

Questions

ENVIRONMENTAL PROTECTION AGENCY

- a. Describe what happens to groundwater when the rate of pumping is less than the rate of infiltration.

The level of the water table drops a little, but overall it is fairly stable, and doesn't change much.

- b. In this situation, how do you think water needs can be met over the long-term?

As long as rainfall and infiltration replenishes the groundwater faster than humans use it, the groundwater supply is reliable and steady. Groundwater is a renewable resource in this situation, and can meet water needs into the future.

- c. Describe what happens to water levels when the rate of pumping is greater than the rate of infiltration.

The water table drops a lot, so much that some of the shallower wells run dry.

- d. In this situation, how do you think water needs can be met over the long-term?

When infiltration is unable to replace groundwater as quickly as pumping removes it, the water table drops. Deeper wells could be dug to chase the table, but then the water table will just drop even further. Over the long-term, groundwater is a non-renewable resource in this situation, and won't be able to supply all the needed water.

The population will either have to reduce its water usage, or find other sources of water.

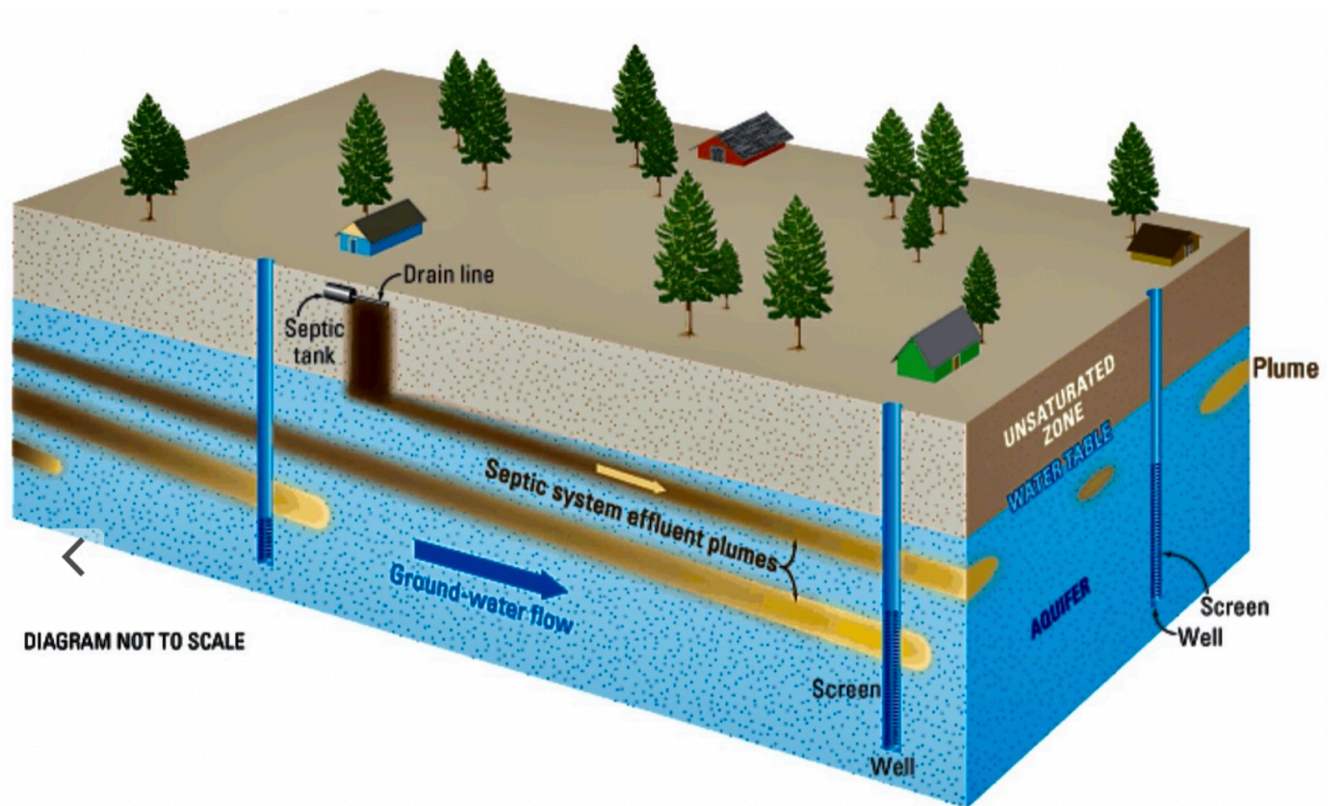
Overuse of groundwater can cause wells to dry up. This often leads to expensive and ultimately futile attempts to keep up with the dropping water table by drilling deeper and deeper wells. Other serious consequences can also follow groundwater overuse.

- e. What happened to the stream as the water table dropped? What would have happened if that water body wasn't a stream, but an ocean?

Water was pulled out of the stream back into the groundwater as the water table dropped. If that had been an ocean, the water moving into the groundwater and into the nearby wells would be seawater. This would contaminate the water supply - salt water is toxic to land plants and animals, so it couldn't be used for drinking or irrigation, and it would harm machinery, so it couldn't be used industrially either.

When too much water is withdrawn from the ground, the land can collapse, a process called subsidence. When groundwater fills spaces in the soil, it supplies part of the internal strength of the ground. When the water is removed, leaving openings filled only with air, the weight of the overlying earth compacts and crushes the spaces.

58 percent of home lots are 1 acre and 82 percent are less than 2 acres make residential densities relatively high for an area where homes are dependent on individual septic systems and wells. A cluster of homes with weak water supplies can be highly effected by new close by housing with water wells. When the low flow water tables are pulled on the results can be septic affluent into the aquifer.



Wastewater from septic systems contains nitrogen in the forms of ammonia and organic nitrogen. As wastewater leaves the septic system drainfield and percolates through the unsaturated zone, these forms of nitrogen are converted to nitrate. When the wastewater reaches the water table it forms plumes of elevated nitrate within the aquifer. The plumes move downward with the ground water and slowly spread. Currently, relatively few wells have water with high nitrate concentrations because these plumes have not had time to reach the depths where most domestic supply wells draw water. As more homes are built, and as plumes move deeper and spread, many more supply wells will be affected.



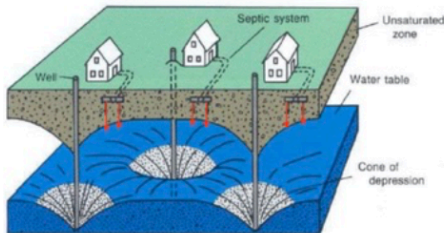
**PLEASE READ THIS
CAREFULLY.
FROM USGS WEBSITE**

by Roger M. Waller

[This report is available in PDF format.](#)

INCREASED PUMPING IN THE IMMEDIATE AREA

Another reason that wells "go dry" is the lowering of the water table by increased pumpage in the immediate area. Housing developments with small lots and individual wells have been built in many rural areas. If the aquifer is low yielding so that pumping causes a large drawdown, a cone of depression will develop around each well. Thus, several domestic wells close together can create a steady lowering of the water table if pumpage exceeds the natural recharge to the system (unless the withdrawn water is returned to the aquifer through septic systems). A third major reason that rural wells "go dry" is the installation of larger capacity wells for municipal, industrial, or agricultural purposes adjacent to residential areas. The increased withdrawals may cause large widespread cones of depression that intersect one another and cause general water-level declines that affect nearby domestic wells.

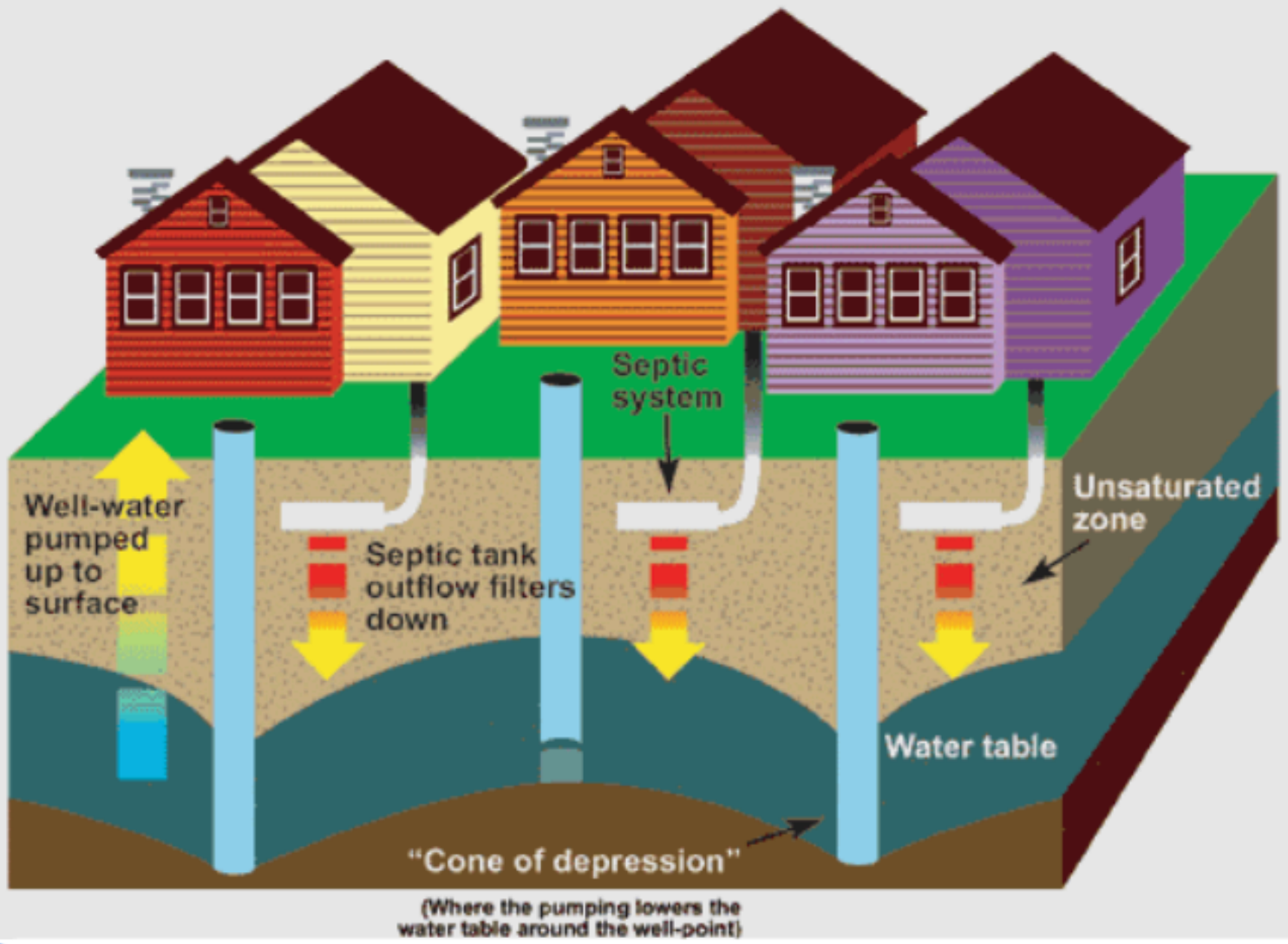


Effect of concentrated housing on ground-water level.

As you can see from this USGS report lowering our water tables from over-use and deeper wells from a neighboring subdivision can not only make our current shortages worse but can cause cones of depression around our wells and cause water to return to our aquifer from our septic systems. Compounding this scenario is the fact that all of our older homes in close proximity to the proposed subdivision have WELLS and SEPTIC DRAIN FIELDS way closer together than current laws allow. This damage is IREVERSABLE.

The fact is 8 deep water wells can very easily lower our water table . If that happens it will pull the water table level down lower than our wells can reach. Our septic drain fields then have the potential to leach tottaly contaminating the entire aquifer. This is irreversible.

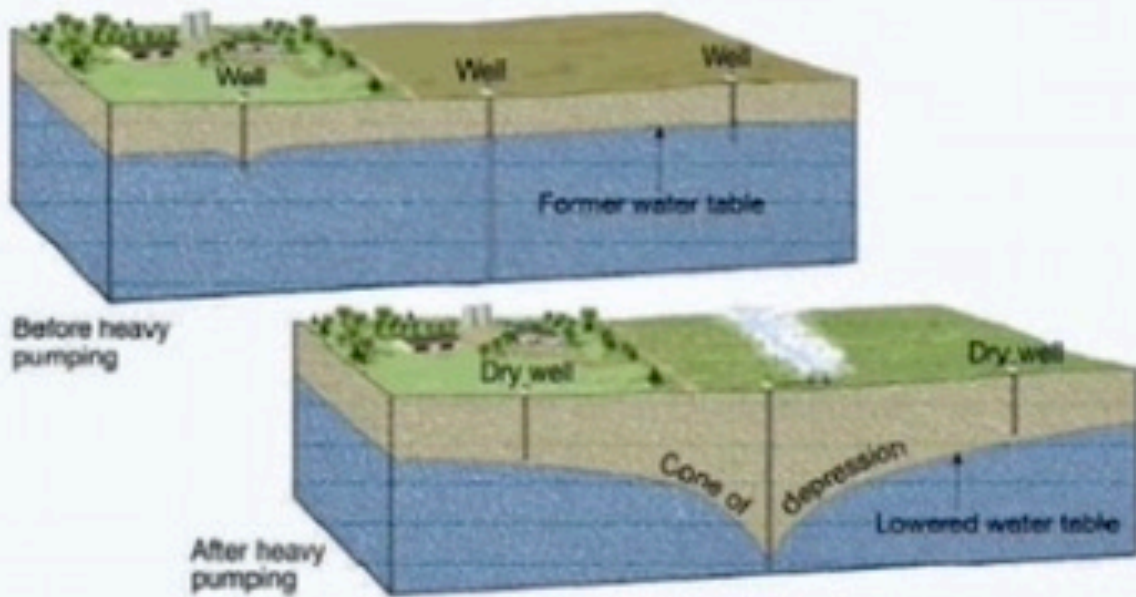
Effect of concentrated housing on groundwater level





EFFECT OF DEEPER WELLS

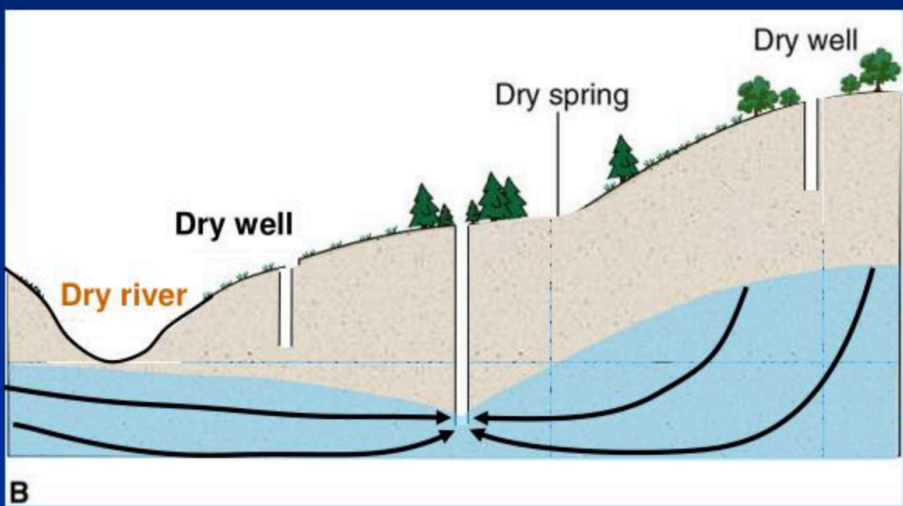
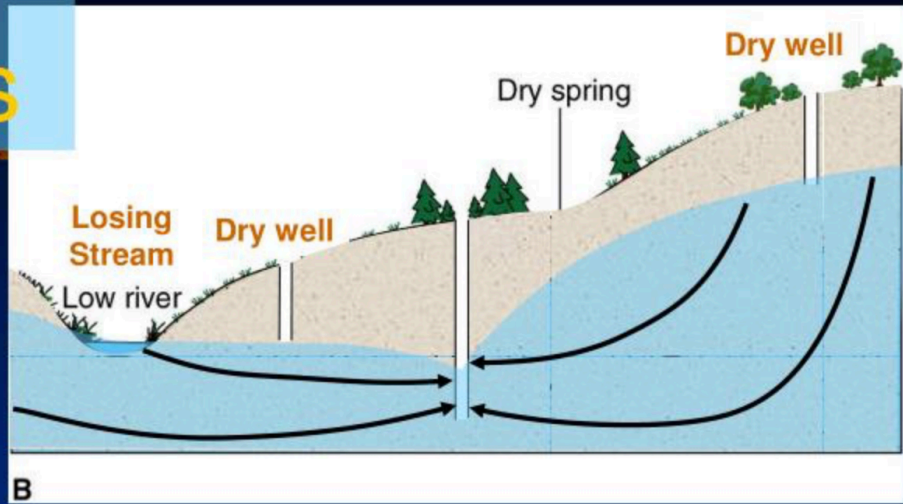
Formation of a cone of depression in the water table



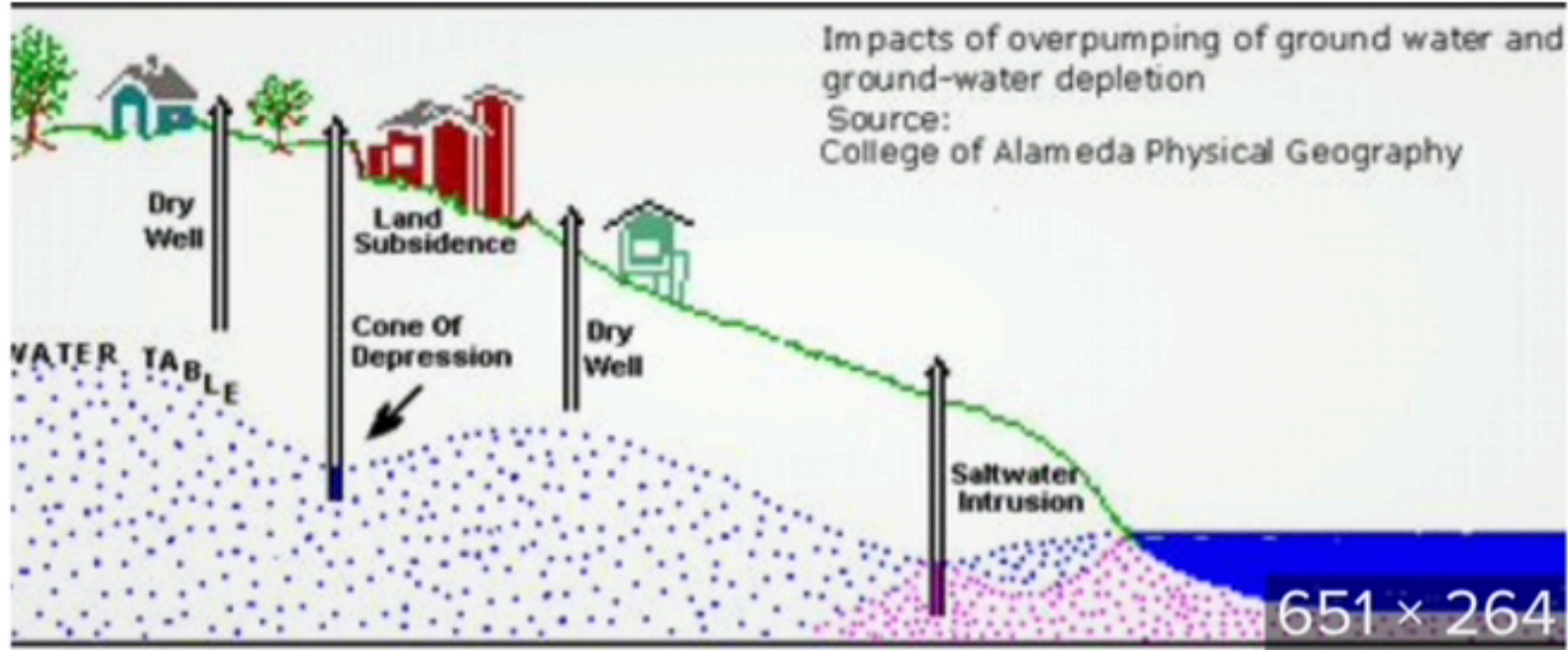
NOTICE HOW A DEEPER WELL CAN RUIN NORMAL WELLS AROUND THEM

Effects of Pumping Wells

- Continued water-table drawdown
 - May dry up springs and wells
 - May reverse flow of rivers (and may contaminate aquifer)
 - May dry up rivers and wetlands

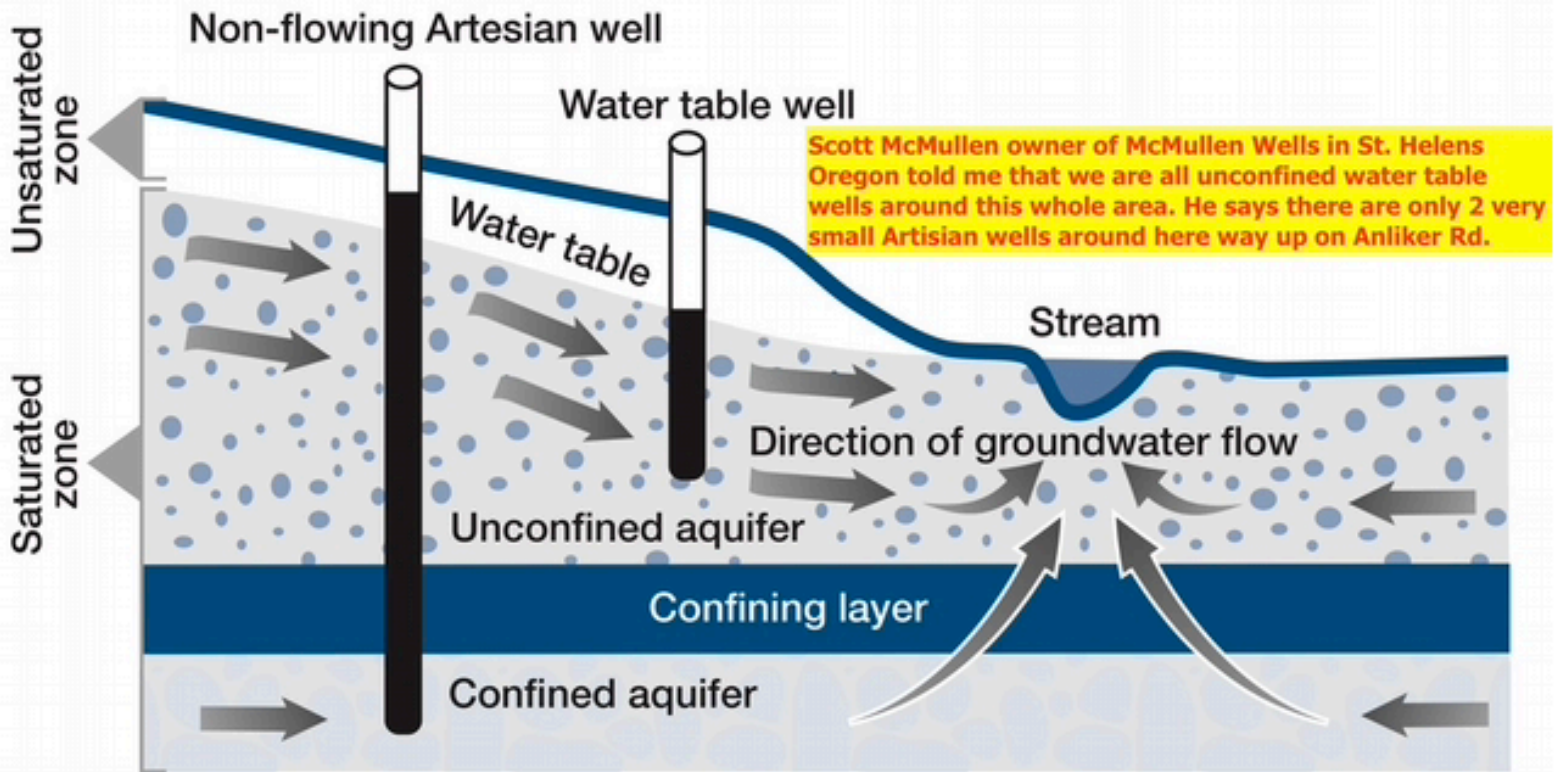


Impacts of overpumping of ground water and ground-water depletion
Source:
College of Alameda Physical Geography

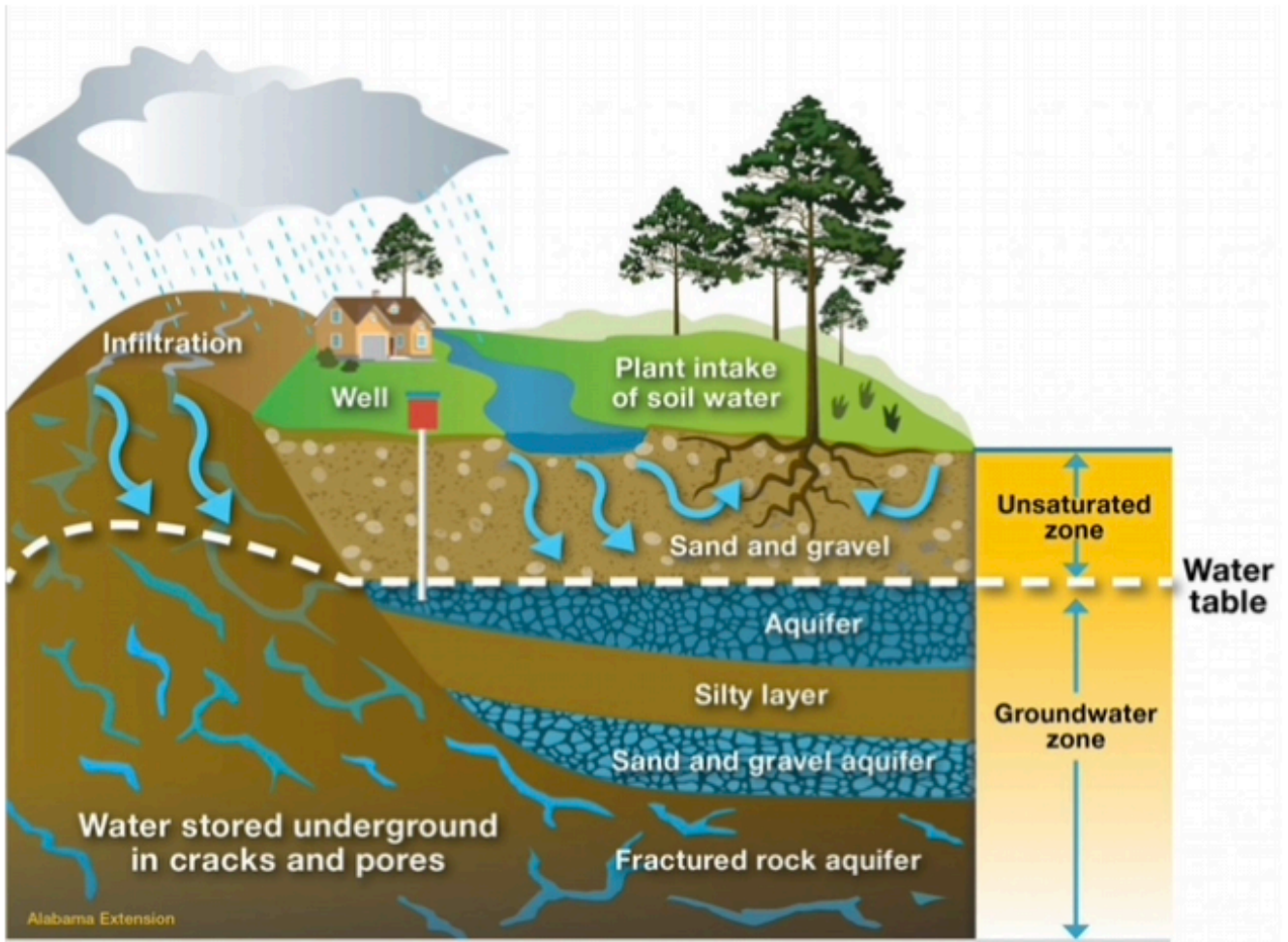


651 x 264

Aquifer diagram



This diagram shows a typical aquifer system. Common definitions of groundwater and well terms are included in the back of this booklet.



7 Dead trees removed from the Hester property right across the street from the proposed Lupine subdivision. This is due to our ongoing ground water depletion that normally fills our aquifers. Its no secret why our wells are very low on water. Parsons just a little ways up the road has many dying trees.





Oregon Water Resources Department Well Report Mapping Tool

Search

Identify

Layers

Bookmarks

Well Reports

Water Wells

Type of Well Report

Water Wells

Monitoring Wells

Geotechnical Holes

Type of Work for Water/Monitor Wells

New Wells

Deepening Wells

Conversion Wells

Alteration Wells

Abandonment Wells

Other

Type of Work for Geotechnical Holes

Well Characteristics

Wildfire Extent



Other Boundaries



Hydrography/River Miles



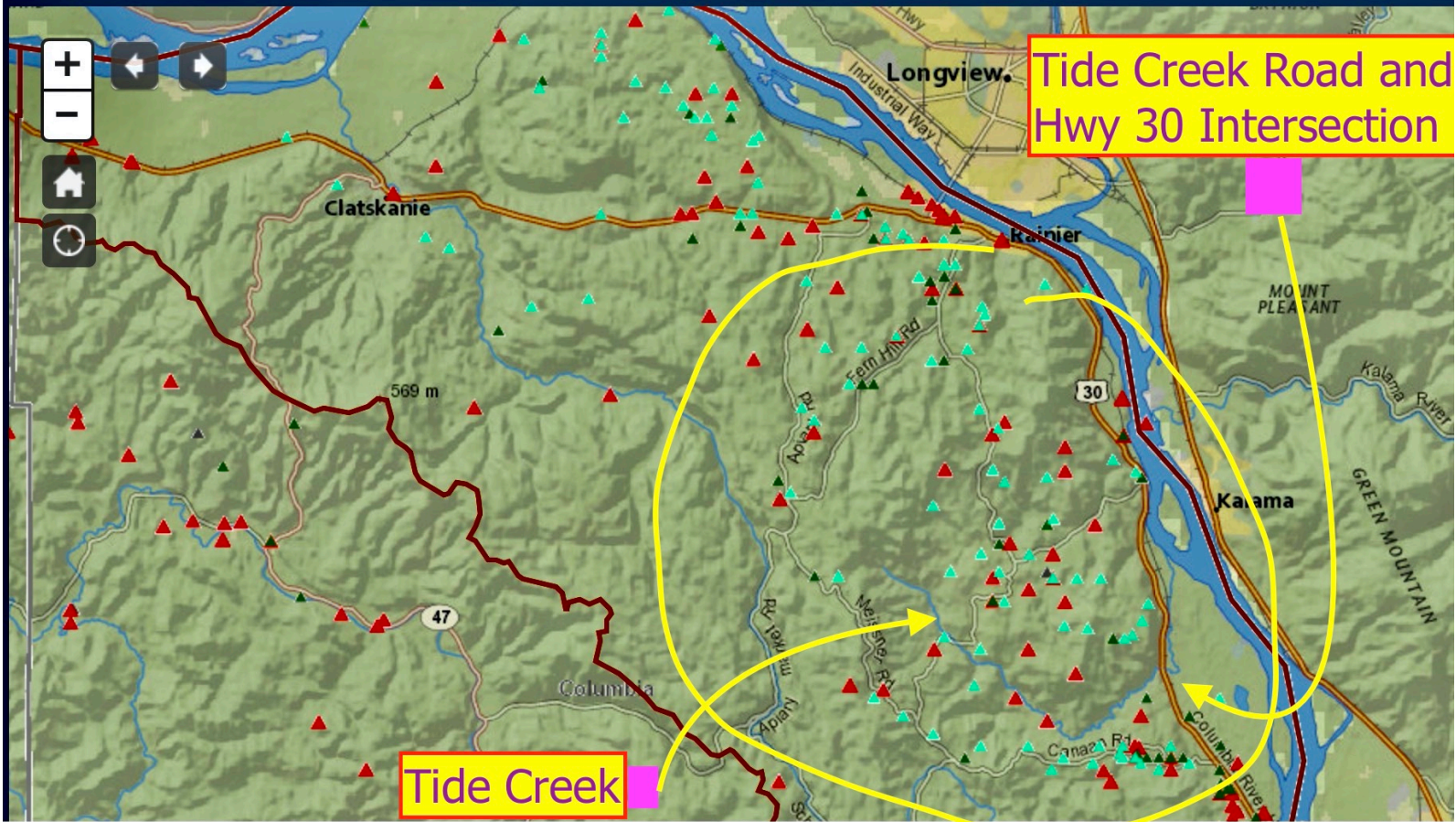
Tax Lots

PLSS

DOGAMI Geology



**# 1 Of 2
map to
follow**



Deepening Wells and Dead Wells in our area
These are only the ones that have been reported


ENVIRONMENT HEALTH

As wells run dry, Oregon residents depend on a state program that trucks in water

The legislative Emergency Board approved \$5 million for the program in early June, and Klamath County residents are the first to need it

BY: ALEX BAUMHARDT - JUNE 30, 2022 6:00 AM



 Klamath County has struggled with persistent drought. A report from the Secretary of State's Office found Oregon agencies in charge of ensuring water quality and quantity are understaffed, underfunded and lack coordination and planning for the future, compromising the state's water security. A new drought package from bipartisan lawmakers hopes to tackle these issues. (Courtesy of the governor's office)

Rhonda Nyseth's well dried up on Sept. 15, 2021, nine months after she bought her house in Klamath Falls.

"When it happened, I won't lie, I started crying immediately," Nyseth said.

She was familiar with the situation. She's a social services emergency liaison for the Oregon Department of Human Services Office of Resilience and Emergency Management.

Last summer, she helped oversee the distribution of more than 100 water tanks, each holding 500-gallons, to residents in Klamath County with empty wells.

Widespread potential loss of streamflow into underlying aquifers across the USA

[Scott Jasechko](#) , [Hansjörg Seybold](#), [Debra Perrone](#), [Ying Fan](#) & [James W. Kirchner](#)

[Nature](#) **591**, 391–395 (2021) | [Cite this article](#)

7868 Accesses | **41** Citations | **302** Altmetric | [Metrics](#)

Abstract

Most rivers exchange water with surrounding aquifers^{1,2}. Where groundwater levels lie below nearby streams, streamwater can infiltrate through the streambed, reducing streamflow and recharging the aquifer³. These ‘losing’ streams have important implications for water availability, riparian ecosystems and environmental flows^{4,5,6,7,8,9,10}, but the prevalence of losing streams remains poorly constrained by continent-wide in situ observations. Here we analyse water levels in 4.2 million wells across the contiguous USA and show that nearly two-thirds (64 per cent) of them lie below nearby stream surfaces, implying that these streamwaters will seep into the subsurface if it is sufficiently permeable. A lack of adequate permeability data prevents us from quantifying the magnitudes of these subsurface flows, but our analysis nonetheless demonstrates widespread potential for streamwater losses into underlying aquifers. These potentially losing rivers are more common in drier climates, flatter landscapes and regions with extensive groundwater pumping. Our results thus imply that climatic factors, geological conditions and historic groundwater pumping jointly contribute to the widespread risk of streams losing flow into surrounding aquifers instead of gaining flow from them. Recent modelling studies¹⁰ have suggested that losing streams could become common in future decades, but our direct observations show that many rivers across the USA are already potentially losing flow, highlighting the importance of coordinating groundwater and surface water policy.



WE ARE IN THIS GREY AREA

1 of 2

EXPLANATION



Unconsolidated-deposit aquifers



Pliocene and younger basaltic-rock aquifers



Volcanic- and sedimentary-rock aquifers

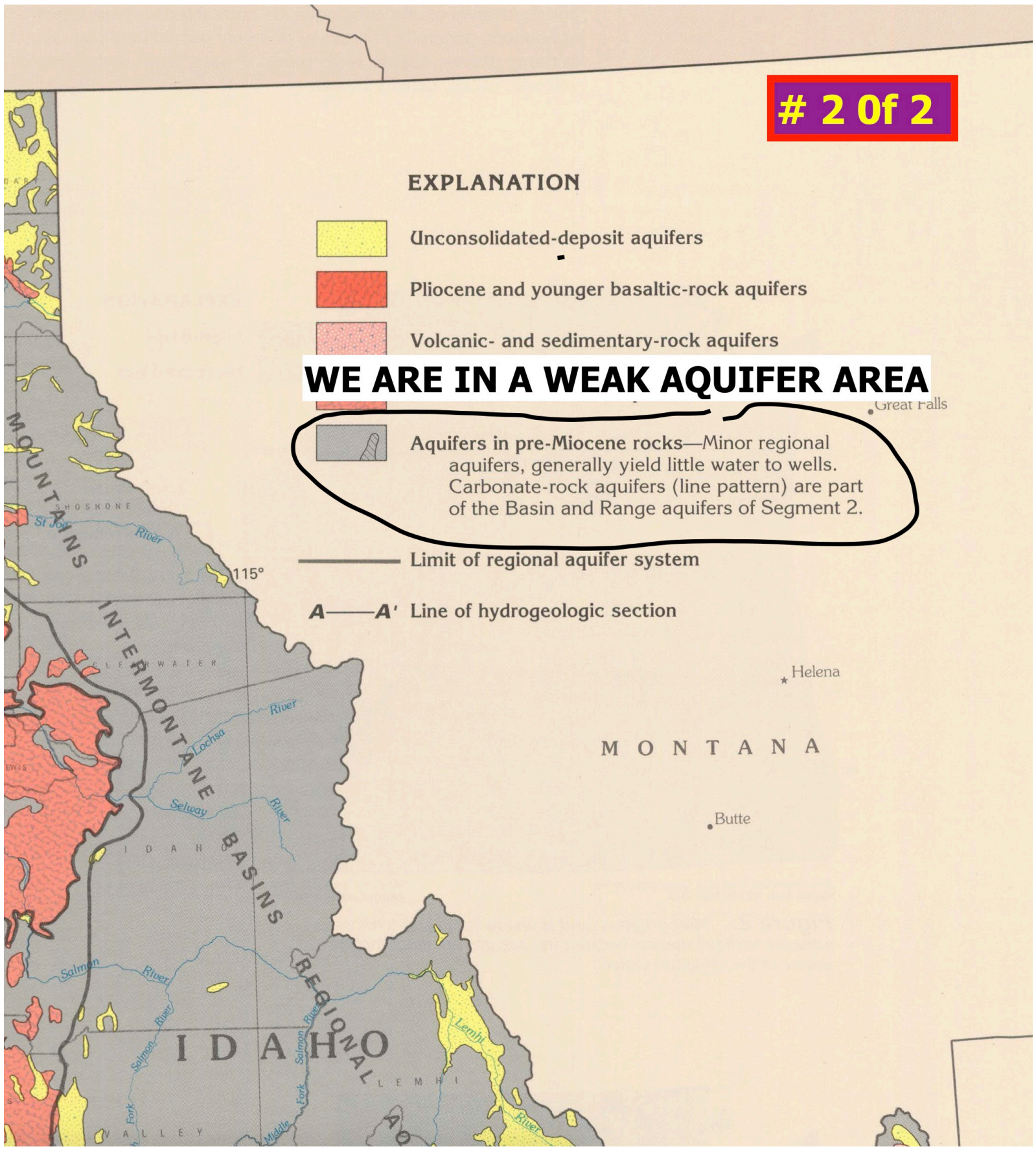
WE ARE IN A WEAK AQUIFER AREA



Aquifers in pre-Miocene rocks—Minor regional aquifers, generally yield little water to wells. Carbonate-rock aquifers (line pattern) are part of the Basin and Range aquifers of Segment 2.

— Limit of regional aquifer system

A—A' Line of hydrogeologic section

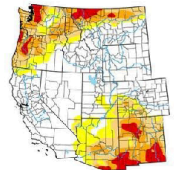
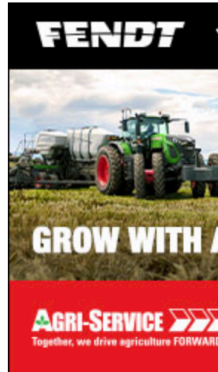


Oregon lawmakers seek more funds for well repair amid declining aquifer levels

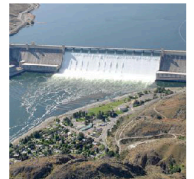
By MICHAEL KOHN EO Media Group Sep 13, 2023 Updated Sep 13, 2023



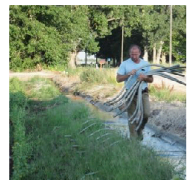
2 of 3



U.S. grabs water



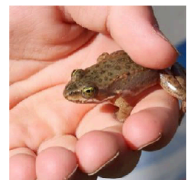
Fed on salt Colorado



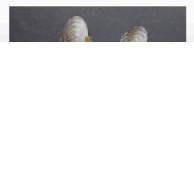
Idaho main supply



Eco star by V



Son sponsored pro



Qua

Neil Fagen, left, and Tate Waldbillig, with Aiken Well Drilling, perform a flow test during the reconstruction of a well in Tumalo on Monday. A state program that helps pay for the cost of repairing wells could receive additional funding next year.

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Funding Help
Homeowners with problematic well who need financial assistance can connect with

BEND, Ore. — A state program that helps pay for the cost of repairing wells could receive additional funding next year. That's good news for the scores of homeowners who have seen their wells dry up amid drought and climate change

challenges

‘Trying to survive’: Wells dry up amid Oregon water woes



By **GILLIAN FLACCUS** and **NATHAN HOWARD** (Associated Press)

MALIN, Ore. July 29, 2021 10:51 a.m.

Dozens of domestic wells have gone dry in an area near the Oregon-California border where the American West’s worsening drought has taken a particularly dramatic toll



Rylee Buckley, 17, drives home in an ATV loaded with two, 7-gallon containers after borrowing water for her animals from a neighbor, Saturday, July 24, 2021, in Klamath Falls, Ore. The Buckley's house well ran dry in May following a historic drought in Southern Oregon.

Nathan Howard / AP