

WATERSCAPE BOWEN ISLAND

Water for our island community

Water in our lives: how we use it

Water — essential to life
Imagine life without water. Impossible! People, animals, plants — we all need water to survive.

Hidden water use
We flush a third of the water we use down the toilet. In the summer, watering our gardens can cause household use to jump 20%.

Where does all that water go?
Drinking and cooking 4%
Garden watering 20%
Bathing and cleaning 28%
Toilet flushing 32%

Water meter
Water meters are used to measure the amount of water used in a household. They are usually located at the street level. A water meter can help you identify leaks in the pipe system.

How we measure up!
Bar chart showing average daily water use per person (liters) for various countries: Canada (200), U.S. (200), U.K. (120), France (100), Australia (150), etc.

My How our water use has changed
Line graph showing average daily water use per person (liters) from 1920 to 2000. Shows a general upward trend with some fluctuations.

Eagle Cliff water use
Pie chart showing water use breakdown: Toilets (32%), Bathing (28%), Garden (20%), Drinking/cooking (4%).

Use water wisely!
Cartoon character with a speech bubble: "It's raining! Use water wisely!"

Hi, I'm Raindrop. Come with me and explore the story of water on Bowen Island.

We are a small island surrounded by salty ocean water, and so there are limits to our freshwater supply. Yet all life — people, other animals, and plants — rely utterly on a continued supply. So we need to answer important questions: Do we have enough water? Are we using it wisely? Are we protecting our drinking water supplies? Are we leaving enough for nature?



OUR DRINKING WATER PROTECT THE SOURCE

Watershed by Patricia Le Sueur 2002
Water shed since the beginning, silver beads of life falling from the sky.

Living water shed for the love of growing things. Living Water cleansing, nourishing, healing.

Mother of all life forms yet forests yielding to serpentine river bed; hissing fingers dipped in still ponds; accepting the scoop of a child's rubber pail.

Powerful Water changing everything in your path wearing smooth the hardest stone in your urgency to return to the sea in this neverending prayer of renewal.

Island Waters precious watersheds children of the salty womb we call you Grafton Honeycomb Josephine home of the red swimmer.

Restless Water singing the shore pebbles dancing the moon how we long to contain you. In our carelessness we alter your flow we squander we poison your gift.

Clutching our hands when will we gaze upon the sea and remember our watersheds the amniotic cradle of our Mothers?

When will we feel the oceans flowing through our veins, fast as lightning? When will every water-loving cell in our body cry out: what do we do to ourselves?

Oh, Troubled Water one shining morning we will gather we will start ready and willing to protect you to honour you.

Living with summer drought: ideas for conserving water

Why should we conserve water?
So our neighbours and ourselves don't run short. So we don't deplete our groundwater. So our ecosystems (because it saves money) are protected. Because being wasteful is irresponsible.

Roof-top rainwater: the untapped resource
An average house roof on Bowen Island (125 square metres) will collect 160,000 litres or 35,000 gallons of water a year. Many homes on Bowen Island store rainwater in cisterns or tanks for use in the garden.

The leak detective — the water meter
Installing a water meter is the best way to detect leaks. A leaking toilet can waste 400 litres (100 gallons) a day.

Thirsty lawns and gardens
Outdoor water use, primarily gardening, increases throughout the year. During the summer, lawns are incredibly thirsty, using four times as much water as during the winter. But there are many beautiful, drought-tolerant plants. Sprinklers can be replaced by efficient systems.

Septic fields recharge groundwater storage
Most water used by households with septic fields returns to the groundwater system. We use the water but we return it to the earth. This is good management. In contrast, sewer systems export water to the ocean, depriving groundwater storage.

Water Meter June!
USE WATER WISELY! HANG YOUR METER!

Water shortages? But this is a rainforest!

My water comes from Mount Baker!
There is no scientific evidence for beliefs that some of our springs or wells flow from Mount Baker or the north shore. All indications point to rainfall as the only source of Bowen Island's fresh water.

Are more droughts coming?
Scientists predict that in the future, southwestern British Columbia will receive more water rainfall, but longer and hotter summer dry seasons. How will this affect the supply of water on Bowen Island?

It all falls from the sky
Rainfall feeds Bowen Island's entire fresh water supply. Moisture from the Pacific Ocean is blown eastwards and falls in rain. Rainwater flows into streams to be carried quickly to the sea (perhaps with a pause in a reservoir or lake) or sinks into the ground to join the slow-moving groundwater system. Shallow groundwater returns to the surface at springs, adding flow to streams. The sea's tides pull water into Bowen Island's coastal aquifers, which are recharged by early groundwater that underlies the seaboard.

Mystery stream supply
Some streams on Bowen Island flow year-round, even through the summer dry season. When I haven't rained for weeks, where can the water be coming from?

Limited resupply!
Based on research in the San Juan Islands, it is estimated that only a small per cent of our annual rainfall, likely less than 15 cm, is stored in the ground as groundwater.

Doing the math: not much storage
Most rainwater returns to the atmosphere through plants and evaporation. Much of the rest is carried quickly to the sea by streams. Some stream water is stored for months to centuries in the slow-moving groundwater system.



Reducing risks: protecting water quality

Protecting our clean water factory
We are a small island with a growing population. We are blessed with extensive forest lands, our clean water factory. Protecting this green infrastructure is vital. In developed areas, we need to commit to best practices to minimize the risk of contamination.

Doing it right — protecting our water vs **Doing it wrong — degrading our water**

Contaminated water supply - Fuel spills, household chemicals, etc.

Is your well protected?
Trouble occurs when contaminated water leaks down into wells. To prevent this, properly sealed wells must have a cap in place on the top of the casing. However, many wells are not properly sealed.

Ensuring a safe water supply
Protecting water quality in source areas is our first line of defense. Beyond that, community water systems (chlorination, ultraviolet radiation) kill bacteria, viruses, and Giardia cysts, and filtration remove turbidity that interferes with the disinfection process.

Water in our lives: how we get it

Diverse water sources
Unlike Vancouverites, whose water comes from a few large rivers, Bowen Islanders get their water from a diverse array of sources: streams, wells, and rainwater.

Map of Bowen Island showing sources of water
Map showing different water sources: Wellhead, Rainwater, Stream, etc.

Water, the local resource
Think about it. Most of the food, energy, and manufactured goods come from far away. Only our water is home-grown. Most of it comes from Bowen Island. So we control the future of our water. It's for us to decide!

Bottled water — the foreign invasion!
Bottled water has become very popular. While it seems safe and convenient, there are disadvantages: it's expensive, it creates waste containers, and it's usually not as good as local water.

Living in our water-saturated watersheds
Vancouver protects water quality in its watersheds by restricting access. Things are different on Bowen Island. Some water-saturated lands are in the Bowen Island Community Lands and are relatively private. But others, such as the Grafton Lake watershed, include residential and commercial areas, roads, and wetland. All of these uses represent potential sources of contamination. Should we be concerned?

The clean water factory: forests, streams, and wetlands

The natural forest: a healthy green infrastructure
The natural forest is a healthy green infrastructure. It filters water, stores it, and slowly releases it into streams.

The modified landscape: a damaged green infrastructure
Development and clearing of land for agriculture and urban areas can damage the natural forest infrastructure, leading to increased runoff and erosion.

Stream 'tornadoes'
In contrast to forests, rain does not easily infiltrate bare soils exposed in disturbed areas. Instead, rainwater runs off the surface, eroding and carrying away fine sediments. During storms, streams flood quickly with muddy waters, eroding banks and filling a stream with silt. Such floods are like a tornado, wreaking havoc to stream life.

Rapid runoff from bare land causes erosion and floods
When rain falls on bare soil, it runs off quickly, causing erosion and flooding.

Forests slowly release rainfall to streams, limiting floods
Forests act as a sponge, absorbing water and releasing it slowly into streams, reducing the risk of flooding.

Forests: most rainfall becomes shallow groundwater
In forests, most rainfall infiltrates the ground, becoming shallow groundwater that can be used by plants and animals.

Cleared land: most rainfall becomes surface runoff
When land is cleared, most rainfall runs off the surface, contributing to erosion and flooding.

Forested corridors: vital to stream health
Forested corridors along streams are essential to stream health. They provide shade, filter water, and prevent erosion.

Investing in greenways: our recent progress
Bowen Island's green infrastructure is in good condition. We've invested in protecting it with greenways, which help maintain the natural forest infrastructure.

Water stored underground: vital and vulnerable

What is groundwater?
Rainwater percolates into the earth. Soil and rock are like a giant sponge. Full of holes — typically tiny pores and cracks just millimetres in size. Below the water table, these holes are full of water. This is groundwater. Groundwater slowly travels through connected zones and cracks just centimetres to metres per year.

Underground lakes and rivers?
Not on Bowen Island. Large underground streams and rivers are only present in limestone areas. Bowen Island's granite and volcanic rocks do not dissolve to form underground rivers.

Groundwater flows from upland recharge areas to valley discharge areas
Groundwater is recharged in upland areas and flows to discharge areas in valleys.

Protecting the balance
Groundwater storage is like a bank account. The balance falls when withdrawals exceed deposits. Nature makes deposits through rainfall, and withdrawals through evaporation and use. We must maintain the balance.

Excessive pumping can reduce flow in streams
Over-pumping groundwater can reduce the flow in streams, affecting the local ecosystem.

Water table ups and downs through the seasons
The water table level fluctuates throughout the year, rising in winter and falling in summer.

Are we depleting our groundwater?
To determine whether we are over-pumping our groundwater, we need a series of monitoring wells. Some groundwater monitoring has started on Bowen Island, but more observation wells are needed.

Want to know more?

The Waterscape Bowen Island poster was developed by Natural Resources Canada, with the support of the partners. To test the idea of community-based water resource posters, the experience gained in the process of community engagement, and in the development of the poster's content and design, has influenced the development of water posters in other Canadian communities.

Water treatment
Protecting water quality in source areas is our first line of defense. Beyond that, community water systems (chlorination, ultraviolet radiation) kill bacteria, viruses, and Giardia cysts, and filtration remove turbidity that interferes with the disinfection process. Some homeowners on Bowen Island use water filters to remove dissolved minerals such as calcium (hardness), iron, manganese, or arsenic.

Water treatment
Drinking water treatment involves several steps: coagulation, sedimentation, filtration, and disinfection.