

A Celebration of the Environment
University of Windsor 2005

TO GREATER HEIGHTS

Pinnacle

THE ENVIRONMENT

Motivated and energized

Undergrads pursue environment studies

Leaders in knowledge

When it comes to large lakes, nobody knows 'em better

Partnerships a win-win

Working with organizations in the community and around the globe, Windsor researchers reach new heights



UNIVERSITY OF
WINDSOR



MESSAGE FROM PRESIDENT ROSS PAUL

It is my firm belief that the environment is the issue of the 21st Century. Especially since Rachel Carson's *Silent Spring*, first published in 1962, we have become increasingly aware of the delicacies and beautiful balances in our natural world and how badly we can take them for granted and damage them. At the same time, study and research has increasingly shown us that we can reverse the many dangerous trends, that nature is strong and that every individual can make a real difference to the quality of world in which we live.

The University of Windsor is proud to have the environment as one of its three pinnacle areas and it is a fitting choice for this, the inaugural edition of *Pinnacle*, especially because it plays such a central role in so many aspects of campus life. The contents of this issue reflect only a small sample of the programs of study, research and campus activity that are environmentally based.

Environmental issues are central to a number of degree programs, notably Environmental Engineering, Environmental Studies, Biological Studies and the research being conducted at the Great Lakes Institute for Environmental Research (GLIER). Courses in Philosophy, Education, Business, Political Science, Human Kinetics and many others are built around environmental issues and approach many complex issues on an interdisciplinary basis.

The interest is not restricted to the classroom. The University uses only natural ingredients to control weeds and is developing an environmental policy; the Green Corridor project celebrates a natural environment and encourages ecological practices across campus and in the community. There are student-led campus pride groups working to beautify and respect our campus.

Underpinning the work in advancing our knowledge of environmental change is the financial support available to students. Without financial awards such as scholarships and bursaries, many of our best students would not be here and our contributions would be far less. This magazine is our way of thanking all of those who have contributed generously to scholarship funds and endowments and encouraging your continuing support, based on the sorts of activities and results depicted in these pages.

The true winners are our young people and all the citizens of tomorrow. We are working together for a better Windsor.

Dr. Ross Paul
President, University of Windsor

To Greater Heights Pinnacle The Environment

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TO GREATER HEIGHTS Pinnacle THE ENVIRONMENT

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UWindsor graduate finds answers blowing in the wind

Alumnus Son Nguyen returns to university eager to clear the air.

Smog. Air pollution. Call it what you will. It's the combination of tiny particles and ozone gas.

For years, at stations across the Windsor/Essex County region, the Ontario Ministry of the Environment (MOE) has tracked and measured the build-up and clearing away of these particles with the changes in the winds, the temperature and precipitation.

Everyone knows it's a growing threat to good health. One report using this data showed a rise in hospital visits – and even deaths – related to respiratory problems when the readings were high.

Son Nguyen believes the MOE data can tell us much more. He wants to put it to use to help us make decisions that could reduce the build-up to high levels and the potential for increased health problems.

Nguyen was one of nine graduates of Windsor's first class in Environmental Engineering in 1991. His co-op placement with Ford Motor Company led straight to a job as plant environmental control engineer. He has worked with Ford ever since.

In 1997, Nguyen handled hazardous material management and transportation at the Ford Global HazMat Office. From

1998 to 2002, posted in Taiwan, he set up the compliance program and other hazardous material initiatives at 42 facilities in 11 countries in the company's Asia Pacific region. On some trips, he'd need to pack for both the winter in Korea and summer heat in Australia. He trained Ford's local people in the hazardous material processes and programs, including his replacement. Today he is back in North America and responsible for advancing environmental compliance programs and innovative initiatives for all the Ontario Ford facilities, from St. Thomas to Windsor, and for the Ford research centre in Dearborn.

Despite these responsibilities, for the last two years he's also been working on his Master of Applied Science degree at his alma mater.

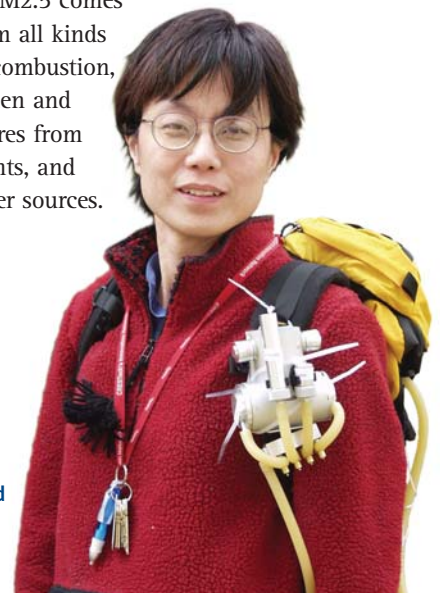
"My thesis is a much more in-depth analysis of this very large collection of data from the MOE air monitoring stations," says Nguyen. "There is so much we can learn from it."

Professor Iris Xu's air-monitoring backpacks are carried by volunteers throughout Windsor to measure mercury and other pollutants in the atmosphere.

He suggests that understanding the conditions that cause the build-up of air pollution to critical levels could show us how to better plan the zoning of our industries and traffic corridors to avoid or reduce overloading areas at risk of high pollution levels.

"My master's work is analytical. We need to understand more about these particulates that are known as PM2.5 because they are no larger than 2.5 microns."

PM2.5 comes from all kinds of combustion, pollen and spores from plants, and other sources.



Enviro-active

They are solid, liquid and gas. “We know that stagnant air and sunshine create smog, but we need to know how the actual particles react with each other in various conditions,” Nguyen says. “If we can learn how it behaves, we can learn how to control it.”

Nguyen says once his analysis opens the doors to a new level of air pollution research, he will be part of that process as well. As soon as he completes his master's, he will jump right into a PhD program. His supervisor for both his master's and doctoral work is Environmental Engineering Professor Iris Xu.

Dr. Xu herself is leading another local air quality project. Her devices, in backpacks being carried around the community, are measuring airborne mercury and other hazardous materials.

“Son is very clear and innovative in his approach. It's a pleasure to work with him,” says Professor Xu. “I believe his work will enable us to develop new models for managing our air environment that could be applied to any location, not just our community.”

Nguyen, now married with two daughters, appreciates the support Ford Motor Company affords its employees who pursue more education.

“It was not as easy when I was an undergraduate. If it were not for the Ontario Student Assistance loans, I would not be where I am today.”

His story also underscores the value of scholarships for deserving students.

Nguyen had no local family to help him. He had escaped Vietnam at age 21, and lived in a refugee camp for two years until a Canadian immigration official told him as she stamped his approval to immigrate, “I believe you are the kind of person Canada needs. Don't let me down.”

“Now, everywhere I go, I am proud to tell anyone that I am Canadian,” he says. “I would love to contact that woman from Immigration Canada once again to tell her thank you, and tell her what I have done.”

Nurses and the environment

People should have access to information about their environment so they can make educated choices, says a graduate student in Nursing at the University of Windsor.

Janet Reddam is a nurse who worked as an occupational health and safety case manager for the Workplace Safety and Insurance Board before returning to the university. She believes nurses can have an important role in linking the environment and the public.

“Elements of our environment that go unseen and unknown have an affect on our lifestyles and our health,” she says. “I suggest that communities become involved and learn about their environments to manage their health.”

Reddam points to developments in building materials, cleaning products, air ventilation and filtering systems, and to new workplace rules for perfumes and other irritants. “These developments are eliminating contaminants that have serious effects on some people,” she says.

Understanding the environment and health is also a concern of Professor Lucia Yiu. She and former Windsor Nursing Professor Lynnette Leeseberg Stamler compiled the bestselling text book, *Community Health Nursing, a Canadian Perspective*, which has an important chapter on environment education in the workplace.

Environmental advocate

When public environmental interests need to be represented, you're likely to encounter David Donnelly, LLB '99, perhaps Ontario's leading public advocacy lawyer. Donnelly has worked for Environmental Defence Canada for 17 years, including eight as executive director, pausing for three years by entering Windsor's law school. Since graduating, he has been counsel to Save the Rouge at the Ontario Municipal Board hearing which led directly to the act of the Ontario legislature to protect the Oak Ridges Moraine. He also represented the Safe Drinking Water Coalition at the Walkerton Inquiry. Currently, he is advocating against a four-lane highway planned to go through Boyd Park, deemed one of the finest forests in the Greater Toronto Area. Donnelly has joined the law firm of Gilbert's LLP, creating Canada's first private environmental law clinic.

Toronto gives U of W alum Green Award

University of Windsor alumnus Jerry DeMarco BA '90 (geography) was awarded the City of Toronto's Environmental Award of Excellence for leadership this year.

These awards honour and celebrate leading companies, organizations and individuals who have contributed to the greening of Toronto.

DeMarco has dedicated his life's work to projects that nurture a green Toronto. As an environmental lawyer, he worked on a project originating in Hudson, Quebec. Hudson passed a bylaw prohibiting non-essential uses of

pesticides, which was then challenged by two lawn-care companies. The Hudson case was already at the Supreme Court of Canada level when DeMarco and his colleague, Ottawa-based lawyer Stewart Elgie, intervened on behalf of the Federation of Canadian Municipalities, the World Wildlife Fund and Nature-Action Québec. Their goal was to uphold the bylaw as well as to significantly broaden the environmental implications of the case. Canada's highest court subsequently set a legal precedent that enabled Toronto to pass its own pesticides bylaw.

Environment of opportunity

Odette School of Business grad Steven Kidd BComm '03 noted a significant number of businesses offering radon gas testing when travelling in the southern United States. He learned about the health threat imposed by radon gas, a naturally occurring carcinogen resulting from the natural breakdown of uranium in soil. But back in Essex County he found no business offering to do the tests. So, he started one.

Kidd launched Canadian Home Safety in 2004. He sells test kits that are sent to an Ontario lab for processing. In the United States, one in 15 tested properties come up with elevated level of radon gas. About 21,000 lung cancer deaths in North America are attributed to radon each year.

A new kind of bus line

The University of Windsor English Department launched a "Poetry on the Buses" campaign in collaboration with the Green Corridor Project.

The project was organized and co-ordinated by Department Head Karl Jirgens and Writing Professional in Residence Marty Gervais. The posters, in every bus in the city, featured writing by professors and notable authors.

Each poster had a poem, a commentary explaining the Green Corridor project and the situation of the local eco-system, while extolling the virtues of bus travel as an alternative means of transportation that helps improve the environment, says Jirgens.

Clean air policies an international concern

Managing air pollution across borders was discussed by legal experts from across Canada and the US at a conference hosted by the Faculty of Law's Canadian-American Research Centre for Law and Policy.

Air Quality and North American Borders, organized by Windsor Law Professor Marcia Valiante, heard speakers from as far as the University of Texas and the Rutgers School of Law. Views were exchanged on what can be done to protect citizens and the environment. Prof. Valiante's analysis of issues in international environmental law have been published for more than two decades.

Motivated & energized

A proposed new route for international traffic is designed to reduce the impact of truck exhaust on Windsor neighbourhoods. It sounds like a real win for the environment, but local environmental groups say there's a trade-off. The route will tunnel under the edge of North America's largest, undeveloped tall grass savanna and disturb other woodland and wetland areas.

It's the kind of ethical dilemma Philosophy Professor Philip Rose loves to analyze.

The professor of Environmental Ethics has made a career of studying how communities and governments grapple with issues involving environmental change. His popular classes can become charged with discussion as students confront new points of view on topics that they had not previously questioned.

- Is the harm justified that we do to nature for personal, political, and economic ends?
- Does everything in nature exist to serve us?
- If killing is wrong, then why is the killing of non-human beings justified?

Some of Dr. Rose's students are enrolled in the University of Windsor's new Bachelor of Environmental Studies program. Introduced only two

years ago, enrolment is restricted to honours students. Early on, Environmental Studies students gain a foundation knowledge in both the arts and social sciences, and the sciences. In senior years, they choose an area of concentration such as resource management, or values and public policy.

"Our graduates will be movers and shakers. They will be active citizens who can take their broad knowledge and apply it in the world. They will be critical, articulate and show better judgment," says Rose. "Our graduates will not be lacking for choices."

Ryan Lahoud is one of those

Environmental Studies students but he isn't thinking that far into the future just yet. Having completed second

year, he's just been enjoying the learning experience. "It's been great, but a lot of work," he says.

Lahoud discovered the Environmental Studies program online in the Belle River High School library. "I didn't expect to see a course that combines two areas I wanted to study: geography and politics."

Kyle Prestanski of Windsor entered Environmental Studies for the same reasons – the unique interdisciplinary course of study – but didn't expect to find himself surrounded by so many like-minded companions.

"I've met a lot more people than I thought I would. The Environmental Studies students recognize each other in larger classes where there are students from other programs. We sit together and pull together on assignments. We



Kyle Prestanski, centre, with friends from left: Nicole Gignac, Matt Doherty, Ryan Lahoud and Katie Oliver.

also hang at the Environmental Studies Lounge and often eat together at lunch.”

The students plan to meet more over the summer, with projects planned to plant trees for the Essex Region Conservation Authority and help out at the Pike Creek clean up.

Their enthusiasm also spills over into recruitment of new students.

Prestanski and others from Environmental Studies are front and centre at university recruitment events, eager to share their enthusiasm with high school students and their parents. “I think this program is pretty unique and special. I’m happy to talk about it anytime,” says Prestanski.

Interdisciplinary Environmental Studies is one of eight undergraduate programs that directly support the University of Windsor’s environmental pinnacle (list on next page). The others are traditional programs with a major focus on a particular discipline.

Science tradition

For example, Pamela Mbagha has just finished her second year in Biological Sciences. She is exploring interests and options, including a research career and medical school. Mbagha has discovered that university learning isn’t restricted to the classroom – she was able to land a work-study position in

the laboratory of celebrated Biology Professor Jan Ciborowski.

Dr. Ciborowski has more than 30 undergraduate students, graduate students, postdoctoral fellows and research assistants working on ecological assessments with funding from governments on both sides of the Great Lakes.

“What I do to help out is pretty simple,” she says as she peers into a microscope and collects minute creatures from a lake-water sample, “but I get to meet others and learn about the research they are doing and what research work is like.”

Whichever road she chooses, scholarships and student loans will make a major difference. Her family are landed immigrants from Tanzania, now living in Ottawa. She has two brothers enrolled in the Odette School of Business.

“I earn good marks,” says Mbagha. “But scholarships will also have to play a part in any decision about my future.”

Engineering

Another group of students at the University of Windsor are taking on environmental questions from the point of view of professional engineering. The University of Windsor was the first in Canada to launch and gain professional accreditation for a Bachelor of Applied Science degree program in Environmental Engineering.

A decade and a half later, Environmental Engineering graduates are working in all types of industries and agencies around the globe, says program coordinator Professor Jerold Lalman. “Where you find people looking at how projects impact the environment, or watching that operations comply with environmental standards, to working on processes or materials to reduce impacts – the chances are you’ll find a University of Windsor Environmental Engineering grad making a difference.”

Pamela Mbagha at work in Biology Lab.



No-trace camping in Algonquin

Windsor students do not have to be enrolled in an environmentally focused program to expand their understanding of the environment.

Many students opt for electives to learn about everything from alternative fuels to alternate lifestyles.

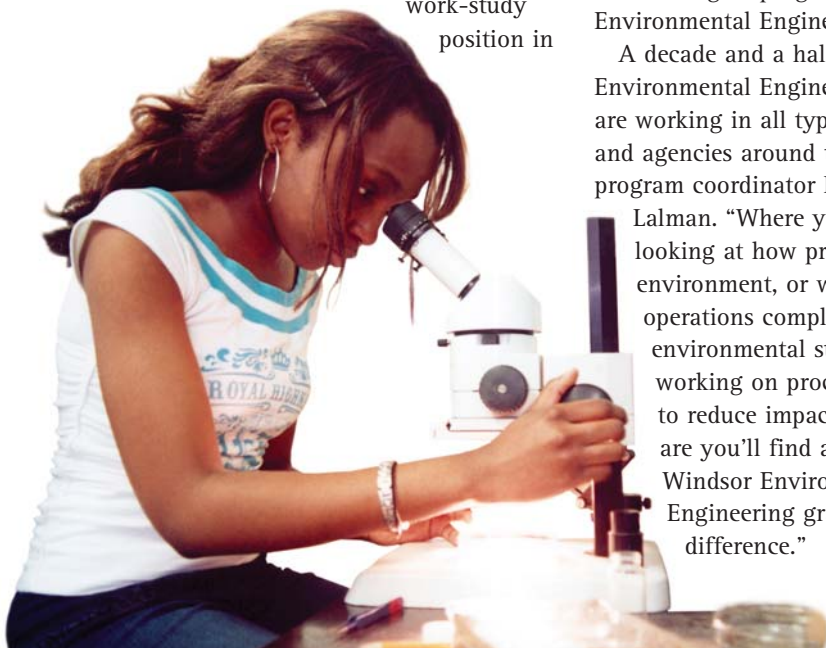
In Kinesiology, students can sign up for the ultimate environmental option: Professor Victoria Paraschak’s Outdoor Recreation. This nine-day adventure in Algonquin Provincial Park energizes students entering the final year of their Bachelor of Kinesiology program.

“It’s all about relationships,” says Dr. Paraschak. “The course has changed since it began in 1965, but it is still an opportunity to learn about yourself, your relationships with others and your world.”

The course experience revolves around a set of principles that promote experiential teaching and learning, trust, dignity, staying positive, recognizing the interconnectiveness of all things; appreciating creative expression and seeking physical, mental and emotional/spiritual health.

Recently, a second outdoor recreation option has been added to the Kinesiology calendar, which uses the parks and trails in Windsor and Essex County to show you don’t have to travel to the wilderness to appreciate a relationship with nature.

Clockwise from top right are Kyle Trudell, Adam Mailloux, Sarah Bowsher, Magda Kubica, Katie Lynn, Erin McMahon, and Neil Gomer





Environmental Engineering student Jenna Templer was the first red-head villagers had seen when she entered Shanong province.

Bachelor degree programs focusing on the environment

Environmental Biology
 Environmental Engineering
 Environmental Geoscience
 Environmental Science
 Environmental Studies
 Geoinformatics
 Geology
 Physical Geography

Many students, particularly those in the co-op stream, haven't needed to wait for graduation to start making that difference. Some have even had the opportunity to travel abroad.

Jenna Templer, for example, was chosen for a coveted placement on a water treatment project in Shanong province in north central China.

"It was the experience of my life so far," she says. "I love to travel, and this was so interesting. It's so rural. It's a place I could never go on my own.

"We were there to help establish a treatment system for the supply of drinking water in this very poor community. We did the surveying to get the project started. We also helped with reconstructing a medical centre that had burned down," she says.

"It was amazing to be thousands of miles from any place I had previously heard of. We lived in tents. It was cold. There was no heat. And the food was very simple.

The big problem was in getting the materials delivered to this remote location so we could do the work."

Templer says living in a very poor

community made her appreciate even more the abundance and the privileges – like turning on the tap and not worrying about getting sick from brushing your teeth – that we take for granted in Canada.

"I came home believing even more that we have to learn to live with less waste and excess."

Templer, who has received a prestigious Natural Sciences and Engineering Research Council of Canada scholarship to help in a Master's program, is far from alone in her beliefs among students. Nor are Mbagi and Prestanski standouts for their enthusiasm.

What may be exceptional at Windsor is that the energy and activity among undergraduate students for meeting environmental challenges can be felt right across this campus.

Professor Rose is not surprised.

"With all the environmental courses the university offers in science, engineering, social sciences and the arts, I expect a very significant number of our students take at least one before they graduate," he says.

Can cars be designed to be recycled?

The death of a vehicle occurs in a frenzy of dismantling, crushing, and shredding at the auto recyclers and metal re-processors. Close to 80 per cent of the car is recovered. The remaining 20 per cent of plastics, fibres, and other materials is usually sent to a landfill.

University of Windsor Environmental and Automotive Engineering Professor Edwin Tam is part of a national research project working to increase the amount of recycled content by taking a “cradle-to-grave” approach. Using a process called Life Cycle Analysis, he learns how vehicle disposal can be enhanced by looking at how the parts are designed, fabricated, removed and recycled.

“Since a high percentage of a vehicle can be recycled, people often assume the process is similar to their home’s blue box, where materials are from much simpler products and are often distinct from one another,” says Dr. Tam. “This isn’t necessarily true with complex things like cars. The recycling process is very intensive and depends on many factors.”

When a vehicle arrives at a recycler, it is usually inspected to determine its worth. A car may be kept by the recycler for parts or it may be sent to the shredder, where it is ground up into

piles of metals and other materials, some that are recyclable. This evaluation is a critical point in the end of life disposal. Dr. Tam is working closely with recyclers from Ontario and Michigan to identify how life cycle assessment can be used to understand and formalize the process.

These decisions are often based on economic factors, but today’s society also values environmental and social factors. Life cycle assessment could help determine how these objectives can best be met.

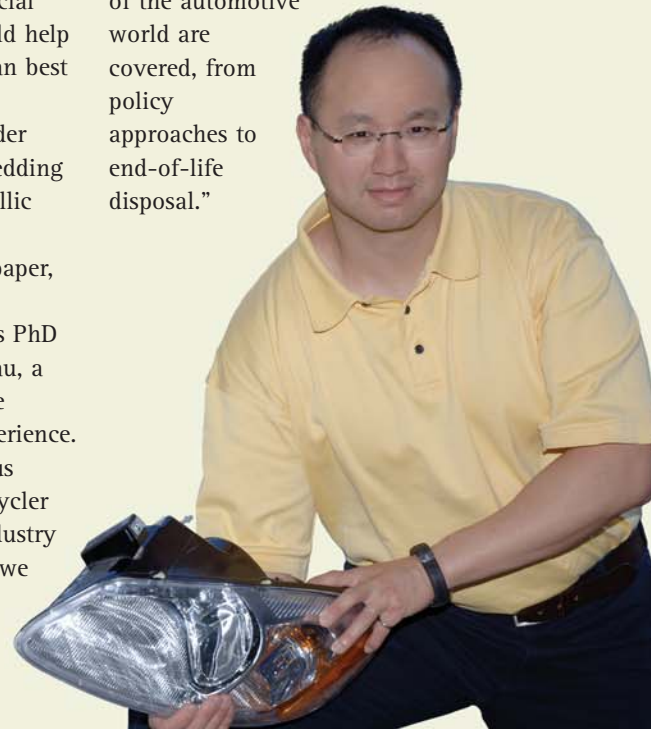
For example, automotive shredder residue, the “leftovers” of the shredding process, is a mixture of non-metallic materials - plastics, glass, rubber, textiles and carpeting, ceramics, paper, etc. - that is difficult to recycle.

Working closely with Dr. Tam is PhD candidate, Susan Sawyer-Beaulieu, a practising engineer with extensive environmental and industrial experience. Both are pleased with the generous response from the automotive recycler community. “It’s an important industry and they appreciate the feedback we can provide,” said Dr. Tam.

The work completed at the

University of Windsor is an integral part of the national project, which includes researchers at the University of Toronto and the University of British Columbia. The work is supported by the AUTO21 Network of Centres of Excellence plus several industry partners, including a major automaker.

“Between the three universities,” notes Dr. Tam, “many more aspects of the automotive world are covered, from policy approaches to end-of-life disposal.”



Dr. Edwin Tam



In 2001, the Government of Canada established the AUTO21 Network of Centres of Excellence, a national automotive research and development

program to help enhance the competitiveness of Canada’s automotive industry. The University of Windsor was elected by 28 Canadian universities to host this important national initiative.

AUTO21 currently supports more than 230 researchers and close to 400

student researchers working on 42 auto-related research projects at 37 Canadian universities. The projects are supported by more than \$12 million per year in combined federal and industry funding.

To learn more about AUTO21, visit www.auto21.ca.

GLIER chrono

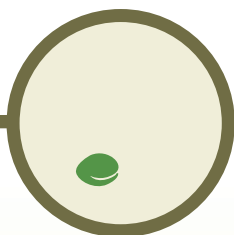
The Great Lakes Institute for Environmental Research (GLIER) at the University of Windsor is a global leader in assessing impacts of multiple stressors on large lakes and their watersheds. The institute organizes this work in two areas of study: environmental chemistry and toxicology, and conservation and resource management.

1982

The inaugural Lake Huron to Lake Erie Corridor Study commences.

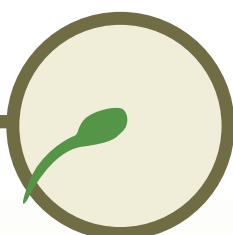
1990

Organic and metal contaminants analysis laboratory established for the Great Lakes Institute, and located in the Biology Building. The lab would achieve high praise during accreditation.



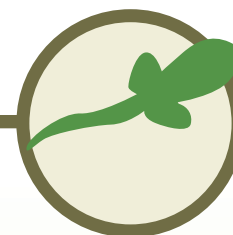
1981

University of Windsor professors Dr. Marie Sanderson, Dr. Paul Hebert, and Dr. Doug Haffner, form the Great Lakes Institute to learn more about the changes taking place in the environment of the Great Lakes and make the information known among educators and the public.



1983

The Great Lakes Institute announces its discovery of what the media term “the St. Clair River Blob.” A mixture similar to dry-cleaning fluids had seeped from chemical plants and accumulated in a giant mass on the river bottom. The discovery led to new monitoring and clean-up of chemicals that escape into the waterway.



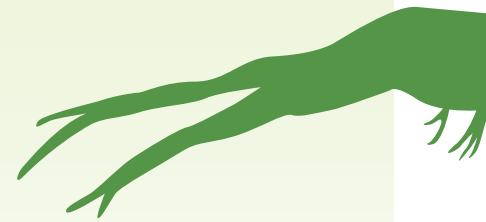
1986

The Great Lake Institute’s Paul Hebert is the first to publish that the zebra mussel, a clam native to the Caspian Sea region of Asia, had somehow invaded the Great Lakes. The invasion would have lasting impact on the economy and the ecology.

1985

Great Lakes Institute offices established in the house at the corner of University and Sunset Avenues. It becomes a formal and informal meeting place for people on and off campus with environmental interests.

logy



1995

New, increased support for staffing and membership leads to new name: Great Lakes Institute for Environmental Research, and new building, London Life Great Lakes Research Centre, on Sandwich Street with Detroit River access.

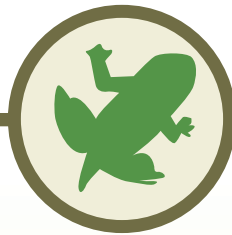
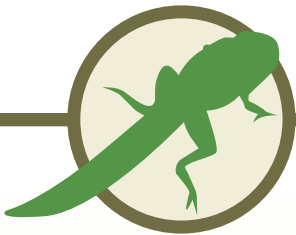
2002

Invasive species lab recognized for leadership, largest in Canada and one of two labs in North America advancing international attention to this global crisis.

2005

Network for Invasive Species established at GLIER recognizes international leadership of Professor Hugh MacIsaac in tracing the origin and documenting the impact of the migration of exotic species.

First University of Windsor graduate degrees conferred through the Great Lakes Institute for Environmental Research.



1994

First calibrated Biomonitoring Study of the Great Lakes initiated in co-operation with the City of Windsor.

1999-2000

Many top young researchers come to Windsor to join the institute. Some receive additional support through Canada Research Chairs program, Canada Foundation for Innovation, and Ontario Innovation Trust.

2003

Professor Dan Heath publishes "Rapid Evolution of Egg Size in Captive Salmon" in the prestigious publication, *Science*.

2006

Institute to celebrate 25 years.

“The supply of fresh water is the number one environmental issue of this century. Ninety per cent of the world’s fresh water is in 14 large lakes. We are the only institute in the world that specializes in large lake environments. Put our knowledge up against any other university’s, and we’ll hammer ’em.”

Dr. Doug Haffner
Canada Research Chair in Great Lakes Ecology
Founding member of the Great Lakes Institute

Partnerships improve effectiveness



Members of Professor Ken Drouillard's research team, from left, Master's of Environmental Science students Ashley Raeside and Mike Burtnyk, and research assistant Karen Balkwill, BSc '02, take water sample from Detroit River.

If it looks like not much has changed when you gaze out at the Detroit River, you're right. And you're wrong.

In the last couple of decades, there have been improvements to waste-water treatment, pollution controls, storm runoff, agricultural practices, industrial processes, wetland preservation, and other initiatives.

All this effort has only prevented the pollution in the Detroit River from getting worse, says Professor Ken Drouillard, of the University of Windsor's Great Lakes Institute for Environmental Research (GLIER). "It's not getting better, but it's not worse. Given the population growth and all the associated issues, this is encouraging."

Dr. Drouillard and colleagues have taken samples of various creatures up and down the Detroit River food web from plankton and insects to the largest game fish. They also sampled sediments, water and plants and compared the results with the original Detroit River Assessment project undertaken by the Great Lakes Institute in the 1980s.

The current project is part of a larger partnership effort to set up a Detroit River Modeling and Management Framework that involves the institute, the City of Windsor's local cleanup committee, the Ontario Ministry of the Environment, Environment Canada, the US Environmental Protection Agency, and the US National Oceanic and Atmospheric Administration.

This time, the project is going further upstream and down, into Lake St. Clair, the St. Clair River, and into Lake Erie.

The greater detail and wider scope will provide better information about hot spots for pollution and fish contamination. Advisories and guidelines for eating local sport fish have been issued for many years. The new study will help to improve those advisories by indicating the areas where the concentration of contaminants in the fish are highest, and the places where the fish present a lower risk.

Traditionally, as many non-resident fishing licenses are sold to anglers

around Essex County as are sold in all of Northern Ontario. This region also has a high concentration of boat owners.

But you don't have to own a boat and a fishing pole to experience the benefits of the studies being carried out by the university's scientists. As Dr. Drouillard says, "just turn on the tap."

Walpole Island First Nation

GLIER scientists are training members of the Walpole Island First Nation to carry out their own environmental monitoring.

"It's a special partnership," says GLIER Director Brian Fryer. "Some people from Walpole Island come to our labs to train to collect samples. The environmental assessment for Walpole Island is compatible with the larger St. Clair River to Lake Erie corridor study."

Education Professor Clinton Beckford is also working with Walpole Island First Nation to learn about their indigenous environmental knowledge. His goal is to pass on an appreciation for this knowledge to our future teachers.

Walpole Island, located at the northern end of Lake St. Clair, is one of the first native communities in Canada to take leadership in the field of environment and sustainable development. "The Walpole Island First Nation has maintained their cultural heritage and traditional knowledge of the environment, while interacting effectively with the non-indigenous population and western environmental scientists to everyone's mutual benefit," says David White, of the community Heritage Centre.

Lake Erie co-operation

Perhaps one of the most comprehensive environmental partnerships on the continent is the Lake Erie Millennium Network. The project brings together resource managers from two federal governments, four US states and Ontario, plus university researchers from institutions on both sides of the border.

These organizations coordinate rather

than duplicate their efforts and share their information to make the most effective use of their resources. Together they track and battle the dead zone, the invading species, the fish population trends, fluctuations in water levels, the loss of natural habitat, and a hoard of new and continuing issues that arise in a highly dynamic ecosystem.

It was Dr. Jan Ciborowski's idea, and he spearheaded the effort that made the network what it is today.

Ciborowski, a professor in Biological Sciences is best known for his work with fishflies, also called June bugs or mayflies. Everyone knows what you are talking about when they swarm out of the lakes and rivers like a plague of tiny dragons to blanket shoreline communities.

Dr. Ciborowski proposed comparing the contaminant levels of these insects, which are found throughout the Great Lakes.

Fishflies spend their early years as larvae in the mud of lake beds where many types of contaminants accumulate. Dr. Ciborowski proposed they could provide a common scale to compare contamination levels throughout the Great Lakes basin.

Because of this idea, and because of his research on other methods of using insects as indicators of environment health, Dr. Ciborowski was invited to join a US Environmental Protection Agency-funded project to develop and test novel environmental indicators that could be used across all the Great Lakes.

In 2003, Dr. Ciborowski received the International Joint Commission's Biennial Award for Great Lakes Science for his "significant influence on environmental quality and the health of the Great Lakes basin ecosystem."

Since its first conference in 1999, the Lake Erie Millennium Network has continued to help managing agencies and scientists exchange information and co-ordinate their resources. At future meetings, members will share the latest information on water level changes and on habitat models for ecological studies.

International reputation

GLIER has become an international crossroads for students from around the world to learn about freshwater lakes ecology. Recently, students and professors there were able to write happy holidays on a backboard in 30 different languages.

The international culture at GLIER stems partly from professors visiting from institutions in other countries.

Joining this culture is a larger group from Indonesia. With support from the Inco's branch in Indonesia, the Science Institute of Indonesia has entered into a partnership with the University of Windsor. Students from Indonesia will come to the University of Windsor for training in environmental research and monitoring, resource management and conservation techniques.

Invasive species network

The phone rings regularly in the office of GLIER Professor Hugh MacIsaac. It may be a reporter from US National Public Radio, CBC or Chicago, or it may be from a colleague in Virginia. It may be from a Muskokas cottage association.

And the calls are coming more and more frequently.

Since MacIsaac's lab used genetics to trace the origin of an invading insect in the Great Lakes back to the harbours of Northern Europe, and back further to the Black and Caspian Seas, he has brought together a network of scientists from both sides of the Atlantic to learn more about the migration of invasive species.

"The threats to the economy that these invading species pose is huge," says Dr. MacIsaac. "Governments everywhere have come to appreciate this and are

backing our efforts to find ways to prevent it. A study we conducted for the Auditor-General's Office pegged damage at between \$13 and \$33 billion per year."

"We have invasive beetles killing our ash trees in Essex County. We have European starling and house sparrows dominating our bird communities. We have zebra mussels, spiny waterfleas, and round goby fish transforming the ecology of our lakes," he says.

MacIsaac heads the new Canadian Network for Aquatic Invasive Species, with members from universities, government and industry from throughout Canada. "People see the work that we have done with the spiny waterflea and offer congratulations. Let me tell you, there is a lot more work to be done before we understand how we are going to handle this issue."

The Green Corridor

A growing community partnership



Environmental Engineering student Angelos Anastassopoulos brings creative ideas and leadership skills to the Green Corridor project.

The Green Corridor project aims to convert that two-kilometre stretch of Huron Church Road from the Detroit River to Tecumseh Road into an environmental gateway.

The first step is the pedestrian bridge near Assumption College High School, which will be green with plants and earthen slopes. The new University of Windsor stadium nearby will address Huron Church Road with sloping green berms and selected shrubbery and trees.

Angelos Anastassopoulos is one of a group of students working on the project. An environmental engineer, he came to the University of Windsor to learn about life-cycle analysis. His master's thesis is an industry-sponsored life-cycle inventory of the automotive paint process. He also works with Health Canada in air pollution health effects research. His PhD will be in this area.

"We are doing something with this corridor area that has never been done anywhere else," says Anastassopoulos. "It will make people see their environment in a whole new way. People will say, 'we don't have to live like this. We can do something. We can do better.'"

Green Corridor students, volunteers and supporters see these as just the beginning. There seems to be no limit to ideas being generated by the multidisciplinary Green Corridor course being offered and coordinated by the School of Visual Arts. The Green Corridor Project will engage travellers with innovative environmental installations as diverse as public art, commercial development, environmental-impact monitoring and scientific research.

Learning through research

Research is at the core of graduate-level education. The University of Windsor has more than 1,000 students working toward Master's or Doctoral degrees. In all areas of campus, we find examples of these graduate students making discoveries about the changing environment.



Jocelyn Leney
GLIER student researcher

“I know now why it takes years for science to progress and for us to learn what we need to know to make the changes we need to make.”

Master of Biological Sciences student Jocelyn Leney knows where the frogs live in Essex County and where they don't.

“It's hard to find any frogs in most ponds and creeks in the county,” says Leney. “I could only find large groups in pristine areas north of Point Pelee. Those areas are what it must have been like before cities and agriculture.”

Leney wonders if the reason frogs are disappearing is linked to contaminants in the soil, water or air currents. “By learning how frogs handle doses of organic contaminants, we might have a clue as to why they are disappearing,” she says. In turn, that knowledge could open windows to environmental effects on our own health.

Leney suggests that understanding what is happening to frogs in Essex County could lead to solving why 42 per cent of amphibian species are declining around the world. She's been studying the rate that frogs are able to eliminate PCBs and polycyclic aromatic hydrocarbons (PAH) that accumulate in the fatty tissue of their bodies.

With the support of an Ontario Graduate Scholarship, Leney came to Windsor from the University of Western Ontario to study with the Great Lakes Institute for Environmental Research (GLIER). Her supervisor, Dr. Doug Haffner, holds the Canada Research Chair in Great Lakes Ecology, and is quick to praise the contribution that

Leney has made to the pool of knowledge. Leney is more philosophical.

“It's been fascinating work, but there was no ‘eureka’ moment,” she says. “I've actually learned that frogs have a greater ability to metabolize and eliminate PCBs and PAHs from their systems than I would have expected.”

Leney will leave Windsor with prestigious publications on her resumé. She plans a hiatus from research to pursue her interest in organic farming. She knows the knowledge that she leaves behind has been exchanged for the wisdom that she will bring to where ever her interests lead. She also appreciates that her work is one necessary step on the path to understanding the decline in amphibian populations worldwide.

“I know now why it takes years for science to progress and for us to learn what we need to know to make the changes we need to make,” she says.

It's a lesson many graduate (Master's, PhD) students come to appreciate. Some take it with them into professional careers, leaving the research world behind. Some choose later to return to the pursuit of “new knowledge.”



Biochemistry student Aaron Steevensz and Environmental Engineering student Katy Modaressi team up to advance our ability to treat industrial waste water.

Process for progress

Katy Modaressi is one who returned. After earning her Master's degree in engineering, Modaressi worked seven years in waste treatment projects for consulting companies in her native Iran. The need for a better way to do her work led her back into research.

"I want to help find better methods for removing and disposing of hazardous materials," she says. "I came to Windsor knowing very little about this community, but I wanted to be part of the team working on this exciting project. We are perfecting what I believe will be one of the most widely used and effective processes all over the world."

Modaressi's focus is on Endocrine Disrupting Chemicals (EDC). EDC is particularly a concern in Iran for the operators of the world's largest oil refinery. These nasty little molecules are on every major industrialized country's list of dangerous pollutants.

The treatment process began as an idea of Windsor Chemistry Professor Keith Taylor, and was initially developed by Environmental Engineering Professors Jatinder Bewtra and Niharendu Biswas. It uses enzymes from

particular plants. In waste water, the enzymes act as a catalyst to turn contaminants into polymers that can be removed by filtering or just letting them sink to the bottom.

And this process works well on EDC. Sounds simple, and it would be if there were a limitless supply of enzyme.

The challenge is that enzyme molecules quit when they become locked inside the polymer. Modaressi is finding ways to keep the enzyme active. This would greatly reduce the cost of the process.

"One of the advantages of this process is in how simple it is. Very little training will be required for technicians to operate the system that adds the enzymes and safely removes the polymer," she says. "Also, this simple process can be incorporated into the waste flow system before it is funneled into tanks or ponds."

Teamwork

In her Essex Hall lab, Modaressi works with other graduate students, including Biochemistry student Aaron Steevensz.

Steevensz earned his undergraduate

degree in the US before deciding to join Dr. Taylor's research team at Windsor to earn his master's degree.

The Sarnia native isn't the first in his family to come to the University of Windsor. His father Richard, a research scientist with Lanxess, earned his Bachelor's degree in Mathematics, a Master's in Physical Chemistry, and finally a PhD in Organic Chemistry all at Windsor. Aaron's mother earned her Bachelor degree in Biology in 1978, and returned to earn an Education degree in 2003. Aaron's twin brother is enrolled in the Electrical and Computer Engineering undergraduate program.

"I've analyzed the process and the problem during my two years working on my Master's," says Steevensz. "I've talked to Dr. Taylor about staying on to do my PhD. I have an idea that I think is really promising but there are hurdles to get over. I'd be cautious about being too optimistic until my idea is proven."

Steevensz likes research work and hopes that a PhD someday will be a ticket to travel and pursue his career in other parts of the world.



Sarah Bailey, PhD
Sampling ballast mud

Detecting aliens

Hard work and fresh ideas are the combination for success for young researchers. Those successes can be exciting times for these students who have become deeply immersed in their field.

Sarah Bailey has felt that excitement during her four years with the Great Lakes Institute for Environmental Research (GLIER).

Like in a scene out of *X-Files*, Bailey descends into the dank, murky hollows in the lowest parts of ocean freighters to seek evidence of invading species.

When cargo holds are empty, these great ships are steadied by flooding their hollowed hulls with water from the harbour, then pumping them out as cargo is loaded. But some mud remains on the floor. With a miner's headlamp lighting the way, Bailey scooped samples of this ooze to take back to her lab.

In the mud, she has found tiny eggs,

which she hatched and identified as insects not found in North America. If these insects escape to flourish in the Great Lakes, as has their cousin the spiny waterflea, or the now notorious zebra mussel, they may seriously upset the natural environment.

Bailey will graduate with her PhD this June.

"Sarah has been involved on the leading edge of uncovering how our environment is changing and what it may mean to the world as we know it," says her supervisor, GLIER biologist Hugh MacIsaac.

"One new invading species in the Great Lakes region has been identified each year over the past decade," she says. "This is a growing problem. I can use my knowledge of genetic and molecular tools to help identify these species and track their origin. That will help us learn how to deal with them."



Peter Andrew-McBride
*Master's degree candidate
in Earth Sciences*

Space, earth and below

Many imaginative young graduate students are pushing the pursuit of knowledge to new levels with high-resolution satellite imagery available through Geographic Information Systems (GIS) technology.

The meadows and wetlands of the Oak Ridges Moraine hover north of Toronto like an outstretched cloak of nature. But this is not a peaceful enclave. Developers clash repeatedly with environmental organizations over plans for the area, as politicians trumpet their positions.

Although this turmoil may seem unrelated to Windsor, a young man in the basement of the University of Windsor's Memorial Hall works quietly and methodically beneath the surface of the controversy.

Earth sciences Master's student Peter Andrew-McBride has an idea for deepening our knowledge of the groundwater in the moraine. Groundwater is the source of the drinking water in this area. The more rain and snowmelt that runs off pavement into

sewers and out to Lake Ontario, the less finds its way into the groundwater.

Environment Canada has set up monitoring stations in the moraine to measure rainfall and predict how much of it will recharge the groundwater supply. However, Andrew-McBride points out that the varied terrain means the amount of rainfall that seeps into the ground can vary significantly and the monitoring stations might not be telling the whole story. Andrew-McBride is analyzing infiltration data he collected over a small plot of land, using a high-tech measurement system developed by his lab-mates.

He is also using high resolution satellite radar images of the moraine to correlate his infiltration analysis over the broad area.

"In simplest terms, we are seeing if we can calculate how a development will affect the water supply for the millions of people who live in Central Ontario," says Andrew-McBride's supervisor, Earth Sciences Professor Phil Graniero.

Community celebration



supports scholarships



The gala Celebration of the Environment, held on June 18, 2005 at the University of Windsor, was a collaboration of innovation and energy by groups from across campus and throughout the community.

“This fabulous event demonstrated the commitment and care that we all share for environmental issues and action,” said Amanda Gellman, Vice-President, University Advancement. “It is amazing what can happen when people from such diverse disciplines come together to combine their creativity.”

In a brief address to welcome everyone, President Ross Paul extended his appreciation to the many sponsors whose generosity made the celebration possible and gave special thanks to the Windsor Family Credit Union for being the lead sponsor. The \$50,000 raised at the gala will support scholarships and may be matched by the Ontario government.

The successful event also depended on the volunteers from the Great Lakes Institute for Environmental Research; the Departments of Civil and Environmental Engineering, and Mechanical, Automotive and Materials Engineering; the Departments of Biological Sciences and Earth Sciences; the Schools of Visual Arts, Dramatic Art; and Music; the Department of English Language, Literature and Creative Writing; The Centre for Flexible Learning; the Centre for Environmental Health of Ontario;

Physical Plant; Food, Housing and Conference Services; the University of Windsor Students' Alliance; and University Advancement.

For the gala, the CAW Student Centre at the University of Windsor was transformed into the imaginary world seen in the award-winning film *Commedia Fantasia*, created by Dramatic Art instructor Gina Lori Riley.

Riley's film was shot in varied Windsor environments: the barren gravel piles at Coco Group of Companies; the lush forests, grasslands and marshes of Memorial Park and Ojibway Nature Reserve; and the industrial confines of the Ford Motor of Canada-Windsor Casting Plant and Windsor Engine Plant. Amazingly, those environments were recreated within the CAW Student Centre and the evening of celebration became a fantastical odyssey of the human condition presented through movement, masks, props, music and costumes worn by 25 student and alumni performers. The player's interactive script was created for the event incorporated research and teaching themes from across campus.

The gala experience was further enhanced by the rich arrangements of the School of Music Jazz Ensemble.

The celebration was the first gala focusing on one of the University of Windsor's Pinnacles. Future celebrations will be held for automotive and social justice.



Colourful, lively and unpredictable presentations by the student and alumni volunteer performers directed by Gina Lori Riley created a uniquely intriguing atmosphere at the gala Celebration of the Environment. Some of those performers include the violinist, top left, the trash-wearing dancer, top centre, the towering chieftans, lower left, dancers at the enviro-house exhibit, lower centre, and the mud people, lower right. Also far left, the School of Music Jazz Band performs during the closing hours of the gala, and Provost Neil Gold participates in a demonstration of lung function testing at a booth run by the Centre for Environmental Health of Ontario. At top right, at their Earth Sciences exhibit, are graduate student Peter Andrew-McBride, research assistant Paul Grzeszczak, graduate student Neil Latour, GIS lab manager Alice Grgicak-Mannion, student Mike Babechuk, and graduate student Johari Pannalal.

The organizing committee of the Celebration of the Environment would like to thank all of our sponsors, supporters, donors and guests. Special thanks to Rev. Jean Sonnenfeld for her commitment to the scholarships in environmental science, medical-related research, and environmental studies.

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Enjoying the gala Celebration of the Environment are, on the left, Harry Sigal with President Ross Paul, Issy Sigal and the Hon. Howard Pawley; centre, WFCU's Susan Stockwell-Andrews BPA '91 and Julie Laforet; and right, a gathering of alumni including WFCU's Helga Reidel BComm '82, BEd '93 with husband Rolf Reidel BAS '83, right, and Jack Sullens BA '85, LLB '90, left.

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