

# ENVIRONMENTAL SCIENCE

ALUMNI NEWSLETTER

Issue 4: January, 2016

## 2015 ENVS Spring Field School

**S**eventeen students completed the annual ENVS 2523 field school course this spring. Students (and professors) braved some very cold and wet weather to work together in the field gaining practical experience.

Field school components this year included traditional and GIS mapping (Dr. McMullin, Dewey Dunnington, and Dr. Spooner); forest assessment and land capability (Peter

Romkey); coastal wetland sediment sampling and quality assurance (Dr. O'Driscoll); terrestrial invertebrate sampling and identification (Dr. Hillier); marine invertebrate sampling and diversity (Dr. Mallory); tree sampling and forest fauna (Dr. Bondrup-Nielsen); and soil profile development and carbon cycling (Dr. O'Driscoll).

The sunshine did come through at the end of the week and it was much appreciated! Students had a great time despite the weather and practiced hands-on techniques in environmental science. Field school and practical experience is a core component of the ENVS program that external donations help to support (see newsletter insert).



*ENVS students working on coastal wetlands*



*ENVS students identify invertebrate samples captured in the field.*



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*The 2015 ENVS field school group during a soil sampling trip.*

## K.C. Irving Environmental Science Center News: Dr. David Kristie

December 2015 marked the midpoint of my second year as Director of Research of the KC Irving Environmental Science Centre and Harriet Irving Botanical Gardens, and 2015 was clearly a banner year for student research in the Irving Centre. It was gratifying to see undergraduate and graduate students from Biology, Chemistry, Environmental Science, Math, Engineering, and Physics participating in diverse environmentally-related research projects in the Irving Centre. I am not aware of any other location on campus that brings students from such diverse disciplines together for research.

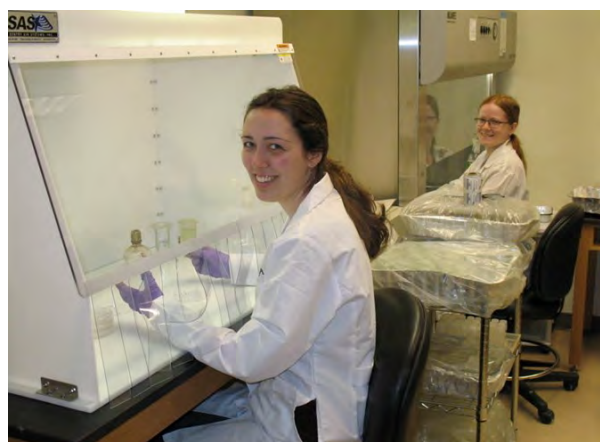
2015 saw significant changes to the research facilities in the KC Irving Centre. The growth cabinet room, which had been primarily used for storage, was reborn as a common laboratory, for general use by researchers and students, and even the occasional laboratory course. The carrel room, which was also un-



top row : Brandon Landry, Tyler d'Entremont, Jocelyn Kickbush, Baillie Holmes, Sarah Adams  
bottom row : Adam Godfrey, Hannah Machat, Rachel Clarke, Sarah Fancy

*All 12 of the current Arthur Irving Scholars at a September get together at Dave Kristie's house.*

graduate and undergraduate student activity (166 researchers) and a truly impressive amount of research funding obtained (over \$3.6 million) since 2007. Change did occur in the Seed Bank, the tissue culture labs, the greenhouses and even the mesocosm benches, which all saw an enormous increase in activity, due to the research activities of Robin Browne, Allison Walker, Glenys Gibson and Kirk Hillier. ENVS students looking for research experience are encouraged to investigate these research programs. This increase in research activity in the Irving Centre was catalyzed in part by scholarships for students and research grants for faculty provided by the Arthur Irving Academy Foundation.



*Arthur Irving Scholars Sara Fancy (ENVS '17), and Sara Adams (ENVS '16), working in the tissue culture lab.*

derutilized, has been converted to the Research Directors lab, and now houses students working on many different projects. Visitors to the building should also note that the research wing which houses the CARE labs, and the greenhouse research corridor on the upper level, are both now open to the public during working hours.

In terms of research, it was business as usual in the CARE labs, with an abundance of



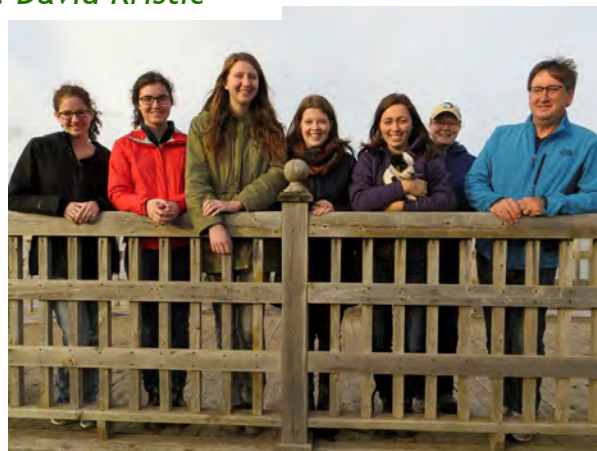
*Honours student Sonya Ardley (ENVS '16), doing her honours research in Dr. Jennie Rand's CARE water quality lab. (also see Co-Op article on page 7 of newsletter).*



## K.C. Irving Environmental Science Center News: Dr. David Kristie

One of the most enjoyable parts of my job is to oversee the application process for the Arthur Irving Scholarships in Environmental Science (see financial aid on the Acadia web-site), and to help mentor the scholarship holders. In April a second round of Arthur Irving Scholarships were awarded and three first year ENVS students were successful. Hannah Machat from Dartmouth NS, Megan MacIssac from Creignish NS, and Sarah Stewart from Sackville NB were each awarded entry scholarships worth \$15,000 a year for four years. One third year scholarship was awarded to a student in biology. In August, Jocelyn Kickbush

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*Ian Spooner and some of the Arthur Irving Scholars on a recent field trip to Grand Pre.*

In January 2016, Sarah Fancy begins a work term with Robin Browne in the Seed Bank. Special thanks to Ian Spooner, Nelson O'Driscoll, Robin Browne, Allison Walker, Ruth Newell, and Melanie Priesnitz for their extra efforts in helping to mentor all of the Irving Scholars during the past year.

And finally, Nelson O'Driscoll and Allison Walker (Biology) were also successful in the recent round of applications for the Arthur Irving Research Grants in Environmental Science. Nelson and Allison received \$20,000 for the first year of a project to study the bioaccumulation of mercury in lichens and mushrooms of Nova Scotia. Other Arthur Irving Research Grants were awarded to faculty in biology and computer science.



*Summer research assistant and Arthur Irving Scholar Rachel Clarke (ENVS '18), scanning specimens to save as digital images for the virtual herbarium.*

from Kaledon BC was awarded the Arthur Irving Graduate Award for Environmental Science and began work in Dr. O'Driscoll's lab on the speciation of mercury that is mobilized and accumulated in a Brier Island bog, pre- and post-remediation.

Last years Arthur Irving Scholarship award winners included four current ENVS students and one recent ENVS graduate who have all become fixtures in the Irving Centre. Rachel Clarke had a productive summer working in the EC Smith Herbarium, before moving on to work in Dr. O'Driscoll's mercury lab. Baillie Holmes worked with Melanie Priesnitz in the gardens, and Sarah Adams worked on her honours thesis concerning endophytic fungi in Allison Walker's mycology lab. Adam Godfrey, the 2014 gradu-



*CARE researchers Dr. Erin Mann, PhD student Sara Klapstein, and Dr. Nelson O'Driscoll setting up a mercury experiment in the research gardens.*

David Kristie

## Alumni Stories: Ngaio Richards (ENVS '98)

I can hardly believe more than 15 years have gone by since I graduated from the environmental science program at Acadia! In the first few years following graduation I co-lead a crew at a State Park for the Vermont Youth Conservation Corps and interned at the Conservancy Wildlife center (a rehabilitation clinic in southern Florida), where I fell in love with vultures and owls. After a year taking supplemental chemistry, ornithology and animal behaviour classes at Bishop's I started a Master's at McGill, assessing threats like habitat loss and pesticide exposure to little eastern screech-owls in the apple orchards of southwestern Quebec. I presented my findings at a global bird of prey conference in Hungary, where I first learned about the 'Asian Vulture Crisis' where the population of three species of Old World Vultures had been reduced from millions to virtual extinction because of exposure to the veterinary drug diclofenac in livestock carcasses. I was then stationed in a northern community in Main Brook, Newfoundland as an intern for the Quebec Labrador Foundation. I was also lucky enough to have an opportunity to

*"I've always been interested in bridging the gap between the field and the lab, especially since I feel like the training I received at Acadia gave me such a solid footing in both realms."*

volunteer as a field tech for the United States Geological Survey on a seabird conservation project in Glacier Bay National Park, Alaska



Ngaio with conservation dogs Wicket, Lily and Orbee in Cameroon (west Africa), waiting to head into Mone Forest Reserve for a second round of Cross River gorilla dung surveys.

and at one of the Aleutian Islands, on the Bering Sea.

From there I went to England, where I did a PhD in wildlife forensic science at Anglia Ruskin University. As a lover of vultures and someone who deeply appreciates the ecosystem clean-up services they provide, I was really affected by the Asian Vulture Crisis. The team that discovered that diclofenac was poisoning vultures faced the problem that the carcasses and the tissues therein (typically sampled for toxicological screenings in such cases) quickly degraded due to the environmental conditions. For my PhD I investigated the feasibility of detecting veterinary agents like diclofenac in more environmentally robust samples like hair and feathers. This would optimize the use of even highly degraded carcasses, to augment the information available and to help identify cause of death for managers, conservationists and other stakeholders on the ground.

I've always been interested in bridging the gap between the field and the lab, especially since I feel like the training I received at Acadia



## Alumni Stories: Ngaio Richards (ENVS '98)

gave me such a solid footing in both realms. The year before I finished my thesis I received a grant from the Royal Chemistry Society to visit Kenya to conduct site assessments and interviews for a book I was editing about the global repercussions of a pesticide called carbofuran, which has become well-known in some circles for being the poison of choice in deliberate poisoning of wildlife in many parts of the world. Mostly it is used to target predators who have consumed livestock or 'threaten' hunting, but with secondary repercussions to a lot of scavengers including vultures. I was very proud of the balance in chapter contributions from analysts and field workers alike. Pesticide poisoning issues differ from those related to intoxication following exposure to veterinary agents, but both affect species in parallel, so addressing them as such makes sense.

I'm now the Forensics & Field Specialist at Working Dogs for Conservation, a Mon-

*"Every day I make use of my environmental science background and the 'think outside the box' multidisciplinary training I received at Acadia."*

tana-based nonprofit that partners with crazy dogs – many of them sourced from shelters – to detect targets of conservation value. This could be anything from scat to endangered or invasive plants to bushmeat and illegal firearms. This work has taken me to arctic Alaska, Cameroon and all across the United States, from California (*helping to protect endangered species like the San Joaquin kit fox and blunt-nosed leopard lizards and their habitat*) to New York (*to assess presence/absence of feral swine*). Not only is this job a dream come true, it also enables me to combine my love of wildlife (and dogs, of course!) with my passion for conservation and my conviction that working with the human community can only benefit our environment. Any given week I could be collaborating with wildlife biologists, a talented network of dog trainers and handlers, entomologists, toxicologists, pathologists, policy-makers. I am also privileged to consult on cases with the dedicated team of wildlife agents, the poison detection dog unit, and the wildlife forensic crime lab in southern Spain on various cases. Every day I make use of my environmental science background and the 'think outside the box' multidisciplinary training I received at Acadia. And every day I pinch myself to make sure what I'm living isn't actually a dream!

-Dr. Ngaio Richards (ENVS '98)



Ngaio and Orbee share a moment during river otter and mink scat surveys on the Blackfoot River of Montana. The scats Orbee found were analyzed for pharmaceuticals, heavy metals and flame retardants (photo credit Marirose Kuhlman, MPG Ranch).

## Co-op Stories: Michael Brophy

I decided to join the Acadia Co-op Program after my first year at Acadia, because I knew environmental science had a lot of different possible career paths and I had no idea which path was the right one for me. I thought that if I joined co-op and got exposed to a bunch of different jobs I would find the best path for me, and that is exactly what happened!

I got my first job with the Sackville Rivers Association, where I was helping to restore the Atlantic salmon habitat within the Sackville River watershed. This job was the perfect job for my first co-op, as I was doing meaningful work in my field and I got to spend most of my summer outdoors! I don't know if it was luck or destiny, but this first job really gave me an initial idea of what I wanted to do for my career. I realized how interested I was in water and how important the aquatic environment was.

*"I knew environmental science had a lot of different possible career paths..."*

After the success of my first co-op, I knew I was interested in water. This was only a start, as water itself is a very broad field. There's the drinking water side, to freshwater systems and the big oceans. So, I started doing some research. I talked to different professors within Acadia to get a better idea of where different water research was being performed. There were two main reasons why I did this: 1) I was interested in doing my honours, so I needed to find a professor to do research with. 2) My last co-op job was all fieldwork, so I wanted to see how I would like working primarily in a laboratory environment. So I started looking up professors in the area. I found a professor from Dalhousie University who had NSERC funding and was doing active research in the drinking water field. So, I decided to send him an e-mail. I explained my situation, how I was interested in water, I wanted to do research for my honours and I needed an 8 month co-op work term. After a few e-mail exchanges, I found myself on my way to Halifax, resume and transcripts in hand, ready for an interview. The interview was quite informal, where we just chatted about my interests and experiences, what I wanted from the job and what I would be working on. And with that, I got offered a job on the spot. I had found myself my very own co-op job that was EXACTLY what I wanted! I was offered an 8-month co-op job in the laboratory setting, where I would be conducting my own research, which I could use for my honours. I was so excited!

I started the job at the beginning of May 2014, where I started off with just basic laboratory work, such as cleaning glassware, dishes and learning how to make

up a few different samples. But, it wasn't long until I started working on two different research projects! I was running a Masters student's entire research project, as well as conducting my own research. My job got very busy, very fast! After about three months of doing my research, my supervisor approached me about my research. He liked my work and

how my research was coming along, and he wanted me to share my research thus far. So, after a lot of data analysis and preparation, I found myself waking up at 5:00am to start my journey to the University of Massachusetts where I would present my research at the New England Graduate Student Water Symposium. I was the only undergraduate student presenting at this conference. It was very nerve wracking I must say, but my presentation went very well. The best part was afterwards, I had multiple people come up to me saying how excellent my presentation was and how they couldn't believe I was doing all this as an undergraduate student!

That gave me confidence in what I was doing, and really put into perspective how important my work was. It wasn't long after I got back from this conference that I was asked to present my work AGAIN, but this time at a bigger, industry based conference: the Atlantic Canada Water and Wastewater Association's annual conference. This conference was more industry based and I was presenting to a lot more people. Again, it was very nerve wracking to present at such a big conference, but my presentation went well and I gained more confidence in my presentation skills. After the busy month and a half of conference preparations, I finished off all my research and got a head start with writing my honours thesis before I ended my work term. It was a sad day when I left the lab, but I couldn't be more thankful for all the opportunities this job gave me.

Looking back on my Acadia experience, I would say joining the Acadia Co-op Program was one of the best decisions I have ever made. I started the co-op program having no idea what I wanted to do as a career, and after three extremely successful co-op work terms, I have found myself starting my Masters degree in January 2016, expanding the research I did for my honours project. The Acadia co-op experience has really shown me the importance of getting work experience in my field, and has lead me in the direction of a career I am passionate about. I would highly recommend the Acadia Co-op Program to anyone who is considering the program!



Michael in the lab

## Co-op Stories: Emma Harris

I began working at the Beaverlodge Farm in May and continued on for eight months completing two co-op work terms. I was very fortunate to be able to complete two work terms here and participate



*Performing emergence counts in 1 m rows.*

in the full growing season from seeding to harvest. Beaverlodge is a substation to the Lacombe Research Center and is one of 19 agricultural research centers operated by Agriculture and Agri-food Canada. This department of the Canadian government is dedicated to improving the agriculture sector by funding projects to conduct valuable agriculture research. Projects that are performed at the station help develop innovative, competitive and sustainable agriculture in Western Canada.

I worked in the Agronomy department, which is a program focusing on the science to improve crop production while understanding and sustaining the environment. I gained knowledge on different crop types, growth stages, weeds and an introduction to plant diseases. As a student my roles included: data collection, maintenance of experimental plots and operating various types of equipment such as combines, tractors and

running the soil sampler truck and corer. In the summer the days consisted of working outdoors on the experimental trials and helping other programs such as the Integrated Pest Management program. Once harvest had completed in October all data collected was processed and shipped off for further analysis. This meant that all the seed and soil samples were cleaned with the Clipper or Deawner and ground with the grinding machine. The Clipper was a system of sieves used on the wheat and canola seed while the Deawner was for the barley seed.

Beaverlodge is a small close knit community that I really got to enjoy over my 8 month term. I gained



*Driving the John Deere with the seed drill.*

a lot of valuable experience that I will carry forward with me to future job placements. Working in the agronomy department gave me a solid foundation in crop sciences and I am really looking forward

to continue on with Agriculture and Agri Food Canada next summer in Plant Pathology.

## Co-op Stories: Sonya Ardley

I am in my fourth year of Environmental Science. This fall I had the opportunity to combine my third co-op work term with research for my Honours thesis. My position was a research assistant in Dr. Jennie Rand's water/wastewater laboratory located in the K.C. Irving Centre. The focus of my work term was to determine the source of toxicity at a food processing plant in Port Williams, NS which primarily processes frozen carrot products. The wastewater is directly discharged into the Minas Basin and has historically met the operating guidelines established by Nova Scotia Environment.

In 2014, Environment Canada issued a random acute lethality test to assess the quality of the final effluent. This test requires fish to survive for an allotted period of time in the effluent. The test failed, which lead to an environmental direction to clean up the effluent. After many weeks of comprehensive sampling, we determined that the source of toxicity was the high biochemical oxygen demand. This indicated that the large organic load in the effluent was providing nutrition to microorganisms for growth and development, and was ultimately

depleting the dissolved oxygen. I began attempting bench-scale treatment experimentation which included activated sludge and coagulation/flocculation. Results show the most time and cost efficient option would be coagulation/flocculation. I enjoyed making this

*"I had an inspirational and educational four months ..."*

project my own, however I am thankful for all the help I received from my supervisor, as well as from other professors and students.

Overall, I had an inspirational and educational four months and I am very appreciative of the work experience I gained through the co-op program at Acadia University.



## E.S.S.A. (Environmental Science Student's Association) Update: *Rachel Clarke*

**H**ello Acadia environmental science alumni! Here is an update from your current environmental science student association.

Kicking off 2015, the Earth and Environmental Science Department hosted a GIS Short Course that was attended by 33 students and faculty, taught by 2 graduate



*GIS Short Course*

students in the department. Early in February, ESSA students attended one of Acadia's Athletic Centre's free skates together. Later on in the term, nine Acadia students (7 undergraduates and 2 graduates) attended the 2015 Science Atlantic Environment



*Science Atlantic Conference. Top Left to right: Dr. O'Driscoll, Adriana Pontalti. Bottom Left to right: Erin McKee, Rachel Clarke, Erin Mann, Sara Klapstein, Amanda Loder, Jillian Bennett, Micheal Brophy.*

Conference, held this year at St. Mary's University. While four students presented honours and PhD research, the others attended their presentations, while also attending workshops and lectures. Additionally, students in the department accompanied Dr. Rob Raeside, Dr. Sandra Barr, and Don Raeside on various field trips to Walton to view Carboniferous stratigraphy and structural geology of the Noel Shore coastline, the South Shore to view several geological features, and Parrsboro to view the Cobequid-Chedabucto fault zone.

Early in November, the annual soccer match between the Earth and Environmental Science Department (E&ES) and the Environmental & Sustainability Studies (ESST) students on Raymond Field. With a handful of E&ES students, supplemented with excess ESST students, our department team came out on top, winning the recycled trophy which now resides in the E&ES common room. Finally,



*ENVS / ESST Soccer Match*

we also hosted the year-end and Christmas potlucks at the end of each term with the Fletcher Geology Club at the Wolfville Curling Club, which consisted of games, some wonderful food, prizes and of course, great company. ESSA is looking forward to more exciting activities and another fantastic year and wishes everyone all the best in 2016.

-Rachel Clarke



## Where Are They Now? (Brief Alumni Updates)

### **Benjamin Misiuk (ENVS '14)**

I am currently working on my PhD in Geography at Memorial University of Newfoundland



*Ben field sampling*

in St. John's, studying with Drs. Trevor Bell and Evan Edinger. My research is on benthic habitat mapping: mapping in order to classify habitats on the seabed. My field sites are all Arctic and sub-Arctic on the east coast of Baffin Island. Some of my methods include multibeam echosounding, benthic grab sampling, underwater video, and scuba diving (photos attached). The ENVS program at Acadia prepared me well for this work.

Some of my spare time activities include volunteering at a local aquarium scuba



*Ben field sampling*

diving to collect animals for their displays, building a computer, woodworking, running, and playing the violin.

Despite the beauty of Newfoundland and the North I really miss Wolfville and would jump at an opportunity to move back somewhere down the road. I hope current students appreciate the beauty and culture of the town and surrounding area. Hope all is well in the department!

### **Peter Morse (ENVS '99)**

Merry Christmas! As for updates, in September I was made a Research Scientist with Natural Resources Canada at the Geological Survey of Canada in Ottawa following a post-doc there as a NSERC Visiting Fellow in a Government Lab, and just over a year ago Molly (Miranda) and I had our third baby. All the best to you in the New Year,

### **Miranda Saroli (ENVS '10)**

I'm working as a Research Assistant with an NGO called Access Alliance, an organization that provides primary health, community, and settlement services for newcomer and refugee groups in Toronto. Also completed my Master of Environmental Studies at York University last year where my major paper was on the impact of climate sensitive diseases on vulnerable groups in Toronto. That's about it! Hope you're doing well, and all the best in 2016!

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If you have any news of your activities (or those of your classmates), please let us know. Did you write an annual newsletter at Christmas or have a great picture? Send a copy to us for future newsletter stories by e-mail or snail mail.

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