

Ogallala Aquifer Myths

Time for TRUTH

About the significance of recent aquifer level
changes from drought

By

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Background

This report documents the initial results of an examination of publicly available data in order to obtain a preliminary (and truthful) understanding of the **FACTS** about claimed depletion of the Ogallala (High Plains) Aquifer.

With the ongoing drought, there has been what is best described as **NEAR PANIC** on the part of various individuals, entities, and organizations in Nebraska who are in some way involved in water policy matters. This **NEAR PANIC** has resulted in drastic changes to Nebraska water law, widespread drilling moratoriums, possible expansions of those moratoriums, and probable additional actions by the Nebraska Department of Natural Resources under the provisions of the recently passed LB962 water law. These could result in attempts to restrict groundwater pumping and/or force reductions in irrigated acreage in areas like the central Platte valley where DNR is getting ready to declare “fully appropriated” and/or “over appropriated” status to large areas of the Platte river basin.

Any and all of these actions harm the near and long-term economic interests of agricultural landowners, producers, and in fact the economy of the entire state of Nebraska.

The question that needs to be asked and answered is:

Are these harmful actions warranted due to long-term considerations surrounding aquifer depletion – **based on SOUND SCIENCE and SOUND ENGINEERING PROOF** that there is truly a problem?

General Conclusions

The information which is contained in the balance of this report leads to the following conclusions and comments.

An examination of water level readings in Dawson County for the period from 1930 to 2004 does not suggest that the aquifer is being significantly depleted when compared to the long-term historical levels.

There is data to support claims that the aquifer water levels have been declining sharply in recent years. The last several years do show the aquifer levels have recently been declining.

BUT, this is only part of the story. The entire story needs to be understood.

However, a broader look at the available data going back to the 1930s/1940s provides a very different perspective. When longer-term data is examined, it appears the recent declines do not indicate a problem with long-term supplies from the aquifer.

In fact, it appears that the aquifer levels beginning in the early to mid 1980s represent an unusually high level of storage in the aquifer, which has resulted from an intense recharge from the unusually moist period of the 1980s.

In fact, the aquifer's recent decline is simply returning the storage to the point where the long-term historical levels have been.

This does NOT represent a clear reason for the extreme levels of concern being expressed by certain agencies and individuals that would lead one to believe the aquifer depletion is serious and "the sky is falling".

Instead, it appears that the various entities and individuals who would lead us to believe that "the sky is falling" have completely failed to understand the real situation. **The reality is that the aquifer is simply returning to the levels it has normally experienced in the past after being unusually well charged during the 1980s.** Mother Nature does behave this way. Furthermore, engineers with competence in design and evaluation of dynamics of systems [which probably does NOT include hydrologists – at least the ones that have been involved in this work] will tell you that all physical things respond to physical shock in this manner. The aquifer has experienced the equivalent of a "shock" from the large infusion of moisture in the 80s and is merely recovering back to it's equilibrium state.

Therefore, the claimed problem with the aquifer levels seems to be a problem with the way the situation is being evaluated and portrayed – and not truly a problem with the aquifer.

Approach/Methodology/Discussion

Water level data was first obtained from the Central Platte Natural Resources District (CPNRD). This data covers a time period beginning in 1982. My intent was to further understand reports from CPNRD that portions of the district were showing water level increases while others were showing decreases. This really represents a relatively short period of time.

I began evaluating this data for some of the monitoring wells in Dawson County. Dawson County was the initial choice because of my land ownership there, coupled with indications that the drilling moratorium area there is to be considered for expansion due to an expected action by DNR to declare that part of the Platte Basin to be “over-appropriated” under the provisions of LB962. This could result in drastic measures which could harm landowners and producers. It is a potentially serious matter.

All the data I looked at shared a common trend – the increasing levels during the 80’s and 90’s, followed by declines in the late 90s/early 2000s. I began to search for pre-1982 data for these same observation wells and found some of that in the USGS and Nebraska DNR databases.

An evaluation of data for 1977 to 1982 for sample sites also showed a common characteristic. These levels were generally stable – and LOWER THAN that in the time period covered by the CPNRD data. It appeared to me that I had possibly found yet another trend – lower and stable levels prior to the 1982 and later period being used by CPNRD for decision-making. So, more questions still needed to be answered.

A representative plot of this data is shown in Figure 1 below.

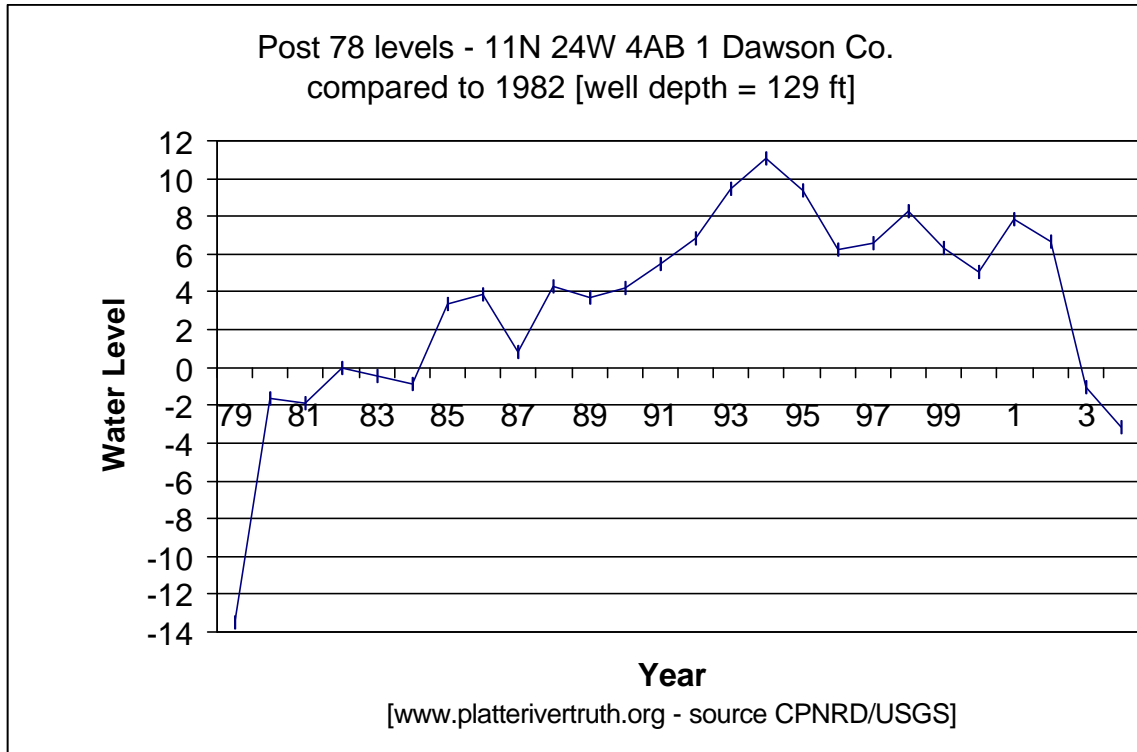


Figure 1: Representative Dawson Co water levels changes monitored by CPNRD

The next logical step was then to look for truly long-term data going as far back as possible. This should provide a better understanding of whether the period from 1982 and later is typical of the aquifer's condition.

I started to look for data which covered the period from the late 1990s back to 1930s/1940s which the “professionals” call “pre-development”. The USGS and Nebraska DNR databases were used for this search and concentrated on Dawson County for the previously stated reasons. The USGS data is more complete and comprehensive than the DNR or CPNRD data. And, it is easier to use to assess general trends, which is the purpose of this work.

There are very few sites that offer a long-term set of data covering the period of interest. This actually poses another question about just how the “professionals” are determining what the “pre-development” level of the aquifer is – at least with any confidence. That is beyond the scope of this work, however, but does need to be remembered.

There are two sites in Dawson County that do have long-term data with few gaps from the late 1940s to the late 1990s. These two sites are very close to each other (in fact, in the same section), are of moderate depth, and are several miles north of the Platte River.

Data from one of these two representative sites is shown below in Figure 2.

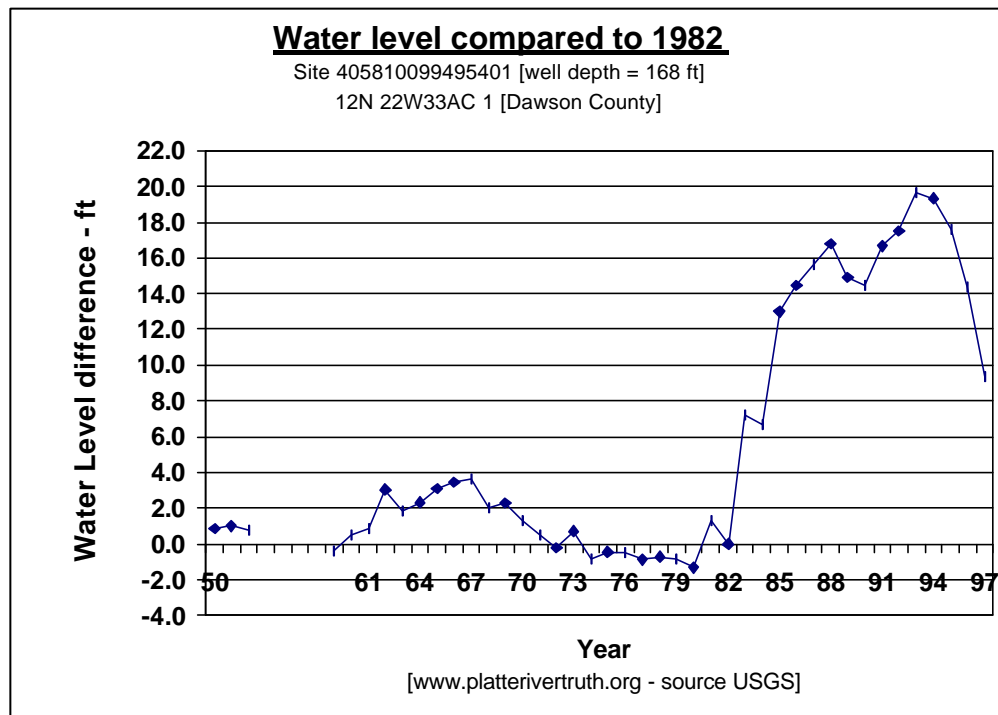


Figure 2: Long-term Dawson Co. water level changes

This plot clearly shows that the water level of the 80s and 90s is NOT typical. It also shows the effect of a somewhat wet period in the 60s and the dry period of the 70s with the resulting increased and lowered water levels respectively. Unfortunately, there is no data to show the effect of the drought of the mid to late 50s. The effect of the unusually wet period of the 80s on the aquifer levels is vivid, as is the end of that period and the beginning of the present drought.

While the data from the late 1940s does cover the period prior to the primary period of development

of groundwater resources, it would still be preferable to have data from the 1930s or earlier to obtain the longest possible understanding of the aquifer water levels. There is some data available in the USGS database, but it does require some interpretation and what might be called “bridging” to later data from other locations in Dawson County.

The available data to allow this “bridging” between the two data sets is in figure 3 below. This “bridge” is done using a commonly accepted method of generating relative comparisons when data is separated in time, as long as there is a common period between two sets of data being “bridged”. In this case, the 1952 date is common to that of both data sets and the previous data of figure 2 shows that 1952 readings were similar to 1982, so the common reference used in below figure 3 is the 1952 year data.

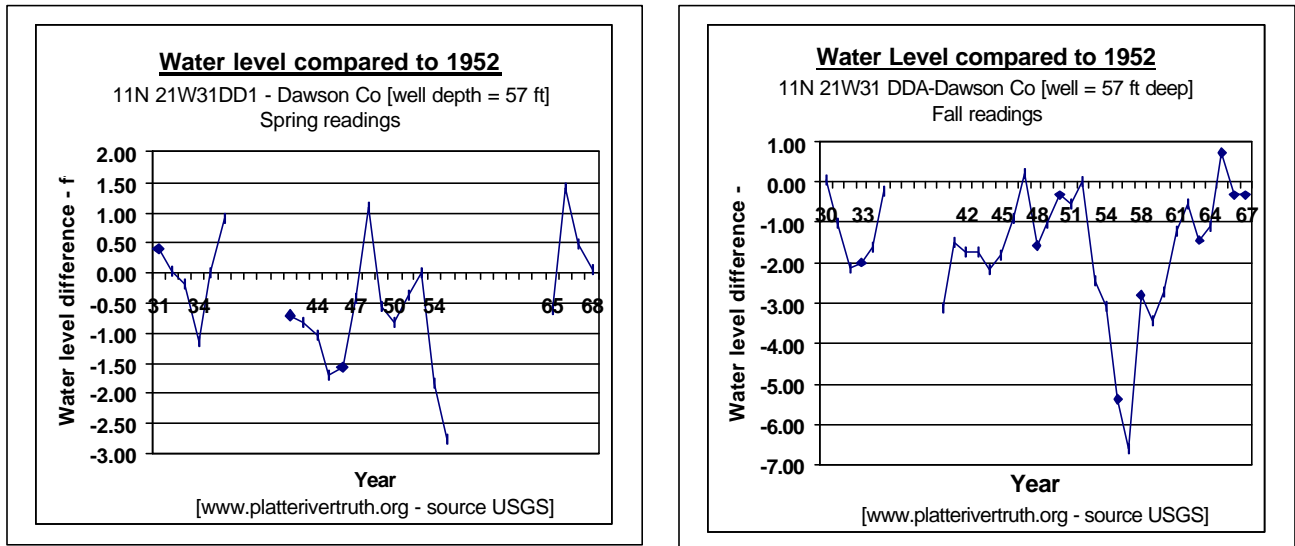


Figure 3: Representative pre-1950 levels

The data of Figure 3 suggests that the water levels prior to the 1950s/1960s also remained relatively stable and lower than the levels of the 1980s. It also reflects the drought of the 1950s with the sharp reduction in levels. The effect is probably more noticeable due to the relatively shallow depth of this well at 57 ft compared to the data of figure 2 for the 168 ft deep well.

Therefore, available data from credible sources such as USGS indicate that the period of the 1930 to early 1980s was a relatively stable period, with some changes appearing due to drought of the 1950s and 1970s. Those small reductions in levels all recovered quickly. Then, beginning in the 1980’s there was an abnormally high level of the aquifer, probably resulting from an unusually moist period.

RECOMMENDATIONS

There is NOT clear and credible scientific proof that a recent decline in measured water levels represents a true and credible long-term threat to the future of the Ogallala Aquifer.

It is apparent that the assessment of aquifer levels, as it relates to establishing sound water policy in Nebraska has been done without a proper assessment of the long-term historical situation. **The entities tasked with this responsibility have failed to properly use their own data in a manner that would normally be considered sound from a scientific and engineering perspective. These entities must be forced to stop misleading the public as they currently are doing by ignoring the long-term nature of the situation. It is time for sound scientific and engineering principles to be applied with a long-term view of this situation. This misleading situation must be corrected immediately.**

These entities have failed – either deliberately for political reasons or through a failure to adequately examine the situation from a sound scientific and engineering viewpoint – to realize that the natural aquifer storage cycle simply appears to be reversing itself back to a normal state. And, at the same time, they have clearly failed to so inform the public.

It is time these entities such as Nebraska DNR, Central Platte NRD, and others be forced to OBJECTIVELY AND RATIONALLY examine the facts of the matter. They must not just look at recent data and cause others to become unnecessarily alarmed by a failure to properly assess the overall long-term situation.

It again appears politics and desire for control may have again closed the eyes of people who claim to be scientists and engineers and the outcome of their “professional” work appears to be incorrect.

It is time that politicizing of this process be stopped – and immediately. There is simply no good reason for this "panic".

Those who would control water use have either “missed the truth” or are deceiving the public.

This author cannot understand how it is that “professionals” who are highly paid to advise public officials on these matters could have simply “overlooked” the long-term situation that this author has rather easily observed by simply examining the data available from those same organizations employing these “professionals”.

If this author’s conclusions are correct – and available data clearly supports these conclusions – then the system of public entities has broken down and failed to do a responsible job for the public whose tax dollars pay them!

It is highly probable that politics has been injected into this collection of public organizations, elected and appointed officials, and has caused the process to become so politicized that the “professionals” are simply acting from political considerations and NOT sound scientific and engineering principle.

This data - all from credible sources clearly suggests that there is no sound basis for extreme measures to be taken. The "professionals" are effectively misleading the public by only discussing and acting on a limited period of time, which is NOT REPRESENTATIVE of the situation.

AND, FINALLY:

When this analysis is combined with others previously done, it is this author's conclusion that the process of analysis and decision-making on water issues in the state of Nebraska has essentially collapsed. It is nothing more than a political process that is being misused. Sound scientific and engineering principles and methodology are no longer being correctly applied.

The public affected by these flawed decision-making processes deserves far better than this. The future of the entire Nebraska economy is being jeopardized by this completely dysfunctional and political process.

It is time the public demand the WHOLE truth, which they have NOT been getting.

In the meantime, the public should reject extreme measures which are likely to be pursued by Nebraska DNR and other entities, including some of the Natural Resource Districts.

**IT IS TIME FOR TRUTH TO BECOME THE BASIS FOR
DECISIONMAKING ON WATER ISSUES**