



Brownsville's "Blue Ribbon" Resacas Reduce Hurricane Dolly Flood Losses

Full Mitigation Best Practice Story

Cameron County, Texas

Brownsville, TX—When Hurricane Dolly came in the summer of 2008, Brownsville was ready with an ingenious disaster defense that kept hundreds of homes from flooding. The Rio Grande Valley leaders capitalized on natural assets, creativity, and teamwork to handle Hurricane Dolly's 10 to 14 inches rainfall across the city.



As Brownsville's Joe Barrera, who manages the Brownsville Irrigation District, explains, this Texas town is networked with what they call resacas, water-filled, winding "blue ribbons" that aid in flood control and water storage, and add an aesthetic character to the city. Recently, city officials thought to use the resacas for flood control in a management network that stretches across multiple agencies.

"Resacas are the piecemeal remains of old channels of the Rio Grande River that used to meander all through what is now Brownsville. The river now flows along the city's southern fringe," said Barrera. "A hundred years ago, farmers in the [Rio Grande] Valley hit on the idea of damming up the dry resaca channels so they could become linear lakes. We use the water to irrigate crops – sunflowers, soybeans, wheat, corn, rice, onions, cabbage."

Over time, flooding became a chronic problem in this city of 150,000 that dubs itself "On the border by the sea." Hurricane Beulah, for example, dropped up to 30 inches of rain in 1967, and is the kind of storm that Brownsville leaders know may occur again in any year. In more recent years, Brownsville has experienced serious flooding in 1984, 1993, 1996, 1997, 1998, and 2004.

When Dolly stormed ashore July 23rd in 2008 as a Category 2 hurricane, rain across Brownsville varied from 6 to 14 inches. Some Brownsville residents call Dolly a 100-year storm; others say it was less. Nonetheless, in the old days, they would have been awash.

But not this time. "We did a lot of things differently this time, and it paid off well," said Brownsville Assistant City Engineer Doro Garcia, Jr. "I don't think in the history of Brownsville we have been able to manage that much water without flooding."

Joe Barrera said, "I didn't have a single complaint call." The city reported some flooded streets but virtually no complaints of water in buildings.

Brownsville leaders reduced Dolly's flooding impact dramatically with a multi-pronged program of prevention, pipes, pumps, planning, and partnerships. The city's flood-mitigation program requires careful planning, vigilant management, and close cooperation among a patchwork of entities with differing authorities.

"I have to say," said Barrera, "we've worked on it. This is a joint effort among a lot of people who work together well. It could never work without our partners."

Together, they developed updated plans and procedures, starting with a major flood protection study in 2004. They created flood detention basins in strategic areas, using a combination of local money and other funds such as U.S. Housing and Urban Development (HUD) Community Development Block Grants (CDBG). Three detention ponds reduced flooding directly for more than 35,000 people, according to Ben Medina, Brownsville Planning and Community Development Director.

In addition, they cleared, cleaned, and dug flood storage ponding areas wherever they could throughout the community: in canals, drainage channels, and pipes; in recently completed detention facilities; and in open spaces such as the water features in the golf course. They shared heavy equipment and information, and worked together to manage an intricate system of pumping and storing water.

"We started four days before Hurricane Dolly and lowered the water in our resacas," said Barrera. "That gave us space to store excess runoff. Four years ago, we built a 52-inch drain pipe from the Resaca de la Guerra. We improved pumping capacity,

too. Now we can pump 38,000 gallons a minute in the south area. So we managed to keep the water level within banks – although we had a close call when we lost power to our pumps for a day.”

As proud as they are of reducing flooding in the Dolly storm, the Brownsville team is also keenly aware that larger storms are ahead.

“It is important to say that we are still vulnerable to flooding from larger rains,” said Anne Whitko, consultant with Ambiotec Civil Engineering Group Inc. “We still have a lot of work to do. If we had received the larger rains that went north of us, we would have probably had flooding.”

“We dodged one,” said Doro Garcia. “This storm is a wakeup call.”

Among Brownsville’s priorities include backup generators to ensure that pumps can work even when electric power fails; control gates for the resacas; more flood storage areas within the city; comprehensive planning for drainage and hazard mitigation; and common data management systems to share information, such as flood flows.

Brownsville shows that investments in prevention and partnerships can pay high dividends.

“I think our aggressive approach to working together on drainage really paid off in this storm,” said City Engineer Carlos Lastra. “If it had not been for everything we had done, it would have been really bad.”

Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region VI**

State: **Texas**

County: **Cameron County**

City/Community: **Brownsville**

Key Activity/Project Information

Sector: **Public**

Hazard Type: **Flooding**

Activity/Project Type: **Flood Control**

Activity/Project Start Date: **01/2004**

Activity/Project End Date: **Ongoing**

Funding Source: **Local Sources**

Activity/Project Economic Analysis

Cost: **Amount Not Available**

Non FEMA Cost: **0**

Activity/Project Disaster Information

Mitigation Resulted From Federal
Disaster? **No**

Value Tested By Disaster? **Yes**

Tested By Federal Disaster #: **1780 , 07/24/2008**

Repetitive Loss Property? **No**

Reference URLs

No URLs were submitted

Main Points

No Main Points were entered.



1. Brownsville leaders team up to fight flood problems together



Joe Barrera with his Resaca de la Guerra pump.