Lower Elkhorn Natural Resources District (LENRD)
2012 Spring Groundwater Level Report

Mike finished our Spring Well Measurements. This being the first time in two years Mike has had to measure the observation wells. Mike measured the depth to water in approximately 243 wells this spring to estimate the quantity of our groundwater supplies. Two of these wells were excluded due to conditions of the well.

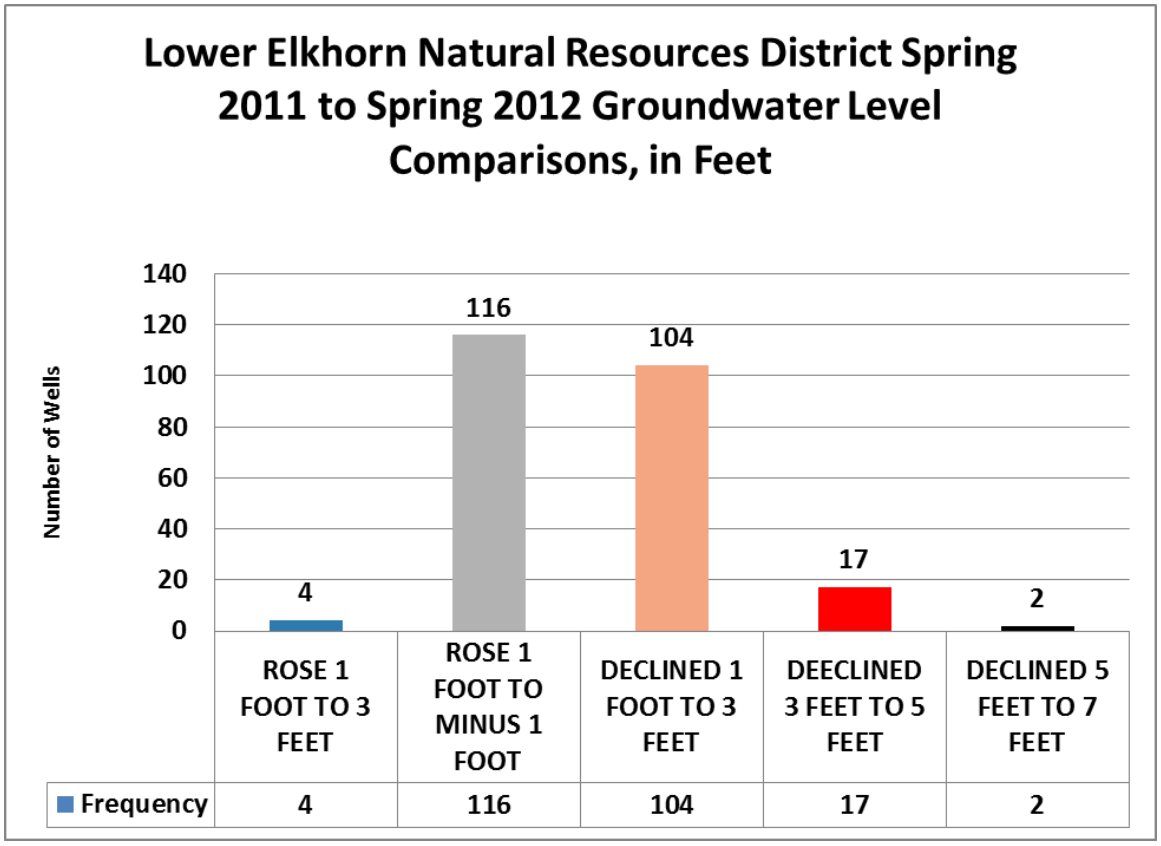
Spring measurements provide us with an idea of groundwater levels for estimating the groundwater's stable, non-pumping level. The geology in northeastern Nebraska is complex, making a district-wide assessment of groundwater conditions difficult, but the following statistics can give us a general feel for what Mike found in the irrigation wells they measured.

In reporting the water levels for this year; staff thought we should do the grouping a little different so you can see what the range of water levels was. We started a range from "Rose 1 Foot To Minus 1 Foot." Then we created ranges for the following:

Rose 1 Foot to 3 Feet – 4 Wells
Rose 1 Foot to Minus 1 Foot – 116 Wells (32 Positive/83 Negative/1 – No Change)
Declined 1 Foot to 3 Feet – 104 Wells
Declined 3 Feet to 5 Feet – 17 Wells
Declined 5 Feet to 7 Feet – 2 Wells

- Of 243 wells, 206 wells had a **decline** in groundwater levels from Spring 2011 to Spring 2012. Of the 206 wells, 83 declined from 0 to 1 Foot. 104 wells declined from 1 Foot to 3 Feet; 17 Wells declined from 3 to 5 Feet. The biggest drop was a well in Burt County that was -5.83 feet lower than last Spring.
- Of 243 wells, 36 wells had **higher** groundwater levels from Spring 2011 to Spring 2012. Of the 36 wells, 32 wells rose from 0 to 1 Foot. Four wells rose from 1 Foot to 3 Feet; the largest increase was a well in Dodge County, which was 2.09 Feet higher than last Spring as shown on the map.
- One well didn't change in water levels; this well is located in Knox County and is a deep well, having to go just over 250 feet to water.

Each well is measured twice and the accuracy has to be within 3 hundredths of a foot for each well which is the same accuracy we always strive for when measuring the wells.


Lower Elkhorn Natural Resources District Spring 2011 to Spring 2012 Groundwater Level Comparisons, in Feet
Number of Wells
140
120
100
80
60
40
20
0
4
116
104
17
2
ROSE 1 FOOT TO 3 FEET
ROSE 1 FOOT TO MINUS 1 FOOT
DECLINED 1 FOOT TO 3 FEET
DEECLINED 3 FEET TO 5 FEET
DECLINED 5 FEET TO 7 FEET
Frequency
4
116
104
17
2

Predevelopment Levels

This spring, investigations were made on changes of water levels from predevelopment to spring 2012. Again, 243 wells were measured and of these, 79 don't have predevelopment levels. One well was excluded due to the condition of the well. Of the predevelopment numbers used, the source data comes from the Groundwater Management Plan, 1996 Revision.

What is predevelopment?

The Lower Elkhorn NRD has adopted triggers and actions to protect groundwater quantity. Triggers are actuated when groundwater elevations drop to specified levels. When a trigger is actuated, the NRD will begin a series of actions to protect groundwater quantity supplies or to remediate existing groundwater quantity problems. These proactive actions consist of several phases, called action levels that respond to worsening conditions with increasingly rigorous corrective measures. Each action level has its own triggering mechanism, so that changing conditions will trigger new action levels. The controls used in the action levels include various methods of restricting the amount of water that may be pumped from the groundwater reservoir. The Lower Elkhorn NRD groundwater quantity protection triggers are based on the groundwater levels that existed before widespread installation of groundwater removal methods (such as irrigation wells). These groundwater levels must be estimated and are referred to as predevelopment levels.

The District will initiate actions when groundwater levels in an area drop 15 feet below predevelopment estimates for that area for a period of 5 to 7 years. If the controls used in the management area are not effective and ground water levels continue to drop, more restrictive actions will be initiated when groundwater levels drop 20 feet below predevelopment estimates for 3 to 4 years after the establishment of Action Level 2.

When a problem is detected by the groundwater quantity monitoring program, Action Level 1 will be triggered and groundwater level monitoring will be intensified (more wells will be measured) in that area. If the intensified monitoring documents that a groundwater level depletion problem exists in the area, Action Level 2 will be established which will require volume monitoring of wells and the use of one or more ground water management practices as outlined on page 103. If groundwater levels do not stabilize with these regulations, Action Level 3 will be triggered and additional groundwater management practices will be required.(Source: Groundwater Management Plan; Lower Elkhorn Natural Resources District, 1996 Revision. Pg. 100-101)

Of 165 wells, 51 had a decline in ground water levels from predevelopment to spring 2012. Of the 165 wells, 22 declined more than 2 Feet. The biggest decline was a well in Colfax County that declined -14.09 Feet. A monitoring well has been placed in the vicinity of the irrigation well and equipment is installed to record the water levels this summer. Also, 17 wells declined from 0 to 1 Foot and 2 wells declined from 1 to 2 Feet.

Of 165 wells, 114 wells had an increase from predevelopment to spring 2012. Of these 114 wells, 95 rose more than 2 feet. The largest rise was a well in Cuming County rising 44.39 feet. This well in Cuming County is where another monitoring well has been installed nearby and equipment will be placed to record water levels. Other wells that rose are 8 from 0 to 1 feet, 11 wells from 11 to 12 feet.