Table of Contents

Katrina - *Scenario C: 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 MRGO channel.
- Specifically, Scenario C incorporates modified topography, bathymetry and Manning's *n* friction coefficients reflecting:
  - The elimination of the MRGO channel.
  - The 1956 wetland conditions, including increased density in the areas of Caernarvon Marsh, the Golden Triangle Marsh, La Loutre Ridge, and the Central Wetlands.
  - The 1958 pre-MRGO configuration of the Gulf Inter-Coastal Waterway ("GIWW") channel.
  - The elimination of dredged mounds along the MRGO that were created during the dredging process.
- The model represents all the St. Bernard Polder breaches as they occurred during Hurricane Katrina.

Katrina - *Scenario C: Modeling conditions*

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

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**

Table 11

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

- In the C Scenario, flooding evolves within St. Bernard Polder in much the same way as in the actual Hurricane Katrina event, *i.e.*, Scenario A1.
- There is a reduction in flow conveyance and an increase in friction in the pre-MRGO GIWW which led to a 1.5 ft reduction in water levels in the central and southern portions of the IHNC.
- The difference in flow conveyance between the pre-MRGO GIWW and the 2005 MRGO Reach 1 is modest during flooding conditions, and results in only a modest increase in head drop through the GIWW, which in turn reduces water levels within the IHNC as water flows from Paris Road to Seabrook. However the reduction in water levels is limited by the controlling water levels at Paris Rd. and Seabrook.
- Within St. Bernard Polder there was a reduction in water levels in the Lower Ninth Ward and its vicinity, but no significant difference in water levels elsewhere in the Polder. The latter is predominantly the result of an increase in *exterior* water levels in the vicinity of Paris Road.

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

- The evolution of flooding within St. Bernard Polder in Scenario C is largely similar to the flooding that occurred during the actual Hurricane Katrina event.
- The flooding is simply diminished by a small amount in the vicinity of the Lower Ninth Ward and St. Bernard Parish west of Paris Road, and is somewhat greater in other portions of the Parish.

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

8/29/2005 at 2 am CDT

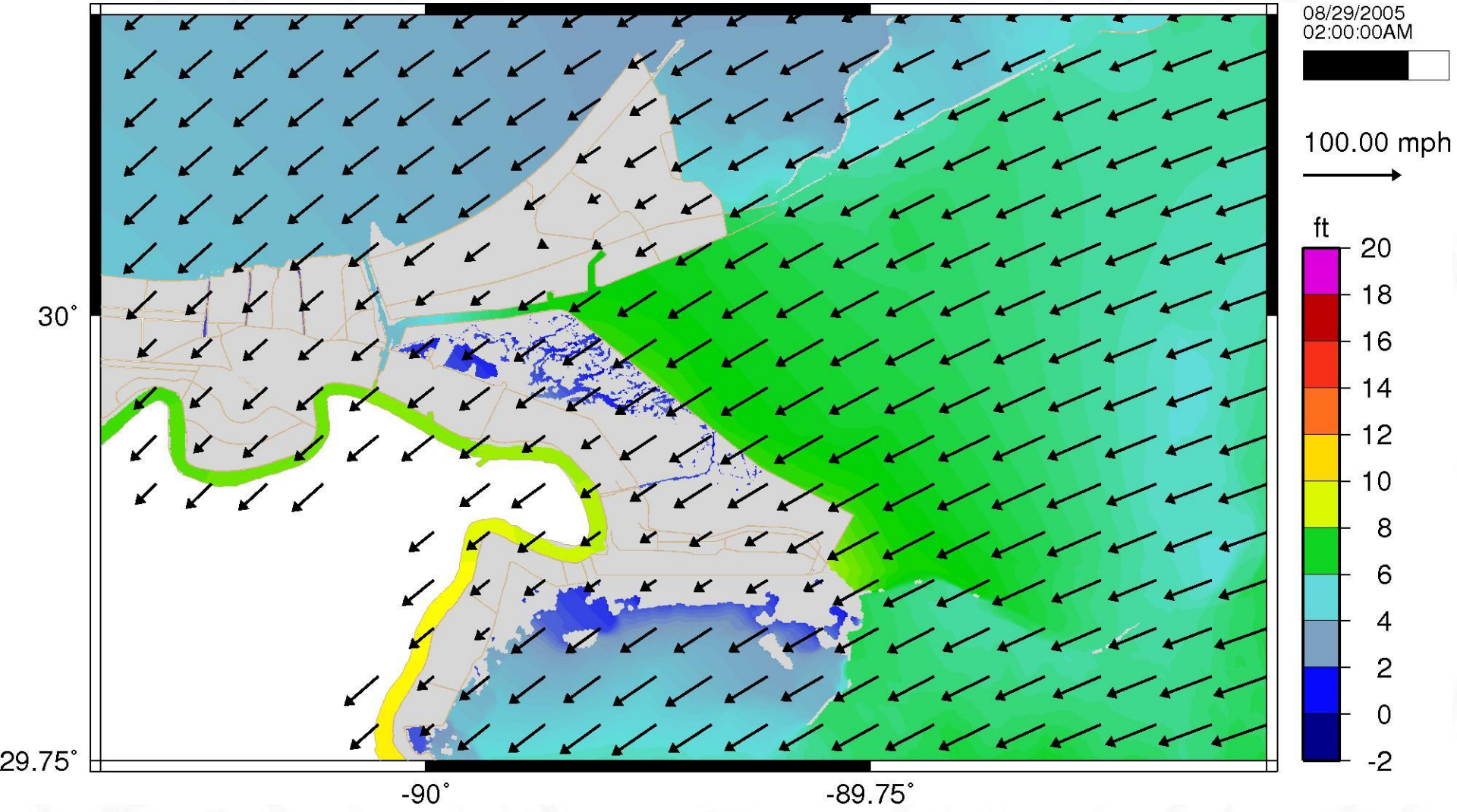


Figure 38a

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

8/29/2005 at 4 am CDT

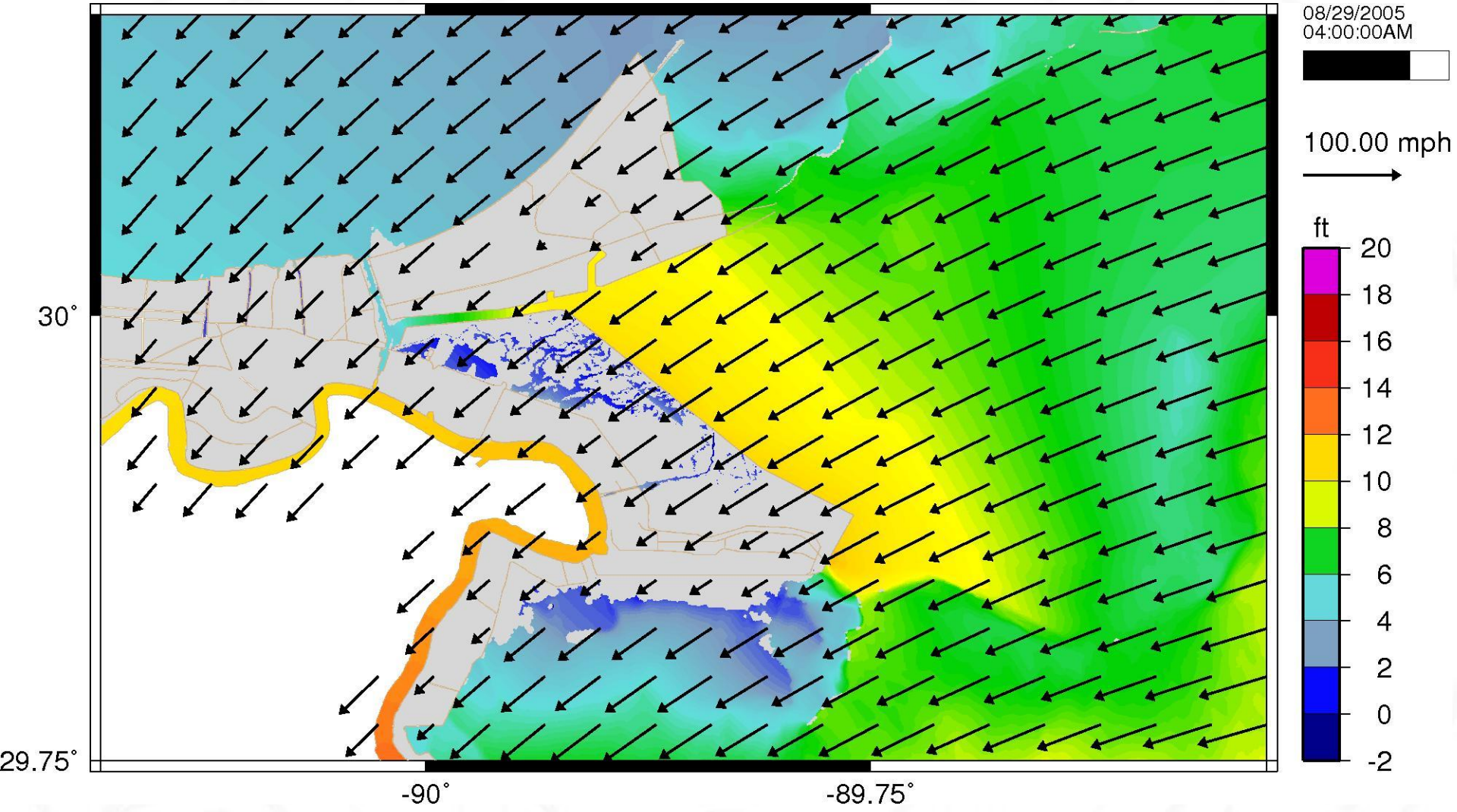


Figure 38b

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

8/29/2005 at 6 am CDT

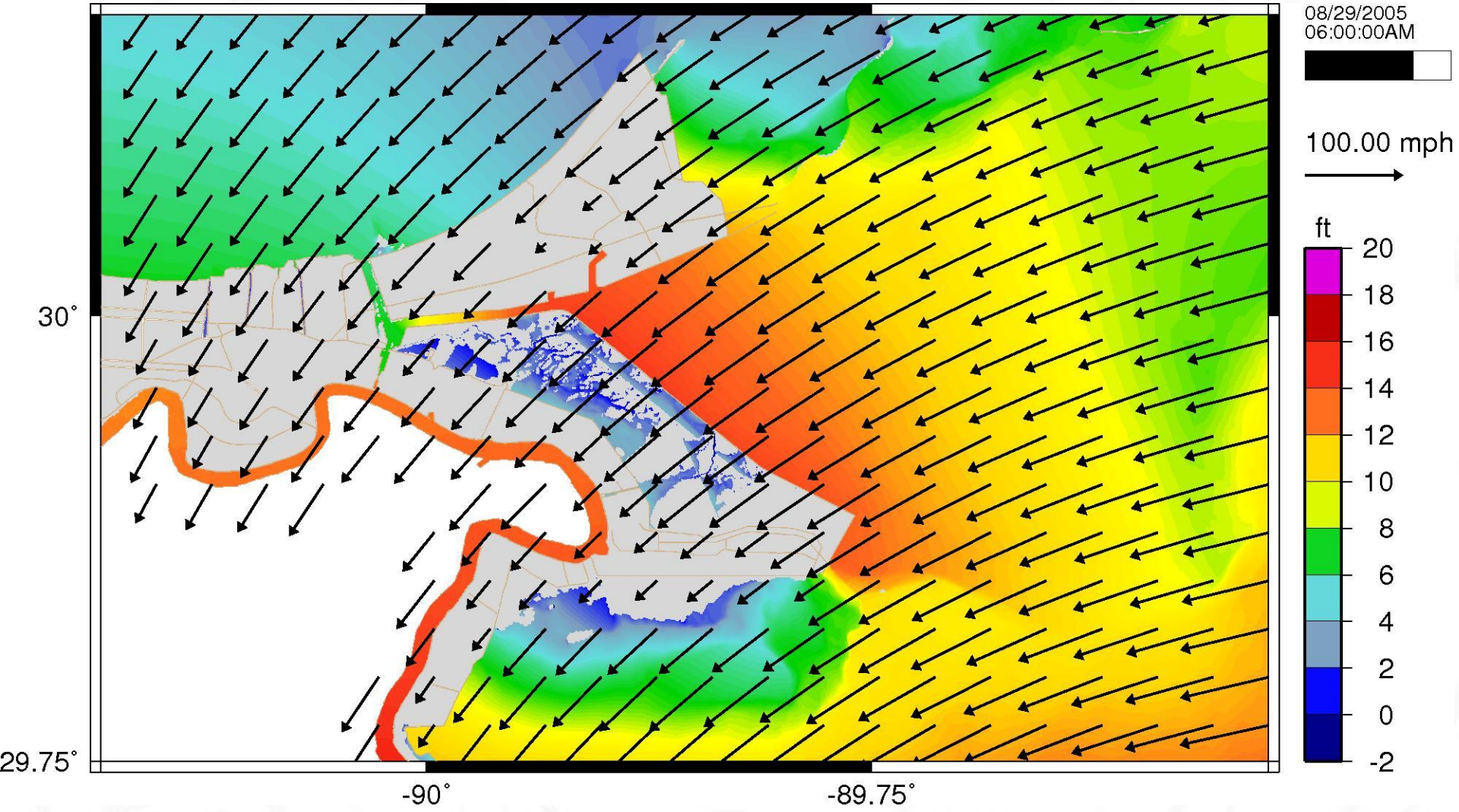


Figure 38c

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

8/29/2005 at 7 am CDT

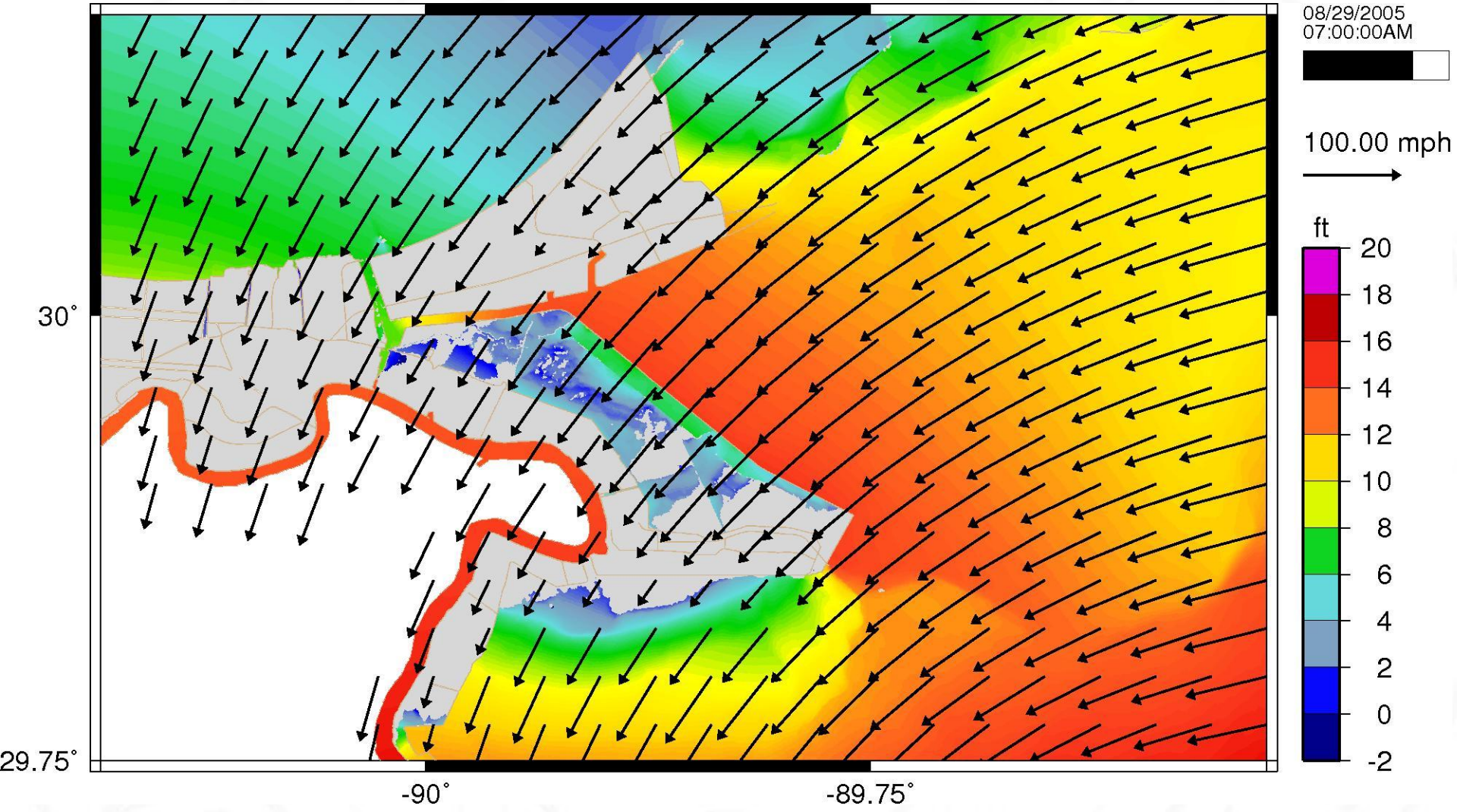


Figure 38d

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

8/29/2005 at 8 am CDT

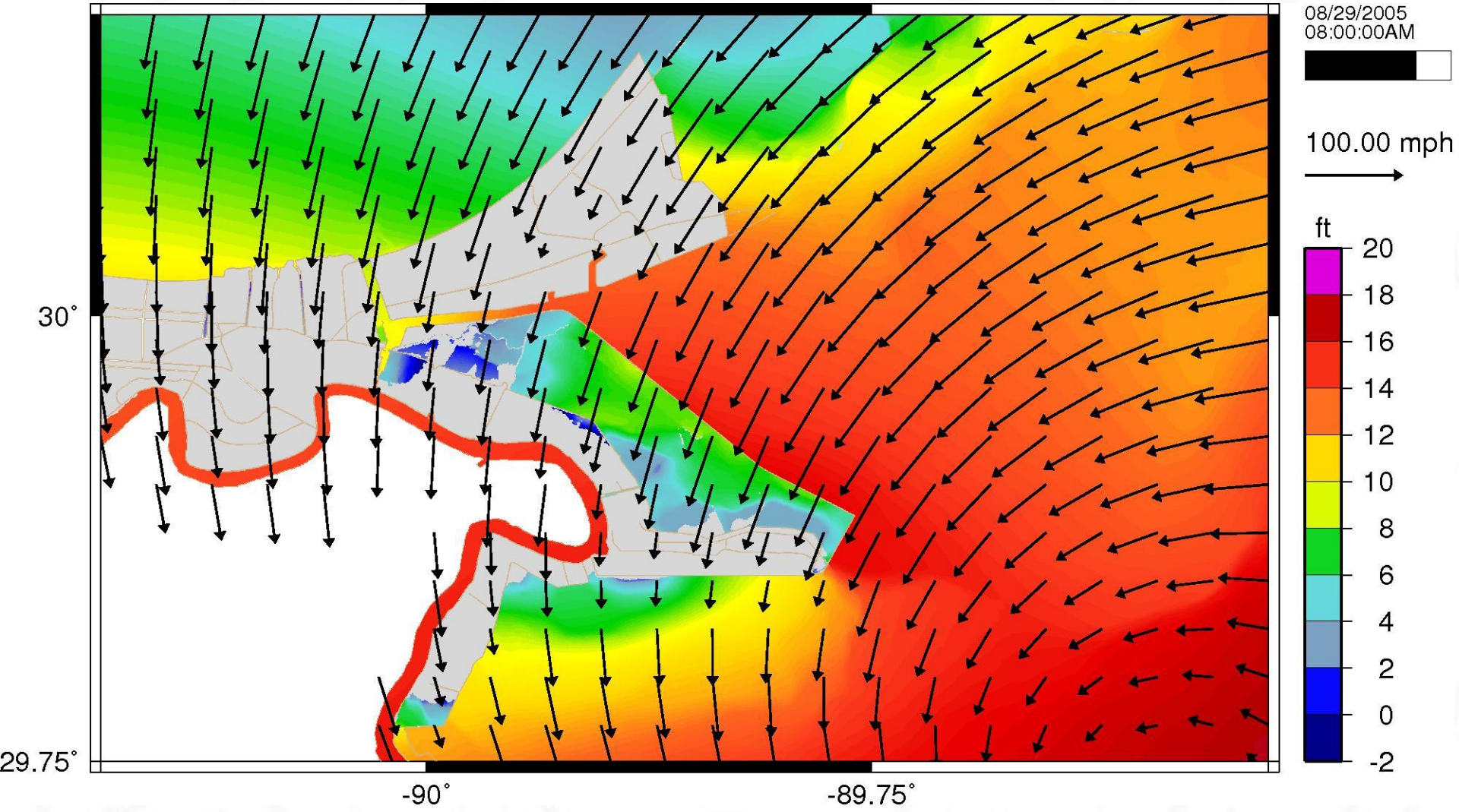


Figure 38e

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

8/29/2005 at 9 am CDT

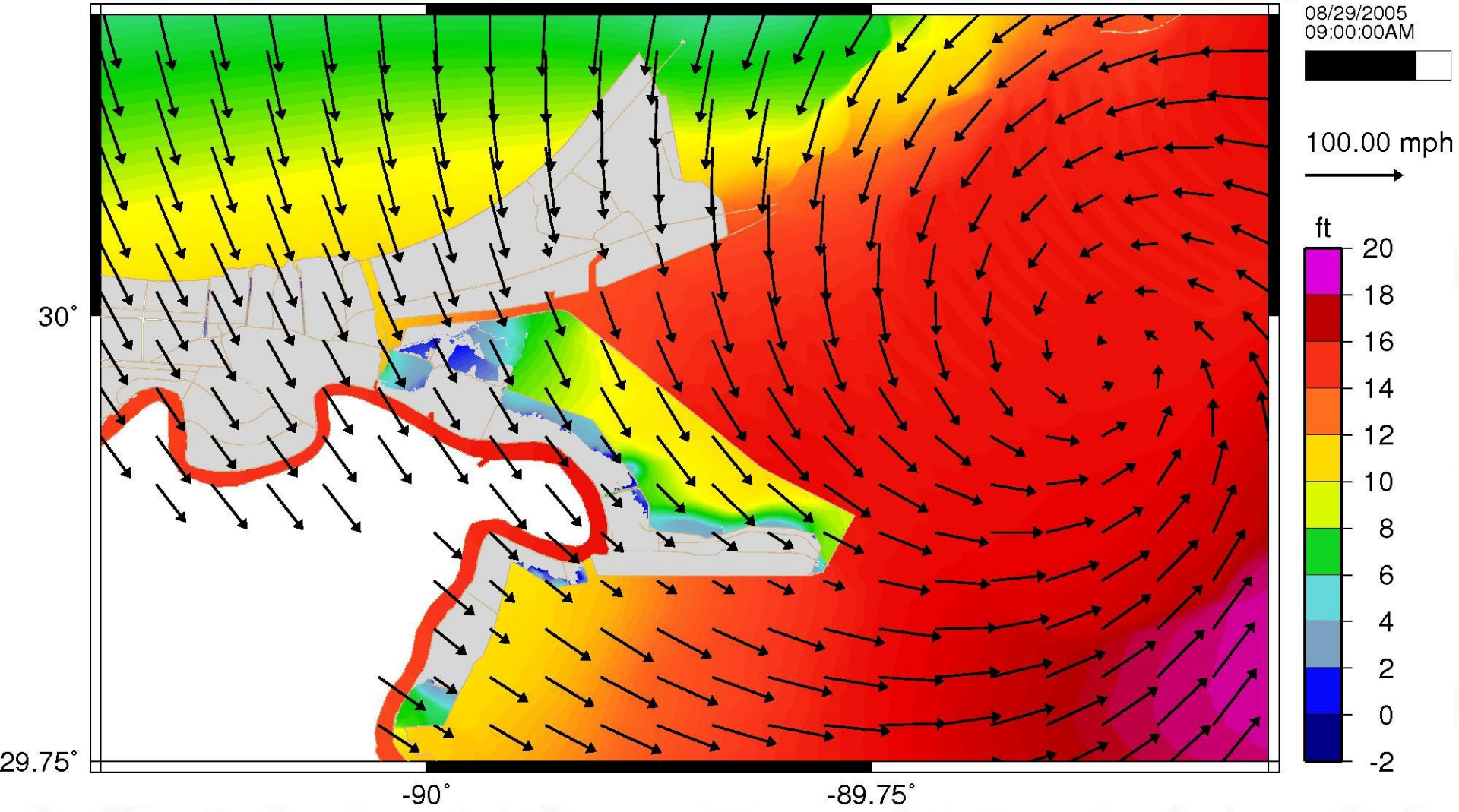


Figure 38f

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

8/29/2005 at 10 am CDT

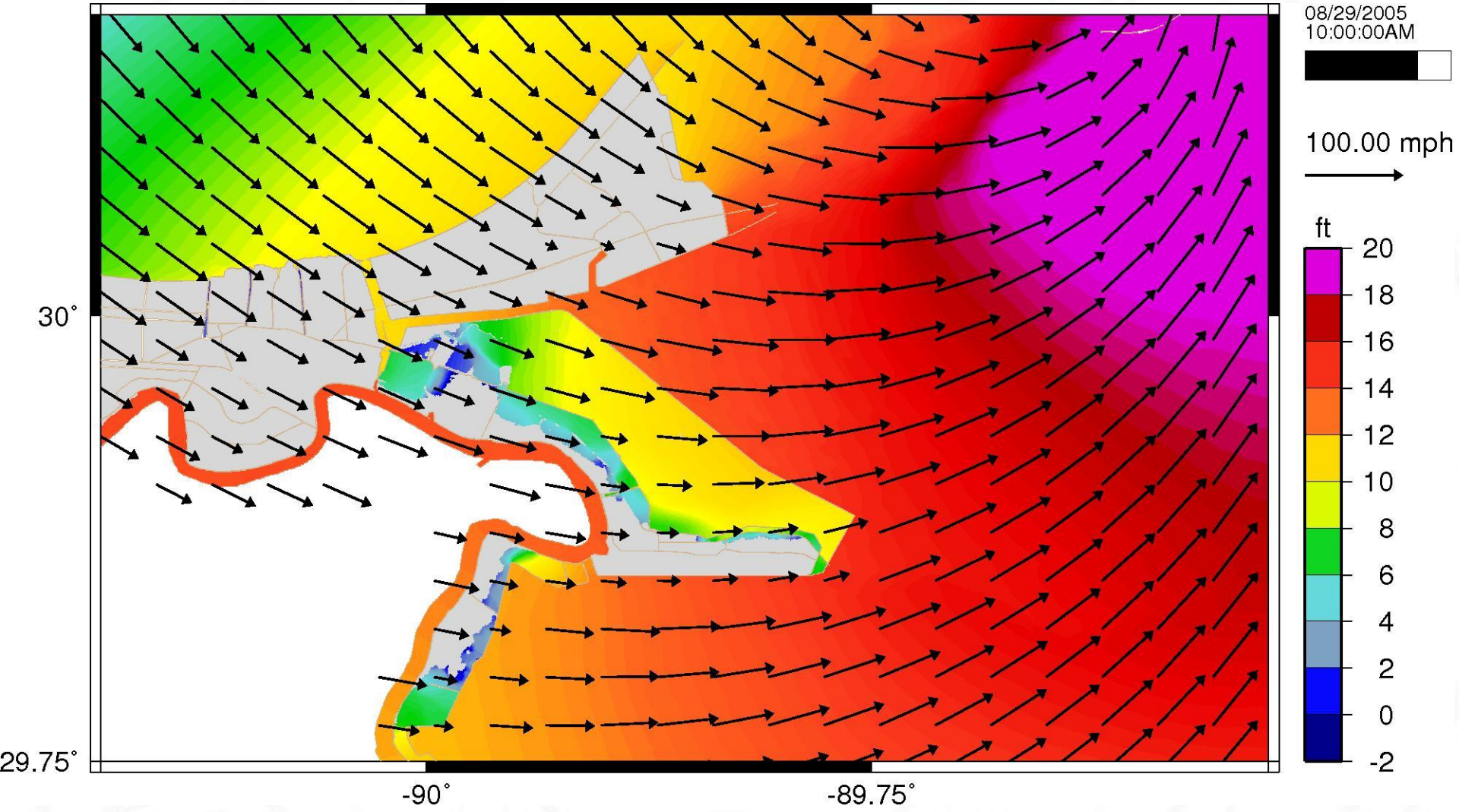


Figure 38g

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

8/29/2005 at 11 am CDT

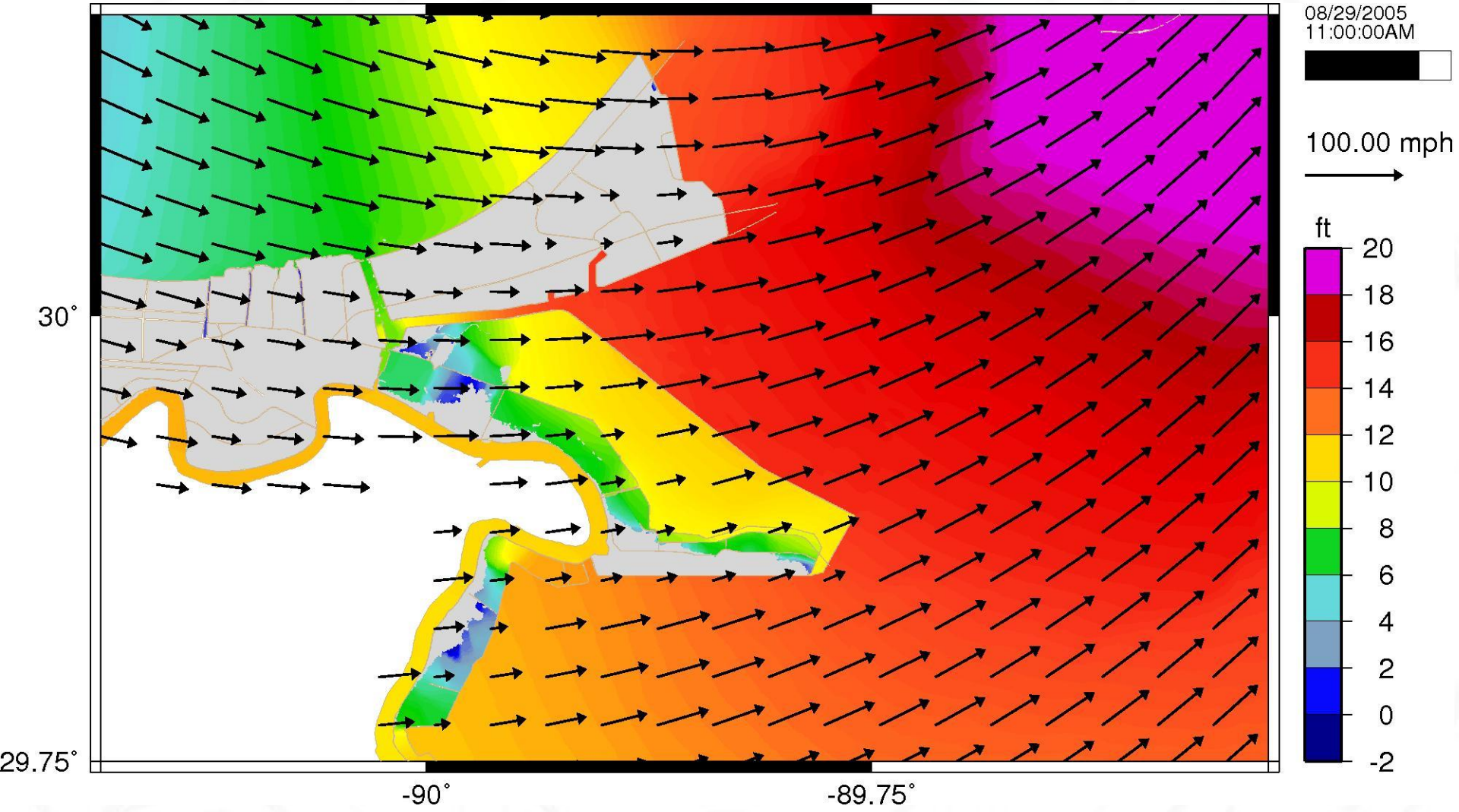


Figure 38h

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

8/29/2005 at 12 pm CDT

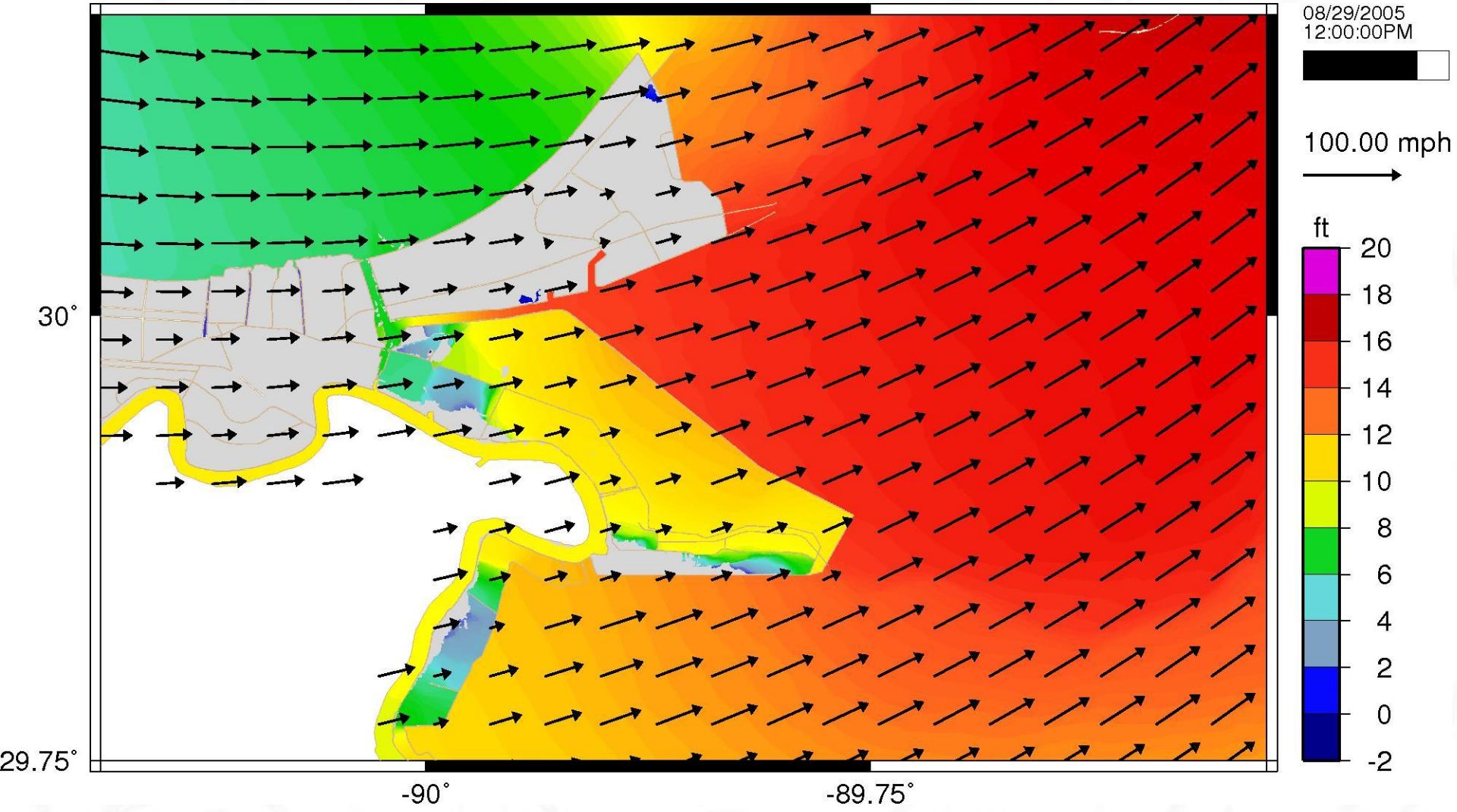


Figure 38i

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

8/29/2005 at 1 pm CDT

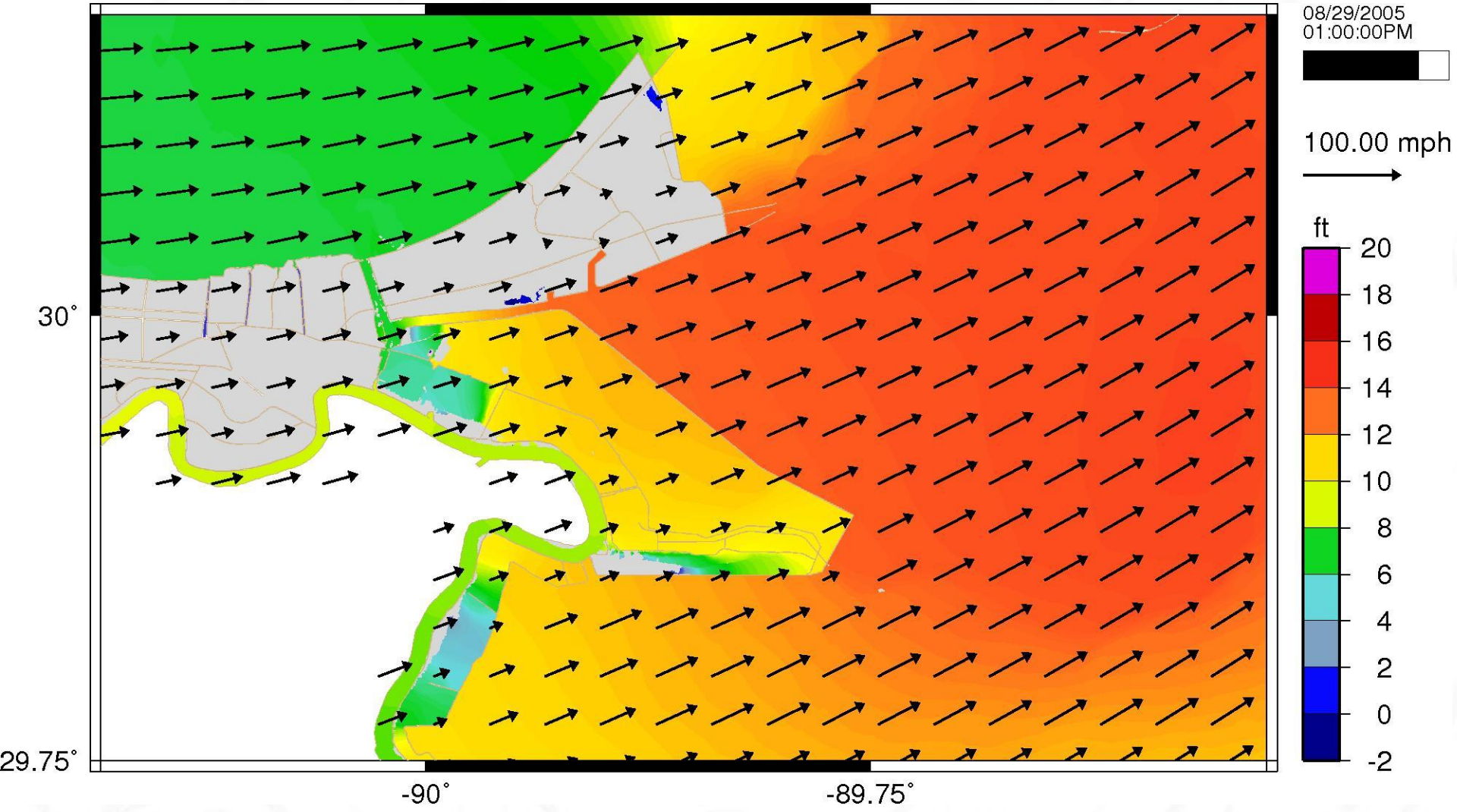


Figure 38j

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

8/29/2005 at 2 pm CDT

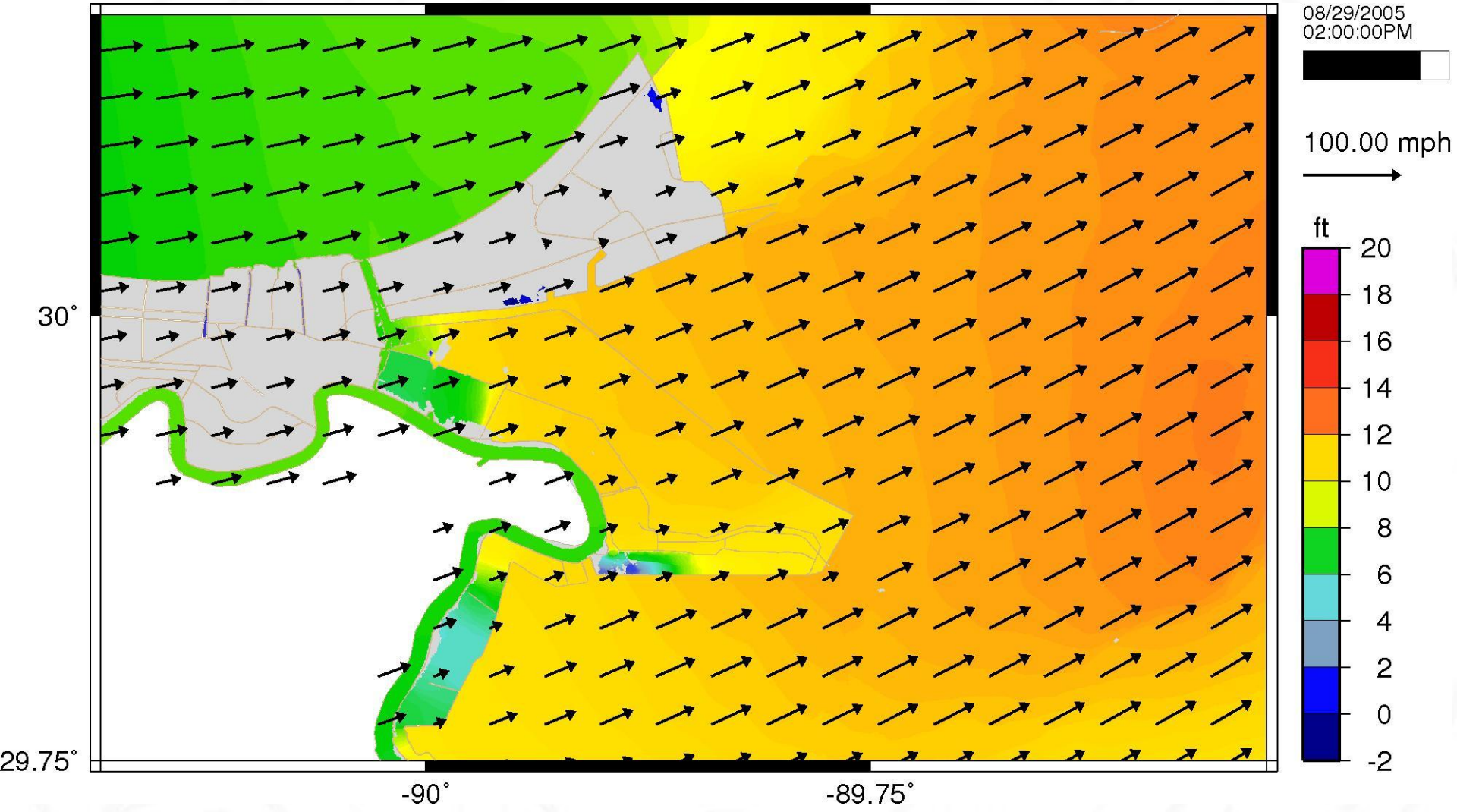


Figure 38k

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

8/29/2005 at 3 pm CDT

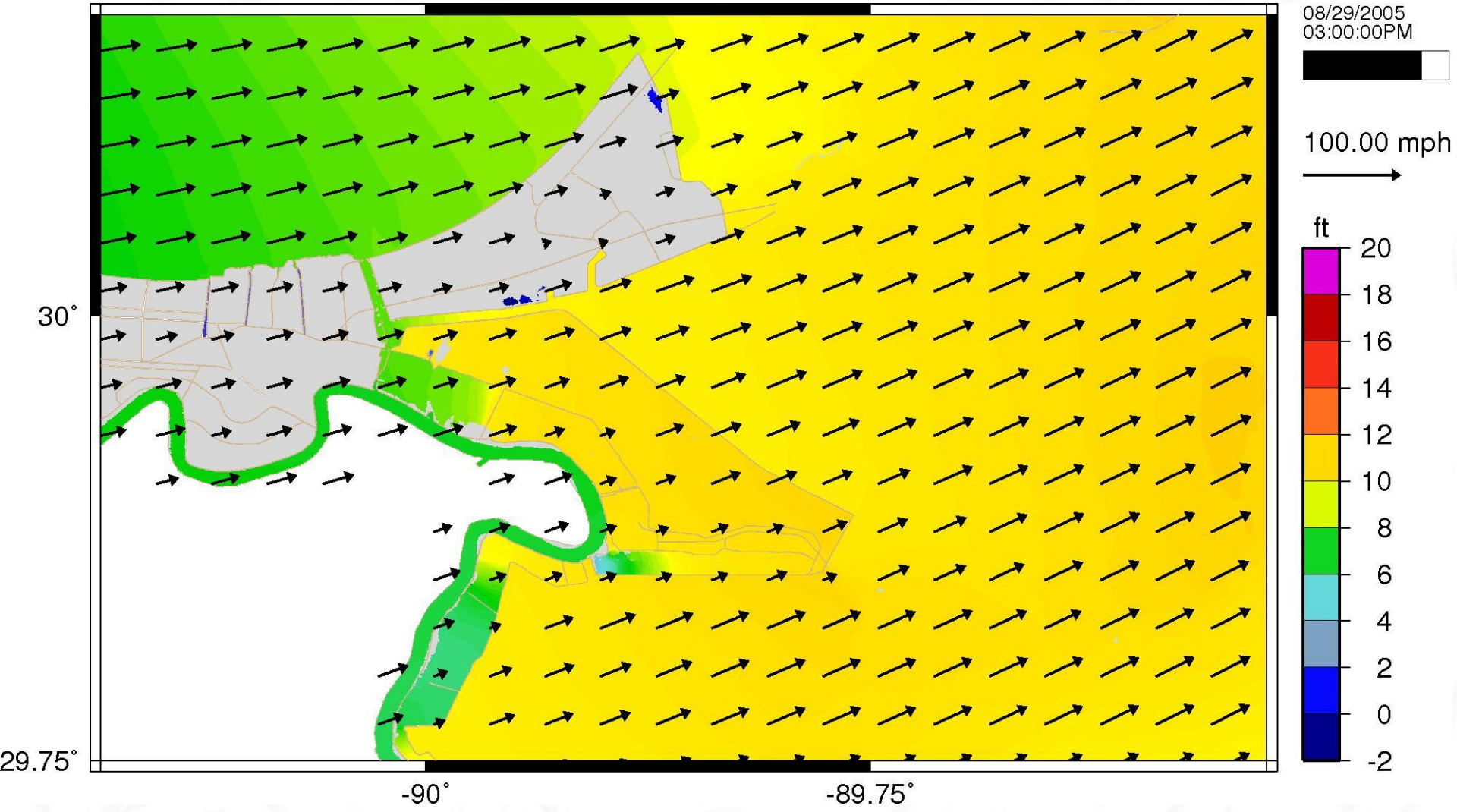


Figure 38l

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

8/29/2005 at 4 pm CDT

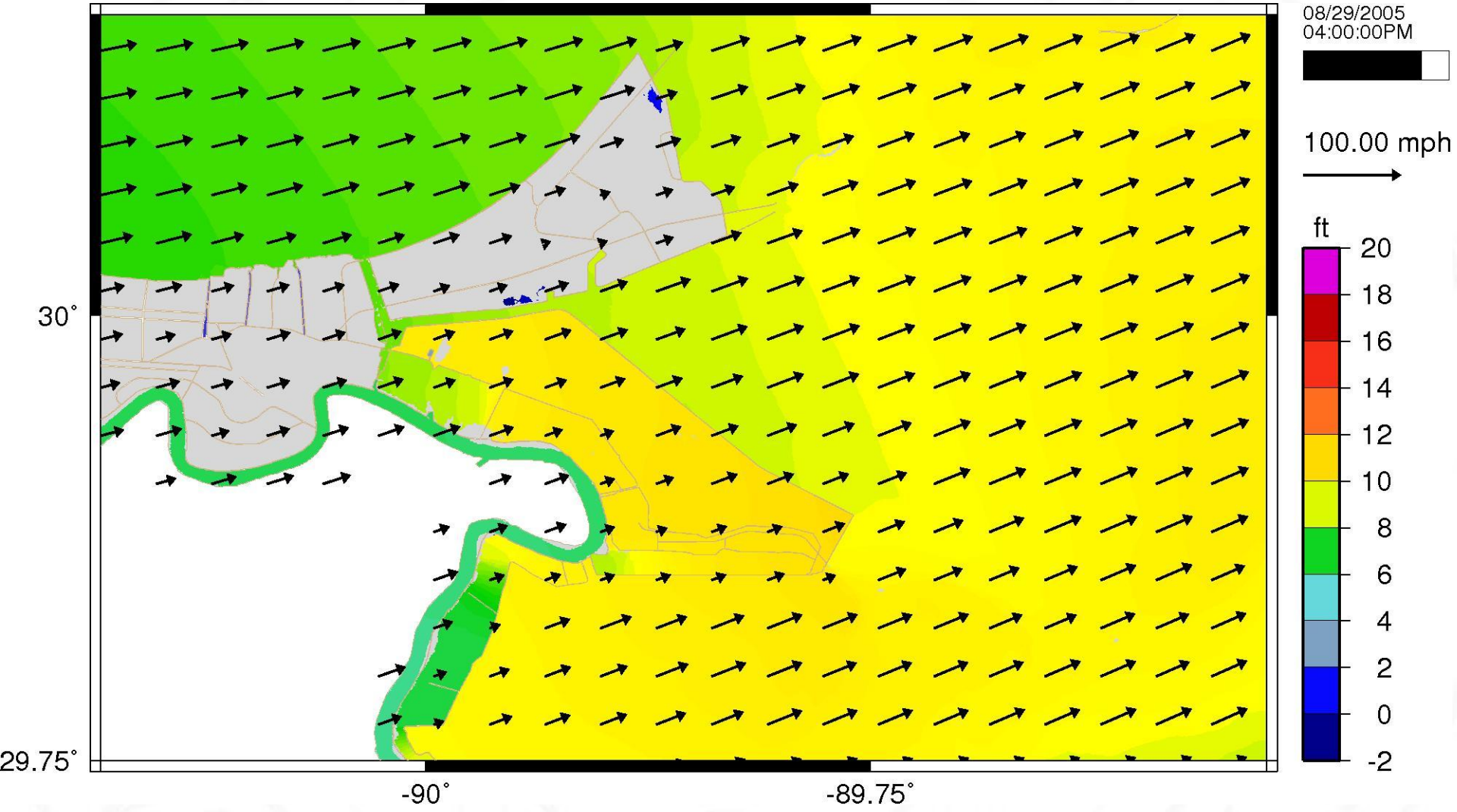


Figure 38m

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

8/29/2005 at 6 pm CDT

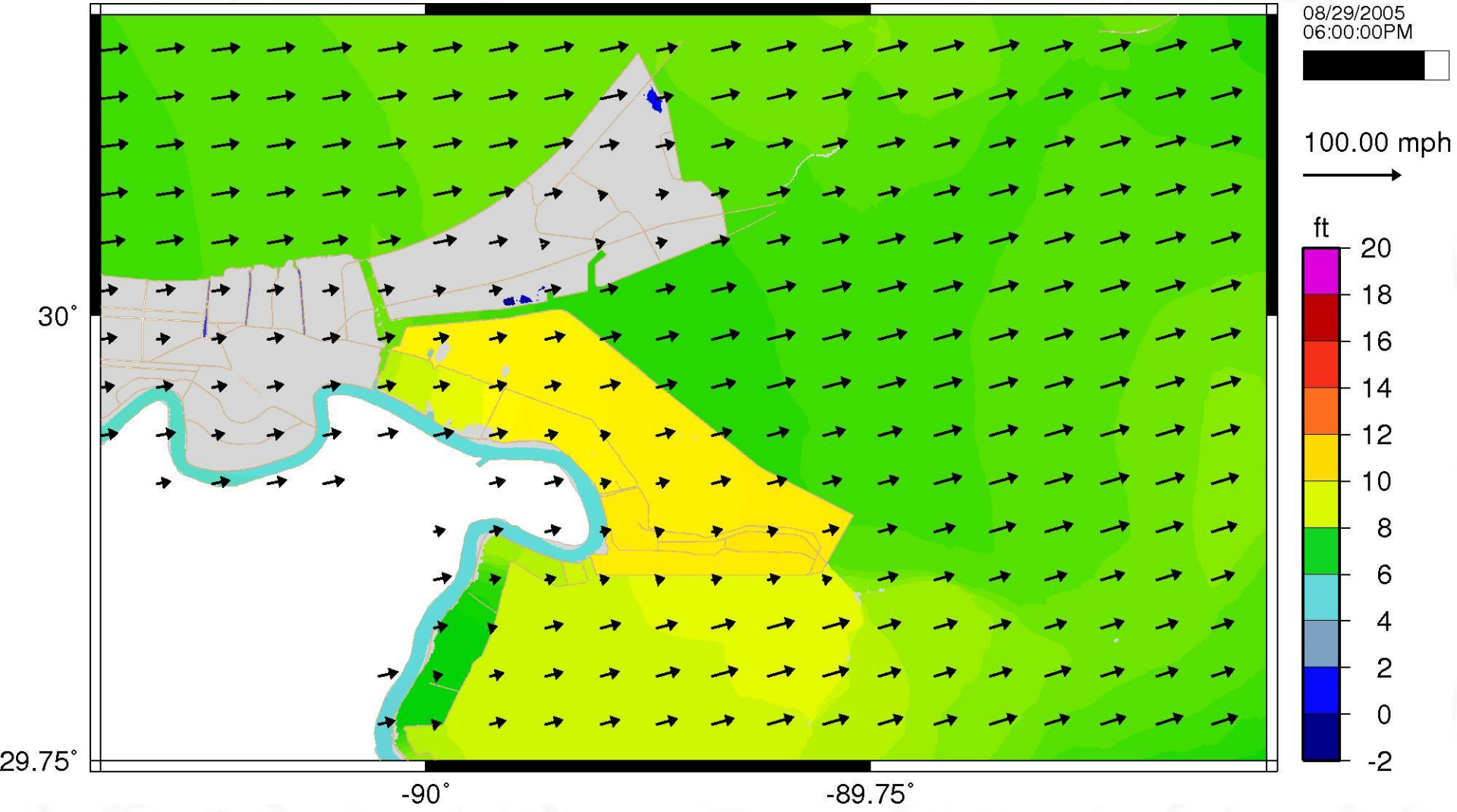


Figure 38n

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

8/29/2005 at 8 pm CDT

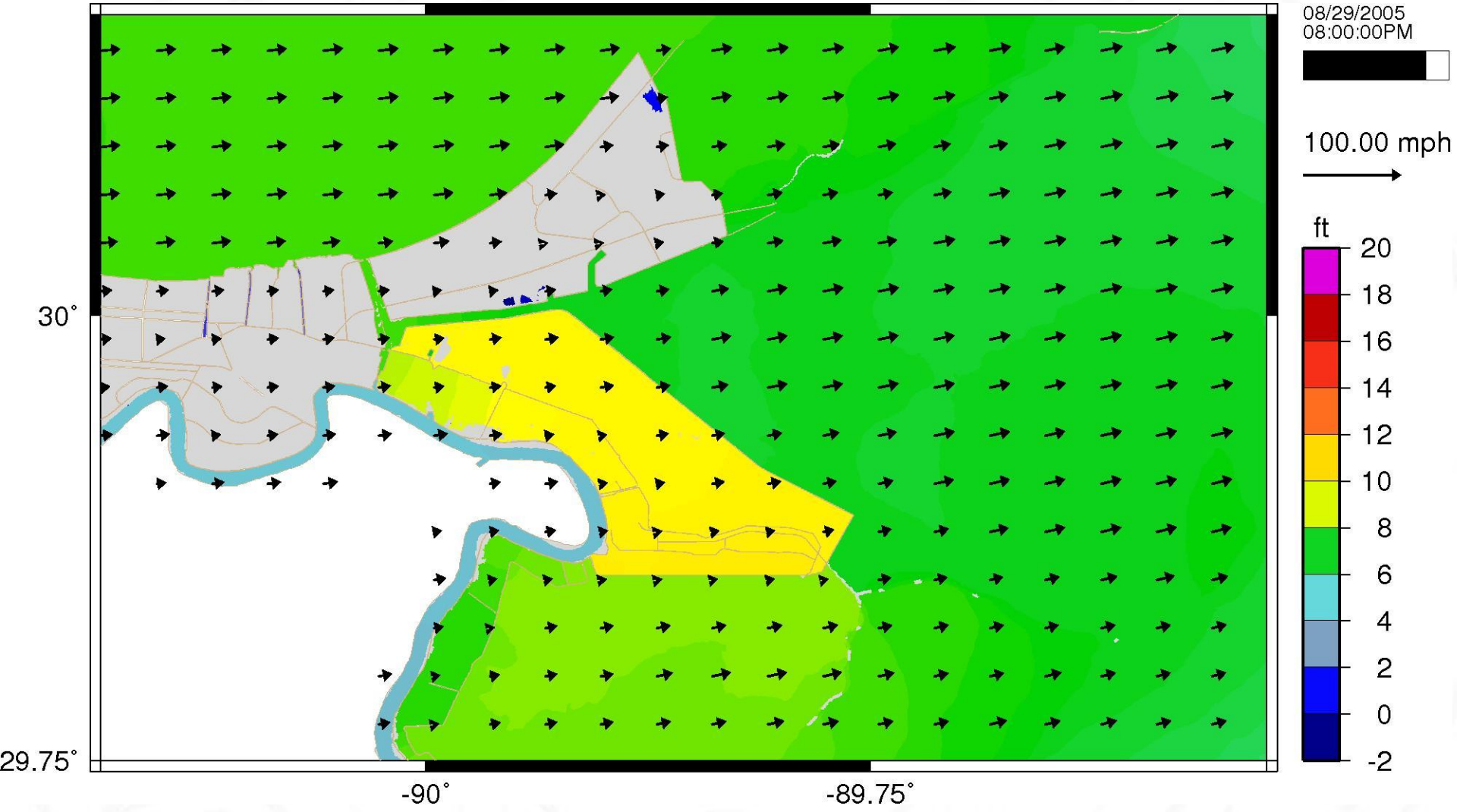


Figure 38o

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

8/29/2005 at 10 pm CDT

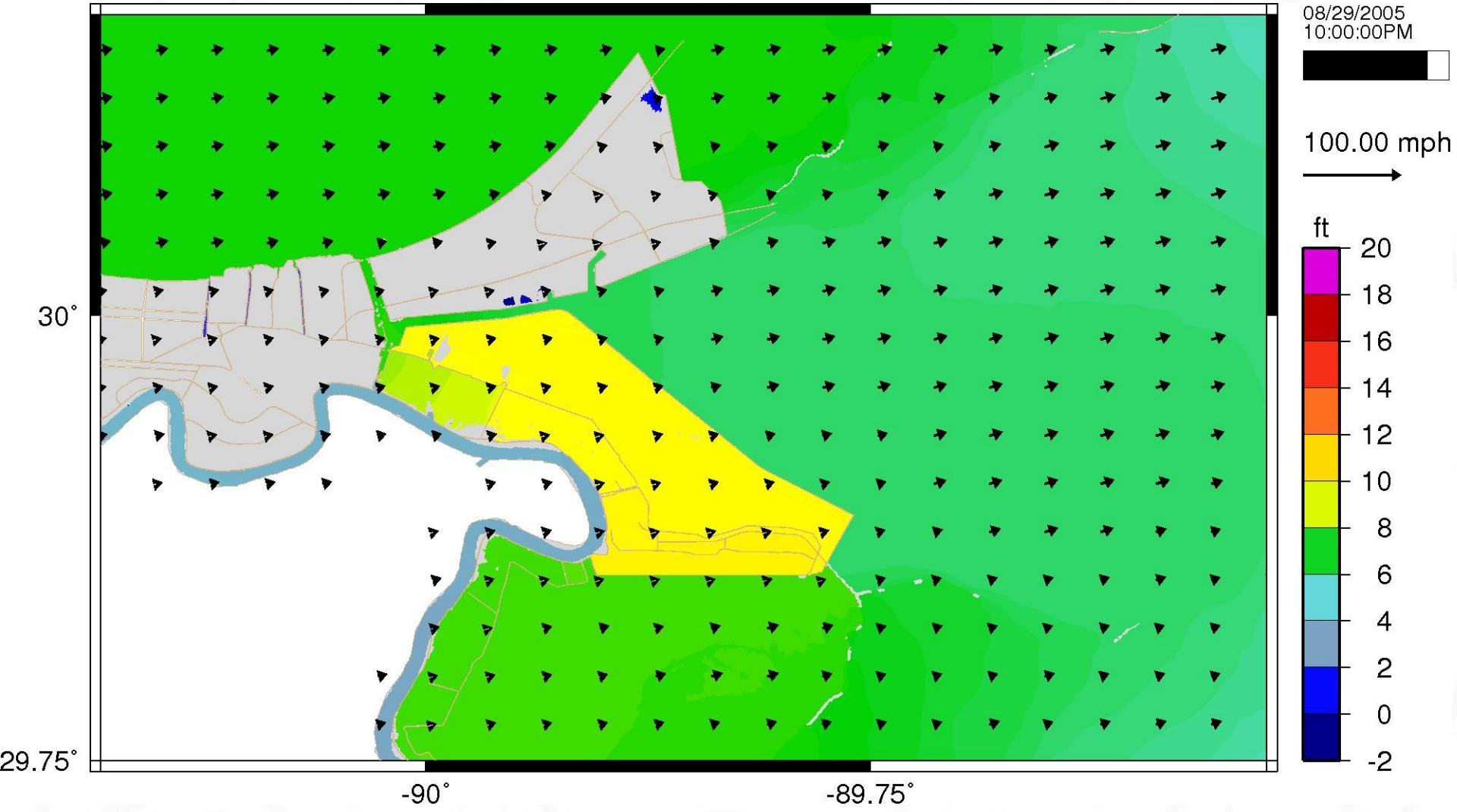


Figure 38p

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

8/30/2005 at 12 am CDT

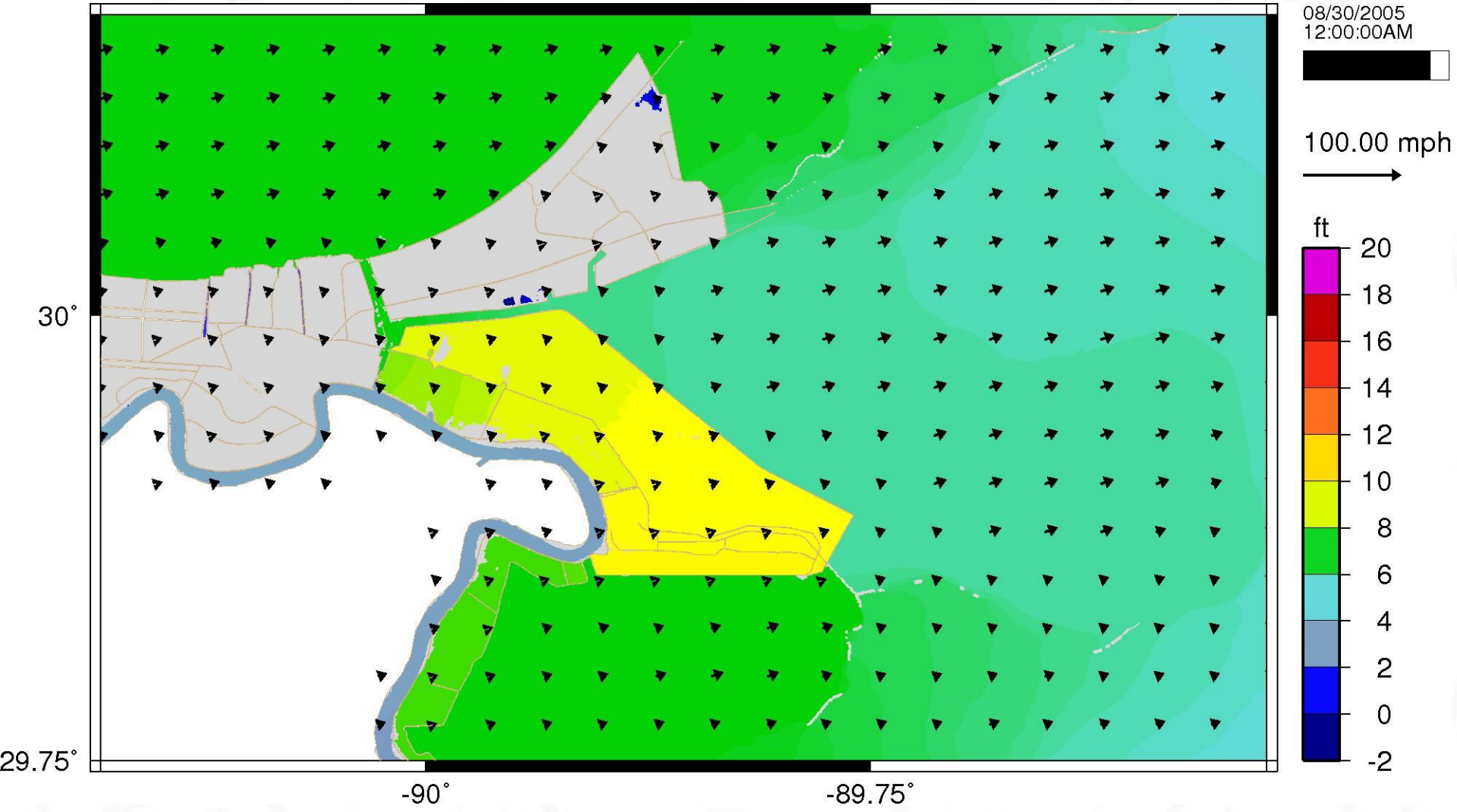


Figure 38q

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

- The following slides depict the differences between the flooding in the *No MRGO* Scenario C and the flooding that actually took place during Hurricane Katrina.
- Except for small differences in the maximum water elevations in the Lower Ninth Ward and St. Bernard Parish west of Paris Road, these comparisons confirm that - given the breaches of the IHNC floodwall Reach 2 levees - the existence of the MRGO itself, and the condition of the surrounding wetlands had very little impact on flooding during Hurricane Katrina.

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

Maximum C

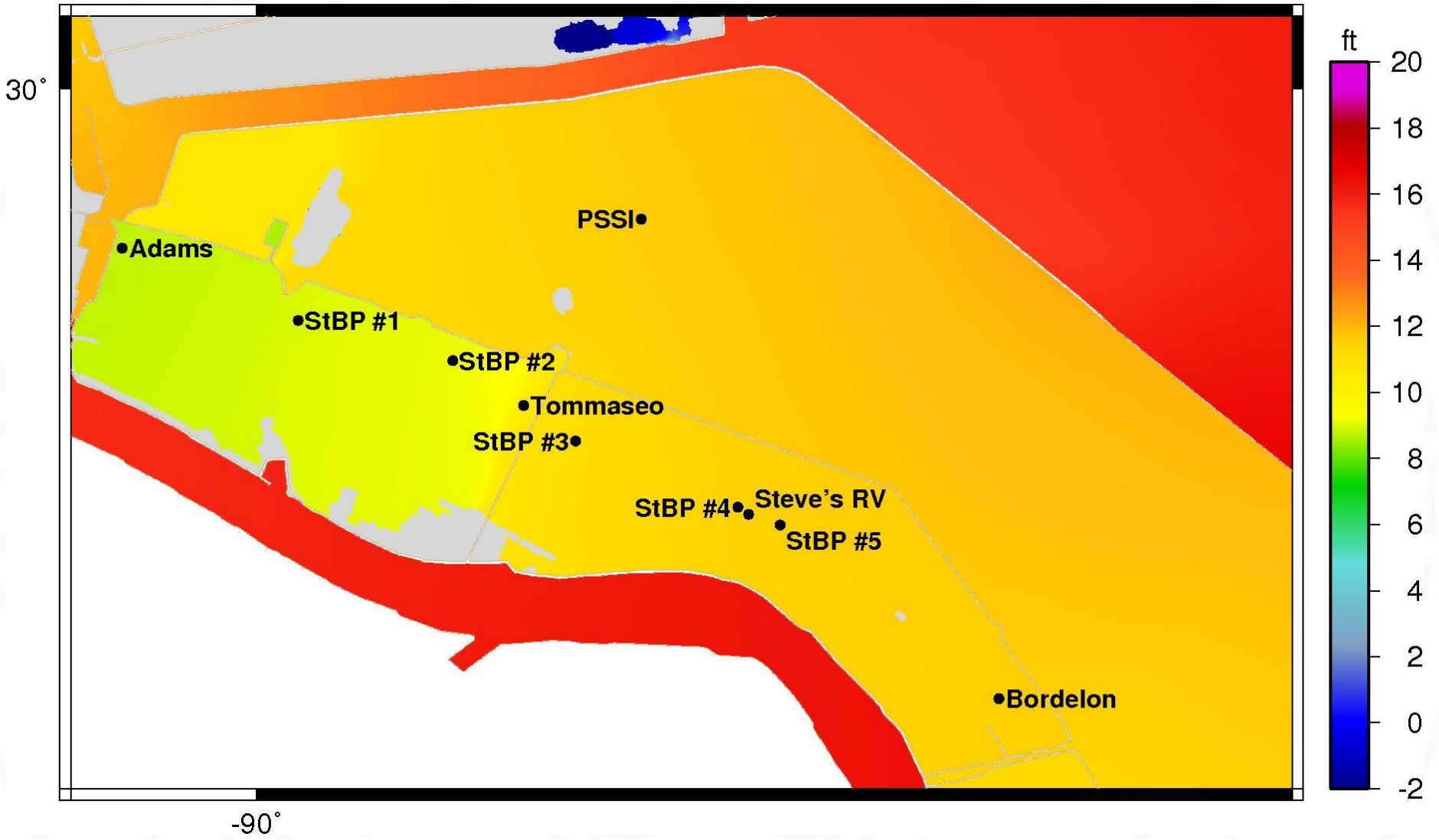


Figure 39

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

Maximum A1

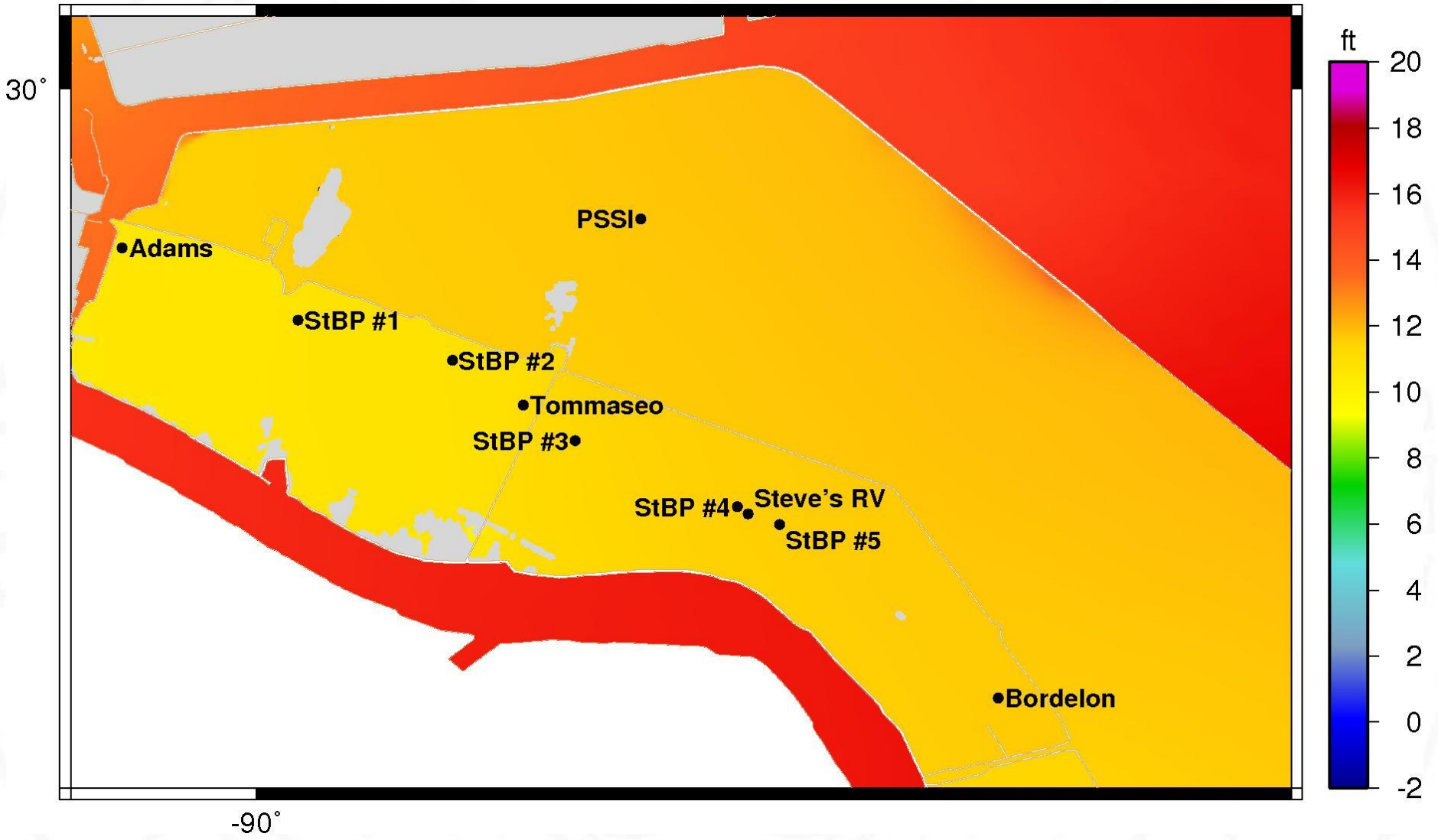


Figure 40

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

Maximum A1 less Maximum C

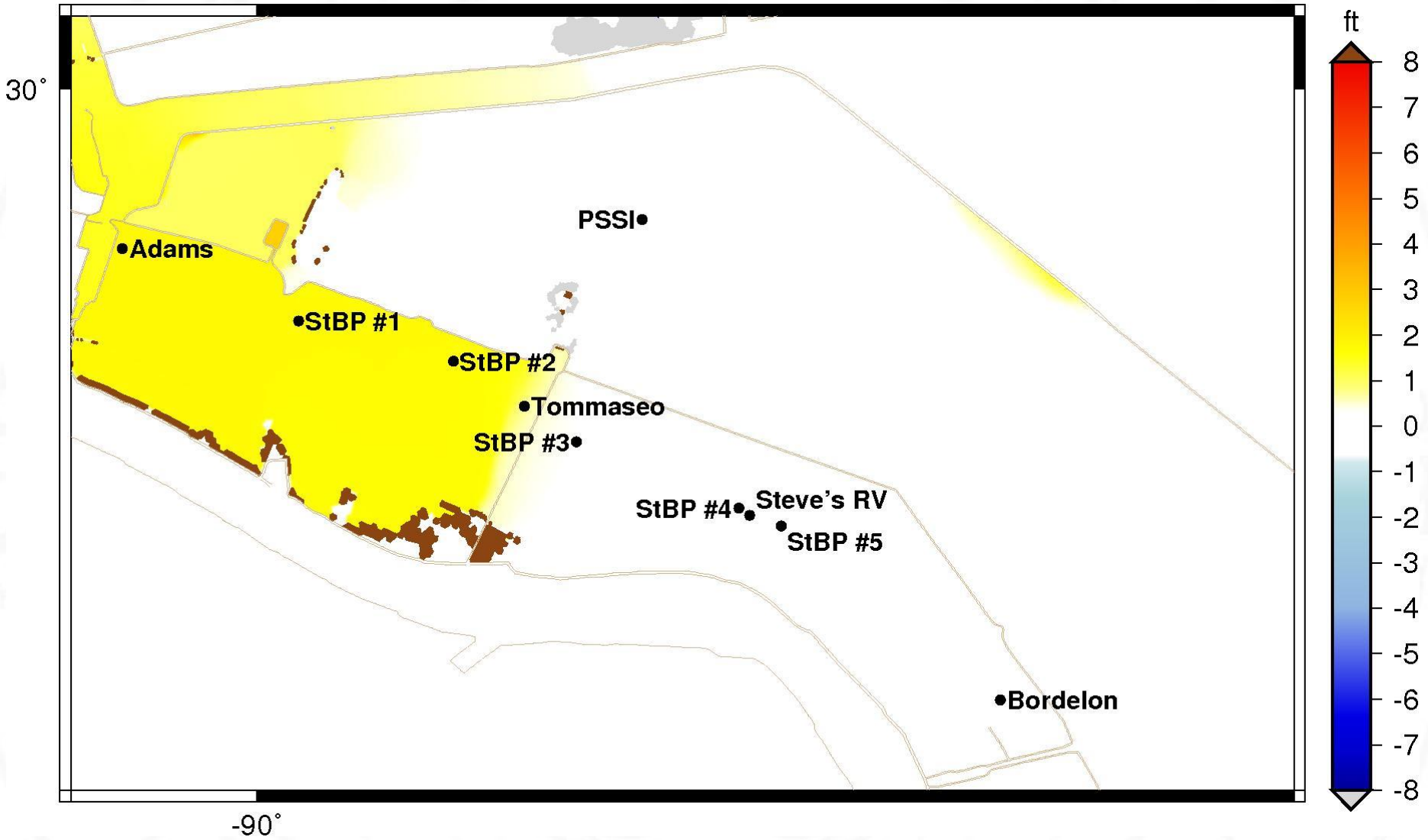
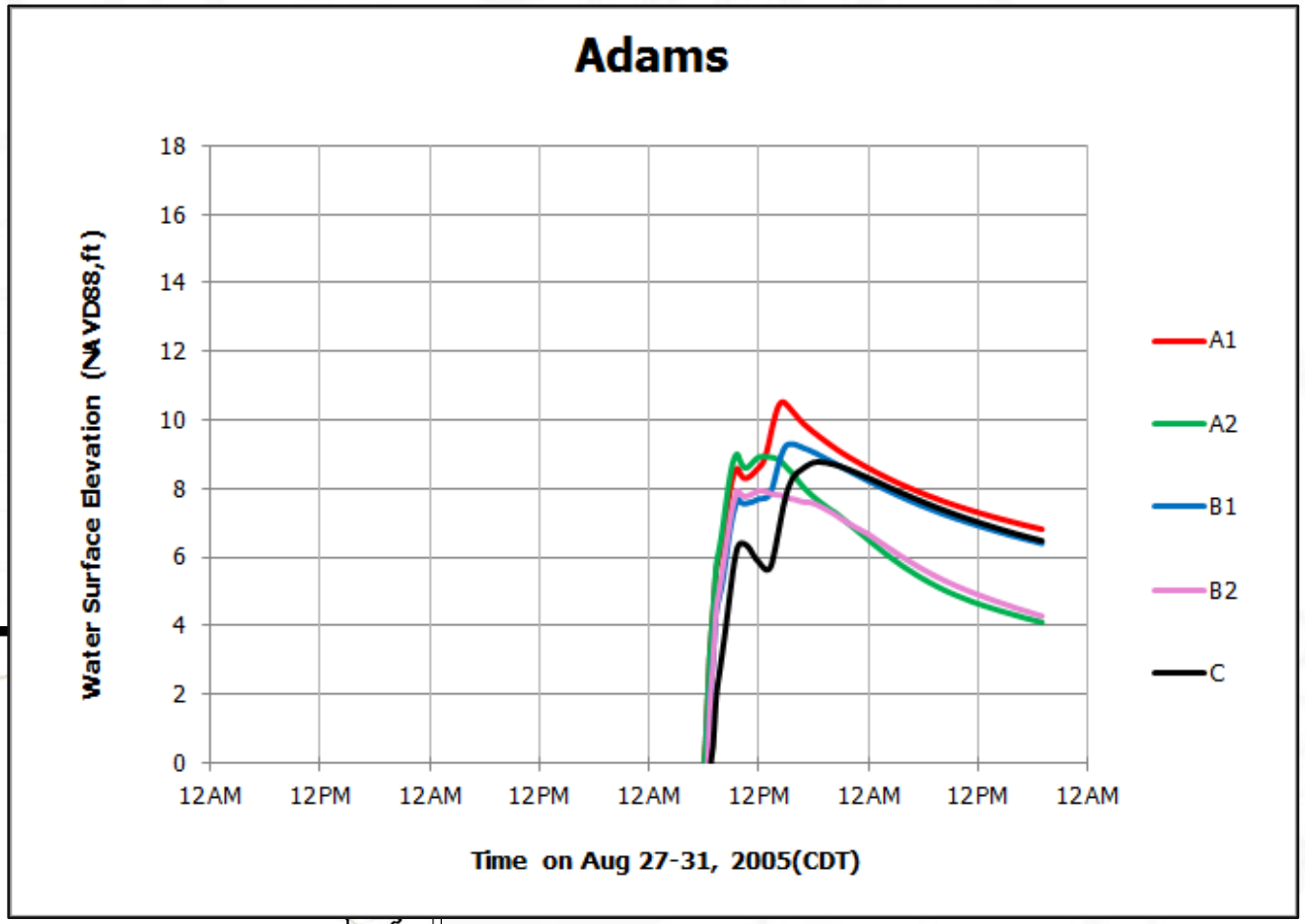


Figure 41

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

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

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



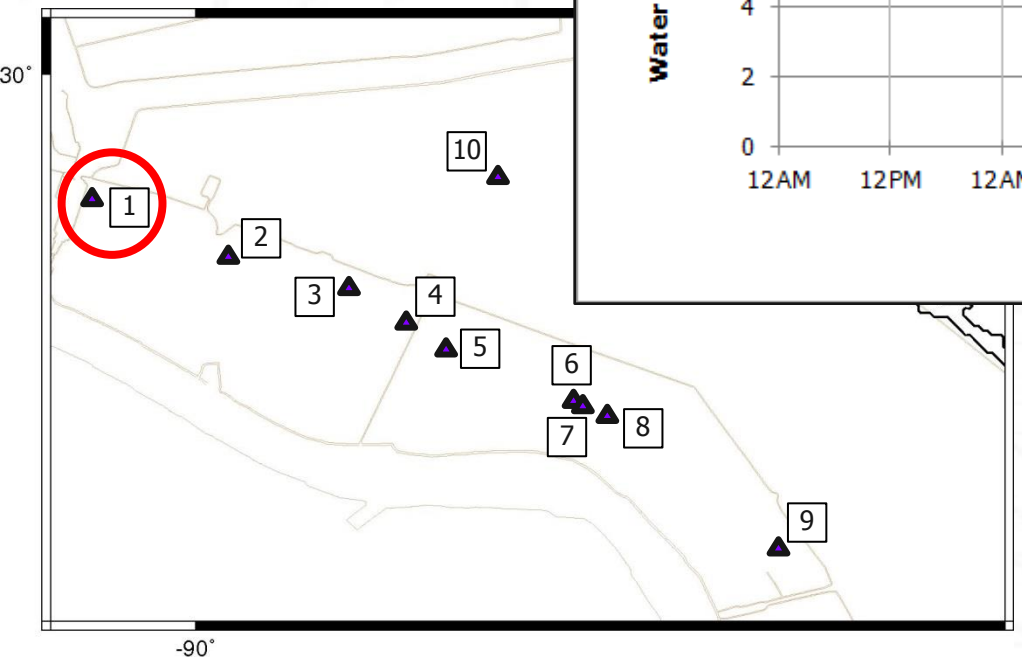
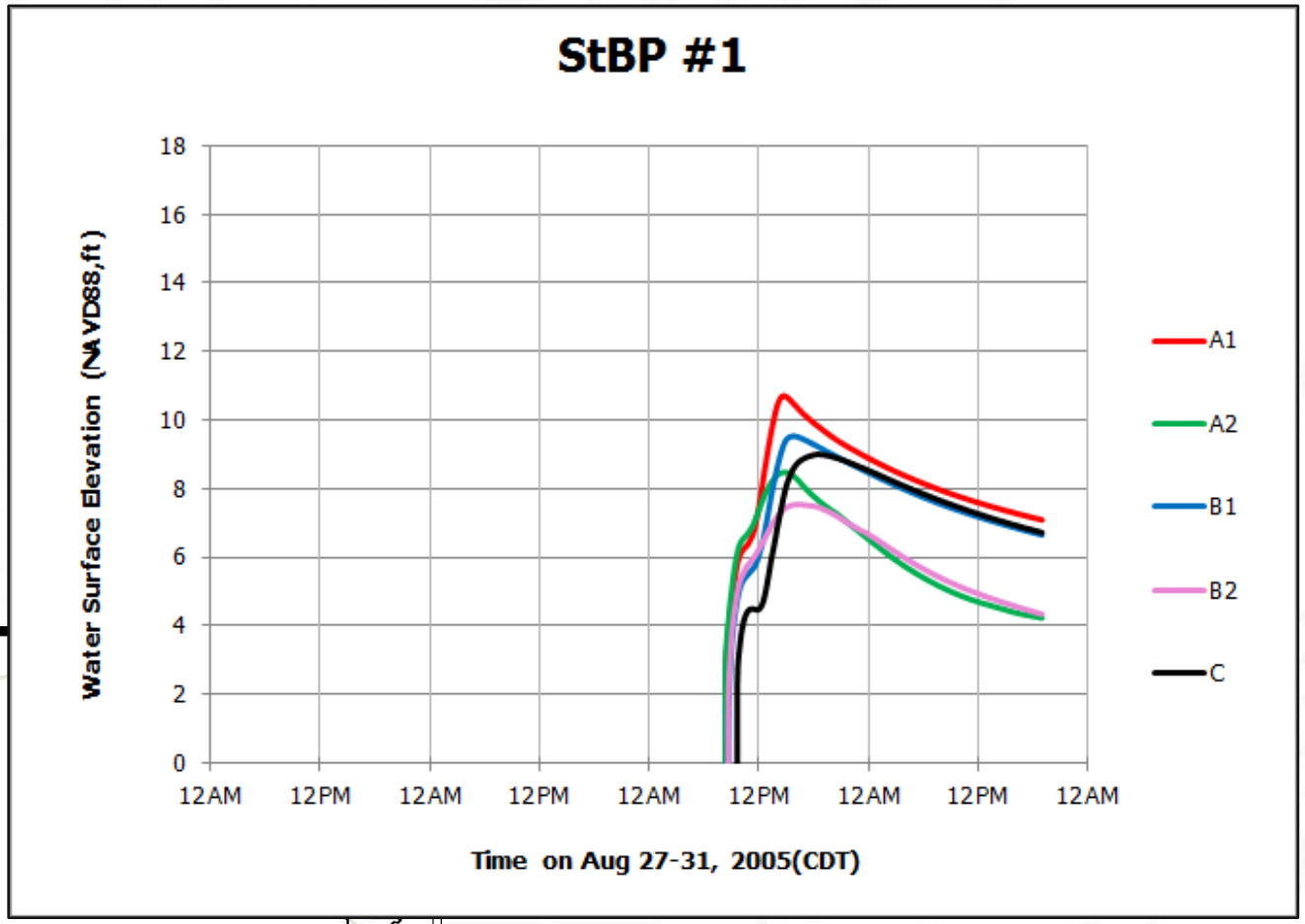


Figure 42a

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



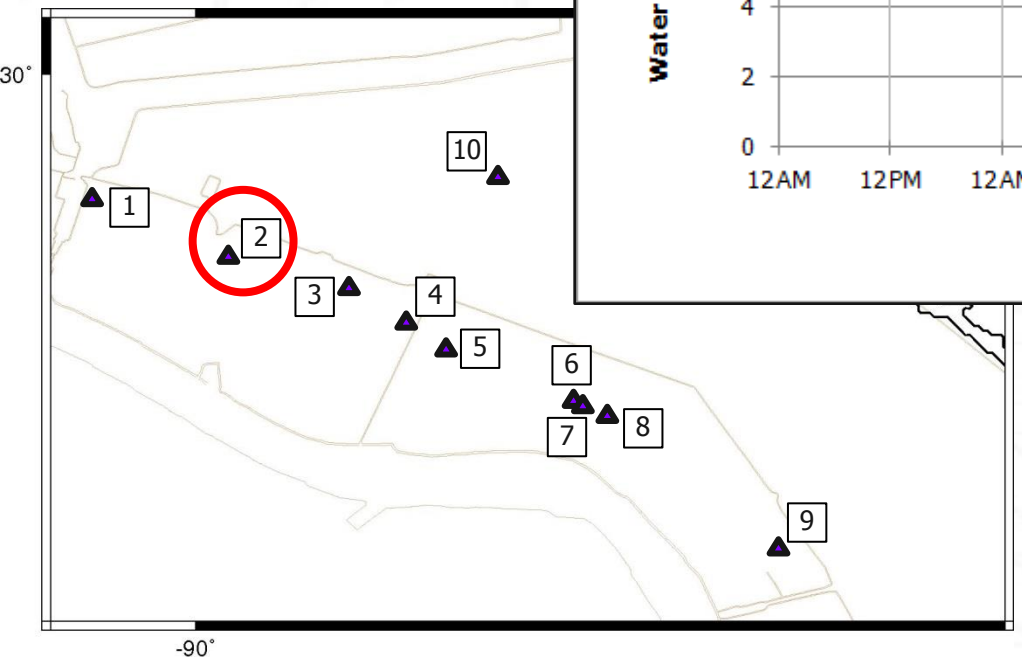
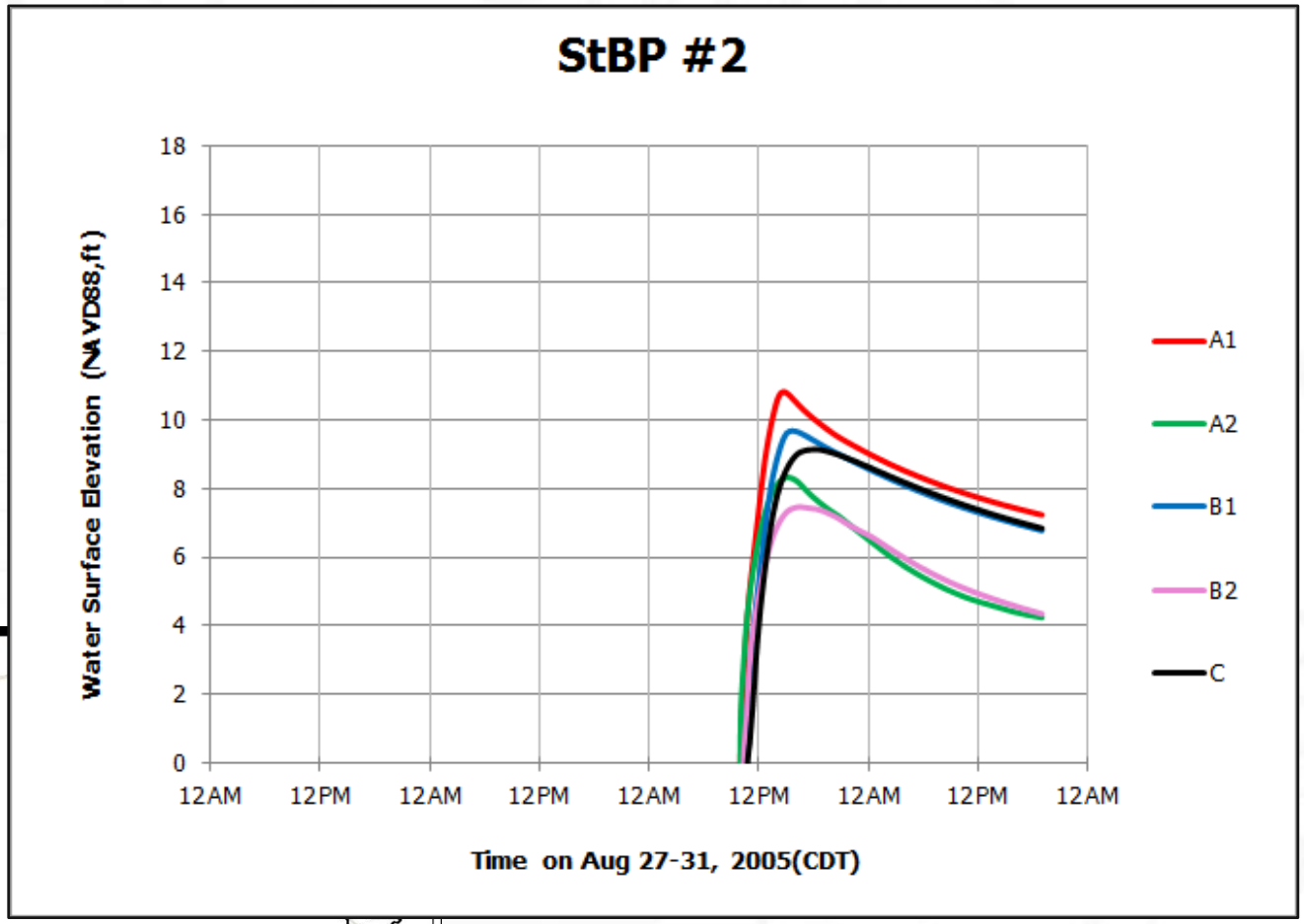


Figure 42b

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



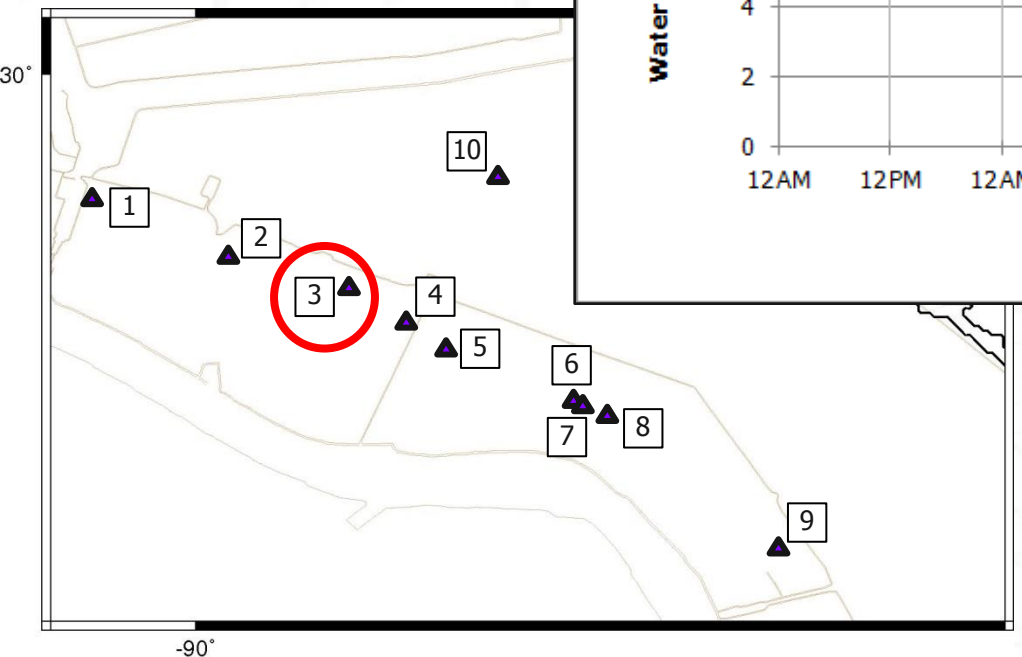
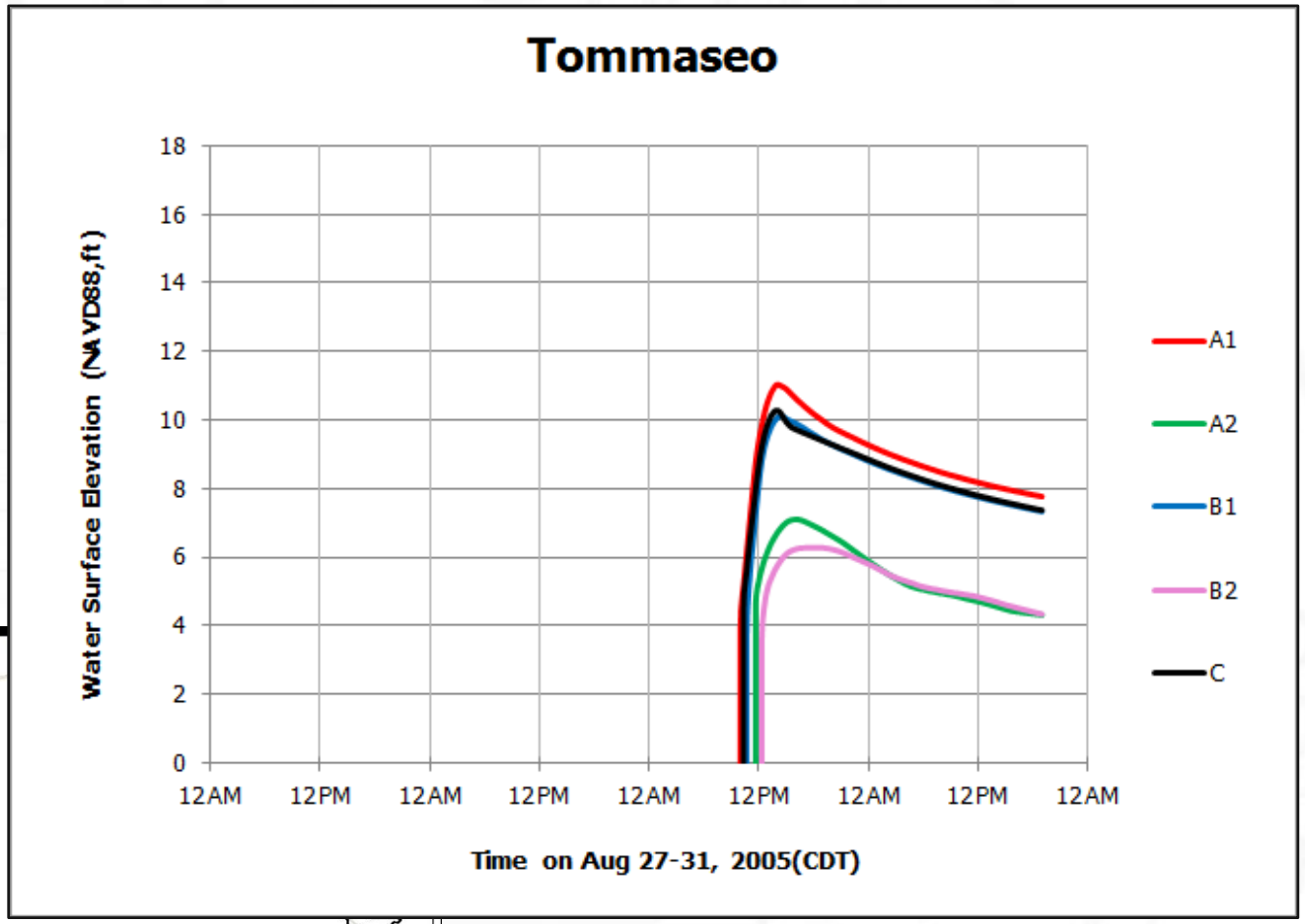


Figure 42c

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



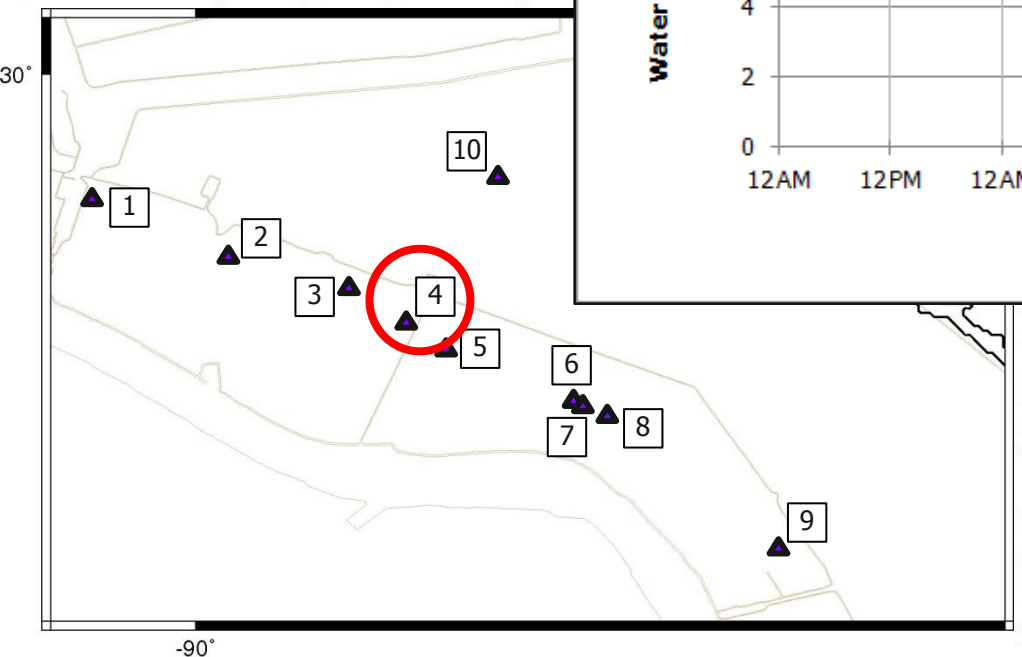
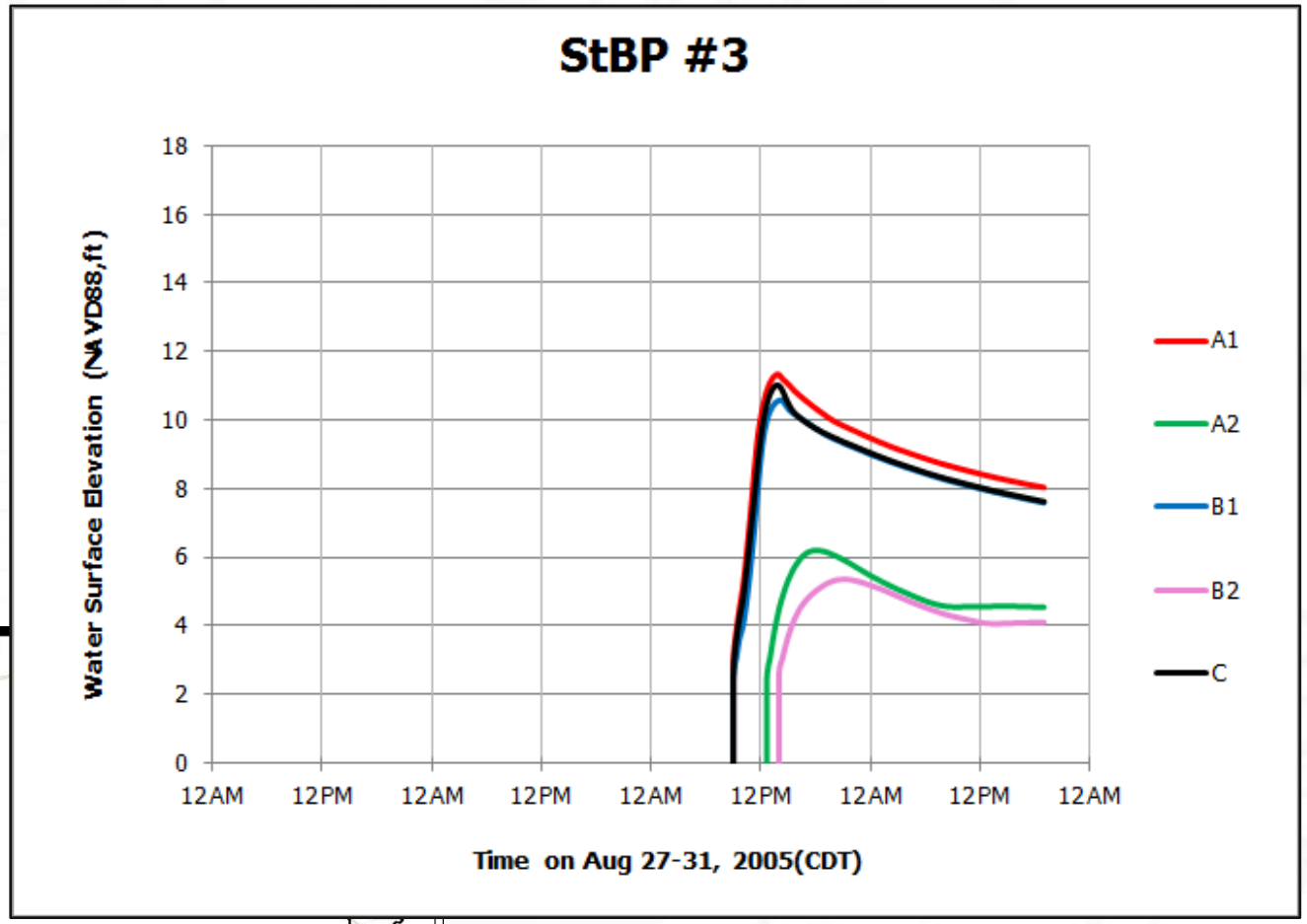


Figure 42d

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



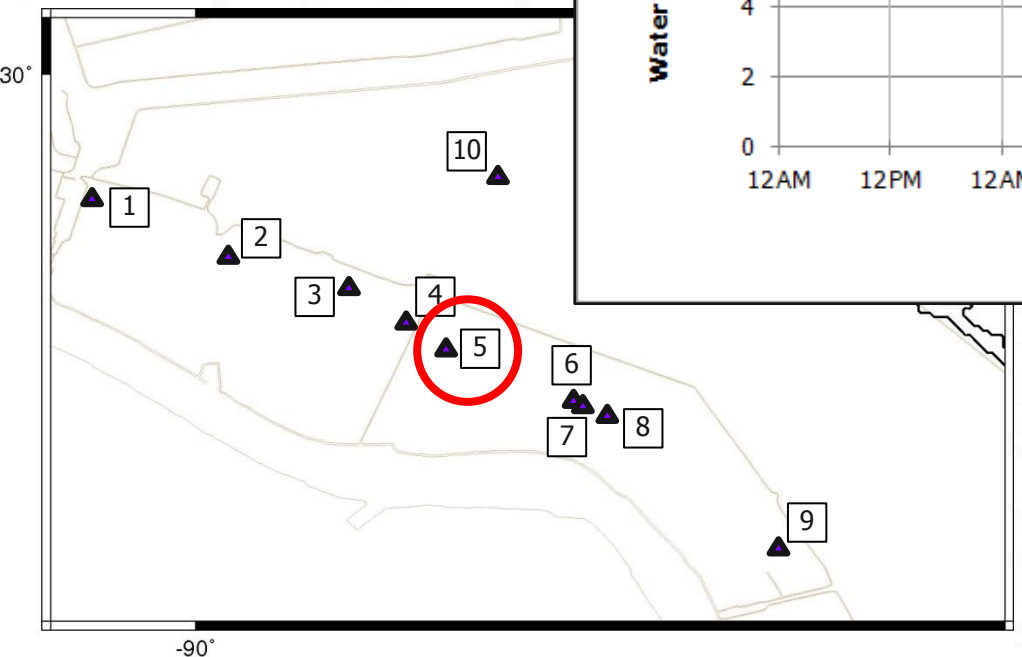
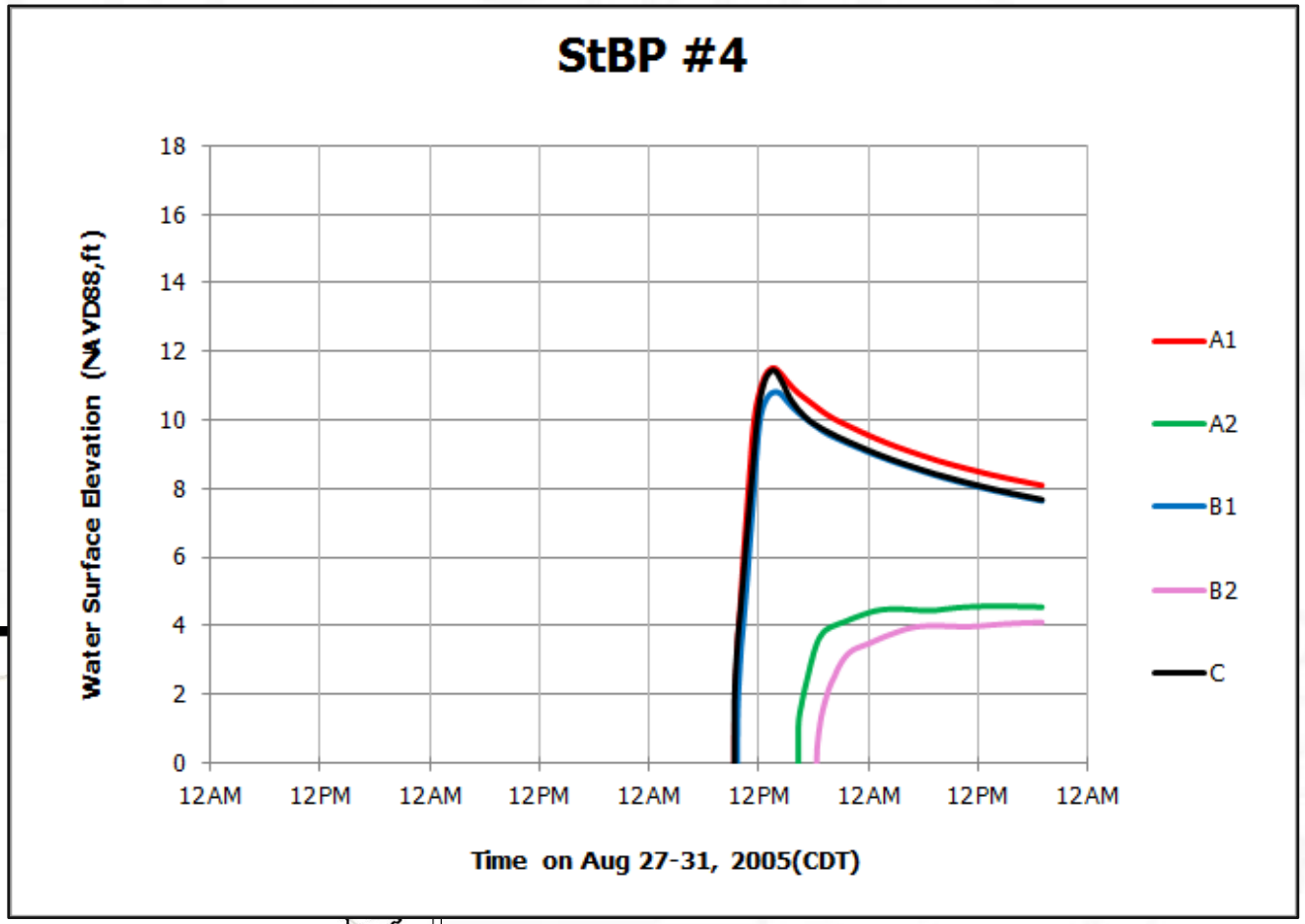


Figure 42e

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



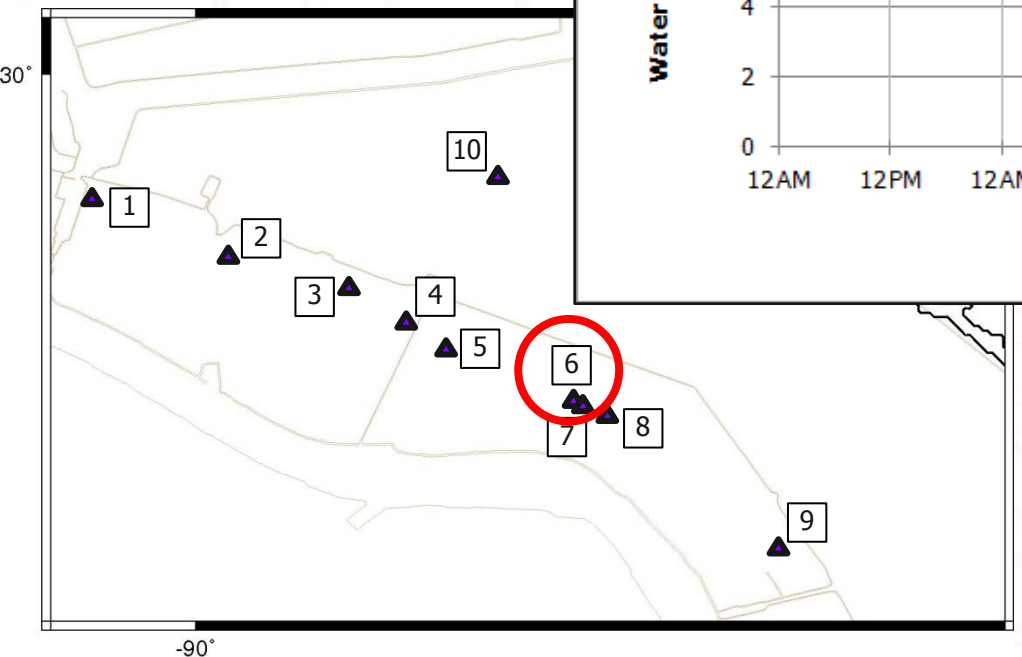
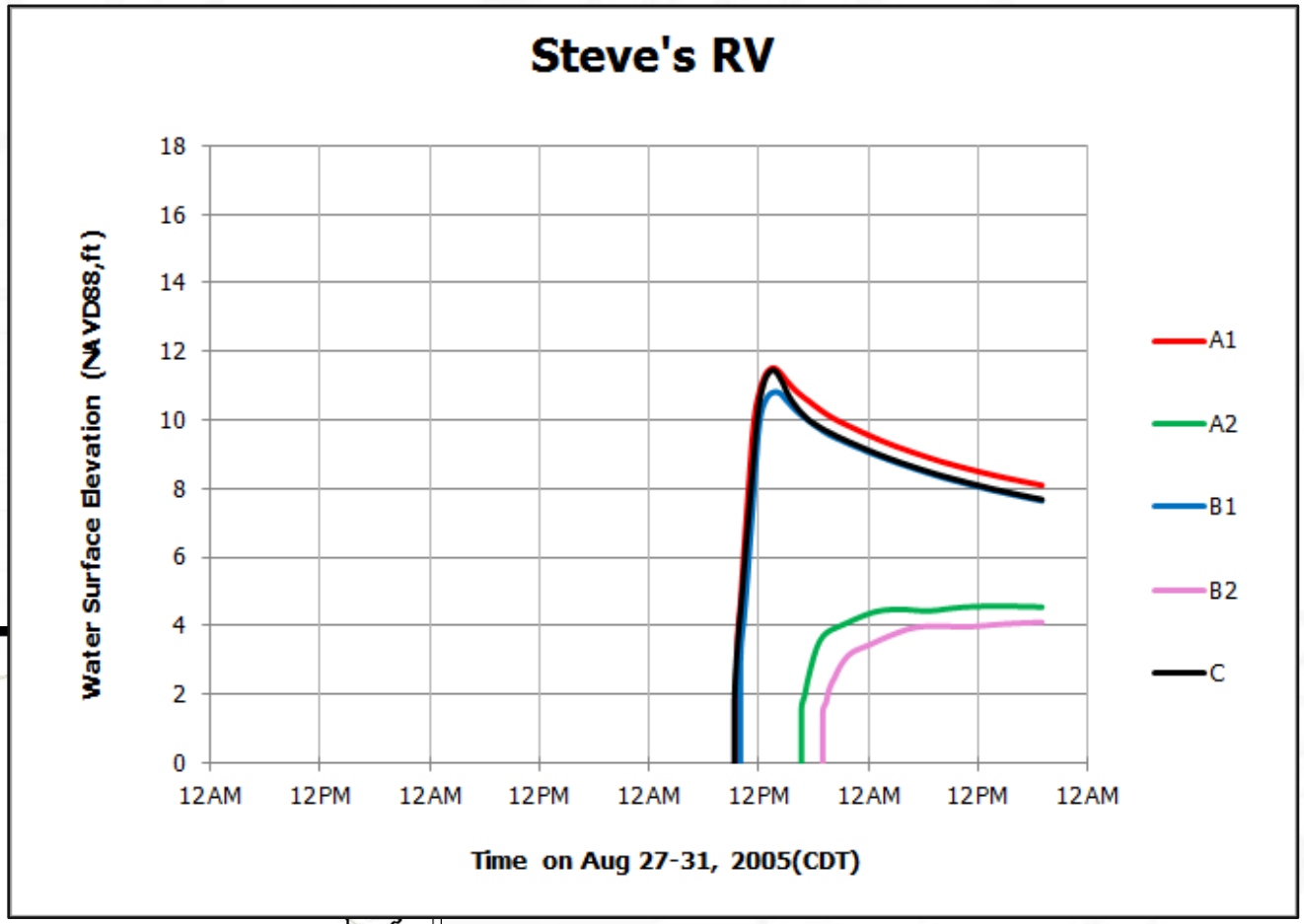


Figure 42f

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



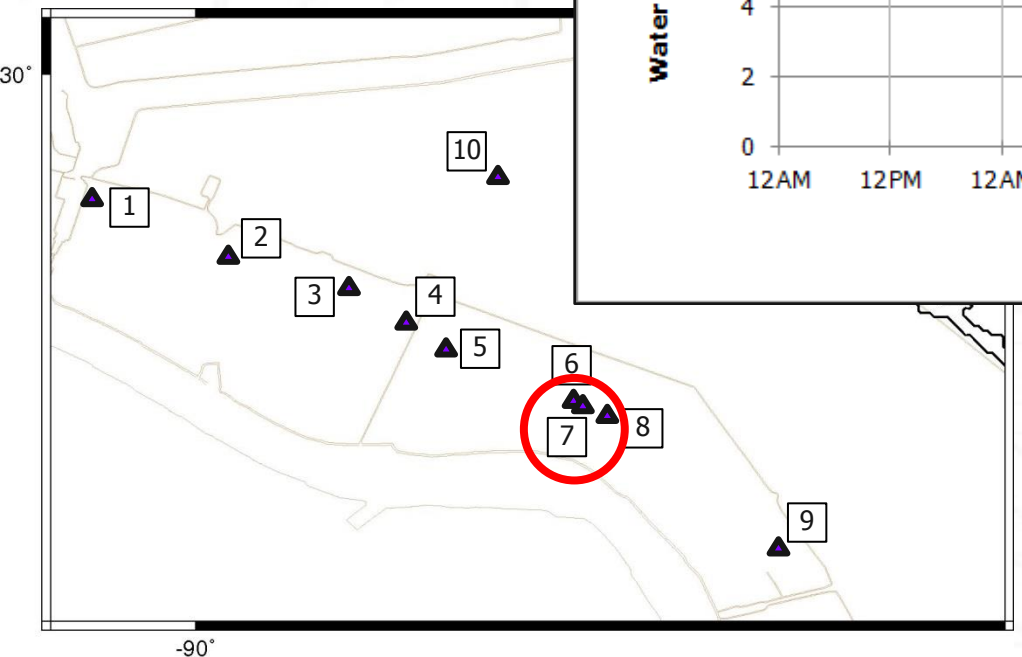
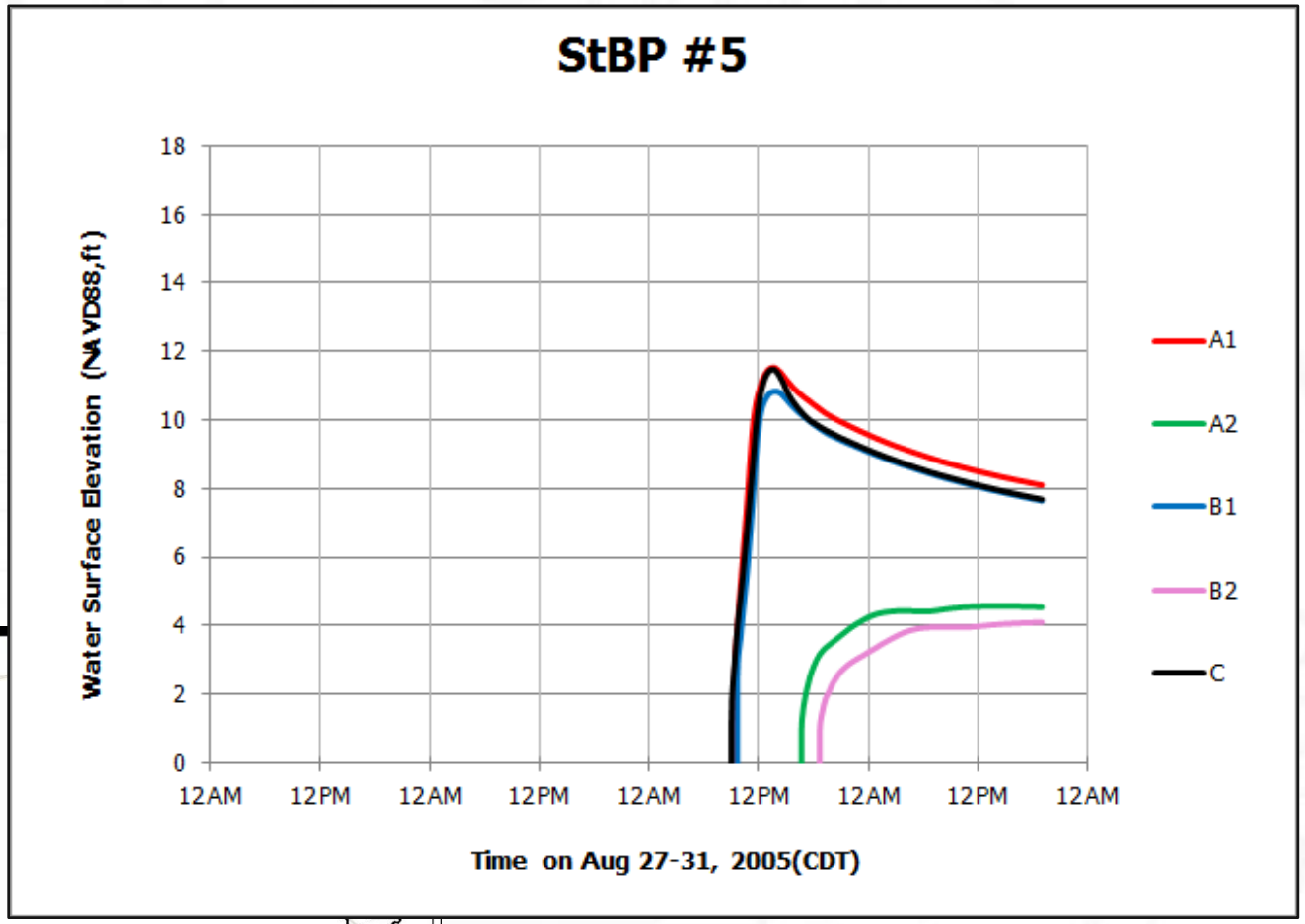


Figure 42g

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



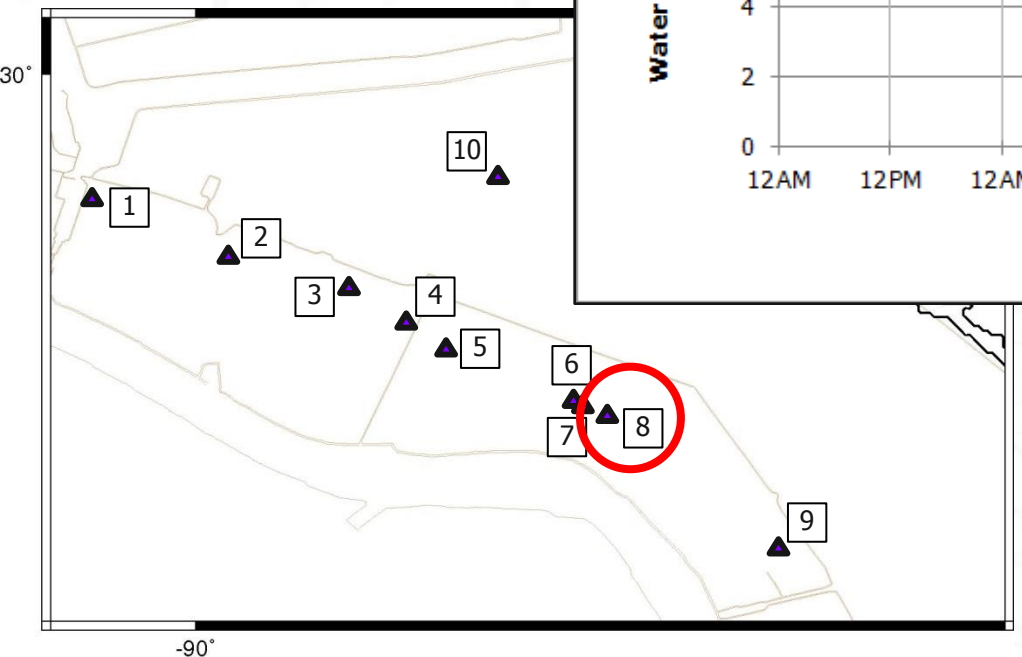
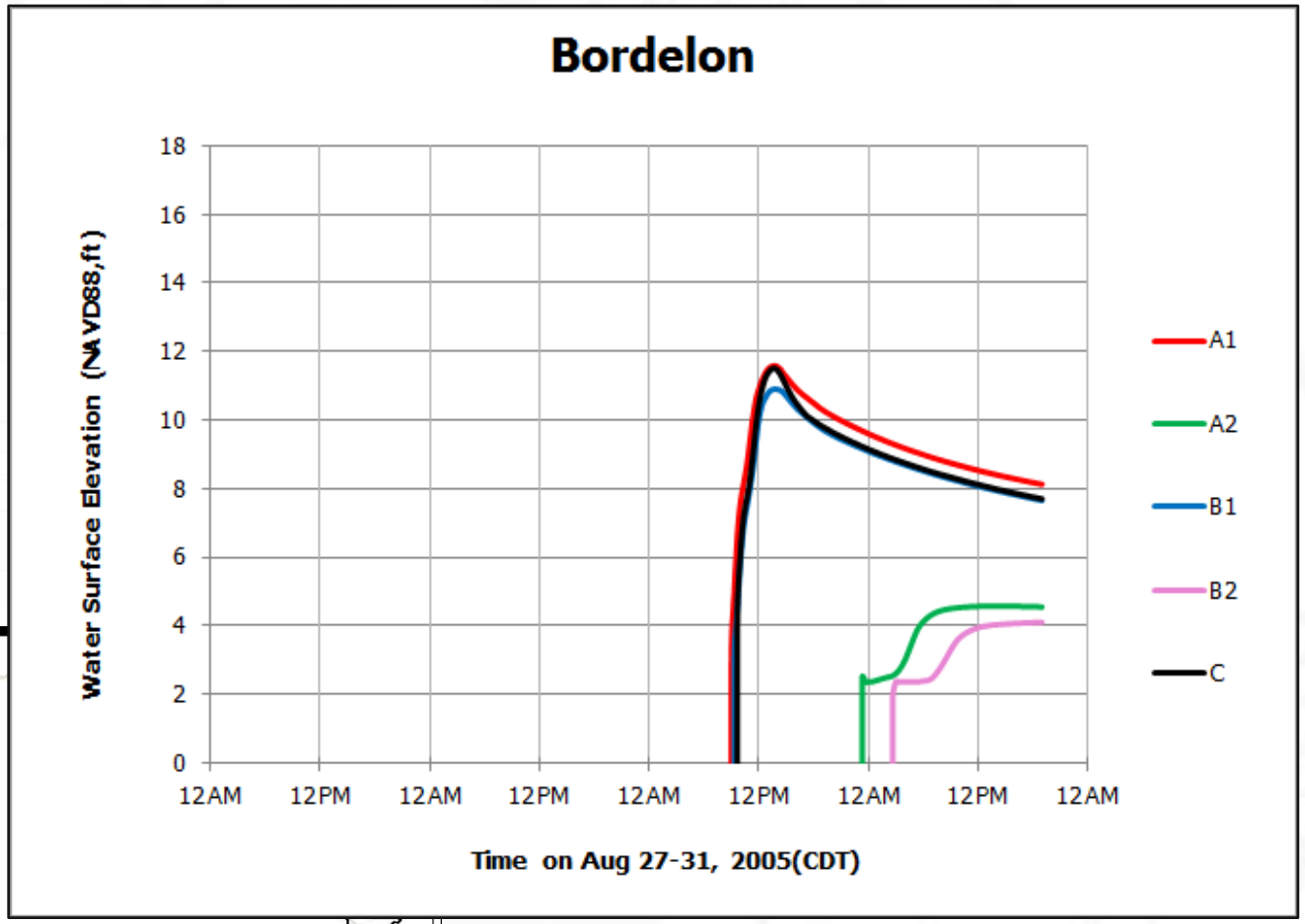


Figure 42h

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



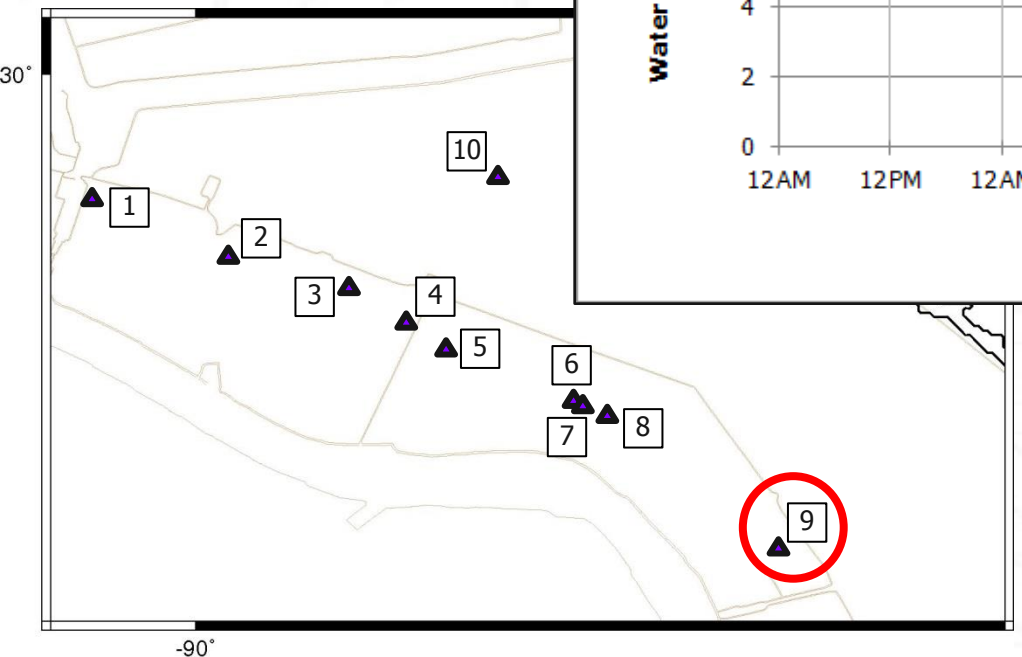
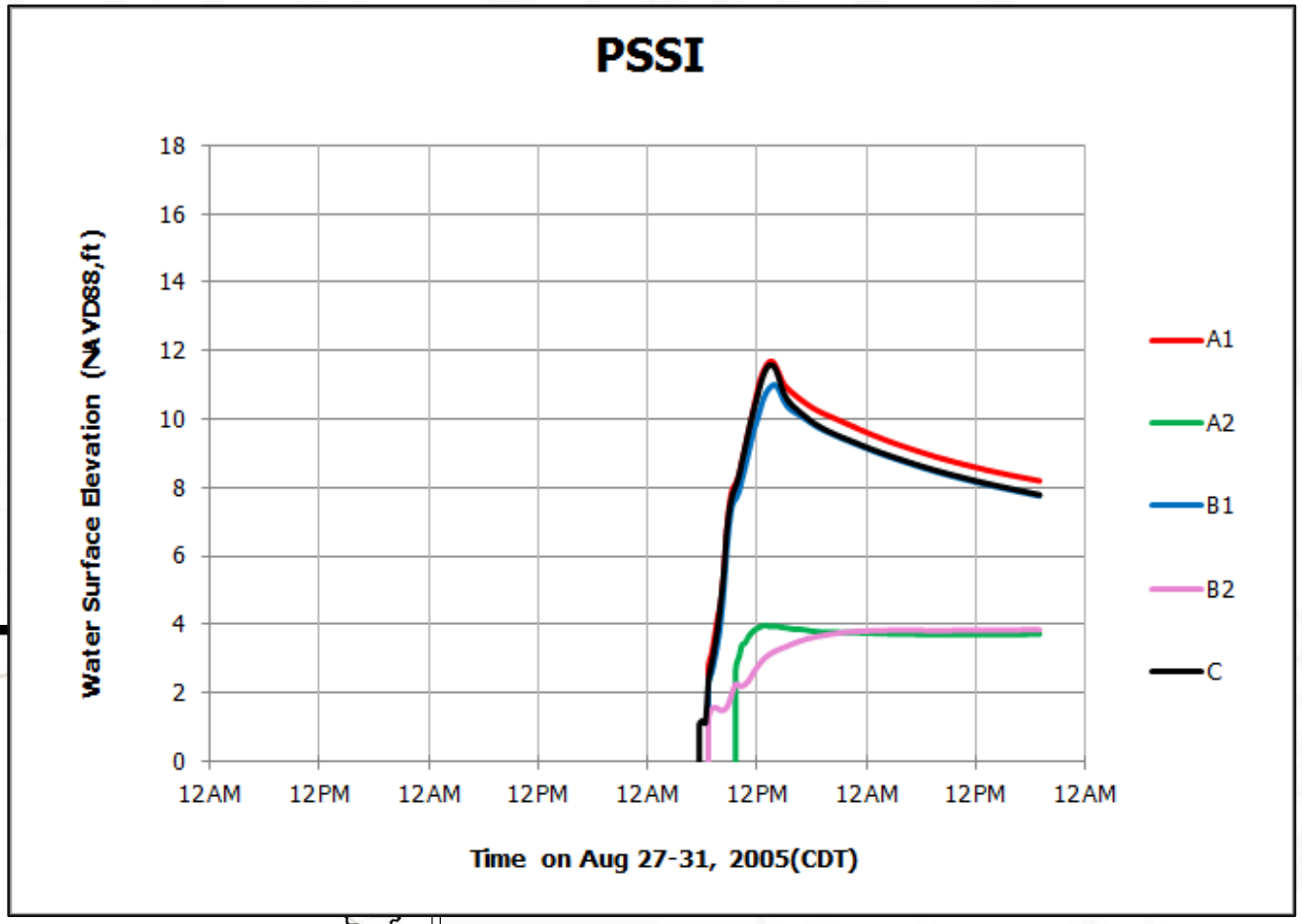


Figure 42i

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



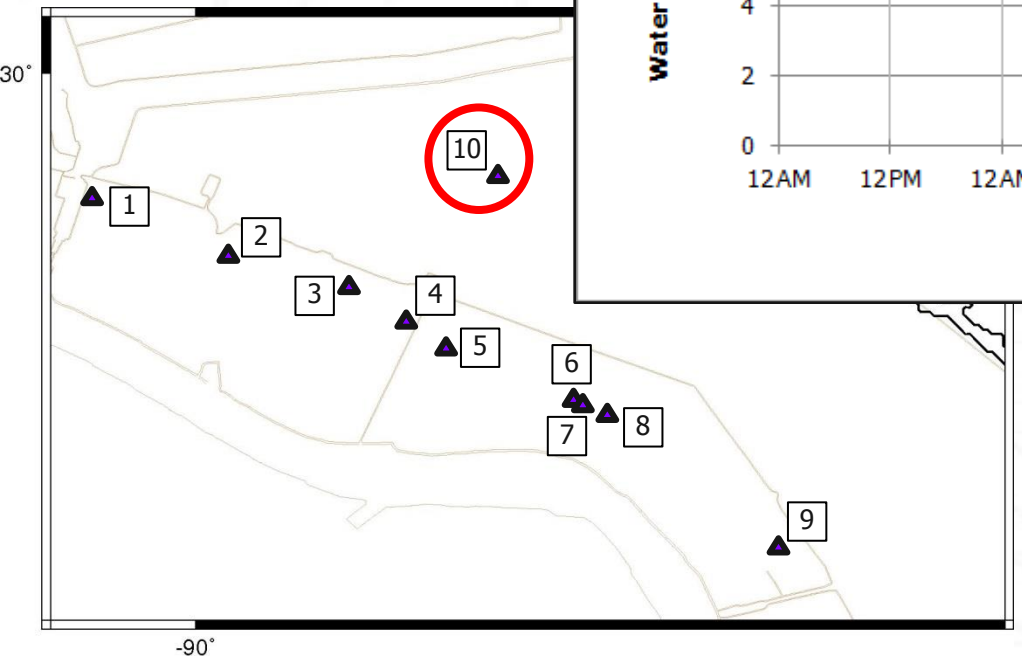
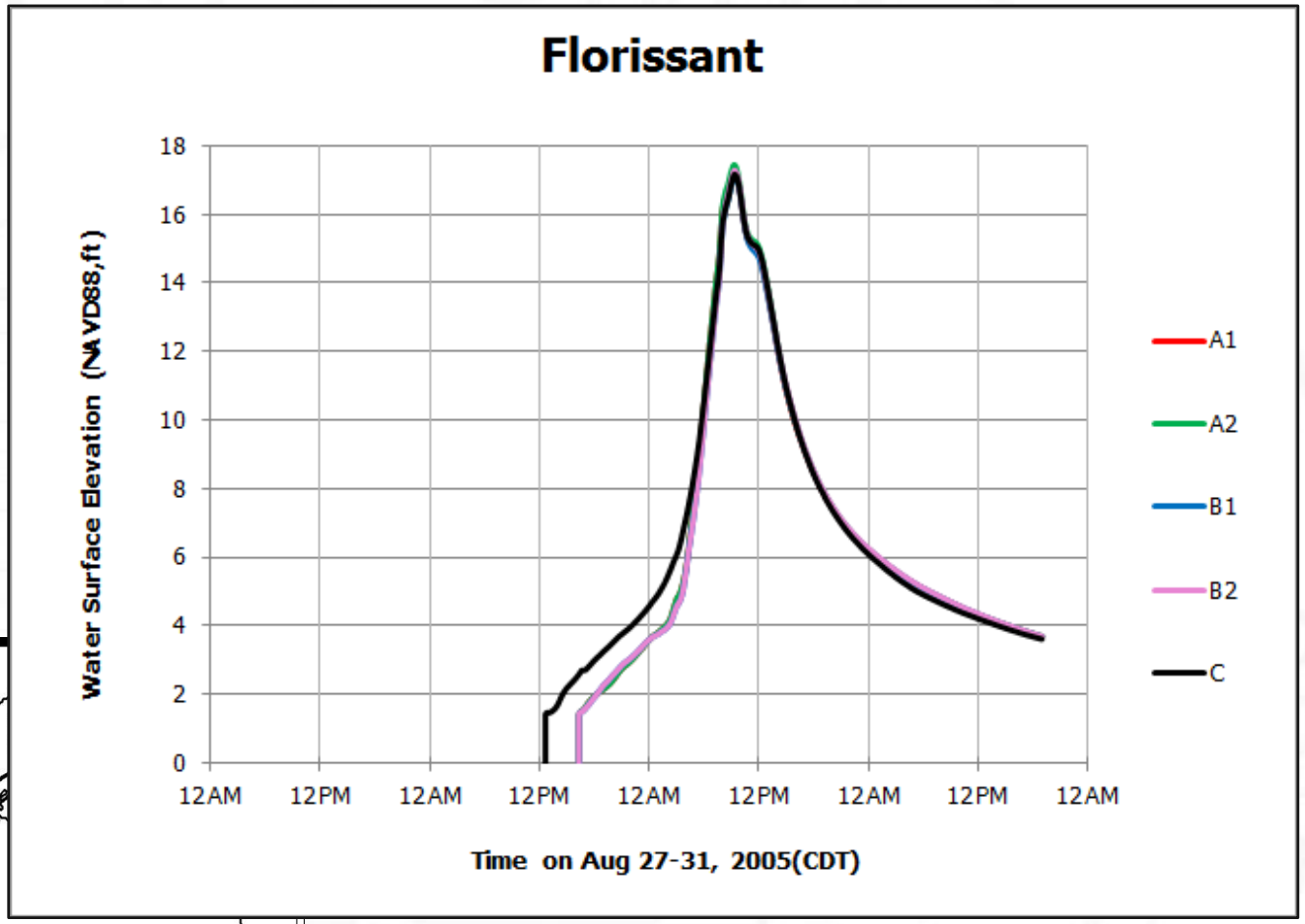


Figure 42j

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



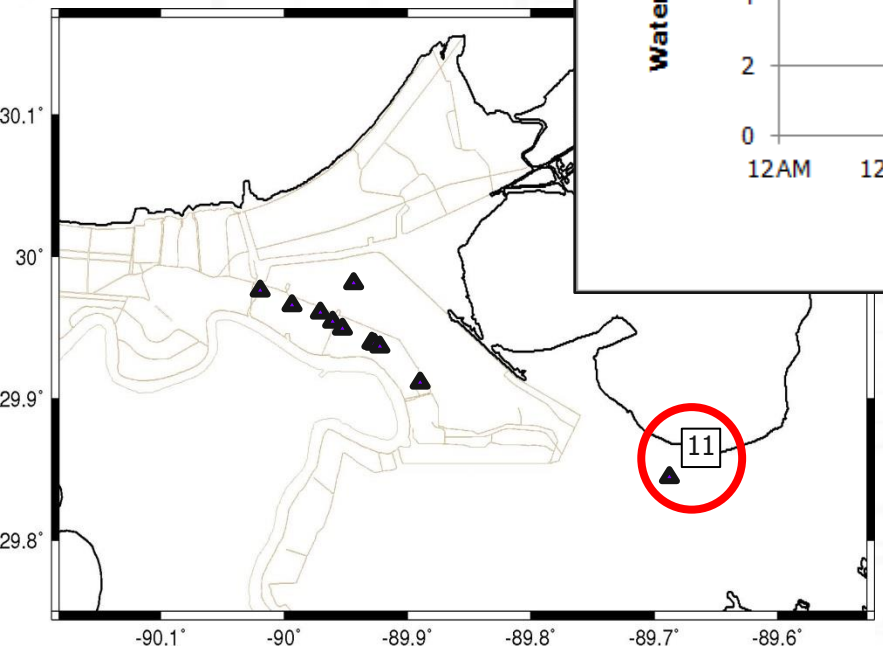


Figure 42k

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

- The maximum water surface elevations (in ft) at each Trial Property in the Scenario C *"No MRGO/1956 Wetlands"* are summarized in the table below.

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

Table 12