



Our Watersheds

Holland Creek

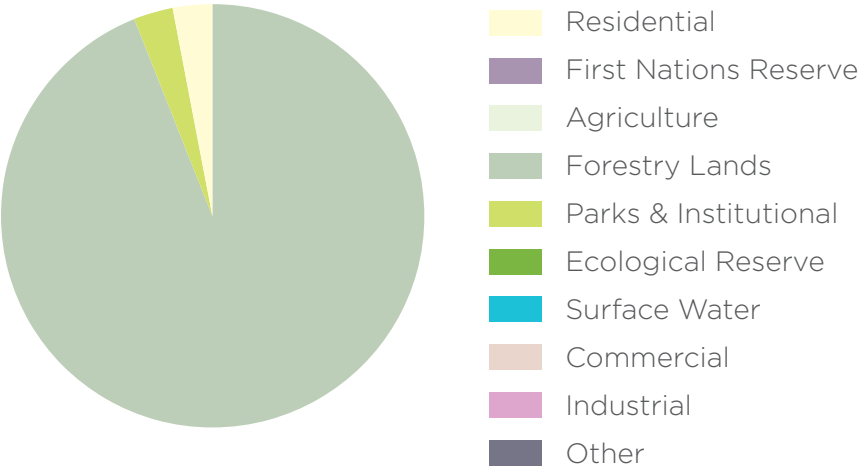
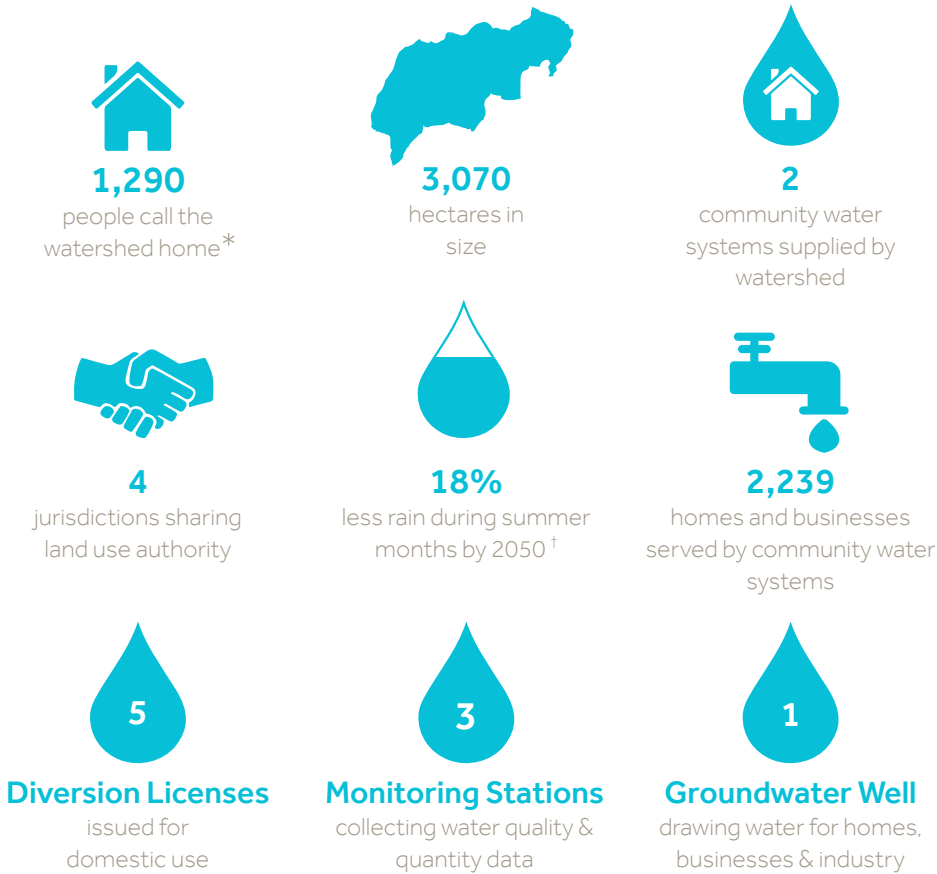
At 3,070 hectares, the Holland Creek Watershed has a relatively small catchment area. Holland Creek winds through forestry and residential lands before draining into the waters of Ladysmith Harbour. The watershed contains a diversity of ecosystems, including: rare wetlands, and mature Coastal Western Hemlock forests.

94% of the watershed is designated for forestry. With some active forestry lands, the Holland Creek watershed has some **susceptibility to surface water quality threats.** Surface water in Holland Lake is critical to life in the watershed and to the surrounding communities which depend on it as a drinking water source. However, **expanding human populations** in the area place increasing stress on this **critical water source** for the **Town of Ladysmith** and the **community of Diamond.**



-  CVRD Watersheds
-  Holland Creek

Holland Creek at a glance:



*Estimate based on 2016 Population Census, Statistics Canada
 †CVRD, (2017). Climate Projections for the Cowichan Valley Regional District

Land

Steep slopes, deep gullies and high summits such as Coronation Peak and Stanton Peak shape much of the Holland Creek Watershed which provide **productive forestry lands**. The intrusive rock exposed at the ground surface in the Holland Creek watershed is a feature of the “Island Plutonic Suite”—a geologic formation common across Vancouver Island.

In general, soils in the watershed are well draining and shallow; mostly glacial deposits made up of gravelly, loamy sand or material derived from underlying rock formations. Less well-drained soils are found in flat low-lying areas of the lower watershed and following tributaries to Holland Creek.

Habitat

Most of the watershed is part of the Coastal Western Hemlock biogeoclimatic zone. As such, the watershed is home to unique habitats where **Western hemlock, Western redcedar and Douglas-fir** trees grow in mature forests and **diverse wetland ecosystems**.

The watershed supports one at risk plant community which favors dry, nutrient rich conditions—Grand Fir/Dull Oregon-grape. This plant community includes **some of the most rare and biologically diverse natural areas in B.C.** The watershed is home to various plants and animals of concern, all of which are vulnerable to climate change and a growing population. Beyond such impressive habitat value, natural



Coastal Western Hemlock Biogeoclimatic Zone

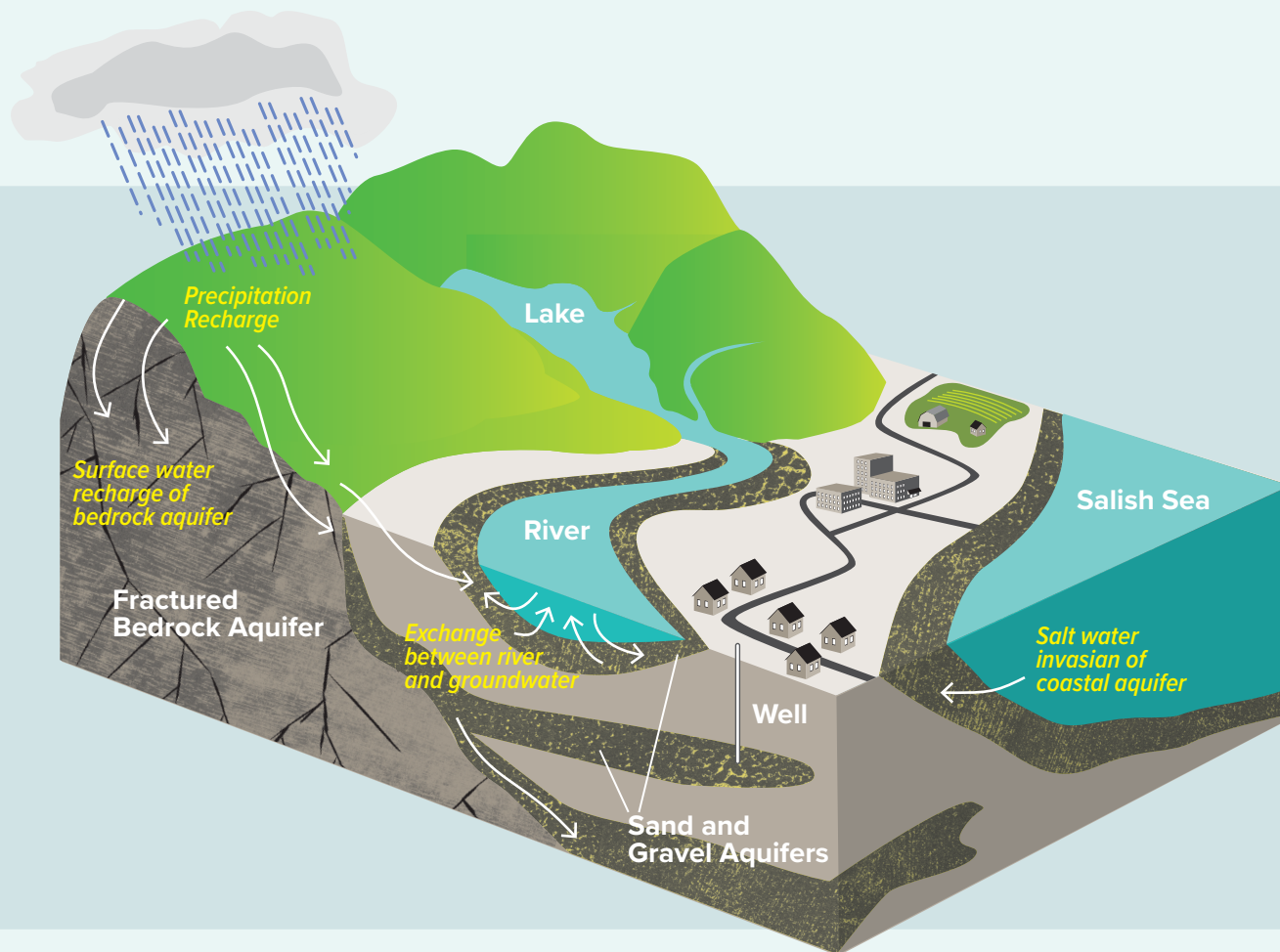
A “biogeoclimatic zone” is an area with similar patterns of energy flow, vegetation and soils as a result of specific climate conditions. Southwestern BC is home to the Coastal Western Hemlock biogeoclimatic zone, the wettest in the province. This highly productive rainforest is home to an enormous variety of plants and animals including bears, wolves, cougars, Pacific giant salamanders, Northern Goshawks and Marbled Murrelets.

spaces in the area provide a number of essential ecosystem services such as absorbing carbon and filtering pollutants from our water systems.

Water

Life in the Holland Creek watershed relies on water in the creeks, lakes, wetlands and aquifers. Holland Lake, Heart Lake and a number of small wetlands support surface water storage in the watershed. There are [5 surface water diversion licenses](#) in the watershed. The diversions are for the [Ladysmith community water system](#). There is 1 mapped aquifer in the watershed, the Ladysmith aquifer.

Shallow sand and gravel aquifers such as this one in the coastal environment can be quick to recharge. However, they tend to have areas which are unconfined, meaning that they have [limited protection from surface contaminants](#). There is [1 well](#) in the watershed. It is for [domestic use](#).



What is an aquifer?

Aquifers are rock or soil that can contain groundwater. Sources of water that can become groundwater include:

1. recharge from rain or snow that soaks through an unsaturated zone
2. surface water bodies such as streams, lake and wetlands

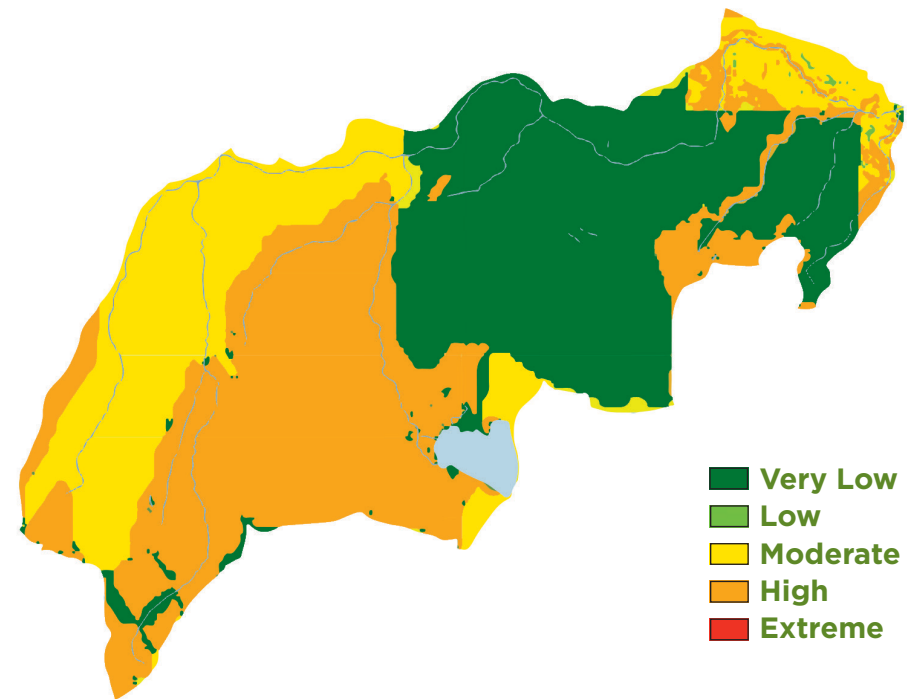
The characteristics of the rock and soil determine the speed at which water passes into an aquifer, how much water can be stored within it and how vulnerable it is to contamination.



Holland Creek: Combined Risk Assessment

Understanding Risk

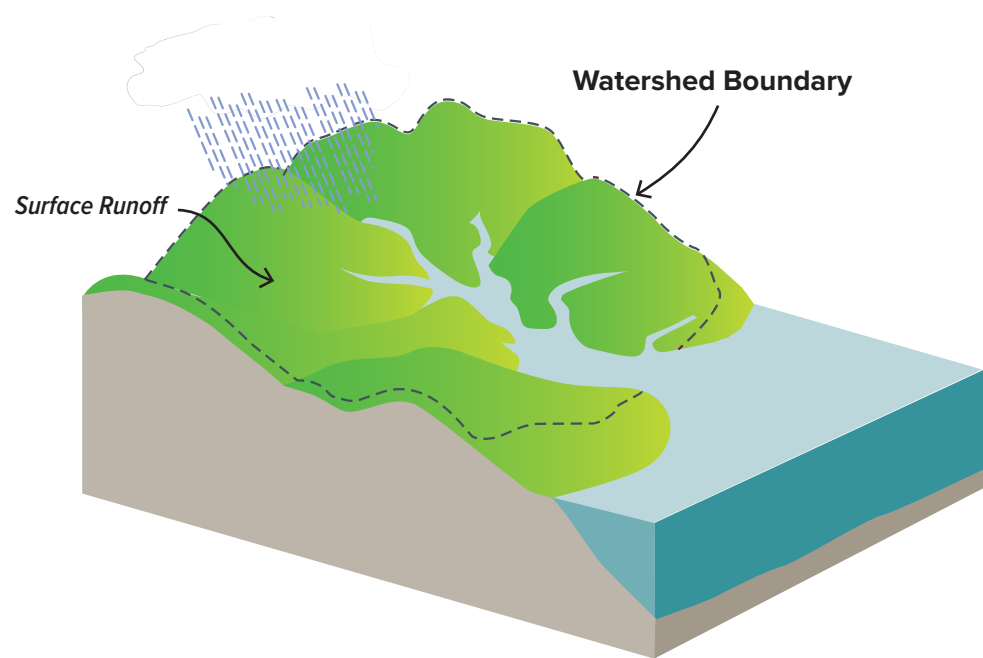
Making good decisions around development and resource use requires an understanding of risk. Risk is a product of the likelihood of a hazard occurring and its consequences. The map at right is based on 5 factors: groundwater contamination, surface water supply, stream water quality, slope failure and flood. Risk in the Holland Creek watershed is largely driven by surface water contamination. Risk-mapping can inform land-use planning and stewardship.



Watershed Management Q&A

What is a watershed?

A watershed is an area of land that catches rain and snow and where water flows downward into a common river, stream, lake, or aquifer. All land is part of a watershed and we all live in a watershed.



What is watershed management?

Watershed management aims to preserve watershed health as a whole. This means connecting land-use planning with resource management in order to make decisions that meet community needs today and in the future. Inter-agency collaboration and community involvement are essential to this process.

What does this have to do with the CVRD?

Our engagement with residents of the Cowichan Region provided a clear message: the sustainability of our drinking water is a top priority when it comes to managing growth and change in the region. This message became official in the fall of 2018, when residents voted in favour of a new Drinking Water and Watershed Protection Service. This service will allow the CVRD to focus on protecting drinking water at its source in a number of ways, including developing watershed management plans, monitoring water quality and supply, and working closely with the community and other agencies to protect this precious resource and inform land use planning.

How is the region expected to change?

A temperate climate and an abundance of natural beauty make the Cowichan Region a highly desirable place to live; our population is growing steadily throughout the region, up 4% from 2011 to 2016. This growth is occurring in tandem with a changing climate where summertime drought and wintertime flooding are the new normal. Preparing for the changes ahead will require all levels of government, local authorities, and community members to work together in developing an integrated and cooperative approach to decision-making.

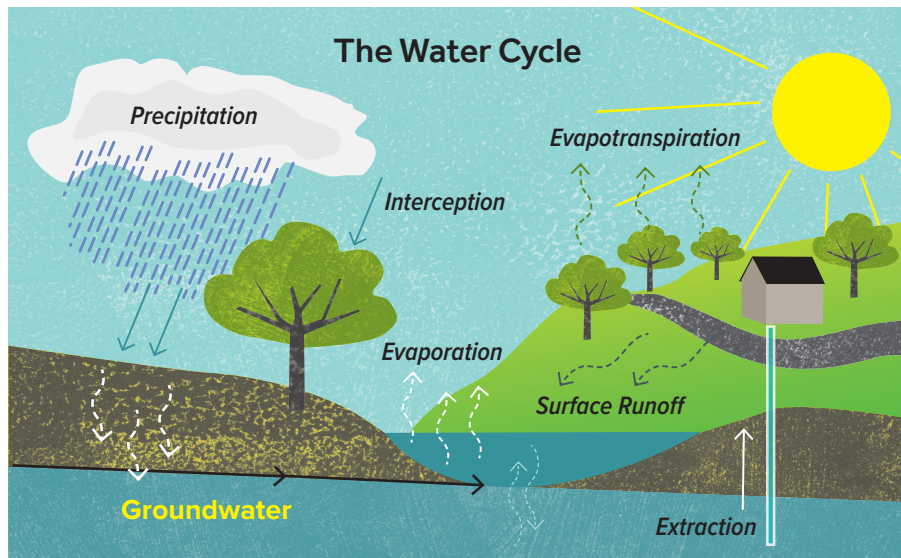
Watershed Management in action

Water Balance

To understand how our watersheds can sustain development, we need to first understand how much water is entering the watershed as rain and snow and how much water is needed to support natural processes. Then we can begin to understand how much there is for human uses. Water balance is about understanding how much water is entering the watershed (water in) and how much water is being used or leaving the watershed (water out).

Maintaining natural water balance is important because:

- **Too much water** can lead to erosion, slope destabilization and flood.
- **Without enough water** fish can't survive, vegetation dies, groundwater does not recharge and drinking water supplies diminish.



When natural areas are altered, we often lose the slow-release function of vegetation and soil. We disturb the natural balance of water when we pave surfaces, cut down trees, and divert watercourses. In the Holland Creek watershed, changes to the water balance have been largely driven by **forestry activities and community water extractions**. Climate change impacts on precipitation will only increase the stress.

Community-informed Planning

The CVRD will be engaging with community members in the Holland Creek watershed to prioritize concerns related to watershed health and livability.



Water Quality & Availability



Integrated Development



Stream & Groundwater Protection



Flood Protection



Habitat Restoration & Enhancement

A Shared Resource

We can all help!

- Everyone can do their part to conserve water.
- Residents can construct rainwater catchment systems.
- Builders can choose low impact development options.
- Homeowners should ensure septic systems are functioning.
- Farmers & foresters can manage fertilizers & pesticides.



Our approach to watershed management will focus on:

- » Protecting water resources
- » Understanding the unique pressures and risk for each watershed
- » Protecting the ability of watersheds to supply sustainable water to meet ecological and community needs
- » Making land use decisions informed by watershed planning
- » Rainwater management to mimic natural hydrology
- » Integration of development with stormwater management

What does this process look like?

The CVRDs approach will be ongoing and adaptive:

