

- Purpose of the Study
- Principal Findings
- Expert Background and Qualifications
- ADCIRC Models
- ADCIRC Models for Southern Louisiana
- SL16 Model Applied to St. Bernard Polder
  - Katrina Hindcast - *Scenario A1*
  - Katrina - *Scenario A2*
  - Katrina - *Scenario B1*
  - Katrina - *Scenario B2*
  - Katrina - *Scenario C*
  - Katrina - *Scenario D*
  - Katrina - *Scenario E*
- **Conclusions**
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- **Scenario A1** accurately simulates the surge and wave conditions that actually occurred during Hurricane Katrina.
  - The modeled hydrographs outside and inside St. Bernard Polder closely match hydrographs measured by gauges during the storm.
  - The model closely matches high water marks both inside and outside of the Polder, including in locations within close proximity to each of the Plaintiff Properties.
  - The model also matches a variety of observed data, including stopped clock data, photographs, videos, and property owner testimony concerning the extent of flooding and the timing of flooding during Hurricane Katrina (*Fitzgerald, 2013*).

- **Scenarios A1, A2, B1, B2, C, D, and E** result in very little differences in peak water surface elevations experienced external to St. Bernard Polder.
- The largest differences are experienced in the southern portion of the IHNC where there is less than a 0.7 ft difference in peak water level between **Scenario A1 and Scenarios A2, B1, B2, and D**, and less than a 1.5 ft difference in peak water level between **Scenario A1 and Scenarios C and E**.
- The peak water surface elevations exterior to the St. Bernard Polder for all the scenarios are summarized in Table 17 which list peak storm surge elevations at 10 locations shown in Figure 53 in and around St. Bernard Polder for all seven scenarios.
- The peak water surface elevations at Plaintiff's Properties inside and outside of St. Bernard Polder are summarized in Table 18 for all seven scenarios.

- Ten locations exterior to and surrounding St. Bernard Polder identified with blue circles and numbered e1-e10. Plaintiff's properties are identified with yellow triangles.

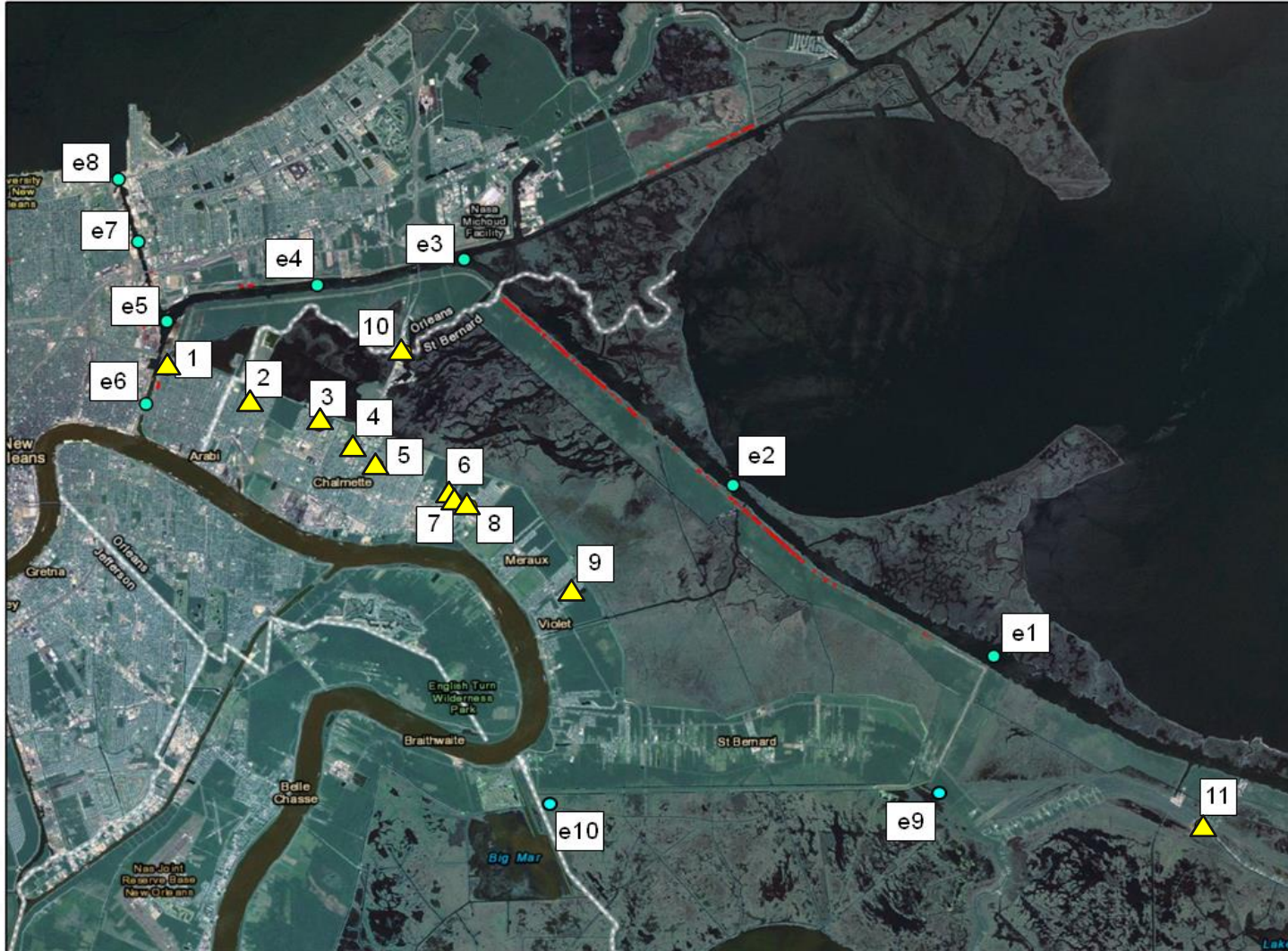


Figure 53

- **Scenarios A1, A2, B1, B2, C, D, and E** peak water levels (in ft relative to NAVD88 2004.65) at ten exterior locations around St. Bernard Polder for all seven scenarios.

Exterior Location	Scenario A1	Scenario A2	Scenario B1	Scenario B2	Scenario C	Scenario D	Scenario E
<b>e1</b>	17.0	17.3	16.7	17.0	16.8	16.5	16.2
<b>e2</b>	16.8	17.3	16.6	17.1	16.7	16.3	16.2
<b>e3</b>	15.0	15.6	14.8	15.4	15.3	15.1	15.2
<b>e4</b>	14.1	14.6	13.7	14.2	13.4	14.5	14.2
<b>e5</b>	13.4	13.7	12.7	13.0	12.0	13.5	12.2
<b>e6</b>	13.5	13.8	12.8	13.1	12.0	13.7	12.4
<b>e7</b>	12.4	12.6	11.9	12.1	11.5	12.4	11.6
<b>e8</b>	11.6	11.7	11.4	11.4	11.1	11.5	11.0
<b>e9</b>	16.3	16.4	16.0	16.2	16.2	16.3	15.9
<b>e10</b>	13.2	13.3	13.0	13.1	13.2	13.3	13.0

Table 17



- Scenarios A1, A2, B1, B2, C, D, and E** peak water levels at Plaintiff's properties (in ft relative to NAVD88 2004.65) for all seven scenarios are summarized in the Table below.

Location	Scenario A1	Scenario A2	Scenario B1	Scenario B2	Scenario C	Scenario D	Scenario E
Adams	10.5	9.0	9.3	8.0	8.8	14.1	13.8
SBP #1	10.7	8.5	9.5	7.5	9.0	14.3	14.1
SBP #2	10.8	8.3	9.7	7.5	9.1	14.5	14.3
Tommaseo	11.0	7.1	10.1	6.3	10.3	14.7	14.5
SBP #3	11.3	6.2	10.6	5.4	11.0	15.0	14.9
SBP #4	11.5	4.6	10.8	4.1	11.5	15.6	15.5
Steve's RV	11.5	4.6	10.8	4.1	11.5	15.6	15.6
SBP #5	11.5	4.6	10.8	4.1	11.5	15.8	15.7
Bordelon	11.6	4.6	10.9	4.1	11.5	16.8	16.6
PSSI	11.7	4.0	11.0	3.8	11.6	14.8	14.9
Florissant	17.3	17.5	17.2	17.3	17.2	17.1	16.9

Table 18

- **Scenario A2** demonstrates that even if the Reach 2 levees had not breached, flooding from the IHNC breaches alone would have caused significant flooding at each of the Plaintiff Properties within the federal levee system, and the same catastrophic flooding that actually occurred within the Lower Ninth Ward of New Orleans and the portion of St. Bernard Parish west of Paris Road.
- To the extent the Court finds the United States liable for the breaching of the Reach 2 levees, but not the IHNC floodwall breaches, the **Scenario A2** modeling results establish the baseline flooding levels that would have occurred during Hurricane Katrina anyway.

- **Scenario B1** demonstrates that, given the breaching of both the Reach 2 levees and the IHNC floodwall, the expansion of the MRGO from its authorized dimensions to its 2005 dimensions, and the degradation over that time of the surrounding wetlands had little impact on the flooding that took place during Hurricane Katrina, and that the same catastrophic flooding would have taken place at each Trial Property under those circumstances.
- Accordingly, to the extent that the Court holds the United States liable for the expansion of the MRGO but not the breaching of the Reach 2 levees, the **Scenario B2** modeling results provide the baseline flooding levels that would have occurred on each Trial Property during Hurricane Katrina in the absence of United States action.



- The **Scenario B2** modeling results show that, even if the Reach 2 levee breaches did not occur, the MRGO did not expand, and the wetlands did not degrade relative to their 1956 conditions, significant flooding still would have occurred at each Trial Property inside the federal levee system during Hurricane Katrina, and catastrophic flooding still would have occurred on the Plaintiff Properties located in the Lower Ninth Ward and the portion of St. Bernard Parish west of Paris Road.
- Accordingly, to the extent the Court holds the United States liable for the Reach 2 levee breaches and not the IHNC floodwall breaches, **Scenario B2** provides the baseline flooding levels that would have occurred on each Trial Property during Hurricane Katrina in the absence of United States action.

- The **Scenario C** modeling results show that, given the breaches of the Reach 2 levees and IHNC floodwall, even if MRGO were never dredged, and the wetlands did not degrade relative to their 1956 conditions, catastrophic flooding still would have occurred at each Trial Property inside the federal levee system during Hurricane Katrina.
- Accordingly, to the extent the Court holds the United States liable for the dredging of the MRGO, and the full degradation of the wetlands, but not the breaching of the Reach 2 levees, **Scenario C** provides the baseline flooding levels that would have occurred during Hurricane Katrina in the absence of United States action.

- The **Scenario D** modeling results show that if the federal levee system were never built, flooding at each Trial Property located inside the federal levee system during Hurricane Katrina would have been 3-5 ft worse than actually experienced during the storm.
- The **Scenario E** modeling results show that if the MRGO was never dredged and the wetlands remained in their 1956 conditions, but the federal levee system was never built – *i.e.*, the United States did not fund or build any flood protection or navigational project adjacent to St. Bernard Polder, flooding at each Trial Property located inside the federal levee system during Hurricane Katrina would have been 3-5 ft worse than actually experienced during the storm.
- To the extent that the Court holds the United States liable for the dredging and expansion of the MRGO, and/or the degradation of the wetlands, but holds that Plaintiffs' properties are not entitled to any particular level of protection from the federal levee system, these modeling results show what baseline level of flooding would have occurred during Hurricane Katrina in the absence of United States action.

- **Scenarios A1, A2, B1, B2, C, D, and E** demonstrate that no variable tested in my modeling had any impact on the flooding experienced at the Florissant property.
- Accordingly, to the extent the Court holds the United States liable for the dredging and expansion of the MRGO, all wetlands degradation, and the breaches of the Reach 2 levees, the modeling results show that the Florissant property would have flooded to 17 ft regardless of any United States' action.

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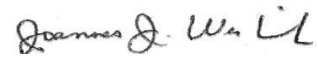
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Pursuant to 28 U.S.C. 1746, I, Joannes J. Westerink, certify under penalty of perjury that the above testimony is true and correct.

Dated: 11-12-2013

A handwritten signature in black ink, appearing to read "Joannes J. Westerink". The signature is cursive and somewhat stylized.

Joannes J. Westerink

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