

Storm Data and Unusual Weather Phenomena - July 2010

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

CAMERON COUNTY --- 0.6 NE RANCHO VIEJO [26.04, -97.54], 2.0 S VILLA CAVAZOS [25.99, -97.60], 1.3 SSW MAUDLIN ARPT [25.95, -97.54], 1.8 SSW BROWNSVILLE [25.90, -97.51], 2.4 SSE PORTWAY ACRES [25.89, -97.46], 2.3 NW PORT BROWNSVILLE [25.97, -97.45], 2.2 S BAYVIEW [26.10, -97.40], 0.3 NE LAURELES [26.10, -97.50]

07/01/10 00:00 CST	0.50K	Flash Flood (due to Heavy Rain)
07/01/10 01:30 CST	0	Source: Emergency Manager

Widespread urban flooding affected an area from west of Brownsville through Brownsville, Olmito, Los Fresnos, and near Bayview during the afternoon and into the very early morning hours of July 1st (see June report for starting time of event). Much of the flash flooding, where water reached 3 feet or higher or threatened structures, occurred in typically poor drainage locations in all areas.

Total rainfall for the entire event ranged from 8 to near 10 inches in the areas that tended to flood, with an estimated 5 to 7 inches occurring during and just prior to the significant flood impacts. Damage from freshwater flooding directly due to Alex was unknown as of this writing. For the July data, only a very small value is included, as the primary flood impacting rains fell on June 30th.

HIDALGO COUNTY --- 2.2 S MERCEDES OLD REB ARP [26.14, -97.87], 2.2 NW PROGRESO [26.13, -97.99], 1.1 NW DONNA [26.18, -98.06], 2.6 S EDINBURG [26.26, -98.17], 1.1 NNE EDINBURG MUNI ARPT [26.31, -98.19], 1.0 SE LA VILLA [26.29, -97.91]

07/01/10 00:00 CST	0.50K	Flash Flood (due to Heavy Rain)
07/01/10 01:30 CST	0	Source: Emergency Manager

Widespread urban and poor drainage flooding affected an area from Mercedes and Weslaco northwest to Edinburg, likely including known flood problem areas in Elsa, Edcouch, La Villa, and other places where drainage remained an issue nearly two years after Dolly. The flooding began toward sunset after more persistent heavy rains arrived in the area, and continued into the very early morning hours of July 1st (see June report for start times). Much of the flash flooding, where water reached 3 feet or higher or threatened structures, occurred in these typically poor drainage locations in all areas.

Total rainfall for the entire event ranged from 8 to near 10 inches in the areas that tended to flood, with an estimated 4 to 7 inches occurring during and just prior to the significant flood impacts. Damage from freshwater flooding directly due to Alex was unknown as of this writing. The primary estimate is shown in the June report.

Residual rains from the last feeder bands associated with Hurricane Alex continued to maintain local freshwater flood conditions across portions of the Lower Rio Grande Valley into the post-midnight hours. Road closures from residual high water would continue for a few hours after the rains ended, and conditions would begin drying quickly soon after daybreak on the 1st.

Note: Damage values are set close to zero, as the main damage occurred during the earlier flooding during the afternoon and evening of June 30th.

JIM HOGG COUNTY --- 2.0 SSE HEBBRONVILLE [27.29, -98.67], 0.2 SW HEBBRONVILLE [27.32, -98.68]

07/02/10 16:09 CST	1.50M	Tornado (EF1, L: 1.90 mi , W: 100 yd)
07/02/10 16:15 CST	0	Source: NWS Storm Survey

A tornado was reported in the Hebbronville area by the border patrol and public.

A tornado touched down in the Hebbronville area just after 5 pm, flipping a tractor trailer, uprooting trees, snapping large limbs, and causing a gas leak. The tornado knocked out power to at least 1762 AEP Power customers, more than half of the town. The tornado formed along a remnant shear axis left behind after Hurricane Alex dissipated in Mexico. The elevated humidity levels combined with daytime heating and low to mid level turbulence likely contributed to the development of the tornado producing thunderstorm.

A preliminary assessment of damages in Hebbronville indicated areas of EF-1 (85 to 105 mph) winds. The EF-1 damages occurred in the central and southeast areas of Hebbronville into the center of town, EF-0 damages occurred from the center of town to areas northwest of town which included areas around Hebbronville High School.

The tornado formed to the southeast of Hebbronville between 450 and 5 pm. The tornado crossed State Highway 285 about 1/2 mile east of the intersection with State Highway 16, and entered a Texas Department of Transportation maintenance yard, tearing a section off a roof and collapsing a section of a metal parking area. It continued to the north northwest into a residential area, taking the roof off one modular home, snapping several power poles, rolling a mobile home onto its roof, and damaging numerous mesquite trees. The tornado continued moving northwest toward downtown and knocked down numerous power lines, then struck a grocery store and blew a billboard onto a few parked cars. A loaded tractor trailer was rolled onto its roof and against the grocery store. The tornado then moved north northwest, causing lesser tree damage along Maria and Frans Avenues. The weakening tornado crossed over a school, with no notable damage. It then moved by Hebbronville High School's Gruy stadium, bending a goalpost and knocking over some fencing around tennis courts just west of the school campus. The tornado then lifted, with no damage noted beyond this location.

Considerable damage was rated EF-1 from the southeast side of Hebbronville until reaching downtown, with wind speeds of 90 to 100 mph. EF-0 damage (below 85 mph) was seen from northwest of downtown to the area around the high school.

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Scattered thunderstorms, developing in the residual shear zone left behind by Hurricane Alex more than a day earlier, produced additional rainfall across the Upper Valley and Brush Country of Deep South Texas on July 2nd. One of these storms strengthened over northern Jim Hogg County into southern Duval County, and fed on the low level rotation to generate a mini-supercell which quickly dropped a tornado in Hebbronville.

Damage was sufficient to allow the area to be placed into the Federal Disaster Declaration area, lumped in with flood/river flood damage near and along the Rio Grande.



Tornado touchdown over Hebbronville, TX (Jim Hogg County), a little after 5 PM July 2nd, 2010.

(TX-Z257) COASTAL CAMERON

07/04/10 11:00 CST	2	0	Rip Current
07/04/10 16:00 CST		0	

Direct Fatalities: M21IW, M24IW

Two young men became caught in a moderate longshore swell or rip current near Public Beach Access Point #2 on South Padre Island on July 4th. One of the men drowned, and the other was rescued but in critical condition and unconscious at the time. The second man would perish four days later after life support was removed due to brain death.

Residual swells several days in the wake of Hurricane Alex may have contributed to the potential for deadly rip or long shore currents.

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STARR COUNTY --- 1.1 NNE GRULLA [26.28, -98.64], 3.1 NE ESCOBARES [26.45, -98.94]				
	07/06/10 15:45 CST		0	Heavy Rain
	07/06/10 18:00 CST		0	Source: Unknown

Repeating thunderstorm cells dropped locally heavy rainfall, causing nuisance urban type flooding near Rio Grande City during the late afternoon of July 6th. The cooperative station at Rio Grande City recorded 1.1 inches of rain but radar estimated heavier rains of 3 inches or more from just north of La Grulla to a few miles north of Escobares.

A cluster of thunderstorms produced radar estimated 3 or more inches of rain across the highway 83 corridor of south central Starr County during the late afternoon of July 6th. No reports of flash flooding were received from the area; river flooding on the Rio Grande would begin a few days later.

CAMERON COUNTY --- (BRO)BROWNSVILLE ARP [25.92, -97.42], 0.1 W BLUETOWN [26.07, -97.82]				
	07/08/10 09:30 CST		0	Heavy Rain
	07/08/10 11:30 CST		0	Source: ASOS

Heavy rains of 1 to locally 3 or more inches fell roughly between Brownsville and the southwest corner of Cameron County during the mid morning of July 8th as weak Tropical Depression #2 made landfall along the Lower Texas coast. Rainfall of more than 3 inches was recorded at Brownsville/South Padre Island International Airport over the course of two days, with 1.71 inches falling on the 8th. Minor, nuisance urban-type flooding was reported in southern Cameron County as the rains moved through.

An area of torrential rains fell for a few hours, mainly along and just north of the Rio Grande, during the mid to late morning of July 8th as Tropical Depression #2 accelerated onto the Lower Texas coast on South Padre Island at around 915 AM CDT. Overall rainfall across the Rio Grande Valley ranged from one half to more than 3 inches; heaviest rains of 2 to 3 inches fell in a band from southern Cameron County northwest through extreme eastern Hidalgo County.

STARR COUNTY --- 0.5 W FALCON HGTS [26.55, -99.14], 1.1 WNW LOS SAENZ [26.40, -99.02], 1.1 ENE ROSITA [26.40, -98.90], 0.5 SE RIO GRANDE CITY [26.38, -98.81], 1.9 NE RATCLIFF [26.27, -98.60], 2.2 SSW RATCLIFF [26.22, -98.63], 2.8 S FRONTON [26.38, -99.08], 1.8 NNW CHAPENA [26.55, -99.18]				
	07/08/10 13:20 CST		37M	Flood (due to Planned Dam Release)
	07/31/10 23:59 CST		0.50M	Source: River/Stream Gage

Incredible rainfall estimated to be more than 50 inches in around 10 days' time between June 30th and July 9th across the front range and peaks of the Sierra Madre Oriental in Coahuila Province, Mexico, ultimately flowed through the entire Lower Rio Grande basin for much of the summer of 2010. The rare and extreme event rapidly produced major flooding along the river in Starr County, the result of planned dam releases from Falcon International Reservoir, which lasted for nearly a month, beginning on July 9th and continuing through August 3rd.

Releases of water from reservoirs behind dams on both sides of the border began soon after the heaviest rains from Alex ended. On July 4th, releases began at the Marte R. Gomez Reservoir, flowing into Mexican Floodways but also toward the Rio Grande bordering Starr and western Hidalgo County. On July 5th, water levels had increased sufficiently at Amistad Dam, located much farther upstream near Del Rio, Texas, to begin releases down the river. By the 7th, with waters from Amistad having created major flooding in and near Laredo, Falcon Reservoir, located along the Rio Grande including Starr and Zapata County, began releasing water.

The initial rate of 15,000 cubic feet per second (cfs) was initially within capacity of the United States side of the flood control system, and the expectation for a potentially critical flood area between Falcon and Anzalduas Reservoir just upstream from Mission (Hidalgo County) was high water, but little if any flooding. That would quickly change on July 8th, when releases from Falcon Dam were more than doubled to 39,700 cfs (1125 cubic meters per second, cms). Soon after these releases were increased, the river quickly rose from just above flood stage (50 feet) at Rio Grande City to above major flood stage (53 feet) on July 9th. The time it took to rise from flood stage (1320 CST July 8th) to above major flood (630 AM July 9th) was a little more than 17 hours.

By July 14th, outflow from Falcon Dam was raised to 60,000 cfs (1700 cms) in order to relieve pressure on the dam from the reservoir pool, which had risen steadily above conservation stage of 301.2 feet at 822 AM CST July 12th. This release rate would both raise and swell the Rio Grande downstream; reports from local emergency management noted the river up to 2 miles wide in some spots. Prior to the peak outflow, the river crested at 57.63 feet at 6 AM July 11th, the second highest level ever recorded. A secondary peak occurred five days later - 57.31 feet at 4 PM CST July 16th.

All this water would continue to remain high and spread, and hundreds, of structures were impacted during the event. The city of La Grulla was under mandatory evacuation by July 15th as increasing water levels and currents threatened more of the community than earlier in the week; these orders would continue until July 22nd when the waters began to recede slowly. As a precautionary measure in the city of Roma, three small subdivisions located in the low lying areas and along the bank just south of the Port of Entry were placed under mandatory evacuation. These included De La Cruz sub-division about (20 to 25 homes), Campo Verde (4 homes), and Garza sub-division (1 home). By July 22nd, the flooding in Starr County had impacted 178 homes/businesses, including 65 in La Grulla and 39 in Roma. 166 families required temporary housing. Preliminary damages to highways and bridges in Starr County was at \$19 million; preliminary public and private property estimates were listed at an additional \$18 million. Agricultural damage was also notable in flooded areas. Full accounting of both crop and property damage will be available during autumn, 2010.

Torrential rainfall from Hurricane Alex and remains, followed by daily peltings of rain across the front range of the Sierra Madre Oriental,

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and concluding with the remnants of Tropical Depression Number 2 dropped perhaps 50 or more inches of rain across Coahuila Province, Mexico, which flowed steadily through 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. Severe flooding in Monterrey, Nuevo Leon, México from June 30th through July 2nd, from an estimated 30 inches of rain in this area was a portent of future impacts on the Rio Grande during the weeks to come.

Releases of water from reservoirs behind dams on both sides of the border began soon after the heaviest rains from Alex ended. On July 4th, releases began at the Marte R. Gomez Reservoir, flowing into Mexican Floodways but also toward the Rio Grande bordering Starr and western Hidalgo County. On July 5th, water levels had increased sufficiently at Amistad Dam, located much farther upstream near Del Rio, Texas, to begin releases down the river. By the 7th, with waters from Amistad having created major flooding in and near Laredo, Falcon Reservoir, located along the Rio Grande including Starr and Zapata County, began releasing water. The initial rate of 15,000 cubic feet per second (cfs) was initially within capacity of the United States side of the flood control system, and the expectation for a potentially critical flood area between Falcon and Anzalduas Reservoir just upstream from Mission (Hidalgo County) was high water, but little if any flooding.

That would quickly change on July 8th, when releases from Falcon Dam were more than doubled to 39,700 cfs (1125 cubic meters per second, cms). Soon after, the river surged to major flood levels in Starr and extreme western Hidalgo County, where the river widened significantly and flooded rangeland, as well as several small communities along its banks, during the weekend of July 10th and 11th. By July 14th, outflow from Falcon Dam was raised to 60,000 cfs (1700 cms) in order to relieve pressure on the dam from the reservoir pool, which had risen steadily above flood stage of 301.2 feet during the morning of July 12th . This release rate would continue until July 27th, followed by gradually reduced rates over the next several days. By August 2nd, releases were brought down to 30,000 cfs.

In all, major flooding continued for nearly a month, starting at 730 AM CDT on July 9th and continuing through August 3rd! Flood conditions (50 feet or higher) continued a few days beyond, with levels dropping below flood stage on August 10th at 330 am CDT. In total, the river was in flood at Rio Grande City, and at points immediately upstream in Starr County, from the afternoon of July 8th through the early morning of August 10th, 33 days in total!

A number of small communities along the Rio Grande west of the Lower Rio Grande Valley Flood Control System were impacted by the now sprawling river for most of July, soon after the large releases began at Falcon International Reservoir. These included locations from Starr County immediately downstream of the dam, extending along the river to the Hidalgo County line. Voluntary and mandatory evacuations were ordered for a number of threatened communities; as of this writing, no fatalities had been reported directly from the high waters. There were dozens of water rescues on the river through the period, many of them transmigrants attempting to cross from Mexico into Texas.

On August 3rd, President Obama declared most counties in the Rio Grande Valley a Major Disaster, eligible for federal funding to assist with the longer term recovery. Deep South Texas Counties included Starr and Zapata (due to flooding). Property and Crop damages from the flood in Starr and Zapata Counties will ultimately total over \$50 million when all assessments are completed. As of July 29th, property damage estimates in Starr County had reached \$37 million; additional property damage values had not been received from Zapata County. Crops planted in flood zones were destroyed by the long duration of nutrient rich waters. As of September 17th, FEMA had approved more than \$8.3 million in state and federal grants for Texans affected by the flooding. The value will likely rise as assessments continue across Starr, Zapata and Webb County, which will likely take most of the disbursements.

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Flooding along the Rio Grande Between Starr County, TX, and Tamaulipas State in northeastern Mexico. Photo courtesy of Starr County Emergency Management

HIDALGO COUNTY --- 0.8 WSW CARRIZELOS [26.27, -98.58], 0.8 ESE HAVANA [26.24, -98.51], 0.6 NW LA TOYA [26.24, -98.48], 0.4 ESE PENITAS [26.23, -98.44], 2.8 S LA TOYA [26.19, -98.47], 0.9 SSE SAM FORDYCE [26.22, -98.54], 2.8 W SAM FORDYCE [26.23, -98.59]				
	07/09/10 06:30 CST		6.45M	Flood (due to Planned Dam Release)
	07/31/10 23:59 CST		1.50M	Source: Emergency Manager

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<p>Incredible rainfall estimated to be more than 50 inches in around 10 days' time between June 30th and July 9th across the front range and peaks of the Sierra Madre Oriental in Coahuila Province, Mexico, ultimately flowed through the entire Lower Rio Grande basin for much of the summer of 2010.</p> <p>The rare and extreme event rapidly produced major flooding along the river in southwest Hidalgo County, the result of planned dam releases from Falcon International Reservoir. River flooding likely began along the banks of the Rio Grande in Hidalgo County less than 18 hours after flooding began at river side locations in Starr County. Affected communities included Cuevitas, Havana, and the south portions of La Joya and Penitas - locations not protected by the Lower Rio Grande Valley Flood Control Project levee system. The city of Los Ebanos, surrounded on three sides by the river, was most impacted by the flood, which was well over a mile wide for several weeks. Significant flooding continued into the first days of August.</p> <p>Mandatory evacuations were initiated on July 12th for Los Ebanos, in the southwest corner of the County; the evacuation level was reduced to voluntary on July 20th. The early evacuations proved fateful, as pressure on a retention pond dike caused it to rupture, spilling water into some neighborhoods and forcing most residents to leave the area. Additional impacts were noted between Los Ebanos and the Anzalduas Diversion Dam, where several residences and roadways were threatened prior to the levee south of Mission.</p> <p>In all, hundreds of structures, as well as paved and unpaved roads, were damaged significantly by the long duration flood. Most of these were in Los Ebanos, but others were along or south of Military Highway between Cuevitas and the south portion of Penitas. Five homes were evacuated near Military Road in Havana where the river flooded them. Damage to property was estimated to be at least \$5 million, with additional damage to crops in southwestern Hidalgo County.</p> <p>Note: Total value of irrigated and non irrigated dryland crop (sorghum, corn, and cotton) was not available for locations west of Anzalduas; an early estimate of \$1.5 million between Los Ebanos and Penitas will be updated as information arrives.</p>				
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<p>HIDALGO COUNTY --- 0.3 SE PENITAS [26.23, -98.45], 0.5 WSW CHIHUAHUA [26.22, -98.43], 0.5 NNE ABRAM [26.21, -98.42], 2.5 ESE ABRAM [26.18, -98.39], 0.2 NW MADERO [26.17, -98.33], 1.6 NNW GRANJENO [26.15, -98.31], 2.7 SSW MADERO [26.13, -98.34], 2.0 WSW ABRAM [26.19, -98.45]</p>				
	07/10/10 06:30 CST		6.40M	Flood (due to Planned Dam Release)
	07/31/10 23:59 CST		0.50M	Source: Emergency Manager

Incredible rainfall estimated to be more than 50 inches in around 10 days' time between June 30th and July 9th across the front range and peaks of the Sierra Madre Oriental in Coahuila Province, Mexico, ultimately flowed through the entire Lower Rio Grande basin for much of the summer of 2010.

The rare and extreme event rapidly produced major flooding along the river in southwest Hidalgo County, the result of planned dam releases from Falcon International Reservoir. River flooding likely continued spreading southeast into the area that begins the improved levee system of the Lower Rio Grande Valley Flood Control Project, south of Penitas and extending to Anzalduas Diversion Dam where the system of floodways (spillways) begins. While the levees protected most property behind them, a number of structures built inside the levees suffered significant and costly water damage, from Penitas to south of Granjeno.

The structures included the popular river front Chimney Park RV Resort, which had more than 3 feet of water cover half of the land and property; Pepe's on the River Bar and Grill and the Riverside Club, favorite haunts for Winter Texans and local residents alike which provide river views but unfortunately were covered by feet of mud after the flood waters subsided. A sugar grower reported \$450 thousand in losses of 300 acres of crop on land south of Mission. Dryland/irrigated dryland crops such as cotton, corn, and sorghum may have suffered some loss but values were unknown as of this writing; an estimate of \$500 thousand will be used until additional data arrive.

Property damage likely exceeded \$5 million in these areas alone.

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<p>HIDALGO COUNTY --- 2.3 ENE PROGRESO [26.11, -97.94], 4.4 NNW MERCEDES OLD REB ARP [26.23, -97.89], 3.1 ENE LA VILLA [26.32, -97.88], 0.9 NNE LA VILLA [26.31, -97.91], 1.6 WSW MERCEDES [26.14, -97.94], 1.5 NW GRANJENO [26.14, -98.32], 2.5 ENE HIDALGO [26.12, -98.23], 5.6 SSW DONNA [26.09, -98.07]</p>				
	07/12/10 06:30 CST		6.45M	Flood (due to Planned Dam Release)
	07/31/10 23:59 CST		13M	Source: Emergency Manager

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<p>Incredible rainfall estimated to be more than 50 inches in around 10 days' time between June 30th and July 9th across the front range and peaks of the Sierra Madre Oriental in Coahuila Province, Mexico, ultimately flowed through the entire Lower Rio Grande basin for much of the summer of 2010.</p> <p>Nearly a month of dam releases from Falcon International Reservoir at 60,000 cfs ultimately required water to be diverted at Anzalduas Dam (southwest of Granjeno) into Mexico and the U.S. Floodway system, which includes the Banker Floodway (from near Granjeno to just south of Pharr), the Main Floodway (from just south of Pharr to the "split" at the Arroyo Colorado just southwest of Mercedes, the Arroyo Colorado itself, and the North Floodway, which extends from near Mercedes to near La Villa before curving east to northwest Cameron County.</p> <p>These floodways, protected by a robust system of levees and gates, protected communities outside of the levees by containing up to 50%, or 4 to 8 to feet of fast flowing water, within them. Unfortunately, a number of residences, dozens of paved and unpaved roads with low water bridges, and some agriculture are located within the floodways; significant damage was noted in several locations. Pumping and plugging operations near Weslaco and La Villa successfully kept high water out of poor drainage locations where the potential for freshwater flooding due to heavy rains would have been exacerbated with periodic thunderstorms, which only came once (July 26th). Closed roads included FM 493 and FM 1015, each moderately traveled; at least five homes were flooded along the Main Floodway south of Pharr along "I" Road; 15 to 20 homes were asked to voluntarily evacuate, and at least two other residences were flooded south of Weslaco near FM 88. Floodwaters also submerged portions of the Llano Grande golf course in Mercedes.</p> <p>High flowing water along the river covered a large portion of the Lower Rio Grande Valley National Wildlife Refuge (Santa Ana) south and southeast of Pharr, including a number of unpaved roads. Damage to the roads was unknown at this time; the flooding occurred downstream of the Anzalduas Diversion Dam; river gages downstream at San Benito and Brownsville remained in action stage. Floodwaters did not reach public or private structures, nor roadways, between the Refuge and the Main Floodway.</p> <p>Nearly \$5.2 million in lost dryland/irrigated crop yield was lost in and near the Floodway system in Hidalgo County. One of the grain losses was \$50 thousand, including 170 acres of unharvested land in the Main Floodway south of Donna. Several other crops such as cotton, corn, and citrus were destroyed by the flood along the Main and North Floodways. For cotton, a little over \$1 million was destroyed; for corn, a little over \$500 thousand was destroyed, and for sorghum, more than \$3.5 million was lost. The cost for re-leveling damaged cropland in and near the Hidalgo County portion of the floodway was \$7.5 million.</p> <p>Other property and infrastructure damage likely exceeded \$5 million in and near the Floodway.</p>				
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<p>CAMERON COUNTY --- 5.0 NNW SANTA ROSA [26.32, -97.86], 4.5 N SANTA ROSA [26.31, -97.82], 5.1 NNE SANTA ROSA [26.32, -97.81], 5.5 NNW COMBES [26.33, -97.75], 6.4 NNE COMBES [26.33, -97.68], 5.6 NW FERNANDO [26.33, -97.63], 4.0 NNE COMBES [26.31, -97.72], 3.8 N SANTA ROSA [26.30, -97.82]</p>				
	07/13/10 06:30 CST		0.10M	Flood (due to Planned Dam Release)
	07/31/10 23:59 CST		0.10M	Source: Emergency Manager
<p>Incredible rainfall estimated to be more than 50 inches in around 10 days' time between June 30th and July 9th across the front range and peaks of the Sierra Madre Oriental in Coahuila Province, Mexico, ultimately flowed through the entire Lower Rio Grande basin for much of the summer of 2010.</p> <p>Nearly a month of dam releases from Falcon International Reservoir at 60,000 cfs ultimately required water to be diverted at Anzalduas Dam (southwest of Granjeno) into Mexico and the U.S. Floodway system, which includes the North Floodway which curves east across northwest Cameron County just south of Sebastian.</p> <p>These floodways, protected by a robust system of levees and gates, protected communities outside of the levees by containing up to 50%, or 4 to 8 to feet, of fast flowing water, within them. In Cameron County, there were no reports of structural damage as the North Floodway tracks in largely uninhabited country. However, several paved and unpaved roads were flooded inside the levees, including the Federal Highway 77 (Expressway) frontage road (the Expressway was well above the water level), County Road 506, and FM 1425 (along the Cameron/Hidalgo County line)</p> <p>Crops may have been destroyed by the flood along North Floodways, but damage in northwest Cameron County was unknown as of this writing. Infrastructure damage to roads and low water bridges may have exceeded [\$x] thousand in northwestern Cameron County.</p>				
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<p>WILLACY COUNTY --- 6.9 ESE SEBASTIAN [26.32, -97.69], 6.7 S WILLAMAR [26.33, -97.68], 0.5 WSW SANTA MONICA [26.37, -97.59], 4.1 ENE SANTA MONICA [26.39, -97.52], 4.2 E SANTA MONICA [26.37, -97.51], 4.7 SW SANTA MONICA [26.33, -97.64]</p>				
	07/13/10 06:30 CST		50K	Flood (due to Planned Dam Release)
	07/31/10 23:59 CST		0.10M	Source: Emergency Manager

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Incredible rainfall estimated to be more than 50 inches in around 10 days' time between June 30th and July 9th across the front range and peaks of the Sierra Madre Oriental in Coahuila Province, Mexico, ultimately flowed through the entire Lower Rio Grande basin for much of the summer of 2010.

Nearly a month of dam releases from Falcon International Reservoir at 60,000 cfs ultimately required water to be diverted at Anzalduas Dam (southwest of Granjeno) into Mexico and the U.S. Floodway system, which includes the North Floodway which curves east across southeastern Willacy County between Sebastian and Santa Monica.

These floodways, protected by a robust system of levees and gates, protected communities outside of the levees by containing up to 50%, or 4 to 8 to feet, of fast flowing water, within them. In Willacy County, there were no reports of structural damage. However, FM 507 and FM 1420, as well as several paved and unpaved county roads, were closed at low water crossings inside the levee. On July 17th, a leaky levee valve required pumping water away from homes just east of FM 1420 immediately north of the Levee Road near Santa Monica.

Crops may have been destroyed by the flood along North Floodway, but damage in the Willacy County portion was unknown as of this writing. Infrastructure damage to roads and low water bridges may have exceeded [x] thousand in southeastern Willacy County.

Torrential rainfall from Hurricane Alex and remains, followed by daily peltings of rain across the front range of the Sierra Madre Oriental, and concluding with the remnants of Tropical Depression Number 2 dropped perhaps 50 or more inches of rain across Coahuila Province, Mexico, which flowed steadily through 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. Severe flooding in Monterrey, Nuevo Leon, México from June 30th through July 2nd, from an estimated 30 inches of rain in this area was a portent of future impacts on the Rio Grande during the weeks to come.

Releases of water from reservoirs behind dams on both sides of the border began soon after the heaviest rains from Alex ended. On July 4th, releases began at the Marte R. Gomez Reservoir, flowing into Mexican Floodways but also toward the Rio Grande bordering Starr and western Hidalgo County. On July 5th, water levels had increased sufficiently at Amistad Dam, located much farther upstream near Del Rio, Texas, to begin releases down the river. By the 7th, with waters from Amistad having created major flooding in and near Laredo, Falcon Reservoir, located along the Rio Grande including Starr and Zapata County, began releasing water. The initial rate of 15,000 cubic feet per second (cfs) was initially within capacity of the United States side of the flood control system, and the expectation for a potentially critical flood area between Falcon and Anzalduas Reservoir just upstream from Mission (Hidalgo County) was high water, but little if any flooding.

That would quickly change on July 8th, when releases from Falcon Dam were more than doubled to 39,700 cfs (1125 cubic meters per second, cms). Soon after, the river surged to major flood levels in Starr and extreme southwestern Hidalgo County, where the river widened significantly and flooded rangeland, as well as several small communities along its banks, during the weekend of July 10th and 11th. By July 14th, outflow from Falcon Dam was raised to 60,000 cfs (1700 cms) in order to relieve pressure on the dam from the reservoir pool, which had risen steadily above flood stage of 301.2 feet during the morning of July 12th. This release rate would continue until July 27th, followed by gradually reduced rates over the next several days. By August 2nd, releases were brought down to 30,000 cfs.

Major flooding continued for nearly a month at Rio Grande City - and by proxy, southwest Hidalgo County - starting on July 9th and continuing through August 3rd! Flood conditions (50 feet or higher) continued a few days beyond, with levels dropping below flood stage on August 10th. In total, the river was likely in flood at points downstream in southwest Hidalgo County, from the morning of July 9th through at least August 10th - more than month.

A number of small communities along the Rio Grande west of the Lower Rio Grande Valley Flood Control System were impacted by the sprawling river for most of July, soon after the large releases began at Falcon International Reservoir. These included locations in southwest Hidalgo County. The system of levees and floodways (spillways) downstream of Penitas (where improved levees begin along the river itself) largely worked as designed, containing and diverting water along the river and associated floodways extending through southern and eastern Hidalgo County into extreme northern Cameron and extreme southern Willacy County. However, additional water damage occurred to properties built inside the levees and floodways. Voluntary and mandatory evacuations were ordered for a number of threatened communities; as of this writing, no fatalities had been reported directly from the high waters. There were dozens of water rescues on the river through the period, many of them trans migrants attempting to cross from Mexico into Texas.

On August 3rd, President Obama declared most counties in the Rio Grande Valley a Major Disaster, eligible for federal funding to assist with the longer term recovery. Deep South Texas Counties included Cameron and Hidalgo.

Property and Crop damages from the flood may ultimately total well over \$50 million when all assessments are completed. As of the end of July, private and public property damage estimates in Hidalgo County had reached more than \$19 million. Crops planted in flood zones were destroyed by the long duration of nutrient rich waters; in addition to countywide lost yields due to Alex's heavy rainfall (\$10 million), an additional \$5.2 million was lost in sorghum, cotton, and corn production along the Hidalgo portion of the floodway system, with another \$7.5 million required to re-grade the damaged agricultural infrastructure. Perhaps another \$2 million was lost to crops along and near unimproved levee/no levee areas west of Anzalduas; data on these areas were still being processed as of this writing.

Storm Data and Unusual Weather Phenomena - July 2010

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details
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Flooding on the Rio Grande, extreme southwestern Hidalgo County between Los Ebanos and Penitas (unimproved river banks), July 9th, 2010. Photo courtesy of Hidalgo County Emergency Management

ZAPATA COUNTY --- 1.2 WSW ZAPATA ARPT [26.88, -99.30], 3.2 NE ZAPATA [26.93, -99.20], 2.5 SE ZAPATA [26.87, -99.21], 3.8 NNW LOPENO [26.77, -99.13], 3.0 NW FALCON [26.66, -99.12], 3.2 SW FALCON [26.60, -99.12], 4.0 SE FALCON RES SOUTH [26.59, -99.15]		
	07/14/10 04:00 CST	1M
	07/24/10 08:00 CST	25K
		Flood (due to Planned Dam Release)
		Source: Emergency Manager

Storm Data and Unusual Weather Phenomena - July 2010

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details
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Incredible rainfall estimated to be more than 50 inches in around 10 days' time between June 30th and July 9th across the front range and peaks of the Sierra Madre Oriental in Coahuila Province, Mexico, ultimately flowed through the entire Lower Rio Grande basin for much of the summer of 2010. The rare and extreme event ultimately led to increasing water levels at both Amistad International Reservoir (northwest of Del Rio, TX) and Falcon International Reservoir (adjacent to Zapata County), the result of inflow from Mexican tributaries and upstream reservoirs along the Rio Salado and Rio Conchos in Nuevo Leon and Coahuila State, Mexico.

At Falcon International Reservoir, where inflow from both the upstream Mexican tributaries and Amistad International Reservoir, which had begun releases of 35,000 cubic feet per second (cfs) on July 5th, the pool level rose above conservation stage (301.2 feet) during the morning of July 12th, and would continue a steady rise, reaching "moderate" flood stage (306.7 feet, the point where impacts begin along the shoreline) during the pre-dawn hours of July 14th. Despite an increase in releases from 39,700 cfs to 60,000 cfs from the Reservoir, the pool level continued to rise, peaking at a new record stage of 309.31 feet during the evening of July 17th. The continued high pool level required maintaining releases of 60,000 cubic feet per second for nearly 14 consecutive days, in order to maintain a manageable water level at the dam. At Falcon, the previous record of 308.1 feet (set in October, 1958) was not only broken, but the pool level remained above the prior record for nearly 7 full days, from around 130 AM CDT on July 15th through 930 PM on July 22nd. The pool level was above conservation level (301.2 feet) from the morning of July 12th through 4 PM on August 13th, more than a month.

Releases were gradually lowered toward the end of the month as the pool level began to fall more steadily heading into early August.

During the period of time when the reservoir was in "moderate" flood, or above 306.7 feet, structures and infrastructure was impacted along the shoreline. At least 33 homes had some level of water incursion; damages were still being assessed as of this writing. Lakefront roads were under some water for weeks as well. Individual damage reports included an estimated \$35.5 thousand to water pumps and related equipment. Business losses also mounted at the Reservoir, where bass fishing is popular. At least \$15.3 thousand in losses was reported at Falcon State Park.

As of late September, a best estimate for property and infrastructure damage in Zapata County was at least \$1 million; more is likely when the assessments are completed in autumn 2010.

Torrential rainfall from Hurricane Alex and remains, followed by daily peltings of rain across the front range of the Sierra Madre Oriental, and concluding with the remnants of Tropical Depression Number 2 dropped perhaps 50 or more inches of rain across Coahuila Province, Mexico, which flowed steadily through 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. Severe flooding in Monterrey, Nuevo Leon, México from June 30th through July 2nd, from an estimated 30 inches of rain in this area was a portent of future impacts on the Rio Grande during the weeks to come.

Releases of water from reservoirs behind dams on both sides of the border began soon after the heaviest rains from Alex ended. On July 4th, releases began at the Marte R. Gomez Reservoir, flowing into Mexican Floodways but also toward the Rio Grande bordering Starr and western Hidalgo County. On July 5th, water levels had increased sufficiently at Amistad Dam, located much farther upstream near Del Rio, Texas, to begin releases down the river. By the 7th, with waters from Amistad having created major flooding in and near Laredo, Falcon Reservoir, located along the Rio Grande including Starr and Zapata County, began releasing water. The initial rate of 15,000 cubic feet per second (cfs) was initially within capacity of the United States side of the flood control system, and the expectation for a potentially critical flood area between Falcon and Anzalduas Reservoir just upstream from Mission (Hidalgo County) was high water, but little if any flooding.

That would quickly change on July 8th, when releases from Falcon Dam were more than doubled to 39,700 cfs (1125 cubic meters per second, cms). Soon after, the river surged to major flood levels in Starr and extreme western Hidalgo County, where the river widened significantly and flooded rangeland, as well as several small communities along its banks, during the weekend of July 10th and 11th. By July 14th, outflow from Falcon Dam was raised to 60,000 cfs (1700 cms) in order to relieve pressure on the dam from the reservoir pool, which had risen steadily above flood stage of 301.2 feet during the morning of July 12th. This release rate would continue until July 27th, followed by gradually reduced rates over the next several days. By August 2nd, releases were brought down to 30,000 cfs.

In all, major flooding continued for nearly a month, starting at 730 AM CDT on July 9th and continuing through August 3rd! Flood conditions (50 feet or higher) continued a few days beyond, with levels dropping below flood stage on August 10th at 330 am CDT. In total, the river was in flood at Rio Grande City, and at points immediately upstream in Starr County, from the afternoon of July 8th through the early morning of August 10th, 33 days in total!

A number of small communities along the Rio Grande west of the Lower Rio Grande Valley Flood Control System were impacted by the now sprawling river for most of July, soon after the large releases began at Falcon International Reservoir. These included locations from Starr County immediately downstream of the dam, extending along the river to the Hidalgo County line. Voluntary and mandatory evacuations were ordered for a number of threatened communities; as of this writing, no fatalities had been reported directly from the high waters. There were dozens of water rescues on the river through the period, many of them transmigrants attempting to cross from Mexico into Texas.

On August 3rd, President Obama declared most counties in the Rio Grande Valley a Major Disaster, eligible for federal funding to assist with the longer term recovery. Deep South Texas Counties included Starr and Zapata (due to flooding). Property and Crop damages from the flood in Starr and Zapata Counties will ultimately total over \$50 million when all assessments are completed. As of July 29th, property damage estimates in Starr County had reached \$37 million; additional property damage values had not been received from Zapata County. Crops planted in flood zones were destroyed by the long duration of nutrient rich waters. As of September 17th, FEMA

Storm Data and Unusual Weather Phenomena - July 2010

Location	Date/Time	Deaths & Injuries	Property & Crop Dmg	Event Type and Details
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had approved more than \$8.3 million in state and federal grants for Texans affected by the flooding. The value will likely rise as assessments continue across Starr, Zapata and Webb County, which will likely take most of the disbursements.

(TX-Z257) COASTAL CAMERON

07/14/10 15:00 CST	1	0	Rip Current
07/14/10 15:30 CST		0	

Direct Fatalities: M22IW

High seas, swells, and surf, produced by persistent southeast flow between high pressure in the eastern Gulf and low pressure in the lee of the Sierra Madre Oriental of northern Mexico maintained along shore currents at South Padre Island and perhaps rip currents near the Isla Blanca jetties (which focus wave energy) from July 12th through 13th. On these days, offshore seas rose to between 6 and 8 feet, with a swell period nearing 7 seconds. On the 14th, seas would begin dropping slowly falling to 5 to 6 feet with peak swell period dropping back to 5 or 6 seconds and an average period between 4 and 5 feet.

During the time when conditions were improving but still potentially hazardous, one person drowned in the surf along Isla Blanca Park.

HIDALGO COUNTY --- 0.8 E PROGRESO [26.10, -97.96], 3.4 NNW DONNA [26.22, -98.07]

07/26/10 13:00 CST	0	0	Heavy Rain
07/26/10 16:45 CST		0	Source: CoCoRaHS

Heavy rains, estimated by radar between 2 and 4 inches and measured by both cooperative and CoCoRaHS rain gages (between 1.84 and 2.97 inches), including 2.41 inches in Mercedes, 2.24 inches in Edinburg, and 2.47 inches in Weslaco. The core of the heavy rain fell between 1 PM and 330 PM CST and included Progreso, Weslaco, Donna, and Alamo. Nuisance urban-type poor drainage flooding likely occurred in areas of heavy rain; there was no indication of any enhanced flooding along the main and north floodway between Progreso and Mercedes.

A cluster of thunderstorms developed during the early afternoon of July 26th in western Cameron County and eased slowly through Hidalgo County during the remainder of the afternoon. The storms were fed by a combination of sea breeze enhancement on relatively deep moisture and weak upper level energy over the area. Radar and observational data indicated 2 to 4 inches fell across southeastern Hidalgo County.

While significant flooding was not reported, the cluster impacted the Lower Rio Grande Valley Flood Control Project ("floodway system") in Hidalgo County, particularly the Main and North Floodways between Progreso Lakes and Mercedes. The additional water likely required an increase in pumping of water from poor drainage locations into the floodways themselves.

(TX-Z257) COASTAL CAMERON

07/28/10 17:00 CST	1	0	Rip Current
07/28/10 17:30 CST		0	

Direct Fatalities: M44IW

High seas, swells, and surf, produced by the difference between relatively strong high pressure centered over Alabama and Mississippi and low pressure in the lee of the Sierra Madre Oriental of northern Mexico increased along shore currents at South Padre Island, along with rip currents near the jetties (which focus wave energy), during the day and evening of July 28th. At daybreak, seas were still up near 7 feet along with a 7 to 8 second swell period and an average period above 5 seconds at the NOAA buoy around 60 miles northeast of the beach. Seas continued between 5 and 6 feet during the day, with peak swell period running around 7 seconds.

A rip current aided by the east-southeast swell claimed the life of a man near the South Padre Island jetties near Isla Blanca Park during the late afternoon or early evening on the 28th.