Farmers have new way to fix Lake Winnipeg

Study suggests artificial wetlands

By Bartley Kives

BARTLEY KIVES
ON THE **WATER** FRONT
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RM of THOMPSON — When freshwater scientists sat down to figure out the source of Lake Winnipeg's ecological problems, farmers wound up with a large portion of the blame.

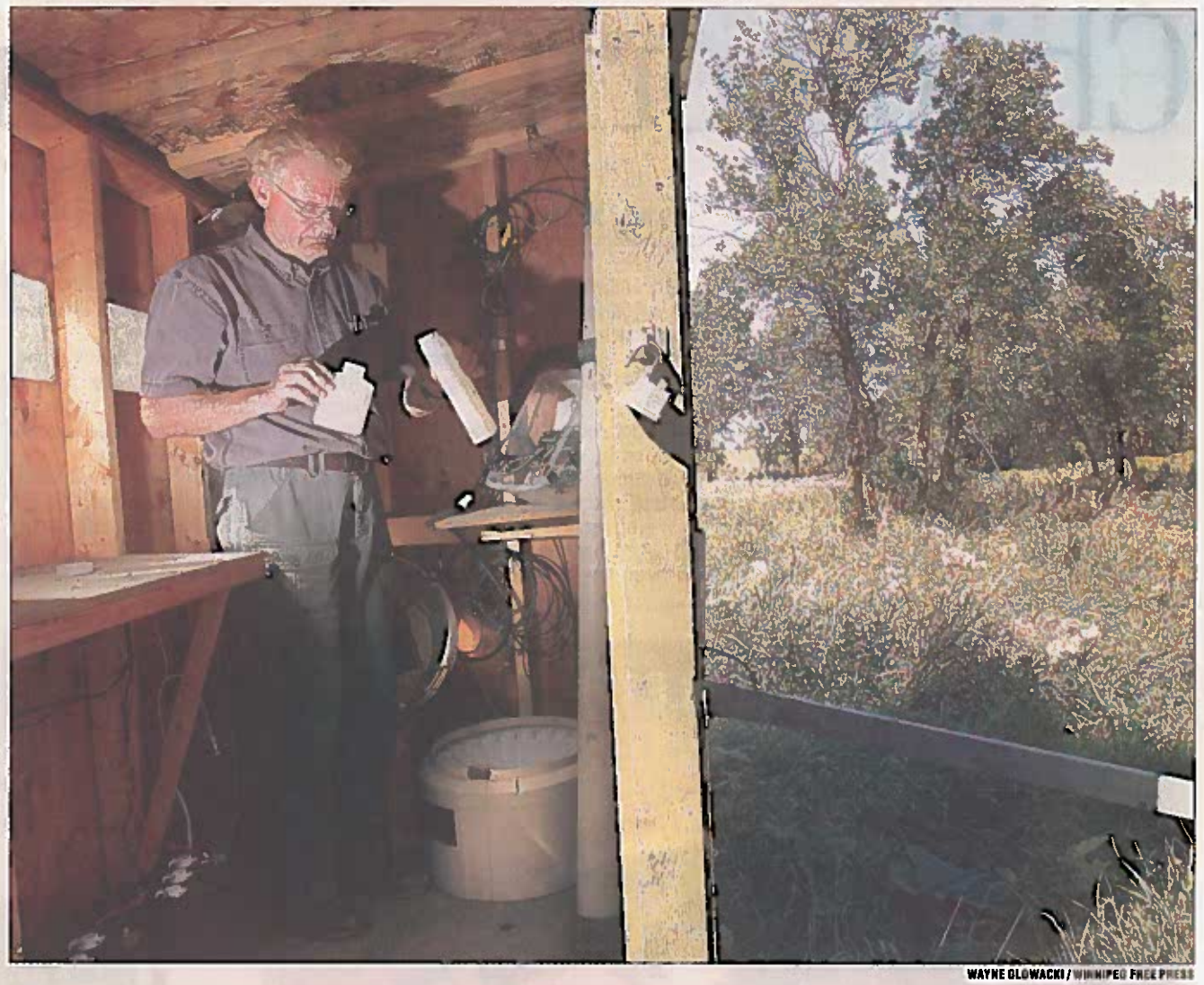
In 2006, the Lake Winnipeg Stewardship board determined agriculture was responsible for five per cent of the nitrogen and 15 per cent of the phosphorus flowing into the world's 10th-largest lake, which suffers from algae blooms and low-oxygen "dead zones" as a result of heavy loads of these fertilizers.

Given the vast size of the Lake Winnipeg watershed, which stretches from the Rocky Mountains to lakes west of Thunder Bay, no individual farm can be held responsible for an algae bloom. But the portioning of blame was an unpleasant surprise for farmers in this province, who shoulder an even heavier load of the blame for the nutrient loads that originate within Manitoba's borders.

Agriculture turned out to be the source of no less than 38 per cent of the nitrogen and 32 per cent of phosphorus that originates within Manitoba and winds up in Lake Winnipeg, the stewardship board concluded in its landmark report.

In the aftermath, the province encouraged producers to reduce the amount of nutrients that wind up flowing downstream from their farms, according to newly published research led by University of Manitoba soil scientist Kevin Tiessen.

Farmers in areas of Manitoba with rolling hills can reduce nutrient loading into Lake Winnipeg by creating small artificial wetlands, Tiessen and fellow researchers at the U of M and a trio of federal agencies suggest after analyzing nine years worth of water-quality data from a pair of small dams on the South Tobacco Creek, west of Miami, Man.



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Tobacco Creek Model Watershed technician Don Cruikshank in a water-monitoring facility at the Steppler Farm on South Tobacco Creek. Nine years of data from the area dams concluded artificial wetlands were effective in reducing nitrogren and phosphorus.

During serious flood seasons. One is a "dry dam" that simply holds back water temporarily, while the other is a "multi-purpose dam" that functions as an artificial wetland — complete with marsh plants — but also serves as a water source for cattle.

In an article published this May in the *Journal of Soil and Water Conservation*, Tiessen and his colleagues found the dry dam reduced the downstream flow of nitrogen by 20 per cent a year and phosphorus by nine per cent a year. The multi-purpose dam reduced nitrogen outflows by 15 per cent a year and phosphorus loads by 12 per cent.

The dams themselves seem to play a role in reducing nutrient loads, possibly by mellowing out the peak water flows that cause the most erosion and free up nutrients that occur naturally in the soil.

"It is clear that small headwater dams and reservoirs are an effective tool to reduce downstream nutrient loading," concluded the researchers, recommending the construction marsh plants to filter out phosphorus and nitrogen because they aren't growing. And during summer rains, brief downpours provide too short a window for plants to take up nutrients.

of agricultural land affects the water quality of Manitoba's largest lakes.

After analyzing the 2009 spring flood, U of M geography student Reanne Pernerowski found the Portage Diversion, an artificial floodway, was responsible for 93 per cent of the phosphorus and 60 per cent of the nitrogen that wound up in Lake Manitoba at the time.

During the same flood season, U of M geographer Greg McCullough also found elevated nutrient loads on the La Salle River. McCullough also found nutrient loads into Lake Winnipeg were roughly four times higher