

# research

## MATTERS



INSET MAP OF THE ISLAND OF CAPE BRETON OR ISLE ROYALE, 1745. MAP 717. Beaton Institute, Cape Breton University.

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## emily MACLEOD

After spending a year in the big city of Montreal, I was more than happy to return to the familiar halls of CBU. I am thankful to Jodi McDavid who had suggested me for the job of Student Research Coordinator with the Office of Research and Graduate Studies (ORGS). Her help (and endless patience!) has contributed greatly to my experience with ORGS. I would also like to thank Dr. Dale Keefe for overseeing the summer projects and offering support when needed; Sander Taylor for making impeccable coffee and Sarah Conrod for contributing to late-afternoon office comedy relief. Last but not least I would like to thank CBU's research students who contributed to the Student Summer Lecture Series and the newsletter. Your work

is invaluable to CBU and continues to influence the school's positive reputation both nationally and abroad.

I am grateful to have had this opportunity to serve you as CBU's Student Research Coordinator. It has shown me the great diversity of research that is a large part of what we do here at CBU. It has also helped me to improve my own work as a researcher. It is important that students have a space to apply the skills learned throughout their education and CBU offers the tools and freedom to do that. During my undergraduate studies I was awarded an internship in conjunction with the Louisbourg Institute and Parks Canada. I have also worked under the supervision of Dr. Richard MacKinnon and the Centre for Cape Breton Studies. It was through my work researching coastal heritage sites and Cape Breton mining culture that I was reminded of the importance in studying and interpreting our local history. It was because of CBU that I had discovered my own interests in public history and heritage studies that have carried over into my current Master's degree at Concordia University in Montréal, Québec. I am forever thankful to the wonderful professors at CBU who saw the potential in me before I saw it myself.

In addition to the ORGS annual newsletter, I have been working with Geoffrey Lee-Dadswell on the Student Summer Lecture Series. I have also been working with social media where it pertains to the research office. When I haven't been tweeting or creating Facebook events for ORGS, I have been working on my Master's thesis. My current research uses an oral history methodology to examine the legacy and relationship between the Fortress of Louisbourg National Historic Site and the town of Louisbourg. My interest in Louisbourg grew from my own personal history with the site as interpreter, guide and researcher. Louisbourg has become an important part of my life and I hope to continue my research on the site for many years to come.

This year I will be finishing my Master's degree with an MA in History and a concentration in Public History. I want to wish everyone continuing success in this upcoming academic year and the best of luck with all your future endeavors!

*Emily MacLeod*

## TRACES THROUGH TIME — PRESERVING FAMILY HISTORY AT THE STEEL PLANT



“My research experience at CBU gave me tremendous confidence and helped me to improve research and writing skills. It helped me to believe that there is potential for me to pursue a career in history research and writing.”

## matthew COOK

In the early 20<sup>th</sup> century, Sydney and its surrounding areas underwent a great industrial boom. The development of the coal and steel industries ushered in waves of immigrants from Europe, America, and the West Indies. However, the opportunity to make a living in the city also drew a large pool of migrant workers from the region's rural areas.

The research of CBU student Matthew Cook traces the history of these rural migrants by electronically sorting a database to look for patterns and to extract quantitative data about the subjects. His research brings together a large number of primary and secondary sources to create a picture of individual migrants and their families. History has always been a personal interest for Matthew, but it was only after he had received his

Bachelor of Commerce degree at St. Mary's University did he make the decision to attend CBU. However, he adds that, “If I had known how fulfilling CBU's history program was when I finished high school, I would never have studied commerce at St. Mary's. Cape Breton University is an extraordinary institution.”

Matthew currently works at the Fortress of Louisbourg National Historic Site in the finance department while he finishes his degree part-time. Despite his full-time job, Matthew continues to contribute to academic scholarship and has made a name for himself within the discipline. Matthew's ambitious study has won him the 2009 David Alexander Prize which is awarded through the University of New Brunswick for the best essay in any university on the history of Atlantic Canada. Matthew has also presented his research at a student research conference at the University of Western Ontario in November 2010. Versions of his essay on Sydney Steel were also presented at the CBU Student Summer Lecture Series (2009) and the Old Sydney Society (2011). His research has also been published in the most recent issue of St. Thomas University's literary and history journal, *The Nashwaak Review*.

Matthew will soon move on from his current research project but will continue to work with the steel workers database. “I think there is a whole career's worth of information and potential publications in there,” and adds that “[the] goal is to continue creating something which will connect academic data with the presentation and preservation of stories of individual people and families.”

Matthew sees graduate studies in his future and feels that CBU has prepared him for whatever else might come his way. As Matthew finishes up his final courses at CBU, he reflects on his time here, “My experience at CBU gave me tremendous confidence and helped me to improve my research and writing skills. It helped me to believe that there is potential for me to pursue a career in history research and writing and various professors, particularly Don MacGillivray and Ken Donovan, have encouraged me to pursue a Master of Arts in History degree. That kind of support goes a long way to making the experience at CBU a very fulfilling one.”

# THEORETICALLY SPEAKING —

## COMPUTATIONAL CHEMISTRY IN THE LAB



"I gained more interest in research itself because I can really appreciate the hard work that goes into everything and the results that are obtained."

jean  
GILLIS

Cape Breton University has a lot going for it. We've got game on the courts with our CAPERS, in The Pit with friends on a Friday night, and with Jean Gillis in the chemistry lab! Jean Gillis, a chemistry student under the supervision of Dr. Dale Keefe, says that she has always liked the physical side of chemistry and her love of chemistry, math, and physics in high school sparked the desire to continue her studies at the university level.

Jean's current research topic involves examining the infrared spectrum of liquid methanol. There is still a lot to be discovered about the structure of liquid methanol which is why Jean finds her work to be particularly exciting. It is known that methanol forms clusters of chains and rings,

but the size distribution of these clusters is undetermined. A previous study suggested that clusters of 5 or 6 are sufficient to mimic its liquid behavior from using a certain level of theory for calculations. Jean's work in the lab relies heavily on theory as she simulates the IR spectra for the pentamers and hexamers and then compares them with an experimental liquid spectrum taken from other literature.

It might sound complicated for those of us who have spent their post-secondary education in the Arts (your editor included) but this has been Jean's summer project for the past two years. Thanks to funding from the Natural Sciences & Engineering Research Council of Canada (NSERC) and an Undergraduate Student Research Awards (USRA) grant, Jean has been continuing her research on liquid methanol throughout the summer of 2011. The process has been challenging, but the workload has prepared her for further graduate studies. Thanks to the help of professors, past students (her older sister Elizabeth had studied in the program and offered tips when needed), and the Keefe Research group, Jean views herself as a much stronger student, "I can't imagine a better chemistry program than the one here at CBU. The professors are all very helpful and they want you to learn so much and become great chemists."

Jean has recently presented her research at ChemCon 2011 which was held at UPEI. Previously she had presented at the Atlantic Theoretical Chemistry Symposium in August 2010. She was surprised at how much she had enjoyed both experiences, "I'll admit that I wasn't really looking forward to attending because I didn't know what to expect and it made me very nervous, but once I was there I realized that everyone was in the same boat as me and it turned out to be one of the highlights of my summer!"

Jean will be conducting research for her Honours thesis in the Fall and looks forward to applying the concepts she has learned in the classroom to her own future projects.

## FEELING ANXIOUS — MEASURING ANXIETY IN CONVERSATIONS



“By doing your own research you get hands-on experience that cannot be taught or explained in a research methods class or from a book. I think it is important to do research and experience the ups and downs that come along with each project!”

### jillian BURNS

Many of us know what it feels like to be anxious when we do public speaking, but sometimes interpersonal communication can cause anxiety as well. Recent graduate of the Bachelor of Science Honours in Psychology program, Jillian Burns, has been studying this relationship which was the basis for her Honours thesis. The title of Jillian’s thesis was “Gender Differences, Anxiety, & Uncertainty in Dyadic Communication between Strangers” and in it she explored “differences in anxiety levels between men and women that arose while conversing with a stranger in a male-female or female-female communication dyads.” Developed through the guidance of supervisor Dr. Peter MacIntyre, Jillian’s project examined an issue that was close to home, “My initial interest in choosing anxiety as the topic for my

research comes from the fact that I personally suffer from nervousness and anxiety in certain situations, such as public speaking or when being videotaped. For this reason I knew I wanted anxiety to be my main focus.” For the experiment, participants came to the lab and were recorded on a webcam while having a conversation 2-5 minutes long with their partner on one of four given topics: their hobbies and interests, favourite foods, favourite television show or movies, and favourite music. After completion of the conversation each of the two participants watched the video, with either the researcher or one of three research assistants, and rated their level of anxiety during the conversation. Immediately following this each participant completed a state anxiety questionnaire. They watched the video for a second time while the researcher or research assistant stopped the video at certain points where increases and decreases in ratings were visible and asked the participant to explain the reasoning behind these changes. Participants then watched the video for a third time, rated the level of anxiety and then completed a state anxiety questionnaire for their conversational partner.

Her research has uncovered some interesting results. Basing her work on past literature, Jillian hypothesized “that state anxiety (anxiety during the conversation) would be higher in male-female dyads, however, we found that state anxiety was actually higher among female-female dyads than male-female dyads.” The study also illustrated a theme which she refers to as “Disinterest” between the male-female dyads that did not occur within female-female dyads. This refers to the idea that males and females were talking about different things or had different interests, but they had also shown little interest in learning about what their partner was talking about.

Jillian says that her experience with CBU students and faculty has made her more confident in her own abilities and she recommends the research assistantships to all students, “Anyone who has the opportunity to become a student researcher at CBU should do it. You get to learn a lot of interesting and unique ways to collect and analyze data and the process of doing a research project from start to finish. You also get to meet and work with a lot of wonderful staff and fellow student researchers!”

Jillian’s year long research project was successful thanks to the help and support of supervisor Peter MacIntyre and fellow researchers Gillian Potter, Rebecca Blackie and Samantha Iannetti.

# PROTECTING OUR BUILT HERITAGE —

## RESEARCHING THE HISTORY OF COMPANY HOUSES



“I have learned a lot about myself and my work ethic in general by being a research assistant.”

# charmaine

## DEAN

Cape Breton’s once booming coal and steel industries have gifted the area’s post-industrial landscape with a unique built heritage. There are more than 800 vacant buildings in the Cape Breton Regional Municipality, many of which are classified as “company houses” – houses which were owned by the coal and steel companies and rented out or bought by their employees. Second year Communications major Charmaine Dean has been employed as a research assistant in a project which examines the development of company houses in a Glace Bay neighbourhood, renovations over time, and the history of the families who lived in them.

Charmaine, who is supervised by Dr. Andrew Molloy and Dr. Tom Urbaniak, has been doing research for a

larger project through the not-for-profit program “Home Match” that works to renovate vacant homes. She was introduced to the topic through a Political Science class, Issues in Local Government, taught by Tom Urbaniak. Part of the course requirement was to research an aspect of how people lived during the industrial boom and during difficult times. Students in the class became involved in a CBU/NSCC design competition for a donated company house near downtown Glace Bay. Thanks in part to the students’ efforts, this home was formally designated as a heritage property by the Cape Breton Regional Municipality and is currently being renovated for affordable housing with the help of volunteers and donors.

Charmaine’s work has continued into the summer of 2011 where she is researching changes over time, as well as local assets, on Mechanic and Foundry Streets in Glace Bay. Her research methodology relies heavily on archival research and the oral narratives of her interviewees, “First I did basic background research using the Beaton Institute and other names that were given as primary sources by my supervisors. I look[ed] at other museums such as the Town Hall and the Miners’ Museum, and through those places I met people that knew others that had information and it began to snowball.”

Charmaine has been enjoying the experience of interviewing and the community feedback has been very positive: “People are able to see the progress of the house, and see how it will benefit the community when it’s finished. They want to help in any way they can and they love to tell their stories, knowing that I want to listen and learn from them.” Connecting with people is an important part of the learning experience for Charmaine and she says, “it’s that the people I meet every day that makes the work exciting for me.”

Charmaine attributes some of her successes to the help she has received from supervisors Andrew Molloy and Tom Urbaniak, but also “the volunteers at the house who are working with Habitat for Humanity and the CBU/NSCC Housing Applied Research Group, as well as contractor Harold Daigle, and Joyce Rankin – all have been fantastic to speak and work with.” Charmaine will continue her studies at CBU and she feels that the challenges she has tackled throughout this process have prepared her for work inside and outside of the classroom.

“When I look at the results and the work I have done, I can see that I am capable of doing whatever I put my mind to. I have been able to learn a lot about myself and my work through this research assistantship!”

# summer

## RESEARCHERS EMPLOYED @ CBU

1. Stephen McIsaac – Joseph Parish – Anthropology & Sociology
2. Ernesto Carillo – Avis Mysyk – Anthropology & Sociology
3. Samantha Lawrence – Tim Rawlings – Biology
4. Amy Lamb – Sean Modesto – Biology
5. James Postlethwaite – David McCorquodale – Biology
6. Jeff MacDonald – David McCorquodale – Biology
7. Jimmy Furlong – David McCorquodale – Biology
8. Alison Donovan – Robert Bailey/  
David McCorquodale – Biology
9. Kari Everett – Robert Bailey – Biology
10. Jimmy Furlong – Robert Bailey – Biology
11. Jeff MacDonald – Robert Bailey – Biology
12. Jennifer Latimer – Vicky Salazar/  
David McCorquodale – Biology
13. Chris McQuaid – Bruce Hatcher – Bras d’Or Institute
14. Jeff Locke – Bruce Hatcher – Bras d’Or Institute
15. Stacey Pettipas – Bruce Hatcher – Bras d’Or Institute
16. Rachelle Porter – Bruce Hatcher – Bras d’Or Institute
17. Kelcie Lahey – Bruce Hatcher – Bras d’Or Institute
18. Dave Woodland – Bruce Hatcher – Bras d’Or Institute
19. Jessica Prendergast – Stephanie MacQuarrie – Chemistry
20. Matthew Bennett – Stephanie MacQuarrie – Chemistry
21. Chris Keefe – Stephanie MacQuarrie – Chemistry
22. Caitlin Fraser – Stephanie MacQuarrie – Chemistry
23. Mary Tait – Stephanie MacQuarrie – Chemistry
24. Preston MacQueen – Stephanie MacQuarrie – Chemistry
25. Chris MacLean – Stephanie MacQuarrie – Chemistry
26. Sam Lloy – Matthias Bierenstiel – Chemistry
27. Tiffany Wilcox – Dale Keefe – Chemistry
28. Cara Andrews – Dale Keefe – Chemistry
29. Jean Gillis – Dale Keefe – Chemistry
30. Margaret Gillis – Dale Keefe – Chemistry
31. Erica Campbell – Dale Keefe – Chemistry
32. Karan Pahil – Dale Keefe – Chemistry
33. Chris Barron – Godwin D’Cunha – Chemistry
34. Ben Johnstone – Godwin D’Cunha – Chemistry
35. Kelsey Aucoin – Allen Britten – Chemistry
36. Christopher MacKenzie – Adango Miyadonye – Chemistry
37. Brittany MacDonald – Adango Miyadonye – Chemistry
38. Qi Xu – Jaime Martell – Chemistry
39. Matthew Larade – Jaime Martell – Chemistry
40. Courtney Thorne – Tanya Barrett – Communications
41. Grace MacNeil – Tanya Barrett – Communications
42. Antje Freund – Christian Wolkersdorfer – Engineering
43. Nicole Prince – Christian Wolkersdorfer – Engineering
44. Jenna LeBlanc – Christian Wolkersdorfer – Engineering
45. Jessica MacSween – Christian Wolkersdorfer – Engineering
46. Martin Bantele – Christian Wolkersdorfer – Engineering
47. Carolina Winter – Christian Wolkersdorfer – Engineering
48. Joshua Shelley – Christian Wolkersdorfer – Engineering
49. Alexander Rudiuk – Ed Barre – Health Studies
50. Heather Green – Andrew Parnaby – History & Culture
51. Jessie MacDonald – Ian Brodie – History & Culture
52. Sheralynne Deveaux – Richard MacKinnon – History & Culture
53. Scott Collins – Heather Sparling – History & Culture
54. Ian Hayes – Chris McDonald – History & Culture
55. Jasmine McMorran – Chris McDonald – History & Culture
56. Daniel Boudreau – James Preen – Math, Physics & Geology
57. Charmaine Dean – Andrew Molloy/  
Tom Urbaniak – Political Science
58. Gillian Potter – Peter MacIntyre – Psychology
59. Jillian Burns – Peter MacIntyre – Psychology
60. Leah MacIsaac – Rachel Baker – Psychology
61. Steven Pace – Geoff Carre – Psychology
62. Paula LeBlanc – Geoff Carre – Psychology
63. Meaghan Higgins – Erin Roberston – Psychology
64. Kevin MacDonald – Erin Roberston – Psychology
65. Kelsey Morrison – Erin Roberston – Psychology
66. Suzanne Myers – Erin Roberston – Psychology
67. Lucy MacDonald – Rubina Ramji – Philosophy & Religious Studies
68. Isabella Yuan – Harvey Johnstone – Shannon School of Business

# research GROUPS @ CBU



## Keefe Research Group

The Keefe Research Group is interested in a variety of projects involving molecular spectroscopy and computational chemistry covering many aspects of physical chemistry.

**Back L-R:** Dr. Dale Keefe, Karan Pahil, Erica Campbell, Tiffany Wilcox, Cara Andrew **Front L-R:** Jean Gillis, Margaret Gillis



## D'Cunha Research Group

The D'Cunha Research Group carries out research in the field of Protein and Enzyme Biochemistry: Structure, function, purification, stabilization, characterization, and clinical and industrial applications.

**L-R:** Chris Barron, Ben Johnstone, Dr. Godwin D'Cunha



## Mine Water Remediation & Management

CBU's Mine Water Remediation and Management team investigates the hydrogeochemistry and hydrodynamics of mine water. In particular, we investigate the 1B mine pool of the flooded Sydney Coal Mine Field. It is there that a passive mine water treatment system exists, consisting of a settling pond and an aerobic wetland. The Mine Water team ensures that this system is monitored properly by routinely conducting flow measurements, as well as a Settling Pond Test which will look at a wide range of parameters, such as electrical conductivity, iron, or pH. In addition, our research team is using a Geographical Information System (GIS) to georeference and vectorize local mining maps, processing and recording data, measuring the stratification of underground flooded mines, and conducting tracer tests.

**L-R:** Nicole Prince, Martin Bantele, Jenna LeBlanc, Dr. Christian Walkersdorfer, Jessica MacSween, Joshua Shelley, Antje Freund



## MacQuarrie Research Group

The MacQuarrie Group conducts research which combines two important fields, functionalized nanomaterials and catalysis. By preparing proline or N-heterocyclic carbene (NHC) based monomers and incorporating them into silica based nanomaterials (Scheme 1) greener, reusable, recoverable, heterogeneous organic catalysts are being developed.

**L-R:** Chris MacLean, Jessica Prendergast, Chris Keefe, Mary Tait, Dr. Stephanie MacQuarrie, Preston MacQueen, Matthew Bennett, Caitlin Fraser

# THE ITCHY TRUTH —

## WHAT DO DIGENEAN TREMATODES MEAN FOR FRESH WATER LAKES?



“Only a year ago, I was just learning about trematodes. Now I feel like a trematode savant and I really enjoy sharing my knowledge with people!”

## samantha LAWRENCE

You might want to read this before you consider a swim in your local fresh water lake. CBU student, Samantha Lawrence, a recent graduate of the BSc (honours) in Biology program has been studying a group of parasitic flatworms called digenean trematodes. For Samantha’s study, she examined the ecosystems of freshwater snails, as they are intermediate hosts to most of the 18,000 known species of trematode, “I set out to determine their diversity within a local freshwater lake by studying the free-swimming cercarial larval stages that are shed from freshwater snails as part of the parasite’s natural lifecycle.”

What are digenean trematodes? They are “parasitic flatworms in the phylum Platyhelminthes and many

of us have encountered the parasite in nature and have not even realized it. Swimmer’s Itch, which many you may have gotten while swimming as a child, is caused by species of digenean trematodes.”

When people go swimming, the cercariae, or the larval form of the parasite, infect their definitive host, a duck. When the cercariae mistake swimmers for a duck, they may try to burrow into his or her skin. This elicits an immune response and the swimmer gets a rash known as cercarial dermatitis or Swimmer’s Itch.

“For the past two decades at least, a sign at Blacketts Lake has warned us that we may get Swimmer’s Itch if we enter the lake. This suggested to me that at least one species of trematode is present within the lake, which made it an ideal place to begin my research.”

Samantha and her supervisor, Dr. Timothy Rawlings, went into the field once a month and trudged through the lake for an hour, allocating snails on vegetation and in the mud with the help of a dip net, “I was visited by ducks, leeches and a variety of insects during my sampling, but overall it was an enjoyable experience!”

Her study revealed that “four snail species were infected with seven species of trematode. Of these seven, she identified four of these trematodes to genus level and inferred lifecycles for these parasites. And yes, one belonged to the genus *Trichobilharzia*, which is one of two genera known to cause Swimmer’s Itch in North America!”

Samantha has since moved on from her thesis research, but looks forward to her future studies, “My plan is to apply to vet school. Prior to my research, I was interested in small animal medicine, but I am now considering research, wildlife biology or aquaculture. If vet school isn’t in the cards for me, I would like to study parasitology at the graduate level.”

Samantha’s supervisor Dr. Rawlings was a huge support for her throughout her studies at CBU and she adds that, “I cannot thank my supervisor, Dr. Timothy Rawlings, enough for the help he has given me over the last year and a half. From sampling in Blacketts Lake, to looking over the hundredth draft of my thesis, to assisting me when I had problems, I want to say thank you.”

# PUTTING THE FUN IN *FUNDULUS* —

## A STUDY ON COASTAL FIELDWORK IN THE ATLANTIC REGION



“When starting a research project in an area that really excites and interests you, your results can sometimes lead to more questions than answers!”

# jennifer

## LATIMER

Many of us are familiar with gene manipulation, cloning, and hybrids through futuristic science fiction movies; however this is a “virtual reality” for CBU student Jennifer Latimer. Jennifer, a recent graduate from the BSc Biology (Honours) program, has spent her last year at CBU using molecular biology techniques to characterize populations of *Fundulus* killifish, particularly the model organism the mummichog (*Fundulus heteroclitus*) and its hybrid offspring with the banded killifish (*Fundulus diaphanus*). Under the supervision of Dr. Katherine Jones and Dr. Michael Tanchak, Jennifer has been examining sites along the Atlantic coast of North America in order to identify and characterize hybrids of the mummichog and the banded killifish. In doing this, she has also been

able to explore and understand the gradual changes within the mummichog throughout the Atlantic region.

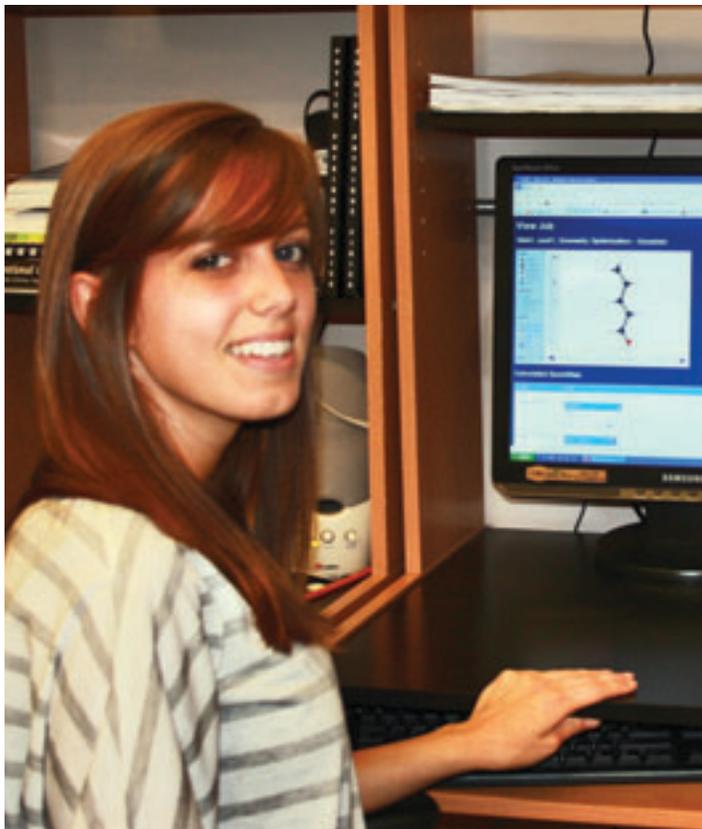
Jennifer became interested in the project after receiving an NSERC USRA grant. The NSERC USRA grant allows students to choose from a variety of research projects in their discipline. Jennifer says that she had decided to work with Dr. Jones and Dr. Tanchak because, “The project gave me a chance to explore molecular biology techniques which I became interested in during my third year when I took a course in Gene Manipulation taught by Dr. Tanchak. The field sampling in estuarine habitats that would be involved in the project really appealed to me. I love field sampling and have always had a keen interest in marine organisms.”

In order to prepare for her field research, Jennifer had to first understand the ecology of the killifish and learned how to identify their habitats in order to find appropriate sampling sites for her project. While she learned a lot in the classroom, it wasn’t until she got out into the field that she was able to put her studies to work—“I learned the practical hands-on skills required to carry out these techniques, independently during my research experience.”

Jennifer will return to school in order to pursue a Master of Science degree, but she’ll be leaving her mummichogs and banded killifish behind, “I was interested in two career path options: either pursuing a research-based career in animal physiology or entering a MSc (Physiotherapy) program and becoming a physiotherapist. After much thought, consideration, and weighing of my options I made my tough decision and decided to accept an offer to Dalhousie’s MSc (Physiotherapy) program.”

Jennifer is currently working under another NSERC USRA grant with her supervisor Dr. Vicky Salazar where both are studying the effects of androgens on the aggressive behavior of the weakly electric gymnotiform fish, *Brachyhypopomus gauderio*. Jennifer also acknowledges the help she received from Dr. Katherine Jones throughout her education at CBU, “She was always so enthusiastic about research and went above and beyond in teaching her students. She really makes research and science exciting for undergraduate students, children, and the general public. She helped me to realize how stimulating and rewarding research can be!”

## BONDING WITH MOLECULES — (AND CREATING GOOD VIBRATIONS)



“You get a lot of experience with one small little project which makes all the things you learn in class relevant and a lot easier to understand.”

### margaret GILLIS

For some of us a summer of formulas, theories, and equations might sound daunting. However, chemistry student Margaret Gillis would beg to differ. Margaret is a student under the supervision of Dr. Dale Keefe and has been performing computational studies of intramolecular hydrogen bonding. More specifically, Margaret has been studying the conformers of 2,4-pentadienal. Chemistry plays an important role in understanding the relationships between humans and their food which is why Margaret is observing 2,4-pentadienal. For those of us unfamiliar with chemical bonding, 2,4-pentadienal is commonly used as a flavouring agent in foods. As a two-time recipient of NSERC USRAs, Margaret has been funded to work in this research position for the past two summers.

One of the unique aspects of her project is that because of its theoretical nature, much of her work has been based on calculations done in the lab. The data Margaret obtains from calculations using geometry optimizations, vibrational frequencies and energy scans of certain molecules by a computer program named Gaussian 03, is used to interpret the properties and behaviours of specific molecules. And all of this work is no small feat for an undergraduate student!

After attending the Atlantic Theoretical Chemistry Symposium in August of 2010, Margaret noticed that her work was comparable to much of the studies being conducted by students at the graduate level. Thanks to the research positions being given to students at CBU, Margaret believes that it, “gives you a chance to perform research at the undergraduate level that is similar to what graduate students do and it really prepares you for what graduate school will be like.”

It has been her research experiences at CBU which have contributed to Margaret’s growth as a student and she adds, “the students at CBU are lucky to have so many opportunities to present our work which gives us not only the experience of sharing our work, but the skills to communicate, be confident and perform at higher levels.” It’s no surprise that graduate studies will be in Margaret’s future, but she affirms that it was the support and guidance she has received throughout her undergraduate degree that has given her the foundation she needs to move forward. Thanks to the guidance of supervisor Dr. Dale Keefe and the fellow students who have participated in the Keefe Group, Margaret believes that she is well on her way to reaching the career goals she had once only dreamed about!

# A TRADITIONAL GIRL IN A MYSTICAL WORLD —

## STUDYING PLACE IN MI'KMAQ LEGENDS



“Discussing research is so important and CBU is an establishment that allows its students to do this in a comfortable, supportive environment.”

## heather GREEN

Cape Breton’s history of oral tradition goes back thousands of years. The connection between this tradition and Cape Breton’s Aboriginal community has been the topic of research for recent CBU History graduate Heather Green. For the past year, Heather has been employed through a partnered internship between the Unama’ki Institute of Natural Resources and Parks Canada. Through this internship, Heather has been able to explore the memory of place through Mi’kmaq legends. More specifically, her research has focused on analyzing the legends associated with Kluskap, the Mi’kmaq cultural hero, and Kluskap’s Cave. Her work continues to be an important part in securing a Historic Sites and Monuments Board of Canada (HSMBC) cultural landscape nomination for Kluskap’s Cave.

The topic of Aboriginal history has been something which has always interested Heather, but she had been hoping for a space to apply that knowledge and build upon her skill set. Heather says, “This research gave me the ability to do [that]. It required me to put the skills I have developed over the course of my undergraduate degree into practice. It also required me to develop my own research methodology, and be involved with various organizations outside of the University.”

Community engagement is quickly becoming a large part of what happens within the historical discipline. More research is being done to foster relationships between the institution and the world beyond the Ivory Tower. Being a part of that relationship has been a personal desire for Heather. She says that she has always seen her research as “working toward something.” This becomes evident as Heather moves on to her graduate studies. She has received MA funding through a SSHRC Canada Graduate Scholarship and will be attending Memorial University in September of 2011 for their Master of Arts in History program. She has accepted a research position working with Dr. John Sandlos and ArcticNet on the Abandoned Mines project. This research will focus on the social and environmental legacy of de-industrialized sites (such as abandoned mines) on Aboriginal communities in Canada’s North, a project that illustrates the importance of studying environmental matters in their historical contexts.

Heather’s future looks bright, but she says it would not have been possible without the support of family, friends, and the faculty at CBU. There are many individuals who have helped her throughout her time at CBU and she is thankful for those at the Beaton Institute, UINR, Parks Canada, and finally the faculty in the Department of History. She credits the supportive and encouraging atmosphere as an important factor in her own successes, “Thank you Graham Reynolds and Andy Parnaby for the support – an ‘open door’ policy makes all the difference to students with many questions to discuss!”



Every Wednesday throughout the summer, students doing research at CBU participated in the Student Summer Lecture Series (SSLS). Organized in conjunction with ORGS' Student Research Coordinator and Dr. Geoffrey Lee-Dadswell, the SSLS enabled students and professors to present their research in an informal setting to both faculty and peers. Throughout the summer we have seen presentations by students from the departments of biology, chemistry, psychology, history and others.



## STATISTICAL PHYSICS & ACOUSTICS

# geoffrey LEE-DADSWELL

Geoff's research generally falls within a branch of statistical physics that is referred to as "transport theory." His main area of research is heat transport in one-dimensional systems. He recently published a paper in this area with three CBU students listed as coauthors: G. R. Lee-Dadswell, E. Turner, J. Ettinger and M. Moy, "Momentum conserving one-dimensional system with a finite thermal conductivity," *Physical Review E*, Vol. 82, 061118, (Dec., 2010). Geoff has also been carrying out research funded by the Offshore Energy Environmental Research Association, investigating the impact of seismic testing on marine invertebrates. Currently Geoff is initiating a new research project attempting to use statistical physics to investigate stability of power grids. Geoff has also played a pivotal role in the student lecture series since its beginnings and continues to participate in many student-supported research events for the sciences and CBU. **THANKS GEOFF!**



## SURF's *Up!* 2012

Looking to showcase your research?  
Don't miss out on an opportunity to participate in Cape Breton University's Research Forum and Showcase during Research Week, March 19-23, 2012.

This is a unique opportunity for CBU students to present their research and course projects.

- Present research and projects in a public forum
- Invaluable experience in the delivery of papers
- Poster presentations
- A non-threatening academic setting
- An academic opportunity outside the norm of larger institutions

*Submissions are sought for oral presentations, poster presentations and course project presentations. Oral presentations should be 15 minutes in length followed by a short question period.*

Deadline for submissions is **March 1, 2012** and all research must comply with CBU's policy on Ethical Conduct for Research Involving Humans.

For more information, contact Brenda Leloup, Office of Research and Graduate Studies, Cape Breton University at [brenda\\_leloup@cbu.ca](mailto:brenda_leloup@cbu.ca) or [www.cbu.ca/research](http://www.cbu.ca/research)

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