

Greater New Orleans Hurricane and Storm Damage Risk Reduction System Facts and Figures

(As of June 2010)

Following Hurricanes Katrina and Rita in 2005, the U.S. Army Corps of Engineers was authorized and funded to design and construct the Hurricane and Storm Damage Risk Reduction System for southeast Louisiana.

The 350-mile system, when completed, will consist of levees, floodwalls, gates and pumps, and will providing 100-year level risk reduction to a five-parish area.

Upon completion of the HSDRRS, the greater New Orleans area will have the best perimeter defense in its history.

Hurricane Katrina - August 29, 2005

- One of America's largest natural disasters
- 127 mph winds at Louisiana landfall
- Maximum surge of 30 feet

Hurricane Rita - September 24, 2005

- 120 mph sustained winds at landfall
- Maximum surge of 15—20 feet

Hurricane Gustav - September 1, 2008

- 105 mph winds at landfall
- 12-foot surge at the Inner Harbor Navigation Canal
- The hurricane system performed as designed and held.

Emergency Response

Immediately after Hurricanes Katrina and Rita, the Corps repaired or replaced 220 miles or 1.16 million feet of levees and floodwalls from September 2005 – June 2006 for the start of Hurricane Season.

The repaired system included:

- 2.3 miles of new floodwalls
- 22.7 miles of new levees
- 195.3 miles of scour repair
- 3 interim gated closure structures
- Unwatered the City of New Orleans; more than 250 billion gallons removed

FEMA Support Mission

(Hurricanes Katrina and Rita)

Water - 2,178 trucks

Power Assessed - 928

Generators Installed - 288

Roofing - 81,318

Structures - 310

Debris - 28.1 million cubic yards



**US Army Corps
of Engineers**

"Every day the Corps of Engineers is working, we are reducing the risk of storm surge for the people of greater New Orleans."

*- Karen Durham-Aguilera
Director, Task Force Hope*

Levees and Floodwalls

There are 350 miles of levees/floodwalls in the HSDRRS

- Levee: an earth embankment, floodwall or structure along a water course whose purpose is flood damage reduction or water conveyance.
- The levees and floodwalls in the HSDRRS are being restored and/or raised to provide the 100-year level of risk reduction.
- Floodwalls have been reinforced at numerous locations, and transitions between floodwalls and levees have been strengthened and armored.
- I-walls have been replaced by stronger T-walls at breach sites. Stick-up has been reduced.

Armoring

- Armoring can be grass, geo-textile materials, stone or paving materials.
- Armoring adds resiliency to a levee and can reduce erosion and scouring of back slopes when wave overtopping occurs.
- Since Katrina the Corps has undertaken a concerted effort to improve standard armoring methods and is working with academia to research the use of various armoring materials.
- About 420 transition spots (where a floodwall meets a levee) will be armored.

Borrow (levee clay)

- Total amount of borrow required for the HSDRRS is approximately 66 million cubic yards.
- Approximately 186 million cubic yards have been approved as suitable for levee construction.
- Approximately 3 million cubic yards of borrow are under investigation.



1 Superdome
= 4.4 million
cubic yards

Major Projects

West Bank & Vicinity Projects

- Approximately 15 miles of levees and 2.5 miles of floodwalls have been raised throughout the West Bank and Vicinity project. The Harvey Canal Floodgate and Company Canal Interim Barge Gate are both complete and operable.
- Approximately 10 miles of levees and 5 miles of floodwalls are being raised throughout the West Bank and Vicinity project.

- \$1.6 B in construction contracts has been awarded (includes the GIWW-WCC), with another \$254 M spent on design, inspection and environmental compliance for West Bank projects.
- A great deal of work is on-going on the West Bank and Vicinity; however, the areas of Belle Chasse, Gretna, Algiers, Harvey, Westwego and Waggaman are still subject to a high level of risk.
- **Gulf Intracoastal Waterway—West Closure Complex**
The GIWW-WCC is a major project that will reduce the risk of storm surge entering the Harvey and Algiers Canals. The nearly \$1B project will consist of a 225-ft. navigable floodgate, floodwalls and earthen levees, a sluice gate, foreshore protection, and the world's largest drainage pump station. Construction of this enormous project began in August 2009 and it is already more than 25% complete.

Lake Pontchartrain & Vicinity Projects (East Bank)

- **Inner Harbor Navigation Canal Surge Barriers**
Construction of the massive IHNC Surge Barrier at Lake Borgne, the largest design-build civil works project in Corps history, began in May 2009. The project is a key feature of the HSDRRS – essential to providing 100-year level protection to a large portion of Orleans and St. Bernard parishes by reducing surge generated from Lake Borgne and the Gulf of Mexico.

The 1.8-mile barrier, the largest of its kind in the world, includes three navigation gates and a barrier wall that will stand 26 feet above the water line.

All of the pilings that make up the barrier wall are in place. By the height of the 2010 hurricane season, more than 90% of the IHNC Surge Barrier will be at the 100-year elevation, including the entire barrier wall, barge gate and tie-ins. There will be a coffer dam in place at the GIWW and at Bayou Bienvenue. The entire barrier and all the gates will be operational in June 2011.

A second floodgate complex will be constructed in the Seabrook area of the Industrial Canal to reduce storm surge entering from Lake Pontchartrain. The Seabrook Floodgate is designed to work in tandem with the IHNC Surge Barrier to provide 100-year level risk reduction to the entire IHNC corridor. Construction on Seabrook will begin in mid-2010.

- **St. Charles Parish** — 4 levee reaches, 4 drainage structures, 2 floodwalls, and 1 fronting protection job are currently under construction. St. Charles Parish features include earthen levees, floodwalls and drainage structures. 10 contracts were awarded in 2009 and 2 in 2010. The final contract is anticipated to be awarded this year.

- **Jefferson Parish** — 10 contracts have been awarded, 9 are currently under construction, and 1 is complete. 6 more are scheduled for award in 2010. All 5 Lakefront levee reaches are under construction for 100-year level of risk reduction. The contract for Causeway modifications and the Kenner West Return Floodwall construction will be awarded in 2010.
- **Orleans Metro** — More than 90% meets 100-year level. 4 of 5 contracts have been awarded. Raising approximately 6 miles of levees and replacing or strengthening 1.5 miles of existing floodwalls. On-going improvements include all road crossings and gates from 17th St. Canal to the west side of IHNC, and modifications to the existing floodgate at Bayou St. John.
- **New Orleans East** — All 11 contracts have been awarded. Raising approximately 25 miles of levees and constructing approximately 2 miles of T-walls from Lakefront Airport to Michoud Canal. Replacing existing gates on Highways 11 and 90.
- **St. Bernard Parish** — 6 of 7 contracts have been awarded. Constructing approximately 23 miles of new floodwalls from Bayou Bienvenue to Caernarvon (raising from 20 to 29 feet and, in some places, to 31.5 feet). Constructing new sector gate at Bayou Dupre. Adding floodgates across Highway 46 and replacing the floodgate at Bayou Road. Constructing new floodwalls with a sector gate across the Caernarvon Canal. Floodwalls will continue along the canal toward the Mississippi River, cross Highway 39 and tie-in with the Mississippi River Levee.

Grand Isle

- Recently completed \$26 million program reconstructed 5.7 miles of sand dunes with a geo-textile tube core / sand cap. Construction began in May 2009 and was completed in April 2010. The tubes were filled with sand removed from excavation of the existing dune. The sand cover and beach nourishment portion of the project was dredged from an offshore borrow site.

Plaquemines Parish

The Corps of Engineers is engaged in two separate Federal projects on a complementary timeline that will reduce risk in Plaquemines Parish below Oakville, where the HSDRRS ends.

- The **Plaquemines Parish Non-Federal Levee project** includes replacing or modifying 32 miles of current levees between Oakville and St. Jude on the west bank of the Mississippi River, and constructing 2 miles of earthen levees from the ground level. When completed in 2014, these levees will be part of the New Orleans to Venice Federal levee system.

- The **New Orleans to Venice project** is completing existing Federal levees on the east bank from Phoenix to Bohemia, and on the west bank from St. Jude to Venice, scheduled for completion in 2014

Southeast Louisiana Project (SELA)

- The SELA program is authorized for interior drainage improvements, to reduce damage due to rainfall flooding in New Orleans, Jefferson and St. Tammany parishes.
- While not part of the authorized and funded Hurricane and Storm Damage Risk Reduction System, St. Tammany Parish is included in the overall SELA program.
- 12 SELA construction contracts awarded since Hurricane Katrina include canal enlargements, bridge replacements, and pump station improvements.
- 7 of those contracts are substantially complete. Of the contracts still under construction, 2 will be completed by summer 2010, 1 in summer 2011, and 2 in summer 2012.
- 23 construction contracts remain to be awarded in Orleans and Jefferson parishes.
- Potential projects in St. Tammany Parish are in the study phase.

Risk Management

- Using the Interagency Performance Evaluation Task Force model results, the Corps released to the public the first-ever flood depth maps.
- Utilizing public meetings, partnering sessions, special presentations and U.S. Army Corps of Engineers Web sites, the Corps is communicating the importance of assuming responsibility for understanding and managing flood risk.
- The Corps partnered with FEMA to assure accurate Flood Insurance Rate Maps are available to depict true risk of flooding.
- Risk cannot totally be eliminated; everyone shares responsibility for buying down risk through insurance, zoning and building codes, coastal protection and restoration, and complying with mandatory evacuations.



Funding

The Hurricane and Storm Damage Risk Reduction System (HSDRRS) is fully funded at **\$14.45 B**.

2nd and 3rd Supplementals:	\$2.2 B
4th Supplemental:	\$3.6 B
5th Supplemental:	\$1.3 B
6th Supplemental:	\$5.7 B
7th Supplemental:	\$0.1 B
Federal share:	\$12.8 B
Non-Federal Cost Share (to be repaid over 30 years)	\$1.5 B
Total:	\$14.45 B

Construction Contracts

Contracts	Number	Estimated Value
Total Planned	361	
Total Awarded	251	\$6.7 B
In Construction	93	\$5.6 B

As of April 22, 2010

Outfall Canals

Construction and installation of the interim closure structures and pump stations at the three outfall canals would normally take 3 to 5 years to design, manufacture and install. The Corps accomplished the basic work (closures and substantial pump capacity) in 8 months – before the start of the 2006 Hurricane Season.

The total maximum pumping capacity today at the three outfall canal pumps is about 16,000 cubic feet per second, the average flow of the Potomac River.

17th St. Canal	- 9,200 cfs total pumping capacity
Orleans Ave. Canal	- 2,200 cfs total pumping capacity
London Ave. Canal	- 5,200 cfs total pumping capacity

Supervisory Control and Data Acquisition (SCADA) equipment installed at the outfall canals last year gives the Corps a computerized control system to operate the pumps and gates while monitoring water levels in the canal.

The pumps, gates and SCADA equipment performed successfully during Hurricanes Gustav and Ike in September 2008. The interim closure structures and temporary pumps at the three outfall canals will be replaced with permanent closures and pumps, scheduled for completion in 2014.

Pump Stations

There are 78 pump stations (Federal and Non-Federal) in the 4-parish area.

Pump Station Repairs:

Of 30 projects over a four-parish area:

- 29 completed
- 1 in construction

Jefferson Parish (\$1 M):

- 8 repair projects: all completed

Orleans Parish (\$37 M):

- 12 repair projects: 11 complete, 1 in construction; repairs will be completed in 2010

St. Bernard Parish (\$22 M):

- 5 repair projects: all completed

Plaquemines Parish (\$19 M):

- 5 repair projects: all completed.

Storm Proofing of Pump Stations

There are **34 planned Storm Proofing projects in Jefferson and Orleans parishes. The program is more than 30% complete. Not all projects will be constructed due to available funding.**

Jefferson Parish (16 projects)

There are 25 pump stations divided into 16 individual storm proofing construction projects; and there is \$136 M in available construction funds.

- 6 in construction, 3 complete.

Orleans Parish (18 projects)

There are 24 pump stations divided into 18 individual storm proofing construction projects, and there is \$204 M in available construction funds.

- 1 in construction, 2 complete

Mississippi River Gulf Outlet

Mississippi River Gulf Outlet (MRGO)

- The MRGO was de-authorized for navigation and closed in April 2009.
- The MRGO Ecosystem Restoration project will restore habitat in the Lake Borgne ecosystem and other areas affected by the MRGO navigation channel.
- The study areas encompass 3.86 million acres of land and open water.