

Groundwater – What is it anyway?

As Canadians we typically pride ourselves on our national image of healthy lakes, streams and wetlands and the natural systems they support. The image and waterbodies are all dependent on groundwater for their existence.

Groundwater is the source of drinking water for approximately one-third of Canadians. This number increases to 80% for rural residents. Industries and municipalities also extract groundwater. Industries include mining, oil, gas, bottled water, manufacturing, forestry, agriculture and various forms of energy production. Municipalities use it for water treatment, gardens, fountains, vehicle washing, and other uses besides provision to residents. In 1999, the average municipal draw was 638 litres per capita/day (including the national average of residential use per capita of 343 litres/day). This means the draw for a municipality is, on average, almost double the use by the residents.

But what is this groundwater that so many of us are drawing on? It is the water that runs underground replenishing our aquifers, our wells, our rivers, wetlands, streams and estuaries. Groundwater moves through the aquifers in a horizontal motion. It also moves vertically from surface down through the till, and it travels from the bedrock up, or through the bedrock to the aquifer.

The aquifers should provide continuous high quality water to our system which includes wetlands, forests, people, fish, etc. A healthy aquifer also controls sea water intrusions, or the invasion of salty ocean water into our freshwater. In order to do this, we need to ensure the flow outward to the ocean does not drop too much. If it does, the meeting point between fresh and salt water will be moved inland, and we will get brackish water (mix of salt and fresh) in our wells. This dynamic may already be an issue on the Little Qualicum River, and other parts of our region.

Groundwater accomplishes all this at a very slow speed. On Vancouver Island a typical speed is one kilometer every 10 years, or 0.3m/day. It can take 30 to a few hundred years for the water to travel through an aquifer to our glass of water. To put this in perspective, groundwater traveling the eight kilometers from Coombs to the foreshore, will take 50-100 years in a sandy aquifer. For every 10 metres of heavier soil, we should add 100 years to that time.

As a result of this slow movement, a key issue is the acceleration of water use. For example, if we remove 100 m/day from a well, where water flows naturally at 0.3 m/day, then the well obviously will disturb the local dynamic. Where there are too many withdrawals, and not enough replacement dry wetlands, rivers, and streams will result. In our next column we will look at some of the groundwater dynamics and how they apply to the area in which we live.

Water Limited explores what we know and don't know about our water supply. It is funded by the Georgia Basin Living Rivers Program and Mid Vancouver Island Habitat Enhancement Society (MVIHES). Articles are written by Michele Deakin. MVIHES coordinates the Englishman River Watershed Recovery Plan, and conducts education, restoration and monitoring projects throughout the mid island area. MVIHES also work to support healthy watersheds and shorelines, and continuity of our biodiversity as a way to contribute to protection and conservation of salmon habitat.