



# THE OFFICIAL TEXAS HURRICANE GUIDE

## Rio Grande Valley Edition

# PLAN.

# ACT.

# SURVIVE!

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Coastal Gaurdians Outreach



Belen de Leon



*All the information you need for hurricane season*

# Introduction

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### TEXAS DEPARTMENT OF PUBLIC SAFETY

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Dear Colleagues,

Hurricanes can be devastating to coastal areas, with powerful impacts from storm surge, high winds, tornadoes, and flooding. It is imperative to prepare for each type of hurricane hazard. Advanced planning and preparation are essential to protecting property, reducing risk and ultimately saving lives.

For these reasons, your local National Weather Service, the Division of Emergency Management of the Texas Department of Public Safety, and other key partners, urge residents of coastal communities to read and study this comprehensive Hurricane Guide.

Thousands of individuals in local, state and federal agencies, as well as voluntary organizations and the private sector, are deeply committed to keeping Texans safe when tropical storms threaten our coastal areas. But we need your help as well.

It is critical for coastal residents to take time to develop a family disaster plan, to review emergency preparations and checklists regularly, to build disaster supply kits in waterproof, easy-to-carry containers, and to stay aware of current weather situations by monitoring NOAA weather radio and local broadcasts.

The Official Texas Hurricane Guide is a roadmap that provides information on the supplies you will need and the actions you should be prepared to take as a storm moves in. It is intended as a user-friendly resource with specific instructions for what to do each step of the way— before, during, and after the storm. It also provides information on ways to improve protection for your home and property.

Please use this guide to learn as much as possible about how to prepare for our most dangerous storms. I hope you will continue your dedicated support of this key initiative.

Sincerely,

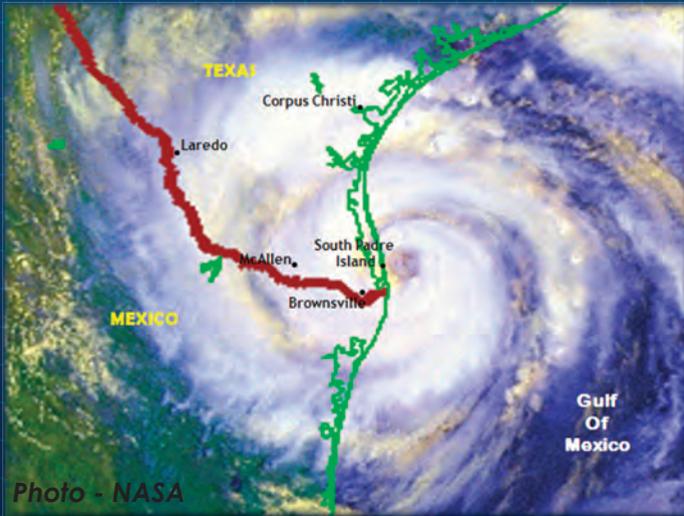
W. Nim Kidd, CEM®  
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Graphic design courtesy of:



# About the Hurricane



High resolution satellite image of Hurricane Dolly (2008) prior to landfall on South Padre Island.

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

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.



Historical perspective of hurricane landfalls in Texas since 1851.



## Definitions to Know



L

**TROPICAL DEPRESSION:** An organized system of persistent clouds and thunderstorms with a closed low-level circulation and maximum winds of 38 mph or less.

6

**TROPICAL STORM:** An organized system of strong thunderstorms with a well defined circulation and maximum sustained winds of 39 to 73 mph.

6

**HURRICANE:** An intense tropical weather system with a well defined circulation and sustained winds of 74 mph or higher.

**TROPICAL CYCLONE:** A general term used to describe a tropical depression, tropical storm, or hurricane.

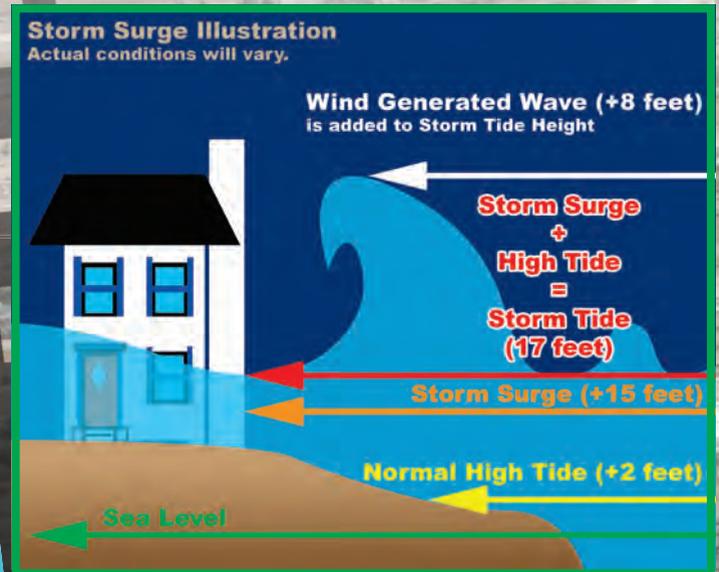
**HURRICANE/TROPICAL STORM WATCH:** Hurricane or Tropical Storm conditions are possible in the watch area within 48 hours.

**HURRICANE/TROPICAL STORM WARNING:** Hurricane or Tropical Storm conditions are possible in the warning area within 36 hours.

# Storm Surge

Storm surge is a large dome of water, 50 to 100 miles wide that sweeps across the coastline along and to the right of where the eye makes landfall. The stronger the hurricane winds, the higher the storm surge. The storm surge can be more than 15 feet in major hurricanes. Storm surge poses the greatest threat to life and property for coastal communities.

Computer simulations of a major hurricane landfall clearly show the huge impact a storm surge could have on a low lying coastal community. Communities such as the Town of South Padre Island (pictured to the left) would be completely submerged if a major hurricane made a direct hit.

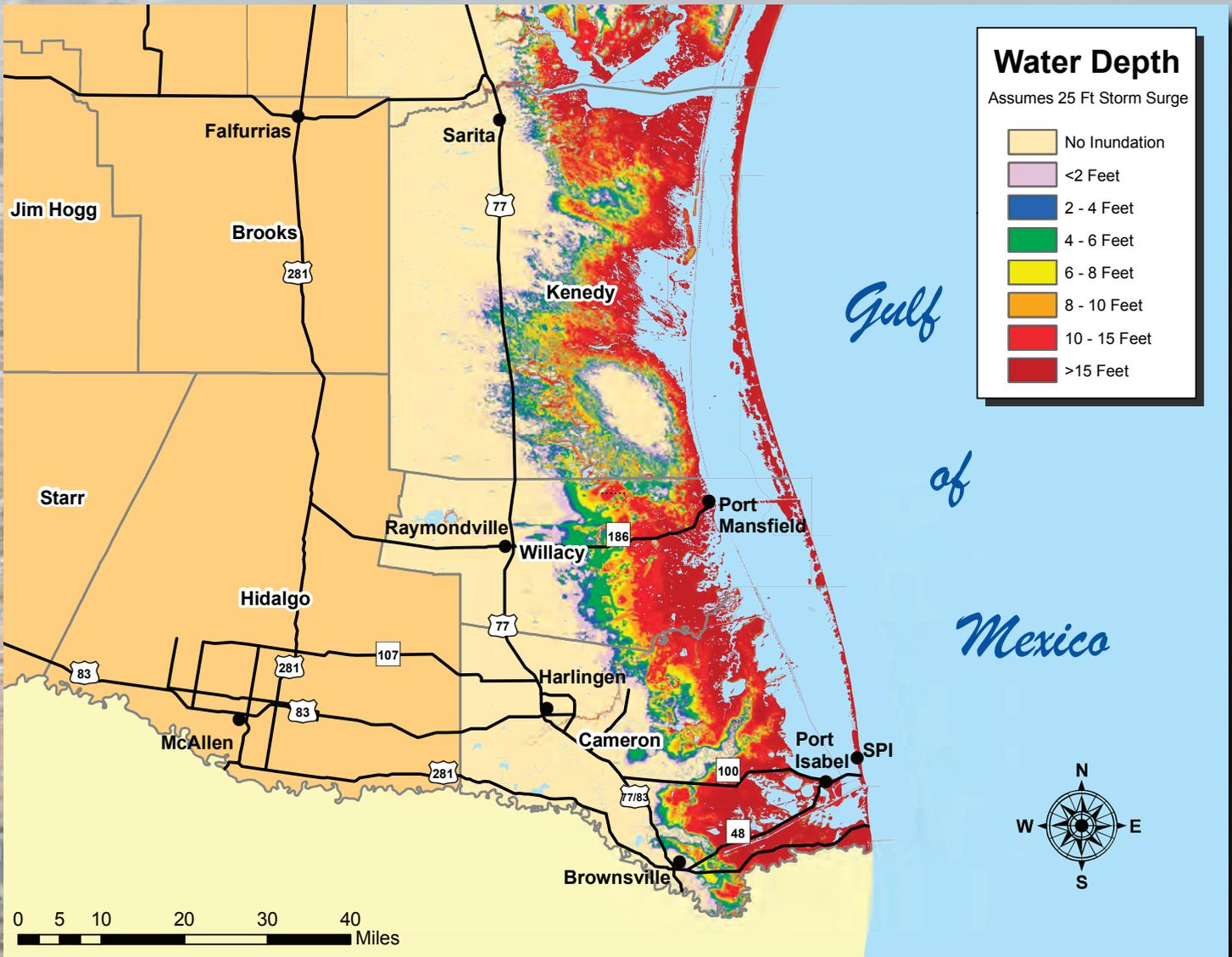


Storm surge from a major hurricane has the potential to submerge and destroy most of the coastal properties in South Padre Island, Port Isabel, and Laguna Vista. Evacuating well inland before a major storm strikes can save your life.

Graphics-Gordon Wells from the Center for Space Research and Mike Peacock (retired) from the Texas Division of Emergency Management.

# Storm Surge

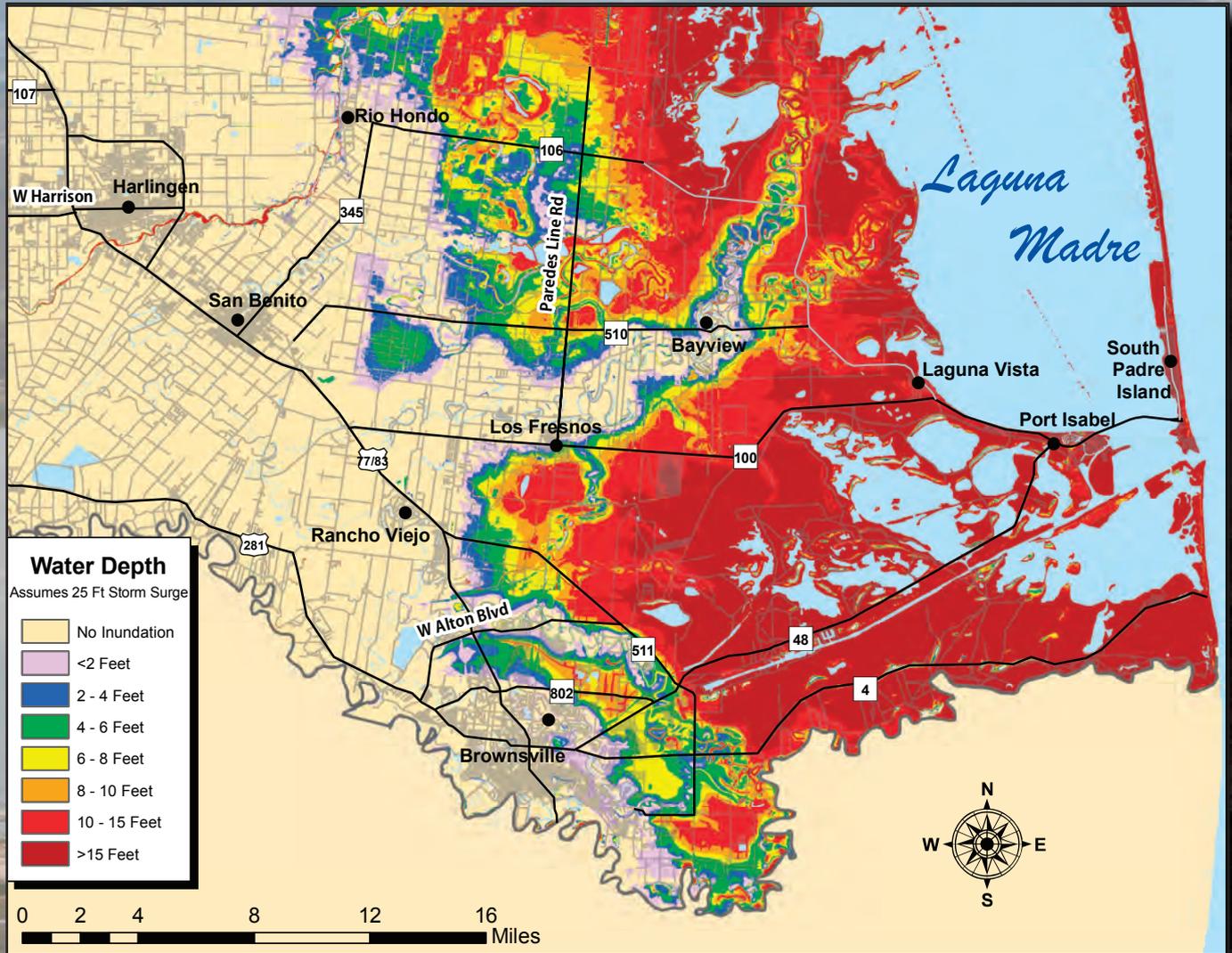
## Deep South Texas Storm Surge Inundation Map



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

# Inundation Maps

## Coastal Cameron County



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

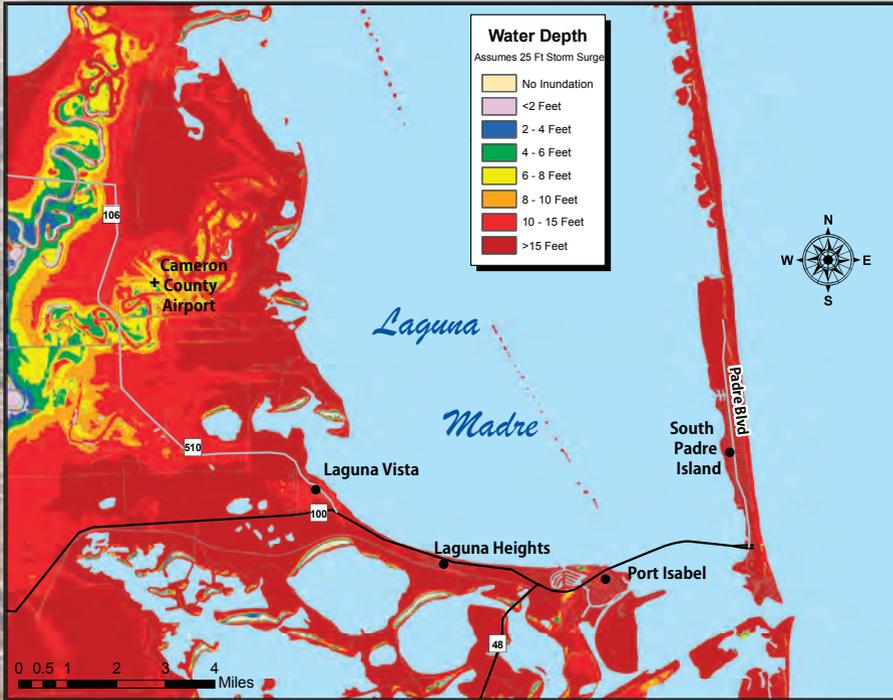
For high resolution inundation maps in your neighborhood, go to:

[weather.gov/rgv](http://weather.gov/rgv)



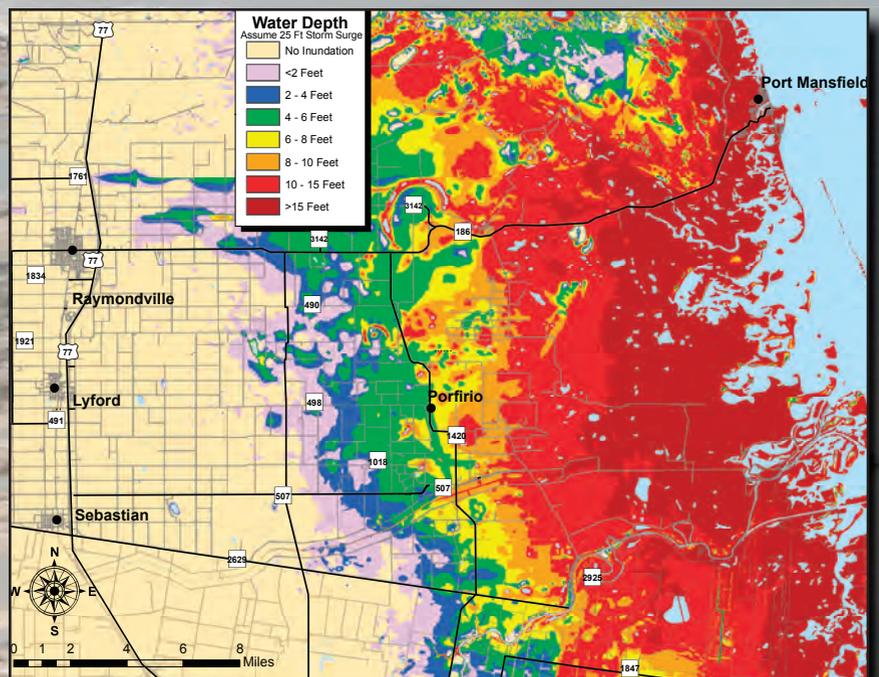
# Inundation Maps

## Port Isabel/South Padre Island



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

## Coastal Willacy County



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

- National Hurricane Center



# Flooding and Tornadoes

## Inland Flooding



There are numerous examples of significant inland 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. Since 1950, inland flooding has caused billions of dollars in damage across the Rio Grande Valley. Hurricane Beulah in 1967 dropped 15 to 25 inches of rain that produced widespread flooding from McAllen to Harlingen. Hurricane Alex in 2010 dumped more than 50 inches of rain across the Sierra Madre Mountains in northeastern Mexico. The runoff into the Rio Grande Basin required dam releases, flooding unprotected riverside communities and resulting in activation of the Lower Rio Grande Flood Control Project floodway for the first time since 1988.

## 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 breaker to prevent short circuits, eliminating 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!**

## Tornadoes

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.



# Destructive Winds



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

**H**urricane 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 typically the most destructive. Hurricane force winds can be felt as far as 150 miles from the coast.

It is imperative to ensure your home or business is well constructed to minimize the damage from the wind. See Page 10 in this guide for cost effective home improvement tips that can help you reduce your damage from a hurricane.



## 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 4 | Winds 131 to 155 mph       |
| ● Category 2 | Winds 96 to 110 mph  | ● Category 5 | Winds greater than 155 mph |
| ● Category 3 | Winds 111 to 130 mph |              |                            |

# Planning and Preparing

## Preparing Your Home Before the Storm

Proper hurricane preparations made ahead of time will not completely protect your property from damage. However, following a few simple tips may greatly reduce the damage to your home and property.



### Important Home Preparation Tips

#### 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.
- Shredded bark is preferred instead of small gravel or stone bedding.

#### Roofing

- Inspect the roof for loose tiles, shingles or debris. Consider replacing old or damaged shingles with new ones rated for hurricane force winds.
- Check for and/or install hurricane clips to secure roof trusses to side walls.
- Clear loose and clogged rain gutters and downspouts.

#### Doors

- Reinforce garage doors and tracks or replace with a hurricane tested door. (See above image)
- Reinforce double entry doors with heavy duty foot and head bolts.
- Use a security dead bolt with a one inch minimum bolt length.
- Doors may be shuttered, but one entry must be left easily accessible.

#### 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.
- Store shutters or plywood lying flat to avoid warping when not in use.



Hurricane clips attaching roof trusses to side walls and enhanced cross bracing on garage door.

# Planning and Preparing

## Business and Employee Preparation



### Tips for Businesses

- 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.
- 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.
- Identify a safe room for employees who must remain in the building.
- 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.

## Protecting Your Boat - Marine Preparations



### Tips for Boat Owners

- Check your marina contract for policies and procedures for hurricanes.
- Check with the manufacturer for proper ways to secure your boat during a storm.
- Consider moving arrangements well in advance of an approaching storm.
- Trailer boats should be removed from the water and securely stored at least 48 hours before a hurricane is expected to make landfall.
- 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.

# Special Needs

## General Preparations for People With Special Needs



**P**reparation in advance of hurricane season is essential, especially for people with special needs. It is essential that a destination is identified ahead of time that can accommodate people with special needs. Shelters should be considered as a **last resort** when people with special needs evacuate because many shelters cannot provide the attention required. Assisting elderly neighbors and acquaintances with pre-hurricane preparations is encouraged.



### Important Special Needs Tips

- Identify with whom you will stay in the event an evacuation becomes necessary.
- Make arrangements for transportation in the event you evacuate. Make sure your transportation can accommodate any equipment or other supplies that need to be taken with you.
- Make sure you have the following items that should be stored in advance:
  - ✓ Extra copies of your prescriptions in case your physician's office is damaged and not operational.
  - ✓ At least a 1 month supply of medications.
  - ✓ Identification.



## Transportation Assistance Registry

**If you will need help evacuating when a hurricane threatens, dial 2-1-1 to register in advance for a ride**

### Dial 2-1-1 as soon as possible...

- Before the start of hurricane season (June 1)
- If you cannot drive and cannot arrange transportation
- If you have a disability or special health care need and require assistance to get out
- If you do not have a vehicle and you have no one else to help you evacuate

### **Is someone going to pick me up or call me when a hurricane threatens?**

Emergency evacuations are handled differently in every community. When a major hurricane threatens, local emergency managers will make every attempt to evacuate someone who does not have the ability to evacuate themselves, if there is enough time to do so safely. Once a hurricane enters the Gulf, individuals should pay close attention to local media to determine when and how evacuations will occur.

# Pets and Livestock

## 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.
- Make sure your pet has a proper ID collar.
- 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.



## Preparations for Livestock

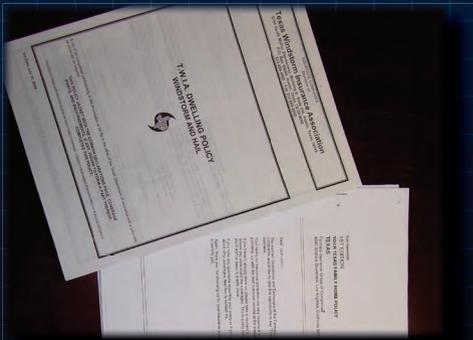


- Ensure all animals have some form of visible identification.
  - Evacuate animals whenever possible. Arrangements for evacuation, including routes and host sites, should be made in advance.
  - The evacuation sites should have or be able to readily obtain food, water, veterinary care, handling equipment, and facilities.
  - Obtain vehicles and trailers needed for transporting each type of animal. Make available experienced handlers and drivers.
- If evacuation is not possible, a decision must be made whether to move large animals to available shelter or turn them loose. This decision should be determined based on soundness and location of the shelter (structure).
  - When necessary, move livestock to higher ground and deny access to flood prone pastures, barns, and other structures.
  - It is important that livestock have plenty of food and clean water.

# Insurance Tips

## Insurance Tips - Before the Storm

- When shopping for insurance, get quotes from different companies and consider financial strength and history of complaints from each company.
- Ask agents for discounts if available.
- 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.
- **DO NOT** cancel an old policy until you have a new policy in effect.
- 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 you evacuate or choose to leave your home for safety, make sure to take the written and photo inventory with you, as well as all insurance policies (auto, home, life, etc.)
- 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.



## Important Web Information

National Flood Insurance Program

[www.floodsmart.gov](http://www.floodsmart.gov)

Texas Windstorm Insurance Association

[www.twia.org](http://www.twia.org)

Texas Department of Insurance

[www.tdi.state.tx.us/consumer](http://www.tdi.state.tx.us/consumer)

1-800-252-3539 (Consumer Help Line)

## Insurance Tips - After the Storm

- Give prompt written notice to your insurance company.
- If you cannot be easily contacted, give your insurance company the contact information of a trusted friend or relative who can reach you if necessary.
- 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.
- Along with insurance adjuster estimate for repairs to home, obtain two or more contractor estimates. Estimates must be broken down per line item.
- Payment advancements are made to policy holder for home repairs, personal property and living expenses. Final payments are made only after completed repairs and adjuster review.

# Contact Info/Supply Kit

The South 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.



**American  
Red Cross**

southtexasredcross.org

## 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:




## Hurricane Supply Kit



- At least a 7-day supply of non-perishable food and a manual can opener
- At least a 7-day supply of water. One gallon 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
- Matches in a waterproof container
- Whistle
- Kitchen accessories and cooking utensils
- Cash
- Extra clothing, blankets, and sleeping bags
- 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



**Belen de Leon**

# Hurricane Names

## 2011

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| <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"/> Irene    | <input type="checkbox"/> Vince    |
| <input type="checkbox"/> Jose     | <input type="checkbox"/> Whitney  |
| <input type="checkbox"/> Katia    |                                   |

## 2012

- |                                   |                                  |
|-----------------------------------|----------------------------------|
| <input type="checkbox"/> Alberto  | <input type="checkbox"/> Leslie  |
| <input type="checkbox"/> Beryl    | <input type="checkbox"/> Michael |
| <input type="checkbox"/> Chris    | <input type="checkbox"/> Nadine  |
| <input type="checkbox"/> Debby    | <input type="checkbox"/> Oscar   |
| <input type="checkbox"/> Ernesto  | <input type="checkbox"/> Patty   |
| <input type="checkbox"/> Florence | <input type="checkbox"/> Rafael  |
| <input type="checkbox"/> Gordon   | <input type="checkbox"/> Sandy   |
| <input type="checkbox"/> Helene   | <input type="checkbox"/> Tony    |
| <input type="checkbox"/> Isaac    | <input type="checkbox"/> Valerie |
| <input type="checkbox"/> Joyce    | <input type="checkbox"/> William |
| <input type="checkbox"/> Kirk     |                                  |

## 2013

- |                                    |                                    |
|------------------------------------|------------------------------------|
| <input type="checkbox"/> Andrea    | <input type="checkbox"/> Lorenzo   |
| <input type="checkbox"/> Barry     | <input type="checkbox"/> Melissa   |
| <input type="checkbox"/> Chantal   | <input type="checkbox"/> Nestor    |
| <input type="checkbox"/> Dorian    | <input type="checkbox"/> Olga      |
| <input type="checkbox"/> Erin      | <input type="checkbox"/> Pablo     |
| <input type="checkbox"/> Fernand   | <input type="checkbox"/> Rebekah   |
| <input type="checkbox"/> Gabrielle | <input type="checkbox"/> Sebastien |
| <input type="checkbox"/> Humberto  | <input type="checkbox"/> Tanya     |
| <input type="checkbox"/> Ingrid    | <input type="checkbox"/> Van       |
| <input type="checkbox"/> Jerry     | <input type="checkbox"/> Wendy     |
| <input type="checkbox"/> Karen     |                                    |

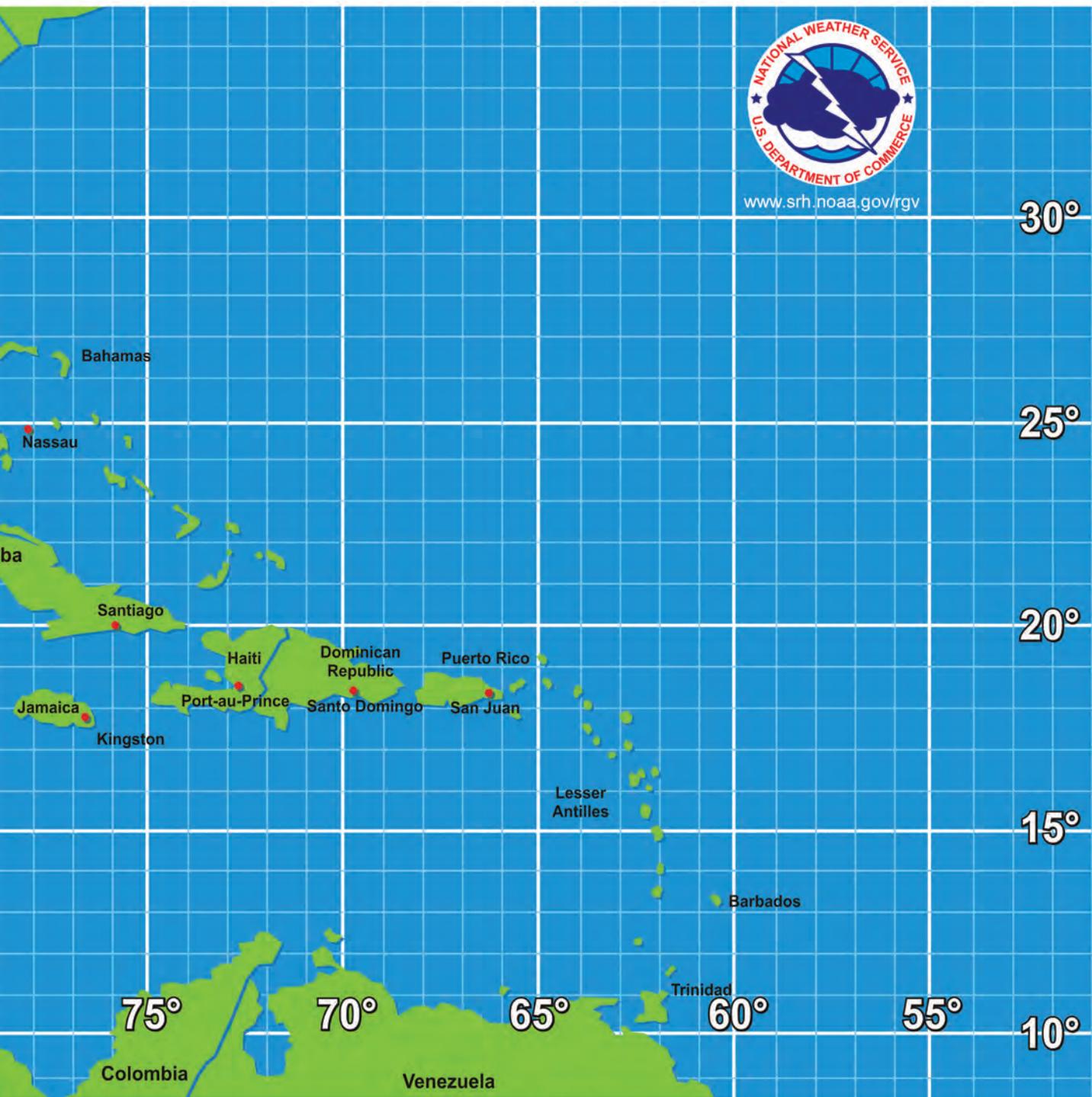


This chart is marked with vertical (longitude) and horizontal (latitude) lines, each representing 1 degree. A storm's position is given in these degrees.



THE OFFICIAL TEXAS

# Hurricane Tracking Chart



es. 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).

# Hurricane Forecasts

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.

## Weather Information

National Hurricane Center

[www.hurricanes.gov](http://www.hurricanes.gov)

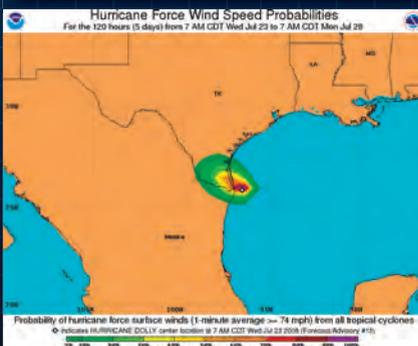
## Forecast Track and Uncertainty Cone

- 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.



## Hurricane Force Wind Probability Graphic

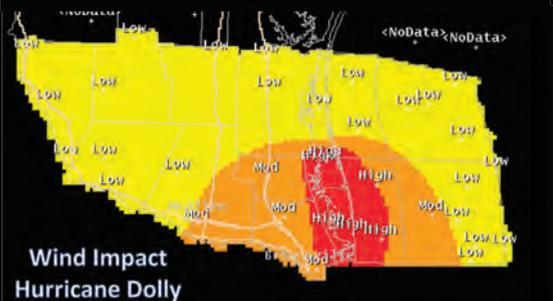
- These charts indicate the chance, in percent, that 74 mph or higher winds will occur at any point on the map within the time period stated.



Remember that hurricane conditions can be felt hundreds of miles away from the center of the storm. DO NOT wait for a hurricane watch or warning before beginning your initial preparations, as it may be too late to complete them.

## Information for the Lower Rio Grande Valley

Your National Weather Service in Brownsville provides impact information specific to communities near the U.S./Mexico border. The Hurricane Local Statement provides text detailing the threat for wind, storm surge, flooding, and tornadoes. Need a quick glance? Check out our graphical hazards page on the web. At right are maps showing potential impact levels from inland flooding and wind.



Find Much More At:

[weather.gov/rgv](http://weather.gov/rgv)

NWS 24-Hour Phone Recording: 956-546-5378

# Final Checklists

## 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.
- Make sure you have supplies to survive on your own for at least one week if you plan on staying.
- 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.
- Get plenty of extra cash in case power goes out and ATMs do not work.
- 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

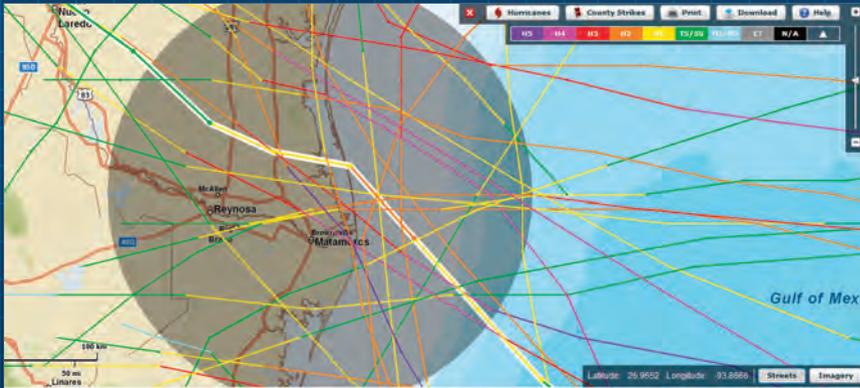
- Turn off propane tanks.
- Unplug small appliances.
- Empty refrigerator and freezer.
- Turn off utilities if ordered to do so.
- Notify family members of your evacuation plans.
- Lower water level in swimming pool by one foot.
- Lock home securely.
- Board up remaining doors and brace garage door.
- Take pets with you.



## Final Actions to Take if Staying

- Close storm shutters.
- 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.
- Beware of the calm winds in the eye of the storm and do not venture outside. Some of the strongest winds may occur shortly after the eye passes.
- **DO NOT EXPECT EMERGENCY RESPONDERS TO BE OF ANY ASSISTANCE WHEN THE MOST DANGEROUS CONDITIONS ARE OCCURRING!**

# Deep South Texas Hurricane History



Map showing hurricanes of category 2 strength or greater which made landfall within 100 nm of Brownsville since 1851. The track of Hurricane Dolly is highlighted.

## Hurricane Beulah (1967)

Much larger and stronger than Dolly, 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 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. This would equate to more than \$4 billion today, accounting for inflation and population increases.



Photo - Brownsville Herald

Flooding in Harlingen, TX from Hurricane Beulah.

Right: Track and rainfall amounts from Hurricane Beulah.

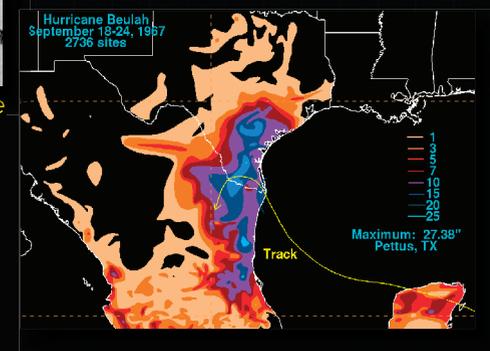
Since 1851, 63 hurricanes have impacted the Texas coast; only twelve as major hurricanes. Major hurricanes have winds of 110 mph or greater and are rated category 3, 4, or 5 on the Saffir-Simpson scale. No hurricane has made landfall in Texas at category 5 strength. Storms of note occurred in the following years:

- 1886: Indianola II** Flooded Brownsville
- 1933: Unnamed** Devastated Brownsville
- 1954: Alice** Rio Grande Flooding
- 1967: Beulah** (See Below)
- 1980: Allen** Severe winds in Port Mansfield
- 1999: Bret** King Ranch landfall
- 2005: Emily** Tropical Storm effects
- 2008: Dolly** Rio Grande Flooding
- 2010: Alex** (See Page 21)



Photo - Brownsville Herald

Home destroyed in South Padre Island, TX from Hurricane Beulah.



# The Lower Rio Grande Flood of 2010

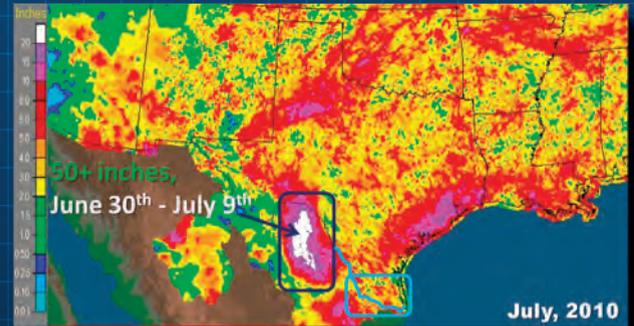
Days of torrential rainfall, from the remains of Hurricane Alex and Tropical Depression #2, fell along the front range of the Sierra Madre Mountains in early July 2010, dumping several feet of water in Coahuila State Mexico. Water rapidly flowed into the Rio Grande basin, requiring a series of planned flood control actions to mitigate the possibility of severe river flooding across the Lower and Middle Rio Grande Valley. Water releases from reservoirs behind dams on both sides of the border began soon after the heaviest rains ended. Planned releases began at Amistad International Reservoir on July 5th. On July 7th, releases began at Falcon International Reservoir, along the Rio Grande near the Zapata/Starr County line. Initial releases of 15,000 cubic feet per second (cfs) on the 7th would more than double on the 8th, and quadruple to more than 60,000 cfs by July 14th.

The dam release widened the river to more than two miles, inundating rangeland and several small communities in Starr and extreme western Hidalgo County beginning July 10th. Inundation would continue for a full month before the river level fell below flood stage. Diversion dams moved water through levee protected spillways on each side of the border and the Rio Grande, channeling water away from highly populated areas and safely into the Laguna Madre. Upstream, water pouring into Falcon International Reservoir raised the flood stage to a new record on July 17th.

Damage was greatest where there were no levees. Roma, Rio Grande City, and La Grulla (Starr County) and Los Ebanos (Hidalgo County) lost tens of millions of dollars in property and farmland to the flood. Additional property damage occurred inside the levee downstream. Riverside restaurants, a mobile home park, and a wildlife refuge were inundated, as were dozens of roads and a golf course.

Levee restoration prior to the 2010 hurricane season, and the vigilance of emergency services employees who monitored the Floodway around the clock, helped avert substantial damage to communities across the Lower Rio Grande Valley. The 2010 Rio Grande Flood simultaneously showed the power of nature and the brain power of man to build a system to mitigate devastation nature might otherwise bring.

**Right:** Map of the Rio Grande basin and associated tributaries in Mexico. Courtesy of International Boundary and Water Commission.



Map showing radar and rain gage estimated rainfall across Texas and northeastern Mexico, July, 2010. Flow of water moves from white colored area (dark blue circle) downstream to the Lower Rio Grande Valley (light blue circle).



Aerial view of partially flooded Chimney Park RV Resort by the Rio Grande south of Mission, Texas. Courtesy of Hidalgo County Emergency Management.



# Tropical Storm Hermine

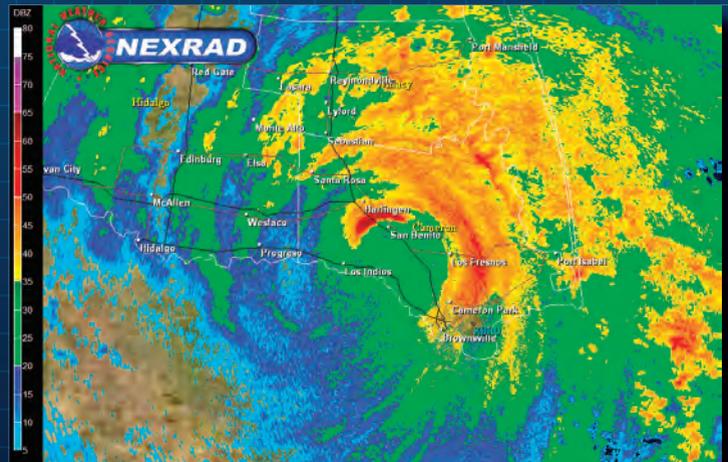
## Labor Day's Midnight Madness

The holiday weekend which began with a sultry Saturday ended as a swirl of dangerous winds, whipped up seas, and torrential rains on a manic Monday midnight, as Tropical Storm Hermine raged across the Lower Texas coast overnight on September 6th and 7th. Hermine, an innocuous but persistent area of showers and thunderstorms over the extreme southwestern Gulf of Mexico early on Sunday, September 5th, sparked to life as a 39-mph tropical storm early on Labor Day, September 6th, 190 miles east of Tampico, Mexico. In only 18 hours, Hermine would be nearing Brownsville and South Padre Island, packing near hurricane force winds and driving rains.

A swath of damaging winds and flooding rains pounded Brownsville, Harlingen, and Raymondville as the eyewall of Hermine tracked along and east of Federal Highway 77 in Cameron and Willacy Counties between midnight and 2 AM CDT, September 7th. Wind gusts above 70 mph blew down hundreds of trees, pulled dozens of roofs off older homes and businesses, and knocked out

power to more than 55,000 customers. In Raymondville (Willacy County), a young girl was injured when a trampoline blew through a window, and roof decking at a motor hotel was lifted off, forcing 10 guests to emergency shelter. Dozens of Mexican shrimp boats sought refuge in the Port of Brownsville; several became stranded at the coast, including two that ran aground on the beaches of South Padre Island. Torrential rains flooded roads and farmland in northeast Cameron and southeast Willacy County. Total damage was estimated at more than 10 million dollars.

Nineteen named tropical storms and hurricanes traversed the Atlantic basin in 2010, yet only Hermine made a direct hit on the United States. Hermine eventually flooded portions of south and central Texas, but her sudden, strong, and scary winds impacted the Lower Rio Grande Valley on a memorable Monday midnight in early September.



*Doppler radar image of the northern eyewall of Tropical Storm Hermine about to strike Harlingen, Texas, at 1226 AM CDT, September 7, 2010.*



**Left:** Collapsed aluminum structure and bent telephone pole at Neuhaus and Co., Raymondville. Courtesy of Willacy County Emergency Management. **Center:** Roof decking lifted at the Best Inn Motor Hotel, Raymondville. **Right:** Mexican shrimp boats aground on South Padre Island.

# College Student Preparation

## Student Information Checklist

- 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, 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 as 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).



## Preparing Your Room

- Unplug all electronics and cover them in plastic
- Shut and lock your window and close your blinds
- Store items off the floor and away from windows
- Take all items off balconies and out of yards
- Follow any additional instructions by your landlord
- Empty refrigerator
- Take valuables



# Evacuation

Evacuees need to consider the projected path of the hurricane when choosing an evacuation route and destination. Evacuation studies estimate that it would take between 15 and 33 hours to evacuate Cameron County, and up to 8 hours to evacuate Willacy County in advance of tropical storm force winds. Please note that northbound traffic from much of Cameron and Willacy County will not use Highway 77 north of Raymondville, but will be redirected toward Highway 281, a potential contra-flow route, from Hidalgo through Brooks County (page 25, right). This underscores the need for coastal residents to have an evacuation plan. When evacuating, be sure to check local weather and highway conditions before departing. When local authorities order an evacuation of your area, leave immediately!



Photo - Associated Press

Evacuation from South Padre Island ahead of Hurricane Dolly.

## Texas Road Information

### TXDOT Road Conditions

1-800-452-9292 or [www.txdot.gov](http://www.txdot.gov)

### TXDOT Pharr Office

1-956-702-6100

### Emergency Broadcast Information

News Talk 710 KURV-AM

KFRQ FM-94.5

KVLY Mix 107.9 FM

KGBT 98.5 FM (Spanish)

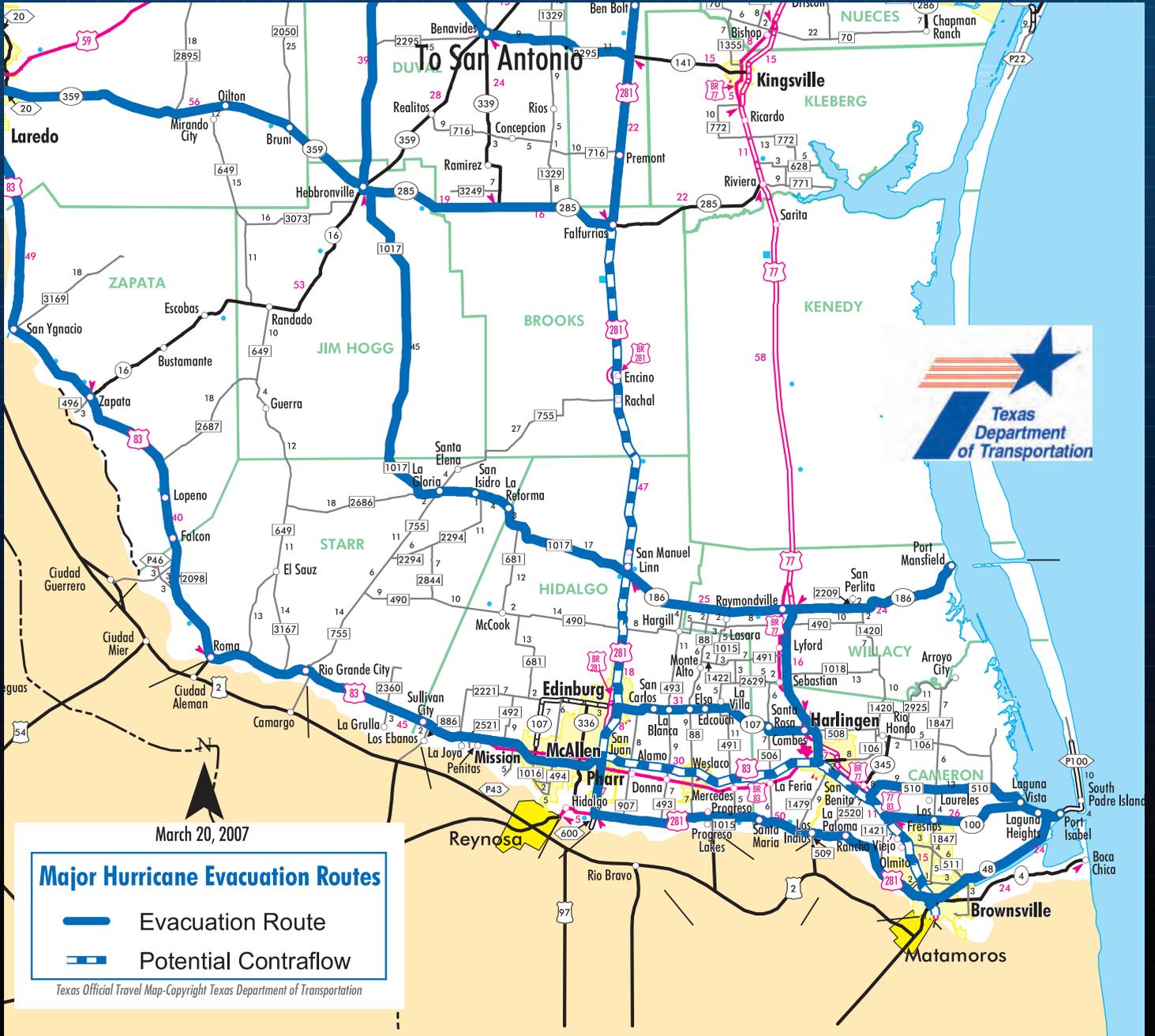


## Final Actions before Evacuating

- Follow evacuation orders provided by your local officials. Once the evacuation order has been given, LEAVE IMMEDIATELY!
- Take your Hurricane Supply Kit with you (as described on page 15).
- Leave as early as possible to avoid heavy traffic and hazardous weather.
- See TXDOT map on the next page for an illustration of primary and alternate evacuation routes. Remember that the primary routes often become congested quickly.
- Do not stay in a mobile home near the coast under any circumstance.
- Remember that large boats and travel trailers may not be allowed to cross the Queen Isabella Memorial Bridge between South Padre Island and Port Isabel once high winds commence.
- Prepare to stay at your evacuation destination for a week or more, as re-entry into the affected area may be restricted.

# Evacuation

## Suggested Evacuation Routes

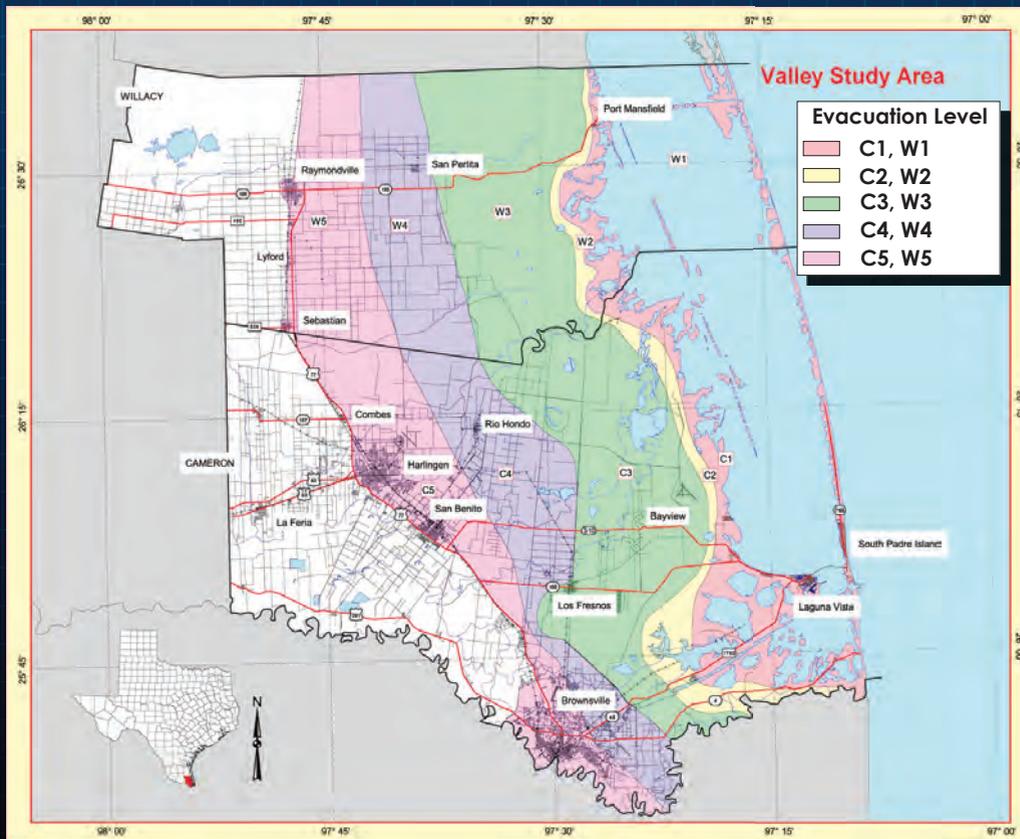


# Evacuation

## Evacuation vs. Inundation: Know the Difference!

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, and
- \* 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.

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



## Special Needs Evacuation

Bus Loading Points will open on an as-needed basis. DO NOT go to Bus Loading Points unless directed by public officials. Specific Pick Up Points will be determined when the special needs evacuation orders are given.

**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.**

# Emergency Information

## CAMERON COUNTY

- **County Emergency Management**  
956-547-7000
- **Sheriff's Office**  
956-544-0860\*
- **Brownsville Emergency Management**  
956-504-7405
- **Harlingen Emergency Operations Center**  
956-216-5920
- **San Benito Emergency Operations Center**  
956-361-3800
- **Port Isabel Emergency Operations Center**  
956-943-2727
- **Town of South Padre Island Emergency Management**  
956-433-9720  
1-800-OKPADRE (Emergency)\*

## HIDALGO COUNTY

- **County Emergency Management**  
956-318-2615
- **Sheriff's Office**  
956-383-8114\*
- **McAllen Emergency Management**  
956-681-1234
- **Mission Emergency Operations Center**  
956-580-8705
- **Edinburg Emergency Management**  
956-292-2001
- **Pharr Emergency Management**  
956-787-7541
- **Weslaco Emergency Management**  
956-968-0367

## JIM HOGG COUNTY

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

\* 24 hour number

## WILLACY COUNTY

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

## KENEDY COUNTY

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

## BROOKS COUNTY

- **County Emergency Management**  
361-675-0783
- **Sheriff's Office**  
361-325-3697\*

## STARR COUNTY

- **County Emergency Management**  
956-716-4800
- **Sheriff's Office**  
956-487-5571\*

## ZAPATA COUNTY

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



## Additional Information

US Department of Homeland Security

[www.ready.gov](http://www.ready.gov)

National Red Cross

[www.redcross.org](http://www.redcross.org)

FEMA

[www.fema.gov](http://www.fema.gov)

**Community Resource Information:  
Do Not Call 911 for Non-Emergencies!**



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



FEMA News Photo



## 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.

## 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.

FEMA News Photo



FEMA News Photo



## 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.

# Returning Home

## Utility Cleanup

FEMA News Photo



- 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, lineworkers 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 can not 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!

## 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.



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