## Hurricane Katrina hits southern US

## Naomi Spencer 30 August 2005

Just after six in the morning on Monday, Hurricane Katrina hit the southern US state of Louisiana with 145 mile an hour winds and waves of up to 20 feet. There have been reports of massive flooding in some areas, while winds and rain have toppled buildings and houses. The Hurricane also caused serious damage in parts of Alabama and Mississippi. Casualty figures are not yet known, however reports late on Monday indicated at least 55 deaths, with 50 of these in Harrison County, Mississippi. This figure will likely rise much higher as the death toll in Louisiana is counted.

Downgraded during the night from category five to four, the storm still inflicted serious damage and flooded an estimated 40,000 homes in Saint Bernard Parish, just east of New Orleans. Meteorologists had been predicting a direct hit on New Orleans, with the chance for complete submersion of the city in water, before the hurricane shifted slightly eastward prior to landfall.

Extensive damage was nevertheless wrought on the entire metropolitan area, home to 1.4 million people. The hurricane hit hardest in the poorer sections of New Orleans, which has a poverty level of nearly 30 percent. Flanking the city on the north, Lake Pontchartrain flooded over the city's levees into low-income neighborhoods, submerging the one-story homes and trailers common in the area and trapping many families on their roofs. An unknown number of these houses were destroyed.

Some 100,000 residents of New Orleans were without the means or stable-enough health to heed the panicked and last-minute orders to evacuate Sunday. Terry Ebbert, chief of homeland security for New Orleans, callously sought to pin the blame for any deaths on these residents themselves, suggesting that all those who chose to stay willfully disregarded calls to evacuate. "Some of them, it was their last night on Earth," he declared. "That's a hard way to learn a lesson."

Monday morning, 9,000 residents and 550 National Guard troops occupied the Superdome sports arena, which lost power and large sections of its roof as Katrina passed over the city. It was considered the sturdiest of the designated shelters, although many also huddled in the lower levels of hospitals, hotels, and apartment buildings to avoid shattering windows.

Scattered reports of at least twenty separate building collapses and hundreds of stranded survivors out of the reach of rescue personnel trickled in to Louisiana Governor Kathleen Blanco's office throughout the day. At least 370,000 residences in Louisiana and another 116,000 in Alabama were without electricity after the brunt of the storm had passed through.

According to a report in the New Orleans paper, the *Times-Picayune*, "An unknown number of residents were trapped Monday afternoon in trees, attics and roofs in New Orleans' hardest-hit areas, and officials are positive that the devastating flooding from Hurricane Katrina is claiming lives. Police/Emergency scanner traffic was busy Monday afternoon with reports of trapped residents, some calling and pleading for help as heavy storm conditions still limited efforts to rescue them...Officers reported some people slipping into the water."

In addition to damage in New Orleans, flooding of more than 20 feet has been reported in parts of neighboring Mississippi and in Alabama. The Associated Press quoted Gulfport Mississippi Fire Chief Pat Sullivan describing the effects of the hurricane as "complete devastation. This is a devastating hit," he said. "We've got boats that have gone into buildings."

It has long been known that if a category four or five hurricane were to strike New Orleans directly, the consequences would be catastrophic. There has been talk of "the big one" for decades. However nothing has been done to improve the levee system, which is widely acknowledged to be insufficient for dealing with a major storm. It appears that New Orleans has narrowly averted this direct hit from Hurricane Katrina.

New Orleans is a city built on silt and drained marshland, positioned at the mouth of the Mississippi River. Some areas of the city are twenty feet below sea level, and the city as a whole is sinking over time. Even the historic French Quarter district, which managed to avoid serious damage due to its position on a higher rim of ground, is still an average of eight feet below sea level.

The city is protected from inundation from the water that surrounds it on three sides by a network of levees and pumps along the Mississippi River, the Gulf of Mexico and Lake Pontchartrain. However, if water pours into the city over the levees, the geography of the terrain, and the levees themselves, hold it in. The water that has flooded parts of the city may take days or weeks to be pumped back out.

Rendered vulnerable by its position in a region frequently hit by hurricanes, New Orleans has a long history of natural disasters. In 1915, a category four hurricane caused Lake Pontchartrain to overflow, killing 275 in the same area hit hardest by Hurricane Katrina.

In 1965, the category three Hurricane Betsy submerged half of New Orleans under water up to 20 feet in some areas, and left 60,000 residents homeless. Hurricane Camille struck the Mississippi Gulf not far from New Orleans in 1969, again causing devastating flooding and displacement. Camille was a category five and the strongest storm to hit the mainland ever recorded, with winds in excess of 200 miles an hour and tidal waves as high as 35 feet. It killed 143 people.

The city was spared destruction from the Great Mississippi Flood of 1927, which inundated 27,000 square miles (70,000 square kilometers) of land from Illinois down to the Gulf of Mexico. In that disaster, broken levees upriver relieved some of the pressure at the mouth of the Mississippi, lessening the severity of flooding in New Orleans. Much of the existing levee system now in place was set up at that time.

Scientists from the Federal Emergency Management Agency, the National Oceanic and Atmospheric Administration, and Louisiana State University have issued a number of studies in the past several years indicating that these levees no longer provide protection to the sinking city, and that another direct hit by a strong hurricane would contribute to catastrophe. A computer simulation of a direct hit by a category four hurricane projected that New Orleans would be submerged in flood water turned toxic by chemicals, fuel, debris, and corpses. In this worst case scenario, tens of thousands of residents trapped in the "bowl" of the city could die and many thousands more would be stranded in the cesspool.

Even after numerous warnings—including one issued before last year's close call with Hurricane Ivan—local, state, and federal policy makers shrugged off the necessity for reenforcing barrier islands, restoring the shock-absorbing wetlands, and constructing proper emergency facilities.

The cost of undertaking disaster prevention was declared by a panel of federal agency and business community representatives to be prohibitively expensive—\$14 billion. Instead, the city opted to commission the Army Corp of Engineers to reinforce the levee system to withstand a category three hurricane for \$740 million. Preliminary damage estimates for Hurricane Katrina run to \$30 billion, not including environmental destruction or the effect on the fuel market as a result of damage to major Gulf oil drilling stations.

The latest hurricane is not an isolated disaster. It is part of a global trend. So far this summer, thousands of people around the world have drowned in massive and abrupt floods. India, known for its torrential monsoons, has taken hundreds if not thousands of casualties in a series of storms that have left houses submerged and survivors vulnerable to hunger and disease. On July 26, Bombay alone saw the deaths of nearly 450 and the displacement of 200,000 residents after a record 94 centimeters (37 inches) of rain fell in a span of 24 hours.

Last week in Eastern Europe, at least 70 people died in

unprecedented rains. The severe weather, particularly the anomalously harsh weather in Europe, has been attributed by meteorologists to an unusual "kink" in the jet stream, the strong atmospheric band of current responsible for regular and reasonably predictable weather patterns. Scientists have predicted that such shifts in the jet stream, accompanied by a sharp increase in the number of hurricanes and other serious weather events, will be one of the consequences of global warming.

While meteorology is a science complicated by chaotic weather patterns, statistics on the tumultuous developments illustrate a definite trend in the past decades. US government meteorological agencies, however, have been muted in acknowledging the role played by global warming in the trend. This is in no small part due to the Bush administration's refusal to accept any limits on carbon dioxide emissions, which cause warming.

Figures from the US National Weather Service and the National Oceanic and Atmospheric Administration regarding tropical storm activity indicate that since 1995, all of the Atlantic hurricane seasons have been above normal, with the exception of the 1997 and 2002 El Niño years, with six of the past ten years classified as hyperactive. This means that on NOAA's Accumulated Cyclone Energy index, which analyzes the collective intensity and duration of each year's hurricane season, cumulative storm activity is at least 175 percent above the median activity, representing an average year. NOAA forecasts the ACE index for 2005 somewhere between 180 and 270 percent of the median, making it the seventh "extremely active year" of the last ten.

According to a National Weather Service report, "Hurricane seasons during 1995-2004 have averaged 13.6 tropical storms, 7.8 hurricanes, 3.8 major hurricanes, and with an average ACE index of 159 percent of the median... In contrast, during the preceding 1970-1994 period, hurricane seasons averaged 9 tropical storms, 5 hurricanes, and 1.5 major hurricanes, with an average ACE index of only 75 percent of the median."

Until the official hurricane season ends in November, the National Weather Service predicts as many as fourteen more tropical storms in the Atlantic, with as many as nine of them becoming hurricanes.



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