(*Note: this post is also available as a PDF at www.texascenter.org/water_plan.htm).*

The 2012 State Water Plan projects a statewide demand/supply (needs) gap of 8.325 million acre-feet/year by 2060. That scary number is often presented as the reason the state needs to fund implementation of the state water plan.

But, when you break it down (see Table 6.1 in the 2012 plan), you see that three regions together account for two-thirds of the gap:

- Region C (Dallas/Fort Worth area) with 1.588 million acre-feet/yr;
- Region H (Houston area) with 1.236 million acre-feet/yr and
- Region O (Llano Estacado) with 2.366 million acre-feet/yr.

We have explored the over-inflated Region C demand projections elsewhere, and a similar analysis of Region H is forthcoming. But, today we take a closer look at the 2.366 million acre-feet annual gap projected for Region O, which is over 28% of the total projected statewide gap for 2060. Not surprisingly, it's all about the sustainability of irrigation water from the High Plains Ogallala Aquifer.

Region O covers much of the Southern High Plains of Texas. Irrigation dominates, accounting for 95 % of the total regional use in 2010, or 4.186 million acre-feet/yr. Virtually all of this irrigation water is supplied by the Ogallala (**Figure 1**).

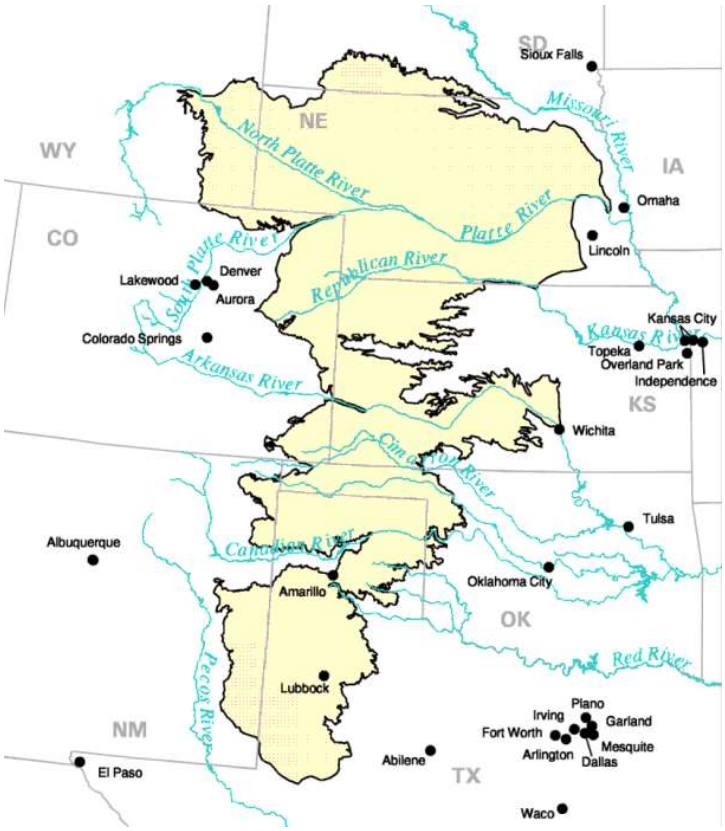

Figure 1. Ogallala Aquifer from [High Plains Water District]

Figure 2 shows the various irrigation demand projections for Region O for the current (2017) and past planning cycles. While these projected demands do decline over time, as discussed below, they do not reflect the constraints on availability of Ogallala water that would be in place with implementation of management systems designed to preserve some aquifer capacity for the future. The decreasing trend in these demand projections is "due to declining well yields and increased irrigation efficiencies." (State Water Plan, p 118, Region O Summary).

Instead, the effect of water management goals on ground water availability is incorporated into the supply side of the planning process. For example, the 2011 Region O Plan projected that water supply will decline 56 % between 2010 and 2060 "due to the managed depletion of the Ogallala Aquifer," with ground water availability decreasing from 3.076 million acre-feet in 2010 to 1.337 million acre-feet in 2060.

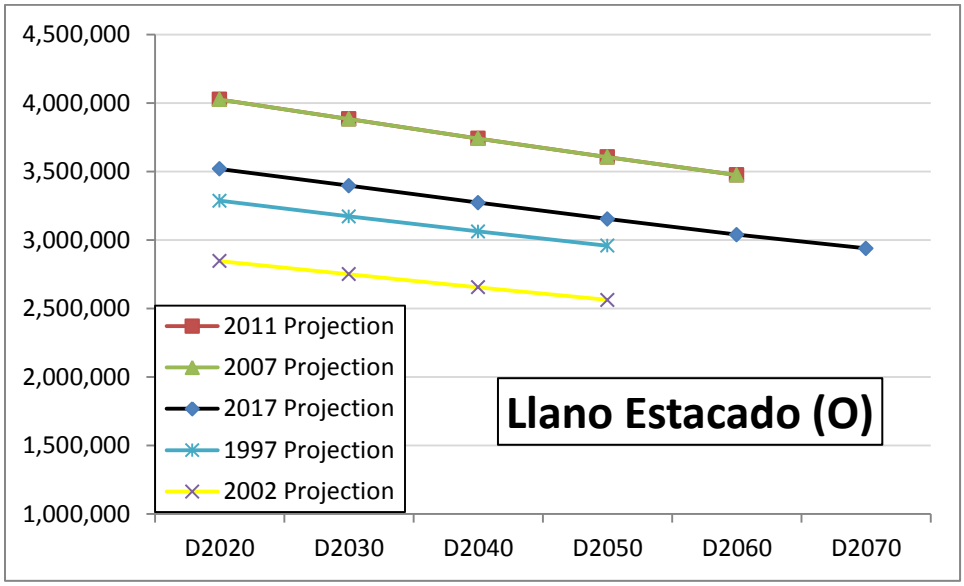

Figure 2. Current and Past Irrigation Demand Projections for Region O

This approach results in the large demand/supply gap, which is theoretically to be addressed with water supply strategies. But, the 2011 Region O plan projects that advanced irrigation conservation will only be able to provide 479,466 acre-feet/year of water in 2010 at a capital cost of $ 346 million.

As the 2011 planning process was coming to a conclusion, the regional groundwater conservation districts in Groundwater Management Area 2, were finalizing their desired future conditions (DFCs)for the Ogallala aquifer and beginning to adopt rules to ensure those DFCs could be met. For the portion of the Ogallala covered by Region O, the central DFC is a 50 % depletion of the aquifer over 50 years.

If the Ogallala is, in fact, to be managed to meet the desired future conditions set by the regional groundwater conservation districts, shouldn't the projected "demands" reflect that management, thus potentially significantly decreasing the statewide projected demand/supply gap that generates so much attention and paints Texas as a state running out of water? Put another way, doesn't showing a huge demand that can never realistically be met undermine the integrity of the planning process?

Region O initially seemed poised to address this important issue in the current round of planning. Earlier this year, Region O consultants worked with irrigators throughout the region to review the 2017 irrigation demand projections from the Texas Water Development Board. While the 2017 projections were on average about 500,000 acre-feet/yr less than the projections from the 2011/2012 planning period (**Figure 1**), they were still far above the ground water availability under the managed depletion scenario reflected through DFC implementation.

According to the consultant's July 2013 report (available here as part of the background materials for the Region O August 1, 2013 meeting (pp. 9-12 of draft non-municipal demand Technical Memorandum from Daniel B. Stephens & Associates, dated July 26, 2013):

The revision to the demand estimates that is proposed here is an attempt to apply the limitations set forth in the DFC process to the demands previously estimated…

Subcommittee meetings with irrigation interests discussed current and future needs of producers and what measures would be required in order to implement the DFC. The general concern was over the best way to account for real unmet needs, particularly for irrigation, and to continue to show irrigation water shortages. Under the proposed methodology, the irrigation demand would be set equal to the volume of water that is available in the policy sense for irrigators to use. This would incorrectly show no unmet needs for the region's irrigators.

Unmet needs are the impetus for development of a particular water management strategy. Advanced irrigation conservation, beyond the conservation measures currently being taken, is a water management strategy that would need to be pursued for the region to meet their groundwater conservation goals. To account for increased conservation, an estimate of conservation volumes was added back into the irrigation demand:

Total irrigation demand = Baseline for irrigation demand + advanced conservation

Thus, the proposed approach was to base the projected irrigation demand on water available under the DFC *plus* an amount that could be achieved via advanced conservation (and then translate that advanced conservation to the water supply strategy side of the plan).

Under this approach, 2060 total projected irrigation demand for Region O would have been **1.328 million acre-feet/yr for 2060** (Figure 5 in the July 2013 consultants' report) versus the 2011/2012 plan's projected 2060 demand of **3.474 million acre-ft/yr**. And the 2070 projected demand under the consultant's approach would have been 1.273 million acre-feet/yr.

For perspective, this proposed approach have meant over 2 million acre-feet less than 2011/2012 plan's projected demand, or *nearly one-quarter of the projected 2060 statewide demand/supply gap from the 2012 plan.*

However, between July and the August 1, 2013 meeting of Region O, the Region O planning group decided instead to request no changes in the TWDB irrigation demand projections. (The revised consultant report and adoption of the TWDB projections can be found here.

What changed? That requires a look behind the scenes at development in groundwater management in Region O, particularly in the High Plains Underground Water Conservation District (HPWD), which covers 16 of the 21 counties in Region O and accounts for the vast majority of irrigation use from the Ogallala.

Established in 1951, the HPWD has been working for decades to conserve and protect the basically non-renewable reserves of the Ogallala. In recent years, as aquifer levels have begun to drop even more steeply than in the past, HPWD sought to enact phased-in metering requirements and pumping limits generally 1.5 acre-feet/acre). While not free from controversy, the new rules—enacted in July 2011 were approved 4-0 by the board as necessary to meet the 50/50 goal for the Southern High Plains portion of the Ogallala.

Two factors appear to have combined to generate resistance to the HPWD's efforts to sustainably manage the Ogallala for both current and future generations: commodity prices and the second is the *Edwards Aquifer v. Day* case (discussed here).

Corn, along with cotton and wheat, is one of the major irrigated crops in the High Plains, from Texas up through Kansas. As shown in the recent report of results from the Texas Alliance for Water Conservation work in the Southern High Plains, crop choices fluctuate with "anticipated prices, weather conditions, and water availability." When corn prices are high, there is an incentive for growers to irrigate as much as possible in order to take advantage of the market. Under that perspective, pumping limitations can be a barrier to short-term profits.

Cropping fluctuations for the 4,700 irrigated acres involved in the TAWA project are shown in **Figure 3**. These thirty voluntarily-enrolled sites represent only a tiny portion of the over 2 million irrgated acres in the Southern High Plains, but may be somewhat indicative of overall trends.

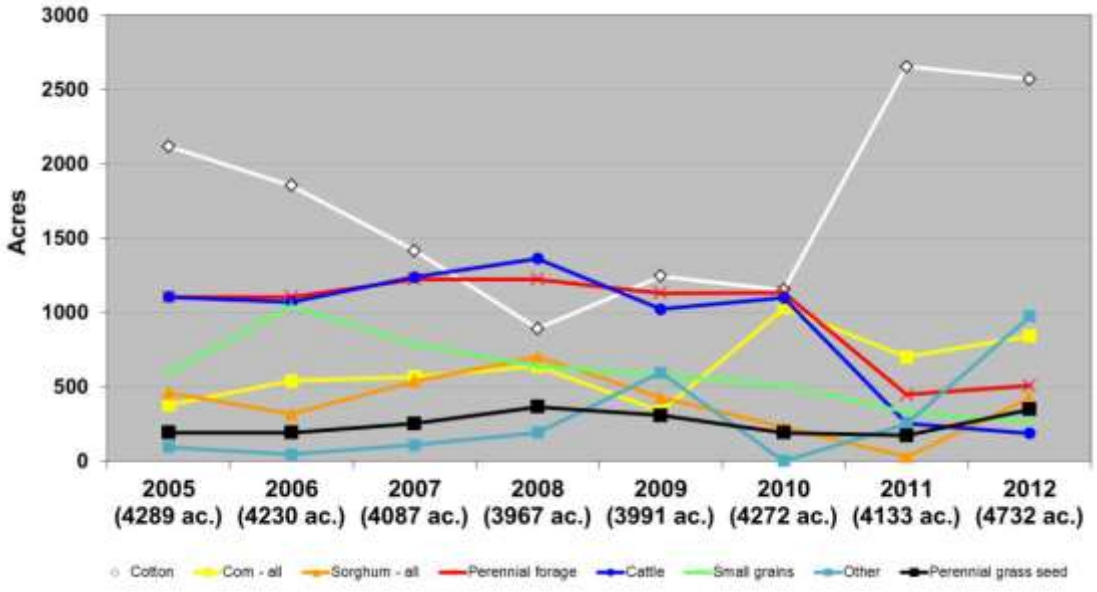

Figure 3. Irrigated crop trends on TAWA sites

Figure 4 shows irrigation use in Region O as compared to national average corn prices for the last five years. Both 2009 and 2011 were years of severe drought in the region, requiring additional irrigation.

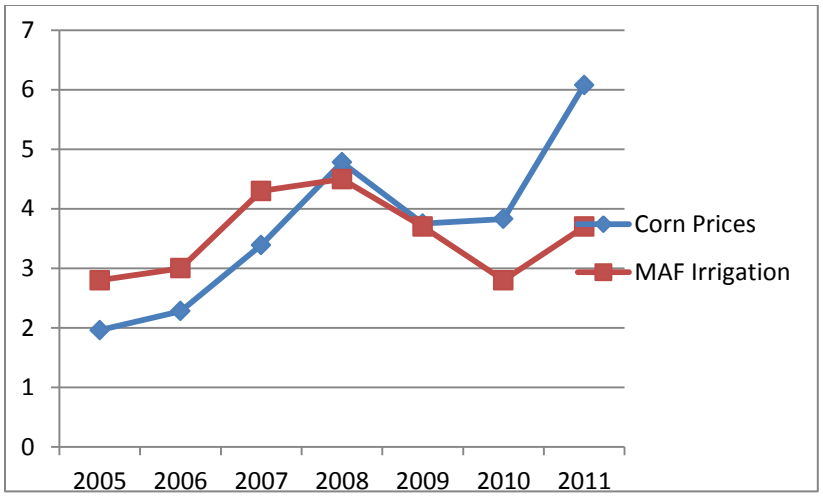

Figure 4. Region O Irrigation Use (million acre-feet/yr) v. National Calendar Yr Average Corn Prices
(Sources: Texas Water Development Board and Farmdoc.illinois.edu)

Region O water use is not as closely correlated with cotton prices (**Figure 5**), though 2010 was a relatively normal precipitation year, which could have reduced cotton irrigation demands.

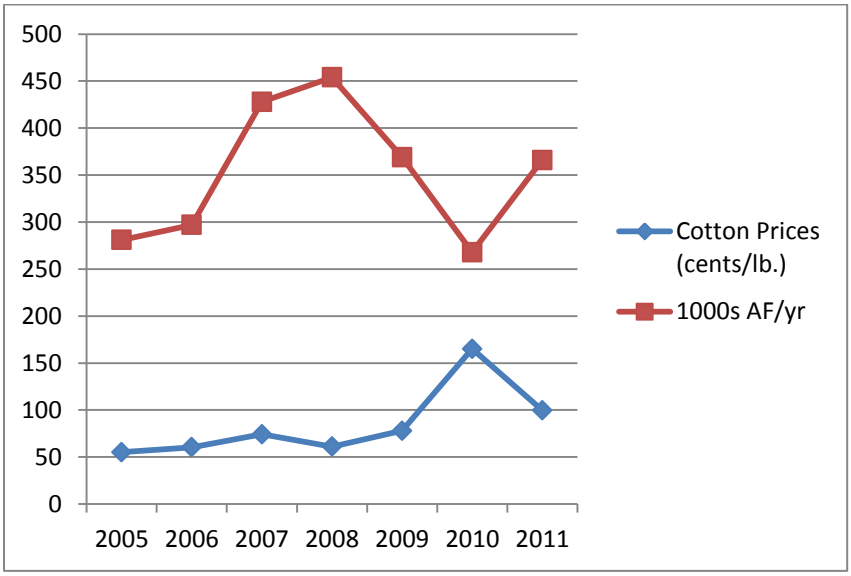

Figure 5. Region O Irrigation Use (1000s AF/yr) v. Calendar Year Avg Cotton Price
(Sources: TWDB and National Cotton Council)

Adding to these higher commodity price-related incentives, in February 2012, the Texas Supreme Court held in the *Day* case that groundwater is owned in place by the overlying landowner. The ruling added fuel to a small group of High Plains farmers arguing against pumping limits on constitutional grounds. The Protect Water Rights Coalition has opposed HPWD's efforts to enact measurement and pumping limits at every turn, often finding support from the Texas Corn Producers.

In November 2012, two HPWD board incumbents were defeated and two more resigned in early 2013. The 12-year director of HPWD, James Conkwright, resigned in July 2013. Mr. Conkwright also stepped down from his position representing HPWD on the Region O planning group.

So, where does Region O go from here? As noted above, the TWDB projections adopted by the Region unfortunately also fail to reflect the aquifer management goal. But, because these demand projections were initially supplied to the Region by TWDB, there is no clear step to change them at this point.

The Region's next steps will be to look at the demand/supply gap and water management strategies. Presumably, the Region should apply the current DFC to determine available supply (as required by 31 T.A.C. Section 357.32(d)). With the application of the DFC/managed available groundwater standard, the demand/supply gap will be as large as or greater than that shown in the 2011/2012 plan, again distorting the total statewide gap significantly. While advanced conservation can be used to help reduce irrigation demand, the over-stated gap and some completely unrealistic figure of "unmet needs" will likely remain.

It's unfortunate that Region O (and TWDB) missed a golden opportunity to help improve the overall integrity of the state planning process and focus instead on what is really needed to achieve sustainable management of the High Plains portion of the Ogallala Aquifer, which continues to decline at alarming rates.

The future of the HPWD, one of the oldest and most successful of Texas groundwater districts would also appear to be in jeopardy unless those many farmers who do care about the future condition of this unique resource, and the communities that depend upon it, become more vocal.