

# 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**  
Water is used to produce the food we eat and the products we use. For example, a car uses thousands of litres of water.

**Where does all that water go?**  
We flush a third of the water we use down the toilet. In the summer, household use to pump 30%.

**User pay!**  
Summer water use in Eagle Cliff dropped 70% when household meters were installed. When we have to pay for what we use, we tend to use less. Meters also identify leaks in the pipe system.

**Necessity — the mother of conservation**  
By international standards, Canadians waste a lot of water. Cheap and seemingly unlimited supplies discourage conservation, but water districts on Bowen Island that suffer seasonal water shortages have become very efficient water users. How did they do it?

**How we measure up!**  
Average daily water use (litres per person):  
Bowen Island: 180  
Vancouver: 200  
Seattle: 180  
Portland: 180  
San Francisco: 180  
London: 150  
Tokyo: 120  
Sydney: 120  
Melbourne: 120  
New York: 120  
Chicago: 120  
Los Angeles: 120  
Houston: 120  
Dallas: 120  
Phoenix: 120  
Denver: 120  
Phoenix: 120  
Houston: 120  
Dallas: 120  
Phoenix: 120

**My! How our water use has changed**  
Average daily water use (litres per person) through the years (1920-2000). Bowen Island shows a significant decrease in water use per person over time.

**Use water wisely!**  
Washing a car: 120 litres  
Showering: 60 litres  
Toilet flushing: 6 litres  
Dishwasher: 15 litres  
Washing machine: 40 litres

### Living with summer drought: ideas for conserving water

**Why should we conserve water?**  
So we don't run out of water. So we don't deplete our groundwater. So we don't have to pay more for water. So we don't have to pump water uphill. So we don't have to pump water uphill. So we don't have to pump water uphill.

**Roofwater: the untapped resource**  
An average house roof on Bowen Island (125 square metres) will yield 180 000 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 (10 gallons) a day.

**Thirsty lawns and gardens**  
Outdoor water use, primarily gardening, increases throughout the year by 20% during the summer. Lawns are incredibly thirsty, using four times as much water as anything else in the yard, but the most water. There are many beautiful gardens of native, drought-tolerant plants. Sprinklers can be replaced with drip 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 a good management. In contrast, sewer systems export water to the ocean, depleting groundwater storage.

**Water Meter June**  
Check your meter for leaks. Turn off all water and check the meter. If the needle moves, you have a leak.

### 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 island 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 winter 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 westwards and falls as rain. Rainwater flows into streams to be carried quickly to the sea. Shallow groundwater returns to the surface at springs, adding flow to streams. The island's fresh groundwater is entirely recharged by rain that infiltrates the soil.

**Mystery stream supply**  
Some streams on Bowen Island flow year-round, even through the summer dry season. When I heard that some streams flow year-round, even through the summer dry season, when 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, less than 15 cm of rainwater, becomes part of deep groundwater storage.

**Doing the math: not much storage**  
Most rainwater returns to the atmosphere through plants and evaporation. Most of the rest that infiltrates the ground is stored in shallow aquifers. Only a small amount infiltrates the ground, reaches capture by plant roots, and can be stored for months to continue in the slow-moving groundwater system.

### OUR DRINKING WATER PROTECT THE SOURCE

**Watershed** by Pauline Le Bel 2002  
Water shed since the beginning: silver beads of life falling from the sky.

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

**Mother of all life forms** yet fearless, yielding to serpentine river bed; blessing fingers dipped in still ponds.

**Powerful Water changing everything** in your path wearing smooth the hardest stone in your urgency to return to the sea in this never-ending prayer of renewal.

**Island Waters** precious, vulnerable 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 wish you slip away from us. In our carelessness we alter your flow we squander we poison your gift.

**Clutching our hands** when will we gaze upon the still mirror of your face and remember our watery beginnings the amniotic cradle of our Mothers?

**Sacred Water** when will we gaze upon the still mirror of your face and remember our watery beginnings the amniotic cradle of our Mothers?

**When will we feel the oceans flowing** through our veins, taste our salty tears? When will every water-loving cell in our body cry out: what do we do to you we do to ourselves?

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

### Reducing risks: protecting water quality

**Attention! BOIL WATER ADVISORY STILL IN EFFECT**

**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 the 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**

**Your septic field: a friend that needs maintenance**  
Septic fields are safe, economical, low-maintenance facilities for sewage disposal on Bowen Island, but they do need an annual check. Waste water flows into a tank where solids are trapped and bacteria break down septic liquids. Liquids flow into the drain field and percolate into the soil. Soil bacteria purify the effluent, producing clean water that recharges groundwater.

**Safe water supply: a friend that needs protection**  
Safe water supply is essential for a safe drinking water supply. Protecting the source is the first line of defense. Beyond that, community water systems use disinfection (chlorination, ultraviolet radiation) to kill bacteria, viruses, and Giardia cysts, and filtration to remove turbidity that interferes with the disinfection process.

**Is your well protected?**  
Trouble occurs when contaminated surface water leaks down into wells. To protect wells, properly sealed wells have gravel pits that seal the well casing to the bottom of the casing. However, many wells are not properly sealed.

### Water in our lives: how we get it

**Diverse water sources**  
Unlike Vancouverites, whose water comes from a large reservoir, Bowen Islanders get their water from diverse sources such as rivers, streams, and wells.

**Watersheds everywhere!**  
All the land area that drains into a stream system is called a watershed. Most areas of Bowen Island drain into some stream, so it is likely that you live in a watershed!

**Hi-tech forests? How they work for us**  
Our forests, streams, lakes, and wetlands provide an amazing service to us: clean water. They have evolved over millions of years of research and development. Forests act as a giant filter. Rain infiltrates the porous organic soils and percolates slowly to streams where it is gradually released as clear water.

**Forests: most rainfall becomes shallow groundwater**

**Cleared land: most rainfall becomes surface runoff**

**Forested corridors: vital to stream health**

**Investing in greenways: our recent progress**

**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.

**Bottled water — the foreign invasion!**  
Bottled water has become very popular. While it seems safe and convenient, there are disadvantages. It is expensive, it creates water containers, and trucking water generates air pollution, causing problems like asthma and global warming.

**Living in our water-supply watersheds**  
Vancouver protects water quality in its watersheds by restricting access. Things are different on Bowen Island. Some water supply watersheds lie within forested Crown Lands and are relatively pristine.

### The clean water factory: forests, streams, and wetlands

**The natural forest: a healthy green infrastructure**

**The modified landscape: a damaged green infrastructure**

**Stream 'tornadoes'**

**Are ditches a part of stream systems? You bet!**

**Green infrastructure?**

**Forests: most rainfall becomes shallow groundwater**

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**Forested corridors: vital to stream health**

**Investing in greenways: our recent progress**

**Water stored underground: vital and vulnerable**

**What is groundwater?**

**Groundwater flows from upland recharge areas to valley discharge areas**

**Protecting the balance**

**Excessive pumping can reduce flow in streams**

**Water table ups and downs through the seasons**

**Are we depleting our groundwater?**

### Water stored underground: vital and vulnerable

**Water stored underground: vital and vulnerable**

**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 leakage of groundwater to streams and the ocean.

**Excessive pumping can reduce flow in streams**  
Groundwater springs feed streams year-round. They are the only source of stream water during the dry season. A pumped well draws down the nearby water table. Excessive pumping for an extended period of time can lower the water table over a broad area.

**Water table ups and downs through the seasons**  
The amount of water stored underground changes through the seasons. Winter and spring rains infiltrate the ground, storing groundwater. The water table rises. When the rains stop, the water table falls as groundwater leaks into streams and the ocean.

**Are we depleting our groundwater?**  
To determine whether we are overpumping our island aquifer, we need a series of groundwater monitoring wells around Bowen Island. These are unlined wells where water table levels can be regularly checked.

### Want to know more?

The Waterscape Bowen Island poster is on the internet at [www.bowenisland.ca/waterscape](http://www.bowenisland.ca/waterscape) and [www.geoscience.bc.ca/gsc](http://www.geoscience.bc.ca/gsc)

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**Geography of Bowen Island:**  
Map of Bowen Island, waters, streams, water licenses, wetlands, and much more. [www.bowenisland.ca](http://www.bowenisland.ca)