Storm Data and Unusual Weather Phenomena - July 2008

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details

TEXAS, South

(TX-Z248) ZAPATA, (TX-Z249) JIM HOGG, (TX-Z250) BROOKS, (TX-Z251) KENEDY, (TX-Z252) STARR, (TX-Z253) HIDALGO, (TX-Z254) WILLACY, (TX-Z255) CAMERON, (TX-Z256) COASTAL WILLACY, (TX-Z257) COASTAL CAMERON

	07/01/08 00:00 CST	0	Drought
	07/24/08 11:00 CST	0	

July began where June left off in Deep South Texas, with Severe (D2) to Extreme (D3) Drought covering the entire area. However, the first widespread significant rainfall of the summer would eventually cover the entire area between the 1st and 8th, and knock the Lower Rio Grande Valley out of Severe or worse drought conditions by the 8th, leaving only the northern tier of counties in Deep South Texas (Zapata, Jim Hogg, most of Brooks, and northern Kenedy) in Severe drought conditions.

CAMERON COUNTY --- HARLINGEN [26.18, -97.70]

	07/07/08 10:30 CST	0	Heavy Rain
	07/07/08 14:00 CST	0	Source: Law Enforcement

Numerous roads in typically poor drainage locations sustained minor flooding in Harlingen when persistent bands of torrential rains moved through the western half of Cameron County during the morning and early afternoon of July 7th. In general, rainfall between 2 and 3 inches fell during this time period, near the end of a weeklong welcome drenching that that dropped between 6 and 9 inches, perhaps higher in a few spots, across the more populated areas of the Lower Rio Grande Valley.

Extensive street flooding was reported in Harlingen and San Benito. This included the Fair Park area of Harlingen, First Street in Harlingen, particularly near the Highway 83 and 77 interchange near downtown. Numerous streets also experienced minor flooding in San Benito, and heavy rains affected construction sites in La Feria near the Hidalgo County line.

Brownsville had more nuisance problems with widespread ponding in poor drainage locations, such as those on Boca Chica Boulevard between McDavitt and Security Drive. In all cases, structures were not threatened, and there were no casualties.

The rains ended before mid afternoon on the 7th, and minor street flooding subsided.

WILLACY COUNTY --- RAYMONDVILLE [26.48, -97.78]

	07/07/08 10:45 CST	1K	Heavy Rain
	07/07/08 14:00 CST	0	Source: Law Enforcement

A number of roads in typically poor drainage locations of Raymondville sustained minor flooding, when persistent bands of torrential rains moved through the western half of Willacy County during the morning and early afternoon of July 7th. In general, rainfall between 2 and 3 inches fell during this time period, near the end of a weeklong welcome drenching that that dropped between 5 and 7 inches, perhaps higher in a few spots, across the more populated areas of the Lower Rio Grande Valley, stretching north and northwest toward the King Ranch (Kenedy County) and northeast Hidalgo County.

Street flooding seeped into the the Raymondville City Hall, soaking some carpeting and forcing crews to sandbag the doorways. Other streets were blocked by Law Enforcement to prevent vehicles from pushing floodwaters into stores in poor drainage areas of downtown. As of this writing, no significant damage was reported.

The rains ended by mid afternoon on the 7th, and minor street flooding subsided.

JIM HOGG COUNTY --- 8.3 NE RANDADO [27.15, -98.77]

	07/08/08 04:00 CST	0	Heavy Rain
	07/08/08 04:45 CST	0	Source: Law Enforcement

Jim Hogg County Sheriff's Department reported the southbound lane of Route 16 experienced nuisance flooding, with one half to one inch of water covering the road for a distance of approximately 3 miles, approximately 13 miles southwest of Hebbronville.

A series of upper level disturbances, lining up from south to north across northeastern Mexico into the Lower Rio Grande Valley and Deep South Texas, during the first full week of July, acted on residual deep tropical moisture left by a dissipating weak tropical wave at the end of June, to produce a prolonged period of cloudiness and locally heavy showers, which added up to an area average of 4 to 8 inches, with locally higher amounts, extending westward into Starr and Brooks County.

The heaviest rainfall was concentrated from eastern Hidalgo into Cameron County, where locally 9 to 10 inches fell in a few spots. Due to the spring and early summer drought, much of the rain was welcome relief for dry soils, though nuisance urban/poor drainage flooding resulted, particularly by the end of the wet period on July 7th and 8th.

Higher rain totals for the period July 1st through 8th included: 10.55 inches 5 miles south southeast of San Benito; 9.33 inches near Rancho Viejo, and 6.17 and 6.18 inches, respectively at Brownsville International Airport and Harlingen Valley Airport (all in Cameron

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County). In Hidalgo County, 6.31 inches fell at the Weslaco/Mid Valley airport, and 4.87 at McAllen/Miller airport.

(TX-Z249) JIM HOGG, (TX-Z250) BROOKS, (TX-Z251) KENEDY

07/08/08 00:00 CST		0	Drought
07/24/08 03:00 CST		0	

Despite widespread rainfall generally ranging from 3 to 5 inches across the Deep South Texas counties of Jim Hogg, Brooks, and Kenedy, the combination of a fairly long duration Extreme (D3) to Exceptional (D4) Drought for most of spring into early summer, along with continued low soil moisture levels, maintained a Severe (D2) Drought designation through the middle of July. Hurricane Dolly's torrential rains, arriving on July 23rd and finishing on the 24th, would end the Drought of 2008.

(TX-Z251) KENEDY, (TX-Z256) COASTAL WILLACY, (TX-Z257) COASTAL CAMERON

07/23/08 04:30 CST		5.20M	Storm Surge/Tide
07/24/08 07:30 CST		0	

(TX-Z249) JIM HOGG, (TX-Z250) BROOKS, (TX-Z251) KENEDY, (TX-Z252) STARR, (TX-Z253) HIDALGO, (TX-Z254) WILLACY, (TX-Z255) CAMERON, (TX-Z256) COASTAL WILLACY, (TX-Z257) COASTAL CAMERON

07/23/08 07:25 CST		0.66B	Tropical Storm
07/24/08 08:30 CST		0	

(TX-Z256) COASTAL WILLACY, (TX-Z257) COASTAL CAMERON

07/23/08 10:00 CST		0.39B	Hurricane
07/23/08 13:00 CST	4	0	

CAMERON COUNTY --- PORT ISABEL [26.07, -97.20], 5.0 N BAYVIEW [26.20, -97.40], RIO HONDO [26.23, -97.58], COMBES [26.25, -97.73], SANTA ROSA [26.25, -97.83], LA FERIA [26.15, -97.83], SAN BENITO [26.13, -97.63], LOS FRESNOS [26.07, -97.48]

07/23/08 10:45 CST		42.75K	Flash Flood (due to Heavy Rain / Tropical System)
07/24/08 04:00 CST		37.50M	Source: Emergency Manager

A little before noon on the 23rd, the southern and western eyewall of Huricane Dolly began to flare up, with radar data indicating reflectivity above 50 dBZ, which is indicative of blinding torrents of rain. These torrents, falling on top of already heavy rainfall earlier that morning, began to produce high water levels, likely 3 feet or more, starting in Port Isabel, Bayview, and Laguna Vista. Soon after the eyewall intensification, Dolly's center made landfall along the Cameron/Willacy County line, then very slowly edged west through southern Willacy County through the rest of the afternoon and evening, reaching the Hidalgo County line at around 9 PM CDT.

Throughout the afternoon, blinding, torrential rains persisted over northern and eastern Cameron County, and flash flooding of increasingly high water - as high as 5 feet in some places - spread west into Las Yescas, Rio Hondo, Harlingen, Combes, Santa Rosa, San Benito, and La Feria. Most of San Benito was under water at one point during the late afternoon.

Measured and estimated rainfall totals in the flash flood areas from Dolly ranged from 14 to 18 inches, though there was one unconfirmed report of more than 20 inches along the Cameron/Willacy County line north of Rio Hondo. Hundreds of homes sustained some level of inundation, and farmland was inundated across the flood zone as well. High water and general flooding would continue for another day or two, except much longer in backed up drainage areas.

Total property damage from the flooding in Cameron County remains unknown. Insured damages reported from FEMA as of October 1st were estimated to be just under $90 thousand, not including agricultural losses, which are estimated to be much greater. Uninsured damages in locations in the flood zone would likely multiply these values many times over. Note that damage values are split between the initial flash flood and the longer duration "flood". Updates will be provided as more data are received.

WILLACY COUNTY --- SEBASTIAN [26.35, -97.80], 7.0 S LA SARA [26.37, -97.92], LA SARA [26.47, -97.92], 3.0 N RAYMONDVILLE [26.52, -97.78], 1.0 N SAN PERLITA [26.51, -97.65], 2.0 S PORFIRIO [26.37, -97.60]

07/23/08 12:45 CST		14.25K	Flash Flood (due to Heavy Rain / Tropical System)
07/24/08 05:00 CST		50M	Source: Emergency Manager

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details

A little after noon on the 23rd, the first torrents of blinding rains from a flare-up of convection in the southern and western eyewall of Huricane Dolly began heading into southeastern Willacy County. These torrents, falling on top of already heavy rainfall earlier that morning, likely began producing high water levels, likely 3 feet or more, starting near Porfirio. Soon after the eyewall intensification, Dolly's center made landfall along the Cameron/Willacy County line, then very slowly edged west through central and southern Willacy County through the rest of the afternoon and evening, reaching the Hidalgo County line at around 9 PM CDT.

Throughout the afternoon, blinding, torrential rains persisted over south central and eventually southwestern portions of the county, within the inner core of convection immediately west of the center of circulation. Flash flooding of increasingly high water - as high as 5 feet in some places - spread west into Raymondville, Lyford, Sebastian, and La Sara. Parts of Raymondville and Lyford were under differening levels of water during the afternoon and into the evening.

Measured and estimated rainfall totals in the flash flood areas of Willacy County from Dolly ranged from 12 to 18 inches, though there was one unconfirmed report of more than 20 inches along the Cameron/Willacy County line north of Rio Hondo. Dozens of homes likely sustained some level of inundation, and farmland was inundated across the flood zone as well. High water and general flooding would continue for another day or two, except much longer in backed up drainage areas.

Property damage data are based on reported, insured values from the FEMA National Flood Insurance Program. Actual values are likely significantly greater, due to the number of residences and businesses that flooded and were uninsured. Crop damage data is also estimated, and will be adjusted as more accurate data are received. Please note that damage values have been split between the flash flood period, and the more general flood event which followed.

HIDALGO COUNTY --- 3.0 NE EDCOUCH [26.33, -97.94], 4.0 N EDINBURG [26.36, -98.17], 10.0 N SHAYLAND [26.36, -98.28], 10.0 N LA JOYA [26.41, -98.57], 2.0 E SULLIVAN CITY [26.27, -98.52], 2.0 S DONNA [26.14, -98.05], 2.0 SE MERCEDES [26.13, -97.90]

	07/23/08 16:00 CST	28.50K	Flash Flood (due to Heavy Rain / Tropical System)
	07/24/08 06:00 CST	10M	Source: Emergency Manager

Torrential rains from Hurricane Dolly began pelting eastern Hidalgo County around 3 PM CDT on the 23rd, and flash flooding began soon after, probably at around 4 PM CDT in the Edcouch/Elsa/Mercedes area, spreading slowly west during the rest of the afternoon and evening. The initial surge of torrential rains, which pounded these areas until around 7 PM CDT or so, became a more widespread area of moderate to locally heavy rainfall later in the evening and overnight, generally along a stripe of central Hidalgo County, along and just north of Federal Highway 83. As with Cameron and Willacy Counties earlier on the 23rd, the heaviest rains were associated with the western and southern portions of Dolly's circulation, which edged into eastern Hidalgo County by around 9 PM CDT on the 23rd, then eased northwest overnight, reaching the four corners of Jim Hogg, Brooks, Hidalgo, and Starr County at little after 230 AM on the 24th.

The prolonged heavy rains quickly produced high standing water, particularly in poorly draining areas of eastern Hidalgo County by late afternoon of the 23rd, including Mercedes, Elsa, and Edcouch. Residential and business flooding with some areas having at least 3 feet of water, continued through the night. Farther west, including the more populated portions of central Hidalgo County, minor to moderate flash flooding developed later in the evening and overnight, with worst conditions favoring poor drainage locations.

Heaviest measured and estimated rainfall included a swath of 10 inches or more from rural western Hidalgo County through the Hidalgo/Cameron and Hidalgo/Willacy County lines, immediately west and south of Dolly's Center. This included the northern portions of Mission, McAllen, Donna, and Weslaco, as well as Edinburg and Alton. Estimated and measured storm totals of 12 to 16 inches were found from Monte Alto the Edcouch and Elsa; it's possible that more than 16 inches fell near the Willacy/Cameron/Hidalgo County line near Monte Alto.

High standing water, particularly in eastern portions of the county, continued for more than a day after the flash flood; some poor drainage locations near Elsa, Edcouch, and Mercedes would maintain flood conditions for another week or more.

Property damage values are those received on insured properties by the National Flood Insurance Program, and are likely well below the actual damages caused by the flooding, particularly in eastern Hidalgo County. Crop and agricultural damage is based, thus far, on data as of October 3rd from the Texas Agrilife Extension Service, who reported Dolly's flood losses to cotton and sorghum as the "worst agricultural disaster in decades". Updated values will be provided as data are received. Please note that damages have been split between the flash flood period, and the longer, general flood which followed.

CAMERON COUNTY --- 1.5 SSW RUSSELLTON [26.06, -97.59]

	07/23/08 22:14 CST	0	Tornado (EF0, L: 0.10 mi , W: 20 yd)
	07/23/08 22:14 CST	0	Source: Trained Spotter

A brief rope tornado was reported by trained Skywarn spotters near the intersection of State Highway 100 and Federal Highway 77, about 3 miles north of Rancho Viejo. No property damage was reported by local authorities from this event.

CAMERON COUNTY --- PORT ISABEL [26.07, -97.20], 5.0 N BAYVIEW [26.20, -97.40], RIO HONDO [26.23, -97.58], COMBES [26.25, -97.73], SANTA ROSA [26.25, -97.83], LA FERIA [26.15, -97.83], SAN BENITO [26.13, -97.63], LOS FRESNOS [26.07, -97.48]

	07/24/08 04:01 CST	42.75K	Flood (due to Heavy Rain / Tropical System)
	07/28/08 12:00 CST	37.50M	Source: Emergency Manager

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details

The combination of 14 to 18 inches of rain, poor drainage issues, and the overarching fact that the flat, saturated landscape of the Lower Rio Grande River Delta drains very slowly, maintained widespread flood conditions well after the rains ended during the early morning of the 24th. Numerous roads and neighborhoods, particularly across northern Cameron County, remained flooded right through the weekend which followed Dolly's passage. In some areas, where ground drainage mechanisms were exceptionally poor, the flooding persisted into August.

One of these areas included neighborhoods across western Cameron County, including La Feria and Santa Rosa, as well as others from San Benito through Harlingen, Rio Hondo, and extending toward Arroyo City, and continuing in some neighborhoods near Bayview and Laguna Heights.

Total property damage from the flooding in Cameron County remains unknown. Insured damages reported from FEMA as of October 1st were estimated to be just under $90 thousand, not including agricultural losses, which are estimated to be much greater. Uninsured damages in locations in the flood zone would likely multiply these values many times over. Note that damage values are split between the longer duration general flood described here, and the earlier flash flood period. Updates will be provided as more data are received.

WILLACY COUNTY --- SEBASTIAN [26.35, -97.80], 7.0 S LA SARA [26.37, -97.92], LA SARA [26.47, -97.92], 3.0 N RAYMONDVILLE [26.52, -97.78], 1.0 N SAN PERLITA [26.51, -97.65], 2.0 S PORFIRIO [26.37, -97.60]

	07/24/08 05:01 CST	14.25K	Flood (due to Heavy Rain / Tropical System)
	07/28/08 12:00 CST	50M	Source: Emergency Manager

The combination of 14 to 18 inches of rain, poor drainage issues, and the overarching fact that the flat, saturated landscape of the Lower Rio Grande River Delta drains very slowly, maintained widespread flood conditions well after the rains ended during the early morning of the 24th. Numerous roads and neighborhoods, particularly across southern Willacy County, remained flooded right through the weekend which followed Dolly's passage. In some areas, where ground drainage mechanisms were exceptionally poor, the flooding persisted into August.

Some of these areas included neighborhoods in Raymondville, Lyford, La Sara, and Porfirio.

Property damage data are based on reported, insured values from the FEMA National Flood Insurance Program. Actual values are likely significantly greater, due to the number of residences and businesses that flooded and were uninsured. Crop damage data is also estimated, and will be adjusted as more accurate data are received. Please note that damage values have been split between the general flood event listed here, and the flash flood period which preceded it.

HIDALGO COUNTY --- 3.0 NE EDCOUCH [26.33, -97.94], 4.0 N EDINBURG [26.36, -98.17], 10.0 N SHAYLAND [26.36, -98.28], 1.0 N MISSION [26.23, -98.32], 1.0 S DONNA [26.16, -98.05], 2.0 SE MERCEDES [26.13, -97.90]

	07/24/08 06:01 CST	28.50K	Flood (due to Heavy Rain / Tropical System)
	07/28/08 12:00 CST	0.10B	Source: Emergency Manager

The combination of 10 to 16 inches of rain, poor drainage issues, and the overarching fact that the flat, saturated landscape of the Lower Rio Grande River Delta drains very slowly, maintained widespread flood conditions well after the rains ended during the early morning of the 24th. Numerous roads and neighborhoods, particularly across eastern and central Hidalgo County, remained flooded right through the weekend which followed Dolly's passage. In some areas, where ground drainage mechanisms were exceptionally poor, the flooding persisted into August.

Some of these areas included neighborhoods in and near Elsa, Edcouch, and Mercedes, and likely in others farther west from Edinburg to Alton, as well as parts of McAllen as well. Near Mercedes, an employee of the International Boundary and Water Commission (IBWC) reported that a structure which allows the canal to drain into the Arroyo Colorado Floodway collapsed. This created an obstruction so the canal filled up and started flowing back into the adjacent community, exacerbating the ongoing flood. Pumping efforts began over the weekend of the 26th and 27th. Other notorious neighborhoods with poor drainage, particularly in and near Elsa, had continued high water for several weeks after Dolly's passage.

Property damage values are those received on insured properties by the National Flood Insurance Program, and are likely well below the actual damages caused by the flooding, particularly in eastern Hidalgo County. Crop and agricultural damage is based, thus far, on data as of October 3rd from the Texas Agrilife Extension Service, who reported Dolly's flood losses to cotton and sorghum as the "worst agricultural disaster in decades". Updated values will be provided as data are received. Please note that damages have been split between the general flood listed here, and the flash flood period which preceded it.

STARR COUNTY --- LA GLORIA [26.72, -98.52], DELMITA [26.68, -98.42], RINCON [26.52, -98.58], 8.0 N RIO GRANDE CITY [26.50, -98.82], ROMA [26.42, -99.02], 5.0 N ROMA [26.49, -99.02], 8.0 N EL SAUZ [26.70, -98.87]

	07/24/08 06:30 CST	10K	Flash Flood (due to Heavy Rain / Tropical System)
	07/24/08 10:30 CST	50M	Source: Emergency Manager

Storm Data and Unusual Weather Phenomena - July 2008

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details

The slow west, then northwest, movement of Hurricane Dolly through Willacy County during the daylight hours of the 23rd generally kept the heaviest rains from moving into the western Lower Rio Grande Valley. However, overnight on the 23rd, and especially during the morning hours of the 24th, persistent heavy rain bands developed, initially just west and southwest of the immediate center of circulation as it moved into southern Jim Hogg County between 230 and 430 AM, then mainly around and after sunrise in bands stretching from Roma in southwest Starr County northeast toward La Gloria. Arroyos in and near Roma filled quickly, and some minor flash flooding likely resulted from the rainfall, before the rains gradually tapered off toward noon on the 24th.

Measured and estimated rainfall in Starr County, particularly where the likely flooding occurred, 8 to 12 inches occurred, with perhaps a bit more just to the southeast of Falcon Heights and north/northeast of Roma.

Property and Crop damage are currently estimated. Property damage is estimated based on insured damage reports from FEMA's National Flood Insurance Program, but are likely a bit lower than actual damages since most impacted areas were likely insured. Updates will be provided as additional data are received.

Hurricane Dolly, the first storm since Bret (1999) to make landfall along the Deep South Texas barrier islands, left a trail of widespread minor to moderate structural and natural damage across much of the Lower Rio Grande Valley and Deep South Texas on July 23rd, and dumped copious rainfall across the area, causing numerous instances of flooding primarily of low lying and poor drainage locations, as well as filling local resacas and arroyos, and causing notable rises on larger area creeks and rivers. Dolly intensified rapidly to an estimated minimum pressure of 962 mb while drifting northward just east of South Padre Island, and its center made landfall between 1 and 2 PM on July 23rd along the unpopulated shoreline of Cameron and Willacy County. Dolly then eased westward across southern Willacy County through the afternoon, continued into extreme northern Hidalgo County as a tropical storm during the evening, then turned northwest and accelerated through Jim Hogg County during the early morning hours of the 24th, passing into Webb County shortly after sunrise.

The strong winds and heavy rains contributed to widespread power outages in the Lower Rio Grande Valley, where at least 236,000 customers lost power, but possibly upwards of 250,000 - primarily across the more populated regions of Cameron, Hidalgo, and Willacy County. Agricultural experts deemed a substantial loss of cotton and sorghum due to the strong winds and torrential rain. As of the end of Calendar Year 2008, estimated insured property damage (wind) based on the standard doubling of insurance estimates from the Property Claims Service of the Insurance Services Office was $1.05 billion. Reported insured flood damage from FEMA's National Flood Insurance Program is $171 thousand; however, it is estimated that the vast majority of flood damage occurred to uninsured properties, and a rough estimate of total flood damage, which was more widespread, and includes agricultural losses, will likely push total flood-related damages to between $100 and $300 million.

It is conceivable that total damage from all Hurricane Dolly related hazards may have exceeded $1.5 billion.

More than 6,000 Lower Rio Grande Valley residents were housed in temporary shelters from Deep South Texas to San Antonio at the peak of the storm; 13,000 residents across the Lower Rio Grande Valley visited FEMA Disaster Recovery Centers after the storm. As of October 3rd, FEMA had distributed $44 million in relief; $30 million to individual households, nearly $10 million to small businesses through the Small Business Administration, and just under $5 million to local governments for infrastructure repair.

Please note that best estimates will be included on a county by county basis as data is received through the rest of the year.

Storm total rainfall from the evening of July 22nd through the early afternoon of July 24th generally ranged from 4 to 10 inches in Kenedy, Brooks, Starr, Jim Hogg, and Zapata Counties, and 6 to 14 inches in Hidalgo, Willacy, and Cameron Counties, with locally more than 18 inches possible in the persistent southern eyewall in northern Cameron and southern Willacy Counties. Widespread freshwater flooding occurred in these areas as Dolly moved through, and low lying, poor drainage, or areas where drainage systems failed were flooded for days, and in some cases weeks, to come.

The late intensification of Dolly just prior to landfall, combined with a brief northward jog before turning to the west along the Cameron/Willacy County line, limited Gulf storm surge effects across the Town of South Padre Island through mid morning on the 23rd. However, hurricane force west winds whipped an estimated 3 to 4 foot water rise from Laguna Madre across the Town, with water briefly stretching across the Island at the height of the event. The town of Port Mansfield, immediately north of the center, estimated a 4 foot storm surge and 5 foot storm tide.

Interestingly, tides to the north of Dolly's center initially fell to below predicted values on increasing northerly winds, before rising during the late afternoon and evening as the cyclone moved inland, and strong southerly flow piled a storm tide of up to 6 feet above Mean Lower Low Water (MLLW) along the uninhabited Kenedy County shoreline.

There was a single confirmed tornado in Cameron County during the late evening of July 22nd, associated with one of the first outer rain bands. No damage was reported.