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of Engineers
Mississippi Valley Division



Corps Hurricane Response

Task Force Hope Status Report Newsletter

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Saffir-Simpson Hurricane Wind Scale vs. SLOSH *You need to know more than the wind speed*

“The greatest potential for loss of life related to a hurricane is from storm surge.”

- National Hurricane Center

By Susan Spaht

The Saffir-Simpson Hurricane Wind Scale rates a hurricane’s present intensity using wind speed as the determining factor. It rates hurricanes by Category using a 1-to-5 scale. A Category 1 hurricane has the slowest wind speed while a Category 5 has the fastest wind speed. (See box on page 3 for Category speeds)

Those of us living on the Gulf Coast are all too familiar with a weather report that gives us the “category” of an approaching storm. However, Hurricane Katrina taught us that the Saffir-Simpson Scale doesn’t give the whole picture on the danger and magnitude of a particular storm. Strong winds can certainly be dangerous and damaging, but there are other elements of a storm to consider when judging your level of risk:



This dramatic photo shows Hurricane Katrina’s surge overtopping levees under the Paris Road Bridge adjacent to the Entergy power plant in New Orleans East.

the diameter (size) of the storm, the forward speed, the track, the intensity and the **surge potential**.

Consider this: Hurricane Camille hit the Gulf Coast in 1969 and was a terrible storm. Camille made landfall with 190 mph winds, a **Category 5** storm on the Saffir-Simpson Scale. But Camille was no match for the devastation and fury of Hurricane Katrina which was one of the worst storms ever to hit the United States.

It had 127 mph winds when it made landfall - a **Category 3** storm on the Saffir-Simpson Scale.

Hurricane Camille delivered a surge of 4 to 8 feet at Lake Pontchartrain

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(depending on location). Hurricane Katrina's surge measured as high as 15 feet at Lake Pontchartrain (in the extreme eastern part of the Lake), and more than 30 feet in areas of St. Bernard Parish.

Wind speed is an important element when determining a hurricane's severity and damage potential but, as these two hurricanes demonstrate, one must also consider a hurricane's **surge** potential.

According to the National Hurricane Center, "the greatest potential for loss of life related to a hurricane is from storm surge."

So, what is "storm surge" and how can we judge a hurricane's surge threat? According to the National Hurricane Center: "Storm surge is simply water that is pushed toward the shore by the force of the winds swirling around the storm. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level 15 feet or more.

"In addition, wind-driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with the normal high tides.

"The level of surge in a particular area is also determined by the slope of the continental shelf. A shallow slope off the coast (such as Louisiana's) will allow a greater surge to inundate coastal communities."

In the late 70s, the National Oceanic and Atmospheric Administration

(NOAA) developed the first rendition of the computer-run storm surge model, called **SLOSH: Sea, Lake and Overland Surges from Hurricanes**.

According to longtime New Orleans TV weatherman Dave Barnes, a member of the Southeast Louisiana Flood Protection Authority-East, "Weather reports have been giving a storm's surge potential since the late 1800s. Since NOAA recognized that the New Orleans region was the most vulnerable in the country to storm surge, SLOSH was designed for this region first.



Dave Barnes is a meteorologist, longtime New Orleans TV weatherman (retired) and a member of the Southeast Louisiana Flood Protection Authority-East. Photo by Hetty Barnes

"The SLOSH model takes into account the hurricane's atmospheric pressure (intensity), size, forward speed, track and wind. It predicts the change of water levels in a region with time, including the highest water level expected.

"The latest version of SLOSH is routinely run by the National Hurricane Center when hurricanes threaten coastal areas. In addition, many or-

ganizations use SLOSH, and other more recently-developed models, to evaluate historical and hypothetical hurricanes for storm surge potential. Emergency managers use the output from the latest version of SLOSH for advance planning, and use it during hurricane emergencies to determine which areas must be evacuated ahead of a storm's expected storm surge."

In general, the more intense the storm, and the closer a community is to the right-front quadrant, the larger the area that must be evacuated.

The problem is always the uncertainty about how intense the storm will be when it finally makes landfall.

"It's important to know that slow-moving tropical storms usually produce greater flooding from rain than fast-moving storms," Barnes added, "regardless of their intensity."

When an advisory to evacuate is issued, people should be aware that strong winds can be expected ahead of the storm's eye and they should plan their evacuation accordingly.

Coastal inhabitants should realize that, after the eye of the storm passes, they will experience wind from the opposite direction. "This is especially important information whether a community is located on the Gulf Coast itself or on an adjacent lake or river," Barnes noted, "because a shift in the wind to a more southerly direction may produce additional flooding after the initial surge moves on shore. Many

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residents of the Slidell area experienced this effect when Hurricane Katrina moved over the area.”

If a storm should threaten

People living along the Gulf Coast are keenly aware that we are in hurricane season right now. If a tropical storm or hurricane should threaten, we should all pay close attention to its size, wind speed (Saffir-Simpson Scale), forward speed, track and its **surge** potential.

There is not much the Corps can do to defend against hurricane wind. That is the responsibility of local government and the individual home and business owner.

The Hurricane and Storm Damage Risk Reduction System that the Corps is building in the five-parish area around New Orleans has been designed to meet the threat of hurricane and storm **surge**. The new perimeter system is designed to reduce the risk of **surge** from a 100-year level tropical event. The Corps is also building extraordinary **surge** barriers at the IHNC in New Orleans East and at the West Closure Complex on the West Bank. Levees, floodwalls and pumps in the \$14.6 billion system are also being designed and built to defend against storm **surge**. 

Evacuate

This area already has the best defense against hurricanes than any time in its history; but if local authorities give the order to evacuate, people should heed that advice. Everyone should be prepared, have a plan, then evacuate when the order comes.

The Saffir-Simpson Hurricane Wind Scale



- Category 1: winds 74-95 mph
- Category 2: winds 96-110 mph
- Category 3: winds 111-130 mph
- Category 4: winds 131-155 mph
- Category 5: greater than 155 mph

Hurricane Reference Web sites

To learn more about storm surge safety actions as well as evacuation information, please visit the National Hurricane Center's Web site at: <http://www.nhc.noaa.gov>

To learn more about the Saffir-Simpson Hurricane Wind Scale, visit this Web site: <http://www.nhc.noaa.gov/aboutsshs.shtml>



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Comments and questions may be sent to the Status Report Newsletter editor at: b2fwdpao@usace.army.mil

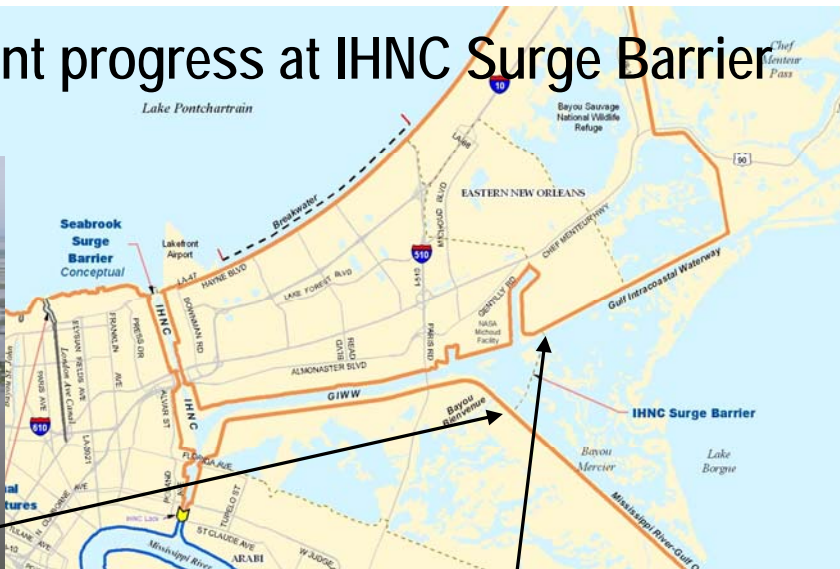
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Corps making significant progress at IHNC Surge Barrier

Pontchartrain



Above is a recent photo of the IHNC Surge Barrier being constructed across the MRGO and tying in to the new floodwall in St. Bernard Parish. At right is the on-going prep work for the IHNC Surge Barrier to tie-in to the levees on the north side of the GIWW .

By Nick Silbert

It's been only a year, but the Corps and its contractors are making significant construction progress at the massive Inner Harbor Navigation Canal (IHNC) Surge Barrier at Lake Borgne.

"All 66-inch soldier piles and 36-inch steel batter piles are in place," said Vic Zillmer, resident manager for the Surge Barrier project, "and we fully expect the barrier wall to be complete by the end of this summer."

The remaining parts to be completed on the wall are the concrete caps, parapet wall, expansion joint pile

caps, concrete infill and pins as well as special caps that connect the barrier wall to the Bayou Bienvenue gate and the Gulf Intracoastal Waterway (GIWW) barge gate.

The final pieces of the IHNC Surge Barrier are the north and south T-wall tie-ins. Pile driving is nearly complete at the northern tie-in which will tie in to the levees in New Orleans East.

The south T-wall, which will tie in to the floodwalls in St. Bernard Parish, is especially challenging due to softer than expected soil conditions. Crews addressed the soft conditions

by dewatering the soil and installing geo-fabric and a layer of stone. The pile driving is once again under way.

The IHNC Surge Barrier, which will stretch 1.8 miles across the confluence of the Mississippi River-Gulf Outlet and the Gulf Intracoastal Waterway and measure 26 feet above the water line when finished, will operate in tandem with the Seabrook Floodgate Structure to reduce risk associated with a 100-year storm surge in some of New Orleans' most vulnerable areas: New Orleans East, St. Bernard Parish, metro New Orleans, the Ninth Ward and Gentilly.



Corps and CDM Constructors win national Design-Build Award



By Nick Silbert

The Design-Build Institute of America (DBIA) presented a 2009 National Design-Build Award last month to the Corps of Engineers and CDM Constructors, Inc. for the St. Bernard Parish Pump Station Rehabilitation project. The award was for the "Rehabilitation/Renovation/Restoration" category. The St. Bernard project was also acknowledged as one of four finalists for the "Best Overall" award which had more than 100 nominations.

The Corps and CDM Constructors repaired three drainage pump stations which were severely damaged during Hurricanes Katrina and Rita.

"It is very rare for a Corps civil works project to win a DBIA award," said Col. Robert Sinkler, Commander of the Corps' Hurricane Protection Office. "This award is not only a big deal in the national design-build community, but it also illustrates innovation and a successful partnership between the Corps and CDM."

The design-build project delivery method allows the design and construction phases to be contracted out to a single design-builder, thus allow-

ing the two phases to take place concurrently to shorten the delivery schedule of the project.

In total, the Corps repaired eight hurricane-damaged pump stations in St. Bernard Parish. Three in particular – Pump Stations 2, 3 and 5 – sustained major damages leaving the parish exposed to floodwater.

In May 2007, the Corps awarded the design-build contract to repair Pump Stations 2, 3 and 5 to CDM Constructors, Inc. The cost of repairing those stations alone was approximately \$20.1 million, a huge chunk of the \$22.3 million cost of repairing all eight pump stations in St. Bernard Parish.

"Public safety is the Corps' top priority," said Col. Sinkler. "The completed repairs to these drainage pump stations will help ensure their reliability during future storm events."

Repairs consisted of replacing pumps, diesel engines, lighting, generators and security fencing as well as elevating stations, engines and electrical components. Additional storm-proofing measures included installing butterfly valves at Pump Stations 2 and 3. These butterfly valves can be closed to prevent floodwater coming through to the protected side.

Other Corps design-build projects in the New Orleans area include Phase 2 of the Interim Closure Structures at the three outfall canals which were completed in 2007, and the Inner Harbor Navigation Canal Surge Barrier at Lake Borgne which is currently under construction.

The recently-advertised contract for the Permanent Canal Closures and Pumps at the outfall canals will also be a design-build project.



In photo above, from left: Mike Malloy, Vice-President of CDM's Federal Services Group (FSG); Robert Davis, Jr., Vice President and Client Service Manager for CDM's FSG; Maj. Jeffrey Hall, Hurricane Protection Office (HPO) Deputy Commander – East Bank; Rick Kendrick, Chief for Program Execution, HPO; John Ashley, Chief of the Existing Pump Stations Branch; Timothy Wall, President of CDM's FSG; Col. Robert Sinkler, Commander of HPO; Steve Thanner, Project Manager for CDM Constructors; John Michon, Project Manager; Randy Persica, Resident Engineer; and Dan Bolinger, Senior Project Manager.



Karen Durham-Aguilera gives *live* interview to Weather Channel

On June 1, the first day of the 2010 Hurricane Season, the Weather Channel called Karen Durham-Aguilera, Director of Task Force Hope, for an interview. Below is a transcript of that interview.

weather.com

W.C.: Mrs. Durham-Aguilera, what is the city doing to prepare for hurricane season?

KD-A: Today is the first day of hurricane season. The Corps of Engineers, along with other Federal agencies, the Coast Guard, the Weather Service, the NOAA fisheries, as well as the local cities and parishes, have been preparing since the beginning of this year getting ready for this season.

As far as the construction of the 100-year Hurricane and Storm Damage Risk Reduction System, if you drive around the Greater New Orleans area, you will see an incredible amount of construction taking place.

I'll give you a couple of numbers: we have over 360 contracts in the \$14.6 Billion program, and right now we've already awarded over 260 of them. We have over 100 contracts ongoing. We only have a few more to award this summer that we need for the 100-year system. So what people will see is an awful lot of construction, and the public should know that the system right now is far better than at any previous time in history. We are a lot better off today than we were even a year ago.

W.C.: What would you say is the mood of people in the city going into hurricane season – how do they feel?

KD-A: People feel a lot better than they ever have before because they see these flood-walls that are in place, they see new levees, they see these surge barriers. There's nothing like it in the entire world. If you go out to the Inner Harbor Navigation Canal, you will see the two-mile-long surge barrier going up, and that surge barrier greatly reduces the risk of storm surge flooding for the 9th Ward, Metro New Orleans, Gentilly, New Orleans East and St. Bernard Parish. So people are a lot more optimistic.

Of course, the thing that's on everyone's minds these days is the oil spill and if that will still be going on by the peak of hurricane season, and is that going to make a difference should we have a hurricane hit this area.

W.C.: Much success to you and the Corps as you continue building that great wall. Two miles long! It's also being called "The Great Wall of Louisiana." Thank you for joining us.



Karen Durham-Aguilera
Director, Task Force Hope

