

SOME SOURCES OF POLLUTION ARE EASY TO TRACK. You can observe, measure, even sample the dirty smoke that comes from a stack or the wastewater flowing out of a discharge pipe. While the control of point source pollution may be neither simple nor inexpensive, you always know where to begin.

Rural non-point source pollution can be more difficult to control than fixing a pipe or a smoke stack. It may come from many possible sources – septic tanks, impoundments and improperly stored manure, the runoff from fields and feedlots. The impact of an individual family farm may be very small in the larger scheme of things; however, cumulatively and if not managed properly, the environmental pressure can damage an ecosystem.

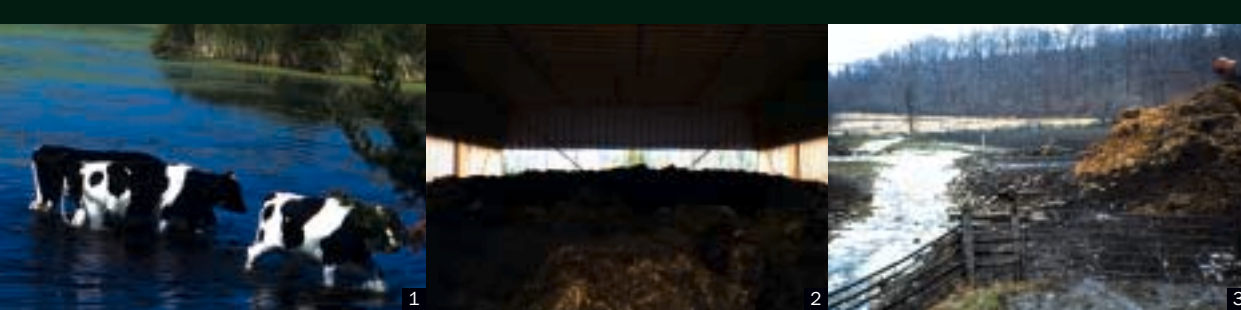
Measuring farm impacts in the Great Lakes Basin is a complicated task. There are many kinds of farms producing everything from grains and oilseeds, corn, fruit and vegetables, livestock, eggs, poultry, and dairy products. Each employs different production methods which affects a shared ecosystem.

Considerable progress has been made under the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) to reduce the environmental impacts of agricultural and rural land use activities. A variety of initiatives and financial incentives have encouraged: the use of conservation tillage to curb runoff and erosion; the proper handling, storage and application of farm wastes to reduce bacteriological contamination; rural buffer strips to protect stream water quality; and integrated pest management techniques to reduce chemical use.

An excellent example of the progress made to date can be found in the Bay of Quinte Area of Concern (AOC).

AGRICULTURE IN THE GREAT LAKES BASIN: FARMERS TARGET NON-POINT SOURCE POLLUTION

CANADA-ONTARIO AGREEMENT RESPECTING THE GREAT LAKES BASIN ECOSYSTEM



Cover: Agriculture in the Great Lakes Basin

1. poor livestock management practice
2. best manure management practice
3. poor manure management practice

These projects have cut the loading of sediment to tributaries and, ultimately, to the Bay of Quinte by 12,000 tonnes a year, and reduced annual phosphorous loadings by 16,500 kilograms.

Cleaning up the Bay of Quinte

Rural water quality has been a key concern in the remediation of the Bay of Quinte, one of 16 Great Lakes Areas of Concern (AOCs) in Ontario. Runoff from agricultural and rural lands can carry a heavy load of phosphorous and other nutrients, as well as pesticides and sediment, into local streams and on down to the shallow, warm waters of the bay.

“Essentially, tributary sources were responsible for between 70 and 75 percent of the nutrient loadings to the Bay of Quinte,” says Barry Jones, Implementation Manager for the bay’s Remedial Action Plan (RAP). Stream silting and sedimentation problems were also linked to rural land use practices.

The Bay of Quinte is a twisting Z-shaped embayment stretching approximately 50 kilometres, east from Trenton, past Belleville, and then south before entering Lake Ontario just west of Kingston. Its huge drainage basin is 17,315 square kilometres of farmland, forests, small villages and larger towns. To the north lie the dairy farms and corn fields of Hastings

and Northumberland counties. To the south, separating the bay from the lake, are the market gardens, beef and dairy farms of Prince Edward County.

“We know that poor agricultural land use management can result in significant changes to local water bodies,” says Jennifer Vincent, a project coordinator for habitat and rural non-point source projects with Environment Canada. “Non-point sources of pollution from agricultural lands can contribute a substantial portion of the sediment, phosphorous, and other pollutants entering water courses.”

As land is developed for agricultural use, its natural buffering capacity for processing sediment, nutrients and pollutants is often knocked out of balance. Poor tillage practices can turn watercourses brown with silt. Heavy chemical use can flood streams with nutrients and pesticides. Improper manure management can contaminate drinking water.

Great Lakes acronyms

The purpose of the Canada-U.S. Great Lakes Water Quality Agreement (GLWQA), is to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem.

The Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) promotes cooperative action between the governments of Canada and Ontario and enlists partners to restore and sustain the environmental quality of the Great Lakes. COA helps Canada meet its obligations under the GLWQA.

Under the GLWQA, Canada and the United States have presently designated 42 Areas of Concern (AOCs), 16 of which are in Canada. In AOCs, environmental degradation is particularly pronounced causing impaired beneficial uses such as restrictions on swimming, fishing and drinking water consumption, and/or contributing to the overall degradation of the Great Lakes.

For each of the AOCs individually tailored Remedial Action Plans (RAPs) have been developed and are being implemented. Restoring the beneficial uses in the AOCs through the RAPs is a key priority for the governments of Canada and Ontario under COA.

Greening the family farm

Ontario's Environmental Farm Plan (EFP) and Best Management Practices Program are internationally recognized as models for building awareness and improving practices. They are being adopted in other jurisdictions around the world.

"Through this process, farmers learn about environmental strengths on their farms, identify areas of concern, and set goals and actions to improve environmental conditions where needed" says the Ontario Ministry of Agriculture, Food and Rural Affairs' Peter Roberts. Since 1993, the EFP program, has been driven by the Ontario Farm Environmental Coalition. It has introduced 19,000 Ontario farmers to environmentally responsible actions that they can adopt on their farms. Original funding for the EFP (1993 – 2000) was provided through the Canada-Ontario Green Plan by Agriculture and Agri-Food Canada (AAFC). The EFP is currently supported by AAFC through the CanAdapt Program administered in Ontario by the Agricultural Adaptation Council.

The EFP is delivered locally by the Ontario Soil and Crop Improvement Association in partnership with the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). Farmers can qualify for up to \$1,500 in project funding to implement on-farm improvements. Currently, Environmental Farm Plan actions have affected over one million hectares of Ontario farmland. The Government of Canada has provided \$10.6 million that has resulted in \$44.6 million dollars of on-farm environmental investments by farmers. Each winter over 2,000 farmers attend Environmental Farm Plan workshops.

Rural non-point source pollution is one of a number of widespread environmental problems in the Great Lakes Basin. "It's a concern pretty much across the board in all the AOCs in southern Ontario," says Vincent. And it is certainly a primary concern of the Bay of Quinte RAP although much progress has been made through partnerships with farmers and rural landowners.

"One of the most cost-effective ways to control nutrient loadings is for farmers to practice conservation tillage rather than conventional tillage" says the Ontario Ministry of



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4. Eastern Bluebird in orchard

Agriculture, Food and Rural Affairs' Peter Roberts. When the stubble and other crop residues are left on a field (rather than plowed under), erosion is reduced, and less nutrients and sediment are washed into streams.

Crop yields may drop temporarily, "It takes about three to five years to re-establish the populations of soil bacteria and worms back to where they'll do a proper job," says Vincent. In the meantime, "you spend a lot less time on the seat of your tractor. The fuel and time savings should help make up for the more expensive off-set disks, seed drills, and heavy duty planters needed to work the fields," she explains.

Partners key to Quinte cleanup

The governments of Canada and Ontario have supported a number of programs that have contributed to the cleanup of the Bay of Quinte. The Government of Ontario has contributed almost \$1 million to implement remedial measures to address non-point source inputs to the Bay of Quinte AOC and through initiatives such as the Environmental Farm Plan, the development and implementation of Nutrient Management Plans and Integrated Pest Management has assisted water quality improvements within the watershed.

Between 1992 and 2001, the Government of Canada's Great Lakes Sustainability Fund (GLSF) and its predecessor, the Great Lakes 2000 Cleanup Fund, have contributed almost \$2 million to environmental projects on farms and promoted remediation efforts around the Bay of Quinte. *(cont'd)*

- 5. conventional till
- 6. conservation till



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GLSF support has been crucial to the remediation of the Bay of Quinte. "We would have been no where without them," asserts the RAP's Jones. Because the GLSF covers only up to one-third of a project's total budget, this financing served as a catalyst to leverage an additional million in support from farmers and other stakeholders. GLSF works closely with area farmers, landowners, and local agencies to help set funding priorities based on local needs.

Rural water program hits targets

To cut phosphorous loadings, a total of 27,000 hectares of cropland have been converted from conventional to reduced or conservation tillage in 198 separate projects. There have been 101 domestic sewage system upgrades, and 50 manure and milkhouse management projects to cut nutrient inputs and bacterial contamination. In addition, 17 erosion control projects, 55 fencing projects, and 25 tree planting projects have helped protect vulnerable stream habitat. Planting shade trees and shrubs along stream banks helps keep the water cool, preserves aquatic habitat, and filters out some of the sediments and other potential contaminants in farm runoff.

Cumulatively, these projects have cut the loading of sediment to tributaries and, ultimately, to the Bay of Quinte by 12,000 tonnes a year, and reduced annual phosphorous loadings by 16,500 kilograms. Fencing projects have protected 40 kilometres of sensitive stream banks and kept thousands of horses, cows and sheep from eroding stream bank and trampling aquatic habitat into muck. In addition, 49 hectares of fragile riverside farmland have been retired from agricultural use.

On March 31, 2001, the Bay of Quinte RAP office shut down its Rural Water Quality Program; after eight years of intensive work controlling nutrient loadings, it had hit all its objectives and the team was ready to move on to other priorities. "We needed to cut the annual phosphorous loadings by 12,500 kilograms," says Jones, "but we raised that by one-third to 16,500 kilograms to add a margin of comfort to the predictive model used to estimate loading reductions.

Orchard pesticides and wild birds

Government of Canada researchers hope to determine whether the reproductive and other health problems seen in wild birds are caused, primarily, by banned pesticide residues or by some of the products currently registered for use in orchards.

In 1988, Environment Canada launched a long-term study of the Tree Swallows and Eastern Bluebirds nesting in orchards in the Great Lakes Basin. The research revealed that increasing pesticide exposure can reduce the survival of both eggs and chicks.

The Ontario Ministry of Agriculture, Food and Rural Affairs used these results to draft the manual "Integrated Pest Management for Apple Orchards". It shows growers how to make more effective use of fewer and less toxic pest control products, and has enabled farmers to make significant reductions in the amount of pesticides used in their orchards.

Our original goal was to bring down the number of summer beach closures to zero," says Jones. "We haven't quite managed that, but the number of beach closures in rural areas is definitely down." The Rural Water Quality Program, together with other RAP projects, has managed to reduce phosphorous concentrations in the Bay to a more acceptable 30 to 40 micrograms per litre level for much of the year.

New COA will focus on challenges

The continuing challenges for agriculture in the Great Lakes Basin are to adopt sustainable management practices for conserving soil, water and wildlife habitat, and to improve the management of nutrients, particularly in areas of intensive livestock and crop production. The governments of Canada and Ontario will work with farmers to address these challenges, both on thousands of individual farms and across entire watersheds.



Canada-Ontario Agreement
Respecting the Great Lakes Basin Ecosystem

To learn more about COA and agriculture in the Great Lakes Basin, contact:

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