

# 5 WRN P887: INTEGRATING FAITH-BASED LEADERS INTO HAZARDOUS WEATHER COMMUNICATIONS FOR HIGHLY VULNERABLE NEIGHBORHOODS IN THE RIO GRANDE VALLEY OF TEXAS

Barry S. Goldsmith\*  
NOAA/National Weather Service Forecast Office  
Brownsville, Texas, USA

Maria M. Torres  
NOAA/National Weather Service Forecast Office  
Miami, FL, USA

Linda Wasserman  
Hidalgo County, Texas, Health Department  
Edinburg, TX, USA

Dr. William Donner.  
University of Texas – Rio Grande Valley  
Edinburg, TX, USA

## 1. INTRODUCTION

Integrated Weather Teams (IWT, Henderson, 2015) have become a critical part of the mission of the U.S. Weather Enterprise to create clear, concise, and unified messaging prior to potentially life-threatening hazardous weather. Traditionally, the IWT was comprised of government and private meteorologists, media partners of all stripes - television, radio, print, and online - and Emergency Management and public safety officials from a variety of disciplines (Woodrum, et. al, 2013). IWTs have been conducted across the United States and are increasingly critical to building a Weather Ready Nation – one that is ready, responsive, and resilient to hazardous weather in order to meet a collective mission to protect life and property.

IWTs are the primary vehicle for building or improving trusted relationships among these groups, and for breaking down barriers of mistrust that may exist prior to forming a team. For the Rio Grande Valley of Texas, along the southern tip of the state bordering Mexico (Fig.1), the region's close-knit cultural values and regional pride in place was able to rapidly grow trusted relationships within the groups. For example, public safety officials from diverse public and private organizations ranging from law enforcement and fire departments to transportation, education, public works, and land management routinely meet to build consensus on how to protect life and property from natural and man-made hazards. Broadcast meteorologists collaborate with each other prior to significant events, such as hurricanes, to ensure a unified message to a bi-lingual community.

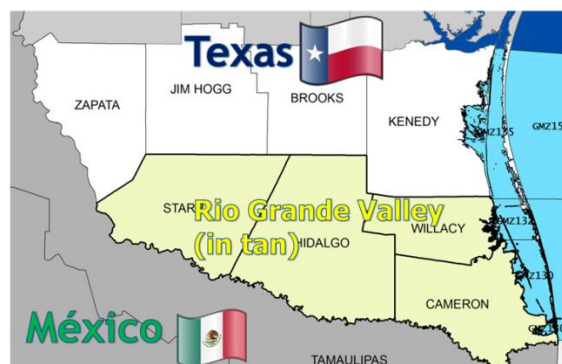


Figure 1. Map showing the location of the Rio Grande Valley in Texas.

The local National Weather Service (NWS) office is viewed as the trusted leader of the team to offer a helping hand for decision support messages across the IWT spectrum.

While the foundation of the Rio Grande Valley's IWT was firm, there remained concern among the members. In a border region where trust between the most vulnerable residents and government is low due to a variety of reasons, would a unified hazardous weather message resonate, and most importantly, rouse at-risk communities to action to protect theirs and their families' lives? In 2016, the NWS Brownsville/Rio Grande Valley office took the initiative to find out.

## 2. NEEDS ASSESSMENT OF AT-RISK RESIDENTS

The Rio Grande Valley is recently known to be the most impoverished region in the United States when accounting for the number of households living below the national poverty line (Sauter, et.al, 2012). Many of the residents live in subdivisions known as *colonias*. *Colonias* initially were setup, as early as the 1950s, along the U.S./Mexico border on non-arable land in

---

\* Corresponding author address: Barry S. Goldsmith, NOAA/National Weather Service, 20 S. Vermillion Rd, Brownsville, TX 78521; e-mail: [barry.goldsmith@noaa.gov](mailto:barry.goldsmith@noaa.gov).

unincorporated portions of counties as a means for low-income housing to a rapidly growing migrant worker community (State of Texas, 2014a). Across the Rio Grande Valley, there are at least 1,500 such neighborhoods. Many residences in *colonias* are poorly built, often in stages with low-cost materials. Water, sewer, electric services, and paved roads are eventually provided, and the quality of construction gradually improves as the neighborhoods become established. Counties often cannot keep pace with the rapid growth of *colonias*; in 2016, the vast majority of residences remained substandard, often composed of mobile homes of inadequate structural integrity or foundational anchors that make them extremely susceptible to windstorms and floods. Based on the 2014 U.S. census, 65 percent of Texas *colonias* were located in the Rio Grande Valley, with an estimated 244,000 residents (State of Texas, 2014b).



Figure 2. Aerial view of a colonia in Mercedes, Texas (Hidalgo County). From Rivera, 2014.

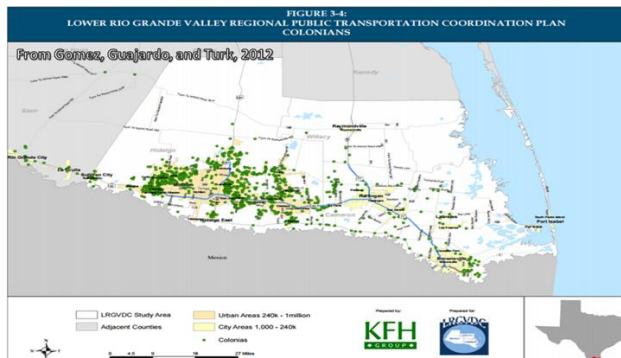


Figure 3. Colonia location (green dots) map for the Rio Grande Valley (focus on Hidalgo and Cameron County, TX), from Gomez, et.al., 2012.

These high-risk populations are at least 95 percent Hispanic descent, with 64.4 percent born in the United States, and 85 percent of the children born in the United States. *Colonia* residents language of choice – Spanish - likely matches that of the Rio Grande Valley overall, where 85 percent of residents speak Spanish regularly at home. However, the number speaking English “not very well” in *colonias* may be significantly higher than the 39 percent indicated in the 2015 U.S. Census update.

Many *colonia* residents are likely to be among the most distrustful of government-based information, for reasons including slow response to improving roads and services, the political discourse on families and immigration, and language barriers. However, one common denominator among all walks of Hispanic life in the Rio Grande Valley is **faith**. As of 2010, 47 percent of the Rio Grande Valley population was affiliated as either Catholic or Evangelical (U.S. Religion Census, 2010); 53 percent were un-affiliated, but a sizable number of this group may not have been accounted for and include some who live in *colonias*. Faith and *familia* - the close-knit nature of extended nuclear families that permeates most populations of the Rio Grande Valley – is the connective tissue of the region. From these realities was born the idea of a *Faith-Based* IWT. The concept of faith intertwined with life safety decisions in modern society is not new; most recently, at least one study conducted in the aftermath of Hurricane Katrina in 2005 indicated:

*“Another important factor found in the study was a strong attachment to their homes, past experience, the importance of social networks, regional cultural temperament and their faith in God.”* (Brown, 2011)

If faith could somehow be summoned to connect with highly vulnerable communities as an effort to build trust - one family, one *colonia*, and one community at a time - the potential for strengthening readiness, responsiveness, and resiliency to hazardous weather where needed most is immense.

### 3. RIO GRANDE VALLEY FAITH-BASED IWT DEVELOPMENT IN 2016

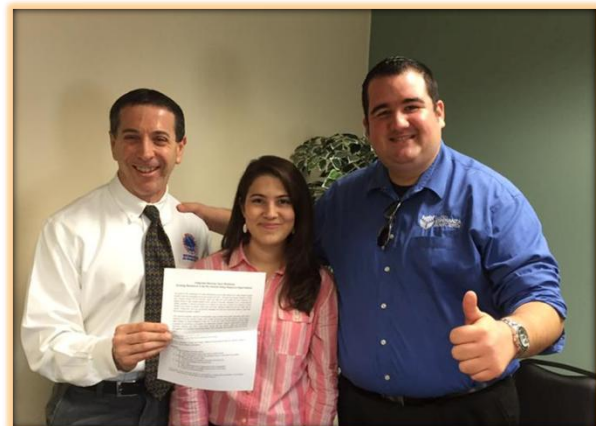


Figure 4. Barry Goldsmith and Maria Torres (left, from National Weather Service Brownsville/Rio Grande Valley) meet with Jorge Sotomayor of Radio Esperanza to sign agreement in February, 2016 for first Faith Based IWT meeting.

2016 was a year filled with building partnerships among Faith-Based leaders and related groups across the Rio Grande Valley. In February, NWS Brownsville/Rio Grande Valley Spanish Language

Liaison Maria Torres and Warning Coordination Meteorologist Barry Goldsmith met to build the initial framework for the first known Faith-Based IWT in the U.S. Maria had developed an excellent relationship with Radio Esperanza, a Spanish-language religious radio network that covers the Rio Grande Valley and a large portion of eastern Mexico, by providing hazardous weather preparedness answers to listener questions as part of a monthly call-in show. Radio Esperanza, a subsidiary of the Rio Grande Bible Institute, gladly volunteered to host the first team meeting in May. Prior to the meeting, Ms. Torres and Mr. Goldsmith presented the concept at the South Texas All-Hazards Hurricane Conference in March. In the audience was Sister Norma Pimentel, Executive Director for Catholic Charities of the Rio Grande Valley, and Ms. Linda Wasserman, Congregational Outreach Specialist for Texas Impact. Both were so intrigued by the Faith-Based IWT concept that they promised to notify local leaders of the upcoming meeting at the Rio Grande Bible Institute in May.

The [meeting](#), attended by an audience of sixty that included two dozen church leaders from the Rio Grande Valley on both sides of the border, Emergency Management representatives, local media, State of Texas government officials, Non-Governmental Organizations, and the University of Texas-Rio Grande Valley, was a highly successful springboard for other meetings and conferences that followed during summer and autumn.

Agenda topics included an overview of NWS standard and unique hazardous weather information, risk assessment of substandard housing in *colonias* and methods to build infrastructure resiliency, a discussion on building capacity for such resilience through IWT partnerships, and most importantly, how Faith-Based leaders can become force multipliers to help at-risk communities become ready, responsive, and resilient.



Figure 5. Group photo of the First Faith-Based IWT Meeting at the Rio Grande Bible Institute, Edinburg, TX, on 18 May, 2016.

Summer and autumn presentations were conducted by Goldsmith and Wasserman to promote the Faith-Based partnerships to additional churches and related organizations, as well as to promote the concept of “Shelters of Faith” to Rotary International at local and District meetings. The presentations and discussions, given at additional IWT-related events, helped build

momentum for future plans and goals to provide eventual stellar examples of a weather-readiness for communities, especially *colonias*, at very high risk for property and human casualties from hazardous weather.

#### 4. LEVERAGING FAITH-BASED ORGANIZATIONS TO BUILD A WEATHER-READY RIO GRANDE VALLEY

The 2016 Faith-Based IWT Meetings and related activities brought forth specific plans to make the vision of ready, responsive, and resilient communities in some of the more underserved populations of the Rio Grande Valley a reality. These plans and goals, to be carried out in the years following 2016, were “Shelters of Faith” and the “Resiliency Rallies”.

##### *Shelters of Faith*

In 2015 and 2016, a number of damaging wind-producing thunderstorm systems affected portions of the Rio Grande Valley. Several of the events struck substandard housing in *colonias* of Hidalgo County; most notably was the [24 April 2015 episode in unincorporated subdivisions north of Donna and Weslaco](#). More than two dozen residential structures were destroyed or demolished and up to 100 in total were damaged during a late evening squall. Some of the demolished buildings were leveled by winds that were *less than hurricane force* –  $32.2 \text{ ms}^{-1}$  in several cases. One displaced family of eight escaped only moments before the rising winds swept the home’s parts meters from its original location. While surveying the damage, Goldsmith noticed a church – literally around the corner – that was being used to temporarily feed and house displaced families with the assistance of the American Red Cross. The church, built to a stronger code, was unaffected by the storm. Goldsmith thought the following at that moment:

- “What if the winds had been even stronger? Would there be survivors - or at a minimum, numerous injuries and fatalities?”
- “What if the church around the corner were opened before the arrival of the damaging winds?”
- “What if the church and colonia residents had NOAA Weather Radio (NWR) to monitor Spanish-language weather information, including warnings?”

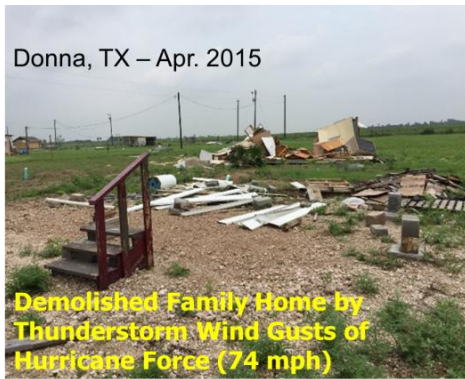


Figure 6. Last stairs standing: Walk-up stairs are all that is left from a mobile home that was blown away by  $32.2 \text{ ms}^{-1}$  winds



Figure 7. Iglesia de Dios Linaje Escogido (church) that was undamaged during the 24 April 2015 storm, less than a mile away from the heavy damage area to the Aurora Valley Colonia in North Donna, TX

The concept of numerous – perhaps dozens – of casualties in just one *colonia* from slightly stronger winds was chilling. In fact, shortly after the initial Faith-Based IWT Meeting on 18 May 2016, such a storm struck the Rio Grande Valley with  $38$  to  $42.5 \text{ ms}^{-1}$  wind on 31 May 2016. That storm fortunately did not strike *colonias*, but caused substantial damage to somewhat better built homes, including mobile units, in neighborhoods not too far away.

Goldsmith, Wasserman, and Torres – with the concurrence of other partners of the Faith-Based IWT – conceived a plan to work with church leaders, community resource centers, public safety and public health officials, and parts of the Weather Enterprise to ask the most trusted leaders in *colonias* and beyond to have their churches become the shelter of security *prior to* the arrival of a significant, near-term life threatening weather event. The system would be designed as follows:

Process:

- The local Weather Enterprise – including NWS, media, trained spotters, etc. – would educate and train high-level Faith-Based leaders on weather hazards, NWS

warnings, and NOAA Weather Radio. Training would be in English and Spanish.

- The high-level Faith-Based leaders, in turn, educate their direct reports – pastors, priests, lay-leaders, etc. – with assistance from the Weather Enterprise
- All levels then educate congregations and faith-based communities on same, especially those at highest risk
- NWR receivers are provided to all participating churches, community centers, and neighborhood leaders, at a minimum, per funding plan (i.e., a grant or other financial instrument)
- Churches run drills to test efficacy of notification system – via telephone, e-mail, text, application, or other

Action:

- NWS/Weather Enterprise predicts damaging thunderstorm wind or hail episode 6 or more hours in advance
- Participating churches spring into action, notifying congregations of opening during the threat period. Volunteer staffing is activated for security purposes
- When warnings are issued, at-risk residents alerted on Spanish-language NWR know to evacuate “around the corner” to the safe, trusted shelter of the church
- **Outcome:** Substandard homes are destroyed or demolished, but families are **safe and unharmed in the church or community center**

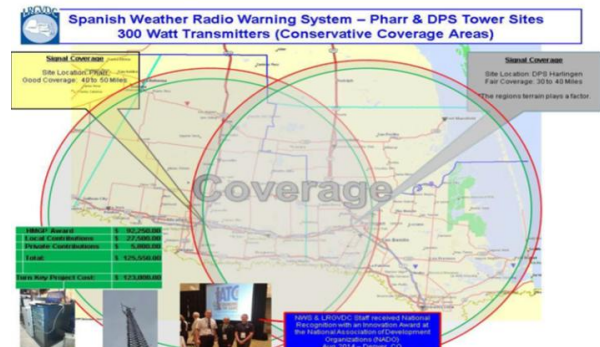


Figure 8. NOAA Weather Radio receivers (top); Coverage area of Spanish-language NWR radio stations serving the entire colonia area. Left circle is for station in Pharr, TX; right circle is for station in Harlingen, TX.

In addition to the laudable public safety and life protection argument, Shelters of Faith makes business sense. Between 2012 and 2014, the State of Texas, working through the Lower Rio Grande Valley Development Council, funded two Spanish-language NWR stations. The [Spanish Early Weather Alert and Warning System](#) (Fig. 8, bottom image) was designed to serve at-risk residents in substandard housing, yet radio receivers (Fig. 8, top image) are few in number in colonias where residents have little additional disposable income to invest \$30 or more on a radio. Subsidies targeted for churches, community resource centers, and some fraction of participating neighborhoods would provide hundreds, if not thousands, of radios to vulnerable communities where Spanish is the dominant and most comfortable language spoken – and help justify the cost of the system.

### Resiliency Rally

A community's ability to respond with minutes to spare to protect lives from a windstorm, hailstorm, or flood is but one component of being Weather Ready. Long term readiness requires more, and answers the question: "Why do our homes have to be threatened with demolition from sub-hurricane force wind?" Completing the "construction" of Weather Ready communities is to reduce the vulnerability of the communities to weather hazards. Faith-based leaders can play a critical, continuing role by promoting efforts to build resiliency, one home and one neighborhood at a time. Faith in God itself can be a motivating factor; after all, the Judeo-Christian belief that a single God made humans unique in the world includes our intricate brains and motor skills, each which can help people of limited means to improve their chances not only for their own survival but to strengthen the structures they call home.

In August, several members of the Faith-Based IWT participated in a *Conferencia de Emergencias Para Las Colonias Del Valle* held at Primera Iglesia Bautista de Alamo (PIBA) in Alamo, Texas. More than 100 *colonia* residents and other vulnerable neighborhoods attended to how to improve resiliency of mobile homes (e.g., roof protection and anchoring), the meaning of disaster declarations, family health concerns during emergencies, short and long term evacuation plans, and how to cope during the recovery phase following a natural disaster. The Action Plan for the resiliency rally includes:

- Frequent Conferencias de Emergencias for more vulnerable communities across the Rio Grande Valley
- A focus on inexpensive methods or assistance programs to reduce substandard housing through "hardening"
- Private/public partnerships that may involve corporate or local hardware stores, government references, such as ready.gov and flash.org, to get building materials in the hands of low-income neighborhoods

- **Outcome:** Stronger buildings constructed or renovated through community efforts, led by Faith-based organizations



Figure 9. Collage from the First Conferencia de Emergencia in Alamo, TX, in August 2016. Speakers included members of the Faith Based IWT, including NWS, emergency management officials, and public health representatives



Figure 10. One example to improve resiliency: Anchoring a mobile home. At left, this home slid off cinderblock piers with no anchors. At right, a pier/anchor system for home that would likely withstand low-end hurricane-force wind.

## 5. BEYOND THE BORDER: SPREADING THE FAITH ACROSS THE U.S.

The common denominator that defines a Weather Ready Nation is *trust*. More than any other issue, the messages of preparedness, awareness, and action must be seen as helpful, not harmful, to the highly vulnerable communities that typically sustain the brunt of damage, destruction, and casualties from hazardous weather. Reaching out to members of society who can spread the message of public safety and mitigation against weather-related damage is equally, if not more, important than an accurate prediction of the hazardous weather itself.

Much is riding on the success of the Rio Grande Valley's Faith Based IWT. The large number of neighborhoods across the Rio Grande Valley that are highly vulnerable to hazardous weather make the region an ideal proving ground for life safety and property protection efforts. Successful development of Weather Ready communities across the Rio Grande Valley could be replicated across the nation; low-income neighborhoods exist in nearly every large metropolitan

area, and a growing number of these neighborhoods speak a common, comfortable language different from English. Building trusted relationships, regardless of income level or language is the first step toward having the community accept the message and make decisions that could save lives; leveraging the relationships to harden the infrastructure of a community can reduce the impact of future hazardous weather events. Time and money are factors, but factors that can be overcome by shared efforts to build resiliency. It really does take a village – neighbors, relatives, church leaders, and those tasked with public safety – to build a Weather Ready Nation.

American Meteorological Society 93<sup>rd</sup> Annual Meeting,  
Austin, TX

## 6. REFERENCES

Brown, Y. Y., 2011: [Weathering the cultural storm: Recasting the natural world of perceived disaster.](#) *Weather and Society Watch*, 2, 14-15.

Gomez, R., and L. Guajardo and W.L. Turk, 2012: [Distance, dispersion, and poverty make difficult choices for public transit.](#) *Reconnecting America*, Blog Entry.

Henderson, J., 2015: [The Integrated Weather Team: A potential collaborative site of critical participation.](#) *10th Symposium on Societal Applications: Policy, Research and Practice*, American Meteorological Society 96<sup>th</sup> Annual Meeting, Phoenix, AZ

Rivera, D.Z., 2014: [The Forgotten Americans: A visual exploration of Lower Rio Grande Valley colonias.](#) *Michigan Journal of Sustainability*, 2, 12 pp.

Sauter, M. B.; and A.E.M. Hess, and S. Weigley, 2012: [America's poorest cities.](#) *247WallStreet.Com* Blog Entry.

State of Texas, 2014a: [Texas Colonias: A thumbnail sketch of conditions, issues, challenges and opportunities.](#) *Office of the Secretary of State, Colonias Frequently Asked Questions*

State of Texas, 2014b: [Tracking the progress of state-funded projects that benefit colonias.](#) *Texas Office of the Secretary of State, Colonia Initiatives Program*, 65 pp.

U.S. Census, 2015: [Quick Facts Demographic Update by Texas Counties](#)

U.S. Religion Census, 2010: The Association of Religious Data Archives, [U.S. Congregational Membership Reports.](#)

Woodrum, C.F., and F. M. McMullen, A. Smith, and C. Kauffman, 2013: [Building a WeatherReady Nation - An Integrated Warning Team \(IWT\) concept.](#) *First Symposium on Building a Weather-Ready Nation: Enhancing Our Nation's Readiness, Responsiveness, and Resilience to High Impact Weather Events.*