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The Official Texas

# HURRICANE

Guide



Rio Grande Valley Edition

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**MAKE YOUR PLAN.  
BE READY!**



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Freddy Vela

## TEXAS DEPARTMENT OF PUBLIC SAFETY

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[www.dps.texas.gov](http://www.dps.texas.gov)



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Dear Colleagues:

Hurricanes are deadly and destructive threats to communities along the Texas coastline. Along with high winds, tropical systems can produce immense storm surge, violent tornados, and dangerous flooding.

In order to help citizens prepare, the National Weather Service has once again collaborated with local nonprofit organizations and the Texas Department of Public Safety's Division of Emergency Management to bring you the Official Texas Hurricane Guide. It is especially crucial for coastal residents to plan and prepare for each type of hurricane hazard to prevent and reduce the loss of life and property and improve community resilience.

This guide is an up-to-date, easy-to-use resource that will help you and your family better understand what to do before, during and after a storm. It will also assist your family with the preparation of a family emergency plan, checklists and a disaster supply kit. Families should review emergency plans and checklists on a regular basis. You can increase situational awareness by monitoring statements issued by the National Hurricane Center, watches and warnings issued by National Weather Service offices in Texas and broadcasts from NOAA weather radio and local media.

The emergency management community and its partners are committed to keeping Texans safe when tropical systems threaten our coastal areas. You can be a proactive and resilient household within your community by reading this guide and preparing your family in advance. For additional information about building and strengthening community resilience, you can visit Weather-Ready Nation at [www.nws.noaa.gov/com/weatherreadynation](http://www.nws.noaa.gov/com/weatherreadynation).

I thank you for your continued dedication to year-round personal preparedness and for your preparations this hurricane season.

Be informed. Be prepared. Be involved.

Respectfully,

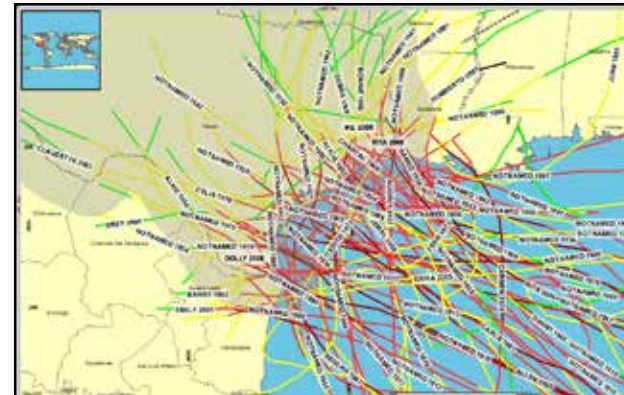
W. Nim Kidd, CEM®, TEM®  
Chief

Texas Division of Emergency Management  
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[@chiefkidd](https://twitter.com/chiefkidd) on Twitter

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Above: High resolution satellite image of Hurricane Ike over the northwest Gulf of Mexico. Image--NASA



Above: Historical perspective of hurricane landfalls in Texas since 1851.

Hurricanes form over warm ocean waters, like those found in the Gulf of Mexico. The hurricane season starts June 1 and ends November 30. The peak threat for the Texas coast exists from August through September. However, hurricanes can and have struck the Texas coast during every month of the hurricane season.

**Since 1851, 63 hurricanes have struck the Texas coast. That is one every three years on average.**

Storm surge and large waves produced by hurricanes pose the greatest threat to life and property along the coast.

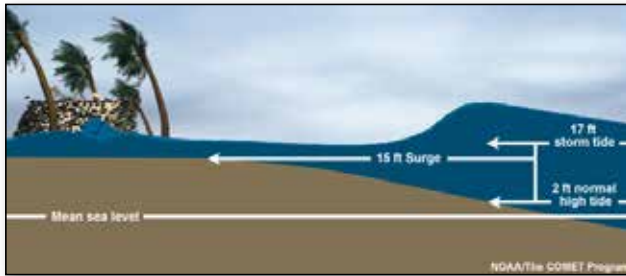
Storm Surge is an abnormal rise of water generated by a storm's winds. Storm surge can reach heights well over 20 feet and can span hundreds of miles of coastline.

Storm Tide is the water level rise during a storm due to the combination of storm surge and the astronomical tide.

The destructive power of storm surge and large battering waves can result in loss of life, buildings destroyed, beach and dune erosion and road and bridge damage along the coast.



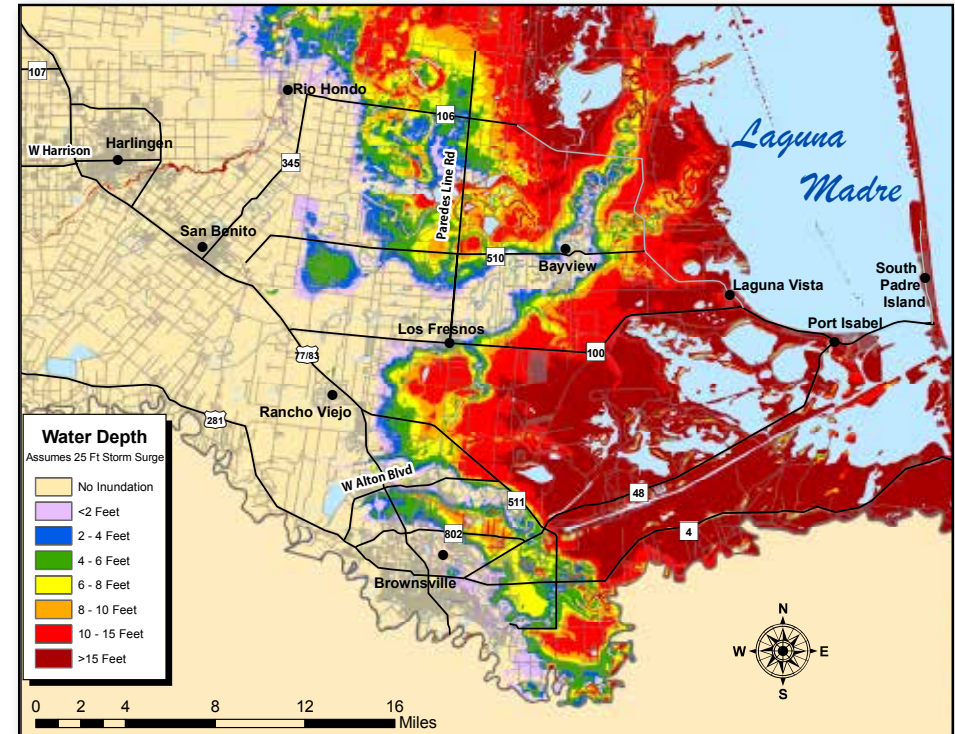
Above: Home flooded by the storm surge from Hurricane Ike in Bridge City, TX. -- TX DPS



## Storm Surge Can Be Deadly! Use these Tips to Be Ready

- Storm surge can occur well before and after the center of the storm passes. Prior to Hurricane Ike, storm tides flooded the Bolivar Peninsula when the skies were sunny and the winds were light. Do not wait until the last minute to leave when an evacuation is ordered.
- Storm surge flooding may extend many miles inland from the coastline, dependent on elevation of the coastal areas. Find out today if you live in an evacuation zone (see pages 26 and 27 in this guide).
- During the peak of the storm surge, emergency responders may not be able to reach you.
- Storm category is unrelated to the danger from storm surge (See page 32 for details).
- Weather conditions and forecasts can change. Always heed the advice of your local elected officials.

## Coastal Cameron County

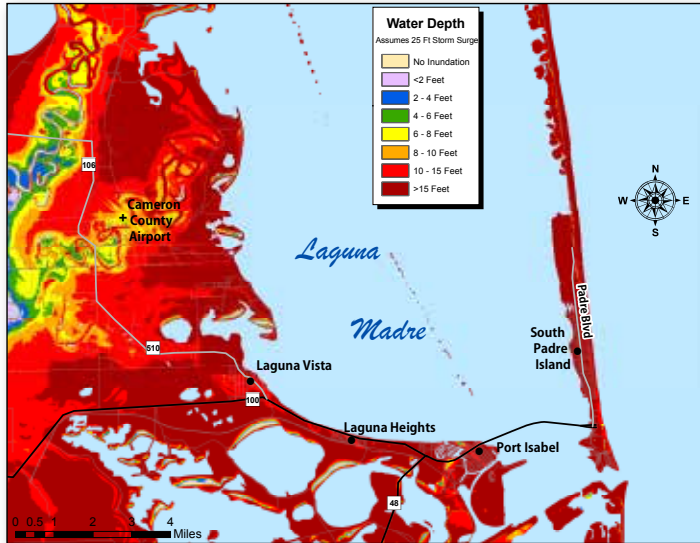


Above: This map indicates the height of the water above ground level for a storm surge of 25 feet. Accuracy is +/- 20%.

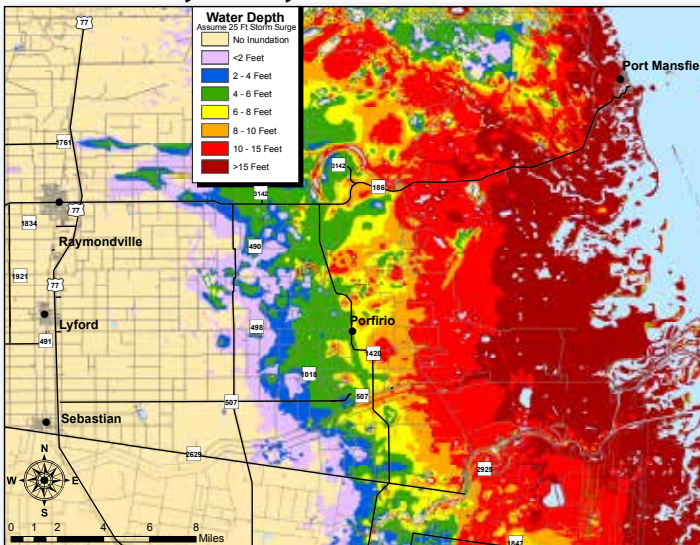
**“The greatest potential for loss of life related to a hurricane is from the storm surge.”**

**- National Hurricane Center**

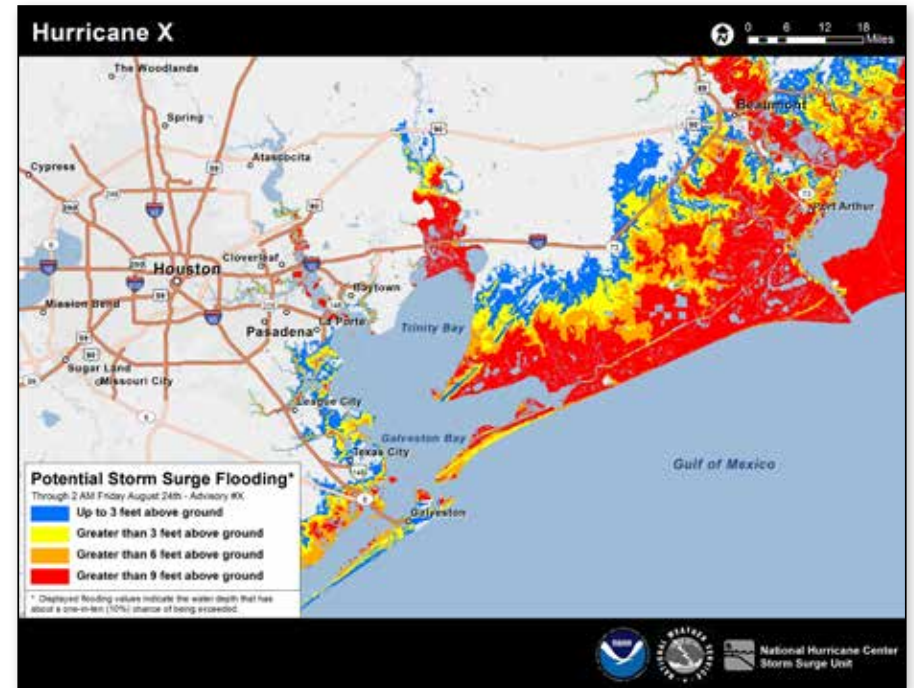
## Port Isabel/South Padre Island



## Coastal Willacy County



Above: These maps indicate the height of the water above ground level for a storm surge of 25 feet. Accuracy is +/- 20%.



Above: \*\*Test storm\*\*, example shown for Houston/Galveston, Texas

## Potential Flooding

NOAA's National Hurricane Center (NHC) will issue an experimental Potential Storm Surge Flooding Map, developed over the course of several years in consultation with emergency managers, broadcast meteorologists, social scientists, and others."

The map will show:

- Geographical areas where inundation from storm surge could occur.
- How high above ground the water could reach in those areas.

Other things to know about this map:

- The first map will usually be issued at the same time as the initial tropical storm or hurricane watch.
- The map is based on the forecast track and intensity for the tropical cyclone, and takes into account forecast errors.
- The map shows inundation levels that have a 10 percent chance of being exceeded, and can be considered a reasonable worst-case scenario for any given location.
- The map is subject to change every six hours, with every new NHC full advisory package.
- The map will be part of an interactive display on the NHC website (hurricanes.gov) when tropical storm or hurricane watches and warnings are in effect.

There are numerous examples of significant flooding caused by land-falling tropical cyclones in Texas. Storms with a slow forward motion are the most dangerous as heavy rains persist for a longer period of time.

## Five Practical Ways to Protect Yourself and Others From the Dangers of Inland Flooding

### Protect Your Personal Documents and Special Items

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

### Buy Flood Insurance: A Plan for Replaceable Items

- The National Flood Insurance Program (NFIP) is available from an insurance agent or the NFIP
- For more information see [www.floodsmart.gov](http://www.floodsmart.gov)

### Flood Proof Your Home - Take Steps to Minimize Flood Damage

- Shut off the main circuit breaker to prevent 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

- Develop a plan of action to keep from panicking 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 radios or televisions 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!



Tropical cyclones also produce tornadoes. These tornadoes most often occur in thunderstorms embedded in rain bands well away from the center of the hurricane; however, they can also occur near the eyewall. Tornadoes produced by tropical cyclones are relatively weak and short-lived, but still pose a threat.

Hurricane force winds of 74 mph or more can destroy buildings, mobile homes, trees and power poles. Debris such as signs, roofing material, siding, and small items left outside become flying missiles in a hurricane. The strongest winds occur in a region of the hurricane called the eyewall. Wind gusts in the right side of the eyewall are the most destructive. Hurricane force winds can be felt as far as 150 miles from the coast.



Above: Wind damage to a billboard from Hurricane Lili in October 2002.

## MOBILE HOME RESIDENTS MUST EVACUATE!

- No mobile home or manufactured home - no matter how new it is - can provide safe shelter from hurricane force winds.
- Straps or other tie-downs will not protect a mobile home from the high winds associated with a hurricane.
- Mobile home residents must evacuate when told to do so by local authorities.



## Saffir Simpson Hurricane Wind Scale

- Category 1 - Winds 74 to 95 mph
- Category 2 - Winds 96 to 110 mph
- Category 3 - Winds 111 to 129 mph
- Category 4 - Winds 130 to 156 mph
- Category 5 - Winds 157 mph or higher

## Home Preparation

### Elevation Matters

- Know the elevation of your home! Are you in a flood and/or evacuation zone?

### Mobile Homes

- Check tie-downs for rust or breakage.
- Residents of mobile homes must evacuate when told to do so!!

### Landscaping

- Trim trees, shrubbery and dead limbs, especially ones close to your home.
- Repair or replace broken or damaged fences.

### Roofing

- Inspect the roof for loose tiles, shingles or debris. Consider replacing old or damaged shingles with new ones rated for hurricane force winds.
- Clear loose and clogged rain gutters and downspouts.

### Doors

- Reinforce garage doors and tracks or replace with a hurricane tested door.
- Reinforce double entry doors with heavy duty foot and head bolts.
- Use a security dead bolt with a one inch minimum bolt length.

### Windows

- If possible, install tested/manufactured hurricane shutters.
- Inspect existing shutters to ensure they are in good working order.
- Alternative: Use 5/8" or greater exterior grade plywood secured by 2 1/2" screws and/or special clips. Obtain wood and fasteners, cut wood to size, pre-drill holes and place anchors on homes.



## Business and Employee Preparation

- Identify and protect vital records. Backup and store key files off site.
- Protect electronic equipment from possible water damage.
- Have extra cash and blank checks in case extra money is needed after the storm.
- Develop a 24-hour emergency contact with phone numbers of key employees.
- Set up telephone numbers for employees to check in and receive company information.
- Establish a temporary location for business operations in case your facility is damaged.
- Give employees enough time to secure their homes and families.
- Consider paying employees before they leave to prepare their homes.

## Marine Preparations

- Check with the manufacturer for proper ways to secure your boat during a storm.
- 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.

## Preparing for Your Pet's Safety

Your pet should be part of your overall hurricane preparation plans. Below are a few important things to help you prepare:

- Make sure your pet's vaccinations are current and have proof they are current. DO NOT assume that a public shelter or hotel will accept your pet.
- Be sure to have a current photo of your pet.
- Each animal should have a properly sized pet carrier. The carrier should be large enough for the animal to stand up and turn around.
- Pack enough food and bottled water for the duration of your evacuation. DO NOT let your pet eat food or drink water from outside that may have become contaminated.
- Be sure to pack all medications your pet may need along with a muzzle, collar, leash, paper towels, and trash bags.
- Make sure your pet has a proper ID collar.

## STATE OF TEXAS EMERGENCY ASSISTANCE REGISTRY

# STEAR

Do you or anyone you know need some form of assistance during times of an emergency/disaster event? The state of Texas offers Texans the option to register with the STEAR program, a FREE registry that provides local emergency planners and responders with additional information on the needs in their community.

(Texas communities use the registry information in different ways. Registering yourself in the STEAR registry DOES NOT guarantee that you will receive a specific service during an emergency. Available services will vary by community. For more information on how your community will use information in the STEAR registry, contact your local emergency management office.)

### Who Should Register?

- People with Disabilities
- People with access and functional needs such as:
  - ♦ People who have limited mobility
  - ♦ People who have communication barriers
  - ♦ People who require additional medical assistance during an emergency event
  - ♦ People who require transportation assistance
  - ♦ People who require personal care assistance

### How to Register

- <https://STEAR.dps.texas.gov>
- Dial 2-1-1 or use your video phone relay option of choice to contact 211
- Printed or electronic forms (Contact your local government)

### Required Information to Register

- Name
- Address
- Phone Number
- Primary Language

Registration is **VOLUNTARY**.

### Additional questions asked to capture vital information for local emergency planners and responders

- Emergency Contact Information
- Caregiver Information
- Pets
- Transportation assistance for home evacuation
- Communication Barriers
- Disability, Functional or Medical Needs

All of the information you provide will be kept

**COMPLETELY CONFIDENTIAL.**



# Insurance Tips

## Before the Storm

- New and existing policies will not be written or modified when a storm nears the Gulf of Mexico.
- Make sure you fully understand what perils are covered and excluded in your policy.
- Make sure your coverage is adequate to replace your home and contents in today's dollar.
- Determine whether your policy covers additional living expenses for a temporary residence if you are unable to live in your home because of damage from a disaster.
- Before hurricane season, prepare detailed written and/or photographic inventory of your home's contents and store it in a safe place with your policy.
- If your insurance company does not cover flood or windstorm perils, ask about coverage through the Texas Windstorm Insurance Association or the National Flood Insurance Program.

## After the Storm

- Give prompt written notice to your insurance company.
- Photograph or videotape damaged structures and all damaged property. Make a list of damaged or lost items.
- DO NOT throw out damaged property before your adjuster has inspected the debris unless it is a health hazard or impedes local cleanup.
- Protect your property from further damage.
- Keep an accurate record of temporary repair and living expenses if a loss of use is suffered.

## Important Online Insurance Information

- National Flood Insurance Program [www.floodsmart.gov](http://www.floodsmart.gov)
- Texas Windstorm Insurance Association [www.twia.org](http://www.twia.org) Consumer help line 800-788-8247
- Texas Department of Insurance [www.tdi.texas.gov](http://www.tdi.texas.gov) Consumer help line 800-252-3439

Your local Texas Chapter of the American Red Cross recommends that you have the following items in your Hurricane Supply Kit. Do not forget to have a family meeting before hurricane season and review your communication information and evacuation plan. Make sure the contact information such as home, work, school, cell phone numbers, and your "Out of Town" contact person's information is current.



## 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: \_\_\_\_\_

**Whatever comes your way,  
you'll know what to do.**

**Red Cross mobile apps  
put help in your hand.**



**24 hour number to  
call for assistance  
1-800-RED CROSS  
(1-800-733-2767)**

Download our preparedness apps today. Call "REDCROSS" from your mobile phone and we'll send you a link to download the apps, or search the iTunes app store or Google Play for American Red Cross.

## Your chapter of the American Red Cross recommends that you have the following items in your Hurricane Supply Kit.

- At least a 7-day supply of non-perishable food and water. One gallon of water per person per day is recommended
- Battery powered portable television or radio with extra batteries
- Flashlight with extra batteries
- First Aid kit and manual
- Sanitation and hygiene items such as instant hand sanitizing gel, moist towelettes, toilet paper, and feminine hygiene products
- Whistle
- Kitchen accessories, cooking utensils, and manual can opener
- Cash
- Extra clothing, blankets, and sleeping bags
- Matches in a waterproof container
- Photocopies of identification, insurance, prescriptions, household inventory, credit cards, and your latest utility bill
- CD or photocopies of important documents such as birth/marriage certificates and titles
- Prescription medications, eyeglasses, contact lens solution, and hearing aid batteries
- Formula, baby food, diapers, and pacifiers
- Pet carriers, leashes, shot records, and food for each animal evacuating with you
- A good map showing county roads and highways
- Tire repair kit, booster cables, pump, and flares
- White distress flag
- Toys and games for children
- List of family phone numbers and addresses outside the area



## Hurricane Names

### 2015

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| <input type="checkbox"/> Ana       | <input type="checkbox"/> Larry    |
| <input type="checkbox"/> Bill      | <input type="checkbox"/> Mindy    |
| <input type="checkbox"/> Claudette | <input type="checkbox"/> Nicholas |
| <input type="checkbox"/> Danny     | <input type="checkbox"/> Odette   |
| <input type="checkbox"/> Erika     | <input type="checkbox"/> Peter    |
| <input type="checkbox"/> Fred      | <input type="checkbox"/> Rose     |
| <input type="checkbox"/> Grace     | <input type="checkbox"/> Sam      |
| <input type="checkbox"/> Henri     | <input type="checkbox"/> Teresa   |
| <input type="checkbox"/> Ida       | <input type="checkbox"/> Victor   |
| <input type="checkbox"/> Joaquin   | <input type="checkbox"/> Wanda    |
| <input type="checkbox"/> Kate      |                                   |

### 2016

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> Alex     | <input type="checkbox"/> Lisa     |
| <input type="checkbox"/> Bonnie   | <input type="checkbox"/> Matthew  |
| <input type="checkbox"/> Colin    | <input type="checkbox"/> Nicole   |
| <input type="checkbox"/> Danielle | <input type="checkbox"/> Otto     |
| <input type="checkbox"/> Earl     | <input type="checkbox"/> Paula    |
| <input type="checkbox"/> Fiona    | <input type="checkbox"/> Richard  |
| <input type="checkbox"/> Gaston   | <input type="checkbox"/> Shary    |
| <input type="checkbox"/> Hermine  | <input type="checkbox"/> Tobias   |
| <input type="checkbox"/> Ian      | <input type="checkbox"/> Virginie |
| <input type="checkbox"/> Julia    | <input type="checkbox"/> Walter   |
| <input type="checkbox"/> Karl     |                                   |

### 2017

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> Arlene   | <input type="checkbox"/> Lee      |
| <input type="checkbox"/> Bret     | <input type="checkbox"/> Maria    |
| <input type="checkbox"/> Cindy    | <input type="checkbox"/> Nate     |
| <input type="checkbox"/> Don      | <input type="checkbox"/> Ophelia  |
| <input type="checkbox"/> Emily    | <input type="checkbox"/> Philippe |
| <input type="checkbox"/> Franklin | <input type="checkbox"/> Rina     |
| <input type="checkbox"/> Gert     | <input type="checkbox"/> Sean     |
| <input type="checkbox"/> Harvey   | <input type="checkbox"/> Tammy    |
| <input type="checkbox"/> Irma     | <input type="checkbox"/> Vince    |
| <input type="checkbox"/> Jose     | <input type="checkbox"/> Whitney  |
| <input type="checkbox"/> Katia    |                                   |



This chart is marked with vertical(longitude) and horizontal(latitude) lines, each representing 1 degree. A storm's position is given in these degrees. Find the given longitudinal number at the bottom of the chart. Follow it up where it intersects with the given latitudinal line. Place a mark on the intersection point (this is the hurricane's current position).

Stay Connected:



## Latest Weather Information

- National Weather Service [weather.gov/rgv](http://weather.gov/rgv)  
24 Hour Phone Recording:  
(956) 546-5378
- National Hurricane Center [www.hurricanes.gov](http://www.hurricanes.gov)



@NWSBrownsville

The National Hurricane Center (NHC) in Miami, FL is the official source for tropical cyclone advisories and forecasts and is responsible for issuing tropical cyclone watches and warnings for the United States.

### Graphical Tropical Weather Outlook

- NHC product provides an overview of all tropical cyclone activity, indicates areas of interest that have potential for tropical cyclone development.

### NHC Forecast Advisory

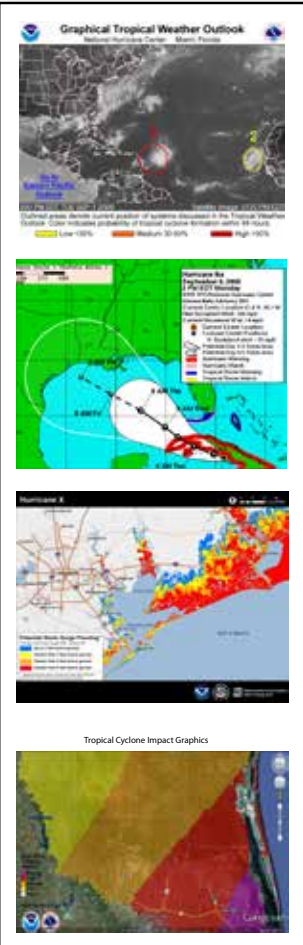
- Most recent position for a storm along with all coastline watches and warnings. Includes a 3 or 5 day track with error cone.
- Error cone represents a 5 year average error. Storms only stay within the error cone 67% of the time.
- DO NOT focus too closely on the exact track forecast - the little black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

### Potential Storm Surge Flooding.

- If a tropical storm or hurricane is threatening your community, go to [www.hurricanes.gov](http://www.hurricanes.gov) to see a map like this, which will show potential storm surge flooding for your area.
- New Storm Surge Watch/Warning graphic will highlight threatened areas.

### Hurricane Threats and Impacts

- Issued by local NWS offices to summarize potential impacts expected from the tropical cyclone.
- Click on each colored area to pop up text that describes potential impact.
- [weather.gov/tcig](http://weather.gov/tcig)



### Actions to Take When a Storm is in the Gulf

- Listen frequently to radio, TV, or NOAA weather radio for bulletins and forecasts of the storm's progress.
- Double check items in your emergency supply kit.
- Fuel and service your vehicles.
- Inspect and secure mobile home tie-downs.
- Board up windows (if shutters do not exist) in case storm moves quickly and you have to leave!  
**TAPE PROVIDES NO PROTECTION!**
- Store lawn furniture and other loose, light weight objects, such as garbage cans and garden tools.
- Garage or store vehicles that are not being used.
- Follow instructions issued by local officials.  
**EVACUATE IMMEDIATELY IF ORDERED TO DO SO!**

### Final Actions to Take if Leaving

- Turn off propane tanks.
- Unplug small appliances.
- Empty refrigerator and freezer.
- Turn off utilities if ordered to do so.
- Lock home securely.
- Take pets with you.



### Final Actions to Take if Staying

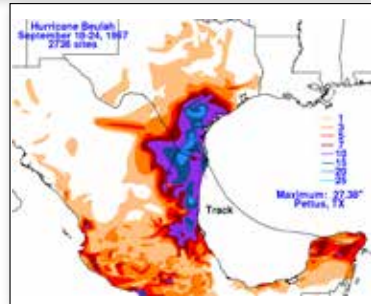
- Close storm shutters.
- Notify family members of your evacuation plans.
- Lower water level in swimming pool by one foot.
- Turn refrigerator or freezer to coldest setting and open only if necessary. (25 pounds of dry ice will keep a 10-cubic foot freezer below freezing for 3-4 days.)
- Follow instructions from emergency managers and be prepared to turn off utilities if ordered to do so.
- Board up remaining doors, brace garage door, and remain inside. Stay away from boarded up windows.
- Take refuge in a predetermined safe room, such as an interior closet, bathroom, or hallway.
- DO NOT EXPECT EMERGENCY RESPONDERS TO BE OF ANY ASSISTANCE DURING A LANDFALLING HURRICANE!**

## Rio Grande Valley Inundated by Powerful Cyclone - September 1967

Hurricane Beulah made landfall just south of Brownsville in September of 1967, then moved northwest through Willacy, Brooks, and Duval Counties before meandering southwest through Zapata County. Beulah brought damaging winds greater than 130 mph and a storm tide of 8 to 14 feet across South Padre Island and communities along the Laguna Madre. Hurricane-force winds were recorded for eight hours at Brownsville, with a peak wind of 109 mph before the anemometer fell. 100 mph gusts were felt as far inland as Pharr, Weslaco, and Edinburg (Hidalgo County).



Beulah continued to wreak havoc while moving inland. The storm spawned at least 117 tornadoes in South Texas, but only one in the Rio Grande Valley. Beulah's slow movement resulted in more than 20 inches of rain from Starr to Brooks County. Flooding devastated Falfurrias after more than 22 inches of rain pushed area creeks over their banks. Nearly every community in Deep South Texas and the Rio Grande Valley had



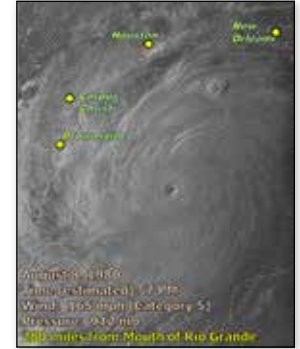
some type of flooding. Excessive water flowing down the Rio Grande and adjacent waterways inundated a number of cities and towns. Several feet of water from the Arroyo Colorado destroyed homes and businesses in Harlingen. High standing water flooded McAllen, Edinburg, and Raymondville. At least 15 people perished in Texas. Statewide damages were estimated at \$170 million, with at least \$100 million in Deep South Texas and the Rio Grande Valley. This would equate to more than \$5 billion today, accounting for inflation and population increases.



Harlingen, TX, Courtesy Brownsville Herald

## The Nightmare That Almost Was

When residents and visitors to the Rio Grande Valley woke up on Saturday, August 9th, 1980, they found themselves staring down the barrel of the gun of potentially catastrophic Hurricane Allen. Allen, a sprawling monster that covered most of the western Gulf of Mexico, contained a small but potent core with 160 mph winds just 120 miles from shore. Chugging westward at 12 mph, Allen was on track to slam into Cameron County in twelve hours or less. Early warning and Allen's menacing size prompted at least 200 thousand people - two-fifths of the population - to evacuate or take shelter in a variety of locations well inland from the coast. Fortunately, Allen's potential nightmare became merely a bad dream. The cyclone reached the edge of the high pressure ridge hours later; Allen slowed dramatically which allowed dry air from the Sierra Madre mountain range to enter the storm from the west, and colder waters were pulled toward the Gulf surface. These impacts combined with interaction with land to weaken Allen rapidly as the storm curved slightly north. Landfall of the small but decayed center shifted to uninhabited South Padre Island just after midnight on August 10th, sparing the Rio Grande Valley an impact that would have rivaled Beulah.



Peak winds were measured at 138 mph in the fishing village of Port Mansfield and 78 mph in Brownsville; storm surge ranged from 8 feet along South Padre Island and Port Isabel to 12 feet in Port Mansfield, and up to a foot of rain fell from McAllen to Hebbronville.

There were no human casualties from Allen in the Rio Grande Valley, a result of the weakened storm that grazed the highly populated region combined with effective evacuation and sheltering. There were numerous impacts to man-made and natural structures from storm surge, tornadoes, wind, and rainfall flooding. Insured property damage was initially listed near \$50 million; total property and crop damage was at least \$100 million for the Rio Grande Valley. Winds caused heavy damage in Port Mansfield and knocked down or uprooted hundreds of trees in Cameron County; at least 70 percent of residents lost electricity. Up to 20 percent of maturing citrus fruit was blown off trees in Hidalgo County. Significant structural damage in Brownsville was limited to two outer-band tornadoes on August 9th that lifted roofs on at least thirty homes. Storm surge tossed boats ashore and flooded many bayside homes in Port Isabel, and inundated property from near Boca Chica Beach to South Padre Island. Hotels and resorts spent weeks to months cleaning up from wind and water damage at the beach.

While Allen's rains broke the back of a long-term drought, they were too much to bear for un-harvested cotton. Forty percent of the crop was washed away by the torrential rains, which also flooded city streets with up to four feet of water in Brownsville, McAllen, and Edinburg.

Allen's memory reminds the Valley to always be ready. The next hurricane nightmare might be much more than just a bad dream.

## Hurricane Surf

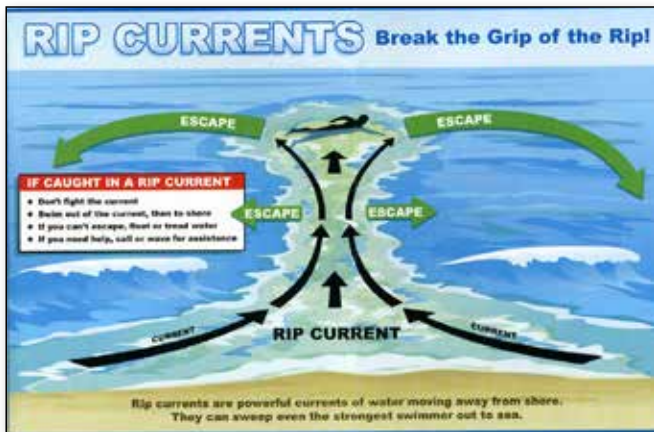


Along with big surf come strong rip currents. Rip currents are the leading surf hazard for all beach goers and result in over 100 drownings every year in the United States. The strength and size of rip currents are related to the size of the surf and wave period. Rip currents typically form at the low spots in the surf, at the breaks in the sandbars, and near jetties and piers.

Photo: gscottimaging.com

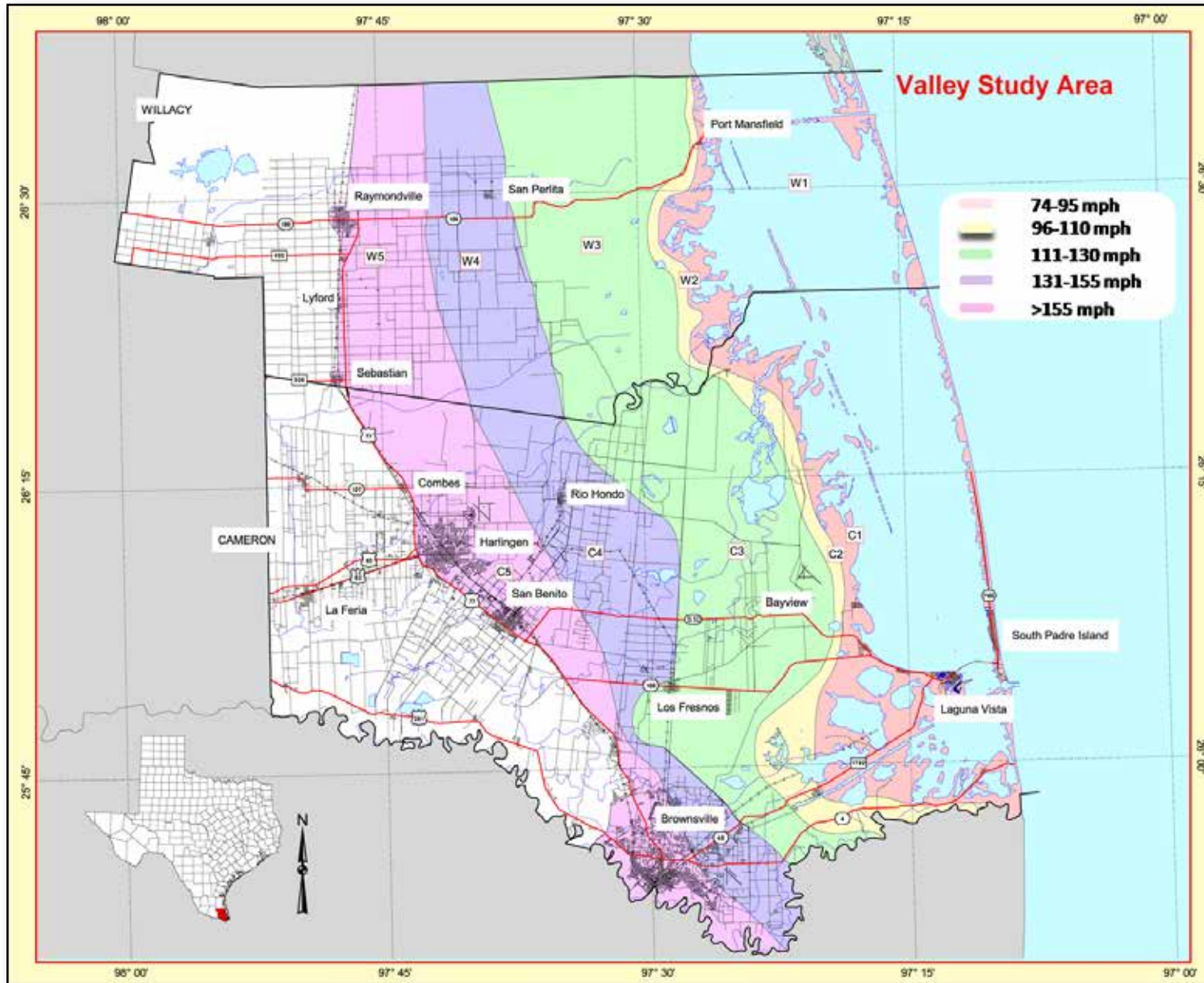
## Rip Currents

If caught in a rip current, don't panic, but 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.



- Assure that all contact information and emergency contact information is accurate with your campus' registrar's office.
- If your campus offers an emergency management communication system, register as a user of the system.
- Plan your method of evacuation and your destination before a storm enters the gulf.
- Monitor local radio and TV stations for updates.
- Contact your campus Student Affairs Office if you need assistance with evacuation.
- If you require any assistance due to a disability-related accommodation, please contact your campus Disability Services Office to make necessary arrangements.
- Communicate with your family regarding status and location
- If your campus is evacuating, you will not be allowed to remain on-campus and it is highly recommended that you leave the city. Do not go to a coastal location.
- Take your driver's license, student I.D. card, and a copy of your housing lease as well as medical insurance cards and other important documents when you evacuate.
- If you bank with a local bank or credit union whose infrastructure may be damaged by the storm, withdraw some funds as you may not have access to them once you leave the area.
- International students must take passports with US student visa inside, I-20, I-94, student I.D. and class schedule.
- If using personal transportation, take as many of your valuable or irreplaceable items as you are able.
- If driving, make sure all roads that you are driving are open and safe. You can call the Department of Transportation at 1-800-452-9292 or check on-line for conditions at [www.txdot.gov](http://www.txdot.gov)
- Follow baggage limits if participating in an assisted evacuation program.
- Take a 30-day supply of medications in original pharmacy containers.
- Make a record of any valuables left behind (description, serial numbers, etc). Take pictures of all belongings.
- If you are evacuating to a shelter, make appropriate arrangements for pets. Most shelters do not accept pets.
- Do not plan to return to campus until an all-clear is given (monitor media and campus web-site).





On pages 5 through 7 of this guide, water depth maps show how far inland sea water will penetrate from a storm surge of 25 feet. Below, the Valley Study map shows evacuation zones, labeled 1 through 5. For level 5 in Cameron County (C5), evacuations would be required for the majority of the population, including most of Harlingen, San Benito, and Brownsville. These zones, particularly for the most severe hurricanes, differ from the inundation maps in two ways:

- The maps account for the decay of the wind field as a hurricane moves inland.
- A large number of houses beyond the inundation area will not withstand severe winds.

For example, portions of Los Fresnos and Rio Hondo are outside of the inundation zone, but within zone C4 (purple) of the Valley Study Map. This means for a landfalling Category 4 hurricane, life-threatening consequences are possible from severe winds alone. For Brownsville, San Benito, and Harlingen, a landfalling Category 5 hurricane could result in life-threatening consequences from severe winds alone.

Bus Loading Points will open on an as-needed basis. **DO NOT** go to Bus Loading Points unless directed by public officials.

Call 2-1-1 and register every year if you will need bus transportation. One piece of luggage per person. Have ID and any medications.

Valley Study Map showing evacuation zones. Compare this map to the inundation maps on Pages 5 through 7 of this guide.

**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 BY HAVING A COPY OF YOUR LATEST UTILITY BILL.**

## 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.

## 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!

## CAMERON COUNTY

- **County Emergency Management**  
956-547-7000  
cameronready.com
- **County Sheriff's Office**  
956-544-0860\*
- **City of Brownsville**  
956-504-7405  
oem.cob.us  
Twitter: @BOEMHS
- **City of Harlingen**  
956-216-5920  
www.myharlingen.us  
Twitter: @Harlingen\_Texas  
Facebook: Harlingen, Texas
- **City of La Feria**  
956-797-3121  
cityoflaferia.com
- **Town of Laguna Vista**  
956-943-1792  
lvtexas.us  
Twitter: @LagunaVistaTX  
Facebook: lvtexas
- **City of Port Isabel**  
956-943-2727  
portisabel-texas.com/cityhall  
Twitter: @portisabeltexas  
Facebook: Port Isabel Texas
- **City of San Benito**  
956-361-3800  
cityofsanbenito.com  
Facebook: San Benito Office of  
Emergency Management  
Twitter: @SanBenitoOEM

- **City of South Padre Island**  
956-761-8144  
myspi.org  
Twitter: @SouthPadreTexas  
Facebook: South Padre Texas
- **City of Los Fresnos**  
956-233-5768  
citylf.us  
Twitter: @CityLosFresnos  
Facebook: citylf

## HIDALGO COUNTY

- **County Emergency Management**  
956-318-2615  
www.co.hidalgo.tx.us/index.  
aspx?NID=85  
Twitter: @HidalgoCounty  
Facebook: Hidalgo County Texas
- **County Sheriff's Office**  
956-383-8114\*
- **City of Alamo**  
956-781-2004  
alamotexas.org  
Twitter: @CityofAlamo
- **City of Edinburg**  
956-383-7691  
cityofedinburg.com  
Twitter: @cityofedinburg  
Facebook: City of Edinburg, Texas
- **City of Hidalgo**  
956-843-2286  
cityofhidalgo.net
- **City of McAllen**  
956-681-1234  
mcallen.net/emergency  
Twitter: @CityofMcAllen  
Facebook: City of McAllen  
Government

- **City of Mercedes**  
956-565-3102
- **City of Mission**  
956-580-8705  
missiontexas.us  
Twitter: @CityofMissionTX
- **City of Pharr**  
956-787-7541  
www.pharrem.com  
Twitter: @PharrTX  
Facebook: CityofPharr  
YouTube: pharrtech  
Live: http://pharnow.net
- **City of Weslaco**  
956-968-0367  
weslacotx.gov/EmergencyManagement.  
html  
Twitter: @WeslacoCity

## STARR COUNTY

- **County Emergency Management**  
956-716-4800
- **County Sheriff's Office**  
956-487-5571\*
- **Rio Grande City**  
956-487-0672  
cityofrgc.com  
Twitter: @riogrande78582  
Facebook: Rio Grande City, Texas  
Twitter to: @CityofRGC
- **City of Roma**  
956-849-1411  
cityofroma.net  
Facebook: City of Roma, Texas

## WILLACY COUNTY

- **County Emergency Management**  
956-689-5456
- **County Sheriff's Office**  
956-689-5577\*

## ZAPATA COUNTY

- **County Emergency Management**  
956-765-9942
- **County Sheriff's Office**  
956-765-9960\*

## BROOKS COUNTY

- **County Emergency Management**  
361-326-3681
- **Sheriff's Office**  
361-325-3697\*

## JIM HOGG COUNTY

- **County Emergency Management**  
361-527-4100

## KENEDY COUNTY

- **County Emergency Management**  
361-595-8527
- **County Sheriff's Office**  
361-294-5205\*

## Additional Information:

- **US Department of Homeland Security**  
ready.gov
- **American Red Cross, South Texas Chapter**  
southtexasredcross.org
- **FEMA**  
fema.gov

**Do Not Call 911 for Non-Emergencies!** \* Is 24 hour #.



## Flooding – on Land and by the Sea – Often Trumps the Wind

A hurricane, by definition, is a “bad” storm. At minimum, a hurricane will disrupt a routine for a few days. At maximum, a hurricane will devastate a community forever. For many people over the past four decades, the perception of hurricane “badness” came from the Saffir-Simpson Hurricane Scale. It seemed so easy to grasp. A Category 1 hurricane contained 74 to 95 mph winds, a storm surge of 4 to 5 feet, and surface pressure  $\geq 980$  mb. A Category 5 hurricane contained wind greater than 155 mph, a storm surge  $>18$  feet, and surface pressure  $<920$  mb.

Then came Allison, Charley, Katrina, Ike and Sandy!

Each of these storms damaged billions of dollars in property, and all but Charley killed dozens to hundreds of people. None of these storms had impacts that purely matched the Saffir-Simpson Scale. Only Charley (2004) met the wind criteria, now the only feature of the Saffir-Simpson Hurricane Wind Scale (SSHWS). The following table summarizes each storm.

Storm	Main Impact Area	Year	SSHWS (landfall)	Damage (\$billions)	Primary Impact
Allison	Houston	2001	None	5.5	3+ feet of rainfall; record inland flooding in Houston
Charley	Southwest Florida	2004	4	15.4	Extensive Wind Damage, but only a 4 to 7 foot storm tide
Katrina	Louisiana and Mississippi	2005	3	81.3	Storm tide up to 28 feet. Catastrophic storm surge flooding; thousands of persons drowned
Ike	Upper Texas and Southwest Louisiana	2008	2	29.3	Storm tide up to 20 feet. Extensive to catastrophic storm surge flooding; several dozen persons drowned or missing
Sandy	Northeast U.S.	2012	1*	50+	Vast majority of damage from $\geq 10$ foot storm tide along NJ/NY coast; dozens of persons drowned

\*Storm considered Post-Tropical at Landfall

†Dollar values in year of landfall



Left: Inland flooding in Houston from Tropical Storm Allison in 2001. Courtesy of Harris County Flood Control District/Steve Fitzgerald  
Center: Bolivar Peninsula scraped clean by Hurricane Ike's Storm Surge in 2008. Right: Damaged and Destroyed homes along the New Jersey Shore from Sandy in 2012. Courtesy of U.S. Coast Guard.

## Where to Get “More” Information

Before a hurricane or tropical storm threatens the Rio Grande Valley, surf to <http://weather.gov/tcig> and click “Brownsville” on the map to discover the potential impact for all threat levels for wind, inland flooding, coastal (storm surge) flooding, tornadoes, and marine hazards (at sea). When a cyclone threatens, the maps will display colors for the expected potential impact for each hazard. How each hazard ranks can inform your preparedness and evacuation decisions.

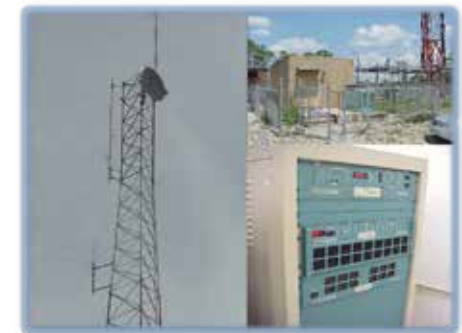


## NOAA Weather Radio Goes Bilingual in the Rio Grande Valley

In a world plugged into continuous weather information, NOAA Weather Radio remains a critical tool that can alert people to potentially life-threatening weather in the middle of the night when the power goes out. Across the Rio Grande Valley, weather-vulnerable neighborhoods contain a significant number of residents whose primary language is Spanish. Understanding and being able to translate an alert from English to Spanish can be difficult for many of these residents; the additional time to process the information and take action could literally be the difference between life and death. Until now.

A Homeland Security Grant from FEMA sparked a two-year collaborative effort among the National Weather Service, the State of Texas, and the Lower Rio Grande Valley Development Council culminating with the Spanish Language Public Safety Warning System. The Warning System's core components include two new NOAA Weather Radio transmitters, broadcasting from Harlingen and Pharr. Broadcasts and special alerts now cover nearly all communities. Spanish language radio and television stations that are part of the Emergency Alert System are able to select the feed(s) from the Spanish language transmitters, removing the need for a third party to translate the information from English to Spanish.

Should a hurricane threaten the Rio Grande Valley this year, owners of NOAA Weather Radios will be able to tune to the specific frequency and receive critical information that will describe the hazard, potential impact, and recommended safety actions in the language they are most comfortable hearing.



Collage showing NOAA Weather Radio transmission antenna (left), equipment shelter (top right), and transmitter housed in rack.

Transmitter Location	Station Identification	Frequency
Harlingen	WZS-2542	162.450
Pharr	WZS-2541	162.475



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