



HOUSTON WATER EXTREME WEATHER EVENTS

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HOUSTON PUBLIC WORKS
MARCH 20, 2019

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The land area of all these cities COMBINED would fit within our land area.

Houston Area:
650 Sq. Miles



HOUSTON WATER

1600 FTE

DRINKING
WATER
SYSTEM

7 PUBLIC
WATER
SYSTEMS

OPERATIONS
AND
PROGRAM
SUPPORT

WASTEWATER
SYSTEM

39 WWTP

3 SURFACE
WATER
PLANTS

PLANNING

384 LIFT
STATIONS

ANNUAL
BUDGET
\$ 387M O&M
\$ 375M CIP

100
GROUND
WATER
WELLS

7,144 MILES
PRESSURE
MAINS

COMPLIANCE

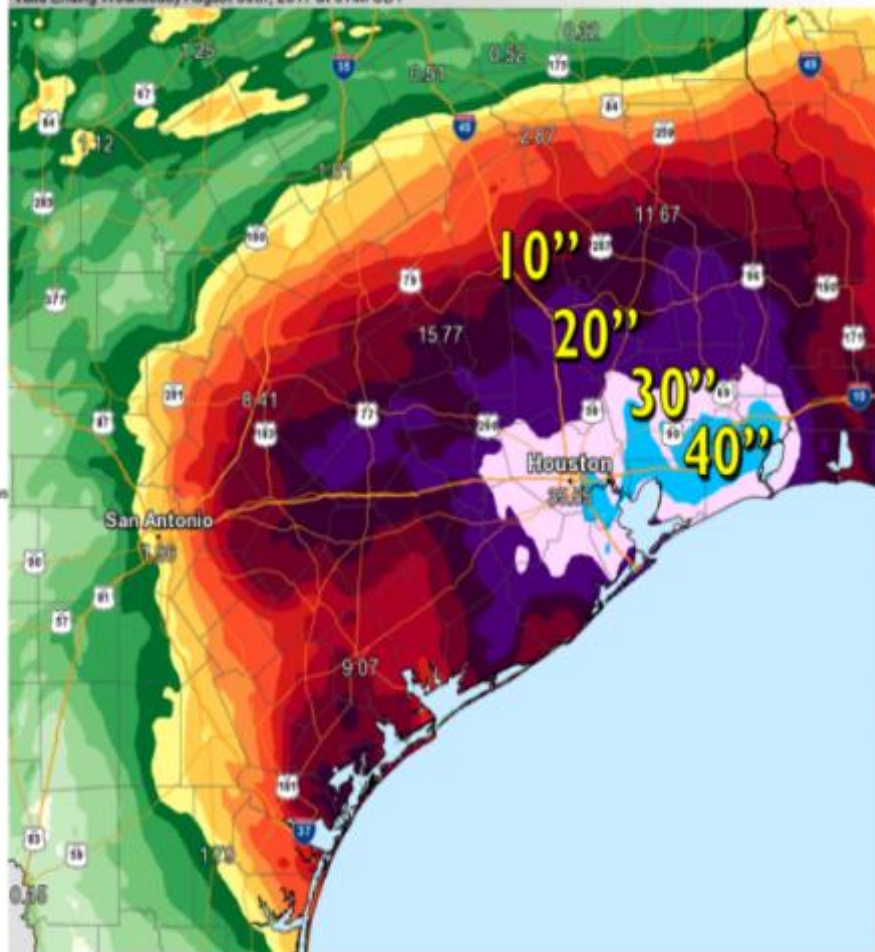
127,827
MANHOLES

6,195 MILES
GRAVITY &
FORCE
MAINS

WEATHER EVENTS

- 2008 HURRICANE IKE – CAT 2, 110 MPH MAX SUSTAINED WINDS
- 2011 DROUGHT OF RECORD ~45 WEEKS, 95% OF TX IN DROUGHT
- 2015 MEMORIAL DAY FLOOD, 12” RAIN IN 10 HOURS
- 2016 TAX DAY FLOOD, 17” RAIN IN 14 HOURS
- 2016 MEMORIAL DAY FLOOD, 8” – 13” RAIN
- 2017 HURRICANE HARVEY, 36-48” RAIN IN HOUSTON METRO

Valid Ending Wednesday August 30th, 2017 at 6 AM CDT



5 Day Point Rainfall Amounts in Inches

- Harvey continued to produce record breaking **rainfall totals** of **45 to over 50 inches**... with continued rainfall
- **Cedar Bayou** - 51.88
- **Berry Bayou** - 44.88
- **League City** - 49.84
- **Mary's Creek** - 49.80
- **Goose Creek** - 44.08
- **Greens Bayou** - 41.36
- **Buffalo Bayou** - 35.60
- **Addicks Dam** - 33.44

Apexis View
An interactive map of the Harris County Flood Control District

Graphics Created
August 30th, 2017
7:00 AM CDT

Point rainfall
data courtesy



Hurricane Harvey 2017

>60" Rain

31 of 67 river forecast points set new records!

Houston, TX



80% of Harvey flood victims didn't have flood insurance!
(Consumer Federation of America estimate)

82 fatalities, ~155,000 structures flooded, ~1/4 million vehicles flooded



Lake Houston Spillway 8/30/17

Beltway 8 @ I-10 Toll Road 9/2/17

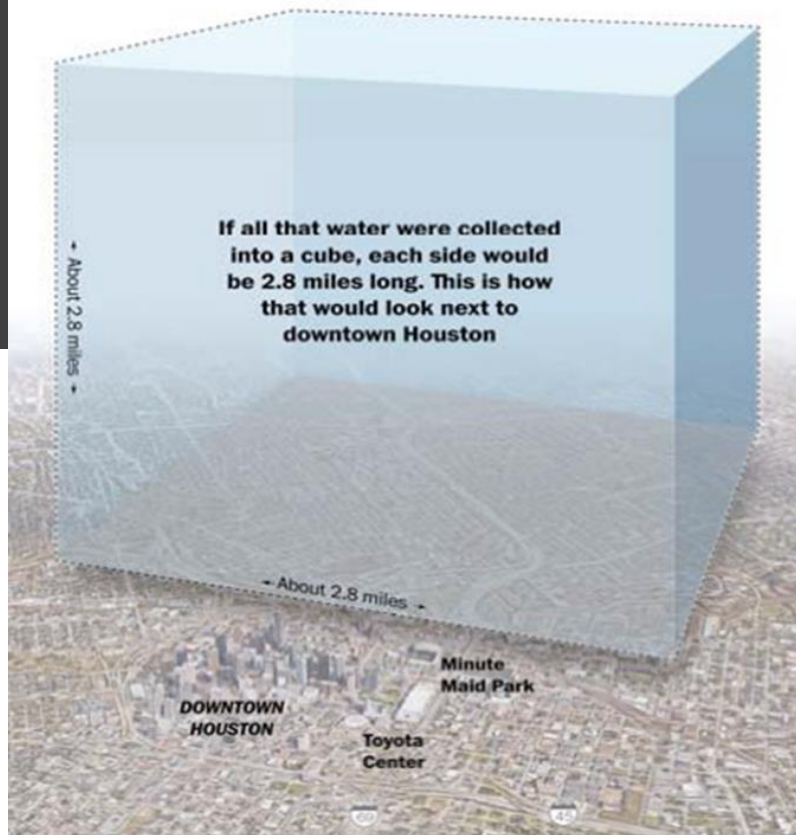




Figure 17. Texas World Speedway after Harvey being used to store flooded cars. Photo credit Brazos Drones.

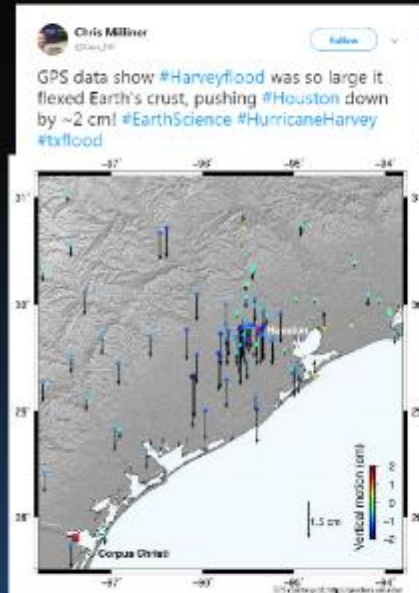
What would 24.5 trillion gallons of water look like?

As of Wednesday morning, about 24.5 trillion gallons of rain have fallen along the Gulf of Mexico. About 19 trillion gallons across the greater Houston area and Southeast Texas, as well as an additional 5.5 trillion in Louisiana.



2 cm is estimate how much Houston sank into the Earth under weight of water from Harvey

Source- Chris Milliner, NASA JPL



DRINKING WATER OPERATIONS



NO
Power
Loss

Drinking
water
remained
SAFE!

NO
boil water
notice issued



NORTHEAST WATER PURIFICATION PLANT

SINCE HARVEY

- ❑ LEAK ON 102" RAW WATER LINE
- ❑ LEAK ON LARGE DIAMETER TREATED WATER LINES
- ❑ HUNDREDS OF LEAKS IN DISTRIBUTION SYSTEM
- ❑ RAW WATER QUALITY HAS CHANGED

WASTEWATER OPERATIONS



Turkey Creek Wastewater Treatment Plant

4
wastewater
plants
flooded

**100 lift
stations
damaged**

**All plants
operational
within 3
weeks**

ALERTHOUSTON

HARVEY RECOVERY UPDATE



HOUSTON - Two of Houston Water's wastewater treatment plants in west Houston (West District and Turkey Creek) which provide sanitary sewer service to zip codes: 77024, 77041, 77043, 77055, 77077, 77079, 77080, and 77094 (impacted areas are highlighted on the map below) remain flooded in up to 8 feet of water as of Monday, Sept. 4, at 7 p.m.

Wastewater is water that goes down the drain and into the sanitary sewer system. In homes this includes water from sinks, showers, bathtubs, toilets, washing machines and dishwashers.

Houston Water is asking the community in the impacted areas to please help conserve wastewater to avoid sanitary sewer backups.

A few ways to help conserve wastewater include minimizing laundry use, taking shorter showers, not running the dishwasher, and flushing the toilet a little less. Please share any other creative ways to help conserve our wastewater using the #HarveyReduceUse.

Houston Water crews and partners in the Energy Corridor are working together to try to restore the wastewater treatment plants as quickly as possible.

The City of Houston's drinking water remains SAFE; this includes the tap water that comes out of the faucet.

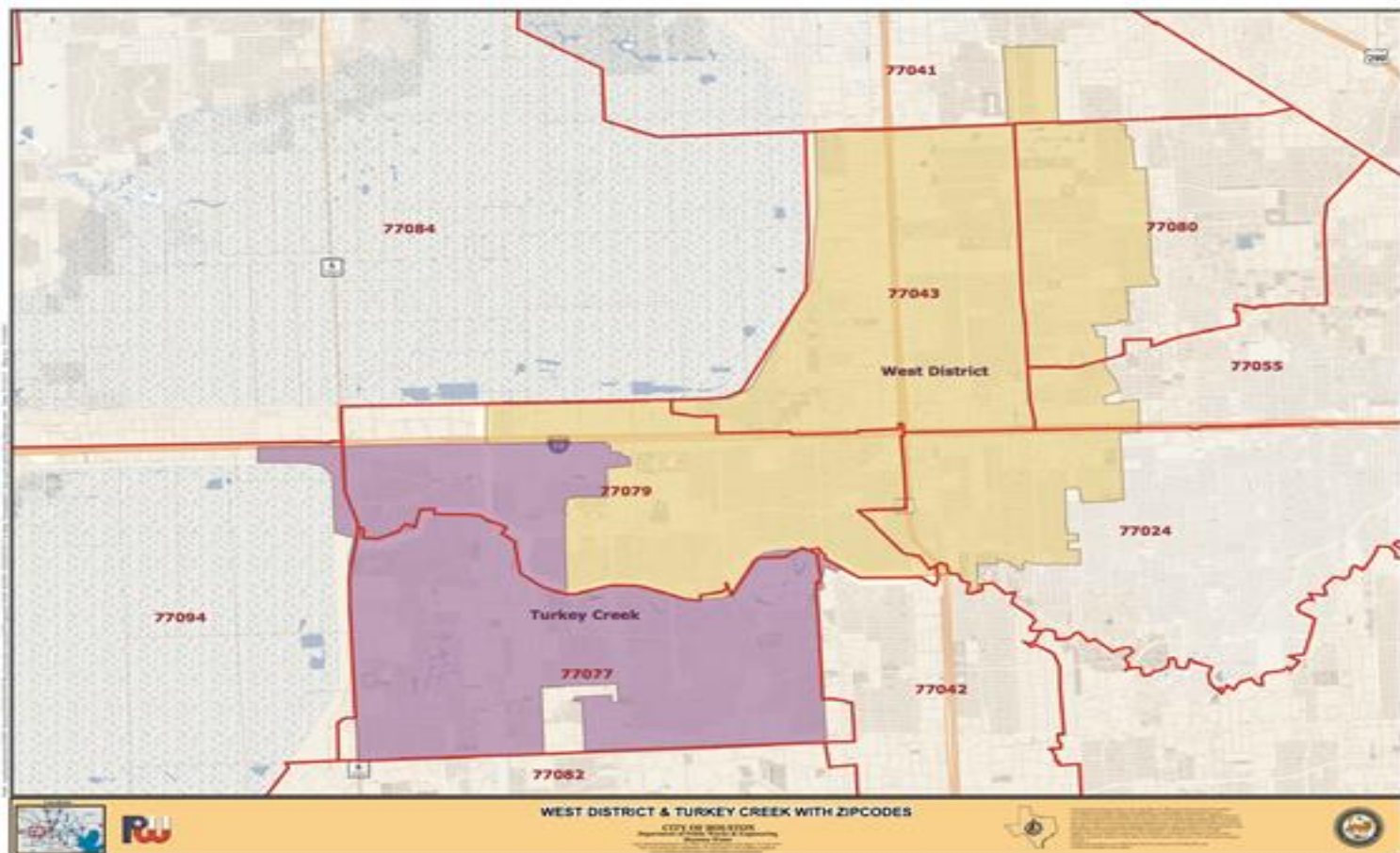
Updated information will be posted to HoustonEmergency.org, Facebook.com/HoustonPWE and on Twitter [@HoustonPWE](https://twitter.com/HoustonPWE). For questions and concerns call 3-1-1

IMPACT



West District Treatment Plant





WASTEWATER TREATMENT PLANTS DURING HARVEY



WASTEWATER TREATMENT PLANT AFTER HARVEY



LESSONS LEARNED/FOCUS FORWARD

- STAFFING

- ASSET MANAGEMENT

- PARTNERS / COMMUNICATION

- PATIENCE AND FLEXIBILITY

QUESTIONS?

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