



Harris Galveston Subsidence District

Testimony to the Committee on County Affairs

Michael J. Turco – General Manager

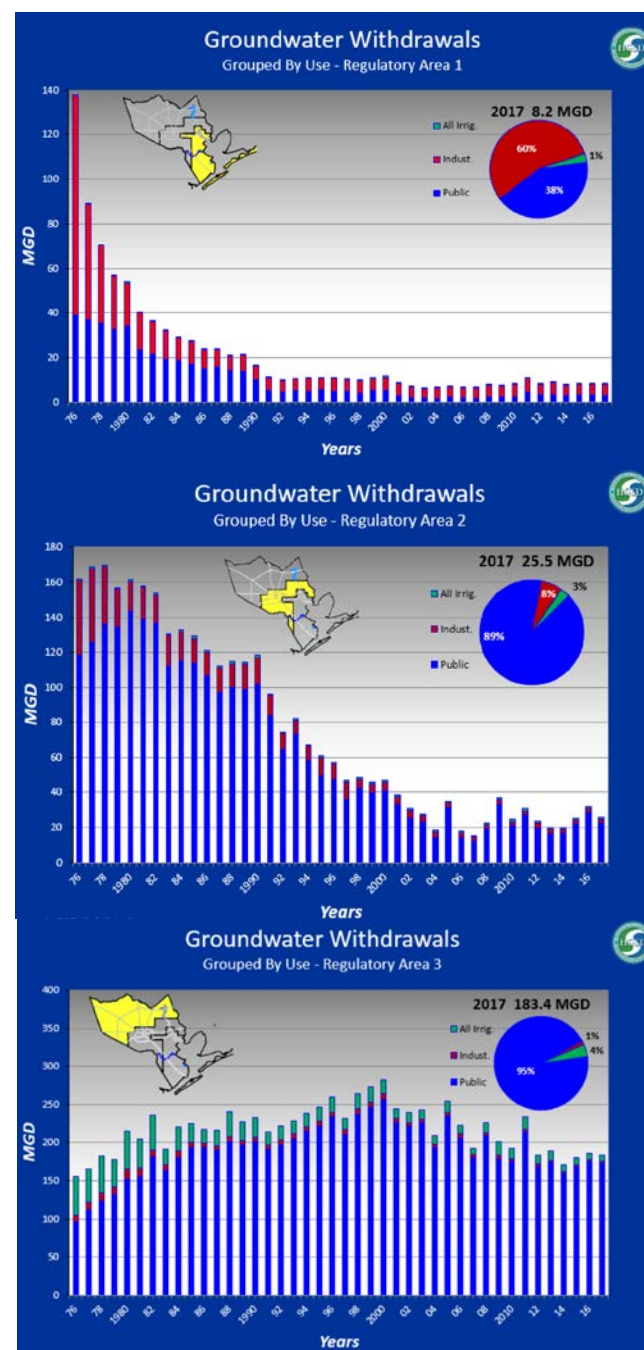


Regulating Groundwater Withdrawal

The reduction in groundwater withdrawal in areas 1 and 2 due to the regulatory policies established by the District has resulted in the increase in water levels of the aquifer and reduction in the rate of subsidence.

Areas 1 and 2 are currently considered “fully converted” where no more than 10% and 20% of the users total water demand can be sourced from groundwater, respectively.

Area 3 is currently in the process of conversion. In 2010, the area converted to 70% groundwater. Future conversion deadlines occur in 2025 (40%) and 2035 (20%). By 2035, alternative sources of water will comprise 80% of the total water demand in Area 3



Evangeline Long Term Water-Level Altitude Change (1977 - 2018)

Contour Interval: 40 feet
Range: -320 to 240

Evangeline Points 1977-2018

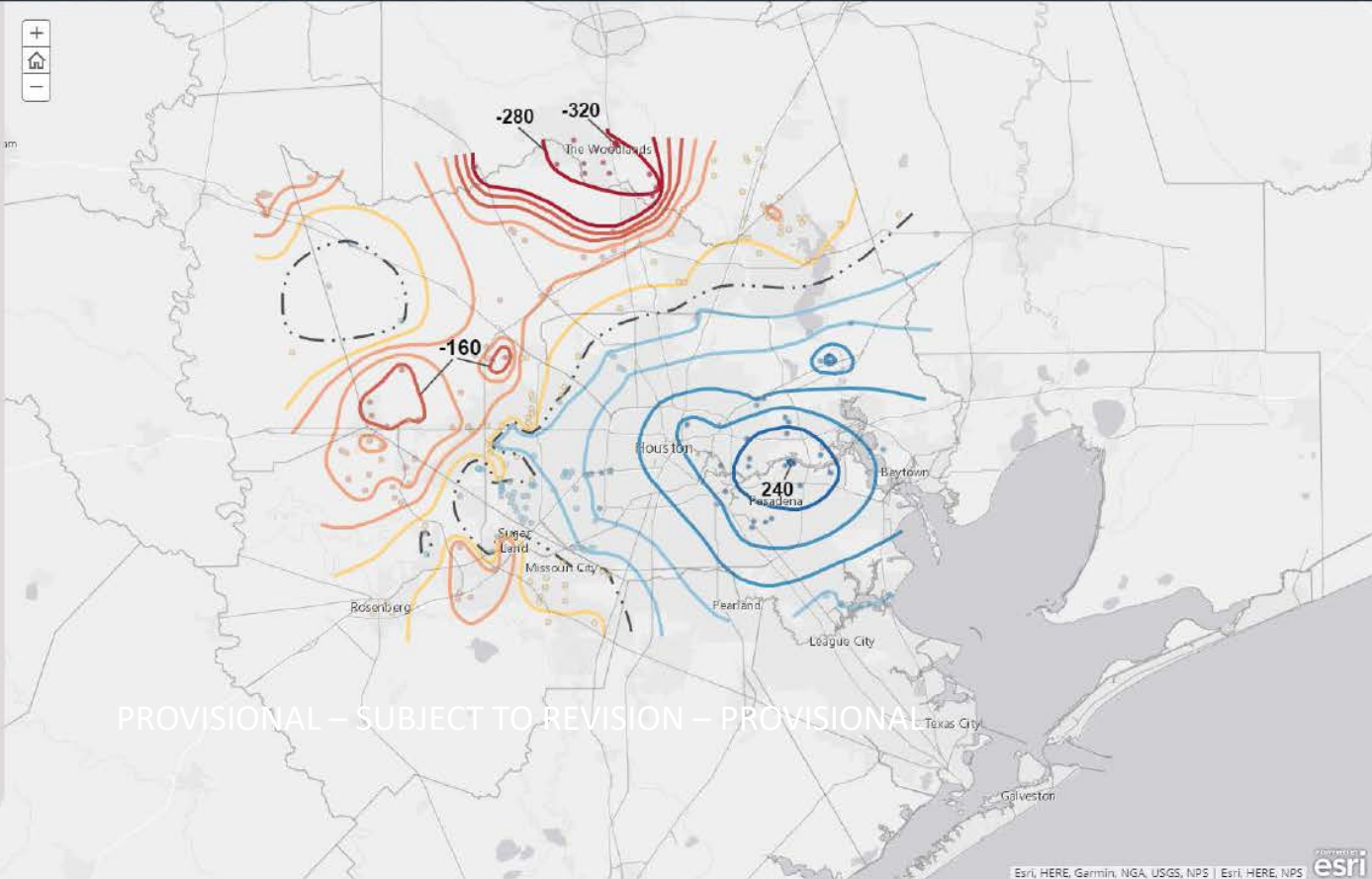
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- 161 to 260
- 81 to 160
- 1 to 80
- 0
- -1 to -40
- -41 to -120
- -121 to -200
- -201 to -320

Evangeline Contours 1977-2018

Contour

- 200 or 240
- 120 or 160
- 40 or 80
- 0
- -40
- -80 or -120
- -160 or -200
- -240 or -320



Water-level change in the Gulf Coast Aquifer, 1977 to 2018.

The reduction in pumpage has resulted in the increase of water-level in the aquifer system in those areas and a reduction in subsidence rates. Data provided by the USGS.

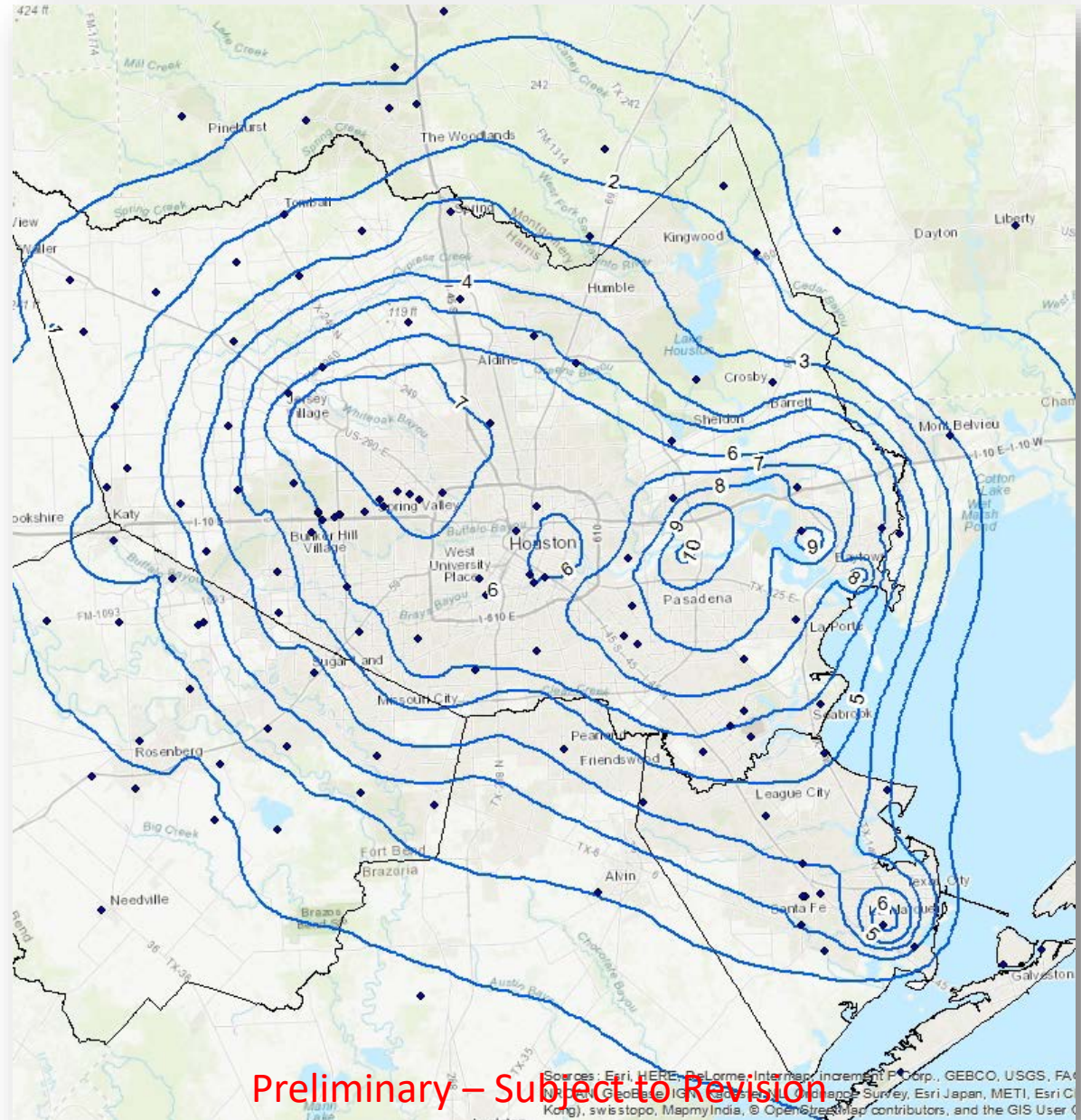


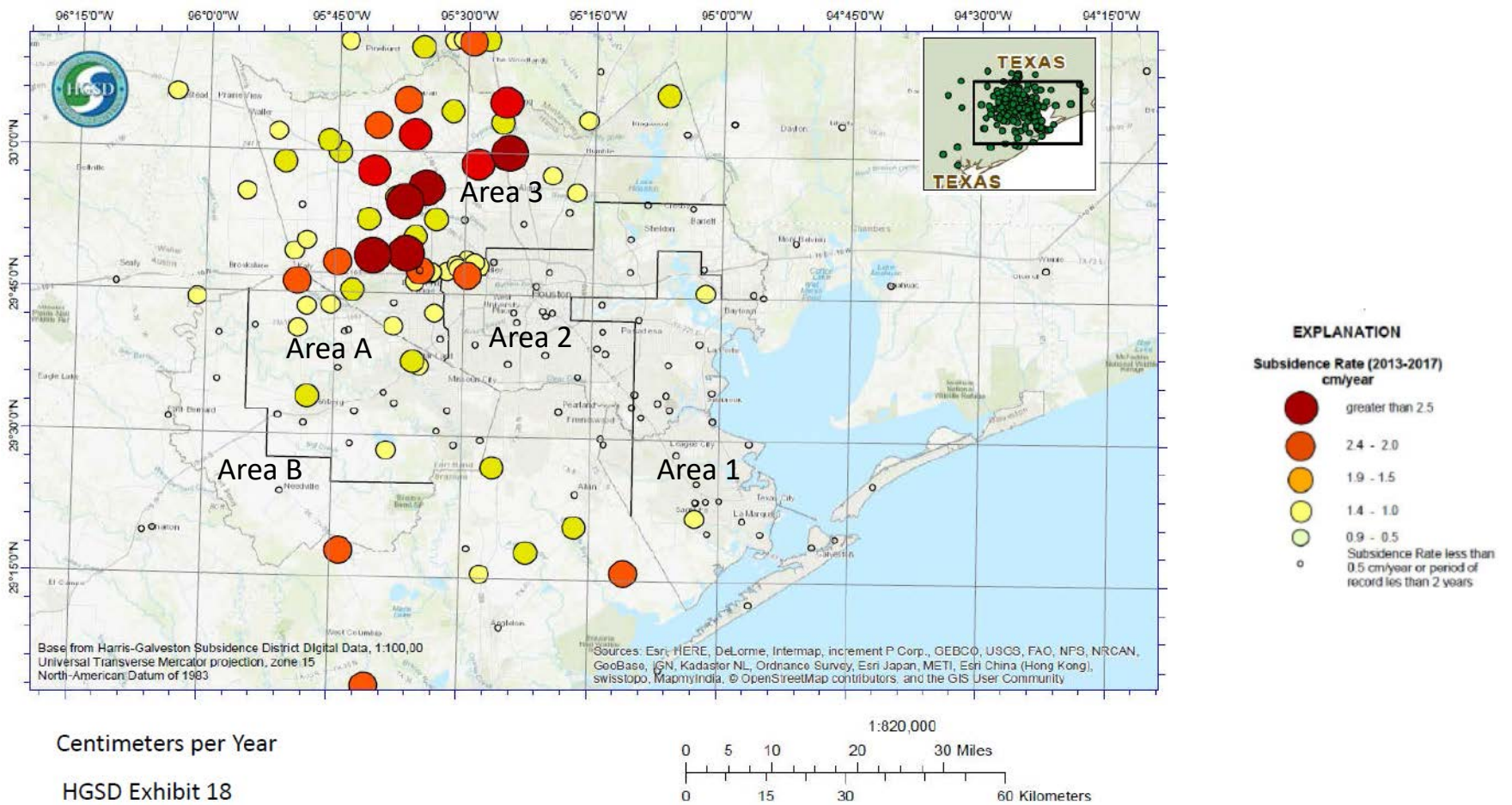
Estimated Subsidence 1906-2016

Since 1906 about 10 feet of subsidence has occurred near the ship channel and Baytown. The area that has experienced about 6 feet of subsidence covers the most of the area inside the beltway extending to Seabrook.

Most of the subsidence that occurs today occurs West and North of the Beltway in areas currently working to construct the necessary infrastructure to reduce groundwater and increase the use of alternative source waters.

The issue of subsidence is not unique to the two Districts, significant rates of subsidence are occurring today in Brazoria, Montgomery, and Waller Counties.





Subsidence Monitoring Network in Harris, Galveston, Fort Bend, and surrounding Counties operated in cooperation with the University of Houston, Lone Star Groundwater Conservation District, and the Brazoria County Groundwater Conservation District, 2017.

Subsidence Monitoring Network and rates in Harris County and Surrounding areas, 2017

District monitoring network extends throughout the Harris, Galveston, Fort Bend, and into surrounding counties. Data show the impact of reduction of groundwater use on the occurrence of subsidence in the region.

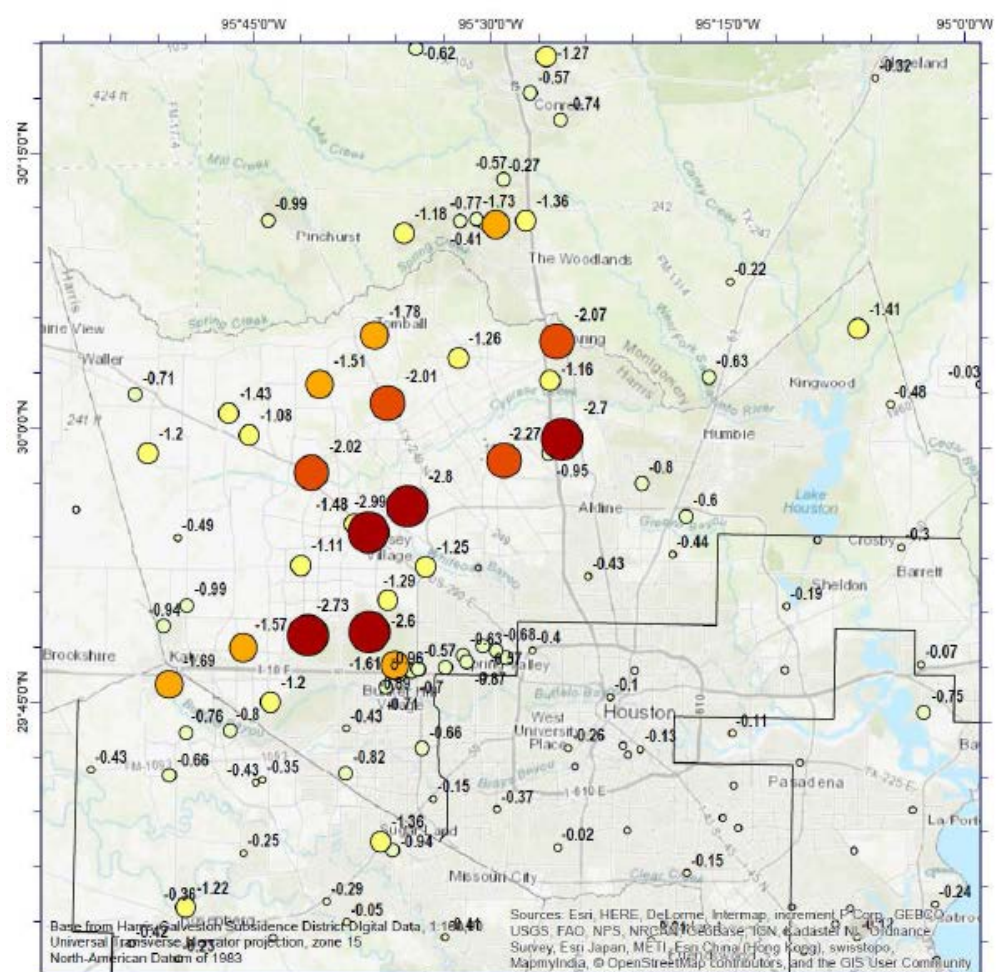


Annual Subsidence Rate 2013-2017

The highest subsidence rates observed today in the region are located in Southern Montgomery County, Northern and Western Harris County, North-eastern Fort Bend County.

The City of Houston in cooperation with the Regional Water Authorities are currently undertaking the largest water infrastructure project in the US to supply alternative water to these areas.

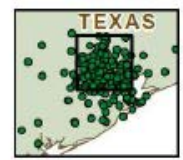
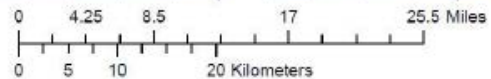
Subsidence has generally ceased in areas where conversion has been completed and groundwater use has been reduced.



EXPLANATION

Subsidence Rate (2013-2017)
cm/year

- greater than 2.5
- 2.4 - 2.0
- 1.9 - 1.5
- 1.4 - 1.0
- 0.9 - 0.5
- Subsidence Rate less than 0.5 cm/year or period of record less than 2 years



Annual estimated subsidence rate from GPS data measured from 2013-2017 at monitoring locations with more than two years of data.