

INTRODUCTION

Water is a precious resource. The success of your farm business and the health of your family depend on having a clean and abundant supply.

Water is also a shared resource. Water used on your farm, whether for livestock, laundry, drinking, or mixing with pesticides, has been used by other people, fish, and wildlife before you, and will be used by them again after it leaves your farm.

As a user of water, you have a right to expect an ample supply of clean water to meet your needs.

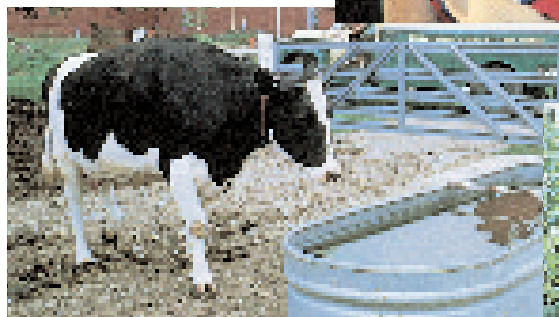
Likewise, it's expected that water leaving your farm, either through evaporation, infiltration to ground water, or surface runoff, will still be abundant and clean for the next user.

Historically, agricultural technology has allowed us to manipulate the quantity and quality of water supplies to increase productivity. Today, new technology, and a better understanding of natural processes, can help you protect your water while maintaining productivity.

This booklet will show you practical ways to conserve water and safeguard its quality. The following chapters separate the farm operation into four areas:

- the home
- the barn and other farm buildings
- the field
- wetlands, watercourses, woodlots, and ponds.

We recommend that you read this booklet from start to finish: like the water cycle itself, each chapter contains material that has some bearing on the whole!



How you use water affects the quality and quantity of water on your property – and that of your neighbours and community.



But first, a brief look at how water – and the pollutants it can carry with it – pass through our environment. You need to understand the water cycle before you can develop an effective water management plan for your operation.



Ontario settlers valued water, establishing their farmsteads along lakes and rivers.

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PATHWAYS OF WATER

Water is in constant motion, continually recycling through the environment in a series of pathways called the water cycle.

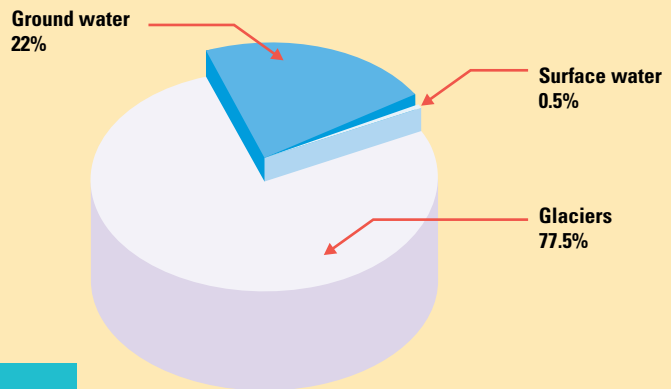
The water cycle establishes a water balance in every hectare of land and kilometre of stream. We can affect this balance, positively or negatively, as we change our land and water use.

The illustration on pages 4 and 5 shows the many ways that water moves on, through, underneath, and out of a typical farm operation.



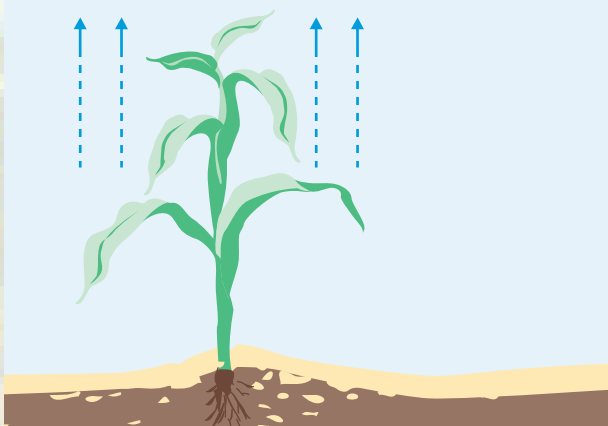
Farming influences the water cycle. Management will affect the amount of precipitation that infiltrates the ground, how much flows over the surface, and will even have an impact on evaporation rates.

COMPOSITION OF EARTH'S FRESHWATER



Water covers more than 70 % of the earth's surface. Only about 3.5 % is freshwater; the remainder is saltwater seas and oceans.

TRANSPIRATION FROM A CORN PLANT



A single corn plant transpires 1.25 litres/day of moisture to the atmosphere. When fully grown this transpiration can increase to 3.8 litres/day.

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PATHWAYS OF POLLUTION

Water is a universal carrier. Its properties enable it to dissolve many substances, and carry them with its flow. Pollutants can be carried with water through all phases of the water cycle.

Your farm is part of the overall water cycle, having an impact on both the surface water that runs over it and the ground water that runs beneath it.

Normal farming practices involve the use of many substances that can potentially contaminate water: pesticides, fuel, fertilizers, manure, to name a few.

These substances can move into surface water, either by being attached to sediment eroded from agricultural land, or dissolved in runoff. They can infiltrate soil to contaminate ground water supplies.

ONTARIO PERSPECTIVE

Most of Ontario's agricultural production lies within the Great Lakes – St. Lawrence River basin. This is the largest fresh surface water system in the world. It holds 20 percent of the world's available fresh water.

As the number of water users in Ontario continues to increase, there are greater demands on our water supplies. When planning for the future we must ensure that water is used as efficiently as possible and protected from pollution.

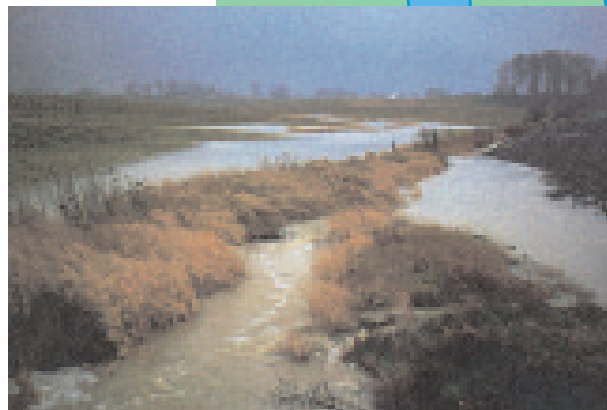
Did you know that water is the common property of all Ontario citizens? To protect our water resources and all who use them, a variety of laws and regulations is in place.

Read over the summary of acts and regulations starting on page 91. It will help you understand the goals of each, and the implications of them for you as a rural landowner.

Many strategies for protecting water resources have economic benefits. Proper management of the water that flows over and beneath your farm will help to ensure productive agriculture along with a healthy environment.

Over 25% of Canada's agricultural production and more than 25% of Canada's population are within the Great Lakes – St. Lawrence River watershed.

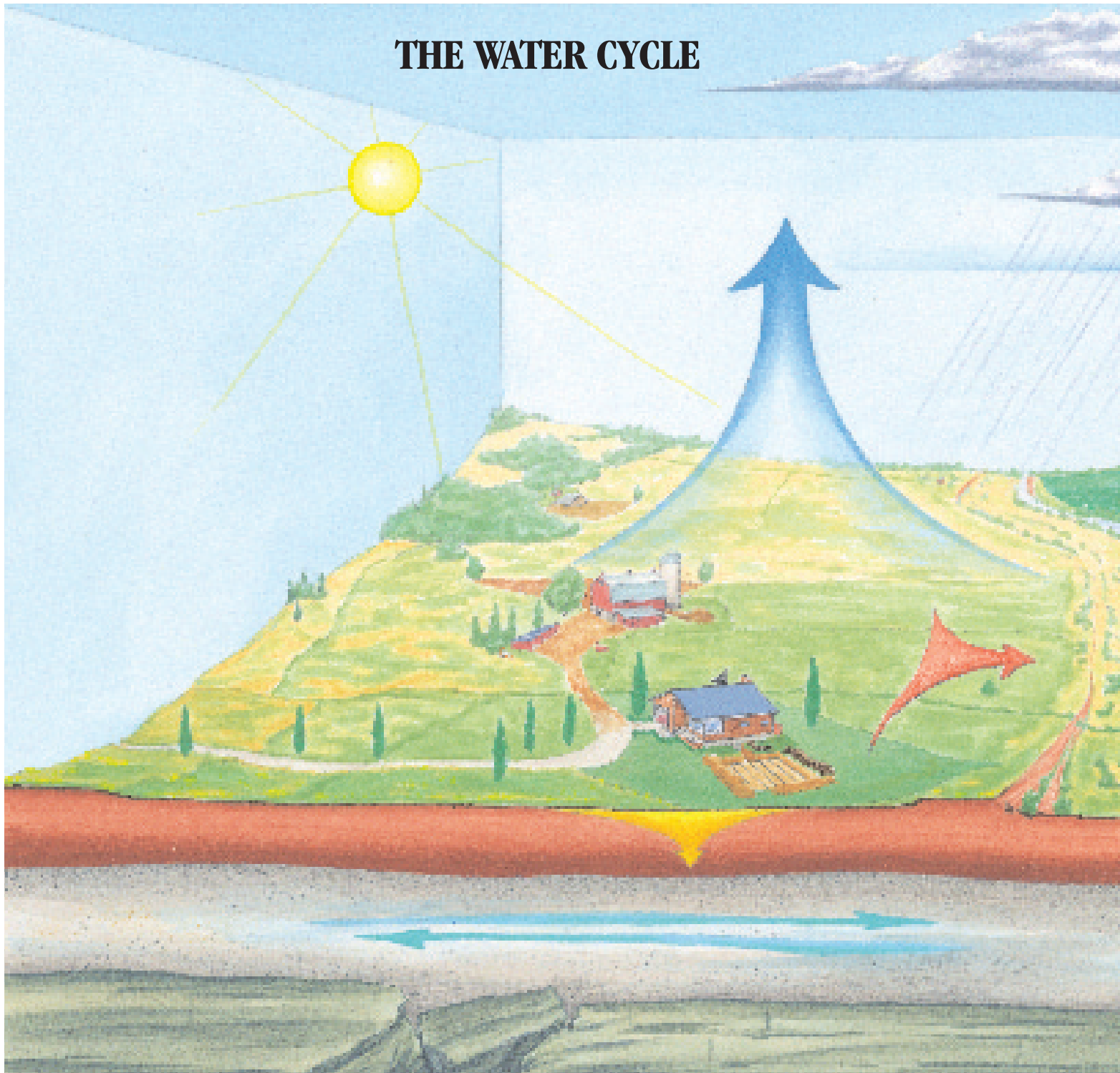
GREAT LAKES — ST. LAWRENCE BASIN



Your farm is part of a drainage basin called a watershed. Water moves within watersheds, eventually flowing to larger bodies of water – in this case, the Great Lakes.

Pollutants carried off the farm eventually reach the main sources of Ontario's drinking water – the Great Lakes and the St. Lawrence River.

THE WATER CYCLE



The water cycle establishes a balance in every part of your property. The arrows in the illustration above show you the many ways water moves onto, through, underneath, and out of a typical farmstead. You can also see the many opportunities you have to affect the quality and quantity of this precious resource.

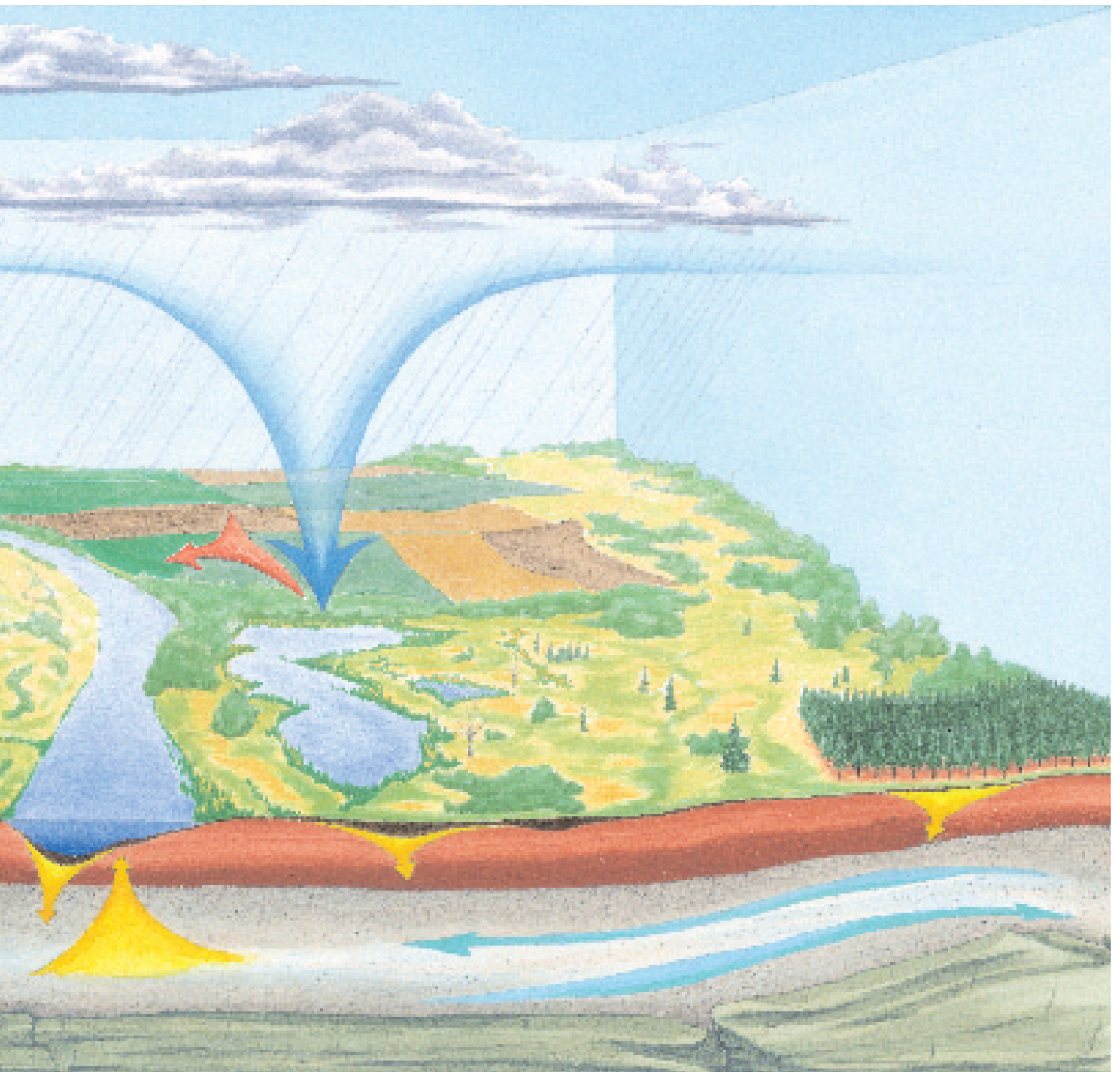
Precipitation, mostly in the form of rain or snow, falls on land, buildings, and bodies of water. Precipitation can be temporarily stored in ponds, lakes, and rivers, held by snow and vegetation, or stored as ice and snow.

Some of the water falling on land and buildings flows overland as runoff

to bodies of **surface water** (e.g. lakes and rivers). Some of the water that's held by soil or vegetation will **infiltrate** through soil materials, to be stored as **ground water**. Ground water can then move to lakes, rivers, ponds, wetlands, or to the soil surface.

At the soil surface, water can be **evaporated** directly to the atmosphere, or **transpired** when plants release moisture to the air.

Ground water flowing to the surface, or small surface water bodies (such as wetlands, ponds, and creeks), form part of a larger surface water system called a **watershed**. Water from this area will move to ever-larger bodies of water, such as large rivers and lakes.



Precipitation



Runoff



Evaporation and Transpiration



Ground water flow



Infiltration (uncontaminated)



Infiltration (potentially contaminated)



Ground water recharge