

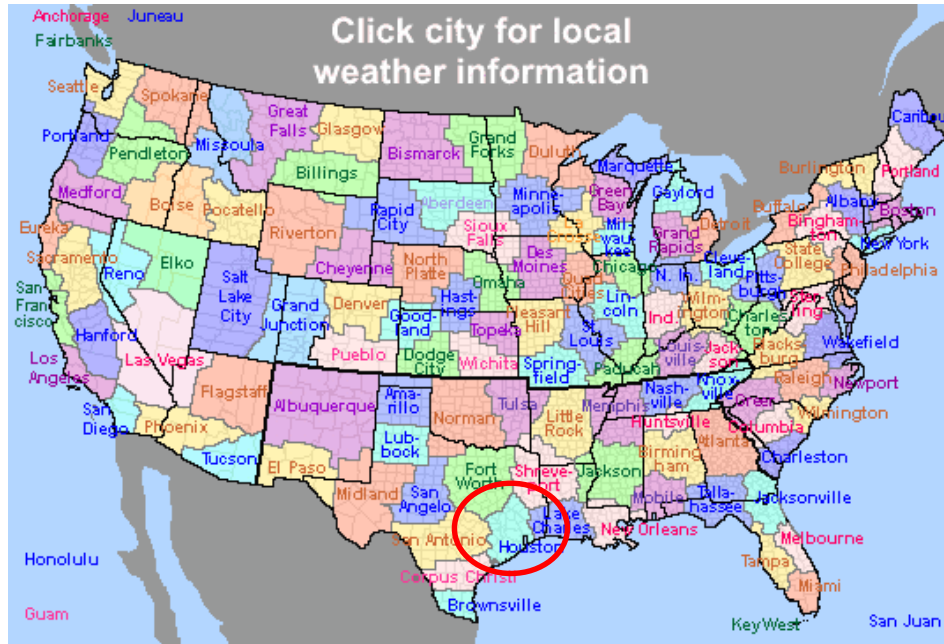


# 2018 FloodWarn Training

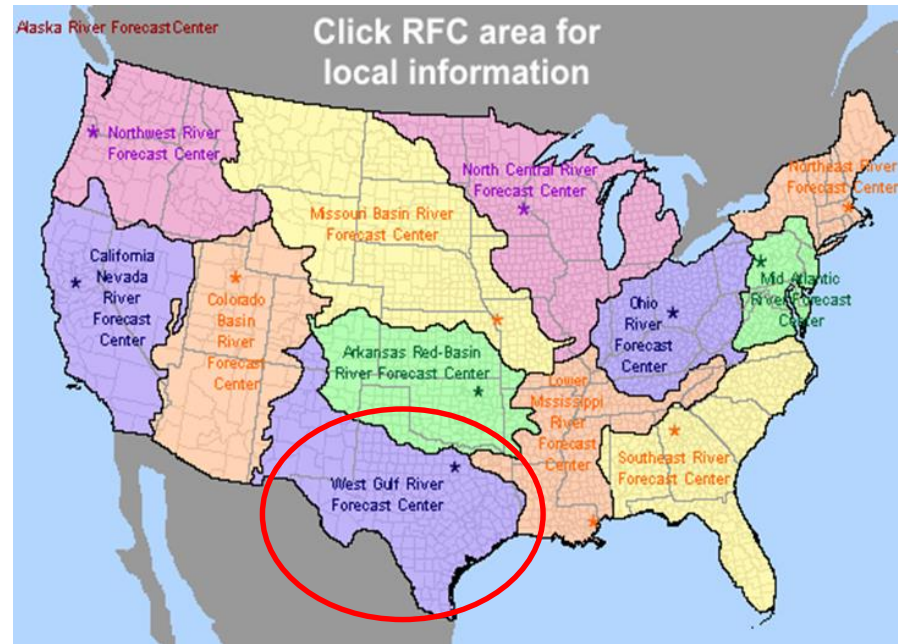
Katie Landry-Guyton  
Senior Service Hydrologist/Meteorologist  
National Weather Service- Houston/Galveston, TX

# National Weather Service

## Weather Forecast Offices



## River Forecast Centers



# Outline

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Flooding Importance

Flooding Types and Causes

Flood Products

River Flooding

Partners

Flood Safety

Reporting Flooding

Flood Risk

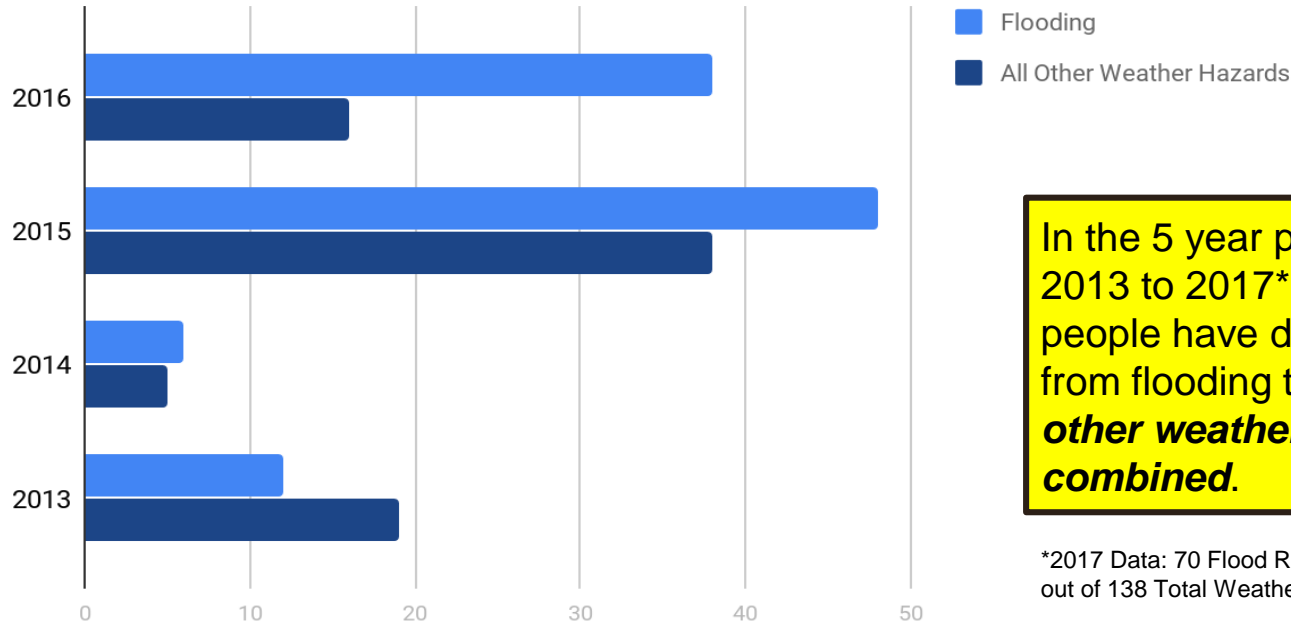




# Flooding Importance

# Flooding is Deadly!

## Weather-Related Deaths in Texas

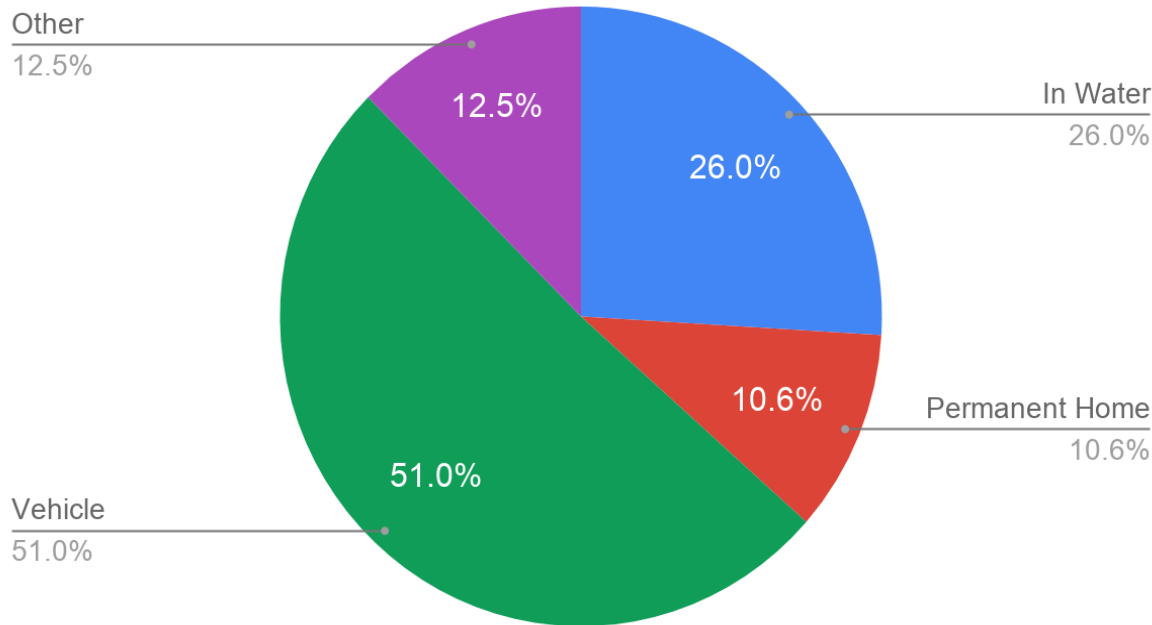


In the 5 year period from 2013 to 2017\*, **more** people have died in Texas from flooding than ***all other weather hazards combined.***

\*2017 Data: 70 Flood Related Deaths in TX out of 138 Total Weather-Related Fatalities

# Flood Fatalities

Texas Flood Fatalities by Shelter from 2013-2016



Over half of the flood fatalities in Texas occurred while people were in their car.

# Houston Floods: April 18, 2016





# Recent Big Floods...

Memorial Day 2015

Tax Day 2016

Brenham 2016

Harvey 2017



Tax Day 2016



Brenham 2016



Harvey 2017

## And other historic floods...

Tropical Storm Allison

1994 Flood

Tropical Storm Claudette





# Flooding Types and Causes

# What Causes Flooding?

- Intense rainfall
- Rain over several days
- Dam/levee failures
- High tides or storm surge
- Snowmelt
- Ice or debris jams



# Types of Flooding

## Ponding & Sheet Flow Flooding

Flooding that occurs gradually over time, usually 6 hours after the rain begins or longer (longer duration)

## Flash Flooding

Flooding that develops quickly (typically 6 hours or less) either from heavy rainfall or dam/levee failure (shorter duration).

## River Flooding

Flooding that occurs from water escaping river banks.

## Coastal Flooding

Flooding along a coastline either from high tides or storm surge during a tropical storm or hurricane



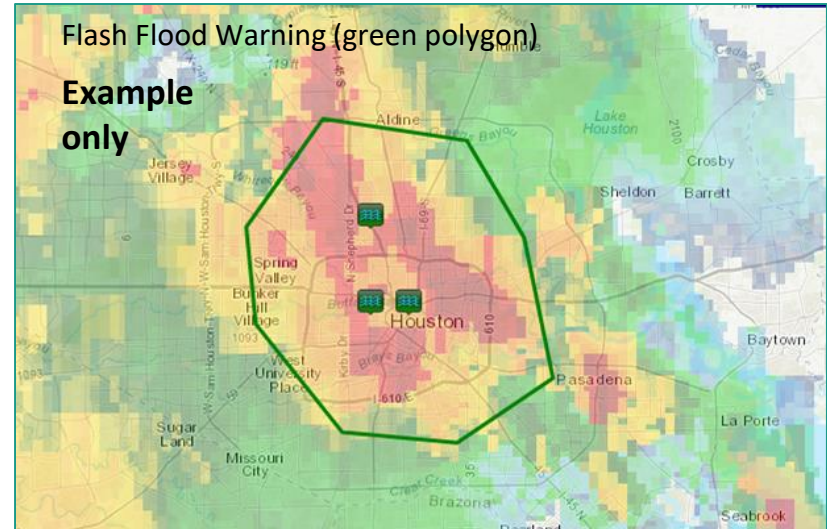
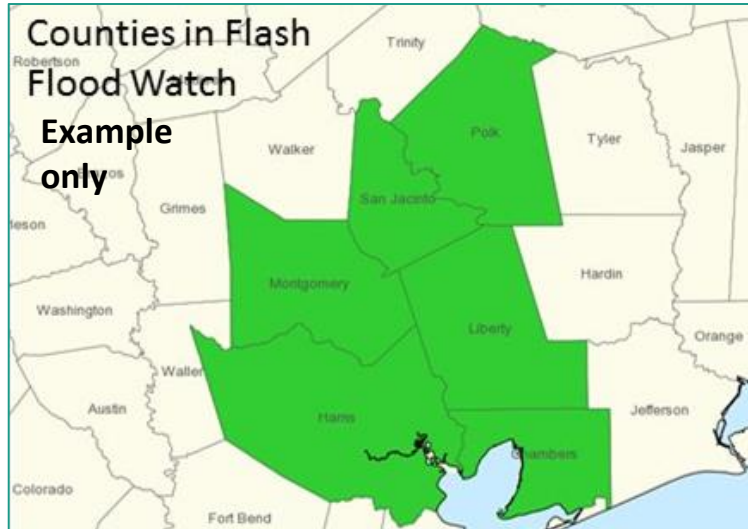


# Flood Products

# Watch vs Warning

A **Watch** is issued when conditions are favorable to occur.

A **Warning** is issued when the threat is *occurring or imminent*, threatening life or property.





# Flood vs. Flash Flood



A **Flood** is an overflow of water onto normally dry land likely caused by rising water in a river/bayou or poor drainage. Flooding is a longer term event than flash flooding. It may last days or weeks.

A **Flash Flood** is a rapid and extreme flow of high water typically beginning within 6 hours of the causative event (heavy/excessive rainfall, dam failure, etc). Flash floods are characterized by:

- ≥ 3 feet of standing water (less if threatening life or property), and/or

- ≥ 6 inches of fast flowing water across a road or bridge, or

- Water in a stream or bayou flowing rapidly out of its banks, or

- A dam break (even on a sunny day)



## Don't underestimate the power of water!



6 inches of fast-moving water can knock over and carry away an adult.

12 inches of fast-moving water can carry away a small car.

18-24 inches of fast-moving water can carry away most large SUVs, vans and trucks.





# Understanding Flooding

## **Urban / Small Stream Advisory**

### **WHAT IS IT?**

Flooding of small streams, streets and low-lying areas. Mainly nuisance level.

### **WHAT TO DO?**

Need to exercise caution. Stay away from areas that are prone to flooding and stay clear of rapidly moving water

## **Flood Watch**

### **WHAT IS IT?**

Flooding is possible – typically within a 6 to 48 hours before rain is expected to reach the area.

### **WHAT TO DO?**

Stay tuned to local river forecasts; prepare for areas near rivers to spread towards nearby roads and buildings

## **Flash Flood Watch**

### **WHAT IS IT?**

Flash flooding is possible – typically 6 to 48 hours before rain is expected to reach the area.

### **WHAT TO DO?**

Have a way to receive local warnings, expect hazardous travel conditions and have alternate routes available

## **Flood Warning**

### **WHAT IS IT?**

Flooding impacts are occurring or imminent.

### **WHAT TO DO?**

Stay *alert* for inundated roadways and follow all local signage! Additional impacts include homes and structures could become flooded and need to be evacuated

## **Flash Flood Warning**

### **WHAT IS IT?**

Flash flooding impacts are occurring or imminent.

### **WHAT TO DO?**

Conditions will *rapidly* become hazardous, life threatening! Do not cross flooded roadways or approach inundated areas as water may still be rising

## **Flash Flood Emergency**

### **WHAT IS IT?**

Flash flood situation that presents a clear threat to human life due to extremely dangerous flooding conditions

### **WHAT TO DO?**

*Immediately* reach higher ground by any means possible



**You make the call...**

What  
type of  
flooding  
is this?



This image depicts what conditions may look like during a Flash Flood Warning.

What  
type of  
flooding  
is this?



This image depicts what conditions may look like during a flood advisory.



What  
type of  
flooding  
is this?



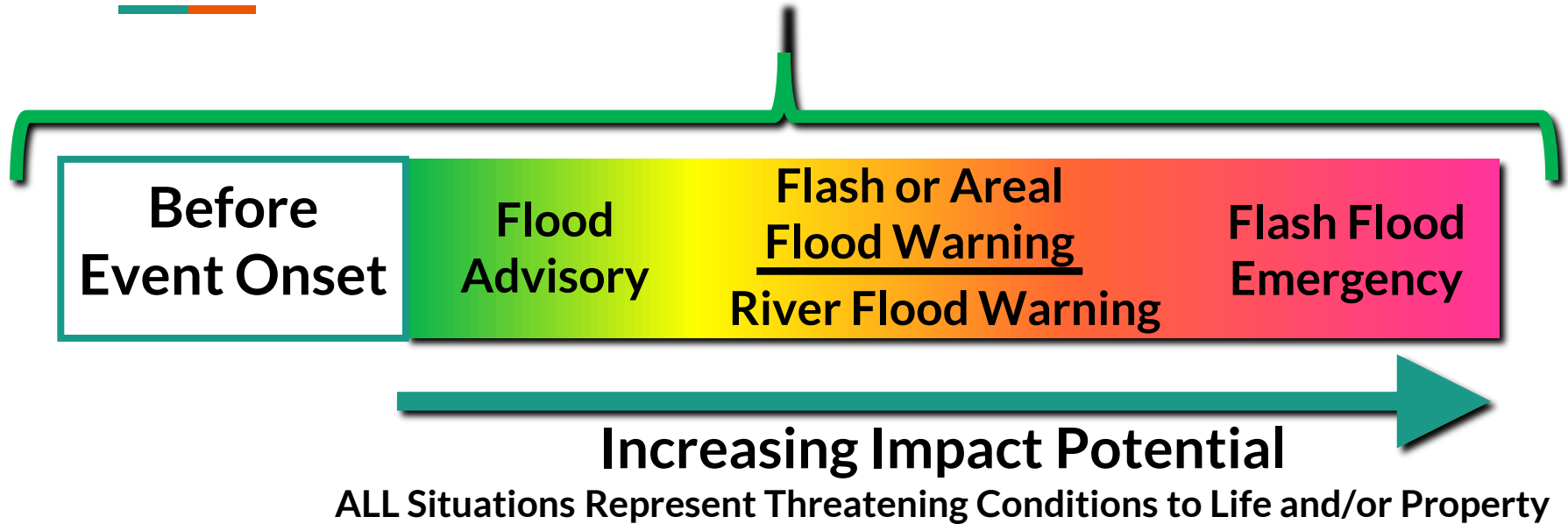
This image depicts what impacts may result from a Flash Flood Emergency. A rapidly moving flood wave resulted in this roadway being completely washed out.

What  
type of  
flooding  
is this?



**This image depicts what conditions may look like during an Areal Flood Warning.**

# Flood Timeline



***Note: Flooding can (and does) occur without a Flash Flood Watch!***



Be sure to have multiple ways to receive warnings.

# Ways to Receive a Warning

## NOAA Weather Radio



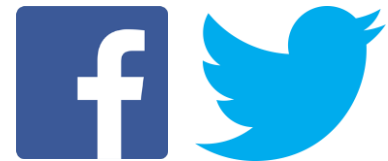
## Wireless Emergency Alerts and Weather Apps



## TV and Radio



## Social Media



NWS Website: <https://www.weather.gov/hgx/>



# River Flooding

# Llano River Flooding

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# River Flooding

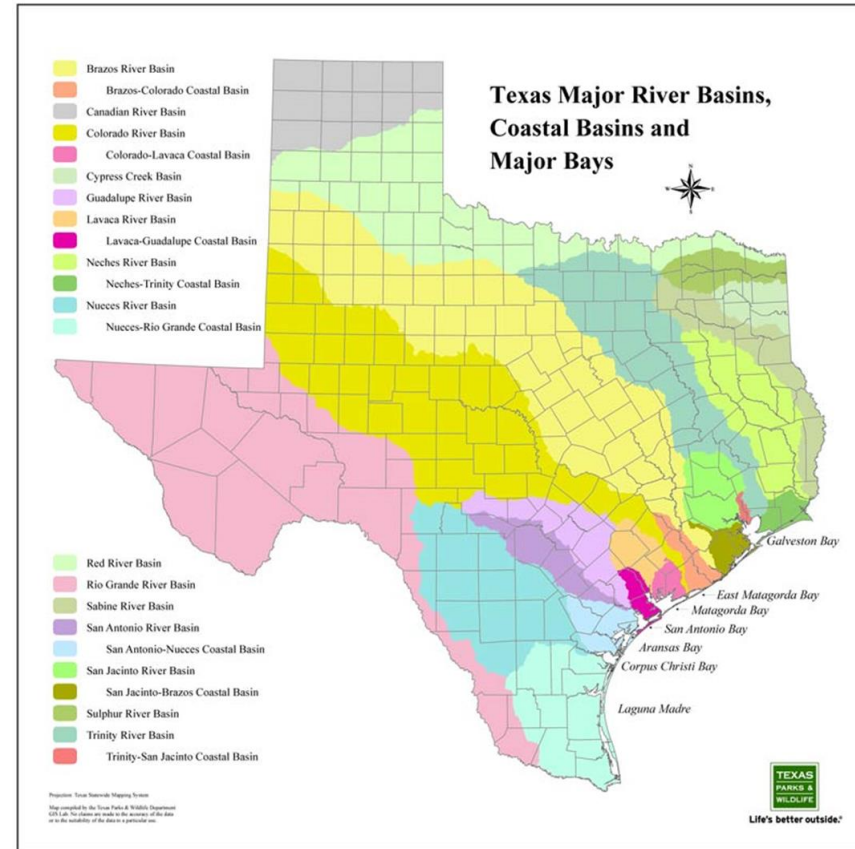
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River flooding occurs when water escapes the river banks. There are different thresholds for river flooding: action, minor, moderate, major and record flooding. This image depicts what a river flooding looks like.

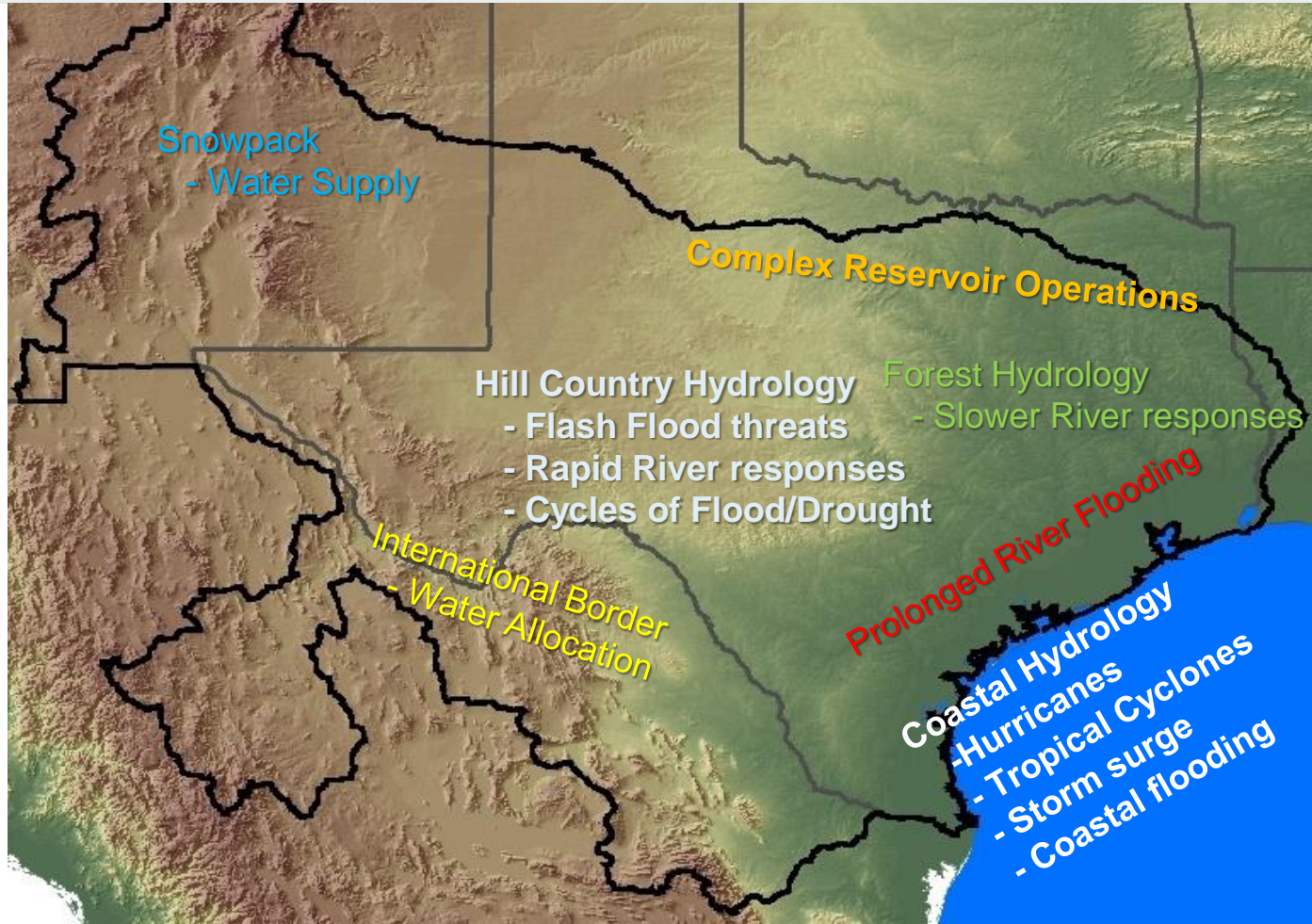
# Watershed

- A watershed, or basin, is an area of land that drains runoff from rainfall (stormwater) to a body of water, either a river, bayou, creek, or lake.
- Topography plays a big role in how watershed boundaries are defined.
- A watershed can flow into another watershed.
- Watersheds vary in shape and size which ultimately leads to unique challenges.





# Diverse Watershed Characteristics in Texas



# Watershed

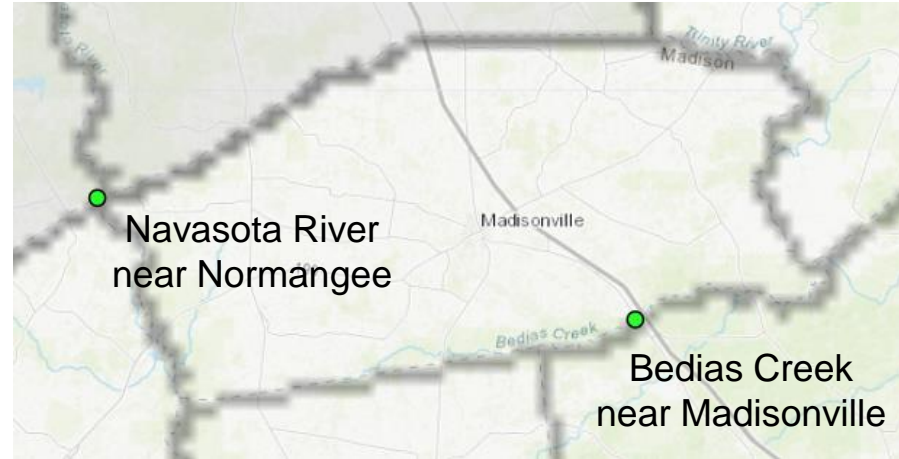
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- **Madison County deals with 2 primary watersheds: Trinity River and Navasota River.**





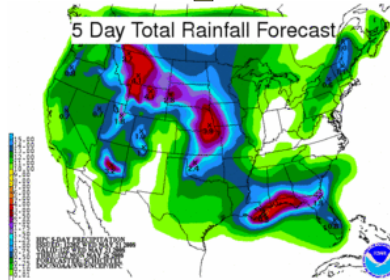
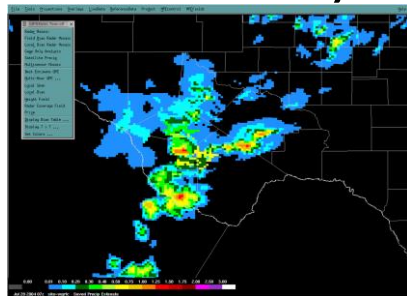
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- Watersheds vary in shape and size which ultimately leads to unique challenges.
- **Madison County deals with 2 primary watersheds: Trinity River and Navasota River.**
- **NWS issues river forecasts for 2 sites in Madison County.**



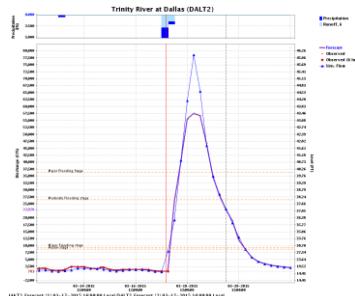
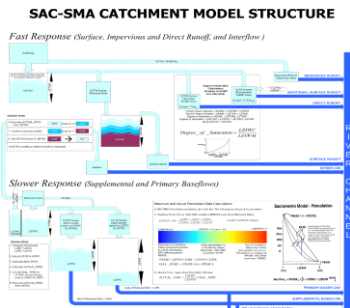
# River Forecast Process

## Rainfall Analysis



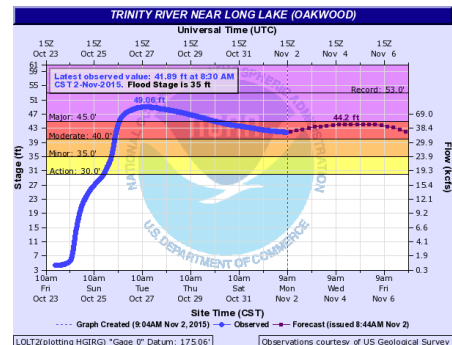
Rainfall estimates and forecasts merged into continuous dataset

## Hydrologic Modeling



Rainfall ingested into hydrologic model.  
Forecasters adjust model parameters in real time

## Forecast



## Warning

FLOOD WARNING  
NATIONAL WEATHER SERVICE HOUSTON/GALVESTON, TX  
926 PM CDT THU MAY 26 2016

...The National Weather Service in Houston/Galveston has issued a flood warning for the following rivers...

Brazos River in Richmond affecting the following counties in Texas...Austin and Fort Bend

/X0015-039-157-473-271425-  
/O.NEW.KHGX.FL.W.0149.160529707302-000000T0000Z/  
/R/NOT2.1.ER.160529707302.160531T0600Z.000000T0000Z/NO/  
126 PM CDT THU MAY 26 2016

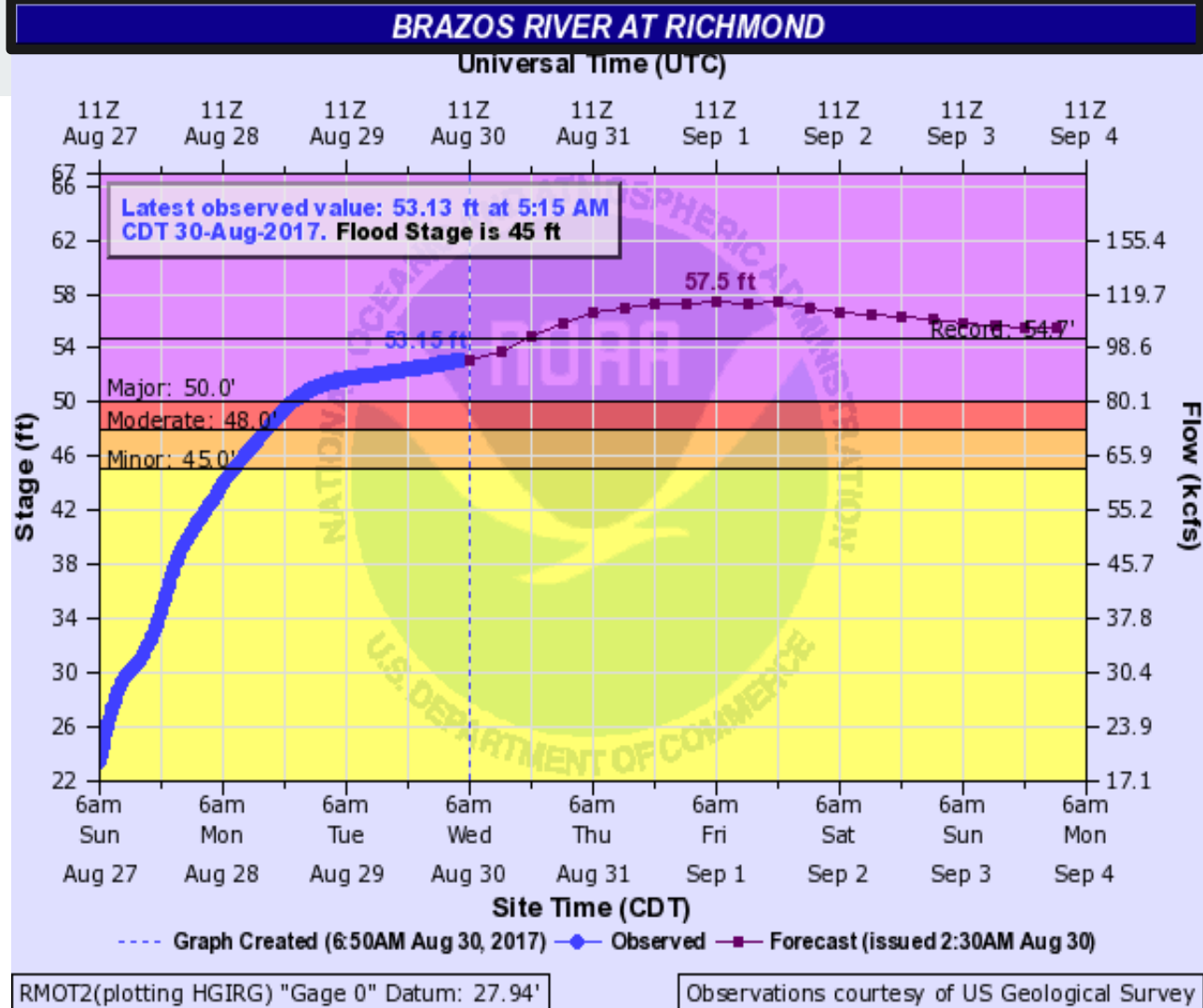
The National Weather Service in Houston/Galveston has issued a

Flood Warning for  
The Brazos River in Richmond.  
from late Saturday night until further notice...or until the warning is canceled.

# Hydrograph Basics

## LOCATION:

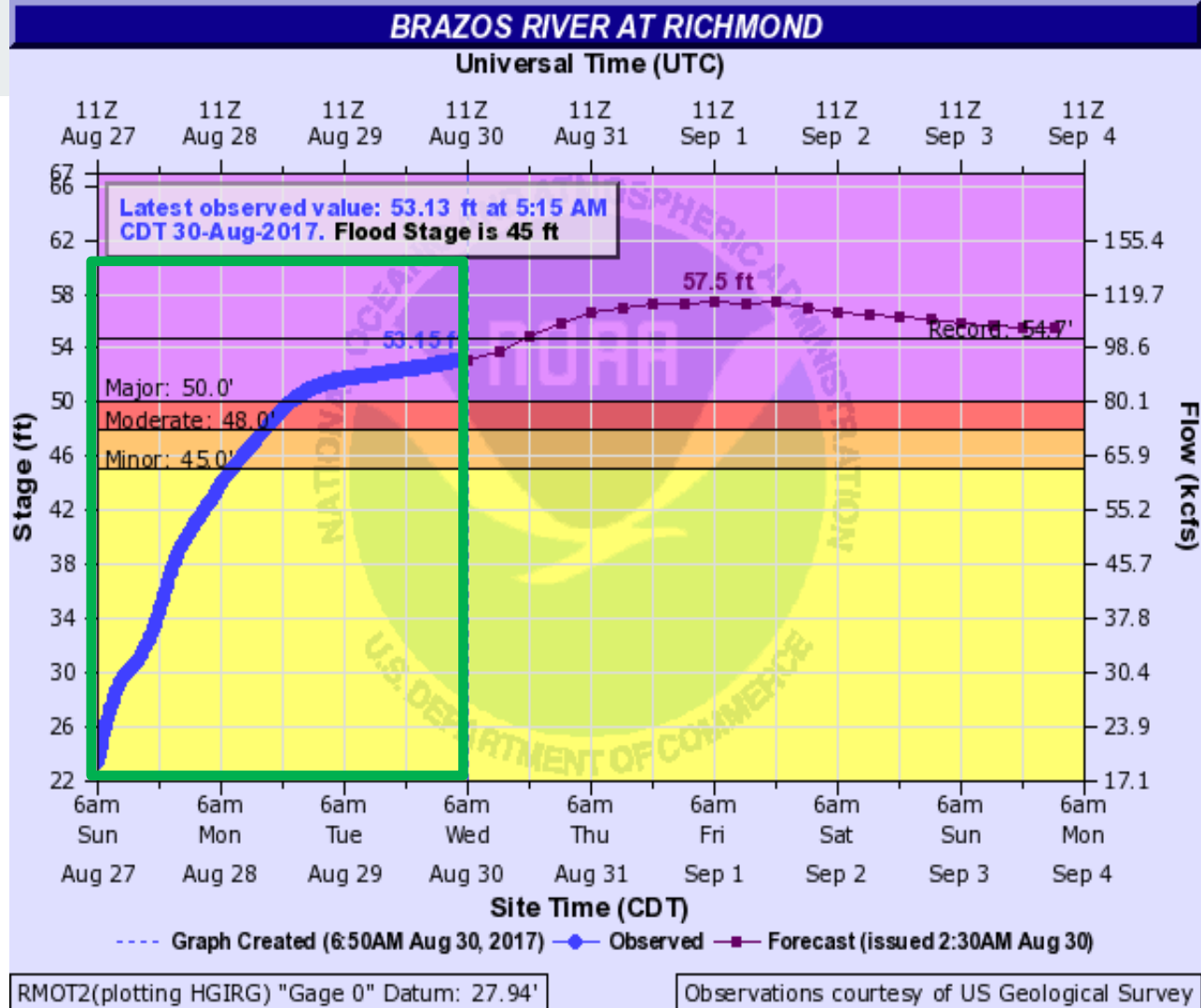
Of the gage the forecast is made, AT means the gage is in the limits of the town/city, NEAR or NR means that town/city has the closest post office



# Hydrograph Basics



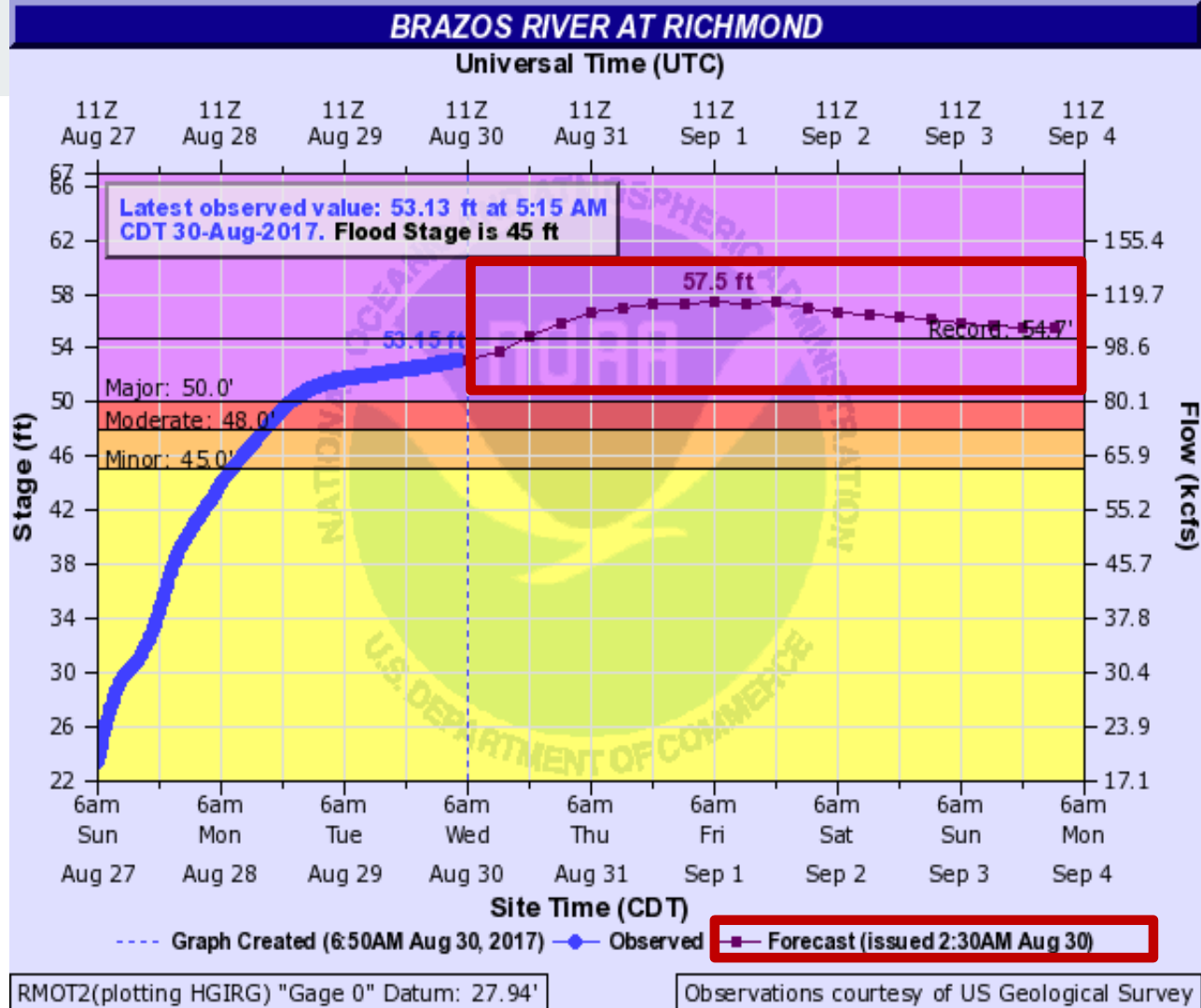
OBSERVATIONS:  
Past river stages



# Hydrograph Basics

**FORECAST:**  
Forecast River  
Stages

**CREST:**  
Peak Stage

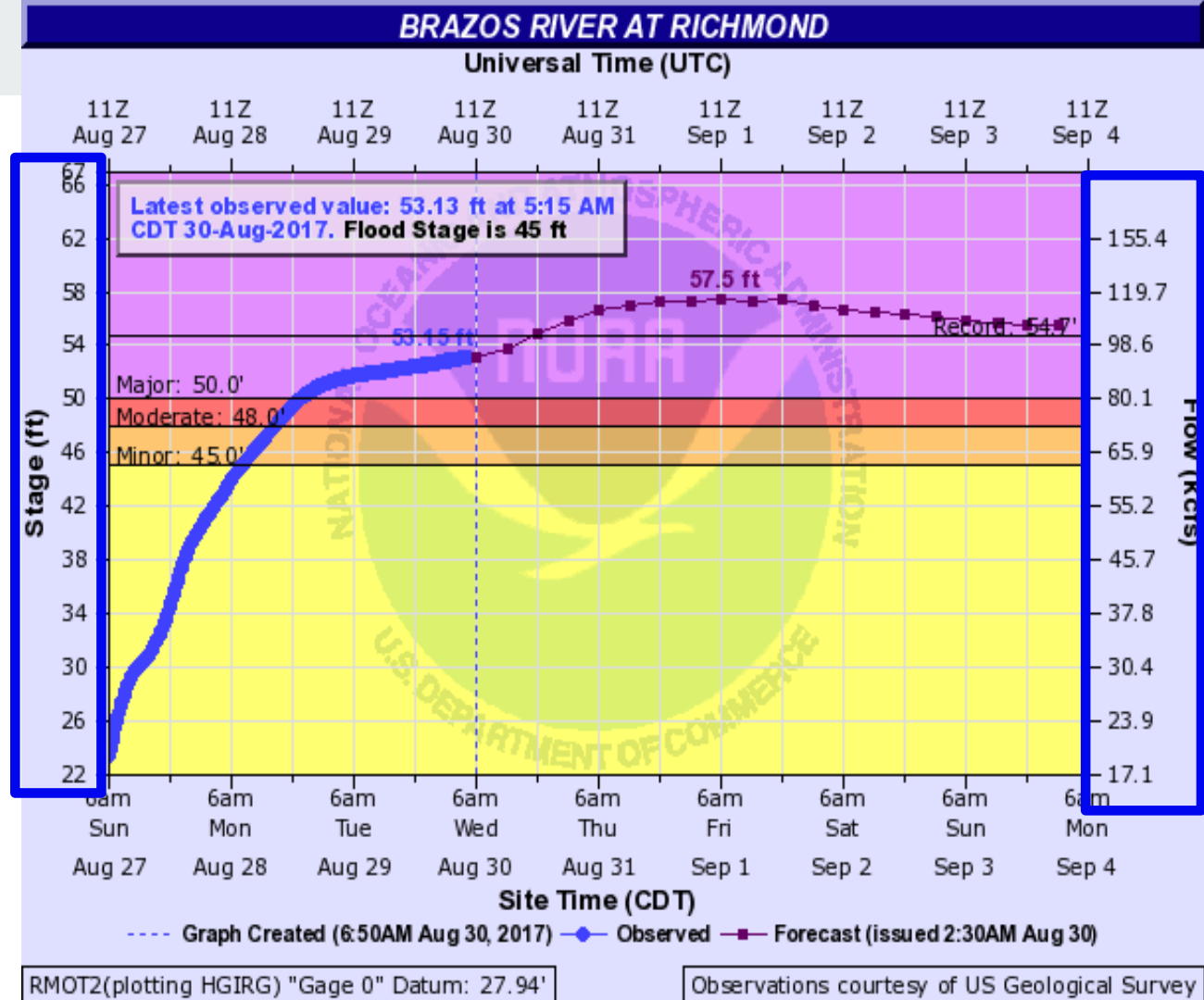


# Hydrograph Basics

## STAGE VS FLOW:

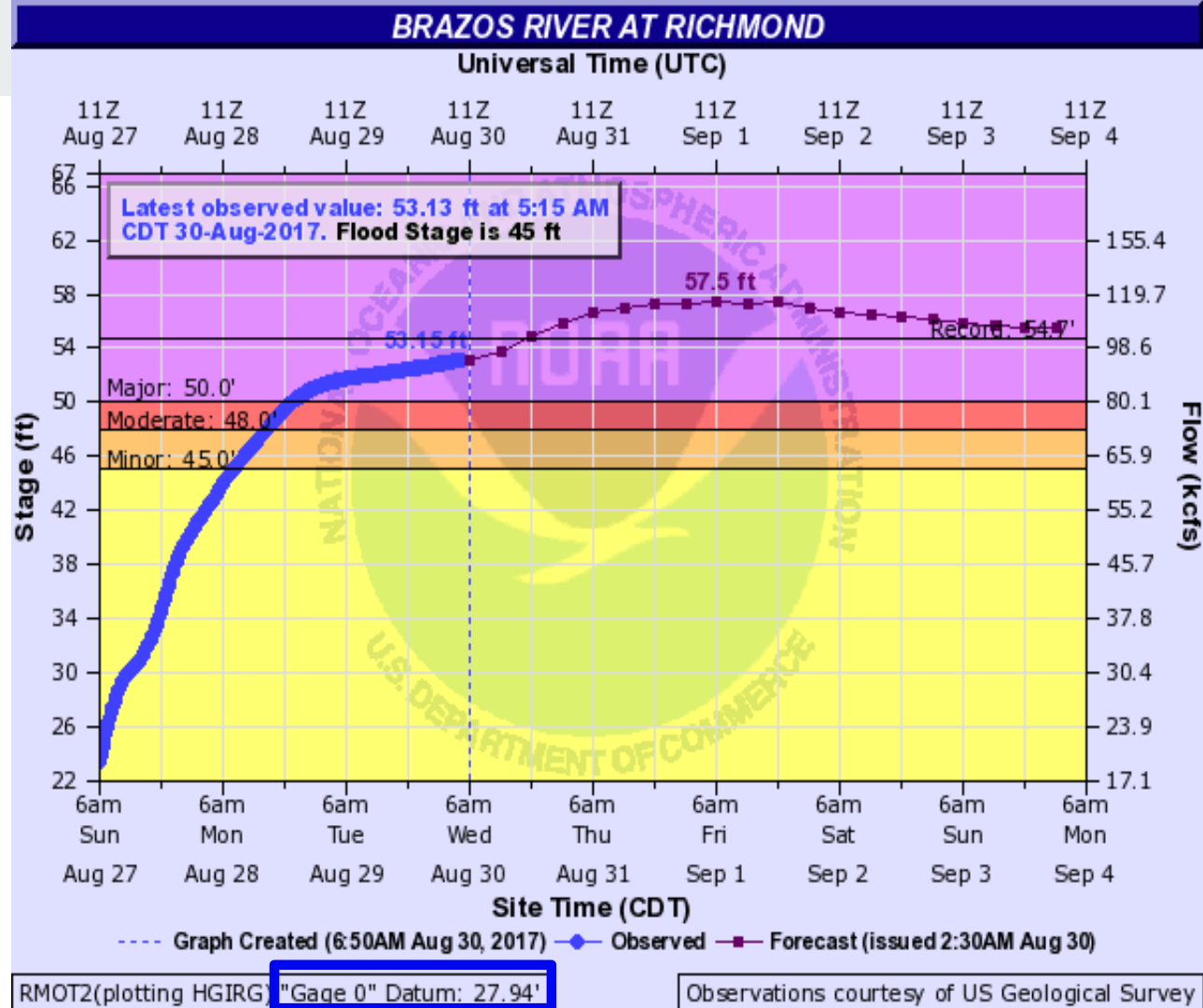
Hydrologists,  
models, reservoirs  
work in flow.  
Emergency  
managers, media,  
general public work  
in stage.

What is flow or a  
cubic foot per  
second?



# Hydrograph Basics

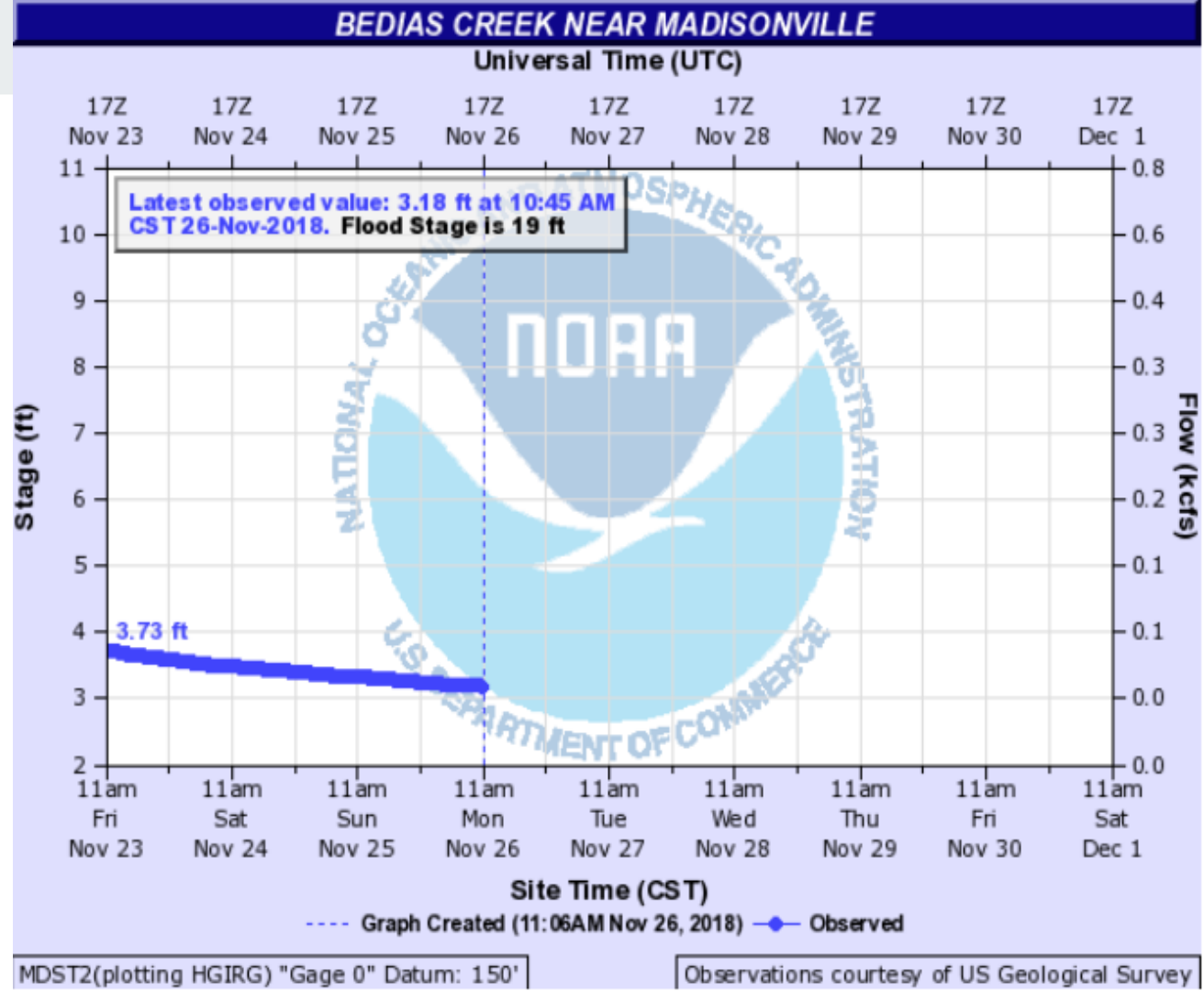
A basketball is roughly a cubic foot, so 20,000cfs is 20,000 basketballs of water passing the gage every second.





# Hydrograph Basics

What is the current stage in MSL?



# Understanding River Criteria Levels



## BELOW CRITERIA

**Impact:** Water is within the banks of the river with no impacts to the surrounding area. Flow speeds may still be high during rainfall or releases which could impact recreational activities

## ACTION

**Impact:** Water is over the banks and into the flood plain, but not a threat to structures or roadways. Some action may be required such as moving farm equipment or increasing awareness

## MINOR

**Impact:** Typically water is impacting areas inside of floodplain which can vary by location. Some low water crossings covered by water, agricultural flooding, water approaching public areas (parks, sidewalks etc.). Areas frequently flooded can expect to be impacted

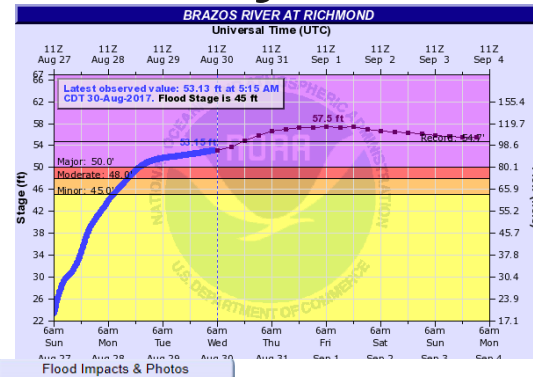
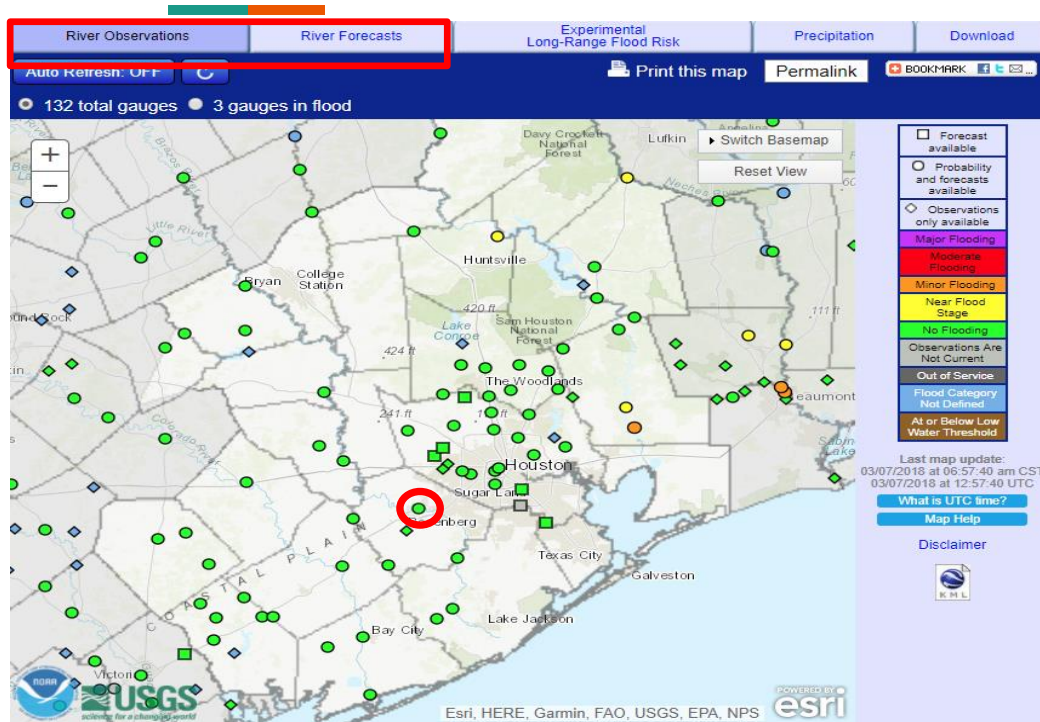
## MODERATE

**Impact:** Water now reaching areas only impacted by significant rain events. Structures can be inundated, several roads covered with water, water may cut off certain areas, widespread agricultural flooding.

## MAJOR

**Impact:** Water is near the highest it's ever been representing rare flooding and significant widespread impacts. Most roads will be covered by water in the area cutting off if not completely flooding subdivisions, rivers can be several miles wide in areas. Homes and structures underwater, bridges inundated and in danger of being hit by debris. Impacts may be greater than ever experienced.

# Advanced Hydrologic Prediction System



Flood Categories (in feet)	
Major Flood Stage:	50
Moderate Flood Stage:	48
Flood Stage:	45
Action Stage:	20
Low Stage (in feet):	0

## Historic Crests

- (1) 55.19 ft on 09/01/2017
- (2) 54.74 ft on 06/02/2016
- (3) 50.30 ft on 10/21/1994
- (4) 50.01 ft on 06/03/2015
- (5) 49.68 ft on 01/01/1992

[Show More Historic Crests](#)

(P): Preliminary values  
subject to further review.

## Recent Crests

- (1) 55.19 ft on 09/01/2017
- (2) 54.74 ft on 06/02/2016

[Collapse](#)

If you notice any errors in the below information, please contact our Webmaster

- Major flooding continues with significant home flooding in the following areas: Valley Lodge near Simonton, Bar Rd, Baker Rd/Cummings Rd/Rio Brazos area north of Rosenberg, Edgewood/Baudet Rd in Richmond, and FM 2759 near Thompsons. Low lying homes in Grand River, Rivers Edge, Pecan Estates in Thompson, and Pecan Bend flood as well.
- Major flooding continues with US90A eastbound lanes inundated and impassible between Harlem Rd and New Territory. Pitts Rd is impassible between US90A and Savannah Dr.
- Major lowland flooding continues with FM 359 impassible between US90A and the Pecan Grove levee near Southern Place Dr. The intersection of FM 359 and Mason Rd is impassible. FM 2759 is completely inundated east of Agnes Rd. Street flooding occurs along Sienna Parkway between McKeever Rd and Steep Bank Trace. Street flooding occurs along McKeever Rd between Sienna Parkway and SH6. Miller Rd near Arcola is inundated.
- Major lowland flooding continues with homes near intersection of Sixth St. and Avenue B in Rosenberg beginning to take on water. FM 1489 is inundated south of Simonton to Johnson Rd. FM 723 is inundated north of Rosenberg to FM 359, making the Kingdom Heights and Riverside ranch subdivisions inaccessible. FM 359 between US90A and Pecan Grove begins taking on water. Thompson Ferry Rd south of LJ Parkway is inundated outside of the leveed area.
- Major lowland flooding continues with homes flooding along Cummings/Baker Roads and in Rio Brazos north of Rosenberg. FM 1093 is inundated to Stansberry Rd in Simonton. Underpass at intersection of SH36/90A west of Rosenberg is inundated/impassible. Fort Bend County flood fight operations in Simonton are exceeded and cease. Low lying streets on west side of Quail Valley take on water. Feeder roads along SH6 near intersection of FM 521/McKeever Rd are inundated. Low lying areas along Knights Ct take on water.
- Major lowland flooding begins as homes in Richmond begin flooding and many homes in Simonton and Thompsons have water in them. FM 1458 near FM 1093 remains inundated and closed. Homes along Carroll and McKeever Roads near FM 2759 in southeast Fort Bend County are close to taking water. Strange Drive, Greenwood Drive, and Second Street in Richmond and Sixth Street, Avenue B, and River Road in Rosenberg and Pittman Road in Thompsons are inundated with over one foot of water.

<http://water.weather.gov/ahps2/index.php?wfo=hgx>



# USGS Water Alerts

- Set alerts when a gauge reaches certain water surface elevations.
- Identify the gauge nearest you
- Click on the gauge

USGS  
science for a changing world

WaterAlert

Sites Map

Select Location

News updated September 30, 2013

Search by Street Address:  
Enter Street Address

Search by Place Name:  
Enter Place Name

Search by Site Number(s):  
Enter Site Number(s)

Search by State/Territory:  
Select an Area

Search by Watershed Region:  
Select a Region

Select Data Type

About WaterAlert

How To Use WaterAlert

Related Information

Sam Houston National Forest

The Woodlands

Houston

Pasadena

Baytown

Sugar Land

Missouri City

Pearland

League City

Reynolds

Angleton

Brazoria Natl Wildlife Refuge

Lake Jackson

0 10 20mi

95.597, 29.141

USGS Water Alerts:

<https://maps.waterdata.usgs.gov/mapper/wateralert/>

# USGS Water Alerts

- Set alerts when a gauge reaches certain water surface elevations.
- Identify the gauge nearest you
- Click on the gauge and select "Subscribe to WaterAlert"

The screenshot displays the USGS WaterAlert website. At the top, the USGS logo and tagline 'science for a changing world' are visible, along with a 'WaterAlert' banner. Below the banner, there are tabs for 'Sites' and 'Map'. A 'Select Location' sidebar on the left contains search options: 'News' (updated September 30, 2013), 'Search by Street' (with an 'Enter Street Address' field), 'Search by Place' (with an 'Enter Place Name' field), 'Search by Site' (with an 'Enter Site Number' field), 'Search by State' (with a 'Select an Area' dropdown), and 'Search by Water' (with a 'Select a Region' dropdown). A 'Site Information' pop-up window is overlaid on the map, showing details for a specific site. The site is located near Houston, Texas, and is circled in red on the map. The pop-up window contains the following information:

- Site Number:** 08069500
- Site Name:** W Fk San Jacinto Rv nr Humble, TX
- Site Type:** Stream
- Agency:** USGS
- [Access Data](#)
- Streamflow:** 7260 ft<sup>3</sup>/sec on 2018-04-02 at 22:15 CDT (TSID 229383)
- Stage:** 42.78 ft on 2018-05-07 at 06:45 CDT (TSID 140334)
- [Subscribe to WaterAlert](#)

At the bottom of the page, there are links for 'Select Data Type', 'About WaterAlert', 'How To Use WaterAlert', and 'Related Information'. A scale bar at the bottom right indicates distances up to 20 miles.

USGS Water Alerts:

<https://maps.waterdata.usgs.gov/mapper/wateralert/>





# USGS Water Alerts

- Set alerts when a gauge reaches certain water surface elevations.
- Identify the gauge nearest you
- Click on the gauge and select "Subscribe to WaterAlert"
- Define how you want to receive the information:
  - Email or phone
  - Frequency
  - Stage or Discharge
  - Stream Elevation(s)
- Note: Use Internet Explorer

## Subscription Form

The U.S. Geological Survey WaterAlert service sends e-mail or text (SMS) messages when [certain parameters](#), as measured by a USGS real-time data-collection station, exceed user-definable thresholds. The development and maintenance of the WaterAlert system is supported by the USGS and its partners, including numerous federal, state, and local agencies.

Real-time data from USGS gages are transmitted via satellite or other telemetry to USGS offices at various intervals; in most cases, 1 to 4 times per hour. Emergency transmissions, such as during floods, may be more frequent. *Notifications will be based on the data received at these site-dependent intervals.*

### Site Info:

Number: 08069500  
 Name: W Fk San Jacinto Rv nr Humble, TX  
 Agency: USGS  
 Transaction ID: stsCN

### Send Notification To:

- [about this...](#)
- ☐ My mobile phone  
☐ My email address

### Notification Frequency:

- [about this...](#)
- Hourly ☐  
 Daily ☒

### Streamflow Parameter(s):

[about this...](#) Recent value:

Discharge, in ft<sup>3</sup>/s ☒ 7260 [\[peak chart\]](#)  
 Gage height, in ft ☐ 42.78 [\[peak chart\]](#)

### Alert Threshold Condition:

- [about this...](#)
- ☒ Greater than (>)  
☐ Less than (<)  
☐ Outside a range (< or >)  
☐ Inside a range (> and <)

Real-time value is greater than:  ft<sup>3</sup>/s

☐ I have read and acknowledge the [Provisional Data Statement](#) and [Disclaimer](#).

Submit

Reset

Cancel

[Related Information](#)



USGS Water Alerts:

<https://maps.waterdata.usgs.gov/mapper/wateralert/>



# Partners

# Partners

## Roles of Primary River Forecast Partners



**US Army Corps  
of Engineers®**

- Operate Flood Control Reservoirs
- Manage Other WR Projects



- U.S. Stream Gage Network
- Water Science Studies



- Issue Weather & Water  
Forecasts, Watches, Warnings &  
Data

## Shared Data and Resources



**US Army Corps  
of Engineers®**

- Assist w/Gage Maintenance
- Assist w/Stream Measurements
- Assist w/Funding Data Networks



- Gage Maintenance
- Stream Measurements
- Focus Stream Gage Network



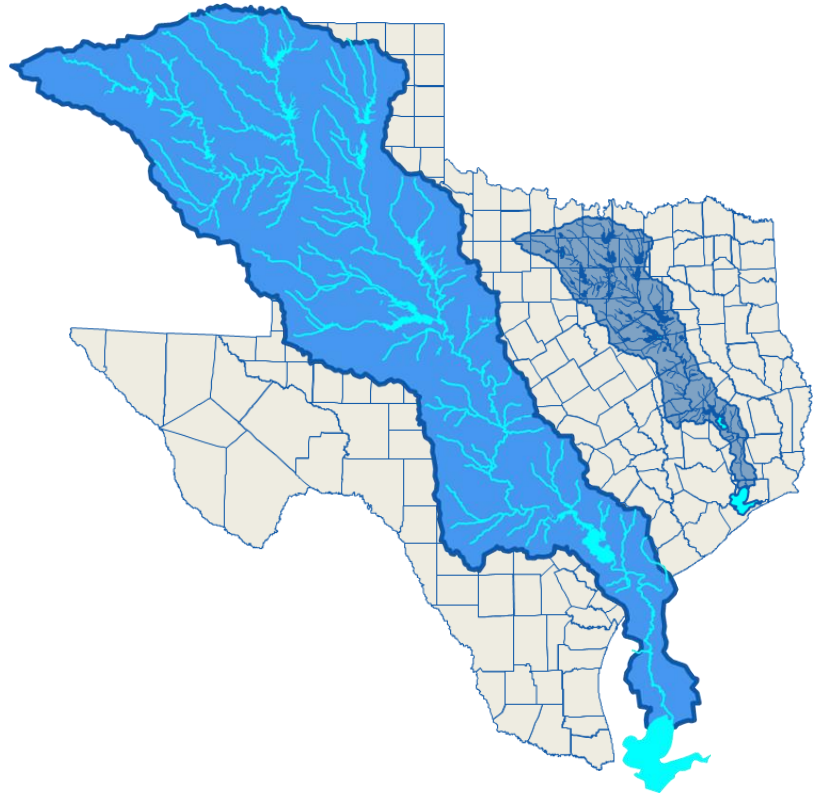
- Cooperative Data Network
- NOAA/NWS Satellite Transmission
- Forecasts/Data for Operations

# Trinity River Basin Over View

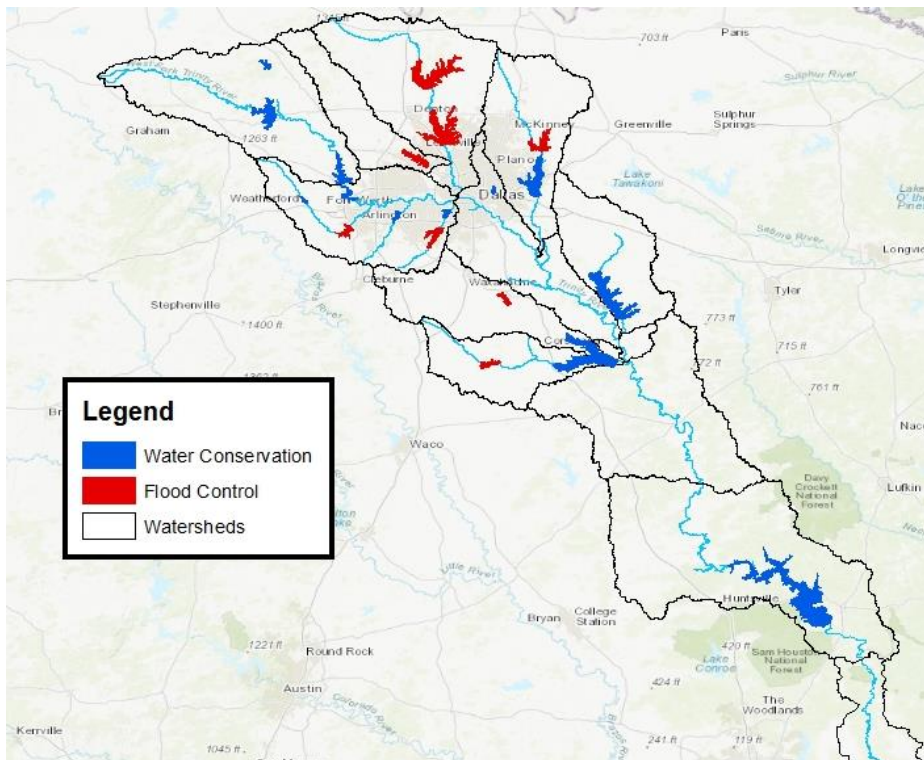


# Basin Facts

- Nearly 18,000 square miles
- More water storage than any other river system in Texas



# Basin Facts



20 reservoirs ranging  
from 1,000 to 83,000  
acres

- 12 Water Conservation
- 8 Flood Control



# Basic Components of a Dam



# Flood Control Reservoir



# Flood Control Reservoir

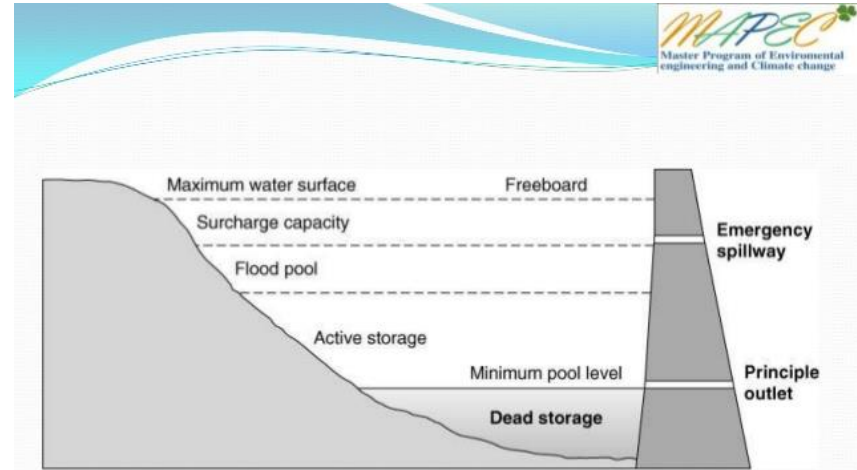
- Built to regulate flood waters
- Examples:

## 1. Lake Grapevine

- Storage-535 MSL
- Flood Pool-560 MSL
- Surge-582 MSL

## 2. Lake Lewisville

- Storage-522 MSL
- Flood Pool-532 MSL
- Surge-552 MSL



**Figure 7.5** Classification of principle storage zones in a cross section of a multipurpose reservoir.



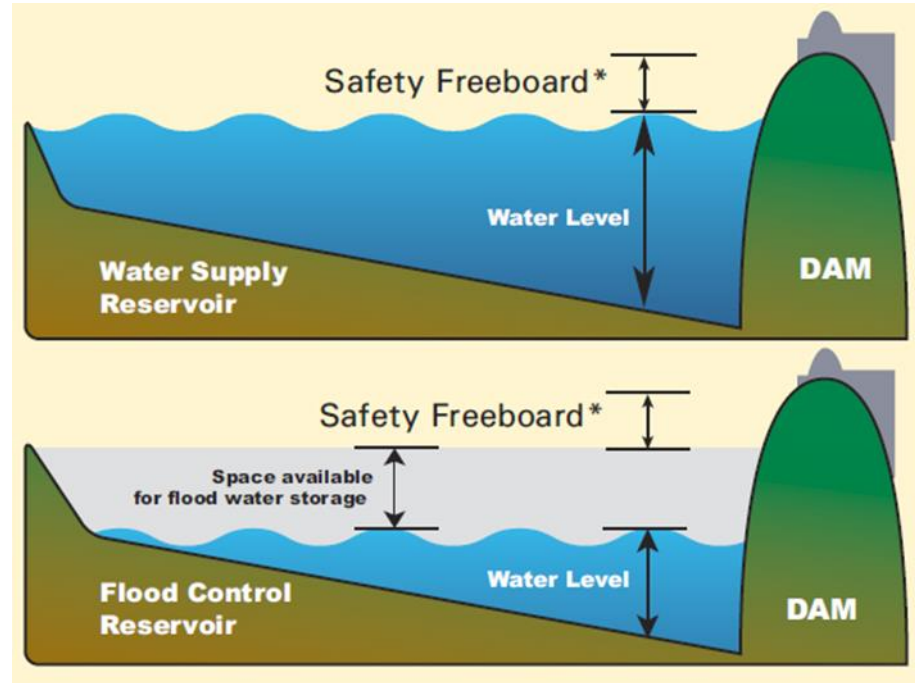


## Water Conservation Reservoir



# Water Supply Reservoir

- Designed to stay near full
- Have very limited capacity to capture storm inflows
- Designed to pass inflows from storms (with some reduction in peak flow)
- Structurally, the gates must open gradually as lake rises
- Still reduces flooding downstream



# Lake Livingston

**WATER CONSERVATION RESERVOIR** is responsible for the safe storage of water and providing drinking water to more than two million southeast Texans.

- 83,000 surface acres
- 1,750,000 acre feet
- More than 350,000 CFS spillway discharge capacity
- Conservation Pool – 131 MSL
- Flowage Easement –135 to 140 MSL





# Gate Operations

- Manage outflow in order to mimic river flows
- Calculate releases adequate to keep pace with increasing inflows without causing sudden surges and without exceeding computed inflows until the peak inflow has been reached.
- Once reservoir elevation has peaked, excess inflow will be released from surcharge storage in an orderly fashion to reduce pool to conservation pool of 131 MSL.





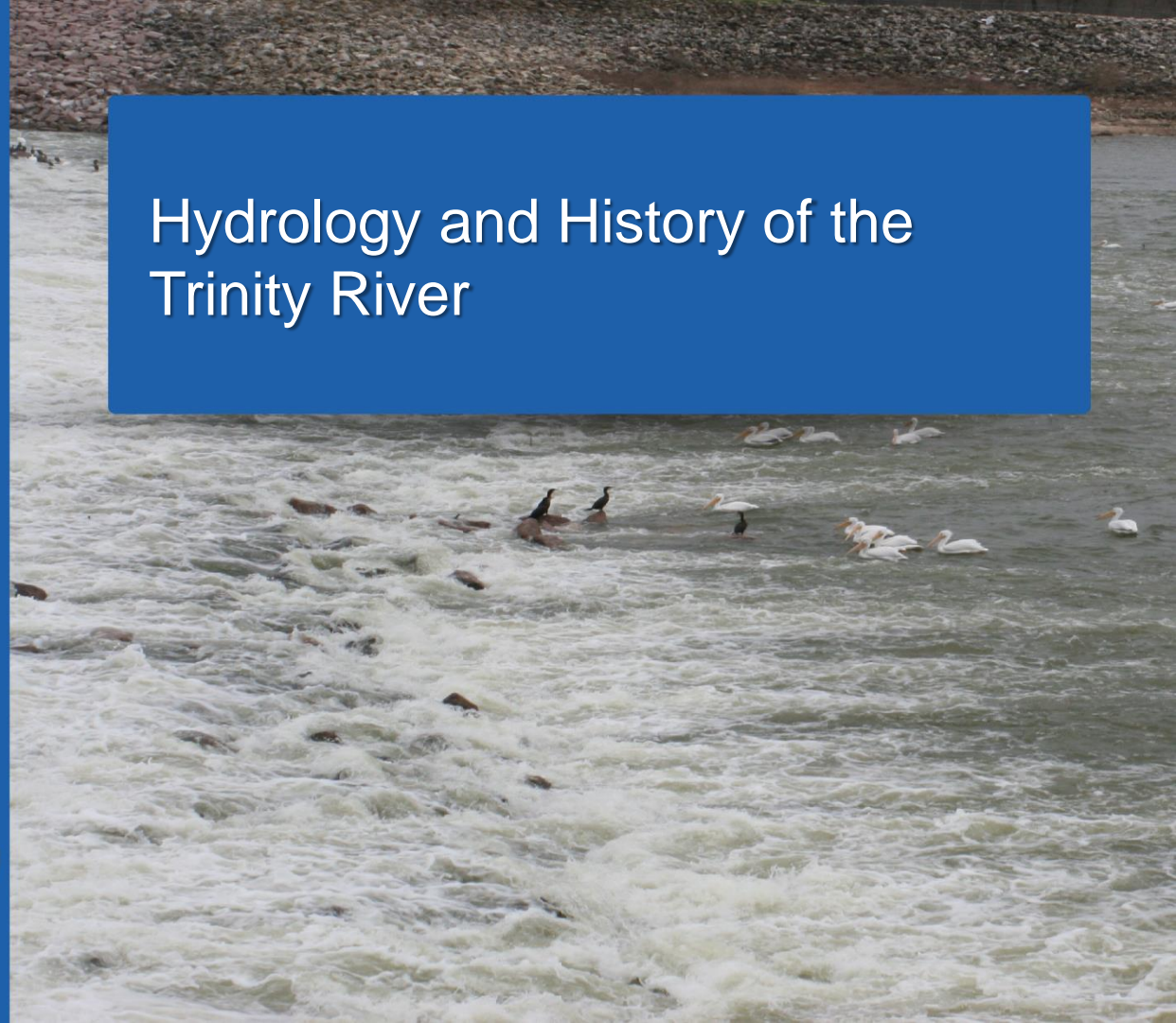
# Lake Livingston Emergency Action Plan

- Implemented at discharge of 20,000 cubic feet/second (CFS)
- Who do we contact?
  - ✓ Emergency Management Coordinator for Walker, Polk, San Jacinto, Trinity, Liberty and Chambers counties
  - ✓ NWS and WGRFC
  - ✓ DPS-Lufkin
  - ✓ Liberty radio
- Methods of notification
  - ✓ Phone
  - ✓ Email
  - ✓ Twitter





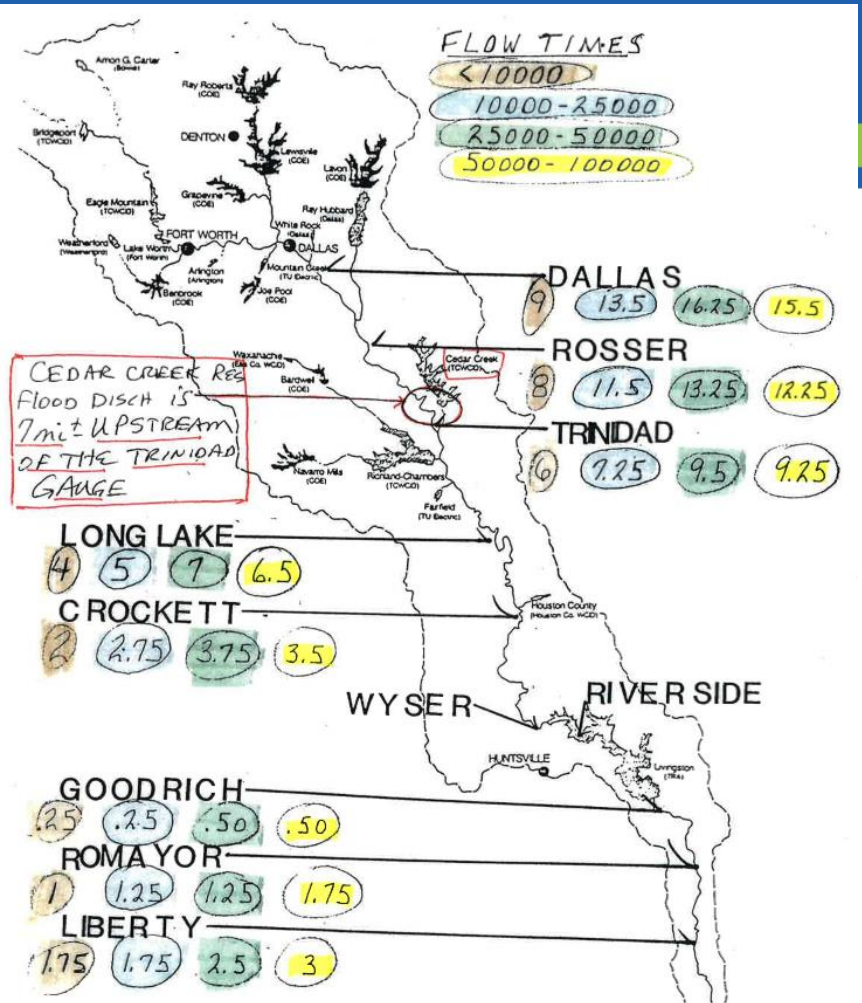
## Hydrology and History of the Trinity River





# Trinity River Travel Times

- Travel times are to/from Lake Livingston



# Historic Flood Stages at Riverside

RANK	YEAR	STAGE
1	1942	142.61
2	1945	141.69
3	1957	139.61
4	1908	139.56
	1968	GATES AT DAM CLOSED
5	1990	139.08

# Riverside 1942





# No Two Floods Are The Same

- What part of the watershed is the flood event originating?
  - Rain event in Dallas
  - Local Rain
- How much of the watershed was covered by precipitation?
- What are the current conditions?





# Flood Safety

What to do before, during, and after a flood?

# Safety Before a Flood



- Prepare a family disaster plan.
- Check if your insurance covers flood damages. If not, get flood insurance.
- Keep insurance and other important documents, such as copies of driver's licenses and credit cards, and other valuable items, in a safe deposit box.
- Assemble a disaster supplies kit. Be sure to include prescription medications, food, and water.
- Find out where you can go if ordered to evacuate.
- Arrange to keep in contact with relatives and friends.
- Know your resources.

Knowing what to do when a flood occurs will increase your family's safety and possibly its survival.

# Safety During a Flash Flood



- Turn around, don't drown when encountering flooded roads.
- Be especially cautious at night when it is harder to recognize the dangers of flooding.
- Stay away or be swept away. River banks and culverts can become unstable and unsafe.
- You should monitor the latest forecasts and be prepared to take action should additional Flash Flood Warnings be issued.
- Have multiple ways to receive weather information (cell phone, NOAA weather radio, television, etc.)

# Turn Around, Don't Drown!

- Most flood deaths occur in vehicles.
- It only takes **six inches of water** for a vehicle to lose contact with the road surface.
- Most vehicles can be swept away in just 18 to 24 inches of water!
- Don't Rely on Your Big Vehicles
- Flooded roads may have hidden dangers, such as washed out road beds or underwater obstructions.
- If your vehicle is caught in rising water, leave it immediately and seek higher ground.



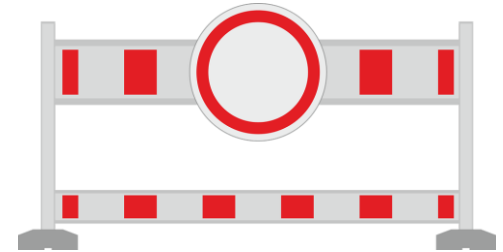
Minnesota road damaged by flood waters, courtesy of FEMA.



# Safety During a Flood

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- Do not sightsee!
- Evacuations are ongoing and first responders are working hard to get people to safety. Do not get in their way!
- Flood waters from creeks, bayous and rivers will be swiftly moving. *Do not go near the flood waters!* They will sweep you away if you go in the water.
- Stay out of the flood waters!
- Roads may still be closed as they could be damaged or still under water. **Barricades are for your protection; do not drive around them!**



# Safety After a Flood

- Don't put yourself in danger.
- Return home only when authorities indicate it is safe.
- Use extreme caution when entering buildings
- Cut power to flooded areas of your home
- Only use generators in well-ventilated areas – **Not** in a closed garage!)
- Do not use power tools while standing in water
- If you smell or hear gas, call the Fire Department.

## Flooding Resources

Flood Safety

Turn Around Don't Drown

State Flood Information

Flood Hazards

NWS Flood Related Products

Forecasts and Observations

National Water Center

Education and Outreach Materials

Partner Agencies

**weather.gov/flood**



# Report Flooding

# What to Report

## Flash Flooding

- Underpasses filling with water
- Impassible roadways
- Any fast-moving water greater than 6 inches in depth

## Any River or Bayou Flooding



Flooding, Washington County (2016)

# Formatting Reports



Reports should include the following information:

**WHO** is calling

**WHERE** the flooding is located

**WHAT** type of flooding is occurring (flash, river, or bayou)

**WHEN** the flooding occurred (is it ongoing?)

**HOW** deep is the water (if you can \*safely\* evaluate this)





## The Good

“I’m a storm spotter located in Sealy at the intersection of Meyer and FM 2187. Water is flowing over curbs; it’s at least 6-8 inches deep in some locations on the road.”

## The Bad

“Hey, we got some flooding here a few minutes ago!”

## The Ugly

“My sister-in-law said the bayou got really closer to her house, did you have a warning out for that?”

# How to Report

## Call us!

Spotter line: 1-800-846-1828

## Report via amateur radio

Call sign WX5HGX

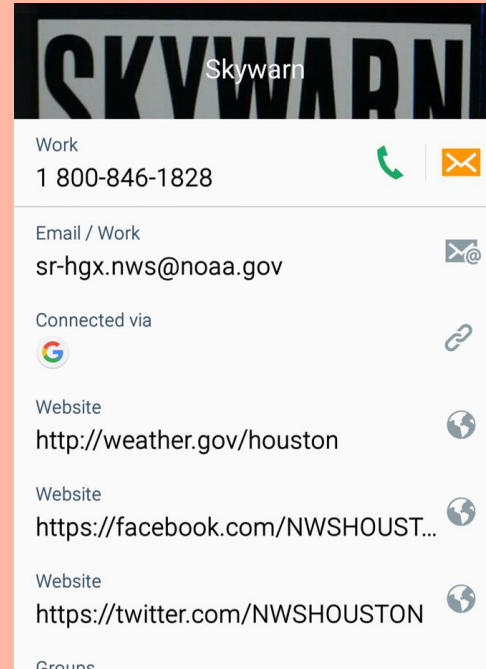
## Email

[sr-hgx.nws@noaa.gov](mailto:sr-hgx.nws@noaa.gov)

## Social Media

Twitter: @NWSHouston

Facebook: NWSHouston



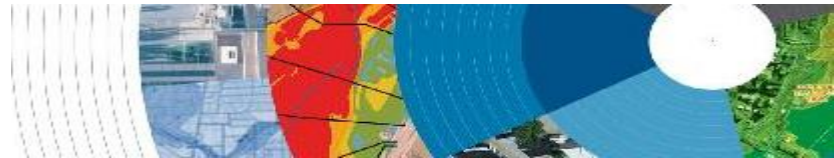
## Spotter Tip

Set up SKYWARN as a contact  
in your smartphone



# Flood Risk

# Flood Risk?



Any situation involving exposure to a Flood danger, harm or loss.

*“While levees can help reduce flood risk...they do not eliminate the risk.”*



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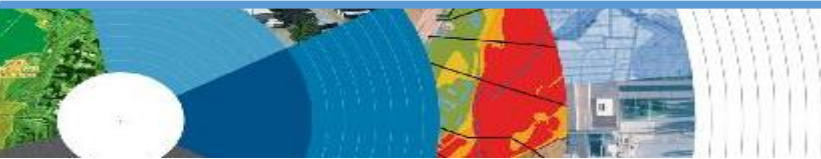
# Flood Insurance/Group Flood Insurance

## Everyone is at risk for flooding

- Brief definition of flooding is any forms of rising water in which 2 properties are affected-one being yours
- Structure Coverage
  - Max coverage \$250,000
- Contents coverage
  - Contents is an optional addition, except for Preferred Risk Policy.
  - Max coverage \$100,000 coverage for Actual Cash Value
- Wait Period
  - Typically - 30-days from purchase until effective.
- Average pay out for Harvey for NFIP was \$112K (March 2018)

## ▪ Group Flood Insurance

- Available during a Presidential Declared event
- If qualified for a IA grant a GFIP will be purchased in the amount of \$600
- Policy is good for 3 years
- Must maintain insurance on the property forever
- Max amount on the policy is \$33,500 this includes structure and dwelling
- Average pay out for Harvey for IA was \$6000



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# Insurance Misconception

- **Misconception:**

*"I'm already covered—my homeowners policy covers flooding."*

- **Fact:**

Most insurance policies do not cover flooding; only flood insurance covers flood damage.

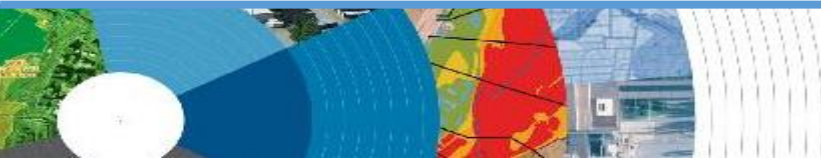
Renters and Business owners should also consider flood insurance for contents.

- **Misconception:**

*"I don't live in a flood zone."*

- **Facts:**

- Floods are the #1 natural disaster in the United States.
- If it can rain, it can flood.
- FIRMs do not show localized flooding from drainage ditches/sewers/road ponding.
- To some degree overland flooding ... but not property to property drainage problems.

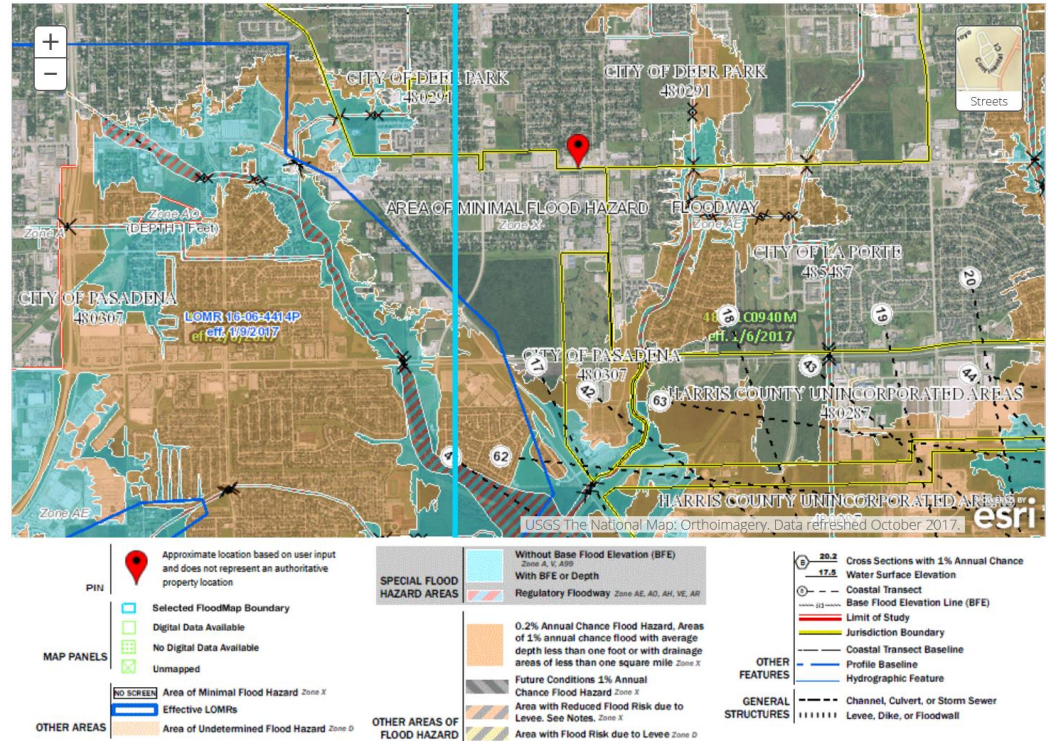


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# What is a FIRM and Flood Zone?

## Flood Insurance Rate Map

- Identifies the flood zones
- SFHA (high risk)
  - A, AE, AO, AH, VE, V etc. (Aqua)
    - 1% annual chance flood
- Non-SFHA (low to moderate risk)
  - B, C and X (Shaded – orange or gray color & non-Shaded)
    - Orange/Gray area – outlines areas protected by Levees
    - Even the non-shaded is a flood zone – a minimal risk.
- Used for rating flood insurance policies
- Are subdivided by panels to cover jurisdictional boundary.
- Shows what the BFE within the zones
- FIRM's show Coastal and Riverine flood risk

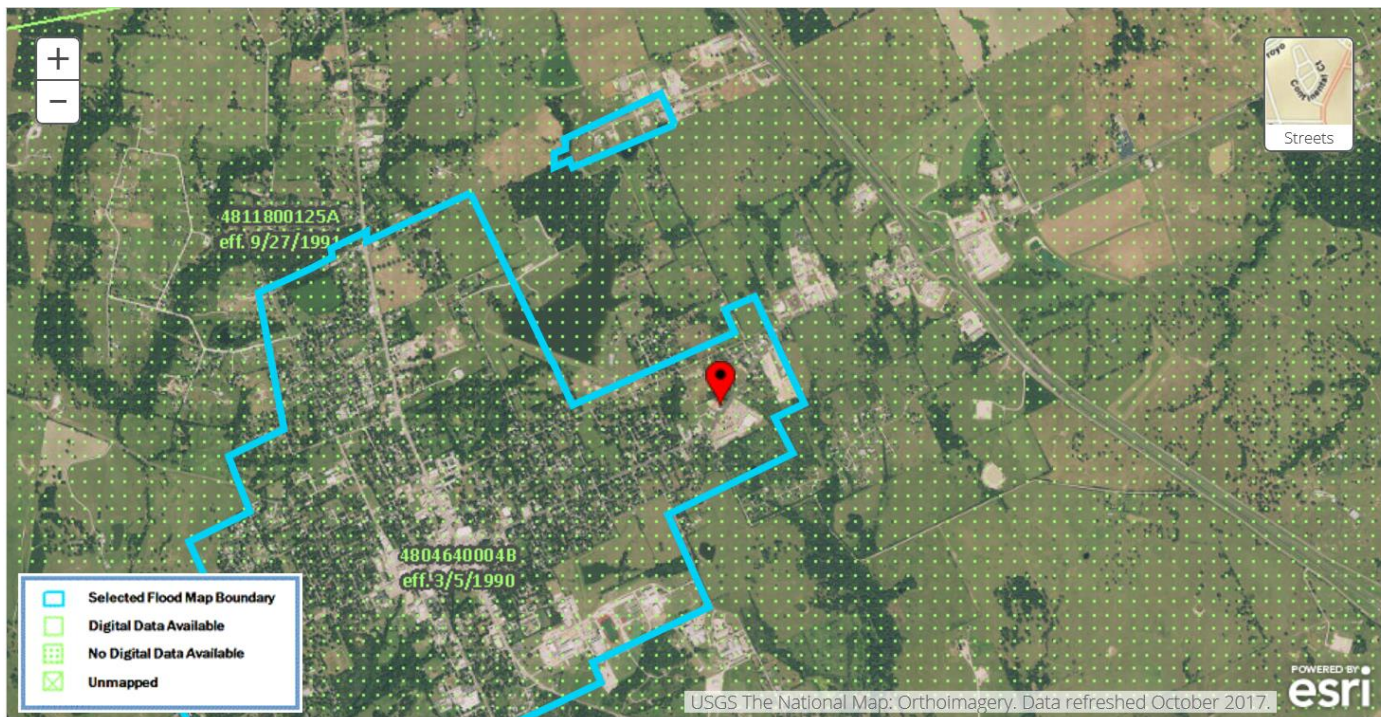
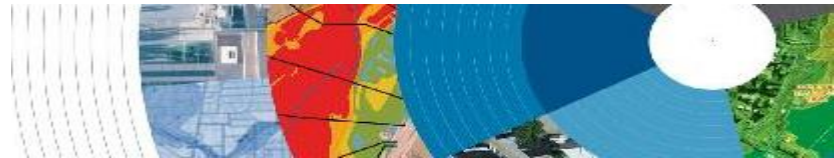


Find your zone at <https://msc.fema.gov/portal/home>



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# What is a Flood Zone?



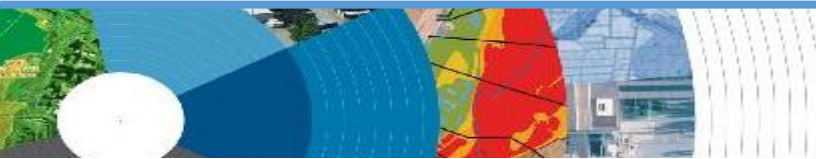
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# Cost of Flood Damage?

2,500 sqft, one-story home with possessions worth \$50,000

Interior Water Depth (Inches)	Cost to Home	Cost to Personal Property	Combined Loss Potential
1"	\$23,635	\$3,172	\$26,807
2"	\$23,720	\$3,172	\$26,892
3"	\$24,370	\$4,917	\$29,287
4"	\$31,345	\$7,207	\$38,552
5"	\$31,425	\$13,914	\$45,339
6"	\$37,260	\$14,777	\$52,037
7"	\$37,691	\$17,700	\$55,391
8"	\$38,122	\$20,624	\$58,746
9"	\$38,553	\$23,547	\$62,100
10"	\$38,983	\$26,470	\$65,453
11"	\$39,414	\$29,394	\$68,808
12"	\$39,845	\$32,317	\$72,162
24"	\$44,325	\$43,001	\$87,326
36"	\$47,905	\$46,633	\$94,538
48"	\$53,355	\$50,000	\$103,355



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# Structure Elevation Impact Insurance Rates



High Risk =  
\$\$\$

Medium Risk =  
\$\$

Lower Risk = \$

The elevation is just one factor, others include: when was the structure, has it flooded in the past, etc.

**EVERY Structure has a risk...**  
*generally the higher the structure the less the risk.*



# Harvey Numbers

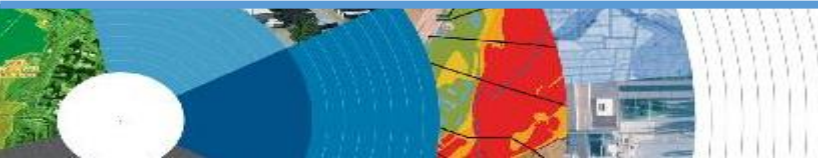
## Insurance claims

- Harris Co (includes cities such as Houston) – 55,570 claims\*\*

## Harris County Numbers\*\*

- 154,170 Homes flooded of which 48,850 in 1% Risk Area (100-yr)
- 34,970 in 0.2% (500-yr) floodplain
- **68% OUTSIDE of the 1% Risk Area.**

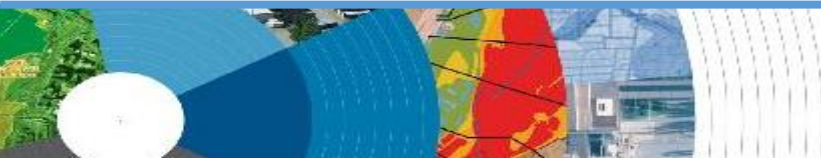
\*\*Data HCFCD Finale Hurricane Harvey Storm and Flood Information –  
<https://www.hcfcd.org/media/2678/immediate-flood-report-final-hurricane-harvey-2017.pdf>



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# Summary

- Living in Texas means we have a flood risk even with heavy rain.
  - Tax Day 2016 and Memorial Day 2015 – not with a tropical system
- Flood Risk is from multiple sources.
- Flood insurance allows individual property owners to manage their risk.
  - **Buy policies that cover the structure AND contents.**



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# Contact Information

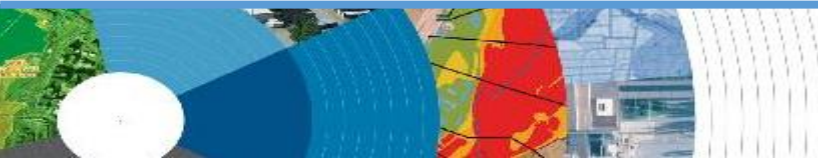
NFIP Hotline  
1-800-427-4661  
[www.fema.gov/nfip](http://www.fema.gov/nfip)

Angela Harrison, Insurance  
Cell 470-557-2794 | [Angela.Harrison@fema.dhs.gov](mailto:Angela.Harrison@fema.dhs.gov)

Yho-Meka Conway, Insurance  
Cell 470-572-0803 | [Yho-Meka.Conway@fema.dhs.gov](mailto:Yho-Meka.Conway@fema.dhs.gov)

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Cell 202-812-6164 | [Lauren.Schmied@fema.dhs.gov](mailto:Lauren.Schmied@fema.dhs.gov)

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# Questions

National Weather Service  
FEMA