

# THE GREEN SPACE

TWU Department of Geography and Environment Newsletter

Fall 2017

## Saving the Whales in the 21st Century

Elizabeth Zwamborn (BIOL/ENVS '13) is answering the rallying call for environmentalism in the 1960s, but in 21<sup>st</sup> century style. She is not just thinking about environmental platitudes, she *IS* saving whales. In her February 22<sup>nd</sup>, 2017 address marking the official launching of the new Trinity Western University Department, the Department of Geography and Environment, she showed us how it is done.

Her presentation not only covered her research on acoustic communications in pilot whales, conducted while doing her Master's at Dalhousie University (accompanied by a dazzling array of whale sound effects), but also showed video footage of her rescuing beached Pilot Whales on Canada's east coast as part of a volunteer effort.

Ms. Zwamborn has been busy saving whales. She has also had extensive experience with other whale species, such as our iconic west coast Orcas, Sperm Whales off the Galapagos Islands, and more recently, she has been taking part in efforts to identify why so many endangered Right Whales have turned up dead in the Gulf of St. Lawrence in the summer of 2017.



*Rescuing a stranded Pilot Whale*



Elizabeth Zwamborn speaks at the launch of the new Department of Geography and Environment

### In This Issue

- Salt Spring Travel Study p. 3
- Alumni news pp. 4-9
- Salmon in the Valley p. 9
- Au Sable Institute p. 10
- Electrofishing p. 11
- Blaauw Eco Forest p. 12
- Crow's Nest p. 13
- Fresh alumni p. 14
- Upcoming conference p. 14



## Saving the whales in the 21st century—the launch of GENV

Kwantlen First Nation elder Lekeyten officially welcomed the new department of Geography and Environment (GENV) to traditional Stölo territory, telling members of the audience that they would remember this night as a poignant time marking a new beginning in looking after this precious place bestowed to us by the Creator.

John Wood, professor at King's University in Edmonton led us in a powerful lament for the travesty that is taking place in the ocean whereby whales are facing unprecedented acoustic pollution via ever increasing nautical traffic, and in particular extremely disruptive ballistic military tests conducted with no regard to the whales.

Elizabeth Zwamborn (BIOL/ENVS '13), now a Ph.D. candidate at Dalhousie University, picked up the tune where John left off and described what she has learned about the acoustic signaling among Pilot Whales and other species, and made a passionate plea for caring for God's creatures by showing a video where she helped rescued a stranded whale.

Markku Kostamo concluded the evening by showing us how attainable the kind of stewardship Lekeyten, John and Elizabeth were advocating for is. Markku has lead the A Rocha Canada stewardship movement since the turn of the 21st century through many activities here in the BC lower mainland that both raise awareness of environmental issues, and through hands-on activities that allow salmon, frogs, toads, Salish suckers, and ultimately whales, to flourish and worship their Creator.

## Why a new department?

Where is the true home for environmental studies or geography programs? Many universities across North America are asking the same question and forming new departments.

In the 2016-17 academic year we launched the new department of Geography and Environment to house these programs at TWU. However, no faculty was broad enough so the department is nestled between the Faculty of Natural and Applied Sciences and the Faculty of Humanities and Social Sciences.

And we are not stopping there. We are now engaging with faculty members across the TWU campus on the environment and finding much common ground. So it's more than a new department—it's a new paradigm to better incorporate the environment — the creation—into everything students learn at TWU.



**Maxwell Ofosuhenne,**  
Co-chair,  
Department of Geography  
and Environment



**David R. Clements,**  
Co-chair,  
Department of Geography  
and Environment





Salt Spring Island Travel Study 2017—pictured here atop Mt. Erskine

## Environmental Travel Studies at TWU

Field Courses at TWU offer a full-immersion experience in the natural environment and develop hands-on skills such as ecological techniques, Geographic Information Systems (GIS), and species identification.

Our Environmental Studies majors and minors must take at least two 3 semester-hour field courses, and such courses are useful for other majors as well, such as Biology or Geography.

TWU offers the Salt Spring (see accompanying article), and the Hawaiian field courses, next offered in May 2018. Students may also fulfill field study requirements via Au Sable Institute courses (see separate feature on our new partnership with the Au Sable Institute).

## Salt Spring Travel Study 2017

Professors Karen Steensma and David Clements led 16 eager students to discover the beaches and trails of Salt Spring Island, and parts of Vancouver Island and the BC lower mainland in May 2017.

Highlights of the travel study included close encounters with giant breadbox-sized moon snails, seeing the sea lit up with bioluminescence, chilling on Alder Island, a private island off the northern part of Vancouver Island, and climbing mountains like Mt. Erskine and Mt. Tuam.

Steensma, Darcy Kehler and Elizabeth Zwamborn enlightened the students on life in the sea while Clements introduced the plant life of the region, and in particular the plants in the rare Garry oak ecosystem, including excellent examples both on our own Crow's Nest property and at the Cowichan Garry Oak Preserve.

Kudos also to the excellent T.A.'s—Joy Marconato, Matthew Strelau, and Kiana Wong (left to right below) who kept the students well-coached, well-organized, and well-fed. Joy was like a mother to the group, and of course, we all need mothers even when living far from home. Meanwhile, Kianna was the kind-auntie type, and Matthew—the eclectic uncle perhaps?



## Alumni News



**Curtis Abney, ENVS '14 with rattlesnake**

### Mastering Snakes

I am studying the thermal ecology of Eastern garter snakes for my Master's at Brock University. This project is really cool because it blends together experimental physiology work in the lab with ecological research conducted in the field. My first objective of the project is to look at the thermal preference of Eastern garter snakes in the lab so that I can identify the range of temperatures that these snakes select when given a choice.

I later couple the data from these temperature preference trials with environmental temperatures that are collected in-situ by artificial snake models that we have manufactured here at Brock. These artificial snakes are fitted with temperature loggers and are shaped, colored, and specifically designed to act very similarly to snakes (from a thermodynamic perspective) so that I can map out the temperatures in the field as the snakes experience them (in some areas we have recorded temperatures above 50C!). This gives me an idea of what habitat types in the garter snakes' environment offer a thermal landscape that complements their thermal preference.

To bring the project full circle I have a series of coverboard plots out in these different habitat types so that I can document the habitat usage by the snakes. In the end, the results from my coverboard surveys will tell me what habitat types were used most frequently by garter snakes, and upon analyzing the environmental temperature and thermal preference data, I will be able to conclude whether the snakes may be selecting their habitats based on thermal cues. In more simple terms, I will (hopefully) be able to determine whether or not the snakes are being found most abundantly in the habitats that are the most thermally suitable for them.

## Master Planner

After completing my degree at TWU, I attended the University of Waterloo for a Master of Arts in Planning. My wife, Ellie ('12) and I headed to Alberta where she was completing her Master's degree. I was hired by a small urban and rural planning consultant where I worked with small, rural municipalities on zoning, subdivisions, development, and community strategic planning for the future. Then, we were offered the opportunity to move back to BC, and I began work with CitySpaces Consulting in Vancouver. Today, I manage projects and support my colleagues on a variety of projects including reviewing and updating municipal regulations, developing long term land use plans, and supporting non-profit organizations as they develop new facilities and affordable housing.



**Spencer Andres, GEOG '10**

**Jim Armstrong, ENVS '01 addresses Langley Township Council on the need for a stormwater management plan for the West Creek watershed (April 10, 2017)**







**Anna Galbraith (GEOG '16) studies glacier dynamics and dendroglaciology on Vancouver Island**

## Cool research for hot summer times

I am at the University of Victoria, working in the university's Tree-ring Lab (UVTRL) with Dr. Dan Smith on a project involving dendroclimatology and dendroglaciology in the Pacific Ranges of the Coast Mountains. Work coming out of the UVTRL in the last few years has focused on reconstruction of climate, glacier behavior, and hydrologic records in the late Holocene all along the Coast Mountains. The varied focuses of the UVTRL all share the common interest of furthering our current understanding of changing climate, particularly in light of challenges such as water security, impacted by the changing timing and quantity of spring and summer glacial melts. I had the amazing opportunity to conduct remote fieldwork at Waddington Glacier and Mantle Glacier in the Pacific Ranges, and am currently using the UVTRL's densitometer to analyze climate signal in subalpine fir and mountain hemlock.

## Serving the Forest and the Creator

Upon graduating from TWU I moved to Bellingham, WA for a year and served with AmeriCorps engaging in environmental restoration and volunteer coordination. I then went on a half year traveling stint which included an India missions trip, Adventure Bible School in New Zealand, and Australia. Shortly after that I began serving with a Young Life camp called Beyond Malibu where I would take high school boys on week long mountaineering trips. In the offseason from guiding I worked back in my hometown of Baker City for the US Forest Service. There I met my wife, Beth, and was married Fall of 2013. A daughter, Elsie Mae, was born to us in May of 2016. Our family is very active within our church serving in a variety of roles, which includes worship, Bible teaching, and my wife as Children's Ministry Director. I currently work for the US Forest Service on the Wallowa Whitman National Forest within the Forestry department. I recently transitioned from the timber production side of things to silviculture. My tasks within this job primarily consist of reforestation (cone collection, sowing seed, and planting seedlings), timber stand improvement (stand exams and pre commercial thinning), and database management which includes a fair amount of GIS. My vocational goal is to continue in the field of forest management and one day become a Forest Silviculturist.



**Cliff DeMastus, ENVS '09**

## More Alumni News



**Aimee McGowan, GEOG/PSYC '15 contributing to the first set of maps of blue carbon habitats in North America**

### Blue Carbon Booster

After graduating from TWU in 2015 with a Geography/Psychology BA, I began my master's degree in Resource and Environmental Management (MRM) at Simon Fraser University with the Climate, Oceans and Paleo-Environments lab. For my master's thesis, I am working as part of a continent-wide blue carbon project led by the Commission for Environment Cooperation, a tri-national organization funded by the governments of Canada, Mexico and the United States. Due to the paucity of geospatial and carbon storage information along the Pacific Coast of Canada, my role in this project is to determine the distribution and extent of three seagrass meadows in southern Clayoquot Sound, British Columbia, and quantitatively assess above and below ground eelgrass density, biomass and carbon storage. This research will be used to contribute to the first set of continental maps of blue carbon habitats within North America, and help fill the data gap that exists in the Northeast Pacific seagrass bioregion on the extent and density of eelgrass. Further, this research will provide a baseline for determining the role eelgrass habitats play in climate change mitigation on the Pacific Coast of BC.

Along with writing my thesis, I am currently on co-op with Agriculture and Agri-Food Canada in Agassiz, BC. In this position, I am working as an entomology assistant in the integrated pest management (IPM) and behavioural ecology lab, which focuses on developing IPM strategies that are environmentally responsible, sustainable and reduce-risk.

Completing a MRM degree has been a very busy but incredibly rewarding experience. I have had an opportunity to collaborate with scientists from across North America, share my research before the Ministers of Environment of Canada, Mexico and the United States, and explore different fields of science. I am very thankful to have studied at TWU, as it opened the doors that lead me to where I am today. I look forward to continuing with my studies and embracing all the new and exciting opportunities the future holds!

*Blue carbon is the term for carbon captured by the world's ocean and coastal ecosystems.*





**Dave Wilson (BIOL '10) on one of his commutes for his position with Hatfield Consulting**

## **Environmental Consulting—the Joy of Commuting by Jet Boats and Dogsleds**

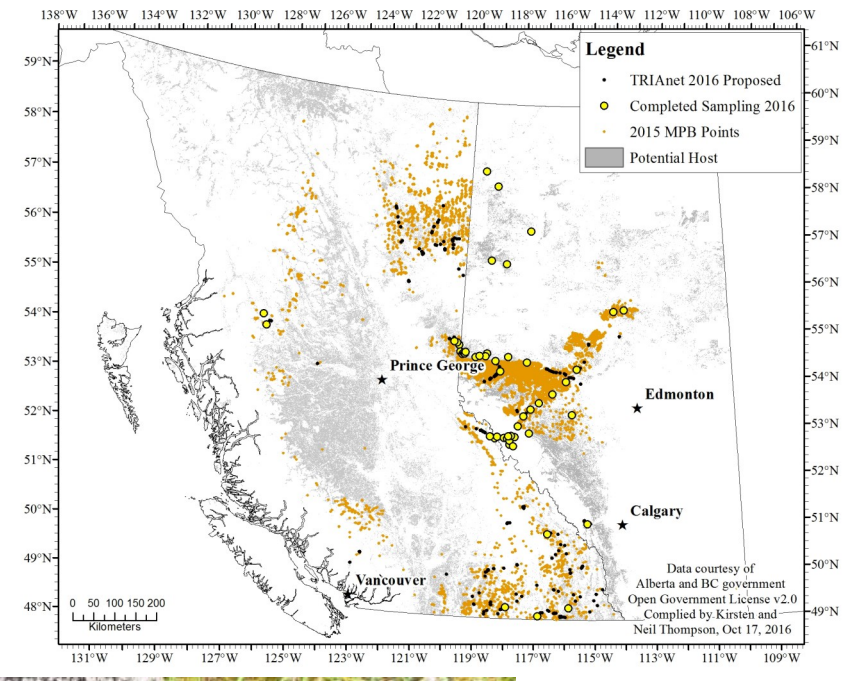
After graduating Trinity Western University in 2010, I took a position as an environmental specialist in the water resources department at Hatfield Consultants in North Vancouver. Through this job, I gained experience working with a variety of clients, performing environmental impact assessments as well as baseline environmental, municipal water supply, and regulatory compliance monitoring throughout Alberta and British Columbia. I enjoyed the variety of field work. Some of the work I was involved included electrofishing, as well as sediment, benthic invertebrate, and water quality sampling.

As a part of the water resources group, most of my work involved building and maintaining climate and hydrology monitoring networks. The hydrometric stations we install can continuously measure water level and temperature. As a part of developing these monitoring networks, manual water level surveys, discharge measurements, and snow surveys are conducted in the field. Although I really enjoyed field work, I have also come to enjoy some time in the office, especially when it was  $-40^{\circ}\text{C}$  in some of our Alberta locations and my coworkers are in the field instead of me! In the office, some of my tasks include reporting, data management and field program planning.

One thing that I did not expect about this job was how enjoyable the commute could be! Some of the locations that we monitor are very remote and in order to access them we have had to use snowmobiles, argos, ATVs, helicopters, jet boats, and even a dogsled team. One other thing that I valued about environmental consulting is that it gave me the opportunity to work closely with industries such as those in the Alberta oil sands. This provided a unique opportunity to see and form my own opinions on topics that we often hear so much about in the media.



## More Alumni News



**Kirsten Thompson (nee Kilde) (BIOL '11) had a very full summer of fieldwork in 2016 for her Ph.D. on mountain pine beetle landscape genomics**

## Beetling around!

Scenes from my second year of a mountain pine beetle landscape genomics Ph.D. in 2016 which was a bit of departure from my fungal ecology masters but is turning out to be super fun. All the yellow dots on the map are where I sampled in one summer. I managed to put 12,000km on the research truck in 29 days (must be a record...). Also in the pictures, my husband Neil Thompson, a silviculture and forest disturbance Ph.D. student who was my field assistant, and my Australian shepherd cross, Daisy.







## Migration back to Minnesota

After living in Washington for 3.5 years while studying bird damage in fruit crops, my husband Cody and I moved back to Minnesota in October 2015. I spent the autumn writing my master's thesis and defended in December (M.Sc. Environmental Science, Western Washington University; here's a link to my thesis for those who are interested: <http://cedar.wvu.edu/wwuet/457/>). Since then I have been pursuing a career in wildlife biology. So far I have protected 30 endangered Great Lakes piping plover nests with the National Park Service, banded 1650 ducks with the Minnesota DNR (which species am I holding in the picture?) and measured the height and diameter of 23,000 trees with the University of Minnesota. I'm currently working for the St. Croix National Scenic Riverway, one of the first rivers in America to receive federal protection. Cody has a great job working for Wargo Nature Center where he gets to teach fun programs such as maple syruping, cheese making, and kayaking. We really miss the Pacific Northwest, but are happy to be closer to family, especially our 2 newborn nieces and our 2 nephews!

**Deanna Leigh, ENVS '07 completed a Master's at Western Washington University in 2015, entitled "The Effect of American Kestrels on Deterrence of Bird Damage to Pacific Northwest Sweet Cherries" co-supervised by Prof. Karen Steensma (TWU)**

## And in other news...

### Big Year for Salmon in the Valley

The 2017 season for the Salmon in the Valley program was one of the biggest yet, with the program extending well into June after starting at the beginning of May. Salmon in the Valley teaches grade 4 and 5 students from the local area about salmon and their habitat. The program is run by TWU Outdoor Lab Supervisor Chris Hall with administrative assistance from Liz Robertson. The program receives financial support from the Salmon River Enhancement Society. The SRES support allows many schools in the Salmon River watershed send classes so the students can find out how to care for the watershed where they go to school.

This year, the Salmon in the Valley teaching assistants faced the usual challenges of highly energized students and also faced occasional—well, actually regular—rain showers but took it all in stride and as shown by their happy smiles and duct tape readiness in the photo!

**Salmon River  
Enhancement Society**



**Salmon in the Valley TA's for 2017:  
Andrea Falk, Tamara Ma and Katharine Sell**



# Trinity Western University signs on as a partner institution with Au Sable

For decades, TWU has enjoyed a fruitful relationship with the Au Sable Institute of Environmental Studies. Students took the unique environmental courses offered at Au Sable's several campuses and got credit for these as TWU courses.

This relationship just got better!

In May 2017, TWU and Au Sable signed a partnership agreement that has many benefits for TWU, Au Sable and TWU students that take Au Sable courses towards their TWU degree. Some of the benefits are

- a guaranteed \$400 tuition reduction/course/student
- access to additional scholarship funding (Au Sable already offered generous support before we became a sustaining partner), e.g., scholarship reserve of \$6,600 for qualified students (e.g. 4 fellowships @\$1400, 2 grants @ \$500)
- preference for up to 2 qualified students in the summer research program at Au Sable
- a representative voice in Au Sable curriculum
- guaranteed access to Au Sable expertise, including the Au Sable college network of partner and participating colleges



**Photos of TWU students at this year's Au Sable classes in Michigan. Left photo: Lungi Roberts is second from left, middle photo: Julie Merchel examining a map, right photo: Lungi Roberts (in shades) following just behind the excursion leader to the left.**

"Many people contributed to the formation of this new Partnership," noted Fred Van Dyke, Au Sable's Executive Director. "We've always admired Trinity Western for their outstanding environmental program, their beautiful campus, and its unique natural areas, and the Au Sable Representatives there, David Clements and Karen Steensma, who worked hard to make this Sustaining Partnership a reality between these two great institutions." Over 80 past and present Trinity Western students are now Au Sable alumni, including Katharine Sell, a TWU student who took Marine Mammals (see photo on right) and Ecological Agriculture at Au Sable's Whidbey Island Campus. Katharine expressed her thoughts about the new Partnership between Au Sable and Trinity Western this way "I am thrilled for the new partnership between TWU and the Au Sable Institute as this will provide life long memories, skills, and impacts on an array of TWU students for years to come. My educational experience at Au Sable was pivotal to my degree and contributed to TWU's mission statement to develop Godly Christian leaders through inspiring hearts and minds. At Au Sable, the inspiration of both mind and heart is continuous and contagious, and helps bring a TWU education full circle." [For more info on Au Sable and the new partnership contact our TWU Au Sable Prof. Steensma or Clements.](#)







**Electrofishing leadership team 2017. Back left to right—Chris Hall, Andrea Falk, Lungi Roberts, Katelyn Cannon. Front left to right: Levi Atamanchuk, Tamara Ma and David Clements.**

## Electrofishing nets 1017 fish in 2017!

We were up all night (well just to 5 am) two nights in a row, June 25 and June 26 to continue the cull of invasive largemouth bass and pumpkinseed sunfish in McMillan Lake at TWU that was started with the first electrofishing operation in 2013.

Here are the 2017 totals tabulated by Tamara:

**Non-native (995 total): Pumpkinseed Sunfish 671, Largemouth Bass 266, Goldfish 15, and Bullhead Catfish 43**

**Native (22 total): Northern Pikeminnow 14, Longnose Sucker 5, Pacific Lamprey 2, Coho Salmon 1**

We extend a big thankyou to the numerous volunteers that helped out on those long nights...especially the ones who made it to 5 am. Lungi Roberts worked all through June to set the stage for Tamara, who then spent the rest of the summer dissecting hundreds of fish, as part of a research project looking at the stomach contents, health and reproductive capacity of the invasive sunfish and bass.





# The Blaauw Eco Forest: centuries deep and diversities wide

The coring device we use to core the peat of the boggy floor in the northeastern section of the Blaauw Eco Forest, known as “Guirrhoorn bog” comes in sections, and we never know how many sections we are going to need until we hit the bottom of the pit layer.

On the edges of the wetland, we may need only one or two sections, but in the middle we need ALL of them—and it is an incredible feeling as the whole length of the device plunges deep below the surface - 6 meters deep! That represents a lot of history, and Katelyn Cannon and Karsten Cheng both did thesis research projects in 2016-17 to look at that history.

Katelyn also began collecting some new biodiversity information in the summer of 2016—setting pitfall traps for insects. As a result, for the Blaauw Eco Forest we now have tallied up the following diversity of species at Blaauw:

**Birds: 63, Mammals 15, Amphibians 8, Reptiles 3, Fish 1, Mollusks 11, other Macroinvertebrates 28, Microinvertebrates 6, grasses 6, herbs 70, shrubs 29, trees 9, mosses 42, liverworts 12, lichens 5, slime molds, 6, fungi 22.**

Then in the summer of 2017, Delia Anderson set out to map the pH of the bog, finding some pretty strong acidic hot spots that will help us better characterize the type of wetland it is, and better understand both its past and its future.

The Blaauw Eco Forest continues to yield fascinating secrets from its depth and its breadth, secrets that we hope to share more widely with the Trinity Western community and the public as we plan to develop a much improved trail system. with interpretive signage Stay tuned for future developments!



**Clockwise from the top left: 6 m coring device preparing the plunge, Prof. David Jordan, Katelyn Cannon and Lungi Roberts plunging the core, pH sampling, Katelyn Cannon, Dr. Sarah Howie (wetland expert with Delta) & Delia Anderson, mushrooms, rough-skinned newt**



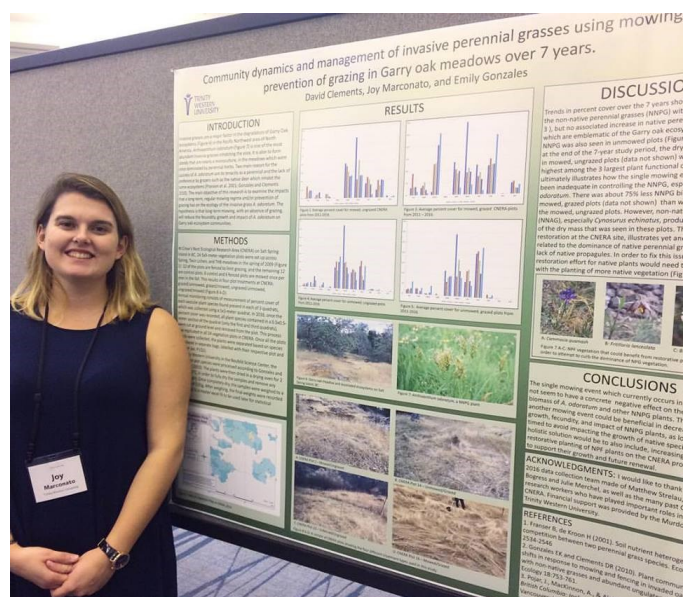


**Crow's Nest Crew pictured here on Mt. Maxwell, Salt Spring Island in 2017: Matthew Strelau, Wes Richardson, Virginia Oeggerli and Joy Marconato**

## View from the Nest

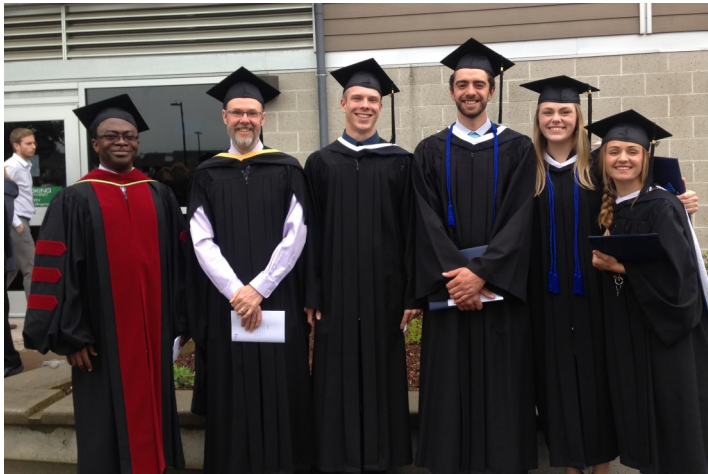
The Crow's Nest Ecological Research Area team once again did a good job in the summer of 2017 tending the nest. Matthew Strelau was back for a record-breaking fourth year in a row, who along with 2-year veteran, Joy Marconato trained up a couple of rookies—Virginia Oeggerli and Wes Richardson. Marconato had also been busy the whole year, 2016-17 working with long-term Crow's Nest vegetation data, shown here on the right presenting her poster at the Invasive Species Council of BC's annual forum in Richmond, BC. Thanks to Marconato's painstaking work weighing thousands of plants and analyzing 7 years of data, the Crow's Nest crew initiated a new mowing protocol this year. She summed up this year's field experience saying "Salt Spring 2017, the second round of CNERA for me, was an absolute adventure. It was filled with surprises, quirks, tons of laughter, and some interesting experiences." Strelau had this to say: "This year was filled with many great moments with hilarity. Some of my favourite memories include bleaching my hair, our weekly movie nights in the Strelau Suite, teaching Wes and Virginia the native plant species, a campfire nearly every night (we probably used more firewood than any other team), frequent trips to Stowel lake, our careful sightings of cougars, slugs on tents, spiders in cabins, fun with the microclimate equipment, listening to Froot, listening to Froot every day...and much more."

**Note:** no cougars were actually seen (ed.)



# GENV Graduates in 2017

A few photos of some of our 2017 grads...look for future alumni highlights of these highly talented graduates!



Prof. Ofosehene, Prof. Jordan, James Linde, Kristophe Berg, Severin Rolland-Berg, and Olivia Seneshen



Matthew Strelau, Evie Morin, Prof. Ofosehene, Karsten Cheng, Prof. Jordan, Ruth Douglas, and Joy Marconato

## **A SACRAMENTAL APPROACH TO ECOLOGY**

A Conference in Honour of Ecumenical Patriarch Bartholomew "The Green Patriarch"

SPONSORED BY THE MONASTERY OF ALL SAINTS

CO-HOSTED BY THE MONASTERY

AND TRINITY WESTERN UNIVERSITY

OCTOBER 6<sup>TH</sup> AND 7<sup>TH</sup>, 2017



**OPEN TO EVERYONE**

**OCTOBER 6<sup>TH</sup>, 6:30 P.M.**

**ROUNDTABLE DISCUSSION AT THE MONASTERY**

**A Christian Understanding of the Ecological Crises**

Monastery of All Saints in Dewdney.

For directions and more information, please telephone 604 556-8517

Website: [www.orthodoxcanada.org](http://www.orthodoxcanada.org).

**OCTOBER 7<sup>TH</sup>, MAIN SESSION**

**10 A.M.-4 P.M.**

**TRINITY WESTERN UNIVERSITY**

**NORTHWEST HALL**

**AN ECUMENICAL DISCUSSION:**

**THE RESPONSIBILITY OF PEOPLE OF FAITH  
TO THE EARTH'S LIFE SUPPORT SYSTEM**

