

2023 ANNUAL GROUNDWATER REPORT

ABOUT THE REPORT

The District collects groundwater and alternative water supply use annually from permittees to understand how much water is being used, how water is being used, and gain perspective on converting groundwater to surface water. The collected data are analyzed and made publicly available as the District's Annual Groundwater Report (AGR).

The information contained within the AGR is the compilation of a multi-agency effort that leverages the resources of the Harris-Galveston and Fort Bend Subsidence Districts with the City of Houston, the U.S. Geological Survey, the University of Houston, the Brazoria County Groundwater Conservation District, and the Lone Star Groundwater Conservation District.

The Annual Groundwater Report includes information on the following:

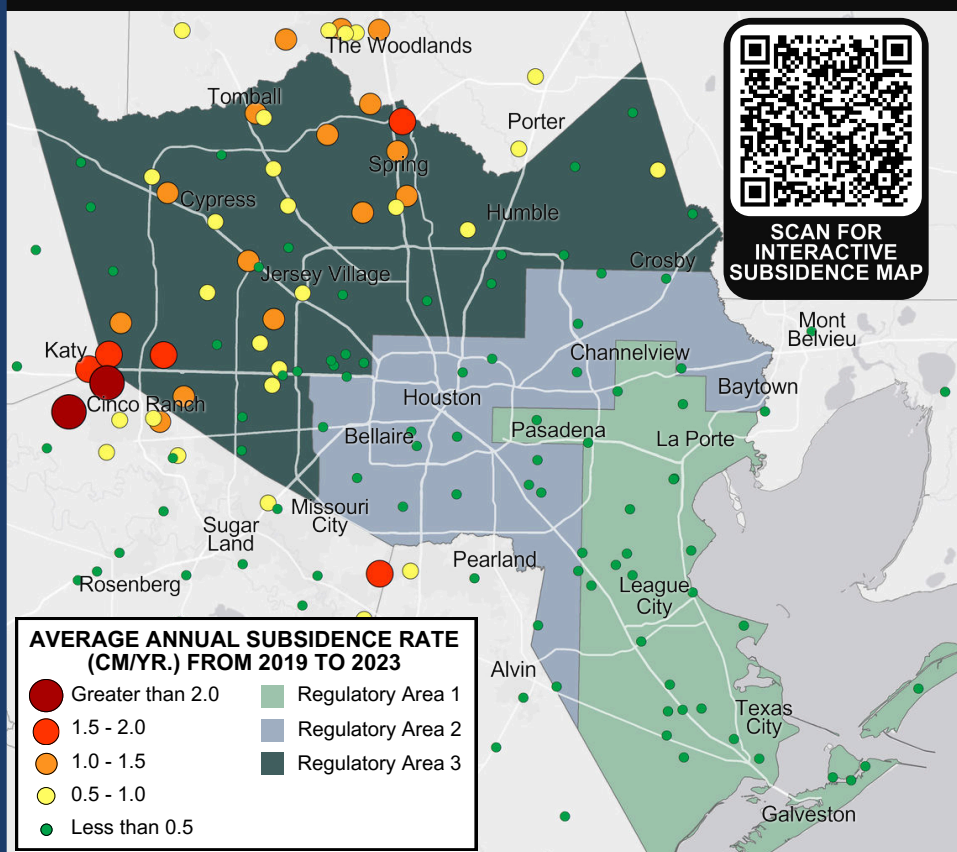
- Precipitation data from weather stations throughout the Houston area
- Groundwater withdrawals and total water demand
- Groundwater levels in the Gulf Coast Aquifer System
- Aquifer compaction measurements and subsidence data

This will be the report's 48th volume and is intended to exceed the requirements of section 8801.117 of the District's enabling legislation.

This document serves as a summary for some of the AGR findings. To access the full report, scan the QR code below.



SUBSIDENCE RATES



5-Year Average Annual Subsidence Rate

The map above shows the recent change in land surface deformation using data collected from global positioning system (GPS) stations from 2019 to 2023. Regulatory Areas 1 and 2 have been fully converted since 2002 utilizing alternative water sources to supply most of their water demands and show little subsidence or even uplift in some areas. The highest subsidence rates occurred in Regulatory Area 3, which has alternative water supply projects currently in progress to reduce reliance on groundwater and meet its 2025 conversion requirement as designated in HGSD's Regulatory Plan.

2023 WATER USE SUMMARY

The District’s Regulatory Plan requires permittees to convert to alternative water supplies to reduce their reliance on groundwater and prevent subsidence. Since 1976, water users have been working to change their water source from groundwater to alternative water. Our region’s primary alternative water supply is surface water sourced from the Brazos River Basin, the San Jacinto River Basin, and the Trinity River Basin. The overall groundwater use within the District in 2023 was 258.6 million gallons per day (MGD), a 2% increase in pumpage from 2022, most likely attributed to drought. The three primary water uses in the District are public supply, industrial, and irrigation. Public supply groundwater use remains the largest single-use category at 237 MGD and accounts for 91% of the groundwater used in the District.

| Water Source | | MGD used in 2022 | MGD used in 2023 | 1-Year Change |
|----------------------|-------------------------|------------------|------------------|---------------|
| Alternative Supplies | Brazos River Basin | 82.67 | 79.31 | -4% |
| | San Jacinto River Basin | 177.23 | 184.35 | +4% |
| | Trinity River Basin | 546.21 | 550.44 | +1% |
| | Reclaimed Water | 4.45 | 5.02 | +13% |
| | Alternative Subtotal | 810.56 | 819.12 | +1% |
| Groundwater | | 253.24 | 258.59 | +2% |
| Total Water Use | | 1063.8 | 1077.7 | +1.3% |

Active Alternative Water Supply Projects

To meet conversion requirements, local entities are working together to plan, design, finance, and construct projects to develop alternative water supplies and distribution infrastructure.

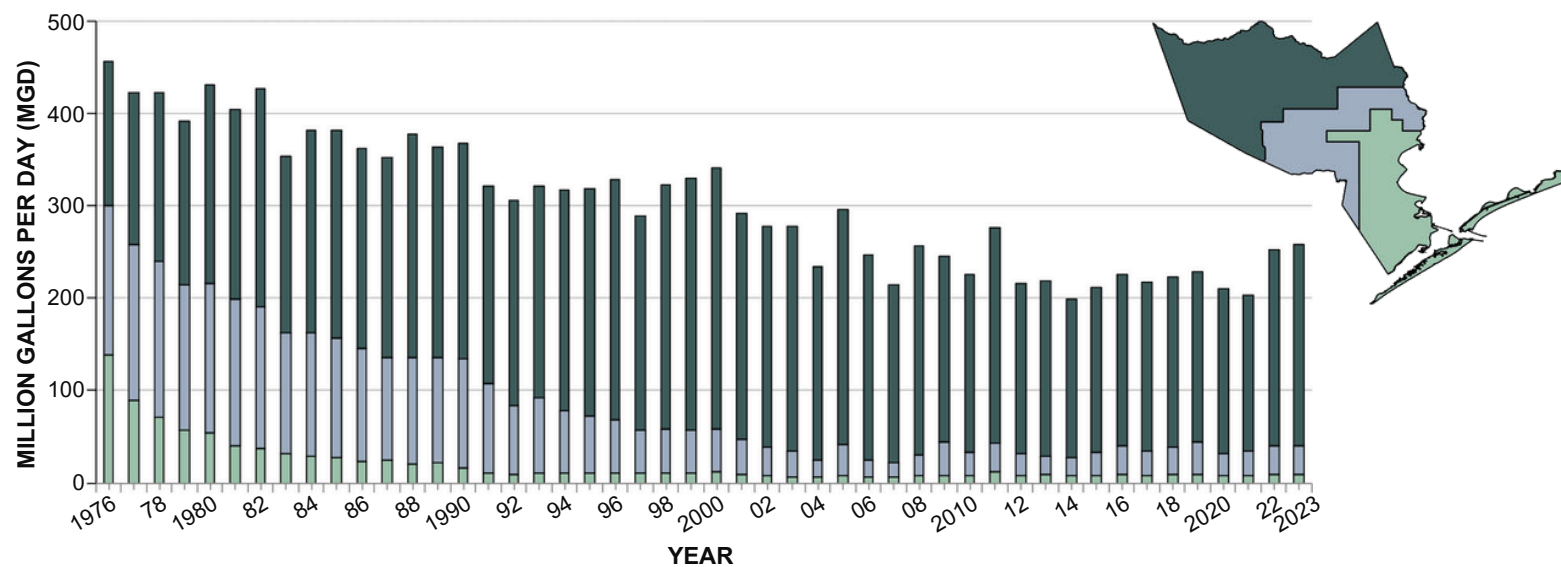
Currently, there are three (3) active water supply projects:

- Northeast Water Purification Plant Expansion
- Surface Water Supply Project
- Northeast Transmission Line

Scan the QR code to view a map of the projects.



TOTAL GROUNDWATER WITHDRAWAL BY REGULATORY AREA



Regulatory Area 1
Regulatory Area 1 (RA1) covers most of Galveston County and the southeastern portion of Harris County. This area converted to alternate water sources in the 1970s, 1980s, and early 1990s. In 2023, total groundwater withdrawal in RA1 was 8.8 MGD, a 5% decrease from the previous year. Most groundwater use in RA1 is associated with industrial use, which comprises 67% of the use in this area. Industrial use has been relatively stable since 1990, and groundwater use for public supply has remained generally stable since 2001. Groundwater withdrawals have declined in RA1 from a maximum of 138.1 MGD in 1976 to 8.8 MGD in 2023, a 94% reduction.

Regulatory Area 2
Regulatory Area 2 (RA2) covers a small northwestern slice of Galveston County and southern and eastern Harris County. It has been converted to alternate water sources since 2002, where possible. In 2023, total groundwater withdrawal in RA2 was 30.9 MGD, a 1% decrease from the previous year. Public supply continues to be the dominant use and has decreased by 81% from a maximum of 143.5 MGD in 1980 to 26.6 MGD in 2023. Overall, groundwater use in RA2 has declined from above 160 MGD in the 1970s to below 40 MGD since 2001. Agricultural irrigation had the largest increase of 49%, most likely attributed to the extreme drought.

Regulatory Area 3
Regulatory Area 3 (RA3) covers northern and western Harris County. Entities in this regulatory area were required to convert to alternate water beginning in 2010. Two subsequent conversion deadlines in 2025 and 2035 remain for permittees with groundwater reduction plans. In 2023, total groundwater withdrawal in RA3 was 218.9 MGD, a 3% increase from the previous year. Like RA2, the largest category of water use is public supply, which was reported at 207.9 MGD and accounted for 95% of the groundwater use in the area. Industrial water use has been below 4 MGD since 2010 and agricultural irrigation use has remained below 10 MGD since 2014.