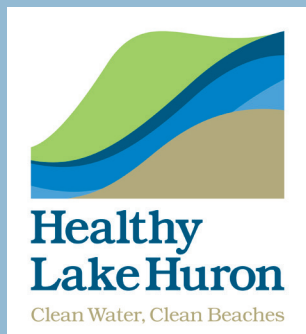


Healthy Lake Huron

Clean Water, Clean Beaches

Newsletter
Summer 2013

Rural stormwater project benefits Lake Huron



This Issue:

- Project highlights for all five priority watersheds
- Crops and Creeks Huron
- Ontario supports Lake Huron
- Living Beaches education
- Bruce Peninsula Biosphere supports Healthy Lake Huron
- Huron Clean Water Project update
- Great Lakes Nutrient Initiative
- Growing Forward 2, Ideas Rooted in Agriculture
- Windbreaks protect soil and water
- Does groundwater impact water quality at your beach?

Healthy Lake Huron participants and supporters

Federal Government – Environment Canada, Parks Canada, Fisheries and Oceans Canada

Ontario Provincial Government – Ministry of the Environment, Ministry of Natural Resources, Ministry of Agriculture and Food, Ministry of Rural Affairs, Ministry of Municipal Affairs and Housing

Municipal/County Councils – Bruce County, Huron County, Lambton County

Health Units – Grey Bruce Health Unit, Huron County Health Unit, County of Lambton Community Health Services

Conservation Authorities – St. Clair Region, Ausable Bayfield, Maitland Valley, Saugeen Valley, Grey Sauble

Other Organizations – Bruce Peninsula Biosphere Association, Environmental Defence, Lake Huron Centre for Coastal Conservation, Pine River Watershed Initiative Network, Western University

International Stakeholders – Lake Huron Binational Partnership

People can do more to limit the impact of heavy rainfall and storms on lake water if they have the right tools to understand and manage how runoff acts in a rural landscape, especially in storm events.

That's why Healthy Lake Huron partners are working to develop a Rural Stormwater Management Model.

One of the key deliverables of the project is the development of new modeling software. Land managers will be able to use this software to better predict the effects of storm events on rural watersheds and the effectiveness of actions designed to manage storm runoff to minimize erosion and improve the quality of waters that flow into Lake Huron.

A project team has been established to develop tools to better understand how storm runoff functions in the rural landscape, determine what kinds of projects will do the most to protect Lake Huron, and where those projects should be located.

In 2012, the project team added or upgraded five water monitoring stations in rural Lake Huron.

Staff members from participating conservation authorities installed the advanced stations in five priority areas: Garvey/Glenn Drain watershed, north of Port Albert; the Bayfield North (North Gullies) watershed, north of Bayfield; the Main Bayfield watershed; the Lambton Shores watershed, near Ipperwash; and the Pine River watershed, south of Kincardine.

"The Rural Stormwater Management Model project is creating new tools that give us more precise and detailed information to better manage stormwater impact in rural areas," says Project Manager Alec Scott, who works with the Ausable Bayfield Conservation Authority.



Photo by Daniel Holm Photography / courtesy ruralstormwater.com

Efforts to control rural stormwater runoff will help keep Lake Huron beaches clean and healthy.

"The new monitoring stations are already providing better data. This is important as we go forward with best management practices and work to control runoff and erosion. We will have a better idea of which projects will work best, the best places to locate those projects, and what size the projects should be."

The Healthy Lake Huron partners on the project have completed terms of reference, a communications plan, and have formed a project team with expertise in stormwater management and software development.

Ausable Bayfield Conservation, the lead agency in the multi-partner project, is working with Emmons & Olivier Resources, Inc., an engineering and environmental consulting firm that specializes in water resources, watershed planning, and modeling; and Computational Hydraulics International (CHI), a consultant in stormwater management, wastewater and watershed modeling software.

Collaboration key on water-quality project

Federal and provincial ministries, county departments, environmental and public health agencies, and landowners are all working together to reduce the impact storms and runoff can have on water quality in Lake Huron.

Ausable Bayfield Conservation Authority (ABCA) is leading the Rural Stormwater Management Model Project water-quality initiative in partnership with Maitland Valley, St. Clair Region, Saugeen Valley, and Grey Sauble conservation authorities and other partners in the Healthy Lake Huron initiative.

The Ontario Ministry of the Environment's Showcasing Water Innovation Program is providing \$700,000 in funding for development of this leading-edge water-quality technology and the contributions from other partners brings the total investment in the project to more than \$900,000.

Partners say the cooperative effort to create this new technology will benefit the economy, the environment, and human health.

The Rural Stormwater Management Model will improve water quality in Lake Huron and help create a rural focus for stormwater management that can be applied in rural areas across the province.

For more information on the Rural Stormwater Management Model Project, visit <http://www.ruralstormwater.com> or <http://www.healthylakehuron.ca/ruralstormwater>.

New wetland areas reduce erosion

It's been a busy year in the Pine River watershed, earmarked by the completion of the Integrated Watershed Management Plan, funded by Ministry of the Environment and completed in partnership with the Saugeen Valley Conservation Authority and the Ontario ministries of Agriculture and Food, and Rural Affairs.

Pine River Watershed Initiative Network (PRWIN) completed the construction of three wetland areas in 2012.

Other accomplishments include: planting 33,600 trees on 15 privately-owned properties with the participation of landowners; constructing an alternative water source for cattle; partnering with the Penetangore Watershed Group to complete watershed restoration activities in the Penetangore River watershed, Eighteen Mile River and Lower Main Saugeen River watersheds; and constructing more than two km of exclusion fencing that keeps cattle out of waterways.

PRWIN was also able to complete its first berm project. Berms work by storing water on a farm field to slow down the surge of runoff that follows an extreme rain storm.

The concept of storing water in Bruce County may seem counterintuitive to farmers who are installing tile drainage to make fields more productive in our often wet climate. While their efforts at removing water have been successful, they can result in unintended consequences downstream.

When rains do come, in recent times they are increasingly intense rainfall events. The increased velocity of water in streams during heaving rains causes erosion at a rapid rate, resulting in literally acres of valuable farm topsoil being quickly lost. Even an expertly drained field is still subject to surface runoff that can carry topsoil into streams, never to be recovered again. This topsoil is a resource we can scarce afford to lose. Once lost, productive fields take countless years to recover.

PRWIN partnered with the Ministry of the Environment, the County of Bruce, VanDriel Excavation Inc. and Farrell Farms in Huron Township to construct a berm designed to hold back water for 24 hours following a rainfall event.



Photo by Telfer Wegg / courtesy ruralstormwater.com

A retention wetland on the Farrell farm is designed to allow topsoil to settle out of stormwater and be absorbed by wetland plants.

This time period is important as the Farrell farm employs the typical crop rotation in the county – wheat, corn and beans, with the beans being the most sensitive to standing water. A bean crop can survive being submerged for up to 48 hours without dieback, so ensuring the water is off the landscape in 24 hours maintains crop health.

With engineering services provided by VanDriel Excavation, a berm was constructed to be about .69 metres high with an average width of 7.6 metres. It was designed to hold back a volume of 1,111 cubic metres of water on the 10.8 hectare field.

Allowing stormwater to pond temporarily behind the berm accomplishes two things. First, it allows the water to slowly enter the municipal drain, thereby decreasing the bank erosion downstream and nutrient input. And second, it allows topsoil to settle out and remain on the farm field rather than leaving via surface runoff.

A related element of this innovative project is a stormwater retention wetland that, during large rainfall events, allows water to leave the municipal drain and enter a stormwater wetland and sedimentation pond. Here, water slows down enough for more topsoil from the farm field to settle and nutrients to be absorbed by wetland plants.

Together, the field berm and the retention wetland work in tandem to conserve the capacity of the agricultural landscape and to further the mandate of the Pine River Watershed Initiative Network, which is to promote “clean water and a healthy ecosystem in the Pine River watershed.”

Monitoring equipment installed on the Pine River

Additional monitoring is underway in the Pine River watershed as part of a partnership project to develop a Rural Stormwater Management Model for the Healthy Lake Huron initiative.

Saugeen Valley Conservation has been leading monitoring work on the Pine River, with additional funding from the County of Bruce.

Staff have been busy over the last year setting up monitoring equipment and analyzing stream data to gain a better understanding of this section in the South Pine River watershed.

A temporary monitoring site has been installed in the upper reaches of the South Pine River branch, draining an area of almost 11 sq. km.

The site was chosen because this section of the river is very similar to the overall watershed in flow characteristics, physiography, hydrology and soils characteristics.

The system is also very reactive and responsive to most storm runoff events.

The installation includes an instream level logger, which provides an hourly record of fluctuating water levels in the river.

Downstream from this temporary station, an automated water quality sampler was installed at a pre-existing, permanent monitoring site near Ripley, where hydro is accessible to run the equipment.

By the end of 2012, staff had measured flow and discharge data from seven storm runoff events.

Due to the drier than normal conditions in 2012, more data will be collected in 2013 to provide a better picture of what typically occurs in the river during and following storms.

A rating curve will be developed to provide a better understanding of the volumes and rate of discharge at this smaller section of the watershed and how this information relates to the entire watershed.

On a broader scale, the results of monitoring on the Pine River will be a valuable component of the Healthy Lake Huron project and the development of a Rural Stormwater Management Model.



A temperature-level logger installed on the Pine River automatically records and stores water flow and temperature data.

Watershed Contacts

Watershed	Contact Person
Pine River	Adrienne Mason, pineriverwin@yahoo.ca , 519-395-5538 Pine River Watershed Initiative Network, www.pineriverwatershed.ca
	Jo-Anne Harbinson, j.harbinson@svca.on.ca , 519-367-3040 ext. 235 Saugeen Valley Conservation Authority, www.svca.on.ca
Garvey/Glenn	Geoff King, gking@mvca.on.ca , 519-335-3557 Maitland Valley Conservation Authority, www.mvca.on.ca
North and Main Bayfield	Mari Veliz, mveliz@abca.on.ca , 519-235-2610 or 1-888-286-2610 Ausable Bayfield Conservation Authority, www.abca.on.ca
Lambton Shores	Muriel Andreae, mandreae@scrca.on.ca , 519-245-3710 St. Clair Region Conservation Authority, www.scrca.on.ca

Bayfield residents working to protect watershed

The people who live around the Bayfield River and nearby creeks have been active over the past year in work to protect and enhance water quality and quantity and forest conditions.

Local citizens are serving on an advisory committee of landowners, stakeholders and government staff to prepare and implement a plan to protect the Main Bayfield watershed. This watershed is one of five areas identified as top priorities by the Healthy Lake Huron partnership.

The local advisory committee's main goal is to improve water quality and quantity within the Bayfield River by reducing total phosphorus, *E. coli* and total suspended solids concentrations in local waterways while increasing wetlands and both forest and streamside cover.

They will also reach out to local organizations and landowners for input on how to make these improvements happen.

The committee has also compiled a list of community groups that might help improve water quality in the watershed.

More than 25 per cent of those groups have committed to specific actions they will take to protect and improve water quality.

That includes projects such as planting trees, maintaining buffers along watercourses and upgrading septic and wastewater systems.

The Fred A. and Barbara M. Erb Family Foundation, a U.S. foundation dedicated to nurturing environmentally healthy and culturally vibrant communities in metropolitan Detroit and supporting initiatives to restore the Great Lakes Basin, provided Ausable Bayfield Conservation with \$100,000 for the work that is being done with landowners to help restore wetlands and to prepare a local watershed plan between 2011 and 2013.

Local residents are protecting water quality and quantity, and improving forest conditions, by tackling beneficial projects at their homes, cottages, farms, and businesses.

They are also active supporting water quality monitoring and attending meetings to learn more and raise awareness.

The advisory committee is engaging citizens by conducting surveys with landowners, making water quality data easier to understand and providing information on grants and technical help that can be found for proposed projects.

The committee also created a watershed plan to involve the local community, show how the plan was created, and how concerns specific to this watershed can be addressed.

Outreach activities in recent months have focused on meetings with local groups, agencies, and organizations.

At one event held at the Clinton Christian Reformed Church, guest speakers included Humanitarian Engineering and Certified Water Specialist Jonathan VanderSteen, Ph.D., and watershed planner Jessica Schnaithmann of Ausable Bayfield Conservation.

Dr. VanderSteen, who had spent several months in Ghana examining the need for reliable drinking water solutions, shared thoughts about his experiences and how relief efforts must provide long-term solutions, not short-term fixes.

He emphasized that active involvement in the local area is a critical step towards improving water quality — locally and globally.

That message reinforced the importance of community efforts to develop and implement a plan and projects to protect and improve water quality in Bayfield River, its tributaries, and Lake Huron, now and in the future.

Crops and Creeks Huron measures effectiveness of best management practices

More than 30 landowners in three watersheds, are participating in a soil health and water quality project called Crops and Creeks Huron.

As part of the project, they completed surveys and provided land management information for more than 70 per cent of the study area and are choosing and implementing more than 30 best management practices (BMPs) on their lands. Their work is helping to measure the economic and environmental effectiveness of best management practices to preserve soil health and water quality.

The Huron County Federation of Agriculture has partnered with Ausable Bayfield Conservation and others on this watershed-based best management practices evaluation project since January 2011.

The work is funded by the Ontario Ministry of Agriculture and Food and the Ministry of Rural Affairs through the Canada - Ontario Agreement Respecting the Great Lakes Ecosystem.

The University of Guelph's Watersheds Evaluation Group has also set up and run a model Soil and Water Assessment Tool (SWAT) to determine the cumulative effectiveness of the four studied BMPs in the Bayfield North (North Gullies) watershed, which includes Gully Creek.

This watershed north of Bayfield is one of five priority areas identified by the Healthy Lake Huron



Rachel and Dwayne Feddes and their children, Ethan, Aaron and Drew, along with Dwayne's father, Al, are shown at the family farm near Holmesville. More than 30 farmers are taking part in Crops and Creeks Huron, a Watershed-Based Best Management Practices Evaluation research project to see how effective best management practices are for the farm business and the environment. Dwayne and Al describe the changes they are making as "long-term investments" to keep their land sustainable.

initiative. Water quality and soil monitoring is being carried out as part of this project to evaluate berms, conservation tillage, cover crops, and fertilizer nutrient reductions.

The project research is still in its early stages but monitoring the BMPs has already yielded positive preliminary results. One project demonstrated a reduction of sediment and nutrients on a strategically located 5x5-metre grassed area at the edge of a field. Another confirmed that berms decreased the amount of sediment between an

inflow channel and the settling area behind the berm, slowing down the water that moves over the land and preventing sediment from entering surface water. Other studies showed that cover crops and conservation tillage also reduce erosion.

The Crops and Creeks Huron initiative will continue to build on previous actions the Bayfield North, Zurich Drain, and Ridgeway Drain watershed communities have taken to identify and implement BMPs to protect and improve water quality in local waterways that flow into Lake Huron.

Walk the Watershed project deepens understanding in Lambton Shores

Last summer, the St. Clair Region Conservation Authority (SCRCA) completed a comprehensive 'Walk the Watershed' Program along Duffus Creek to understand the physical and biological characteristics of this creek by walking from its headwaters in agricultural land to the sandy shores of Lake Huron.

It was a fascinating experience observing the transition in geography over eight km. The program identified bank erosion as a problem along the whole watercourse and SCRVA staff members, in consultation with landowners, are determining ways to mitigate the effects of erosion.

Input from landowners is crucial. In cooperation with landowners, the SCRCA is investigating projects that will retain or slow the flow of the waters from the upper reaches of the watershed, so that the downstream stretches of Duffus will receive the water at slower velocities.

Project costs will be offset through the Lambton Shores Clean Water Cost-Share Program, which offers grants to landowners for eligible projects to improve water quality in the Lambton Shores watershed. Landowner participation is vital in community efforts to build a healthy watershed that drains into Lake Huron.

Other projects undertaken through the grant program include tree planting projects and upgrading a manure storage facility.

Other highlights:

- SCRCA co-hosted a Great Canadian Shoreline Cleanup event in September with the Municipality of Lambton Shores to increase awareness of the importance of shoreline habitat and water quality at Centre Ipperwash Beach.
- In November, SCRCA staff hosted a workshop with a representative from

Ontario Ministry of Agriculture and Food speaking to local farmers about the advantages of cover crops in retaining soil and nutrients on the land.

- A permanent water flow station and a weather station were installed in summer 2012. SCRCA staff will be able to use the information collected to measure changes in the water level of Shashawandah Creek and record how much nitrogen and phosphorus is entering the system through runoff in a storm. This is part of a larger project to develop a Rural Stormwater Management Model to gain a better understanding of how agricultural drainage functions in a rural landscape.
- Currently, SCRCA staff is facilitating discussion on techniques to improve water quality through a landowner-directed steering committee and is raising awareness of the cost-share program and water quality concerns at community events and workshops.



A group of local shoreline residents participated in a Great Canadian Shoreline Cleanup event at Centre Ipperwash Beach.

SWEEP strategies improve water quality in Garvey/Glenn Drain watershed

Over the past two years, Maitland Valley Conservation Authority (MVCA) staff has worked closely with landowners to assess conditions and identify landowner concerns in Garvey/Glenn Drain.

That work identified soil erosion issues along with inadequate stormwater management and corresponding water quality problems.

Intensifying soil erosion is contributing to high concentrations of sediment and nutrients flowing into Lake Huron from the watershed.

When MVCA and landowners reviewed the assessment of watershed conditions, it became apparent that the long-term costs are very high if these issues are not addressed.

Doing nothing is expensive. Taking a proactive approach to stormwater management will protect valuable soil resources, reduce the loss of nutrients and protect water quality. It will also help to protect municipal infrastructure, such as roads and culverts.

In partnership with landowners, MVCA staff developed a Soil and Water Environmental Enhancement Plan (SWEEP) for the entire watershed, as well as for individual properties.

These plans set out strategies for improving water

quality by addressing the impacts of soil erosion and nutrient runoff.

The SWEEP focuses on a systematic approach that encompasses the entire watershed to maximize the effectiveness of stewardship work. SWEEP documents were recently posted on the MVCA website (<http://www.mvca.on.ca>). They will be updated regularly as stewardship projects are completed and consultation with landowners continues.

The Garvey/Glenn Drain watershed has been divided into 12 sub-basins.

In the fall of 2012, the first SWEEP erosion control project was completed in sub-basin one located in the headwaters of the Garvey/Glenn Drain watershed. A series of berms and French Drains were installed to create ponding areas that slow down stormwater runoff. At the end of January, a significant snowmelt and rainfall gave MVCA staff and landowners a chance to see the berms in action. The results were very positive with the berms and drains performing exactly as planned.

Design work and tendering for erosion control projects in sub-basin two was completed in 2012. Work with landowners continues in this area and the construction of several berms is expected to get underway in 2013.

The Garvey/Glenn Drain watershed is also part of a project to develop a Rural Stormwater Management Model. The model will assist with predicting the effects of weather events on water levels and erosion.

This year a permanent stream flow station, three temporary stream level gauges and a weather station were installed in the watershed. Data is now being gathered from this equipment to establish a rating curve that will enable staff to remotely estimate flow levels.

In 2012, eleven sites in the Garvey/Glenn Drain watershed were monitored for water quantity, nutrients and sediment. This monitoring is critically important for evaluating the outcomes of stewardship work and ensuring project objectives are met.

The involvement of landowners and partners in the implementation of the Garvey/Glenn SWEEP will continue to be vital to the success of the project.

To achieve significant progress in managing stormwater, the combined expertise and local experience of landowners, partner agencies and staff will be required.

Together we can effectively protect our local soil and water resources.

Ontario supports local projects to protect Lake Huron

Ontario's Great Lakes Guardian Community Fund is supporting efforts by local communities and organizations to ensure the waters of Lake Huron remain 'swimmable, drinkable and fishable' for generations to come.

Established in 2012 as part of Ontario's Great Lakes Strategy, the fund provides grants of up to \$25,000 to community groups for grassroots activities such as cleaning up a beach or shoreline, or restoring a wetland.

Close to \$190,000 was awarded in 2012 to eight projects in Healthy Lake Huron watersheds. They include:

- Clearing *Phragmites* in the Port Franks community of Lambton Shores and re-establishing native plants (Ausable Bayfield Conservation Authority)
- Planting trees and improving community access to trails, especially for older and disabled visitors (Bayfield River Valley Trail Association, with local partners and community volunteers)
- Restoring and monitoring six streams (Bruce Peninsula Biosphere Association, with area landowners and students)
- Implementing a Living Beaches hands-on student education program to teach students about beach-dune ecosystems and coastal science (Lake Huron Centre for Coastal Conservation, with municipalities and local schools)
- Water quality monitoring and public outreach to encourage protection of Lake Rosalind and Marl Lake (Lake Rosalind Property Owners Association)
- Constructing barriers to slow stormwater runoff, reducing erosion and fertilizer runoff in the Garvey/Glenn Drain watershed (Mid-Huron Beach Property Owners Association, with Maitland Valley Conservation Authority and area landowners)
- Building an interpretative trail and planting native trees along the Pine River (Pine River Watershed Initiative Network, with community partners, volunteers and students)
- Clearing trails and planting trees to restore natural habitats along the Lake Huron shoreline (Saugeen Valley Conservation Authority, with community volunteers).

More information about the Great Lakes Guardian Community Fund and Ontario's Great Lakes Strategy is available on the Ontario Ministry of the Environment website at <http://www.ene.gov.on.ca/>.

Living Beaches — youth education in coastal science

Armed with a recent grant from the Great Lakes Guardian Community Fund and the Suncor Foundation, the Lake Huron Centre for Coastal Conservation will be extending its 'Living Beaches' coastal studies program aimed at educating youth about beach and dune ecosystems.

The Coastal Centre has been involved in youth education for many years, having developed curriculum resources for coastal science education.

Staff has also worked with area schools and school boards to engage students in beach education and restoration activities.

Living Beaches establishes a formal program that teachers can access to find both curriculum and staff resources to help teach students about the Lake Huron coast.

They also encourage teachers to bring students to a local beach to learn some 'beach science basics' and then engage in a dune restoration activity under the guidance of centre staff.

This year the centre has confirmed restoration projects at Station Beach in Kincardine, Blair's Grove in Huron-Kinloss and Goderich waterfront, with other sites pending.

For more information on the Living Beaches program, contact the Coastal Centre at (226) 421-3029, or visit its website at www.lakehuron.ca.



Grade 6, 7 students from Huron Heights Elementary plant locally harvested American Beachgrass at Station Beach.

Bruce Biosphere Association supports Healthy Lake Huron

The Bruce Peninsula Biosphere Association is now a supporting partner in the Healthy Lake Huron initiative.

This grassroots, community-based group is a 10-year-old charitable organization dedicated to implementing the UNESCO World Biosphere Reserves concepts of conservation and sustainable economic development within the Bruce Peninsula portion of the 750 km Niagara Escarpment Biosphere Reserve.

The association is governed by a community board, has no permanent staff and has previously led award-winning projects in the program areas of ecological monitoring and restoration, community engagement, youth and education, and sustainable economic development.

Since late 2011, the association has been moving forward quickly on a number of fronts, including:

- Developing a Conservation and Stewardship Plan, and building a network of local environmental organizations, with funding from the Friends of the Greenbelt Foundation
- Developing a multi-year plan for the restoration of six streams that flow into Lake Huron and Georgian Bay
- Securing a \$3,500 grant to train volunteers for water testing and hiring a part-time co-ordinator to manage water and benthic testing, and analysis
- Using a \$25,000 grant from the 2012 Great Lakes Guardian Community Fund to undertake a full year of water quality sampling and benthic testing for the Six Streams project, and

to implement a cattle exclusion demonstration project

- Submitting grant applications to develop watershed plans for the Old Woman's River and Stokes Bay watersheds, and carrying out demonstration projects for cattle exclusion from creeks and new drain management on agricultural lands, and
- Hosting a dinner in August 2012 to encourage the participation and support of the farming community.

For more information on the Bruce Peninsula Biosphere Association, visit www.bpba.ca or contact the association's Chairperson, Elizabeth Thorn, by email at elizabeth@thorn.ca or by telephone at (519) 900-0352.



Map of the Healthy Lake Huron area of interest boundaries. Courtesy of Ministry of the Environment

Lake Huron Binational Partnership

Lakewide environmental management, restoration and protection activities in the Lake Huron basin are coordinated through the Lake Huron Binational Partnership.

The United States Environmental Protection Agency, Environment Canada, Michigan Department of Environmental Quality, and Ontario's ministries of the Environment and Natural Resources form the core of the Partnership by providing leadership and coordination.

A flexible membership on an issue-by-issue basis is inclusive of other agencies and levels of government, Tribes/First Nations, non-government organizations and the public. To learn more, visit www.binational.net.

Canadian efforts in support of the Binational Partnership to encourage and support community action to protect and restore the lake and its watershed are ongoing through the Lake Huron – Georgian Bay Framework for Community Action.

Please visit www.lakehuroncommunityaction.ca for information, contacts and to sign the Lake Huron Charter – a commitment to work together for a healthy and sustainable Lake Huron watershed.

Windbreak best practices video available

Ontario Ministry of Agriculture and Food has produced a series of best practice videos to demonstrate the use of trees and shrubs to protect agricultural land from soil erosion and runoff.

The Windbreak Video Series also includes interviews with farmers talking about their first-hand experience using windbreaks to protect agricultural crops, buildings and livestock.

To watch the videos, visit ontario.ca/farmstewardship and click on windbreaks.



Eastern white cedar and Norway spruce planted as a windbreak on an Ontario farm.



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Volunteer landowners key in Huron County Clean Water Project success

Landowners in Huron County are demonstrating leadership in rural water quality improvement. By accessing the Huron County Clean Water Project grant and extension support from the Ausable Bayfield and Maitland Valley Conservation Authority, Huron County residents are making a difference.

The County of Huron oversees the program, which provides grants to landowners for projects that protect local watersheds and improve water quality. Since its startup in 2004, the county has contributed \$1.75 million towards the initiative and in 2013 another \$400 000 has been approved by Huron County Council. And they're reporting a great return on that investment. For every dollar the county has invested, an additional \$3.50 has been spent on completed projects thanks to contributions from landowners and other national, provincial and local funding sources.

When those contributions from landowners and other funders are tallied, that's resulted in more than 1,500 completed projects with a total value of more than \$5.8 million.

Highlights of the results so far include:

- Fencing cattle out of almost 40 km of streams
- Planting more than 150 hectares of trees
- Establishing almost 90 km of windbreaks

- Upgrading 289 private wells
- Decommissioning 360 unused wells.

Other completed projects include upgrading or decommissioning manure storage on farms, creating wetlands, diverting water from manure and livestock exercise yards, controlling erosion, implementing stewardship guides, managing storm water runoff, and retiring fragile land from agricultural use.

Huron County residents are eligible for grants of up to 50 per cent for the cost of approved voluntary projects.

The Ausable Bayfield and Maitland Valley conservation authorities deliver the Huron County Clean Water Project on behalf of the County of Huron and even help eligible applicants complete their paperwork.

Applications are reviewed by a local committee made up of landowners, farmers, business people and county councilors. For more information on the Huron County Clean Water Project, visit www.mvca.on.ca or www.abca.on.ca or call 519-335-3557, 519-235-2610 or toll-free 1-888-286-2610.



Federal Government initiative tackles Great Lakes algae

A Great Lakes Nutrient Initiative was recently announced by the Government of Canada to address the complex problems of recurrent toxic and nuisance algae in the Great Lakes.

The project will receive \$16 million in funding over the next four years.

Algae blooms have economic, social and environmental implications.

Toxic and nuisance algae blooms can lead to increased treatment needs for drinking water, disruptions to utilities by clogged water intakes, and negative effects on activities such as swimming, commercial and recreational fishing, and tourism.

Blankets of algae were first witnessed in the lower Great Lakes in the late 1960s and 1970s.

Researchers determined that limiting phosphorus inputs to the lakes would reduce the occurrence of algal blooms.

Canada and the United States responded by limiting phosphorus inputs to the Great Lakes primarily through improved municipal wastewater treatment.

Algal blooms began reappearing in the mid-1990s.

The reasons for the occurrence of algal blooms are more complex than in the past and new solutions are required to address them.

The introduction of invasive species such as zebra and quagga mussels, the intensification of agriculture, increased urbanization, and changes in the intensity, duration and frequency of storm events have significantly changed how nutrients enter the lakes and are used by aquatic organisms.

The Great Lakes Nutrient Initiative will advance our understanding of the causes of recurrent toxic and nuisance algae in the Great Lakes and the management options available.

The initiative has several components, including nutrient science, the development of phosphorus objectives and load reduction targets, the review of policy options for reducing phosphorus loadings and the development of a bi-national nearshore management and assessment framework to improve nearshore water quality.

The initiative will focus on Lake Erie, the most susceptible of the Great Lakes to nearshore water quality issues.

The science and policy approaches developed through the initiative will be transferable to the other Great Lakes and bodies of water in Canada.



Source: Environment Canada, Technical Operations Services Dive Unit (EOALRSD), Chris Duggan

Studies by Government of Canada scientists have confirmed that limiting phosphorus inputs to the Great Lakes will reduce the occurrence of nuisance algae blooms. While the initiative focuses on Lake Erie, the science and policy approaches will be used in other Great Lakes and bodies of water in Canada

Researchers study groundwater impacts on beaches

Does groundwater impact water quality at your beach?

This question puzzles many communities trying to determine if septic systems and leaky sewers contribute to the algae that washes up along the shoreline or if they increase the number of beach postings caused by high *E. coli* levels.

Researchers at Western University, University of Waterloo and Environment Canada's National Water Research Institute are pooling their expertise to tackle this question in a three-year project funded by the National Sciences and Engineering Research Council of Canada. Evaluating the impact of groundwater to beach water quality in the Great Lakes, and how to manage it, is a complex undertaking.

It requires knowledge of not only specific groundwater pollution sources (such as septic systems, leaky sewers, or agriculture) but also knowledge of the basic processes (physical water flow, chemical reactions and bacterial processes)

underlying the movement of contaminants in the groundwater and their discharge to a lake.

Even if groundwater 100 metres from the shoreline is contaminated with high levels of *E. coli* and nutrients (nitrogen and phosphorus), that does not necessarily mean that these contaminants will discharge from the groundwater to a lake. Groundwater contaminants can undergo important reactions and potentially be removed by natural reactive processes before they are transported into a lake.

Alternatively, as is the case for *E. coli*, contaminants can also accumulate in the beach sand and groundwater at the shoreline waiting for a storm event or sand erosion to transport them to the shallow lake waters.

For this project, detailed field studies of the groundwater flows and the nutrient and bacterial processes will be conducted on several beaches around Lake Huron, Lake Ontario and South Georgian Bay.

Field sites will cover a range of beaches, from pristine to more degraded beaches. The data collected will be combined with laboratory investigations, advanced computer modeling and the development of simple tools to assist beach managers and municipalities when they make decisions regarding the impacts of groundwater as a source of pollution along their shoreline.

For more information regarding this project, please contact Dr. Clare Robinson at Western University (crobinson@eng.uwo.ca).

Beach water testing: how it works

Recreational beaches on Lake Huron's southeast shoreline are tested throughout the summer months by local municipalities.

To assist in the prevention and reduction of water-borne illness, local public health units also test some municipal beaches.

Health units follow a provincial Beach Management Protocol, which includes a pre-season assessment and routine (minimum weekly) sampling during the swimming season. The results of the sampling, combined with the knowledge from historical results, other environmental factors and any available epidemiological evidence are used to determine an appropriate response.

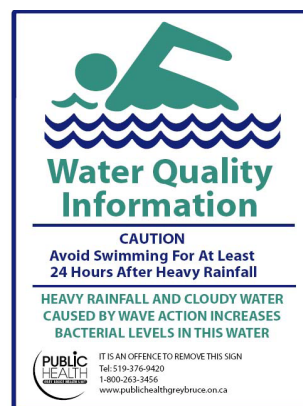
To assist the public in making an informed decision before swimming, the factors contributing to beach water quality are identified on signs at beaches, on websites or social media, and through traditional media, such as radio or newspapers. A beach will be posted as unsafe when the evidence suggests that the beach water is potentially dangerous to human health.

One question asked recently is whether the declining lake levels will have an impact on the testing process or on beach quality itself. Inspectors have certainly noticed the change in levels but it has not had a significant impact on the

sampling process. Samples continue to be collected from beach water at about a one-metre depth, although the sampler may have to walk a bit further to get to that point.

The second part of the question is harder to answer. Environmental factors, such as weather or the presence of waterfowl, can have a significant impact on the bacterial quality of the water. These factors vary from week to week and are recorded as part of regular sampling; however, it is difficult to separate these impacts from any smaller background changes that may be attributable to the lake level.

All that can be said with certainty is that health units will continue to look closely at the evidence to determine if any additional factors are impacting beach water quality.



Signs like the one above are permanently installed at all the beaches monitored by the Grey Bruce Public Health Unit. Credit: Grey Bruce Public Health Unit

Safe swimming checklist

Three Ws of Safe Beach Use

You are often the best judge of water quality for swimming or other recreational uses. By checking weather, water and websites, you can quickly and easily gauge water quality and decide if it is safe to swim.

Weather:

Be aware of recent local weather conditions. Storms or heavy rains typically result in high bacterial counts and unsafe water quality for the next 24-48 hours. It is wise to wait a couple of days after a storm before visiting the beach again.

Water:

After arriving at the beach, a quick visual inspection of the water is one of the best ways to judge if it's safe to go in. Visual indicators of unsafe water quality include: water that is murky with suspended mud or sediment, usually caused by wavy conditions; and the presence of large numbers of birds and bird droppings. If you do venture in but can't see your feet when standing waist deep, you should get out. Rip currents, undertows and heavy wave action increase risk to swimmers.

Websites:

Before you go to the beach, check with the local public health unit to see if local beaches have been posted.

Weather and Water Information

Grey Bruce County:

- Online: www.publichealthgreybruce.on.ca
- By Phone: 519-376-9420 ext. 2501 or Toll Free 1-800-263-3456

Huron County:

- Online: www.huronhealthunit.com
- On Twitter: www.twitter.com/huronbeachinfo
- By Phone: 519-482-5119 ext. 2501 or Toll Free 1-877-837-6143

Lambton County:

- Online: www.lambtonhealth.on.ca
- By Phone: 519-383-8331 or Toll Free 1-800-667-1839