



# the morton centre

learning through earth experience

summer season report  
2003

## **Biodiversity. Sustainability. Climate change.**

More and more often, these words percolate through the dialogue of our day-to-day lives. In the media, in the shifting needs of business and industry, and in the values that shape our own personal decisions, we are learning more and more about how these issues will influence the course of our lives and of our society.

This summer at Acadia University's Morton Centre, these issues are in the spotlight. Through learning programs and their own individual research projects, students are exploring how the environment works and how we, as individuals and as a society, can work and live in a more healthy way within it. Although they represent many disciplines and are pursuing a broad array of study, all share one common sense of purpose: each student recognizes that with knowledge comes the power to create real solutions to the environmental problems we face, today and into the future.

As participants in the second year of a long-term integrated research program at the Morton Centre, this season's student researchers are immersed in a dynamic natural environment that offers many questions. Creating opportunities to seek out their answers through scientific inquiry, personal development, and teamwork is the Centre's primary goal. This summer's season marks the cornerstone in this initiative, with the drafting of preliminary development and management plans that will see the Centre itself as a vibrant living example of a fully sustainable research and learning facility.

That students are fully engaged in this endeavour is a profound understatement; their energy and enthusiasm for their work at the Centre, and the Centre itself, is accompanied by a deep appreciation for their environment, and a sense of responsibility for their own role as stewards of it and the knowledge it provides.

That they are looked to as leaders among their peers, therefore, seems only natural.



**Morton Centre researcher Cate Trueman takes a break from forest data collection to get cozy with one of the locals.**

# the morton centre - in a nutshell

where we are and how we got here

The convergence of several key events marked a new evolution in Acadia's academic landscape in 1995. The inception of a degree program in Environmental Science - the University's first interdisciplinary science program - and the generous donation by Dr. Harry and Mrs. Rachel Morton of their summer farm near Lunenburg on Nova Scotia's South Shore created a new realm of opportunities for students at Acadia.

The Mortons' selfless gift to Acadia has allowed students in Environmental Science and other programs to explore - in the field, in depth, and in context - the complex interactions within natural systems, and the consequences of human activity upon them. The Morton Centre has become a key educational resource, creating opportunities for real-world lessons and hands-on field research experience to students in all years of undergraduate study.

The Morton Centre's natural features create an engaging learning environment. Originally an active farm, its 100 acres contains a rich variety of distinct ecosystems, including a large second-growth forest with mixed hardwood and softwood stands; over a kilometre and a half of shoreline with dynamic erosional and depositional environments and diverse intertidal ecological communities; a low-lying peat bog that hosts a variety of unique plant species; and an estuary, submerged and emerged salt-marshes, and brackish tidal lagoons.

In addition to the biological and geological features on-site, there are many others nearby that provide in-field examples of notable environmental phenomena - such as old-growth forests, dune beaches, and seabird colonies - as well as examples of environmental degradation and unsustainable resource use. With rustic accommodations and lab space, the Centre has the capacity to act as a base for intensive work not only on-site, but throughout the region as well.

In 2002 a research initiative was launched by the Environmental Science program to develop a comprehensive database of the environmental characteristics of the Morton property. In its first season, student researchers established over three hundred forest diversity plots to map out the distribution of tree species on the property. They also created a digital catalogue consisting of high-resolution images of more than 220 species of plants found on the property, and compiled a preliminary bird and mammal inventory. This information formed the core of a strategic environmental assessment of the Centre.



Building upon the hard work of last year's team, the eight researchers at the Centre in 2003 are undertaking five research projects focussing on elements of the research program's five core components: Biodiversity and Ecosystems, Earth Systems, Applied Sustainability, Social Ecology, and Environmental Conditions Monitoring. These components encapsulate the full range of environmental study, providing research foundations for many disciplines.



Their research will not only fulfill the rigorous academic standards that put Acadia graduates at the top of their fields; it will provide valuable information that will shape the development and management of the Centre itself in years to come.



Complementing these research efforts in 2003 is the development of a learning programs initiative that, upon its

implementation in 2004, will see courses and programs in environmental leadership, earth education, environmental field methods, and youth engagement offered at the Centre.

We look forward to making it happen.

# summer season research projects - 2003

getting to know the world we live in

## Modelling Coastal Dynamics with Climate Change

Researcher: **Karissa Belliveau '04 (Environmental Science Honours)**

Since Canada's commitment to the Kyoto Agreement on global warming, the effects of climate change on the environment have been in the spotlight as researchers seek to predict the new patterns in local and global climate. Coastal areas are especially susceptible to these changes as ocean currents shift, sea level fluctuates, and weather becomes increasingly unpredictable. During the summer 2003 season, Environmental Science student Karissa Belliveau is collecting baseline data on the rate of erosion and sediment transport, current and tidal dynamics, and bathymetry of the intertidal and immediate offshore zone at the Morton Centre. Karissa's data will be used as a reference to monitor changes in coastal dynamics over time, and will provide a valuable resource in understanding how changes in these variables will impact coastal communities and ecosystems in the Maritime region.



Up before sunrise to catch low tide, researcher Adrian Beck-Oliver collects shoreline survey data on the erosional dynamics of the Centre's coastline.

## Baseline Intertidal Flora and Fauna Survey

Researcher: **Ric Grant '05 (Biology Honours)**

Ric Grant's research project during the summer of 2003 complements Karissa's coastal dynamics study. Like Karissa's data on erosion and current effects, Ric's baseline survey of intertidal flora and fauna at the Morton Centre will be used as a reference to analyze changes in marine biodiversity as the effects of climate change become more evident. Since the algae and invertebrate species that inhabit Nova Scotia's shorelines are sensitive to environmental conditions, monitoring changes in biological community structure over time serves as an indicator of the integrity and stability of marine systems. Ric is also interested in examining the range and abundance of invasive species of algae and crabs, which have the potential to drastically change the ecological balance of Nova Scotia's coastal areas. In addition to his scientific work, he is developing educational documents on intertidal biodiversity for use in environmental learning programs at the Centre.



## Old-growth Forest Restoration

Researchers: **Janice Flynn '04 (Biology Honours)**

**Molly Patrick '04 (Environmental Science Honours)**

With the shipbuilding boom of the 19th century - which produced Nova Scotia's most famous representative, the Bluenose - the intensity of woodcutting increased dramatically as high-quality timber was sought for hulls, masts, and decking. Throughout the 20th century this logging grew in scope to include commercial clearcutting for paper and lumber production. Not even the Morton property escaped this harvest. In the early 1950s the majority of the forest on the property was clearcut, drastically changing the forest ecosystem. Student researchers Janice Flynn and Molly Patrick are experimenting with ways to promote the forest's return to an old-growth state through sustainable forest management. By selectively and carefully reducing certain opportunistic species and fostering the growth of other, more long-lived trees, they will create a living example of how to restore Maritime forests to their original and ultimately most sustainably productive state. Janice began the 2003 season with a baseline census of bird diversity at the Centre, and Molly has set up a new remote-accessible climate monitoring station on-site.



A specimen of Eastern hemlock (*Tsuga canadensis*), estimated to be over 200 years old. Cate and Adrian found this tree during a research expedition to a coastal old-growth forest, which is being used as a reference for the forest restoration study.

## Renewable/Sustainable Energy Feasibility Study

Researcher: **Adrian Beck-Oliver '04 (Environmental Science Honours)**

Adrian Beck-Oliver's interest in applied sustainability brought him to the Morton Centre to study the potential for producing renewable energy - wind, solar, and microtidal power - using the natural features of the Morton property. A pivotal goal of the Centre is to act as an educational showcase for a variety of applied sustainability projects, and small-scale renewable energy production is one of the key elements of this initiative. Adrian's findings will provide the foundation for one of the most exciting of these projects: using natural systems to produce electricity without degrading the environment.



# planting seeds and spreading the word

## looking forward to 2004

### Picking Up Speed and Falling Into Place

The interdisciplinary and multi-faceted nature of the Morton Centre's focus and goals, while one of its defining characteristics, could quickly create chaos if left unmanaged. Juggling logistical needs and keeping the development process on track requires full-time attention, as research and learning programs meld with infrastructure development and Acadia's ever-evolving academic landscape.

Pulling together the diverse elements of the Centre's development and operations is the task of Morton Centre Project Coordinator and Environmental Science graduate Tony Pesklevits. With two student assistants, Cate Trueman



I come in peace: Karissa Belliveau discusses the finer points of pasture politics with the cows that summer at the Centre.

and Joe Mudge, Tony is working on several projects that will facilitate the development of the Centre's facilities, research, and learning programs, and is building the many connections and collaborations needed to see this development through.

These projects include the creation of a data management system and web-accessible presentation platform for research at the Centre; recommendations for facilities development to meet the growing needs of

activities at the Centre, such as dormitory and lab space; drafting land use guidelines for the property and a "green code" for sustainable living on-site; and developing a trail system throughout the property that allows access to research locations without compromising the ecological sensitivity of its many ecosystems.



Looking forward to 2004, these initiatives and the results of the student research projects will in concert provide an ever-broadening foundation for the Centre's continued growth and development. Infrastructure development through renovations of existing buildings and the construction of new "green" facilities will increase the capacity of the Centre to provide experiential environmental learning programs to both university-level and pre-undergraduate participants.

Continuity means a great deal to the Centre and to the students who learn there. By collecting baseline information on which more specific research can be founded, many questions are answered... but many more are uncovered. The continuous process of scientific inquiry, and of creating meaningful lessons from its discoveries, finds a perfect niche at the Morton Centre.

In 2004 and beyond, the Morton Centre will continue to create opportunities for students to delve into the details of how the environment works and how people work within it; for students to immerse themselves in a natural space in which real learning is a matter of inevitability. The rest, we imagine, will come naturally.



## special thanks

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