HOUSTON HEALTH DEPARTMENT

HOUSTONHEALTH.ORG

Providing Testing Services to Private Well Owners

A Local Public Health Perspective

PRESENTED TO NATIONAL ENVIRONMENTAL MONITORING CONFERENCE

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HOUSTON HEALTH DEPARTMENT

Disclosures

I am a Texans fan

HOUSTON TEXANS

About our Lab

Bureau of Laboratory Services

A Public Health Laboratory serving the greater Houston area and surrounding counties. We provide Clinical and Environmental testing services in Microbiology, Chemistry, Virology Serology, and Molecular Diagnostics. The laboratory currently has 57 employees. The lab is accredited by TNI, CAP, and AIHA.

Environmental Microbiology

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- Potable Water
  - Public systems – Large and small
  - Private wells

- Non-Potable Water
  - Clean Rivers Partner – monitor rivers, streams, lakes, and bayous
  - Waste Water Treatment Plant effluent
  - Raw sewage (complaints)

Local Private Well Challenges

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In Texas, no state agency has authority to regulate private water wells.

- No testing requirements
- No coordinated communication/messaging
- No subsidized testing

Local Private Well Changes

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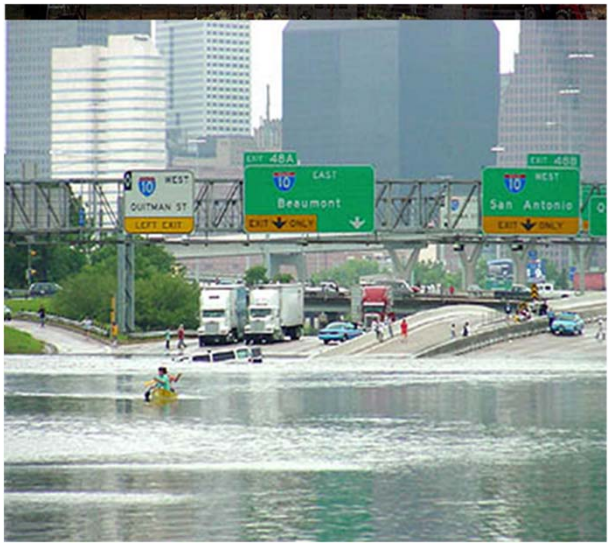
The Water Table is Shallow -Water can be found as little as 7 ft down, though drinking water wells are generally >70 ft.

The Houston area is prone to flooding.

Shallow Water Table + Flood = High risk of contamination



Memorable Flood Events

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Storm Event	Hurricane Harvey August 2017	TS Allison June 2001	Tax Day Flood April 2016	October 1994
4 day total (inches)	47.4	38.5	17.5 (2 day)	28.9

Hurricane Harvey

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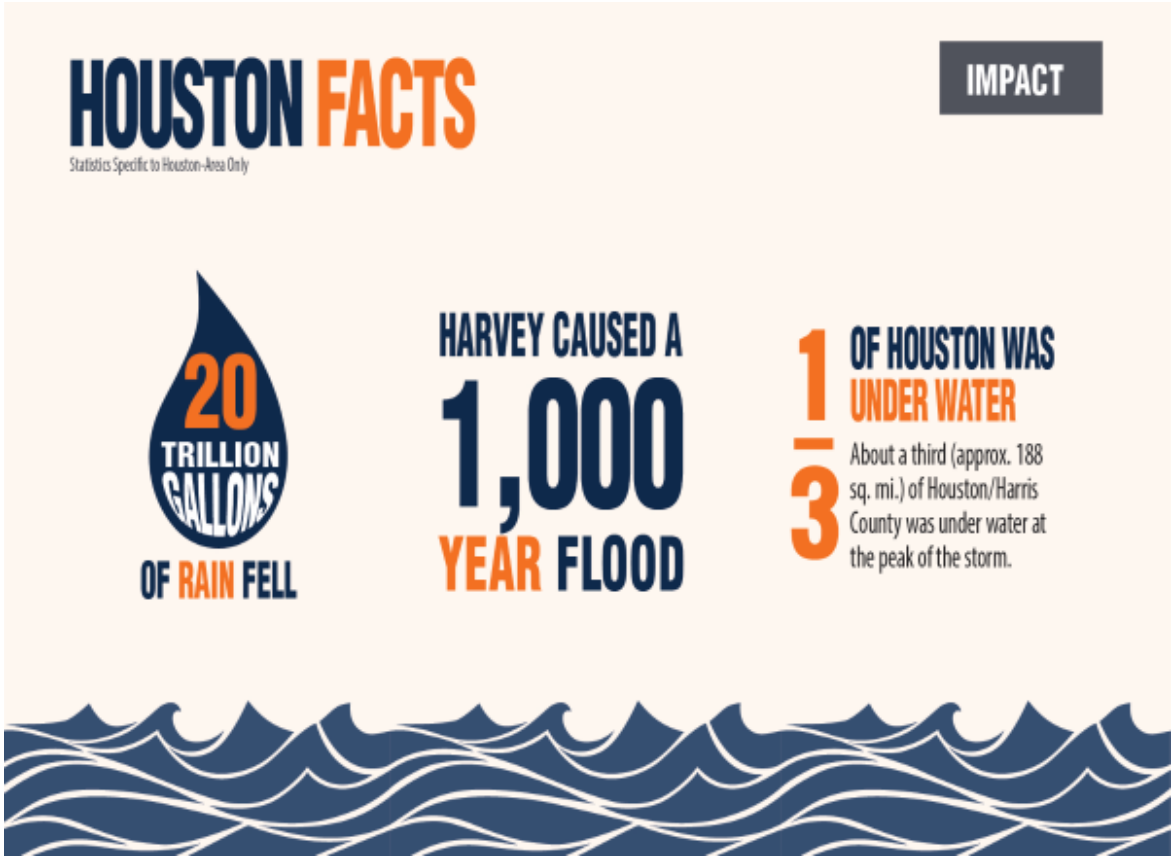

Hurricane Harvey

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SURVEILLANCE

HHD mobilized a significant number of resources to monitor Hurricane Harvey's impact across the city and within shelters. The Laboratory, Environmental, and Epidemiology divisions contributed to efforts at investigating, tracking, and reporting emergent situations during and subsequent to the disaster.

LABORATORY

WATER WELL SAMPLES TESTED FROM 8/29 TO 9/15

VIROLOGY TESTED 35 SPECIMENS FROM EVACUEES AT GRB

AS OF 9/19

4,078 WATER WELL SAMPLES TESTED

1,144 OF THESE TESTED POSITIVE FOR E. COLI/TOTAL COLIFORM BACTERIA

Hurricane Harvey

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- Freeways and surface roads were impassable
- Staff could not make it in (except a few that lived close)
- The lab was closed for 3 business days
- The first 3 weeks we tested over 2000 samples
  - 25-30% positive for coliforms
    - Positives were 60-70 % positive for E. coli
- Many wells were treated numerous times to no avail. This is common after flooding
- Every home in one small town in the area has a well. Every property was flooded – some with 3 feet of water inside the homes. They have NO access to public water.
- Every part of the Greater Houston area was affected
- Some areas are still recovering

Hurricane Harvey

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One day's positive samples after Hurricane Harvey.

Every bottle represents a well or system that requires a phone call to the owner.

Tropical Storm Allison

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- Our main lab was closed for 8-9 weeks
- The satellite lab handled all samples (10000+)
- Whole neighborhoods on private wells inside the city limits were flooded
- One area that had NEVER flooded had 5 ft of water in the houses.
  - Most of the these residents were elderly – some had lived there for over 50 years
  - Every sample from these homes was positive, most were positive for E. coli
  - Not everyone would disinfect, so wells got re-contaminated constantly
  - Most eventually gave up, but didn't move
- Many resulting health issues, including eye, ear and skin infections, as well as gastrointestinal issues.
- At least one family was in the hospital for Chlorine poisoning

Laboratory Preparedness

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Keep an adequate supply of sample bottles, reagents, and other supplies on hand to respond to the early stages of an emergency.

- Practice seasonal planning, keep more supplies on hand during hurricane/rainy season. Use historical data to balance order vs. expiry.
- Be prepared for supply chain disruptions. If employees cannot get into work, your deliveries probably are not coming either.
- Procurement problems. Procurement is not the most efficient process in HHD during the best of times. Use open Purchase Orders if that is an option.

Communicate with your vendors in an emergency. A lot of times they will make things happen.

Laboratory Preparedness

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Documents-Have your paperwork updated for clients and staff

- sampling instructions
- submission forms
- well disinfection procedures

Make all items clients may need available online.

Staff- Cross train staff from other areas on drinking water analysis. Keep Demonstration of capabilities current. Develop a script for making phone notifications with frequently asked questions and recruit additional staff to make notifications for positive samples. You do not need a DOC to make a phone call. Access to translator services is a plus.

Community Partnerships

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- Create a network of city, county and state agencies, city officials, and community leaders. The logistics of sample collection and transportation are outside the laboratory's control BUT the laboratory may be able to bring stakeholders together.
- Create a contact list for stakeholders and other local partners and share it
- If possible, meet with stakeholders and discuss the plan of action. Identify sample bottle distribution/sample drop off points and include directions and phone numbers
- Communicate your hours of operation and coordinate courier delivery times that work for everyone. Consider what is the latest time you will accept samples?
- Who is going to pay? If the well owner is out of your jurisdiction who gets the bill.

The public will be calling the labs for this information - we need to provide it

Lessons Learned

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- Another flood is always possible
- We can never be prepared enough
- Everyone is in shock during and after a catastrophe, tempers can run high.
- Document what worked and what did not work. Hot washes and after action reports are important.
- Have a continuity of operations plan and be familiar with it.
- Have patience…with employees and the public