

Jason Garber's Trip to The Gulf Coast

As many of you would have been aware, I traveled down to the Gulf Coast during the week of October 10. The idea was initially a result of a request from the Hurricane Center at Louisiana State University (LSU) for help in the wake of Hurricane Katrina. The Hurricane Center is based in Baton Rouge, which is about a 45 minute drive (at least pre-Katrina) from New Orleans. The Hurricane Center staff was struggling with the overwhelming demand for their time, particularly considering how close they were to the affected area.

It is safe to say that our involvement with hurricanes is more related to the design for them ahead of time, rather than responding their destruction after the fact. That is not to say that we have never witnessed hurricane damage firsthand, as Peter Irwin had traveled south previously to observe the damage from Hurricanes Andrew (1992) and Hugo (1987). Considering the importance of hurricanes in our line of work, it made sense to take advantage of this opportunity to witness firsthand the damage from Katrina.

As you can imagine, the lines of communication were strained after Katrina, and once we were able to make contact directly with the Hurricane Center, the urgency of their request for help had subsided. The request then became an invitation to help us witness the damage, and to visit any buildings that we may have worked on. At our end, based on workloads and personal commitments, it was decided that I would be the one to go.

One consideration was that I needed a place to stay and hotels were not available. Requests for a hotel room in the Baton Rouge area were greeted with laughter as FEMA had booked entire hotels for a year as part of their rebuilding effort. Professor Elizabeth English, of the LSU Hurricane Center, graciously offered a spare room at her house (which had seen many guests previously, from other visiting researchers to evacuees from New Orleans). Elizabeth was also my guide for much of the visit, and I am grateful for the considerable amount of time she made available to show me around.

The first day got off to a late start and by the time we fought the traffic into New Orleans it was late in the afternoon. We met with Bhavna Mistry at the site of the Harrah's Casino and Hotel development in downtown New Orleans. This was a building that we had worked on recently, which was under construction when Katrina hit. It was too late in the day to get onto the tower, but Bhavna described to us the minimal damage that the hotel tower experienced from the hurricane. Some of the outer panes of the double pane windows had been broken by flying debris. In addition, some of the GFRC (glass fiber reinforced concrete) panels had been damaged on the upper floors, which were not yet enclosed. Bearing in mind that the building was not yet completed, they were very happy with how it had performed. As we would see later on, there was significant damage to many of the other high-rise buildings in the area. The damage to the Harrah's building had been repaired and construction was proceeding as quickly as the depleted workforce would permit. Bhavna noted that the obstacle to getting workers in was finding temporary housing for them.

After this brief visit, Elizabeth had an appointment with a Discovery Channel crew who were documenting the recovery effort. We spent some time in a neighborhood that was “not bad”, in terms of damage. “Not bad,” meant that the houses were more or less intact, but not even close to being livable. The photo in Figure 1 does not come close to capturing the damage in this area. Standing on this street was a shock to me as it was quite simply a mess – however, compared with other areas, the damage in this area was considered to be fixable. Fixing, as with many of the houses in New Orleans, meant “gutting” the house (removing the contents, including the drywall), cleaning out the mould, and rebuilding the interior.

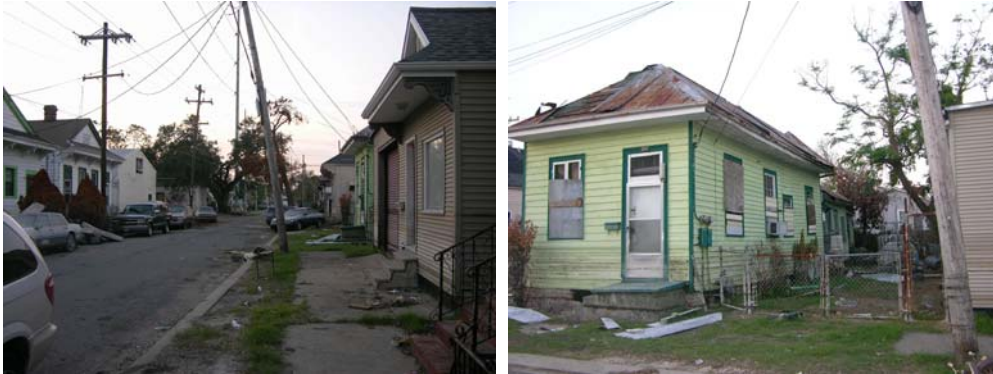


Figure 1 - New Orleans's neighbourhood, where the damage was "not too bad"

The next day, I met with Professors Steve Cai and Ayman Okeil who were off to inspect storm surge damage on some bridges across Bay St. Louis. We actually started at the east end of the bay, in what was left of a town called Pass Christian. This town, in between Bay St. Louis and Gulfport, was close to the eyewall of Katrina.

This put the “not bad” descriptor from the previous day in perspective as this area was devastated. We drove along a beachfront “scenic drive” where the view should have been of the ocean. At the moment, the “view” was of the beachfront properties which were swept clean. Whether it was wind or storm surge seemed a moot point as regardless of the specific cause, there was not much left (Figure 2).



Figure 2 - "Scenic Drive" near Pass Christian

There were two bridges in this area crossing the bay – one for cars and the other for rail. The rail bridge performed much better in that all of the piers survived the storm surge, and only the entire deck had to be replaced. Construction had already begun (Figure 3).



Figure 3 - Rail bridge across Bay St. Louis (reconstruction in progress), from the East End

Figure 4 shows the traffic bridge from the Bay St. Louis side (west) with the piers in the center, and the roadway flipped over to the left. An obvious question would be how one can design for this type of loading (i.e., storm surge). The answer in theory seems to be to have the deck high enough to avoid the surge. However, as can be seen in Figure 3, the deck of the rail bridge was simply being replaced as is. The pressure to get the infrastructure back appeared, understandably, not to allow for time for redesign. That will come later.



Figure 4 Traffic bridge from Bay St. Louis - piers in the center, and the roadway, flipped over, to the left - the right photo is from the East end

For Day 3, I was on my own and it was suggested that I try to document some textbook gable end roof failures that Marc Levitan (director of the hurricane center) had observed north of the city. Some examples are shown in Figure 5.



Figure 5 - Gable end roof failures in neighborhoods north of New Orleans

It was a little unnerving being on my own – I met a nice group of men with machine guns who were guarding a bank. Other than that, there were few people around as these neighborhoods were uninhabitable. I saw some families clearing out their houses, and must admit that I was at a loss as to how to start any type of conversation with them. It was numbing to be driving for miles upon miles of neighborhoods and retail zones, all of which was empty, deserted and heavily damaged if not destroyed.

It was also suggested that I try to make my way into St. Bernard Parish, where people were just being allowed back to see their homes. Unfortunately, being on my own I was unable to get past the roadblock. I then decided to try to make my way to Biloxi, at which point I got stuck in a massive traffic jam. I should have realized this sooner, but I was trying to cross a bridge that no longer existed.

On the way back through New Orleans, I saw a high-rise office tower, which looked to have extensive damage from wind pressure as well as wind-borne debris (Figure 6). It was reassuring to note that much of the damage to the glazing was in areas where we tend to concentrate our pressure taps, although I doubt that this building would have been wind tunnel tested.



Figure 6 - Cladding damage to the Galleria building at the north end of New Orleans

My final day was spent back in downtown New Orleans, with Elizabeth. We began with a bird's eye view from the 23rd floor of the Harrah's Hotel (the hotel that RWDI tested, which was under construction), thanks to Bhavna Mistry. As noted earlier, the damage to Harrah's was minimal (and long since cleaned up), although a notable exception was a textbook case of impact from flying debris, shown in Figure 7.

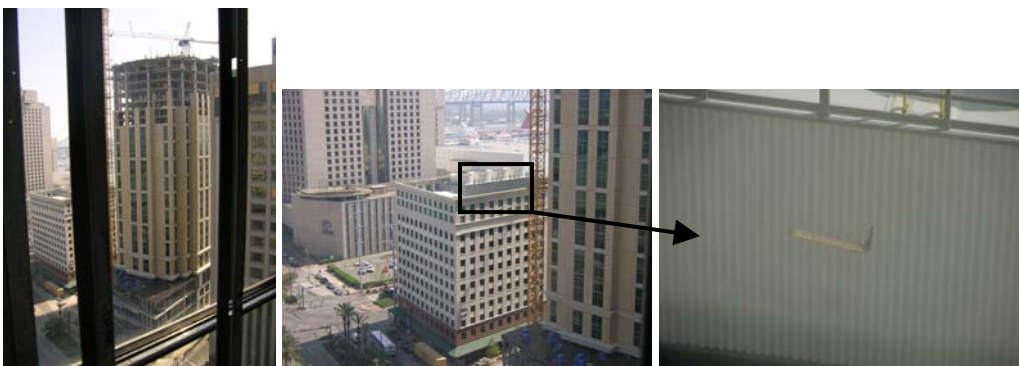


Figure 7 - View of Harrah's from the W Hotel, with 2 x 4 Lodged in Wall

Looking in all directions from Harrah's, there was damage of varying degrees to numerous high-rise towers, as seen in Figure 8.



Figure 8 - Views from Harrah's

From street level, one notable failure was the total collapse of a brick building (Figure 9) – it wasn't apparent at first if this was hurricane damage or deliberate demolition. The demolished cars among the rubble seemed to answer that question.



Figure 9 - Demolished brick building

Also close to Harrah's was a hotel (Figure 10), which experienced multiple failures of the glazing. According to workers at the site, the glass lites were pulled out of the frames – there was no broken glass inside the rooms.

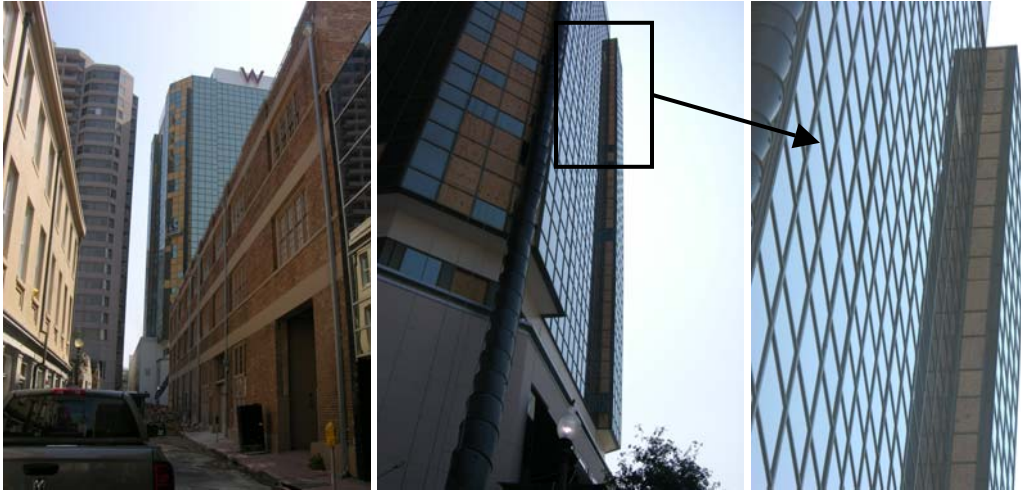


Figure 10 - Suction failures at nearby hotel

We then moved toward the area of the Hyatt hotel (a few blocks from the Superdome). Photos of this hotel were shown extensively by the media, with the concave curtainwall with most of the windows gone. Other buildings in the area also had extensive damage, including the one shown in Figure 11. The gravel found at the base among the sea of broken glass was most likely the culprit rather than wind pressure alone. Standing at the base of this building was unsettling, as falling glass was a definite threat. One worker at the site had a bandage on his neck and a blood-covered T-shirt to prove it.



Figure 11 – High-rise building on Poydras Street (near the Hyatt) – the debris at base was both broken glass and gravel

To finish the day, we headed into St. Bernard Parish (now with Elizabeth, crossing the road block was no problem) to see the damage to areas where residents were just starting to be allowed back in. Again, these were streets which were under water for considerable periods, and the interiors of the houses would need to be gutted (Figure 12).

In general, this was an experience I will never forget. It is an understatement to say that pictures cannot capture the magnitude of the destruction. Obviously, my pictures can't say more to you than any others, because the experience was being there to see it in person. It was hard to imagine that all of these miles that I covered, which were essentially deserted, had been thriving neighborhoods only a two months ago. I am not sure I was processing everything that I saw, and maybe I never will.



Figure 12 - Houses in St. Bernard's Parish