



MARCH 2023

Newsletter for Rocky View County Community-Based Groundwater Monitoring Program
Reporting progress and updates of the program to community volunteers.

Two years of dry weather and little groundwater recharge

We all remember 2021 as the year of drought, when many crops failed. This past year was not as dry as 2021, but it was still much drier than normal years. At the university, hydrologists use the meteorological data that have been adjusted for instrumental errors. Based on these adjusted data, 2021 was the driest year in the last 50 years, and 2022 was the 7th driest. Considering that the source of groundwater is rain and snowmelt, it is easy to imagine that dry weather is not good for recharging groundwater in our aquifers. Thanks to the long-term data of Rocky View Well Watch, we can clearly see the effects of dry and wet weathers on groundwater. Figure 1 shows the water level in selected wells relative to the average water level in each well. A sharp rise in water level shows the effect of snowmelt or heavy rain (usually in June) increasing the pressure of water in the aquifer. Depending on the thickness of sediments above the aquifer, some wells have sharper rises (for example, W15) than others, but most wells in the county had similar patterns reflecting their responses to wet and dry periods. Some wells are showing the lowest water levels since Rocky View Well Watch started in 2008, although they are still within a normal range of fluctuations.

In addition to concerns about your water supply, there is another important reason for keeping eyes on water level in aquifers, in relation to the environmental condition of prairie creeks. Many of the creeks in the prairies are sourced by springs.

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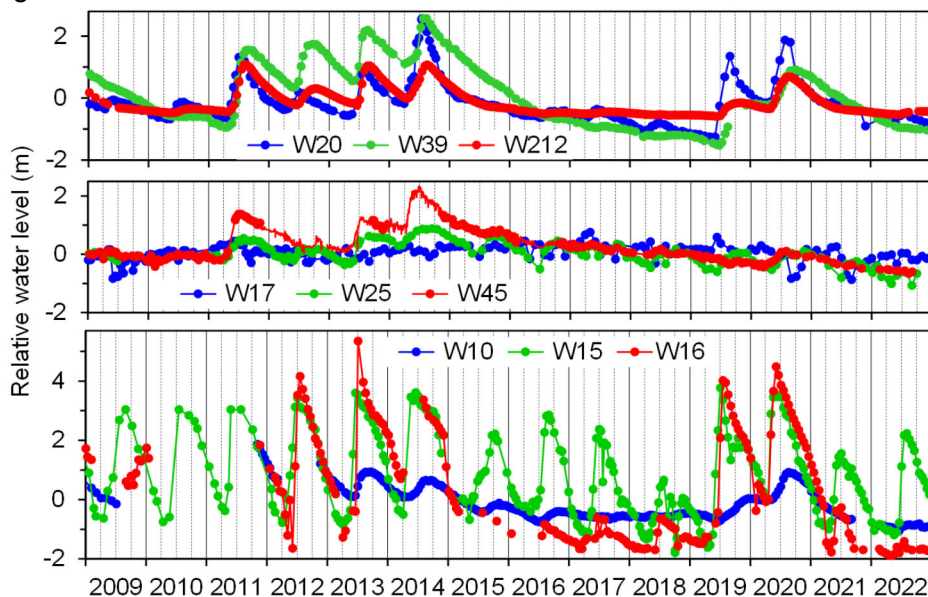
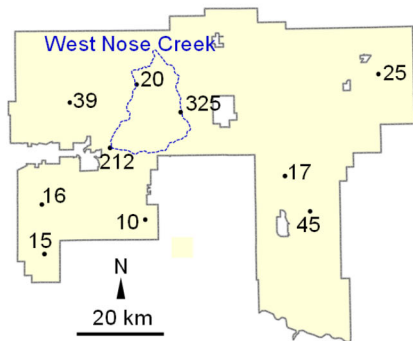


Figure 1. Map showing the location of selected wells within Rocky View County and the watershed of West Nose Creek (left), and graphs showing relative changes in water level in these wells (right).

Without the groundwater supply from springs, the creeks would have little water flowing and even dry up. That is bad for fish and aquatic insects, and can have undesired effects on downstream communities. Groundwater from springs is particularly important in summer, fall, and winter, when creeks have small but steady flow, called 'baseflow'. The spring flow rate is controlled by the water pressure in aquifers, meaning that high groundwater level increases spring flow, which in turn increases creek baseflow. Figure 2 shows changes in the baseflow of West Nose Creek measured in October of each year, and the water level in Well 325, which has a longer record than other wells in Rocky View Well Watch. The creek flow and the water level have a strong connection, and a dry weather causes both to go down. Before the university researchers started monitoring creek flow, it was monitored by Water Survey of Canada during 1982-1995. This period had a drier weather than the past 15 or so years, and the creek flow was generally low. We do not have groundwater data from 1982-1995, but it is likely that water level in the wells was lower. If the current dry condition persists for a few more years, will we see a continued decline in groundwater levels and creek flow? That is an important question, and Rocky View Well Watch will help us answer it in the future.

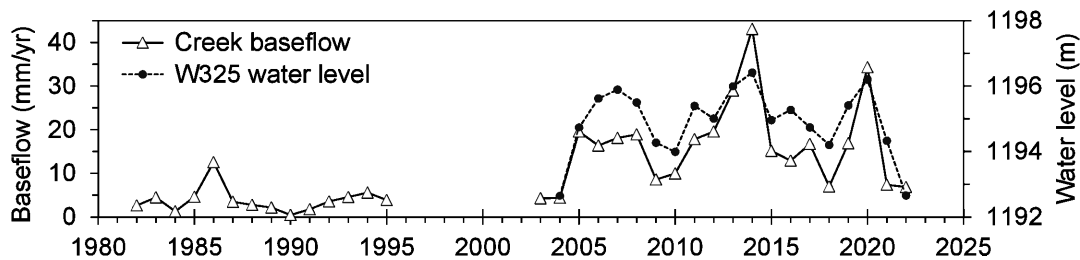


Figure 2. Baseflow measured in West Nose Creek and the water level in Well 325.

New coordinator for Rocky View Well Watch

After two years as the program coordinator for Rocky View Well Watch, Quinn Decent has taken on a new role with a consulting company in Calgary. His position was taken on by Sophie Prevost, who is completing the final year of her undergraduate degree in Earth Sciences at the University of Calgary. This past summer, Sophie conducted a BSc thesis study on the springs feeding Bighill Creek, near Cochrane, mapping and characterizing key springs in the watershed. She plans to continue this research in the upcoming summer. Sophie was born in Ontario and moved to Calgary in 2014, where she developed a great love for the outdoors through the proximity to the mountains. She spends as much of her free time outdoors as possible, enjoying hiking, fishing and hunting. Sophie is passionate about groundwater conservation in the prairies and is thrilled to be involved in this program.



Sophie Prevost at Big Hill Spring.

Rocky View Well Watch web:
<https://gwfn.net/rockyview>

Contact Information: Sophie Prevost - Project Coordinator

Department of Geoscience
 University of Calgary
 2500 University Drive NW
 Calgary, Alberta, T2N 1N4

Phone: 403-220-2495
 E-mail: hydro@ucalgary.ca