From Betsy to Katrina: Shifting Policies, Lingering Vulnerabilities

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As hurricane Betsy roared on shore near Grand Isle, Louisiana, overnight on September 9, 1965, New Orleans was exposed in ways we no longer comprehend. Beyond evacuation and disaster relief, there was little public policy to deal with extreme meteorological events and structural protection was minimal. Yet, several Atlantic seaboard storms the previous decade had ratcheted up public concern and prompted a federal response. Investigations were already underway to develop improved means to deal with massive tropical storms and Betsy provided a considerable push to that effort. Storm prediction lay at the heart of the emerging agenda, but in the immediate aftermath of Betsy two additional initiatives received considerable congressional attention. The first response committed additional federal dollars to construct structural defenses for New Orleans and the second created a federal flood insurance program. This paper will briefly examine these policy adjustments and consider how they helped set the stage for the devastation delivered to New Orleans last summer by Hurricane Katrina.

I am not a scholar of globalization, nonetheless, I would suggest that the policy responses to Betsy have implications that reach far beyond Louisiana and even the US. Indeed, they should be considered in other subtropical coastal areas as examples unsustainable and non-resilient policies particularly as they represent our tendency to respond after a calamity rather than in anticipation of one.

Betsy and Its Impact

A thumbnail sketch of the former benchmark storm for New Orleans will help set the stage. Overnight on September 9-10, 1965 Hurricane Betsy blew on shore from near the mouth of the Mississippi River following a northwesterly course and the eye passed just west of New Orleans near midnight. Newspapers the following morning reported winds in excess of 100 miles per hour and the national weather service's offical wind speed was 125 mph ("Betsy Winds Topped 15' High" 1965). Following the core public policy, some 500,000 residents evacuated homes in low lying areas of the city and the coastal parishes – most moving to schools or military bases on the natural levee within the city. The storm surge broke through the levee along the Industrial Canal and inundated the now infamous lower Ninth Ward, and also areas on the opposite side of the canal. There was also overtopping of lakefront levees. Preliminary reports indicated flood waters ruined some 7,800 homes and over 400 businesses in New Orleans and caused extensive damage in St. Bernard and Plaquemines parishes. A newspaper editorial proudly proclaimed two days after the storm that the death toll was relatively low because the public had been prepared and evacuations successful ("Betsy a Big One" 1965). The Corps of Engineers' final tally was 81 fatalities (U.S. Army Corps of Engineers 1965). Good fortune, as much as preparation, prevented greater damage. A different storm track might have produced more disastrous consequences.

At the time Betsy arrived, there were massive levees to prevent river flooding along the Mississippi River, but much less impressive hurricane protection. A set of low levees and a seawall stood along the south shore of Lake Pontchartrain, but they were inadequate

to keep the storm surge from entering the city's lakefront neighborhoods. A floodwall stood along the Industrial Canal, but it was not designed to offset a major hurricane. Although the Corps of Engineers had contributed to the lakefront levee and the one along the industrial canal, hurricane protection up to 1965 had been largely a local responsibility. That meant evacuation was the primary protection. Given the terrible loss of life (some 556 fatalities) when most residents of southwest Louisiana opted not to evacuate in advance of Hurricane Audrey in 1957, New Orleanians heeded the call to move to higher ground as Betsy approached.

In the storm's immediate aftermath, Louisiana's leaders pleaded for relief funds from Congress and invited President Lyndon Johnson to tour devastated portions of the city. After visiting a darkened evacuation center and meeting displaced families, he was so moved he promptly authorized $2 million in disaster relief and ordered two aides to stay in Louisiana and coordinate federal relief efforts. In addition, there was a common refrain coming from state and federal officials that Louisiana would not let such devastation revisit its coastal parishes and principal city. Leading the chorus was Governor John McKeithen who pledged that his administration would "see that nothing like this occurs in our state again" ("McKeithen Asks" 1965) Since he could not guarantee storms would not arrive at the state's coastline again, he had to seek other means to offset the impacts of wind and surge – and he encouraged better levees. Congressional hearings convened almost immediately in Baton Rouge and New Orleans to assess the impact of the storm and determine how the federal government and the state could live up to the governor's promise.

Levees

In June 1965, months before Betsy struck, Secretary of the Army Stephen Ailes had proposed an ambitious hurricane protection system for New Orleans to Congress. This plan had been under preparation for several years and was an outgrowth of the intensified federal planning effort to deal with hurricanes in general and a response to local desires for improved protection in the New Orleans metropolitan area. Indeed, the plan appeared in the local newspaper 10 days after the storm. Its key components included an expanded and heightened levee system along both the urbanized portion of the lakefront and areas where local boosters envisioned growth in St. Charles Parish and eastern New Orleans, and in neighboring St. Bernard Parish. The plan also called for a levee across the eastern end of Lake Pontchartrain and two flood gates that could be raised to prevent surge from entering the lake as a hurricane passed (Chief of Engineers 1965). Thus on the eve of Hurricane Betsy, Congress had a substantial proposal before it, and on September 27, 1965 it authorized the project. In 1966 the Corps of Engineers began the slow process of final designs and construction. This work, as of early 2005, following numerous court challenges, entanglements with local partners, and funding disruptions was scheduled for completion in 2013.

Despite about 80 years experience with subsidence in areas where Louisiana wetlands were leveed and drained, the levee plan moved forward. One key element of the benefit-cost analysis that justified moving forward was the projected development to follow levee construction. Quite quickly, the Corps moved forward with the giant ring levee

around the eastern New Orleans wetlands. And when the federally financed interstate highway traversed the area, the combined effect of the improved protection and access sparked development. Wetlands reclamation in the humid climes of southern Louisiana depends on effective drainage. The local drainage organization added canals and pumps to lift groundwater and excess runoff out of the newly formed impoundment. With drainage of the peaty soils, oxidation and subsidence follows. Portions of the lakefront neighborhoods sank from four to ten feet. Also during this period, slab construction replaced traditional pier construction. Consequently, the newer homes were built at ground level and not raised several feet above grade. This merely accentuated their susceptibility to flood damage.

It is this subsidence facilitated by the levee and drainage system, not natural topography, that made these lakefront areas so vulnerable to extended flooding following levee failures in August 2005. One early tally indicated some 80,000 homes in New Orleans suffered severe flooding last year – and most were in these areas protected by structures and allowed to subside through human agency. What might have been recognizable in 1965 has become all too obvious: the combination of levees and drainage is not a sustainable means of protection for New Orleans and vicinity. The fact that Katrina lost so much wind speed likely prevented additional flooding in the lakefront areas of Jefferson Parish.

Flood Insurance

In addition to authorizing the Corps' levees, Congress also debated flood insurance. Weary of the heavy costs of disaster relief, they considered legislation that would shift the costs of rebuilding from all tax payers to policy holders through an insurance program not available on the market. While Congress did not pass a flood insurance bill that year, Betsy provided additional impetus to the growing concern with flood damages. Following guidance from noted flood expert and geographer Gilbert White, Congress eventually passed the National Flood Insurance Act (PL 90-448) in 1968. This act created a program that called for systematic mapping of "floodplains" or areas subject to a 1 percent flood risk annually (or the 100-year floodplain), the implementation of local regulations seeking to limit floodplain development, and a federally underwritten flood insurance program available in communities that enrolled in the federal program. Not only did the plan seek to provide an alternative funding mechanism for disaster relief, but it sought to have communities steer development away from flood-prone areas.

In some respects this program proved very successful in the New Orleans area. New Orleans residents, both urban and suburban, eagerly subscribed to the insurance as it became available. Indeed by the early 1970s, subscribership rates for the state as a whole were well above the national average – with the bulk of policy holders in the New Orleans area. Flooding in the levee-ringed, low-lying neighborhoods became a particularly pressing issue in the late 1970s. A spate of intense downpours plagued the city beginning in 1978 and overwhelmed the city's outdated drainage system. Five storms by 1981

caused extensive flooding in the Broadmoor neighborhood, which occupied a place at the so-called "bottom of the bowl" – the natural low area of the city ringed by the natural levee and a ridge to the north. It was not uncommon for floods to damage more than 1500 houses following downpours (Colten 2005).

To combat this problem, the city had revised its building codes to promote more flood-proof construction in 1975. These revisions enabled residents to purchase flood insurance – although systematic enforcement lagged another twenty years. More importantly, the Broadmoor neighborhood was a mature residential area and was not experiencing much new construction that might fall under the revised guidelines. Repeat flooding spawned a neighborhood association that convinced the drainage authority to embark on a major expansion of canal and pumping capacity in 1983 (Colten 2005). This upgrade relied entirely on structural flood control and did not seek to expand the land use and floodproof construction techniques called for by the federal insurance program. Even with an extensive structural system in place, some 67 percent of homes flooded by Katrina had federal flood insurance, underscoring the heavy reliance on that program ("After Katrina Pundits Criticize" 2006).

Suburban Jefferson Parish residents also embraced the National Flood Insurance Program and participated above the national level. There were more than 10,000 subscribers in 1974 and the number grew more than six times by 1991. Unlike New Orleans, the suburban parish continued to grow rapidly during this period and new construction had to comply with flood-proof building codes. Development and new impervious cover soon overwhelmed the parish's drainage system capacity and in the

1980s, during the spate of intense storms, Jefferson Parish led the country in flood insurance claims ("Jeff, Orleans" 1982) When the suburban parish asked its voters to approve bonds to enlarge the drainage system to deal with the repeat flooding, they rejected the proposal. Residents felt they were being asked to pay twice for flood protection – through flood insurance and then again through higher taxes for the drainage system. Furthermore, some of the worst flooding was on the west bank where a largely African American population suffered the most damage. Ironically, the Coubra Drive neighborhood that saw frequent flooding was a federally subsidized housing project – reflecting the all too common clash of uncoordinated federal programs The parish electorate, with 77 percent white population, seemed unconcerned with alleviating suffering on the largely black west bank (Colten 2005).

Following a massive flood in May 1980 that generated some $53 in flood insurance claims, FEMA declared it had paid out enough in Jefferson Parish. Federal attorneys filed a suit against the parish, charging that it was negligent in providing adequate flood protection and that it was not in compliance with NFIP guidelines. After a FEMA victory in the first decision, an appeals court declared the floods "acts of God" and concluded the parish was not wholly responsible. To avoid further litigation, the parish agreed to a $1 million payment to FEMA and a major overhaul of its drainage works. As in the city, canals and pumps constitute the core of the improvements and the structural approach creates a false sense of security. New developments were under construction directly across the street from repeat claim neighborhoods in 2000. Only time will tell when heavy rains and the new impermeable cover will once again exceed the drainage system's

capacity. Structures have not proven to be sustainable in either urban or suburban areas (Colten 2005).

Conclusions

Two federal policy adjustments following Hurricane Betsy shaped the future development of the New Orleans metropolitan area and contributed to the devastation witnessed last summer. Massive federal investment in an inflexible and overbuilt levee system produced what hazards managers have long predicted – a false sense of security. Much of New Orleans growth from 1965 to 1985 was in the New Orleans east/Citrus drainage area. After it was leveed and drained this area subsided, greatly increasing the vulnerability of residents and personal property. Similar structural protections allowed the expansion of east and west bank Jefferson Parish creating similar vulnerabilities. Although serious flooding due to Katrina was limited to New Orleans, a true category 4 storm would have over topped the suburban levees and spread destruction over a much larger area. In fect, Rita almost topped west bank levees. Structural protections have design limits, and when exceeded, serious consequences result. They do not provide the resiliency needed in the face of global warming.

The federal flood insurance program also encouraged development in flood-prone areas. Ineffective enforcement of building codes and subsiding land that soon offset any raised floor levels produced little net flood proofing for either the city or its suburbs. When flood claims became excessive, the federal government forced local governments to

enlarge the capacity of their pumping systems (and after 1995 undertook the major responsibility for a major overhaul of the metropolitan system itself). Ultimately, this program proved counterproductive.

My review of New Orleans's situation has one insight for our discussion of globalization, urbanization, and vulnerability. Namely, that the rejection of traditional building techniques that offered some protection and the movement off the limited area of safe ground atop the natural levee has seriously increased risk in New Orleans. Vulnerability in the urban area is not limited to the poor or minority populations. Damage caused by both Betsy and Kartina was felt hardest by the poor, but extensive federal subsidies for urban growth allowed massive expansion of middle class neighborhoods that shared in the suffering. In effect, massive federal programs propelled the movement of middle class residents into what has been the great sacrifice zones of New Orleans. This has dramatically increased the recovery costs. For those still-growing cities around the world, I would hope Katrina would be a clear message.

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