A Gulfport Resilience Essay of the
Community & Regional RESILIENCE Institute

The Value of Text Messaging

Contributed by the Gulfport CARRI Team

Staying Connected in the Wake of Disaster

On the day before Katrina came ashore in South Mississippi, Jackson County resident Tina Shumate was told her husband had been admitted to Gulfport Memorial Hospital after suffering a heart attack. Tina left her son with his grandparents in Pascagoula and rode out Katrina at her husband's side in Gulfport. Unable to leave the hospital or call to check on the status of her son and parents, Tina was frantic. Though the hospital was running on backup generators, phones lines, Internet connections, and fax machines were useless. Then Tuesday evening—over a day after the storm had passed—Tina received a text message indicating that her family in Pascagoula was safe. Just being able to read the initial text and those that followed proved a tremendous aid to her psychological well-being. "It kept me from losing my mind in the hospital," said a relieved Shumate.

Despite Tina Shumate's ability to grasp both the benefits and technical demands of text messaging, others of her generation were having a harder time. Watching water rising around her Gulf Coast hotel, Teri Bryant became distraught when she could no longer complete calls. Her 16-year-old daughter, meanwhile, found it quite natural to take over the role of family communications director. Fingers nimbly working the phone's keypad, Courtney Bryant contacted family and friends to let them know they were scared but safe.

In many similar cases, teenagers facilitated family communication via text messaging, as parents—unfamiliar with the technology and understandably worried about the safety of loved ones—felt comfortable with letting their children act as go-betweens. As 19-year-old college freshman Chris Sisk related, his brother texted *him* to relay the message that "all was well" because, "He didn't think [our] mom would answer a text." In another situation, after her father's phone stopped receiving calls, 22-year-old Nicole Selby sent him a text that said, "I love u and I'm praying 4 u." Nicole's dad never replied by text because he didn't know how, and instead he kept trying to make voice calls that never fully connected. Selby decided that when she and her dad were reunited, she would sit down with him and teach him how to text.

In case after case, even though savvy young texters were sending messages—and cellular systems were faithfully sending those messages to their final destination—not every recipient had the requisite knowledge to open, view, or respond to texts. One South Dakota woman in her late 40s, distraught that she hadn't heard from her son for many hours after Katrina passed through his area, was oblivious to the fact that she had received a text from him until her daughter pointed out the blinking envelope icon on her phone. After the daughter showed her mother how to open the message, the mother spent the next hour familiarizing herself with this phone feature she had never used before. In another instance, after former Gulf Coast resident Obie Philbrook heard that cellular customers in the storm zone could receive text messages, he started sending messages to his

Responding to the desires of Gulfport, Mississippi, citizens to share their Hurricane Katrina experience with other communities, the CARRI Gulfport Team, including researchers at The University of Southern Mississippi–Gulf Coast, worked with community members to document their stories. The essay presented here, part of CARRI's Gulfport Resilience series, captures a key lesson learned from the Gulfport community's daunting experience with the hurricane.

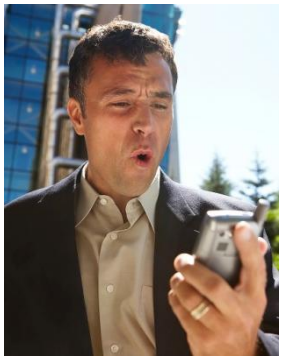
mother on the Coast. To his distress, however, he couldn't verify that she was actually receiving his texts. He reasoned that the problem wasn't the fault of the cellular system, but that his mother probably had no idea how to retrieve or answer a text message.

Texting Comes of Age

Only a few years ago, texting was considered the province of teenagers sending trifling messages to one another in classrooms. Even in this post-Katrina era, people under the age of 24 are twice as likely to send text messages as those who are over 30. This "messaging gap" becomes greater as age increases. For instance, 15-year-olds are seven times more likely to text than 50-year-olds. Speaking at a public awareness conference recently, Lt. Gen. Russel Honoré, former commander of Joint Task Force Katrina, implored, "Old people, you need to know how to text message." Perhaps Lt. Gen. Honoré was aware of the national poll conducted the month before Katrina struck that revealed only 37% of American cell phone subscribers with text-capable handsets had ever sent or received a text message. No data exists that would indicate what percentage of South Mississippians had texted prior to Katrina making landfall—or even what percentage *owned* text-capable phones at that time. However, a good bet would be that no more than a third of cellular subscribers on the Coast were text-savvy on Monday, August 29, 2005. By the following Friday, however, folks in South Mississippi and Southeast Louisiana who had access to a text-capable phone had become part of the "thumb generation."

As Katrina was pounding the shoreline, and after as the extent of the devastation became known, both veteran and novice texters took advantage of the technology to request aid, ease the minds of anxious friends and relatives, inform friends about the location and availability of precious commodities, and even help conduct business. For example, employees at branches of the People's Bank used texts to communicate with staff at the Downtown Biloxi operations center, and to coordinate work schedules of over 200 employees scattered across South Mississippi. Bank Vice-President Wes Fulmer admitted that the use of text messaging was not part of pre-storm planning but that texting in the course of doing business was simply a pragmatic application of an existing technology. It just so happened that enough bank employees were familiar with texting—and had learned vicariously that texts would go through even when voice calls would not—that using texts to communicate with other employees was "a natural thing to do."

In recent disasters of all kinds, both cellular and landline phone networks have failed as voice communication facilitators. Telecommunication experts note that all kinds of communication systems—even wireless Internet systems—fall prey to natural catastrophes. In the face of widespread and pervasive power loss, some systems can carry on normal operation for a few days, but no longer. According to the *New York Times*, the one communication technology that has worked 96% of the time over the past decade is text messaging. Verizon Wireless reported that in the first week after Katrina, call and text volume *doubled* in those parts of the greater Gulf Coast where service was still available. Considering that text messages have a better chance of being transmitted on damaged or overloaded cellular systems, it is no wonder that Coast residents quickly learned that texting was a more reliable form of communication than talking. Using lessons learned from Katrina, the U.S. military advises its personnel and dependents living on the Gulf Coast that text messaging is a viable form of post-storm communication—but warns that subscribers should know how much each text will cost them. In addition to this admonition regarding data rates, advisors also suggest that personnel learn how to text *before* post-storm stress makes the learning curve steeper.



Why Texting Works When Calls Fail

Most texting systems in North America are Short Message Service (SMS) systems. SMS-enabled cell phones access a cellular system's Short Message Service Center (SMSC) via the "control channel" cell phones use to communicate with cell towers. The control channel requires less power and bandwidth than the discrete "send and receive" channels that allow cell phones to make voice calls. Text messages are sent out on the control channel in short bursts of limited size and duration. SMS is a store-and-forward system, so messages sent from a particular subscriber's handset in the form of data "packets" are stored in the SMSC until the intended recipient's handset is on and in range of a cellular tower. Messages can be stored for days, pending delivery, as long as the SMSC has continuous power. During periods when regular call volumes are high, SMS systems can slow down, and message delivery can lag minutes or even hours behind initial sending. However, because SMS data packets are small, they can fill "gaps" in regular call activity that are too small for voice transmissions.

In post-hurricane situations where not all towers in a given system are functioning, SMS texting represents a viable method for emergency communication. Even systems that are only capable of handling a limited number of calls due to damage or overload can still process text messages because messages are "queued" and can be quickly transmitted as soon as a connection becomes available. However, if a given system's towers are severely compromised, even texting may not work. Fortunately for Katrina survivors, cellular systems on the Coast were not so compromised that texts did not work at all: they may have been slow going through at times, but they *did* reach their intended recipients.

Preparing for "The Next Time"

In comparison to traditional landlines, wireless communication systems require far less infrastructure. Even if "all-weather" wireless hardware should suffer system-wide catastrophic collapse, it is much easier to airlift new towers into a disaster zone than it is to replace overhead or submerged lines and associated hardwire switching equipment. Even as telecommunication companies started the task of restoring damaged systems in the days after Katrina came ashore, it was obvious that wireless systems will be vital for communication when the next disaster befalls the Coast. Thus, though cellular operators needed to replace equipment damaged by Katrina, most invested in infrastructure improvements that allow their systems to work longer and rebound faster in the face of the future catastrophe.

To free themselves of the limitations imposed by landline switching in areas most susceptible to landline degradation, companies such as Cellular South spent millions of dollars to install microwave systems that circumvent inoperable landlines. This particular provider brought portable microwave relay equipment to the Coast immediately following Katrina, and the use of this technology facilitated the handling of one million calls per day in the first week of recovery. In addition to providing for their own subscriber base, wireless companies helped the subscribers of other providers whose networks suffered more extensive damage. In the two weeks following the landfall of Katrina, Cellular South processed more than eight million minutes of airtime for subscribers to other cellular networks. Other wireless providers in the region have undertaken infrastructure upgrades that cumulatively cost hundreds of millions of dollars. In addition to installing permanent natural gas–driven generators at most

transmission sites, cellular operators have laid over two million feet of fiber optic cable and purchased fleets of "Cells on Wheels" that can be trucked to the Coast in the event of future tower damage.

With a more robust technical architecture now in place, both the public and civil authorities can contemplate the full range of uses text messaging can offer in the event of a major storm or other disruption in the region. Not only does texting provide average citizens the ability to be in contact with friends and family members, SMS could also aid pre- and post-disaster communication efforts in a number of vital ways. In terms of the private sector, companies can use broadcast texting (sending one text to multiple phones at once) to contact employees about restart operations. In such a way, the management of Smoothie King, Inc. in metro New Orleans was able to reassemble its staff before many other businesses in the area did. However, companies that based their pre-storm contingency plans on the use of wireless phones for *voice* communication were disappointed by the results they experienced. Because cellular systems in the South and Southwest—from Atlanta to San Antonio—were overburdened, even businesses that had planned to use out-of-market phone numbers in the post-storm transitional period were stymied. One communications expert who fled the Gulf Coast for Houston noted, "One of the indignities of … Katrina is the complete collapse of the telecommunications infrastructure. I am 600 miles from my home …, with a brand new cell phone number, and reception is no better."

The public sector may be able to incorporate texting into its disaster planning, as many possible uses appear viable. First, emergency management officials can use broadcast texts to warn of impending dangers. Text messaging was operable throughout the 2004 tsunami crisis in Indonesia and Sri Lanka, and both the Netherlands and Hong Kong have installed SMS systems as civil preparedness aids. In 2003, Hong Kong officials used SMS texting to keep the region's seven million residents apprised of SARS-related information. The state of Louisiana has embraced a proprietary system known as the Roam Secure Alert Network (RSAN) to power the NOLA Ready alert system that state, city, and parish officials can use to send targeted and timely texts and e-mails to citizens. This system was put to the test in September 2008 as Hurricane Gustav neared the northern Gulf Coast, forcing another evacuation of the New Orleans area. Over one million messages were sent to citizens, coordinating agencies, and first responders before, during, and after the storm. As a representative of RSAN pointed out, "During a disaster, text is often the only way to reach people, especially once they evacuate and wait for updates hundreds of miles away from … home."

The added benefit of emergency broadcast texting is its ability to reach the hearing impaired audience currently ill served by Emergency Broadcast System (EBS) radio and television announcements. One hearing impaired Gulf Coast student who relies on text messages and e-mails for most of her day-to-day communication with family and friends did not know the severity of Katrina's destruction until receiving texts from her out-of-state parents. Using this info she came to the realization that she needed to return home to Washington, D.C. "I only knew to leave," she said, "because my parents said [I needed] to leave."

Second, emergency management officials can establish real-time databases of texts between operation centers and first responders in the field. Such databases would be searchable and offer filters that allow users to be either selective or inclusive in viewing and responding to texts. In such a way, a greater range of important information could be shared across a wider range of users. Third, text messages can be integrated into a 911-type system that would enable this mode of communication to keep public safety officials informed of hazardous conditions (such as suspected gas leaks) or criminal activity (such as suspected looting).