Norway Sustainable Energy Grant

by Trish Fitzpatrick

In 2016, the University of Winnipeg entered into a three-year partnerships with the Norwegian University of Science and Technology (NTNU) to explore sustainable energy in the north. Funded by the Norwegian Ministry of Foreign Affairs, the High North Program (https://www.siu.no/eng/Programme-information/Cooperation-outside-the-EU/high-north-programme), supports partnerships designed to expand, strengthen and disseminate knowledge relevant to the high north.

Our project focuses on aspects of sustainable energy system design, evaluation, and governance, through shared research, curriculum development and student exchanges.

We had our kick-off meeting the week of September 12th 2016 in Winnipeg. In December, a small UW contingent travelled to Gjøvik and Trondheim to strengthen energy research and sustainability initiatives. As part of this cohort, Shannon Bailey, an honours student in Environmental Studies and Sciences worked with our Norwegian counterparts on lifecycle analyses of biomass energy (see her article in this issue).

There are a number of upcoming opportunities for students:

- In May, 2017, we are offering a Summer Institute focused on Sustainable Energy. This course is open to senior undergraduate (GEOG 3511) and graduate (GDP 7791) students with an interested in energy issues in Canada and Norway. Students will explore energy policies against the themes of sustainable development, energy justice, human rights, Indigenous worldviews and approaches to development, and community resilience.
- Students from NTNU and the Master's of Development Practice- Indigenous Focus (UW) will also join the Geography Field School hosted in Churchill in August 2018 (more information in article by Chris Storie).
- We have also identified a number of energy-related research projects that students may wish to pursue as part of a thesis or projects course. For more information see: http://www.uwinnipeg.ca/sustainable-energy-project/

UWinnipeg team:

Patricia Fitzpatrick (PI, Geography),
Danny Blair (Dean of Science, Principal, Richardson College for the Environment, Science Director Prairie Climate Centre),
Chris Storie (Geography),
Joni Storie (Geography),
Ed Cloutis (Geography),
Melanie O'Gorman (Economics),
Claire Reid (Master's in Development Practice: Indigenous Development),
Jeff Cottes (Adjunct Professor, Politics)

This issue of *GeoMatters* focuses on the Department's partnership with NTNU exploring sustainable energy in the north. Honours student Shannon Bailey describes her experience travelling to Norway and learning about biomass energy production and Dr. Chris Storie announces a joint UW-NTNU field trip to Churchill in conjunction with the Department's field course. Dr. Storie also writes about a new method to produce land use/land cover maps of Manitoba. Dr. Gina Sylvestre talks about her connection with the North End Wellness Elders Inc. and their work helping seniors living in poverty. Dr. Marc Vachon gives us an update about Department activities and we tell you about another successful Trivia Night.

Please feel free to pass this newsletter to anyone with an interest in geography. Individuals can also see *GeoMatters* at the Geography website, or keep up with us on Facebook (Department of Geography, University of Winnipeg) or on Twitter (@UWGeography).

If you have any suggestions for future newsletter articles, please feel free to contact us at: geography@uwinnipeg.ca

Editors: Joni Storie & Weldon Hiebert

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DEPARTMENT OF GEOGRAPHY
http://geography.uwinnipeg.ca

Sustainable Energy Connects Canada and Norway

by Shannon Bailey

My passion for sustainable development has led me to pursue a degree in Environmental Science at the University of Winnipeg (UW). With the focus of my Honours Thesis on sustainable energy initiatives, I was thrilled to learn I was eligible to travel to Gjøvik, Norway in December of 2016 to visit the Norwegian University of Science and Technology (NTNU). This trip allowed me to visit the town's biomass plant (below) which burns waste wood to supply local residents and businesses with a renewable source of heat energy instead of oil heating systems.

While in Norway, I was able to participate in a number of workshops and networking events. I used RetScreen software to model the energy consumption and greenhouse gas emissions under different scenarios. I was invited to watch the final student presentations on using 3-D printers to build a model-size hydroelectric generator. And I attended a meeting with the mayor of Gjøvik, Bjørn Iddberg to learn about the town's sustainable energy initiatives such as the newly constructed zero emission communities and providing seniors with electric bi-

cycles. I also met local Norwegian students and international students from Sweden, Finland, and Slovakia.

I would strongly urge UW students who are interested in sustainable energy to participate in the future courses and exchanges offered by the Geography department (contact Dr. Patricia Fitzpatrick for more information or go to http://www.uwinnipeg.ca/sustainable-energy-project/). It is the chance of a lifetime to study at an exceptional university and share ideas with innovative people, both faculty and fellow students.

Shannon Bailey with Masters students Dijon Vula, Alketa Sahiti, Njomza Ibrahimi and Goneta Pecani with their class project, a model hydroelectric turbine. (Photo courtesy of S. Bailey).

Biomass plant at Gjøvik, Norway.
(Photo courtesy of S. Bailey)

Norway meets Churchill 2018

by Christopher Storie

The department of Geography is returning to Churchill for the 2018 offering of the 4th year field research course. We will be traveling north in August 2018 for field work and all the usual fun and excitement that comes with the course. However, this year is going to be quite unique. As mentioned in a previous newsletter, several faculty members are part of an international collaborative grant with NTNU (Gjøvik) in Norway. Part of this grant is a "GIS Field trip". Consequently the goal of Churchill 2018 is to integrate our course requirements with the requirements of the Norway grant, moreover, our plan is to integrate our students. Our Norwegian counterparts will be bringing a contingent of their students to Canada to participate in the field course. Furthermore, it is planned that students in the MDP Program, who also have a field experience component, will be participating alongside the rest of us. The goal will be to integrate the three groups together and to have them work on a collaborative project that will benefit the community. Planning has already begun. For students interested in being part of the course please take careful note that GEOG 3330 (Research Methods) is the pre-requisite. For those who do not have the methods course, a methods course from another discipline is normally acceptable, you will just need to contact the course coordinator. Pay attention for signs going up around campus towards the start of the Fall 2017 term for planning and information meetings. For anyone interested in the participating in the course they can contact Dr Christopher Storie (c.storie@uwinnipeg).

Community Resilience and Aging in North End Winnipeg: Facilitating the Grassroots-Policy Divide

by Gina Sylvestre

In my explorations of aging in Winnipeg's North End I have discovered "islands of inclusion" for seniors living in poverty that reflect this community's legacy as a vibrant multicultural enclave of resilience and support. I have also found that in the present landscape of inner city decline where policy is focused on children and families, I have had to evolve as a researcher to become actively engaged in facilitating the divide between grassroots capacity and formal systems of support.

The North End Wellness Elders Inc. (NEWE) senior centre has become my new home where older adults are welcome for meals throughout the week at no cost, and are provided with opportunities for social interaction and physical wellbeing. Duncan Christie, the founder of NEWE, has been developing this centre for eight years with the help of many volunteers and food donations from Winnipeg Harvest and grocery stores.

To participate in a sustainable planning strategy for this community-built resource, I have become a board member of NEWE. We have been successful in securing over $200,000 from the Winnipeg Regional Health Authority for staffing positions over seven years. With its new designation as a "soup kitchen" by Winnipeg Harvest, NEWE has a broader vision of the centre as a food security hub for North End seniors. Such a vision will require further government commitments to support the resolve of this community.

The value of the participatory process has been the knowledge I have gained about a community's ability to respond to its older members in spite of limited recognition by our broader society. I have also learned how research skills are a useful tool to support the maintenance and development of community capacity. I am looking forward to enjoying many more breakfasts at NEWE and continuing to include students in this unique approach to support healthy aging.

Gina with NEWE founder Duncan Christie and board members.

Chef Joann: hot breakast 6 days a week.
(Photos courtesy G. Sylvestre)

Department Update

by Marc Vachon

Since last September 2016, a lot of activities on different fronts have taken place. In terms of infrastructure (i.e. floor space) the Geography Department has been going through some renovation. As such, we will be opening a new computer lab with 12 stations in September 2017. The new lab will offer more labs associated with physical geography courses and we will introduce computer labs with human geography courses. In turn, the room that housed the old mailroom and photocopier has been renovated for the new GESA lounge.

In term of curriculum, all our degrees will now require GEOG-3509 *Canada's Physical and Human Environments*. We hope that this will strengthen our students' geographical knowledge and further understanding between human and physical geography. This is particularly important since geography falls under the umbrella of "social science" in Manitoba high schools where the teaching of geography ranges from 'non-existent' to 'fantastically effective'.

The Department of Geography, in collaboration with Environmental Studies and Sciences, formed a joint exploratory committee to examine the potential for creating a graduate program (e.g., Masters) for both departments. The idea is to create a joint Masters program that would encapsulate the range of topics taught in both departments that include environmental, physical and human geography. Such a project may take a year or two so we will keep you posted on the progress of this initiative.

One final piece of good news; as part of strengthening our physical geography program, the Geography Department is in the process of hiring a new faculty member specializing in soil science. This new complement will greatly enhance our physical geography offering and open new possibilities for research for students.

Finally, this has been another great year for the department in term of teaching, research and student as you read the other articles in *Geomatters*.

"Everywhere's been where it is ever since it was first put there. It's called geography."

— Terry Pratchett in *Wyrd Sisters*

Deep Learning Neural Networks and Remote Sensing in Manitoba

by Christopher Storie

The province of Manitoba is tasked with producing a land use/land cover (LU/LC) map derived from satellite image classification, for province in a timely manner. However, due to a variety of constraints, meeting this deadline has proven challenging. In many cases it may take several years to produce an LU/LC map for the southern agricultural region of the province. After many discussions with GeoManitoba, the agency tasked with producing this map, Drs. Christopher Storie (Geography) and Christopher Henry (Applied Computer Science) have proposed a new method for producing these maps. By using the previous three LULC maps produced and the original Landsat data used to produce these maps these faculty members are able to train a deep learning neural network to automate the classification of future datasets based upon the knowledge learned from the already classified data. The process involves training a pre-defined neural network architecture that has been adapted to use satellite imagery. The adaptation requires the algorithm to handle six separate bands instead of the typical three (red, green and blue). However, this adaptation also increased the computational load of the training process as every calculation is being done six times. The result is that the neural network will be trained on an NVIDIA DIGITS system (an interactive deep learning GPU training system). By using this architecture the computational demand of the training is dramatically reduced as the training is an iterative process with the error being controlled until it reaches an acceptable level. Training of this nature can take days to weeks until the error becomes acceptable. Once the system is properly trained it can be "sealed" and used on a normal computer to classify future datasets automatically. The project is underway and the original data sets have been prepared and are almost ready for the training states. Approximately 52000 images that are 250x250 pixels in size, for the three study years have been generated and are ready for input. Once completed, the goal of the system is to produce LU/LC maps, once the data is ready, in a much shorter amount of time rather than the normal "weeks to months to years" it currently takes. For anyone interested in the technology they can contact Dr Christopher Storie (c.storie@uwinnipeg.ca).

Trivia Night

by Weldon Hiebert

What was the name of the red-sweater-wearing mustachioed man who became an Internet meme after he asked a question about energy policies at the second 2016 presidential debate? This was one of the many mind-bending questions asked at GESA's annual Trivia Night held at Garbonzo's on March 8. The event, hosted by the Geography and Environmental Students Association, is one of many fundraisers by GESA in support of their Eco-Grant. The Eco-Grant is an award of up to $2000+ given out annually by GESA to fund sustainable initiatives on campus. Previous winners have undertaken projects such as beehives on campus, rooftop gardens, a seed library and more. Winners of this year's Trivia Night was "Sucking up to Jeremy" consisting of Trish Fitzpatrick, Nora Casson, Ed Cloutis, Rose Cloutis, Jio Baptista, Ryan Phung, Austin Mackay and Stephen Traynor. Congratulations! And who was the man in the red sweater? Well much to the chagrin of our team, "Six of Nine or 2/3 (lame)", it wasn't Throatwarbler Mangrove but Ken Bone. Thanks to Jeremy Leathers and the rest of the GESA executive for hosting a great event. They brought in $1300 for the Eco-Grant. We have a whole year to "bone" up on our trivia!

Wednesday March 8 was International Women's Day and the women in Geography were in a celebratory mood. Thanks to Trish Fitzpatrick for arranging this photo and to Marc Vachon who took the picture. (Photo courtesy of T. Fitzpatrick)