SGES Leads McMaster’s Role in the CFREF Global Water Futures Program

by Dr. Sean Carey

It was good news for SGES and McMaster University that University of Saskatchewan led proposal entitled ‘Global Water Futures: Solutions to Water Threats in an Era of Global Change’ (GWF) was funded by the Federal Government through the Canada First Research Excellence Fund (CFREF). This $143 million, multi-university project, with $78 million directly from CFREF, will work to transform water science, policy and engineering in Canada through better understanding and tools.

McMaster University contributed just over $12M to this initiative, and researchers in SGES are poised to play a strong role. This fall, stakeholder meetings will be held with proposals to follow and programs rolling out in the new year. As the programs are meant to be multidisciplinary, there is an opportunity for researchers across the university interested in water to participate.

GWF’s overarching goal is to deliver risk management solutions - informed by leading-edge water science and supported by innovative decision-making tools - to manage water futures in Canada and other cold regions where global warming is changing landscapes, ecosystems, and the water environment. End-user needs will be will drive strategy and help shape the science as the project focuses on three main goals:

1. Deliver new capability for providing disaster warning to governments, communities and the public, including Canada’s first national flood forecasting and seasonal flow forecasting systems, new drought warning capability, and water quality models and monitoring that warn of hazards to health and drinking water supply;

2. Diagnose and predict water futures to deliver improved scenario forecasting of changing climate, landscape and water for the future, with information outputs tailored to the needs of users.

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Director’s Corner
by Dr. Bruce Newbold

Dear Friends of SGES,

Another academic year has started, and our hallways are buzzing with the excitement that the new year brings. Although we continued to be challenged by budget issues, there is much to be excited about. Enrollment in our new Co-op program is off to a great start, with 18 new students enrolled this fall semester, complementing the 10 that started in 2015. Across the School, program enrollment is strong. As always, our faculty and graduate students conduct cutting-edge research on issues including water, climate change, transportation, health, and population. A particularly noteworthy development on the research front is the major new CFREF initiative, “Global Water Futures: Solutions to Water Threats in an Era of Global Change”, led at McMaster by Dr. Sean Carey. This research initiative promises to involve multiple faculty from within SGES and the broader campus. SGES is also one of Esri Canada’s Centres of Excellence in Higher Education for GIS, reflecting our excellence in research and instruction in GIS. More on some of the exciting research agendas are included in the following pages.

Despite the loss of faculty and the difficult budget situation, our focus is firmly on the future of the School. We are drafting new program initiatives that will not only strengthen our core programs, but lead us in new directions, particularly in the areas of GIS and the environment, two areas that we have recognized strengths in. Over the past year, we have also continued to interact with our many alumni, both locally and across Canada, showcasing our programs and ambitions. The ability to do this reflects the greatest asset in our possession – people. We are thankful to everyone – past and current – for your contributions to the School and its community.

We were saddened by the passing of Dr. Pavlos Kanaroglou in the spring of this year. Pavlos’ career at McMaster spanned some 25 years, and he was well known for his teaching and research contributions related to GIS, spatial analysis and transportation. Pavlos was a Tier 1 Canada Research Chair, past Director in the School of Geography and Earth Sciences and founding Director of the McMaster Institute for Transportation and Logistics (MITL). In his memory, the Kanaroglou family has established the Kanaroglou Memorial Graduate Scholarship to be awarded to a graduate student working in the McMaster Institute for Transportation and Logistics.

In the area or have a comment? I would love to hear from you and/or have you visit the School.

Bruce Newbold
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SGES Re-Introduces its Co-Op Program
by Pat DeLuca

The 2015-2016 academic year saw the re-emergence of co-operative education in the School of Geography and Earth Sciences. This first cohort, purposefully kept to a small number, saw seven students enroll across three different co-op programs offered by the School. McMaster’s co-op program offers students many advantages, including courses in Professionalism in the Workplace, access to one-on-one coaching and support throughout the duration of the program, and work placements that are 8 months long, ensuring the students are fully immersed in their workplace. One student, Joel Chung (Class of 2018), shared his experience from his work terms which took place from January 2016 – August 2016:

“The McMaster Co-OP experience was overall extremely satisfying for me. I worked for Environment and Climate Change Canada in the Products Division in Gatineau, Québec, where I worked on database management on industries, social-economic data gathering initiatives on toxic substances such as lead in ammunition and jigs and sinkers, and contract development for these toxic substances. Throughout my work term, I improved on skills such as data management, proficiency in spreadsheets, technical writing, and research. I also learned how to work in an office environment collaborating and communicating with other coworkers. I also improved on my French speaking skills and overall presentation skills (in English and in French). Furthermore, I networked extensively throughout the department, exploring other divisions such as Wastewater and Mining & Processing. Further, I learned about the process of entering the public sector after I graduate, which is something I am looking forward to doing. The experience and networking that I gained during my time there is priceless, as there is a good chance they will “bridge” me over to full-time job when I graduate. I realized that the public sector was truly what I wanted to do in the future. I would suggest anyone who has the opportunity to take Co-OP to do so; it is worth it. You will gain insight on what you want to do, and how to get to where you want to be in the future”.

This first cohort will enter their second work term in May, 2017 and complete it in December, 2017. Meanwhile, a new cohort of 18 students is set to begin their work first work terms in January, 2017.
SGES Museum Day for prospective students
by Dr. Maureen Padden

Very few students have had a chance to visit our geologic storage room, which houses our substantial collection. This collection of fossils, minerals and rocks, collected over decades, is usually tucked carefully away and selected samples are used for classes. In February, we staged a pop-up museum day in our teaching lab and pulled out some of the most spectacular samples for everyone to explore.

Over 200 guests, mainly undergraduate students, visited the museum open house. Visitors also included grad students, faculty and a dean was spotted near the reef section of the room. SGES grad students circulated during the event, explaining how our samples are used for research and answering many curious questions.

Snacks and door prizes were organized by the Outreach Committee and added to the festive atmosphere. Museum Day 2016 was an event to celebrate something that makes our School special—our beautiful collection of samples and the understanding of Earth history that flows from them. There are plans to make this an annual event.

Below, graduate students volunteering in the “rock room” with... Left: Brachiopod fossil from the Invertebrate Fossil collection; Top Right: Shale sample from the Sedimentary Rock collection; Bottom Left: Conichalcite from the Christianson Collection; Bottom Right: Pyrite sample from the Mineral collection (Photos by Lisa Leoni and Maureen Padden).
Dr. Niko Yiannakoulias came to McMaster University in 2007 after completing his PhD at the University of Alberta in 2006. His primary fields of interest include medical geography, injury epidemiology and geo-computation techniques for the social sciences. He has developed and applied methods for analyzing spatial patterns of disease (including cancer, cerebrovascular disease, asthma and Parkinson’s disease), solving political districting problems, geographic crime profiling and public health surveillance.

Dr. Yiannakoulias’ research has been funded by the Social Sciences and Humanities Research council (SSRHC) and the Public Health Agency of Canada (PHAC).

Q. Where did you grow up?
Mostly in Alberta, Manitoba and Saskatchewan.

Q. What was your first job?
Working in a restaurant.

Q. What is your educational background?
A BA in political science, and a Masters and PhD in Earth and Atmospheric Science at the University of Alberta. I also did a 2 year after-degree in environmental science between my BA and Masters.

Q. What brought you to McMaster?
An offer of employment.

Q. What is your research focus?
Understanding interactions between environment and people, with a focus on health, crime and risk analysis.

Q. Where is your research going?
I am currently interested in advancing the field of experimental geography – specifically, using computerized experimental tools to understand spatial decision making in a variety of applications in the social and environmental sciences.

Q. What is the biggest challenge that your research faces?
I have a very broad set of academic interests, and would benefit from narrowing my focus somewhat.

Q. What do you enjoy most about teaching?
I take great satisfaction in helping students learn things that they will find interesting or useful in their lives. This includes teaching them things that will advance their careers as students and in the workforce, but also helping them to make more informed decisions about the world.

Q. What inspires you to teach?
I feel that attending university was central to my success and happiness in life; I want to share that experience with as many students as I can.

Q. What keeps you enthused about your career?
Engaging graduate and undergraduate students in research that they find inspiring.

Q. How do you manage stress?
I try to avoid stress by hitting any time deadlines well in advance. This is why I don’t have to do anything last minute.

Q. Besides work, what are your passions?
My wife and daughter are the most important things in my life. I am also a musician (I play guitar, piano, and some other instruments) and am an amateur luthier (I make guitars and other string instruments).

Q. What is the best advice you’ve been given?
Don’t give unsolicited advice.
Dr. Ed Reinhardt is a professor at McMaster University’s School of Geography and Earth Sciences. He is a micropaleontologist studying how groundwater condition changed over climate cycles using cave sediments. His recent research in the Yucatan of Mexico focusses on reconstructing the potability of groundwater through drought cycles during the late Holocene. This has implications for the decline of Maya civilizations but also for future groundwater management in the coastal zone.

Q. Where did you grow up?
Ottawa

Q. What was your first job?
Bicycle mechanic

Q. What is your educational background?
BA in Interdisciplinary Studies from Carleton University, PhD in Earth Sciences Carleton University.

Q. What brought you to McMaster?
To work with Mike Risk, Henry Schwarz and Alan Dickin and the world class isotope facility.

Q. What is your research focus?
Right now, I am focused on understanding how groundwater was impacted by climate change and its role in the demise of the Classic Maya in the Yucatán.

Q. Where is your research going?
I obtained a CFI grant for a new ITRAW core scanner that allows us to analyze cores at much higher time resolution than before. This has opened new avenues of research for spatial and temporal analysis of environmental change.

Q. What is the biggest challenge that your research faces?
Physical access. We are diving in aquatic caves that have vast tunnel systems. It takes specialized scuba diver training to do this safely and to accomplish complex research tasks underwater.

Q. What do you enjoy most about teaching?
Mentoring students to achieve their life goals.

Q. What inspires you to teach?
Research, if I can inspire excitement in the earth sciences some may decide to continue as graduate students and researchers.

Q. What keeps you enthused about your career?
The ability to pursue exiting avenues of research. I find it fascinating to go back in time and reconstruct environmental change from sediment cores. New instrumentation and techniques are allowing us to better understand climate change and anthropogenic impacts which are pressing societal issues.

Q. How do you manage stress?
Doing Crossfit – keeps me in shape for working in the field. Carrying scuba tanks through the jungle isn't easy on the back, so core strength is important.

Q. Besides work, what are your passions?
Motorcycle racing. Going fast on the track is nearly as exciting as taking sediment cores.

Q. What is the best advice you’ve been given?
Gerry Middleton gave me this advice not long after arriving at McMaster. Change your research focus every 10 years, it keeps you enthusiastic and engaged.
In Memory of Dr. Pavlos Kanaroglou

Pavlos accepted a position in 1990 with the School of Geography and Earth Sciences which became his home for 25+ years. Pavlos was a Tier 1 Canada Research Chair, past Director in the School of Geography and Earth Sciences and founding Director of the McMaster Institute for Transportation and Logistics (MITL).

Pavlos had a long and distinguished academic career. He was an outstanding role model to his students and in many cases had tremendous impact on their personal and professional development.

In recognition of Pavlos’ work, the Kanaroglou Memorial Graduate Scholarship will preserve Pavlos’s legacy and promote his life’s work for years to come. Beginning September 2017, the Kanaroglou Memorial Graduate Scholarship will be awarded to one graduate student annually. This award will honour Dr. Pavlos S. Kanaroglou, (Professor Emeritus), for his invaluable contributions to research and education in the study of Geography and Earth Sciences at McMaster University. It is to be awarded to a graduate student working in the McMaster Institute for Transportation and Logistics.

Additional gifts will serve to increase the value of this scholarship, and can be made securely at: www.ifundmac.ca

In 2016 the ECCE was quite active with outreach, education and research. With respect to outreach we hosted several high schools in our annual GIS Day in December, a group of gifted high school students in July, where they learned what GIS Day is and completed a site selection problem, locating land for a winery and took part in the McMaster Environmental Crawl, where over 70 people from the community visited the GIS Labs to learn about GIS in research in the School. Several students attended the annual ESRI Canada User Conference this past October 5th (17 attendees from SGES in total), 2 students went to Palm Springs for the ESRI Developer Summit last March, and over 20 people attended ESRI’s Education conference last school year, with 16 of the approximately 30 presentations by either current or former McMaster students.

Our students were very successful in competitions sponsored by Esri Canada this past year. First for the Esri Young Scholar Award, where students have to submit a poster highlighting their research, we had 4 of the top 9 submissions. Second, each year, each of the ECCEs across Canada are required to participate in the Annual App Challenge, where students form groups to create apps based on GIS technology.

In March, we had 12 students in 4 teams participate in the challenge, with all four finishing in the top 12 out of 27 teams. Our best finisher, consisting of Anastassios Dardas, Karl Chastko and Spencer Elford finished in third place. You can check out their app (and our other submissions) at https://sciwebserver.science.mcmaster.ca/gislab/ecce.html

One of two GIS labs at McMaster University. Photo by Haley Spennato
SGES Leads McMaster’s Role in the CFREF Global Water Futures Program Continued

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3. Develop new models, tools and approaches to manage water-related risks to multiple sectors, integrating natural sciences, engineering, social and health sciences to deliver transformative decision-making tools for evidence-based responses to the world’s changing cold regions. In summary, GWF will position Canada as a global leader in water science for the world’s cold regions, where snow, ice, and frozen soils control the storage and release of water, and as a global partner of choice for transdisciplinary water research. More information on the project can be found at http://gwf.usask.ca

PhD student Nadine Shatilla conducting research in the Yukon this past summer. Photo taken by Renee Lemmond.