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Katrina - *Scenario D: Modeling conditions*

- I next modeled Hurricane Katrina to isolate and study the incremental impact on flooding at each Trial Property of the existence of the federal levees.
- This Scenario is identical to Scenario A1 with exception that the sections of the IHNC levee, the MRGO Reach 1 levee, and the MRGO Reach 2 levee have been eliminated.
- The modeling of this Scenario therefore eliminates the federal levees built along the MRGO, and brings back levee protection to the 40 Arpent levee - the levee that lies to the west of the Central Wetlands within St. Bernard Polder and which existed prior to the construction of the MRGO Reach 1 and MRGO Reach 2 levees.
- Modeling of this Scenario continues to include local levees near Poydras, LA and St. Bernard, LA along Bayou Road.
- The wetland conditions are identical to the 2005 wetland conditions modeled for Scenario A1.

Katrina - *Scenario D: Modeling conditions*

- The following table compares the relevant differences in modeling conditions for Scenarios A1, A2, B1, B2, C, and D.

Scenario	MRGO Status	Marsh Status	Levee Breaches	Description
A1 (Katrina Actual Event Conditions)	2005 pre-Katrina dimensions	2005 pre-Katrina conditions	Breaching occurring as during Katrina	Base case: Actual Katrina Hindcast
A2 (2005 MRGO/ 2005 Wetlands/ IHNC Breaches Only)	2005 pre-Katrina dimensions	2005 pre-Katrina conditions	IHNC Breaches Only	Base case reflecting levee breaches only in the IHNC floodwall
B1 (MRGO As-Designed/1956 Wetlands)	MRGO at its authorized dimensions as of completion in 1968	1956 Wetland conditions	Breaching occurring as during Katrina	Katrina impact absent bank erosion channel widening/ wetland degradation
B2 (MRGO As-Designed/1956 Wetlands/IHNC Breaches Only)	MRGO at its authorized dimensions as of completion in 1968	1956 Wetland conditions	IHNC Breaches Only	Katrina impact absent bank erosion channel widening/ wetland degradation reflecting INHC breaches only
C (No MRGO/ 1956 Wetlands)	No MRGO	1956 Wetland conditions	Breaching occurring as during Katrina	Katrina impact without MRGO, and with 1956 wetland topography
D (No Federal Levees/2005 MRGO/2005 Wetlands)	2005 pre-Katrina dimensions	2005 pre-Katrina conditions	No levees along MRGO Reach 1 and 2	Katrina impact with MRGO but without levees along MRGO. MRGO and wetlands with 2005 conditions

Table 13

Katrina - *Scenario D: Flooding in St. Bernard Parish*

- Scenario D, which maintains MRGO and the 2005 wetlands conditions, but eliminates the federal levees, results in 0.5 ft less water along the southern portion of MRGO Reach 2, 0.1 to 0.4 ft more water in the MRGO Reach 1 and the IHNC, and between 3 and 5 ft more water in St. Bernard Polder.
- There is less water along the southern portion of MRGO Reach 2 because more water moves into the Polder.
- More water develops in MRGO Reach 1 because water now moves unimpeded between the Polder and the MRGO Reach 1.
- Ultimately, greater flooding develops within the Polder because it travels unimpeded from Lake Borgne into the Central Wetlands and over the 40 Arpent levee into the populated areas of the Polder.
- The Trial Property located outside the federal levee system is unaffected, and floods to the same extent as in Scenario A1.

Katrina - *Scenario D: Flooding in St. Bernard Parish*

- The following slides, Figures 43a-q, show the evolution of flooding inside St. Bernard Parish in Scenario D.
- Without the federal levees, the Central Wetlands were easily overwhelmed as water moved in from Lake Borgne.
- The 40 Arpent levee and the levees protecting Poydras, LA and St. Bernard, LA were subsequently easily overtopped and the interior protected areas were flooded.
- In this Scenario, the entire Polder is inundated by Hurricane Katrina storm surge waters as high as 16 ft by 10:00 am CDT on August 29, 2005.

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 2 am CDT

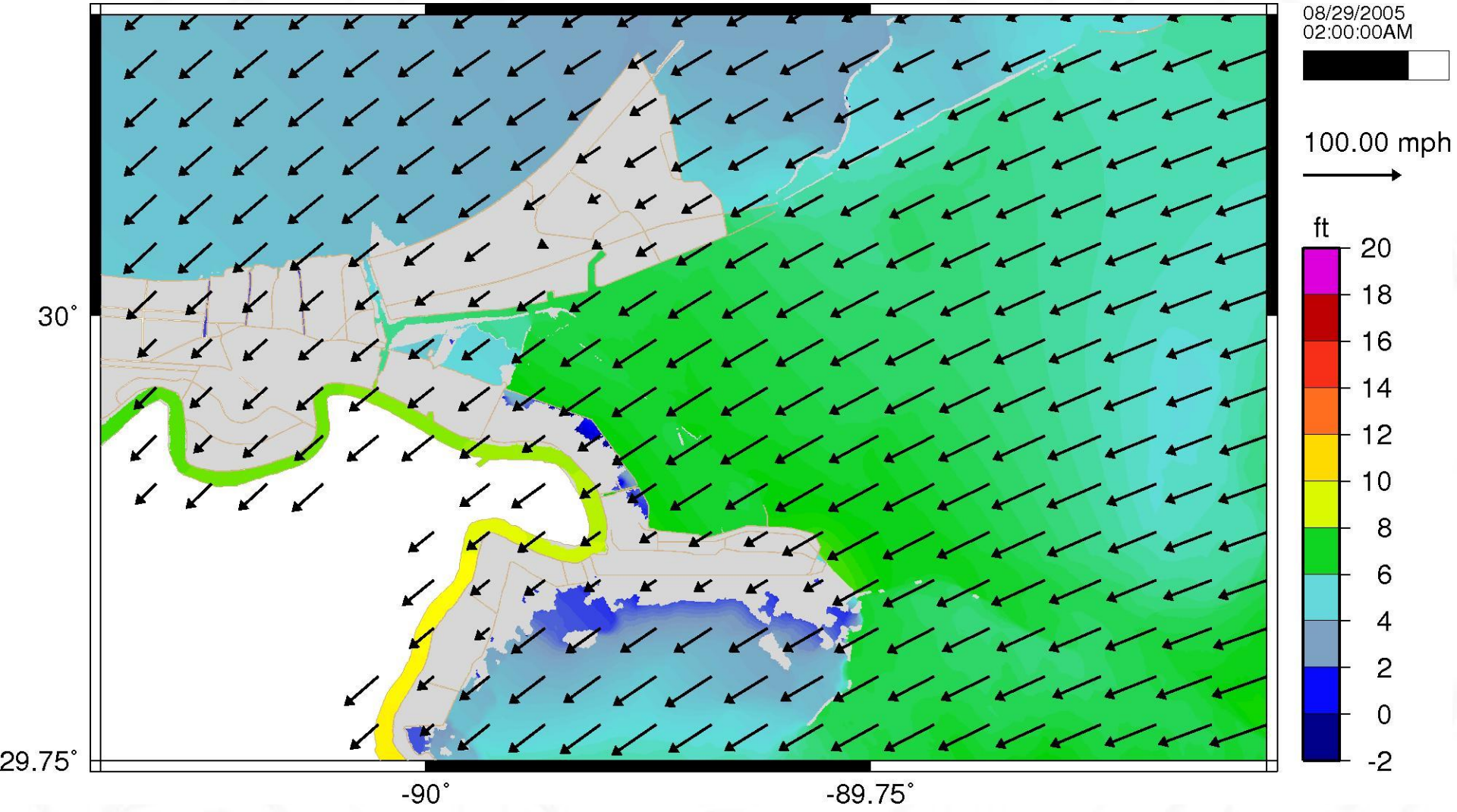


Figure 43a

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 4 am CDT

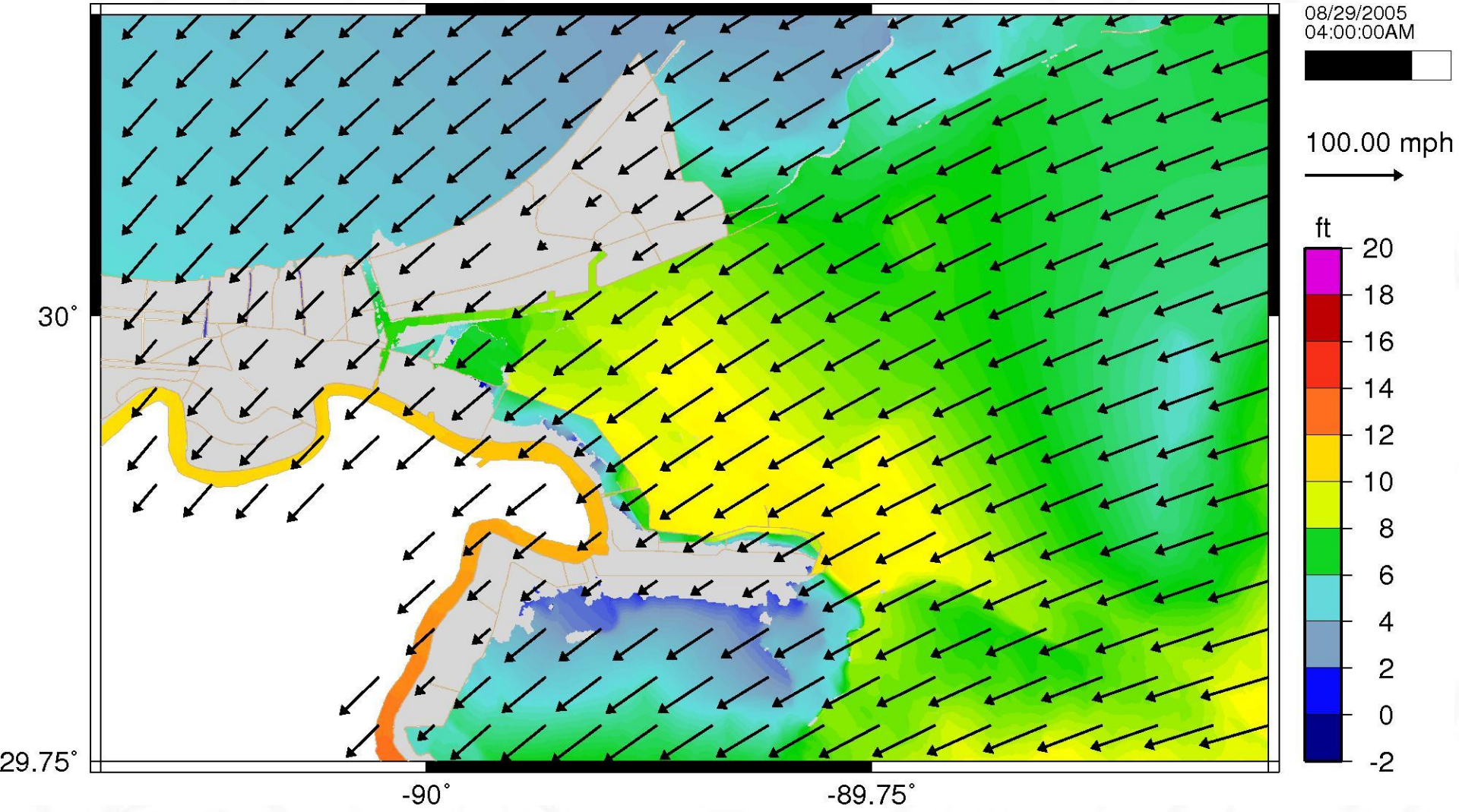


Figure 43b

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 6 am CDT

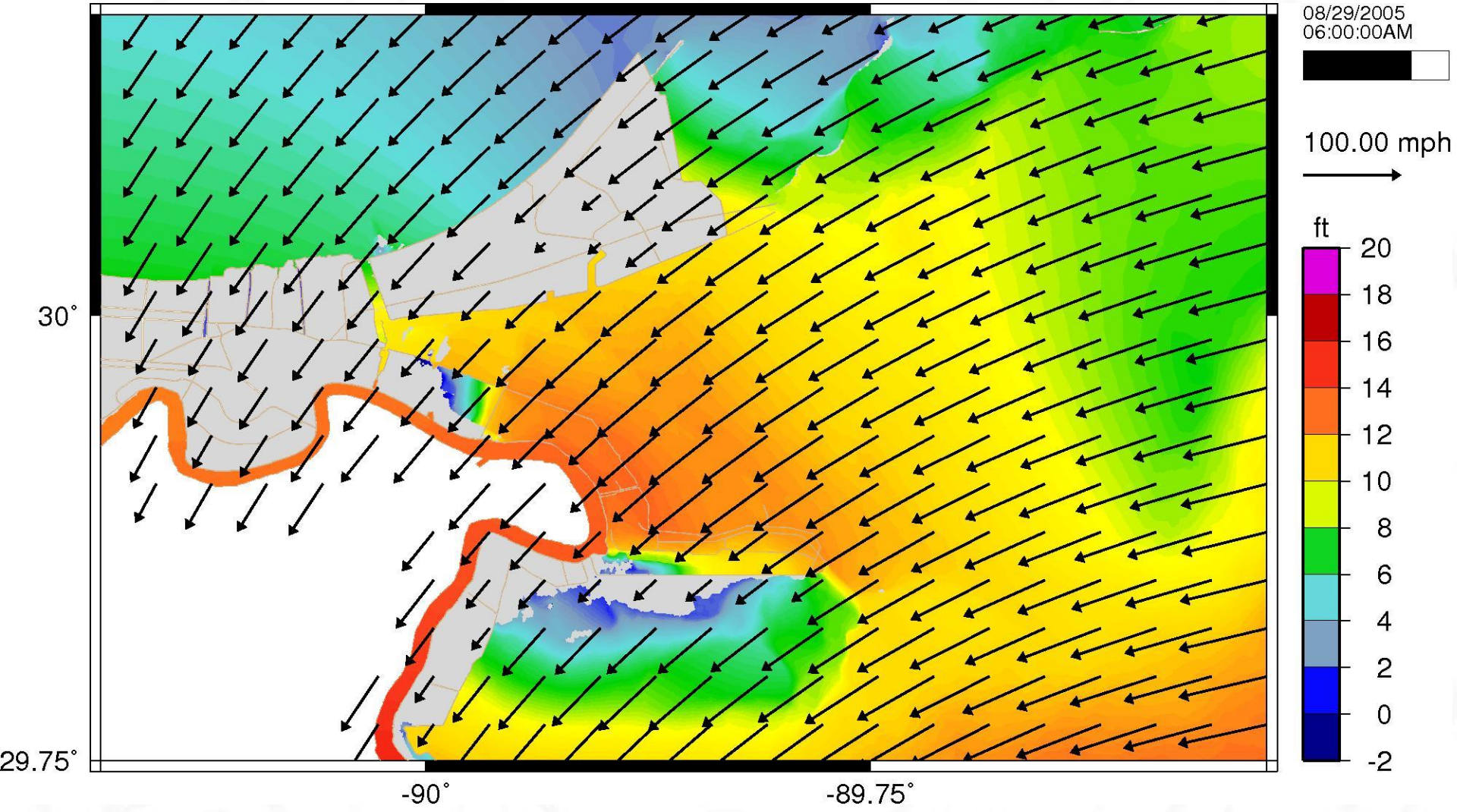


Figure 43c

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 7 am CDT

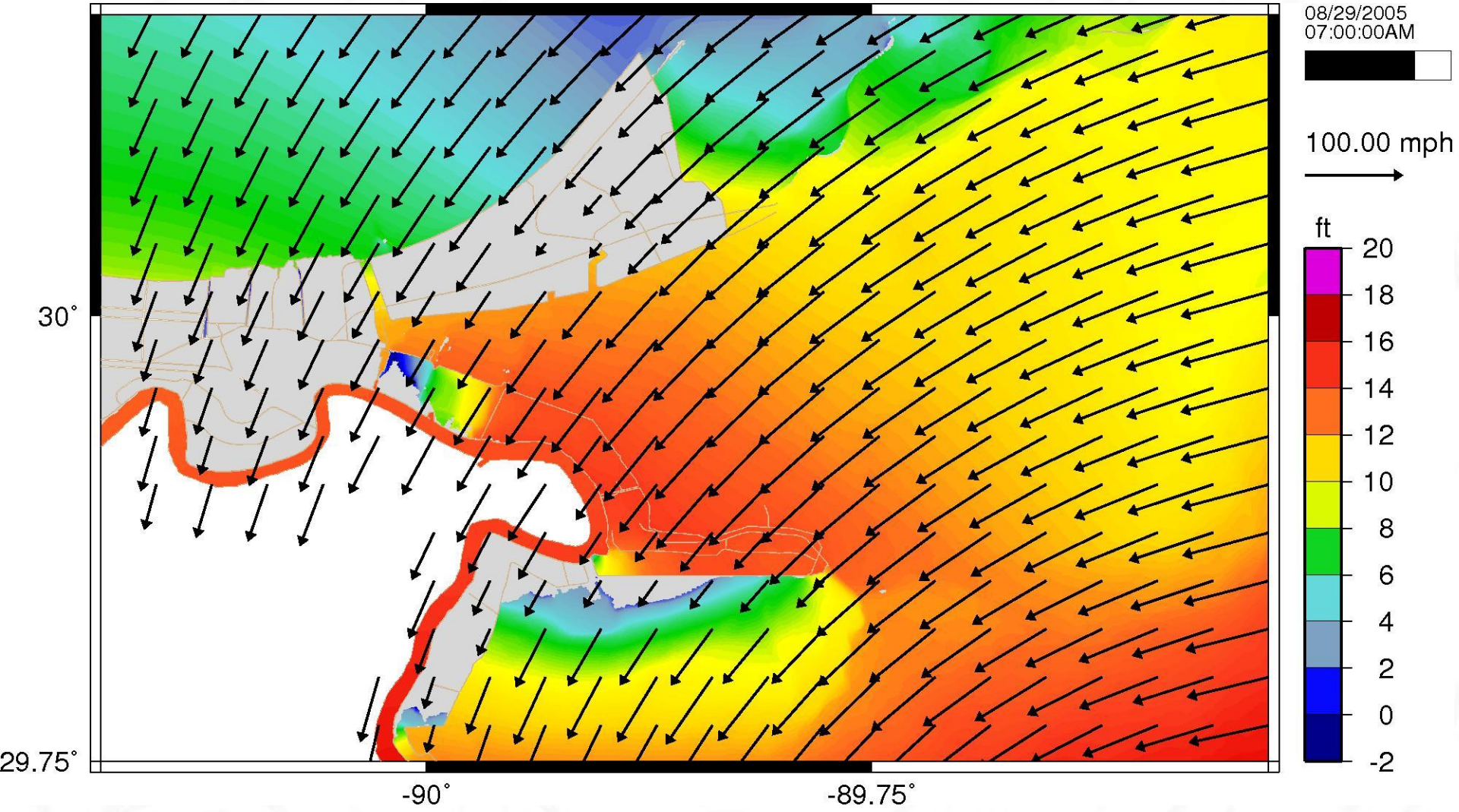


Figure 43d

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 8 am CDT

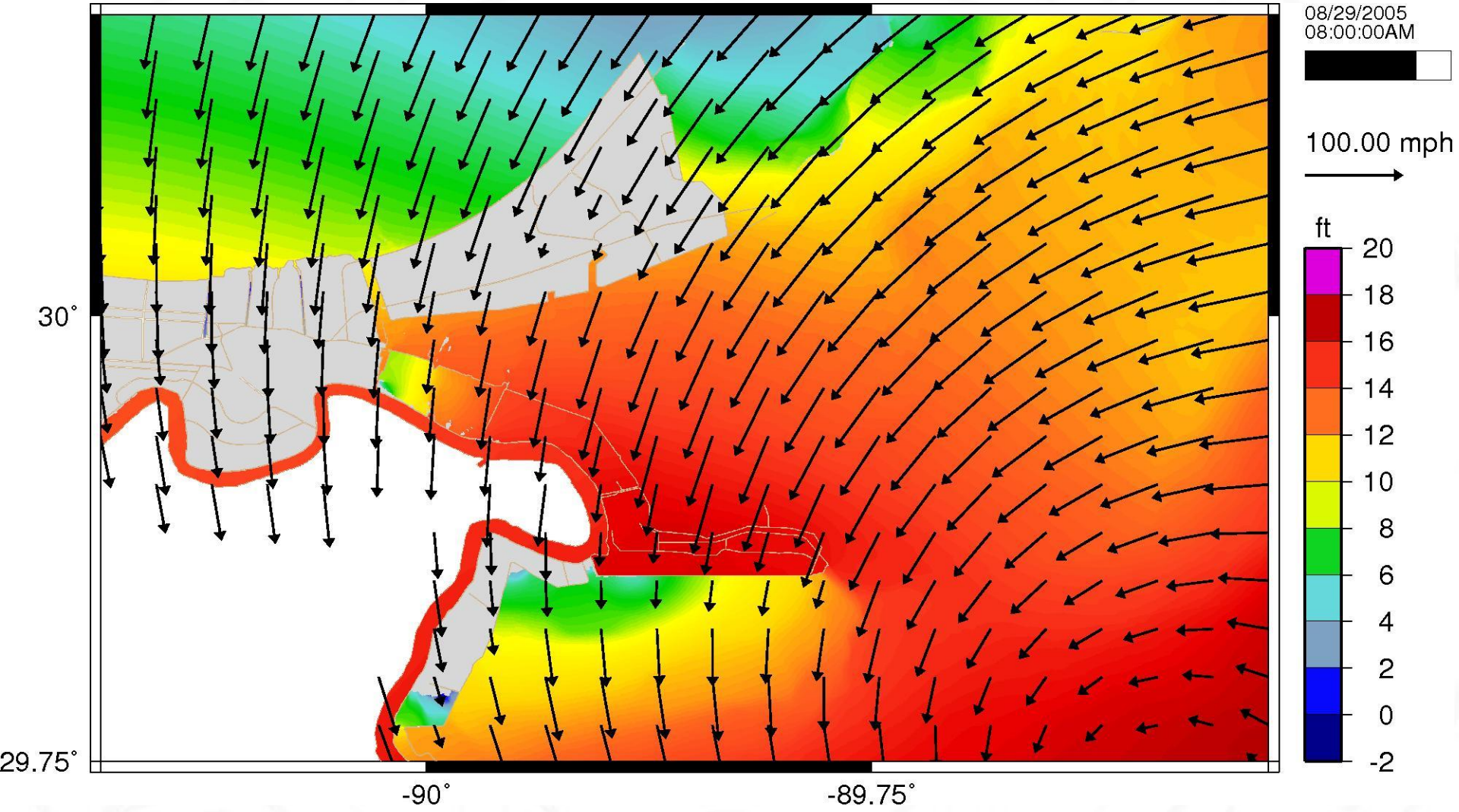


Figure 43e

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 9 am CDT

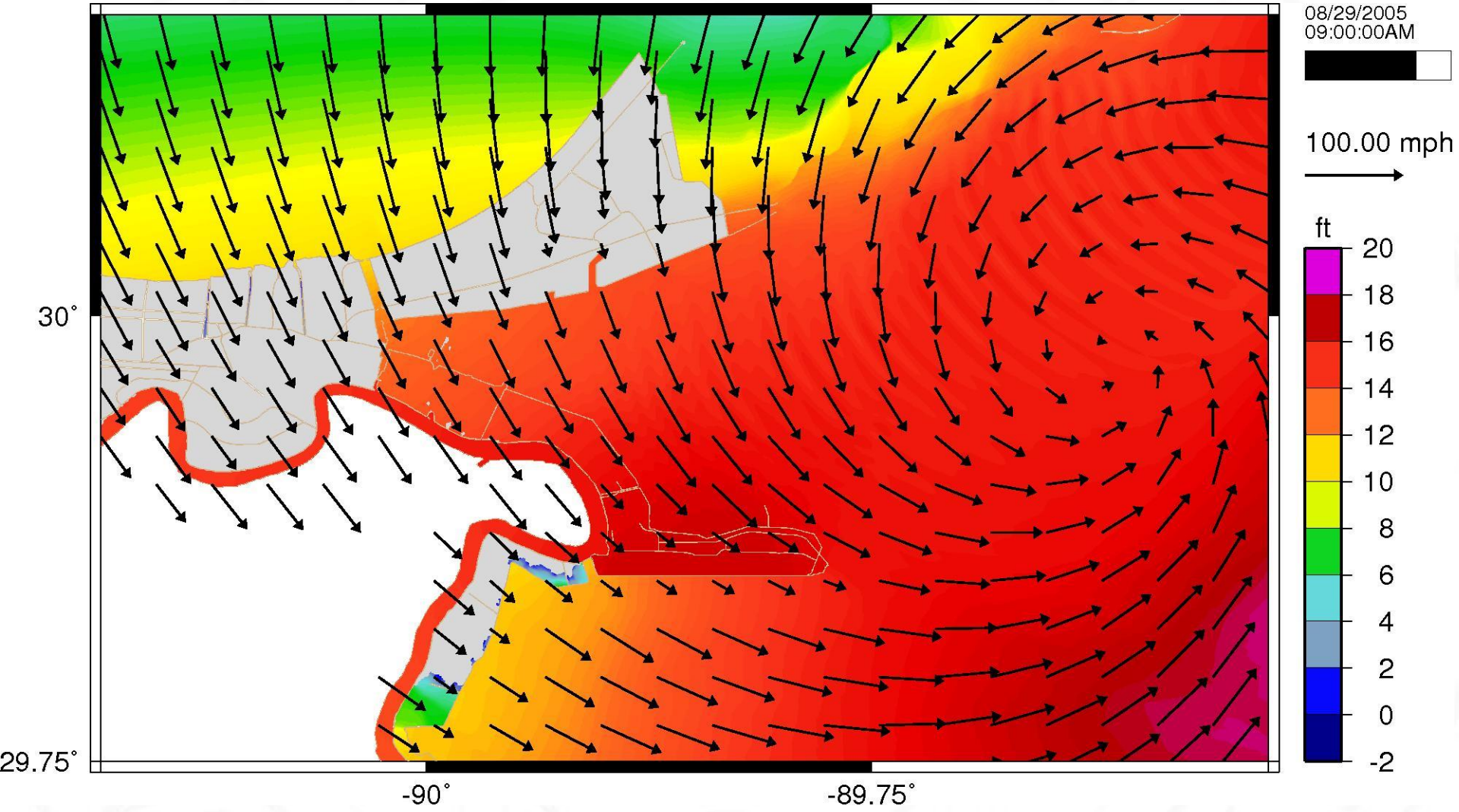


Figure 43f

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 10 am CDT

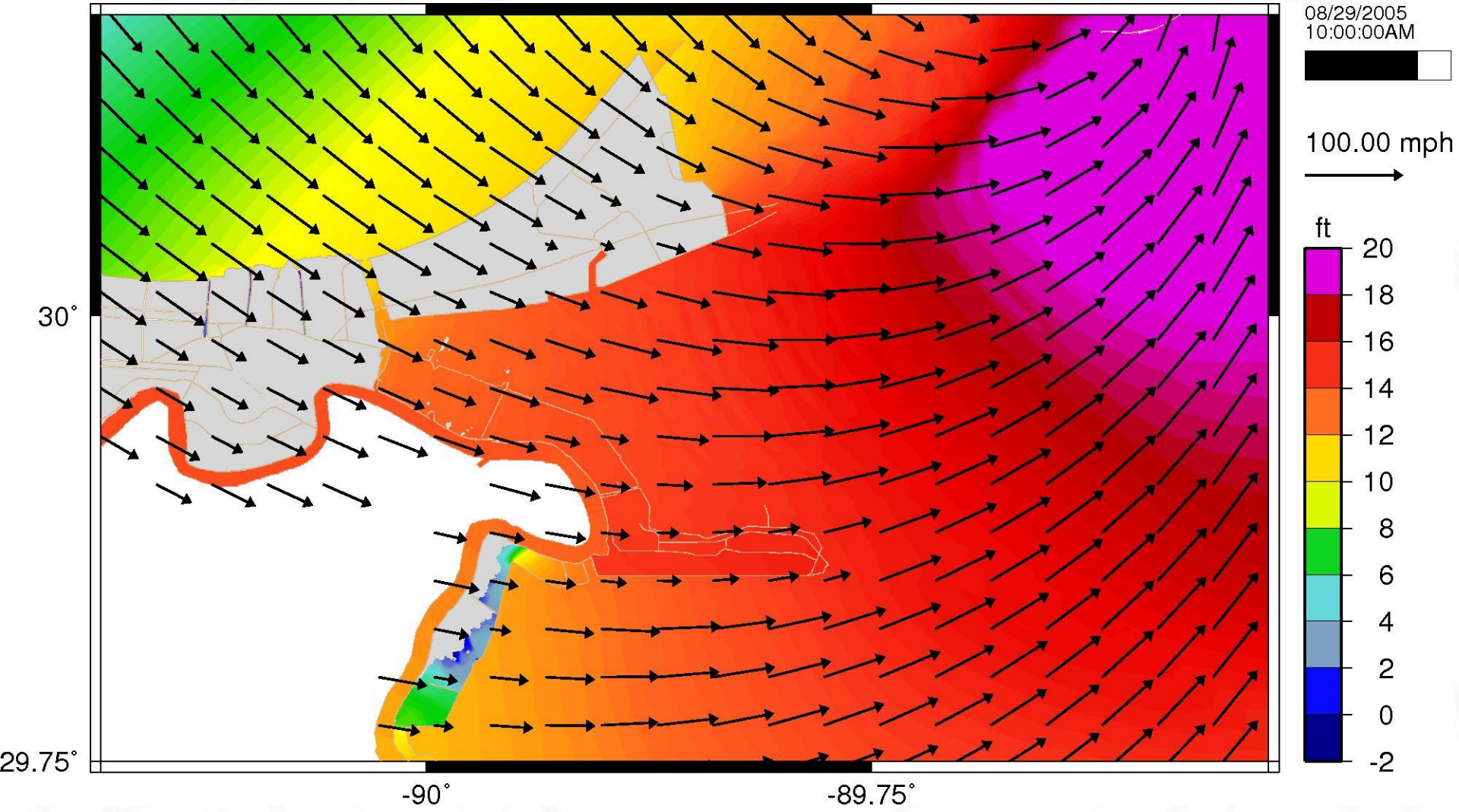


Figure 43g

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 11 am CDT

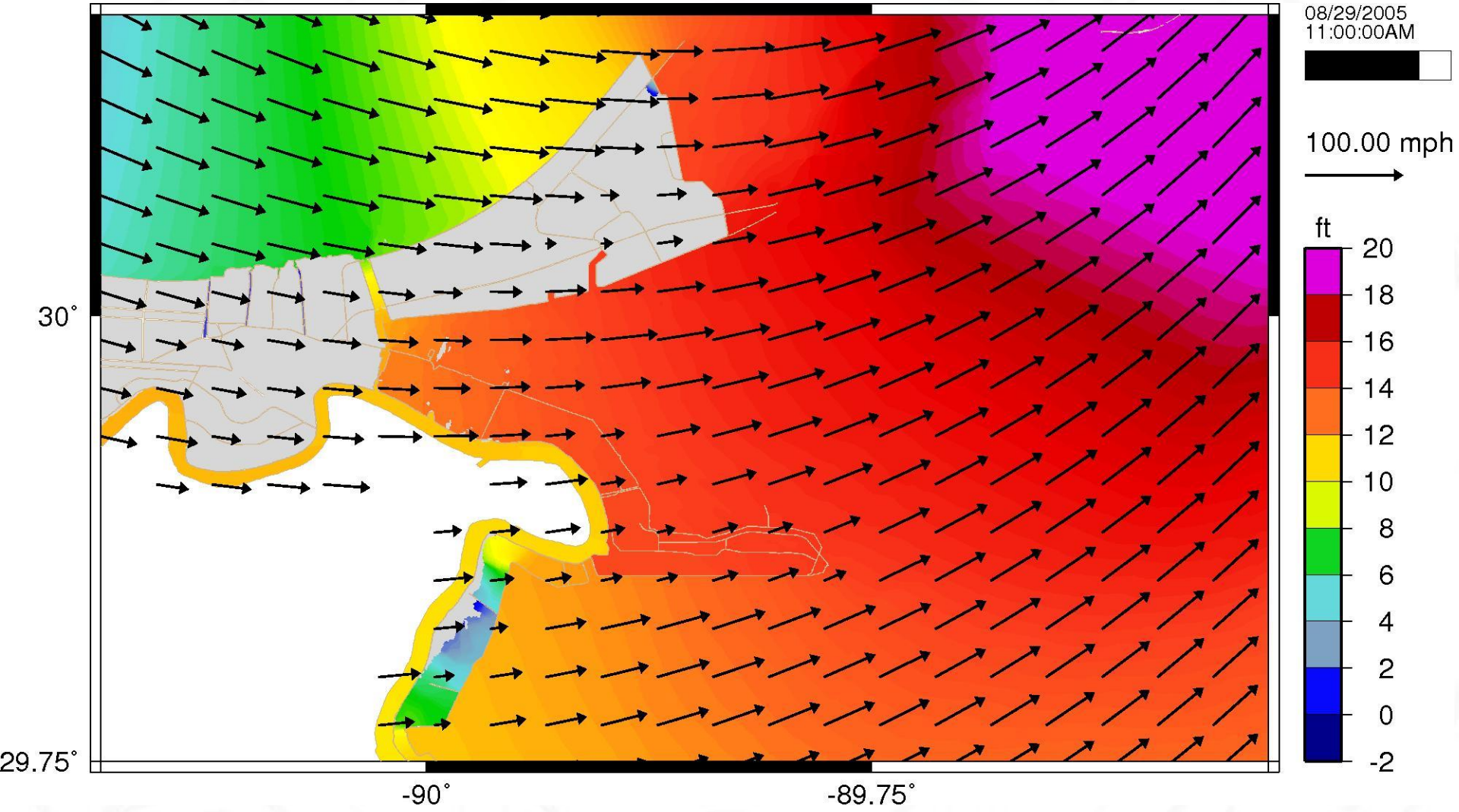


Figure 43h

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 12 pm CDT

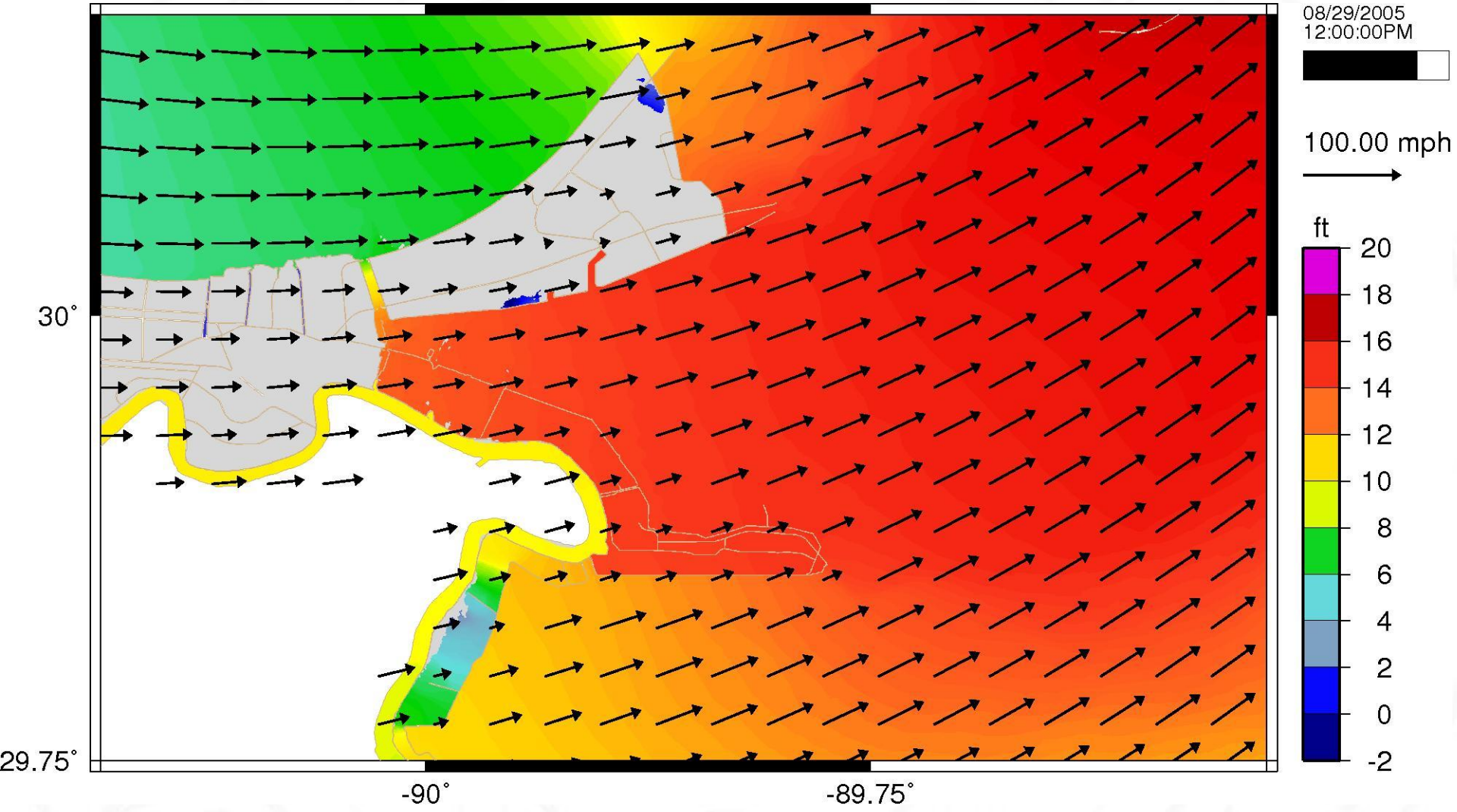


Figure 43i

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 1 pm CDT

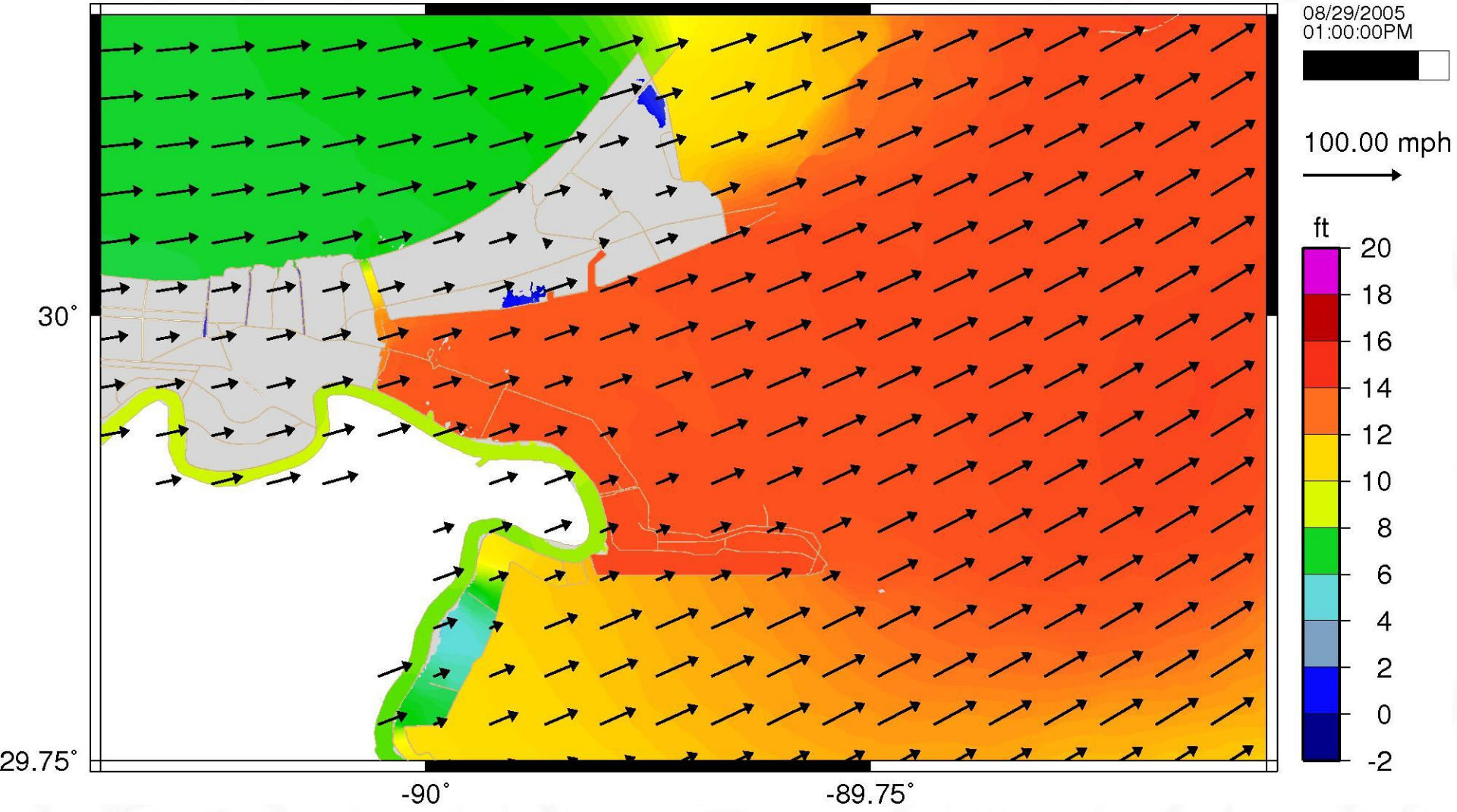


Figure 43j

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 2 pm CDT

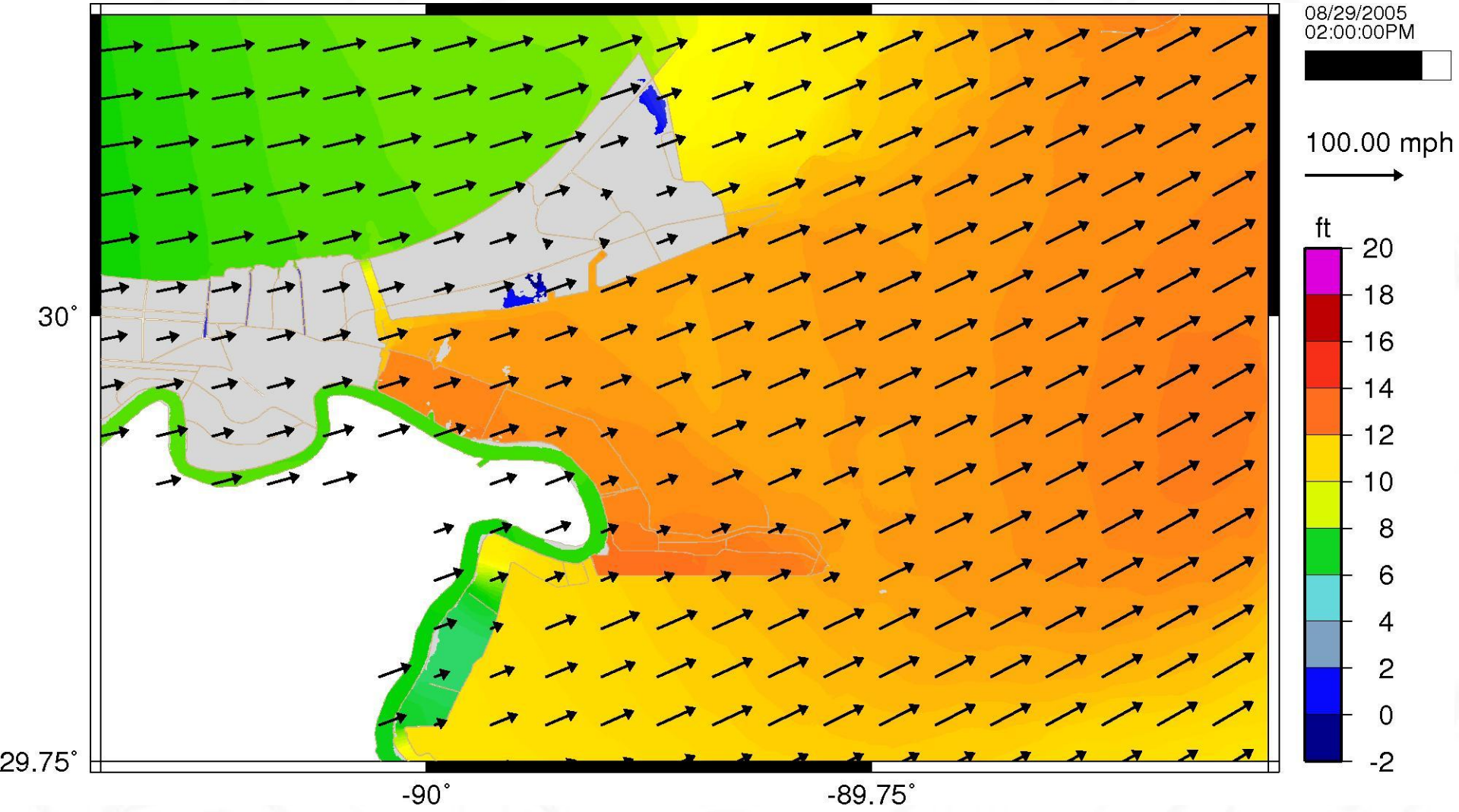


Figure 43k

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 3 pm CDT

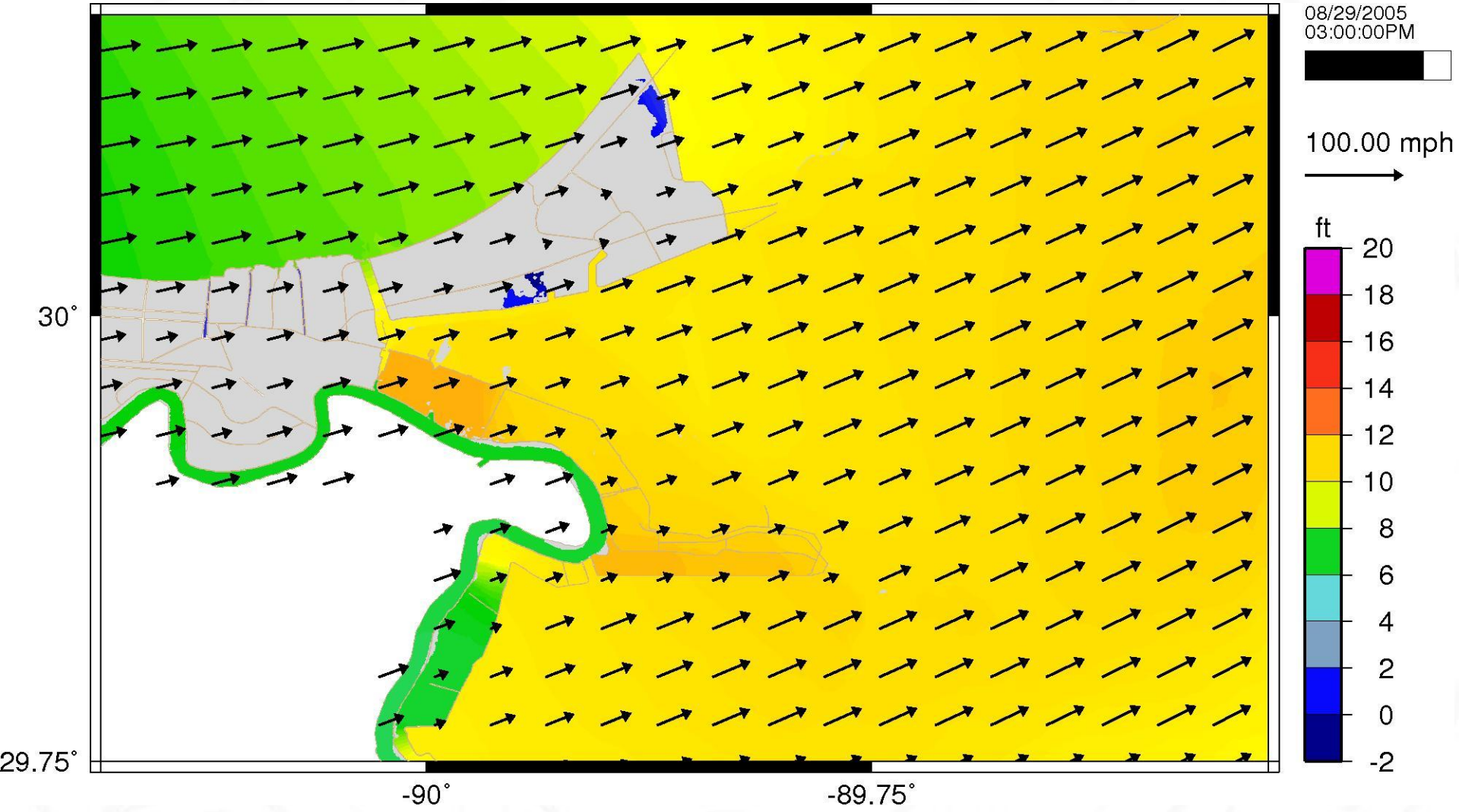


Figure 43l

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 4 pm CDT

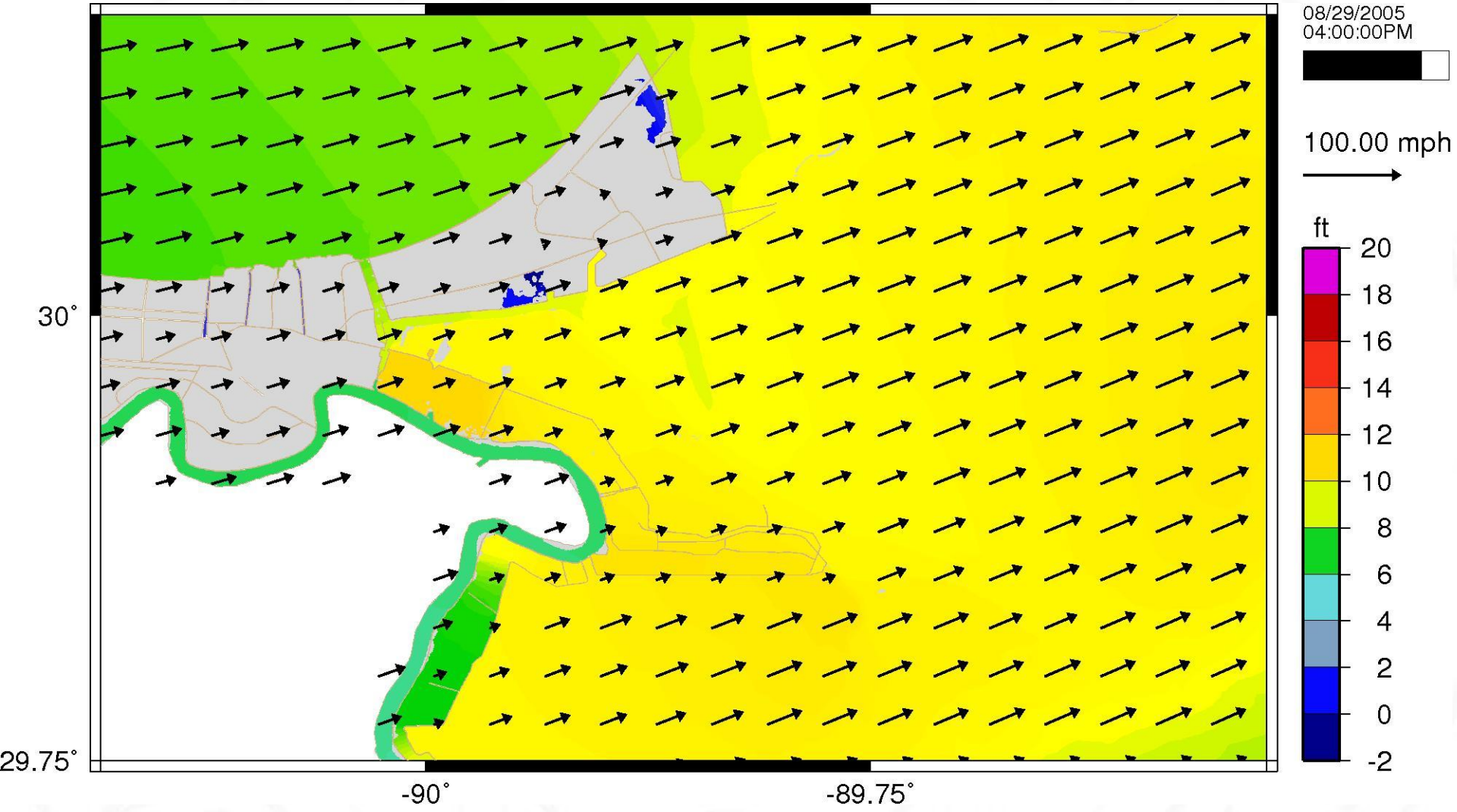


Figure 43m

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 6 pm CDT

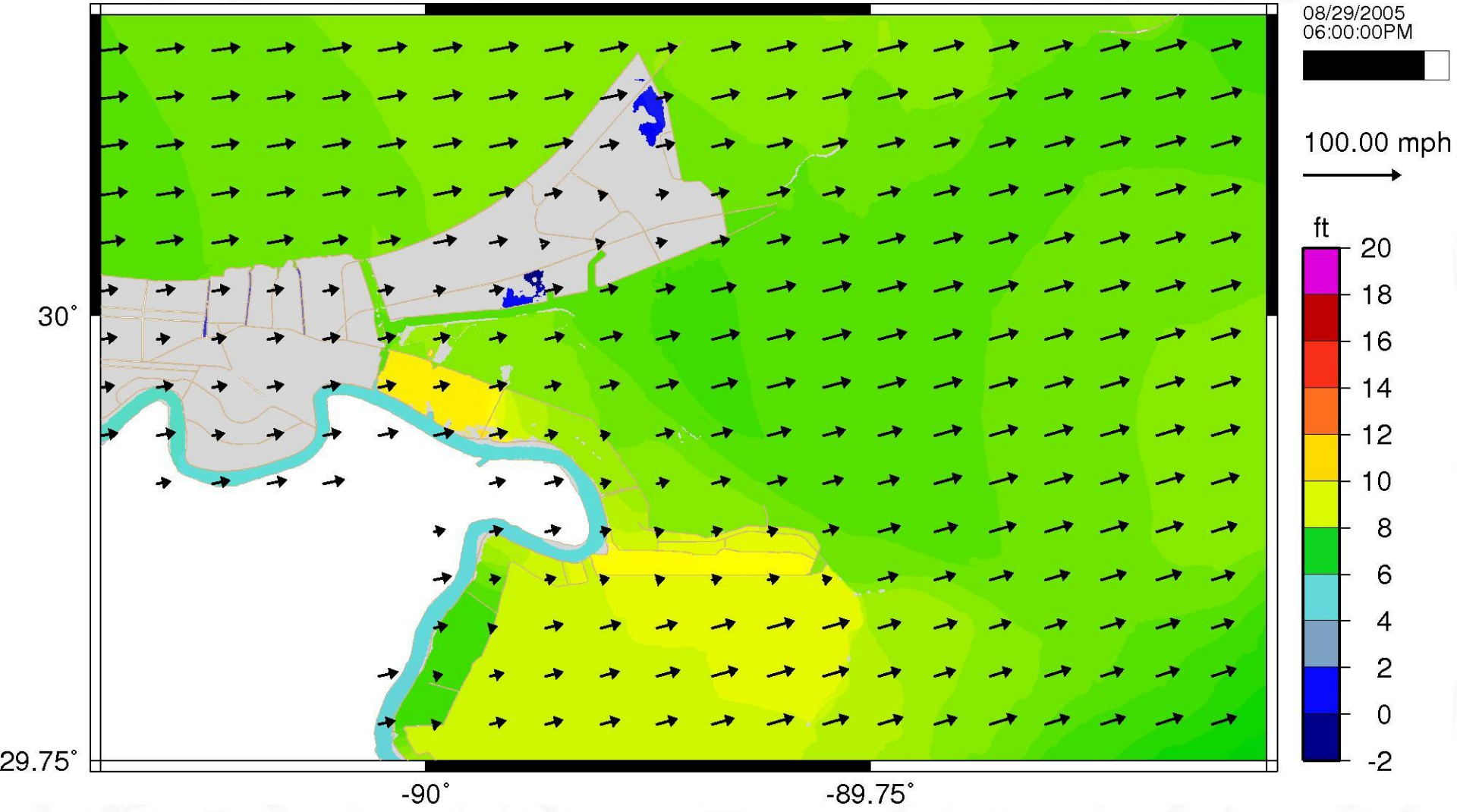


Figure 43n

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 8 pm CDT

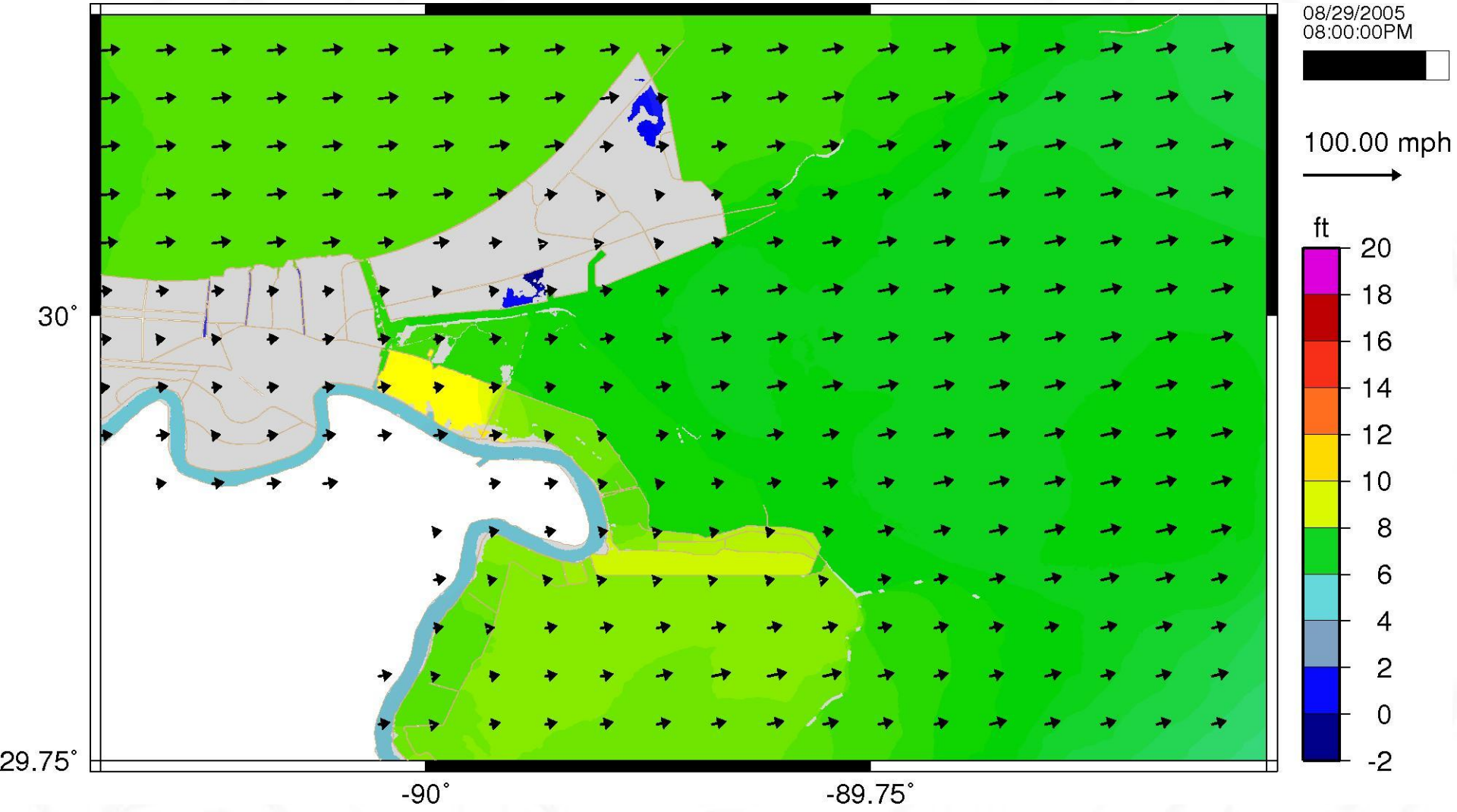


Figure 43o

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/29/2005 at 10 pm CDT

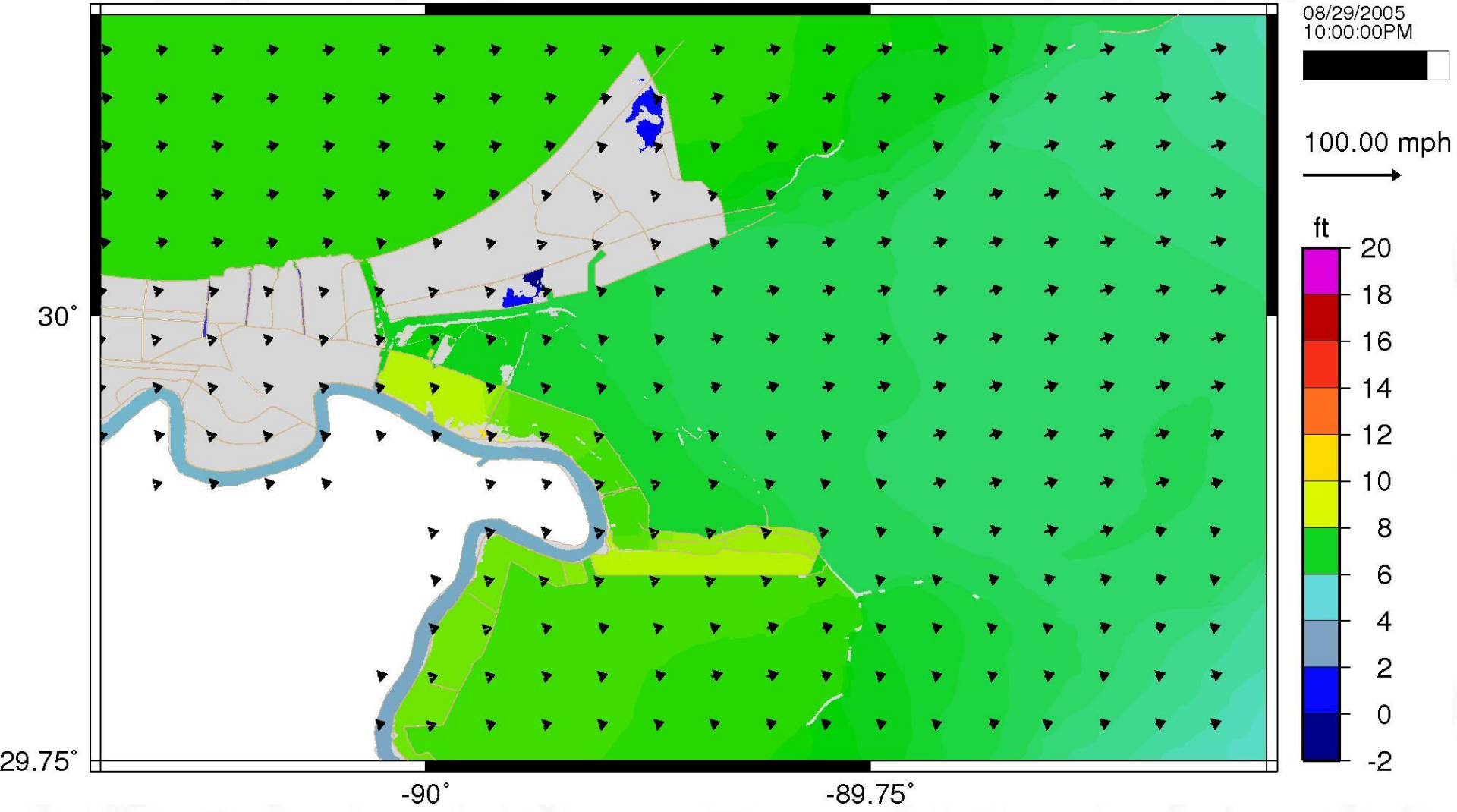


Figure 43p

Katrina - *Scenario D: Flooding in St. Bernard Parish*

8/30/2005 at 12 am CDT

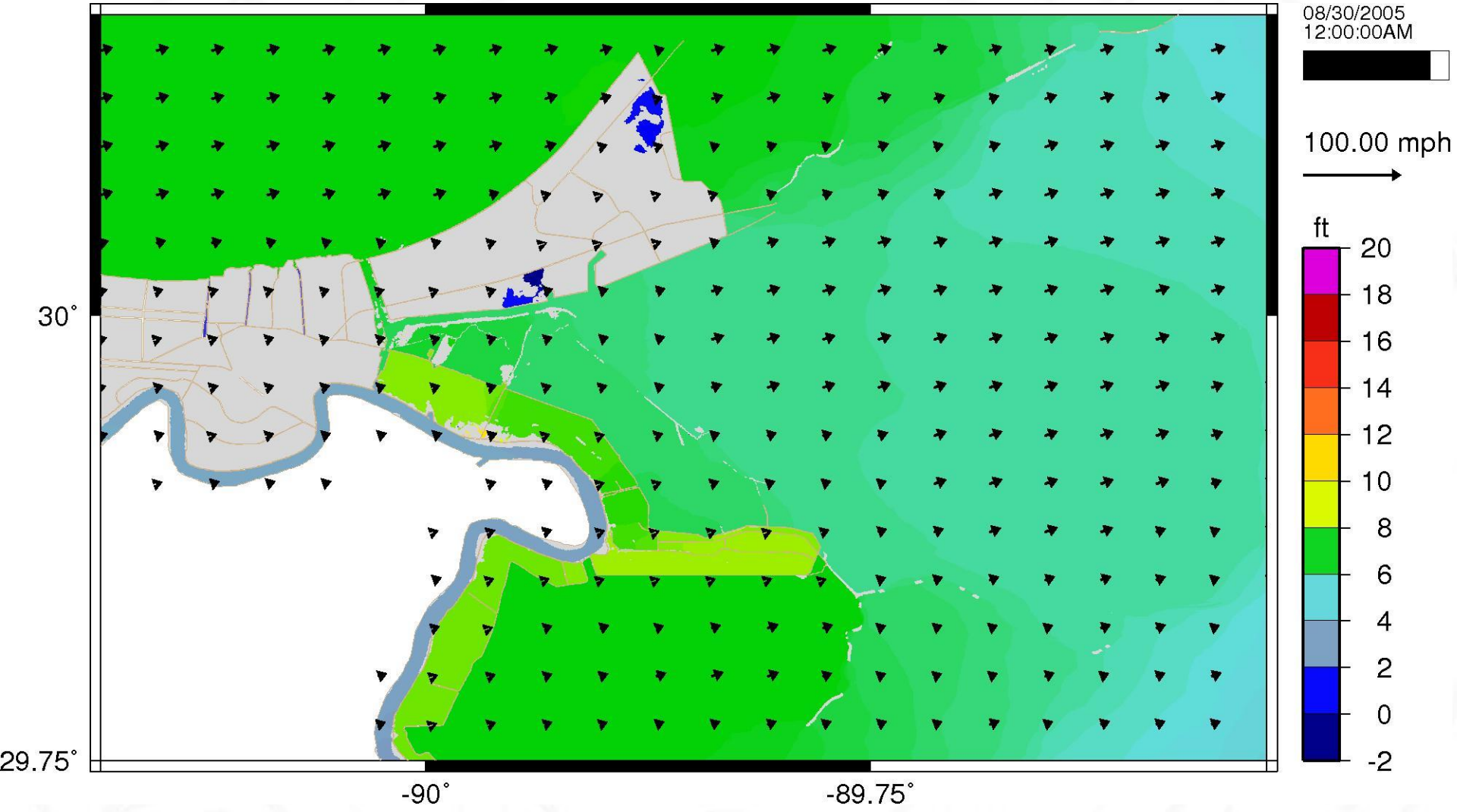


Figure 43q

Katrina - *Scenario D: Flooding in St. Bernard Parish*

- The following slides, Figures 44-46, depict the differences between the flooding in the *No Federal Levees/2005 MRGO/2005 Wetlands* Scenario D and the flooding that actually took place during Hurricane Katrina.
- Flooding is greater throughout the Polder in Scenario D, and substantially greater in the easternmost portions of the Polder that would otherwise lie within the federal levee system.

Katrina - *Scenario D: Maximum scenario D surge elevations*

Maximum D

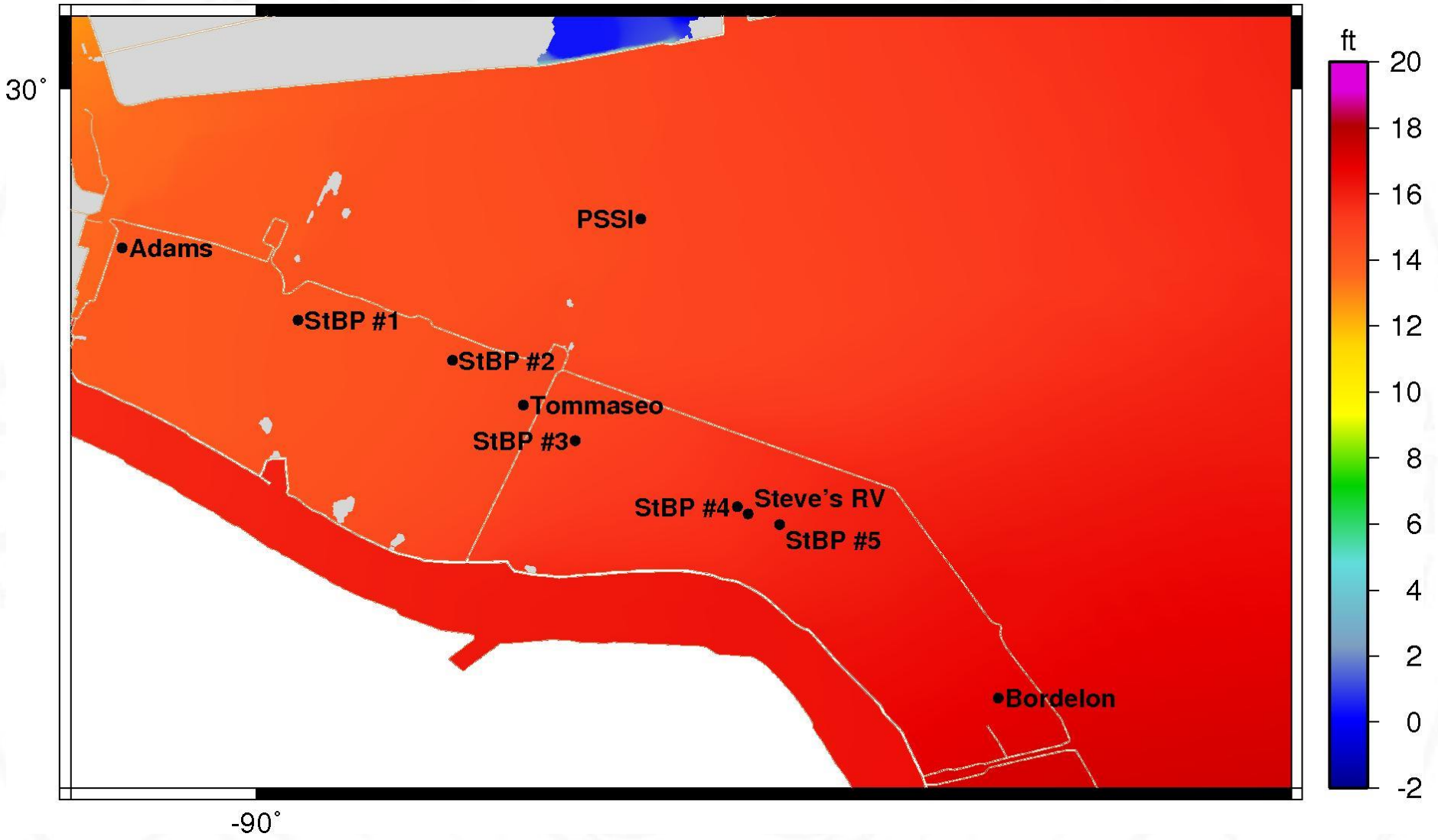


Figure 44

Katrina - *Scenario D: Maximum scenario A1 surge elevations*

Maximum A1

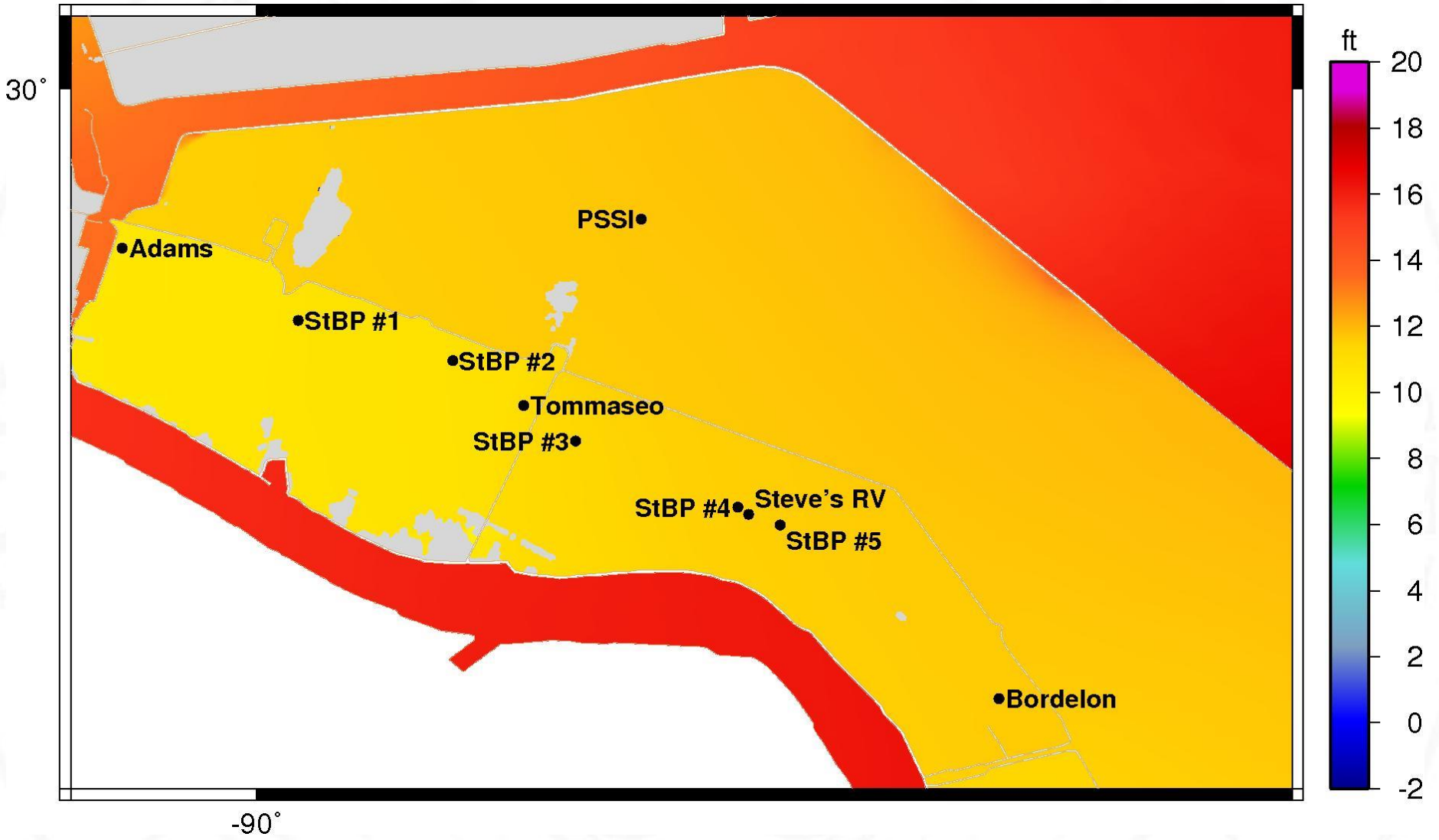


Figure 45

Katrina - *Scenario D: Difference between scenarios A1 and D surge*

Maximum A1 less Maximum D

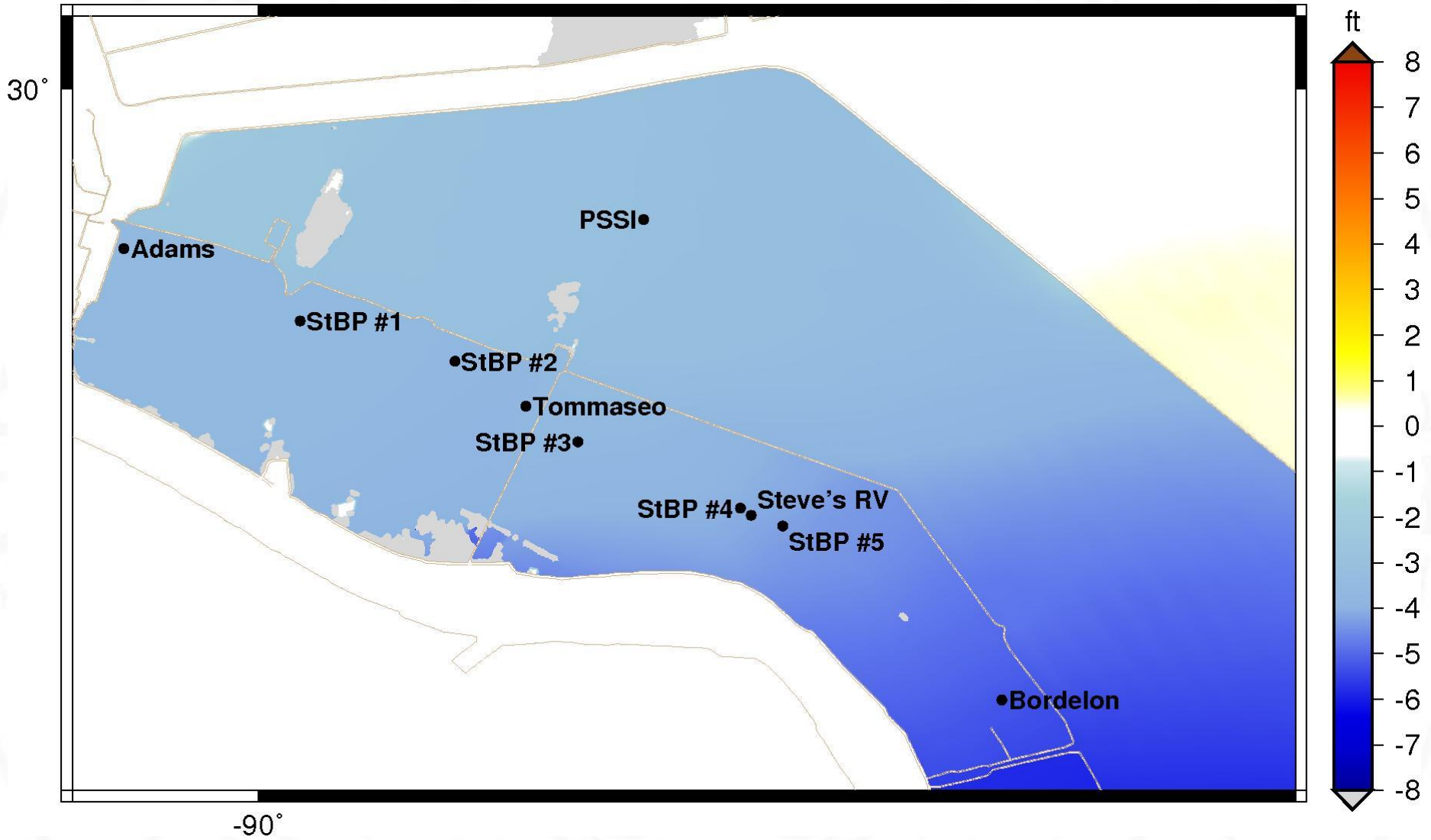
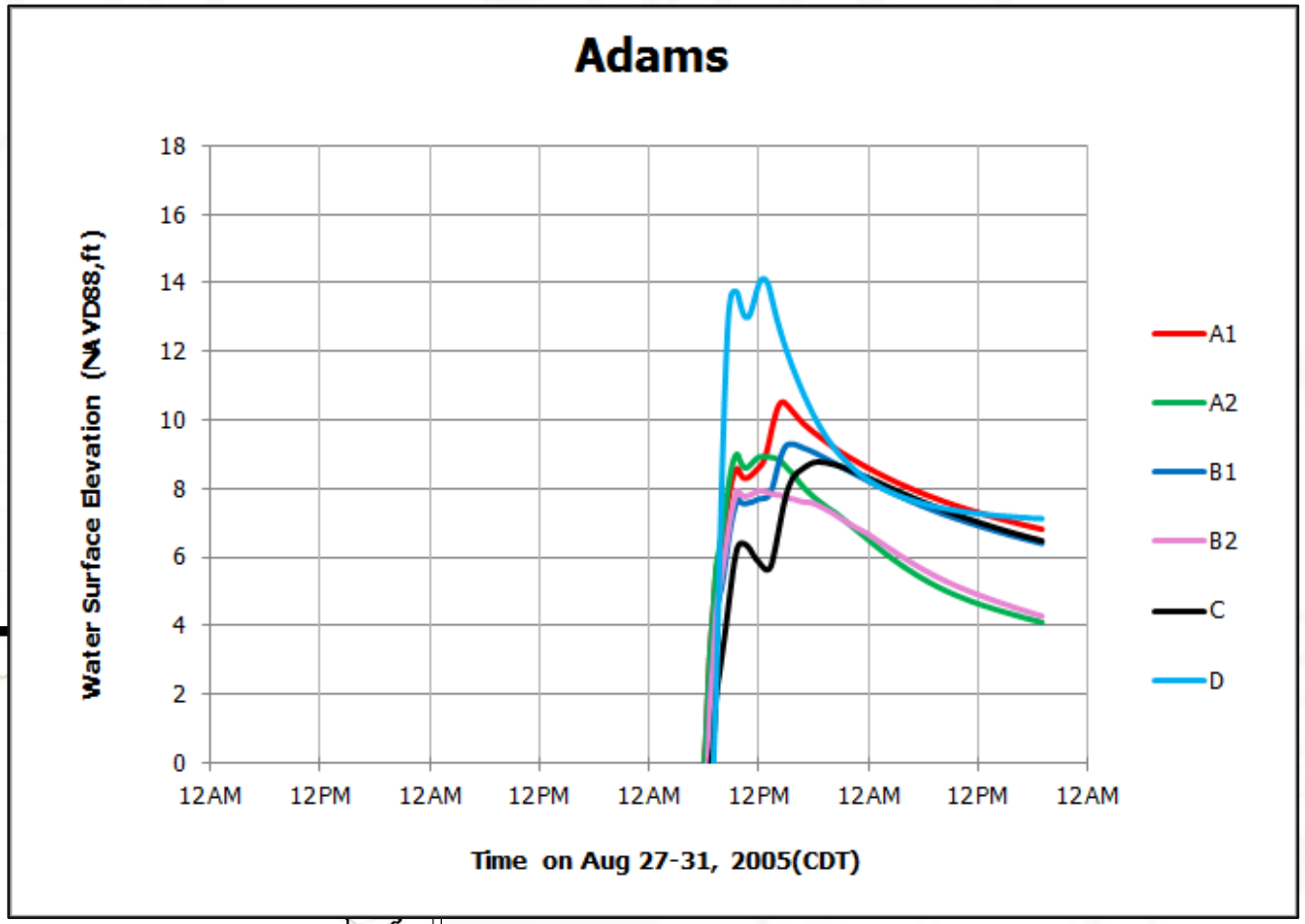


Figure 46

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*

- The following hydrographs, Figures 47a-k, depict the maximum flood elevations and the timing of the flooding at each Trial Property in Scenarios A1 (red), A2 (green), B1 (dark blue), B2 (pink), C (black), and D (light blue).
- The hydrographs also indicate the geographic location of each Trial Property inside the Polder.

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



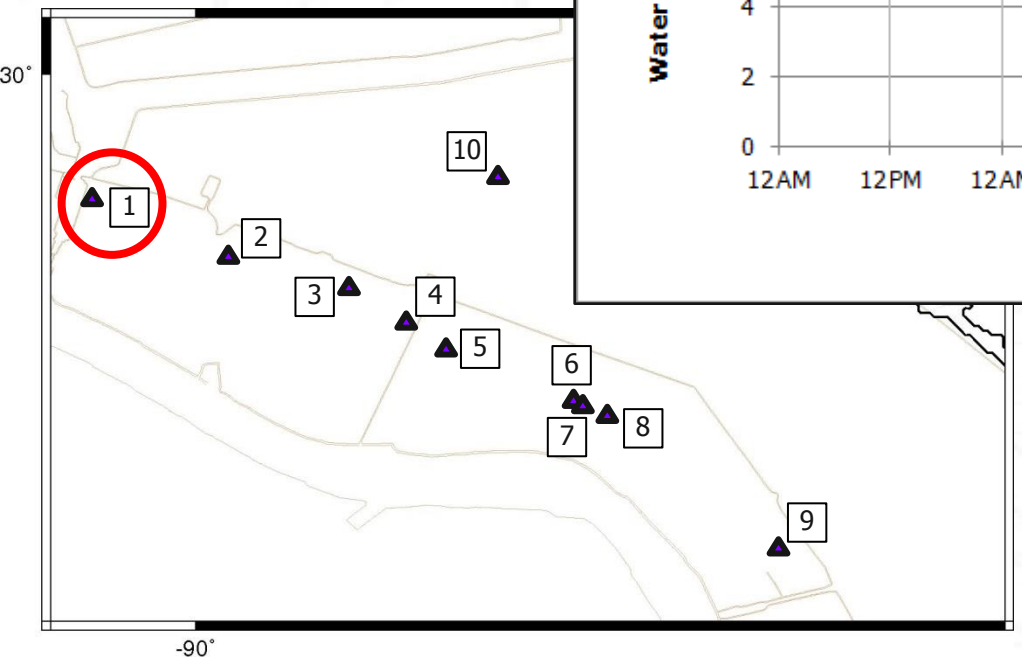
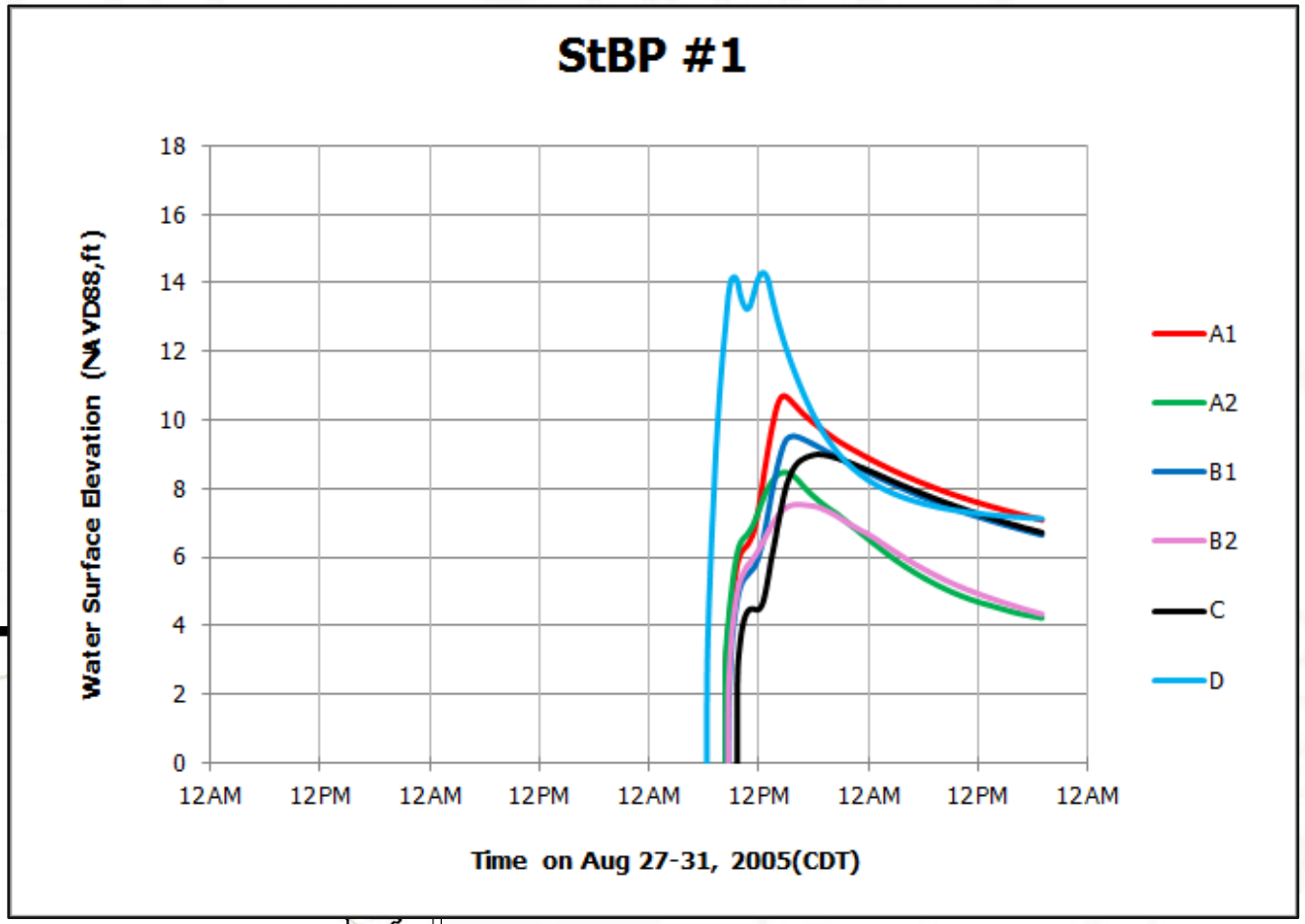


Figure 47a

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



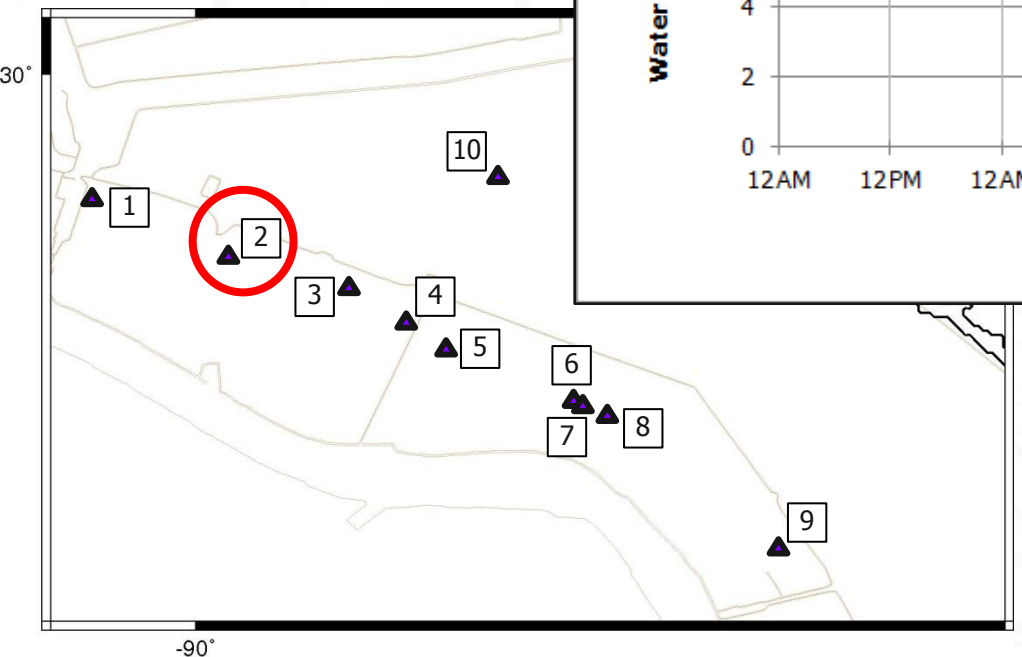
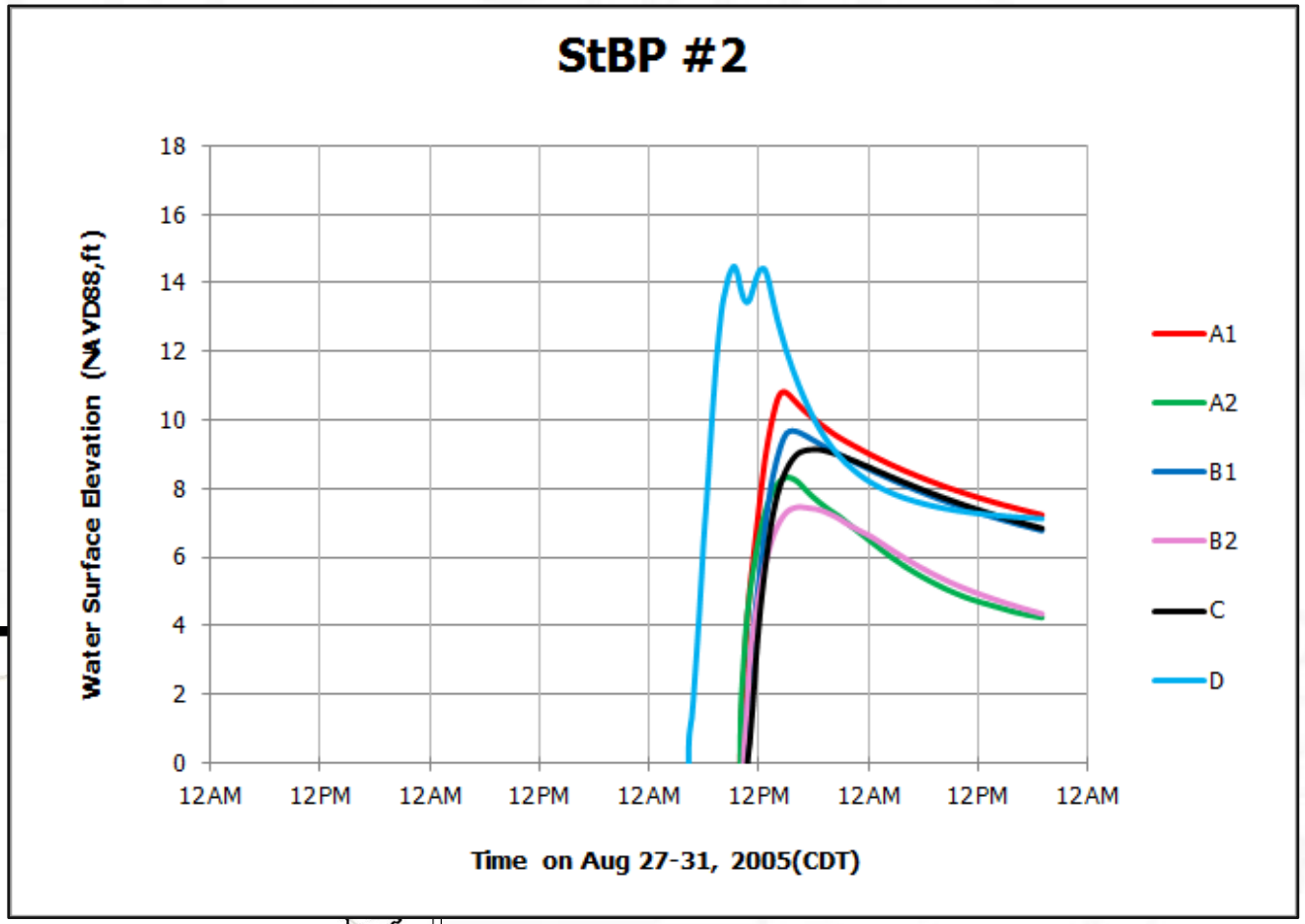


Figure 47b

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



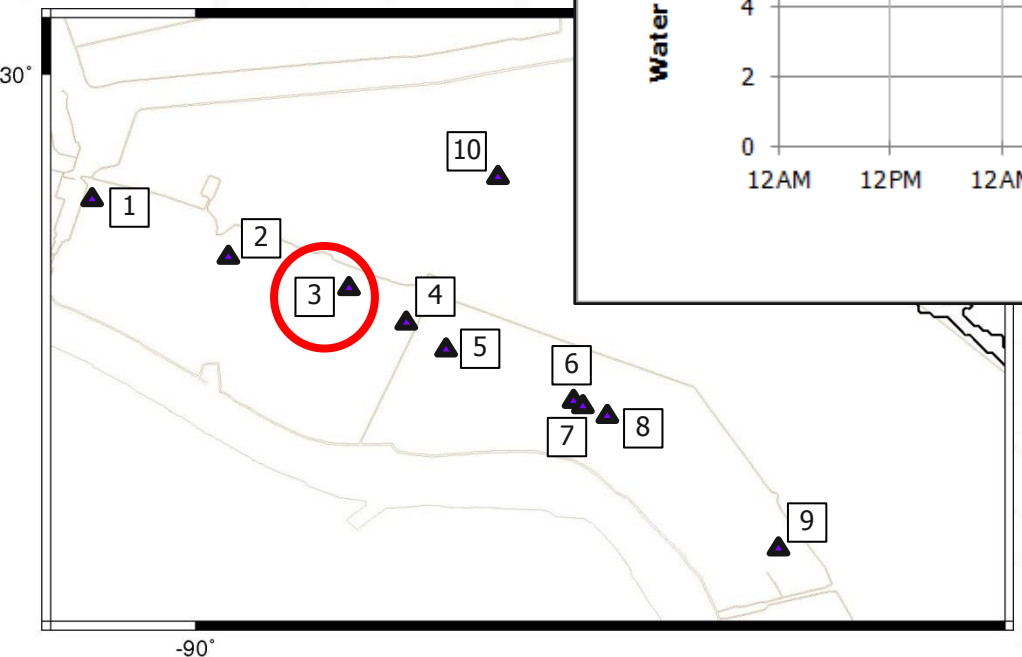
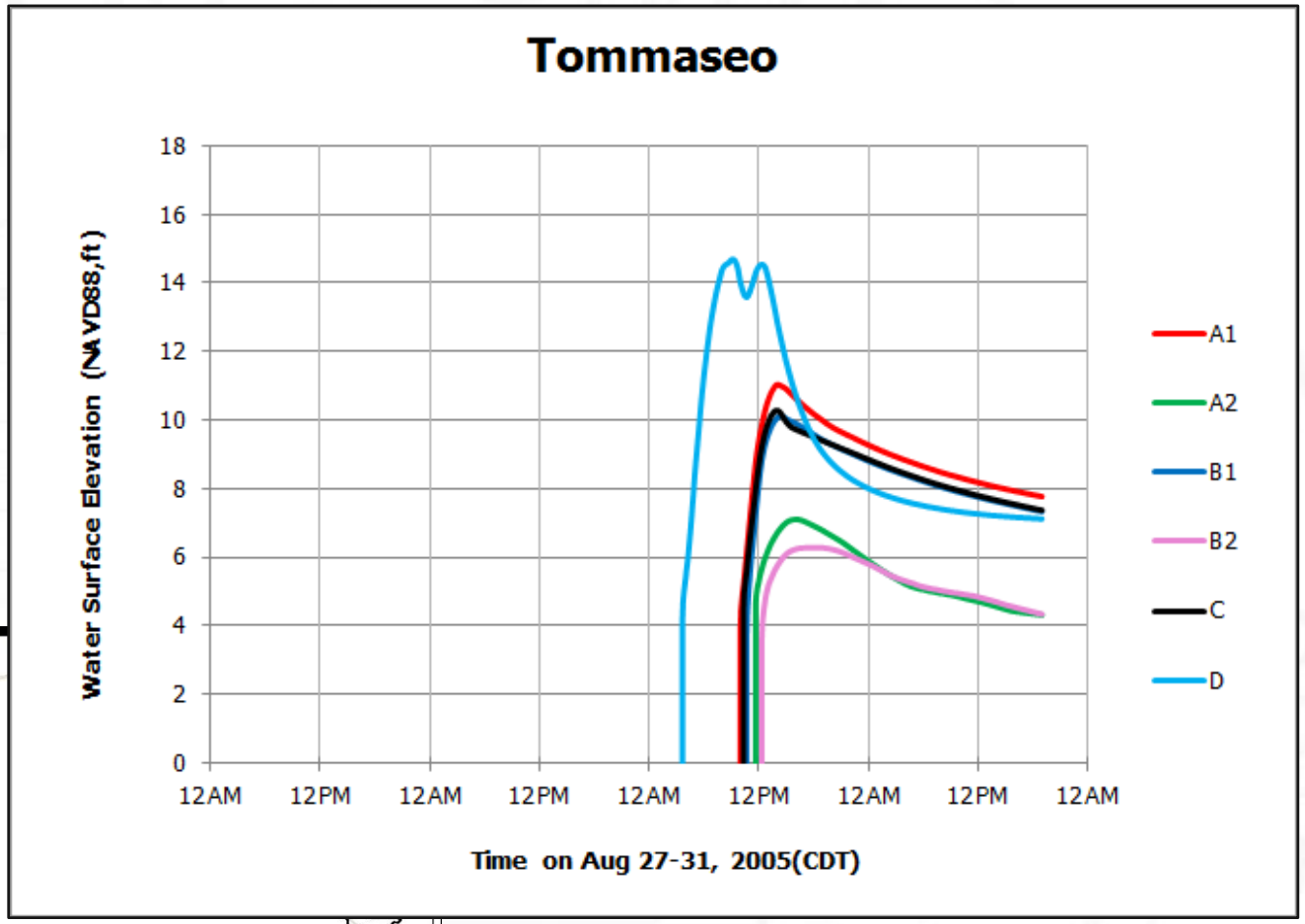


Figure 47c

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



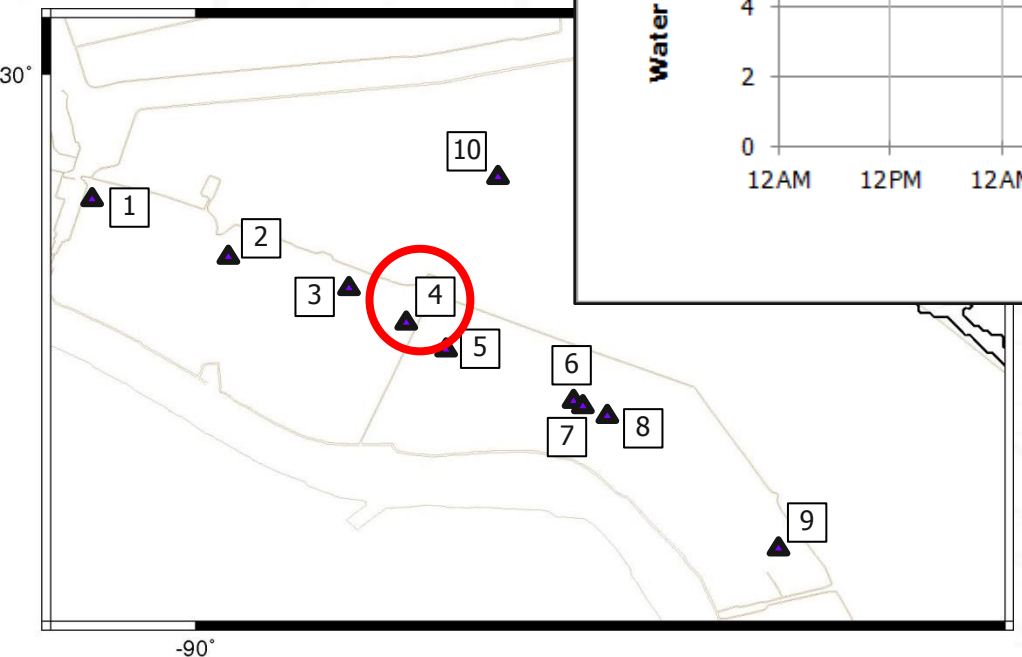
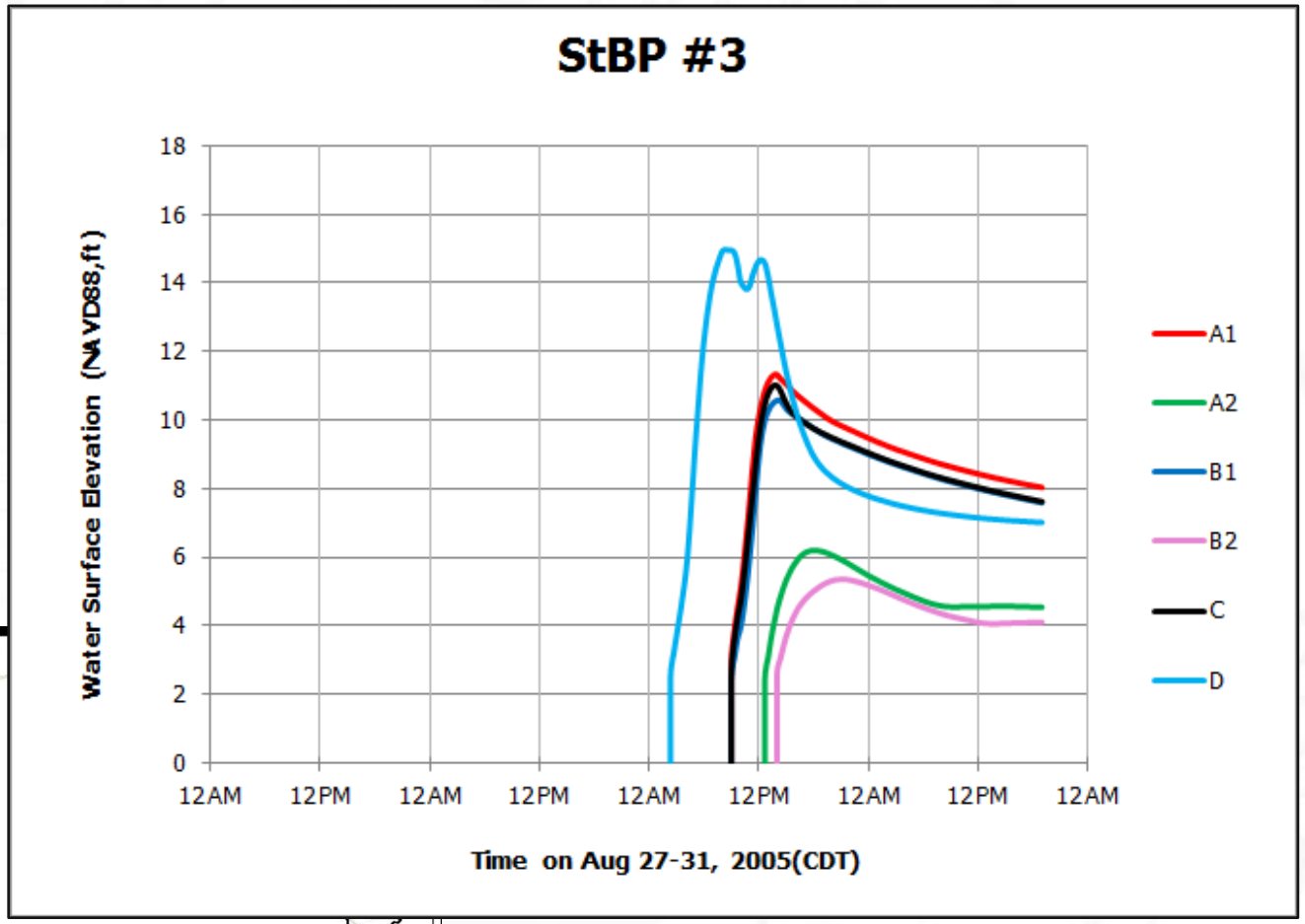


Figure 47d

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



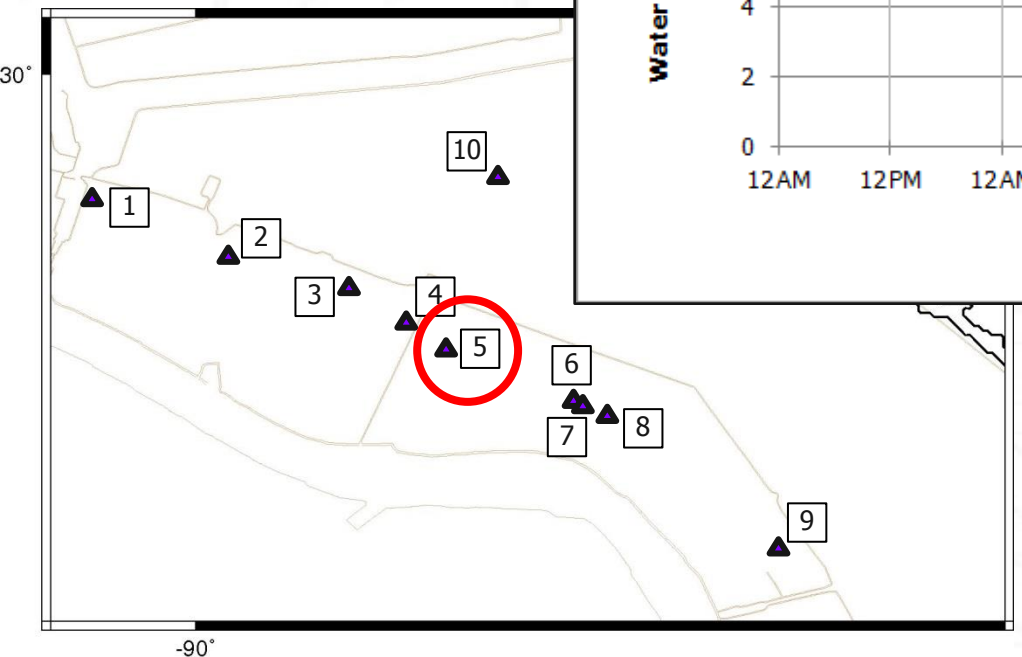
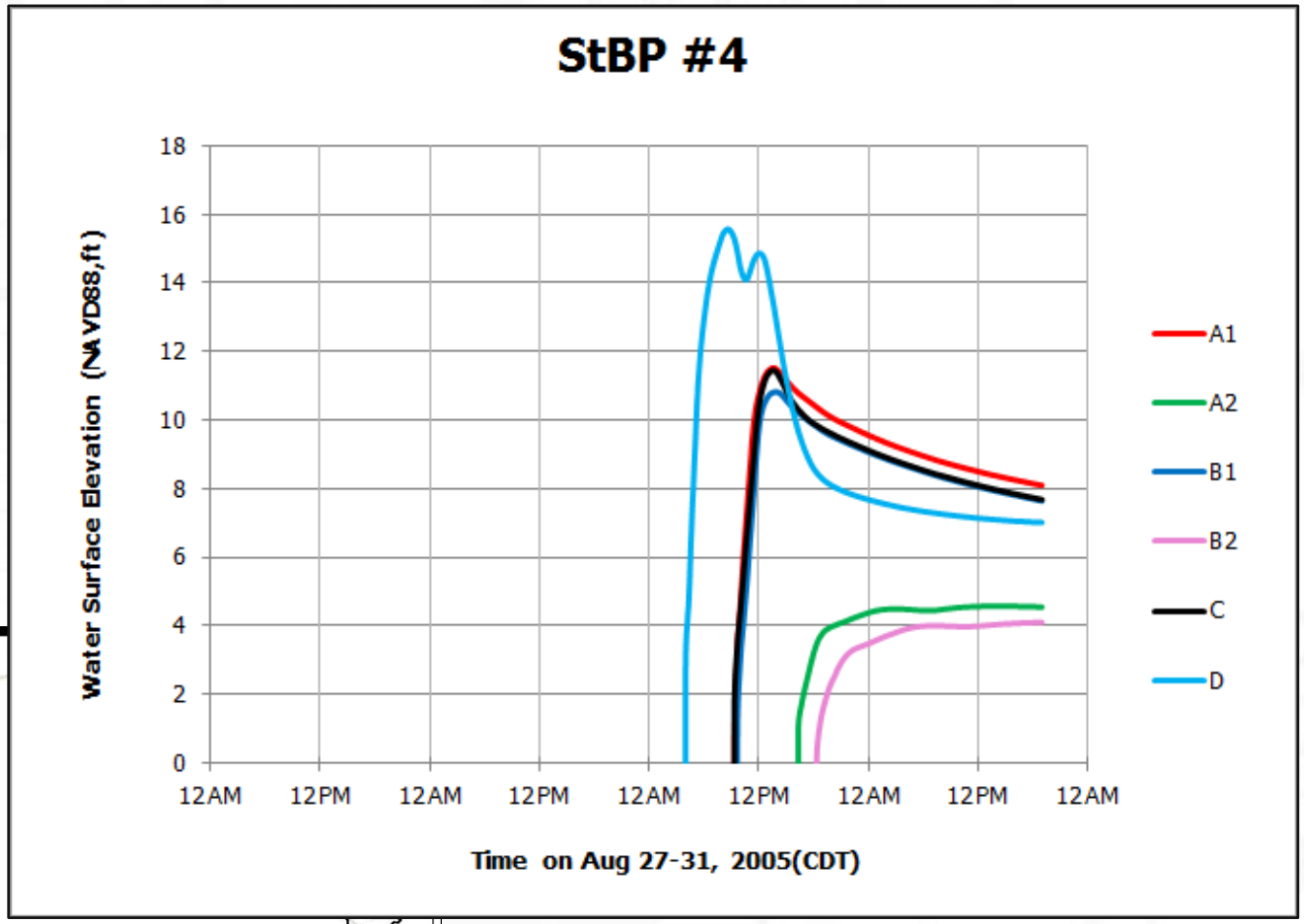


Figure 47e

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



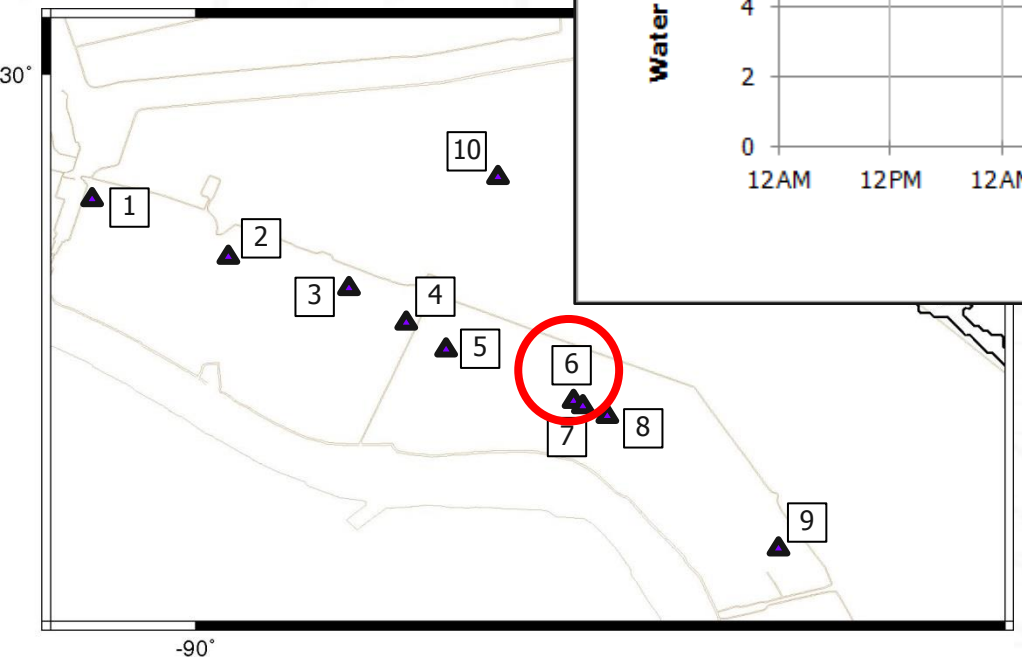
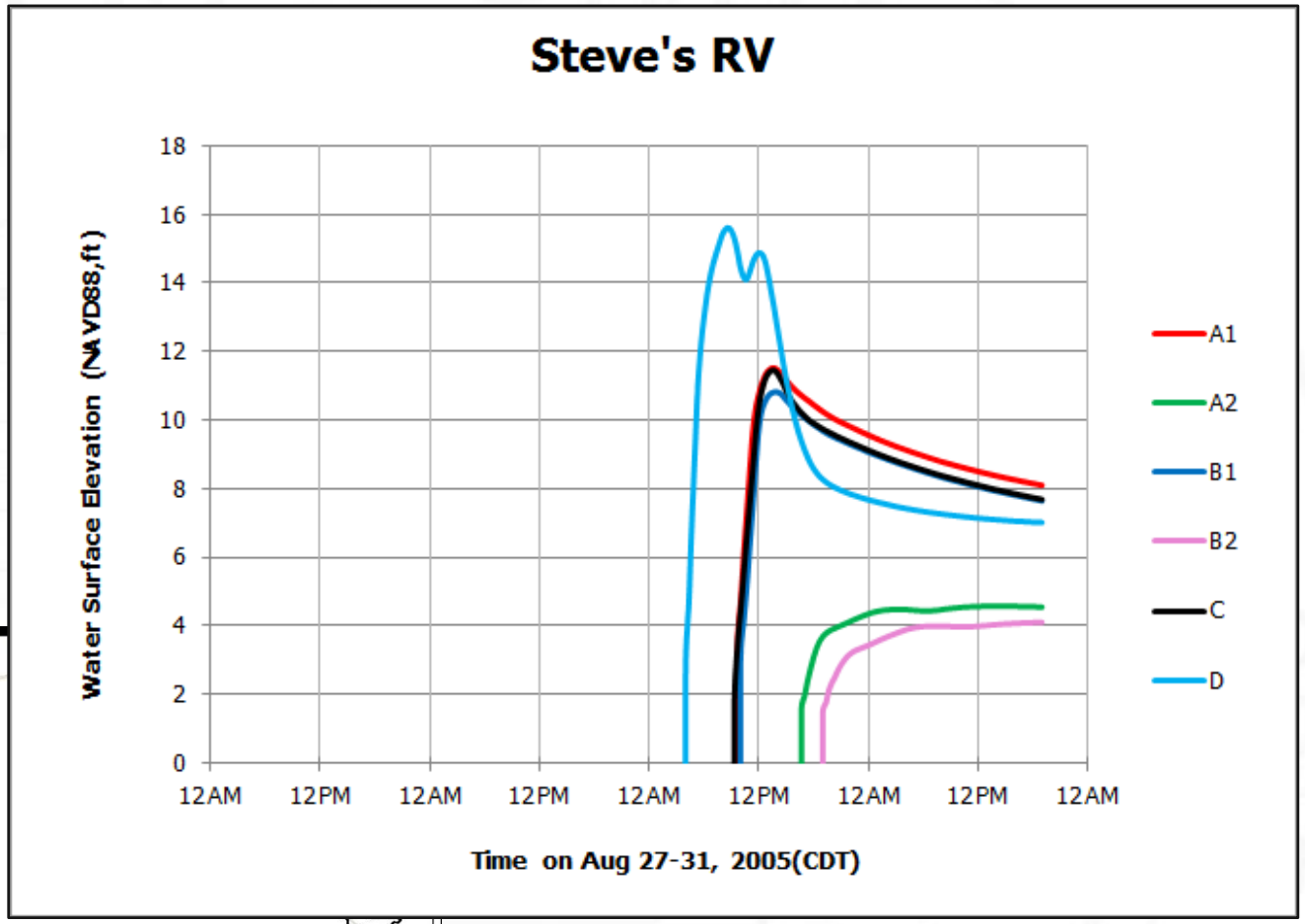


Figure 47f

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



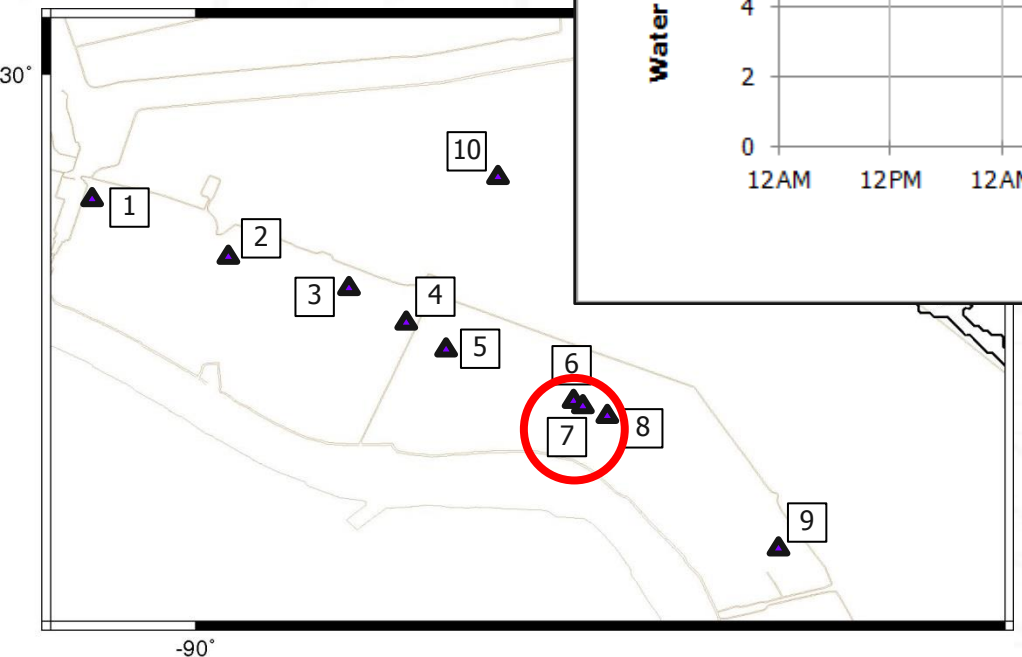
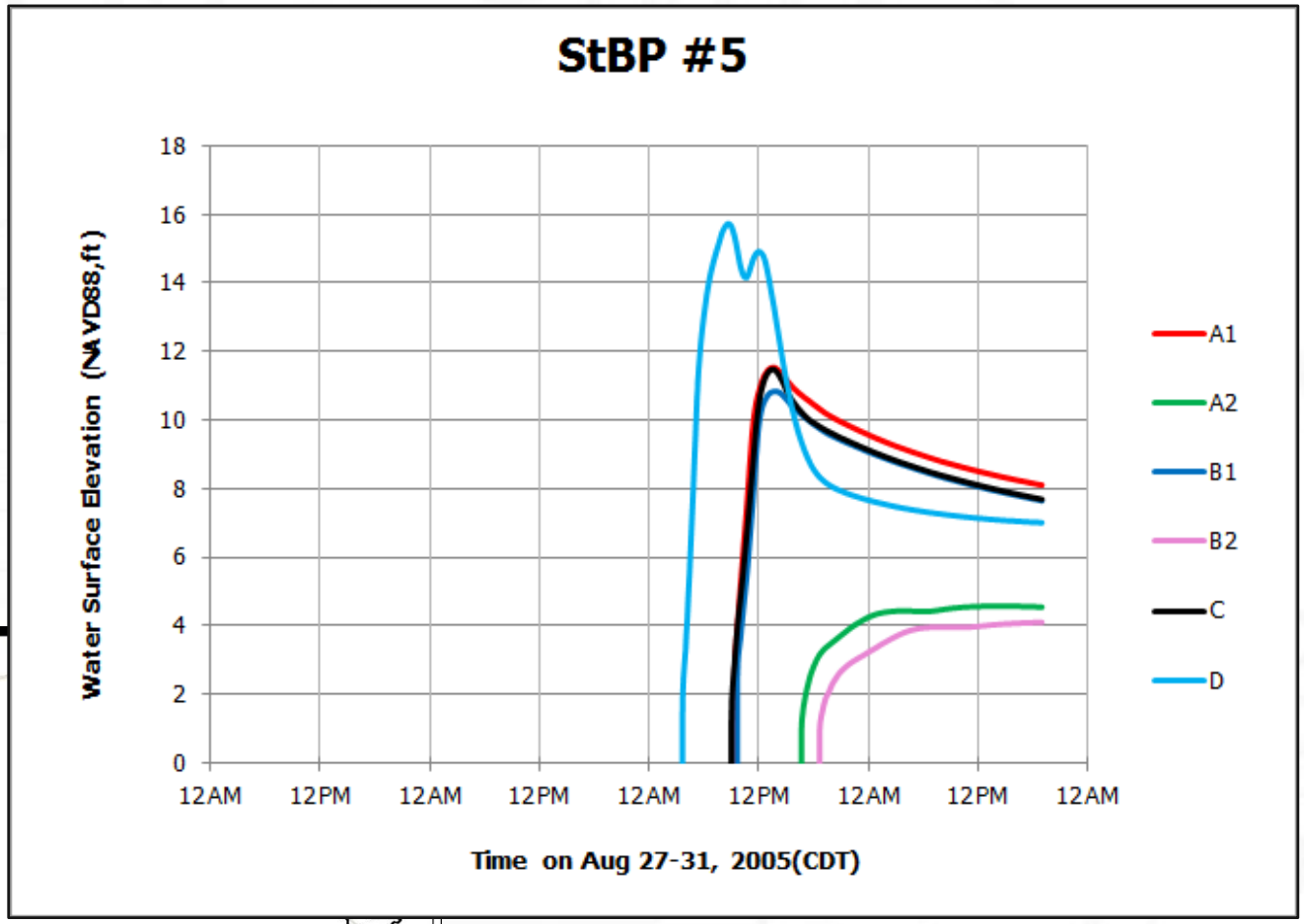


Figure 47g

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



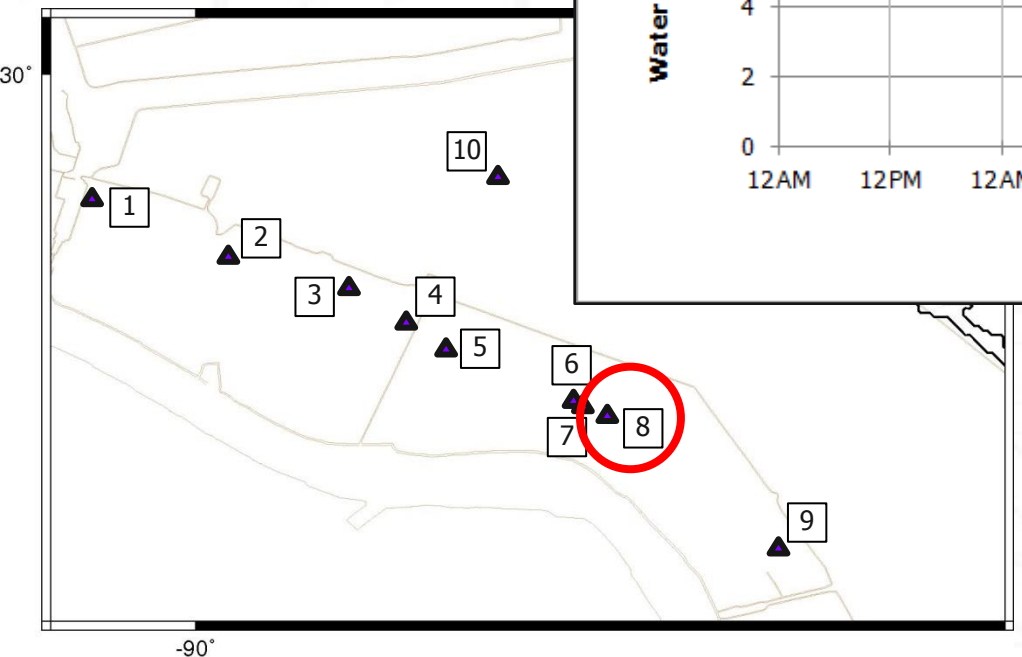
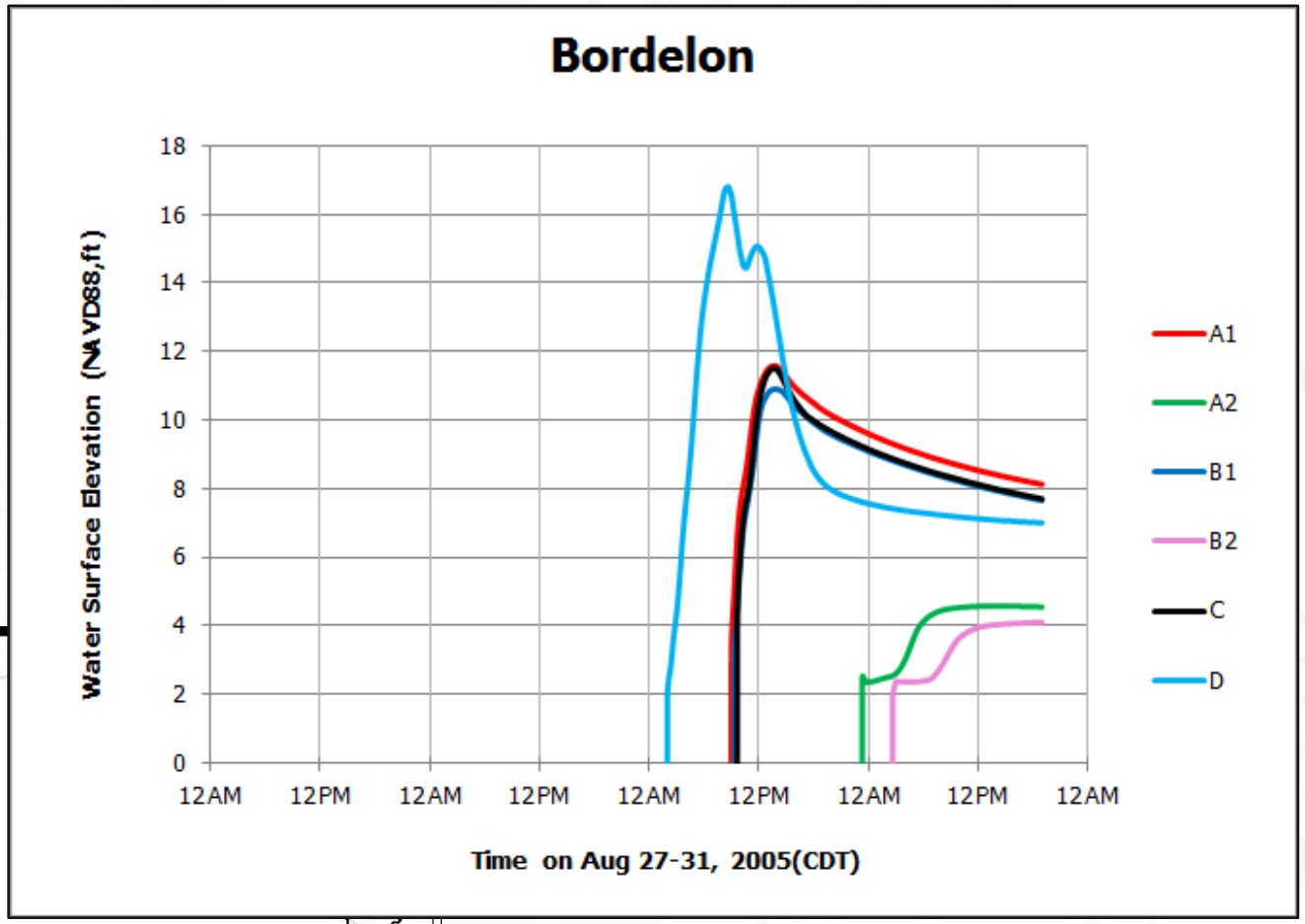


Figure 47h

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



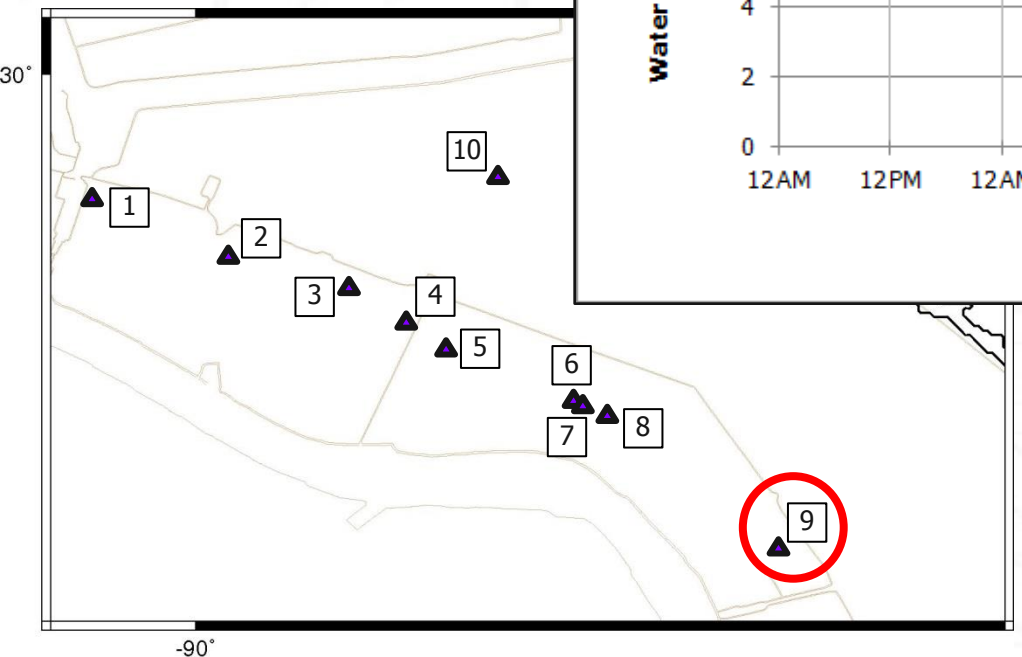
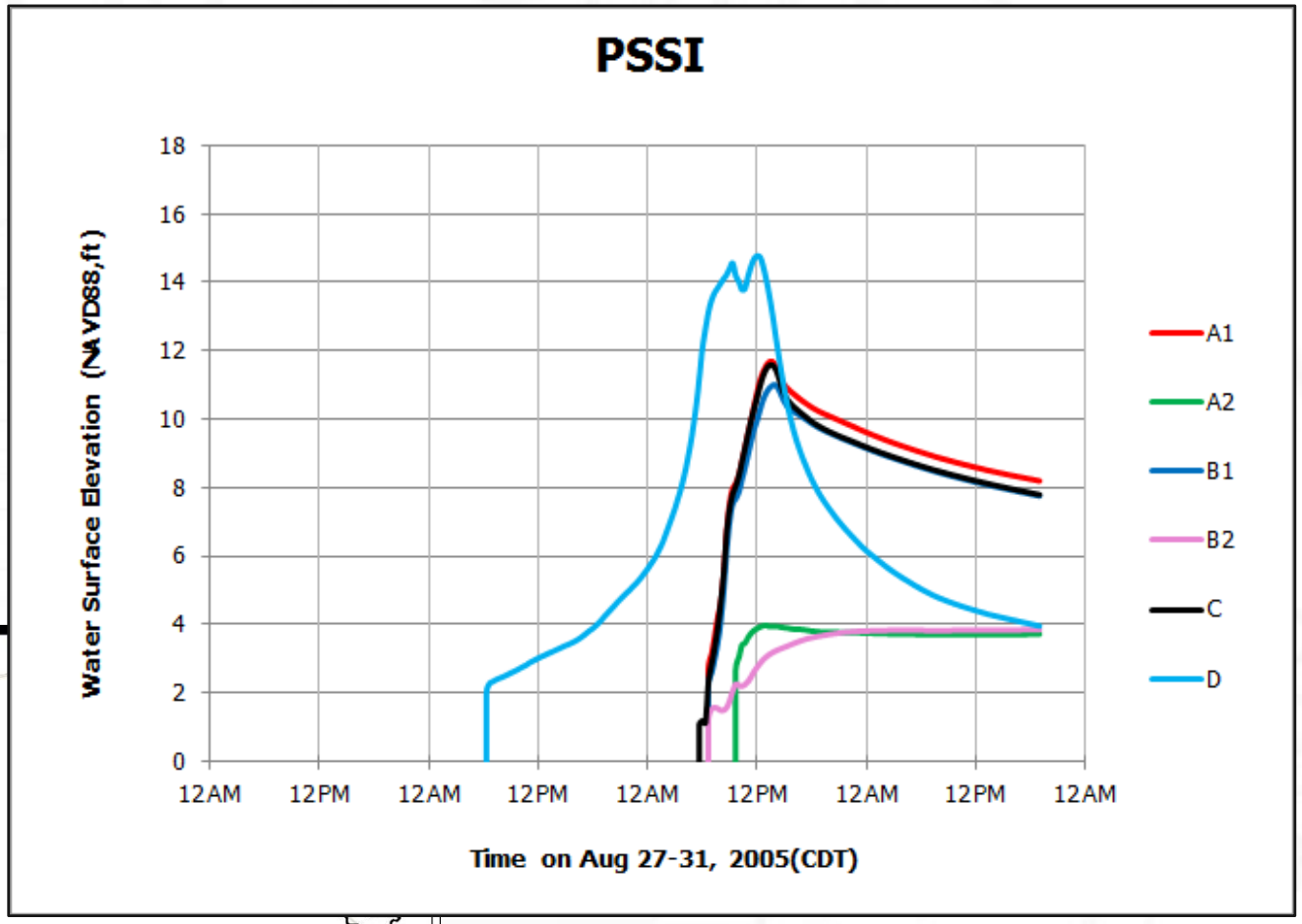


Figure 47i

Katrina - *Scenario D. Interior water surface time series at Plaintiff Properties*



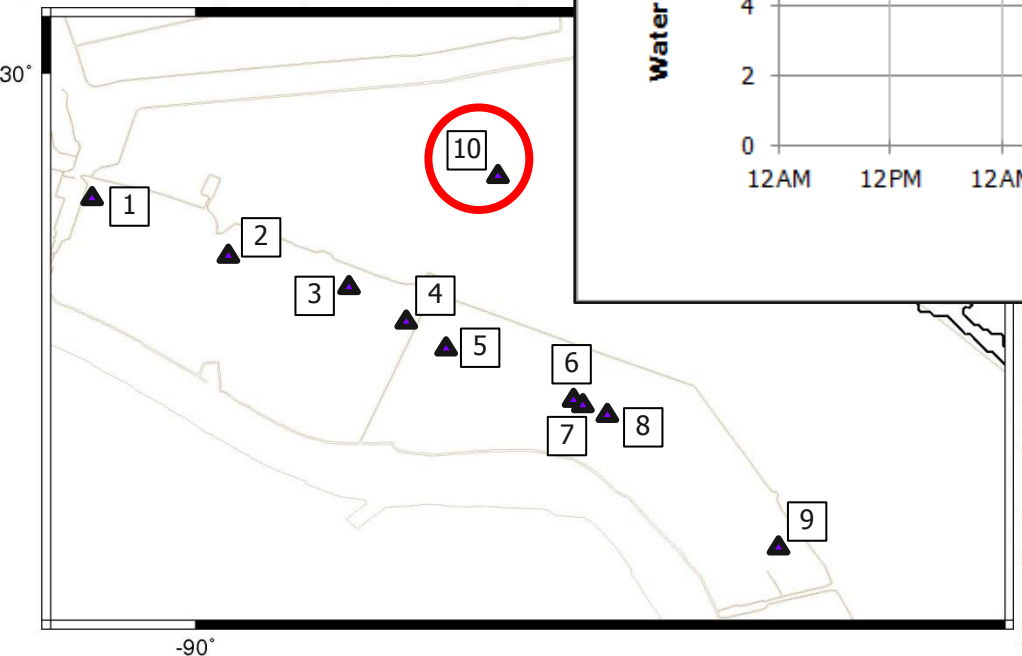
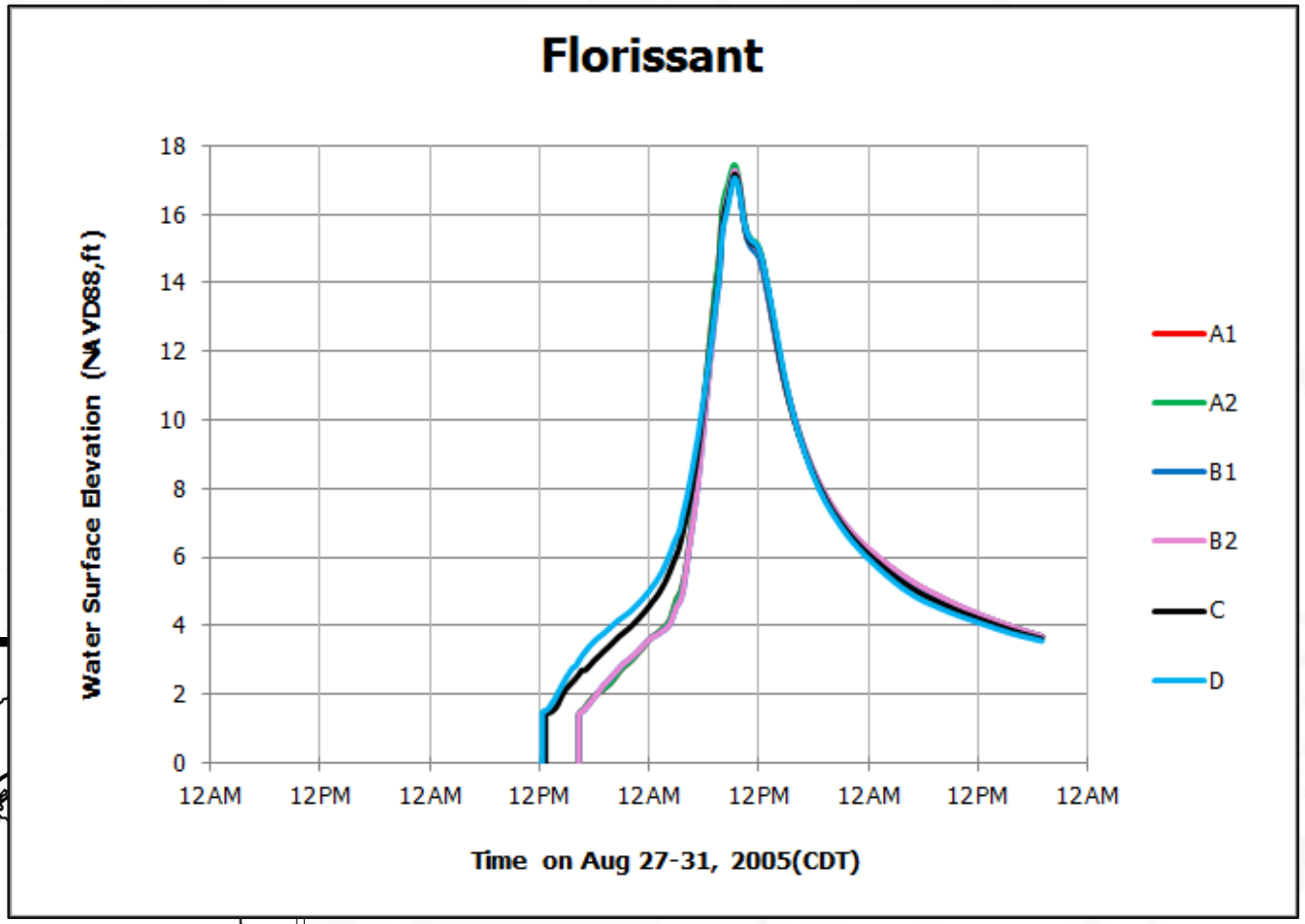


Figure 47j

Katrina - *Scenario D: Interior water surface time series at Plaintiff Properties*



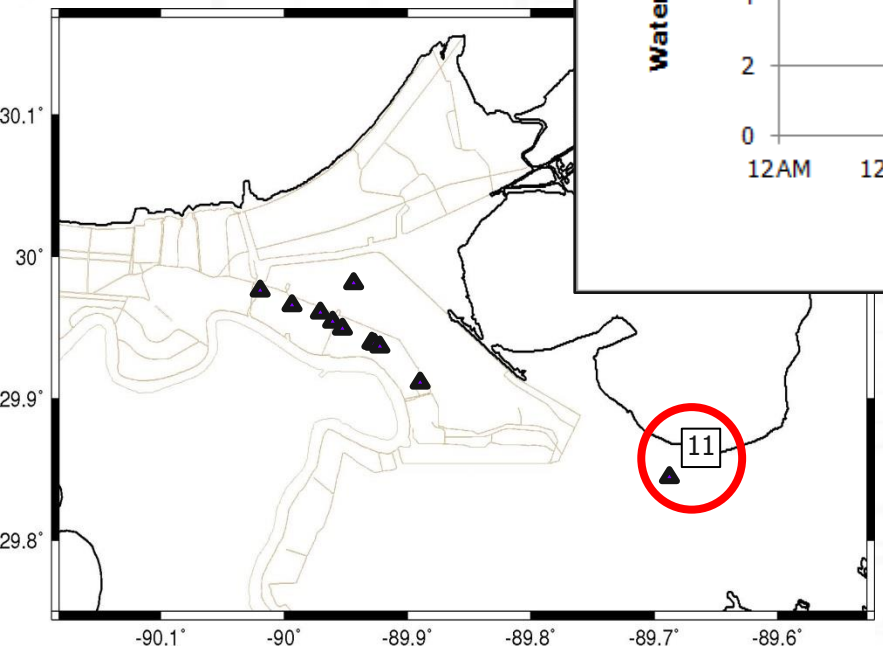


Figure 47k

Katrina - *Scenario D: Flooding conclusions for Plaintiff Properties*

- The maximum water surface elevations (in ft) at each Trial Property in the Scenario D *"No Federal Levees/2005 MRGO/2005 Wetlands"* are summarized in the table below.

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

Table 14