

Irrigation Water Demand Projections Methodology for the 2026 Regional and 2027 State Water Plans

Methodology summary

The draft irrigation water demand projections are based upon the average of the most recent five-years of water use estimates (2015 through 2019) for each region-county and either:

- held constant between 2030 and 2080 or
- in counties where the total groundwater availability over the planning period is projected to be less than the groundwater-portion of the baseline water demand projections, the irrigation water demand projections are held constant for 10 years (roughly equivalent to the mortgage period of farm equipment) beyond the point that the groundwater availability falls below the baseline demand, in most cases 2030 to 2040, after projected demands will begin to decline, depending on and commensurate with the groundwater availability.

After draft projections (decades 2030 through 2080) for each region-county are provided to the Regional Water Planning Groups (RWPGs), the RWPGs may request alterations to the draft projections, subject to adequate justification, documentation, and EA approval per guidance in *Exhibit C: General Guidelines for Development of the 2026 Regional Water Plans*.

Key changes from the previous planning cycle's projection methodology: None

Major Assumptions/Updates

- Baseline use calculated as average of five years of TWDB annual region-county level estimates (2015 - 2019).
- Irrigation water demands will be held constant unless constrained by modeled available groundwater (MAG), then, after a single decade delay, the demands will decline at the same rate as the groundwater availability. This is to both acknowledge the decline in availability and yet allow for a need to be reflected that can be addressed with strategies such as conservation. This is the same method used to develop irrigation projections for the 2021 Regional Water Plans.

Baseline default projection methodology

Data Sources:

- TWDB historical water use estimates by region and county (2015-2019), including reuse.
- Projected total groundwater availability volumes including the most recent MAG volumes from the 2021 Joint Groundwater Planning process (some MAG data is under review and is subject to change). At the time these draft irrigation projections were developed, updated MAG data was not available from Groundwater Management Areas 1, 8, 9, 10 and 12.

Each year, the TWDB Agricultural Conservation department develops annual irrigation water use estimates at the county level by applying a calculated evapotranspiration-based "crop water need"

estimate to reported irrigated acreage from the Farm Service Agency. These estimates are then adjusted based on surface water release data from the Texas Commission on Environmental Quality and comments from groundwater conservation districts, irrigation districts, and river authorities.

As part of the regional and state water plans, the TWDB Projections and Socioeconomic Analysis department develops irrigation projections. Future water demands for irrigation purposes are significantly impacted by commodity prices, production costs, federal agricultural policies, and federal energy policies. Any attempt to forecast such factors and their impact on water use over a 50-year period would be impractical. A more credible methodology is to focus on recent historical irrigation water use data as an indicator of future use. Therefore, the baseline dry-year irrigation demand projection for most areas will be the average of the annual irrigation water use estimates over the most recent five years of water use data and that average volume will then be held constant over the planning period.

However, much of the projected irrigation demands of the state are supplied by groundwater sources that are projected to decline significantly over 50 years. If the baseline irrigation water demand projections associated with groundwater and summed over 50 years, exceeds the projected groundwater resource (modeled available groundwater volume) summed over 50 years, then the water demand projections will reflect groundwater availability constraints as described below.

Constrained water demand projections

Starting at the year 2030 baseline projection, the demand volume will be held constant for at least one decade. If the annual groundwater availability is lower than the baseline projection at the beginning of the planning period (2030), then beginning in 2040, the subsequent demands will parallel the trend of the groundwater availability (MAG). See Figure 1. If the annual groundwater availability equals or exceeds the default baseline annual groundwater projection at the beginning of the planning period (2030) but then falls below the baseline projection at a later point, then the irrigation water demand projections will not begin to parallel the groundwater availability until the following decade, after the point at which groundwater availability has fallen below the baseline demand projections. See Figure 2.

Figure 1- Potential Draft Irrigation Water Demand Projections: Declining Groundwater Example

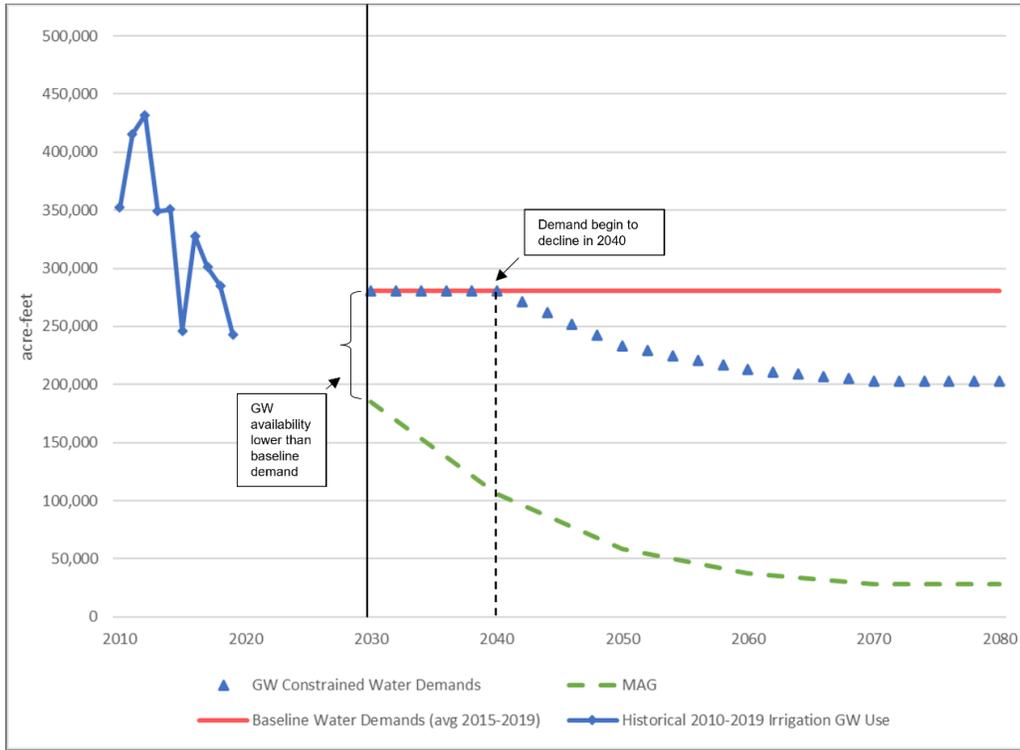
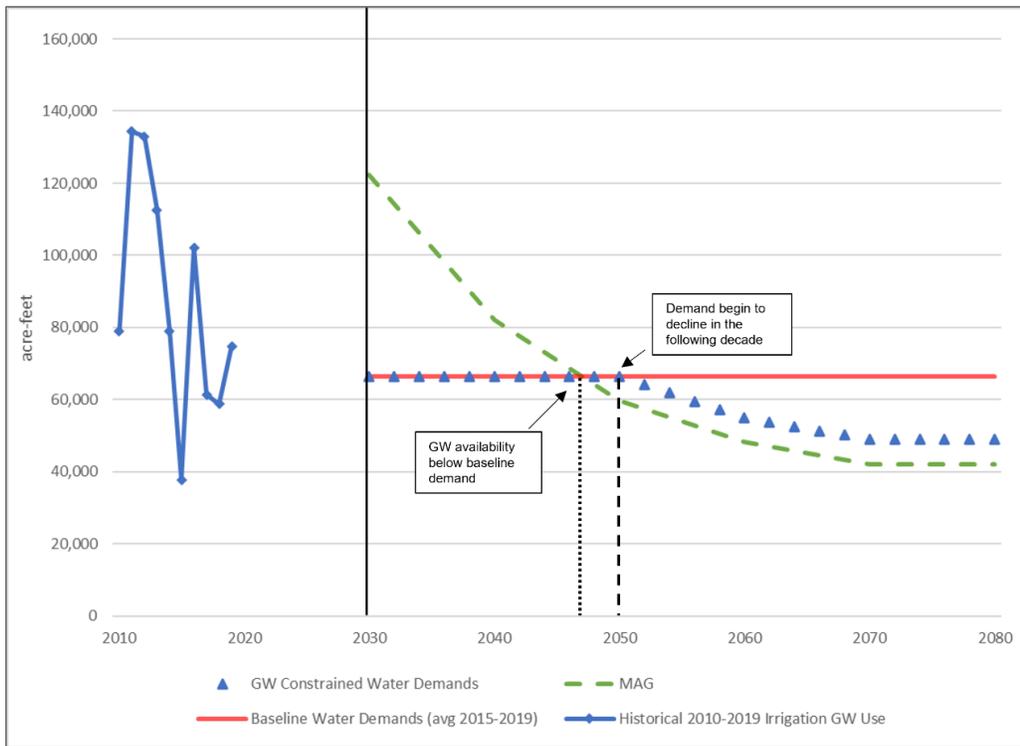


Figure 2- Potential Draft Irrigation Water Demand Projections: Declining Groundwater Example



While constraining water demand projections based on water resource availability would most likely occur in areas primarily utilizing groundwater, such constraints could also occur in areas with limitations of surface water rights or contracts. At this stage however, TWDB does not have sufficient information to attempt to constrain surface water demands and will defer to RWPGs to identify such instances, if appropriate. The portion of the baseline irrigation water demand projection anticipated to be supplied by surface water and reuse, based on recent water use data, will be added to the constrained groundwater demand.

Key Data Sources

Links to the key data sources in developing the projections:

1. Historical water use (county):

https://www3.twdb.texas.gov/apps/reports/WU_REP/SumFinal_CountyReportWithReuse

2. 2021 RWP Projections (county):

https://www3.twdb.texas.gov/apps/reports/Projections/2022%20Reports/demand_county