

11/10/2023

2023 Fall Ground Water Level Report



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SOUTH PLATTE NATRUAL RESOURCES DISTRICT

This report summarizes the results of the fall 2023 ground water level measurement program. Water levels were collected by NRD staff Chris Kaiser. Ground water level data are collected twice a year, during the spring and fall. This report is not as detailed as our spring report. The fall report only shows the major areas of aquifer stress/drawdown during the irrigation season (typically from April – October). During the time frame when fall measurements are taken, the aquifer is still fluctuating from “pumping pressure” during the irrigation season. Because of this fluctuation, the fall measurements and the year to year differences between those measurements will vary due to the amount of water pumped during the growing season. An example would be a pivot planted to corn during the 2022 growing season. In 2023, the producer may plant a lower water use crop and thus the pumping pressure will be considerably less during 2023. Hence, we are measuring a high pumping well in 2022 (great cone of depression) and comparing that to a low pumping well (low cone of depression) the following year and as to be expected, the water level will typically be higher than the previous year’s measurement. The opposite would be expected if the well was used very little during 2022 and had a high water use in 2023. This is just one example. Many different scenarios and biases play into interpreting fall levels. During the droughts of 2012, 2020, and 2022 we saw almost all wells decline in the fall regardless of crop type planted. Due to these reasons, fall levels are not a good interpretation of aquifer level decreases/increases.

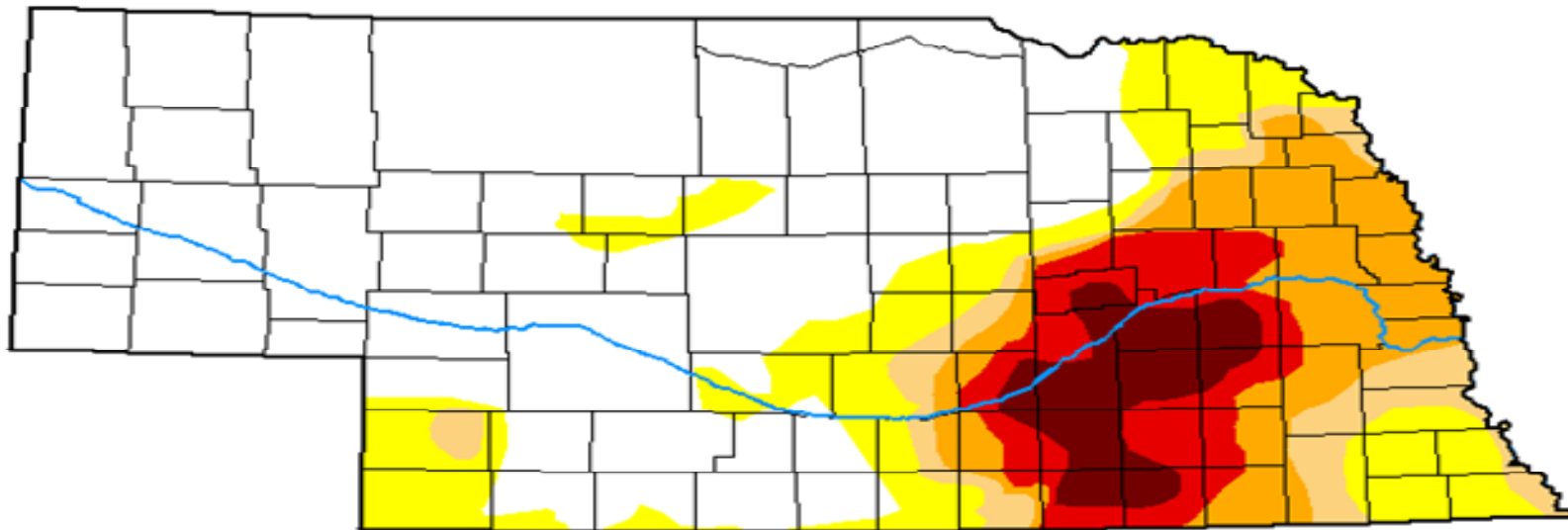
Attached in this report are maps depicting how water levels are mapped across the district and locations where our observation wells are located. Also attached in this report are fall-fall water level correlations going back one year. Something new this year, I added a map that shows drawdown that occurs during the irrigation season. We can do this by comparing spring water levels to fall water levels.

As of this report, the SPNRD is currently observing 87 irrigation wells, 12 livestock wells, and 111 dedicated SPNRD owned monitoring wells. The SPNRD is one of the few NRD’s that collect fall water level data.







**Please note all water management decisions are based off of the spring ground water management report, amongst other projects and studies. This report is for informational purposes only.*

U.S. Drought Monitor Nebraska

November 7, 2023
(Released Thursday, Nov. 9, 2023)
Valid 7 a.m. EST



Intensity:

-  None
-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

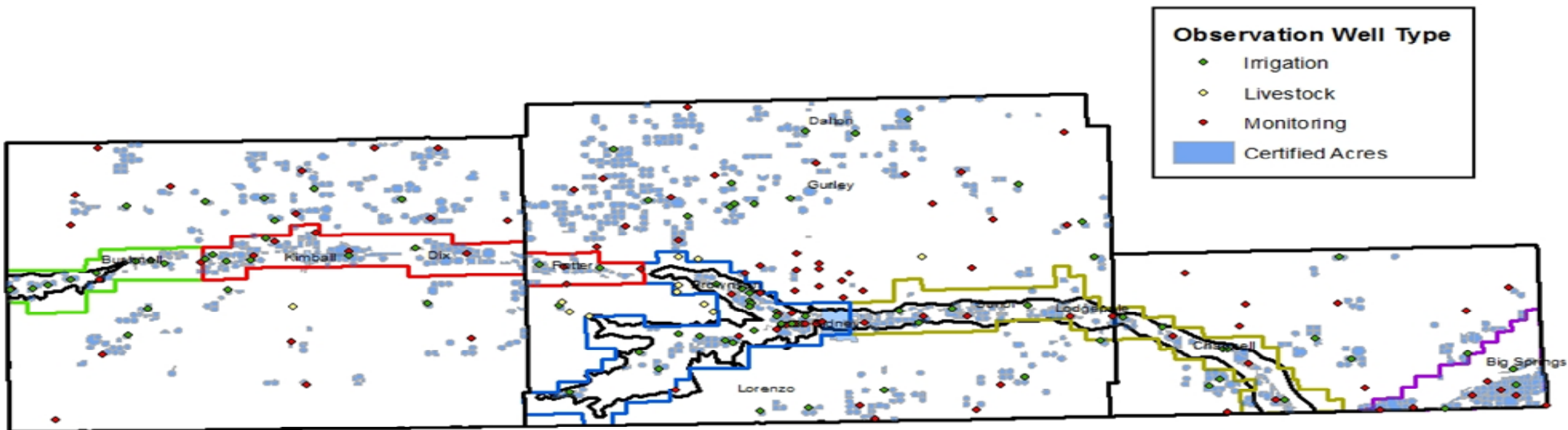
Lindsay Johnson
National Drought Mitigation Center



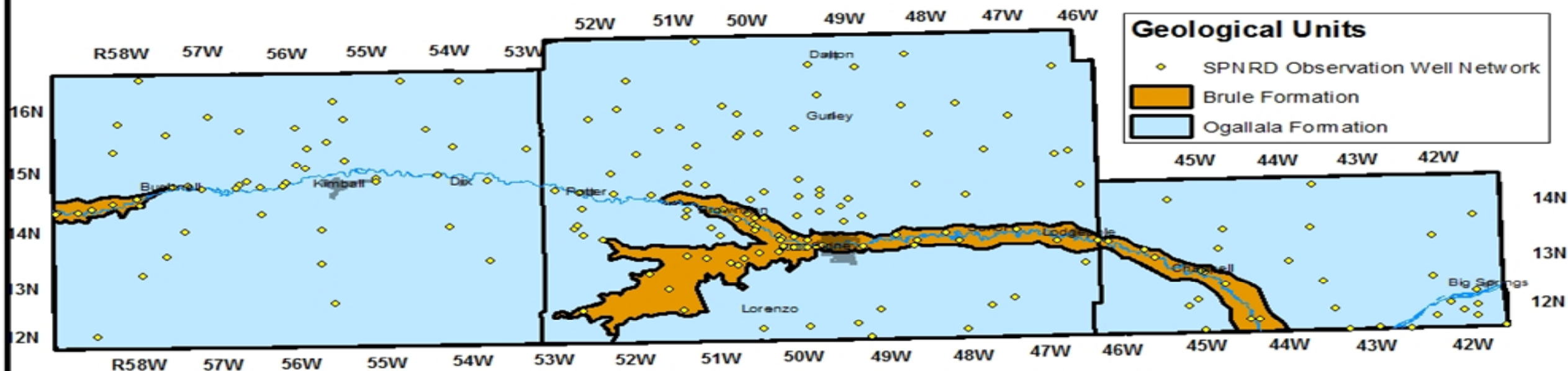
droughtmonitor.unl.edu



SPNRD Observation Well Network



SPNRD Geological Breakdowns



All wells located within each geological unit are only influenced by wells within each sole unit. That is, wells located in the southern ogallala unit are only influenced by the wells located there. It does not "share" water, nor is it influenced with wells in the Brule Formation. As of this time, the SPNRD has determined there is no hydrologic connectivity between the brule and ogallala formations, respectively. All maps have been created in this manner. The geological units described above are derived from the Platte River Cooperative Hydrology Study (COHYST).

Cone of Depression

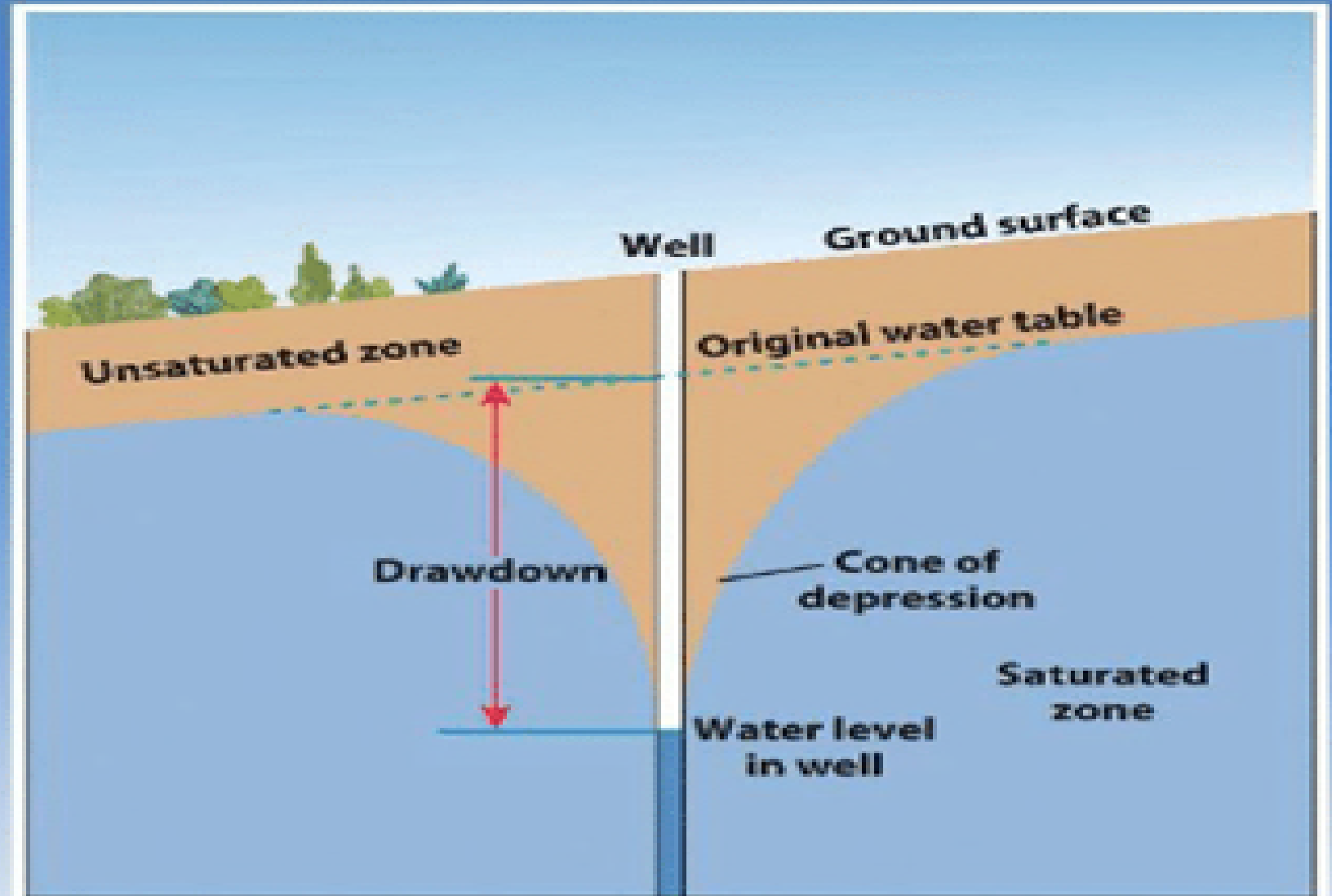


Figure 11.10
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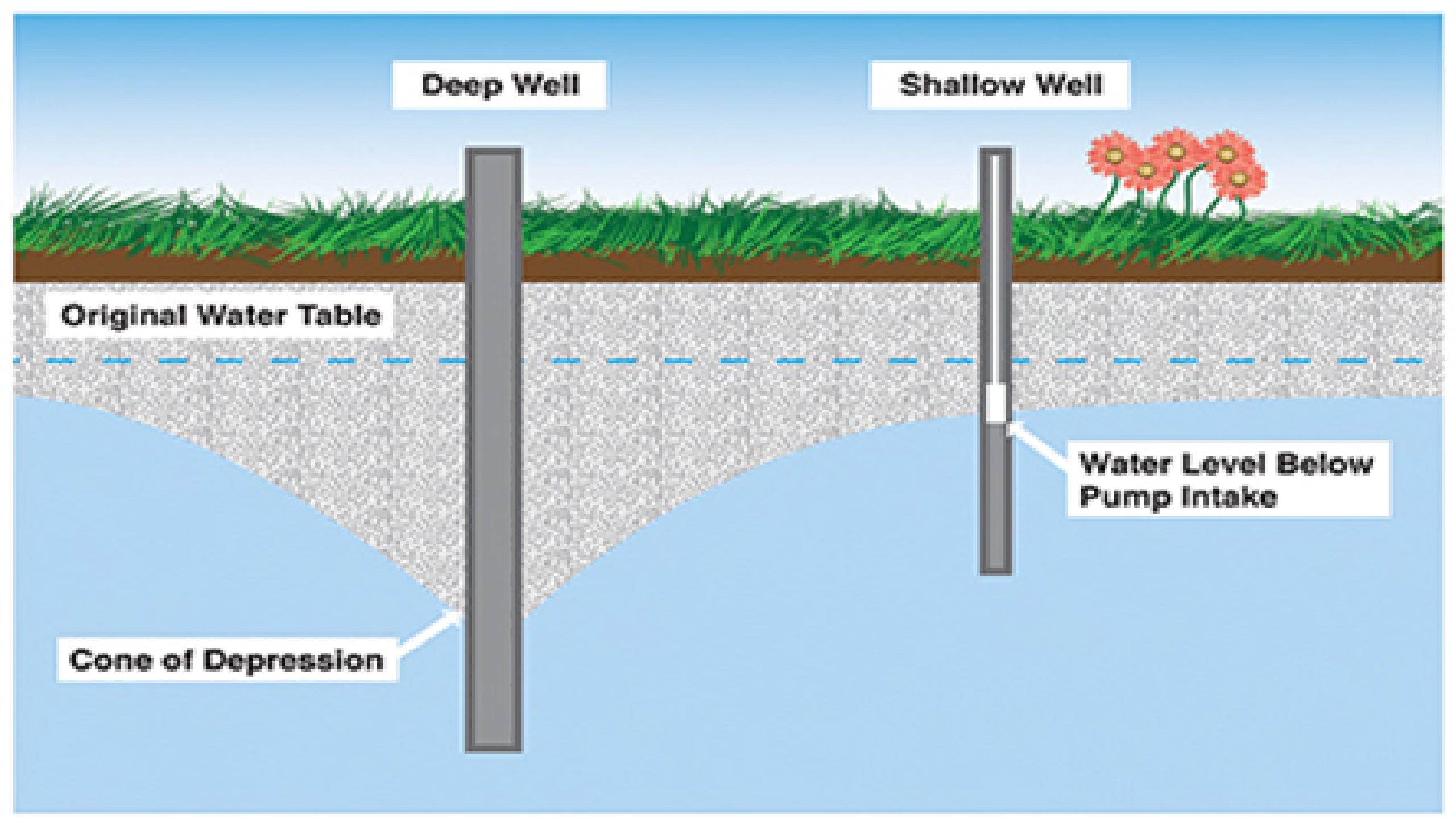
Deep Well

Shallow Well

Original Water Table

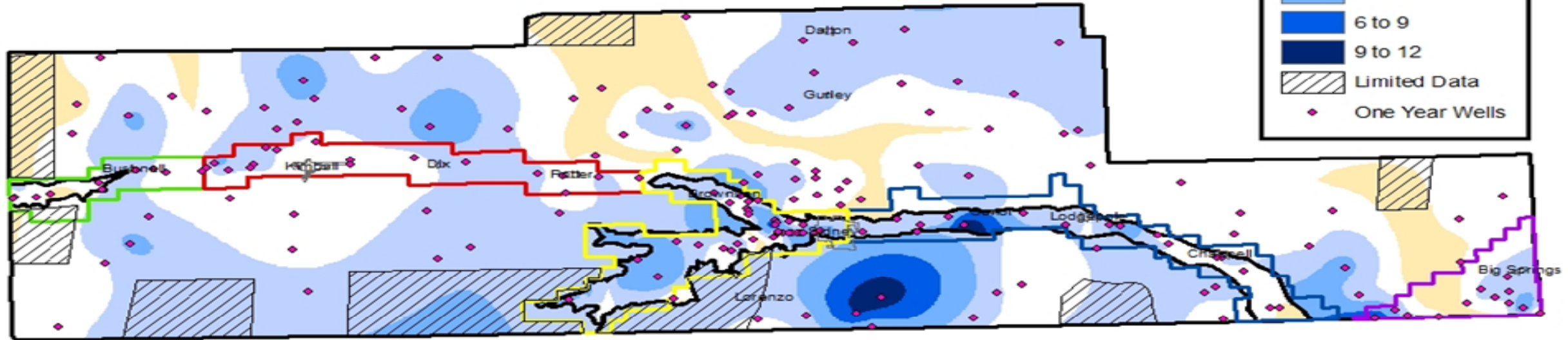
Water Level Below Pump Intake

Cone of Depression



1 Year Water Level Differences

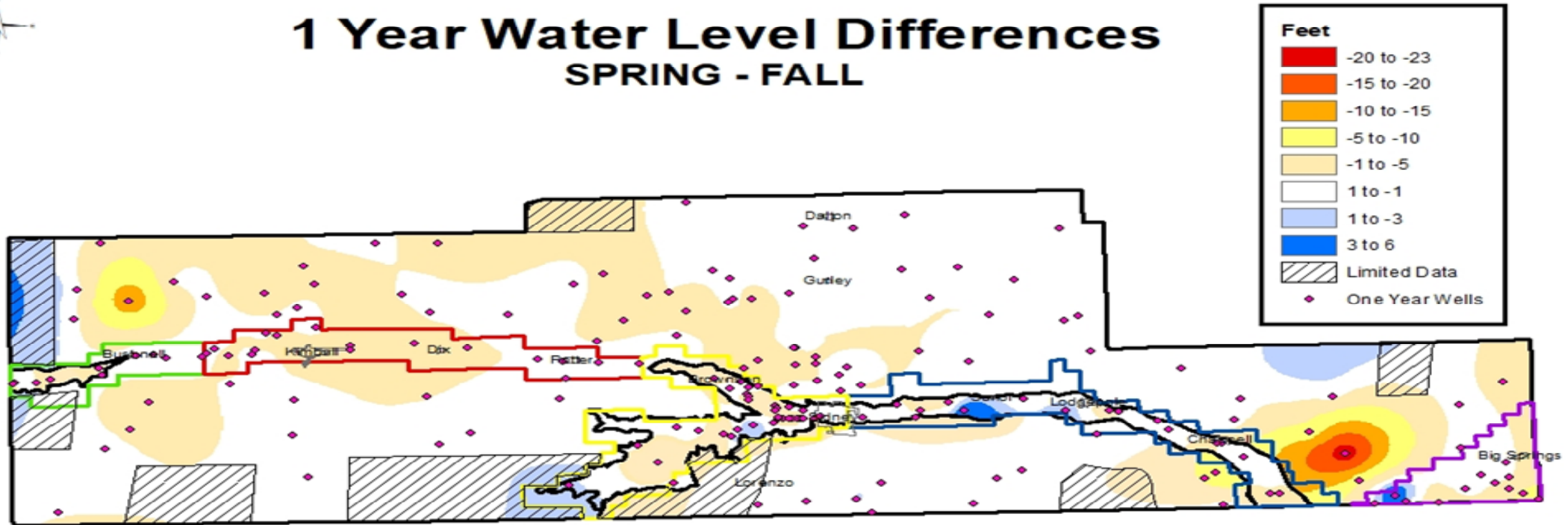
FALL - FALL



South Platte NRD 1 Year Stats by Subarea

Subarea	Ave.	Max	Min	# of Wells
Pine Bluffs to Oliver	0.43	2.18	-1.43	11
Oliver to Buffalo Bend	1.04	4.01	-0.6	19
Buffalo Bend to Sidney	2.64	7.94	-1.12	37
Sidney to Colorado	2.18	10.33	-1.12	17
South Platte Valley	1.61	8.82	-3.27	13
Fully Appropriated	1.15	10.32	-2.13	99
Districtwide	1.5	10.33	-3.27	196

1 Year Water Level Differences SPRING - FALL



South Platte NRD 8 Month Stats by Subarea

Subarea	Ave.	Max	Min	# of Wells
Pine Bluffs to Oliver	-0.93	1.04	-3.61	11
Oliver to Buffalo Bend	-0.87	0.17	-2.68	19
Buffalo Bend to Sidney	-1.12	2.05	-4.82	37
Sidney to Colorado	-0.51	5.63	-3.94	17
South Platte Valley	-1.04	5.71	-7.34	13
Fully Appropriated	-1.35	1.02	-22.18	99
Districtwide	-1.15	5.71	-22.18	196