



7 Research and Education

Achievements in Research and Education since the Establishment of the Oak Ridges Moraine Foundation





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Oak Ridges Moraine Foundation
July, 2011

Cover photo: Hermina Pinkney

Measuring Success on the Oak Ridges Moraine

This report is the seventh in a series of eight reports commissioned by the Oak Ridges Moraine Foundation (ORMF or the Foundation). Started in 2010, the ORMF's *Measuring Success on the Oak Ridges Moraine* project was launched to assess how effective the provincial government, the ORMF and all other Oak Ridges Moraine (ORM or the Moraine) partners have been in meeting the Oak Ridges Moraine Conservation Plans' (ORMCP or the Plan) purpose and objectives. This work was undertaken in preparation for the scheduled legislative review of the ORMCP in 2015.

The ORMF was created to provide support and encouragement for activities that preserve, protect and enhance the environmental integrity of the ORM as well as to support the maintenance of a trail along its length. The ORM is a unique and irreplaceable landscape that covers approximately 190,000 hectares and stretches 160 km from the Trent River to the Niagara Escarpment. Shared and enjoyed by millions of people, it is the source of water for many river systems, home to a wealth of natural habitats and an enormous groundwater recharge system for south central Ontario. It is often described as a rain barrel since its permeable sands and gravels absorb and collect rain and snow melt, which then slowly filters into the deep aquifers below the ground. It is estimated that more than 250,000 people rely on the Moraine to provide them with clean drinking water. Boasting 273 km of trail and countless outdoor recreational activities, the ORM offers something for everyone. It is a vibrant place for people to live, work and play in harmony with nature.

The Foundation has been in place now for over eight years and so it seemed appropriate that a comprehensive evaluation of its achievements as well as those of its numerous partners be undertaken.

In carrying out this assessment, the Foundation adopted a comprehensive approach that looked at overall effectiveness of the Plan and not just those elements that related to the responsibilities of the Foundation. In this way the final product would be useful for both the Foundation and the many stakeholders engaged in various aspects of the implementation of the ORMCP. Accordingly, the Foundation identified a wide range of matters worthy of investigation and further discussion. The results are captured in the following reports:

1. An Assessment of Stakeholder Awareness, Support and Concerns for the Implementation of the Oak Ridges Moraine Conservation Plan
2. Assessing Compliance of Policy and Regulatory Agencies to the Requirements of the Oak Ridges Moraine Conservation Plan

3. Assessing the Health of the Oak Ridges Moraine within a Watershed Context
4. Assessing the Health of the Oak Ridges Moraine within a Landscape and Municipal Context
5. Achievements in Land Stewardship since the Establishment of the Oak Ridges Moraine Foundation
6. Achievements in Land Securement since the Establishment of the Oak Ridges Moraine Foundation
7. Achievements in Research and Education since the Establishment of the Oak Ridges Moraine Foundation
8. Improvements to the Oak Ridges Moraine Trail since the Adoption of the Oak Ridges Moraine Conservation Plan

Enviroscape Consulting Services prepared reports 1 to 4 and 8 under the direction of the Measuring Success Steering Committee, an ad hoc group that drew on expertise from government, university and non-government organizations. The remaining reports were prepared by the ORMF in consultation with the steering committee. The draft reports were released on March 9, 2011 for a 90-day commenting period; there was excellent feedback and constructive comments received from numerous groups and individuals.

These eight reports will continue to be shared with stakeholders to promote discussion and to facilitate the development of improved approaches for the long-term protection of the Moraine. Their contents represent the opinions and advice of the consultant and steering committee that prepared them and do not necessarily reflect the views or opinions of the ORMF Board of Directors or its members. The objective is that the results of this project will aid in the implementation of the ORMCP and related initiatives on a number of fronts, including:

- Insights into the perceptions of stakeholders on the significance and effectiveness of the Plan and its associated initiatives;
- The identification of areas where future investigation is required in preparation for the 2015 review of the ORMCP;
- The identification of opportunities for improvement to the current implementation process that can increase the effectiveness of the Plan;
- The demonstration of approaches that can be used for the establishment of a monitoring program for the ORM;
- The promotion of greater awareness and appreciation of the considerable achievements of the Foundation and its partners in the protection and enhancement of the environmental integrity of the ORM;

- The identification of areas where the Foundation may wish to focus its program efforts in the future; and
- The identification of additional partnership opportunities the Foundation may wish to pursue.

Resolving some areas of concerns will likely require approaches that go beyond simply amending the ORMCP or funding the ORMF but instead may require a re-examination of implementation in other areas such as broader provincial water management programs, monitoring programs and provincial audit responsibilities.

Measuring Success Steering Committee

- David Burnett, Conservation Authorities Moraine Coalition
- Joyce Chau, EcoSpark
- Debbe Crandall, Save the Oak Ridges Moraine Coalition (STORM)
- Kim Gavine, Oak Ridges Moraine Foundation
- Lisa Grbinicek, Niagara Escarpment Commission
- Fred Johnson, Enviroscape Consulting
- Dan McCarthy, University of Waterloo
- John Riley, Nature Conservancy of Canada
- Lisa Turnbull, Oak Ridges Moraine Foundation

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Contents

08	1.0 PURPOSE
08	2.0 RESEARCH
	2.1 Background
	2.1.1 Establishment and Role of the Oak Ridges Moraine Foundation in Research on the Oak Ridges Moraine
	2.1.2 Specific Goals, Objectives and Targets of the Oak Ridges Moraine Foundation in Research
	2.2 Oak Ridges Moraine Research Activities prior to the Establishment of the Oak Ridges Moraine Foundation in 2002
	2.2.1 The Geological Survey of Canada and the Ontario Geological Society
	2.2.2 The Joint Regional Initiative
	2.2.3 York-Peel-Durham-Toronto Coalition and the Conservation Authorities Moraine Coalition
	2.2.4 Academics
	2.3 Oak Ridges Moraine Research Activities since the Establishment of the Oak Ridges Moraine Foundation
	2.3.1 Overview
	2.3.2 Oak Ridges Moraine Research Activities Funded by the Oak Ridges Moraine Foundation
	2.3.3 Oak Ridges Moraine Research Activities Supported by the Oak Ridges Moraine Foundation
13	3.0 EDUCATION AND PUBLIC UNDERSTANDING
	3.1 Background
	3.1.1 Establishment and Role of the Oak Ridges Moraine Foundation in Education and Public Understanding on the Oak Ridges Moraine
	3.1.2 Specific Goals, Objectives and Targets of the Oak Ridges Moraine Foundation for Education and Public Understanding
	3.2 Education and Public Understanding Activities prior to the Establishment of the Oak Ridges Moraine Foundation in 2002
	3.2.1 Government Agencies to Grassroots
	3.2.2 The City of Toronto
	3.3 Oak Ridges Moraine Education and Public Understanding Activities since the Establishment of the Oak Ridges Moraine Foundation
	3.3.1 Overview
	3.3.2 Oak Ridges Moraine Education and Public Understanding Activities Funded by the Oak Ridges Moraine Foundation
	3.3.3 Oak Ridges Moraine Foundation Projects
	3.3.4 Synergy with other Program Areas
	3.3.5 Educating About the Role of the Oak Ridges Moraine Foundation
19	4.0 EFFECTIVENESS OF THE OAK RIDGES MORAINÉ FOUNDATION'S RESEARCH AND EDUCATION/PUBLIC UNDERSTANDING PROGRAMS: CHALLENGES AND OPPORTUNITIES
20	5.0 OBSERVATIONS
	5.1 Research
	5.2 Education/Public Understanding
21	6.0 RECOMMENDATIONS
23	REFERENCES
24	Appendix A — Suggested Topics for Student Research or Theses
26	Appendix B — Draft Statement of Goals and Objectives for the Moraine Research Coalition

1.0 PURPOSE

The purpose of this report is to evaluate how successful the Oak Ridges Moraine Foundation (ORMF or the Foundation) has been in meeting its goals in the two program areas of Research and Education/public understanding. The effectiveness of grant funds is evaluated, and recommendations are made for further work that needs to be completed. More specifically, this report examines:

- ORM research and education/public understanding initiatives undertaken prior to the establishment of the ORMF;
- ORM research and education/public understanding initiatives since the establishment of the ORMF;
- effectiveness of the ORMF in meeting research and education challenges and opportunities
- observations and conclusions pertaining to research and education/public understanding on the ORM; and
- recommendations for future work in the areas of research and education/public understanding.



Photo: Robert Brown

2.0 RESEARCH

2.1 Background

2.1.1 Establishment and Role of the Oak Ridges Moraine Foundation in Research on the Oak Ridges Moraine

The ORM is a complex natural system, one that links social and ecological attributes. There have been numerous studies on its geology, natural heritage, surface and ground water systems, all of which helped to support the development and release of the Oak Ridges Moraine Conservation Plan (ORMCP or the Plan) in 2002 by the Province of Ontario. Some of the key objectives include:

- To protect the ecological and hydrological integrity of the Oak Ridges Moraine Area;
- To ensure that only land and resource uses that maintain, improve or restore the ecological and hydrological functions of the Oak Ridges Moraine Area are permitted;
- To maintain, improve or restore all of the elements that contribute to the ecological and hydrological functions of the Oak Ridges Moraine Area, including the quality and quantity of its water and its other resources; and
- To ensure that the Oak Ridges Moraine Area is maintained as a continuous natural landform and environment for the benefit of present and future generations.

However, much like the ORM's geology, the successful protection of this valuable landscape is multi-layered. Factors like urbanization and human use place a strain on the ecological health of the ORM; as a result, there is a continuous need to evaluate the effects of these influences as well as to consider how they might be mitigated. In order to address these concerns, the current condition, i.e., baseline, of the ORM must be known and its health monitored over time to track and assess changes. New approaches and technologies must be utilized that can assist in protecting the ecology and hydrology of the ORM. More information about the ecological goods and services that the ORM provides, such as drinking water and natural habitat, must also be determined. All of this information will help to guide the future conservation management of this unique landscape known as southern Ontario's rain barrel.

In 2002, the Province provided \$15 million for the establishment of the Oak Ridges Moraine Foundation (ORMF or the Foundation). Recognizing the need for non-regulatory actions to complement the policies of the ORMCP, the founding directors of the ORMF undertook a broad consultation of Moraine stakeholders to determine priority actions. The ORMF's Strategic Plan (2003) identified five key areas of program funding: land securement, land stewardship, the Oak Ridges Moraine Trail

(ORMT or the Trail), education and public awareness and research. Since 2003, the ORMF, comprised of an independent board of directors, has distributed diligently in excess of \$14 million in grants to 177 projects and working closely with ORM partners has leveraged an additional \$35.8 million.



2.1.2 Specific Goals, Objectives and Targets of the Oak Ridges Moraine Foundation in Research

Research was identified in the 2003 Strategic Plan as one of the ORMF's five key funding program areas. Expenditure guidelines were set for each of the grant program areas, with 5 to 10% of the \$15 million designated to be spent on ORM-based research with a desired funding ratio of 2-parts partner funds to 1-part ORMF funds (2:1).

The ORMF applied the following criteria for funding research-based grants:

- the project would be ORM-based;
- the project would be related to the ORMCP;
- the project would have general application across the ORM; and
- the project would not duplicate the research mandate of the provincial ministries.

The ORMF's Strategic Plan identified the following priorities for its programming:

- To encourage more timely sharing and easier access to information collected by government and non-government organizations (NGOs) on the resources of the ORM;

- To support forums dealing with ORM-related research in order to identify and raise the profile of current research activities, to identify needs for additional research, and to share results of science, research, and monitoring on the ORM. Such forums will be an important priority in the first year of this Strategic Plan; and
- To encourage those with the mandate to monitor and report on the status of the ORM's resources, as specified in the Implementation section of the ORMCP.

2.2 Oak Ridges Moraine Research Activities prior to the Establishment of the Oak Ridges Moraine Foundation in 2002

The ORMCP was established to protect the headwaters of the Greater Toronto Area (GTA) and north flowing watersheds. Leading up to its development, various research projects were undertaken by government agencies to help guide the Plan.

2.2.1 The Geological Survey of Canada and the Ontario Geological Survey

Between 1993 and 1999, the ORM was the focus of a multi-disciplinary hydrogeological study led by the Geological Survey of Canada (under the National Geoscience Mapping Program [NATMAP]) in partnership with the Ontario Geological Survey (OGS) and other agencies. The six-year study took a broad water resource management approach that addressed a range of water resource issues. To understand better the complex interplay between its geology, hydrogeology and human and ecological dependence on its waters, the study focused on understanding what the "inside" of the Moraine looks like and how it functions. The emerging picture challenged the status quo, raising implications for land and resource management policies and practices.

The study produced a number of products. These included:

- fifteen digital maps that summarized the geology and post-glacial deposits of the ORM and the GTA at a scale of 1:50,000;
- maps providing more detailed glacial and post-glacial geology mapping for the central portion of the ORM at a scale of 1:20,000;
- a three-dimensional conceptual model of the area; and
- a regional geological and hydrogeological model of the ORM.

The ORM is a complex natural system, one which links social and ecological attributes.

This research was instrumental in further defining the groundwater characteristics not only of the ORM but also areas to the north and south. It has also helped to address a variety of water resource management issues, most particularly the watershed planning and source water protection programs currently operated by the Province and conservation authorities.

This work was initiated by both the federal and provincial geological surveys in recognition and support of the Province's long-term commitment to the protection of the ORM. (Dave Sharpe, Geological Survey of Canada, personal communication.)



2.2.2 The Joint Regional Initiative

In 1999 the Regions of York, Peel and Durham collaborated through the Joint Regional Initiative to produce a background paper titled *Oak Ridges Moraine – Towards a Long Term Strategy*. The paper put forward a case and a process for the Province, the regions and other interested parties to work together towards a long-term strategy for the ORM.

2.2.3 York-Peel-Durham-Toronto Coalition and the Conservation Authorities Moraine Coalition

In order to better understand and characterize the hydrogeology of the ORM, the York-Peel-Durham-Toronto (YPDT) Coalition and the Conservation Authorities Moraine Coalition (CAMC) initiated regional- and local-scale groundwater studies which support the development of the ORMCP and which continue to provide municipalities with information and the technical expertise to help guide their watershed planning and Source Water Protection initiatives.

2.2.4 Academics

Although ad hoc academic research has been taking place on the ORM even before the release of the ORMCP there was not a landscape-based organization collecting this information. The Moraine Research Coalition (MRC; see profile on page 10), founded through the University of Waterloo's biosphere reserve project, is currently promoting the population of a map-based database which will identify all research projects that have occurred on the ORM (including those done before the establishment of the ORMF) to provide a full picture of the history of research on the Moraine.

2.3 Oak Ridges Moraine Research Activities since the Establishment of the Oak Ridges Moraine Foundation

2.3.1 Overview

Research on the ORM has occurred in many forms. The ORMF has supported select ORM-based research efforts conducted by universities, conservation authorities and non-profit groups, mostly through financial grants. However, the ORMF has also acted as an 'information hub' for work undertaken on the ORM — connecting research agencies, promoting synergies between projects and communicating gaps in research.

The Province and conservation authorities across the ORM have collected and continue to collect extensive information on the natural heritage, water resources, landform features and characteristics of the ORM. Much of this information has been stored in the provincial Land Information Ontario (LIO) warehouse and is available to most stakeholders who have entered into an appropriate agreement with the Province. In addition, the Ministry of Natural Resources (MNR) has prepared a comprehensive inventory that summarizes the nature of natural heritage features, functions and attributes throughout the ORM (MNR 2003). Unfortunately, to date this report has not been finalized for public release. A series of 17 technical papers to assist in the implementation of the natural heritage and hydrological policies of the ORMCP were also completed by the MNR and the Ministry of the Environment (MOE) in the following areas:

- Identification of Key Natural Heritage Features
- Significant Wildlife Habitat
- Supporting Connectivity
- Landform Conservation
- Identification and Protection of Vegetation Protection Zones for Areas of Natural and Scientific Interest (ANSI, Life Science)

- Identification of Significant Portions of Habitat for Endangered, Rare and Threatened Species
- Identification and Protection of Significant Woodlands
- Preparation of Natural Heritage Evaluations for all Key Natural Heritage Features
- Watershed Plans
- Water Budgets
- Water Conservation Plans
- Hydrological Evaluations for Hydrologically Sensitive Features
- Subwatersheds – Impervious Surfaces
- Wellhead Protection – Site Management and Contingency Plans
- Recreation Plans and Vegetation Management Plans
- Sewage and Water System Plans
- Stormwater Management Plans

The YPDT Coalition is currently developing and maintaining a digital file of all relevant reports and datapoints generated on the ORM. This file is not yet complete but already includes an impressive amount of material. It is currently not readily available or accessible to all stakeholders.

Academic interest in the Moraine remains strong. While best efforts are made to document the wide range of research that is being conducted, it is to be expected that the ORMF is unaware of all current research projects. However, with the continued development and population of the map-based database by the MRC, researchers and stakeholders will be able to continuously learn about each other’s research projects.

2.3.2 Oak Ridges Moraine Research Activities Funded by the Oak Ridges Moraine Foundation

Between 2002 and 2009 the ORMF issued seven grants through its Research program:

Conservation Foundation of Greater Toronto

- Permeable Pavement/Bioretenion Swale Demonstration\$25,000

The overall objectives of this study were to assess the long-term performances and effectiveness of permeable pavement and bioretention swales for stormwater management. (See project profile on page 11 for more information.)

- Evaluating the Natural Function of Headwater Streams\$118,750

This study quantified the relationship between disturbances in the headwater systems of three watersheds that originate on the ORM and their related downstream fish communities.

Reducing Wide Trails in Large Forests

“Our results show that forest interior birds avoid wide trails while edge species are attracted to them. We suggest that land managers should seek to reduce and limit the amount of wide trails in large forests to ensure that they maintain their conservation value for forest-birds as well as provide recreation opportunities. As well, we suggest that based on our findings on-road point counts are not suitable substitutes for off-road point counts to sample forest interior birds in mixed deciduous and coniferous plantations in southern Ontario.”

Institute for Watershed Science, Trent University



University of Waterloo

- Investigation of ORM as a Biosphere Reserve (Phase 1)\$45,000

This grant undertook exploratory research and a documentation review in support of the establishment of the Oak Ridges Greenbelt Biosphere Reserve.

- ORM as a Biosphere Reserve (Phase 2).....\$66,180

This grant undertook the following: finalization of the Oak Ridges Greenbelt Biosphere Reserve nomination document; fostering of stewardship, livelihoods and learning initiatives; and garnering of sufficient local, community and political support of reserve status for the ORM.

Ecojustice Canada

- Understanding the Cumulative Impact of Water Takings on the Oak Ridges Moraine.....\$50,000

This project identified and reported on groundwater allocations to all large water uses on the Moraine in order to identify areas with high groundwater usage and areas experiencing issues with groundwater quantity. Improvements that could be made to regulatory tools and evaluation of the effectiveness of the Permit To Take Water system were also reported on.

Watershed Science Centre/Trent University

- Impacts of Roads and Trails on Forest Bird Communities**\$24,250**

The objective of this research project was to determine whether, with current land uses, protection of the Ganaraska Forest will ensure the long-term viability of the forest bird communities and how each forest type and trail system currently established in the forest contributes to this viability.

- Impacts of Roads and Trails on Forest Bird Communities (2nd grant).....**\$32,035**

Work associated with the first grant was continued with a broadening of sample areas to single- and double-track trails, woodland roads and small clearings in the Northumberland County Forest in order to compare the findings with the results found in the Ganaraska Forest.

Total Funding to Research Projects:	\$361,215
Funding Leveraged:	\$1,228,846
Total Funding Supporting ORM Research:	\$1,590,061



2.3.3 Oak Ridges Moraine Research Activities Supported by the Oak Ridges Moraine Foundation

In addition to funding research grants, when resources permitted the ORMF provided stakeholder support that was directed at improving the climate for ORM-oriented research and monitoring. A number of other initiatives undertaken by the ORMF in other program areas supported research goals.

As part of the creation of two resource centres (one in Richmond Hill and one at the Ganaraska Forest Centre), the ORMF initiated the establishment of an information or reference library to house a full spectrum of publications related to the ORM, including those that deal with environmental, social and political characteristics, natural and cultural resources and policy. As part of this initiative, an annotated bibliography for all ORM-related resources was started. Once this bibliography is complete, this resource will be available on the ORMF's website (www.ormf.com).

In 2009 the ORMF initiated the Measuring Success Project, of which this report is one in a series of eight reports. Launched in anticipation of the ORMCP review scheduled for 2015, the Measuring Success Project looks at the current health of the ORM and the effectiveness of the ORMCP to protect its ecological and hydrological integrity and with input from stakeholders, recommends refinements to the policies associated with the Plan. The series of reports include:

1. An Assessment of Stakeholder Awareness, Support and Concerns for the Implementation of the Oak Ridges Moraine Conservation Plan
2. Assessing Compliance of Policy and Regulatory Agencies to the Requirements of the Oak Ridges Moraine Conservation Plan
3. Assessing the Health of the Oak Ridges Moraine within a Watershed Context
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Moraine Research Coalition

The ORMF's Oak Ridges Moraine Symposium (2007) called for more coordination and collaboration on the ORM on a number of fronts, including research. Research initiatives have led to establishing a network or coalition to coordinate ongoing research across the ORM. Led by the University of Waterloo, the MRC's goal is to promote coordination and collaboration among researchers whose work focuses on the ORM while fostering linkages among researchers and practitioners. See Appendix B on page 21 for the Statement of Goals and Objectives for the MRC.

3.0 EDUCATION AND PUBLIC UNDERSTANDING

3.1 Background

3.1.1 Establishment and Role of the Oak Ridges Moraine Foundation in Education and Public Understanding on the Oak Ridges Moraine

Raising public awareness of the ORM and its ecological and hydrological functions is a key factor in ensuring that this landscape is conserved and protected. When the ORMF was established in 2002, there was reasonable public awareness of the ORM as an entity but few people knew where its boundaries were and what defined it. In a 2005 Ipsos Reid poll commissioned by the ORMF, 76% of the residents surveyed reported that they did not live on the ORM even though they did. Knowing the ORM is part of your community is the first step in developing a respect for the role it plays. It is also clear that many of the ecological benefits that the ORM provides, such as groundwater and recharge and discharge functions, are not readily understood by the public. These science-based concepts need to be communicated to the public in a way that can easily be understood.

In the ORMF's Strategic Plan (2003), education/public understanding was identified as one of the ORMF's five key funding program areas. Guidelines for expenditure were set for each of the grant program areas. As a guideline, 10 to 15% of the \$15 million was proposed to be spent on ORM-based research with a desired funding ratio of 2-parts partner funds, 1-part ORMF funds, i.e., 2:1.

3.1.2 Specific Goals, Objectives and Targets of the Oak Ridges Moraine Foundation for Education and Public Understanding

The ORMF's Strategic Plan identified the following priorities for the Foundation's programming:

- To support partners who wish to develop and publish educational materials that raise awareness of the ORM's natural history and land use;
- To explore how the Foundation can assist in maintaining and improving student access to outdoor education;
- To support a program of public signage, delivered through partners such as the Ontario Ministry of Transportation, municipalities and trail associations. The signs would include road signs that indicate location of the ORM and interpretive signs, providing information on the ORM, associated with points of entry (e.g., ORMT access points);

Performance Evaluation of Permeable Pavement and a Bioretention Swale

A permeable pavement and bioretention swale demonstration site was set up by the Toronto and Region Conservation Authority (TRCA) at Seneca College's King Campus in 2005. A three-year study (completed in 2008) evaluated the effectiveness of permeable pavement and bio-swales under southern Ontario's climate conditions. The parking lot selected for this project was specially constructed with drainage collection systems designed to facilitate monitoring and evaluation of the stormwater management performance of the two practices. Surface and subsurface flows are directed through a sophisticated plumbing system to

an underground sampling vault where monitoring equipment is powered by solar panels and a wind turbine. A section of conventional asphalt pavement serves as a control for comparative purposes.

Information and diagram courtesy of Toronto and Region Conservation Authority



Permeable Pavement Parking Lot

Field Monitoring Program

The field monitoring program included year-round measurements of surface and subsurface water quality, flow rates and volumes, infiltration rates, depth profiles of soil chemistry, surface and subsurface temperatures, pavement strength and maintenance issues. Older permeable pavement and bio-swale sites in the GTA were also monitored to assess how well these stormwater management practices stand up over time. Overall, results were positive, showing good infiltration, improved water quality, limited impacts on soils and low potential for groundwater contamination by sediment bound particulates such as metals and hydrocarbons. Data from this study was shared with Walmart Canada, SmartCentres and other commercial developers for consideration on future builds and retrofits in the GTA. The report created as part of this study was a key resource in the development of the permeable pavement guideline provided in the recently released Toronto and Region Conservation Authority/Credit Valley Conservation Authority Low Impact Development Stormwater Management Planning and Design Guide. For more information on study results, visit: www.sustainabletechnologies.ca.



Permeable Pavement Demonstration Site

Information and photo courtesy of Toronto and Region Conservation Authority

- To support public forums designed to raise the profile of the ORM, sharing information on initiatives being undertaken in support of the ORMCP, and recognizing achievements; and
- To report regularly through its website and annual reports in order to inform the public of the ORMF's own activities and priorities on the ORM.

3.2 Education and Public Understanding Activities prior to the Establishment of the Oak Ridges Moraine Foundation in 2002

3.2.1 Government Agencies and Grassroots

The development of the ORMCP was initiated in large part due to citizen action and a well-developed grassroots movement that dates back to 1988. In 1999 groups such as Save the Oak Ridges Moraine Coalition (STORM), Ontario Nature (formerly Federation of Ontario Naturalists) and Earthroots brought public attention to the ORM, advocating for its protection by educating the public about its ecological and hydrological significance. Studies undertaken by the MNR prior to the release of the Plan, along with work by the federal and provincial geological surveys and the Ministry of Environment in developing detailed geological and hydrogeological mapping for the ORM, were used by these groups to support their advocacy campaigns. However, a targeted ORM education program did not exist. Other groups, such as the Oak Ridges Moraine Land Trust (ORMLT) and the Oak Ridges Trail Association (ORTA), existed and were providing some public awareness of the ORM despite not having a focus on education per se.

3.2.2 The City of Toronto

In 1990 and 1992 respectively, former Toronto Mayor and Commissioner of the Royal Commission on the Future of Toronto's Waterfront David Crombie issued two reports: *Watershed* (interim report), and *Regeneration* both of which strongly reinforced the need for protection of interconnected green spaces, including the need for provincial protection of the ORM. A number of years later in 1999, the City of Toronto established the Oak Ridges Steering Committee. Led by then-Councillors David Miller and John Adams, the committee was set up to protect the ORM from development and to raise awareness among Toronto residents of the need to protect the headwaters found in the ORM. The committee strongly advocated for the passing of the ORMCP and held various public forums in order to garner support for it and to receive feedback. Information about the importance of the ORM can still be found on its website.

3.3 Oak Ridges Moraine Education and Public Understanding Activities since the Establishment of the Oak Ridges Moraine Foundation

3.3.1 Overview

One of the primary objectives of the ORMF was to have ORM-related information put directly into the hands of the general public and school children. This objective was achieved through a variety of approaches, among them grants issued to partners as well as projects undertaken by the ORMF itself.

In addition to the work done by the ORMF, various partner efforts have contributed to raising awareness of the ORM. Even prior to the ORMF's outreach education program, various conservation authorities, such as the TRCA, had ORM components in their programming. Other groups such as Earthroots, Ontario Nature and STORM have used educational materials issued in print or published on websites as a key component of their advocacy campaigns.

3.3.2 Oak Ridges Moraine Education and Public Understanding Activities Funded by the Oak Ridges Moraine Foundation

Between 2002 and 2009, the ORMF issued 18 grants under the umbrella of its Education and Public Understanding program. Of these 18 grants, seven represented restricted funds issued to the Foundation and consultants who were charged with the implementation of key educational initiatives.

Centre for Land and Water Stewardship

- ORM Stewardship Handbook.....\$27,333

Creation of a stewardship handbook for rural, non-farm landowners.

- Pond Management Handbook \$5,000

Initial development of a resource for rural landowners with information pertaining to best practices for management of ponds.

Nature Conservancy of Canada

- Rice Lake Plains Initiative – Communications.....\$58,850

The objective of this project was to restore key areas of tall grass prairie and oak savanna habitat in the Rice Lake Plains through co-operative efforts, public outreach, conservation science, land stewardship and legal protection of land. Activities included media events, press releases, articles, displays, interpretive signs, workshops and tours of the area.

Otonabee Region Conservation Foundation

- Oak Ridges Moraine Education Program.....\$5,000

The purpose of this project was to educate residents of Cavan-Millbrook-North Monaghan about the importance of the ORM. Interpretive signage was developed and workshops were undertaken to encourage participation in stewardship projects.

Rouge Valley Foundation

- Community Resource Centre Projects.....\$6,000

Support for the development of an information brochure and implementation of small restoration projects that had an educational focus and engaged local schools and community groups.

Ganaraska Region Conservation Authority

- Oak Ridges Moraine Information Centre.....\$500,000

This project established an Oak Ridges Moraine Information Centre within the new Ganaraska Forest Centre. Interpretive display, hands-on activities and ORM literature are available to educate the public about the ORM.

Town of Richmond Hill

- Oak Ridges Moraine Eco-Centre.....\$86,486

This centre is currently under development within the Oak Ridges Community Centre, which is located on the shores of Lake Wilcox. The ORM Eco-Centre will include a library/resource

centre focused on the ORM, a workshop/seminar area, an indoor/outdoor classroom, a meeting area, changing exhibits and displays, and a trailhead to the Moraine trail system and near-by protected natural areas.

Ontario Streams

- Newberry Park: Wetland Restoration and Education Resources.....\$40,000

This project produced ORM interpretive signage along with marker posts depicting where the ORM is located. These materials were created to enhance the educational opportunities of this wetland restoration project.

Green Communities Canada

- Well Aware in the Oak Ridges Moraine.....\$171,665

An ORM-specific Well Aware program was developed for landowners. Well Aware is designed to encourage residential well owners to protect their wells and to educate them about our common groundwater supplies. The program achieves this objective by helping participants identify potential risks to their wells, and by giving them the necessary knowledge to maintain properly the quality of their well water. Given that one of the ORM's most important functions is its service as a water recharge and discharge area, well protection is imperative. Through the Well Aware on the ORM program, 10 community forums were undertaken, events that attracted more than 240 participants; 213 guided self-assessment home visits were conducted; and 16 workshops with over 276 participants were undertaken for information providers such as real estate agents, conservation authorities, etc..

The development of the ORMCP was initiated in part as a result of a grassroots movement.

Toronto and Region Conservation Authority

- Homeowner's Information Toolkit.....\$18,350

The Homeowner's Information Toolkit brought together existing information from various environmental groups to create a comprehensive resource for new homeowners in Richmond Hill who purchased houses in the areas that surround the Oak Ridges Corridor Park.

- Support for Three Children's Water Festivals.....\$30,000

This grant supported the 2009 Children's Water Festivals held in Durham, York and Peel Regions with provision of ORM resources to be incorporated into programming. An estimated 22,000+ students, teachers, parents and volunteers attended the three festivals.



Photo: EcoSpark

Ganaraska Forest Centre

3.3.3 Oak Ridges Moraine Foundation Projects

In addition to funding research grants spearheaded by partners, the ORMF provided stakeholders with resources and implemented projects internally in order to disseminate ORM information to various audiences. Funding for these initiatives were placed in the following restricted funds:

- Education Program #1 \$100,000
- Education Program #2 \$220,000
- Education Program #3 \$25,000
- Education Program #4 \$15,500
- Outreach and Education In-Class Programming \$107,915
- 2015 Plan Review Preparedness \$100,000

The following are activities undertaken through these funds:

- Strategic Communications and Marketing Plan

In 2006 the ORMF commissioned the development of a Strategic Communications and Marketing Plan, one which focused on raising awareness of the ORM in order to help maintain the Moraine's protection into the future. Through this exercise the "The Moraine. For Life." branding was developed.

- ORM Brochure

An ORM brochure was developed in consultation with the ORM Education Steering Committee established by the ORMF in 2005. Representatives from conservation authorities, municipalities and non-government organizations sat on the committee and provided input into the content and design of the brochure. The brochure focuses on the natural features and recreational opportunities on the ORM and has been made available to all stakeholders for their use.

- Moraine for Life Symposium

The ORMF convened the Moraine for Life Symposium on February 12-13, 2007 to bring together stakeholders to

reflect on the accomplishments of the ORMCP and to consider future challenges. Over 250 representatives from all levels of government, environmental organizations, stewardship councils, conservation authorities, universities and agricultural groups, as well as private sector corporations and associations, were in attendance. Challenges and opportunities related to the protection of the ORM's water, land and community well-being were explored. A report with the stakeholders' recommendations was released following the Symposium. The key recommendations in the report were:

- To be consistent in the areas of policy implementation, policy compliance, ecological restoration, monitoring, data and information availability, and to make funding needs a top priority;
- To establish an ORM-wide coordination body and to ensure that funding is equitably distributed and sustainable;
- To undertake more education, public outreach and research into ORM-related issues;
- To undertake a more comprehensive approach to monitoring and data and information sharing with clear standards and technical guidelines to follow; and
- To ensure that the concept of community well-being and appropriate valuation of the ORM and the land and water resources it provides are considered in the costs and benefits associated with the protection and restoration of ORM lands, and that this concept be communicated to the public.

- Moraine for Life Website

The ORMF developed an ORM website (www.moraine-for-life.org) that includes video animations of the formation of the ORM and general information on the ORM's ecology.

- Map Products

The following map products were developed and have been made available for use by partners:

- a hands-on 3D relief map that can be used to illustrate the topography of the ORM; and
- a large-scale foldable map that can be used in classroom settings and in large groups to illustrate the extent of the ORM and the communities it encompasses.

- Engaging Small to Medium Businesses on the ORM

Small and medium businesses on the ORM were targeted in outreach efforts to educate them about the importance of the ORM.



Michael Scott (former Executive Director of the ORMF) and Minister James Bradley at the Moraine for Life Symposium

- Door-to-Door Delivery of Homeowner's Kit

The ORMF created and implemented a door-to-door delivery plan for the homeowner's welcome kit. The kit, developed in partnership with the TRCA, York Environmental Alliance and the Oak Ridges Friends of the Environment, provided ORM information for new residents in Richmond Hill surrounding the Oak Ridges Corridor Park. The kit itself was a bucket with a folder containing a broad range of ORM resources, an environmentally friendly cleaner and a Moraine for Life sponge. These kits were delivered in person to the doorsteps of residents and discussions and questions were welcomed.

- Outreach Education Program

In 2005 the ORM Education Steering Committee explored the possibility of developing an ORM-based curriculum. A request for proposals from organizations capable of undertaking such program development and implementation revealed that the costs associated with such an initiative would be substantial (from \$400,000 to \$2 million for 1.5 days of curriculum a year). It was also noted that even with the considerable effort needed to develop the curricular material, there was no guarantee that this material would be delivered in all schools as it would be used at the discretion of the school and/or educator. In order to get ORM messages directly into classrooms at a more feasible cost and timely manner, the ORMF developed a curriculum-based ORM outreach education program. This in-class program was delivered to over 265 classrooms free of charge from 2008 to 2009. All of the resources created for this program, including props such as the relief map, were then provided with training to the nine conservation authorities on the ORM and three ORM-based groups for their future use in outreach education. (See project profile on page 17 for more information.)



Photo: Toronto and Region Conservation Authority

Moving Through the Moraine at the York Children's Water Festival

- Children's Groundwater Festivals

In addition to the 2009 grant to TRCA, financial support of the 2007 and 2008 Children's Groundwater Festivals in Durham, York and Peel Regions was provided by the ORMF. In 2008 the *Moving through the Moraine* activity was developed in partnership with the TRCA. It has been used at various Children's Groundwater Festivals since then and will continue to be used annually at the York Children's Water Festival. The hands-on activity shows children how water moves through the ORM and the threats that exist to our water resources.

- Engaging the Arts Community

The arts community was encouraged to get involved in educating the public about the ORM through a contest that offered a grant to the best storyline for an ORM-focused play. Resurgence Theatre Company successfully submitted a proposal to develop *Beware the Falling Trees: Lorraine and the Great Moraine Adventure*, a play that educates young audiences about the importance of groundwater on the ORM. Adapted from a fable by Paul Leet Aird, this entertaining production was performed as part of the York Shakespeare Festival at Fairy Lake in Newmarket in 2008 and 2009, and also made a tour to elementary schools in the fall of 2008. The production reached over 4000 audience members and was very well received, especially among children in grades 2 to 6.

- Workshop in a Box

Workshop in a Box kits were developed as a comprehensive resource to help partners to deliver, more easily, ORM workshops to private landowners. The kits contain information ranging from templates for press releases, workshop organization checklists and Power Point presentations to hands-on props that can be used during workshop sessions. The kit themes are broad — aquatic, terrestrial and trees of the ORM — but allow the organization that is undertaking the workshop to take the base of information provided and then either expand or contract the sessions at as desired. All of the themes provide suggestions for activities with participants and are also designed with the intent of training those in attendance with species identification skills that will serve as a means of connecting them with the importance of protecting the ORM habitat. The workshop kits are available free of charge to partner organizations. These ready-

A report with the stakeholders' recommendations was released following the 2007 Moraine for Life Symposium.

to-go packages allow partners to increase public outreach activities with minimal effort required and greatly benefit organizations with limited staffing resources.

- The Oak Ridges Moraine Trail

In partnership with ORTA, the ORMF reached out to ORM landowners and municipalities for assistance in the effort to connect the ORMT. Three public events (Northumberland County Forest, Warkworth and Castleton) were held to raise awareness about the Trail and its recreational opportunities, as well as to celebrate the finalization of the connection of the Trail across the ORM. Trailhead kiosks were erected at the two Eastern gateways (Warkworth and Castleton), as well as an interpretive sign at Northumberland County Forest. The signage included information about the significance of the ORM.

- Measuring Success Project

This report is one of a series of eight reports completed under the Measuring Success Project, whose intent is to measure the success of the implementation of the ORMCP as well as to identify opportunities for improvement.

Total Funding to Education and Public Understanding Projects:	\$1,548,199
Funding Leveraged:	\$5,515,651
Total Funding Supporting Moraine Education and Public Understanding:	\$7,063,850

3.3.4 Synergy With Other Program Areas

A number of additional ORMF initiatives contributed to raising public awareness of the ORM. One project of note is the Caring for the Moraine project. Although Caring for the Moraine was focused on implementing restoration projects on private lands, it achieved its goals by educating ORM landowners. On-site visits by technical professionals were provided by partner agencies in order to inform landowners of the natural significance of their properties and to educate them in the ways they could become better land stewards. Workshops were also under-



Opening of the Castleton Trail Gateway

taken across the ORM, which gave landowners core knowledge about the Moraine such as tree species present on the ORM and the value of wetlands, etc. As part of this project, more than 11,114 letters were sent to ORM landowners, 627 properties were visited by conservation professionals and 2,354 landowners participated in 65 workshops.

In 2009 the ORMF worked with Trees Ontario and the Ontario Forestry Association (OFA) to create a series of ORM-focused lesson plans for educators as part of the OFA's Focus on Forest program. Information on the history of the ORM, seed germination, forecasting and collection were included as part of these resources. This initiative was funded under Trees Ontario's stewardship grant, which focused on creating sustainable seed sources for ORM restoration.



The ORMF was a key funding partner in the Monitoring the Moraine project, a comprehensive community-based monitoring program that engages and sustains community volunteers in science, stewardship, monitoring and decision-making on the ORM. This project was developed and continues to be implemented by EcoSpark (formerly Citizens' Environment Watch) and STORM, and has been very successful in raising awareness of the ORM through active citizen engagement and resource materials that range from introductory guides to more advanced participatory guides.

3.3.5 Educating About the Role of the Oak Ridges Moraine Foundation

In a 2009 survey undertaken by Pollara 81% of Ontarian's surveyed indicated they are unfamiliar with the Oak Ridges Moraine Foundation. Part of the reasons for this is that the Board of Directors of the ORMF made a conscious and strategic decision to focus financial resources on on-the-ground projects. This decision has served the ORMF well in terms of being able to report impressive results from the \$15 million investment made by the Province of Ontario. However, as these funds became expended, the ORMF is left in a position where some of the public remains unaware of the value the Foundation has brought to its community and thus may not understand how critical it is to continue the work the Foundation has been facilitating or undertaking itself. Many may also feel that the very existence of the ORMCP legislation protects the ORM, and so the Moraine no longer needs continued resources directed at it through other initiatives. Better communications from the ORMF to the public on the threats and issues that still exist on the ORM would show that a combination of both the regulatory, i.e., the ORMCP, and the non-regulatory, i.e., restoration and land securement, work is needed to ensure the continued conservation and protection of the ORM.

4.0 EFFECTIVENESS OF THE OAK RIDGES MORaine FOUNDATION'S RESEARCH AND EDUCATION/PUBLIC UNDERSTANDING PROGRAMS: CHALLENGES AND OPPORTUNITIES

Despite the fact that the two grant programs, Research and Education/Public Understanding, represent a smaller aspect of the ORMF's work, there have been some impressive strides made as a result of grants in both areas. Almost \$2 million dollars (\$1,909,414) were granted to support these program areas with an additional \$6,744,497 leveraged, bringing the total of project dollars to \$8,653,911.

The program areas have benefited from having a landscape-

Oak Ridges Moraine Outreach Education Program

In 2007 the ORMF, working in collaboration with a local educational consultant, developed a series of in-class, curriculum-linked presentations for students in grades kindergarten to 12. For three years an outreach education program was offered free of charge to schools located on or around the vicinity of the ORM. The program was a great success. More than 6,000 school children in over 260 classes learned about the importance of water and wildlife protection on the ORM through these interactive presentations. When the ORMF was no longer able to continue to offer this program, a "Train the Trainer" session was held and the resources developed for the program were transferred to the nine conservation authorities on the ORM and the three ORM-based groups (STORM, ORMLT, and ORTA). The ORMF continues to facilitate outreach education on the ORM by assisting schools in locating educational professionals in their area who can provide ORM programming.



Sherry Pettigrew of Second Wind Services delivers an in-class ORM presentation

based organization in place that engages in collecting data, facilitating partnerships and ensuring that consistent messaging about the significance of the ORM is relayed to the public.

Both of these program areas require time to achieve their goals and objectives. Many research projects are subject to academic cycles and timelines. Projects also need to show trends in order to draw conclusions — that is, some projects may take years before results can be garnered. With respect to educating and raising public awareness, maintaining the momentum gained over the granting period is needed to continue to make inroads. As well, the approaches taken need to be flexible over time so that diverse audiences can be reached. Both of the program areas need a longer-term dedication of resources in order to ensure that the ORMCP remains strong in its provisions and continues to have public support for its implementation.

In the report *An Assessment of Stakeholder Awareness, Support*



and Concerns for the Implementation of the Oak Ridges Moraine Conservation Plan (Enviroscape Consulting Services, 2010) education came up as the second highest priority

for future funding on the ORM. While research needs were also recognized, it ranked much lower in priority for stakeholders.

The experience gained by the ORMF and its partners in the first eight years of the Foundation's funding program has helped to identify many opportunities that will increase the effectiveness of Research and Education and Public Understanding programming.

5.0 OBSERVATIONS

5.1 Research

Observation #1:

While the ORMF originally set a guideline of 5 to 10% of its grant funding to be allocated to the research program area, by the end of the grant program, approximately 3% of total grants was allocated towards research. The shortfall may have been due to the limited numbers of applications and a misalignment between the ORMF's funding criteria and the state and focus of the full range of research during the granting period; academic research projects tend to be difficult to align with practical outcomes both temporally and conceptually.

Observation #2

It is also presumed that there are various ORM-based research projects of which the ORMF is unaware despite efforts to collect this information and bring together scholars interested in ORM research. Universities, in particular, are large organizations with many departments whose faculty members may have an interest in any one of the many disciplines that pertain to the ORM, i.e., geology, biology, planning, economics, social learning and/or sustainability. The ORMF supported the establishment of the MRC, led by University of Waterloo, but the coalition is in its infancy and there is a need for it to reach out to more institutes and to broaden its contacts with other disciplines of study. Currently the MRC functions primarily as an information exchange network for government research bodies and academic institutions. The value of this group could be enhanced considerably if its membership worked together to identify research priorities and to co-ordinate efforts to encourage researchers to focus on initiatives that addressed identified needs and deficiencies. In the future, the ORMF and other bodies could direct funding support to research projects that contribute to such priorities.

As part of the work undertaken by the ORMF's Measuring Success Steering Committee, a number of areas were identified where gaps in research still exist. The ORMF needs to work closely with the MRC and other stakeholders to communicate the need for information in these areas and to encourage uptake

by those looking for research opportunities. (See Appendix A for further details.)

Observation #3:

Despite the excellent work that was undertaken through the grant program, overall it is felt that the ORMF could have played a greater role as a research “hub” on the ORM. Some efforts were made to establish this role but with limited staff resources and a heavier focus on program areas such as Stewardship and Land Securement, the ORMF fell short of some of the intentions expressed in the Strategic Plan for the Research program. In particular, one priority identified in the Strategic Plan was to raise the awareness of research activities on the ORM. As the ORMF’s grant program became more established, a conscious decision was made by the ORMF Board of Directors that the focus of funding would be on-the-ground deliverables. While this has had impressive payoff with respect to tangible benefits out in the communities and on the ground, the trade-off is that promotion of the ORMF’s role in research on the ORM has been sparse.

5.2 Education/Public Understanding

Observation #1:

Despite a recognition that further work needs to be undertaken in the area of Education and Public Understanding, the ORMF granting program did meet the objectives articulated in its Strategic Plan. A guideline of 10 to 15% of the granting program was to be allocated to the Education and Public Understanding program area. Upon closure of the grant program, approximately 11% of the total grants the ORMF issued were for this program area.

Observation #2:

The ORMF and its partners undertook some excellent projects that have helped raise awareness of the ORM. In the future there needs to be an increased focus on outreach to ORM stakeholders and the broader public through various media. In particular, the ORMF needs to more effectively communicate information regarding the role of the Foundation and the work it supported. All members of the public from school children to business need to be further educated about the ecological significance of the ORM and its important role in groundwater protection. To date this type of education has been primarily delivered to ORM residents. In the future education efforts must expand to reach the broader Greater Toronto Area so they can understand the benefits it provides to downstream communities. Raising public awareness of the ORM is key for the ORMCP to remain strong in its provisions.

Observation #3:

Despite a recognition that further work needs to be undertaken in the area of Education and Public Understanding, the ORMF granting program did meet the objectives articulated

in its Strategic Plan. A guideline of 10 to 15% of the granting program was to be allocated to the Education and Public Understanding program area. Upon closure of the grant program, approximately 11% of the total grants the ORMF issued were for this program area.

Observation #4:

All members of the public from school children to business need to be further educated about the ecological significance of the ORM and its important role in groundwater protection. To date this type of education has been primarily delivered to ORM residents. In the future education efforts must expand to reach the broader Greater Toronto Area so they can understand the benefits it provides to downstream communities. Raising public awareness of the ORM is key for the ORMCP to remain strong in its provisions.

6.0 RECOMMENDATIONS

Recommendation #1:

The ORMF needs to share widely with the Province, the public and its partners the successes it has achieved in supporting new research projects on the Moraine and in particular the successful Outreach Education Program promoting the Oak Ridges Moraine as a significant landform.

Recommendation #2:

The ORMF should identify and encourage research groups to pursue projects that fill major needs or gaps in the management of the ORM.

Recommendation #3:

The ORMF should work with the MRC to develop a more strategic role for the coalition in promoting greater co-ordination and cooperation among the partners and to encourage greater focus on research efforts that will fill needs and gaps. This effort could include the establishment of a research or bursary granting program.

Recommendation #4:

The ORMF should work with partners to improve current information and data-sharing systems to make the information more complete and up to date and to render it more readily accessible to stakeholders. In this regard, the ORMF should continue to support the establishment of effective reference libraries at the two ORM resource centres.

Recommendation #5:

The ORMF should encourage the YPDT and the CAMC to maintain, improve and share its comprehensive hydrological files with other stakeholders.

Recommendation #6:

The ORMF should support the MRC in the development of its web- and map-based database, an initiative intended to create a resource for research underway on the ORM among all its stakeholders.

Recommendation #7:

The ORMF should continue to expand the ORMF's Caring for the Moraine Project to ensure a long-term private landowner contact program teaching landowners about the ecological significance of their properties through site visits and workshops in order to help foster good land stewards.

Recommendation #8:

The ORMF should develop and implement an ORM Groundwater Protection Outreach Education program to engage elementary and high school students in the Greater Toronto Area along with adult audiences such as those associated with service groups, local clubs and the like.

Recommendation #9:

The ORMF should expand its outreach education program delivery beyond the boundaries of the ORM to educate citizens of the GTA about the ecological significance of the ORM.

Recommendation #10

The ORMF should broaden audiences that receive ORM information through presentations and workshops by making an effort to include business associations, Rotary clubs and other service groups.

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Appendix A — Suggested Topics for Student Research or Theses

Prepared by EnviroScape Consulting with input from the Measuring Success Steering Committee

Updated: June 19, 2011

1. Prepare annotated bibliographies for studies, research and theses prepared on the Oak Ridges Moraine (ORM) in all or any of the following subject areas:
 - Natural Sciences
 - Geology and Hydro-geology
 - Hydrology
 - Natural Heritage
 - Social Sciences
 - Socioeconomic
 - History
 - Ownership/Land Use
 - Policy Sciences
 - Policy development
2. Studies that look at changes in socioeconomic patterns in the ORM before and after the introduction of the Oak Ridges Moraine Conservation Plan (ORMCP), including:
 - shifts/trends in agricultural uses, ownership and management practices;
 - shifts/trends in the housing and residence patterns since the introduction the ORMCP;
 - shifts/trends in the aggregate industry since the introduction of the ORMCP; and
 - shifts/trends in institutional uses on the ORM.
3. Studies that examine the response to or impact on planning and development groups working on the ORM including:
 - Examining shifts or changes in the planning and operational procedures of large utility corporations such as Hydro, Pipeline Companies and Ministry of Transportation in response to the introduction of the ORMCP;
 - Examining the response of large private corporations to the introduction of the ORM;
 - Examining decisions of the Ontario Municipal Board and other tribunals in response the introduction of the ORMCP;
 - Studies that specifically examine shifts, changes and perceptions within the Real Estate Industry in response to the introduction of the ORMCP;
 - Studies that specifically examine the impacts of the ORMCP on agricultural or rural land uses in the ORM; and
 - Studies that identify potential sustainable land use models that could be applied to development on the ORM.
4. Studies that examine the role and status of open space on the ORM including:
 - Studies that specifically examine shifts, changes and perceptions within the park and open space management agencies in response to the introduction of the ORMCP.
 - The adequacy of parks, open space and trail systems in the ORM;
 - Critical comparisons of the ORM park system to other park systems in similar natural areas such as the Niagara Escarpment;
 - A detailed examination of the effectiveness of the land securement strategies carried out across the ORM by various agencies; and
 - A study of the existing and proposed Oak Ridges Trail System and its potential role in a regional or provincial trail network.
5. A detailed examination and comparison of the policies and implementation strategies of the ORMCP to the Niagara Escarpment Plan and the Greenbelt Plan including observations on strengths, weaknesses and gaps.
6. A detailed examination of the effectiveness of certain technical implementation measures, for example the effectiveness of the technical guidelines prepared by the Province for the identification of significant wildlife habitat and the effectiveness of the policies and guidelines to implement watershed plans.
7. A study examining peoples perceptions and awareness of the ORM. This could be a landowner survey carried out in a sample portion of the ORM in which landowners are specifically canvassed to determine awareness, support and implications of the ORMCP to their lives and the lives of others in the community.
8. A natural heritage study that examines the status, importance and security of certain species, species guilds or habitats on the ORM. For example:
 - An examination of the status of open field habitat, its level of protection and security and the degree to which it is being protected on the ORM would be interesting;
 - An examination of pine plantations to assess the degree to which they are being managed to facilitate restoration to native assemblages of vegetation;
 - The status or state of invasive species incursions on the ORM and what is being done to control or manage these invasions; and
 - Site specific case studies of changes in vegetation cover over time on defined parts of the ORM, before and after the introduction of the ORMCP.

9. A comprehensive survey of research being carried on the ORM and the identification of gaps requiring additional study.
10. Anything that takes a closer look at the micro-climatological and macro-climatological influences of the ORM.
11. An examination of the impact of the ORMCP on carbon emissions and global warming in general.
12. An examination of land stewardship programs across the ORM and a determination of their effectiveness.
13. Studies that look at ways of improving monitoring of the ORM, including:
 - Any study that identifies potential performance indicators and targets that examine the health of the ORM or the effectiveness of the ORMCP (Note: indicators that measure social and economic change, community values and cultural values are areas that desperately need to be looked at);
 - An analysis of existing monitoring systems existing on the ORM in terms of their effectiveness, relevance, completeness and affordability; and
 - An examination of potential community based models for monitoring the ORM.

Appendix B — Draft Statement of Goals and Objectives for the Moraine Research Coalition

Draft Statement of Goals and Objectives

Oak Ridges Moraine Research Coalition
(Proposed)

DRAFT - May, 2009

Introduction:

Interest in Oak Ridges Moraine research has steadily increased since the late-1980's and especially since the enactment of the Oak Ridges Moraine Conservation Act and Plan in 2001 and 2002. Academic research in numerous disciplines as well as interdisciplinary research has been undertaken at several universities and colleges across southern Ontario. Governments on various levels, conservation authorities and non-government organizations (NGO's) have also led and contributed to research on the Oak Ridges Moraine. The 2007 Oak Ridges Moraine Symposium called for more coordination and collaboration on a number of fronts on the moraine, including research. These initiatives and efforts have led to interest in a network or coalition to coordinate ongoing research across the moraine.

Goal and Objectives:

To promote coordination and collaboration between researchers whose work focuses on the Oak Ridges Moraine while fostering linkages between researchers and practitioners. The coalition will endeavour to achieve this goal by meeting the following objectives:

1. Undertake an inventory of existing social and natural science and policy research on the moraine and identify key gaps in knowledge, information and data;
2. Foster collaborative research projects, funding proposals and outreach and dissemination initiatives intended to raise the profile of, and ensure the sustainability of, the linked social and ecological systems of the moraine; and,
3. Promote community service learning by fostering strong relationships between researchers and practitioners with over-lapping interests in the sustainability and ecological and hydrological integrity of the Oak Ridges Moraine.

Members and Proposed Structure of the Coalition:

The coalition is intended to bring together researchers, reflective practitioners and citizen scientists from universities,

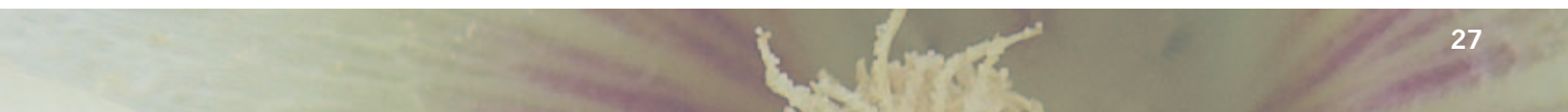
colleges, government agencies at various levels, conservation authorities and non-government organizations to share their moraine-based knowledge, information, data and experience. The coalition, at least initially, will be structured as a loose network of researchers (or network of research networks) with representation, in the form of a liaison, from each institution/agency/organization. The liaison will be the main contact/conduit between the coalition and the member institution/agency/organization and it will be the responsibility of the liaison to update other coalition members, students and relevant research contacts (i.e. Associate Dean of Research) regarding coalition activities/initiatives. Coalition members could also act as nodes or links to other relevant networks of researchers or practitioners to ensure cross-fertilization and to reduce the duplication of efforts. Regular, rotating meetings will be held to provide updates on on-going and proposed research, possible collaborative research projects and special topics (for instance, community service learning, research methods/approaches etc.).

Potential Research Foci/Framework of the Proposed Coalition:

The coalition could utilize the up-coming 2015 consolidated Oak Ridges Moraine Conservation Plan, Niagara Escarpment Plan and Greenbelt Plan review as well as the proposed Oak Ridges Moraine UNESCO Biosphere Region to provide foci for the above objectives. The 2015 consolidated plan review represents an opportunity for researchers to provide NGO's, government agencies, citizens and private sector organizations with coordinated, relevant research outputs that could be used to improve these important pieces of legislation. The proposed UNESCO Biosphere Region affords a framework within which researchers play a key role in providing logistical support to ensure on-going environmental conservation efforts as well as local economic development opportunities that support sustainable livelihoods across the moraine.

For Whom the Coalition Would Be of Interest:

The coalition is meant to provide existing, emerging and future researchers with interests on the Oak Ridges Moraine with a forum to share and disseminate existing and proposed research. It is meant to provide students with a single-window to the wide breadth of potential research projects available on the moraine as a "living laboratory". And the coalition is intended to provide consumers of research such as government agencies, NGO's, citizen's and private sector organizations that have research needs on or around the moraine with a pool of interested and willing researchers with relevant knowledge, expertise and skills.





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