

# The Texas Water Planning Process

W. David Meesey, Texas Water Development Board

*Meesey holds a master's degree in public administration from Southwest Texas State University (now Texas State). He is employed by the Texas Water Development Board (TWDB) as a program specialist and special assistant to the Deputy Executive Administrator for Water Resources Planning and Information. David was formerly the Manager for Regional Water Planning, overseeing a staff of project managers who work with 16 water planning groups to produce regional water plans. He is also the project manager for the Lower Colorado regional water planning area, which includes Austin (and formerly for the Brazos and Lavaca regions), providing assistance to the regional planning group with contracts, rules, technical assistance such as developing water demand and supply projections, and all other facets of water planning. The main purpose of a water planning group is to produce a unique water supply plan for their region. The approved regional plans form the basis of the State Water Plan every five years. David assisted with the development of the 2002 and 2007 State Water Plans and presented them at public meetings around the state. Currently, he is assisting with the development of the 2011 plan, Water for Texas.*



Thank you. I am proud to be here and am enjoying it too. Like I said earlier I get a kick out of just being on the other side of the microphone because sometimes it is nice to see other people, their perspective and find out what their issues are. Let's figure out how you guys do it here and how we do it there; in some ways it is very different and in other ways it is not so different.

Figure 1 is our most recent state water plan that

we completed in 2007. We are now on a five-year cycle, which means we never leave this either, it is perpetual planning, so good thing I am a planner. We are working on our next state water plan, which will come out in 2012.

I work for the Texas Water Development Board. We do regional and state water planning, which includes 16 Regional Water Plans and 1 State Water Plan every 5 years. We also do flood mitigation

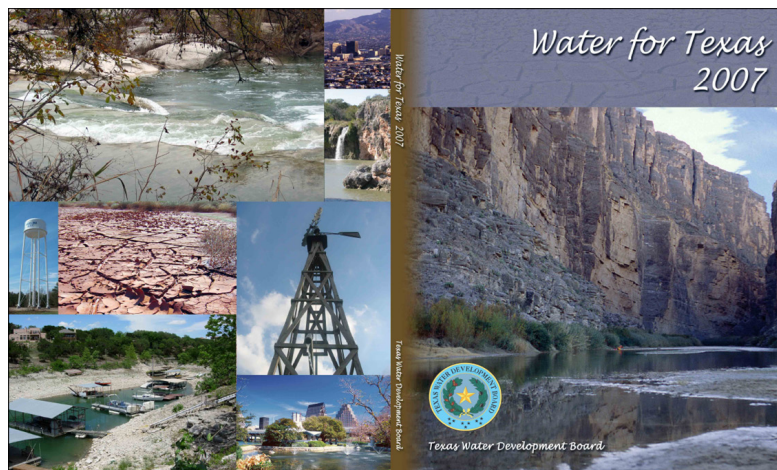


Figure 1. State Water Plan Completed in 2007

planning, which is new responsibility, we have only been doing that for the last couple of years. The legislature transferred that duty from the Texas Commission on Environmental Quality to our agency a couple of years ago, and with that comes the national flood insurance program requirements and flood mitigation planning, so we are kind of on the learning curve for the flood programs. These are actually the opposite of what I do, regional water planning, which is drought based. I also administer a regional water and wastewater facility planning grant program. That is a 50% matching grant program to do regional infrastructure facility planning studies. We do a lot of financial assistance that helps implement some of the things that we do in planning, we have various loan programs, and we do everything from financing water development to some of the infrastructure that is needed in water and wastewater in the state. We have an economically distressed area program that even provides very low interest rate loans, in some cases no interest and in other cases even outright grants for our poor communities to implement some of their water needs.

We also do data dissemination through the Texas Natural Resources Information System (Fig. 3). What I mean by that is when I started in the business data were maps and quad sheets, as my kids say I learned how to count on the abacus but that is a different story, now days it is all digital. Now we have aerial photography, satellite photos, digital maps, GIS, all the things that can be used in the next generation of planning, and we also assist with national disaster response efforts statewide.

Water planning in Texas was a legislative response to drought. In the 1950s, most of our state had just gone through our worst drought in recorded history, which is probably only 100-150 years, but most of Texas suffered through extreme drought in the 50s, anywhere from 7-10 years. At the end of that period, this being Texas, of course we had a flood, but also the legislature created our agency, the Water Development Board and provided constitutional bond authorization of \$200 million for water development. So we have been in the planning, water development, and financing business ever since. Since that time, we have produced eight state water plans and now we are on a regular cycle, after our first one in 1961 to our most recent in 2007. Then in the mid-90s we had another pretty extensive drought, pretty severe, although short in duration. It was not like the long one in the 50s, it lasted a couple of years,

but it caused \$6 billion of economic losses in 1996, mostly from agriculture, and threatened the water supplies of nearly 300 entities. You know a drought coming along at the right time is good for financing your programs if you have that kind of weird perspective about things, and that drought got the impetus behind the legislature to create the current planning paradigm that we have, and also to provide appropriations to pay for it. In the past we have suffered from not having adequate funding, but lately we have had the legislature step up to the plate and appropriate money for us to do our planning and also implement our plans.

Figure 2 depicts what is not drought planning, but that is kind of what comes along at the end of each one of these drought cycles it seems like. We will go a few years of drought and then we will have these unbelievable floods. That is actually a picture of Canyon Lake spillway being breached for the first time ever in the early 90s.



Figure 2. Canyon Lake Spillway Being Breached for the First Time Ever in the Early 90s

Figure 3 shows how our state is divided into 16 regions, the closest one to you being far west Texas, which goes out to El Paso, and I know we have people here, Bobby Creel for one, and some other folks like the Bureau of Reclamation guys that actually do participate in the regional planning effort in that region occasionally. I think Bobby said they are non-voting members. I am a non-voting member of the planning group that I work with also, but that is a good thing and I think that is maybe something to recommend to anyone else who might consider doing this type of thing, to go a little bit farther, reach out to the next state, and talk to Mexico, which we try to do as well, and

actually participate in each other's planning efforts. I think you get a lot better perspective for what the other guy is doing if he is at your meeting or you are at his meeting or at least you do some work together.

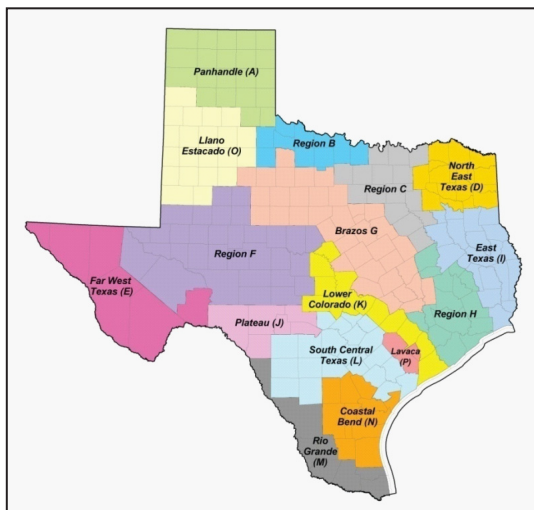


Figure 3. Texas is Divided into 16 Regions

Well how do you do a water plan? First of all, when we do a regional water plan we plan for 50 years because it is drought based. We project the population, how many people do we have as of the last census, how many we expect to have region by region and then on the state level by decade for 50 years. Then we ask how much water we are going to need, and project demands for 50 years. How much water do we have? What are our supplies of groundwater, surface water, and what will happen when we compare the two? We do that region by region for each water user group within the region, we compare the supplies with the projected demands, and in areas where it appears to be short we develop water management strategies or projects or other efforts to meet those future water needs. Those can be anything from structural projects like a reservoir or a groundwater well field to something as simple as implementing additional water conservation or reusing wastewater effluent, desalination, or any of those kinds of things. Once the planning groups select their water management strategies then they produce a regional water plan every 5 years.

Our agency is involved in several roles, such as resolving conflicts, but one of the reasons that we don't always have to resolve conflicts is because we do have the requirement in statute to approve each regional water plan, so although they do conflict

sometimes we are able to work with them normally to get them resolved because in the end we have to approve them to be official. At the end of the five-year process, we take all the completed plans and the data, blow it up into a statewide water plan and add our own experiences and our own policy recommendations for the legislature.

The regional water planning process is a very open and collaborative process. All meetings are open to the public, in fact, there is a public member on each of the regional water planning groups. At least 11 different statutory interests are represented in each water planning group; most regions have an average of 18-20 members. The 11 interests include the public, environment, municipalities, industry, agriculture, counties, small business, water districts, electric generating utilities, river authorities, and water utilities.

So what is going on in our state? Figure 4 is pretty graphic. Since 2000, when our population was about 21 million to say 2010, we are almost at 25 million and by the way, that number is going to come in pretty close to being accurate. We project 45.5 million people by the year 2060. That is pretty good growth, which means we have more than doubled over that 60 year period.

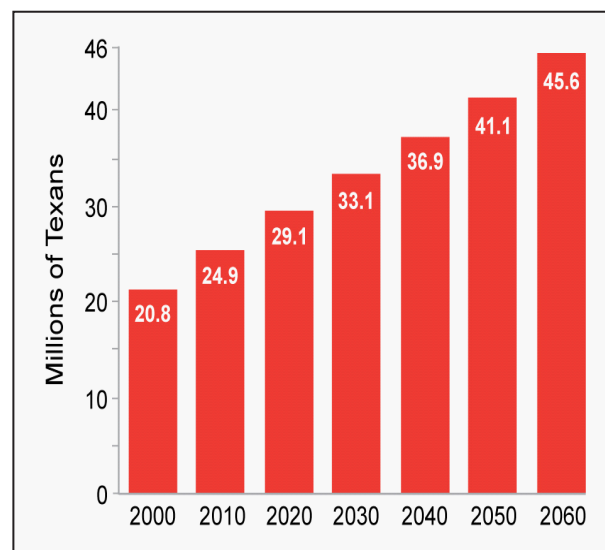


Figure 4. Statewide Projected Population Growth

In the meantime, what happens to our water demands; how much water are we going to need? Figure 5 shows that it is increasing as well. You can see our projections are going from about 17 million acre-ft of water usage in 2000 to about 21.5 million acre-ft, the projected usage by 2060. That is

a healthy increase in water, but it is nothing like the doubling of population.

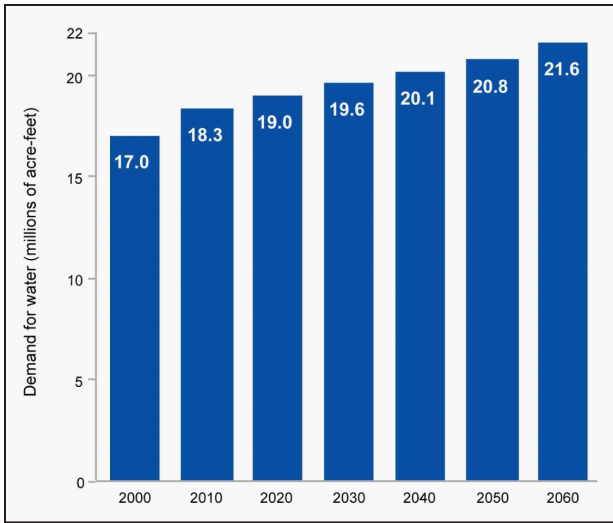


Figure 5. Projected Water Demands

Why would one suspect that is the case? Why does population double and projected water use not double?. Two reasons: conservation is one and irrigated agriculture the other. Conservation is a conscious effort both on the municipal side and on the agricultural side to reduce the water demand. But look at our long-term irrigation trend (Fig. 6), that is the one that has been declining and is projected to continue to decline over time. You can see our municipal usage graph just about doubles, that one follows the population growth pretty closely, but our irrigated agricultural sector is declining and will continue to decline over time. In fact, 10 years farther out beyond that graph those two lines will cross.

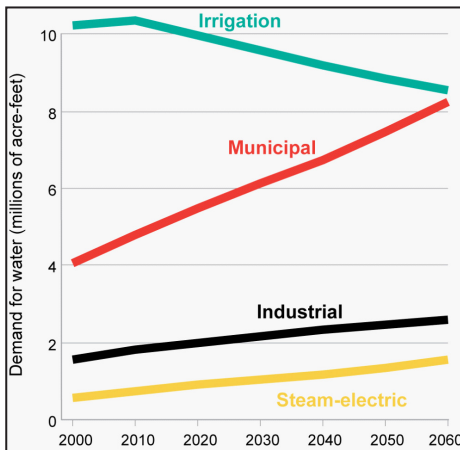


Figure 6. Project Demand Trends

In the meantime, what happens to our water supply (Fig 7)? If we do nothing, it declines over time, both groundwater and surface water. Why would the amount of water you have decline? Groundwater declines over time because we are overdeveloping and overusing. Sometimes you hear the word mining; we are over-reliant on the aquifer and we are using it faster than it can recharge. Surface water and reservoir storage on the other hand, is reduced over time through sedimentation, so if you do nothing the amount of water that you have in 50 years is less than you have today. You can see that projected decline is about 18 million acre-ft currently to about 14.5 million acre-ft in 2060, and again that is if you don't do anything. It is a fact today that, in our state, we don't have enough water to meet all of our needs now if we were to have a drought of record recur. Figure 8 is an actual picture of a lake that is at about 60 percent capacity in west Texas.

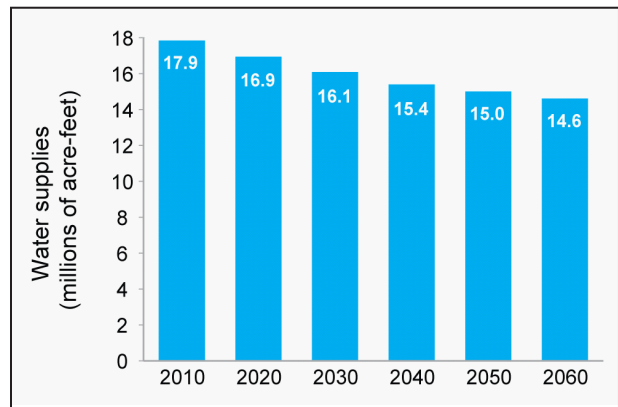


Figure 7. Projected Water Supply



Figure 8. An Actual Picture of a Lake that is at about 6 Percent Capacity in West Texas

Figure 9 shows how much water we need during a drought, it increases from about 3.7 million acre-ft in 2010 to 8.8 million acre-ft in 2060. That is a pretty healthy increase, and that is where that growing population comes in.

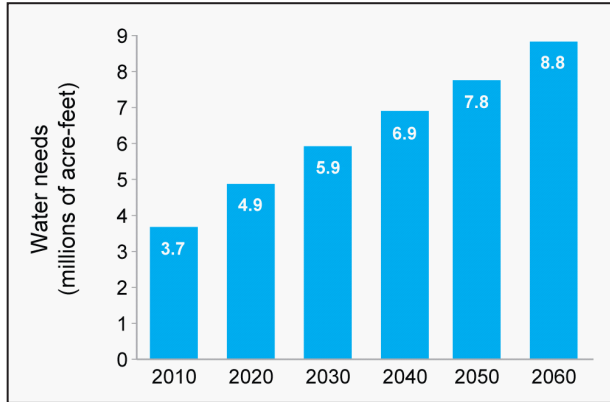


Figure 9. Water Supply Needs in a Drought

Water management strategy evaluations are done by each regional planning group. As I mentioned a while ago, each region has to evaluate all of the potential ways to meet the needs for additional water. Some of the factors that are taken into consideration include water quantity and reliability, financial costs, impacts to environment and agriculture, impacts to water quality, and other factors such as regulatory requirements, time required to implement, and so on. In our state water plan, if all the strategies are adopted, then it does produce enough water to meet their needs, almost exactly the same amount as how much they need (Fig. 10).

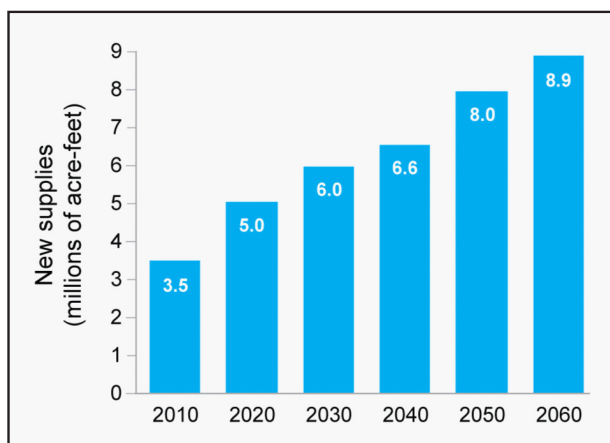


Figure 10. Water Volume from Recommended Water Management Strategies

Part of the recommendations deals with reservoirs; new reservoirs were recommended in our most recent state water plan (Fig. 11). They tend to occur in the eastern half of the state and that is because it rains considerably more in the east. We get an average of eight inches of rain a year in El Paso at one extreme to nearly 50 inches of rain at Orange, Texas, and every several miles it varies all the way across the state. We have 21 recommended reservoirs, in this picture. Actually some of these had already been recommended, but the water plan recommends anything from small off-channel reservoirs to full-size reservoirs depending on the need of the region. This will not be cheap. In fact just the capital cost alone in 2005 dollars was approaching \$31 billion and that is not including the operation and maintenance costs and it is not in current dollars. It costs a lot of money, and the future cost is going to be higher.

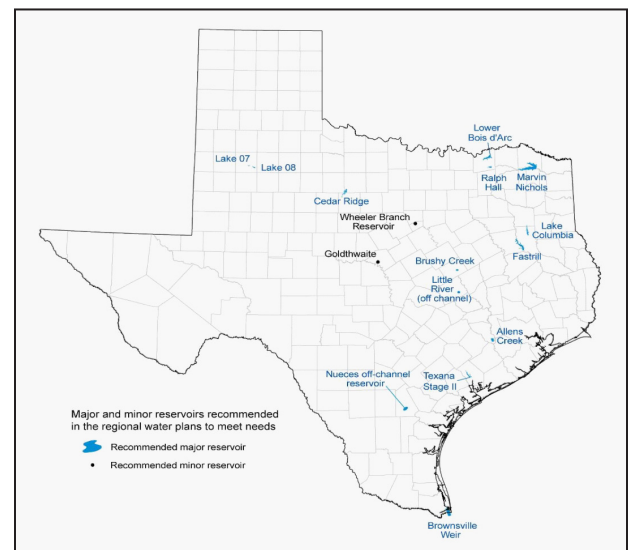


Figure 11. Recommended Major and Minor Reservoirs

What is the cost of not implementing the plan? We have done a bit of economic analysis on that question and we estimate a \$9.1 billion loss to our economy if we do nothing and we do not implement some of the recommendations in 2010. The loss of local and state taxes is estimated at \$466 million in 2010 and \$5.4 billion in 2060. But the big kicker is that as much as 85 percent of the state would not have enough water to meet all of their needs if we had a recurrence of the drought of record by 2060.

One important aspect has been a fairly recent legislative change in Texas that in order to get funding from the Water Development Board, a proposed project must be consistent with the approved regional and state plans. That connects the planning with the financing and implementation programs. This does not affect private financing but it does affect state financing. We have some newer funding programs from the last two sessions where we received appropriations that pay for programs that have a little bit lower interest rate, better terms, but in order to access that funding the recommended project actually has to be in the plan.

Something in our projections we call rural county - other, which only a planning nerd could love. We plan for communities with populations of 500 or greater or large supply corporations; and entities with 280 connections or greater. That still leaves rural portions of counties unaccounted for and we tend to lump those together and call that remainder county - other. We do projections based on that remaining county entity. In order to get financing for a project, if you are in that county portion, the project at least has to be consistent with the recommendations in the regional water plans for county - other entities.

Entities can do several things to access funding and to be consistent with state and regional water plans: they can have discussions with the regional planning group; the current plan may be amended; or the project may be included in the next plan. If a project is not consistent with the regional water plan, we streamline the process a little bit and a minor amendment may be possible or perhaps a waiver may be requested from the TWDB.

Another reason why we plan concerns the regulatory side of things and the Texas Commission on Environmental Quality (TCEQ). In order to get a water right permit, what you propose also has to be consistent with the regional water plan and with the state water plan, although the TCEQ has a right to grant a waiver too.

Some of the things that are coming along, we talked about extensively already: west Texas as well as New Mexico using desalination and some of the less traditional sources like wastewater reuse and water conservation, rainwater harvesting, conjunctive use of ground and surface water and aquifer storage and recovery (ASR). I heard a lot of talk already today about conjunctive use and even some about aquifer storage and recovery.

Sometimes people accuse us or at least our groundwater process as being a little bit combative and here is the proof: we are a rule of capture state, which is very different from our surface water law. Our groundwater law operates entirely differently, except where it is modified by groundwater districts, and we have a lot of groundwater districts but they are not statewide.

We also have something called groundwater management areas, which cover the state; each grouping of groundwater management areas has individual groundwater districts in it. Figure 12 is a map of the groundwater management areas. Each district comes up with its desired future conditions, which is how they want to manage aquifers in their districts. I guess really what I am trying to say here is although we use groundwater availability models and they are very good tools, that we are fortunate enough to have the funding to produce them. In the end, the final decision on groundwater availability is more political than it is a scientific one. Certainly the science is in the background and it will get you to a certain point, but the final decision is as much about politics and I know that is probably true in just about every state.

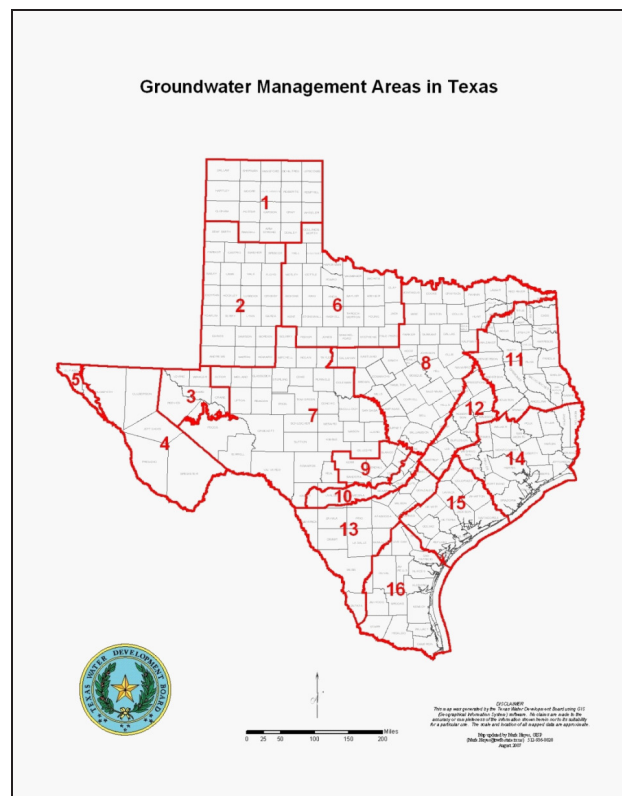


Figure 12. GMA Map

We have an alphabet soup of so many acronyms you can't keep up with them all. We will produce managed available groundwater (MAG) estimates once each district comes up with its desired future conditions (DFC) calculated by the TWDB. To me this could spell t-r-o-u-b-l-e because it has not been entirely tested in court. Some people predict that is where it is finally going to go but we will wait and see about that.

One of the things right now is that groundwater management process is not yet in sync with regional water planning, mainly because the statutory deadlines don't match up. This will be corrected in a few years once all of the desired future conditions are developed, then the regional water planning groups will have to use those numbers as their available groundwater, but right now they don't.

We have made some policy recommendations to our legislature in the last plan: Both regional planning groups and the state water plan made these recommendations. One of the recommendations was for funding; we recommended that they continue to appropriate money for our regional and state planning efforts and also provide appropriations for implementation. In the last two sessions we have been very fortunate because they have appropriated money mainly to leverage lending. It's to pay the debt service on loans so that we can take a \$90 million appropriation and stretch it out to over \$900 million in actual available capital. We had a recommendation to designate the unique reservoir sites that we have identified. However, we would also like to find a way to acquire some of those sites so that we can build some of the future reservoirs, but that is very expensive and that has not happened yet.

We have an issue with interbasin transfers of surface water. This came up as an issue and it is in the constitution but it is also in statute for about the last 10 years. A new interbasin transfer of surface water loses its priority and becomes the most junior water right in the basin, so obviously it is not too reliable. We asked the legislature to provide some guidance on that or some relief and that has not happened yet.

For wastewater reuse there are varying opinions on what happens to treated wastewater when it is discharged into a stream; does it become property of the state and subject to appropriation doctrine or is it available for that discharging entity to pick up

downstream and reuse? The traditional answer has always been not without another permit from the TCEQ. Also there are different legal opinions on the difference between surface water-based wastewater effluent and groundwater-based effluent. We have asked the legislature for guidance on that and that one is still pending.

So how do you get a hold of us if you have any other questions? We have a pretty good website at [www.twdb.stat.tx.us](http://www.twdb.stat.tx.us). We have information there about our financial programs, our planning programs, regional water plans, state water plans, all of our produced reports, most of them are scanned now and available online, different program areas are explained, and different program contacts. We are trying to make as much available online as possible. I am available for questions and I will stick around too. Thank you very much.