Texas Water Development Board - Irrigation Water Use Estimates

Important Note!

The Texas Water Development Board's (TWDB) 2003, 2004 and 2005 Irrigation Water Use Estimates were developed by a different process than the previous annual estimates dating back to the year 1985. During the 1985-2002 period, TWDB annual irrigation estimates were made for the **on-farm** use of irrigation water and did not initially include any distribution losses which may occur in surface water delivery systems. Beginning in 2003, the availability of more comprehensive irrigated acreage data on a statewide basis and better access to surface water use reports available from the Texas Commission on Environmental Quality (TCEQ) has lead to a change in TWDB methodology for annual irrigation water use. Therefore, a comparison of TWDB web site data from 1985-2002 and the 2003-2004 and future data may not be valid in many instances where there is significant uses of surface water. The new irrigation water use data methodology is described below.

DATA METHODOLOGY

Irrigated Acreage Data:

1. Comprehensive, statewide USDA-Farm Service Agency (FSA) records of irrigated crop acreage data are obtained and tabulated by county and aggregated into major crop types and serve as the primary source of irrigated acreage data.
2. FSA irrigated acreage data often includes acreage for Fallow, Skip Rows, Turn Rows, which is classified as Irrigated Land. However, this is removed from the acreage data base because it normally does not receive irrigation water.
3. FSA data also includes irrigated acreage identified as Crop Acres-Failed Acres. These crop acres are typically planted, receive some irrigation, and then fail to reach harvest because of hail, insects, disease, lack of sufficient rainfall or irrigation. These irrigated crop acreages are subtracted from the initial total irrigated acreage for that crop and utilized as a special crop type of Failed Acres. Different irrigation water use rates reflective of partial season irrigation may be assigned for failed acres of cotton, corn, wheat, etc.
4. Some crop types and some counties may not be adequately covered by the FSA acreage data base. In some instances, Texas Agricultural Statistics data, TCEQ data, and local contacts provide information for specific (unique) irrigated crop acreage data.
5. Although it is not agricultural irrigation, many golf courses are self-supplied from private groundwater or surface water sources. These uses are not included in the TWDB Municipal Water Use Survey and are actually classified as irrigation use in the TCEQ surface water permit system. Therefore, to the extent possible, these type of golf courses are included in the irrigation use estimates.

Water Use Estimate Process:

1. The new TWDB methodology for estimates of irrigation use in each county begins by using a crop water use based on Potential Evapo-Transpiration (PET) data AND a historical ratio factor based on past estimates of actual use. In general, for each county with significant irrigated acreage, the annual 1985-2000 crop irrigation use data (on-farm use) was estimated by USDA-Natural Resources Conservation Service (NRCS). The acre-feet per acre use from this data was compared to the calculated PET data for the same period and a ratio of actual use to potential use was developed. The PET data was calculated and then adjusted by this historical ratio to provide the **initial** irrigated crop water use estimates for each county in the State.
2. After incorporation of the responses from the local groundwater conservation districts and inclusion of surface water use reports, revised crop water use estimates were developed as appropriate.
3. The annual estimates of irrigation water use are developed to include data for actual conditions as affected by rainfall, availability of groundwater and surface water supplies, and irrigated cropping patterns. This provides a variation from year to year.
4. The value of permitted water use by Groundwater Conservation Districts and TCEQ Surface Water Rights represent a maximum irrigation use and are not directly utilized in the estimates of annual irrigation water use.

Groundwater Use:

1. Preliminary irrigation county crop/water use data sheets are provided to all known Groundwater Conservation Districts (GCDs) in the State.
2. TWDB made numerous revisions to crop water use rates and some acreage data based on responses from the GCDs.
3. Available supply of groundwater, rainfall, and need for irrigation water can make the annual estimates vary widely from year to year.

Surface Water Use:

1. For the first time, the TWDB's irrigation data utilizes the annual surface water use reports provided to the Texas Commission on Environmental Quality. Therefore, as utilized, these data already include any transmission and distribution losses that were not included in the On-Farm estimates developed in previous years.
2. The TCEQ Austin Office provides extensive data files for permits not located in a Water Master area, including permit holder information and monthly data. These files are condensed by TWDB into the annual total of diversion use by individual permits in each county and then totaled for each county. The Comments Section on individual permits provides a good reference (crop types, golf courses).
3. There are three locations of offices for TCEQ Water Master data files: Lower Rio Grande Valley, Middle Rio Grande, and South Texas.
4. When applicable, the TCEQ reported data is reviewed and adjusted to move/transfer some reported use from permit location downstream to where water is actually used (a release from a reservoir for a downstream irrigation district for example).
5. Available surface water supply, rainfall, and need for irrigation water can make the annual reports vary widely from year to year.

Wastewater Use:

1. If wastewater use was included in the TCEQ surface water use report files, it was included as surface water use and an attempt was made to note this on the work sheets.
2. In some instances, TWDB staff is aware that wastewater from a "No Discharge" permit is utilized for irrigated crop production, but is not included in TCEQ surface water use reports. TWDB staff created a separate designation (waste water) for this and do not include it as use of either groundwater or surface water.

Future Irrigation Use Data:

1. Until we are able to receive and utilize the 2006/2007 digital/spatial acreage data that is potentially available from FSA, the irrigation use data are not geographically specific within the boundary of the county. The 2000 Irrigation Survey Maps (paper) are the most recent source for geographic distribution of irrigated acreage.
2. After each new year's data is completed, TWDB staff will review the current per acre water use estimate procedure to include the effects of the new data using total surface water use and the local estimates from GCDs. Future irrigation use rates may include other considerations, such as available irrigation well metering data, TWDB' Agricultural Water Conservation Demonstration Initiative Projects data, and the Texas Cooperative Extensions' AgriPartners Program data.
3. TWDB staff will initiate a process to study the TCEQ permit report system for waste water use for irrigation and develop a more comprehensive process and data base for inclusion of waste water used for irrigation purposes.