



Forests and Forest Soils – A Source of Freshwater

INTRODUCTION

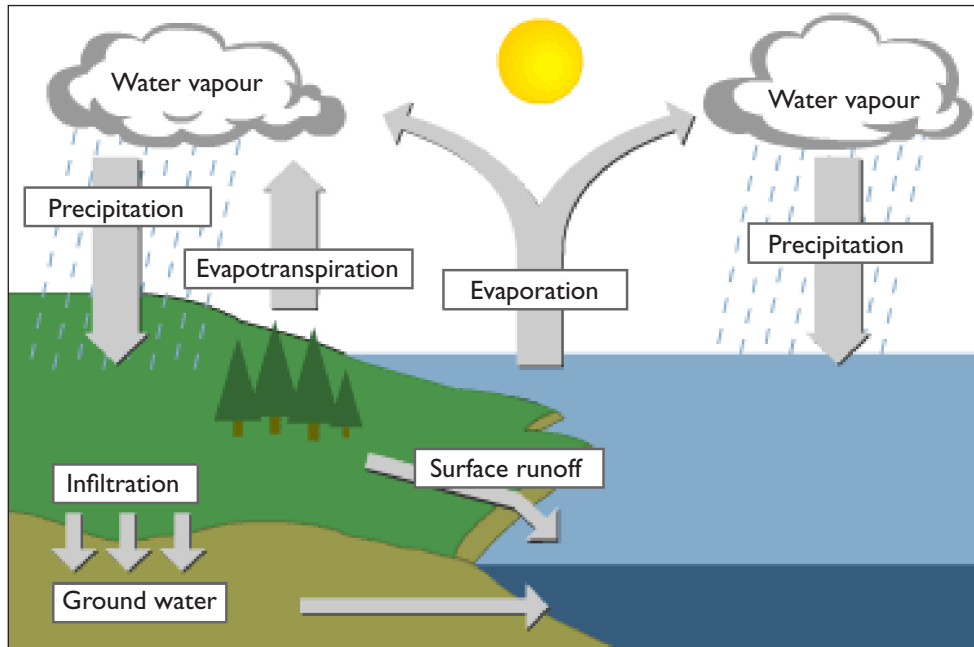
Have you ever considered where our water comes from? Whether the drinking water for your community comes from a lake, river or groundwater, its original source is a forest ecosystem. Many species of animals use water as a habitat and humans use water for drinking, washing and for the production of food and goods that support our way of existence.

Forests and forest soils provide the link between the earth's air and water ecosystems. Forest soils decompose waste, regulate water flow, filter contaminants and support plant growth. The cycling of tree nutrients and human pollutants is dependent on various chemical and biological processes within the soil. Forest and forest soils play a vital role in maintaining and protecting freshwater supplies. Almost 9% of Canada's surface area is covered by freshwater – that is 20% of the world's freshwater.

WATER MOVING THROUGH THE FOREST

During rainfall, some of the water that falls on a forest will be intercepted by the trees and evaporate. Water that reaches the forest floor seeps into the soil and infiltrates the deep soil layers, where its flow is slowed. Water can be taken up by trees and plants and returned to the air through transpiration. The remaining water travels through the soil, where various processes occur to help purify the water. Surface and sub-surface runoff eventually drain water from the land to a stream or lake.

In the winter, flow through the soil is reduced as snow accumulates on the forest floor. During the spring thaw the water from the melting snow will infiltrate the soil just before the trees become active and start requiring more water. The surplus of water in the soil results in a large amount of flow reaching surface water bodies quickly, which can cause flooding. In some cases this fast-moving water does not have the opportunity to react with the soil before it enters streams and lakes.



Water in the forest soil is an important component of the hydrologic cycle.

WHAT CAN I DO?

Protecting our forests and our freshwater supply through the use of environmentally sustainable practices is everyone's responsibility.

You can protect forests and forest soils by:

- planting trees at your home or in your community
- protecting forests surrounding water bodies
- using proper disposal methods for household garbage and hazardous waste.

You can conserve water resources by decreasing the amount of water you use in your everyday routine by:

- taking shorter showers
- using small amounts of water to brush your teeth, rather than running the tap
- collecting rainfall for irrigating gardens and limiting lawn watering
- washing clothes only when you have a full load



Freshwater is an important forest resource.

WHAT RESEARCHERS ARE DOING

In an effort to protect and enhance the health of the forests, researchers at the Great Lakes Forestry Centre are studying the impact of human activity, such as forest harvesting, air pollution, and climate change, on forest ecosystems. At the Turkey Lakes Watershed, north of Sault Ste. Marie, researchers are comparing the effects that different harvesting methods have on soil processes and water quality and quantity. In unharvested watersheds at Turkey Lakes the impact of acid rain on soil water, stream and lake chemistry has been studied since 1979. At the Esker Lakes Research Area, north of Cochrane, researchers are examining the role of shoreline trees and soils in regulating nutrient transport to boreal lakes. Along with determining if current forest management practices are adequate for water protection, researchers also hope to enhance the conservation of water quality and quantity in forested watersheds.

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Soil provides the connection between air and water in forest ecosystems.

SOURCES OF RELEVANT INFORMATION

For practical information about forest and water conservation:

www.nrcan.gc.ca/cfs/
www.livingbywater.ca/

For educational information and activities for teachers and students:

www.nrcan-nrcan.gc.ca/kids/index_e.html
www.on.ec.gc.ca/greatlakeskids/