H2infO

CHENEY LAKE WATERSHED, INC

Citizens Working for Clean Water

Winter 2013

What Causes a Drought?

By Howard Miller

So what causes a drought? Is it lack of rain or lack of moisture? At first this may sound like the question so often asked, "Which comes first - the chicken or the egg?"

We all know that lack of rain causes a drought. Or is it too much evaporation? Simply put, when you evaporate more moisture than you add, you have a moisture deficit. A moisture deficit over time, no matter how small, will create a drought to some degree.

Let's back up and define "drought". Webster's Dictionary defines a drought this way: a period of dryness especially when prolonged. By that definition all of us in Central Kansas are in a drought. None of us have any control over how much rain falls from the sky, but we can control how much we capture on our farm.

How receptive to rain are the soils on our farm? Soil types can affect that to a certain degree, but to a larger degree it's soil porosity. Porosity is simply looking at how open the pores are in the soil and how readily water percolates down through the soil layers.

You might think I am suggesting that you go out and drill holes in your soil to let the water percolate or soak into the soil. In a sense, I am, but not with a drill and drill bit; I recommend using earthworms. Many of our soils once had an ample supply of earthworms, but as we depleted the organic matter in our soil the earthworms died off from a lack of food.

So how can we get the organic matter back and the earthworms with it? We can greatly improve organic matter levels by simply having a living root growing in the soil for much of the year. We have become accustomed to thinking of growing seasons and the fact that we grow a crop for 3 - 6 months and then the land lies idle until the next growing season. The challenge is for us to understand that by extending the growing season to 300 or more days a year, we can begin to store more moisture in our soil.

I know this goes against all logic and at first I thought people who grew cover crops and then told me they had a net gain of moisture had lost their mind. But they had not lost their minds. Instead, they had discovered and unlocked a soil secret that would revolutionize our understanding of soil science.

One of these people that likes to think outside the box is Gene Albers, a Kingman County producer. Gene maintains that by growing cover crops and having more residue, he is able to produce more grain than his neighbor who tills. Gene has discovered that as he intensifies his crop rotations with cover crops between cash crops, he sees increased residue levels and increased yields.

In 2012, Gene was able to grow dryland soybeans that yielded 10 bushels per acre. You may think this is not an outstanding yield until you realize he had very little rainfall and the beans followed a cover crop of oats, barley, triticale, turnips and tillage radishes. Gene says that as his residue levels have increased, his yields have followed that increase. Gene believes that cover cropping is one of the best new practices that have been introduced to farmers in quite some time. Do cover crops make it rain more on Gene's farm? No, cover crops allow Gene to infiltrate and store more of the rain. In a sense you could say Gene has become a better steward of the rain that falls on his farm.

Here is the challenge for all of us: We need to carefully look at how we are using the rain that falls on our farms. If we can incorporate cover crops and store more of that rain, we create less runoff and we get to keep more of the rainfall we received. The bottom line is that all plants need water to grow; so if we capture and store more in the soils on our farms we can grow healthier plants. Healthy soils equal healthy plants which produce healthy yields.

Effects of Groundwater Pumping on Streamflow

Excerpted from USGS Groundwater Resources Program, titled "Streamflow Depletion by Wells—Understanding and Managing the Effects of Groundwater Pumping on Streamflow" and is available in print and online at http://pubs.usgs.gov/circ/1376/ .

Groundwater provides drinking water for millions of Americans and is the primary source of water to irrigate cropland in many of the nation's most productive agricultural settings. Although the benefits of groundwater development are many, groundwater pumping can reduce the flow of water in connected streams and rivers—a process called streamflow depletion by wells. The US Geological Survey has released a new report that summarizes the body of knowledge on streamflow depletion.

"Groundwater discharge is a critical part of flow in most streams--and the more we pump below the ground, the more we deplete water flowing down the stream," said USGS Director Marcia McNutt. "When viewed over the long term, it is one big zero-sum game."

Groundwater and surface-water systems are connected, and groundwater discharge is often a substantial component of the total flow of a stream. Wells capture groundwater that would otherwise discharge to connected streams, rivers, and other surface-water bodies.

"Managing the effects of streamflow depletion by wells is challenging, particularly because of the significant time delays that often occur between when pumping begins and when the effects of that pumping are realized in nearby streams." said Paul Barlow, USGS hydrologist and author of the report.

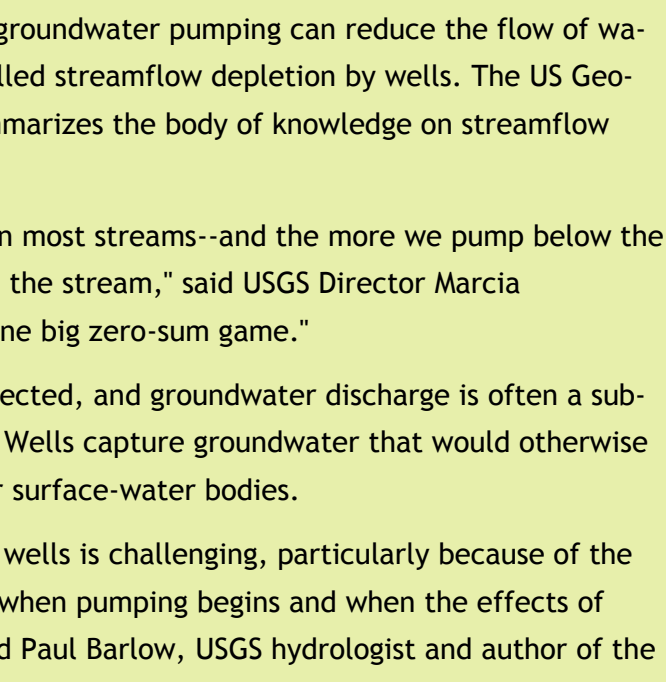
Major conclusions from the report:

- Individual wells may have little effect on streamflow depletion, but small effects of many wells pumping within a basin can combine to produce substantial effects on streamflow and aquatic habitats.
- Basinwide groundwater development typically occurs over a period of several decades, and the resulting cumulative effects on streamflow depletion may not be fully realized for years.
- Streamflow depletion continues for some time after pumping stops because it takes time for a groundwater system to recover from the previous pumping stress. Full recovery of the groundwater system may take decades to centuries.
- Streamflow depletion can affect water quality in the stream or in the aquifer. For example, in many areas, groundwater discharge cools stream temperatures in the summer and warms stream temperatures in the winter, providing a suitable year-round habitat for fish. Reductions in groundwater discharge to streams can degrade habitat by warming stream temperatures during the summer and cooling stream temperatures during the winter.
- The major factors that affect the timing of streamflow depletion are the distance from the well to the stream and the properties and geologic structure of the aquifer.
- Sustainable rates of groundwater pumping near streams do not depend on the rates at which groundwater systems are naturally replenished (or recharged), but on the total flow rates of the streams and the amount of reduced streamflow that a community or regulatory authority is willing to accept.

WATER PERMIT PROCESSING SUSPENDED IN PARTS OF RENO COUNTY

With aquifer levels dropping in parts of Reno County, the Equus Beds Groundwater Management District has suspended processing of all new water permit applications for at least a year in a portion of the Cheney Lake watershed. The Board voted in October to recommend that Division of Water Resources Chief Engineer David Barfield temporarily suspend the water appropriation application process in this area. The Chief Engineer agreed and signed the order, effective October 10, 2012.

The Board's action does not affect current water permits nor does it affect pending applications that the District staff has already reviewed. Water permit applications can still be filed during the year suspension, but permits will not be approved or denied until the study is finished. Putting applications on hold will give District staff time to review the area to determine if the current regulations governing approval or denial of applications are adequate.



Enhanced Well Spacing Area & Application Review Suspension Area

The District has requested that applications filed on or after October 10, 2012 in the following areas be suspended for processing for up to one year:

Township	Range	Section
23 South	6 West	31, 32, 33
23 South	7 West	31-36
24 South	6 West	4-9, 13-36
24 South	7 West	1-36
25 South	5 West	30, 31
25 South	6 West	1-36
25 South	7 West	1-36
26 South	5 West	6-8,17-21,27-35
26 South	6 West	1-36
26 South	7 West	1-36

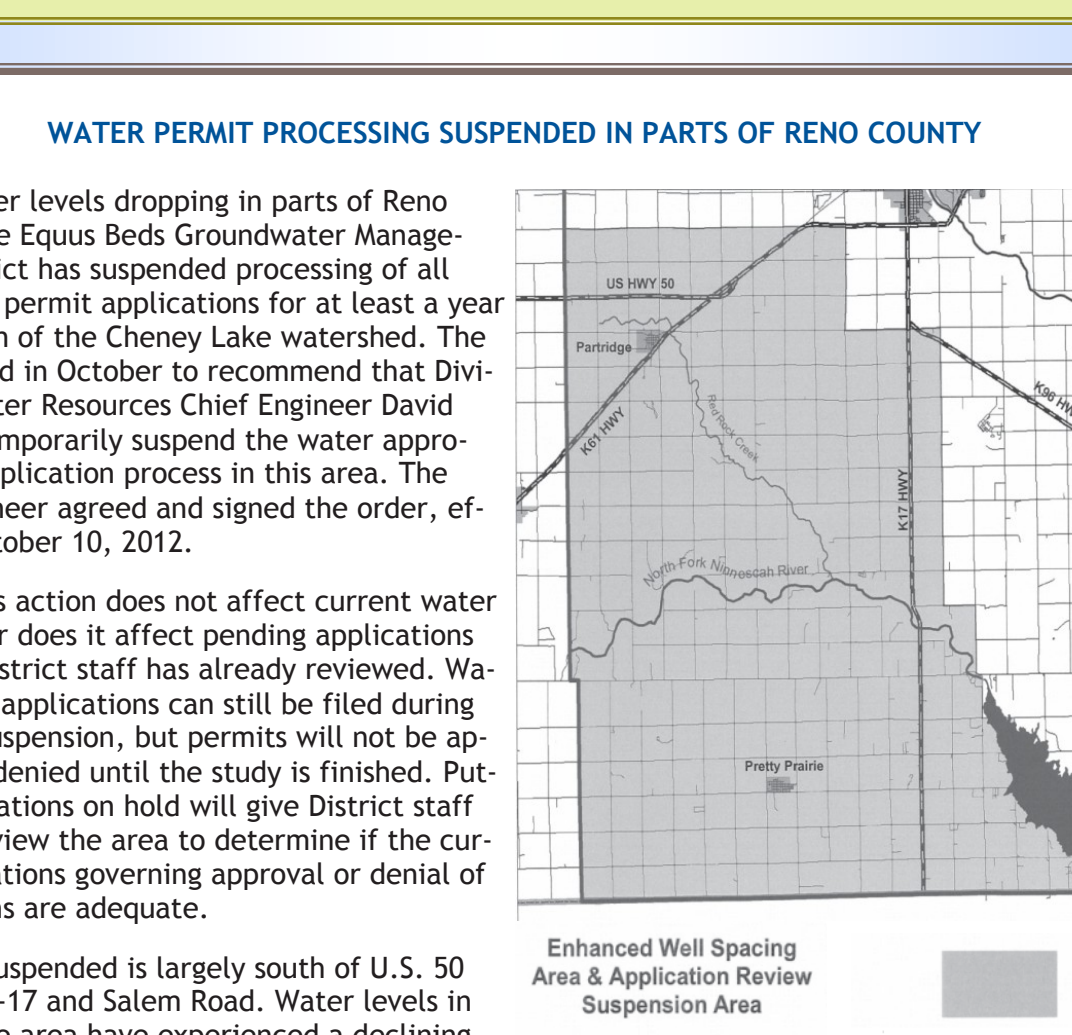
The area suspended is largely south of U.S. 50 between K-17 and Salem Road. Water levels in parts of the area have experienced a declining trend in the past 12 years. Drought the past two years has triggered an increase in applications for irrigation permits. From January 1, 2011, through October 1, 2012, agriculture producers have filed 23 new irrigation water permit applications in this area, including eight in the Pretty Prairie area, and 15 in the Partridge area, with the North Fork of the Ninnescah River dividing these two areas.

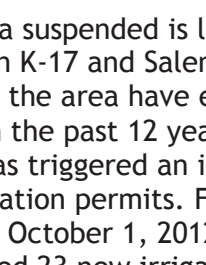
Several additional applications were filed prior to the October 10, 2012 date, and the concern is that any more development could exasperate the problem. Staff will review the area to see if there should be any more development allowed or if any modifications to the safe yield calculations are needed to prevent further groundwater declines and impairment of existing water rights.

Upcoming Events

- Monday, Jan. 28th—Grazing Meeting featuring Doug Peterson, State Soil Health Conservationist, Missouri NRCS
- Thursday, Feb.7th—Annual Meeting, featuring Mary Knapp, State Climatologist
- Thursday, Feb. 21st—Grazing Meeting featuring Rancher Panel
- Monday, March 11th & Tuesday, March 12th—The Dust Bowl: a film by Ken Burns, at the historic Pretty Prairie Civic Theater
- Tuesday, March 12th—SKRCA Soil Improvement Spring Workshop

See Attachment for full details!





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H2infO is published by the Citizen's Management Committee (CMC) of the Cheney Lake Watershed, Inc. and the Reno County Conservation District with funding provided by a U.S. Environmental Protection Agency Section 319 non-point source pollution grant through the Kansas Department of Health and Environment and State Water Plan Funds.

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