

Memorial University's Research Magazine Spring 2012

MATTERS

research

Surviving an Arctic disaster

A new approach to understanding regions in NL

Gauging children's earliest memories

Research funding growth



Letter from the vice-president (research)

Research is an expensive undertaking. In order to succeed, researchers depend on highly motivated students, the assistance of specialized staff, access to state-of-the-art equipment and facilities, and adequate operating funds. In short, they need an environment that encourages and enables research excellence. Building and sustaining that environment depends, in large part, on external investments secured through tough, peer-review competitions.

In 2010-11, Memorial received \$98 million in external research support—funding earned by outstanding researchers from all campuses of the university. In this edition of *Research Matters*, you will find examples of this research. They include new discoveries impacting our understanding of human health, technologies that are improving safety in harsh offshore environments, and fundamental research describing our complex and rapidly changing world.

And Memorial is poised for even further research growth. To best position us for these opportunities, we have developed a new Research Strategy Framework. In the coming weeks and months, we'll be sharing the framework more broadly. Developed through extensive consultations across the university and in communities throughout Newfoundland and Labrador, this framework lays out the means by which we will continue to grow our activity, impact and reputation in research.

This is an exciting time for Memorial University. We're building on the vibrant culture of creativity and innovation that has always characterized this place and this university. Indeed, we're on the road to something big.

A handwritten signature in black ink, appearing to read 'Christopher Loomis', with a stylized flourish at the end.

Christopher Loomis, PhD

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Editor
Meaghan Whelan

Assistant editor
Lisa Riggs

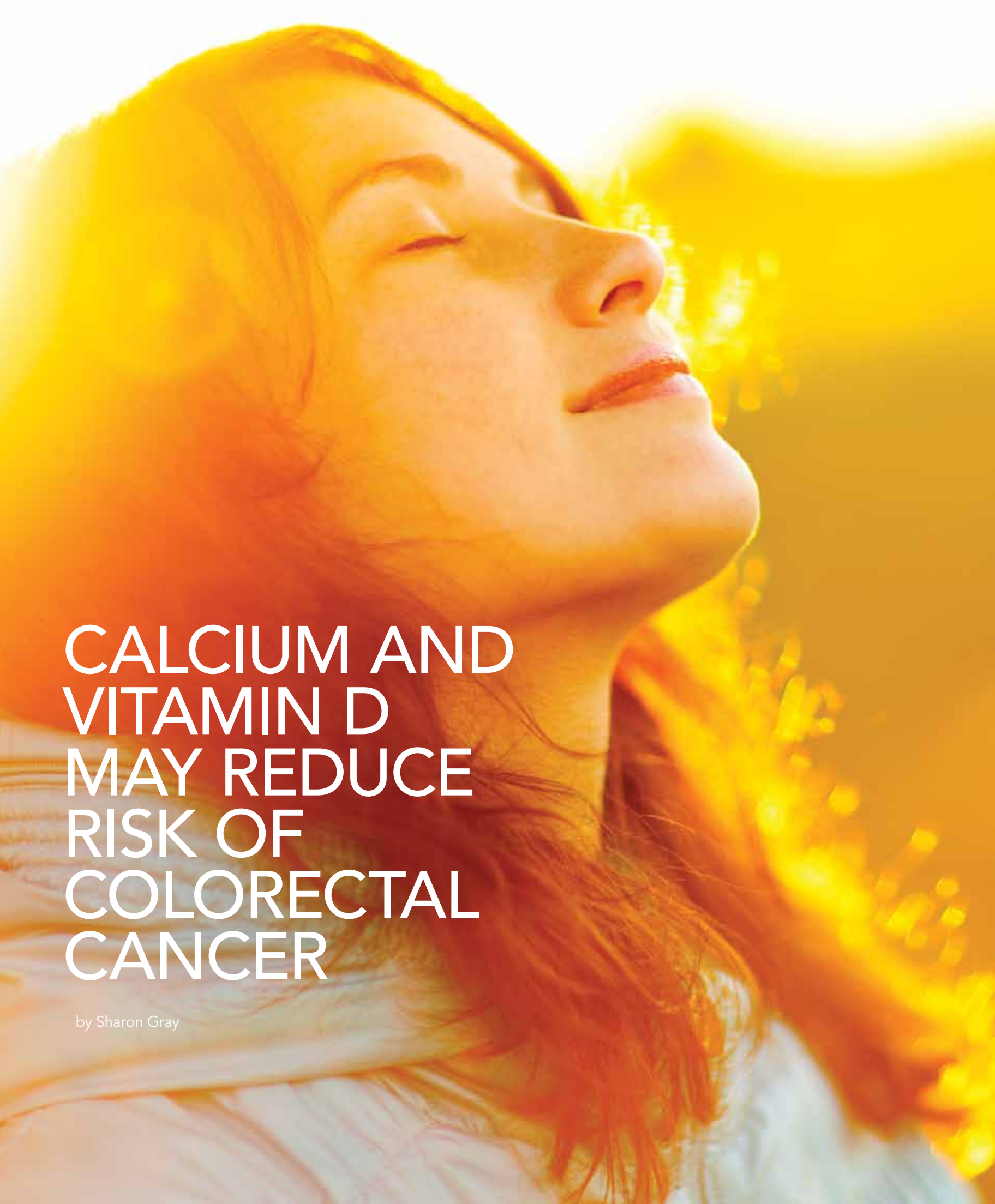
Contributing writers
Kiley Best
Melanie Callahan
Rebecca Cohoe
Jennifer Deon
Moirá Finn

Kelly Foss
Sharon Gray
Janet Harron
Meaghan Whelan

Graphic design
Helen Houston

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A close-up, profile view of a woman with long, wavy red hair. She is looking upwards and to the right, towards a bright, glowing sun. The background is a soft-focus field of tall grasses, also bathed in the warm, golden light of the sun. The overall mood is peaceful and serene.

CALCIUM AND VITAMIN D MAY REDUCE RISK OF COLORECTAL CANCER

by Sharon Gray

DIET HAS LONG BEEN REGARDED as one of the most important environmental factors associated with colorectal cancer, and now a new study led by researchers at Memorial University shows that dietary calcium and vitamin D are associated with a lower risk of colorectal cancer. The study was based on the comparison of dietary information between colorectal cancer patients and controls, collected from more than 4,000 participants in Newfoundland and Labrador and Ontario.

The study, *Calcium and Vitamin D and Risk of Colorectal Cancer: Results from a Large Population-based Case-control Study in Newfoundland and Labrador and Ontario*, was published last year in the *Canadian Journal of Public Health*.

Data for the study was obtained from the Newfoundland Familial Colorectal Cancer Registry and the Ontario Familial Colorectal Cancer Registry. Participants willing to participate in the study filled out a family history questionnaire, personal history questionnaire and food frequency questionnaire.

Results of the study showed that overall, higher calcium and vitamin intake are associated with lower risk of colorectal cancer in both Newfoundland and Labrador, and Ontario. For people with low intake of calcium and vitamin D from foods, supplements containing the two nutrients are associated with reduced risk of colorectal cancer. Although Newfoundland and Labrador has the highest incidence of colorectal cancer in Canada, people in Newfoundland and Labrador have lower calcium intake and eat less fruits and vegetables than their Ontario counterparts.

Newfoundland and Labrador is geographically isolated, culturally distinct and relatively economically disadvantaged, thus fresh fruits and vegetables are less often available. "Consequently people may consume more preserved and salted traditional foods," said Dr. Barbara Roeböthan, Community Health and Humanities, one of the authors of the study.

Dr. Peter Wang, Community Health and Humanities and also an author on the study, said the roles of dietary

calcium and vitamin D are correlated since vitamin D regulates the absorption of calcium.

Dr. Wang said one of the strengths of this study was that the large sample size allowed the identification of associations that might not be detectable in smaller studies. "More importantly, previous findings by other researchers about the protective effects of calcium and vitamin D on colorectal cancer risk were confined to specific study populations and this makes it difficult to generalize the results. In this study we examined the effects of calcium, vitamin D and dairy product intake on the occurrence of colorectal cancer in two Canadian provinces with different rates of colorectal cancer incidence."

RESULTS OF THE STUDY SHOWED that overall, higher calcium and vitamin intake are associated with lower risk of colorectal cancer in both Newfoundland and Labrador, and Ontario.

The study on calcium and vitamin D and the risk of colorectal cancer was part of Zhuoyu Sun's M.Sc. thesis under the supervision of Memorial faculty members Drs. Peter Wang, Barbara Roeböthan, Sharon Buehler and Yanqing Yi. It was supported by several funding agencies including the Canadian Institutes of Health Research and the Newfoundland and Labrador Centre for Applied Health Research. ■

SURVIVING AN ARCTIC DISASTER

by Michelle Osmond

WITH INCREASED TOURISM AND RESEARCH in our oceans, what are the chances people can survive an accident like the *Costa Concordia* disaster? What if the air temperature is only 5° celsius? According to Dr. Fabien Basset of Memorial's School of Human Kinetics and Recreation (HKR), there are more and more cruise ships visiting the Arctic where cold air temperatures compound the risks for survival even after passengers reach a lifeboat.



Until now, the majority of studies on cold exposure involve very cold conditions where people reach hypothermia (35°C core temperature) within four to six hours. Ethically, researchers are not allowed to let subjects reach that point so there is a lack of data on the physiological consequences of prolonged shivering.

However, Dr. Basset and graduate student Zachery Hynes are co-investigators on a recent study that intends to fill this gap. The effects a 24-hour Arctic survival simulation on human physiology and cognitive function was led by the Maritime Arctic Survival Science and Engineering Research Team (MASSERT). Dr. Basset and a team of researchers are looking at the effects of shivering on performing the basic survival skills necessary to signal for help.

Conducted at Brock University in Ontario, subjects were exposed to moderate cold (7.5°C) for 24 hours while wearing light cotton coveralls. The researchers wanted the subjects to shiver, activating their cold response, without losing so much heat that they reached hypothermia.

The goal was to push subjects to the limit of what they could tolerate for 24 hours and find out how shivering could be sustained during prolonged exposure. They also looked at cognitive performance and how it would be affected by long-term cold exposure, if people could perform the basic survival skills necessary to signal for help after 24 hours, how long could they maintain heat balance and what the effects were on major physiological systems.

Dr. Basset admits the subjects were people who had already experienced long-term cold exposure

i.e., Niagara Parks Police and Coast Guard personnel.

“We knew that this subject pool may not be representative in terms of fitness and cold experience compared to the target population who might require a mass rescue from a cruise ship or aircraft,” said Dr. Basset. “But we needed subjects who could psychologically push themselves through the very strenuous experimental protocol and conditions.

“Overall, six of the eight subjects tolerated the entire 24-hour exposure. All subjects reported that the combination of environmental conditions and clothing was near or at the point of what they could voluntarily endure. But, the good news is, they were able to sufficiently regulate their body temperature through shivering and movement.”

Dr. Basset and the rest of the team also found that cognitive responses for memory, executive control, attention and spatial reasoning were largely unaffected.

“The absence of significant changes in cognitive performance over the 24 hours of cold exposure testing is in itself an important finding, given that testing of this type and duration has not been done before,” he added. “This experiment represents the best case scenario for the average person, that is they are able to protect themselves from very cold air, splashing water and wind which means they should be capable of surviving while waiting for a rescue team.”

Dr. Basset adds that MASSERT would now like to determine what could happen to seniors who are the main clientele of the cruise ship industry. ■

IF HELP IS 24 HOURS AWAY, can a person survive long-term cold exposure?



Memorial develops **RESEARCH STRATEGY FRAMEWORK**

GOALS OF THE RESEARCH STRATEGY FRAMEWORK

- 1.** Attract, retain, support and celebrate people engaged in and supporting research
- 2.** Support an environment of research excellence
- 3.** Engage with community partners and collaborators locally, nationally and internationally to create, share and apply research
- 4.** Support fundamental and applied research excellence in areas of strategic opportunity

by Meaghan Whelan

IN 2009, MEMORIAL'S RESEARCH REPORT proclaimed, "this is the start of something BIG" in recognition of the university being named the No. 1 university in Canada for research funding growth by Re\$earch Infosource.

The report noted that, "coming out on top isn't the end result. You won't find us resting on our laurels. Where we go from here is the real challenge. Luckily for us, Memorial is packed with faculty, students and researchers just brimming with brilliant ideas of what to tackle next."

It was recognized that, in order for Memorial to really shine, the university needed to build a framework that supports researchers, engages with the wider community and builds on a culture of research excellence.

To that end, the university launched the development of a strategic research plan (later retitled the Research Strategy Framework). The project followed an iterative and collegial process, with extensive opportunities for active engagement with and input from internal and external stakeholders.

The outcome is a document that sets the vision, mission and guiding principles for research at Memorial and identifies the goals and objectives necessary to achieve success.

The Research Strategy Framework was unanimously endorsed by Memorial's Senate in September 2011.

Dr. Jennifer Connor, associate professor in the Faculty of Medicine and member of the Senate Committee on Research, put forward the motion to approve the framework.

"One of the things I spoke to when I introduced the motion was the inclusive nature of the project. Everybody in the university had the opportunity to participate in their academic unit and in the open sessions and have their voices heard," she said.

"From a personal perspective, I was delighted to see the extent that scholarship is a part of the strategy. Research needs to be understood as including scholarship, creative activity and curiosity driven research. It's wonderful to have that stated by the university."

Dr. Christopher Loomis, vice-president (research), said the document will guide Memorial's institutional planning, its investments in research and recruitment to the university.

"The Research Strategy Framework is very much an aspirational document. It pushes us to pursue, support and celebrate excellence in all forms of research," he explained. "The framework was shaped by the feedback we received from within the university community, and from communities around the province."

These broad consultations helped identify 10 cross-cutting strategic themes on which Memorial will focus. "They represent areas of existing research strength and/or emerging opportunity in which Memorial is particularly well-positioned to enhance its national and international reputation," he explained.

According to Dr. Loomis, the priority now is on communication and implementation. While the document is available online, www.mun.ca/research, the university will formally release the framework to the public in late spring of 2012.

STRATEGIC RESEARCH THEMES

- ABORIGINAL PEOPLES
- ARCTIC AND NORTHERN REGIONS
- COMMUNITY, REGIONAL AND ENTERPRISE DEVELOPMENT
- CREATIVE ARTS, CULTURE AND HERITAGE
- ENVIRONMENT, ENERGY AND NATURAL RESOURCES
- GOVERNANCE AND PUBLIC POLICY
- INFORMATION AND COMMUNICATION TECHNOLOGY
- OCEANS, FISHERIES AND AQUACULTURE
- SOCIAL JUSTICE
- WELL-BEING, HEALTH AND BIOMEDICAL DISCOVERY

"We're looking forward to sharing the Research Strategy Framework in a creative way that not only communicates our vision for the future, but captures the excellence of our researchers," said Dr. Loomis.

The Research Strategy Framework, along with the Teaching and Learning Framework and the Engagement Framework, will be used to guide Memorial's overall planning process and will inform the institution's decision-making and strategic direction. ■

Fisheries research is her Cup of Tea

by Kiley Best

“Consultation with fish harvesters is key to sustainable fishing and marine conservation as a whole.”

KATE BARLEY CALLS HERSELF THE TEATIME SCIENTIST.

While her nickname refers to her passion for her home country’s national beverage (she hails from the seashore town of Cleethorpes, England), it could also be an appropriate description of Ms. Barley’s approach to building stronger connections between scientists and fish harvesters around the world.

A PhD candidate with the Marine Institute’s Centre for Fisheries Ecosystem Research (CFER), Ms. Barley is on a global mission to understand how humans, fisheries and conservation all interact, especially in areas where fishing is closed. Her research includes a worldwide review on fishery closures and how these closures can be a tool for fishery sustainability and conservation.

Supported by the NSERC Canadian Fisheries Research Network, Ms. Barley’s work is starting in Canada, talking one-on-one with fish harvesters (perhaps over a few cups of tea) in Southern Labrador about the closure of the Hawke Channel area, which has been off limits to shrimp trawling since 2004.

“A fish harvester’s knowledge of an area is often extensive and I want to capture their views on the effectiveness of the closing of that area,” Ms. Barley said. “Has it benefited them or not? What are their opinions on what, from an ecological perspective, has happened in this area during the closure? Has it been positive or negative? That’s what I’m hoping to gain from my conversations with each individual.”

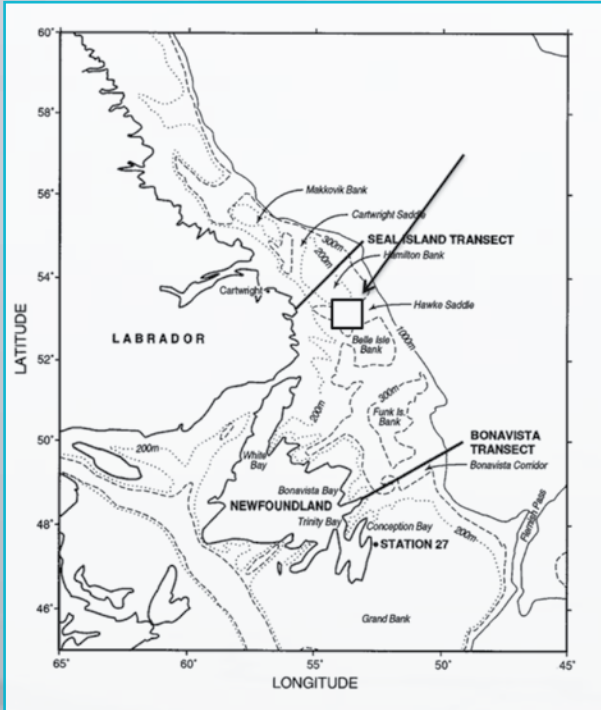
Ms. Barley will combine the ecological and fisheries knowledge gleaned from fish harvesters with fisheries survey data, collected pre- and post-closure, to see if there is a correlation.

“Consultation with fish harvesters is key to sustainable fishing and marine conservation as a whole,” she said. “The goal of my research is to bridge knowledge gaps between the different groups involved in the fisheries sector so that together, they can make more informed decisions. There are positive examples worldwide of stakeholders working together successfully and, to be resilient, this experience needs to be shared globally to achieve the best solutions locally.”

It’s logical then that Ms. Barley’s next step is to find out how fish harvesters are impacting their sector in other parts of the world where fishing is closed.

To further the global to local focus, Ms. Barley will travel to Tanzania to interview fish harvesters in Mafia Island Marine Park, using a Going Global Grant from Memorial’s International Centre and School of Graduate Studies. There she’ll examine current perceptions and support for closed areas and specified use zones within the marine park.

Ms. Barley will also attend the International Union for Conservation of Nature (IUCN) World Conservation Congress in Jeju, Korea, to lead a roundtable on how fish harvesters are involved in closed areas around the world.



Kate Barley, PhD candidate with CFER

But before she heads out to talk with fish harvesters around the world, Ms. Barley will join other CFER scientists and graduate students onboard the RV Celtic Explorer, a state-of-the-art research vessel chartered from Ireland’s Marine Institute. She will take part in CFER’s ecosystem-based research in the waters, both inshore and offshore, around Newfoundland and Labrador. This will include acoustic surveys, multi-species trawl fishing, biological sampling and oceanographic data collection using the most sophisticated technology in the field.

The ship will also revisit Ms. Barley’s case study area, the Hawke Channel, to conduct an acoustic survey and map the seafloor topography of the area using multi-beam sonar.

This will be the second survey for Ms. Barley and the CFER team on the RV Celtic Explorer. During the 2011 survey, she wrote the ship’s daily blog and attracted followers on both sides of the Atlantic who wanted to know more about CFER’s first overwintering cod survey. She intends to continue the blog on the 2012 survey through the Marine Institute’s website.

Ms. Barley says working with Dr. George Rose, his team of scientists, technologists and other graduate students in CFER, has provided an excellent learning opportunity. “Choosing to do my PhD at CFER has allowed me research experiences far more than I ever expected,” she said. “With the opportunities for research funding and extensive work at sea, CFER is an exciting place to be.”

Ten other graduate students are a part of CFER, where they are examining freshwater hydro acoustics, Icelandic capelin migratory patterns and Atlantic cod feeding behaviour, migratory behaviour and reproduction and otolith microchemistry.

Ms. Barley is chronicling her current research, conversations and global travels on her way to completing her PhD on a new blog, aptly named teatimescientist.blogspot.com.

Be sure to read it with a good cup of tea. ■

Kiley Best holds a B.Sc. from Memorial, is currently working toward a M.Sc. and is a fisheries technologist with CFER.

A NEW APPROACH to understanding regions in Newfoundland and Labrador

by Rebecca Cohoe

THERE'S A LOT OF TALK about the state of rural communities in Newfoundland and Labrador. New research at Memorial is countering the conjecture with statistical fact, along with some suggestions for the future.

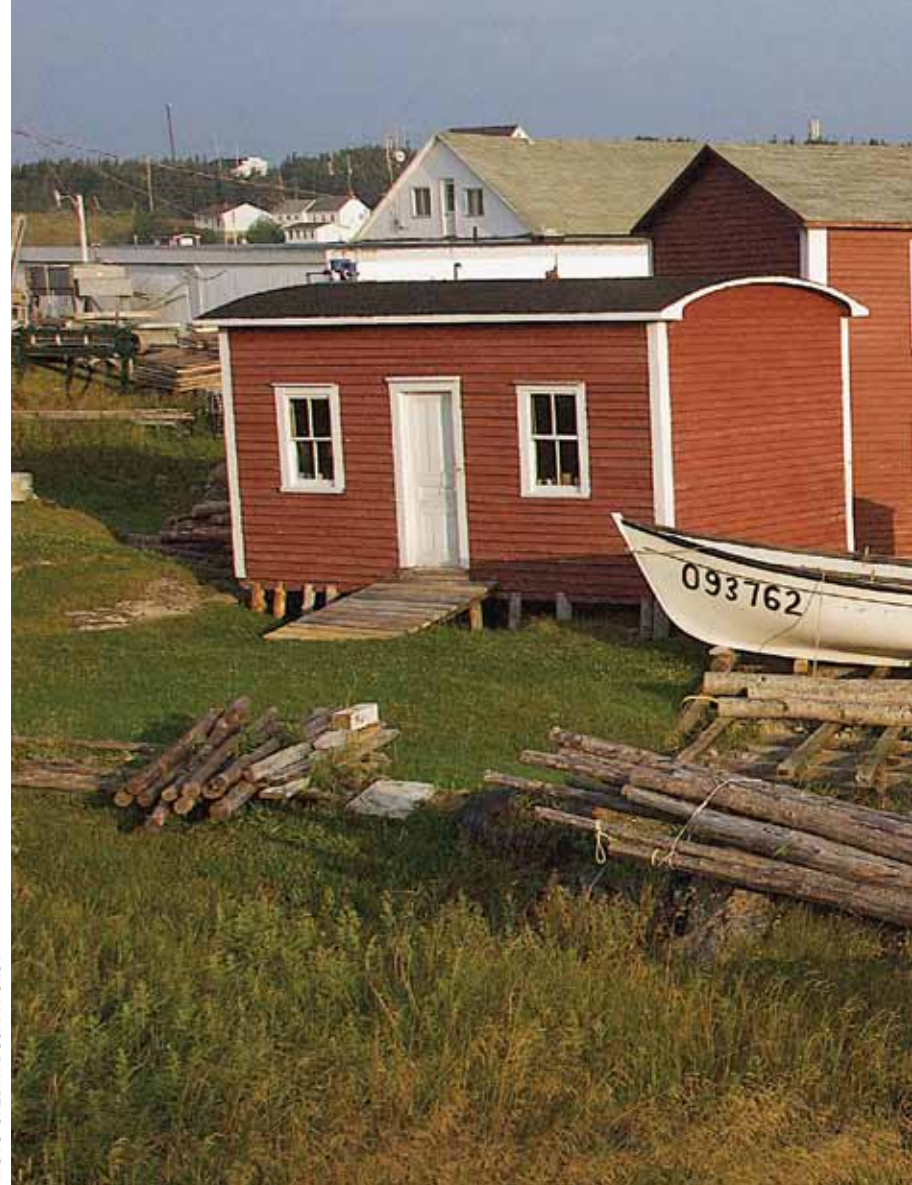
The findings are part of a multi-year research project to identify more effective ways of organizing economic development efforts in the province. The project, Rural Urban Interaction NL—Understanding and Managing Functional Regions, is a collaboration between Memorial's Leslie Harris Centre of Regional Policy and Development, the Canadian Rural Revitalization Foundation, Municipalities Newfoundland and Labrador (MNL) and faculty from Memorial's Department of Geography.

The research was undertaken by Dr. David Freshwater, Department of Agricultural Economics, University of Kentucky, and Department of Geography, Memorial University; and Drs. Alvin Simms and Kelly Vodden, Department of Geography, Memorial University.

Work was guided by an advisory committee of individuals representing federal and provincial departments and agencies, municipalities and development organizations, as well as collaboration and communications with partner organizations in each of the case study areas: the Irish Loop, Twillingate-New World Island and the Labrador Straits.

"Municipalities Newfoundland and Labrador has been researching and promoting regional collaboration for several years now," said Craig Pollett, executive director, MNL. "This research has provided us with useful new perspectives on and valuable new tools for encouraging regionalization."

PHOTO CREDIT: BOJAN FÜRST



Change Islands, Newfoundland and Labrador

At the heart of the project is the concept of functional regions. Unlike administrative boundaries, such as municipal lines or Regional Economic Development Zones, functional regions are defined by existing patterns of spatial interaction. More simply put, functional regions group populations based on the way that people live their lives. Unlike traditional administrative boundaries, functional regions account for the movement of people within a region, and the impact that that movement can have upon planning and development.

One outcome of the research project is the Regional Economic Capacity Index (RECI). RECI is a web-based tool that uses statistical data to assess the strengths and weaknesses of a community. It standardizes data inputs so that socio-economic scores are expressed as percentages and translated to textual information allowing users to assess the strengths and weakness of a community.



RECI can help assess the strengths of adjacent communities, which can lead to more strategic regional development.

“RECI takes different types of data and shows how it all works together,” explained Dr. Simms. “It’s about creating useable information out of raw data.”

The comparison function is particularly useful when assessing the strengths of adjacent communities. Some may serve a specialized function, such as a fish plant location, while others may be particularly well suited to provide retail services. With those strengths in mind, communities may employ different development strategies based upon the larger regional context.

Collaboration is also central to the second element of the project: governance. Historically, rural communities in Newfoundland and Labrador place a high value on independence. However, with declining resource industries and demographics, collaboration may be the best path to a viable future.

According to the researchers, paying attention to functional regions could lead to more responsive and

relevant governance at local and provincial levels. Because functional regions are defined by spatial interaction, they avoid the problem of placing boundaries in inappropriate places and of making regions too geographically large for activities that are based on daily interaction.

Dr. Rob Greenwood, project chair and executive director, Harris Centre and the Office of Engagement, said it must be noted that the researchers aren’t advocating municipal amalgamation.

“This research highlights the many opportunities for neighbouring municipalities to work together to their mutual benefit, while maintaining their independence as democratic governments,” he said. “Much collaboration is already taking place, but our hope is that this research and the RECI online tool will enable much more.”

To read the reports and access RECI, please visit the Harris Centre website at www.mun.ca/harriscentre. ■



One engineer
+ Memorial
MBA degree
= **A DIVERSE
WORKFORCE
STRATEGY**

by Moira Finn

THAT AN MBA RESEARCH PROJECT could have real-world benefits for an energy company is not out of the ordinary. Indeed, more than one business strategy originated in research or a class assignment from Memorial's Faculty of Business Administration.

What is unusual, however, is when the researcher is an electrical engineer and the outcome is the start of an actionable strategy for workplace diversity.

In 2009 engineer Nancy Hart was looking for a research project to complete her MBA degree. At the same time her employer and MBA sponsor, Nalcor Energy, was seeking to develop and implement a diversity strategy.

Just a few years later, that strategy is an integrated part of Nalcor's human resources operations and strategic planning process.

A diverse and inclusive workforce is a critical business issue for many Canadian companies—especially energy companies, which are in fierce competition for skills and talent in a global market.

And while the value of diversity is clear, the processes for effectively implementing and managing diversity programs are not well established.

"Neither reviews of industry best practice, nor academic literature showed a proven course for implementation," Ms. Hart said of the initial findings of her research.



“This research explores how a diverse workforce strategy contributes to organizational successes.”

Accustomed to the project work that is the mainstay of engineering, Ms. Hart took a non-traditional view of implementing a diversity strategy.

“Large energy companies like Nalcor already have a plan or a program for virtually everything they do—whether environmental stewardship or developing multi-million-dollar projects,” Ms. Hart explained. “Why not take this same approach and apply it to diversity?”

Ms. Hart used Nalcor’s well-honed annual strategic planning process as a model for the development and integration of a workplace diversity program.

“It was already understood, accepted and used throughout every level of the organization from the shop floor to the boardroom,” she said.

Ms. Hart credits research collaborator Dr. Tom Cooper, assistant professor, strategic management, Faculty of Business Administration, with guiding the research and making sure that implementation of a diversity strategy always complemented existing strategic corporate objectives.

“This research explores how a diverse workforce strategy contributes to organizational successes,” Dr. Cooper said. “And while it can be implemented by Nalcor, it is also relevant to a broader audience and that is valuable research.”

The opportunity to conduct independent research projects, under faculty supervision, is an important part of the Memorial MBA program. These research projects link theory and practice, enabling students to do in-depth work in a particular area of interest.

“Research projects are a valuable component of the MBA program as they allow students to explore areas of interest and customize their electives to meet their learning objectives,” explained Peggy Coady, director of graduate programs within the Faculty of Business Administration.

“We have had many MBA students undertake interesting research projects that involve important issues for local organizations. MBA students are able to apply the knowledge and skills from their course work in a highly focused way through the faculty-supervised research projects. These have proven to be highly productive and rewarding experiences for the students, faculty members and organizations—just like Nancy’s.”

Indeed, the research has garnered attention among energy companies. Already, Ms. Hart has presented the findings at an oil and gas conference and may also publish the work. ■

OPEN SOURCE MAPPING:

a new direction in cartography

by Janet Harron



OUR RELATIONSHIP TO MAPS has changed drastically in the last 10 years. While people used to rely on paper maps, they now regularly use web applications like Google Maps to locate places, calculate itineraries or rely on GPS when travelling by car.

But one thing about maps that hasn't changed is the need for information on locations. With the rise of collaborative mapping or crowd-sourced mapping, people are once again working together to gather and share this critical data.

Associate geography professor Dr. Rodolphe Devillers is interested in the use of geographic information by the general public. He is using this emerging trend in collaborative mapping as a focal point for his research.

With more similarities to the open source world of Wikipedia than traditional cartography, collaborative mapping allows any Internet user to view, edit and use geographical data in a collaborative way.

"The Government of Canada, for example, updates the objects on their maps at a rate of 25 years on average," said Dr. Devillers. "When you look at a map, you're looking in fact at a representation of reality from years ago. This can have severe impacts if the map is used to support some types of decision-making processes."

Alternatively, in a world of collaborative mapping, there is a built-in capability of always being up to date. And even though people who are not

"In many cases, Wikipedia has been proven more accurate than established encyclopedias. The same applies for collaborative mapping."

specialists might make mistakes, they are regularly corrected, similar to entries on Wikipedia.

“In many cases, Wikipedia has been proven more accurate than established encyclopedias. The same applies for collaborative mapping,” explained Dr. Devillers, who believes collaborative mapping is particularly effective in highly populated regions like cities.

“The rule of thumb is that the more population you have in a place—assuming of course they have Internet access—the more people are likely to contribute to these maps and the better the map will be.”

For example, the OpenStreet Map of St. John’s is fairly good but in areas with relatively low population, such as Flatrock or Pouch Cove, only main roads are currently mapped.

This issue of efficacy is essentially what Dr. Devillers is studying.

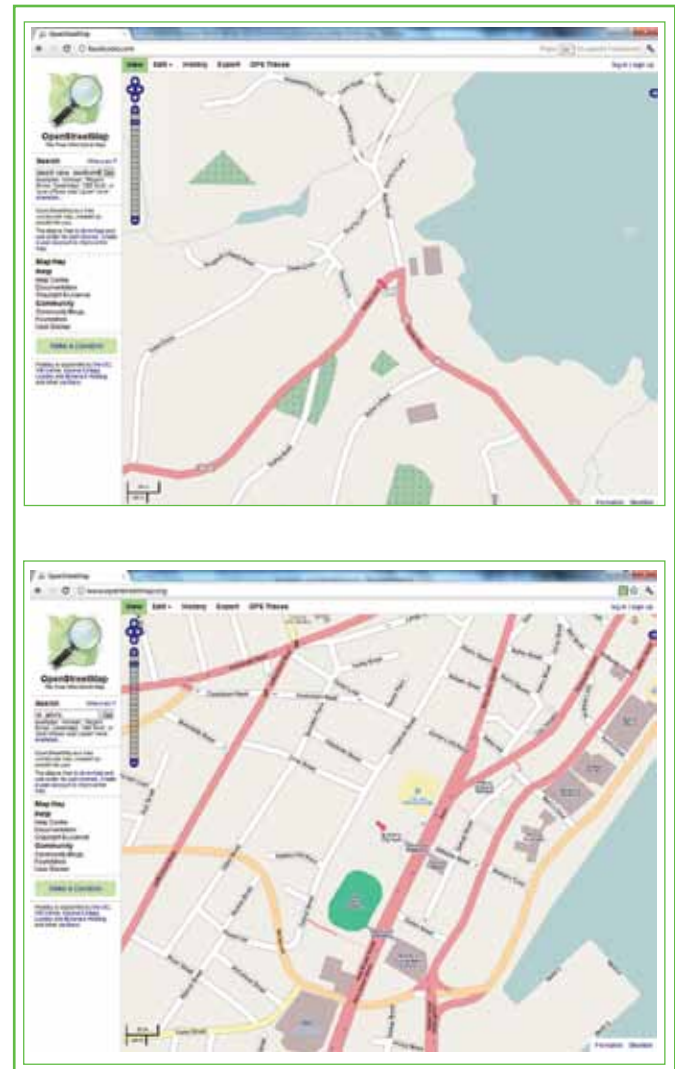
“I am trying to understand what makes these maps good or bad, useful or not. How we can identify and measure the problems, how maps can be improved, how we can inform the users of their inaccuracies and understand the types of uses that can be made with these maps and the ones that can’t,” he explained.

Two major grants awarded in 2011 by the Natural Sciences and Engineering Research Council of Canada (NSERC) will enable Dr. Devillers to get the answers he is looking for.

One of the first steps will be a workshop he will organize this year at an international conference in geographic information systems (GIS) in Columbus, Ohio.

“This workshop will bring together some of the world leaders on this topic and will allow us to set a road map for research in this field,” said Dr. Devillers, who is currently on sabbatical leave at James Cook University’s ARC Centre for Excellence for Coral Reefs Studies in Queensland, Australia.

He will have two new PhD students and a post-doctoral fellow starting work on the project in the fall of 2012. One of them, currently working for the Canadian national mapping agency, will be focusing on how integrating geographic data collected by citizens and data produced by the government can lead to better maps.



OpenStreet map of Pouch Cove (above) and St. John’s

According to Dr. Devillers there is an increasing interest from industry and governments in collaborative mapping.

“Natural Resources Canada has been exploring the potential of using such technology to complement and validate their maps for the past two to three years,” Dr. Devillers explained. “A lot of interest has also been generated around the use of collaborative mapping in support of crisis and emergencies management. For instance, citizen groups are getting together to help create maps as a result of the environmental disasters such as the earthquake in Haiti, the Gulf of Mexico oil spill and flooding in Australia.”

There is no doubt that as people around the world create and use collaborative mapping, this ancient technology has the potential to become a huge repository of our human and physical environment. ■

INDEPENDENT REPORT REVEALS MEMORIAL'S CAPACITY IN FISHERIES ENVIRONMENT RESEARCH

by Meaghan Whelan

“Memorial has effectively become a one-stop shop, not just for Newfoundland, but for the rest of Atlantic Canada, in the provision of a full range of oceans-related research and training.” The statement above was concluded by a panel of international experts tasked with evaluating the impact of investments from the Canada Foundation for Innovation (CFI) in Memorial.



The Ocean Sciences Centre, currently undergoing massive expansion, is expected to become an international destination for cold ocean, deep water research.

MORE SPECIFICALLY, the panel was tasked with assessing the degree to which focussed CFI investments have contributed to increased strategic research planning, research capacity, productivity, innovation and recruitment and development of highly qualified personnel at Memorial University.

The CFI investments, comprising 15 projects, totalled \$5,267,777. With partner funding included, the overall project value was \$15,013,209.

The CFI Outcome Measurement Study (OMS) began with a self-study report to the international panel. This was followed by an intense two-day site visit during which faculty, staff, students and some of Memorial's key research partners from the public and private sector impressed upon the panel the depth, breadth and impact of their research within the fisheries environments theme.

“The OMS provided us with a unique opportunity to demonstrate the quality of our research, the careful stewardship

and strategic use of investments provided by the CFI and related sponsors and the strong connections we have built with our community partners,” explained Dr. Christopher Loomis, vice-president (research). “These are the features that make Memorial University a natural and effective place to invest in research.”

In analyzing Memorial’s strategic research planning, the expert panel said, “It is rare to see research planning so deeply impacted by the external context or the palpable commitment of an institution to the people of a province as is the case at Memorial University.”

Memorial’s special obligation to the people of Newfoundland and Labrador is particularly evident in the fisheries environment theme, reflecting research on issues from coastal governance and sustainability to habitats and population ecology—from viable aquaculture to ocean observation.

CFI investments in the Ocean Sciences Centre (OSC) at Logy Bay and the Bonne Bay Marine Station on the West Coast were recognized as critical for attracting and building the critical mass of expertise necessary for cold oceans and aquaculture research. The panel noted that once the current expansion of the OSC is completed, the facility will become the international go-to location for the specialized study of invasive species, deepwater organisms and marine diseases in cold oceans.

“One of our primary goals was to impress upon the panel the quality, scope, relevance and impact of our research, both here and beyond,” Dr. Loomis said. “We’re extremely proud of all those who contributed to the success of the Outcome Measurement Study, as well as the strong endorsement from the international panel in the way we deployed these hard earned investments to deliver benefits from the research.”

The overall message of the report is that Memorial is an excellent steward of CFI investments. While the panel noted some of the challenges faced by Memorial University—the provision of adequate research space, maintaining highly skilled technical support and attracting private sector funding in key research areas—they acknowledge that, “Despite the challenges, [Memorial] seems to be very well organized and doing an excellent job at remaining contemporary within a rapidly evolving environment of the fisheries sector—the capture and culture fisheries—and the impacts of globalization.”

CFI funding is intended to enhance Canada’s ability to undertake world-class research and technology development, particularly to build state-of-the-art research infrastructure and to attract and retain top researchers and students. ■

EXCERPTS FROM THE EXPERT PANEL REPORT

On research capacity:

The expert panel commented on the existence of valuable interactions amongst disciplines, genomics and physiology; social sciences, and natural sciences. Memorial University’s relatively small size and institutionalization policies have promoted multidisciplinary research.

On recruiting highly qualified personnel:

There is evidence of active collaboration with students to write publications arising from their research, and encouragement for them to give presentations of their work at conferences. In their interactions with students, the expert panel noted that they were both articulate and excited by their research.

On research productivity:

Some of the research outcomes [in the theme of fisheries environments] have had significant international recognition; for example, the work on sea cucumbers (Dr. Annie Mercier), the paradigm shifting work on transgenic fish (Dr. Garth Fletcher), the work on cod genes and virology (Dr. Matthew Rise), the biogeography work (Dr. Paul Snelgrove), the internationally recognized work on the behavioural and evolutionary ecology of fishes (Dr. Ian Fleming), and the work on protobranch bivalves (Dr. Raymond Thompson). There is also international penetration of Dr. Ratana Chuenpadgee’s work on governance of fisheries and coastal systems.

GRENFELL CAMPUS POISED FOR RESEARCH GROWTH

DR. ANTONY CARD APPOINTED TO NEW LEADERSHIP ROLE

by Melanie Callahan

GRENFELL CAMPUS HAS A NEW ASSOCIATE VICE-PRESIDENT responsible for growing research capacity. The executive committee of Memorial University's Board of Regents appointed Dr. Antony Card to the position of associate vice-president (Grenfell Campus) research in February 2012.

Dr. Card is currently the dean of the School of Human Kinetics and Recreation (HKR). Since joining Memorial University in 2002, he has served HKR in various roles including assistant professor, associate professor, associate director, director and the position he holds today. He has a national and international reputation in the areas of childhood obesity, inactivity and comprehensive school health. Dr. Card has been successful in obtaining grants to study nutrition, obesity and healthy living, including an evaluation of Newfoundland and Labrador's school health promotion and research on provincial youth smoking rates.

"Dr. Card's strong background in collaborative and community research is an excellent fit for Grenfell's associate vice-president research position," said Mary Bluehardt, vice-president, Grenfell Campus. "The strategic goals of Grenfell's Research Office focus on collaboration, interdisciplinary research and fostering partnerships and alliances in our region and beyond. Dr. Card has a demonstrated record of fostering opportunities for outreach and partnership development.

His research in the fields of health and wellness and health promotion is also advantageous as Grenfell continues to advance a centre for aging and bridge with Western Regional School of Nursing."

In addition, Dr. Bluehardt noted his experience as dean of HKR, where diversity in research and its various sources of funding is encouraged and supported, will serve Grenfell Campus well.

"I am excited to join Grenfell," said Dr. Card. "My priority will lie in supporting all areas of research and scholarly activity. I will embrace diversity of research and will support all divisions, in different fields of study. I have a keen interest in building partnerships with industry, the community, government and the research senate which will foster research and help form important relationships.

"The recognition of opportunities for dissemination is also critical, including the linking of Memorial's St. John's and Corner Brook research offices. Researchers sometimes struggle with issues and could learn from the experiences of their peers. Building a bridge between the two campuses will be mutually beneficial."

Dr. Card also noted that he will build on his own personal success in receiving research funds and grants to work with Grenfell researchers to identify such opportunities.

It is this eagerness to foster research that assures the realization of increased research potential at Grenfell.

“Dr. Card is a proven leader who will bring great vision to Grenfell Campus of Memorial University,” said Dr. Gary Kachanoski, president and vice-chancellor. “I am looking forward to working closely with him and the rest of the Grenfell community as we build on our past accomplishments and excellence. With a full team now in place, we are looking to the future with tremendous optimism.”

Dr. Card holds a PhD from the University of Bedfordshire in Bedford, U.K., and an MA and BA from the University of Southampton in Hampshire, U.K.

The associate vice-president (Grenfell Campus) research is a part of the senior administrative team at Grenfell Campus. Responsibilities include expanding research portfolios across various disciplines, promoting research priorities and theme sets, and assisting Grenfell faculty members to develop research projects and seek financial assistance. Dr. Card will also be tasked with encouraging investment in research infrastructure, grants and proposals, and supporting research enhancement, research compliance and technology transfer. ■



“ I will embrace diversity of research and will support all divisions, in different fields of study.”

DR. ANTONY CARD

Gauging children's EARLIEST MEMORIES

by Kelly Foss

ON ANY GIVEN DAY, Dr. Carole Peterson or her student assistants may be found jumping on beds or playing with Legos. The professor of psychology must go where her interview subjects take her—and things trying to interview a two-year-old.



It's all part of a day's work when your research is centred on childhood amnesia—the absence or scarcity of memories before age four.

Dr. Peterson, a University Research Professor in the Department of Psychology at Memorial, has always been interested in children's autobiographical memory skills—their ability to recall and tell stories about themselves.

By interviewing children ages four to 13 about their earliest memories, verifying them with parents and then retesting those memories again when she saw the child years later, she found that the youngest kids were able to recall memories from when they were barely two years old, but these memories were often lost by the return visit.

"The thing I found really interesting when I looked at the infantile amnesia literature was the explanation that kids can't recall autobiographical memories because they don't have the language or memory skills or a sense of self, and yet I'm interviewing four-year-olds who are remembering earlier events, so that explanation is out the window. Yet, it's true that by the time they get to be an adult they can't remember any of those things. That doesn't happen with kids who are 10 and up. Their memories seem to be cemented."

What she found most interesting was that parents were amazed, not only that their young children could remember that far back, but also by the particular memories they recalled.

"That's the next thing we're looking at is why children recall particular memories. The things they recalled were often moments that were so pedestrian the question is why that particular memory stuck with them."

In 1991 her research took a slightly different track when she read an article about how unreliable children were as eyewitnesses in court.

"I realized it was because they were interviewing children about the wrong things," explained Dr. Peterson. "They're interviewing them about things kids don't care about or are not interested in. Guts and gore is what they love talking about."

That's when she began recruiting children and their parents based on visits to the emergency room of the Janeway, a children's hospital in St. John's.

"Because those children had been involved in events serious enough to bring them to the Janeway, we were able to interview both the children and adult eyewitnesses and document how accurate the kids' stories were. Then we followed up with them five years later to see how much they were able to recall and the accuracy of their statements."

Dr. Peterson says children have historically been seen as unreliable witnesses about forensic events because it was believed they couldn't remember events very well and furthermore couldn't differentiate fantasy from reality. That meant they were not allowed to testify in court and police, courts and juries dismissed most of what they said.

"So egregious injustices occurred because children had no voice, and if there were no adult witnesses to the abuse or other forensic events, they were out of luck in terms of the justice system," she explained.

But those beliefs proved to be incorrect. Dr. Peterson's research found that even after five years many children had excellent memories for events, including extremely high accuracy rates and there was no confusion between fantasy and reality.

"I documented that children as young as 2½ could be good witnesses, although of course they are hard to interview and are vulnerable to coercive or suggestive questioning," said Dr. Peterson. "Three-to-five-year-olds were surprisingly good witnesses, and older children even better. This was even true when children were screaming hysterically in pain at the time of the event."

Dr. Peterson's research, along with that of others, has had an important impact in giving children a voice in the forensic system, and children are now routinely appearing in court. ■



Nancy Dahn, Timothy Steeves and Dr. Clark Ross.

MAKING BEAUTIFUL MUSIC

TWO CLASSICAL
COMPOSITIONS
WITH A MEMORIAL
CONNECTION
NOMINATED
FOR JUNOS

by Janet Harron and Meaghan Whelan

THE 2011 JUNO AWARDS had special resonance at Memorial's School of Music. It was the first year faculty members in the school were nominated for Canada's national music awards.

A musical portrayal of love and loss earned Dr. Clark Ross a nomination for Classical Composition of the Year, while a piece commissioned for Duo Concertante, violin professor Nancy Dahn and pianist Timothy Steeves, was up for the same award.

Dr. Ross' work, *Last Dance*, is a tango-based composition for piano. Encouraged to submit the composition by a producer at the Canadian Music Centre's Centrediscs label (which produced Canadian pianist Barbara Pritchard's CD *Piano Atlantica* on which the recording appears), Dr. Ross said the nomination was meaningful on several levels.

"It's gratifying," he said. "Being a composer is like being a writer—it's sort of a lonely profession and you have to believe in yourself. Every now and then, it's nice to have an external body reinforcing that belief. Plus," he laughs, "my kids are proud of me!"

So is the School of Music's dean, Dr. Ellen Waterman.

"Clark Ross is a wonderful creative artist, and this Juno nomination reflects his importance on the Canadian music scene," she said.

Dr. Ross was originally commissioned to write *Last Dance* by Memorial University pianist Dr. Kristina Szutor

through the Newfoundland and Labrador Arts Council. Born in Venezuela to Canadian parents, Dr. Ross, who has taught at Memorial for 20 years, drew on his Latin American roots to write the piece, whose outer sections are based on a slow tango or habanera rhythm.

Duo for Violin and Piano, composed by R. Murray Schafer and commissioned by Duo Concertante, earned the Juno for Classical Composition of the Year.

When the duo commissioned a work from the internationally renowned Canadian composer, they were excited to play the composer's very first piece for the combination of violin and piano.

Dr. Schafer works very closely with musicians, and the duo spent time at his Ontario farmhouse playing for him and discussing ideas. They recorded the work on their recent CD *Wild Bird* and the piece was subsequently nominated for the Juno.

"It's a classic example of the power of collaboration," explained Dr. Waterman. "With the help of research grants from Memorial University, the Duo Concertante was able to achieve this important commission and make a superb recording that is garnering international attention. The Juno award is a tribute to a great composer and two very dynamic interpreters."

Commissioning partners in the work included the Tuckamore Chamber Music Festival, the Ottawa Chamber Music Festival and CBC Radio. ■

SCHOOL OF MUSIC ALUMNI nominated for 2012 Junos:

Album of the Year: "The Once" (Andrew Dale, B.Mus. 2003)

New Group of the Year: "Hey Rosetta" (Josh Ward, B.Mus.2007 and Romesh Thavanathan, B.Mus. 2008)

Listen online: Last Dance
www.clarkross.ca/Progr-LastDance.htm

BUILDING SHIPS FOR HARSH CONDITIONS

STePS² project aimed at safe design and assessment of ships and offshore structures in the Arctic

by Darcy MacRae

THE ARCTIC is poised to be a strategic location for industrial activity. Offshore oil and gas, shipping and fishing companies will need to know how the harsh conditions will affect valuable equipment and tools, making the Sustainable Technology for Polar Ships and Structures (STePS²) project a valuable and essential piece of research.

STePS² seeks to significantly improve the understanding of high energy collisions between marine ice and steel structures, while gaining an improved knowledge of the resistance and/or failure characteristics of man-made structures under high loads from ice.

The project aims to develop validated practical design tools that will permit the design and assessment of safe ships and offshore structures for Arctic conditions.

Dr. Claude Daley, chair of ocean and naval architectural engineering with the Faculty of Engineering and Applied Science, is the principal researcher on the STePS² project. He and a team of faculty members, post-doctoral fellows and graduate and undergraduate student researchers are conducting an extensive set of laboratory experiments covering ice crushing, structural response to ice loads and the hydrodynamics of ice blocks as they move around a ship or structure.

Given the harsh conditions in the Arctic, it is understandably a difficult location in which to conduct research. As a result, Dr. Daley and his team of researchers are relying heavily on the use of the high performance computer models.

“These experiments will be used to validate high performance computer (HPC) models. The HPC models, developed on several software platforms, will then be used to model and examine full-scale ice loading scenarios on both ships and structures,” Dr. Daley explained. “With the experience and results from these HPC scenario simulations, we can create simple and robust design and assessment tools that can be used by industry.”



According to Dr. Daley, the HPC models produce accurate and important research data that is vital to the STePS² project.

“Development of computers and software is enabling increasingly sophisticated numerical simulations of ice-structure interactions,” Dr. Daley said. “Improved ice load models will be implemented using high performance computing, validated with laboratory tests and full scale data.”

As the project progresses, the results of the team’s experiments will combine to support and verify the future phases of STePS². For the graduate and undergraduate researchers taking part in the project, the experience will prove to be very beneficial.

“A significant number of individuals will gain new knowledge and experience in the issues, challenges and methods to permit sustainable projects in the Arctic offshore,” Dr. Daley said.

STePS² is a five-year project conducted in partnership with the National Research Council Canada. It is funded by the Atlantic Canada Opportunities Agency (ACOA) Atlantic Innovation Fund (AIF), the Research & Development Corporation of Newfoundland and Labrador (RDC), Husky Energy, the American Bureau of Shipping (ABS), Rolls Royce Marine, Samsung Heavy Industries and BMT Fleet Technology Ltd. Additional funding, which supports students working on the project, is being provided through Mitacs, Natural Sciences and Engineering Research Council of Canada (NSERC) and Memorial University. ■

TACKLING THE OBESITY EPIDEMIC

by Jennifer Deon

THE IMPACT OF THE OBESITY EPIDEMIC IN

Newfoundland and Labrador has long been a passion of Dr. Laurie Twells, assistant professor with the School of Pharmacy and Faculty of Medicine. Her research has examined the adult obese population in Newfoundland and Labrador and its impact on the healthcare system.

In this province, one in every three adults is obese, with a body mass index (BMI) greater than 30. A key finding from Dr. Twells' studies was that obese adults in our province report more chronic conditions—and consequently use and cost the health care system more than normal-weight individuals.

Within this group, there has been a disproportionate increase in individuals that are excessively obese and are classified as class II (BMI greater than 35) and class III obese (BMI greater than 40). But what Dr. Twells found particularly interesting was that it was the individuals in the higher classes of obesity that had the most impact on the health care system.

The study demonstrated that, when compared to normal weight individuals, class II and III individuals in Newfoundland and Labrador are six times more likely to have cerebrovascular diseases, including high blood pressure, heart disease, stroke and are five times more likely to report having diabetes.





In addition, these individuals had double the number of visits to a general practitioner per year compared to normal-weight individuals.

The study clearly identified the problem that obesity poses, however, a long-term, effective solution to obesity has been a challenge to individuals and health care professionals.

Currently, the only medically effective treatment for class II and III obesity and its related health conditions is bariatric or weight loss surgery.

In May 2011, Eastern Health, the largest regional health authority in the province, started offering laparoscopic bariatric surgery (sleeve gastrectomy or LSG) to eligible class II and III obese patients.

Compared to other bariatric surgeries, LSG as a stand-alone procedure is a relatively new type of surgery: a non-reversible procedure resulting in the removal of 80 per cent of the stomach, leaving a much smaller stomach or sleeve. Approximately 70-100 surgeries are planned to be carried out annually within Eastern Health.

The introduction of bariatric surgery as a treatment for some of the obese individuals in Newfoundland and Labrador presented a timely opportunity for Dr. Twells to expand on her previous research.

Dr. Twells identified there is limited research on LSG, in Canada and elsewhere, on the experiences of patients who choose bariatric surgery as a treatment of their morbid/clinical obesity and on patient expectations of weight loss, mid-to-long-term patient outcomes, and patient-reported health outcomes post-surgery.

As a result, a new multidisciplinary team has been formed at Memorial to investigate bariatric care in Newfoundland and Labrador.

“What is exciting about this research is that, from the very beginning, we have been working closely with the multidisciplinary clinical team to develop a comprehensive bariatric care research program that will capture the patient’s total experience,” Dr. Twells explained.

This research team, led by Dr. Twells and Dr. Debbie Gregory (Faculty of Medicine), consists of researchers at Memorial, health care professionals and decision-makers from Eastern Health and policy makers at the provincial Department of Health and Community Services.

Dr. Twells said that a key outcome of this program is the development of a more evidence-informed practice in the area of bariatric care.

“Our research team is working very closely with the clinical team to ensure our study results will be fed back to the clinical team on a timely basis,” she said.

Dr. Twells noted that it is every researcher’s dream to be able to witness how research is making a difference to those who can benefit from it. The ultimate goals of her team’s research is improving health care delivery, sustaining long-term patient health outcomes and improving population health in Newfoundland and Labrador.

“While the program is still in its initial phases, the implications are exciting—not only for the patients themselves, but also for the health care system in Newfoundland and Labrador as a whole.” ■



OF NOTE

Innovation Centre renamed to honour Angus Bruneau



Tom Paddon, Vale general manager, with Angus Bruneau and his son Stephen Bruneau.

guests joined Dr. Bruneau and his family — including his son, Memorial engineering professor Dr. Stephen Bruneau — to recognize Dr. Bruneau's many contributions to Memorial and to Newfoundland and Labrador.

Dr. Angus Bruneau has a close and multi-faceted relationship with Memorial. His tenure as dean of the Faculty of Engineering and Applied Science from 1968-1974 saw the development of the co-operative education program—one of only two such programs offered by Canadian universities at the time.

Upon his 2006 retirement as chair of the board at Fortis Inc., Dr. Bruneau's colleagues at the corporation contributed \$100,000 towards the renovation of the main lecture hall in the university's S.J. Carew engineering building. The lecture hall has since been known as the Angus Bruneau Engineering Lecture Theatre.

Dr. Bruneau is also a tireless volunteer in several capacities at Memorial as well as a long-time donor. In 2007 the university was the recipient of a generous \$1-million donation from Dr. Bruneau and his wife Dr. Jean Bruneau. The gift continues to fund the Angus Bruneau Student Leadership and Innovation Fund in Engineering, which provides life-changing opportunities to students in Memorial's Faculty of Engineering and Applied Science.

MEMORIAL UNIVERSITY AND VALE

celebrated the ongoing legacy of one of Newfoundland and Labrador's most outstanding citizens in the field of engineering and research-based innovation by renaming a building on the university's St. John's campus in his honour.

The Inco Innovation Centre was renamed as the Bruneau Centre for Research and Innovation after **DR. ANGUS BRUNEAU**, Memorial's founding dean of the Faculty of Engineering and Applied Science, during a special ceremony in April 2011.

The large, well-utilized lecture theatre in the building has since been known as Innovation Hall.

Memorial University President and Vice-Chancellor Dr. Gary Kachanoski, Vale General Manager Tom Paddon and numerous special

FIRST PHD GRADUATES IN SCHOOL OF PHARMACY AND FACULTY OF BUSINESS ADMINISTRATION

MOHAMED MAHMOUD (commonly known as Shaker) successfully defended his PhD thesis *New Biodegradable Elastomers for Therapeutic Protein Delivery*, last April making him the first graduate student to receive a PhD from the School of Pharmacy.

The research involved working on a new drug delivery system capable of providing a more constant and sustained delivery of treatment for cancer. Dr. Mahmoud was supervised by Dr. Husam Younes, an adjunct professor with the School of Pharmacy at Memorial University, and co-supervised by Dr. Mohsen Daneshtalab, the associate director of graduate studies and research at the School of Pharmacy.



Drs. Husam Younes, Mohamed Mahmoud and Mohsen Daneshtalab



Dr. Wilfred Zerbe, dean of the Faculty of Business, and Dr. Behzad Hezarkhani

BEHZAD HEZARKHANI crossed the stage at Convocation in October 2011 as the first PhD graduate from the Faculty of Business Administration. His thesis, *Transshipment of Decentralized Supply Chains*, was focused on sharing common resources among supply chain members in order to mitigate the risks of uncertain demands. Dr. Hezarkhani was supervised by University Research Professor Dr. Wieslaw Kubiak.

MEMORIAL BECOMES FIRST NATIONAL PARTNER OF HEART AND STROKE FOUNDATION CENTRE FOR STROKE RECOVERY

MEMORIAL UNIVERSITY OF NEWFOUNDLAND has joined the Heart and Stroke Foundation Centre for Stroke Recovery (CSR), becoming its first partner outside Ontario. This marks the beginning of the CSR's expansion across Canada, as it evolves into a truly national organization.

The CSR is a unique, multi-site research institute dedicated solely to innovative research into ways to promote faster, more complete stroke recovery. Its ultimate goal is to dramatically improve the lives of stroke survivors and their families by learning more about how people recover from stroke at the molecular, cellular, functional and cognitive levels.

"Memorial was selected as the first expansion site because of their track record in stroke recovery research arising from their strategic focus on this area, both at the institutional level and within the Faculty of Medicine," said Dr. Dale Corbett, CEO and scientific director of the CSR.

"The partnership will benefit all parties. Memorial faculty members who belong to the CSR will have access to the knowledge, technology and professional network of our world-class research centre. By the same token, the other CSR partners will benefit from the very considerable knowledge, research facilities and accumulated expertise of Memorial researchers."



TWO MEMORIAL PROFESSORS NAMED TO ROYAL SOCIETY OF CANADA

Two Memorial University professors have been honoured by the Royal Society of Canada (RSC) for their outstanding contributions to research and education.

Memorial's **DR. IAN JORDAAN** and **DR. DANNY SUMMERS** were recently named fellows of the RSC's Academy of Science in recognition of their distinguished work to date. Dr. Jordaan is a University Research Professor and a professor *emeritus* in the Faculty of Engineering and Applied Science at Memorial University, as well as being a principal consultant in ice engineering at C-CORE. Dr. Summers is a University Research Professor with Memorial's Department of Mathematics and Statistics.



Dr. Danny Summers (l) and Dr. Ian Jordaan



Dr. Chris Kozak

CHEMISTRY RESEARCHER NAMED TERRA NOVA YOUNG INNOVATOR

CHRIS KOZAK, an associate professor with the Department of Chemistry, is the newest Terra Nova Young Innovator. The award recognizes, promotes and supports innovative new faculty researchers whose work impacts positively on their departments and has the potential to be of significance to society at large.

For his research, Dr. Kozak will receive \$50,000 from the Terra Nova development, an offshore oil field operated by Suncor Energy. The award will fund his work on developing a catalyst for making plastics from inexpensive, renewable starting materials.

GRENPELL SCIENCE PROFESSOR RECOGNIZED BY NSERC FOR SCIENCE PROMOTION

Bush plane, lobster boat, snowmobile: **GEOFF RAYNER-CANHAM** has used just about every means of transportation possible to reach out to students in isolated areas and bring them his message: chemistry is everywhere!

And now Dr. Rayner-Canham's unrelenting efforts to spread the word about chemistry have earned him a prestigious award—the Natural Sciences and Engineering Research Council of Canada's individual award for science promotion, including a medal, certificate and \$10,000 prize.

For the last 18 years, Dr. Rayner-Canham has presented sell-out, on-campus chemistry shows to high school students at schools in Western and Central Newfoundland. And for the last 10 years he has taken a modified version of the show to remote schools throughout Newfoundland and Labrador, coastal Quebec and even to some schools in Nunavut. Thanks to NSERC's PromoScience Program, he has been able to bring that message to more than 5,000 students during his travels of more than 25,000 kilometres.

ENGINEERING STUDENT WINNER OF CO-OP STUDENT OF THE YEAR AWARD

A student from the Faculty of Engineering and Applied Science received a national award in recognition of the research she completed as part of a co-operative education work term. **LAURA PITTMAN**, a fifth-year mechanical engineering student, was named the university 2011 Canadian Association for Co-operative Education (CAFCE) Co-op Student of the Year.

From May to August last year, Ms. Pittman took part in a co-operative work term with Shell Canada's Deep Basin Drilling Team. One of her chief goals was to complete a competitor study of horizontal wells in the Deep Basin East area. Her original scope included a study of competitor designs and practices, which was expanded to include the analysis of time and cost performance. The future cost savings per well resulting from Ms. Pittman's research is expected to provide significant financial benefits for Shell.

Ms. Pittman was presented with a certificate by CAFCE in honour of her award, as well as an Emery-Dufault Award, named after two of the founding members of co-operative education in Canada. Ms. Pittman is the first recipient of this award from Memorial University.



Laura Pittman



Keri Smith

OVARIAN CANCER RESEARCH SCHOLARSHIP FOR GRAD STUDENT

KERRI SMITH, a PhD student supervised by Dr. Ann Dorward, has been awarded a \$3,000 Teal Heart Scholarship in a national competition. This fellowship is awarded by Ovarian Cancer Canada for graduate students engaged in ovarian cancer research. Ms. Smith also received a travel award from the Canadian Institutes of Health Research Institute of Cancer Research to attend the Inaugural Canadian Cancer Research Conference held in Toronto in November 2011.

Ms. Smith's research is on the identification of tumour susceptibility genes that lead to spontaneous appearance of a particular sub-type of ovarian tumour, called juvenile-onset granulosa cell tumours. Using a mouse model that develops these tumours and mimics pediatric cases, she uses this model for gene discovery and to provide information about genetic etiology that could be translated to human cases.

Ms. Smith presented a research poster at a conference for Canadian Cancer Research and her work has also been submitted to the journal *Cancer Research* for publication. ■

RESEARCH FUNDING CONTINUES TO GROW

\$97.8 MILLION IN EXTERNAL RESEARCH FUNDING IN 2010-2011

WHETHER IT WAS STUDYING methods of improving safety at sea, using archaeological tools to delve into the economic and social history of outport Newfoundland or investigating the integrity of buried energy pipelines, it's been a busy and successful year for the research community at Memorial University.

In every faculty and school, researchers are following their intellectual curiosities about the world around them and applying their disciplinary skills to diverse and complex problems. That work, having been recognized by peers in national funding competitions, earned more than \$97 million in external research funding in 2010-2011, up from approximately \$91 million in 2009-2010.

Dr. Christopher Loomis, vice-president (research), said Memorial's success in attracting external research funding builds on the university's growing reputation for research excellence.

"All research costs money, and in scientific and technological disciplines, these costs can be substantial," said Dr. Loomis, vice-president. "External funding secured in national and international competitions pays the operating costs, provides salary support for students, trainees and highly skilled staff and enables the acquisition of state-of-the-art equipment which is essential for world-class research. Our success in these competitions is a clear illustration of the research excellence taking place at Memorial University."

External research funding at Memorial comes from many sources including the national granting councils, charitable foundations and organizations, federal and provincial government departments, industry partners and individuals. Funding is tracked by the Office of Research Services.

MAJOR RESEARCH PROJECTS FUNDED IN 2010-2011



\$6.8 MILLION TO BUILD THE SUNCOR ENERGY OFFSHORE RESEARCH & DEVELOPMENT CENTRE

SUNCOR ENERGY AND THE RESEARCH & DEVELOPMENT CORPORATION of Newfoundland and Labrador (RDC) have jointly invested in a \$6.8-million expansion of Memorial's S.J. Carew Building. The building, home of the Faculty of Engineering and Applied Science, will be expanded to provide dedicated space for innovative research and industry collaboration related to the ocean technology and offshore petroleum sectors. Suncor Energy is contributing \$2 million to the project and RDC is investing \$4.8 million.

\$2.2 MILLION TO STUDY THE GENETIC ROOTS OF DISEASE, DRUG EFFICACY AND ADVERSE EVENTS

THE POPULATION THERAPEUTICS RESEARCH GROUP in the Faculty of Medicine has received more than \$2 million to create the Newfoundland Genealogical Toolkit. The toolkit is a state-of-the-art information technology platform able to generate large family trees necessary to conduct world-class studies on the role of genetics in disease and undesirable drug reactions.

It will provide support for new gene discoveries linked to diseases, genetic causes for adverse drug reactions, pharmacogenetic (drug-genetic interactions) studies and personalized medicine. The project is funded by the Atlantic Canada Opportunity Agency (ACOA), RDC, the Arthritis Society, the Canadian Institutes of Health Research and the Faculty of Medicine.



\$2.5 MILLION TO SUPPORT WOOD FIBRE RESEARCH AT GRENFELL CAMPUS

RESEARCHERS AT GRENFELL CAMPUS are part of a \$2.5-million Canadian research initiative focusing on wood fibre: how it is distributed across the landscape and how the properties of fibre are related to tree and stand structure. Such knowledge is vital to the transformation of the pulp and paper industry and to new and more innovative products.

Using lasers (LiDAR: light detection and ranging) and advanced computer models, researchers measure the structure of tree stands and the quality of tree fibre.

Partners include Natural Resources Canada-Canadian Forest Service, the Canadian Wood Fibre Centre, ACOA, the Government of Newfoundland and Labrador, RDC, the University of Sherbrooke, Nova Scotia Community College, the Department of Natural Resources, Corner Brook Pulp and Paper and FPInnovations.

\$7.3 MILLION FOR FOUR NEW RESEARCH CHAIRS

With public and private investment of more than \$7.3 million, Memorial added four new research chairs in 2010-2011:

THE NSERC-ALTIUS INDUSTRIAL RESEARCH CHAIR IN THE FACULTY OF SCIENCE, Dr. Stephen Piercey, is investigating ore deposits associated with ancient volcanoes and sedimentary environments to create knowledge and research tools that may be transferable to industry and applied in the search for new resources. The chair was established by the Natural Sciences and Engineering Research Council of Canada (NSERC) and Altius Minerals Corporation, with support from RDC and Memorial University.

THE STEPHEN JARISLowsKY CHAIR IN CULTURE CHANGE IN RAPIDLY DEVELOPING MODERN SOCIETIES, FACULTY OF ARTS, will focus on culture change and the strategies required to affect immigration integration and retention. It is supported by the Montreal-based Stephen Jarislowsky Foundation, Elinor Gill Ratcliffe, a local philanthropist and the Government of Newfoundland and Labrador, through the Department of Human Resources, Labour and Employment (HRLE).

THE VALE RESEARCH CHAIR IN PROCESS RISK AND SAFETY ENGINEERING, Dr. Faisal Khan, will help find solutions to the challenges faced by process industries, providing safer design and operations, particularly in harsh environments. The chair is supported by Vale, RDC and ACOA. Associated with Memorial's Faculty of Engineering and Applied Science, the chair will expand and support the faculty's safety and risk engineering program.

THE CHEVRON CHAIR IN PETROLEUM ENGINEERING, Dr. Lesley James, will research ways to maximize the recovery of oil from offshore Newfoundland and Labrador fields and build capacity in the Faculty of Engineering and Applied Science for petroleum engineering research. The chair is supported by Chevron Canada Limited and RDC. ■



Meet Memorial University. The natural place where people and ideas **become**.

OUR STUDENTS – 21st-century explorers from more than 80 countries, 18,500 strong, intrepid and curious, ready to take risks and adventures to achieve their potential, to become



OUR PEOPLE – engaging and committed faculty and staff, expert guides who facilitate exploration and experiential learning to help others become

OUR RESEARCH – spanning many disciplines, with faculty and students focused on expanding our understanding of our world and solving its problems, making ideas become



OUR ALUMNI – more than 65,000 seasoned explorers and problem solvers, inspirational exemplars of the transformational power of a Memorial University education

OUR CAMPUSES – four diverse learning and exploration environments uniquely shaped by our North Atlantic location and heritage, each offering the freedom to explore and experience the world



St. John's campus



Harlow campus, U.K.



Grenfell Campus, Corner Brook



Marine Institute campus, St. John's

