

Irrigation Water Use Estimates

Texas Water Development Board (TWDB) staff estimate agricultural irrigation water use for every county in the state. This annual process began in 1985 through a partnership with the U.S. Department of Agriculture-Soil Conservation Service (now known as the Natural Resources Conservation Service) who assisted in the development of county-level irrigation surveys every five years. In between those irrigation surveys, TWDB staff adjusted the estimates based on data from the Texas Agricultural Statistics Service. These estimates, compiled from 1985 through 2002, are on-farm water use estimates.

The current irrigation estimates process that began in 2003 is a result of a more comprehensive statewide dataset of irrigated acreage and improved access to surface water use data. TWDB now collaborates with the U.S. Department of Agriculture-Farm Service Agency for irrigated crop acreage data and the Texas Commission on Environmental Quality for surface water irrigation diversions data.

Also beginning in 2003, TWDB staff began estimating irrigation water use to account for delivery system losses. The previous estimates process did not account for any distribution losses that often occur in surface-water delivery systems. For this reason, the historical on-farm irrigation estimates developed between 1985 and 2002 may not be comparable with estimates developed in and after 2003 in counties with surface-water irrigation. The following provides a brief explanation of how irrigation water use estimates are currently determined.

Irrigated Acreage Data

1. obtain certified irrigated crop acreage data from the Farm Service Agency
 - a. aggregated at the county level by crop, with no individual producer information
 - b. includes failed acres for each crop, which TWDB aggregates into the crop category “failed”
2. compare Farm Service Agency irrigated crop acres to historical averages by crop for each county
 - a. not all Texas producers participate in Farm Service Agency programs
 - b. TWDB staff must adjust to include historical acreage data (for example, irrigated forage-hay-pasture, pecan orchards, turfgrass operations, vineyards, vegetable crops)
3. include acreage data for self-supplied golf courses
 - a. irrigated from groundwater wells or permitted surface water
 - b. the TWDB Water Use Survey does not capture these self-supplied entities

Draft Irrigation Water Use

1. compile the previous five-year average of irrigation rates for each county
 - a. the irrigation rate is the total amount of water applied to an acre of crop (measured in inches per acre)
 - b. irrigation rates do not include water naturally incurred from rainfall nor any other forms of precipitation
2. develop county-level adjustment factors

- a. evaluate weather data (such as evapotranspiration, relative humidity, wind)
 - b. compare to conditions experienced during the previous five years
 - c. develop adjustment factors to account for drier or wetter than average conditions
3. calculate the draft irrigation rates for each crop in each county based on county-level adjustment
4. multiply the draft irrigated acres by the draft irrigation rates to determine county-level draft totals for irrigation water use per crop

Source of Irrigation Water: Surface Water, Groundwater, or Wastewater Reuse

1. acquire data on surface-water irrigation diversions from the Texas Commission on Environmental Quality
 - a. data are available for free download from www.tceq.texas.gov
 - b. select the irrigation diversion data
 - c. determine the county of use through comparisons with the water rights files and additional information gathered from river authorities
2. determine estimates of wastewater reuse for agricultural irrigation from TWDB Water Use Survey and other entities reporting wastewater reuse
3. calculate groundwater use estimates as the portion of the county totals not attributed to either surface water or wastewater reuse

Draft Irrigation Estimates Review

1. compile county crop sheets containing draft acres, draft irrigation rates, irrigation application efficiency, and draft county acre-feet (by source: groundwater, surface water, and wastewater reuse)
2. mail the crop sheets to all the groundwater conservation districts in the state for review, comments, and revisions to estimates in their jurisdiction
3. follow-up with each district to ensure ample opportunity for revisions based on local knowledge
4. review and incorporate suggested revisions

Final Irrigation Estimates

1. TWDB staff provide the final irrigation estimates to the TWDB Water Use Survey staff to incorporate into the Historical Water Use Survey database, located at www.twdb.texas.gov/waterplanning/waterusesurvey/.
2. TWDB staff continues to investigate ways to improve this process. Absent actual water use reports for all irrigation water use, these estimates provide the best known representation of actual irrigation water use in Texas.

If you have questions regarding the irrigation estimates process, please e-mail at AgConservation@twdb.texas.gov.