The Official Southeast Texas HURRICANE & SEVERE WEATHER GUIDE

IT ONLY TAKES ONE STORM!



WEATHER.GOV/HOUSTON

Source: NOAR



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A Letter to Residents

For the Atlantic, 2022 was close to normal as far as number of named storms is concerned. The most significant hurricane impact was from Hurricane Ian which brought deadly wind and storm surge to the west coast of Florida. Severe thunderstorms produced numerous tornadoes in the Greater Houston area in January 2023. This included an EF-3 rated tornado which tracked for over 24 miles across Southeast Harris County, including the cities of Pasadena, Deer Park and Baytown. The region also experienced periods of heat, cold and drought over the past year.

Severe weather can take many forms in Southeast Texas from hurricanes, floods, tornadoes and severe thunderstorms to extreme heat and cold. This year marks the 15 year anniversary of Hurricane lke which brought damaging winds and deadly storm surge. This is also the 40 year anniversary of Hurricane Alicia which is the last "major" hurricane landfall in our forecast area bringing Category 3 winds to Galveston. Both of these storms were much different than Harvey from 6 years ago, which locally had little in the way of wind or surge but led to catastrophic flooding from record rainfall.

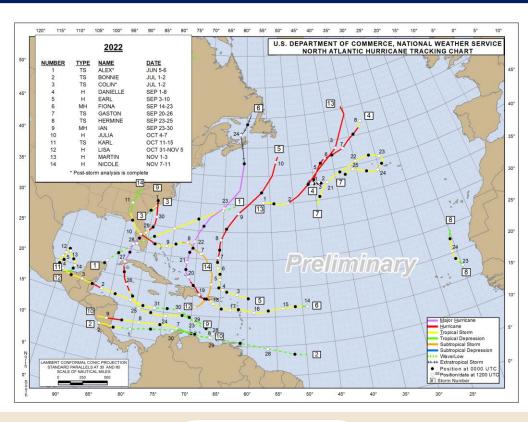
This guide will cover how to prepare for these various hazards and describe what actions to take to keep you safe. You will find numerous checklists for what to do before, during and after a hurricane. This guide contains contact information for your local emergency managers, numerous resources and links where you can find more information.

We hope you find this guide useful. An electronic version of this guide can be found on the National Weather Service Houston/Galveston Forecast Office website <u>weather.gov/houston</u>. Please be encouraged to place the link to this guide on your website and share it out through email and social media.

Dan Reilly

Warning Coordination Meteorologist National Weather Service Houston/Galveston, TX

2022 ATLANTIC HURRICANE SEASON REVIEW



Click Here for detailed reports on each storm



ABOUT THE HURRICANE



TROPICAL DEPRESSION

A tropical cyclone with maximum sustained winds of 38 mph or less.

TROPICAL STORM

A tropical cyclone with maximum sustained winds between 39 and 73 mph.

HURRICANE

An intense tropical cyclone with sustained winds of 74 mph or higher. A tropical cyclone is a large low pressure system that derives its energy from warm ocean waters of the tropics. It is characterized by a closed counterclockwise circulation in the Northern Hemisphere and thunderstorms organized near the center of circulation. The hurricane, the strongest classification of a tropical cyclone, typically has an eye at the center with a ring of thunderstorms around it, and spiral bands of thunderstorms extending outward from the center.

In the North Atlantic, the tropical cyclone is defined as a tropical depression, tropical storm or hurricane, depending on the strength of the maximum winds in the storm. Every tropical cyclone brings some combination of the following hazards: damaging winds, storm surge flooding, tornadoes, flooding from heavy rainfall, high surf and rip currents.

SAFFIR-SIMPSON HURRICANE WIND SCALE

Category	Sustained Wind Speed (mph)
One	74 – 95
Тwo	96 – 110
Three	111 – 129
Four	130 – 156
Five	157+



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TROPICAL WATCHES & WARNINGS

WATCH PHASE – 48 Hours Out

TROPICAL STORM WATCH

Tropical Storm force winds are **possible** in the watch area generally within **48 hours.**

HURRICANE WATCH

Hurricane force winds are **possible** in the watch area generally within **48 hours.**

STORM SURGE WATCH

The **possibility** of life-threatening inundation from rising water moving inland from the shoreline (storm surge flooding) somewhere within the specified area, generally within **48 hours**.

WARNING PHASE – 36 Hours Out

TROPICAL STORM WARNING

Tropical Storm force winds are **expected** in the specified area generally within **36 hours.**

HURRICANE WARNING

Hurricane force winds are expected in the specified area generally within **36 hours**.

STORM SURGE WARNING

The **danger** of life-threatening inundation from rising water moving inland from the shoreline (storm surge flooding) somewhere within the specified area, generally within **36 hours**.





DANGER HIGH SURF & RIP CURRENTS

The first danger from a tropical system can occur days before the first raindrop falls: High Surf and Dangerous Rip Currents



FEMA Jocelyn Augustino

Rip currents are the leading water hazard for all beach goers and result in over 100 drownings every year in the United States.

The strength and size of rip currents are related to the size of the surf and wave period.

Rip currents typically form at the low spots in the surf, at the breaks in the sandbars, and near jetties and piers.

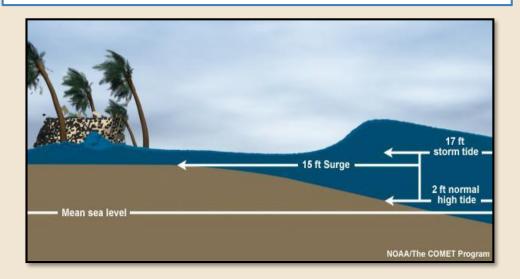
If caught in a rip current, don't panic. Instead, swim parallel to the shore. The current is usually only about 50 feet wide and you should be able to swim out of it. At that point, you can swim back to shore. If you are still unable to reach the shore, draw attention to yourself: face the shore, wave your arms, and yell for help.

For more information: www.usla.org/page/RIPCURRENTS www.weather.gov/safety/ripcurrent www.weather.gov/safety/beachhazards





Storm surge is the abnormal rise of water generated by a storm, over and above the predicted astronomical tides. The storm tide is the height of water relative to a reference level or datum that includes storm surge and astronomical tide. The combination of storm surge flooding and battering waves can be very destructive as seen with Hurricanes Ike (2008), Carla (1961), the 1900 Galveston Hurricane and many others.



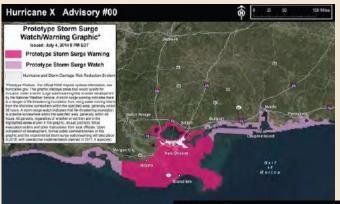
All about storm surge: https://www.nhc.noaa.gov/surge/

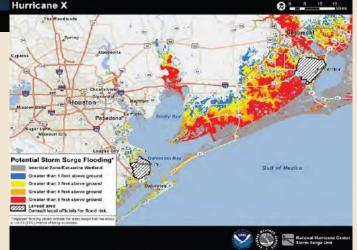
Hazard Risk Maps. Check out to gauge your risk/vulnerability. https://www.nhc.noaa.gov/nationalsurge/



When a hurricane or strong tropical storm approaches, the National Weather Service (NWS) will produce two maps to convey the storm surge flood threat. The first is the storm surge watch and warning map showing areas at risk for life threatening surge. See example to the left.

The other type of map is the Potential Storm Surge Flooding map. It shows the reasonable worst case scenario for depth of water above ground due to storm surge flooding for a given storm. See an example on the lower right.







Storm Surge Can Be Deadly! Here are 6 Tips to be Ready

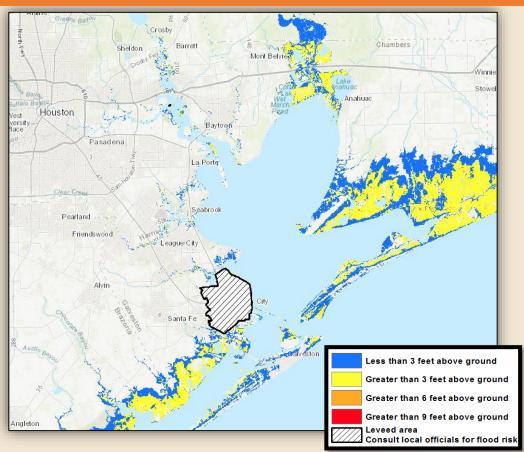
- Storm surge flooding is often the greatest threat to life and property from a hurricane. It poses a significant threat for drowning. A mere six inches of fast-moving flood water can knock over an adult. It takes only two feet of rushing water to carry away most vehicles.
- 2 Storm surge can cause water levels to rise quickly and flood large areas in just minutes, and you could be left with no time to take action if you haven't already evacuated as instructed.
- **3** Storm surge is not dependent on the Saffir-Simpson Hurricane Wind Scale. Hurricane categories are based only on winds and do not account for storm surge. Any wind category can all cause life-threatening storm surge.
- Many Gulf Coast areas are vulnerable to storm surge including areas many miles inland from the coastline depending on elevation of the coastal plain. Find out today if you live in a storm surge zone (see pages 12-17 in this guide).
- 5 Storm surge can occur before, during and after the center of the storm passes through an area, and can sometimes cutoff evacuation routes. The water can also rise well in advance of the coming storm, in some cases 36 hours or greater. When an evacuation is ordered, do not wait until the last minute to leave.
 - During the peak of a storm surge event, it is unlikely that emergency responders will be able to reach you if you are in danger.





Galveston Bay Potential Storm Surge Flooding Map

Category One Storm



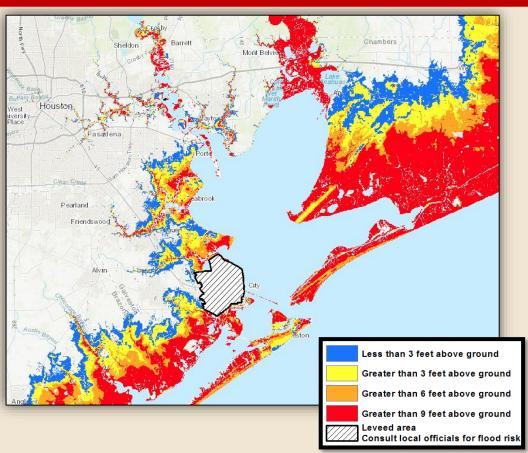
This map shows the height above ground the water <u>could</u> reach and depicts the worst-case scenario from storm surge flooding. <u>https://www.nhc.noaa.gov/nationalsurge/</u>





Galveston Bay Potential Storm Surge Flooding Map

Category Three Storm



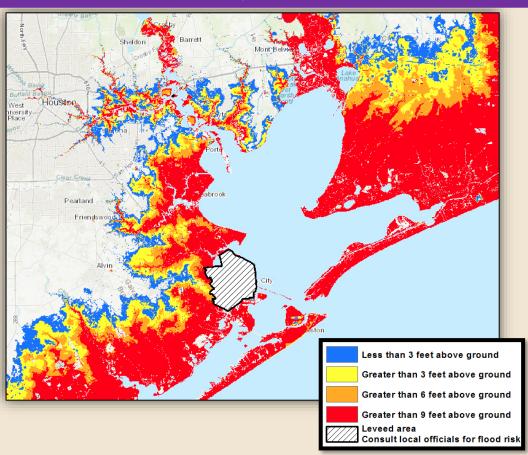
This map shows the height above ground the water <u>could</u> reach and depicts the worst-case scenario from storm surge flooding.





Galveston Bay Potential Storm Surge Flooding Map

Category Five Storm



This map shows the height above ground the water <u>could</u> reach and depicts the worst-case scenario from storm surge flooding.





Matagorda Bay and Brazoria Coastline Potential Storm Surge Flooding Map

Category One Storm



Less than 3 feet above ground
Greater than 3 feet above ground
Greater than 6 feet above ground
Greater than 9 feet above ground
Leveed area Consult local officials for flood risk

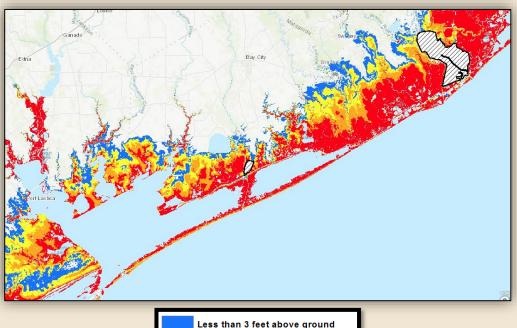
This map shows the height above ground the water <u>could</u> reach and depicts the worst-case scenario from storm surge flooding.





Matagorda Bay and Brazoria Coastline Potential Storm Surge Flooding Map

Category Three Storm



	Less than 3 feet above ground
	Greater than 3 feet above ground
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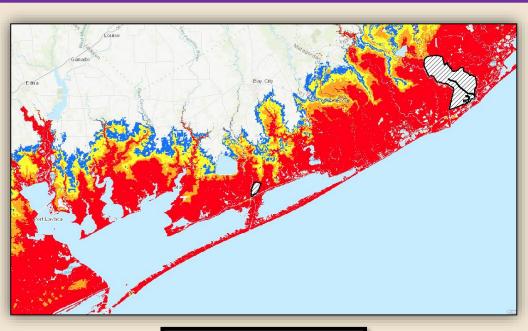
This map shows the height above ground the water <u>could</u> reach and depicts the reasonable worst-case scenario from storm surge flooding.





Matagorda Bay and Brazoria Coastline Potential Storm Surge Flooding Map

Category Five Storm

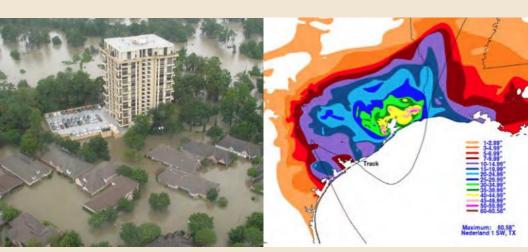


Less than 3 feet above ground	
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This map shows the height above ground the water <u>could</u> reach and depicts the reasonable worst-case scenario from storm surge flooding. <u>https://www.nhc.noaa.gov/nationalsurge/</u>

HEAVY RAIN FLOODING

Texans are all too familiar with catastrophic flooding from slow moving hurricanes and tropical storms. Examples include Claudette (1979), Allison (2001), Harvey (2017) and Imelda (2019). Slow storm motion and high rain rates produced extremely high rainfall totals in these storms with catastrophic flooding the result. The map at the bottom of the page shows the rainfall from Harvey. Harvey set the record for most rainfall from a tropical cyclone in the United States with 60.58 inches of rain measured in Nederland, TX. Harvey was also noteworthy by the large area over which this extreme rainfall fell. Tropical Storm Claudette was another record breaker with 43 inches of rain falling over 24 hours in Alvin, TX.



Flooding of Cypress Creek near Champions Forest Drive. Hurricane Harvey. Photo Credit: HCFCD.

Total rainfall from Harvey (2017). Record rainfall 60.58 inches Nederland, TX. NWS



HEAVY RAIN FLOODING

5 Ways to Prepare for Flooding from Heavy Rainfall



Protect Your Personal Documents and Special Items

- · Store valuables in plastic tubs with locking tops
- In case of an evacuation, you should be able to secure and move all your valuables within 15 minutes

Buy Flood Insurance – Even if Not in the 100-year Flood Plain

- · Your homeowners policy will not cover flood loss.
- The National Flood Insurance Program (NFIP) is available from an insurance agent or the NFIP
- For more information see <u>www.floodsmart.gov</u>

Flood Proof Your Home – Take Steps to Minimize Flood Damage

- Shut off the main circuit breaker to prevent appliances from short circuiting and eliminate the threat of electrocution
- · Raise outside air conditioning units onto platforms above ground level
- · Store rarely used or expensive items in the attic or on high shelves

Develop a Family Flood Plan



- Know your flood risk. You can find out the flood zone your are in by entering your address at the FEMA flood portal. <u>https://msc.fema.gov/portal</u>
- Develop a plan of action to keep from panicking or withdrawing during an emergency
- Have an evacuation route and alternatives planned in the event you are asked to evacuate
- · Communicate your plans with friends or family outside of your home area
- Battery powered can be used in the event of a power outage

Never Drive on Flooded Roads

- Driving into flooded roadways puts your life and the lives of others at risk
- Unless told to evacuate, you are probably safest staying at your current location
- · If you encounter flood waters when driving, Turn Around, Don't Drown!



Flash flooding from heavy rains is one of the most dangerous hazards for Southeast Texas. With flow off the Gulf of Mexico providing abundant moisture, high rainfall rates are not uncommon, with greater than 4 inches per hour observed on occasion. When thunderstorms follow each other or "train" over one area, which can be common during a tropical system or a cluster of slow-moving thunderstorms, rainfall of several inches over a short period is not uncommon with flash flooding a result.

It is important to understand what actions to take to protect yourself from flash flooding hazards.

Flood Related Watches, Warnings, Advisories

Flash Flood Watch: Be Prepared, Stay Alert, Keep Watch. A watch is issued when conditions are favorable for flash flooding, but occurrence, timing, and location is still uncertain.

Flood Advisory: Be advised, be cautious. A Flood Advisory is issued when flooding may cause significant inconvenience and if caution is not exercised, could lead to situations that may threaten life and/or property. Conditions are not quite as severe as with a warning.

Flash Flood Warning: Take Action! A warning is issued when potentially life-threatening flash flooding is imminent or occurring. A flash flood is a sudden violent flood that can develop quickly...within hours.

FLASH FLOOD EMERGENCY: Extreme Danger! Rarely used. Reserved for rare cases of extreme danger to life and property from flash flooding, a historic event with an extreme threat to life and property.





During a Flood

- Avoid walking or driving through flood waters. Turn Around, Don't Drown! Just 6 inches of moving water can knock you down, and 2 feet of water can sweep your vehicle away. Most flash flood fatalities occur in vehicles.
- If floodwaters rise around your car, abandon the car immediately and move to higher ground. Best option is to get out through the windows. Force door open if necessary, before becoming completely submerged.
- Avoid camping or parking along streams, rivers and creeks during heavy rainfall. These areas can flood quickly and with little warning.
- If in a flood prone area from a nearby stream or creek you may be asked to evacuate and move to higher ground. Obey evacuation orders if given.
- Never drive around barricades.

After A Flood

- Return home only when authorities say it is safe.
- Be aware of areas where floodwaters have receded and watch out for debris, snakes, fire ants, alligators, etc. Floodwaters often erode roads and walkways.
- Do not attempt to drive through areas that are still flooded.
- Avoid standing water as it may be electrically charged from underground or downed power lines.
- Photograph damage to your property for insurance purposes.

For more information: www.weather.gov/safety/flood www.ready.gov/floods



DANGER DAMAGING WINDS

Hurricane force or strong tropical storm force winds can damage or destroy structures, down trees and impact infrastructure with loss of power, phone and/or sewer/water. Signs, roofing material. siding, and unsecured small items left outside can become flying missiles in a hurricane. The strongest winds occur in a region of the hurricane called eyewall, the ring of the thunderstorms that surround the eye. Wind gusts in the right side of the track in the are the most eyewall destructive. Hurricane force wind gusts can be felt well inland, far from the coast, especially for stronger fast moving hurricanes. The Saffir-Simpson Hurricane Wind Scale can give you an idea of the wind impacts expected from the hurricane. Severe thunderstorms can also produce damaging winds.



Photo credit FEMA.

MOBILE HOME RESIDENTS MUST EVACUATE!

Mobile homes especially are vulnerable to hurricane winds and tornadoes. It's important for mobiles homes to be properly strapped down, but even then a mobile home is not a safe place to be in a hurricane or tornado! It is better to seek shelter in a more sturdy structure ahead of the storm, prior to the arrival of the stronger winds. Think about where that structure would be, whether with relatives friends or or in neighborhood shelter. Include that as part of your preseason hurricane planning.





DANGER DAMAGING WINDS

Saffir-Simpson Hurricane Wind Scale



Very dangerous winds will produce some damage:

Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.



Extremely dangerous winds will cause extensive damage:

Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.



Devastating damage will occur:

Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes. Considered a Major Hurricane.

Catastrophic damage will occur:



Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months. Considered a Major Hurricane.

Catastrophic damage will occur:



A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months. Considered a Major Hurricane.

Click here for detailed impact table





DANGER TORNADOES



Photo credit NOAA.

Tropical cyclones can also produce tornadoes which most often occur in thunderstorms in outer rain bands on the right hand side of the track, away from the center of the hurricane. They can also occur in the eyewall. Tornadoes produced by tropical cyclones are usually relatively weak and short-lived but not always. A strong tornado that developed in Hurricane Carla's outer bands killed 6 in Galveston in 1961. Twenty three tornadoes were confirmed with Harvey, all forming in the outer rain bands on the right side of the storm.

Tornadoes are rated based on the damage they cause using the <u>Enhanced</u> <u>Fujita Scale</u>. The scale runs from zero for the least damage to EF5 for total destruction. Most tropical cyclone tornadoes are EF0 or EF1. In April 2020, an EF3 tornado struck Onalaska, TX.

> For more information: <u>www.weather.gov/tornado</u> <u>www.ready.gov/tornado</u>





SAFETY TORNADOES

Tornadoes are fairly common in Southeast Texas. A tornado can strike very quickly with little warning. It's important to know what to do should a tornado approach so you can take quick protective action.

Tornado Related Watches and Warnings

Tornado Watch - Conditions favor the development of tornadoes. Stay alert, be ready to act should a tornado threaten. Watch the sky and have a way to receive warnings (smart phone apps, NOAA Weather Radio, commercial radio or television).

Tornado Warning - A tornado has been sighted or indicated by weather radar. Take shelter immediately if in the warned area.

TORNADO EMERGENCY - Issued in exceedingly rare circumstances when there is a severe threat to human life and/or catastrophic damage is imminent or ongoing and reliable sources confirm tornado.

What to do in a Tornado Warning

If you are in a structure (e.g. residence, small building, school, nursing home, hospital, factory, shopping center, high-rise building) go to the center of a small interior room or interior hallway on the lowest level, away windows, doors, and outside walls. Put as many walls as possible between you and the outside. Avoid large rooms with large span roofs (gymnasiums, cafeterias, etc).

If in a high-rise building go to a small interior room or hallway on the lowest floor possible away from windows. Have a pair of sturdy shoes stored in your shelter room and put them on. Do not open windows.

If you are in a manufactured or mobile home get out immediately and go to a preidentified location such as the lowest floor of a sturdy, nearby building or storm shelter. Mobile homes, even if tied down, offer little protection from tornadoes. It is important to identify such a sturdy shelter you can get to quickly as part of your severe weather plan.

If caught outside with no shelter make every effort to get to a safe shelter. If this is not possible your best course of action is to lie in a low spot or ditch and cover your head with your hands. It is not advisable to get under a bridge or overpass.





Doors and Windows

- Reinforce garage doors and tracks or replace with a hurricane rated door.
- Doors may be shuttered but one entry must be left easily accessible.
- Use a security dead bolt at least 1 inch long.
- If possible, install tested, manufactured hurricane shutters or hurricane-rated windows.
- Alternately may use 5/8" or greater exterior grade plywood secured by 2 1/2" screws and/or special clips.
- Taping windows is <u>not</u> recommended! It offers very little protection and may be dangerous.

Landscaping

- Trim trees, shrubs and any dead limbs, especially close to home.
- Repair or replace damaged fences.
- Secure any loose items in your yard, on your property ahead of the storm.

Roofing

- Inspect roof for loose or damaged shingles. Consider replacing with shingles that are rated for hurricane force winds.
- Check and/or install hurricane clips to secure roof trusses to side walls.





<u>Businesses</u>

- Understand your risk, develop a preparedness, mitigation and business continuity plan.
- Conduct an employee awareness campaign including who will need to evacuate and who will shelter. Make sure emergency supplies are on hand.
- Conduct periodic severe weather/hurricane drills to practice the plans.
- Review insurance coverage including flood and injury policies.
- Evaluate surroundings, make sure any loose objects are secured.
- Evaluate risk including awareness of local flood plains and any flood walls or levees. Elevate structures if feasible, necessary, otherwise consider building levees or flood walls to repel floodwaters. Locate critical contents within the structure to at least one foot above Base Flood Elevation.
- Make sure any chemicals onsite are safeguarded.
- Keep any critical systems maintained, including communications, power, electrical, water, etc. Have a backup if possible (e.g. generator, UPS, etc).
- Make sure the structure is strong enough to withstand a hurricane and its effects; have it evaluated by a professional engineer.
- For more information go to <u>ready.gov/business</u>



Boat Owners

- Plan to secure or move your boat ahead of a storm. Check with your marina and boat manufacturer for best ways to do this. Plan ahead of season where you would move your boat.
- Purchase necessary hurricane materials such as additional mooring lines, crew anchors, fenders, fender boards, chafing gear, and anchors.
- Safe storm moorings should consist of good condition ropes of sufficient diameter and length, with at least three or four substantial anchor points. Do not moor parallel to bank. Receding tides often capsize boats in this type of anchorage.

Pet and Farm Animals

- Make sure pets and animals have enough food and water.
- If staying be sure animals have a safe, secure location to ride out the storm, clear of hazards such as tools, debris or toxic products.
- If evacuating make sure you have an appropriate pet carrier or vehicle and have identified a shelter or location ahead of the season.
- Keep an emergency kit for your pet complete with food, water, medicines, basic first aid, collar or harness with ID tag (to be worn at all times), favorite toys, treats.
- Keep a picture of you and your pet together.
- Have newspapers and trash bags for sanitation.
- Always plan to bring pets inside, take them with you if evacuating. Never keep a pet chained, whether indoors or outdoors.
- For more info go to <u>https://www.ready.gov/pets</u>





Helping Others

If you or someone you know medical, functional have or access needs, such as impaired vision, hearing loss, or limited mobility, make sure there is a support structure in place to help that person respond to a threat. hurricane Such individuals can often benefit from a caretaker or "hurricane helper," someone who can look out for that individual and ensure they have the necessary resources to evacuate and/or shelter when the storm threatens.



FEMA News Photo

For more information: www.ready.gov/disability www.togetheragainsttheweather.com

State of Texas Emergency Assistance Registry (STEAR) - Dial 211

If you will need help evacuating from a hurricane or any other hazard, dial 2-1-1 to register with STEAR. You will be asked a series of questions which will allow emergency managers to identify those who need extra assistance evacuating. It is necessary to do this each calendar year. There is also an option to register online.

For more information: <u>https://tdem.texas.gov/stear/</u>





PREPARATION DISASTER SUPPLY KIT

Getting your disaster supply kit prepared and ready before hurricane season is essential.

At least a 7 day supply of non perishable food and water. Have a manual can opener on hand.	Photocopies or scanned images of identification, insurance, prescriptions, proof of residence such as latest utility bill
Battery powered television or radio with extra batteries.	Photocopies or scanned images of proof of identification such as birth and marriage certificates and titles
Flashlights with extra batteries	Extra medications
First Aid Kit and manual	Thre repair kit, booster cables and flares
Sanitation and hygeine items such as hand sanitizer, toillet paper, moist toweletts	Toys and games for childeren; car chargers.
Matches in a waterproof container	Road maps
Whistle	List of contacts, important phone numbers.
Extra cash	Cell phone charger, portable battery

<u>For more info:</u> FEMA: <u>www.ready.gov/kit</u> American Red Cross: <u>www.redcross.org/get-help/how-to-prepare-</u> for-emergencies/survival-kit-supplies.html





PREPARATION EMERGENCY CONTACTS

Many people keep their contacts on their phone or computer. It's a good idea to keep a paper copy of your close contacts in case you lose power and your phone is out of charge. This might include family members, loved ones, your local emergency management office, insurance agent, doctor, bank, etc. For families it is good to have an out of town contact that family members can check in with, verify they are okay, and can share their location, especially if evacuated.

Emergency Contact Information

Out of Town Contact Address:
Out of Town Contact Phone Number:
Work Telephone Number:
Cell Number/Spouse Cell Number:
Children Cell Number:
School Telephone Number:
Doctor Telephone Number:
Bank/Credit Card Telephone Number:
Insurance Company Information:



WEATHER.GOV/HOUSTON



Wireless Emergency Alerts (WEA) are emergency messages sent by authorized government alerting authorities through your mobile carrier. Most WEA alerts come the National Weather Service and include tornado warnings, the most extreme flash flood and severe thunderstorm warnings, hurricane and storm surge warnings among others. No signup is required! Alerts are sent automatically to WEAcapable phones during an emergency.

These alerts are geotargeted so you should receive them when the cell tower closest to you is in the warning polygon. Because of this the WEA system will work even if you are travelling. For example if you are on the road and travel into a tornado-warned area, you will receive the alert. WEA alerts are similar to a text message but likely with a notification sound. The version of WEA you will receive will depend on which phone/device you use. Newer phones will be capable of getting the alerts in English or Spanish (WEA 3.0). For more information on Wireless Emergency Alerts, click the link below.





PREPARATION INSURANCE TIPS

Before the Storm

- Keep a written inventory of your possessions.
- Take photos or video of each room and the exterior of your home and business.
- Gather important insurance documents such as insurance cards and policies. Keep them with you or stored at a safe location.
- Review your insurance policies with your insurance agent. Understand what is and is not covered, what limits there may be. Make adjustments if necessary.
- If you rent, consider renter's insurance to protect damage or loss of your belongings.

National Flood Insurance Program (NFIP)

Homeowners and commercial property policies typically exclude coverage for damage from flooding. Speak to your insurance agent about purchasing a separate flood insurance policy from the National Flood Insurance Program (NFIP)

For more information about flood insurance, contact the NFIP 1-800-427-4661. or go to <u>www.floodsmart.gov</u>

Important	 National Flood Insurance Program <u>www.floodsmart.gov</u> Texas Windstorm Insurance Association
Online Insurance	<u>www.twia.org</u> Consumer help line 800-788-8247
Information	Texas Department of Insurance <u>www.tdi.texas.gov</u> Consumer Help Line 800-252-3439





PREPARATION INSURANCE TIPS

Texas Windstorm Insurance Association (TWIA)

If your property is located in one of Texas' 14 coastal counties, or parts of southeastern Harris County, you will likely only be able to obtain insurance coverage for windstorm or hail damage from a special insurance pool called the Texas Windstorm Insurance Association (TWIA.) To qualify for TWIA coverage, your property must pass a windstorm inspection and must meet certain windstorm resistant building standards. You cannot buy or change TWIA coverage once a hurricane has entered the Gulf of Mexico. For more information about windstorm coverage call TWIA or visit its website 1-800-788-8247. www.twia.org

Insurance Tips - After the Storm

- Contact your insurance agent or company promptly. Keep a record of all contacts, interactions you have with your company. Be prepared to answer questions about the extent and severity of the damage. Videos and photos may be very helpful.
- If your home is not insured, contact your local Red Cross or FEMA Disaster Recovery Center for assistance. Call FEMA at 1-800-621-FEMA (3362).
- Make a list of your damaged property. Photograph or video the damage if possible. Don't throw away damaged items until your insurance adjuster has had a chance to view them.
- If there is partial damage to your home, make reasonable and necessary temporary repairs to protect your home and property from further damage. Cover broken windows and holes to keep rain out. Don't make permanent repairs until instructed by your insurance company. Keep a record of your repair expenses and save all receipts.





PREPARATION EVACUATION

Actions Before Evacuating:

Follow orders from local officials

Once the evacuation order is given, LEAVE IMMEDIATELY

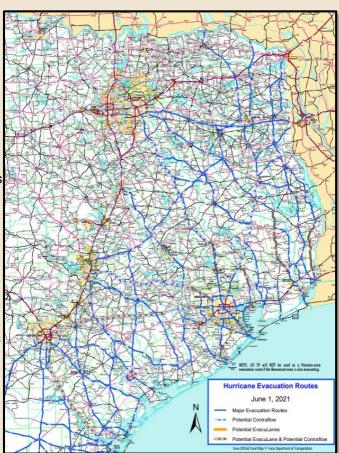
Take your Hurricane Supply Kit with you

Leave as early as possible to avoid heavy traffic and hazardous weather

Remember that large boats and travel trailers may not be allowed to cross local bridges and causeways once high winds commence

Prepare to stay at your destination for a week or more as re-entry may be restricted

Maps show routes where contraflow may be enacted with all traffic being routed outbound; this will be used exceedingly rarely



Go to this link for full Hurricane Evacuation Maps

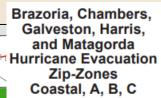
Evacuees NEED to consider the projected path of the hurricane when choosing an evacuation route and destination. Its generally best to evacuate inland first rather than up or down the coast.





WHARTON

PREPARATION EVACUATION





Some zip codes are split into north (n) and south (s) for evacuation purposes.



Link to Evacuation Zones Website

Evacuation zones loosely correspond to the following hurricane categories. However, surge depends on other factors like storm size and speed. Its best to heed recommendations and any evacuation orders made by local officials. What zone are you in? If you area is NOT shaded in on the map, most of the time an evacuation would not be ordered. Zones are closely related to storm surge flooding risk.

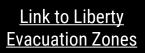
Guif of Mexico

Purple - Cat 1; Yellow - Cat 1 or 2; Green - Cat 3; Orange - Cat 4,5.





PREPARATION EVACUATION



For Liberty and Jackson Co. maps, evacuation zones correspond to the following hurricane categories.

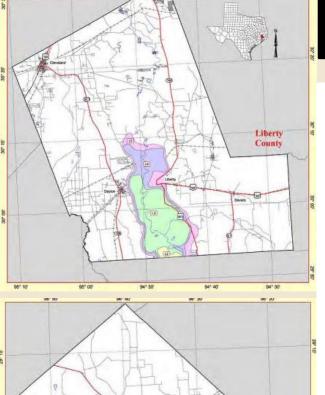
However, surge depends on other factors like storm size and speed. Its best to heed recommendations and any evacuation orders made by local officials.

Orange- Cat 1 Yellow- Cat 2 Green- Cat 3 Purple- Cat 4 Pink- Cat 5

Jackson County

> Link to Jackson Evacuation Zones







PREPARATION FINAL CHECKLIST



Hurricane Rita 2005. Photo Credit NASA.

If Staying

Hurricane in the Gulf

- Monitor the latest forecast from trusted sources like the NWS and local media.
- Make sure emergency kit is complete.
- Make sure vehicles are fueled and serviced. Garage any vehicles not being used.
- Shutter or board up windows if possible. Taping windows is NOT advised.
- Store lawn furniture and other loose, lightweight items.
- Get extra cash; make sure have adequate supply of medicines.
- Listen for any evacuation orders from local officials.
 - Turn off propone tanks.
 - Unplug small appliances.
 - Turn refrigerator and freezer to lowest setting.
 - Identify a family member who all can check in with. Notify family members of your evacuation plans.

If Leaving/Evacuating

- Lower water in swimming pool by at least one foot.
- Lock home securely.
- Take pets with you.
- Bring your supply kit with you!

- Close storm shutters if available.
- Turn refrigerator and freezer to lowest setting and open only if necessary.
- Beware of calm winds in the eye of the storm, do not venture outside. The strongest, most dangerous winds in the hurricane often occur just prior to and just after the passage of the eye.
- Lower water in swimming pool by at least one foot.
- If ordered to evacuate, its best to leave. If you decide to stay and conditions deteriorate, first responders will not be able to help you or your family.





PREPARATION RETURNING HOME

IF YOU EVACUATED THE AREA, WAIT FOR AN ALL CLEAR FROM THE CITY OR COUNTY BEFORE ATTEMPTING TO RETURN TO YOUR HOME. BE PREPARED TO SHOW PROOF OF RESIDENCE.

Debris Cleanup

- Cities and counties will publish a schedule for debris pick-up and removal. Debris cannot be removed from private property.
- Construction materials, vegetative debris, household hazardous waste and household appliances will need to be placed into separate piles and moved to the curbside for pick-up.



General Cleanup

- · Be cautious of structural damage and downed power lines.
- DO NOT attempt to move structural supports or large pieces of debris.
- DO NOT run power generators indoors. Inhalation of carbon monoxide from the exhaust can cause death. Ensure exhaust is well ventilated.
- DO NOT use open flames indoors.
- Restrict your driving to emergency use only. Road conditions may not be safe until road debris is cleared.

Water

- Listen for instructions regarding public water supply. Use only bottled, boiled or treated water until you know that your water supply is safe.
- You can use household chlorine bleach to treat water for drinking or cleaning. Add 1/8 teaspoon of bleach per gallon of clear water or 1/4 teaspoon of bleach per gallon if water is cloudy. Allow water to stand for 30 minutes before using.

Interior Cleanup

- Disinfect and dry interior buildings and items inside. This will prevent growth of some bacteria, viruses, mold, and mildew that can cause illness.
- Clean walls, floors, and counter tops with soap and water. Disinfect them with a solution of 1 cup of bleach to 5 gallons of water.
- Wash all clothes and linens in hot water. Air dry and spray all unwashable items with disinfectant. Steam clean carpets. Throw away all items touched by water that cannot be disinfected.





PREPARATION RETURNING HOME

Utility Cleanup

- Check for gas leaks. If you smell or hear gas leaking, leave immediately. DO NOT use the phone or turn on lights in your home. Call the gas company from a neighbor's phone.
- Report any visible damage of power lines to the electric company. Turn off power at main breaker if any electrical equipment or circuits have been exposed to water.
- DO NOT connect generators to your home's electrical circuits. If a generator is on line when electrical service is restored, it can become a major fire hazard. Also, line workers working to restore power will be endangered if a generator is hooked up to the home's circuits.



• It is likely that an electric company other than your own will reconnect the lines to your home; however, they cannot turn the service back on. Only your electric company can actually turn the power back on to your house.

Sewage Cleanup

- If you suspect water or sewage lines are damaged, do not use your plumbing (toilets, sinks, etc.). Contact the water company or a plumber for repairs.
- A chemical portable commode can be created by the following:
 - Use 5 gallon buckets with tight lids, lined with heavy duty plastic garbage bags.
 - Add kitty litter to the bucket as a disinfectant and deodorizer. Keep lids on firmly.
 - Keep buckets in a cool, dark place. Clean and disinfect buckets immediately.
- Your toilet can also be used by flushing until the bowl has no water. Then, line with heavy duty trash bags and disinfect with chlorine bleach after each use. Remove waste to an outside location.
- If significant sewer outages have occurred, instructions for disposal of human wastes will be announced.
- DO NOT dispose of human waste through your regular trash!





INFORMATION HURRICANE NAMES

Have you ever wondered how a hurricane gets its name?

The National Hurricane Center (NHC) actually does not name tropical storms and hurricanes. Instead, the names are established by the World Meteorological Organization and then rotated every six years. If a storm is too deadly or costly, the name will be retired.

2023	2024	2025	2026	2027
Arlene	Alberto	Andrea	Arthur	Ana
Bret	Beryl	Barry	Bertha	Bill
Cindy	Chris	Chantal	Cristobal	Claudette
Don	Debby	Dexter	Dolly	Danny
Emily	Ernesto	Erin	Edouard	Elsa
Franklin	Francine	Fernand	Fay	Fred
Gert	Gordon	Gabrielle	Gonzalo	Grace
Harold	Helene	Humberto	Hanna	Henri
Idalia	Isaac	Imelda	Isaias	Imani
Jose	Joyce	Jerry	Josephine	Julian
Katia	Kirk	Karen	Kyle	Kate
Lee	Leslie	Lorenzo	Leah	Larry
Margot	Milton	Melissa	Marco	Mindy
Nigel	Nadine	Nestor	Nana	Nicholas
Ophelia	Oscar	Olga	Omar	Odette
Philippe	Patty	Pablo	Paulette	Peter
Rina	Rafael	Rebekah	Rene	Rose
Sean	Sara	Sebastien	Sally	Sam
Tammy	Tony	Tanya	Teddy	Teresa
Vince	Valerie	Van	Vicky	Victor
Whitney	William	Wendy	Wilfred	Wanda

For a printable hurricane tracking map, please click on this link.



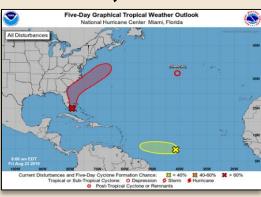


INFORMATION FORECASTS

Graphical Tropical Weather Outlook (May 15 – Nov 30)

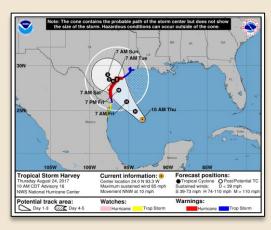
This National Hurricane Center (NHC) product provides an overview of all tropical cyclone activity and indicates areas of interest that have potential for tropical cyclone development.

https://www.nhc.noaa.gov/aboutgtwo.php



NHC Forecast Advisory

- Most recent position for a storm along with all coastline watches and warnings. Includes a 3 or 5 day track with error cone.
- Error cone represents a 5 year average error. Storms only stay within the error cone 67% of the time.
- DO NOT focus too closely on the exact track forecast – the little back line.
- Impacts may occur well outside the cone.



https://www.nhc.noaa.gov/aboutcone.shtml

Available at <u>www.hurricanes.gov</u>



INFORMATION FORECAST GRAPHICS

Time of Arrival Graphics

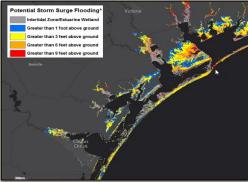
These maps are useful planning tools; one map shows the earliest reasonable, the other the most likely arrival time of tropical storm force winds.



https://www.nhc.noaa.gov/arrivaltimes/

Potential Storm Surge Flooding Map

If a hurricane is threatening your community, go to <u>hurricanes.gov</u> and view the potential storm surge flooding map, which will show the reasonable-worst case scenario from storm surge inundation for your area.



Storm Surge Watch/Warning

- A storm surge watch is the possibility of lifethreatening storm surge within 48 hours.
- A storm surge warning is the danger of lifethreatening storm surge within 36 hours.
- If you are located in a storm surge watch or warning, you are not safe. Take action to protect your life. Promptly follow evacuation and other instructions from emergency management officials.



Hurricane Threats and Impacts

This product issued by local NWS offices will summarize potential impacts expected from a tropical cyclone. Click on the colored area and text that describes potential impacts will display. www.weather.gov/srh/tropical?office=hgx



https://www.weather.gov/media/srh/tropical/HT L Explanation.pdf

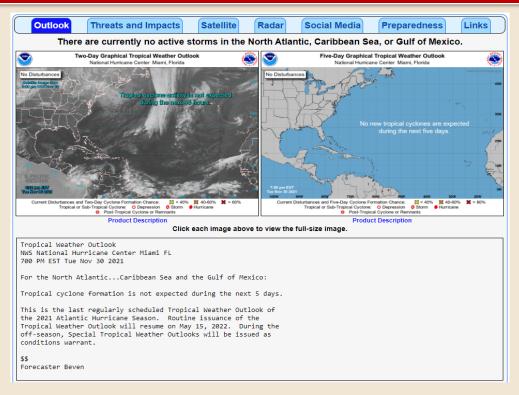
WEATHER.GOV/HOUSTON



INFORMATION LOCAL FORECAST

<u>Click here for</u>

NWS Houston/Galveston Tropical Webpage



One-Stop Shop for all tropical related forecast information, tailored to each forecast area along U.S. coastline.

Active Storms tab appears when NHC initiates Tropical Cyclone advisories.

Local Products tab also becomes active when WFO Issues Watches/Warnings for local area.

Satellite and Radar data is always available.

Preparedness tab is always available and provides quick access to local evacuation maps, preparedness guides, and videos.

Scrolling down the page provides access to NHC products related to each active storm and WPC rainfall products.





Austin County

979-865-5911 austincounty.com

Brazoria County	979-864-1201 brazoriacountytx.gov/departments/emergency management
Alvin	281-388-4363 - alvin-tx.gov
Angleton	979-849-2383
Bailey's Prairie	979-849-0134
Brazoria	979-798-2489
Brookside	281-485-3048
Clute	979-265-6194
Danbury	979-922-1551
Freeport	979-265-6194
Hillcrest Village	281-756-0577
lowa Colony	281-369-3444
Jones Creek	979-233-3091
Lake Jackson	979-415-2500
Liverpool	281-581-2342
Manvel	281-489-1212
Oyster Creek	979-233-8481
Pearland	281-977-4640 - pearlandtx.gov
Richwood	979-265-8157
Surfside Beach	979-239-1151
Sweeny	979-548-3321 - sweenytx.gov
Quintana	979-233-0848
West Columbia	979-345-5121





Brazos County	979-821-1011 www.bcdem.org
Bryan	979-821-1000
College Station	979-821-1000 - www.cstx.gov/dem
Burleson County	979-567-2001 co.burleson.tx.us/burlesoncounty- alert-system/
Chambers County	409-267-2445 www.chamberstx.gov
Mont Belvieu	281-576-2021
Colorado County	979-733-0184 www.co.colorado.tx.us/
Fort Bend County	281-342-6185 www.fbcoem.org
Fort Bend County Arcola	
	www.fbcoem.org
Arcola	www.fbcoem.org 281-431-0606
Arcola Beasley	www.fbcoem.org 281-431-0606 979-387-2775
Arcola Beasley Fairchilds	www.fbcoem.org 281-431-0606 979-387-2775 281-341-4638
Arcola Beasley Fairchilds Fulshear	www.fbcoem.org 281-431-0606 979-387-2775 281-341-4638 281-346-1796
Arcola Beasley Fairchilds Fulshear Kendleton	www.fbcoem.org 281-431-0606 979-387-2775 281-341-4638 281-346-1796 979-532-8240
Arcola Beasley Fairchilds Fulshear Kendleton Meadows Place	www.fbcoem.org 281-431-0606 979-387-2775 281-341-4638 281-346-1796 979-532-8240 281-983-2900 281-403-8500 -
Arcola Beasley Fairchilds Fulshear Kendleton Meadows Place Missouri City	www.fbcoem.org 281-431-0606 979-387-2775 281-341-4638 281-346-1796 979-532-8240 281-983-2900 281-403-8500 - www.missouricityready.com





Fort Bend County	281-342-6185 www.fbcoem.org
Richmond	281-342-2849 - www.richmondtx.gov
Rosenberg	832-595-3700 - www.rosenbergtx.gov
Simonton	281-533-9809
Stafford	281-261-3950
Sugar Land	281-275-2700 - www.sugarlandtx.gov/105/Emergency- Management
Thompsons	281-343-9929
Weston Lakes	281-533-0907
Galveston County	281-309-5002, 888-384-2000 www.gcoem.org
Bayou Vista	409-935-0449
Clear Lake Shores	281-334-1034, 281-334-2799
Dickinson	281-337-4700 - www.ci.dickinson.tx.us
Friendswood	281-996-3335 - ci.friendswood.tx.us
City of Galveston	409-765-3710 - galvestontx.gov
Hitchcock	409-986-5559 - www.hitchcockpd.com
Jamaica Beach	920-572-4073 - ci.jamaicabeach.tx.us
Kemah	281-334-5414
La Marque	409-938-9202 - www.cityoflamarque.org
League City	281-554-1000 - www.leaguecity.com
Santa Fe	409-925-2000
Texas City	409-643-5840
Tiki Island	409-935-1427





Grimes County	936-873-4404 www.grimescountytexas.gov
Navasota	936-825-7388
Harris County	713-881-3100 www.readyharris.org
City of Houston	713-884-4500 - www.houstonoem.org
Baytown	281-422-2311 - www.oembaytown.org
Bellaire	713-662-8202 - www.bellairetx.gov
Deer Park	281-478-7281 - www.deerparktx.gov
El Lago	281-326-5900
Galena Park	713-672-2556
Humble	281-446-4298 - www.cityofhumble.com
Jacinto City	713-674-8424
Jersey Village	713-466-2130
Κατγ	281-574-8633 - www.cityofkaty.com
La Porte	281-470-0010 - www.lpoem.org
Morgans Point	281-471-2171
Nassau Bay	281-333-2677 - www.nassaubay.com
Pasadena	713-475-5588 - www.pasadenatx.gov
Seabrook	281-291-5600
Shoreacres	281-471-2244
South Houston	713-947-7700
Taylor Lake Village	281-326-2843
Tomball	281-290-1301
Webster	281-332-1826
West University Place	713-662-5836





Houston County	936-544-7175, 936-544-2862
Housion county	hyper-reach.com/txhoustonsignup.html

Jackson County	361-782-2352 www.co.jackson.tx.us
Edna	361-782-3122
Ganado	361-771-2800

Liberty County	936-334-3219 www.co.liberty.tx.us
City of Liberty	936-336-8118

Madizon Country	936-348-3810
Madison County	www.co.madison.tx.us

Montgomery County	936-523-3900 www.mctxoem.org
Conroe	361-782-3122
Shenandoah	361-771-2800

Polk County	936-327-6826 www.polkcountyoem.com
Alabama-Coushatta	936-563-1100



979-337-7300

San Jacinto County	936-653-3395 sjc.oem@co.san-jacinto.tx.us
Walker County	936-435-8740 www.co.walker.tx.us
Waller County	936-826-8282 www.co.waller.tx.us
Washington County	936-334-3219 www.co.liberty.tx.us

Wharton County	979-532-1123 www.co.wharton.tx.us
El Campo	979-543-5311 - www.cityofelcampo.org
City of Wharton	979-532-4811 x570 - www.cityofwharton.com/page/em_home

Brenham





INFORMATION OUR CONTACTS

National Weather Service WFO Houston/Galveston, TX

1353 FM 646 Suite 202 Dickinson, TX 77539

Phone: 281-337-5074 Web: www.weather.gov/houston





Visit: www.weather.gov/wrn/

