

# Moscow-Pullman Daily News - DNews.com

By Hillary Hamm, Daily News staff writer  
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Jim Osiensky is frustrated.

The University of Idaho hydrogeology professor often has more questions than answers in his area of research, which includes the study of the complex basalt aquifers throughout the Palouse Basin. The aquifers are the only source of natural potable water for residents of the Palouse, but little is known as to their size beneath the Earth.

The Palouse region is littered with researchers, ecologists, activists, municipal leaders and residents who have guessed on the unknowns, such as which communities are tapping the underground water, the source of recharge and the volume of the area's main aquifers, the deep Grand Ronde and the shallower Wanapum.

How the Palouse Basin interacts with the 63,000-square-mile Columbia River Plateau poses even more questions. The intricate aquifer system was created by a molten basalt flow about 17 million years ago and encompasses a substantial portion of southeast Washington, northern Oregon and a portion of western Idaho. It also lies between the Cascade and Rocky Mountains, split by the Columbia River. Oregon cities such as The Dalles, Pendleton and Umatilla draw from the basalt system, as do Yakima, the Tri-Cities, Walla Walla and Spokane in Washington. Moscow is the farthest eastern city included in the plateau and makes up the Palouse Basin, along with Pullman.

Some researchers speculate that the Palouse Basin - which makes up only a sliver of the larger plateau - is not affected by water users in other portions of the aquifer, but that hasn't been substantiated either.

"There are a lot of hypotheses, but the frustration is that we just don't know much," Osiensky said. "There's a lot of gray area."

## Draining the tub

Osiensky uses a bathtub analogy to help people visualize the Palouse Basin. The bathtub's faucet is like water coming into the basin through recharge or conservation efforts, while the drain is equal to wells drawing water from the ground.

"Most basins ... have an inflow and an outflow. Before man, the recharge likely matched the outflow," he said. "When man gets involved and starts drilling wells, you mess with that natural balance. Now, we've got the drain open and the faucet running and a bunch of straws in there pulling water too."

Osiensky said the hills and curves of the Palouse Basin make it hard to determine how far the aquifers extend into the Earth, and what barriers may prevent the flow of water. A dry well in one location doesn't necessarily mean the aquifer in that section is dry.

"One foot over, there may be water," he said.

Despite the questions, researchers know residents in Pullman and Moscow are the main users of both the Wanapum and Grand Ronde aquifers. The Grand Ronde is believed to be dropping anywhere between six to 18 inches a year depending on rainfall, recharge and how much is pumped from wells. The Wanapum is in stable condition because its use has declined since the 1950s.

Steve Robischon, executive manager of the Palouse Basin Aquifer Committee and assistant director of the Idaho Water Resources Research Institute, said the towns of Moscow, Pullman and Palouse draw an estimated 2.8 billion gallons of water annually - that averages out to about 150 gallons per person, per day. Most residents don't use that volume, and the average is skewed by large water users. Most of the data that leads to the estimated use is provided from wells operated by WSU, the University of Idaho, Pullman and Moscow.

"That brings up the question of what is happening outside these wells," Robischon said. "Is there water leaving the basin? If there is, we need to worry more."

The city of Pullman may be better off when it comes to pumping water from the Grand Ronde, Osiensky said. In Pullman, water can be pumped at a depth of about 2,000 feet, while in Moscow, it's limited to about 1,400 feet because of granite barriers at the base of Moscow Mountain. The depth may be different in the more rural areas. In other geologic basins, such as that around Pasco, Wash., the Grand Ronde exists at about 10,000 feet.

Osiensky said tests show the Grand Ronde water level in Pullman and Moscow are decreasing at the same rate - which means the cities are using the same water source. The city of Palouse also is suspected to be on the system, since well pump tests indicate the water level dips one-tenth of a foot when Moscow wells are pumping at capacity.

It remains unclear whether Colfax and other communities in Whitman County are part of the Palouse Basin system.

Guy Gregory, a senior hydrologist with the Washington State Department of Ecology in Spokane, believes Colton and Uniontown are a part of the basin, but Colfax draws from a smaller, more western underground water source. The area's topography suggests there may be underground barriers that prevent the city of Colfax from accessing water from the Palouse Basin.

"I think there's a boundary that exists," he said. "I think there's a separate little basin."

Osiensky disagrees, though he can't prove it - yet. He points to a possible ancient river bed that was discovered at a depth of 1,787 feet when a well was drilled for Washington State University several years ago.

Osiensky said the river bed found in Pullman may be the same one discovered years ago when workers drilled a well in Colfax. Carbon dating tests would have to be done on the water and rock to know for sure, but the findings could prove Colfax is included in the Palouse Basin. If the water flows to Colfax, it also may make its way to the Rock Lake area in northwest Whitman County.

Osiensky added that 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, rather than like the plateau, where the molten rock cooled slowly, with gaps that allow more water to be stored.

Measuring what can't be seen

How water trickles into the aquifers also is puzzling subject matter.

WSU professor of hydrogeology Kent Keller said tests of the water in the Grand Ronde proves it's not all "infinitely old," so it's recharging from somewhere.

The question is from where.

Keller theorizes that runoff from Moscow Mountain could provide some recharge, and water from the Wanapum or near-surface sediment layers also could be percolating through to the Grand Ronde.

"It could be, but we don't know," he said, adding water leaking from the Wanapum into the Grand Ronde could be a good thing, unless there are contamination issues.

Osiensky said there may be some gaps in the aquifer layers around Kamiak Butte and Four Mile Creek where water can pass in and out of the basin, but his instincts make him suspect any recharge water comes from the west. The granite at the base of Moscow Mountain and nearby buttes is horse-shoe shaped to the north, east and south and likely acts as a boundary for the Palouse Basin. He added that water in the western portions of the basin has been found to be younger than the 20,000-year-old water under Moscow and Palouse.

But it's a hard hypothesis to confirm since it likely would mean the water was somehow flowing uphill.

"There's some possible explanations, but you can't prove it," he said. "Since we can't see it, we can't measure it."

Interconnections not clear

More information about the Palouse Basin won't necessarily answer how it relates to the Columbia River Plateau.

Scientists have no clear evidence to indicate if water pumped in the Palouse Basin affects other communities in the plateau, which all report different rates of decline and recharge.

Keller has a gut feeling that the water use by other communities in the plateau won't affect those on the Palouse.

"In principle, everything is connected in the hydrological system," he said. "But pumping here is not going to affect pumping there, and pumping there is not going to affect pumping here. There's just no way in the world."

Osiensky agrees, but isn't 100 percent sure. He said the same topography that may limit recharge could also keep water inside the Palouse Basin and away from other communities in the plateau. The peaks and buttes in the region - such as Granite Point, Kamiak Butte and Moscow Mountain - may prohibit much water from entering or leaving the area.

PBAC's Robischon said isolation could be a good or bad thing. Some people hope the basin is isolated, so Palouse residents alone are responsible for the water source. Others wish the basin was tied in with the rest of the plateau because it could mean less risk of depleting the aquifers.

Robischon said more research is needed to determine what's really going on underground. Until then, he says, conservation is the best bet.

"In the next five to 10 years, I think we'll know more," he said.

On the Web:

n UI Hydro Program Web page: [www.sci.uidaho.edu/HydrologyProgram/](http://www.sci.uidaho.edu/HydrologyProgram/)

Hillary Hamm can be reached at (509) 334-6397 ext. 307, or by e-mail at [hhamm@dnews.com](mailto:hhamm@dnews.com).