



US Army Corps
of Engineers
Mississippi Valley Division



Corps Hurricane Response

Task Force Hope Status Report Newsletter

June 20, 2013

U.S. Army Corps of Engineers celebrates

A major contract **Start** and a major project **Completion**

by Susan Spaht

June has been a very significant month for the Corps of Engineers construction teams working on the Hurricane and Storm Damage Risk Reduction System. On June 14, a groundbreaking ceremony was held at the 17th Street Outfall Canal to mark the **start** of construction of the Permanent Canal Closures and Pumps. And on June 17, a ribbon-cutting ceremony was held at the site of the U.S. Hwy. 90 overpass and floodwall to announce the **completion** of the West Bank & Vicinity project.



Ceremonial flags at the 17th Street Outfall Canal mark the location for the groundbreaking activities that announced the start of construction for the Permanent Canal Closures and Pumps, one of the largest contracts in the HSDRR USACE Photo by Patti Geistfeld

PCCP Construction Starts

After a couple of false starts, the Permanent Canal Closures and Pumps (PCCP) project has finally started construction. On June 14, Corps leadership; national, state and local officials; the media; and interested citizens gathered at the 17th Street Outfall Canal to ceremoniously break ground on construction of this huge project. At a cost of

\$614,755,700, this is the third largest contract in the HSDRRS. This contract is for construction of the permanent pumps and gates at the 17th Street, London Ave. and Orleans Ave. outfall canals. The permanent features will be constructed by PCCP Constructors, a joint venture of Kiewit Louisiana Co., Traylor Bros., Inc. and the M.R. Pittman

Group, LLC. PCCP Constructors will work at all three outfall canals simultaneously.

Continued on page 2

Also in this issue:

- Causeway Bridge project complete.....Page 4
- Storm Surge Forecasting.....Page 7
- Commander's Letter.....Page 11

Continued from page 1

The initial awarding of this monumental contract was in April 2011. That contract was protested by two of the final phase competitors, thus causing a delay. In September 2012, the Corps awarded the contract again. Even though protests were initiated again, the Corps agreed to do corrective actions. The protesting contractors agreed to informal dispute resolution procedures, and the contract moved forward.

The Permanent Canal Closures and Pumps, commonly called the Permanent Pumps, will provide permanent and more sustainable measures for reducing the risk of a 100-year level storm surge entering the three outfall canals. Currently, 100-year risk reduction is being provided by interim closure structures and pumps. These temporary structures were built at the mouths of all three outfall canals immediately following Hurricane Katrina in 2005, and were in place and performing before the start of the 2006 hurricane season. The in-



terim structures were built with a life expectancy of only five to seven years, but the Corps' maintenance crews have maintained these structures in excellent working condition while the contracting process for the Permanent Pumps worked its way forward. The interim structures, even though temporary, were built to the 100-year level of storm surge risk reduction and have performed as designed in five named tropical weather events, most recently during Hurricane Isaac.

Construction of the Permanent Pumps is expected to be completed in February 2017. The interim structures will remain in place and operational until the Permanent Pumps are complete and operational. At that time the interim structures will be dismantled.

West Bank & Vicinity Complete

On Monday, June 17, the Corps of Engineers hosted a ribbon-cutting ceremony to commemorate the completion of permanent features along the West Bank & Vicinity (WBV) perimeter risk reduction system. With the installation of the two final monoliths of the recently completed Western Tie-In, the entire West Bank & Vicinity perimeter now has all of the permanent 100-year features in place.

The WBV includes risk reduction features on the west bank of the Mississippi River in St. Charles, Jefferson, Orleans and Plaquemines parishes. The huge project includes



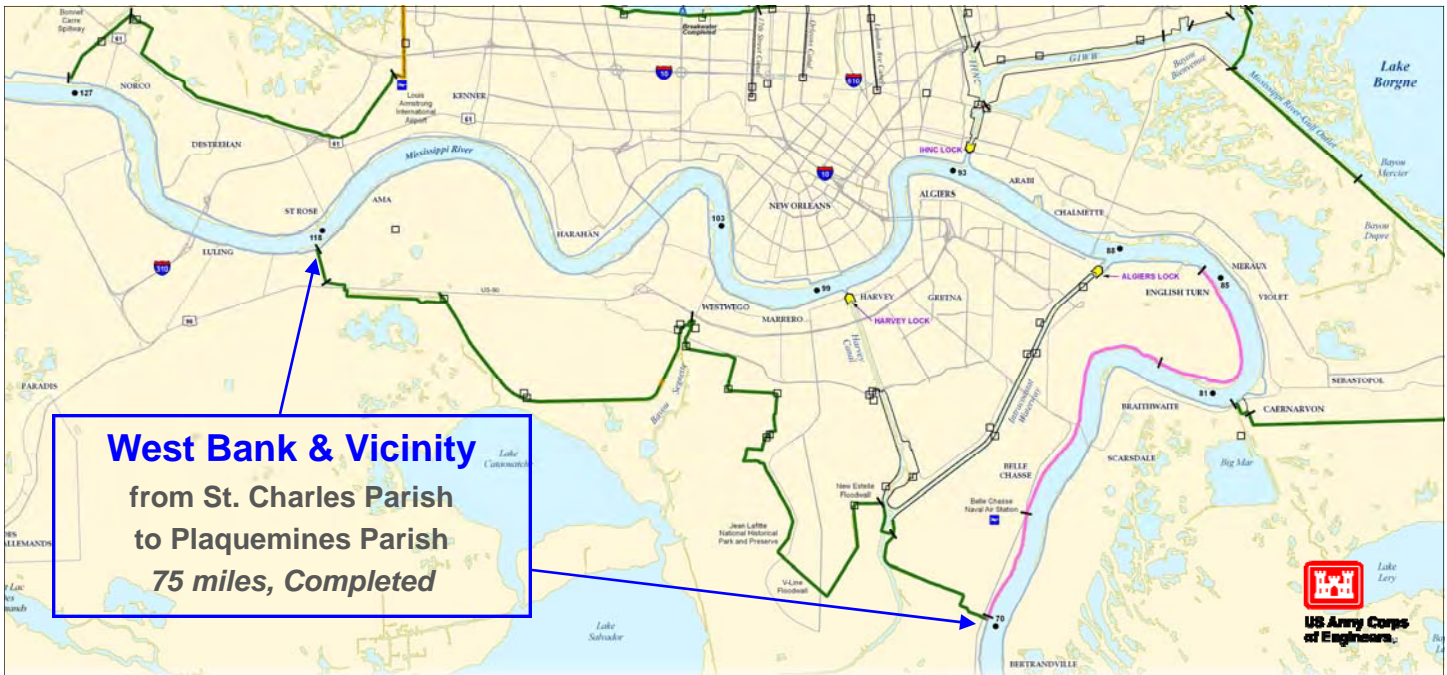
Col. Richard Hansen, Commander of the New Orleans District, is interviewed at the Permanent Pumps groundbreaking ceremony.

making improvements to, or building from the ground up, 75 miles of levees, floodwalls, water control structures and other risk reduction features for the four parish area. It includes approximately 50 construction contracts worth approximately \$3 billion.

The West Bank & Vicinity project runs from the Western Tie-In project at the Mississippi River in St. Charles Parish, all the way to the Eastern Tie-In at the Mississippi River in Plaquemines Parish.

The ribbon-cutting ceremony was held at the U.S. 90 highway bridge near the Davis Pond guide levee. This is the location of WBV-73 that included construction of a floodwall under the highway, and the highway bridge over the floodwall. Crews recently installed the last two monoliths to close the last construction gap in that project. When Hurricane Isaac came through this area last summer, the Corps closed those construction gaps with sand baskets to hold back any storm surge. But that also shut down traffic on Hwy. 90, one of the

Continued on page 3



Continued from page 2

west bank’s major evacuation and re-entry routes. The new bridge will allow this important traffic artery to remain open during and after future tropical events.

The West Bank & Vicinity project also includes one of the largest construction projects in the \$14.6 billion Hurricane and Storm Damage Risk Reduction System, the Gulf Intra-coastal Waterway- West Closure Complex, which is home to the largest drainage pump station in the world, and the largest sector gates in the country.

Getting Closer...

“We have a lot to celebrate this month,” said Mike Park, Chief of Task Force Hope. “With completion of the West Bank & Vicinity project, we now have all the permanent features in place along a 75-mile perimeter stretch of the Hurricane and Storm Damage Risk Reduction System; and we have started construction on one of the most important



A ceremonial ribbon is cut at the WBV-73 floodwall by, from left, James Fondren, representing Sen. David Vitter; V.J. St. Pierre, President of St. Charles Parish; Col. Richard Hansen, Commander of the New Orleans District; John Young, President of Jefferson Parish; and Mike Stack, District Administrator, LADOTD.

contracts in the system, the Permanent Pumps at the outfall canals.

“We still have lots of work to do, but we are moving ever closer to our goal of providing the people of south Louisiana the 100-year risk reduction system that Congress and two Presi-

dents signed off on. We are constructing a state-of-the-art system unlike anything else in the world, and we are building it within an incredible timeframe. We made a promise to the people of this state, and we are keeping it.”



Historic Canopy *final touch on Causeway Bridge project*



The historic canopy lights at the Lake Pontchartrain Causeway Bridge were reinstalled on June 10. It was the final touch to a \$43 million HSDRRS construction project that had some very interesting aspects to it.

USACE Photo by Scott Riecke

by Susan Spaht

The floodwall and eight new traffic lanes on the south shore of the Lake Pontchartrain Causeway Bridge have been in place for several weeks, but the construction team would not declare the project complete until they had replaced the original historic canopy lights which were removed prior to construction and held in storage until now.

Boh Bros., the construction company in charge, took care of that last detail on Friday, June 10, working under bright lights - starting at midnight and finishing at 4:00 a.m. - in order to

minimize traffic disruption on the busy thoroughfare. The canopy lights, originally erected on the bridge in 1956, were installed on a new truss which is now in place and welcoming northbound drivers as they enter the Causeway Bridge.

As part of the Hurricane and Storm Damage Risk Reduction System, the \$43 million Causeway Bridge project was started in October 2010 and included construction of an elevated bridge/ramp over a new 10-foot high concrete floodwall that ties in to the new perimeter surge defense system. The Causeway is used by more than 40,000 vehicles on a normal weekday, and this world-famous bridge also serves as an important

evacuation route when hurricanes threaten the area. So, closing alternating lanes of traffic during construction on this vital vehicular artery was a complicated process that involved special coordination among the contractor, the State, the Levee Board, the Causeway Commission, the parishes, and the Corps.

"This has been quite an extraordinary process," said Carlton Dufrechou, General Manager of the Lake Pontchartrain Causeway Commission. "We have one of the busiest major bridges in the world. We knew that traffic delays would be a huge consideration when construction

Continued on page 5



Lake Pontchartrain Causeway Bridge 1956 - 2010

Continued from page 4

started, but the Corps and Boh Bros. worked really hard to help keep our commuter traffic flowing as smoothly as possible. The bridge is now wider and more serviceable than it was before.”

More at Stake Than Traffic

The movement of traffic, as important as that is, was only one of the challenges that faced the Causeway construction team. Early on in the process, there were also the considerations of cultural and environmental issues, real estate concerns, and historic structures issues.



Carlton Dufrechou

Cultural and Environmental: The area around the shores of Lake Pontchartrain is known to have been

home to many American Indian tribes over the centuries. Following extensive testing, the Corps’ archeologists determined that no ancestral bones or artifacts would be affected by construction dredging. The Indian tribes were consulted and accepted the findings.

Real Estate: The south shore Causeway area is a very busy commercial area with several major utility lines running beneath the construction area. All dredging and construction of the project, therefore, had to be carefully coordinated with the utility companies to prevent the loss of or damage to any utility lines. The Corps also had to coordinate the removal and relocation of Causeway Commission property, including the historic canopy.

Public Input

The Corps’ new perimeter surge defense system, which runs the length of the south shore of Lake Pontchartrain, had to go “over” the Causeway Bridge, or “under” it. Among the

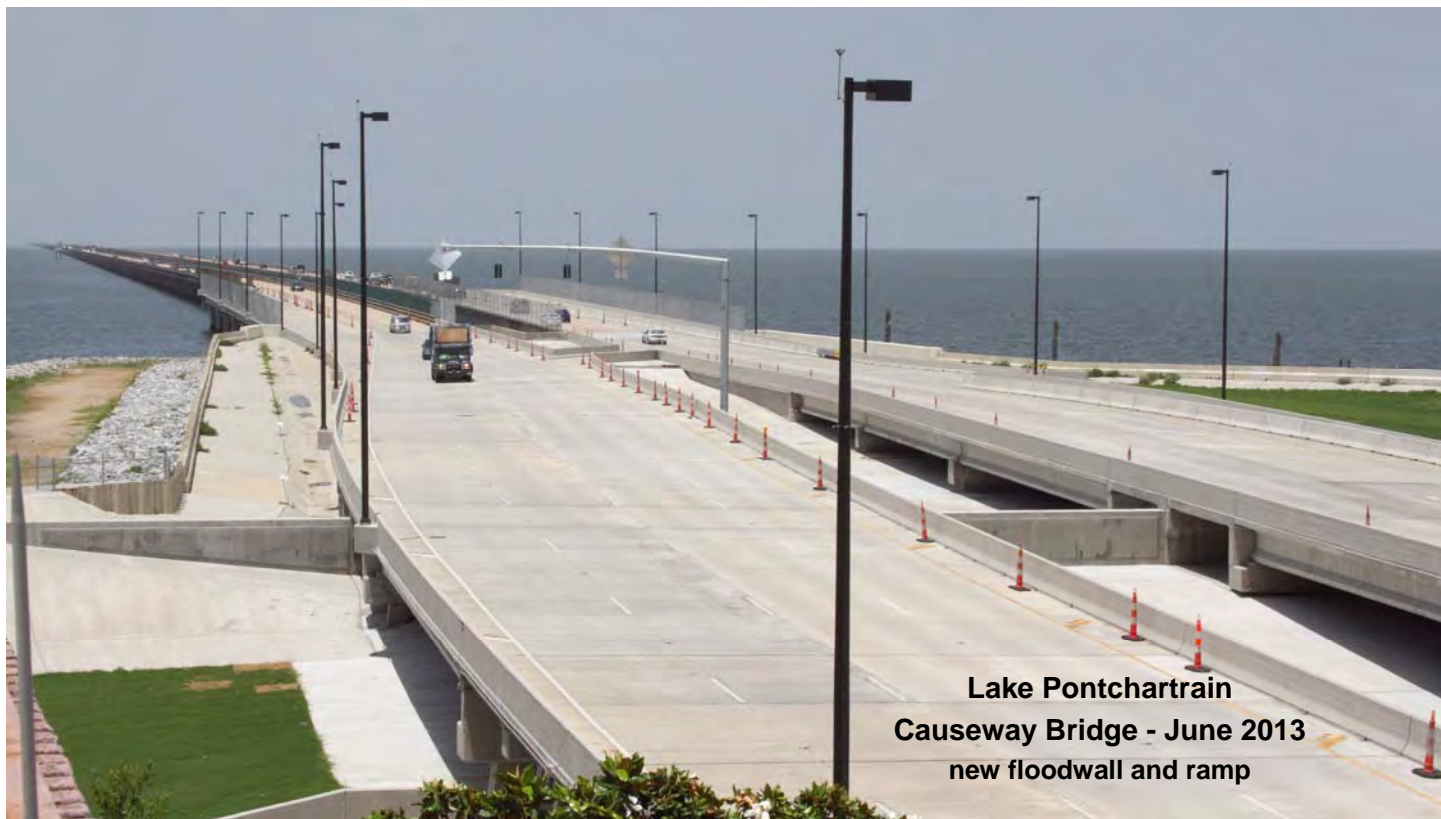
original construction alternatives being considered by the Corps was a swing gate over the traffic lanes on the bridge. The local sponsor, as well as public sentiment, overwhelmingly rejected the swing gate alternative to close the roadway to surge waters, fearing that evacuating citizens and/or emergency vehicles might be caught on the wrong side of the closed gates before, during or after a hurricane.

After a considered evaluation process, the Corps agreed with their concerns and decided to construct the floodwall under a ramp/bridge with continuously open lanes of traffic.

Construction Surprises

According to Project Manager Justin Smith, “When we started the Causeway project we had a very aggressive construction schedule which ended up being affected by a few surprises we ran into along the way.” During excavating work, for example,

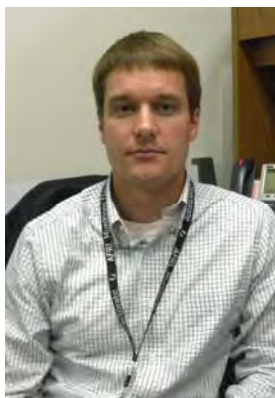
Continued on page 6



**Lake Pontchartrain
Causeway Bridge - June 2013
new floodwall and ramp**

Continued from page 5

the pile driving team ran into a hardened area that they had not expected. “Approximately 65,000 linear feet of pilings were necessary for this project,” explained Smith, “and we found some of them *hit refusal* and could not reach their full depth. We had to stop work when that happened and get an engineering assessment to decide whether we needed to add more pilings or just cut off what was there.” That took time out of the schedule.



Justin Smith

Other schedule-affecting events came in the form of Tropical Storm

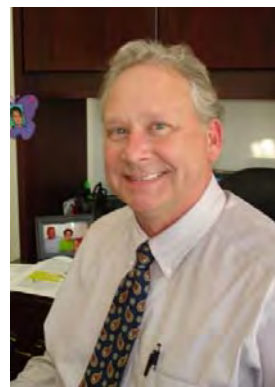
Lee and Hurricane Isaac, both of which caused flooding of the work area and some amount of time loss.

The Causeway construction team reached 100-year designation in March 2012, 18 months after the start of construction. “When you consider the small construction footprint, the non-stop traffic, the site conditions, and all the other complicated aspects of this job,” said Smith, “I’m satisfied that the work went as fast as it could and, more importantly, we ended up with a first quality result.”

One thing Smith said he is sure of: “The Causeway Bridge project has been a testament to the importance of partnership and teamwork. Every day during construction, all these different organizations had to coordinate their efforts and timing to keep construction and traffic moving forward. This has been a team of teams working for the good of the public.”

Ready for Hurricane Season

“The Lake Pontchartrain Causeway Bridge project has been a very complicated construction job,” said Mike Park, Chief of Task Force Hope. “I congratulate the project team for the excellent job they did in keeping our partners and stakeholders informed along the way, keeping the traffic flowing, and keeping the public’s safety in mind at every step of the way. This has been one of the more demanding construction jobs in the HSDRRS, and we are pleased to have this important project in place and ready for the approaching height of hurricane season.”



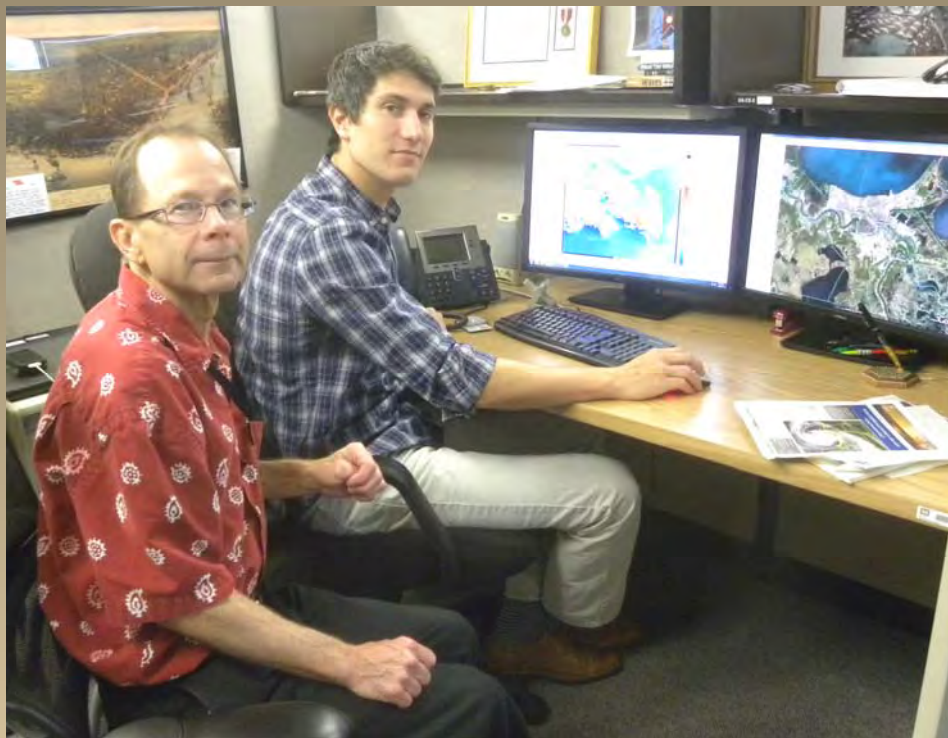
Mike Park



Storm Surge Forecasting, *a very tricky science*

*This article was written
by Maxwell Agnew*

Editor's Note: *Max Agnew has been a hydraulic engineer with the Corps' New Orleans District since 2008. He received a BS in Civil and Environmental Engineering from the University of California at Davis, and a Master's Degree in Civil Engineering from Notre Dame where he studied under Professor Joannes Westerink.*



Shown are Dr. Jay Ratcliff, left, a technical expert with ERDC, and Max Agnew of the Corps' Hydraulics and Hydrologic branch in New Orleans. The H&H Branch advises the Corps' Emergency Operations Center when the time is right to close and open surge gates and system openings during tropical events. USACE Photo

In the years following Hurricane Katrina, the state of practice of storm surge modeling and forecasting evolved at a rapid pace. "Ongoing research efforts are continually improving our knowledge and understanding of hurricanes from their creation (cyclogenesis), transition from low to higher intensity, to their dissipation," according to Dr. Jay Ratcliff, a seasoned hydraulic engineer at the Corps' Engineer Research and Development Center (ERDC), who specializes in hurricane storm surge modeling and has personally observed the developments throughout the years. Despite a high investment in research dollars, there will never be an exact forecast. "There's always a better way," said Dr. Ratcliff whose statement applies to many aspects of hydraulic engineering and hurricane science.

Prior to and during a storm, the New Orleans District's Emergency Operations Center (EOC) depends on the District's Hydraulics and Hydrologic (H&H) branch for storm surge predictions to coordinate gate closures and other operations that protect people and infrastructure from storm surge flooding. The H&H branch has a variety of tools for storm surge prediction; each method has different strengths and weaknesses. After conferring with their technical tools, H&H personnel often rely on engineering judgment to pick the best forecast information for presentation to the EOC and the district commander.

Variety of Tools

Predicting the flow of air and water during a hurricane is a complicated task involving physical scales from the macroscopic atmospheric components to the microscopic air and sea interaction at the water surface. As a result, specialists from a variety of disciplines are involved. For example, meteorologists specialize in predicting the path, intensity, and associated wind and pressure fields of a storm. The meteorological output is then passed to hydraulic engineers and hydrologists who run their own sophisticated models that pre-

Continued on page 8

Continued from page 7

dict storm surge, waves, rainfall and other hazards. The complexity of the modeling processes reflects the complexity of the phenomenon.

Most hydraulic engineers realize that running a model is easy, while interpretation and explanation is the most complex and challenging step in the process. The output, along with the uncertainty and assumptions of the modeling, must be interpreted and explained to decision makers.

ADCIRC (ADvancedCIRCulation) Surge Guidance System

ADCIRC is a system of computer programs for solving time dependent, free surface circulation and transport problems in two and three

dimensions. In a single simulation, ADCIRC can provide tide and storm surge elevations and velocities corresponding to each node over a very large domain encompassing regional domains such as the western North Atlantic Ocean, the Caribbean Sea, and the Gulf of Mexico. The ADCIRC system was developed by Dr. Rick Leutlich and Dr. Joannes Westerink.

For the 2013 hurricane season, the Corps' H&H branch plans to work with Professor Rick Leutlich of the University of North Carolina, and Jason Fleming of Seahorse Consulting, to produce storm surge forecasts using the ADCIRC Surge Guidance System (ASGS). The ASGS uses Department of Defense (DoD) supercomputers to run detailed storm surge models automatically

based on the latest track and intensity data (meteorological input) from the National Hurricane Center (NHC). The most useful aspect of the ADCIRC forecasts is the output hydrograph, displaying time vs. water level at any location throughout coastal Louisiana. (see Figure 1)

The District EOC is in charge of the timely opening and closing of hundreds of floodgates around the Greater New Orleans area that are over roads, railroads, waterways and other openings. It is important that these transportation and egress routes be left open as needed for commerce or evacuation, and closed in time to defend against oncoming surge. Decision makers in the EOC

Continued on page 9

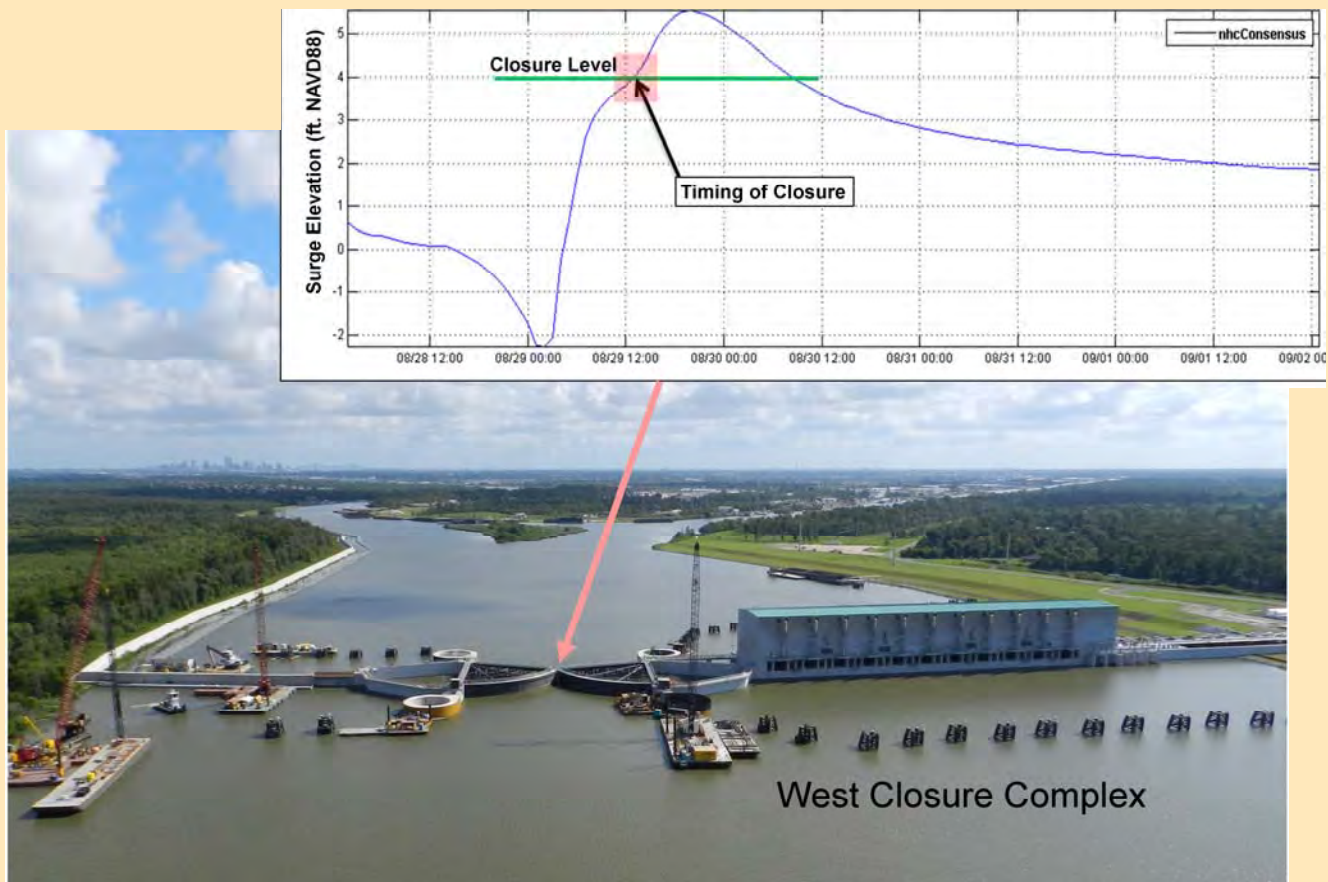


Figure 1 : The ADCIRC model predicts water elevation time-series before the storm makes landfall. This information is used to determine the closure timing for many HSDRRS components. This image displays the Hurricane Isaac forecasted hydrograph at the West Closure Complex.

Continued from page 8

need guidance showing the correct timing of when water levels will reach thresholds for gate closures and openings. This information is critical to coordinate with the Coast Guard and the navigation industry, as well as with residents and businesses who need to evacuate.

The accuracy of the surge forecast depends greatly on meteorological forecasting. If the track suddenly veers left or right from the forecasted National Hurricane Center (NHC) consensus track, the ADCIRC surge forecast will be inaccurate. The limitation of the ASGS is that only a few simulations, perhaps one veer-left, one consensus track, and one veer-right, can be made with each NHC advisory. If the storm does something completely different than the three chosen tracks, the ASGS surge forecast will no longer be valid. Surge information from the ASGS is kept internal to the EOC and the local government liaisons, because the Corps of Engineers is not the public's official forecasting organization. Releasing information that is inconsistent with the official government forecaster (NHC) could mislead and confuse the public.

Figure 2 displays an ADCIRC surge elevation plot from a simulation of Hurricane Isaac. The images show the surge dynamics over Southeast Louisiana, with warmer colors representing higher water levels. During the early part of the storm, the winds are predominately coming from the East, causing surge to build along the lower Mississippi River levees and enter Lake Borgne. As the storm passes, the winds are predominately

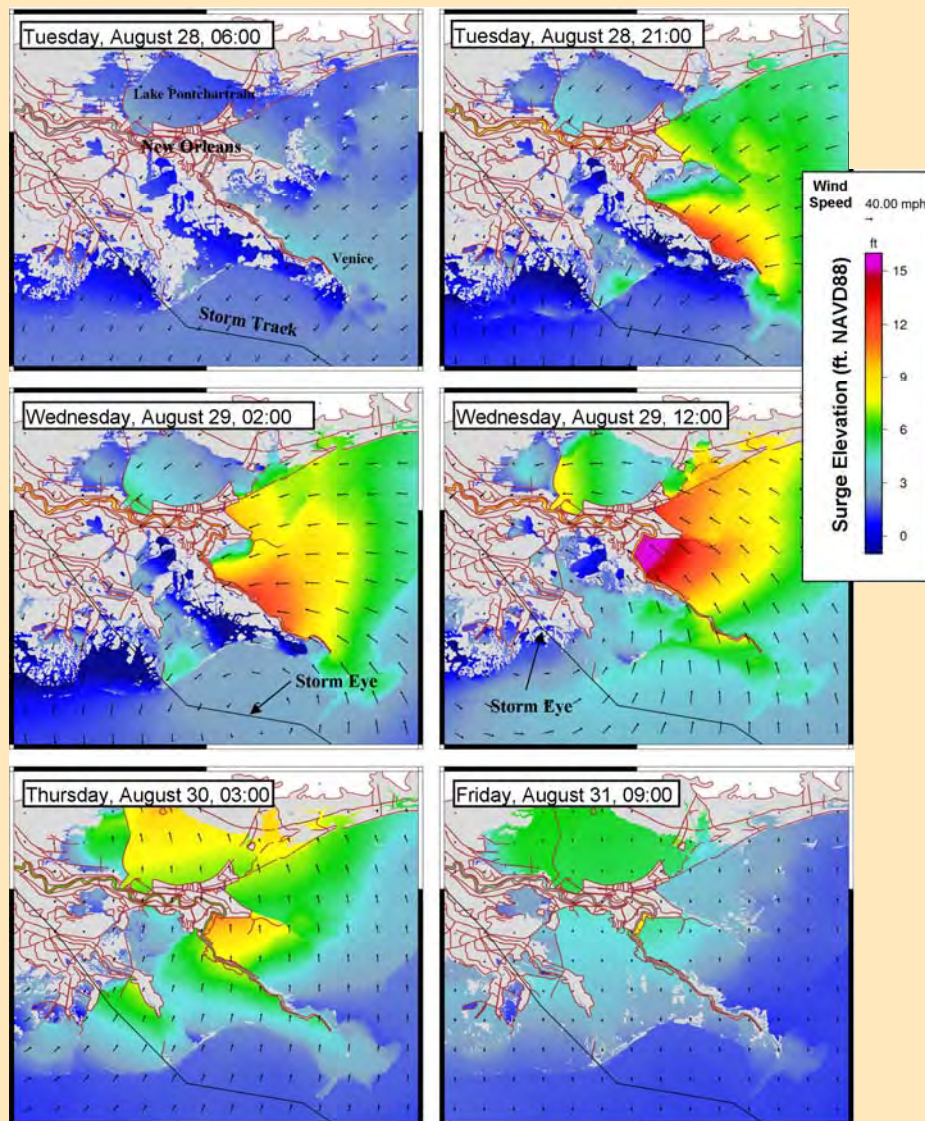


Figure 2: ADCIRC surge elevation time series for Hurricane Isaac. The ADCIRC model predicts the surge elevation over the course of the storm.

from the South, causing surge to enter the Barataria Basin, and build in Lake Pontchartrain and the North Shore.

ADCIRC Surge Atlas

When the greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS) was in the design phase, a suite of 152 hypothetical storms was processed with the ADCIRC model, producing surge data for a variety of possible storm scenarios. H&H developed a

tool known as the Surge Atlas which provides peak surge elevation maps and hydrographs for each of these 152 storms. If a hurricane's forecasted track is similar of one of the 152 synthetic storms, the results of the selected storm are analyzed and compared to other surge forecasts. The Surge Atlas provides information quickly and without having to run computer models. Each storm has unique track and intensity, so there is always a possibility that the real

Continued on page 10

New NHC Surge Graphics

The National Hurricane Center is currently in the process of revamping the way surge forecasts are communicated to the public. "Scientists, by their very nature, use very sophisticated language, technical language. It turns out that nobody else understands what we're talking about. So once we figured that out, we started using more plain language" said Jamie Rhome, leader of the NHC storm surge unit. The new graphics will be easy to read for the general public, showing storm surge inundation, expressed as "feet above ground," in high resolution. If the new maps are

Continued from page 9

storm will not match one of the synthetic 152 storms in the Atlas.

NHC P-Surge

The National Hurricane Center releases probabilistic storm surge forecasts for each advisory in a product known as P-Surge. The graphics produced by the NHC display water level with a certain probability of being exceeded. For example, the 10 percent P-Surge plot displays storm surge heights in feet above normal tide level which have a 10 percent chance of being exceeded during the storm. The graphic is based on an ensemble of Sea, Lake, and Overland Surge from Hurricanes (SLOSH) model runs using the latest NHC hurricane advisory. The exceedance heights depend on the historical accuracy of the NHC's forecasts. The probabilistic approach

accounts for the uncertainty of the modeling. One of the strengths of the SLOSH model is its ability to compute thousands of possible storms very efficiently. This allows all sorts of possible scenarios to be evaluated when a hurricane is threatening the coast. The illustration on this page shows the P-Surge example for Hurricane Isaac.

One of the downsides of the NHC P-surge information is that no hydrograph output is publicly available. The P-surge plot shows peak surge elevation values for a given level of assurance, but no information is provided about how and when surge will reach that level. Without a hydrograph, it is difficult to estimate the timing of closure for HSDRRS floodgates and surge barriers.

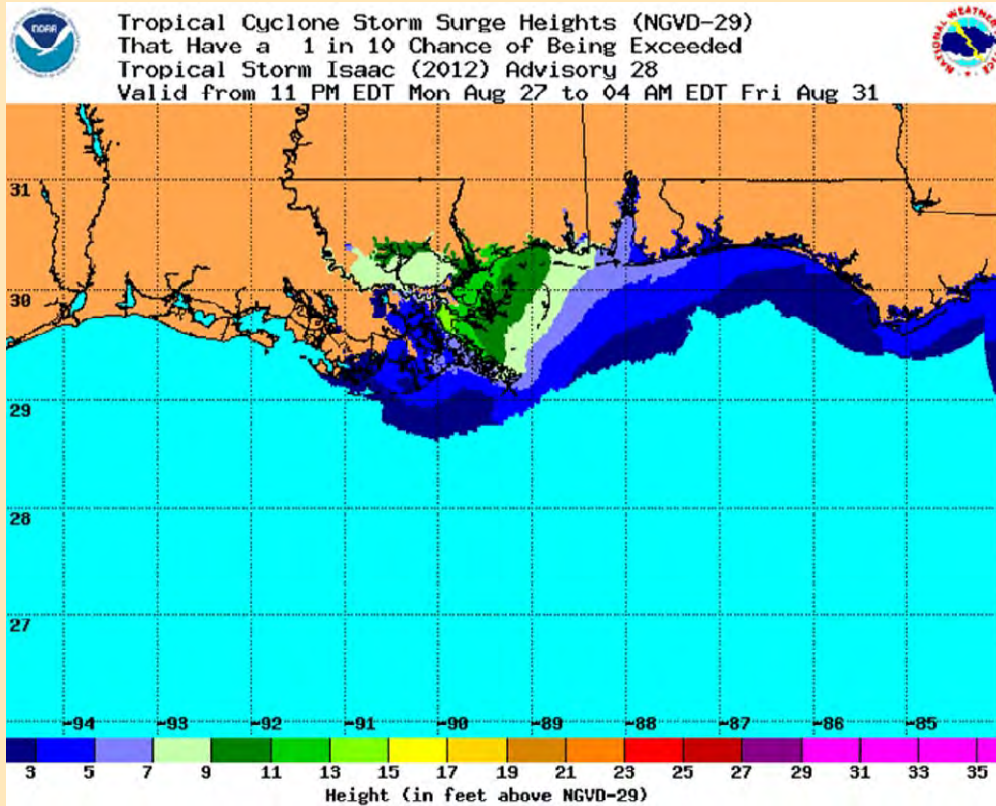
The P-surge forecasts are published online at: <http://www.nws.noaa.gov/mdl/psurge/>

not ready for the 2013 season, the plan is to have them available for 2014.

Despite considerable advancements in surge modeling, there will never be an exact forecast.

For operations in the EOC, the approach is to gather all available data, weigh the strengths and weaknesses of each source, and present the best estimate to the decision makers. This process often involves engineering judgment.

For the general public, the best approach is to monitor the National Hurricane Center's website for advisory updates, surge estimates and warnings. Local government officials will make the call if an evacuation is necessary.





Letter from our Commanding General



As another hurricane season begins, the Corps can be justly proud to celebrate several major milestones delivered by Team New Orleans. This year will be the first since Hurricane Katrina hit that the Corps does not need to rely on any construction closure structures in the Hurricane and Storm Damage Risk Reduction System to defend the area against surge from a tropical event. As a result of the superb efforts of all professionals working in New Orleans, all construction openings in the system have been closed permanently, and the system is able to stand on its own to defend the area.

Congratulations to all who have worked so hard to get us to this important juncture!

Team New Orleans recently completed construction on the Lake Pontchartrain Causeway Bridge project, a high profile roadway and major evacuation route; and completed the final contract in the 100-year perimeter system of the West Bank & Vicinity project. With the recent award of the Permanent Pumps contract, the third largest construction contract for the system, we are closing in on meeting our full commitment to the people of Louisiana. With each passing month and every completed project, the Greater New Orleans area is equipped with a more robust Hurricane and Storm Damage Risk Reduction System.

However, we have a great deal of work still ahead, so we must remain focused on overcoming the challenges we face, and vigilant against delays that may prevent us from delivering every element of the system for the citizens of lower Louisiana as quickly and effectively as possible. Last week I had a constructive meeting with Mr. Graves from the Coastal Protection and Restoration Authority to discuss some of these issues. We

both agreed that we would work to develop and execute a plan to assist the appropriate authorities in the greater New Orleans area to prepare for taking over full control of all aspects of the HSDRRS. We agreed that this year during the 2013 hurricane season, Louisiana authorities would observe USACE professionals utilizing the project, and for the 2014 hurricane season our experts will provide an "over-the-shoulder" support and review of CPRA and Louisiana Authorities' operation of the project. I have asked COL Hansen to develop the details to carry out this agreement as soon as possible.



Maj. Gen. John Peabody

Finally, on May 23rd I was honored to preside over the change of command between COL Ed Fleming, and the incoming commander, COL Rick Hansen. All of us congratulate COL Fleming and his family on an extraordinarily successful command tour in New Orleans, and wish them our very best in their next assignment in Washington DC, where Ed will serve as the Executive Director for Civil and

Emergency Operations. COL Rick Hansen is already picking up quickly where COL Fleming left off. We are grateful to welcome him and his family to the Mississippi Valley, and I look forward to working with him on the many challenges facing the New Orleans District and the Mississippi Valley Division.

Team New Orleans continues to make its distinctive mark on history, and I am both honored and humbled to be associated with each of you.

Building Strong!

John Peabody

Maj. Gen. John Peabody, Commander
Mississippi Valley Division

Contact Information

U.S. Army Corps of Engineers

The *Status Report Newsletter* supports the information program for Task Force Hope and its stakeholders.

It also serves as the primary tool for accurately transmitting the Corps' hurricane risk reduction efforts to stakeholders.

This is an online publication that is open to public distribution.

Past issues can be found at:

http://www2.mvn.usace.army.mil/hps2/hps_newsletters.asp

and

<http://www.mvd.usace.army.mil/Media/Publications/TaskForceHopeNewsletter.aspx>

The Status Report Newsletter is an unofficial publication authorized under the provisions of AR 360-1. Views and opinions expressed are not necessarily those of the Corps of Engineers or the Department of the Army.



Status Report Newsletter
Task Force Hope
Strategic Communications
7400 Leake Ave., Room #388
New Orleans, LA 70118

Task Force Hope
(504) 862-1949

New Orleans District
(504) 862-2201