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By Hillary Hamm, Daily News staff writer
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Pullman once boasted "the largest and purest supply of water to be found in any town on the coast."

The advertisement from the early 20th century touted the young city's artesian wells as the only such wells in the state. There were seven wells in all, with some pushing out more than 1,000 gallons a minute, and "no question of getting others at a depth of less than 100 feet."

Pullman's founders could not have known that what once was believed to be water aplenty would cause today's concern about what might be a limited resource. Wells that yielded water at as shallow as 80 feet must be dug deeper to hit water, and the issue of water has pitted conservationists against those who want their communities to build and grow.

"Pullman did try to lure people to town with the water," Pullman Public Works Director Mark Workman said with a laugh. "It is a little ironic considering we've got so many water problems now."

The artesian wells no longer exist, and what became of the free-flowing water source isn't exactly known.

"Maybe (the aquifer) is leaking," Workman theorized.

It could be.

Cities across the Northwest are experiencing varied declines of water throughout the extensive aquifer system called the Columbia River Plateau, which encompasses an estimated 63,000 square-miles of southeast Washington, northern Oregon and a portion of western Idaho. The Palouse Basin, which includes the cities of Pullman and Moscow, are located along the plateau's eastern boundary.

The Grand Ronde and Wanapum are the primary aquifers, which people across the plateau access from sub-basins - smaller basins possibly divided by rock. Pullman and nearby communities that share water in the Palouse Basin - a tiny fraction of the plateau on the eastern boundary - have documented up to 18 inches a year drop in the Grand Ronde aquifer's supply. The Wanapum - once the primary aquifer for the Palouse area - is more stable since its use declined after the 1950s.

Less than 150 miles away in the Columbia Basin, the city of Moses Lake is experiencing a drop of more than three feet of water per year while the rural agriculture irrigation district nearby reports an even more drastic decline.

In Pendleton, Ore., situated above the Umatilla Basin, water levels were dropping about three feet a year until city leaders made changes to conserve.

Jim Osiensky, a professor of hydrology at the University of Idaho, said researchers know little about the aquifer system on the Palouse and not much more about the plateau and how it affects water quality and quantity in other basins throughout the region.

"It's a very large area," he said. "We don't know much."

Osiensky said a large flood of basalt created the plateau about 17 million years ago and formed the Grand Ronde and Wanapum aquifers. The northeast-moving basalt cooled around already established crystalline rock peaks - such as the granite Kamiak Butte and Moscow Mountain on the Palouse - and cooled in varying thicknesses. Some sheets of basalt are up to 6,000 feet deep.

Gaps were created between the layers as the rock cooled. The gaps - called interflow zones - are permeable areas at the top and bottom of basalt lava flows where water is primarily stored. Interflow zones vary depending on whether the basalt cooled rapidly with water, or more slowly over time.

The Wanapum likely dates back 14.5 million to 15.5 million years while the Grand Ronde may be up to 17 million years old. Osiensky said the water in the Grand Ronde is estimated to be about 20,000 years old.

Different groundwater basins also were developed from a combination of topographic and geological variations that formed faults, folds, dikes and sediment beds as the molten rock cooled around the area.

Basalt is an ideal substance for groundwater storage because of the gaps, cracks and folds in the rock, though only a small amount of water can be stored, Osiensky said. For example, one and a half cubic feet of basalt is only able to produce a couple of teaspoons of water - if there's water present. Sediments, such as sand, are the best for aquifers, because there are more pores that water can infiltrate.

Guy Gregory, a senior hydrologist with the Washington State Department of Ecology, said Palouse-area residents are lucky to have groundwater available that is fresh and more isolated from sources of contamination than other methods.

"You can drill a well and there it is. It's there, it's cool," he said.

The Wanapum is the most shallow aquifer and can be seen above ground in some areas around the Palouse. Rock cut away for the Pullman-Moscow Highway, for example, are dikes in the aquifer that separate basalt flows and often trickle water during periods of high recharge. The Wanapum is believed to be about 200 feet thick and buried by up to 300 feet of silt under the highest hills on the Palouse.

The Grand Ronde aquifer provides the most groundwater to residents throughout the area and is believed to be up to about 1,000 feet below the surface in Moscow. A portion of the aquifer is believed to be exposed at the surface in Pullman where Paradise Creek flows under the Quality Inn near the Bill Chipman Trail, Osiensky said.

The lesser-known Imnaha aquifer is located below the Grand Ronde at a depth of about 2,000 feet. Osiensky said WSU tapped into this aquifer in the 1970s, but it did not consistently draw water so the university backfilled the well. At such a depth, sediments like clay seal off basalt fractures and limit water storage. The water also is more susceptible to leakage from the bottom or to contamination from dissolved minerals.

The city of Pullman may be better off when it comes to pumping water from the Grand Ronde in the future, Osiensky said. In Pullman, water can be pumped at a depth of about 2,000 feet, while in Moscow, it's limited to around 1,400 because of granite barriers at the base of Moscow Mountain. The depth may be different in rural areas.

Osiensky said communities to the east of Moscow Mountain - such as Troy and Potlatch - are believed to draw water from the Troy Basin, which suffers from its own issues of decline. The basalt that created the Troy Basin likely flowed into a canyon all at once, unlike the plateau, where the rock cooled slowly, with gaps that allow more water storage.

Workman said Palouse residents will have to watch their water use carefully to avoid further deterioration of the aquifers, even though the population may not be to blame for the loss of the artesian wells.

"We don't know how much water we have or how much time we have," he said. "The fact that it's dropping means we should be taking steps to conserve."

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