



*This document is a fact-checked source for understanding Houston and the impact of Hurricane Harvey. Some estimates are preliminary and the document will be revised as additional reports become available.*

## HOUSTON IN PERSPECTIVE

### POPULATION

- **The nine-county Houston-The Woodlands-Sugar Land Metropolitan Statistical Area (MSA)<sup>i</sup> added 851,971 residents from '10 to '16.** That's more than the total population of metro El Paso (841,971) or metro Baton Rouge (835,175). During this period, metro Houston added more residents than any other U.S. metro.
- **Metro Houston had a population of 6,772,470 residents in '16.** If metro Houston were a state, it would have the 16th largest population in the U.S., behind Massachusetts (6,811,779) and ahead of Tennessee (6,651,194).
- **Harris County had a population of 4,589,928 residents in '16.** If Harris County were a state, it would have the 26th largest population in the U.S., behind Louisiana (4,681,666) and ahead of Kentucky (4,436,974).
- **The City of Houston had a population of 2,303,482 residents in '16.** If the city were a state, it would rank 36th in population in the U.S., behind Kansas (2,907,289) and ahead of New Mexico (2,081,015) and Nebraska (1,907,116).

### GEOGRAPHY

- The nine-county **Houston metro area covers 9,444 square miles**, an area larger than five states, including New Hampshire, New Jersey and Connecticut. **Harris County covers 1,778 square miles**, enough space to fit New York City, Philadelphia, Boston, Chicago, Seattle, Austin and Dallas, with room still to spare. **At 655 square miles, the city of Houston** is larger than six European countries, ranking just below Luxembourg and above Malta.
- To visualize the size of Hurricane Harvey in relation to other U.S. regions, click [here](#).

All population and geography estimates are derived from the U.S. Census Bureau. For more information about Houston, please see [Houston Facts](#).

# HURRICANE HARVEY

## RAINFALL

- **Harris County averaged 40 inches of total rainfall from Harvey**, equivalent to 1.2 trillion gallons. Harvey dropped 51.88 inches of rain near Cedar Bayou, the highest total ever recorded for a single U.S. weather event. The meter at IAH measured 31.26 inches while Hobby measured 27.88 inches.<sup>ii</sup>
- At one point, nearly every stream, bayou and channel in Harris County was at or above its bank.<sup>iii</sup>
- **Harvey dumped nearly a year's worth of rainfall on the Houston region.** Houston's annual rainfall has averaged 49.2 inches since '70. The ten-year average is 48.9 inches.<sup>iv</sup>

## RESPONSE AND RECOVERY

- The Texas Department of Public Safety reports that there were **13 shelters open in the Houston MSA housing approximately 1,464 evacuees as of September 22.** Outside of the metro area, there are 647 evacuees in 8 shelters. The state number may include some Houston-area residents sent to shelters outside the region.<sup>v</sup>
- **At the peak on August 31, there were 34,575 evacuees in shelters across Texas.**<sup>vi</sup>
- State and federal agencies have performed **122,331 rescues and evacuations** throughout Texas as of September 12. Another 5,249 pets and animals were rescued. TxDPS does not mention whether this includes private citizen rescues.<sup>vii</sup>
- Various Texas state agencies have expended more than **\$321.5 million on Harvey relief efforts** as of September 19.<sup>viii</sup>
- As of December 5, **632,388 individuals or households** in metro Houston had submitted valid registrations for **FEMA's Individual and Households Program (IHP) and 249,259 registrations were approved for \$1.0 billion in assistance.**<sup>ix</sup>

Metro Houston Registrations of FEMA's Individual and Households Program (IHP), as of December 5, 2017						
County	Valid Registrations	Registrations Percent of Total (%)	Approved Registrations	Registration Approval Rate (%)	IHP Amount (\$)	IHP Amount per Approved Registration (\$)
Austin	839	0.1	311	37.1	1,072,695	3,449
Brazoria	40,096	6.3	18,282	45.6	66,736,045	3,650
Chambers	6,069	1.0	3,131	51.6	24,169,816	7,720
Fort Bend	58,421	9.2	22,277	38.1	88,929,995	3,992
Galveston	44,838	7.1	19,730	44.0	96,930,062	4,913
Harris	449,842	71.1	172,712	38.4	686,448,407	3,975
Liberty	10,576	1.7	4,678	44.2	26,068,855	5,573
Montgomery	19,360	3.1	7,288	37.6	33,414,137	4,585
Waller	2,347	0.4	850	36.2	3,615,516	4,254
<b>Metro Houston</b>	<b>632,388</b>	<b>100.0</b>	<b>249,259</b>	<b>39.4</b>	<b>1,027,385,526</b>	<b>4,122</b>

Source: FEMA

- On February 13, 2018, Governor Abbott announced \$1 billion in hazard mitigation funds from FEMA for Texas cities and counties affected by Harvey, half of which will be immediately available. This amount is distinct from the \$90 billion relief package Congress approved a week earlier for Texas and other states affected by disasters in 2017.
- As of December 5, 2017, the **Small Business Administration has approved \$2.7 billion** in federal disaster loans for 30,000 Texas businesses and residents impacted by Hurricane Harvey.
- More than **400 individual business donations** have been made since August 28 with corporations and business owners pledging over **\$300 million** toward Harvey relief. Approximately a hundred companies have donated \$1 million or more. Houston-based companies have led the effort with at least \$60 million pledged so far.<sup>x</sup>

## ECONOMIC IMPACT

- **Harvey's impact will be greater than Hurricane Ike's.** Ike was a wind event with some rain while Harvey was a rain event with little wind. Since Ike hit in '08, the region's population has increased by more than a million residents, property values have risen and the value of the region's business infrastructure has grown.
- **Hurricane Harvey is the nation's third largest economic disaster** after Hurricane Katrina (\$174.5 billion) and the 9/11 attacks (\$109.5 billion).<sup>xi</sup>
- Moody's Analytics estimates **Harvey's losses for the U.S. at \$81.5 billion**, a downward revision from the previously reported \$97 billion. The new estimate includes \$73 billion in property losses and \$8.5 billion in lost economic output. Moody's forecasts a drop in metro Houston employment and gross regional product in Q4/17 with an increase above pre-Harvey levels in Q1/18.<sup>xii</sup>
- **Wells Fargo estimates total losses to be around \$90 billion:** \$40 billion in damage to homes; \$5 billion in autos and household items; \$28 billion in business interruptions; and \$17 billion in damages to commercial property and public infrastructure.<sup>xiii</sup>
- The Federal Reserve Bank of Dallas forecasts the Houston and Beaumont metros combined will **lose 42,000 to 74,000 jobs in September. Most of the losses will be recouped in October** as employees displaced by Harvey return to work and hiring for repair and reconstruction efforts being. By November, the region's employment should surpass pre-Harvey employment levels.<sup>xiv</sup>
- In metro Houston, **492 businesses are reported as having major property damage**, roughly 0.3 percent of the region's 154,250 business establishments.<sup>xv xvi</sup>

- FlightAware reported that **9,400 commercial flights were cancelled** from August 25 through September 2 at George Bush Intercontinental Airport (IAH) and William P. Hobby Airport (HOU). The Houston Airport System reports that Harvey-related disruptions resulted in **nearly one million fewer passengers** passing through IAH and HOU.
- There are impacts that reverberate beyond a data point, the most significant being the loss of life. Various sources have placed the **death toll from Harvey at 82** as of September 15 with 35 casualties occurring in Harris County.<sup>xvii</sup>

## COMMERCIAL REAL ESTATE

- Xceligent reports that 7,155 of the region's 89,400 commercial properties (office, industrial, multi-family and retail), or around eight percent, were in Harvey-affected areas. It is still to be confirmed if the properties received damage.
- 57 of the region's 1,200 office buildings suffered damage. These buildings represent 15.5 million square feet or less than seven percent of inventory. Damage ranged from roof leaks to flooded lobbies, basements and garages.<sup>xviii</sup>

## RESIDENTIAL REAL ESTATE

- Initial estimates suggest **Hurricane Harvey damaged or destroyed 97,212 single-family homes** in metro Houston. Sixty-six percent of the impacted homes are in Harris County. Damage estimates for Chambers County have not yet been reported.<sup>xix</sup>
- **Approximately seven percent of the Houston region's 2.4 million housing units were impacted** by Harvey.<sup>xx xx1</sup> Housing units include single-family, mobile and multi-family. Damage to housing units are categorized as follows<sup>xxii</sup>:
  - Minor damage: 60,147 (2.5 percent)
  - Major damage: 37,757 (1.6 percent)
  - Destroyed: 3,638 (0.2 percent)
- **64,405 housing units were "affected,"** meaning the home sustained some damage, but is habitable without repairs.<sup>xxiii</sup>
- TxDPS reports 6,574 multi-family units in Texas affected, damaged or destroyed by Harvey. Of those, **3,426 units were in metro Houston** (1,182 multi-family units were affected, 1,655 were damaged and 589 were destroyed).<sup>xxiv</sup>
- The TxDPS estimate may be on the low end. Apartment Data Services has surveyed 95 percent of all multi-family properties in the region. ADS found **15,662 units in 215 properties, about 2.4 percent** of Houston inventory, were damaged due to high water.<sup>xxv</sup>
- **83 percent of single and multi-family homes in the Houston metro do not have flood insurance.**<sup>xxvi</sup>
- **Half of the area that flooded in Harris County occurred outside of the 100-year and 500-year floodplains.**<sup>xxvii</sup>

## VEHICLES

- The Houston region may lose approximately **300,000 vehicles with a total value of \$2.4 billion**. The impact on new car dealerships is estimated at \$140 million which includes damaged/destroyed inventory, lost potential sales, facility clean-up and repair. The impact on used car dealers and independent repair shops is estimated at \$100 million.<sup>xxviii</sup>

## ENERGY INDUSTRY

- **On August 30, more than a quarter of the nation's refining capacity (about five million barrels per day) was offline because of Harvey.** As of September 7, 16 percent of U.S. refining capacity (about three million barrels per day) remains offline.<sup>xxix</sup>
- Retail gasoline prices averaged \$2.68 per gallon on September 4, **28 cents per gallon higher than prices a week ago.** Supply disruptions and refinery outages caused by Hurricane Harvey continue to affect gasoline supply and prices, particularly along the U.S. East Coast and the Gulf Coast, where gasoline prices are 39 cents/gal and 35 cents/gal higher, respectively, than they were a week ago.<sup>xxx</sup>
- The chemical industry is still assessing the damages from Hurricane Harvey. Plant restarts are expected to emerge throughout the week with constraints on railroads, pipelines and export capabilities potentially limiting output. **For olefins and polyolefins, nearly 50 percent of production remains offline as of September 7.**<sup>xxxi</sup>
- Eleven ports are partially closed or open with restrictions. The port of Freeport is open and the other major ports are in recovery. The U.S. Coast Guard is lifting more restrictions to vessel traffic. Some 55 oil tankers remain waiting in anchorage off the Texas ports.<sup>xxxii</sup>

## UTILITIES

- As of September 12, there were **9,285 electric utility customers in the state of Texas without power.** Of those, 240 were in the Entergy service area (which in Houston includes Chambers, Liberty, Montgomery and Waller counties), and 2,119 were in the CenterPoint service area (which includes the remainder of the Houston MSA).<sup>xxxiii</sup>
- **CenterPoint restored power to 878,000 meters from August 26 to September 2.**<sup>xxxiv</sup>

## BUILDING RESILIENCY

- In February 2018, the federal government allocated approximately **\$89.2 billion to disaster relief through H.R. 1892** for Texas, Florida, Puerto Rico and other areas recovering from natural disasters. The bill designates specific amounts to federal agencies who will work within the bill's guidelines to determine the amounts that local entities will receive.<sup>xxxv</sup>
- The Partnership has identified **\$54.3 billion in projects needed for flood resiliency** in the Houston region. The types of projects would include the construction, improvement and restoration of bayous and reservoirs in the region, street and drainage improvements, storm surge protection and home buy-outs.<sup>xxxvi</sup>
- **Home buyouts**, one flood mitigation strategy that buys out consistently-flooded homes, are primarily funded through FEMA, the Department of Housing and Urban Development, and local entities. One grant program of FEMA's requires that local governments match 25 percent of federal funds received. Properties must meet several federal and local criteria to be approved for buyout, and **the process can take between one and three years**. Once a property has been bought out, the parcel is restored as a natural greenspace.<sup>xxxvii</sup>
- **Harris County has completed the largest number of buyouts in the country**, acquiring nearly 3,100 properties for \$342 million between 1985 and 2017. Harris County's buyout process is based on priority—not first come-first served. HCFCF estimates that at an average payout of \$175,000 per property, purchasing all 3,300 homes on the district's priority buyout list (prior to Harvey), would cost approximately \$600 million.<sup>xxxviii</sup>
- Since Harvey, **HCFCF has received more than 3,500 voluntary buyout applications**—though only one in five meet the buyout criteria—and the District estimates that 107,000 homes remain in floodplains, though many will not qualify.<sup>xxxix</sup>
- In late **September 2017, \$20 million in County funds were authorized for the Harris County Engineering Department to use for home buyouts** in unincorporated Harris County. Thus far, approximately 57 properties have been acquired. Another 41 properties have been purchased by HCFCF since late September, using funds received after the 2015 Memorial Day and 2016 Tax Day floods.<sup>xl</sup>

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<sup>i</sup> The nine counties included in the Houston MSA are: Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller.

<sup>ii</sup> National Oceanic and Atmospheric Administration (2017, August 30). *Storm Summary Message*. Retrieved from: <http://www.wpc.ncep.noaa.gov/discussions/nfdsc1.html>

<sup>iii</sup> Harris County Flood Control District.



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- <sup>iv</sup> National Weather Service and Greater Houston Partnership (2017). *Houston Facts*.
- <sup>v</sup> Texas Department of Public Safety (2017, September 22). Texas Division of Emergency Management State Situation Report. Retrieved from: <https://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3498>
- <sup>vi</sup> Texas Department of Public Safety (2017, August 31). Texas Division of Emergency Management State Situation Report. Retrieved from: <https://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3385>
- <sup>vii</sup> Texas Department of Public Safety (2017, September 12). Texas Division of Emergency Management State Situation Report. Retrieved from: <https://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3444>
- <sup>viii</sup> Texas Department of Public Safety (2017, September 19). DSO Spreadsheet 17-0021 Harvey 2017 091917. Retrieved from: <https://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3483>
- <sup>ix</sup> Federal Emergency Management Agency (2017, September 28)
- <sup>x</sup> Greater Houston Partnership Research analysis of reported contributions as of September 12, 2017.
- <sup>xi</sup> Moody's Analytics Webinar (2017, September 14). *The Economic Impact of Hurricane Irma*.
- <sup>xii</sup> Moody's Analytics Webinar (2017, September 14). *The Economic Impact of Hurricane Irma*.
- <sup>xiii</sup> Wells Fargo Economics Group (2017, September 8). *Impact of Hurricane Harvey*. Retrieved from: [http://image.mail1.wf.com/lib/fe8d13727664027a7c/m/2/harvey\\_impact\\_20170908.pdf?utm\\_source=SFMC&utm\\_medium=email&utm\\_campaign=&utm\\_content=&utm\\_term=7230679&sid=42857](http://image.mail1.wf.com/lib/fe8d13727664027a7c/m/2/harvey_impact_20170908.pdf?utm_source=SFMC&utm_medium=email&utm_campaign=&utm_content=&utm_term=7230679&sid=42857)
- <sup>xiv</sup> Phillips, Keith. (2017, September 5.) NABE Webinar: *Hurricane Harvey: Regional, Macro and Energy Implications*. Retrieved from: [https://nabe.com/NABE/Events/Event\\_Display.aspx?EventKey=RURT9517&WebsiteKey=91b9e16d-e6fe-4f31-a4af-02c194225c32](https://nabe.com/NABE/Events/Event_Display.aspx?EventKey=RURT9517&WebsiteKey=91b9e16d-e6fe-4f31-a4af-02c194225c32)
- <sup>xv</sup> Texas Department of Public Safety (2017, September 22). DSO Spreadsheet 17-0021 Harvey 2017 092217. Retrieved from: <https://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3496>
- <sup>xvi</sup> Texas Workforce Commission. (2017, August). Quarterly Census for Employment and Wages. Retrieved from: <http://www.tracer2.com/cgi/dataanalysis/PeriodSelection.asp?menuchoice=industry>
- <sup>xvii</sup> Harris County Institute of Forensic Sciences. (2017, September 8). Storm-Related Deaths. Retrieved from: <https://ifs.harriscountytexas.gov/Documents/HarrisCountyHarvey-RelatedDeaths.pdf>
- <sup>xviii</sup> CBRE. (2017, September 19) Data presented at the Greater Houston Partnership's "Getting Back to Business" workshop.
- <sup>xix</sup> Texas Department of Public Safety (2017, October 8). DSO Spreadsheet 17-0021 Harvey 2017 100817. Retrieved from: <http://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3561>
- <sup>xx</sup> Texas Department of Public Safety (2017, October 8). DSO Spreadsheet 17-0021 Harvey 2017 100817. Retrieved from: <http://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3561>
- <sup>xxi</sup> U.S. Bureau of the Census. 2011-2015 American Community Survey. DP04 Selected Housing Characteristics.
- <sup>xxii</sup> As defined by FEMA, "affected" structures sustained some damage but are habitable without repairs. "Minor" includes structures that are damaged and uninhabitable, but will be habitable within 30 days after repairs. "Major" includes structures that are uninhabitable and require extensive repairs that will take more than 30 days to repair. "Destroyed" includes structures that have sustained loss or damage to such an extent that repairs are not economically feasible.
- <sup>xxiii</sup> Texas Department of Public Safety (2017, October 8). DSO Spreadsheet 17-0021 Harvey 2017 100817. Retrieved from: <http://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3561>
- <sup>xxiv</sup> Texas Department of Public Safety (2017, October 8). DSO Spreadsheet 17-0021 Harvey 2017 100817. Retrieved from: <http://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3561>
- <sup>xxv</sup> Apartment Data Services
- <sup>xxvi</sup> Partnership analysis of FEMA data. FEMA data retrieved from: <https://bsa.nfipstat.fema.gov/reports/1011.htm>
- <sup>xxvii</sup> Natural Hazards Research and Mitigation Group at the University of California, Davis. (2017, September 1). Preliminary Analysis of Hurricane Harvey Flooding in Harris County, Texas. Retrieved from: <https://californiawaterblog.com/2017/09/01/preliminary-analysis-of-hurricane-harvey-flooding-in-harris-county-texas/>
- <sup>xxviii</sup> InfoNation, Inc. of Sugar Land
- <sup>xxix</sup> IHS Markit. (2017, September 7). Hurricane Harvey Overview.
- <sup>xxx</sup> Energy Information Administration (2017, September 6). Today in Energy. Retrieved from: <https://www.eia.gov/todayinenergy/detail.php?id=32792>
- <sup>xxxi</sup> IHS Markit. (2017, September 7). Hurricane Harvey Overview.
- <sup>xxxii</sup> American Chemistry Council
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<sup>xxxiii</sup> Texas Department of Public Safety (2017, September 12). Texas Division of Emergency Management State Situation Report.

Retrieved from: <https://www.dps.texas.gov/dem/sitrep/GetFile.aspx?id=3444>

<sup>xxxiv</sup> CenterPoint Energy

<sup>xxxv</sup> Greater Houston Partnership analysis of H.R. 1892

<sup>xxxvi</sup> Greater Houston Partnership (2018, February). Flood Resiliency Task Force Funding Comparisons

<sup>xxxvii</sup> Harris County Flood Control District

<sup>xxxviii</sup> Harris County Flood Control District

<sup>xxxix</sup> Kinder Institute Harris County Flood Control District

<sup>xl</sup> Harris County Flood Control District