

Findings

Of The

Evaluation of Storm Surge in Areas Outside the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS)

By

Thomas Nolan Thompson
March 11, 2019

Objective:

Verify and validate the SL15-1965 grid used to model HSDRRS impact on unprotected areas within the Lake Pontchartrain Basin.

Background:

In April of 2013, the Corps agreed to perform an evaluation of the cumulative impact of all risk reduction structures built after Hurricane Betsey in 1965, to determine the HSDRRS's comprehensive impact on unprotected areas within the Lake Pontchartrain Basin. The Corps released their HSDRRS impact evaluation in August of 2018.

Issue:

The SL15-1965 grid is the baseline used to model HSDRRS impact on unprotected areas within the Lake Pontchartrain Basin. However, significant discrepancies exist between elevations used in the SL15-1965 grid and elevation data recorded in other Corps' documents. The discrepancies call into question the accuracy of the SL15-1965 grid and needs to be resolved before incorporating the Corps' HSDRRS impact report findings into the Corps' Comprehensive Environmental Document (CED) Greater New Orleans (GNO) Hurricane and Storm Damage Risk Reduction System (HSDRRS) Phase II.

Documents Reviewed to Compare Findings:

1. An Evaluation of Storm Surge in Areas Outside the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS); prepared by U. S. Army Corps of Engineers New Orleans District (MVN) Authors: Maxwell Agnew, MVN Hydraulics and Hydrologic (H&H) Branch, Julie Z. LeBlanc, P.E., MVN H&H Branch, Stacey Frost, P.E., MVN H&H Branch; Technical Reviewers: Ty Wamsley, ERDC (Engineering Research and Development Center) Coastal Hydraulics Lab (CHL), Hasan Pourtaheri, P.E., MVN H&H Branch – The date the evaluation report was written is unknown, but it was released on August 2, 2018, in response to a March 3, 2018, Freedom of Information request.
2. Hurricane Betsy September 8-11, 1965 U. S. Army Engineer District, New Orleans, Louisiana November 1965
3. Lake Pontchartrain and Vicinity, Louisiana - Letter from the Secretary of the Army - dated: July 6, 1965

Findings:

The credibility of the Corps' Evaluation of Storm Surge Impact Outside of the HSDRRS is based entirely upon the accuracy of the SL15-1965 grid. Therefore, the Corps needs to identify all supporting documentation used to develop the SL15-1965 grid and resolve conflicts that exist with other Corps documents. Until these discrepancies and issues are resolved the Corps' evaluation can not be accepted as a true and correct evaluation of HSDRRS impact on areas outside of the protection barriers.

Construction on the HSDRRS continues to expand with structures like the addition of the West Shore Lake Pontchartrain Risk Reduction System. Each new HSDRRS structure influences the overall surge impact, and must be included in the evaluation to obtain the true "Comprehensive" HSDRRS impact to the lake basin.

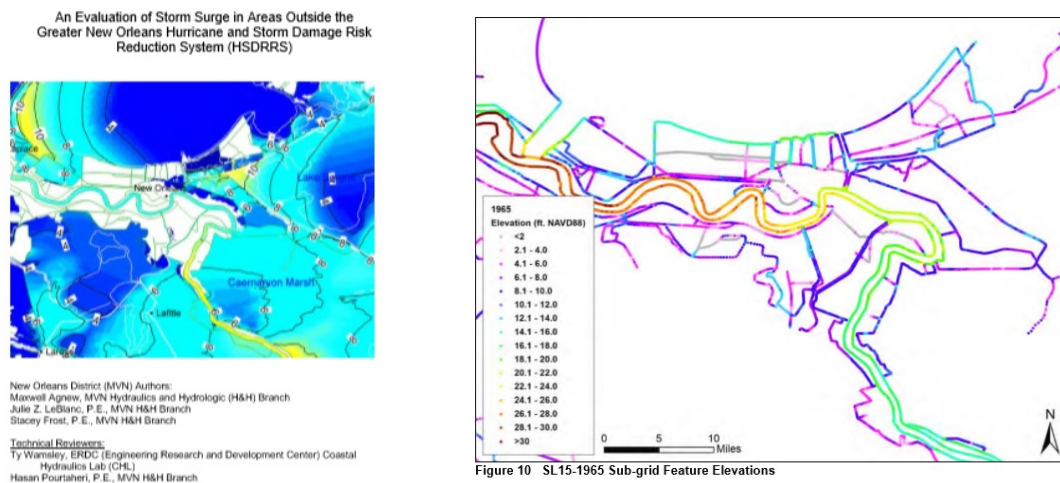
Another issue with the Corps' Evaluation of HSDRRS impact report is the lack of figures illustrating Lake Pontchartrain's outflow surge as hurricanes continue north and winds shift and rotate to the south and east. Lake Pontchartrain's outflow surge, along the HSDRRS, has the greatest impact on east St. Tammany Parish. The impact report should provide figures showing that outflow surge.

Request:

Request a review of the findings and provide a formal written response.

Supporting Justification of Findings:

Document 1 - The SL15-1965 grid used in the Corps' HSDRRS evaluation of storm surge impact shows high levees along the Lake Pontchartrain shoreline that were either significantly lower or did not exist in 1965 (Page 18, Figure 10).



The Corps used drawings from a 1987 General Design Memorandum of the South Point to the Gulf Intracoastal Waterway levee and the levee along the Inner Harbor Navigation Canal to extract and "estimate" the approximate levee elevations used in their SL15-1965 baseline (See grid assumptions and levee elevation extractions on page 13, paragraph 4 through page 14 paragraph 4 and Figure 10 on Page 18). "Actual" topographic elevations are given in the 1965 Corps' Hurricane Betsy Report and the 1965 Army's Lake Pontchartrain and Vicinity Report.

In addition, the levees used to establish the SL15-1965 baseline are located on the extreme eastern and southern edges of New Orleans East, but their estimated elevations were extracted to "assume" the existence of a levee along the northern edge of New Orleans East lake shoreline that 1965 Corps documents state "will require" a 6.3 mile long levee, with an elevation of 10 feet.

Because the Corps modeled a non-existent levee, with an assumed elevation of approximately 14 feet, thousands of acres of floodplain that did exist in 1965, were omitted from their SL15-1965 grid. This discrepancy has a significant impact on the validity of the SL15-1965 grid model. Reference: Figure 15 on Page 24.

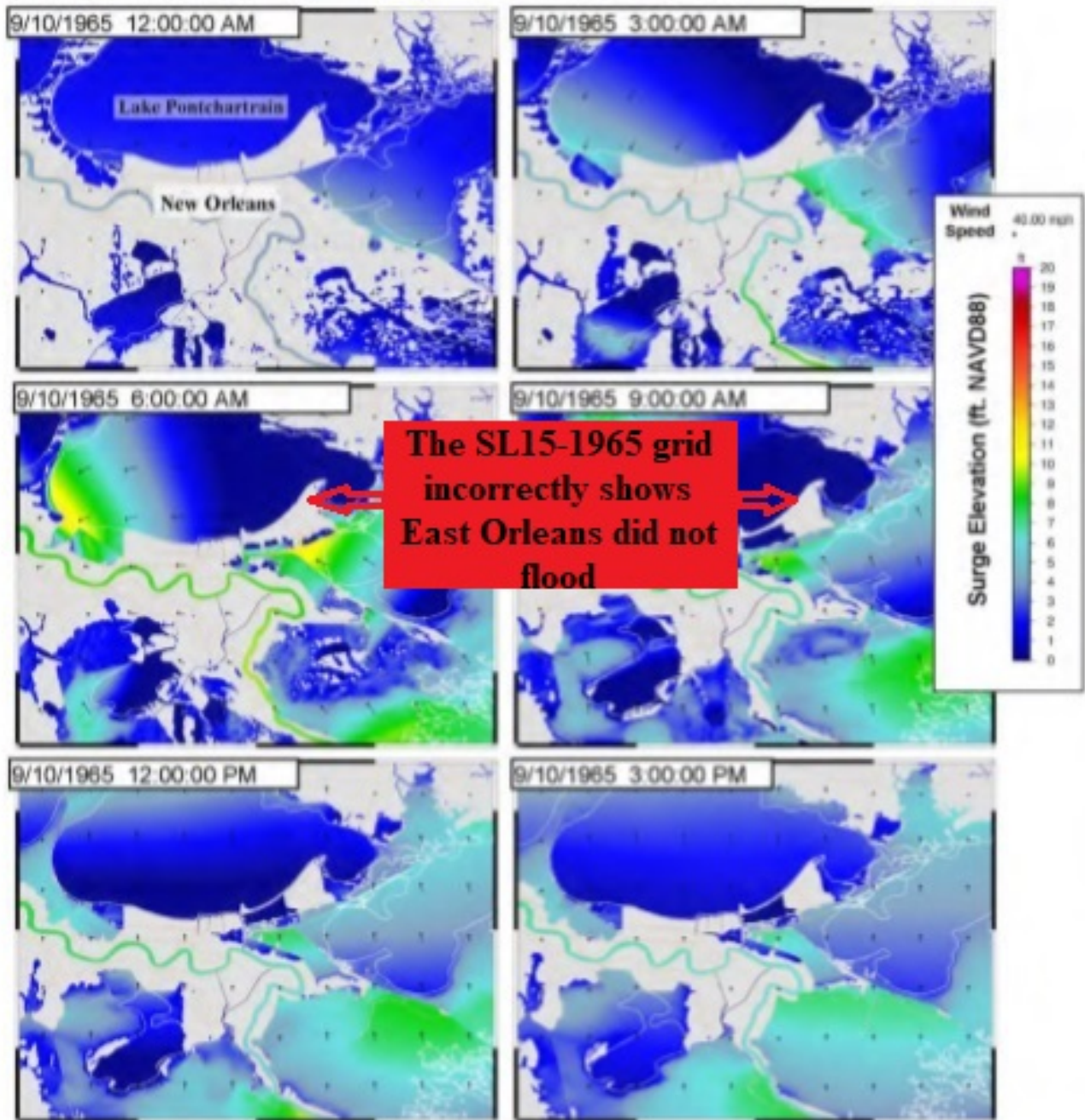
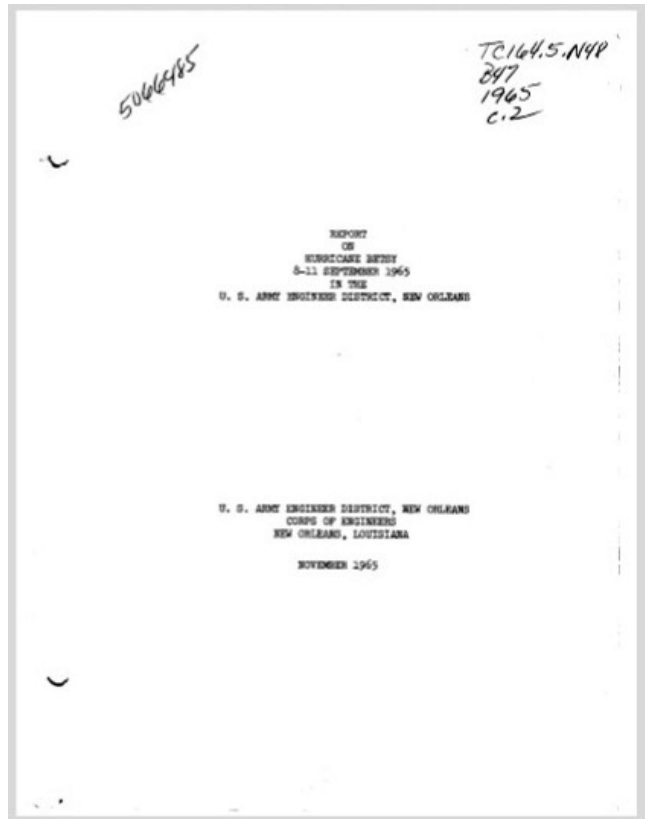


Figure 15 Storm Surge Development for Hurricane Betsy on the SL15-1965 Grid.

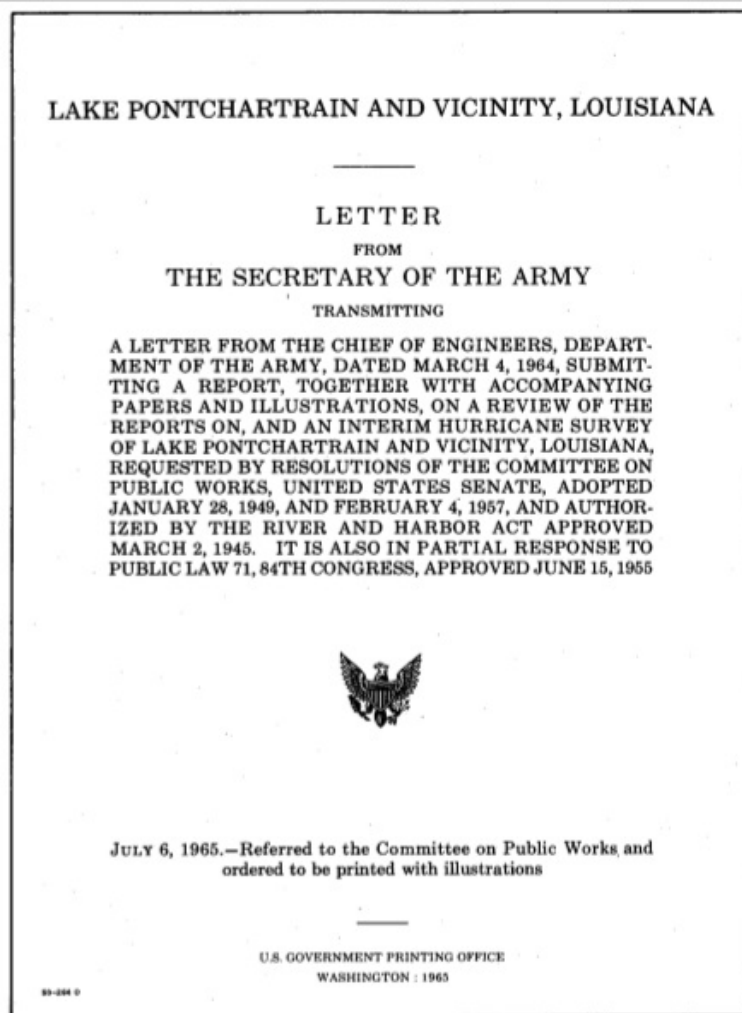
Document 2 - The 1965 Corps' Hurricane Betsy Impact Report identified existing 1965 levees and structures and shows storm surge inundation locations which conflicts with the SL15-1965 grid used in the Corps' HSDRRS Evaluation of Storm Surge Impact report's Figure 15.



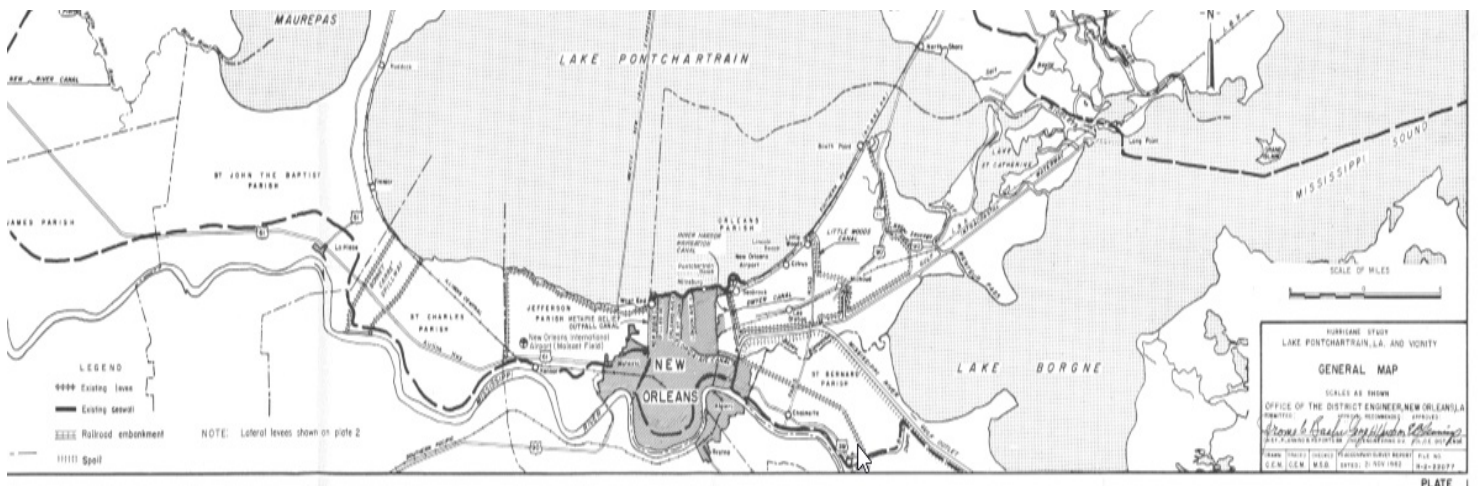
The 1965 Corps' Hurricane Betsy Impact Report Plate 5 on page 82 shows no levees along the northern edge of New Orleans East lake shoreline and storm surge inundating thousands of acres of flood plan that existed in 1965. This discrepancy has a significant impact on the validity of the SL15-1965 grid model.



Document 3 - The Secretary of the Army documented the status of existing levees and topographic features in their 1965 Lake Pontchartrain and Vicinity document. The finding in the Secretary of the Army document conflicts with the SL15-1965 grid used in the Corps' HSDRRS Evaluation of Storm Surge Impact report.



Existing 1965 levees documented in The Secretary of the Army's letter on Page 88 Plate 1



The 1965 Secretary of the Army's letter states that the only 1965 surge protection between Jefferson Parish and the Inner Harbor Navigation Canal was a step-face concrete seawall along the lakefront and levees along its east and west boundaries listed on page 27, paragraph 1 of the letter.

1. New Orleans. The portion of the city between Jefferson Parish and the Inner Harbor Navigation Canal is designated New Orleans. It is protected from moderate lake stages by a step-face concrete seawall along the lakefront and levees along its east and west boundaries. The drainage system, with pumping plants discharging into the lake and in operation for many years, has caused subsidence of natural ground elevations as much as 6 feet below mean sea level.

The 1965 Secretary of the Army's letter states that the only 1965 surge protection in the Inner Harbor Navigation Canal area was a canal spoil bank about 5 feet high listed on page 27, paragraph 2 of the letter.

2. Inner Harbor Navigation Canal. The lands between the levees along both banks of the canal have been raised to an average elevation of about 5 feet with spoil from the canal. No other protection is afforded to this area against flooding from the canal.

The 1965 Secretary of the Army's letter listed New Orleans East protection in paragraph 4 on pages 33 and 34, as follows: a 2.3 mile seawall at the New Orleans Airport with an average elevation of 11 ½ feet; a severely damaged 11 ½ mile Southern Railway embankment about 9.3 feet high that "Will Not" provide protection against hurricane tides and waves; west protection consisted of the Inner Harbor Navigation Canal having a grade of 9.6 feet; east protection consisted of a levee extending from South Point to the Gulf Intracoastal Waterway with an elevation of 11.6 feet; south protection consisted of a levee along the Gulf Intracoastal Waterway with an elevation of 9.6 to 14 feet. No other levees or surge protection is referenced along the Lake Pontchartrain shoreline.

(4) Citrus and New Orleans East. The New Orleans Airport is fronted by a vertical seawall with an average elevation of 11.5 feet and a length of 2.3 miles. The embankment of the Southern Railway extends along the remainder of the south shore to the east for approximately 11.5 miles with an average elevation of about 9.3 feet. The embankment is a heterogeneous fill composed largely of cinders, and has been severely damaged on many occasions in the past by relatively minor hurricane tides and waves. This type of embankment will not provide dependable protection against major

levee along the Inner Harbor Navigation Canal having a grade of 9.6 feet, on the east by a levee that extends from South Point to the Gulf Intracoastal Waterway with an elevation of 11.6 feet, and on the south by a levee along the Gulf Intracoastal Waterway with elevation 9.6 to 14. The Paris Road-Michoud slip levee separates this area into two segments, Citrus and New Orleans East. The Citrus area drains through a system of open canals with one pumping station at Citrus. This partially developed area of 8,900 acres is drained by a 520-c.f.s. electrically driven plant. An emergency power source is provided. Improvements to this system are being planned. The New Orleans East area has no major drainage system at this time but plans for the development of an adequate system for the area are well advanced. Some small units are in operation.
