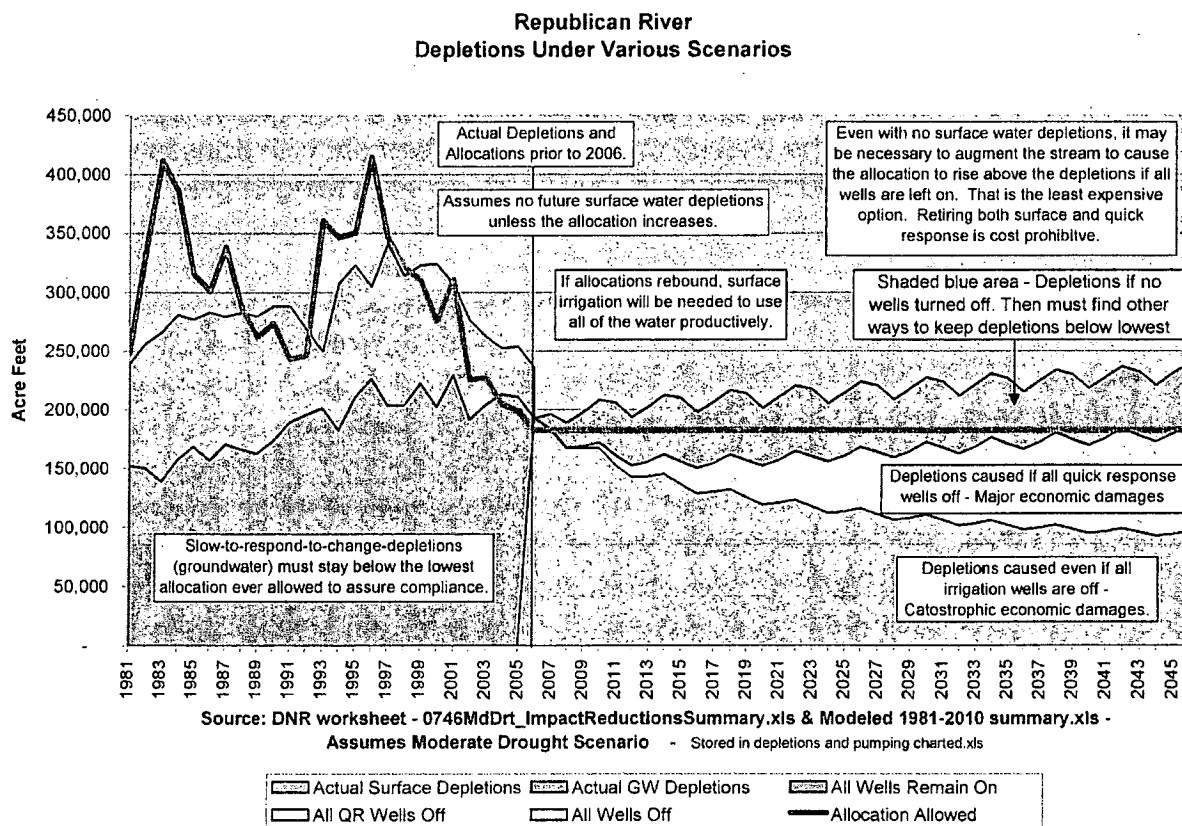


The Problem Summarized In A Graph



Graph 1

Apologies for the complicated graph; but if you take the time to understand it, you will comprehend most of the key elements of the problem.

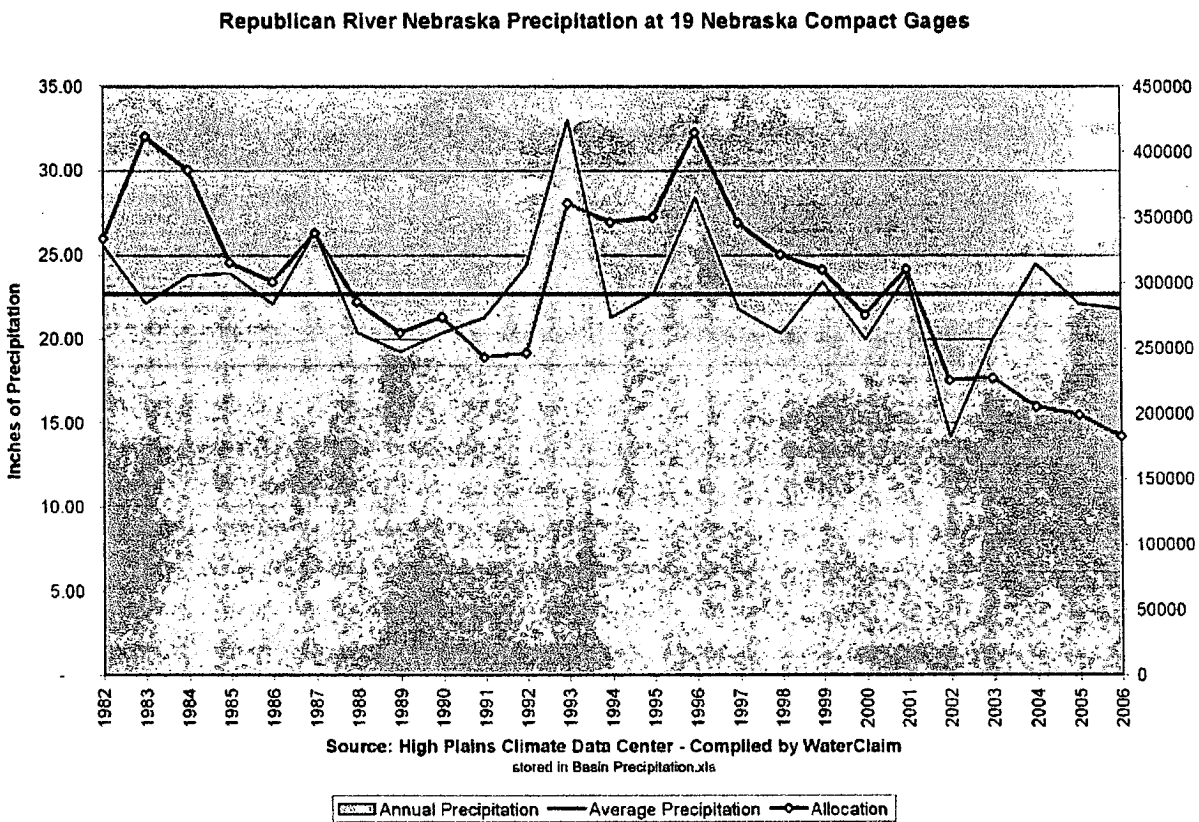
The red line is the amount of the water supply that Nebraska is allowed to use each year. Nebraska usage must remain below the red line. We do not know what the red line will be until the year after it is set. To compensate for this, we are allowed to average our usage over either 2, 3 or 5 years, depending on how dry it is and if we implement plans to reduce usage. As you can see, the red line fluctuates a great deal from year to year. What the red line will do is unpredictable.

Because changes in groundwater pumping take years to affect the stream, it is not possible to adjust groundwater pumping on an annual basis to assure compliance. Even large adjustments in the allocation allowed to groundwater irrigators will have very little benefit, and what benefit they do have will take years to be evident.

The cause of the current problem is that the allocation has dropped to historic lows and the drop in allocation has been much faster than the significant reduction in depletions. Even if there had been no surface depletions for the last three years, Nebraska would still have been over its allocation.

It is important to note that irrigation does not affect the red line. Reductions in base flow (seepage from the aquifer via springs) are not a component of the red line. Instead, reductions in base flow are a component of depletions. The Model puts the base flow that would have been present, if irrigation did not exist, into the allocation and then takes the missing base flow back out as a depletion charged to groundwater irrigation. In other words, the red line has not gone down because of irrigation.

Until recently, the changes in the allocation closely follow the changes in precipitation. For some unknown reason, the allocations since the agreement with Kansas went into effect have not rebounded. Identifying why might reveal something of great value to Nebraska.



Graph 2

One of the most practical ways to deal with the problem (other than changing the Model) is to set the depletions caused by slow-to-respond-activities below the lowest possible allocation. One can then use activities that have an immediate effect on the stream (less than one year) to use all of the available water so that none is wasted and unnecessarily sent to Kansas. The only uses that affect the stream in the same year they are used are surface diversions.

On Graph 1, this concept can be seen by following the red line across the graph at 182,000 acre feet. We need to keep the depletions caused by groundwater below the red line. We can raise the red line to give us more room by augmenting the stream.

Failure to stay below the red line could result in all wells being shut off, which would result in catastrophic economic damages.

If the allocation stays low, then groundwater will use more than the allowed allocation. This is not caused by over-pumping but is caused by an allocation that has dropped to historic lows. The only way to eliminate the annual problem in the short term is to eliminate all surface irrigation, which would then include all evaporation and augment the stream. Augmenting the stream raises the red line. There are no other choices that result in immediate compliance.

Failure to augment the stream means Nebraska will continue to fail to meet its year-to-year requirements, if the allocation continues to stay near its historic lows.

If Nebraska does not want to continue to augment the stream, then it must reduce depletions caused by groundwater pumping. It will take time for results to be seen from those reductions, under even the most aggressive policies.

| According to the Model - for every 10,000 acres of groundwater pumping that is permanently shut off, there will be the following increase in stream flow (in acre feet) | | |
|---|----------|--------|
| Quick | | |
| Year | Response | Upland |
| 1 | 374 | 13 |
| 2 | 640 | 6 |
| 3 | 867 | 18 |
| 4 | 1,090 | 51 |
| 5 | 1,351 | 85 |
| 5 Yr Avg | 864 | 35 |
| 10 Yr Avg | 1,152 | 102 |
| 20 Yr Avg | 1,383 | 253 |
| 40 Yr Avg | 1,479 | 504 |

Source: DNR - Derived from 0746MdDn_Impactreductionssummary.xls
Stored in: depletions.xls

Table 1

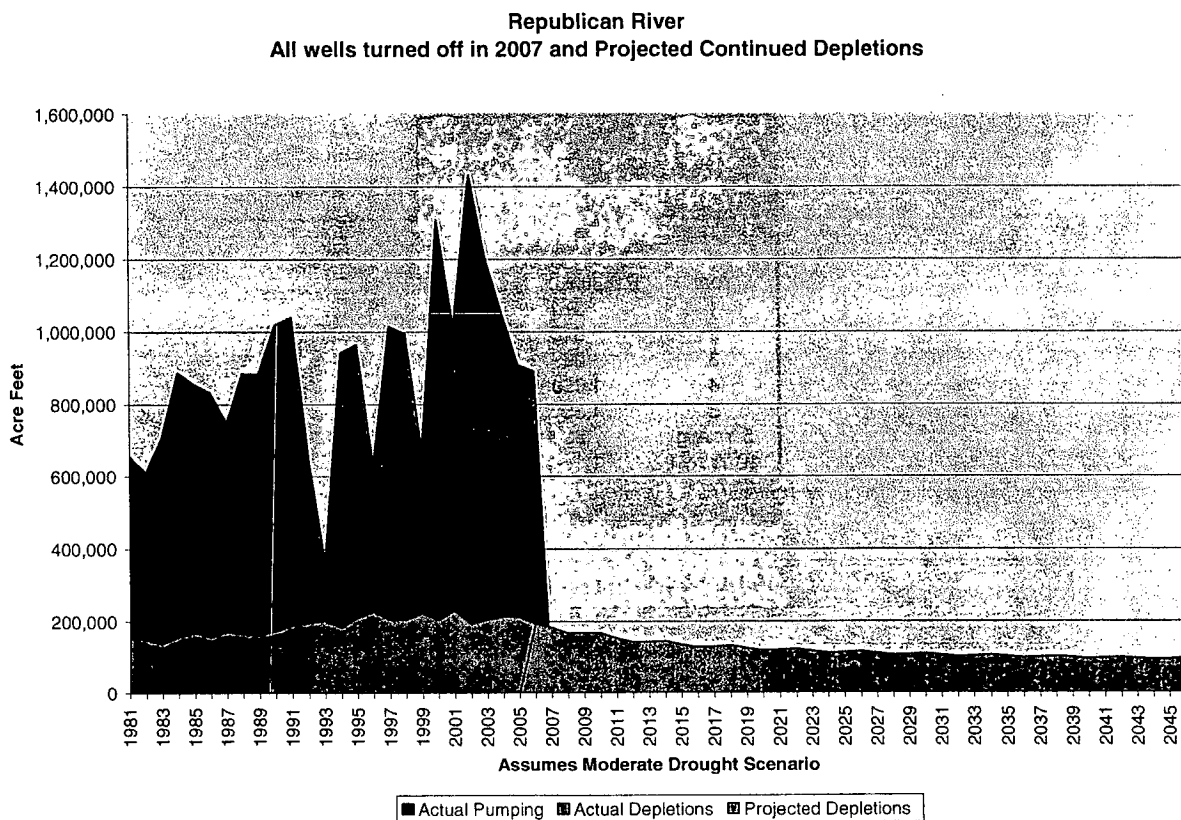
There are 1,086,584 irrigated acres in the Upper, Middle, and Lower Republican NRDs. Of those acres, 333,967 are designated as "quick response," meaning they are within 2.5 miles of either side of the center of the stream or tributary. Wells outside this area are called, "upland wells."

There are about 34 units of 10,000 acre quick response wells. Shutting off all quick response wells would result in 34 multiplied by 374 acre feet, or 12,716 acre feet more water in the stream after year one. There are 75 upland well units of 10,000 acres. Shutting off all upland wells would result in about 975 more acre feet of water in the stream in year one. That means we have to shut off the pumping of about 1,000,000 acre feet a year to get a 13,698 acre foot benefit to the stream in the first year. That is a 1.4% efficiency rate. The efficiency rates grows slowly over time. The 40-year average efficiency rate is 9%. That means that for every acre foot we stop pumping, 9% of that water will be in the stream 40 years from now.

Those who want to achieve compliance via regulation -- which is a polite way of saying via a forced reduction in pumping -- need to realize that the results they are looking for will take a very long time to come.

Because of the lag effect (the delayed effect of pumping on the stream), more wells will have to be shut off each year. Graph 1 shows that, by the end of 2045, all irrigation within a five mile wide corridor of the river and all of its tributaries, must be permanently shut off in order for groundwater depletions to be guaranteed to remain below the lowest point of the red line. That is without the use of augmentation.

Keep in mind that, even if all of the irrigation wells are turned off, depletions will continue for the foreseeable future. Reducing allocations by 5% or 10% will have even less of an effect. Reducing allocations is largely a symbolic gesture that inflicts pain because it seems like the right thing to do, even though it doesn't help.



Graph 3

Basing all of our decisions on keeping groundwater depletions below the lowest allocation mark will waste a huge amount of economic resources.

It would be a much better use of resources to cause the red line (allocations) to go up. Reducing allocations and shutting off wells to solve the problem is very inefficient, very expensive, and very disruptive.

The Red Line – Allocations - What makes the red line, go up?

1. Precipitation
2. Augmenting the stream – this can be done by pumping or diverting water into the stream. Where we obtain the water for this makes a big difference on how efficient such a method might be.
3. Removal of conservation practices, such as terraces – Conservation practices are the primary cause of the allocation being low. Conservation practices were intentionally omitted from the Model, according to the head of the DNR, “because we didn’t want anyone to notice their effect and decide to remove them.” Until the effects of conservation are addressed, the allocations will never be as high as they could be. It is important to note that conservation practices have many very good benefits. But, they also cause less water to be in the streams. At the moment, because of the decision to leave conservation out of the Model, irrigation is being required to use less water in order to compensate for the effects of conservation.
4. Removal of trees near the stream – Removing trees will cause less evaporation through the plant leaves and, hence, leave more water in the stream. This increases the virgin water supply. Nebraska has the right to use 49% of any increase in the supply caused by the removal of trees. Kansas has the right to the rest of the water.
5. Correcting errors in the Model – Only this can be done without cost. However, there seems to be little interest by the DNR to correct the errors that have been identified. Why wouldn’t the DNR want to correct errors? The DNR adamantly insists that it wants to find and remove errors, yet huge documented problems remain (see WaterClaim website for descriptions).

Where that red line is has huge economic repercussions. Mostly vegetation management is on the table for discussion. The higher the allocation, the more economic activity will happen.

It is likely that the red line will naturally go back up again, as it has in the past. However, unless a large amount of water and resulting economic activity is to be wasted, Nebraska needs to be in a position where it can use that water. Irrigating crops is the only practical thing to do with that much water. It may seem obvious to many, but some do not consider that if we want to eat, we need to use water to irrigate crops before it flows into the Gulf of Mexico and turns into salt water. Irrigating crops is not a bad thing. It is necessary. There is a lot of water that falls from the sky each year, and one main practical use of that much water is irrigation. There is far more water than can be used by cities.

As surface irrigation rights are bought out, some people will choose to permanently retire their equipment, and we will not be able to use all of the water we have in the past. The maximum amount of depletions surface irrigation has been able to cause in the past is 140,000 acre feet. If groundwater depletions are limited to 200,000 acre feet and surface uses cause the maximum depletion possible, then Nebraska would only be

able to use 340,000 acre feet of water. If the allocation for Nebraska goes over 340,000, then we have no way to use the water and we lose it.

Most people are willing to ignore that problem because we have a much more immediate concern. How do we make sure we stay within the allocation we have?

There will be a temptation by policy makers to buy surface water on a year-to-year basis, implement a reduction in groundwater allocations of 5% or 10%, and call it good. As can be seen, that is likely to fail and will fail as a policy if the allocation is near the 200,000 acre feet level.

LB 701, as currently written by the NRDs and permitted to happen by Senator Mark Christensen, will not solve the problem.

What is required is a purchase or lease of all surface water. That purchase or lease needs to be at a price that will permit an augmentation program to also be put in place. It is my belief that it would be very wise to make that a permanent or very long term transfer of control of surface water rights to an entity that can make sure the surface water is used in such a way to assure compliance with the Compact Agreement.

If that transfer of control happens at near market price, then there would be enough money to also build an augmentation system that will permit existing groundwater irrigation to continue at the level of good stewardship at which it is happening now.

When technology and crop science allows a reduction in the amount of groundwater used without hurting the Basin economically, it will be wise to do so. Still, realize that doing so will take years to generate benefits that will eliminate the probable need for augmentation.

If the red line jumps because of an increase in precipitation, then it will be very tempting for policy makers to allow groundwater depletions to grow. If that happens, your policy makers are failing to protect you and are risking a complete shutdown of irrigation if the allocation drops again.

Note that nothing in LB 701 or in these suggested solutions does anything to eliminate the existing accumulated overages. In my opinion, the only economical and politically acceptable way to deal with the accumulated overages is to either wait for precipitation to increase and eliminate them that way and/or write a check to Kansas for the damages and beg for mercy from a Judge. The residents of the Basin have a good case that the State made it impossible for them to do anything to avoid this problem and that they should not be punished by having their wells shut off. Even so, there is a fair chance that a Federal Judge will get to decide if that is true.

At the moment, the NRDs are not showing enough information to the Legislature. The two Legislative representatives for the Basin, and it seems some others, are hoping that by giving the NRDs a new ability to tax, the NRDs will figure it all out and make the problem go away. Perhaps the NRD board members fully comprehend this and know exactly what they are going to do. But, so far, they haven't detailed their plans.

This is no insult to the NRD board members, as many of them are very smart people. However, all of them have full time jobs; and, this is the busiest time of the year for them. As a whole, they really don't have time to do what is required of them. A

volunteer board made up of people who meet once a month and spend most of their time working on approving permits will have a challenge doing what is required.

At the Amendment Hearing on LB 701, the Lower Republican NRD testified that it did not want to purchase surface water. But, it is lobbying the Legislature to give it authority to impose a new huge tax. The Upper Republican NRD has hinted that it intends to do a surface water purchase and also begin to retire quick response wells. That would work, if they have enough money. I don't think they will, even with the huge new taxes.

None of the NRDs have said anything about doing both a surface water purchase and augmentation. That doesn't mean they won't. It is much less expensive to augment the stream than retire quick response wells, and it also allows Nebraska more flexibility. But right now, the NRDs are not revealing to the public how they intend to keep the State in compliance. They are simply asking for the money and asking the Legislature to trust that they will solve the problem.

Price of Water

The compensation rate for water is also going to be a very contentious issue. In 2005, the Nebraska Supreme Court ruled that surface water appropriations are not property. That was a huge decision that is still not believed or even comprehended by most people holding water rights. If the Nebraska Supreme Court continues to hold that position, then it is possible that surface irrigators can have their access to water withheld without compensation. If that is true, then there is no need to purchase or lease the water rights. However, it may be the right thing for society to provide compensation.

If society decides to compensate the surface irrigator, what rate should the owner be paid? The surface irrigators are asking for \$50 an acre inch on Frenchman Cambridge and \$80 acre inch on Bostwick. The NRDs and DNR have agreed to pay at those rates. The Legislature has, thus far, not done so.

If the land with water is purchased at market rate and then the land resold without the water right, the value of water is about \$8 an acre inch. It would be far less expensive for the buyers to pay that lower rate; however, the only way to do that would be to take the water use right by force at market rate. Pity the person or group that decides to do that. However, if this does not happen, then those with surface irrigation rights will be receiving a huge benefit at the expense of everyone else.

Groundwater irrigators also need to keep in mind that their access to water can be reduced to nearly nothing without compensation. Many a surface irrigator argues that since they were using the water first, groundwater irrigators should be shut off until the problem goes away. They are very angry with anyone who suggests that they might lose their surface water rights with or without compensation while groundwater can still be used.

Where do we go from here?

I believe almost all of the elected officials would like to keep as many people irrigating as they can while still staying in compliance. I know that a lot of people in the Basin don't believe that and are starting to believe they have a better chance with a Judge. But, I have worked closely with both groups, and I believe the Omaha and Lincoln Senators and the Governor want a good solution that hurts the fewest people. Many of them have been getting bad information from the DNR and the big city press. Some of them have believed that bad information, and why shouldn't they? I am hoping that we can get the facts to them so they can choose what is best for the most people.

The NRDs, especially the Upper Republican NRD, have tried to create a package deal that lets the NRDs take control of the situation. That package was created in secret and its development was hidden, even from the sponsoring Senator. The Republican River Basin NRDs feel that the Legislature doesn't need or want to understand the details of the problem.

Kansas will have the option of beginning proceedings against Nebraska after August 2007. While it would be a difficult timeline, it is possible that Kansas could persuade the US Supreme Court to appoint a Special Master to take control of the Republican River Basin sometime in 2008. Almost all of Nebraska's elected officials would like to avoid that.

Nebraska does not have anyone looking at the best way to manage the Basin to stay in compliance while also best using all resources of the Basin. The mentality of most water policy makers is to only reduce. That mind set needs to be broadened to consider how to build in order to best use the resources we have, including the ability to go outside our boundaries for those resources (just as cities do in order to maintain their supply levels).

There needs to be someone who can manage the Basin so as to keep the State in compliance and also make sure that all of the water is used beneficially in Nebraska. As a whole, Nebraska is a water-rich state with the ability to be innovative in moving water from areas of excess to areas in need. Sometimes, I think we get to focusing so narrowly on one portion of the State encountering problems that we don't realize that we're an entire State of people who can keep help each other. There are other states across the nation who have been innovative with water transfers. There's no reason why Nebraska cannot be just as resourceful. It simply requires a different attitude than what can be found today.

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