the initial results have been fantastic!



In just over 4 months, donors have given over \$21,000. that is just from our members who believe in our mission "to understand and sustain the North".

75% of these contributions were under \$100! The 4 for 40 campaign is a grassroots campaign driven by contributions from our members who are standing up and support research and education in the sub-arctic!



Money is great, but our members are helping out any way they can! Larry Trask, a carver and former learning vacation participant is allowing us to sell 3 of his sculptures with 50% of the proceeds being donated to the CNSC!

It has been a great start to our campaign, but we still have a long way to go!

What are we doing to keep the campaign rolling?

- We're reaching out to organizations that share our passion for subarctic research and education who can help us reach our goal
- Making sure our supporters are recognised as the amazing individuals they are!
- Reaching out to supporters to make sure they are getting the information they want about the CNSC!

There are many ways you can continue to help as we charge towards our goal!

- Consider making a monthly donation! Regular donations provide more stability for the CNSC and by making a regular contribution, you may be able to make more of an impact than you could with a one-time donation.
- Include a gift to the CNSC in your estate planning. Your gift is made after you pass on, and will provide a legacy for subarctic research. ❄️

Established in 1976, the Churchill Northern Studies Centre is an independent, non-profit research station located along the western coast of Hudson Bay.

board of directors

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to understand and sustain the north

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The Birdfish Newsletter is produced by CNSC staff with assistance from researchers and program participants.

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contribute



Although our new building is finished, our fundraising is not! Like any major project, there are still many loose ends requiring attention.

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Your contribution is still needed to ensure that our redevelopment meets all the expectations that YOU, our participants, researchers, and members have for the future of the CNSC. No contribution is too small. Every gift counts.

And it's so easy...

Clip this form and mail it with your cheque payable to: CNSC Capital Campaign, Churchill Northern Studies Centre, P.O. Box 610, Launch Road, Churchill, Manitoba, Canada, R0B 0E0;

Or visit our web site at www.churchillscience.ca and click on the big blue Donate button. This will take you to a secure site that exclusively handles donations to organizations like ours. Additional information about the security features is provided on the web page.

Or just give us a call at (204) 675-2307.

All donations will be recognized in campaign materials and annual reports unless you wish to remain anonymous. Tax receipts are provided for all Canadian contributions over \$25. Contact Kim at (204) 675-2307 or daley@churchillscience.ca for details.



Help Us Save \$\$\$\$ and Trees...

Did you know that you can receive the *Birdfish* via email?

Help the CNSC save on postage and save trees by opting to receive your *Birdfish* via email. Renewing your membership? Check the box to receive your *Birdfish* in electronic form. Membership up to date? Just contact Kim at (204) 675-2307 or daley@churchillscience.ca and say change my status to email only. Since our last newsletter, several dozen members have taken advantage of this option and earned themselves a \$10 credit for use in our giftshop (in-person purchases or select mail items). ❄

join

the Churchill Northern Studies Centre Today!



We rely on our membership to provide the support and funding needed to make the CNSC a place for world class research and education programs in the Canadian subarctic. Join us now and be part of these exciting times at the CNSC. Already a member? Use this form to ensure your membership remains current and YOU stay abreast of Centre activities.

Name: _____ E-mail: _____ Tel: _____

Address: _____ City: _____ Province/State: _____ Postal/Zip Code: _____

In accordance with the Personal Information Protection and Electronic Documents Act, names, addresses or other personal information collected by Churchill Northern Studies Centre is used for internal purposes such as informational mailings, membership renewals and other communications, and is not shared with any third party. Complete details of our privacy policy are available by contacting the CNSC.

NEW* membership RENEW* my membership I would like to receive my copy of *The Birdfish* in electronic form

Individual \$50 Student/Senior \$40 Family \$80 Corporate \$500 *One-year CNSC membership

I would like to send a one-year gift membership to:

Name: _____ Address: _____ City: _____ Province/State: _____ Postal/Zip Code: _____

Telephone: _____ E-mail: _____

Message for gift card: _____

Tax receipts are provided for Canadian donations of \$25 or more. Membership fees are not tax-deductible.

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P.O. Box 610, Launch Road
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or call (204) 675-2307



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CNSC Membership

Total amount \$ _____

cheque or money order payable to the CNSC enclosed. (Preferred)

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expiration date (mm/yy): _____

name on card: _____

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We appreciate your support of the Churchill Northern Studies Centre. Your donations support research and education that makes the world a better place. Thanks very much.