APPENDIX D
Public Comments and Concerns

Question #1
Do the model simulations show surge elevations for the full path/duration of these scenarios passing over Lake Pontchartrain? Will the study be revised to show the southeast Lake Pontchartrain surge tilt as the surge leaves the Lake Basin?
The only reference to surge flow is on Page 14 paragraph 1, of the Corps' evaluation states: the comparison between the SL15-2012, grid and the SL15-1965, grid was modeled to show only surge flows "into" Lake Pontchartrain. In addition all simulation Figures only show wind and surge elevations as the Lake Pontchartrain is tilted to the northwest. The highest surge levels within the Lake Pontchartrain Basin are created when storm winds rotate to the southeast funneling the surge out of the lake (outflow surge). Therefore, official confirmation is needed to confirm that the study model simulations show the full cycle of Lake Pontchartrain Basin's wind and surge tilt, both to the northwest and the southeast.

Question #1 Response
The modeling includes storms that cause the "outflow funnel surge" described above. Noted in the original question, the "outflow funnel surge" destroyed the I-10 bridge in 2005 during Katrina. This outflow is included in the ADCIRC simulation of Katrina, and other storms. ADCIRC simulates the entire duration of each storm and captures the complete surge development and subsequent draining of the floodplain.

The ADCIRC modeling of these storms includes the full time-series of surge development and subsequent draining. The model includes inflow and outflow of Lake Pontchartrain. A surge animation of Katrina or Storm 023 would show winds and surge approaching Eden Isle from the west after the storm crossed the lake. However, the corps approach is not to evaluate such a specific storm when evaluating overall impacts to surge patterns. Storm specific impacts can vary considerably depending of track, size, forward speed, intensity etc. The purpose of the Corps modeling is to determine overall impacts of a wide range of storm parameters.

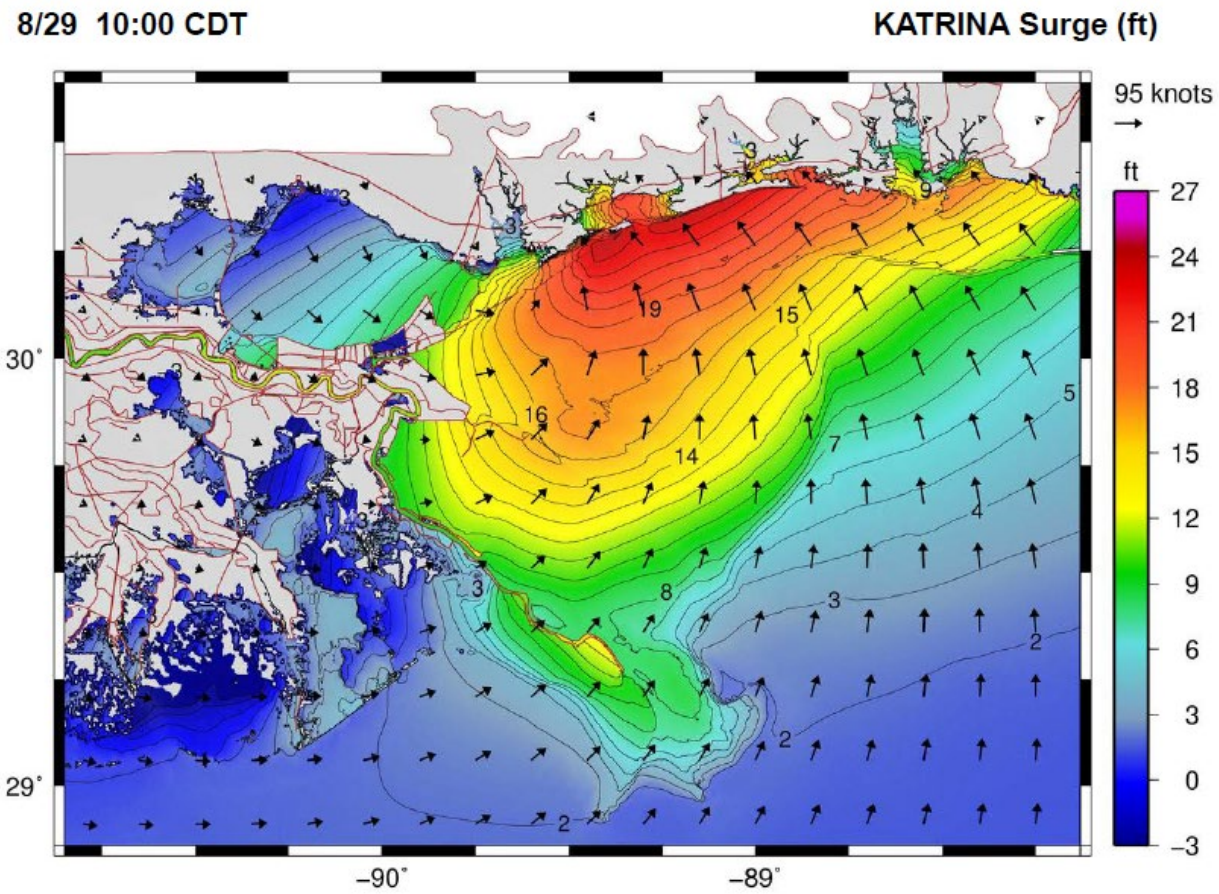

Figure 1 Snapshot of simulated ADCIRC water levels of Hurricane Katrina showing outflow surge from Lake Pontchartrain. Simulation time is 8/29 10:00 CDT.

Question #2 –Why is there a discrepancy between the Corps' study surge elevations and other independent studies? Will the Corps address these discrepancies?
Table 3, page 37, of the Corps' study shows a peak elevation of 12.4 feet at Eden Isles. However, The Lake Pontchartrain Basin Foundation Study Dynamics of Storm Surge in the Pontchartrain and Maurepas Region, has the Hurricane Katrina Slidell surge elevation at 16feet (Table 3, page 26 of the study).

Table 3: Record water levels in feet at various locations around Lake Pontchartrain, based on a SURGEDAT dataset covering 1900 - 2013. The highest water levels in the lake are expected in Slidell (northeast shoreline) and Frenier (southwest shoreline.)

Location	Storm	Year	Water Level (ft)	Calculated Recurrance Interval (yr)	Datum
Slidell	Katrina	2005	15.7	114	NAVD88
Frenier	Betsy	1965	13.1	115	Unknown
New Orleans Lakefront	Katrina	2005	11.9	98	NAVD88
Mandeville	Katrina	2005	10	78	NAVD88

Question #2 response
High water marks surveyed after the storm by FEMA show coastal flooding elevations of 10.5 to 13.5 feet NAVD88 were recorded in the Slidell vicinity. These values tend to agree with the Corps' Katrina simulation. Typically, ADCIRC matches HWM data to within 1.5ft, but higher discrepancies between observed and modeled high water marks can occur.

https://www.fema.gov/pdf/hazard/flood/recoverydata/katrina/katrina_la_hwm_public.pdf

From page x:
Northern Shore: St. Tammany and Tangipahoa Parishes
The increased volume of water was forced into Lake Pontchartrain by hurricane winds. This caused water to pile up on the north shore of the lake and resulted in storm surge extending northas far as US Highway 190 in Slidell and to Interstate 12 north of Mandeville. HWMs recorded flooding elevations ranging from 7 to 16 feet, with the general trend of the highest values on the east end of the north shore working westward to lower surge values. Coastal flooding elevations of 10.5 to 13.5 feet were recorded in the Slidell vicinity.

HWM data recorded by FEMA

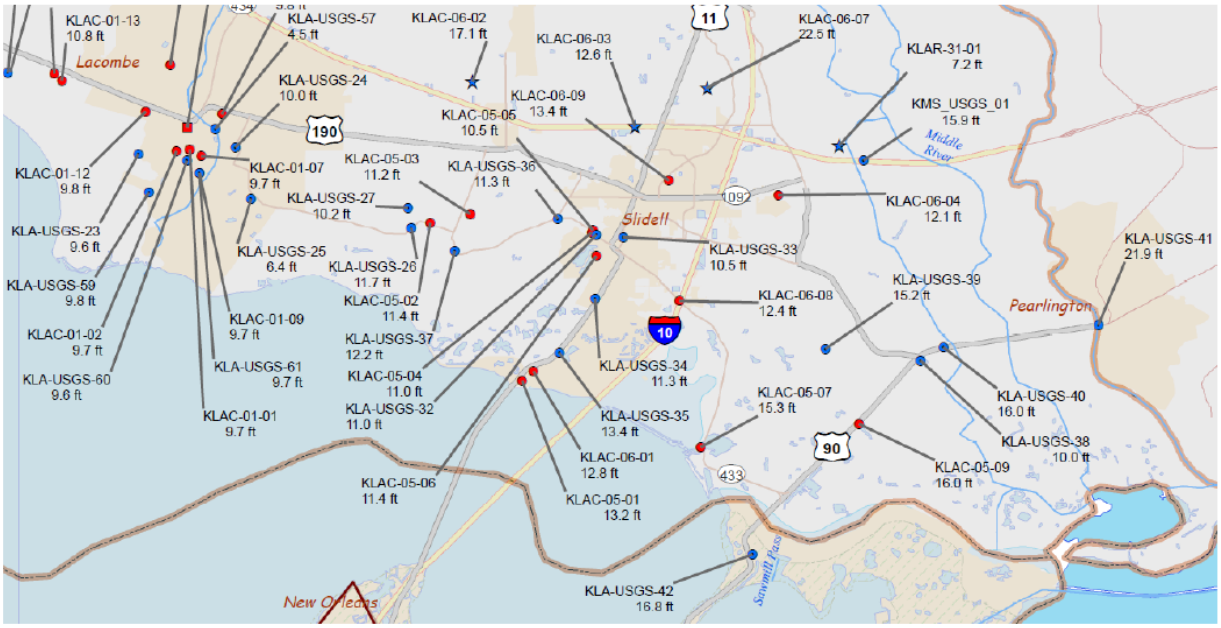

Figure 2 Hurricane Katrina High Water Mark Records from FEMA

Question # 3 –Will the Corps address questions raised about how the 1965 vs. current HSDRRS impacts were determined?
See attached comments by Bob Jacobsen:
The Report Section 2.4, says that the Figure 10 1965 (pre-Betsy) linear feature elevations are taken from information showing “existing conditions” on the original(mid-60s, post-Betsy) Hurricane Protection System Design Memos. For example, see the Report Figure 5 copy of 1967 Design Memo. This Figure 5 shows that there is a substantial “existing” levee at the time of the 1967 design. The Report states that the elevation of this “existing” levee is what is used as the 1965 “pre-Betsy” elevation in Figure 10. HOWEVER, an initial perusal of historical topography (http://historicalmaps.arcgis.com/usgs/) indicates that this substantial “existing” levee shown in Figure 5 may not have been present in 1965 for Betsy. It is important to consider that there likely was significant post-Betsy emergency levee work” done in the immediate aftermath of Betsy in 1965-66 (maybe with federal funds).HOWEVER, if the Report is meant to evaluate the impact of full post-Betsy improvements, then perhaps the real 1965 topography should be used. In this latter case, there may be many reaches of 1965 linear feature elevations that need to be substantially reduced.

Question #3 Response:
The Corps is aware that the historical U.S. Geological Survey topographic maps produced at the time of Hurricane Betsy do not indicate levees around New Orleans East. However, our experience is that these maps do not always provide the best source of information regarding levee alignments and elevations. With this understanding, we sought and consulted additional resources to gain better insight into what levees existed during this time period. We identified the U.S. Army Corps of Engineers’ “Interim Survey Report-Lake Pontchartrain and Vicinity, 21 NOV 1962” during our research for the project. In addition to the attached map, the below is an excerpt from this report that describes the levee system as it existed in 1962:

"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 for approximately 11.5 miles with an average elevation of about 9.3 feet. The area is protected on the west by a 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 south by a levee along the Gulf Intracoastal Waterway with elevation 9.6 to 14."

We attempted to develop each scenario based on the best information accessible when preparing to undertake this modeling effort. Based on our research, the 1962 survey report provides the most accurate information regarding the existing levee details when establishing the 1965 baseline.

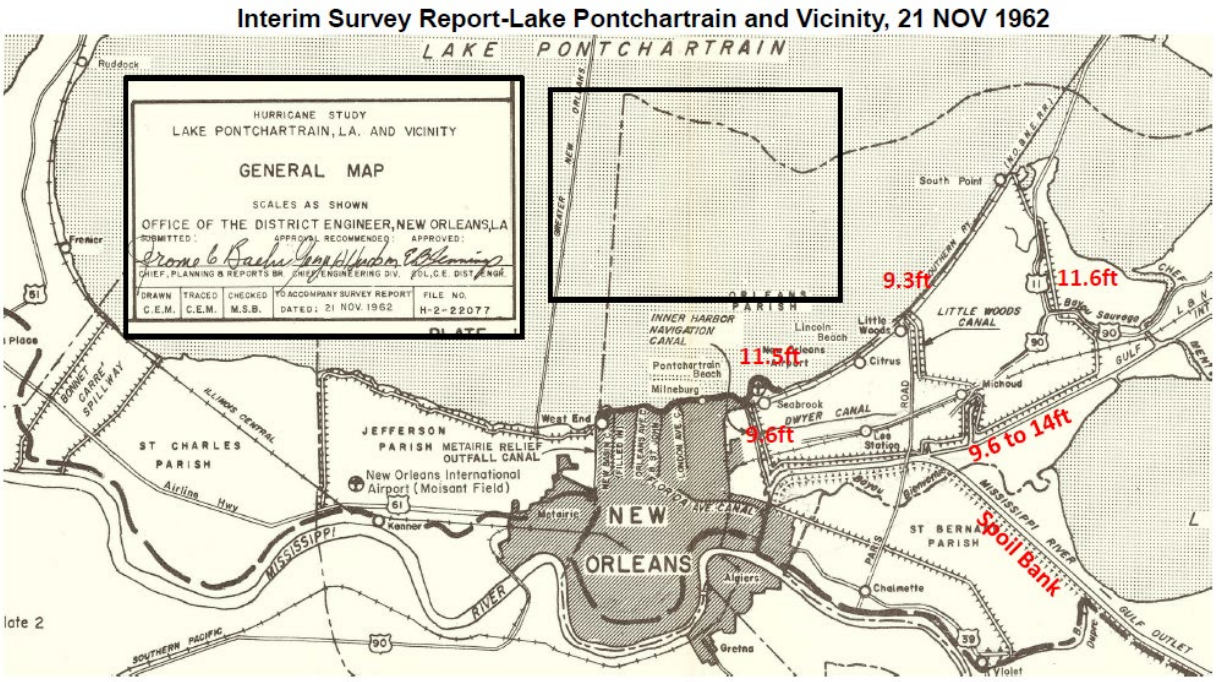

Figure 3 Elevations from "Interim Survey Report-Lake Pontchartrain and Vicinity, 21 NOV 1962"

Subsequent review revealed a discrepancy between the levee heights described in "Interim Survey Report-Lake Pontchartrain and Vicinity, 21 NOV 1962" and the elevations assigned in the SL15-1965 ADCIRC grid. Specifically, the elevation assigned in the SL15-1965 grid for the Southern Railway was approximately 14 ft NAVD88 based on a report from the 1980s. This elevation conflicts with the 1962 report which states the elevation is approximately 9.3ft NGVD. A lower levee elevation assigned in the SL15-1965 ADCIRC grid will result in more inundation within the polder for certain storms. This effect has potential to increase the estimates of induced flooding, since a greater volume of water will be displaced to the polder exterior for "with-project" conditions.

To remedy this error in the assumed levee elevations, a series of ADCIRC simulations were conducted with most up-to-date understanding of the levee system as it existed in 1965. An ADCIRC grid developed by CPRA in 2017 was utilized for this re-analysis. Figure 4 displays the updated elevations assumed in the 1965 ADCIRC grid. In the latest simulations, the elevations along the Southern Railway were set to natural ground elevations (< 2 ft NAVD88), which is less than the 9.3 ft NGVD elevation described in the 1962 report. Since the railway enbankment was composed on substandard material, it could not be included in the analysis because it was assumed it would have failed completely during a storm surge event. Figure 5 displays the elevations assumed in the 2017 "With Project" ADCIRC grid. From 1965 to 2017, there has been a significant increase in the perimeter levee and floodwall elevations, and also creation of new barriers, such as the Inner Harbor Navigation Channel Surge Barrier. These changes to HSDRRS have potential to displace volume during surge events and increase water levels on the exterior. The ADCIRC simulations comparing 1965 to 2017 give a general idea of the magnitude of increase due to levee and floodwall construction.

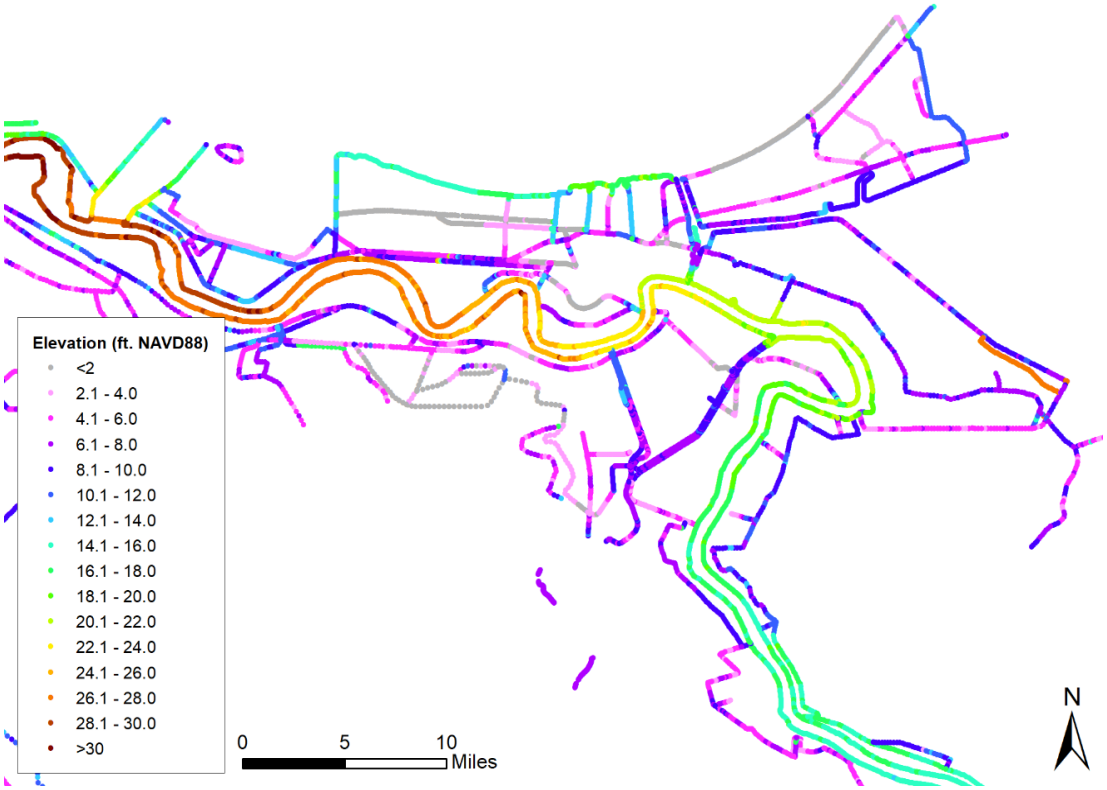

Figure 4 Elevations assumed in the updated CPRA-1965 ADCIRC grid

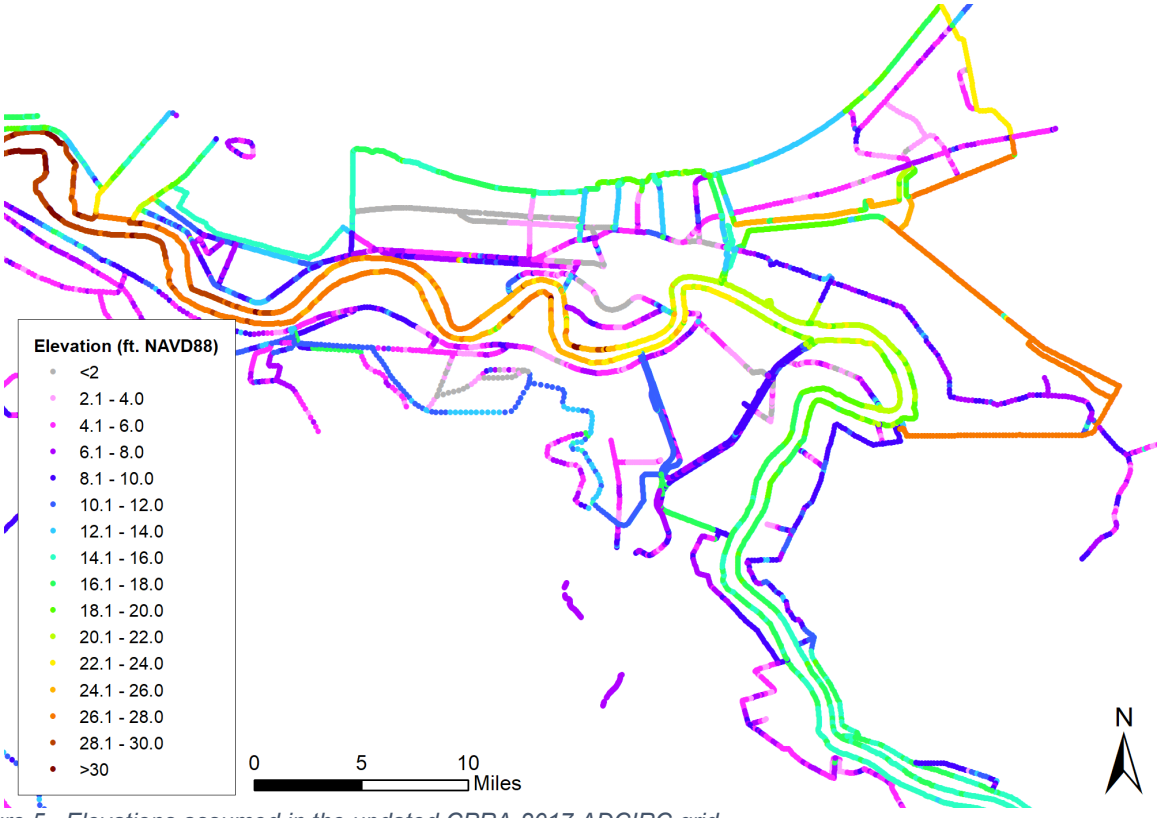

Figure 5 Elevations assumed in the updated CPRA-2017 ADCIRC grid

Figure 6 displays the maximum water surface elevations produced during the ADCIRC simulation of Hurricane Katrina assuming the 1965 levee elevations. The lower elevations assigned in the grid result in a tremendous amount of volume entering the Saint Bernard, New Orleans East, and New Orleans Metro Polders. In the 1965 simulation, the levee elevations of the Saint Bernard and New Orleans East polders are completely overwhelmed, resulting in complete inundation within the polder. Figure 7 displays the maximum water surface elevation produced by Katrina assuming the 2017 levee elevations. The simulation shows very little overtopping into the HSDRRS polders. Figure 8 displays the difference in maximum water surface elevation between the 2017 and 1965 simulations of hurricane Katrina. The difference plot shows the increase in water surface elevation that can be attributed to the raising of levees from 1965 to present day. At Eden Isles, the maximum surge produced by Katrina on the 1965 grid was 15.4 ft NAVD88 while the maximum surge produced by the 2017 grid was 15.8 ft NAVD88. This means an increase of approximately 5” (or roughly 3%) can be attributed to construction of the HSDRRS at Eden Isle. When looking at a broader area, the maximum increase in water surface elevation along the Northshore communities of Slidell and Pearlington is shown to be roughly 8 to 10”. The earlier simulations showed a maximum surge at Eden Isles of 12.1 ft NAVD88 for the SL15-1965 grid and a maximum surge of 12.4 ft NAVD88 for the SL15-2012 grid. This results in a 4” increase in peak surge level with is a roughly 2% increase in peak surge elevation. The percentage increase in surge elevation is slightly higher (3% vs 2%) using the most up-to-date assumptions.

An additional suite of ADCIRC simulations was conducted to compare results on from the updated 1965 ADCIRC grid to the 2017 ADCIRC grid. Synthetic storms S008, S012, S014, S015, S023, S026, S069, S077, S085, S094, S126, S146 were simulated. These are the same synthetic storms as simulated in the earlier analysis. Table 1 contains the peak surge results for each of the synthetic storm for 1965 and 2017 conditions as well as the difference and percentage difference. Figure 9 displays a map of the selected output locations. The estimates of induced flooding varies by storm and location. Comparison to the earlier estimates of induced flooding show roughly the same order of magnitude of the percent increase. For example, the previous results for all storms show increase in peak surge elevation at Eden Isle to Pearlington on the order of 3 to 6%. The latest simulations show an increase on the order of 3 to 7%. The overall conclusions derived from the latest simulations show that a slightly higher estimate of induced flooding, when compared to previous estimates, can be attributed to the construction of HSDRRS levees from 1965 to present day.

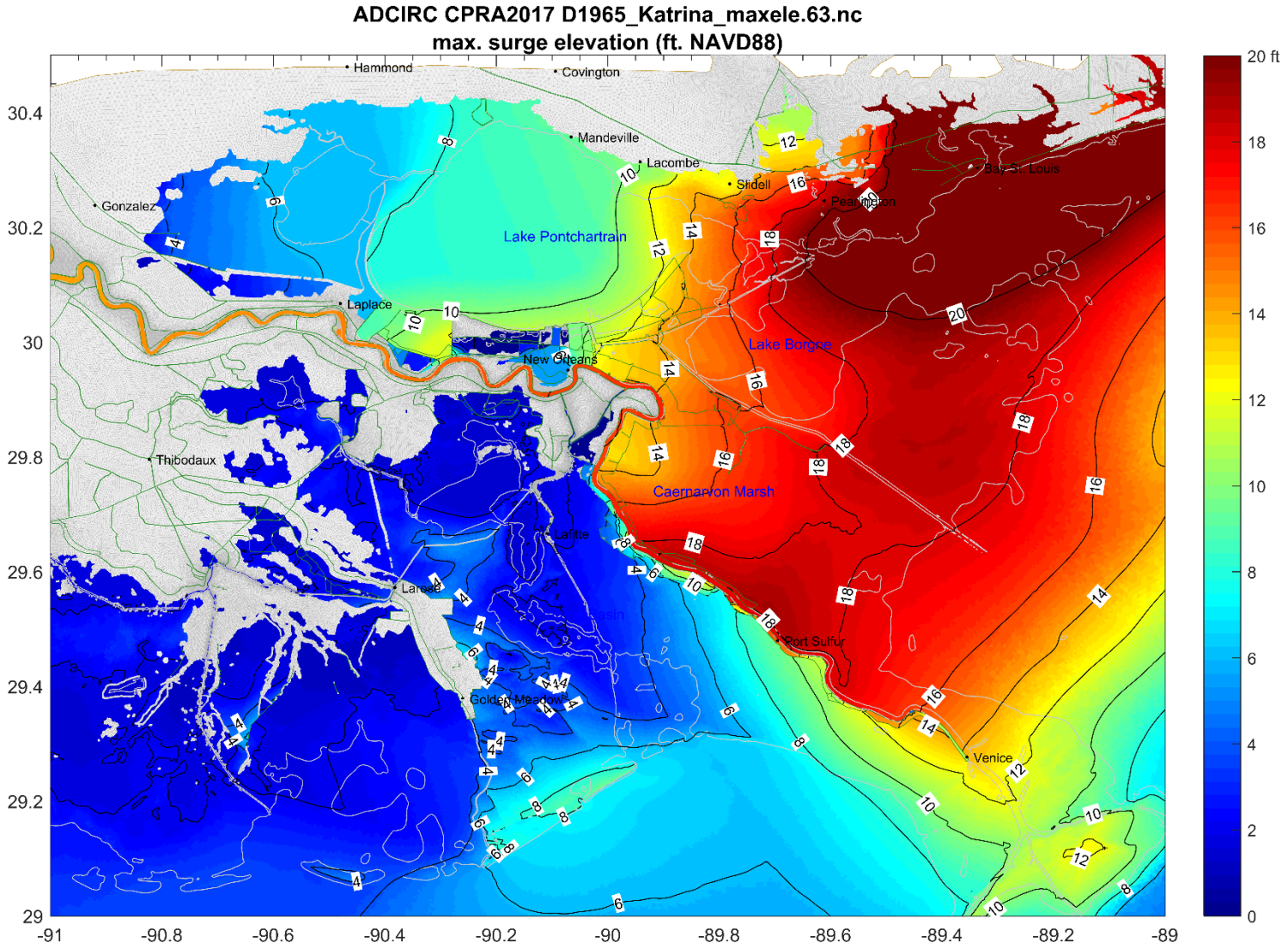

Figure 6 Maximum Water Surface Elevation from Hurricane Katrina Simulation for 1965 Conditions

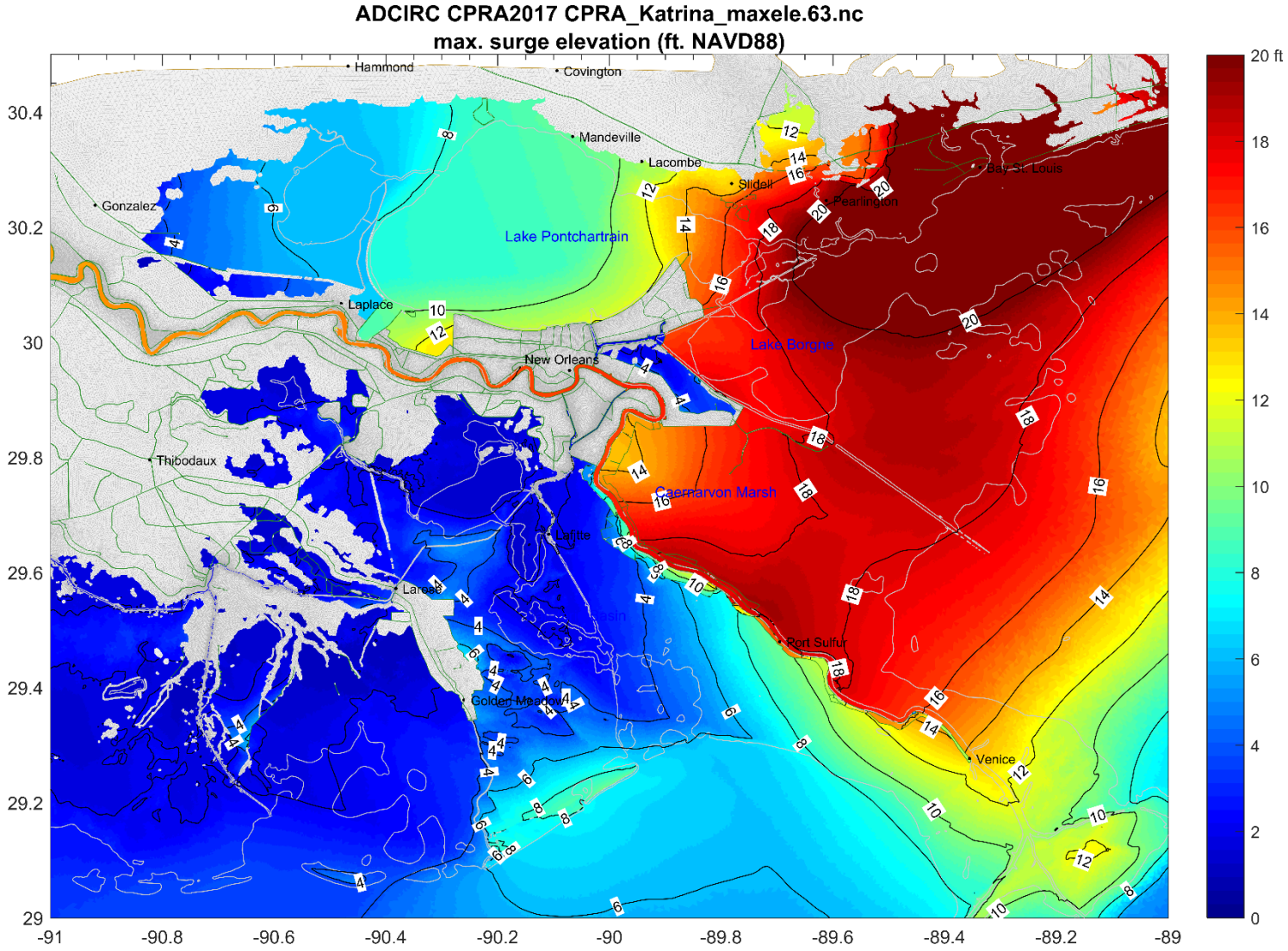

Figure 7 Maximum Water Surface Elevation from Hurricane Katrina Simulation for 1965 Conditions

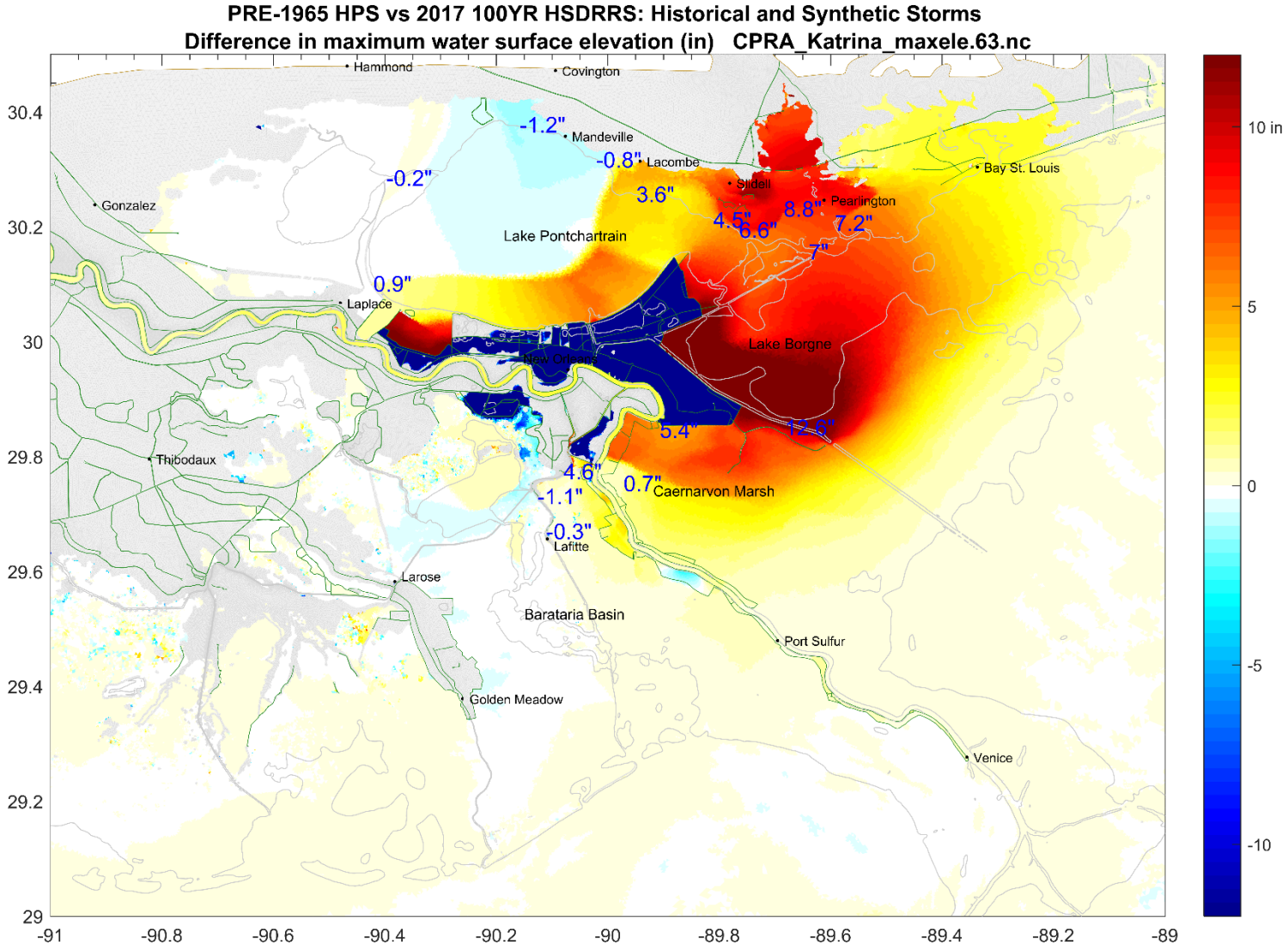

Figure 8 Difference in Maximum Water Surface Elevation between 1965 and 2017 ADCIRC simulations of Hurricane Katrina.

Table 1 Comparison of Peak Surge at Selected Output Locations for the updated 1965 and 2017 ADCIRC Grids

Metairie	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	10.7		7.2		7.0		7.4		8.5		8.7		9.8		3.2		8.1		11.0		9.4		8.3		8.9	
2012 Peak Surge (ft. NAVD88)	11.0		7.2		7.1		7.4		8.4		8.7		9.9		3.0		8.1		10.6		9.0		8.0		8.1	
Difference 1965 to 2012 (ft.)	0.28	2.6%	0.01	0.2%	0.06	0.9%	0.00	0.0%	-0.18	-2.1%	0.03	0.4%	0.12	1.2%	-0.18	-5.7%	0.02	0.2%	-0.40	-3.6%	-0.34	-3.6%	-0.32	-3.8%	-0.76	-8.6%

Kenner	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	10.0		7.3		7.0		7.3		8.5		9.8		9.9		5.3		8.9		11.0		10.8		8.4		9.3	
2012 Peak Surge (ft. NAVD88)	10.2		7.3		7.0		7.3		8.4		9.9		10.1		5.1		8.9		10.6		10.8		8.1		9.4	
Difference 1965 to 2012 (ft.)	0.19	1.9%	0.02	0.2%	0.07	1.0%	0.00	-0.1%	-0.17	-2.0%	0.04	0.4%	0.15	1.5%	-0.14	-2.7%	0.02	0.3%	-0.43	-3.9%	-0.01	-0.1%	-0.32	-3.9%	0.08	0.8%

Caernarvon	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	14.1		13.5		13.3		14.8		17.4		12.8		16.4		8.1		5.2		20.5		19.7		17.0		19.3	
2012 Peak Surge (ft. NAVD88)	14.6		14.2		14.0		15.7		18.4		13.6		17.5		8.3		4.9		21.4		20.5		17.8		20.1	
Difference 1965 to 2012 (ft.)	0.45	3.2%	0.73	5.4%	0.71	5.3%	0.85	5.7%	0.97	5.5%	0.80	6.3%	1.13	6.9%	0.21	2.6%	-0.38	-7.3%	0.90	4.4%	0.75	3.8%	0.84	5.0%	0.74	3.9%

IHNC Surge Barrier	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	14.3		10.0		10.0		10.6		12.4		12.3		14.9		8.2		10.4		15.5		17.0		12.8		14.6	
2012 Peak Surge (ft. NAVD88)	16.3		11.7		11.5		13.1		14.9		16.4		21.0		9.7		13.1		18.2		20.1		15.1		17.4	
Difference 1965 to 2012 (ft.)	2.07	14.5%	1.72	17.2%	1.55	15.6%	2.49	23.4%	2.53	20.4%	4.10	33.4%	6.18	41.5%	1.48	18.1%	2.62	25.1%	2.67	17.2%	3.09	18.1%	2.27	17.7%	2.73	18.6%

Shell Beach	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	16.3		8.4		8.3		8.6		10.4		10.8		13.3		4.6		10.1		13.0		14.9		11.4		13.0	
2012 Peak Surge (ft. NAVD88)	17.6		9.2		9.1		9.5		11.6		12.3		15.3		4.9		11.3		14.4		16.4		12.5		14.3	
Difference 1965 to 2012 (ft.)	1.23	7.5%	0.75	8.9%	0.74	8.9%	0.94	11.0%	1.15	11.1%	1.54	14.3%	2.05	15.5%	0.36	7.9%	1.14	11.2%	1.36	10.4%	1.48	9.9%	1.14	10.0%	1.29	9.9%

Venetian Isles	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	15.6		9.0		9.0		9.6		11.4		10.9		14.2		5.8		7.7		13.7		14.8		11.5		12.8	
2012 Peak Surge (ft. NAVD88)	16.5		9.9		9.8		10.8		12.5		12.8		16.8		6.3		9.2		15.0		16.6		12.7		14.0	
Difference 1965 to 2012 (ft.)	0.88	5.7%	0.85	9.4%	0.79	8.7%	1.12	11.7%	1.17	10.3%	1.90	17.3%	2.59	18.2%	0.43	7.3%	1.47	19.0%	1.28	9.4%	1.85	12.6%	1.18	10.2%	1.23	9.6%

Eden Isle	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	15.4		7.4		8.1		8.4		9.9		11.9		15.0		2.3		2.3		11.6		10.6		8.7		9.4	
2012 Peak Surge (ft. NAVD88)	15.8		7.6		8.2		8.6		10.1		12.2		15.4		2.3		2.3		11.2		11.1		9.0		9.7	
Difference 1965 to 2012 (ft.)	0.40	2.6%	0.15	2.0%	0.12	1.5%	0.26	3.0%	0.15	1.5%	0.25	2.1%	0.40	2.6%	-0.01	-0.3%	0.00	-0.1%	-0.41	-3.6%	0.57	5.4%	0.33	3.8%	0.29	3.1%

Pearlington, MS	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	19.3		10.2		10.3		11.4		12.9		15.3		19.8		4.8		3.3		13.7		13.6		11.8		12.1	
2012 Peak Surge (ft. NAVD88)	20.0		10.7		10.6		11.9		13.5		15.9		20.6		4.9		3.3		14.5		14.6		12.5		12.8	
Difference 1965 to 2012 (ft.)	0.65	3.4%	0.48	4.7%	0.37	3.6%	0.55	4.8%	0.64	5.0%	0.62	4.1%	0.82	4.1%	0.11	2.2%	0.05	1.4%	0.82	6.0%	1.01	7.4%	0.76	6.5%	0.74	6.1%

Manchac Pass	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	6.3		8.2		7.3		8.5		9.1		6.4		7.4		4.9		3.4		13.1		10.9		9.2		10.8	
2012 Peak Surge (ft. NAVD88)	6.3		8.1		7.3		8.4		8.8		6.4		7.5		4.9		3.3		12.4		10.3		8.8		10.2	
Difference 1965 to 2012 (ft.)	-0.01	-0.2%	-0.07	-0.8%	0.01	0.2%	-0.08	-0.9%	-0.22	-2.5%	0.06	1.0%	0.10	1.3%	-0.07	-1.5%	-0.07	-2.1%	-0.65	-4.9%	-0.63	-5.8%	-0.37	-4.0%	-0.62	-5.8%

Mandeville	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	9.3		8.2		8.6		8.9		10.6		8.8		10.7		3.1		2.9		13.6		11.8		9.1		10.6	
2012 Peak Surge (ft. NAVD88)	9.2		8.2		8.6		8.8		10.2		8.9		10.8		3.0		2.9		13.0		11.0		8.7		9.8	
Difference 1965 to 2012 (ft.)	-0.08	-0.8%	-0.01	-0.1%	0.01	0.1%	-0.12	-1.4%	-0.37	-3.5%	0.14	1.6%	0.09	0.8%	-0.05	-1.5%	-0.03	-1.0%	-0.65	-4.8%	-0.80	-6.8%	-0.41	-4.5%	-0.84	-7.9%

LaPlace	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	8.2		9.5		8.6		11.3		11.6		11.6		11.6		9.9		11.2		14.3		13.5		11.0		11.8	
2012 Peak Surge (ft. NAVD88)	8.3		9.4		8.6		11.3		11.5		11.7		11.6		9.9		11.2		14.0		13.5		11.0		11.9	
Difference 1965 to 2012 (ft.)	0.08	1.0%	-0.08	-0.8%	-0.01	-0.1%	-0.08	-0.7%	-0.03	-0.3%	0.02	0.2%	0.01	0.0%	0.00	0.0%	-0.05	-0.4%	-0.25	-1.8%	-0.02	-0.2%	-0.03	-0.3%	0.08	0.7%

MSY Airport	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	11.8		7.1		6.9		8.7		9.6		12.6		12.7		5.7		11.8		11.6		12.4		8.8		11.3	
2012 Peak Surge (ft. NAVD88)	12.7		7.2		7.0		9.1		10.0		13.2		13.5		5.6		12.3		12.2		13.2		8.9		11.8	
Difference 1965 to 2012 (ft.)	0.94	8.0%	0.05	0.6%	0.08	1.2%	0.36	4.1%	0.35	3.6%	0.54	4.3%	0.78	6.1%	-0.14	-2.4%	0.51	4.3%	0.58	5.0%	0.72	5.8%	0.13	1.5%	0.50	4.4%

Braithwaite	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	13.2		13.8		13.2		14.9		17.7		12.1		15.5		9.8		9.3		21.5		20.3		17.6		20.4	
2012 Peak Surge (ft. NAVD88)	13.8		14.4		13.9		15.6		18.6		12.8		16.5		9.8		9.3		22.2		20.9		18.3		21.0	
Difference 1965 to 2012 (ft.)	0.55	4.2%	0.65	4.7%	0.68	5.2%	0.78	5.3%	0.88	4.9%	0.66	5.4%	1.02	6.6%	0.08	0.8%	-0.03	-0.3%	0.67	3.1%	0.57	2.8%	0.77	4.4%	0.59	2.9%

Jean Lafitte	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	2.3		6.3		4.7		6.6		6.8		2.4		3.1		2.6		2.2		11.5		3.3		6.0		6.6	
2012 Peak Surge (ft. NAVD88)	2.2		6.5		4.9		6.7		6.9		2.5		3.0		2.6		2.2		12.1		3.8		6.1		7.0	
Difference 1965 to 2012 (ft.)	-0.09	-4.2%	0.18	2.9%	0.12	2.6%	0.11	1.7%	0.11	1.7%	0.06	2.3%	-0.07	-2.4%	0.01	0.5%	0.05	2.5%	0.51	4.5%	0.57	17.5%	0.08	1.3%	0.41	6.2%

Lafitte	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	1.9		7.2		5.7		7.9		8.2		2.8		3.4		4.3		2.8		13.1		4.6		7.6		7.9	
2012 Peak Surge (ft. NAVD88)	1.9		7.2		5.7		7.9		8.2		2.8		3.3		4.3		2.8		13.5		4.9		7.6		8.1	
Difference 1965 to 2012 (ft.)	-0.03	-1.4%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	-0.01	-0.3%	-0.02	-0.7%	0.01	0.1%	0.02	0.7%	0.35	2.7%	0.23	4.9%	0.00	0.0%	0.13	1.7%

Crown Point	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	1.5		6.1		4.9		6.6		6.9		2.6		3.1		2.6		2.3		12.0		4.8		5.8		7.2	
2012 Peak Surge (ft. NAVD88)	1.8		6.9		5.6		7.7		8.0		2.9		3.5		2.9		2.5		13.3		6.4		6.6		8.8	
Difference 1965 to 2012 (ft.)	0.36	24.9%	0.87	14.4%	0.78	16.0%	1.10	16.8%	1.12	16.2%	0.23	8.7%	0.39	12.6%	0.33	12.6%	0.18	7.6%	1.32	11.1%	1.58	33.0%	0.82	14.1%	1.66	23.1%

Waveland	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	25.6		10.1		9.6		11.3		12.5		17.0		21.5		8.4		11.5		12.7		13.0		11.9		11.2	
2012 Peak Surge (ft. NAVD88)	25.8		10.3		9.7		11.5		12.8		17.3		22.0		8.4		11.6		13.0		13.4		12.0		11.5	
Difference 1965 to 2012 (ft.)	0.25	1.0%	0.12	1.2%	0.13	1.3%	0.16	1.4%	0.25	2.0%	0.35	2.0%	0.46	2.2%	0.02	0.2%	0.02	0.2%	0.38	3.0%	0.34	2.6%	0.19	1.6%	0.31	2.7%

Boutte	Katrina		S008		S012		S014		S015		S023		S026		S069		S077		S085		S094		S126		S146	
1965 Peak Surge (ft. NAVD88)	NaN		5.9		2.9		5.0		4.7		NaN		NaN		2.4		2.3		8.9		NaN		5.1		NaN	
2012 Peak Surge (ft. NAVD88)	NaN		6.2		3.2		5.4		5.2		NaN		NaN		2.5		2.3		9.7		NaN		5.4		NaN	
Difference 1965 to 2012 (ft.)	NaN	NaN	0.33	5.5%	0.26	8.7%	0.36	7.1%	0.46	9.7%	NaN	NaN	NaN	NaN	0.09	3.8%	0.05	2.2%	0.87	9.8%	NaN	NaN	0.27	5.2%	NaN	NaN

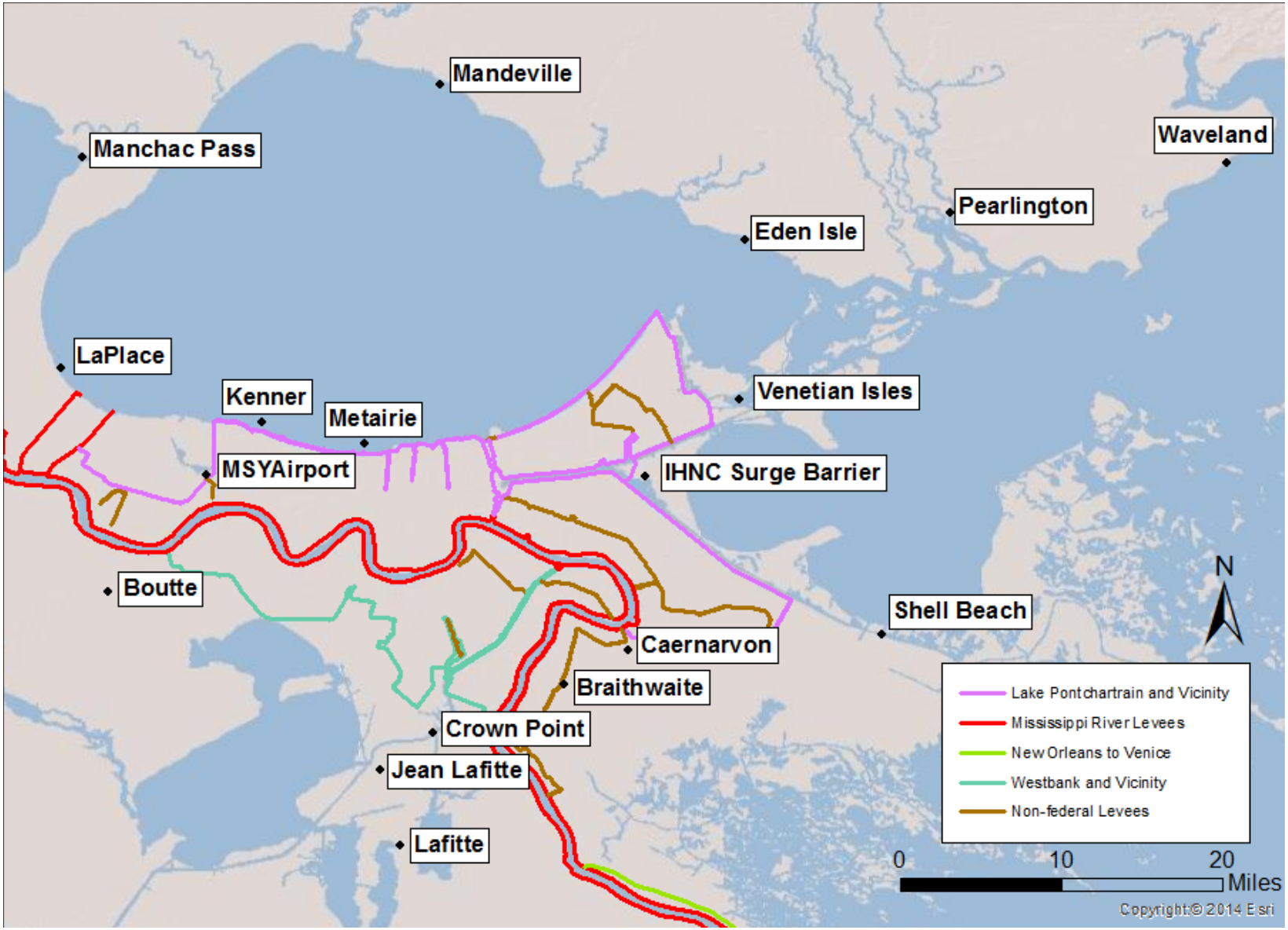

Figure 9 Selected Output Locations