
SPRING 2018 GROUNDWATER LEVEL REPORT

DATE: 4/2/2018

TO: SOUTH PLATTE NRD BOARD OF DIRECTORS, NEBRASKA PANHANDLE LANDOWNERS

FROM: Chris Kaiser

This report summarizes the results of the spring 2018 groundwater level measurement program. Groundwater levels were collected by South Platte NRD employees Chris Kaiser and Tyler Sanders during March of 2018. During 2017, rainfall events were close to average for precipitation amounts in Kimball, Cheyenne, and Deuel Counties averaging 0.11" above historical averages. The Oliver to Buffalo Bend subarea and the Buffalo Bend to Sidney subarea is where the majority of water level decreases occurred. There were increases observed in the northern table of Kimball County and the southern table of Cheyenne County. The Pine Bluffs to Oliver Reservoir subarea showed the biggest increase. It should be noted that those increases only occurred in the Brule formation portion of that subarea. There were only two wells that showed major decreases compared to last year. One of the wells was located 2 miles west and 3 miles north of Kimball in the Oliver to Buffalo Bend subarea and the other well was 9 miles east and 1 south of Chappell in the fully appropriated subarea (tablelands). Districtwide, water levels decreased -0.0004 feet on average based on 201 well measurements.

Attached in this report are data correlating precipitation changes from normal amounts compared to the average decline/incline in ground water levels. A map indicating allocation subareas and a map indicating how we correlate water level changes within geological boundaries are also attached. Included are one, five, nine, fifteen, and twenty-five year water level difference maps. Allocations took effect in 2009 and the nine-year map shows comparisons of where water levels have changed since the District was under a full allocation. Random selections of wells are graphed showing long term data trends. Landowners who have NRD observation wells installed on their property, as well as landowners from whom we take irrigation measurements are sent hydrographs of their current water level each spring.

The SPNRD added one new monitoring well in the fully appropriated subarea in northern Deuel County in 2018. We budget for one monitoring well a year. The main criteria we look for in placing new monitoring wells are locations where we don't have any hydrogeological data. We are always looking for willing landowners who would allow us to take well measurements to use in this report or to install monitoring wells on their property. If you're interested in allowing the NRD to use your irrigation or livestock well for monitoring water levels, please let us know.

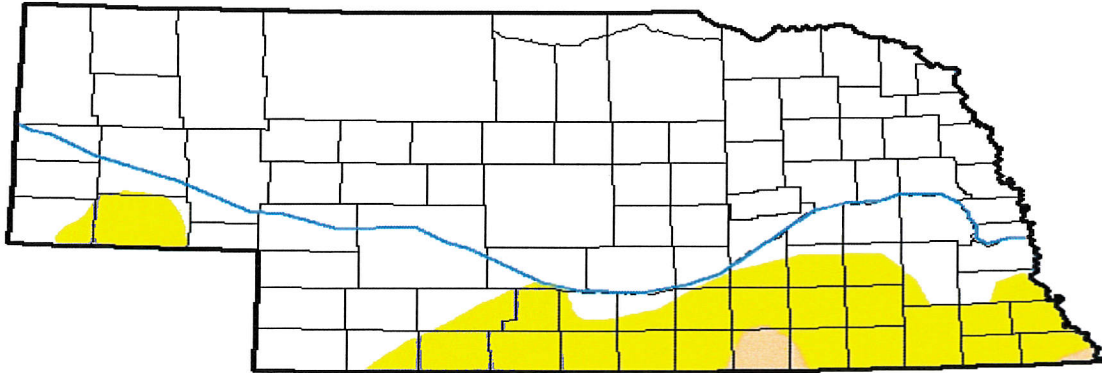
*Any inquiries regarding other information that is not included in this report (geology, well construction, hydrographs) can be obtained at the SPNRD office.

U.S. Drought Monitor Nebraska

March 27, 2018
(Released Thursday, Mar. 29, 2018)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	81.17	18.83	1.00	0.00	0.00	0.00
Last Week 03-20-2018	81.17	18.83	0.86	0.00	0.00	0.00
3 Months Ago 12-26-2017	9.32	90.68	2.03	0.00	0.00	0.00
Start of Calendar Year 01-02-2018	9.32	90.68	2.03	0.00	0.00	0.00
Start of Water Year 09-26-2017	82.67	17.33	4.01	0.00	0.00	0.00
One Year Ago 03-28-2017	72.64	27.36	5.45	0.00	0.00	0.00



Intensity:

- 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. See accompanying text summary for forecast statements.

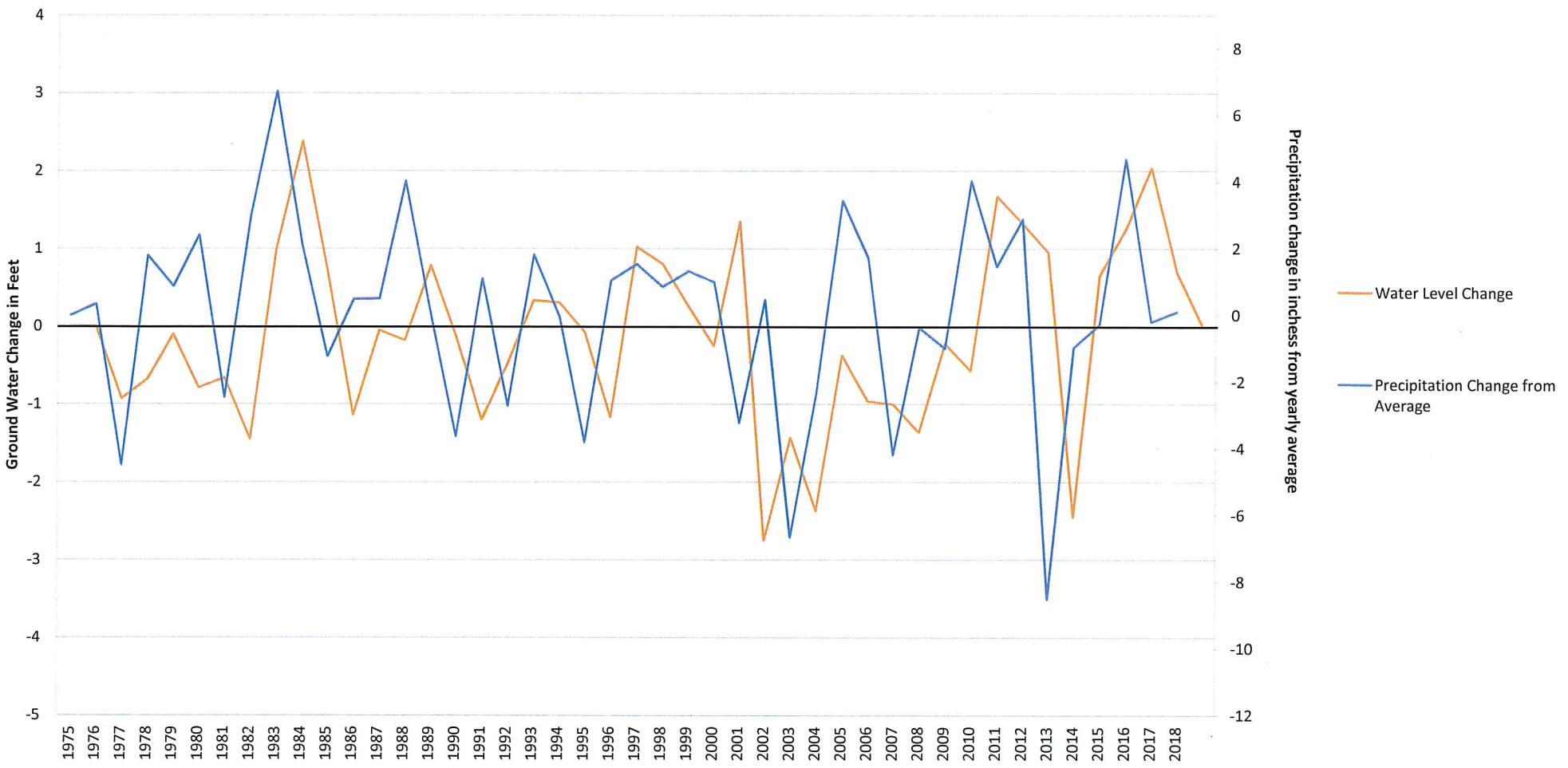
Author:

Chris Fenimore
NCEI/NESDIS/NOAA

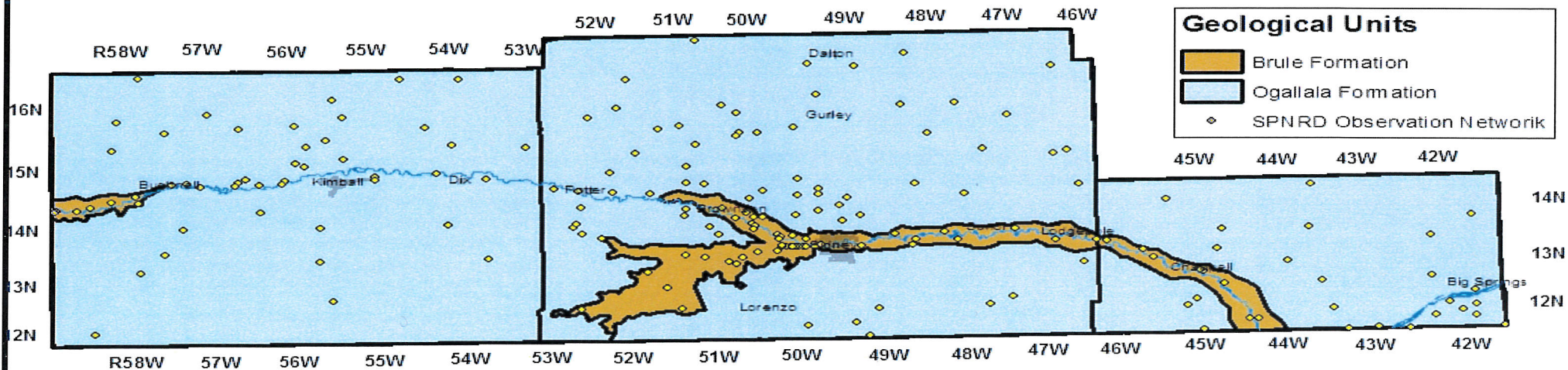


<http://droughtmonitor.unl.edu/>

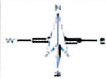
Groundwater and Precipitation Accumulation Changes 1976-2017



SPNRD Geological Breakdowns



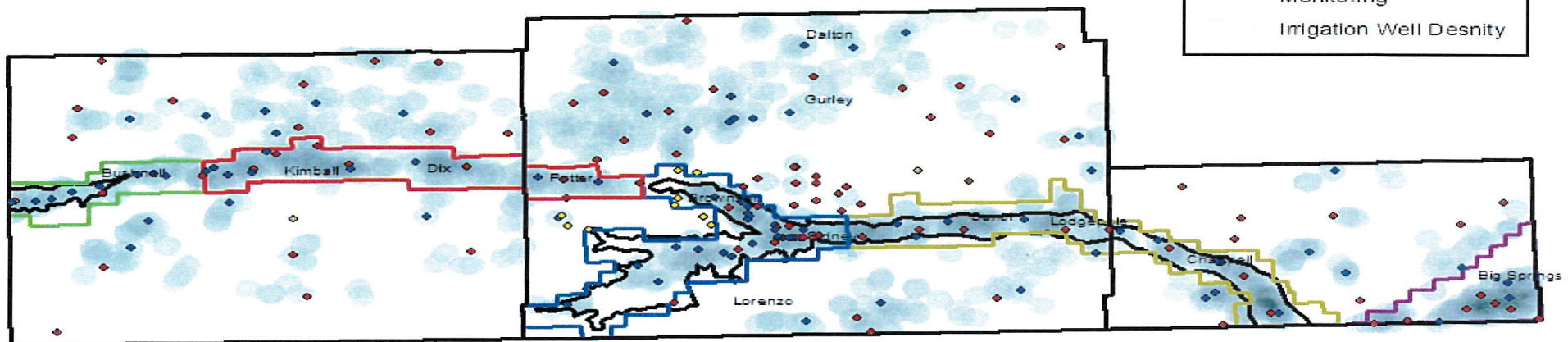
All wells located within each geological unit are only influenced by wells within each sole unit. That is, wells located in the southern ogallala unit are only influenced by the wells located there. It does not "share" water, nor is it influenced with wells in the Brule Formation. As of this time, the 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).



SPNRD Observation Well Network

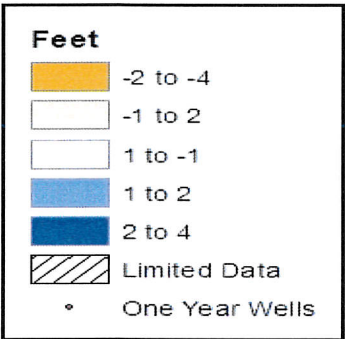
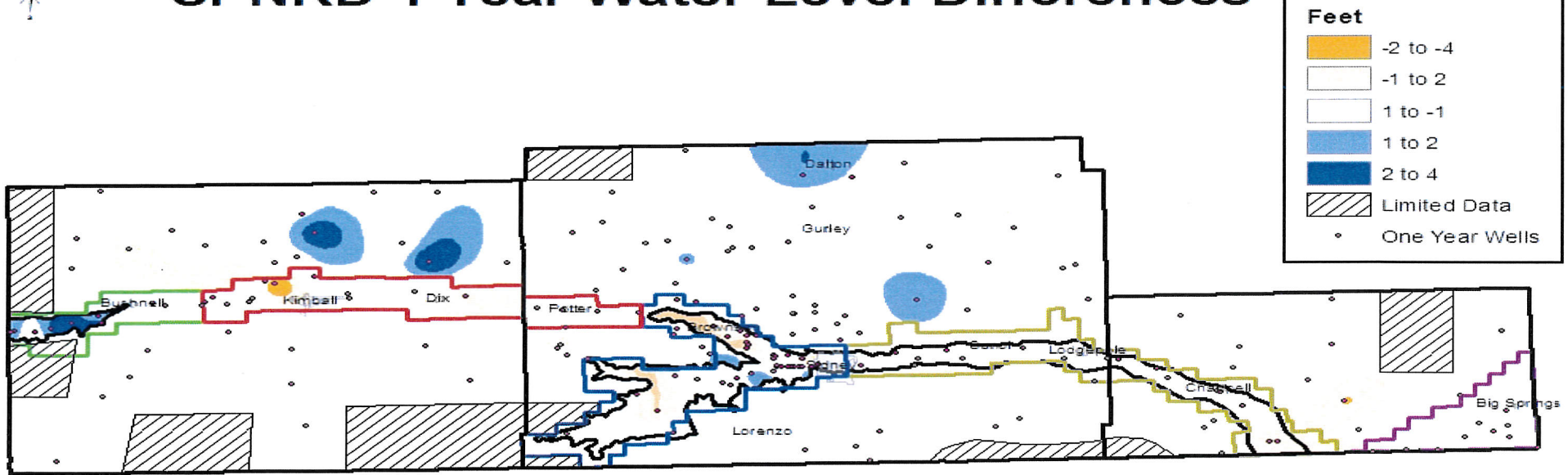
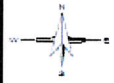
Observation Well Type

- Irrigation
- ◊ Livestock
- Monitoring
- Irrigation Well Density



SOUTH PLATTE
NATURAL RESOURCES DISTRICT

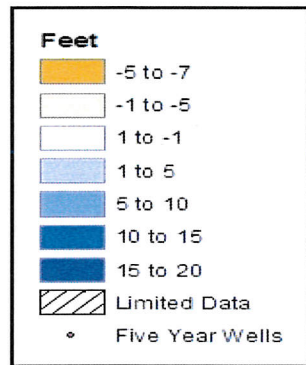
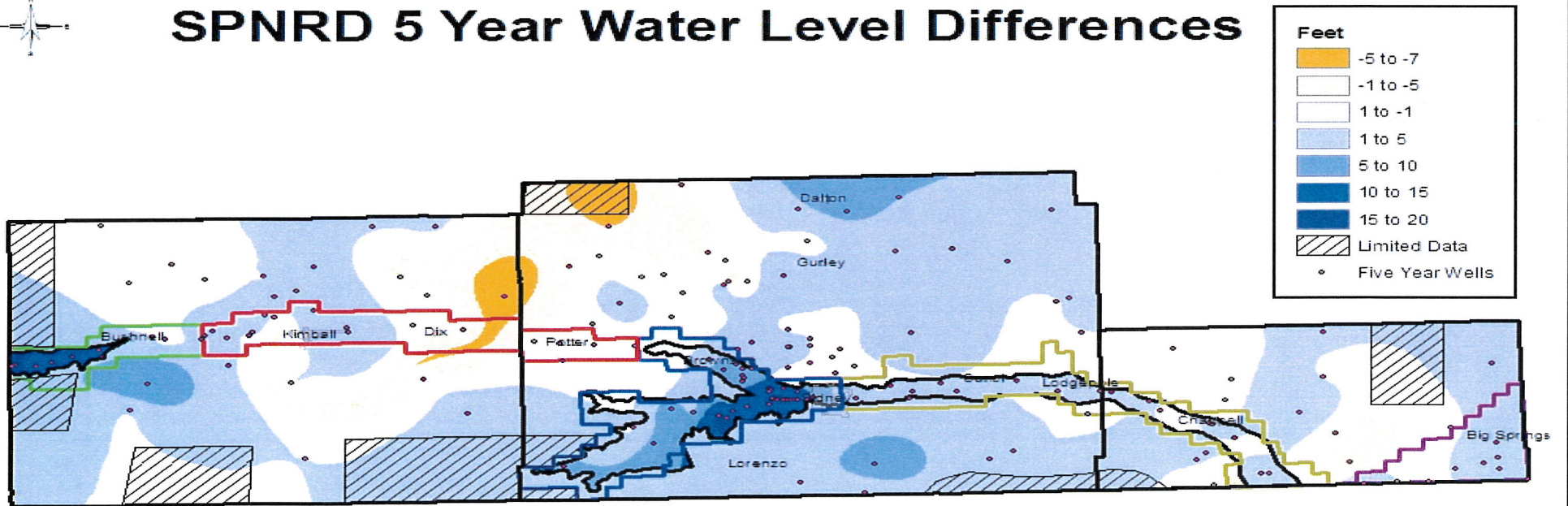
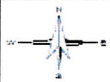
SPNRD 1 Year Water Level Differences



South Platte NRD 1 Year Stats by Subarea

Subarea	Ave.	Max	Min	Count	Decline	%Decline
Pine Bluffs to Oliver	1.15	2.41	-0.36	11	2	18%
Oliver to Buffalo Bend	-0.66	0.23	-3.58	19	15	79%
Buffalo Bend to Sidney	-0.36	1.29	-2.4	40	23	58%
Sidney to Colorado	-0.15	1.57	-1.4	17	13	76%
South Platte Valley	-0.13	0.29	-1.28	11	5	45%
Fully Appropriated	0.17	3.48	-2.09	103	42	41%
Districtwide	-0.0004	3.48	-3.58	201	100	50%

SPNRD 5 Year Water Level Differences

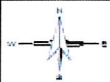


South Platte NRD 5 Year Stats by Subarea						
Subarea	Ave.	Max	Min	Count	Decline	%Decline
Pine Bluffs to Oliver	11.17	19.94	0.36	11	0	0%
Oliver to Buffalo Bend	1.45	5.77	-2.71	18	6	33%
Buffalo Bend to Sidney	10.92	16.43	0.78	36	0	0%
Sidney to Colorado	1.81	3.65	0.63	17	0	0%
South Platte Valley	2.21	4.3	-0.45	10	1	10%
Fully Appropriated	1.03	8.66	-6.34	86	25	30%
Districtwide	3.84	19.94	-6.34	178	32	18%



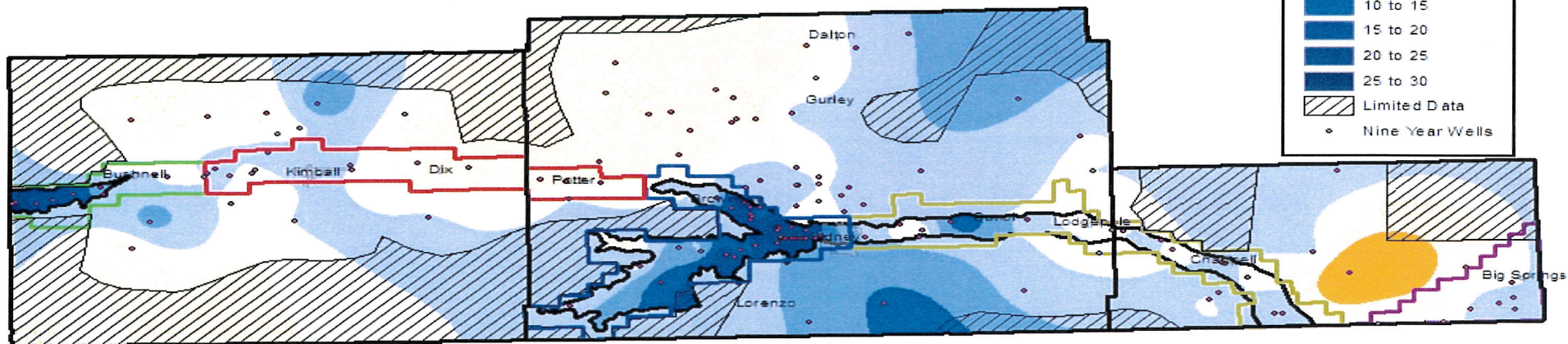
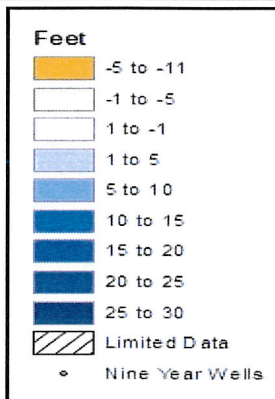
SOUTH PLATTE
NATURAL RESOURCES DISTRICT

Spring 2013 - Spring 2018



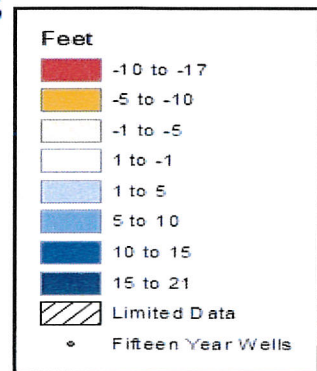
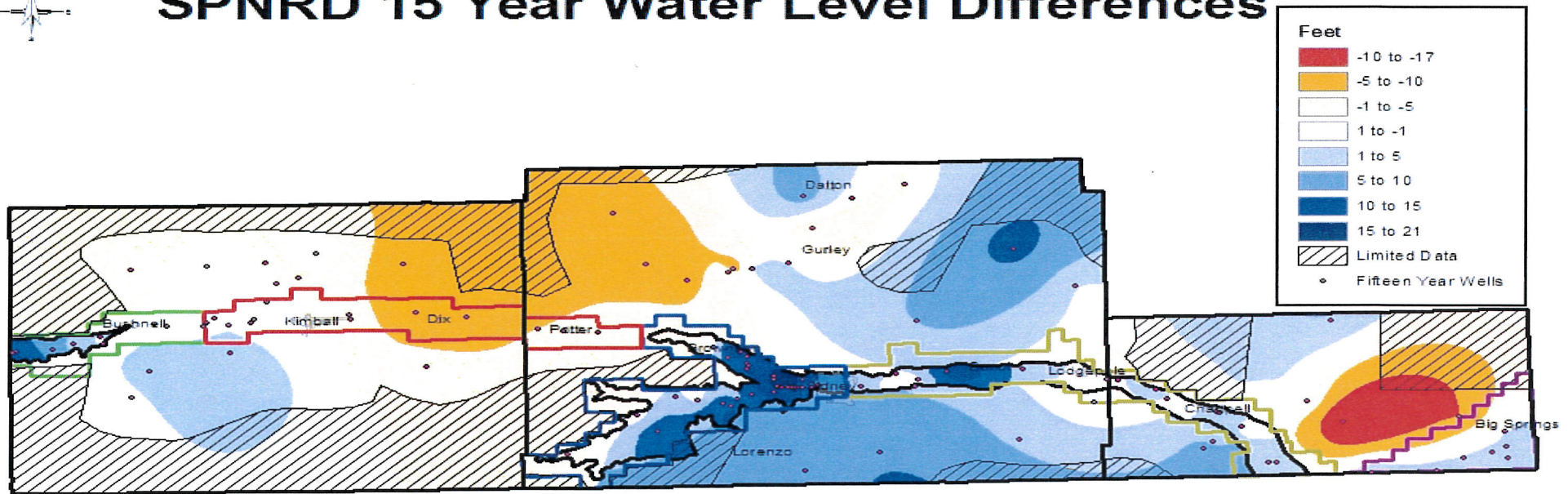
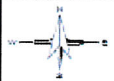
SPNRD 9 Year Water Level Differences

*2009 WAS THE FIRST YEAR ALL SUBAREAS WERE UNDER AN ALLOCATION



Subarea	Ave.	Max	Min	Count	Decline	%Decline
Pine Bluffs to Oliver	13.5	29.66	0.2	11	0	0%
Oliver to Buffalo Bend	0.14	2.5	-2.99	14	5	36%
Buffalo Bend to Sidney	17.45	24.88	0.68	36	0	0%
Sidney to Colorado	2.31	10.88	-0.12	15	1	7%
South Platte Valley	1.00	2.68	-2.52	8	2	25%
Fully Appropriated	0.76	10.96	-10.88	61	23	38%
Districtwide	5.98	29.66	-10.88	145	31	21%

SPNRD 15 Year Water Level Differences



South Platte NRD 15 Year Stats by Subarea

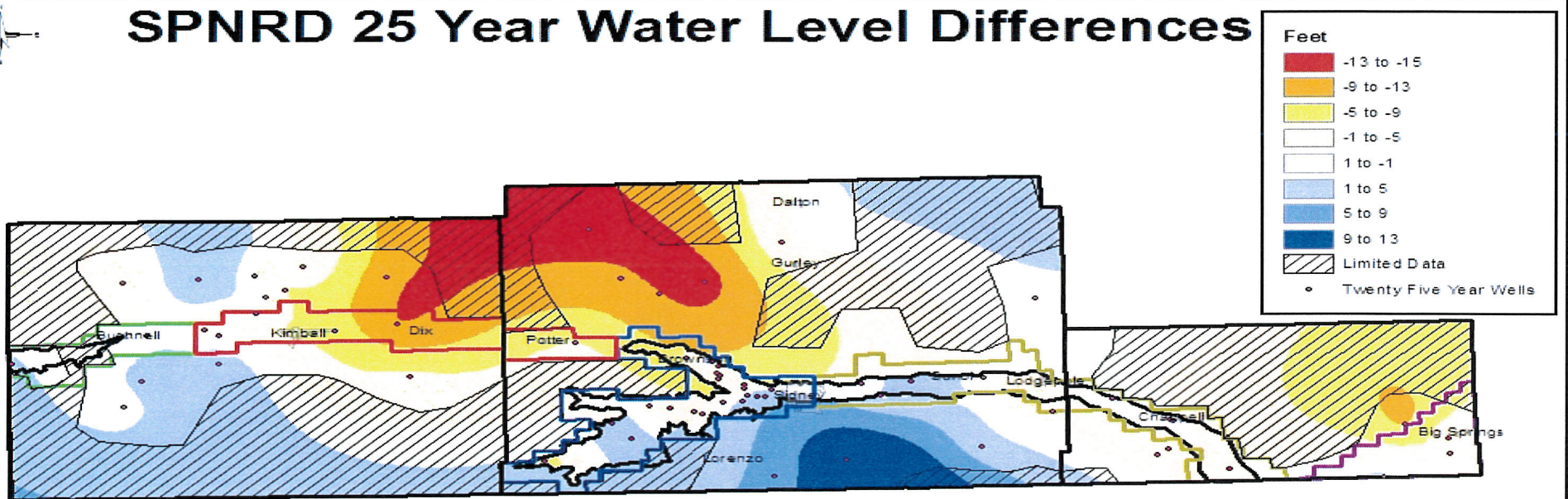
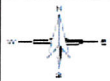
Subarea	Ave.	Max	Min	Count	Decline	%Decline
Pine Bluffs to Oliver	5.86	16.2	5.86	10	2	20%
Oliver to Buffalo Bend	-2.34	0.84	-7.78	13	8	62%
Buffalo Bend to Sidney	10.16	20.27	-2.4	31	1	3%
Sidney to Colorado	2.58	11.19	0.54	15	0	0%
South Platte Valley	0.99	4.96	-9.72	8	1	13%
Fully Appropriated	-0.1	11.16	-16.69	34	17	50%
Districtwide	3.48	20.27	-16.69	111	29	26%



SOUTH PLATTE
NATURAL RESOURCES DISTRICT

Spring 2003 - Spring 2018

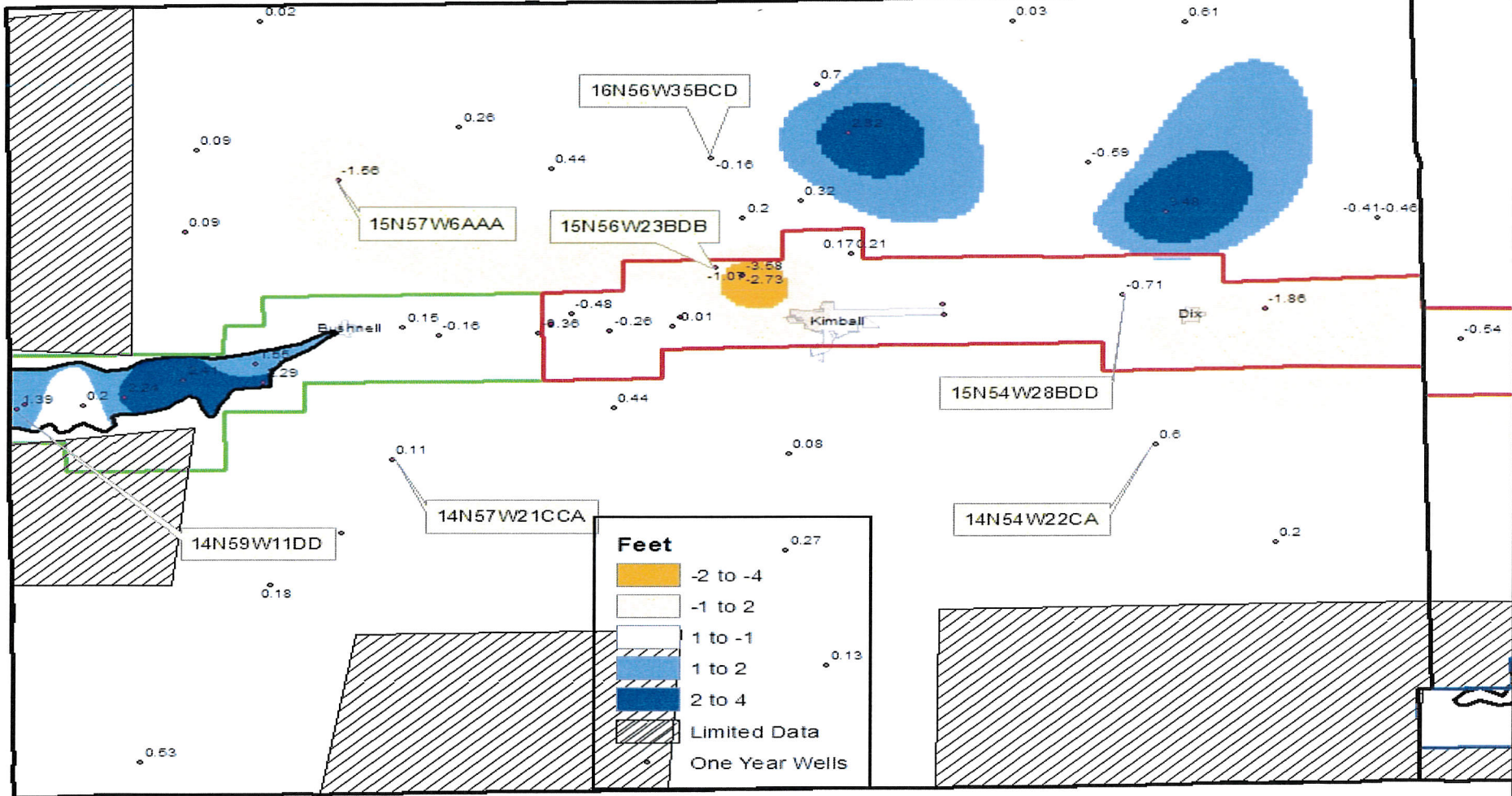
SPNRD 25 Year Water Level Differences



South Platte NRD 25 Year Stats by Subarea

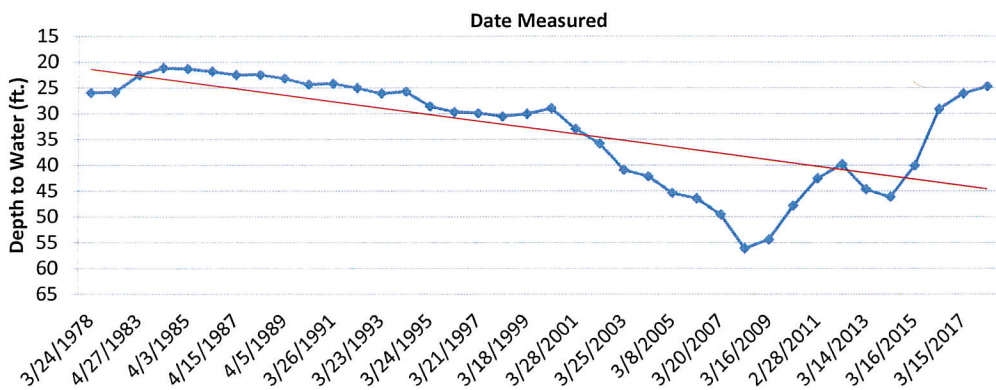
Subarea	Ave.	Max	Min	Count	Decline	%Decline
Pine Bluffs to Oliver	0.77	1.36	0.18	2	0	0%
Oliver to Buffalo Bend	-4.6	-0.44	-12.74	6	6	100%
Buffalo Bend to Sidney	-1.23	3.67	-7.11	21	13	62%
Sidney to Colorado	-0.13	3.39	-2.55	8	5	63%
South Platte Valley	-3.1	1.67	-9.17	4	3	75%
Fully Appropriated	-2.59	13.24	-14.47	23	15	65%
Districtwide	-1.95	13.24	-14.47	64	42	66%

Kimball County Hydrograph Locations

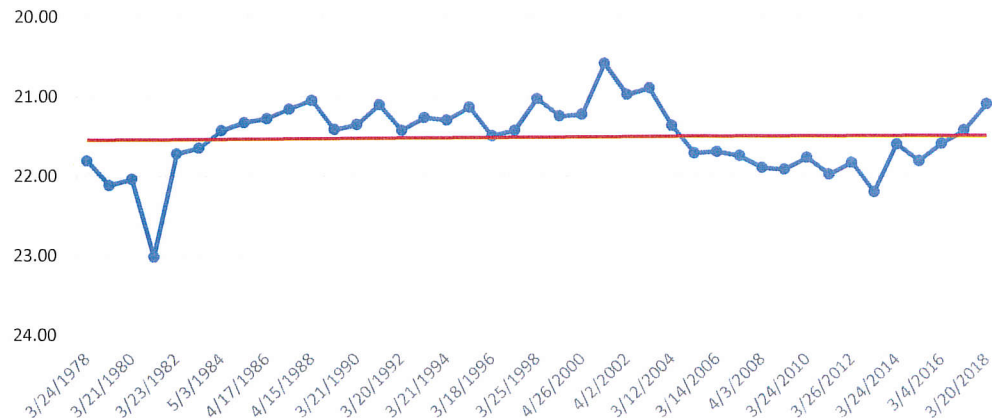


Spring 2017 - Spring 2018

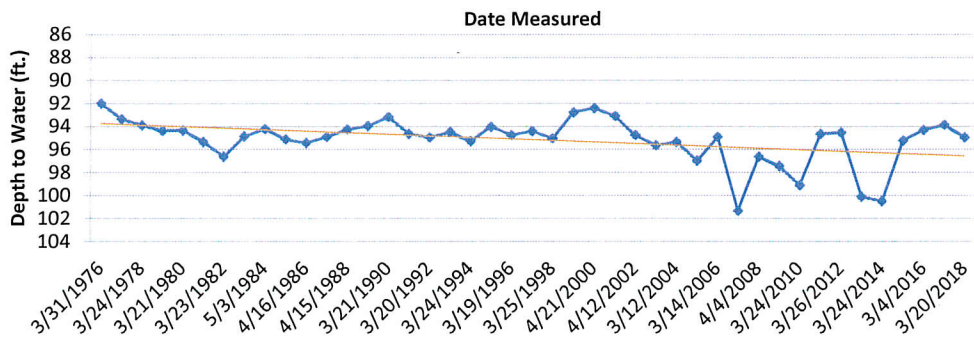
14N 59W 11DD
NE/WY Stateline 1 East of Pine Bluffs
Brule Formation
Pine Bluffs to Oliver Reservoir Subarea



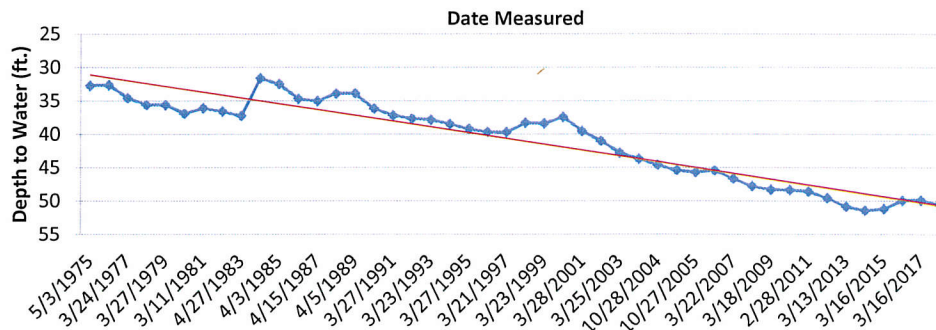
15N 57W 33AB
1 East of Bushnell
Ogallala Formation
Pine Bluffs to Oliver Reservoir Subarea



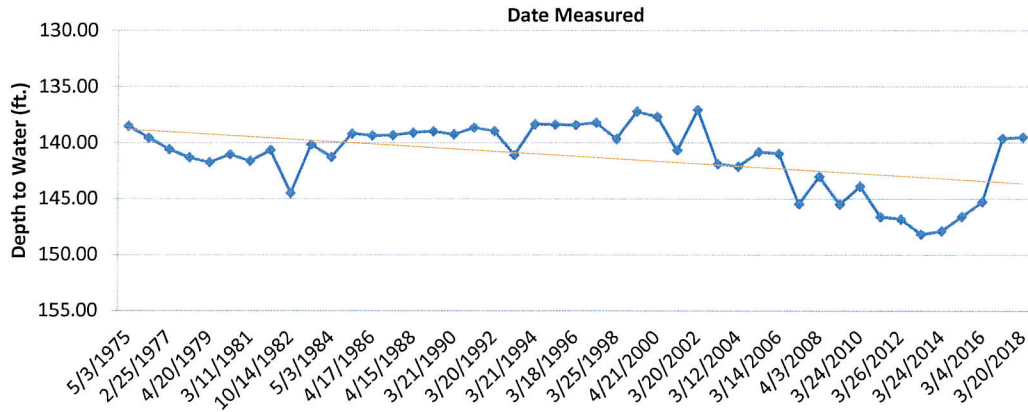
15N 56W 23BDB
3 West 2 North of Kimball
Ogallala Formation
Oliver Reservoir to Buffalo Bend Subarea



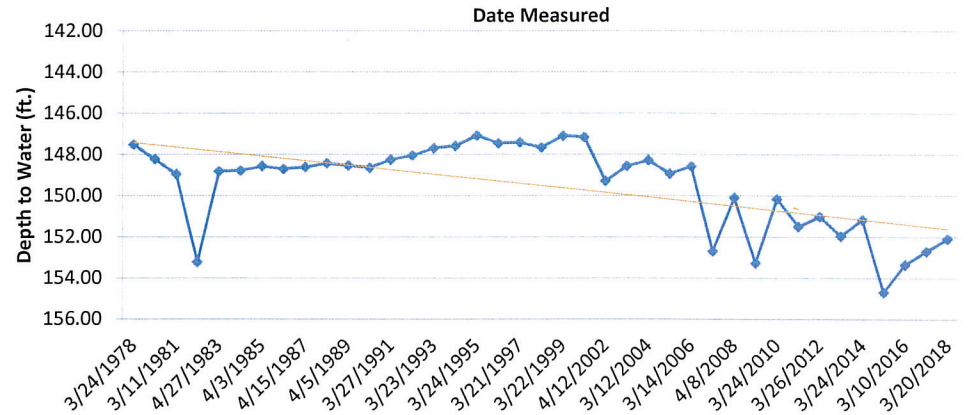
15N 54W 28BDD
1.5 West of Dix
Ogallala Formation
Oliver Reservoir to Buffalo Bend Subarea



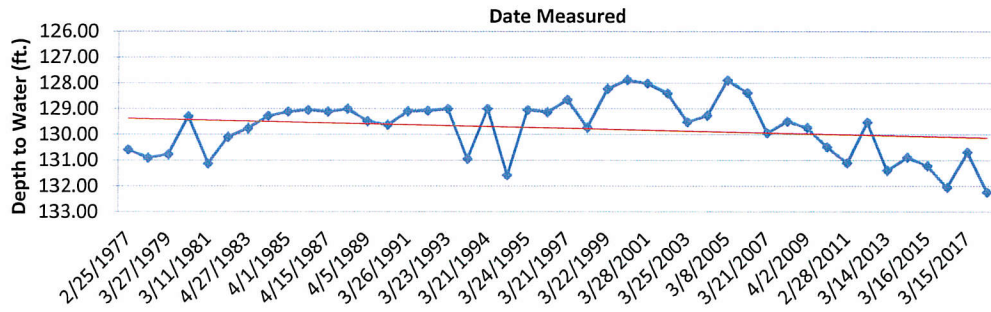
14N 57W 21CCA
5 South 1 East of Bushnell
Ogallala Formation
Fully Appropriated Subarea



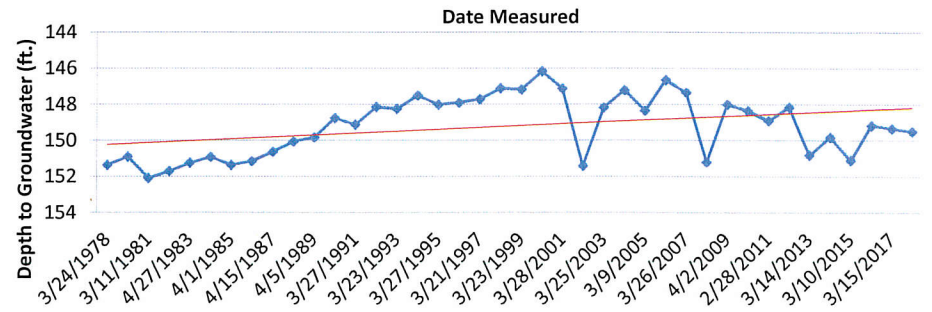
14N 54W 22CA
4 South 1 West of Dix
Ogallala Formation
Fully Appropriated Subarea



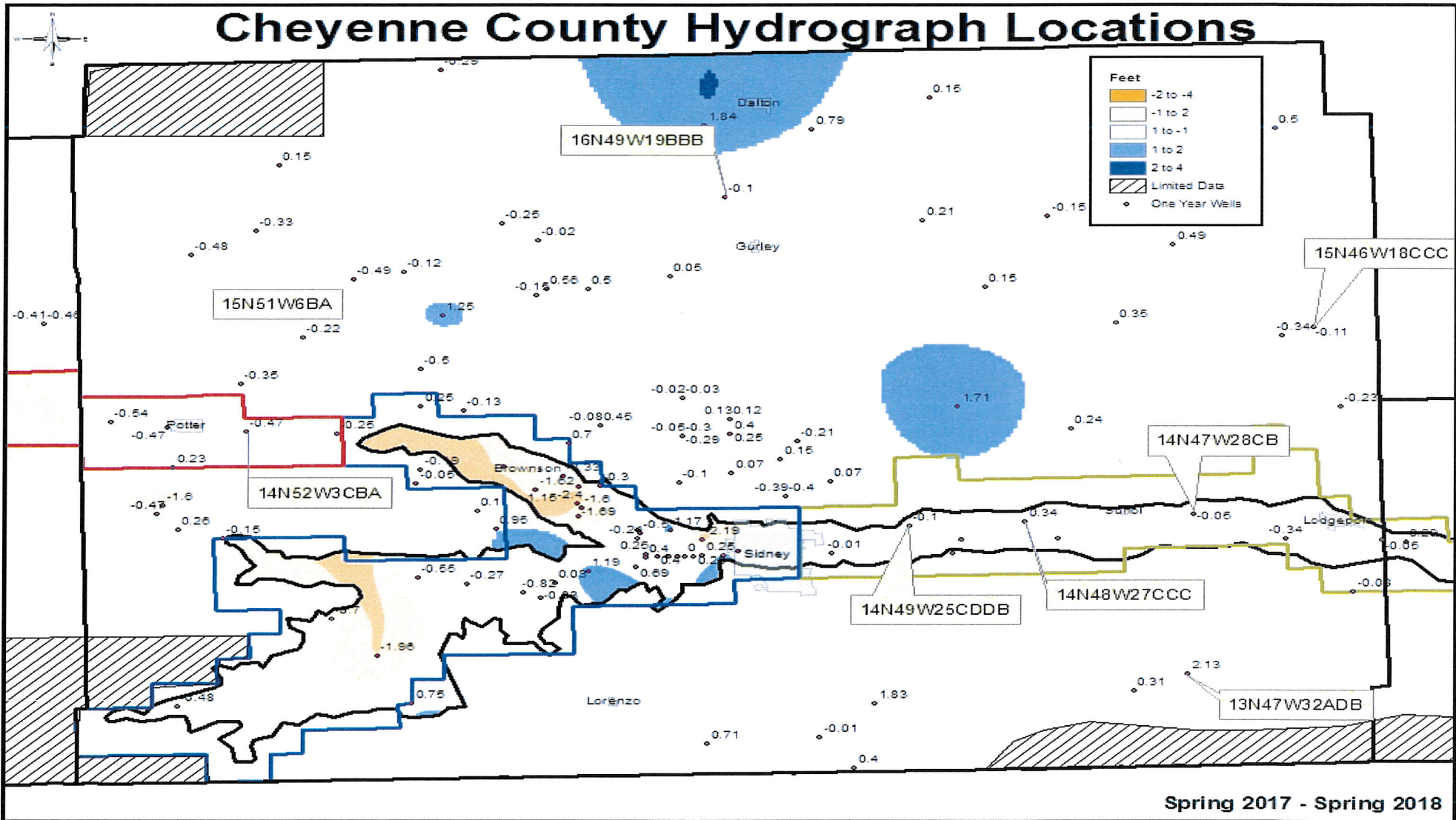
15N 57W 6AAA
5 North of Bushnell
Ogallala Formation (North Table)
Fully Appropriated Subarea



16N 56W35BCD
6 North 3 West of Kimball
Ogallala Formation
Fully Appropriated Subarea (North Table)

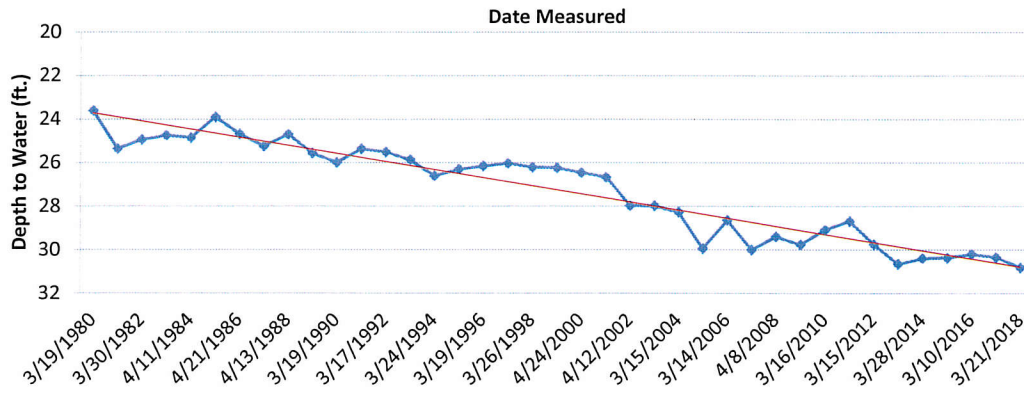


Cheyenne County Hydrograph Locations

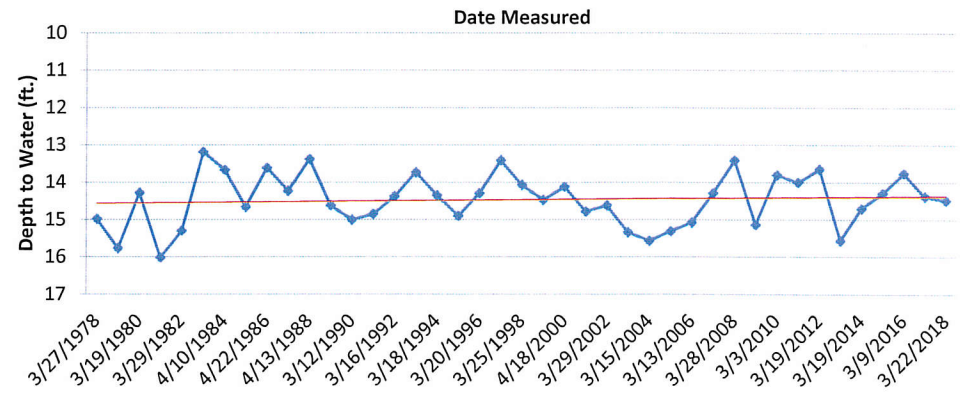


Spring 2017 - Spring 2018

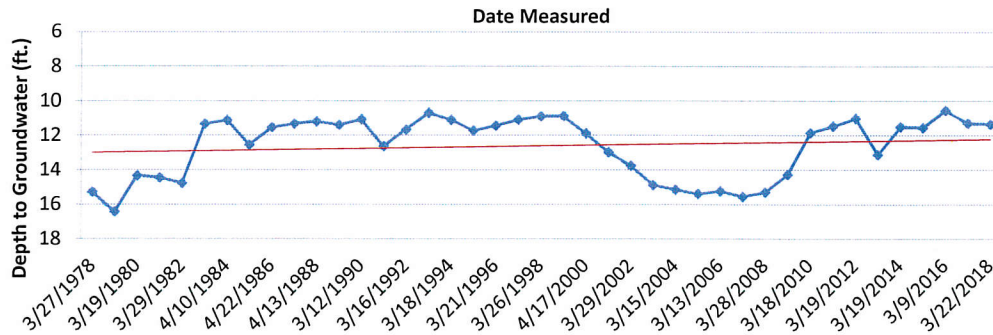
14N 52W 3CBA
 2 East of Potter
 Ogallala Formation
 Oliver Reservoir to Buffalo Bend subarea



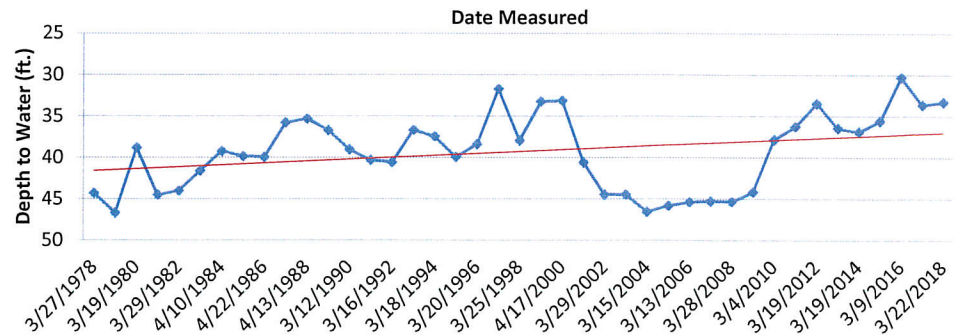
14N 49W 25CDDB
 7 East 1 North of Sidney
 Brule Formation
 Sidney to Colorado Subarea



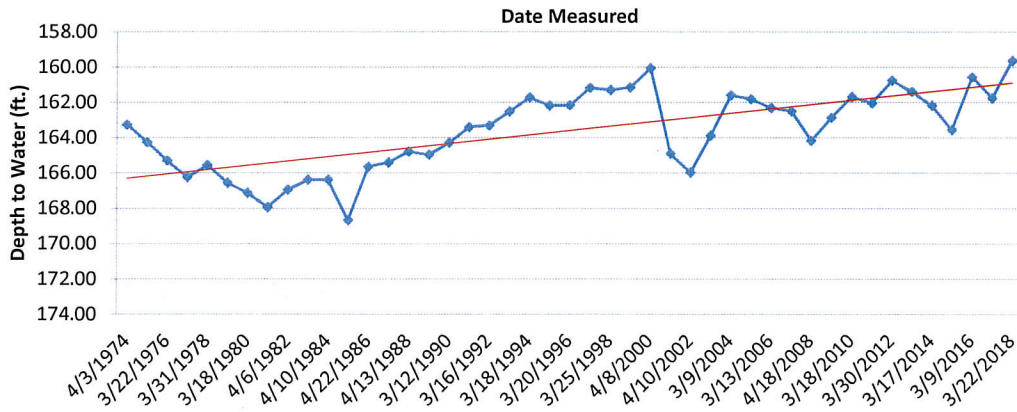
14N 47W 28CB
 2 East of Sunol
 Brule Formation
 Sidney to Colorado Subarea



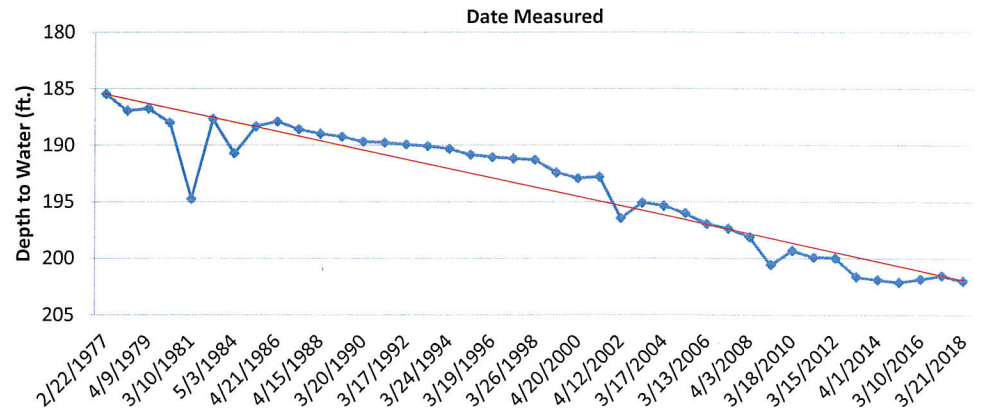
14N 48W 27CCC
 2 West of Sunol
 Brule Formation
 Sidney to Colorado Subarea



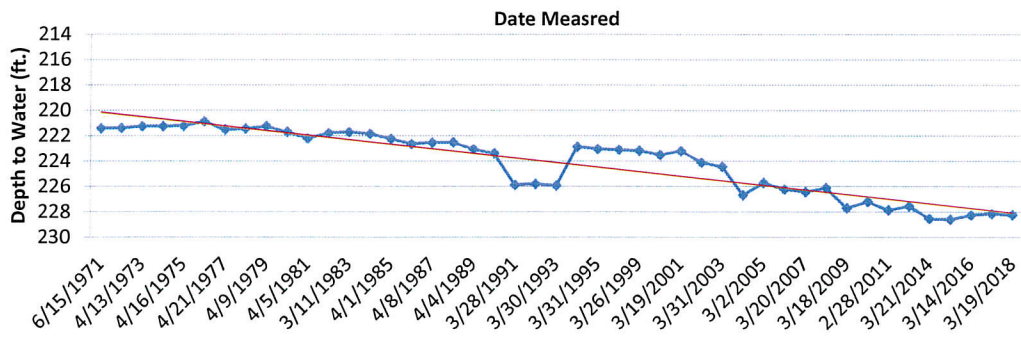
13N 47W 32ADB
6 South 4 West of Lodgepole
Ogallala Formation
Fully Appropriated Subarea (South Table)



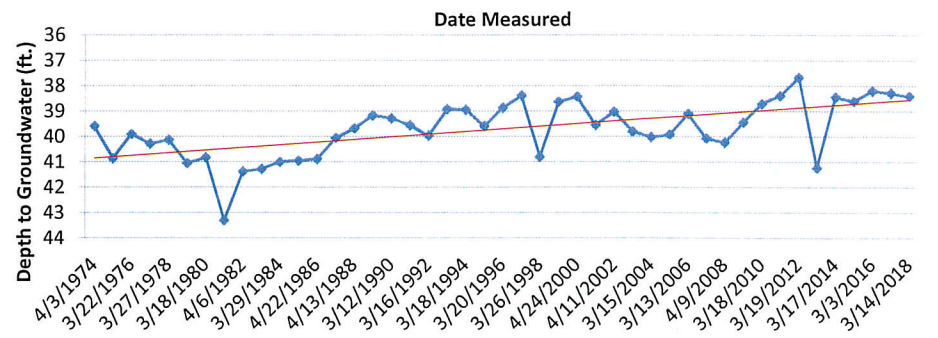
15N 51W 6BA
6 North 5 East of Potter
Ogallala Formation
Fully Appropriated Subarea (North Table)



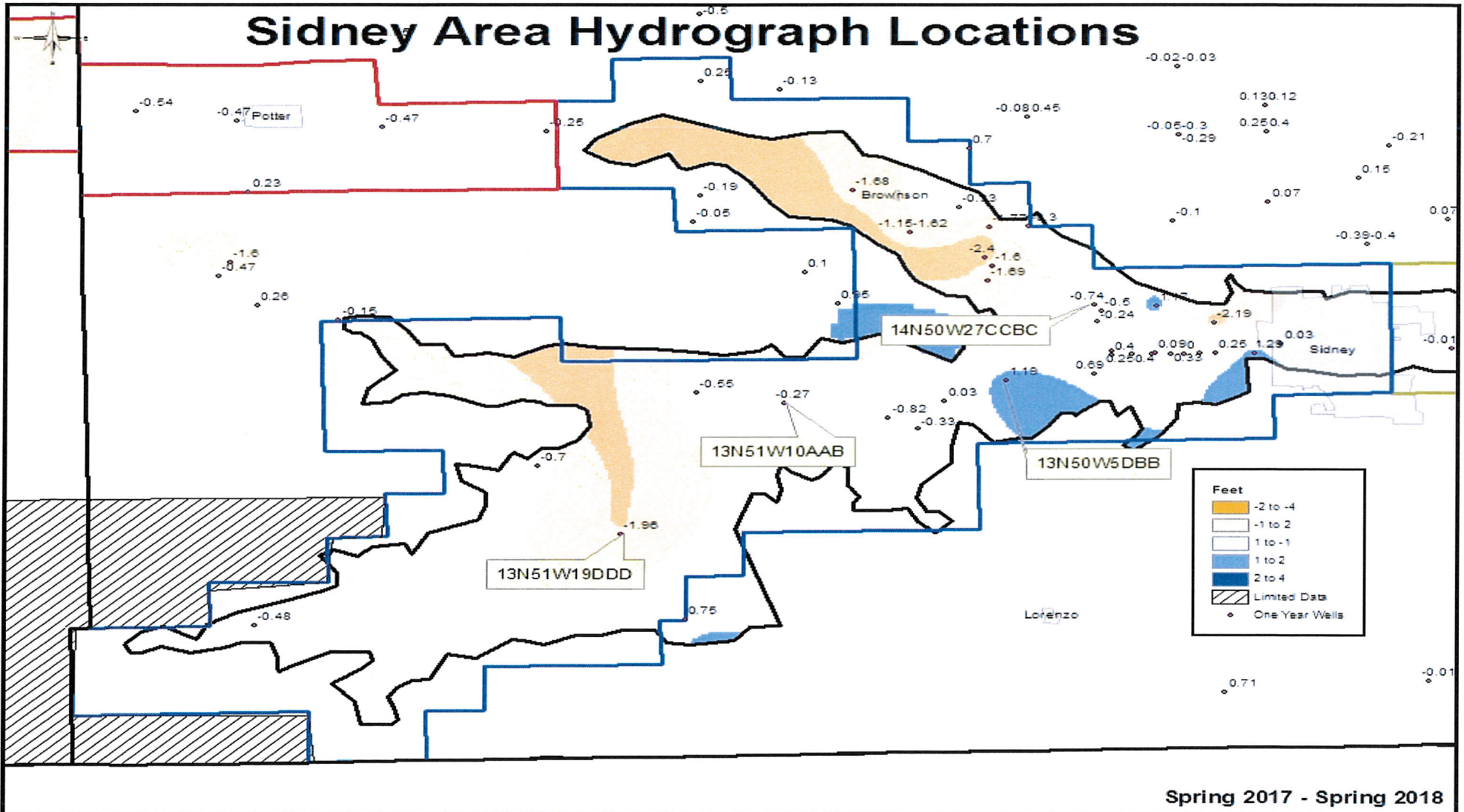
16N 49W 19BBB
2 North 1 West of Gurley
Ogallala Formation
Fully Appropriated Subarea (North Table)



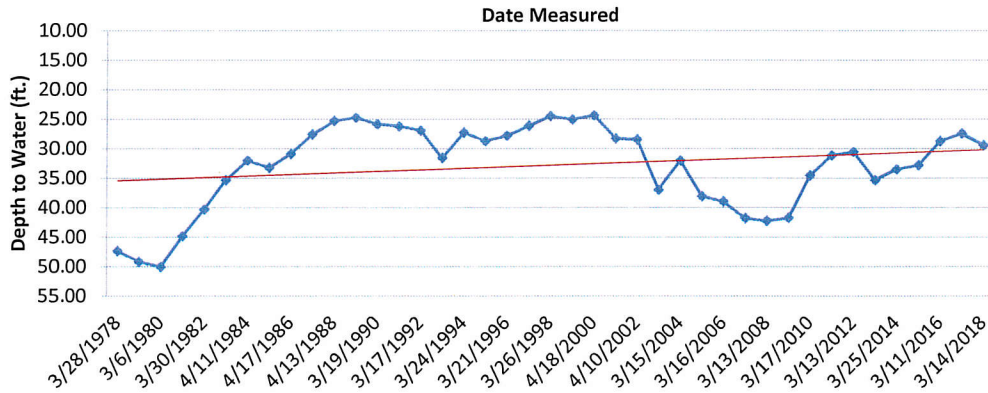
15N 46W 18CCC
8 North 1 West of Lodgepole
Ogallala Formation
Fully Appropriated (North Table)



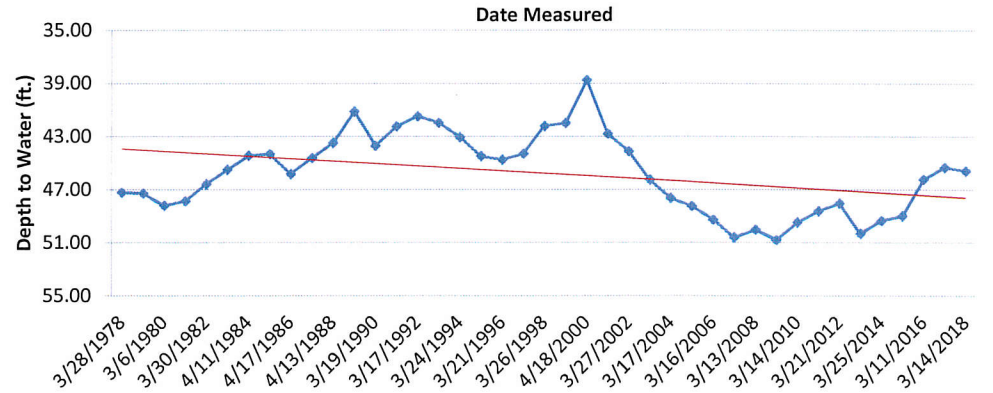
Sidney Area Hydrograph Locations



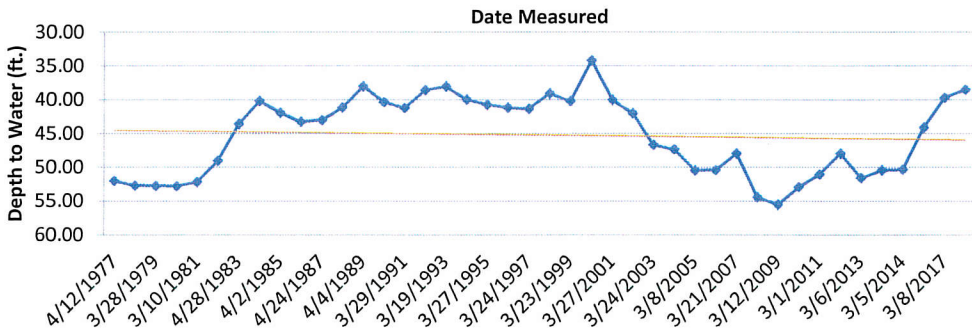
13N 51W 19DDD
4 South 11West of Sidney
Brule Formation
Buffalo Bend to Sidney Subarea



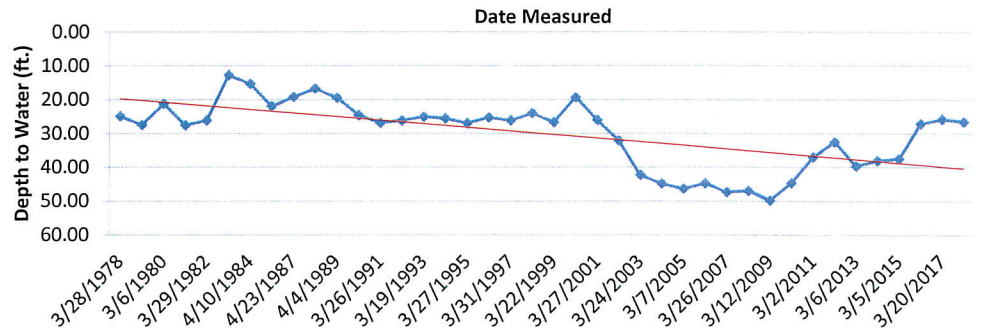
13N 51W 10AAB
1 South 8 West of Sidney
Brule Formation
Buffalo Bend to Sidney Subarea



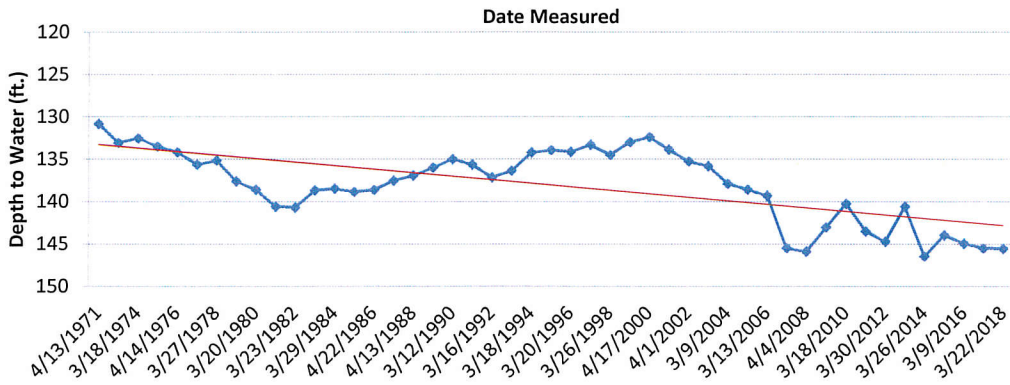
13N 50W 5DBB
4.5 West of Sidney
Brule Formation
Buffalo Bend to Sidney Subarea



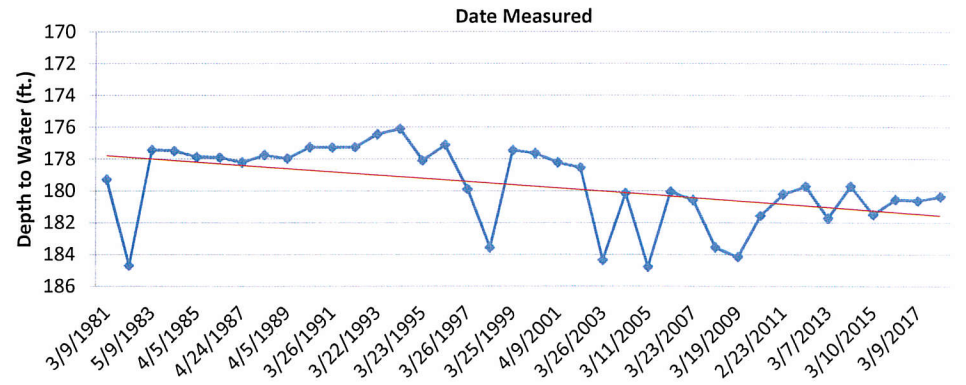
14N 50W 27CCBC
3 West of Sidney
Brule Formation
Buffalo Bend to Sidney Subarea



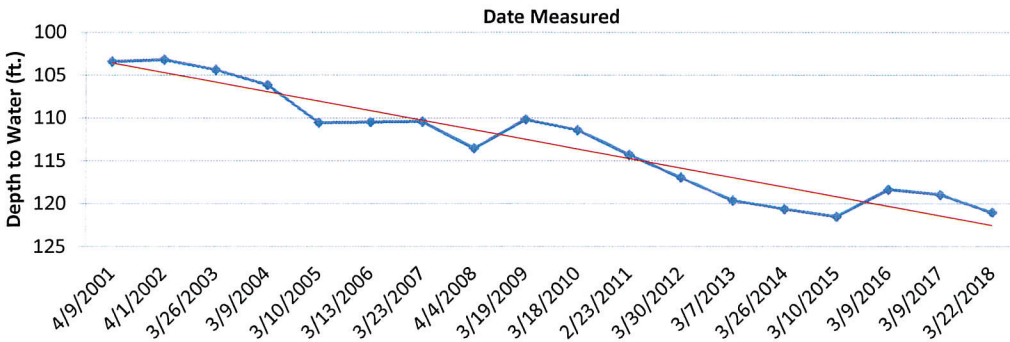
13N 42W 29AAA
 4 West 1 North of Big Springs
 Ogallala Formation
 South Platte Valley Subarea



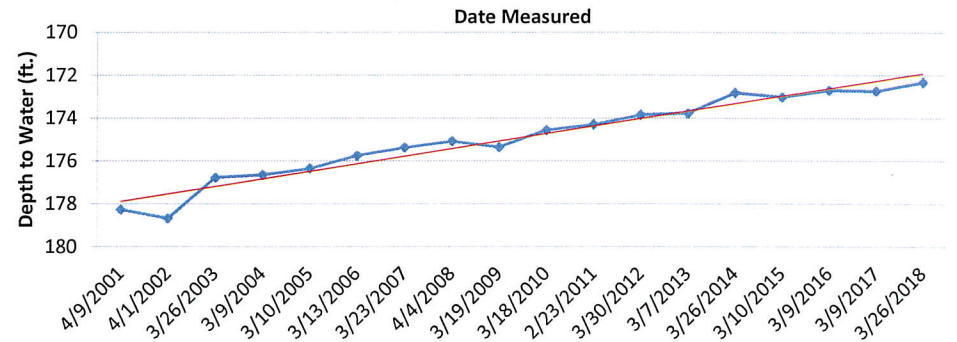
13N 45W 34CC
 3 South of Chappell
 Ogallala Formation
 Full Appropriated Subarea (South Table)



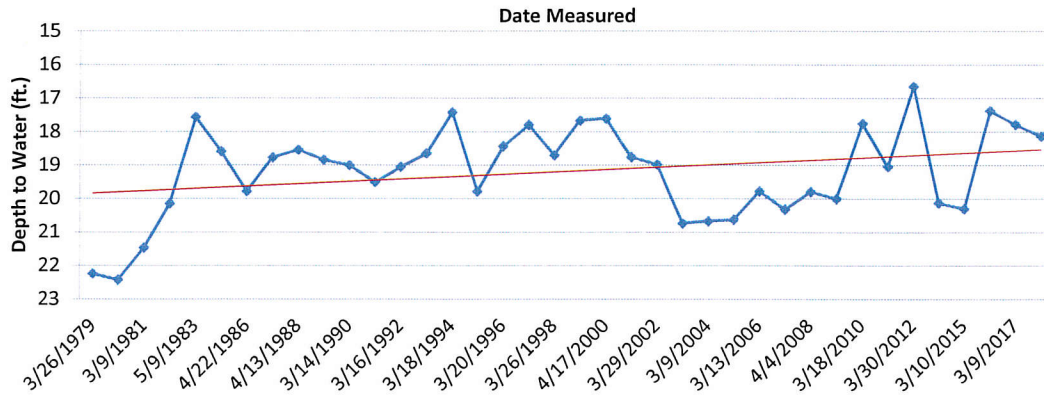
13N43W30BCBC
 8 East 1 South of Chappell
 Ogallala Formation
 Fully Appropriated Subarea (North Table)



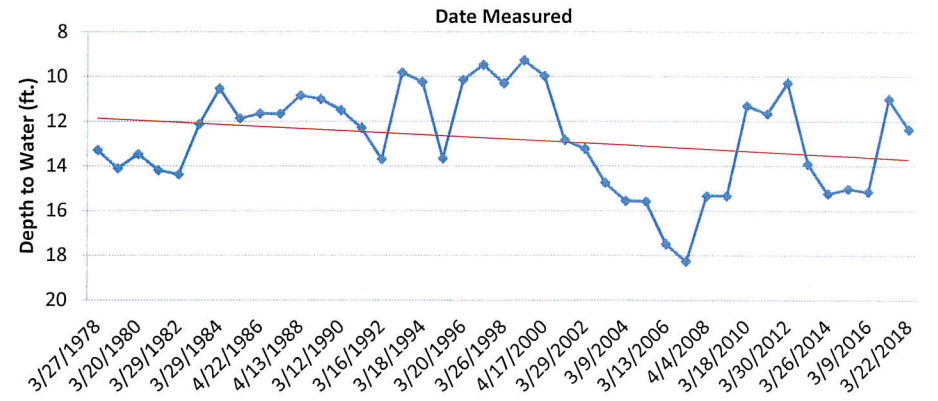
14N44W1CADD
 9 North 7 East from Chappell
 Ogallala Formation
 Fully Appropriated Subarea (North Table)



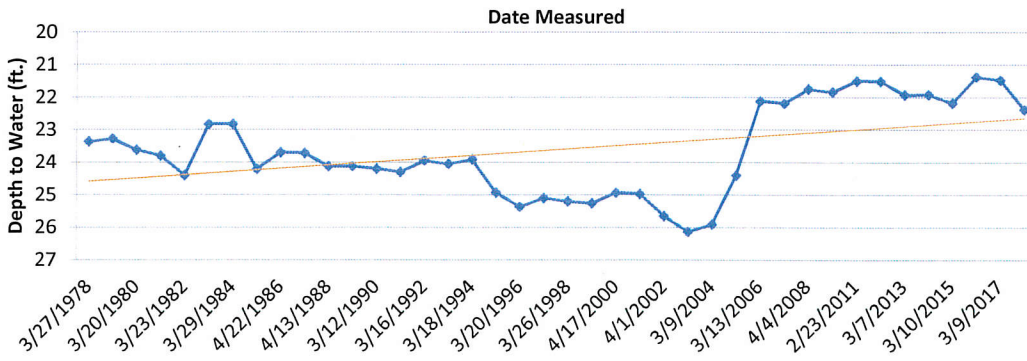
13N 45W 22BAB
in Chappell by viaduct
Brule Formation
Sidney to Colorado Subarea



12N 44W 18BB
1 North of CO/NE State Line
Brule Formation
Sidney to Colorado Subarea



12N 43W 24BB
4 South 6 West of Big Springs
Alluvium/Ogallala Formations
South Platte Valley Subarea



12N 42W 3DDD
2 South 1 West of Big Springs
Alluvium/Ogallala Formations
South Platte Valley Subarea

