



2022 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 is 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:

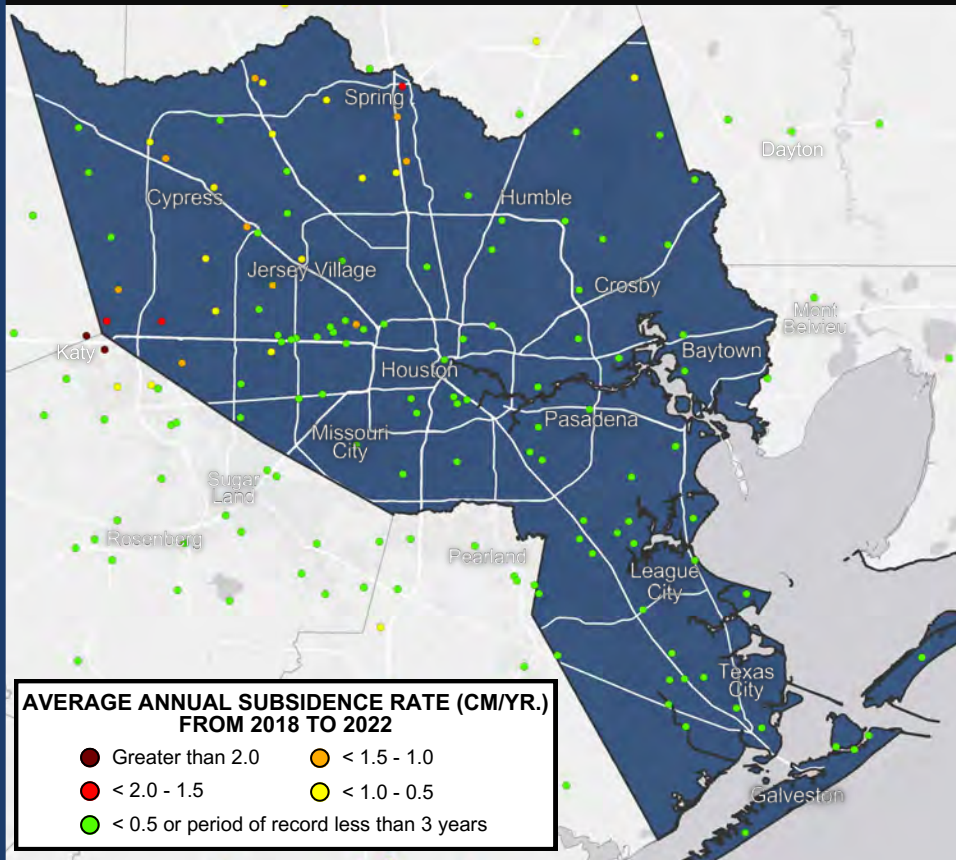
- Precipitation data from weather stations throughout the Houston area
- Groundwater withdrawals and total water demand
- Groundwater levels in the Gulf Coast Aquifer System
- Aquifer compaction measurements and subsidence data

This will be the report's 47th volume and is intended to exceed the requirements of section 8801.117 of the District's enabling legislation.

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



SUBSIDENCE RATES



Average Annual Subsidence Rate from 2018 to 2022

The average annual subsidence rate is useful for showing the recent change in land surface deformation at each GPS station. The map above shows the average annual subsidence rate from 2018 to 2022 for over 200 GPS stations in the greater Houston area. Regulatory Areas 1 and 2 show little to no subsidence, as both areas have been fully converted since 2002. The highest subsidence rates (greater than 2 centimeters per year) occur in Regulatory Area 3, which is still being converted to alternative water supplies.

2022 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 2022 was 252.9 million gallons per day (MGD), a 24% increase in pumpage from 2021, most likely attributed to drought in the summer of 2022. 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 231.63 MGD, and accounts for 92% of the groundwater used in the District.

Water Source		2021	2022	1-Year Change
Alternative Supplies	Brazos River Basin	70.9	82.7	17%
	San Jacinto River Basin	172.8	177.2	3%
	Trinity River Basin	535.9	546.2	2%
	Reclaimed Water	3.5	4.5	29%
	Alternative Subtotal	783.1	810.6	4%
Groundwater		204.0	252.9	24%
Total Water Use		987.1	1063.5	8%

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 four active water supply projects:

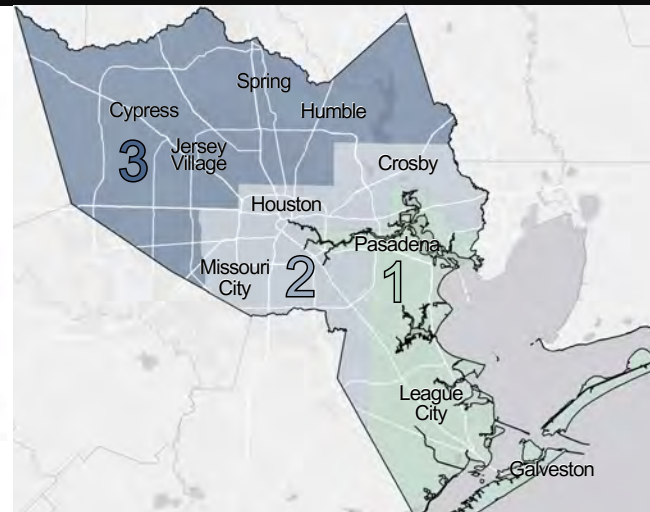
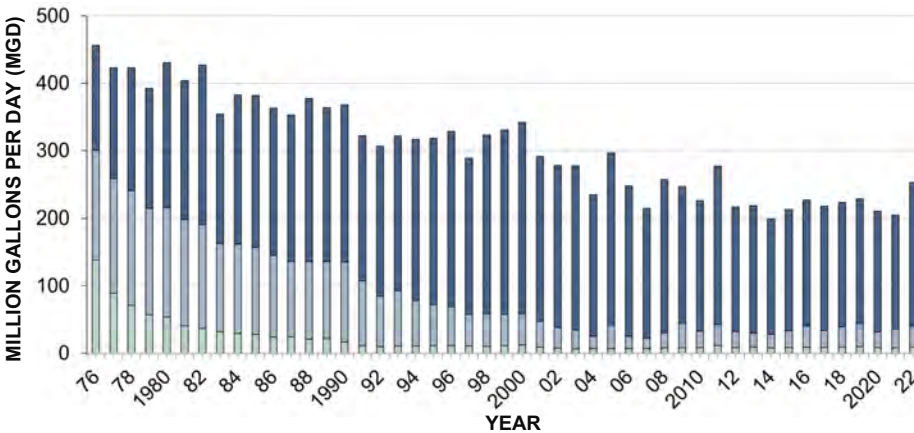
- Northeast Water Purification Plant Expansion
- Surface Water Supply Project
- Northeast Transmission Line
- Luce Bayou Interbasin Transfer

SCAN ME



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

GROUNDWATER WITHDRAWAL BY REGULATORY AREA



Groundwater Withdrawals from 1976 to 2022

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 2022, total groundwater withdrawal in RA1 was 9.2 MGD, a 17% increase from the previous year. Most groundwater use in RA1 is associated with industrial use, which comprises 71% 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 9.2 MGD in 2022.

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 2022, total groundwater withdrawal in RA2 was 31.1 MGD, a 15% increase from the previous year. Public supply continues to be the dominant use and has decreased by 80% from a maximum of 143.5 MGD in 1980 to 27.6 MGD in 2022. Overall, groundwater use in RA2 has declined from above 160 MGD in the 1970s to below 40 MGD since 2001. Irrigation had the largest increase of 29%, most likely attributed to the summer 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 2022, total groundwater withdrawal in RA3 was 212.6 MGD, a 26% increase from the previous year. Like RA2, the largest category of water use is public supply, which was reported at 201.5 MGD and accounted for 95% of the groundwater use in the area. Industrial water use has been below 4 MGD since 2010. While irrigation water use remained below 10 MGD since 2014, a 59% increase in irrigation use was reported in 2022, most likely attributed to the exceptional drought in summer. Groundwater withdrawals in RA3 show an increasing trend from 1976 through 2000, reflecting the impacts of climate and population increase as development progressed in northern and western Harris County.