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Katrina Hindcast - Scenario A1: Maximum surge elevation in and around St. Bernard Parish

Maximum A1

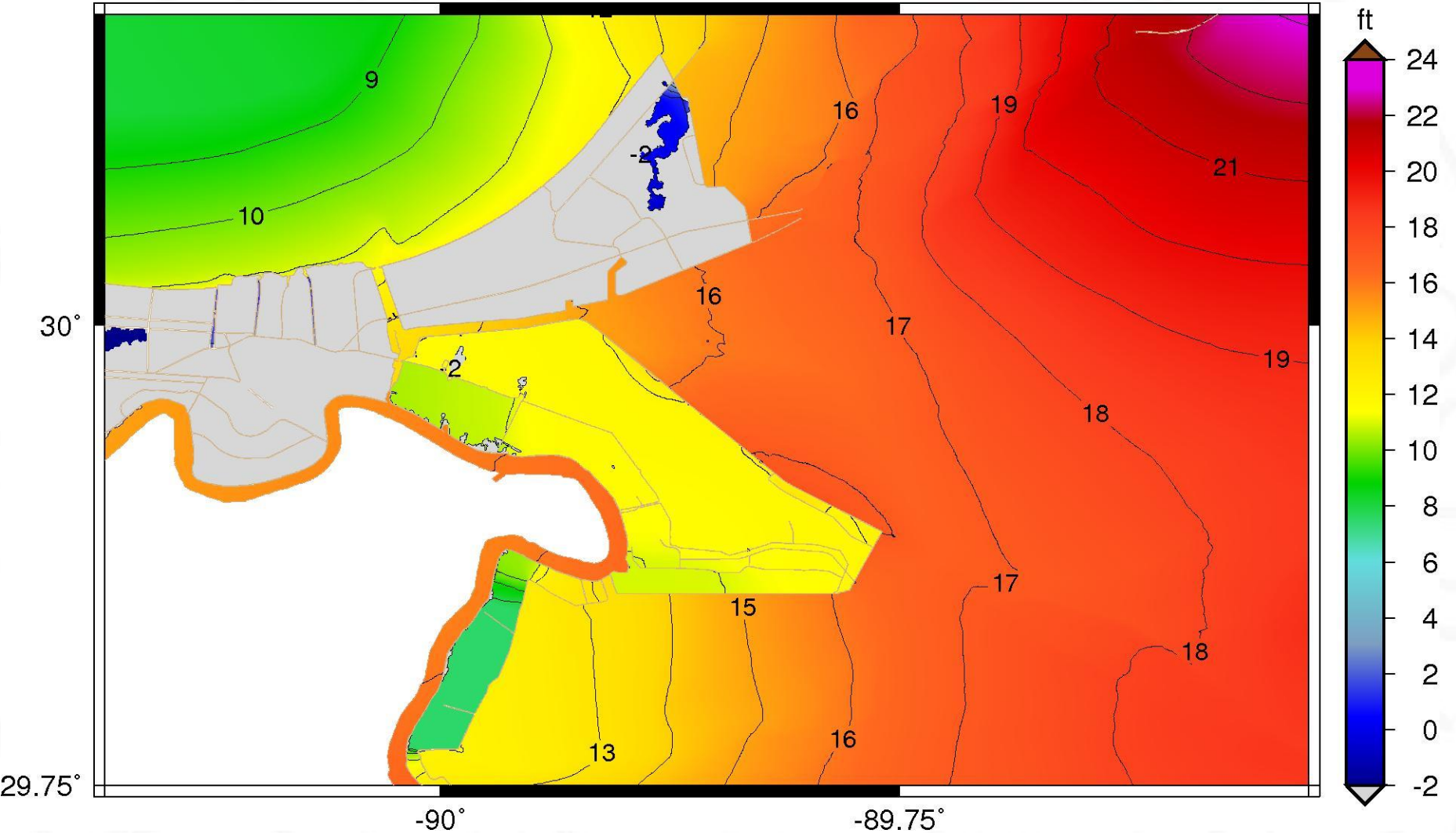


Figure 17

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Katrina Hindcast - Scenario A1: Maximum surge elevation in western St. Bernard Polder

Maximum A1

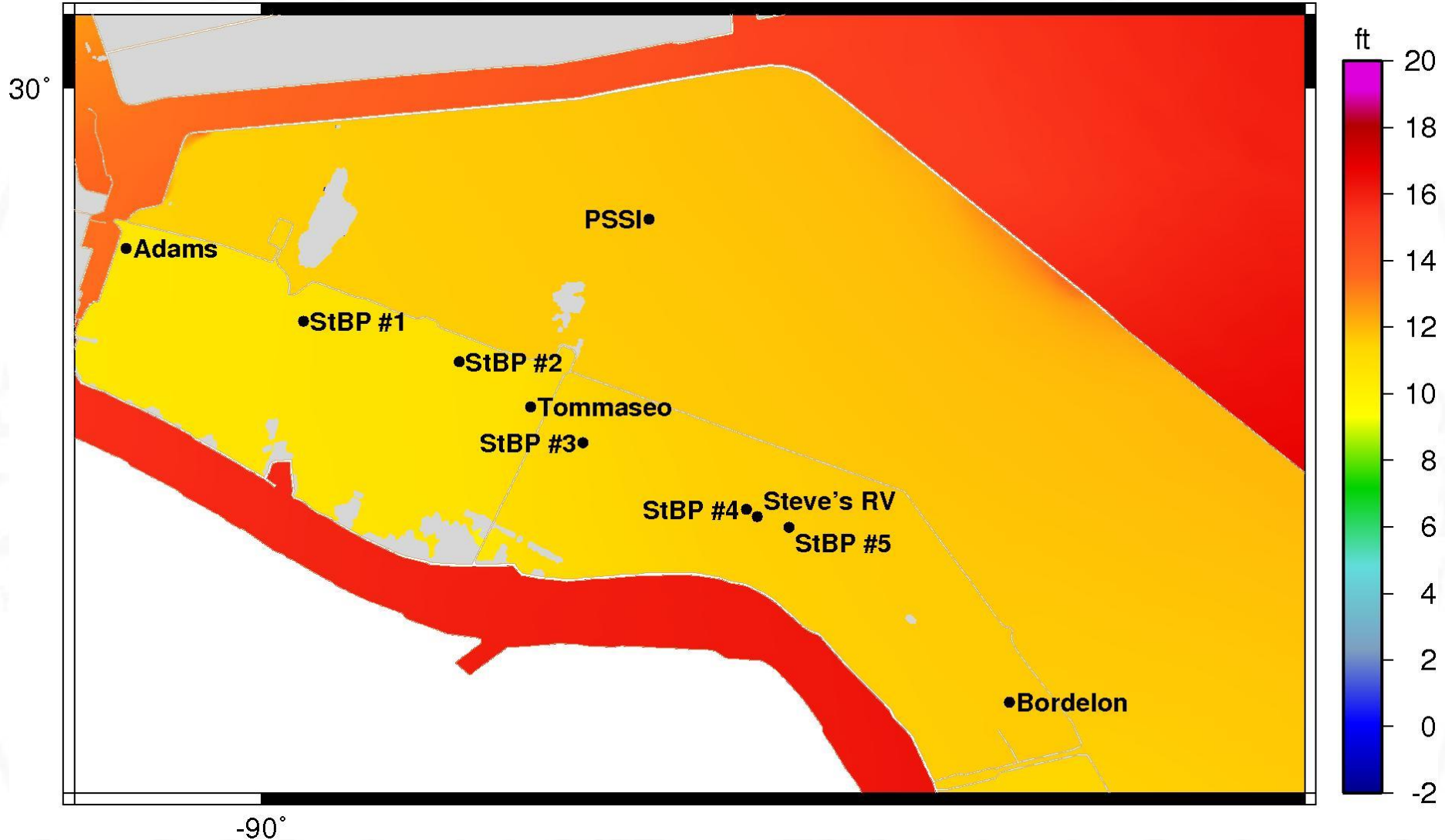


Figure 18

- The A1 Scenario modeling results in and around St. Bernard Polder and at each Trial Property location closely match the high water mark (HWM) data and other forensic evidence collected in the aftermath of Hurricane Katrina.
- The HWM data throughout the region are used as the indicators of the maximum “still-water levels” and do not include the active motion of wind waves but do include the effects of wave setup. The HWM data is obtained from three data sets: USACE; URS/FEMA; Fitzgerald (*Ebersole et al., 2007; URS 2006; Bunya et al., 2010; Fitzgerald, 2013*).
- As shown in the following series of slides (Figures 19a-zzk), the **ADCIRC** modeling in and around St. Bernard Polder shows an average absolute difference between data and model of 0.59 ft, a standard deviation of 0.75 ft; and a 95% confidence interval of 1.50 ft.

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Katrina Hindcast - Scenario A1: HWM comparison of model to data

- Differences between **ADCIRC** high water and measured HWM in and around St. Bernard Parish. Plaintiff Properties indicated with purple triangles.

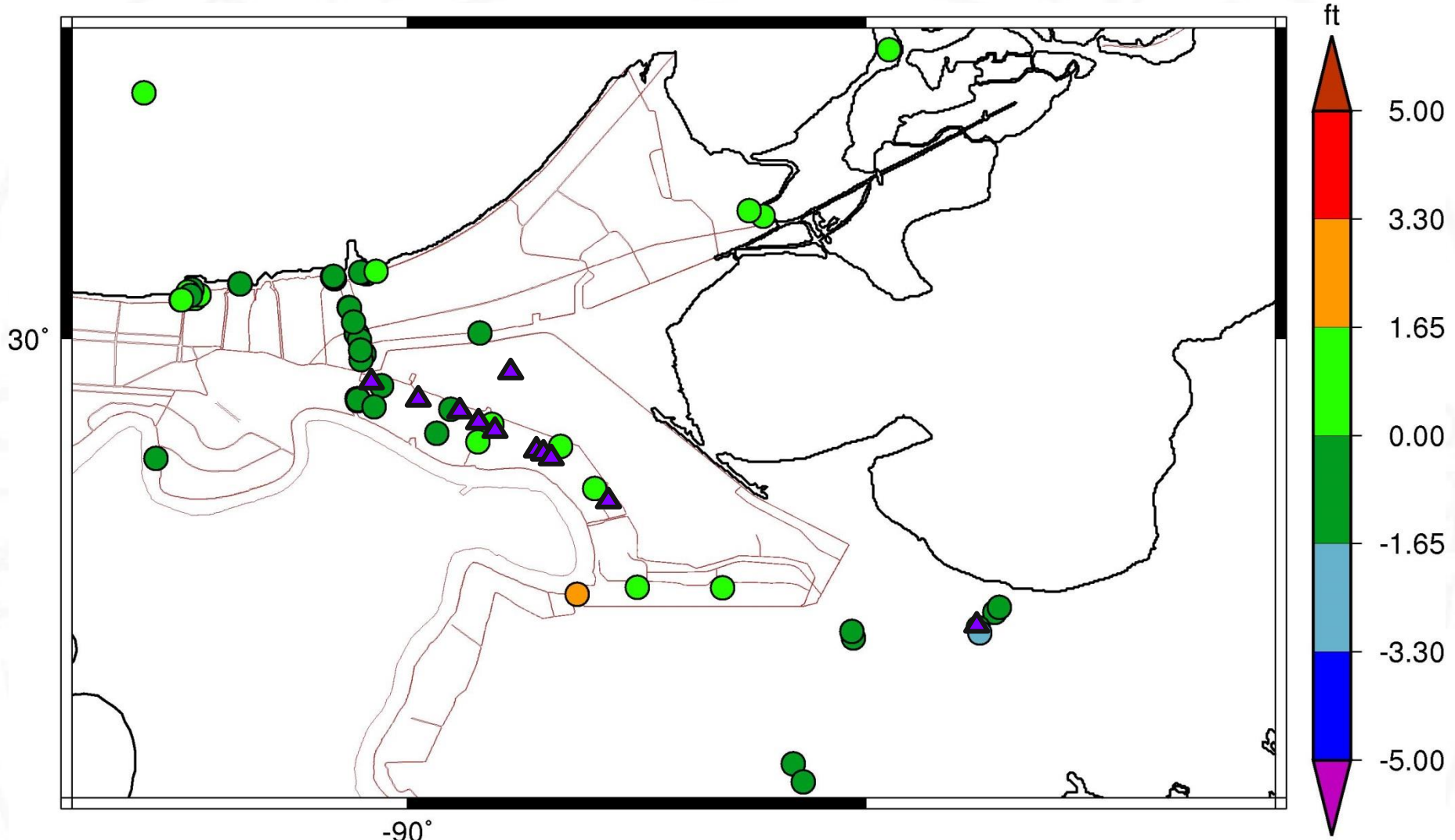


Figure 19a

▲ = Location of Plaintiff Property

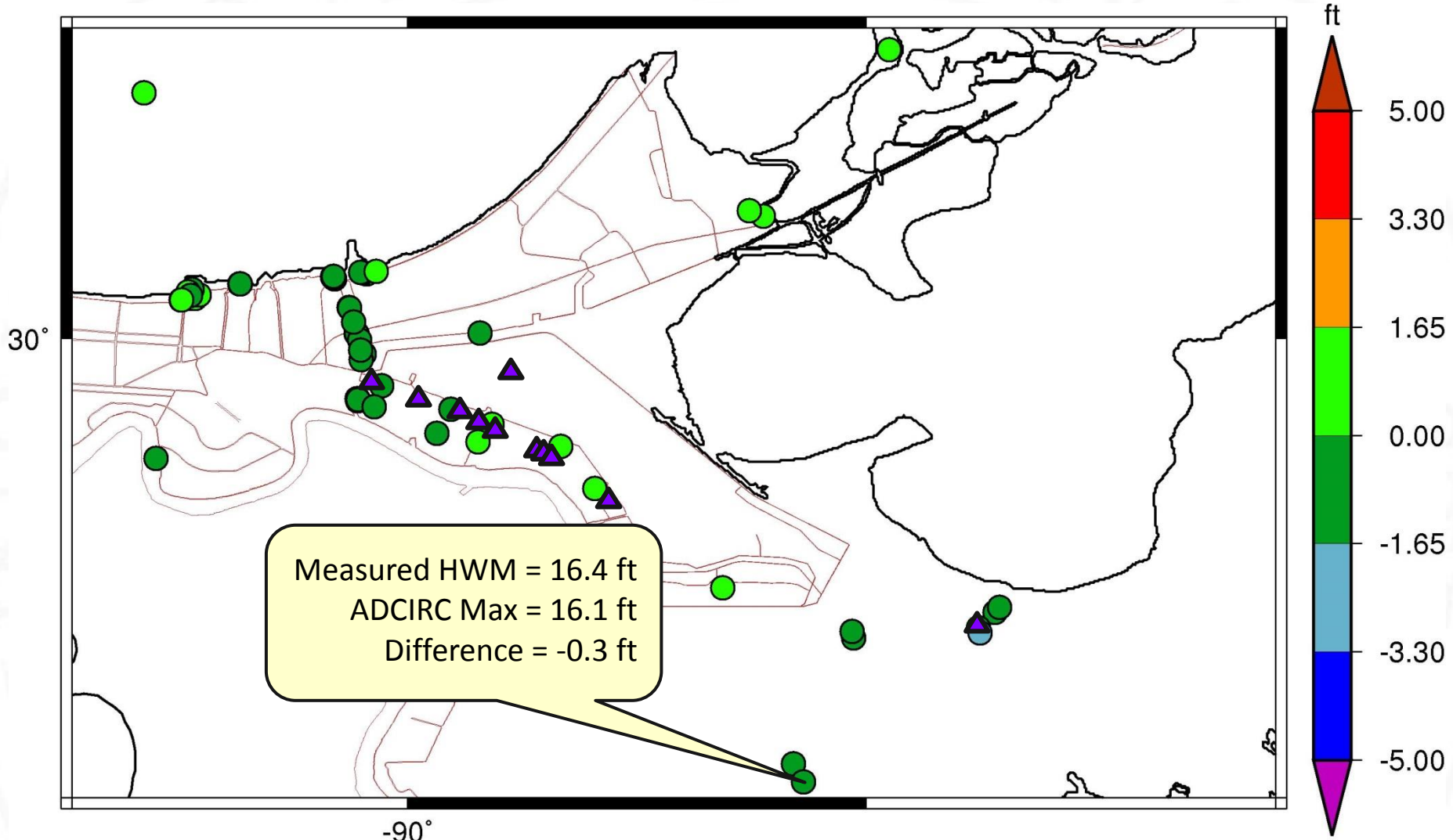


Figure 19b

▲ = Location of Plaintiff Property

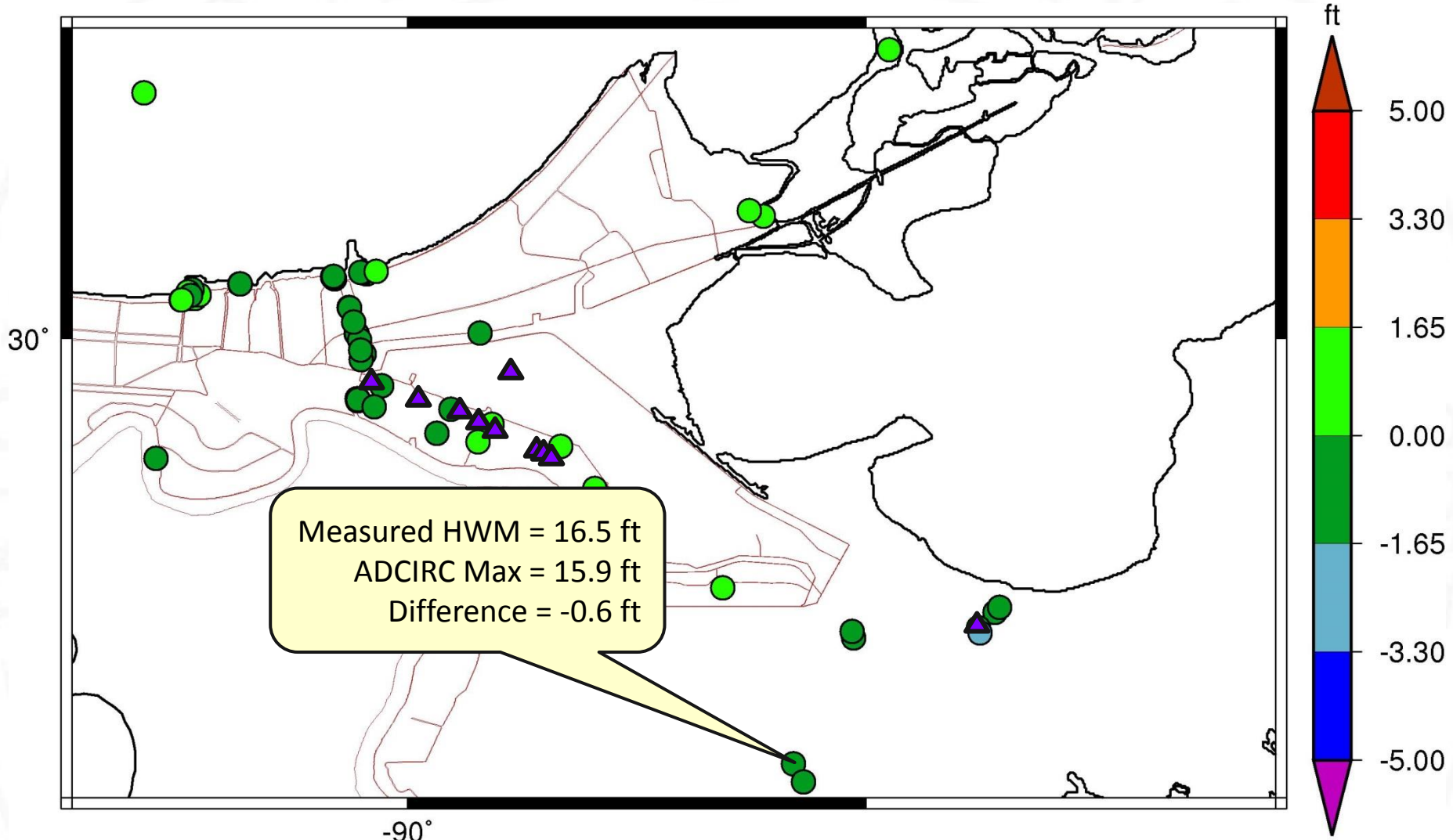


Figure 19c

▲ = Location of Plaintiff Property

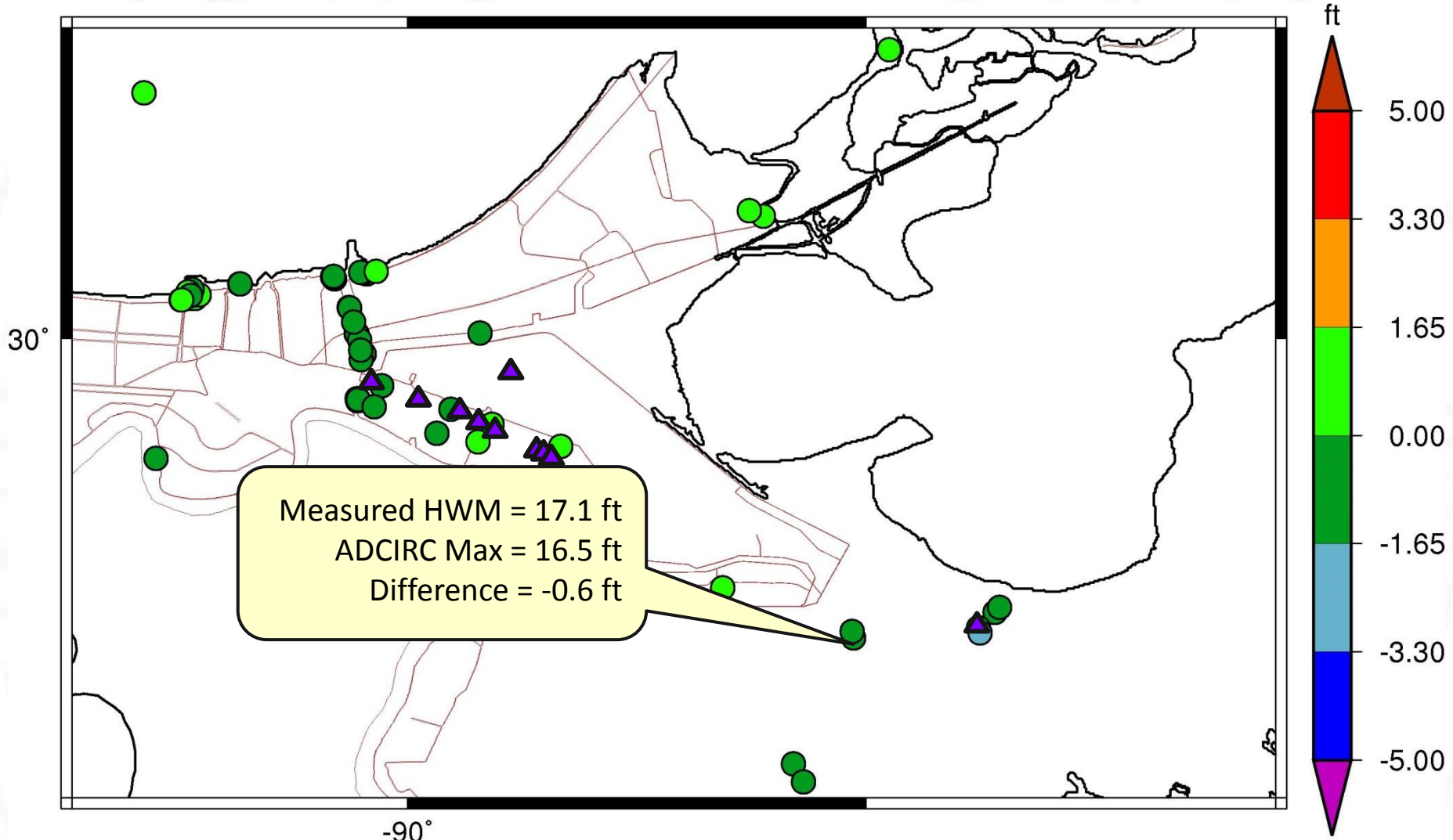


Figure 19d

▲ = Location of Plaintiff Property

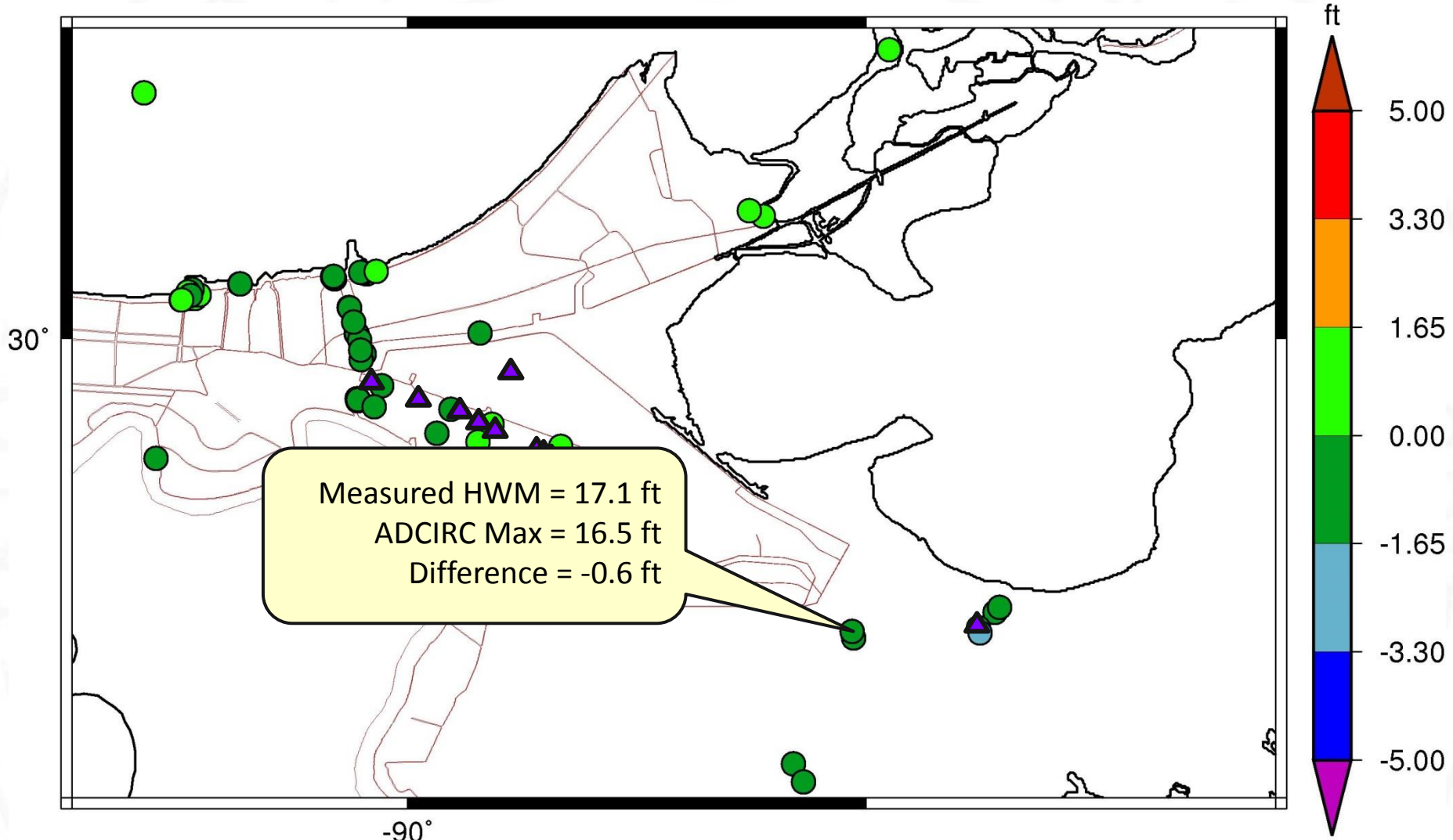


Figure 19e

▲ = Location of Plaintiff Property

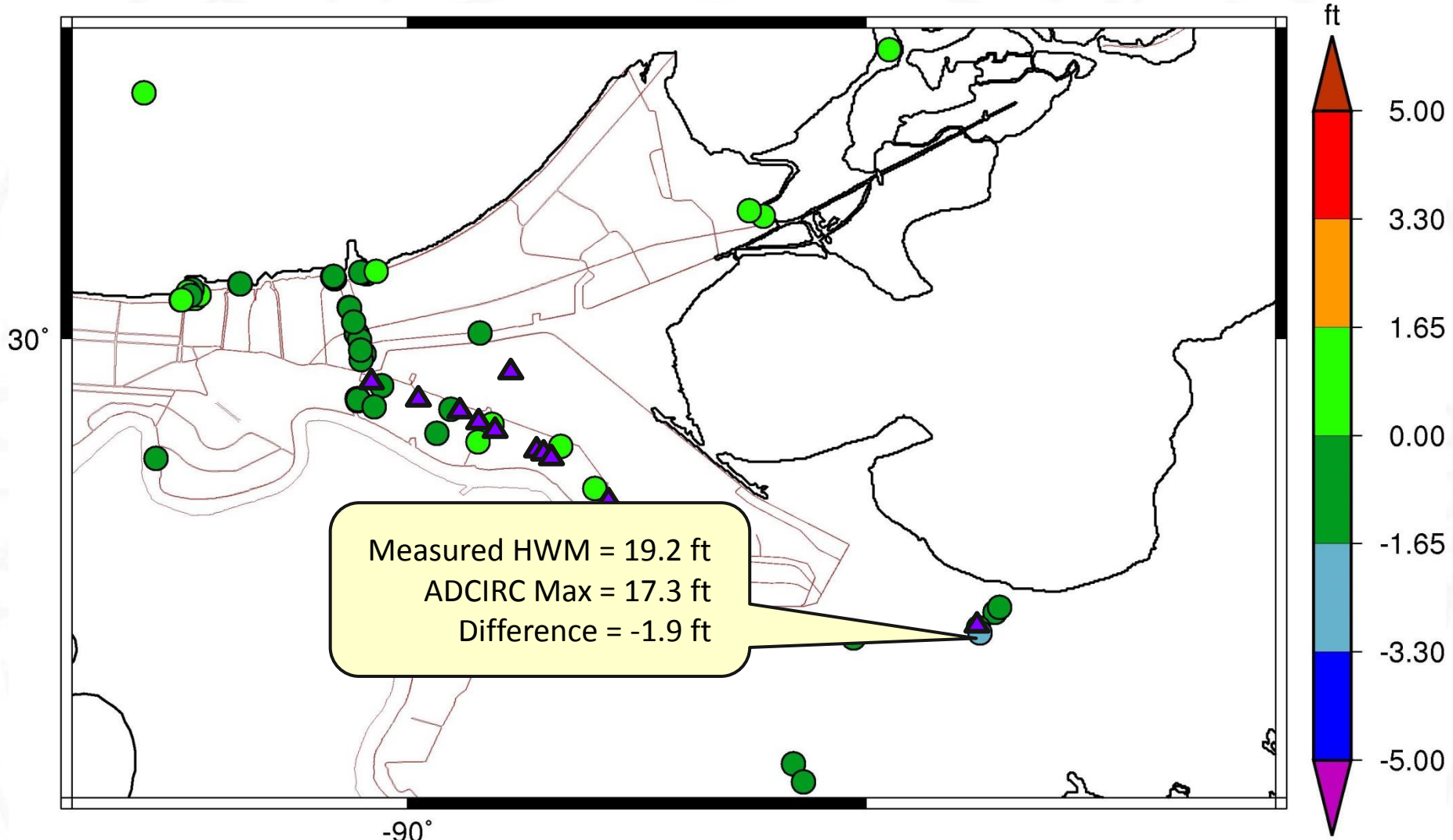


Figure 19f

▲ = Location of Plaintiff Property

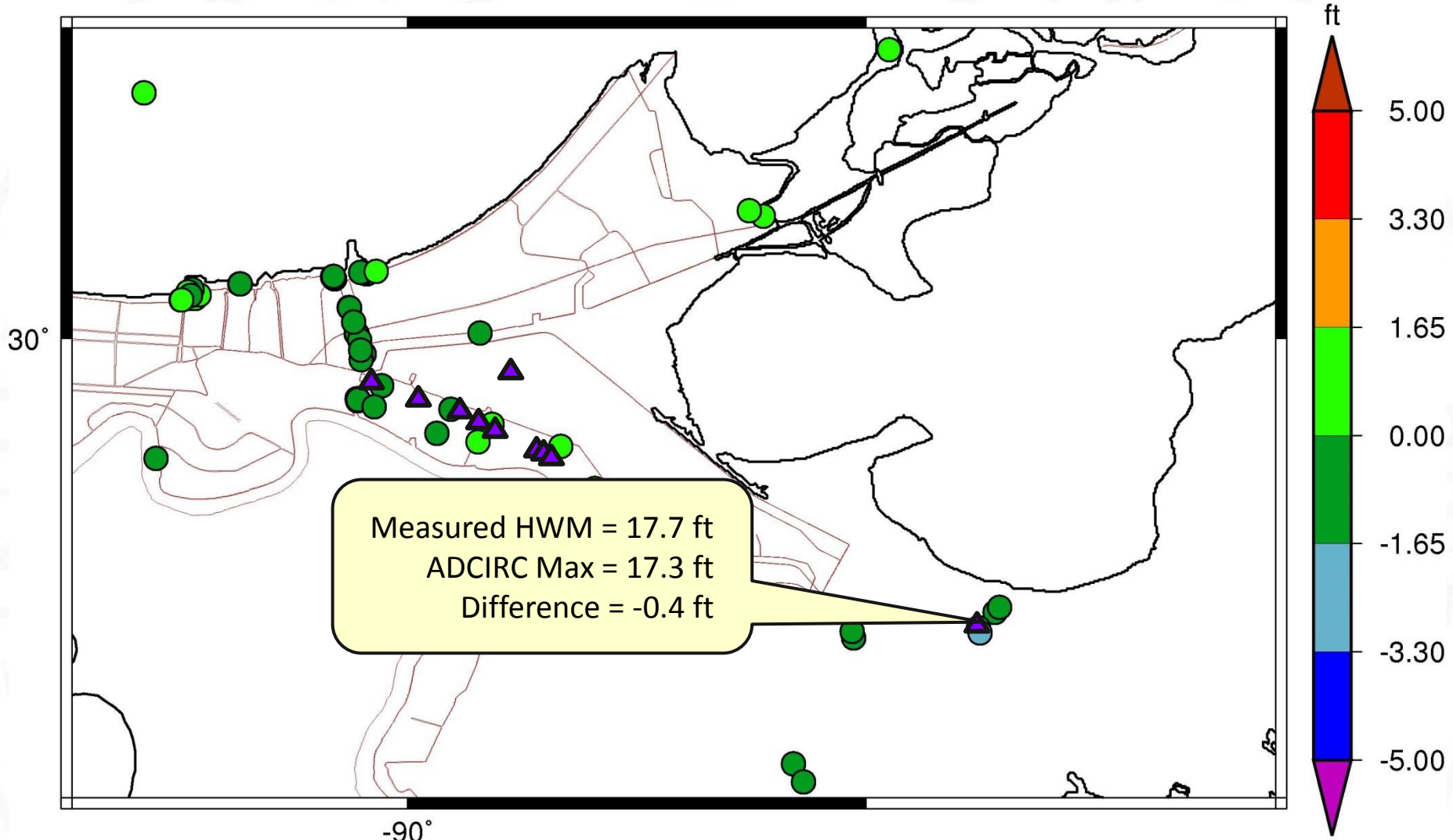


Figure 19g

▲ = Location of Plaintiff Property

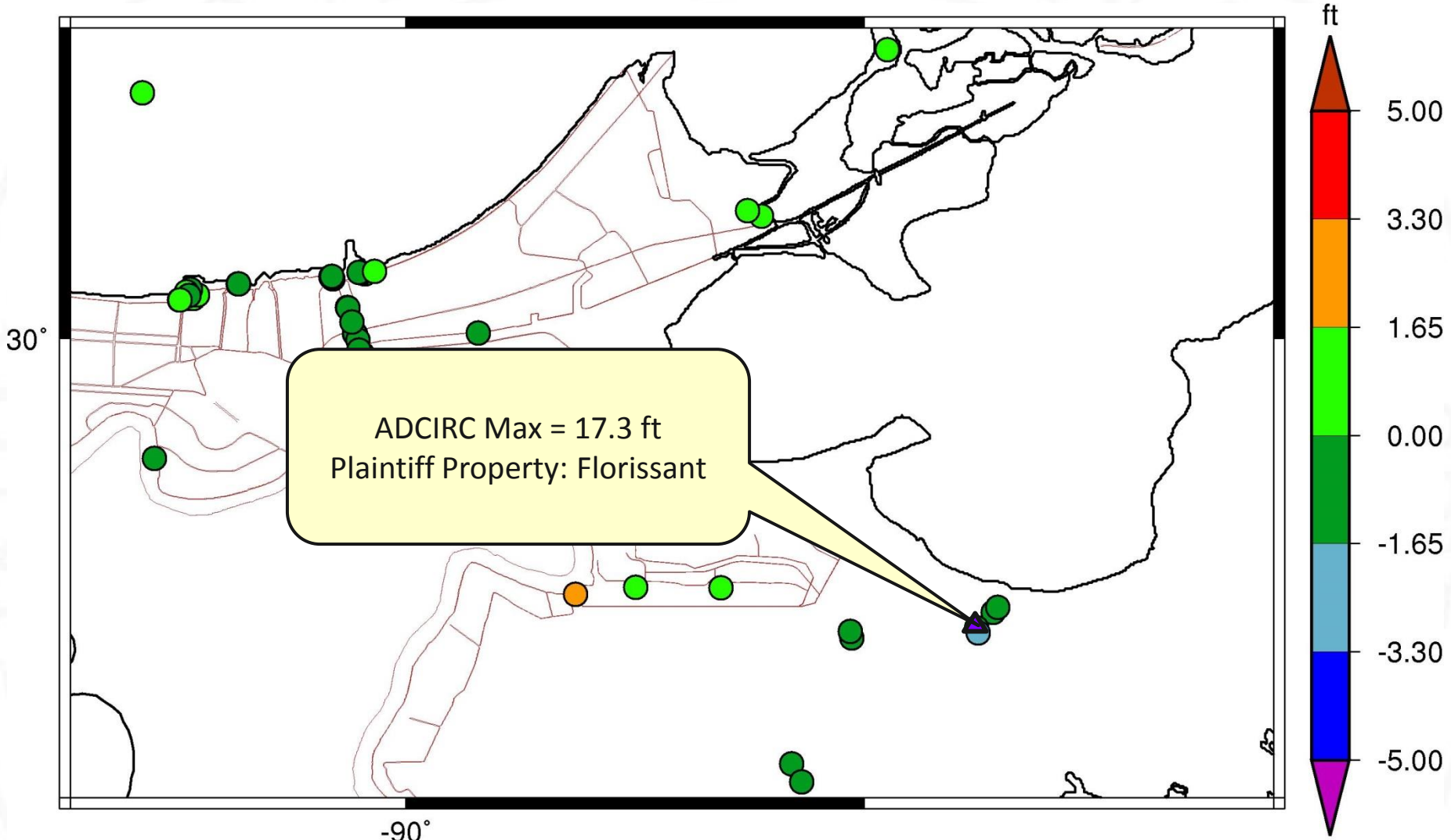


Figure 19h

▲ = Location of Plaintiff Property

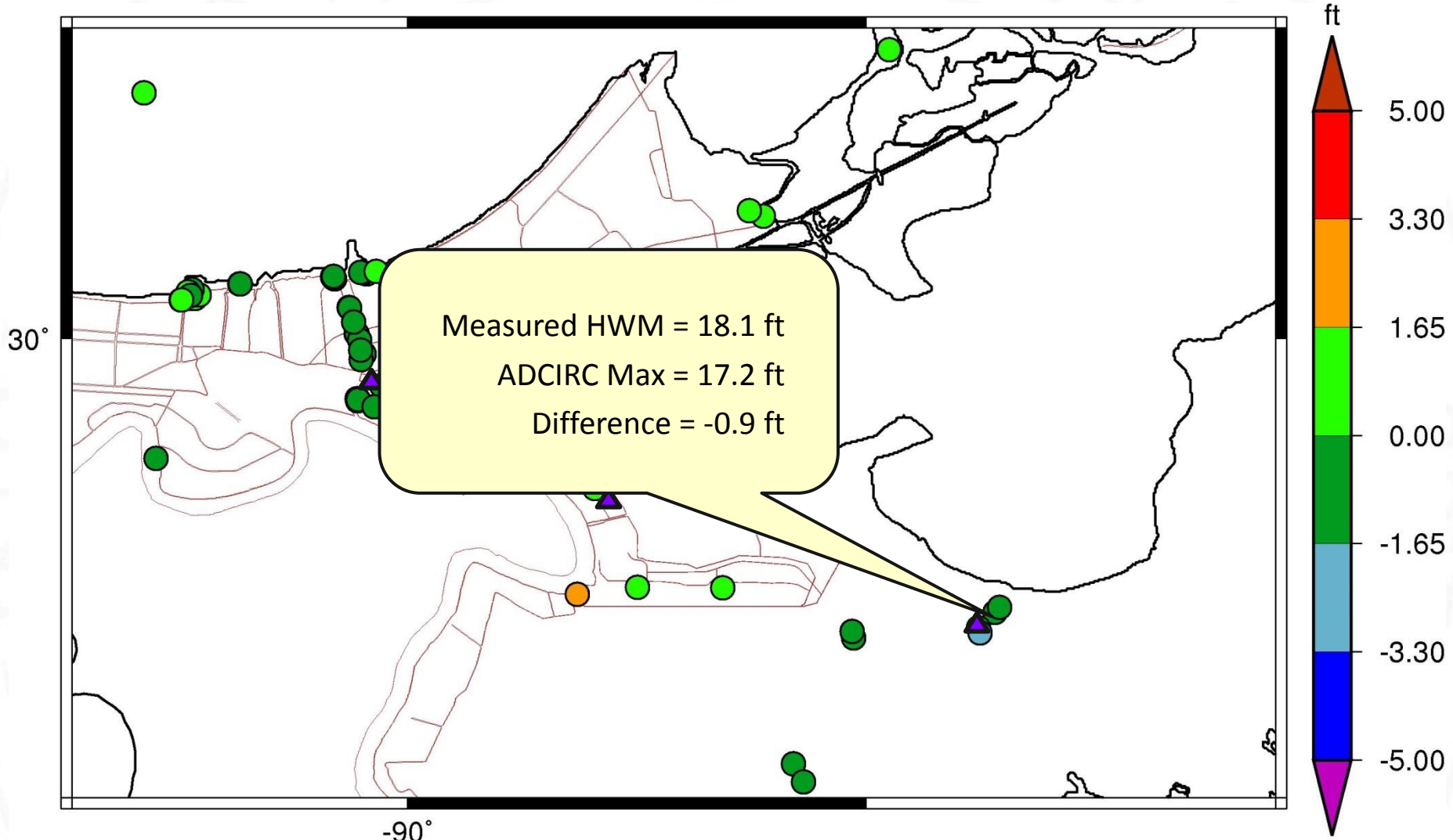


Figure 19i

▲ = Location of Plaintiff Property

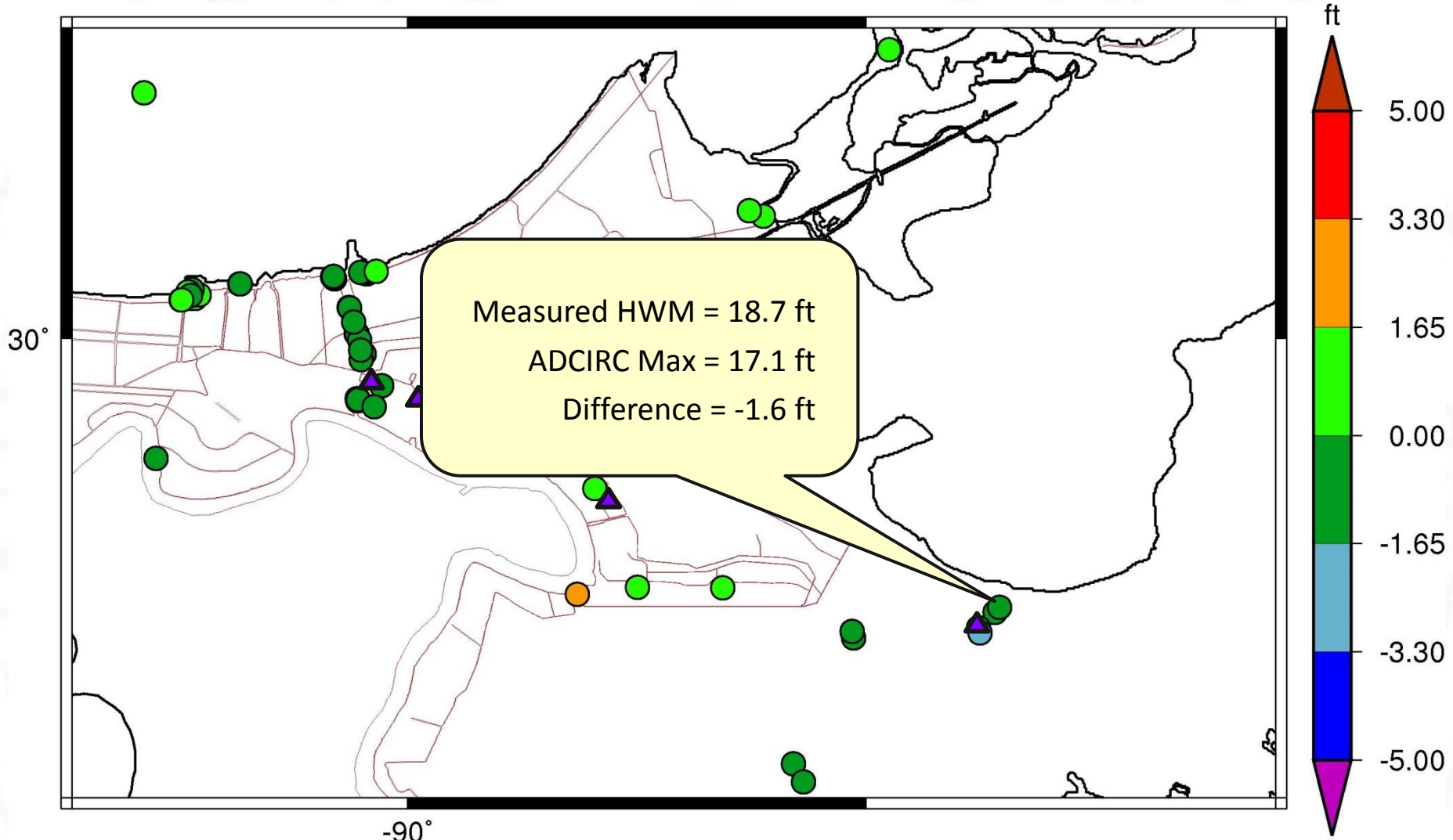


Figure 19j

▲ = Location of Plaintiff Property

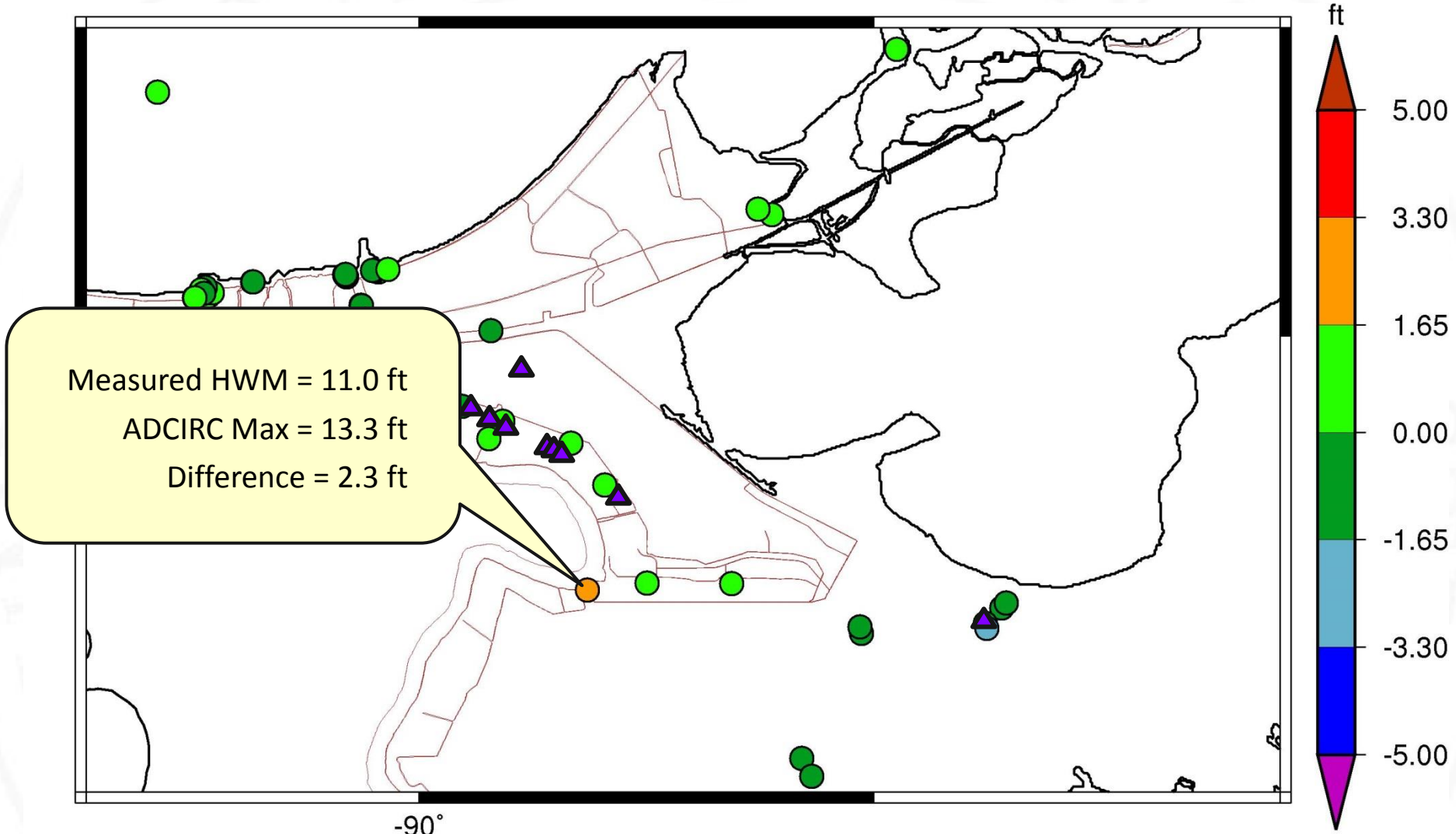


Figure 19k

▲ = Location of Plaintiff Property

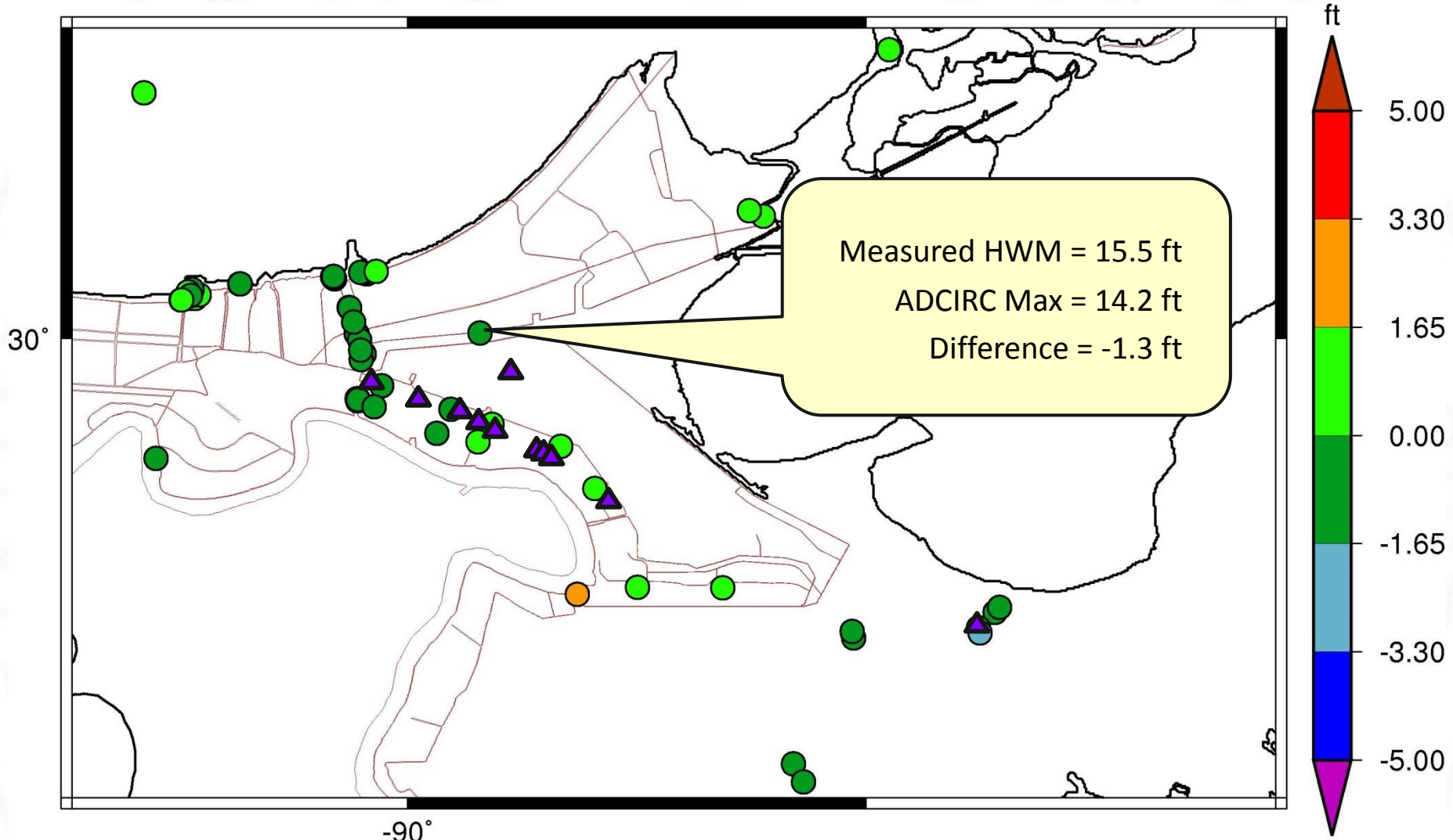


Figure 19I

▲ = Location of Plaintiff Property

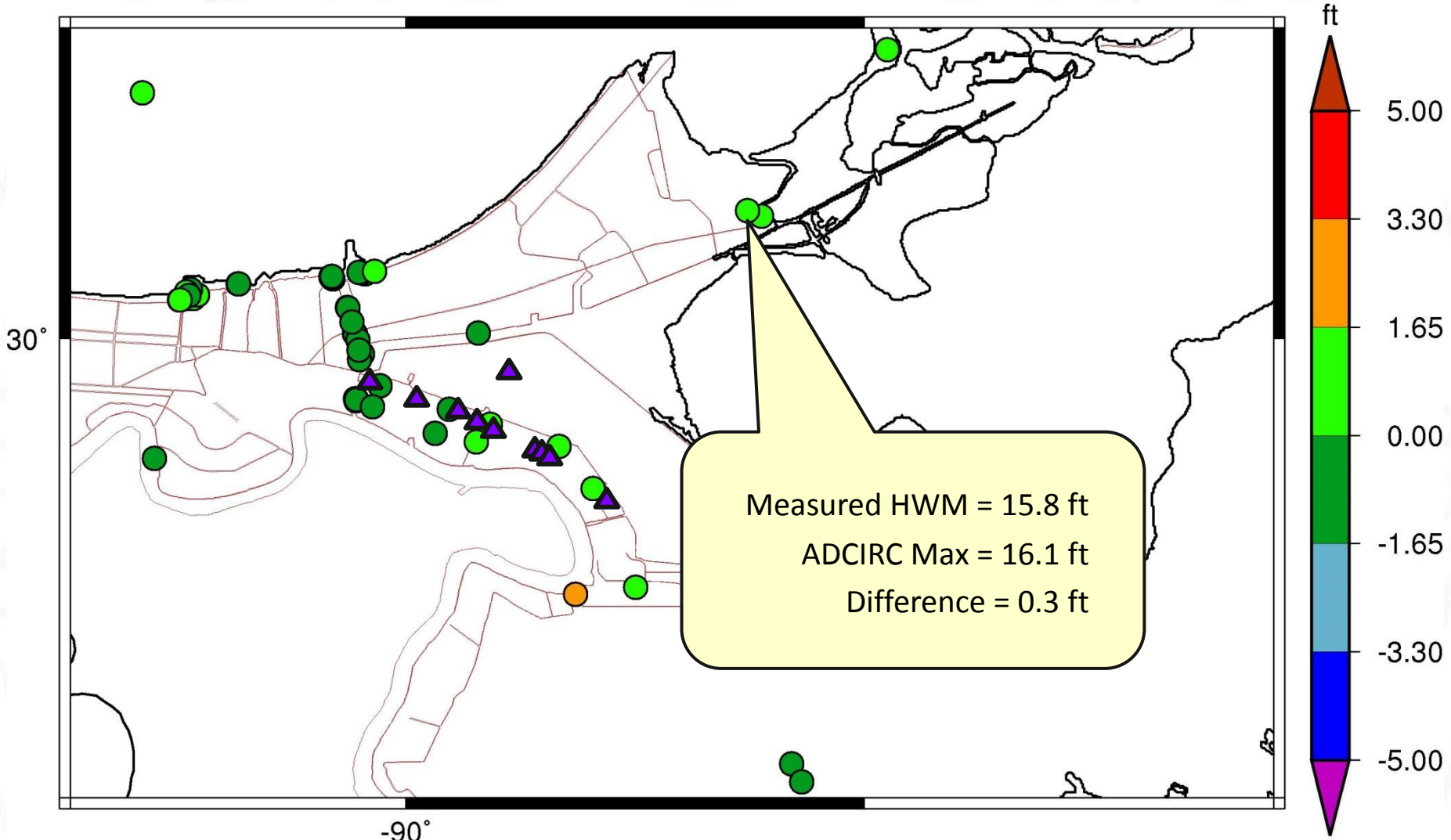


Figure 19m

▲ = Location of Plaintiff Property

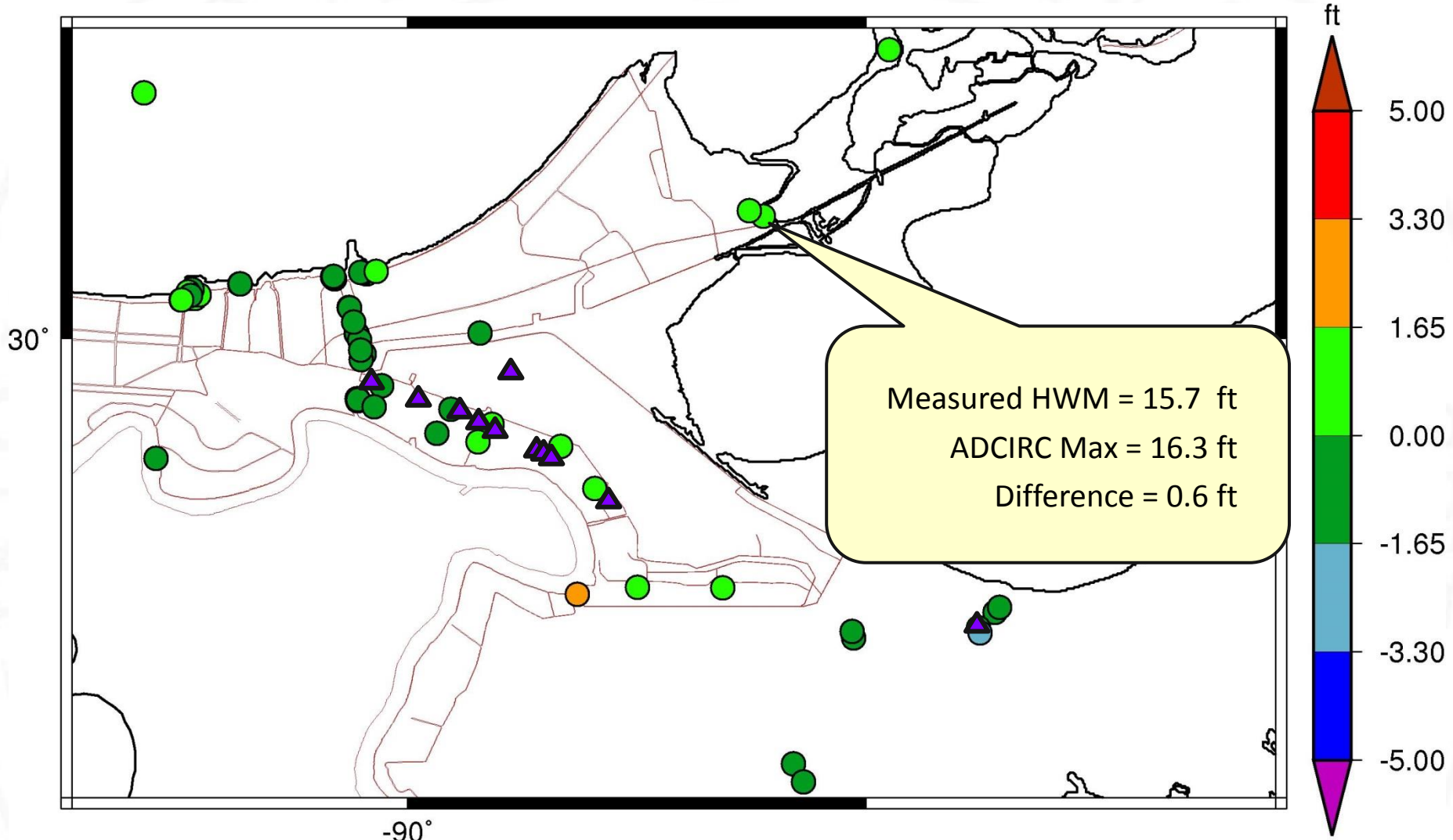


Figure 19n

▲ = Location of Plaintiff Property

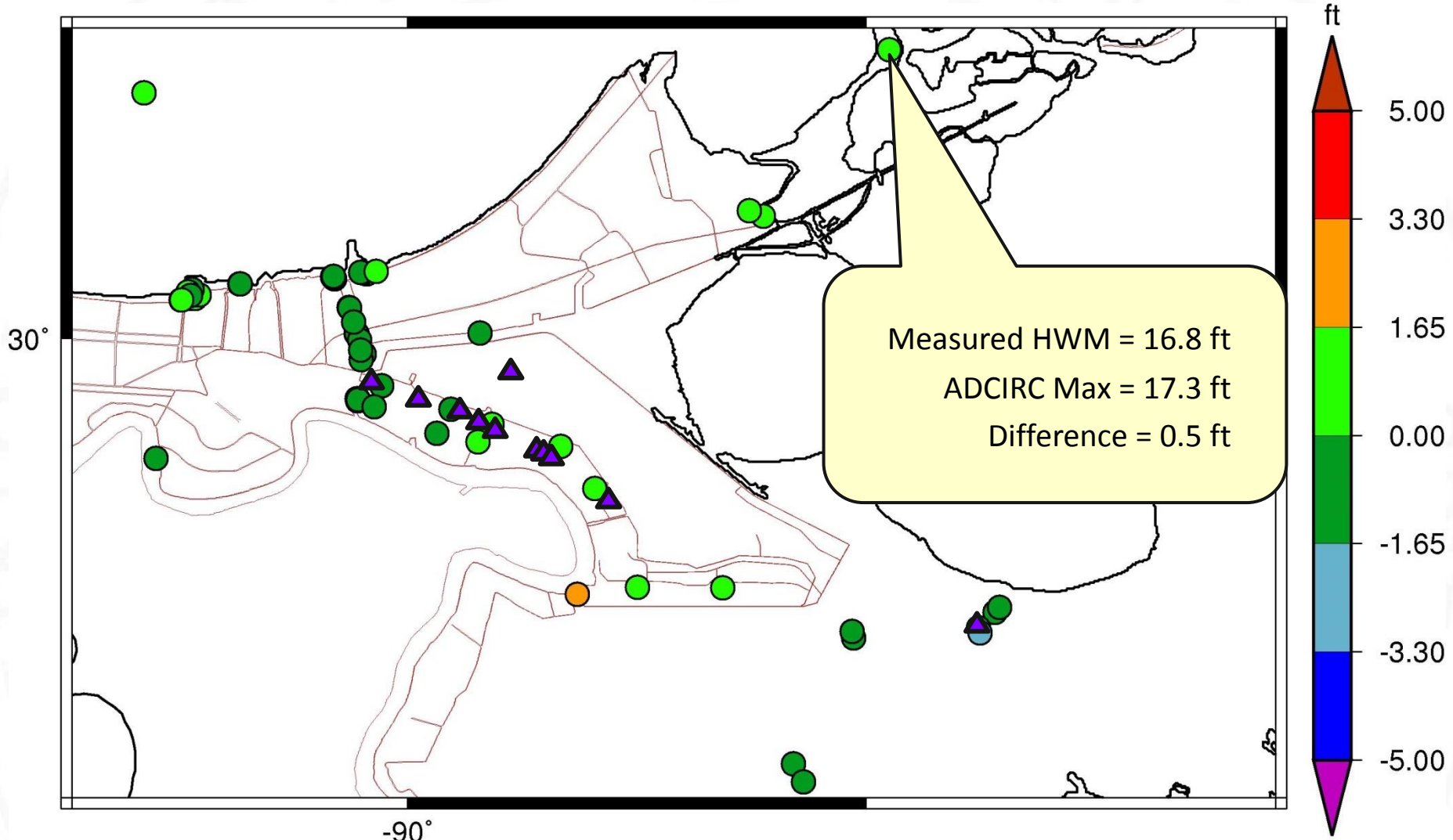


Figure 19o

▲ = Location of Plaintiff Property

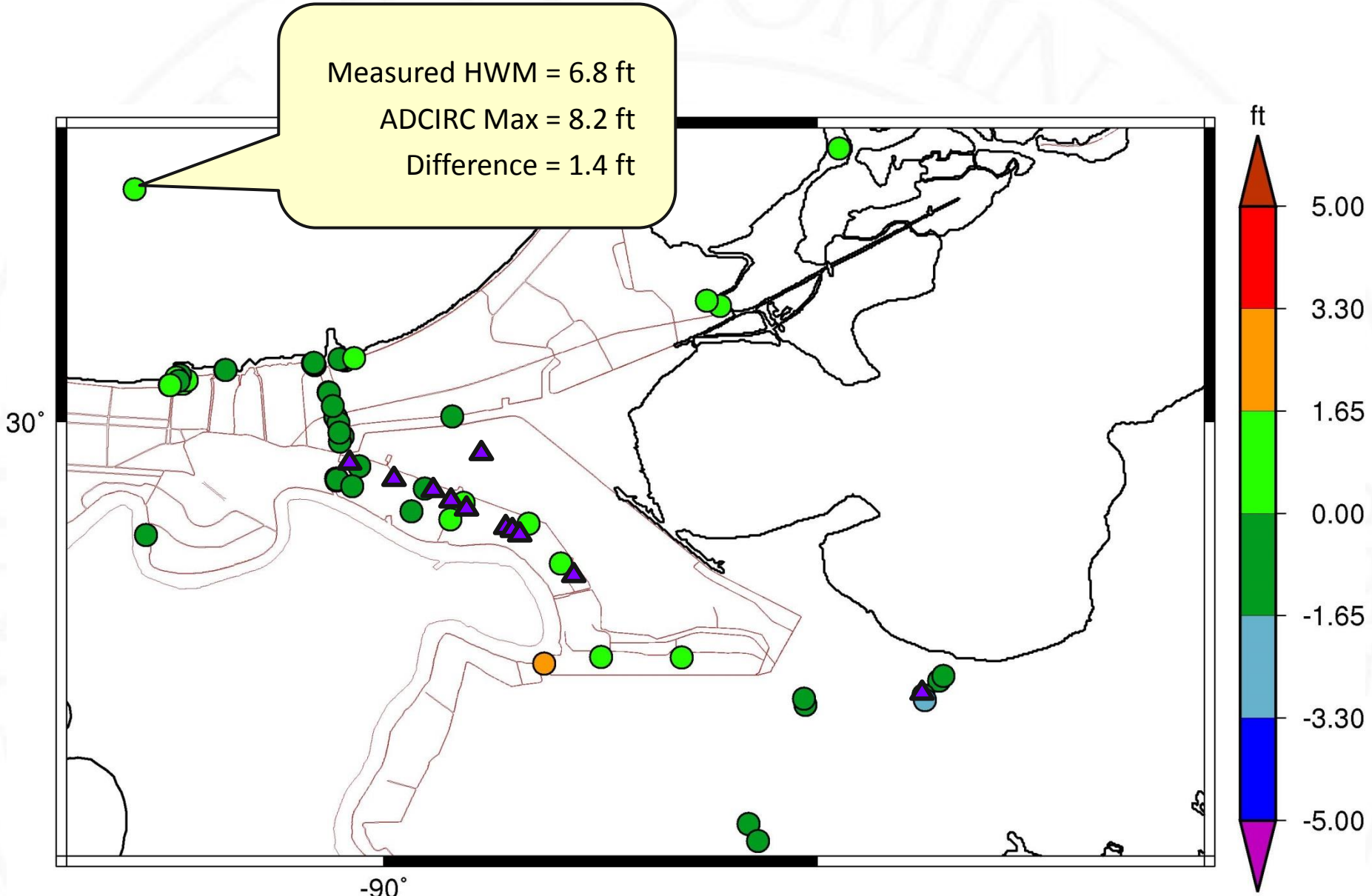


Figure 19p

▲ = Location of Plaintiff Property

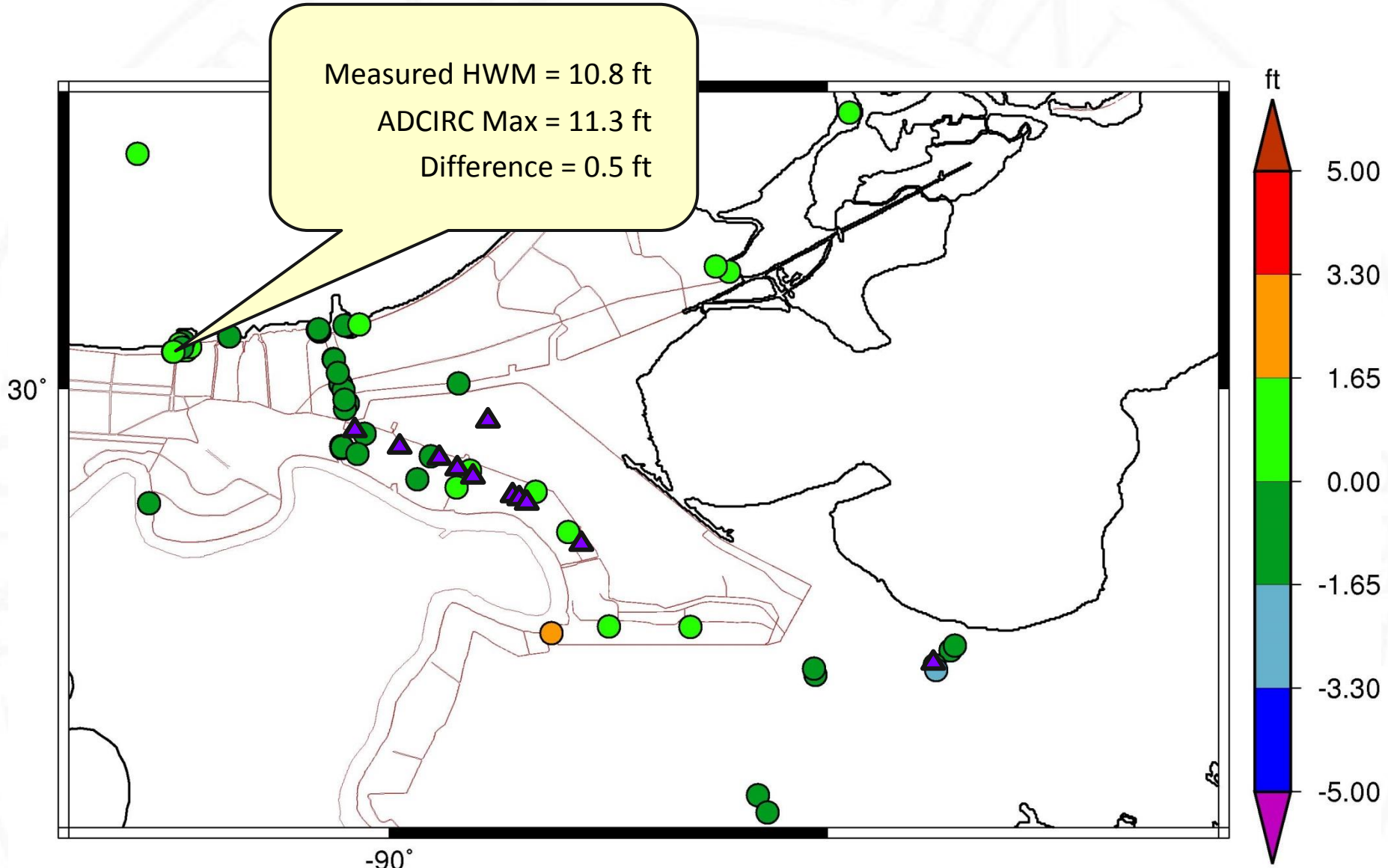


Figure 19q

▲ = Location of Plaintiff Property

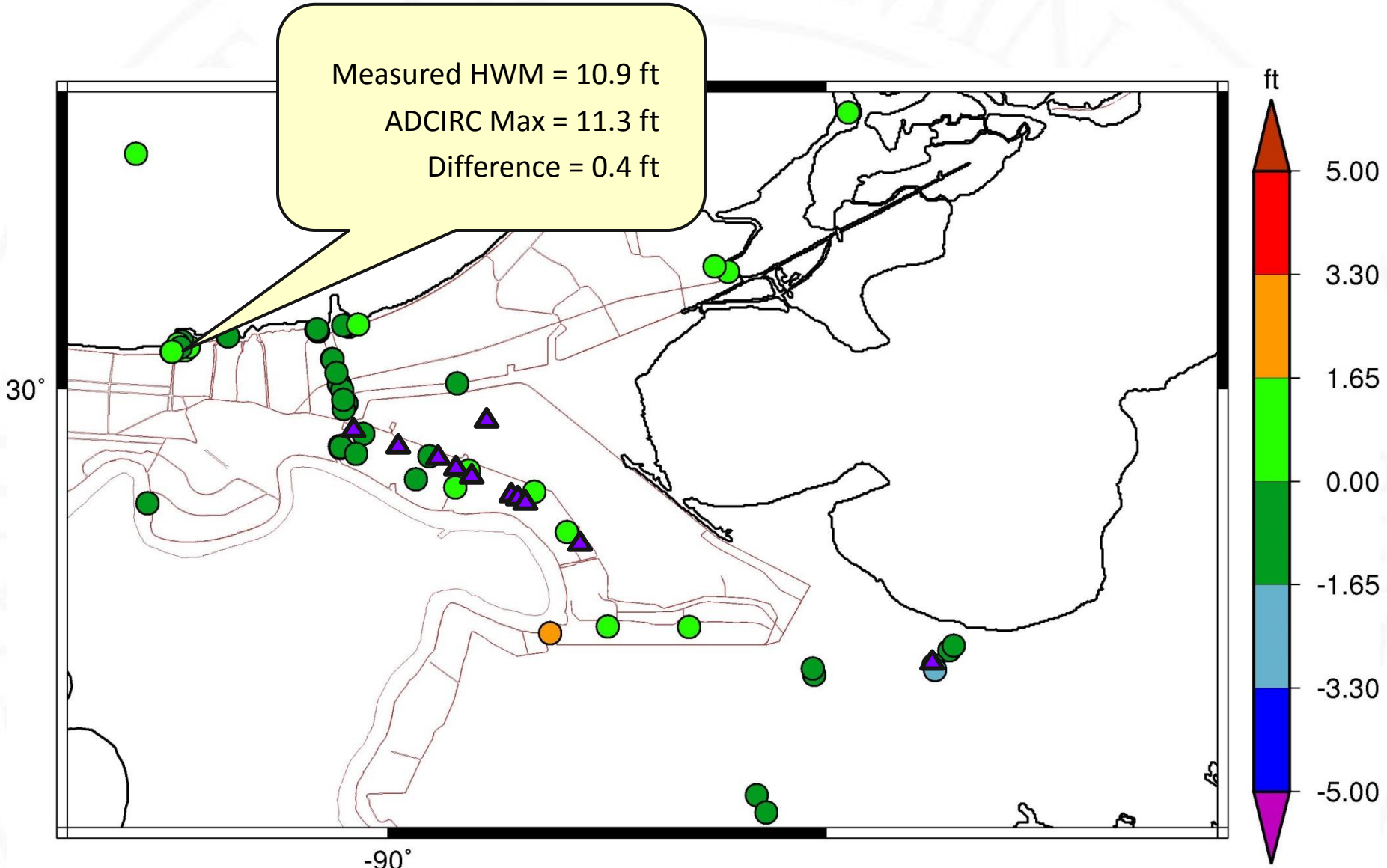


Figure 19r

▲ = Location of Plaintiff Property

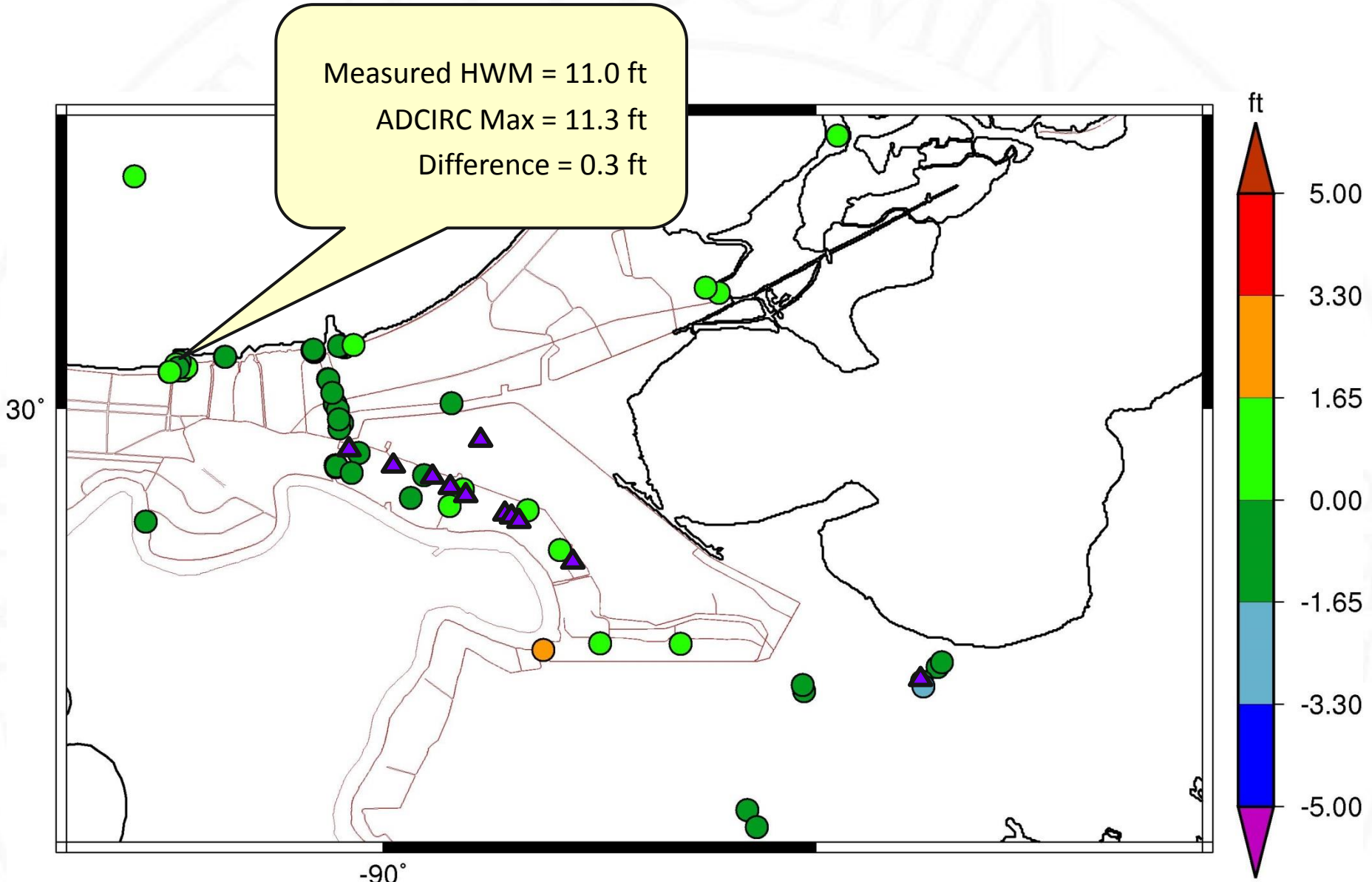


Figure 19s

▲ = Location of Plaintiff Property

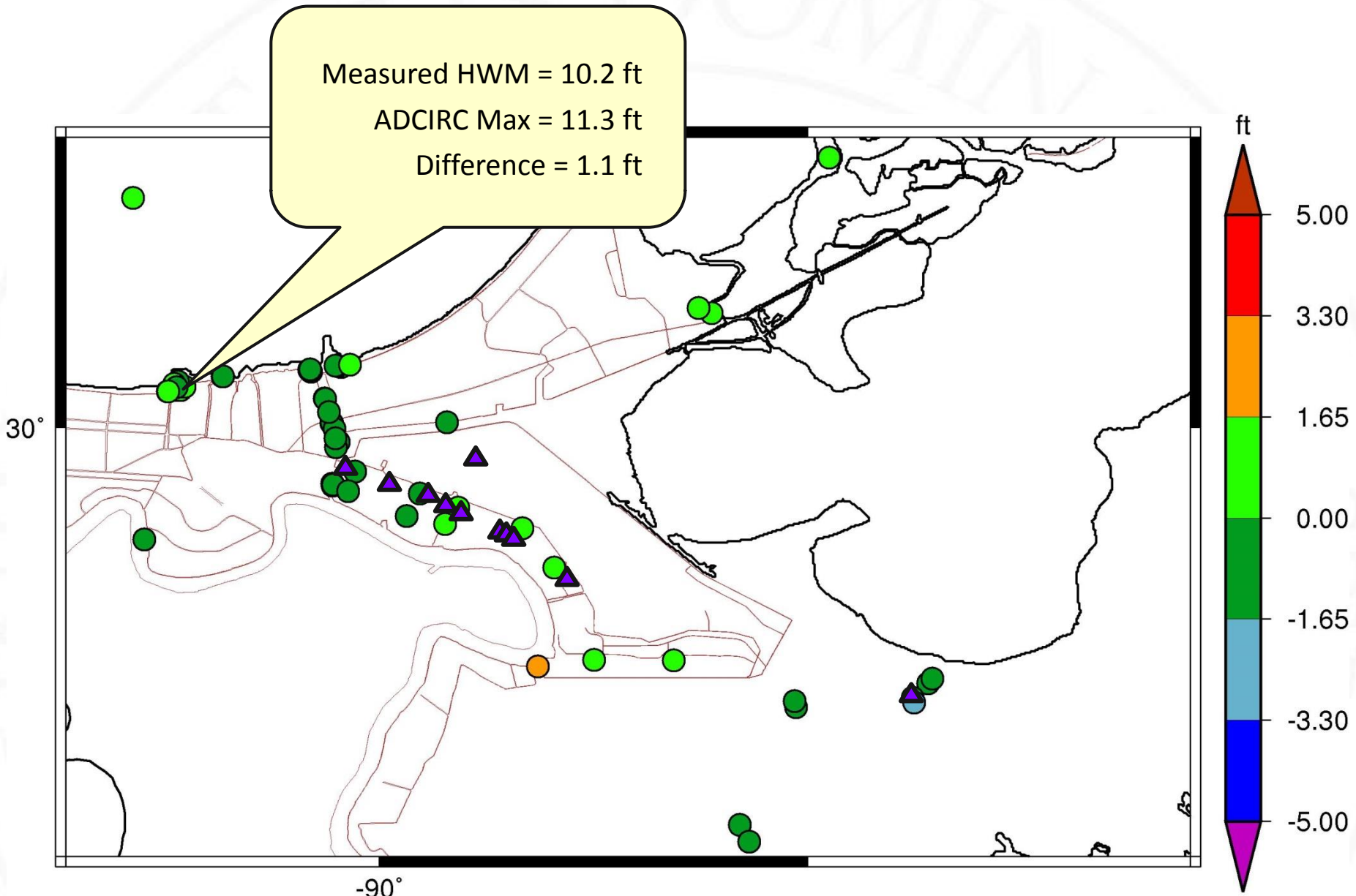


Figure 19t

▲ = Location of Plaintiff Property

Measured HWM = 10.8 ft
ADCIRC Max = 11.3 ft
Difference = 0.5 ft

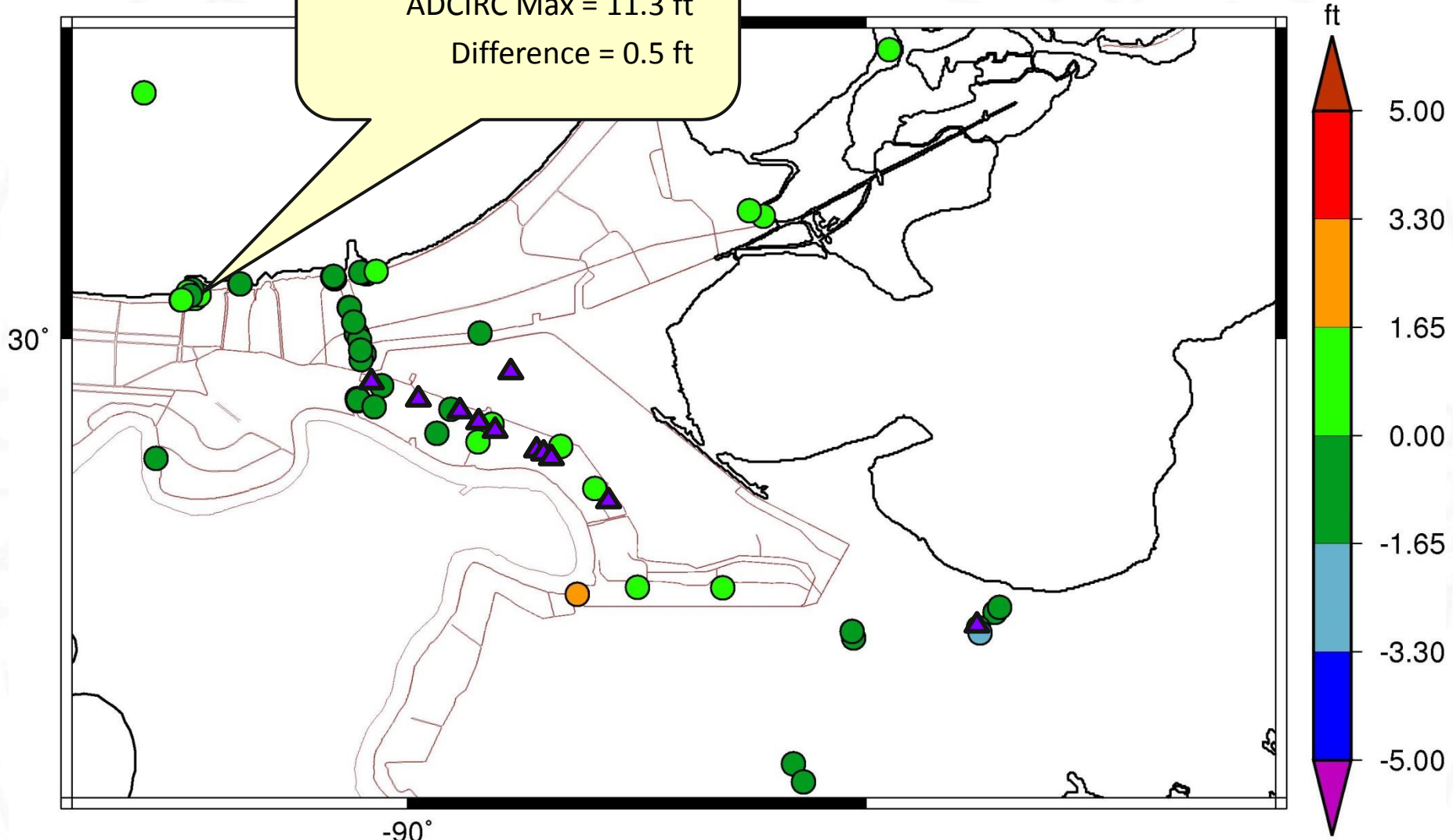


Figure 19u

▲ = Location of Plaintiff Property

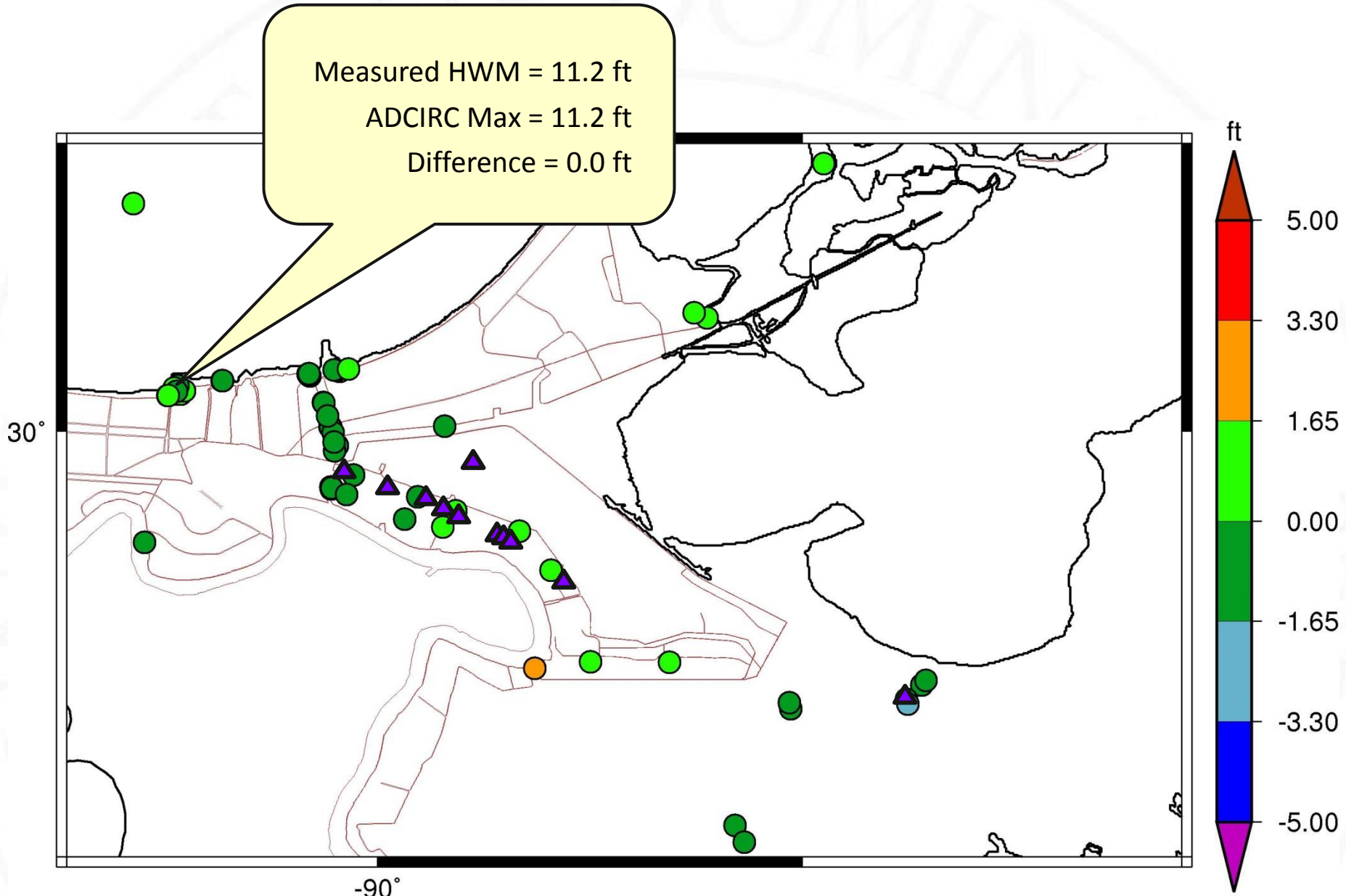


Figure 19v

▲ = Location of Plaintiff Property

Measured HWM = 11.8 ft
ADCIRC Max = 11.2 ft
Difference = -0.6 ft

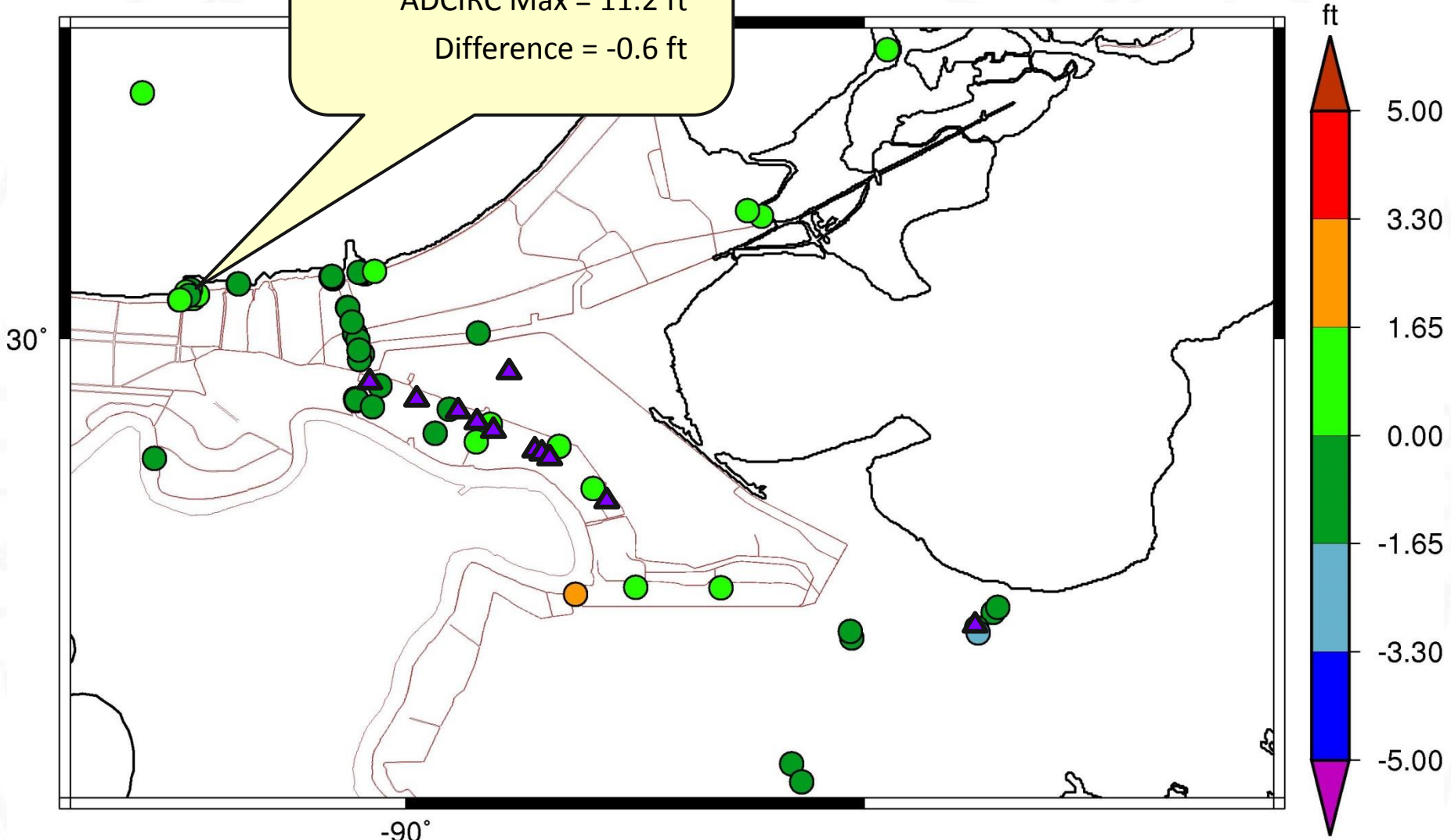


Figure 19w

▲ = Location of Plaintiff Property

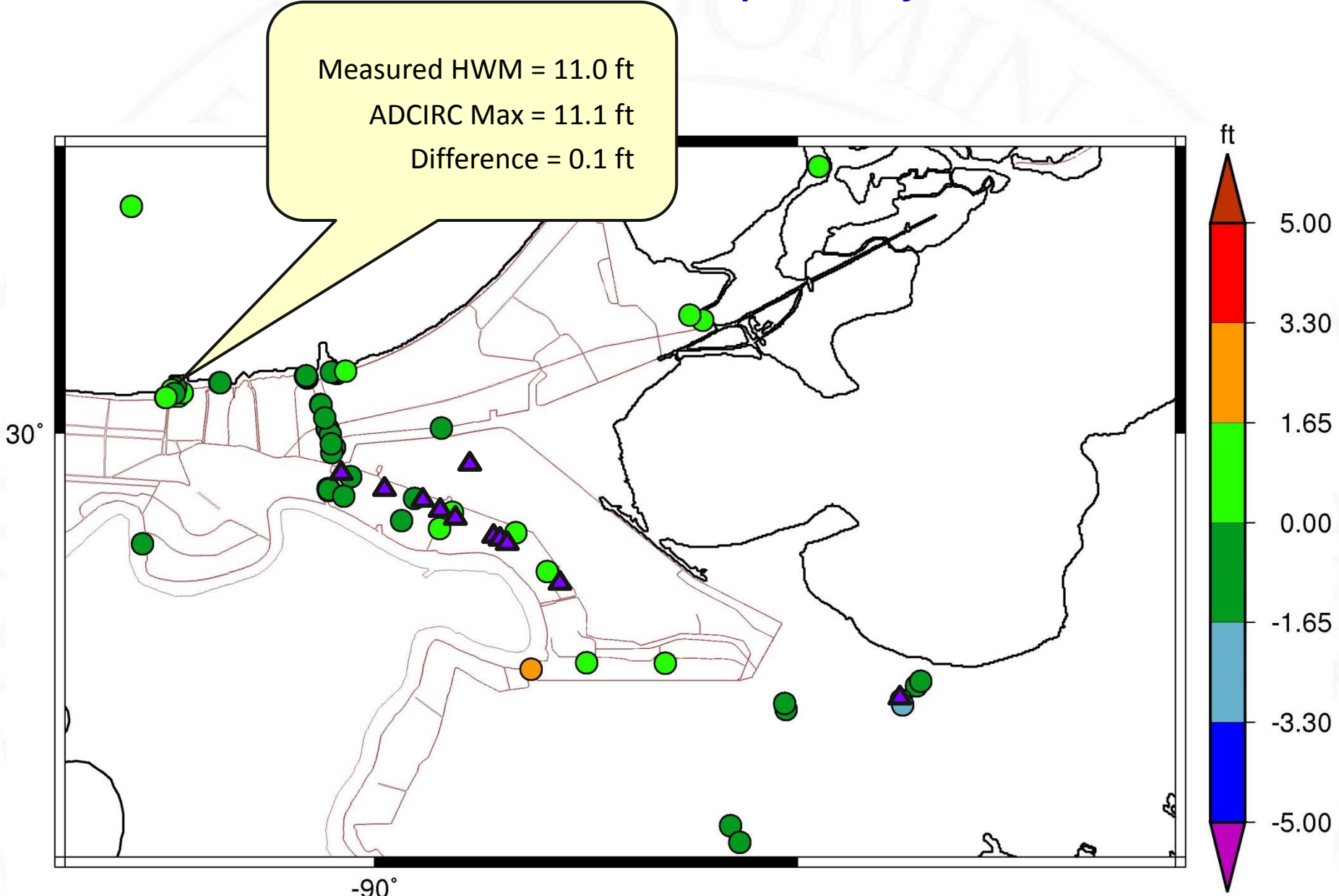


Figure 19x

▲ = Location of Plaintiff Property

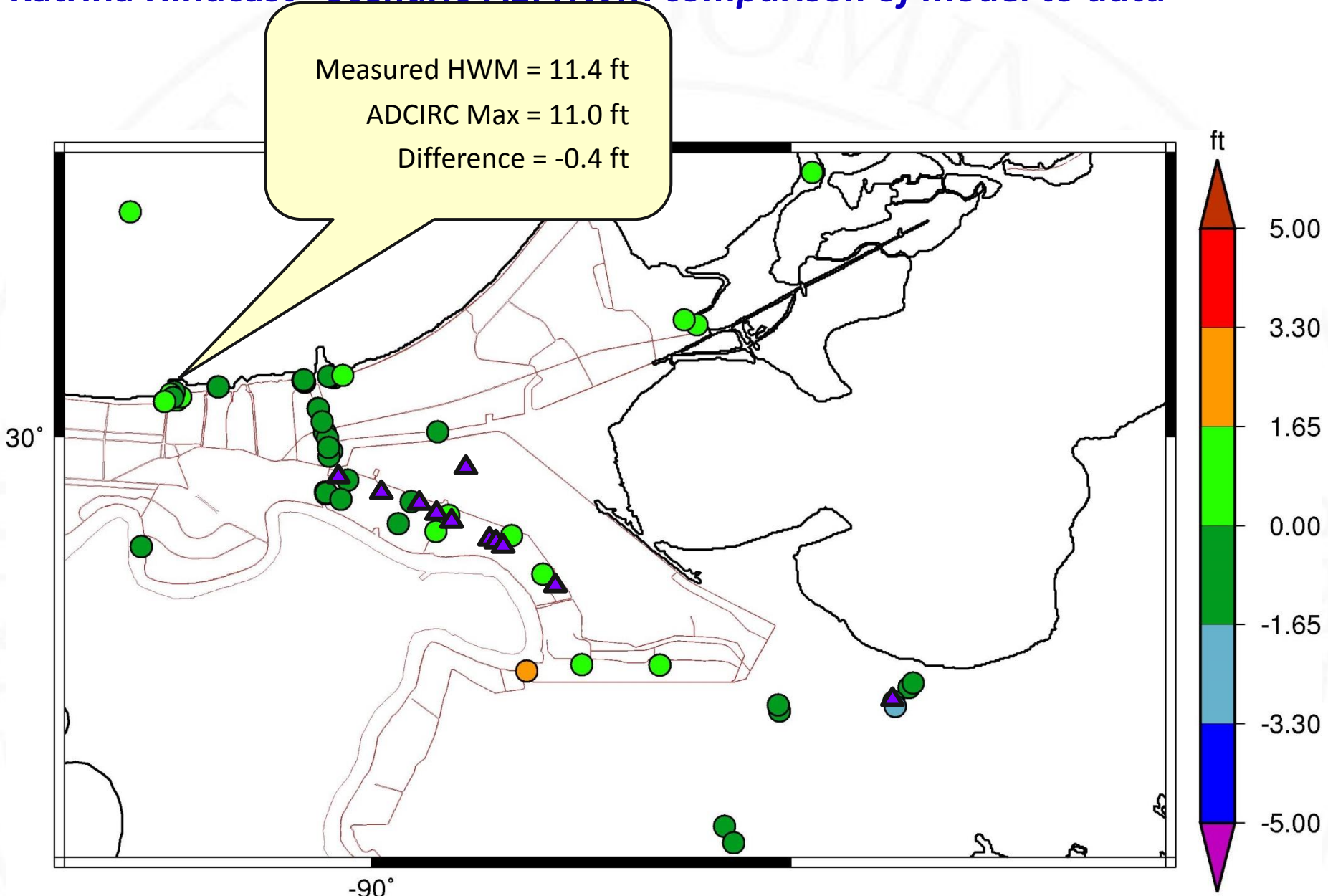


Figure 19y

▲ = Location of Plaintiff Property

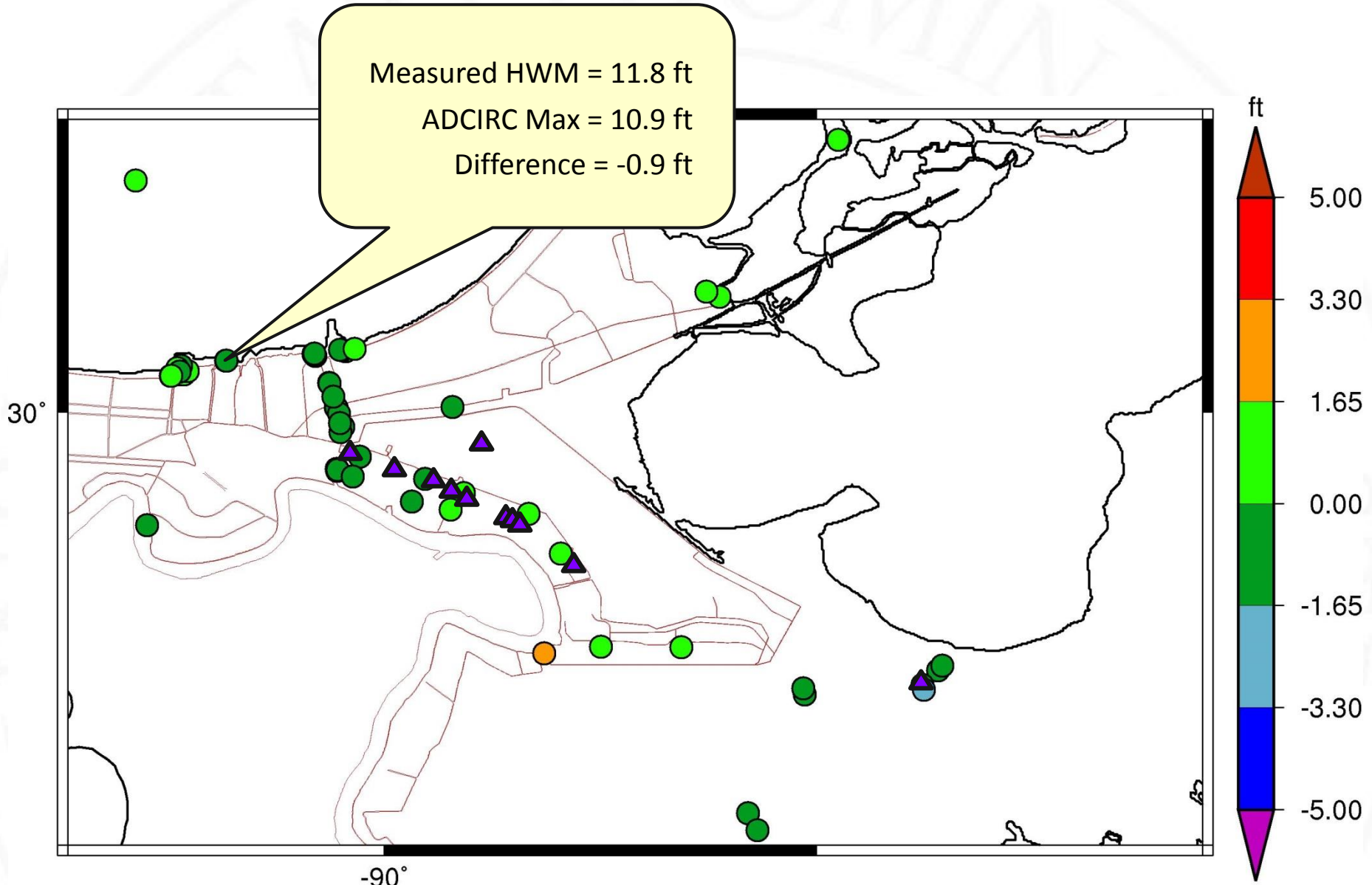


Figure 19z

▲ = Location of Plaintiff Property

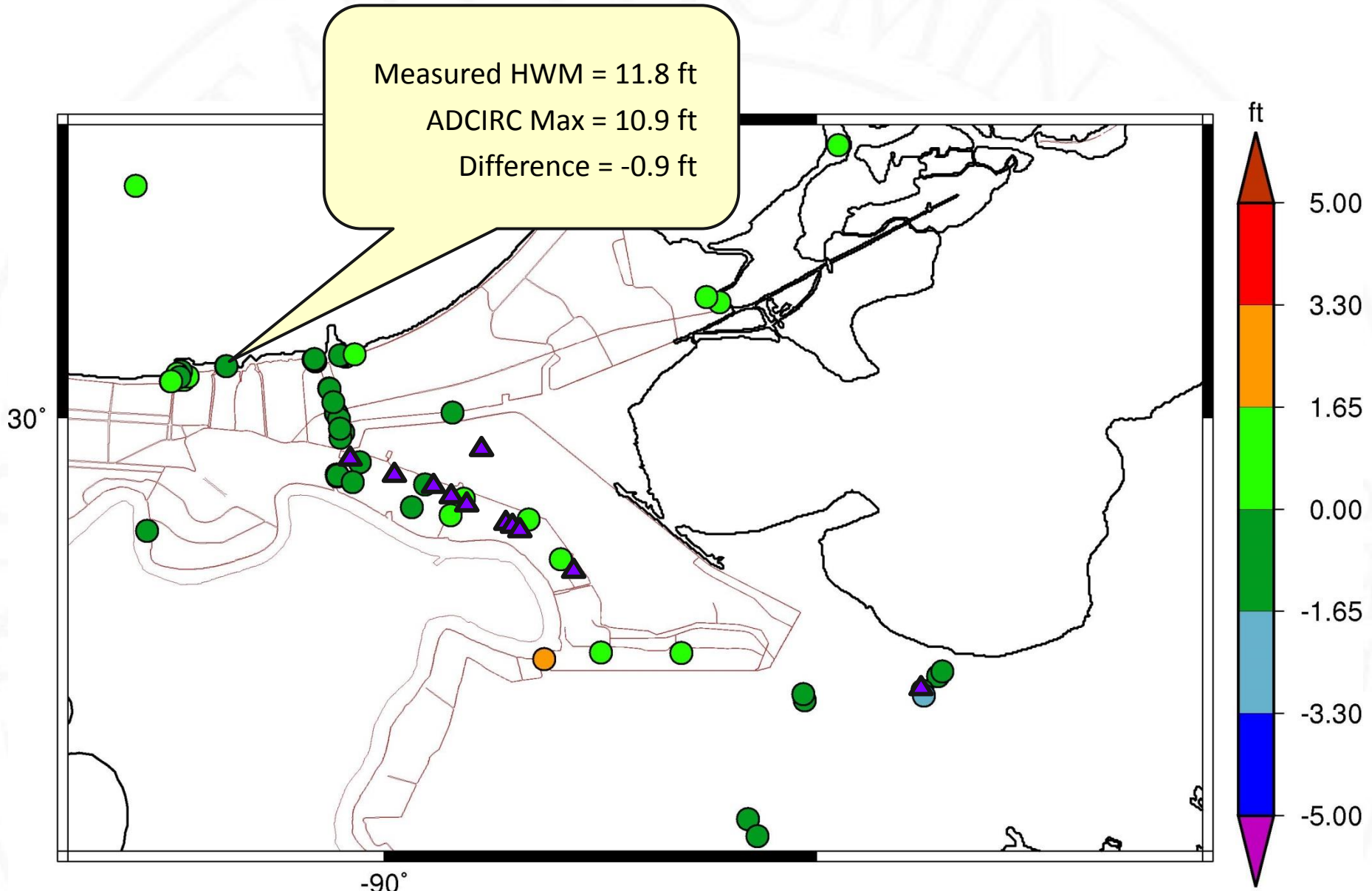


Figure 19za

▲ = Location of Plaintiff Property

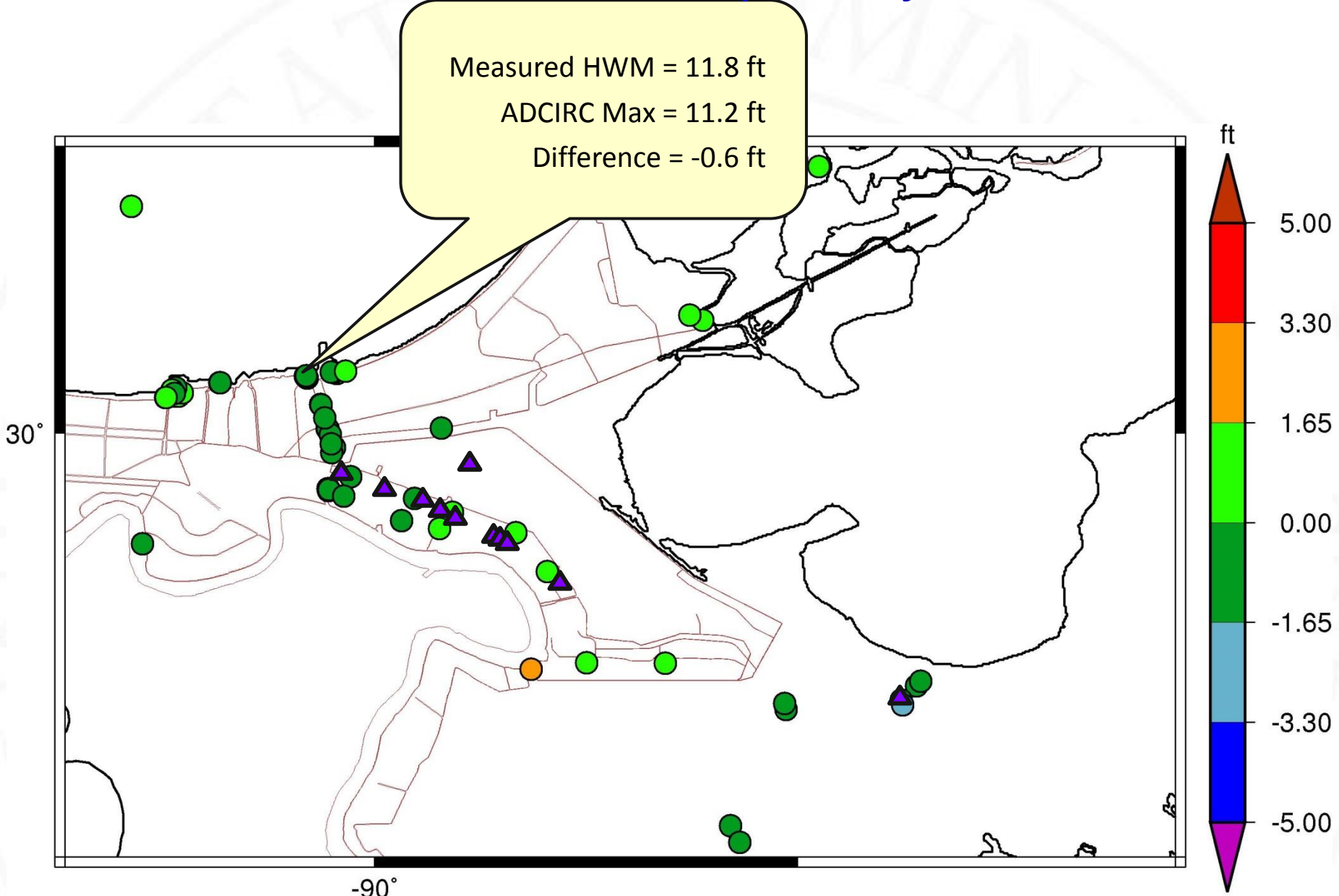


Figure 19zb

▲ = Location of Plaintiff Property

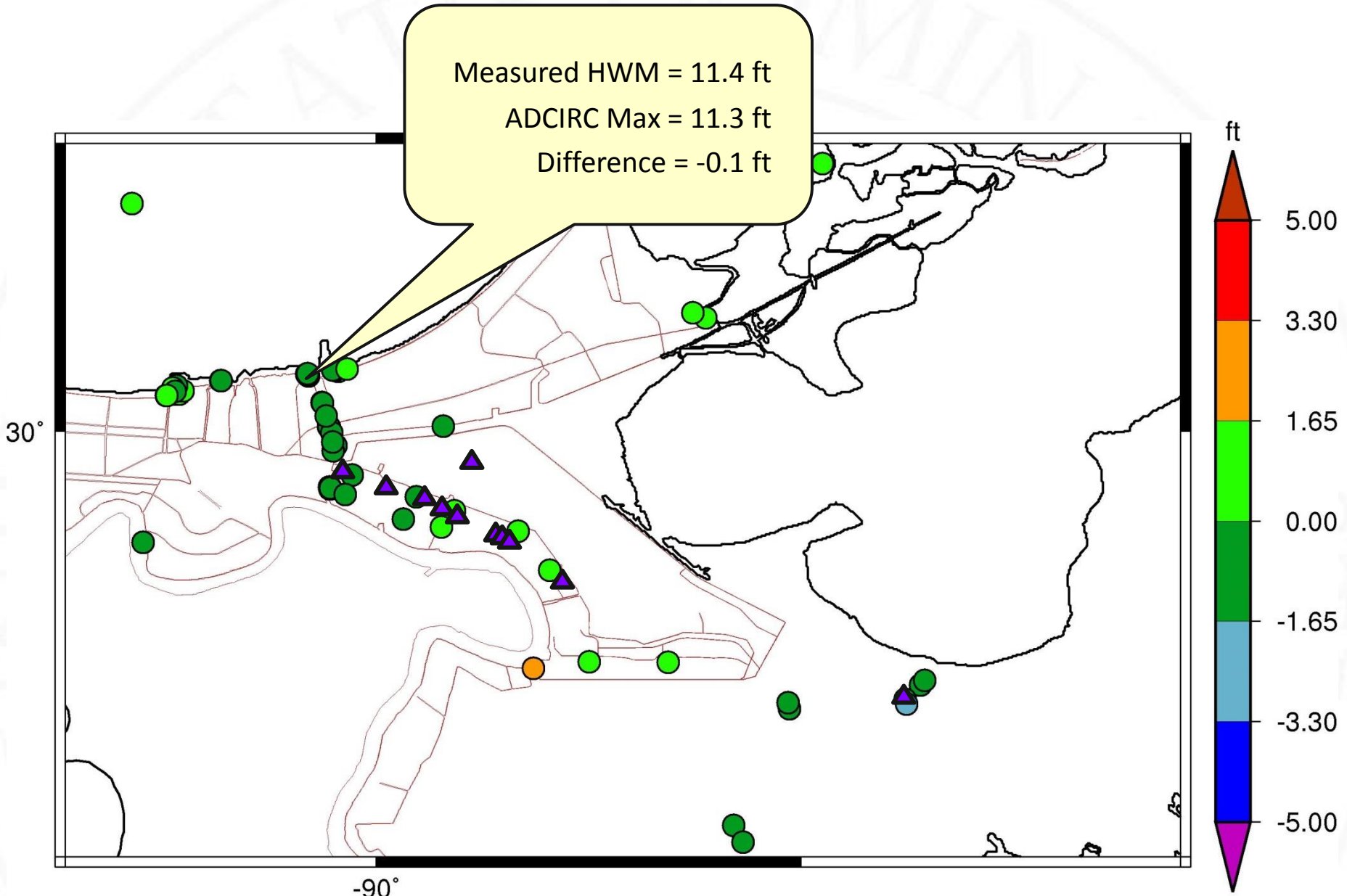


Figure 19zc

▲ = Location of Plaintiff Property

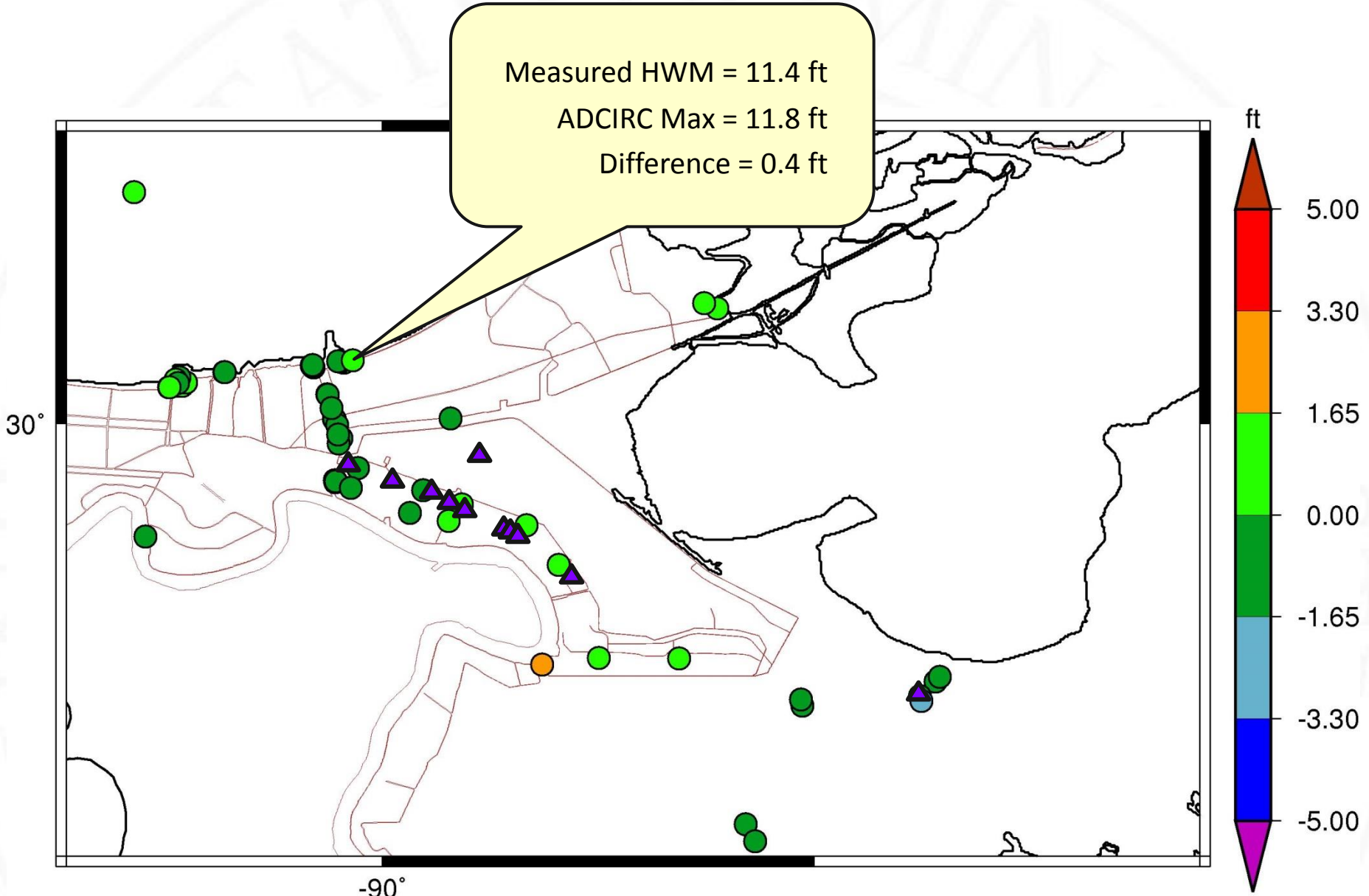


Figure 19zd

▲ = Location of Plaintiff Property

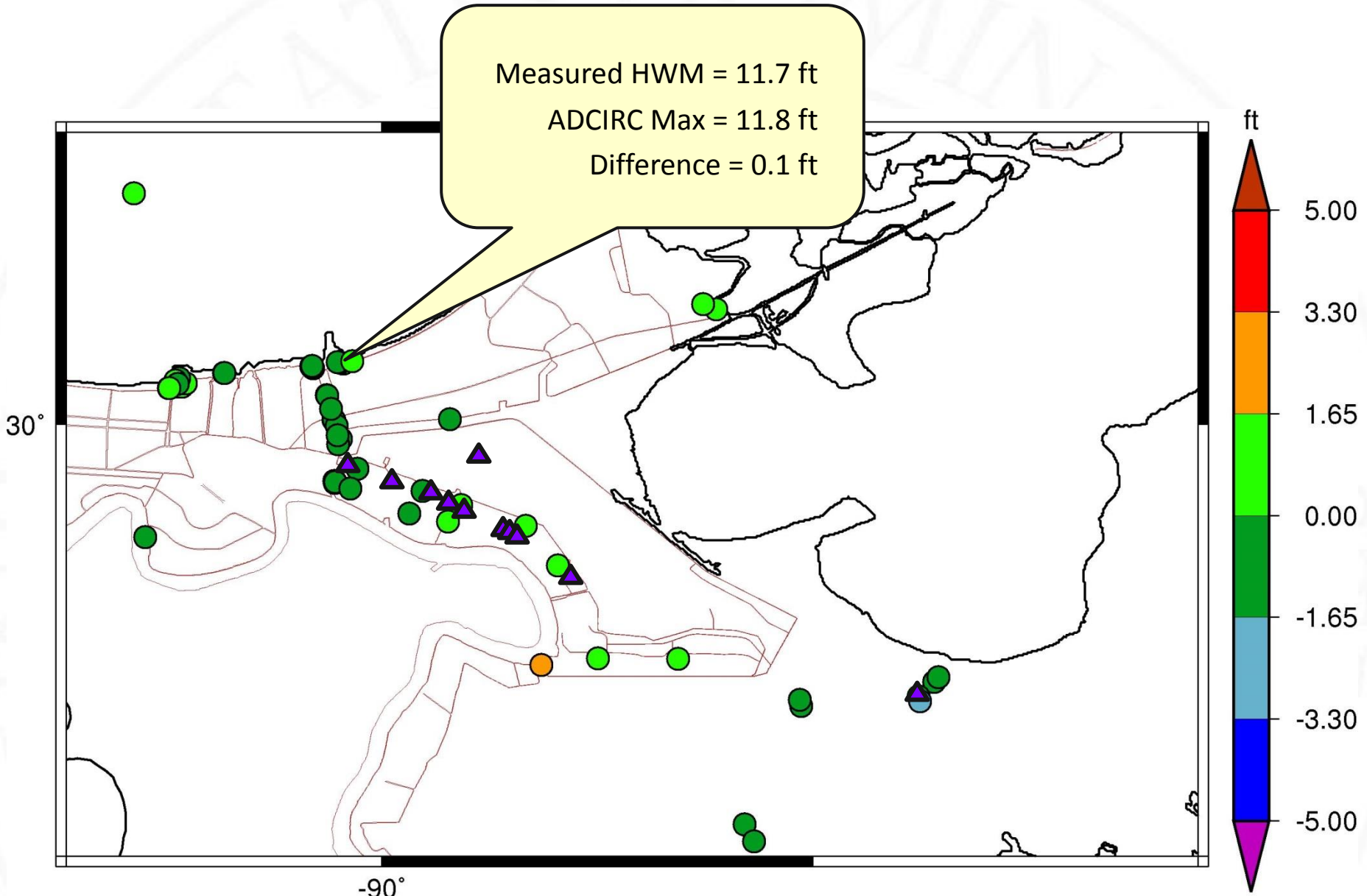


Figure 19ze

▲ = Location of Plaintiff Property

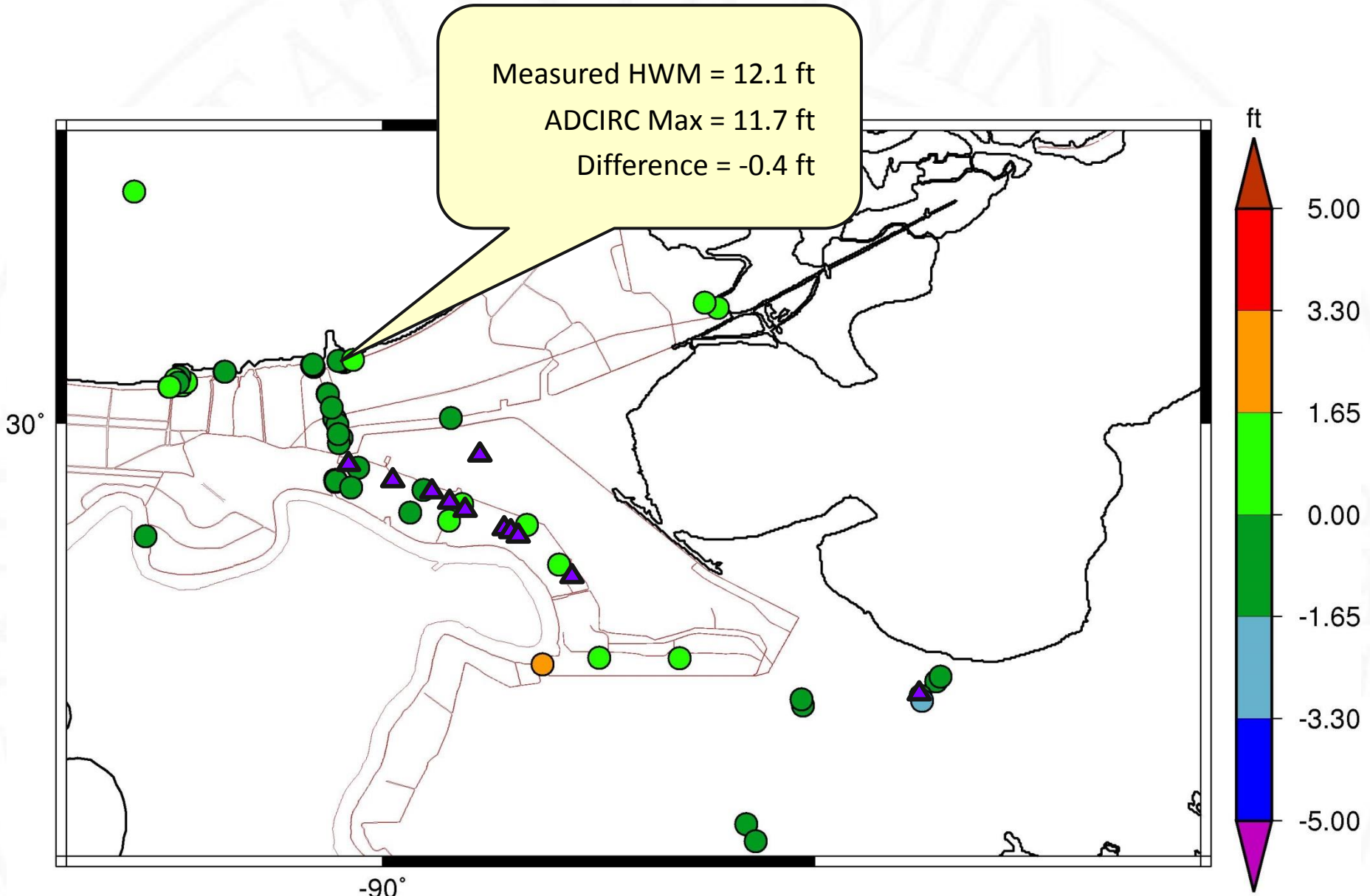


Figure 19zf

▲ = Location of Plaintiff Property

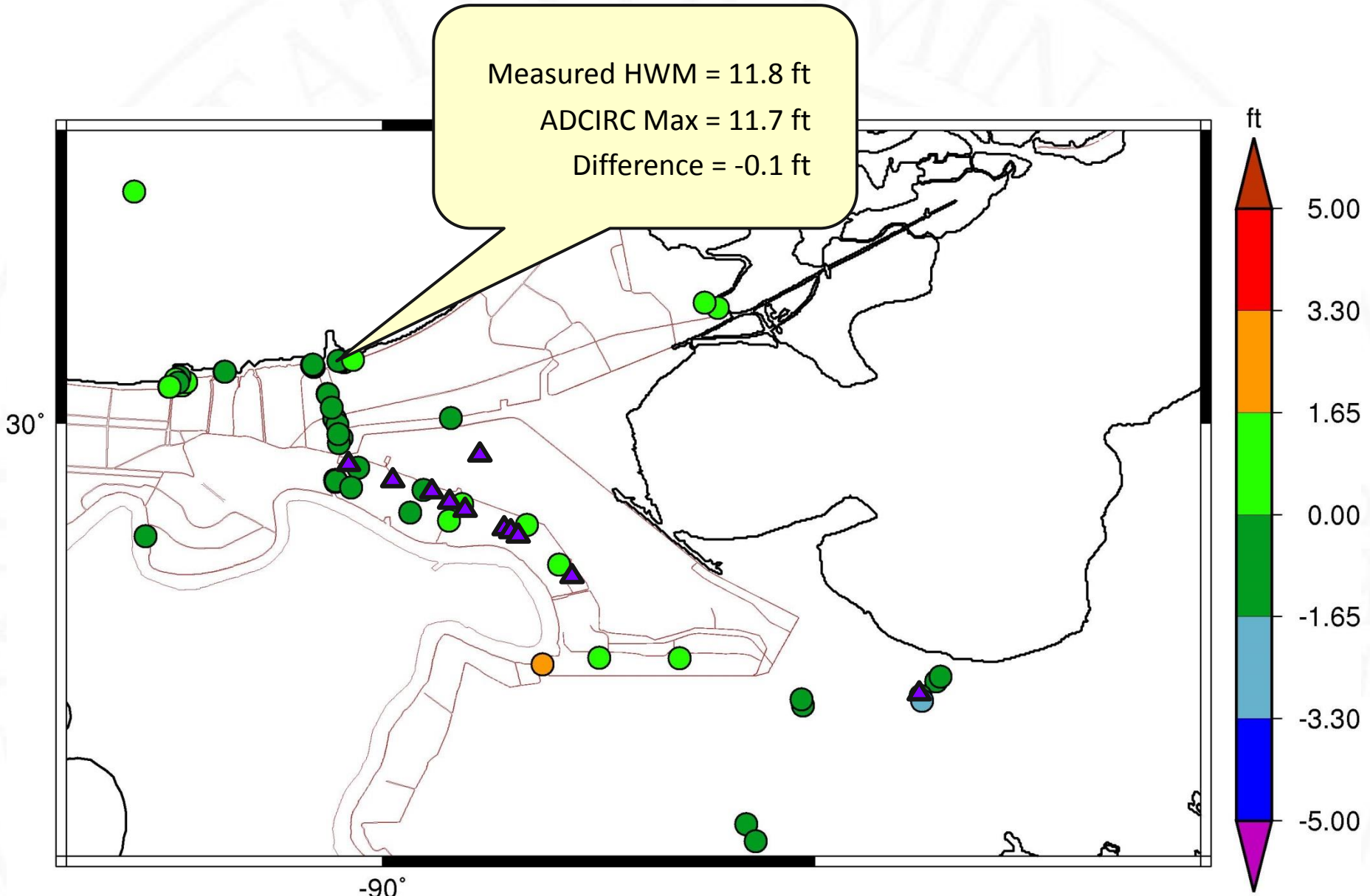


Figure 19zg

▲ = Location of Plaintiff Property

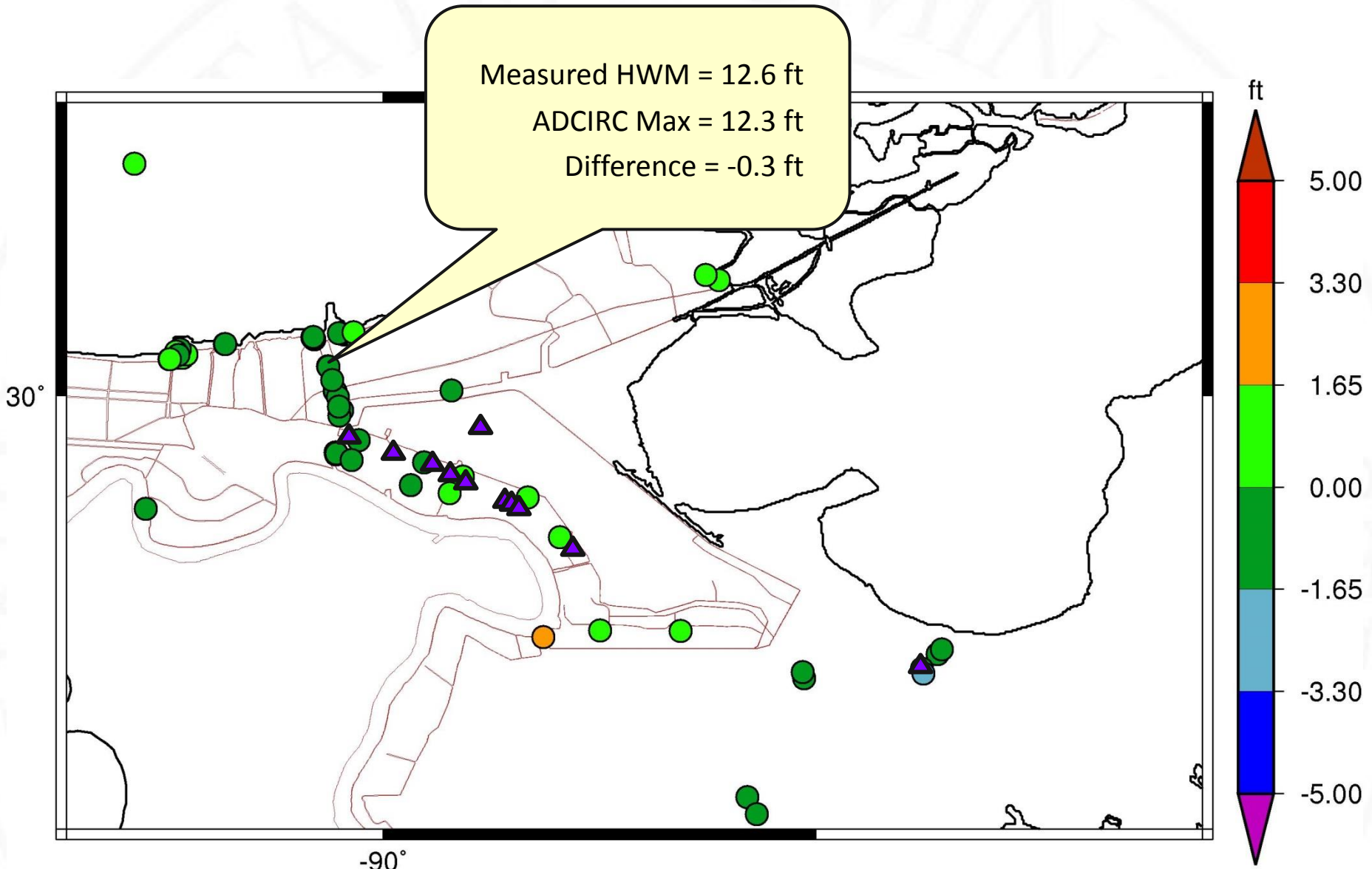


Figure 19zh

▲ = Location of Plaintiff Property

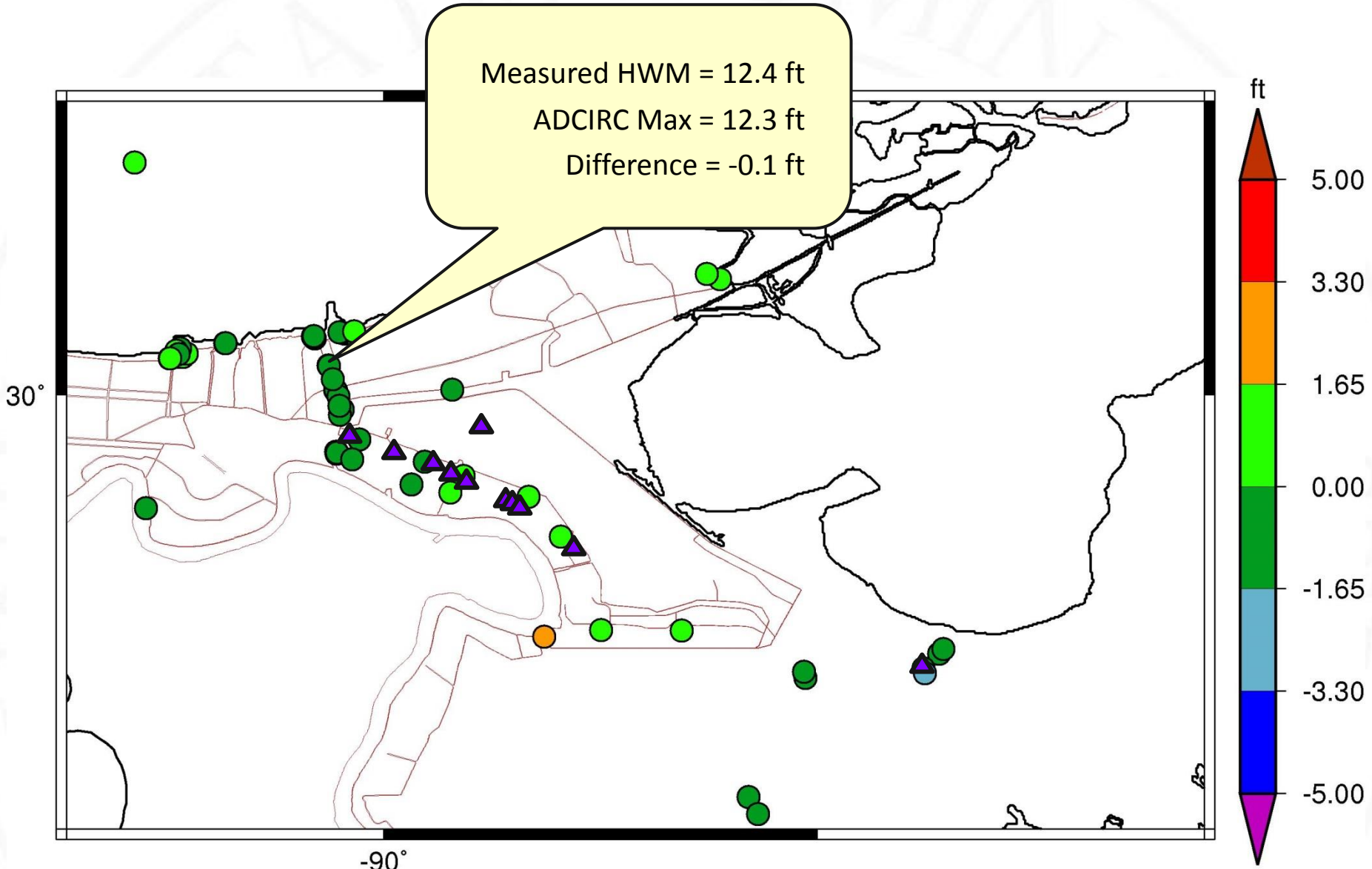


Figure 19zi

▲ = Location of Plaintiff Property

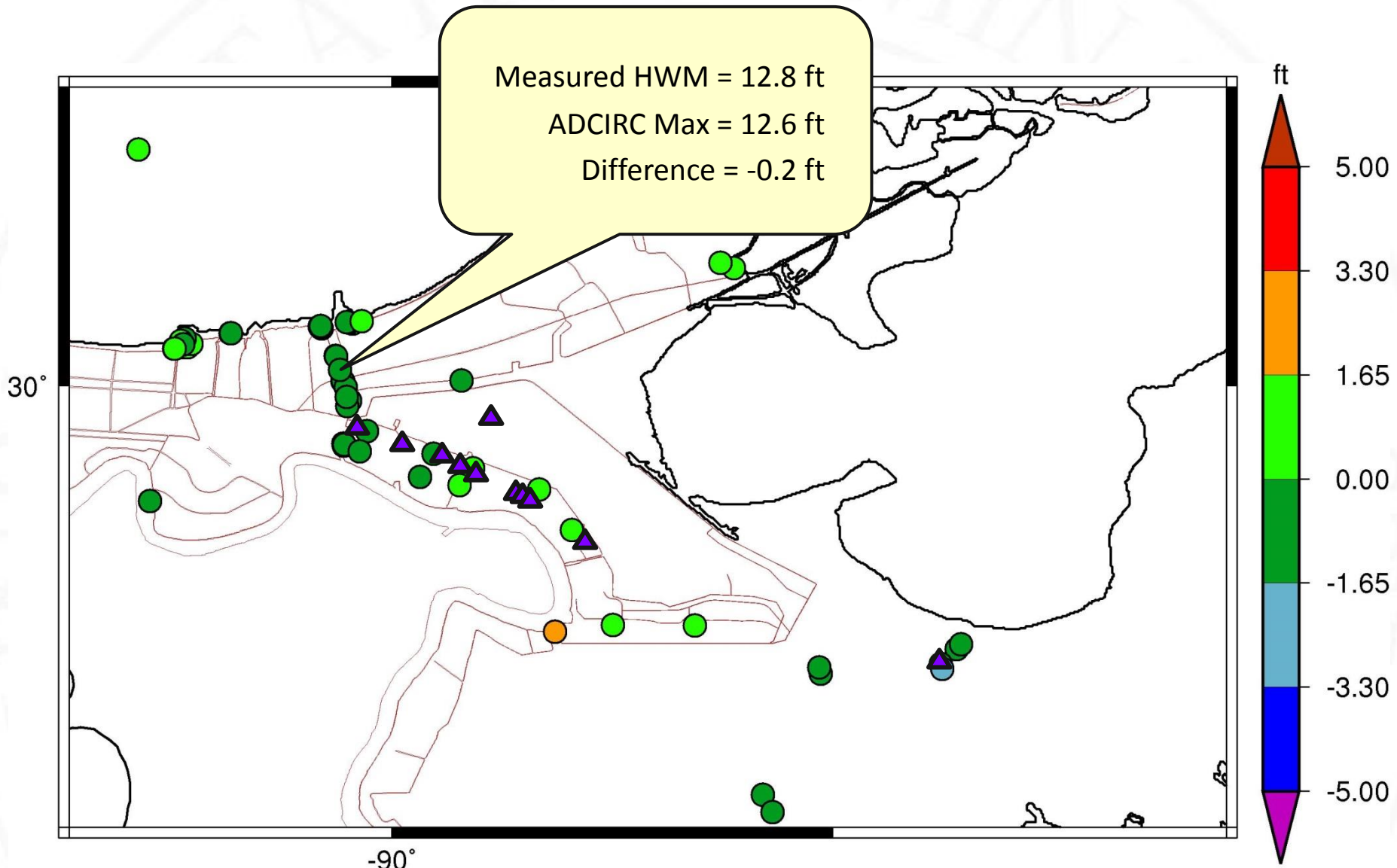


Figure 19zj

▲ = Location of Plaintiff Property

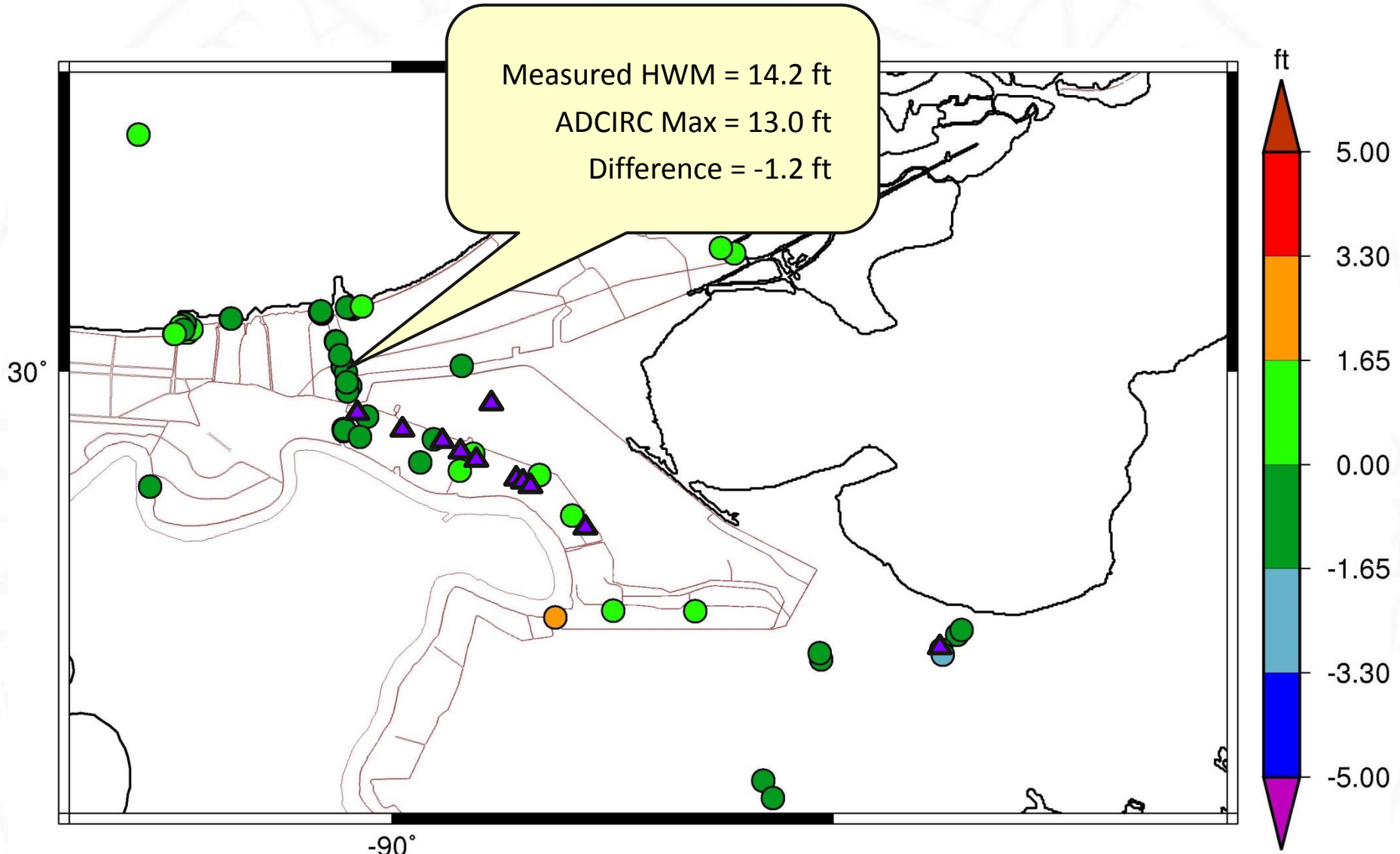


Figure 19zk

▲ = Location of Plaintiff Property

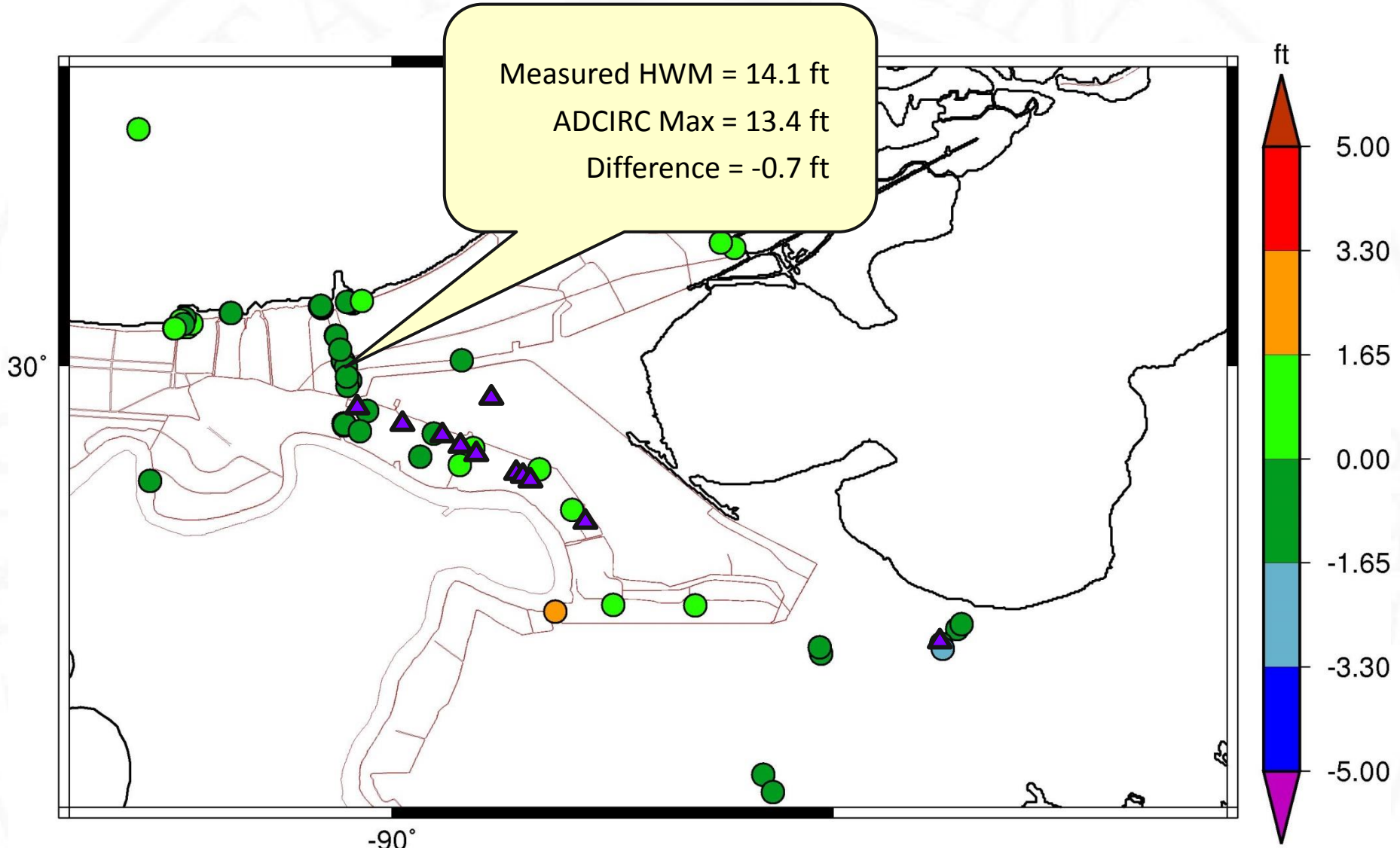


Figure 19zl

▲ = Location of Plaintiff Property

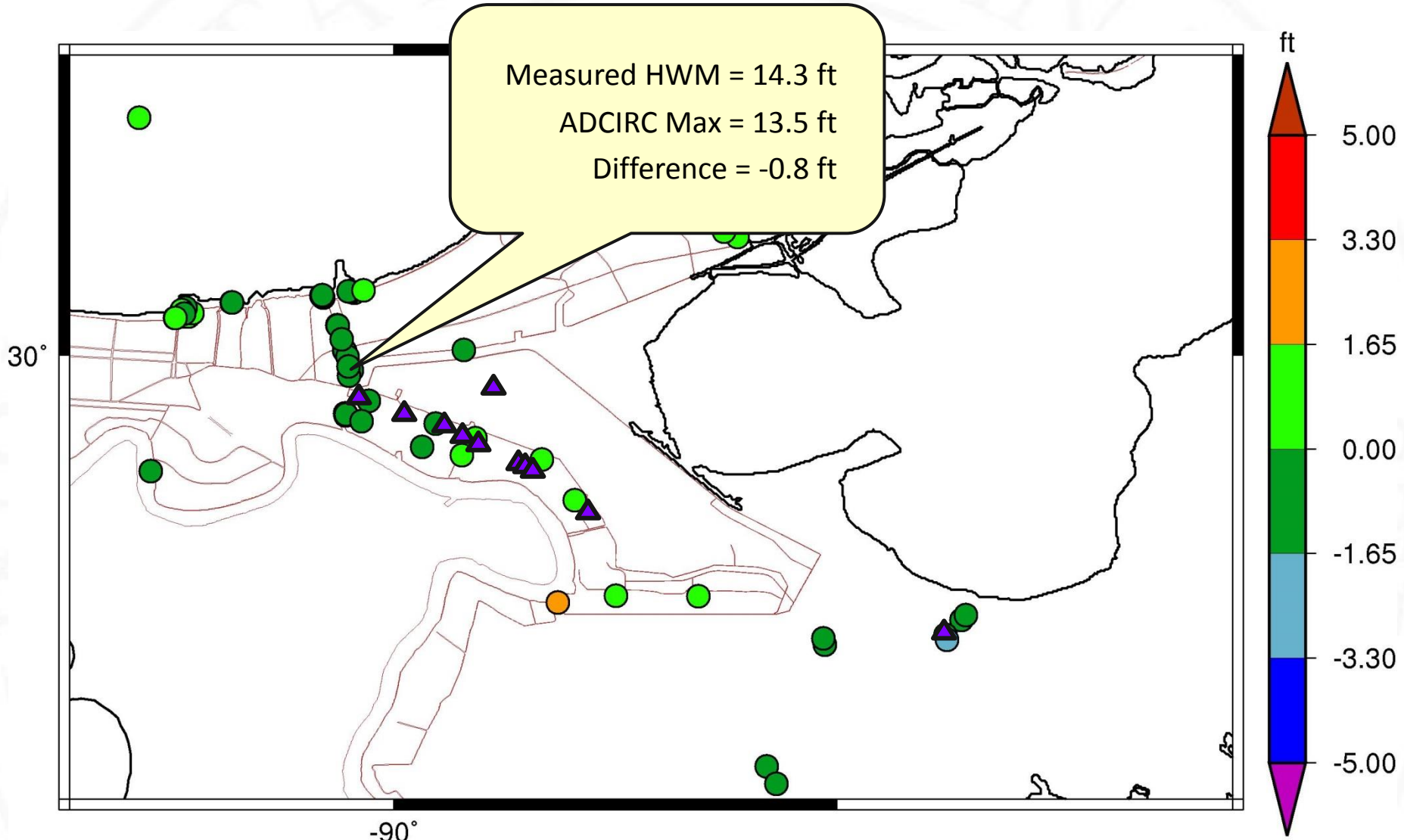


Figure 19zm

▲ = Location of Plaintiff Property

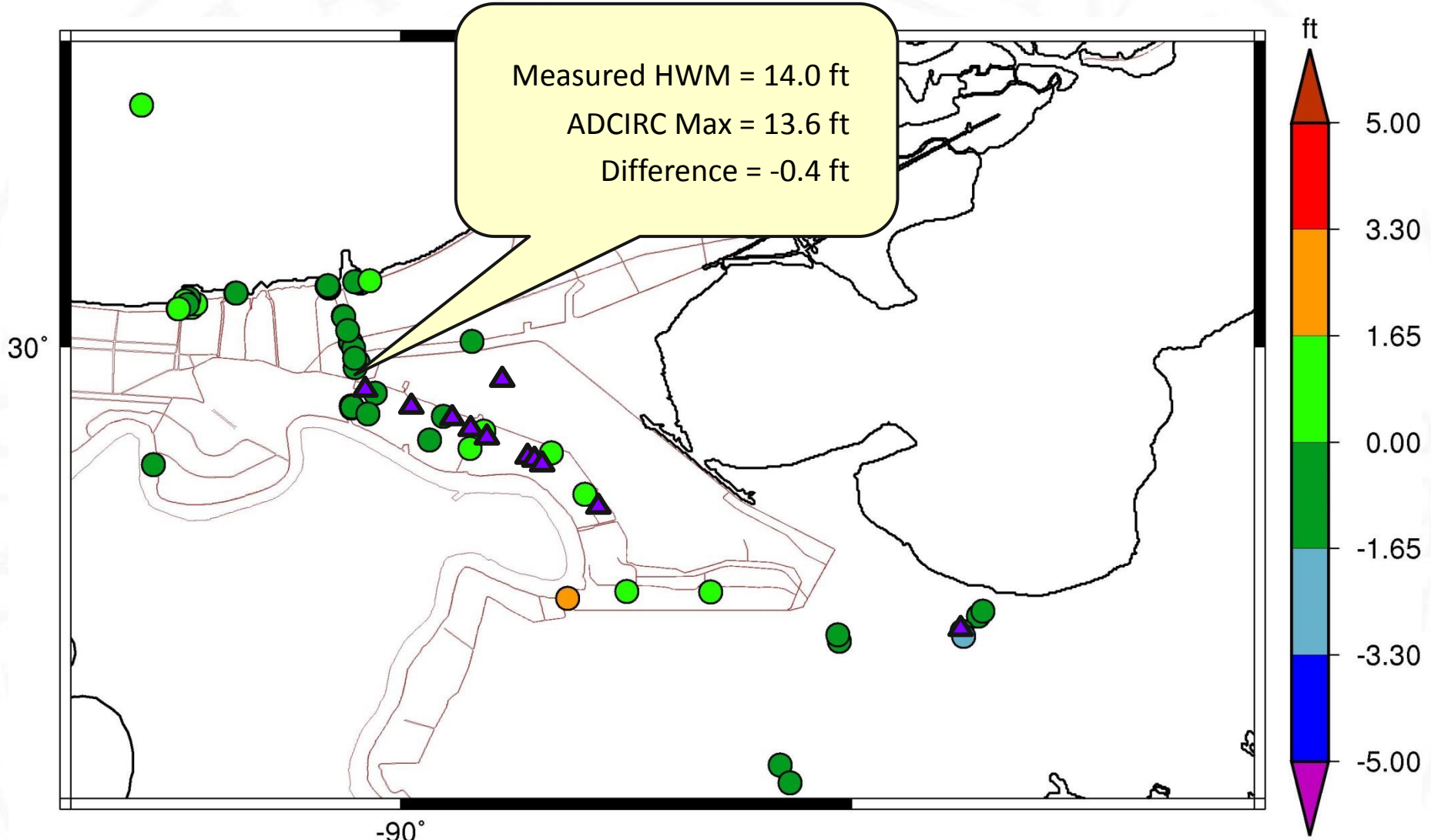


Figure 19zn

▲ = Location of Plaintiff Property

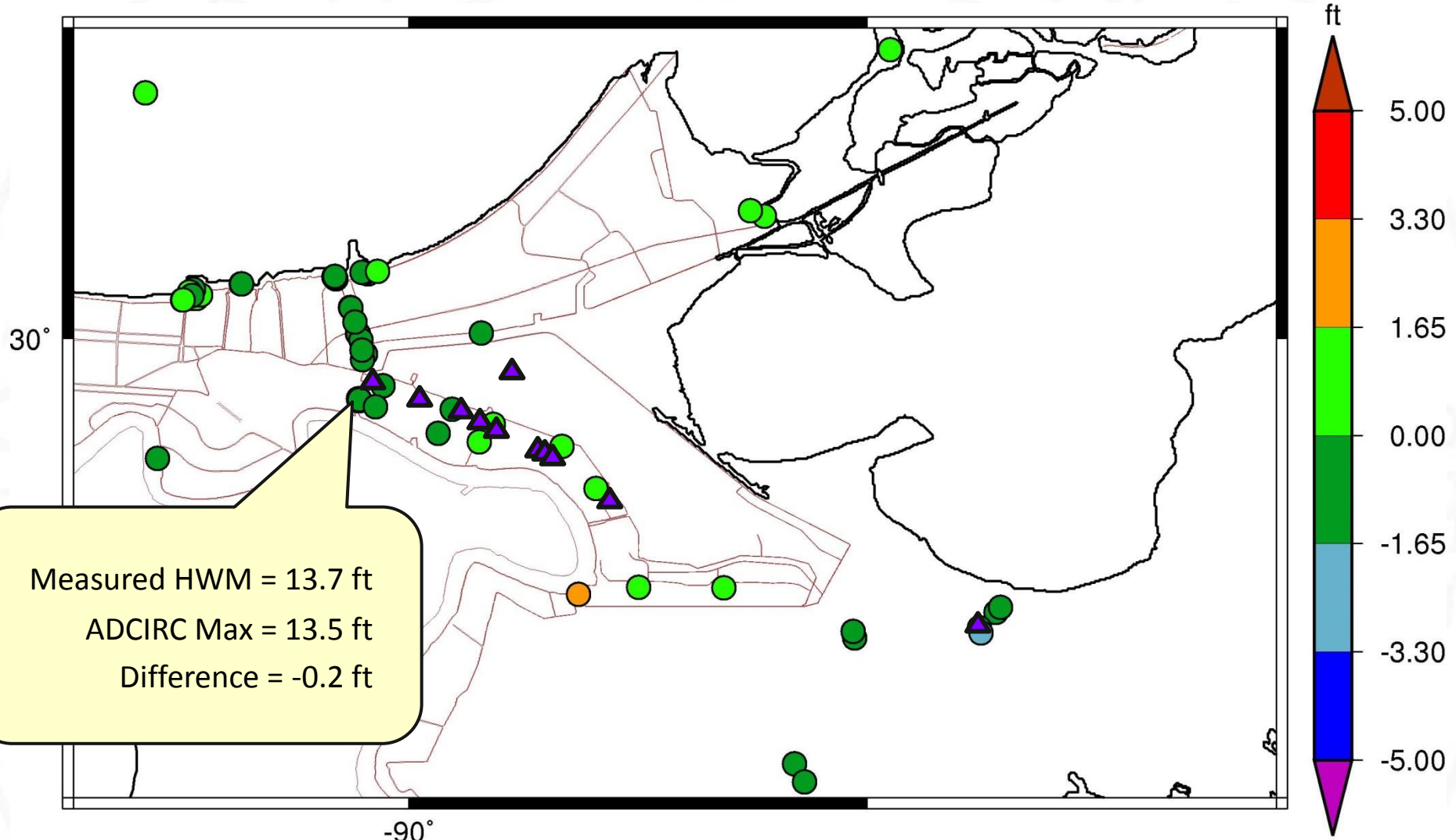


Figure 19zo

▲ = Location of Plaintiff Property

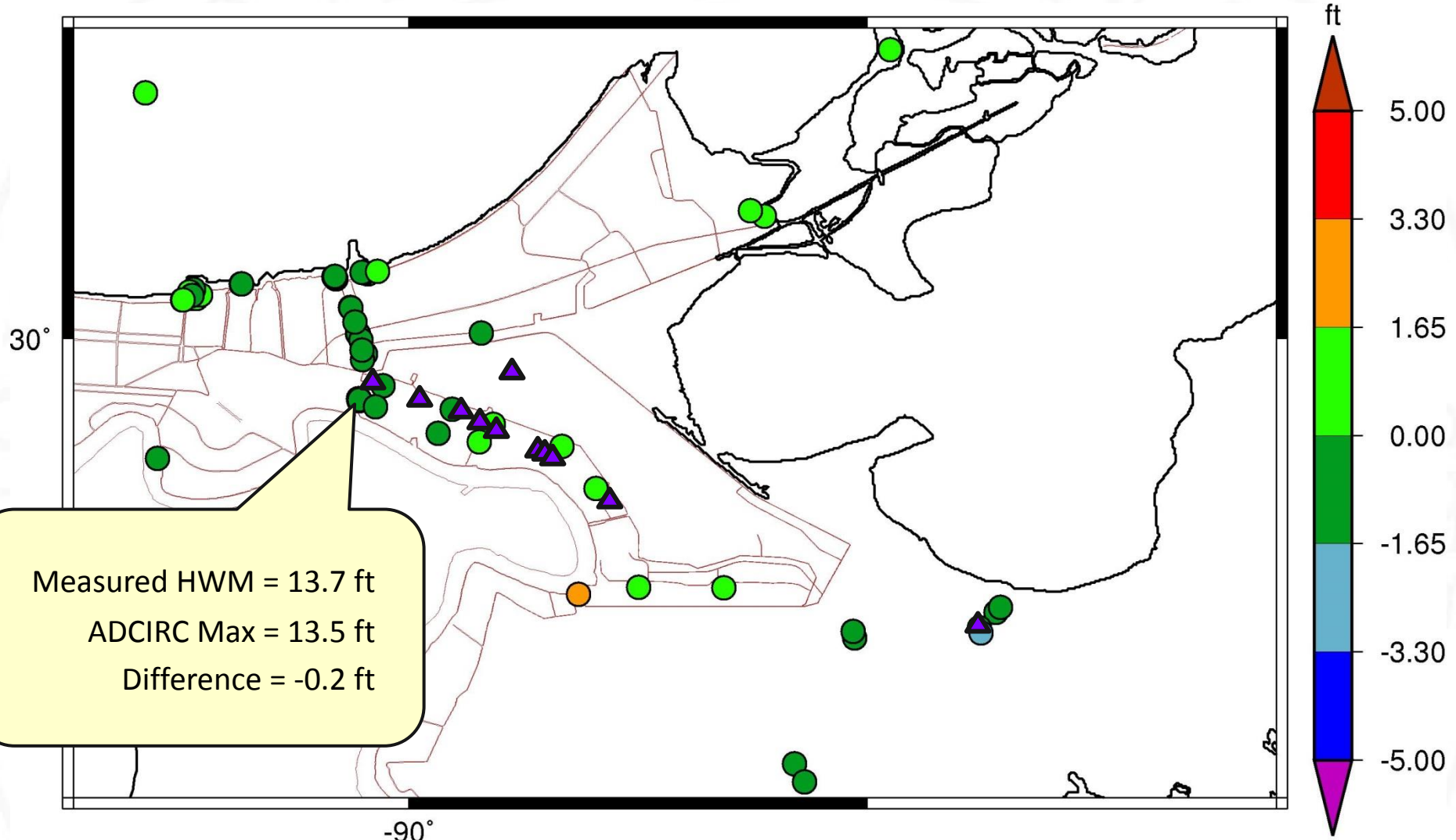


Figure 19zp

▲ = Location of Plaintiff Property

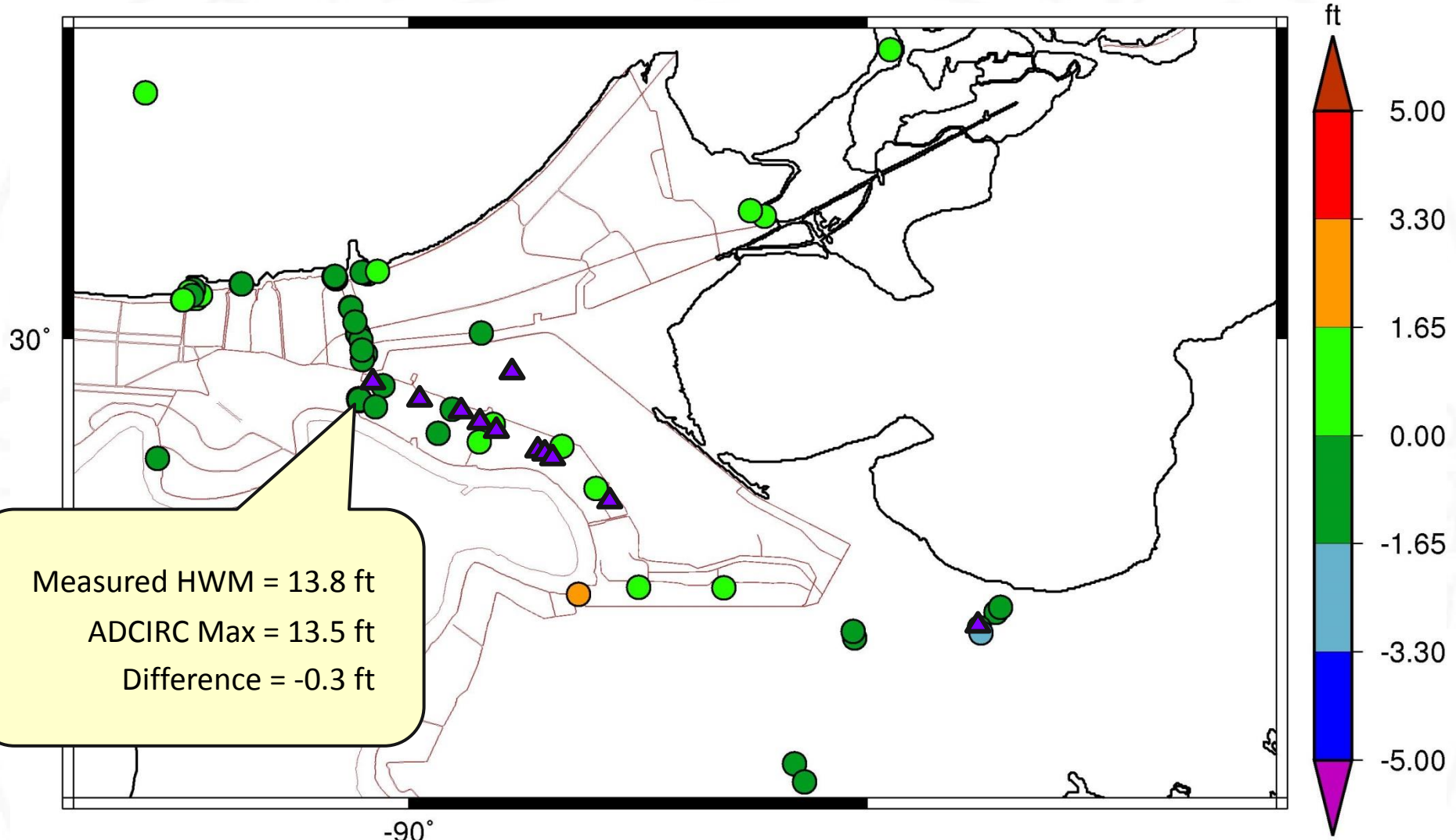
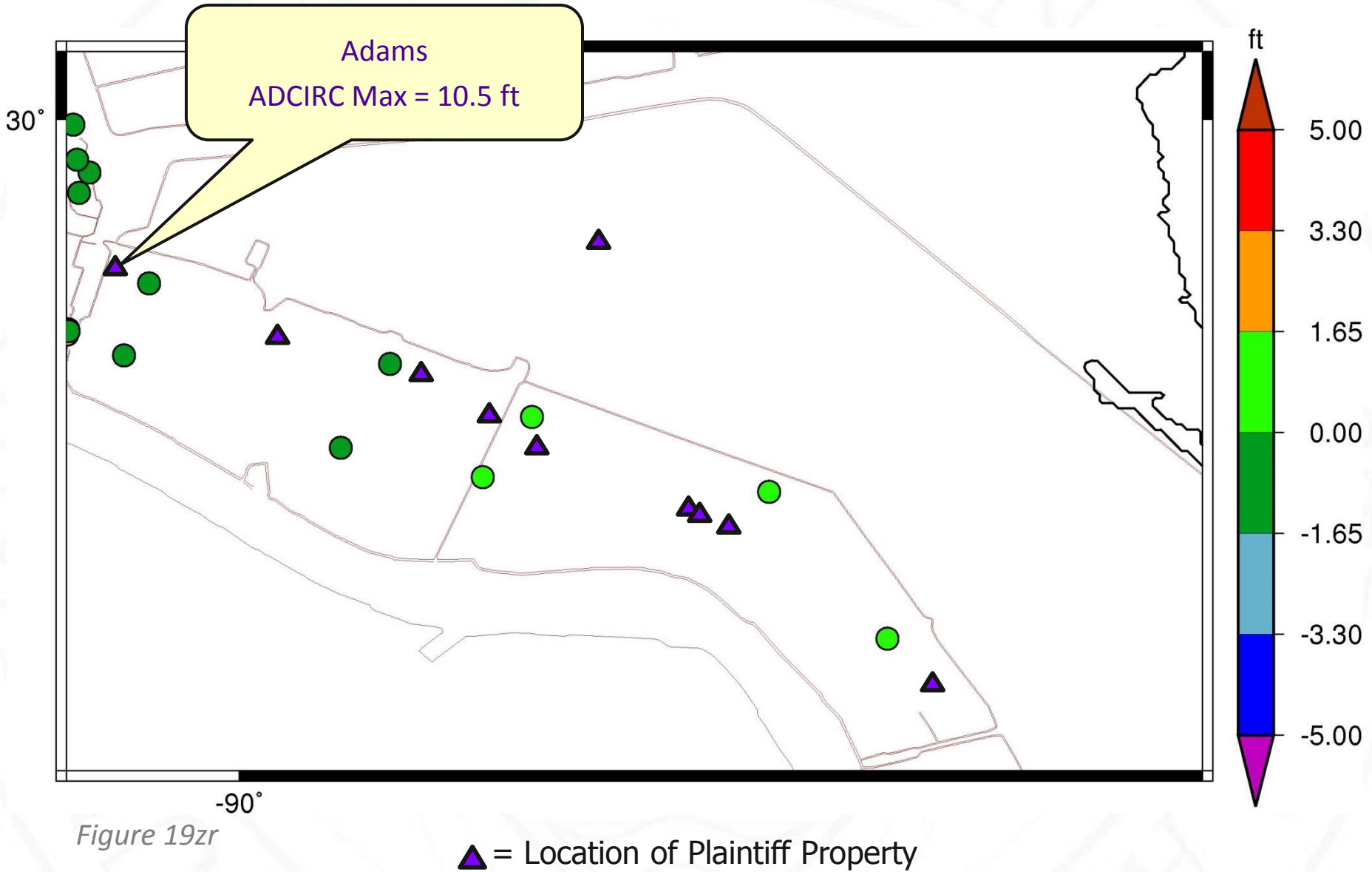


Figure 19zq

▲ = Location of Plaintiff Property



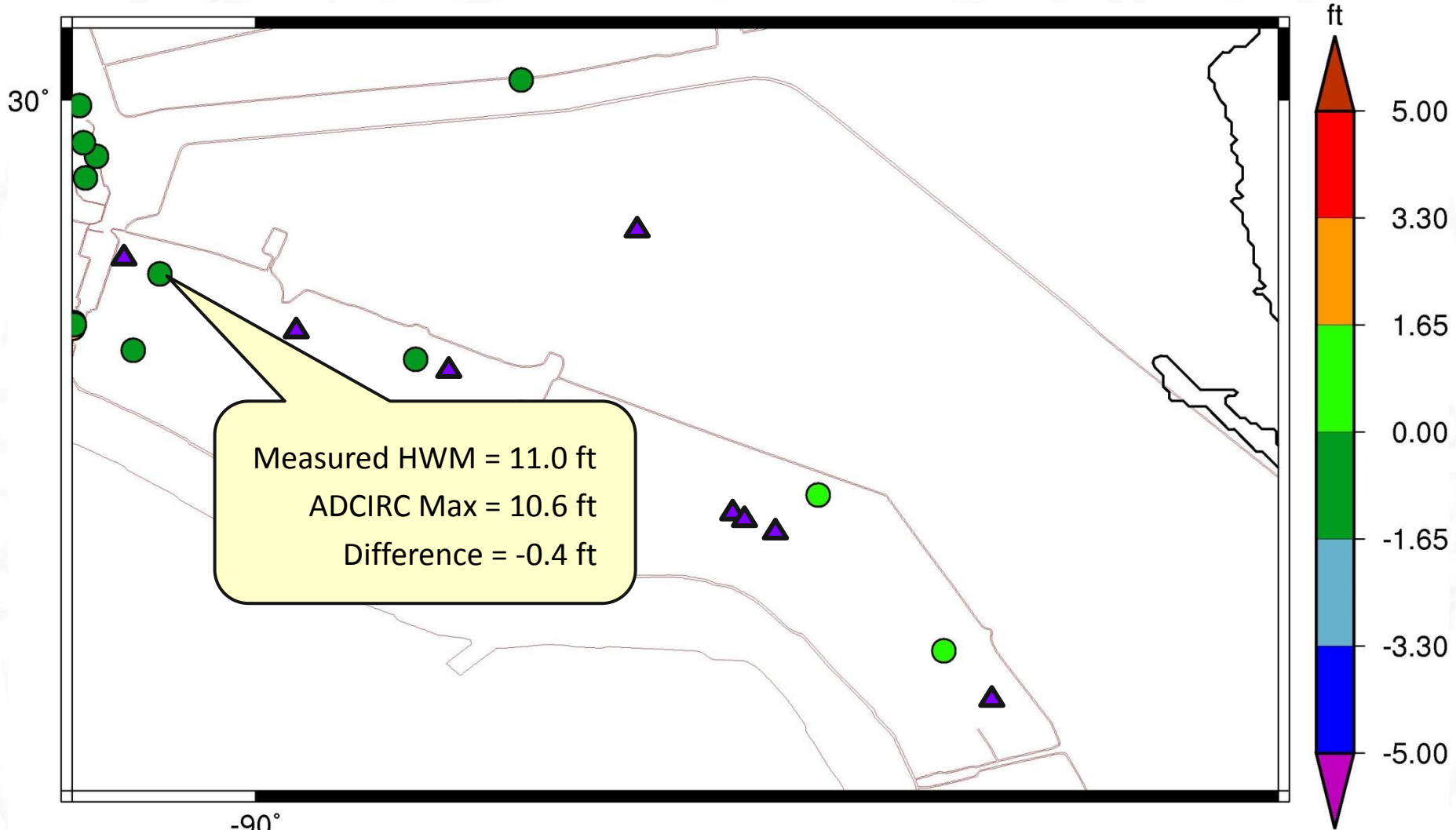
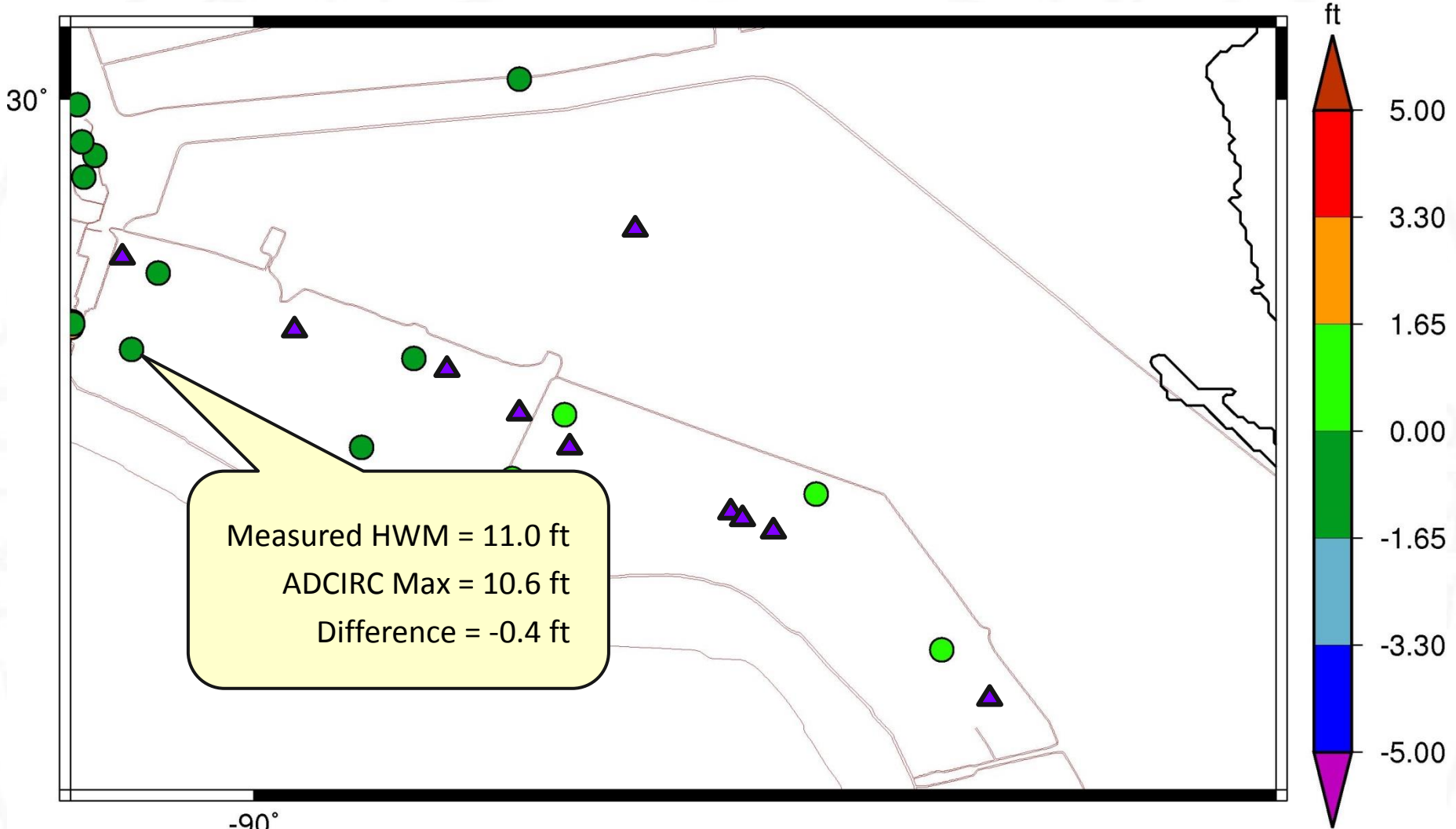


Figure 19zs

= Location of Plaintiff Property



-90°

Figure 19zt

▲ = Location of Plaintiff Property

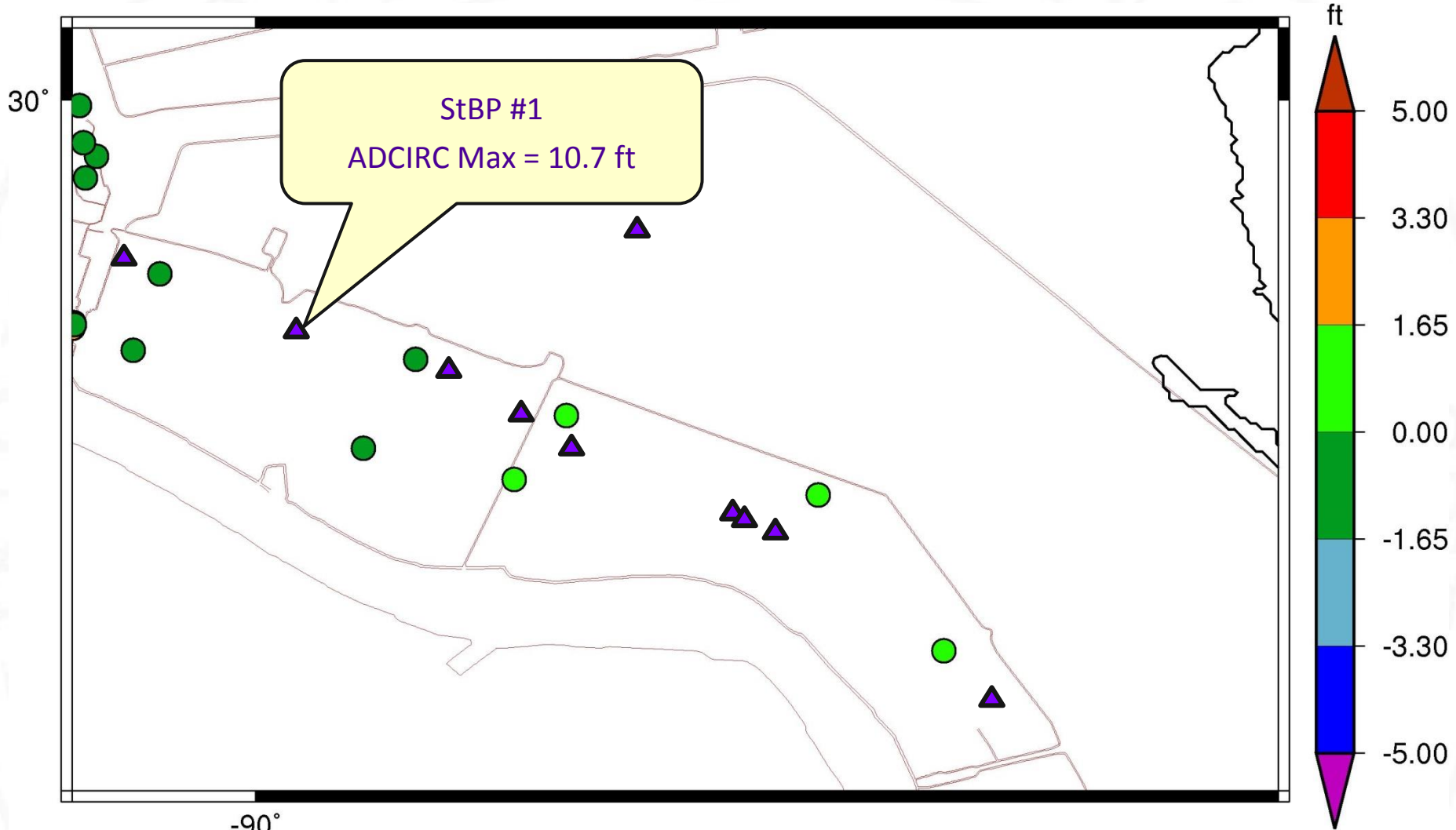
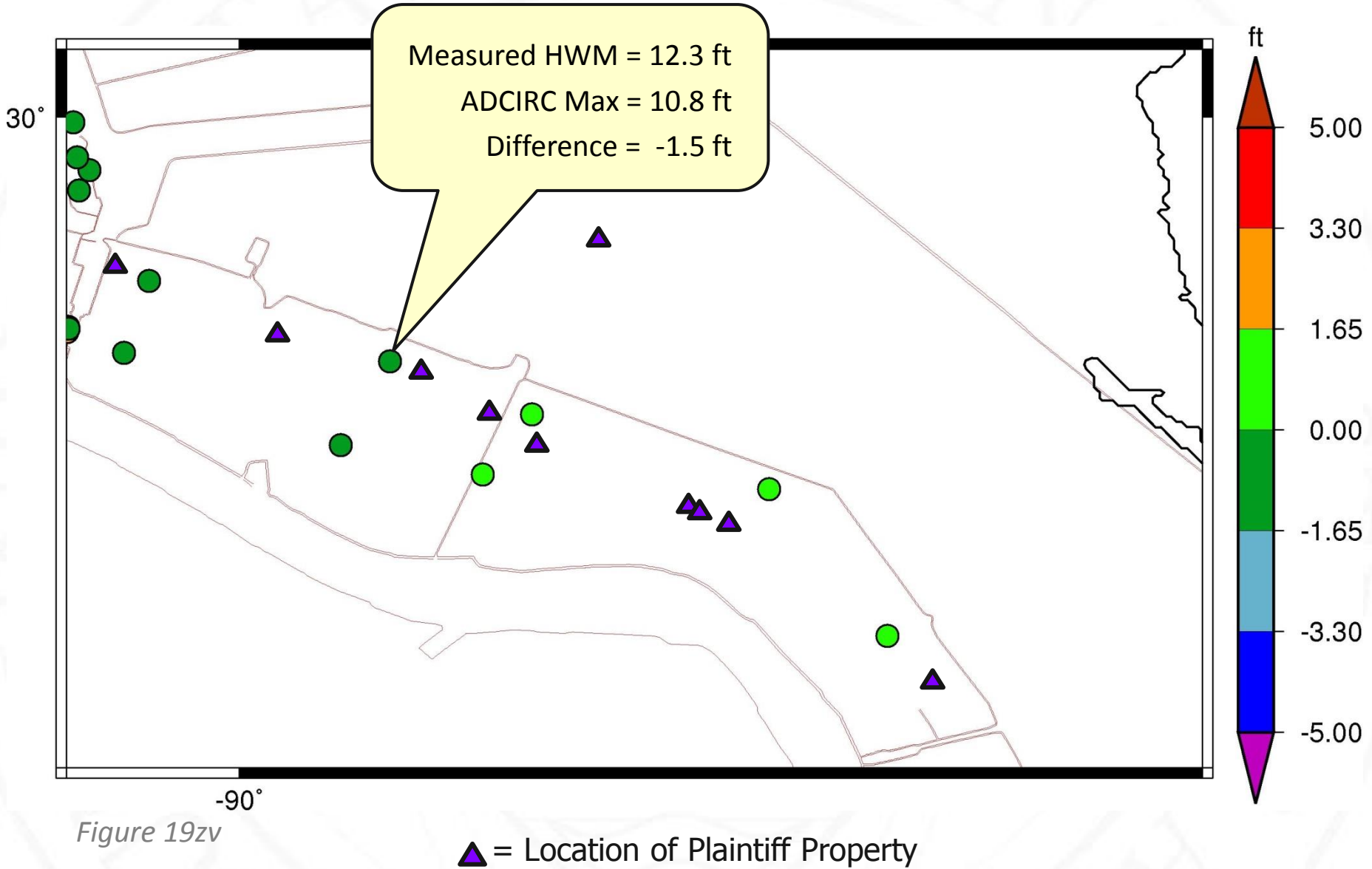


Figure 19zu

▲ = Location of Plaintiff Property



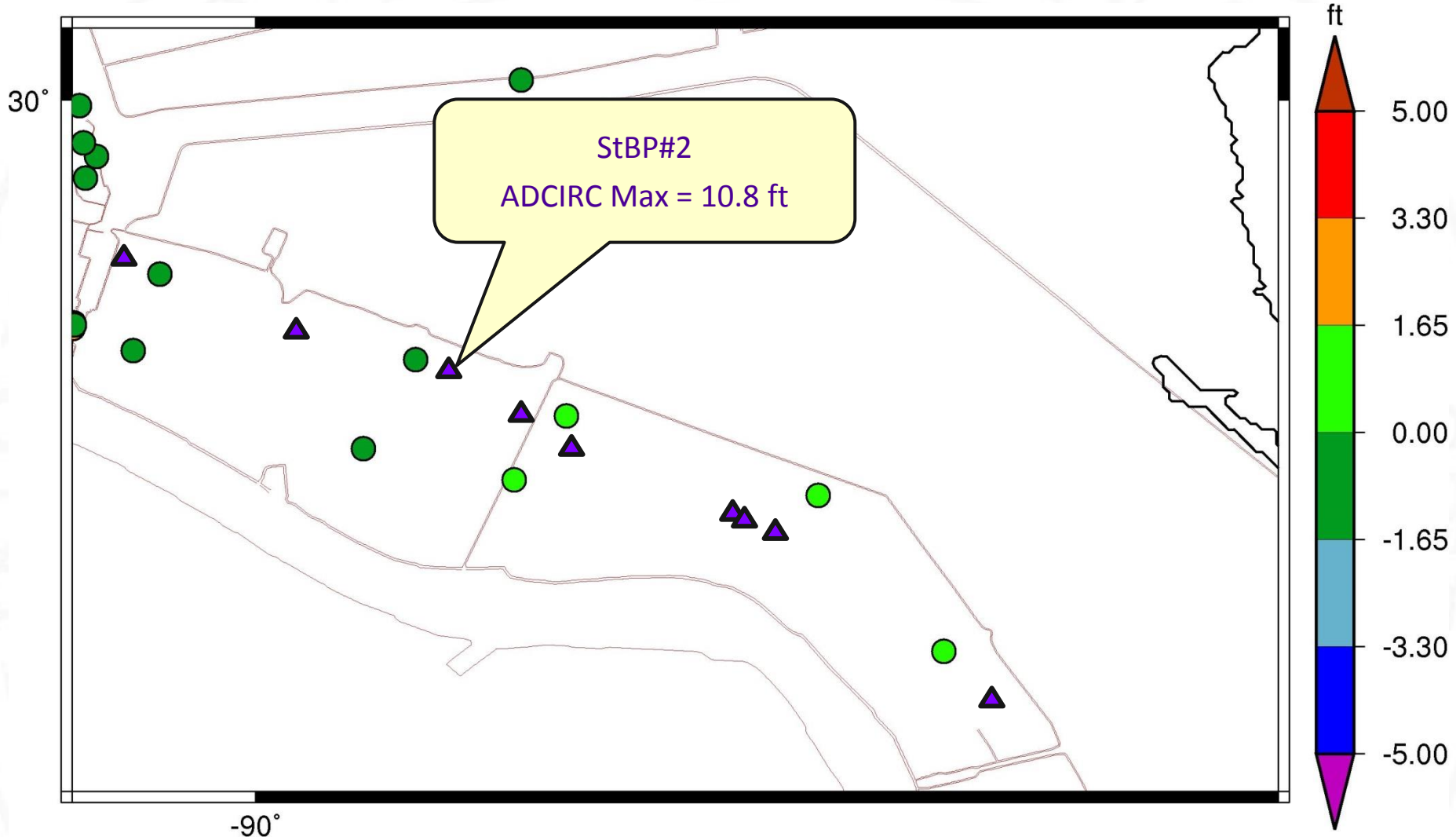


Figure 19zw

▲ = Location of Plaintiff Property

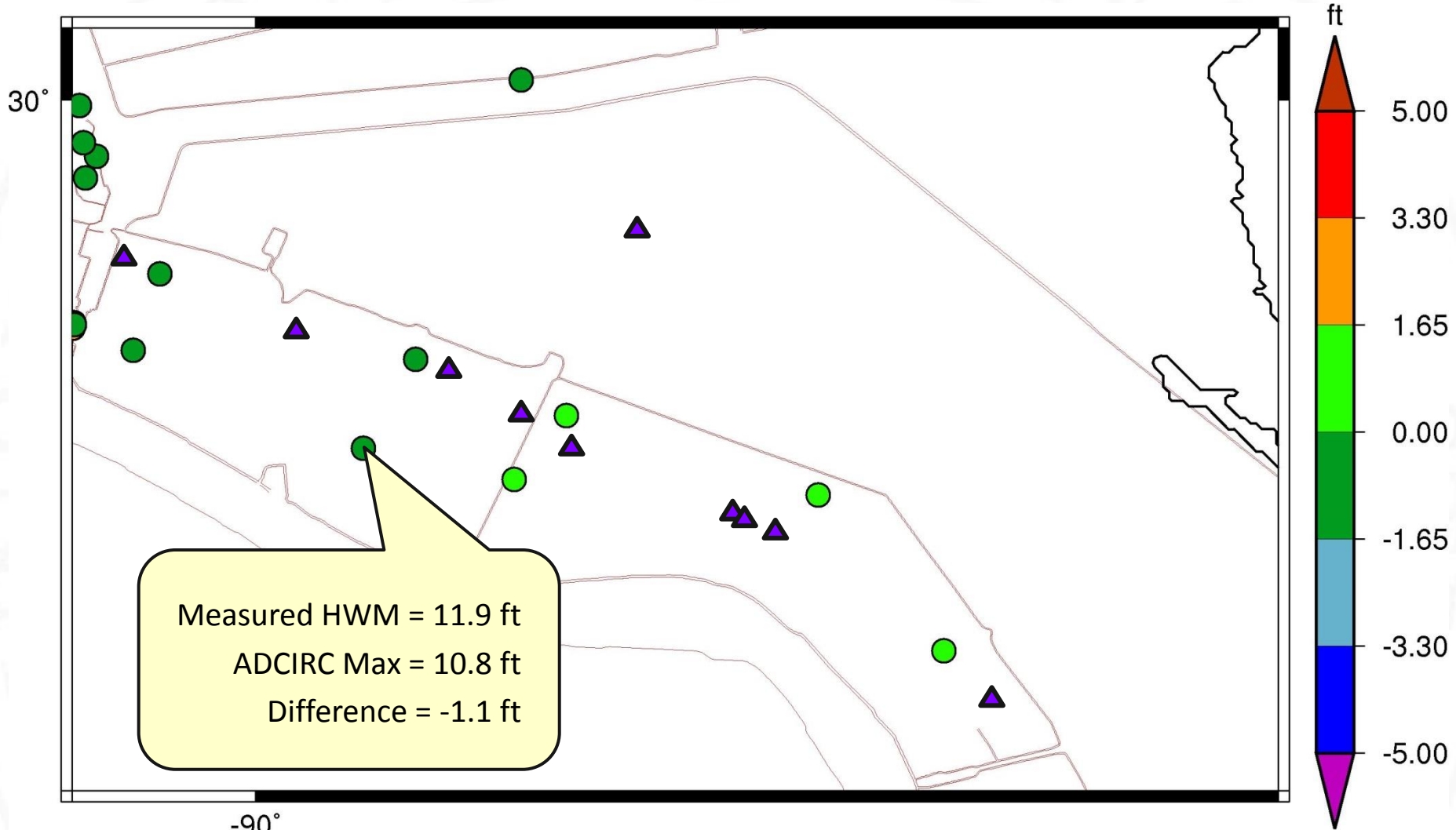


Figure 19zx

▲ = Location of Plaintiff Property

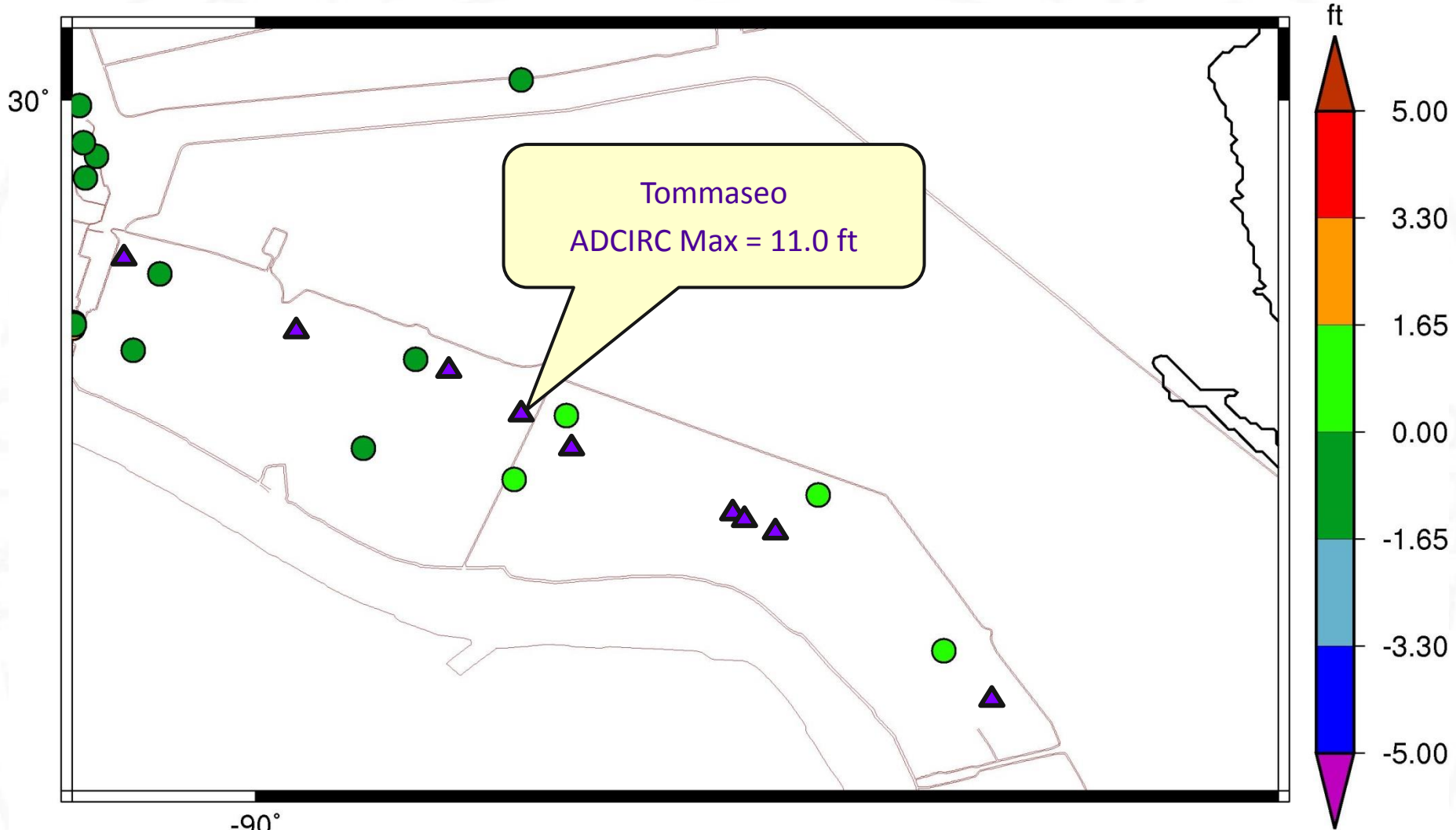


Figure 19zy

▲ = Location of Plaintiff Property

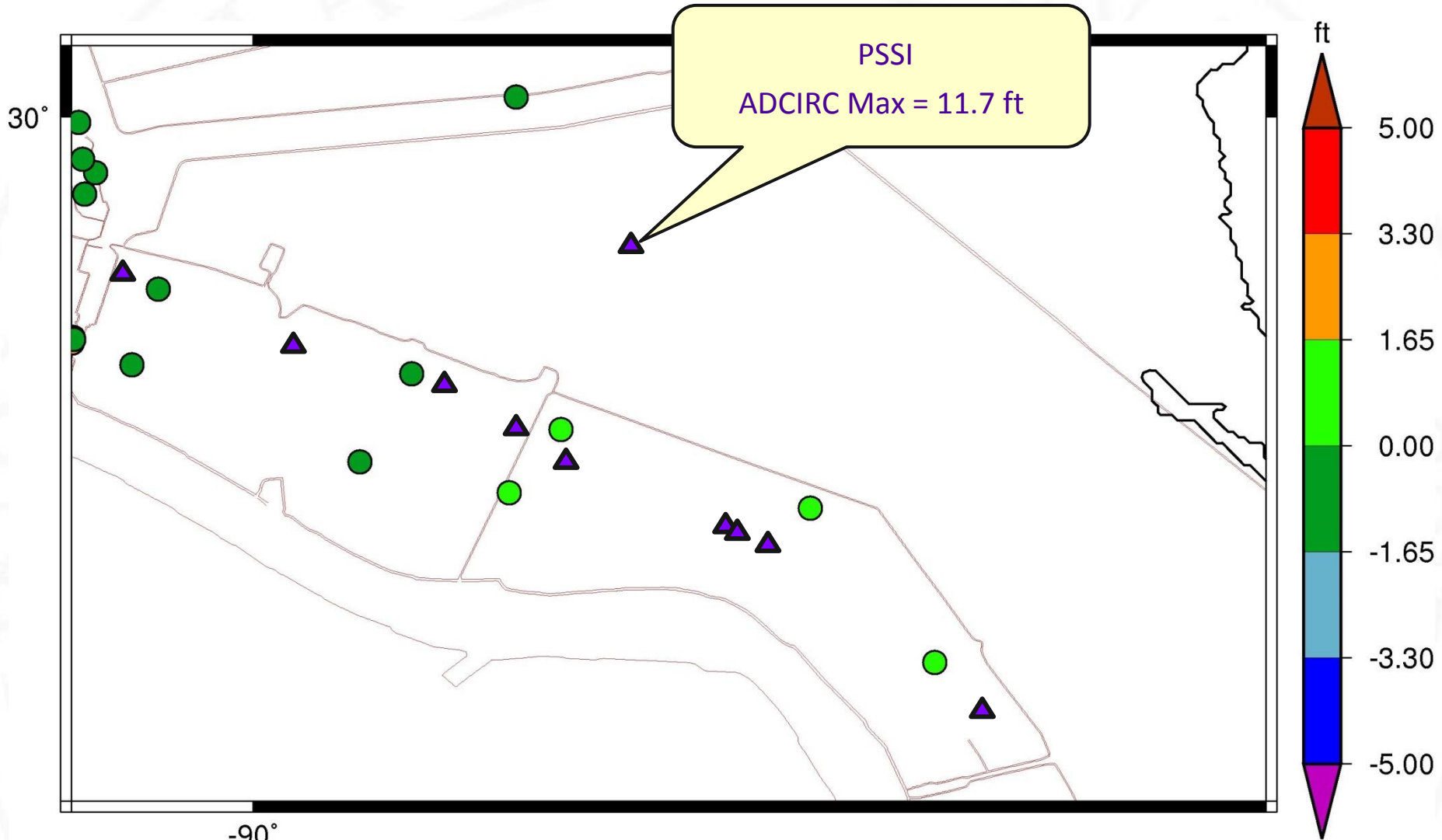


Figure 19zz

▲ = Location of Plaintiff Property

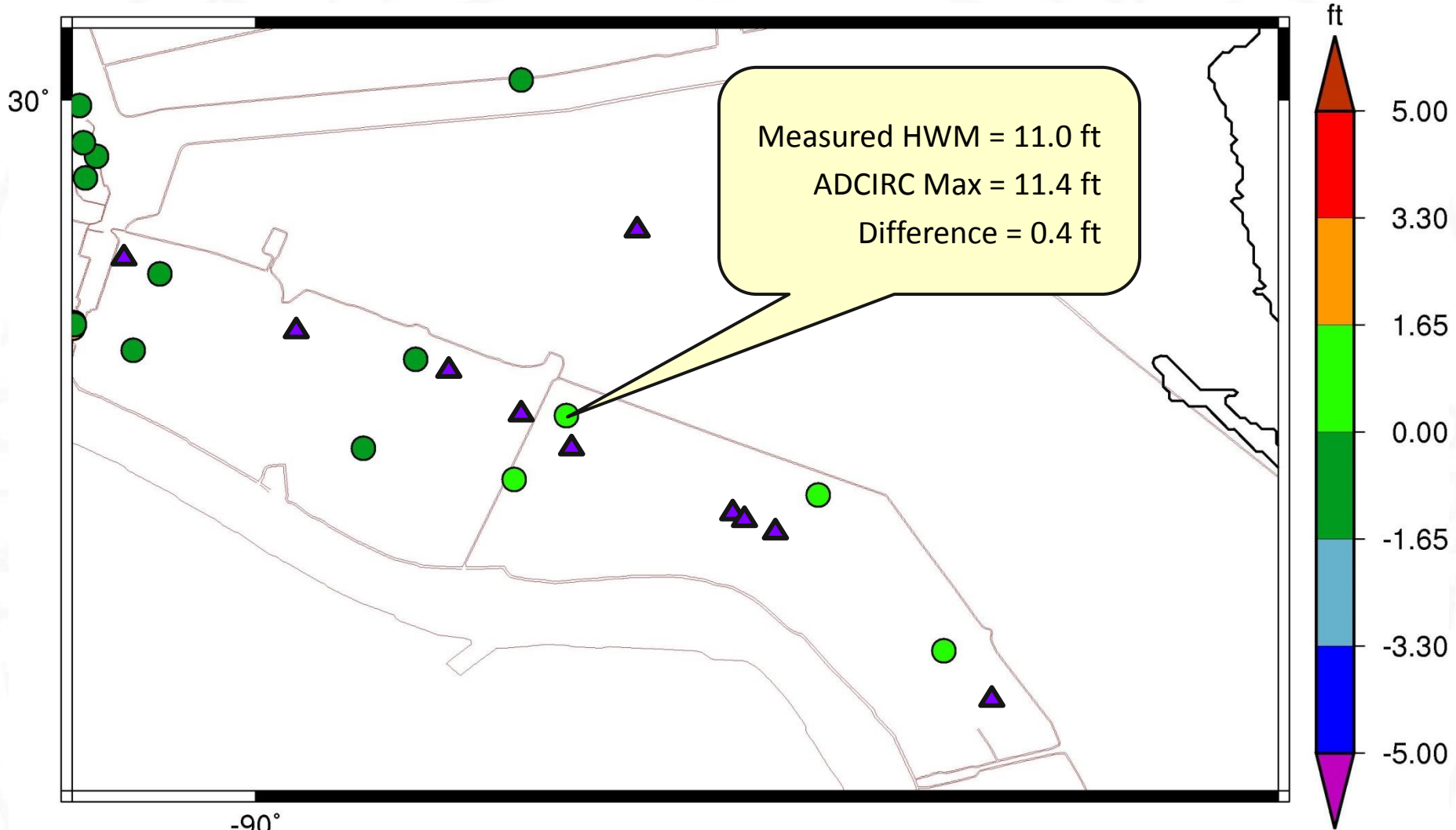


Figure 19zza

▲ = Location of Plaintiff Property

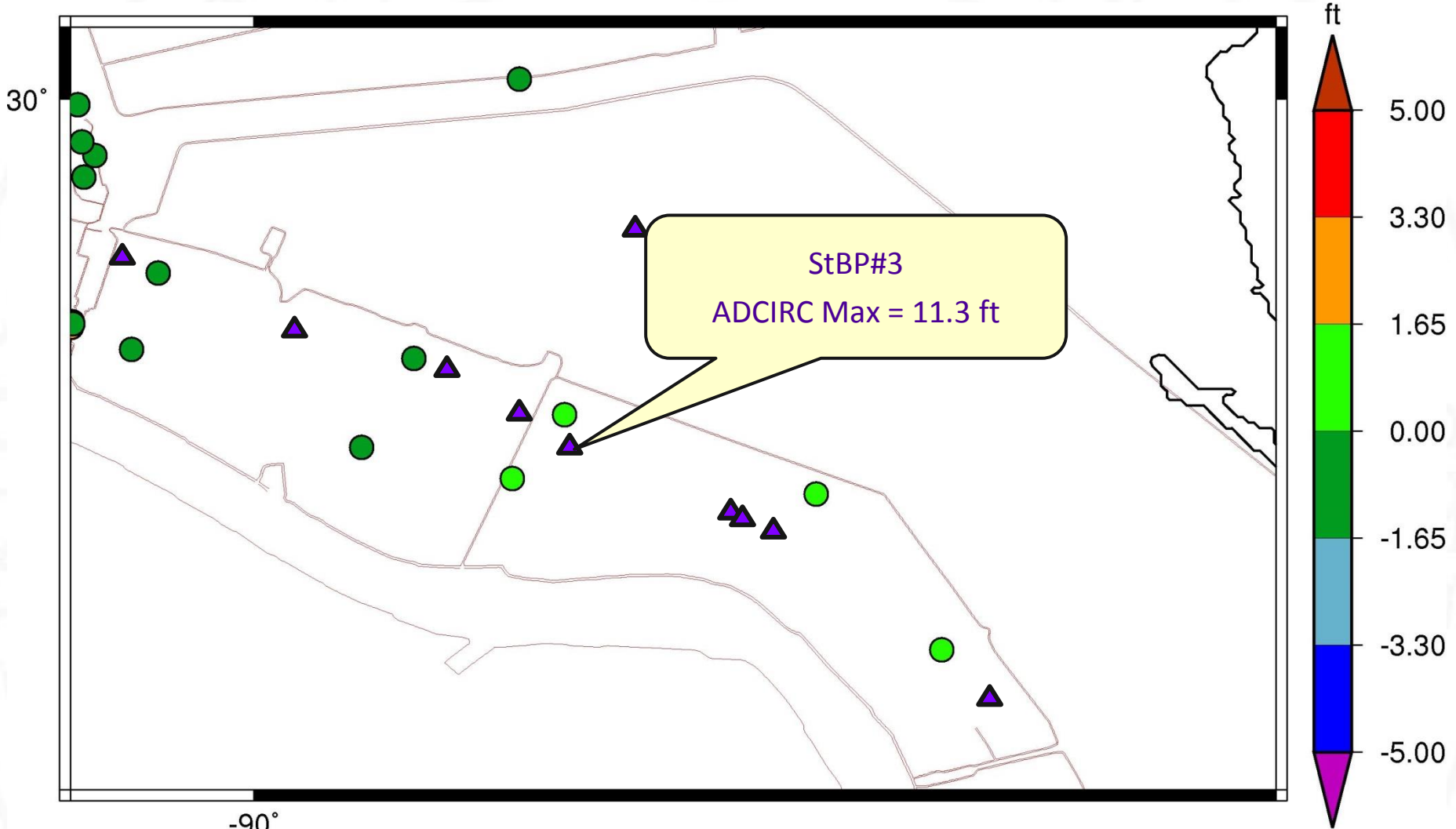


Figure 19zzb

▲ = Location of Plaintiff Property

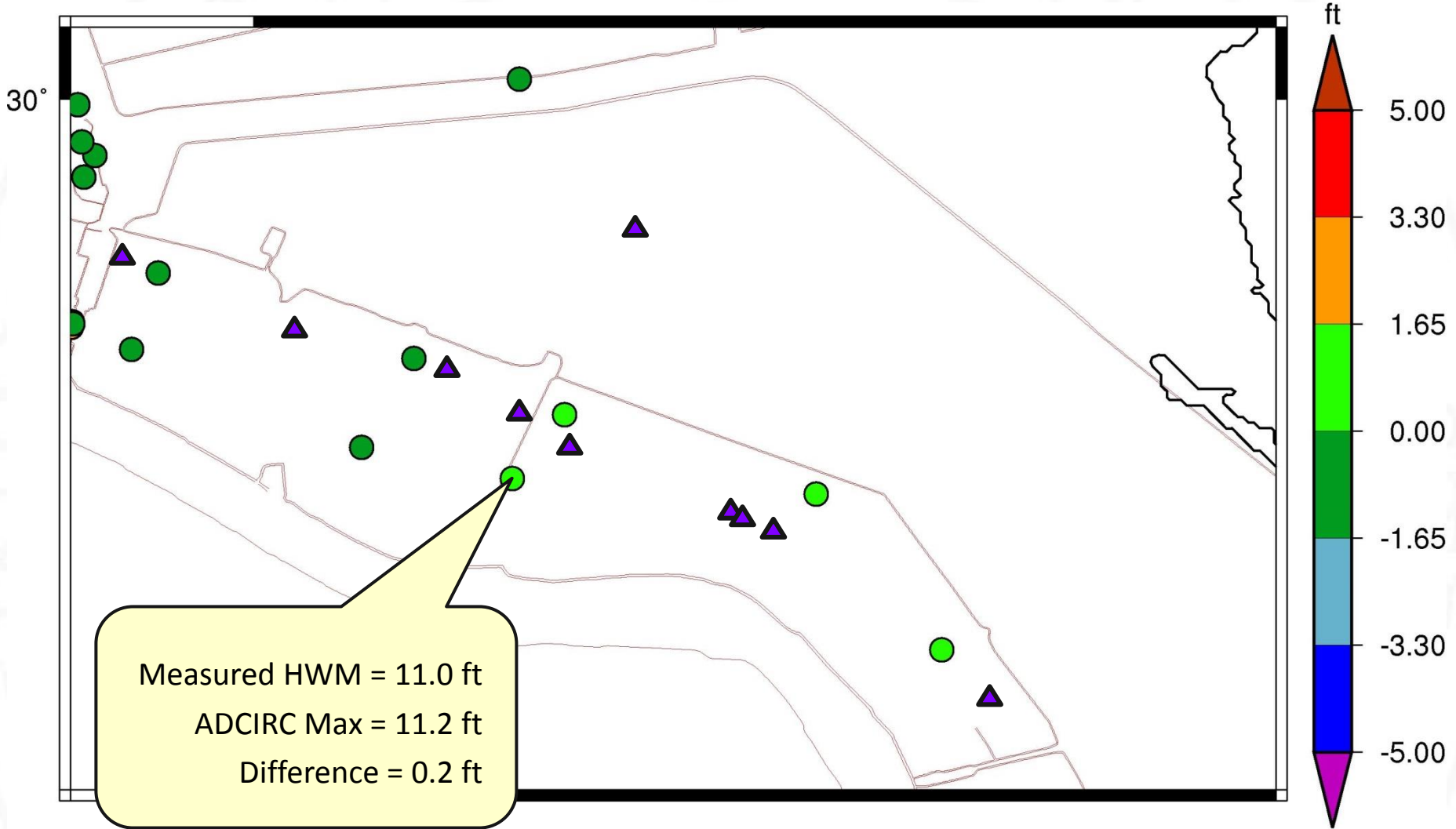


Figure 19zzc

▲ = Location of Plaintiff Property

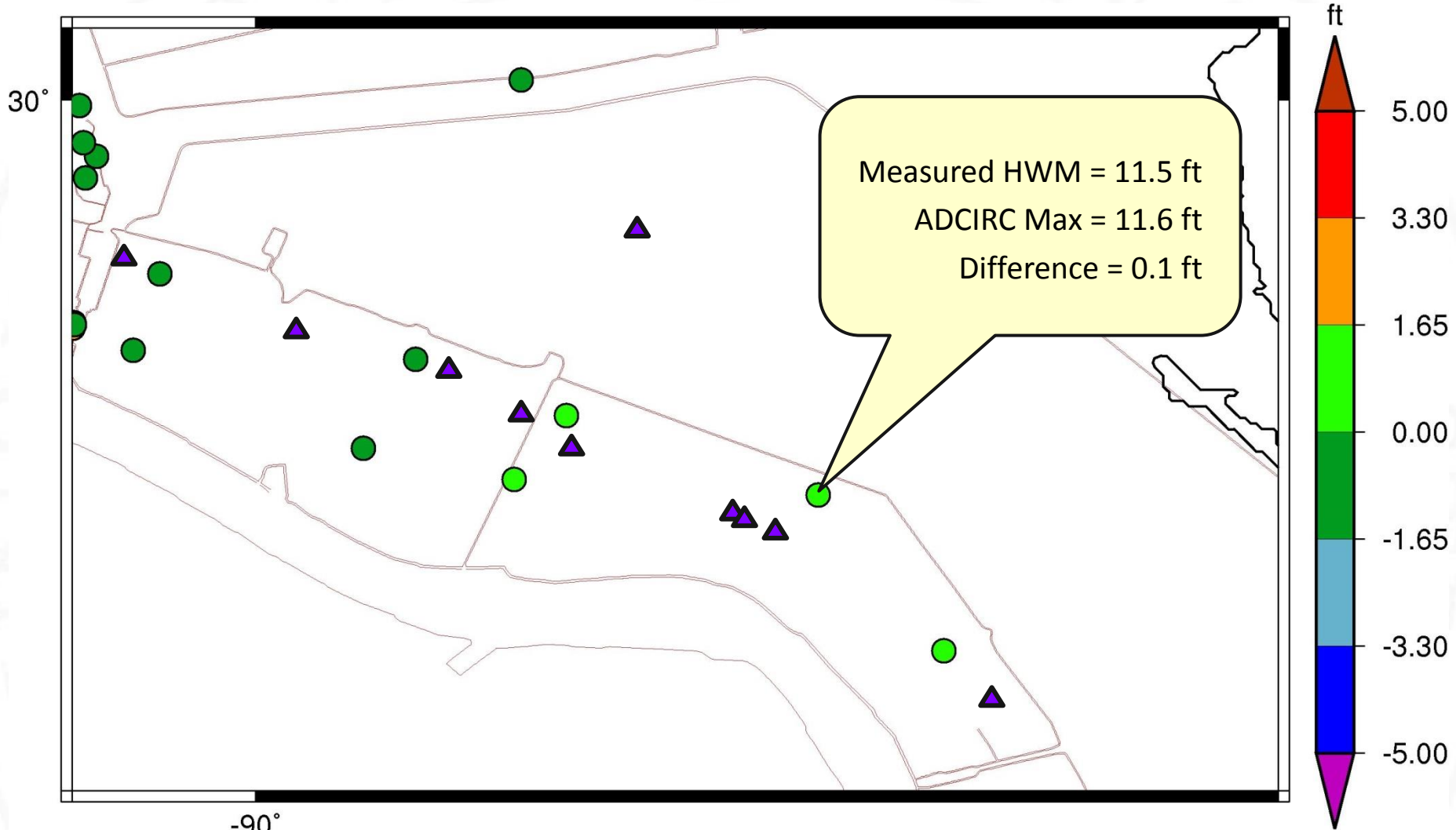


Figure 19zzd

▲ = Location of Plaintiff Property

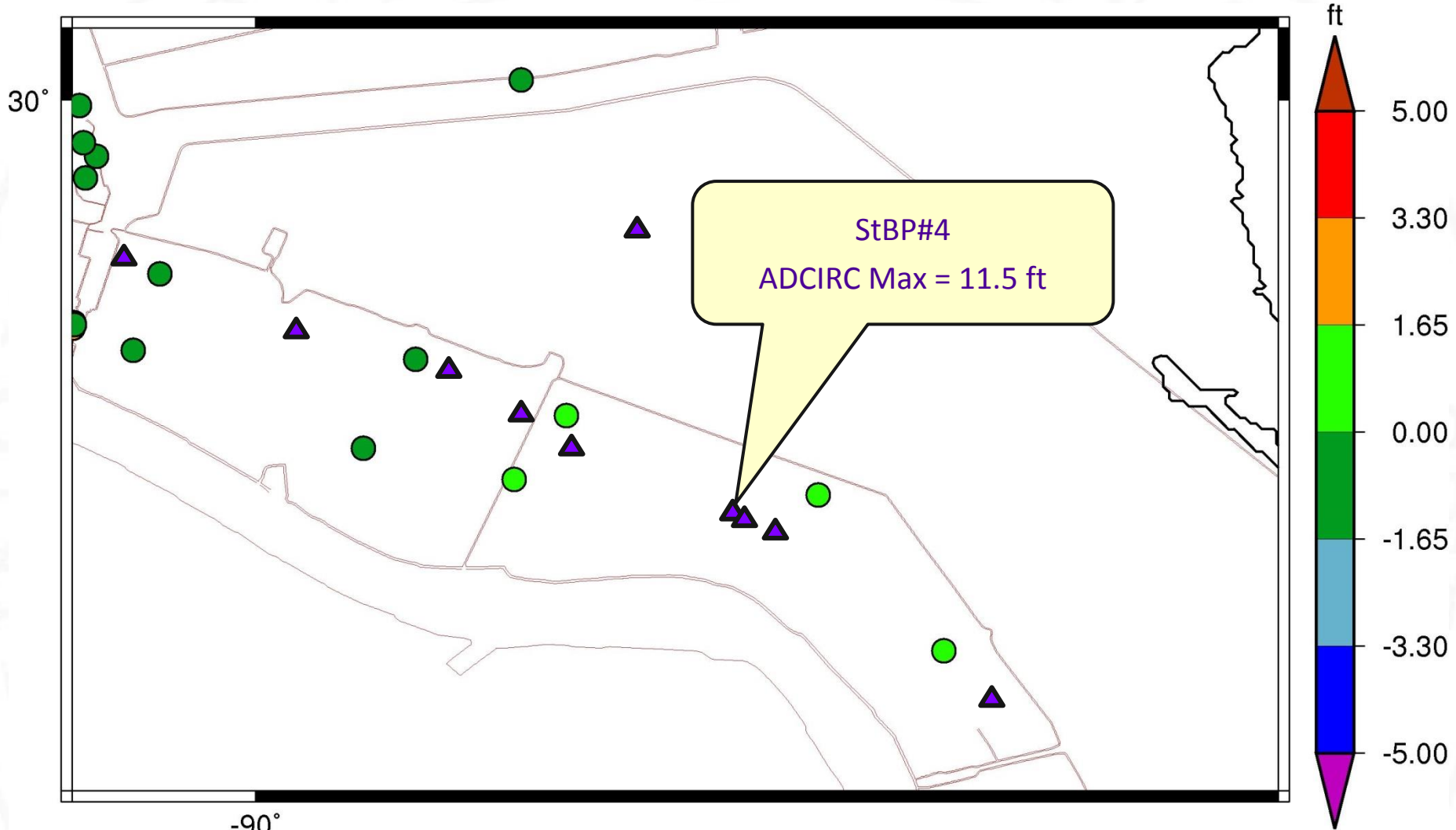


Figure 19zze

▲ = Location of Plaintiff Property

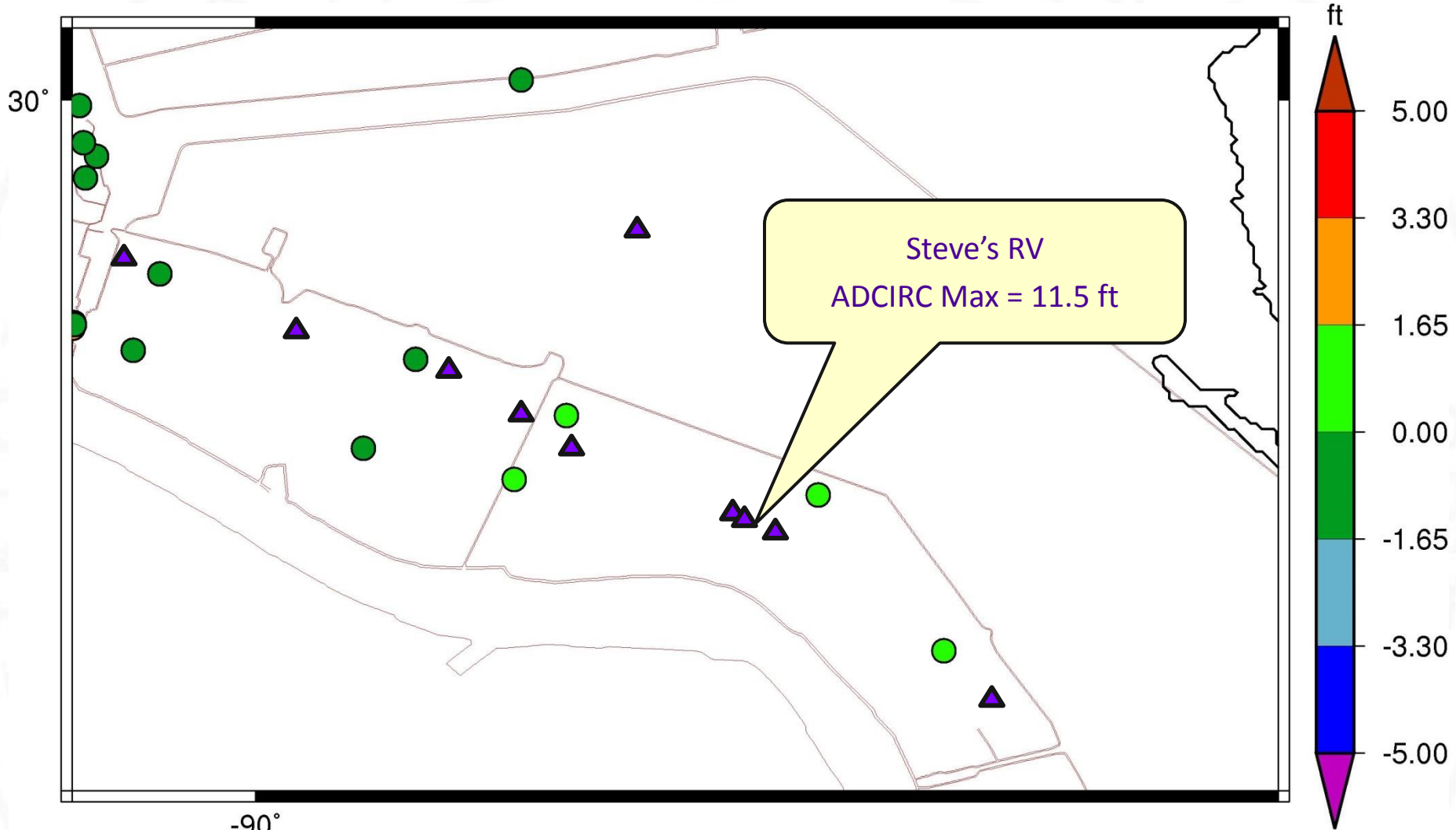


Figure 19zzf

▲ = Location of Plaintiff Property

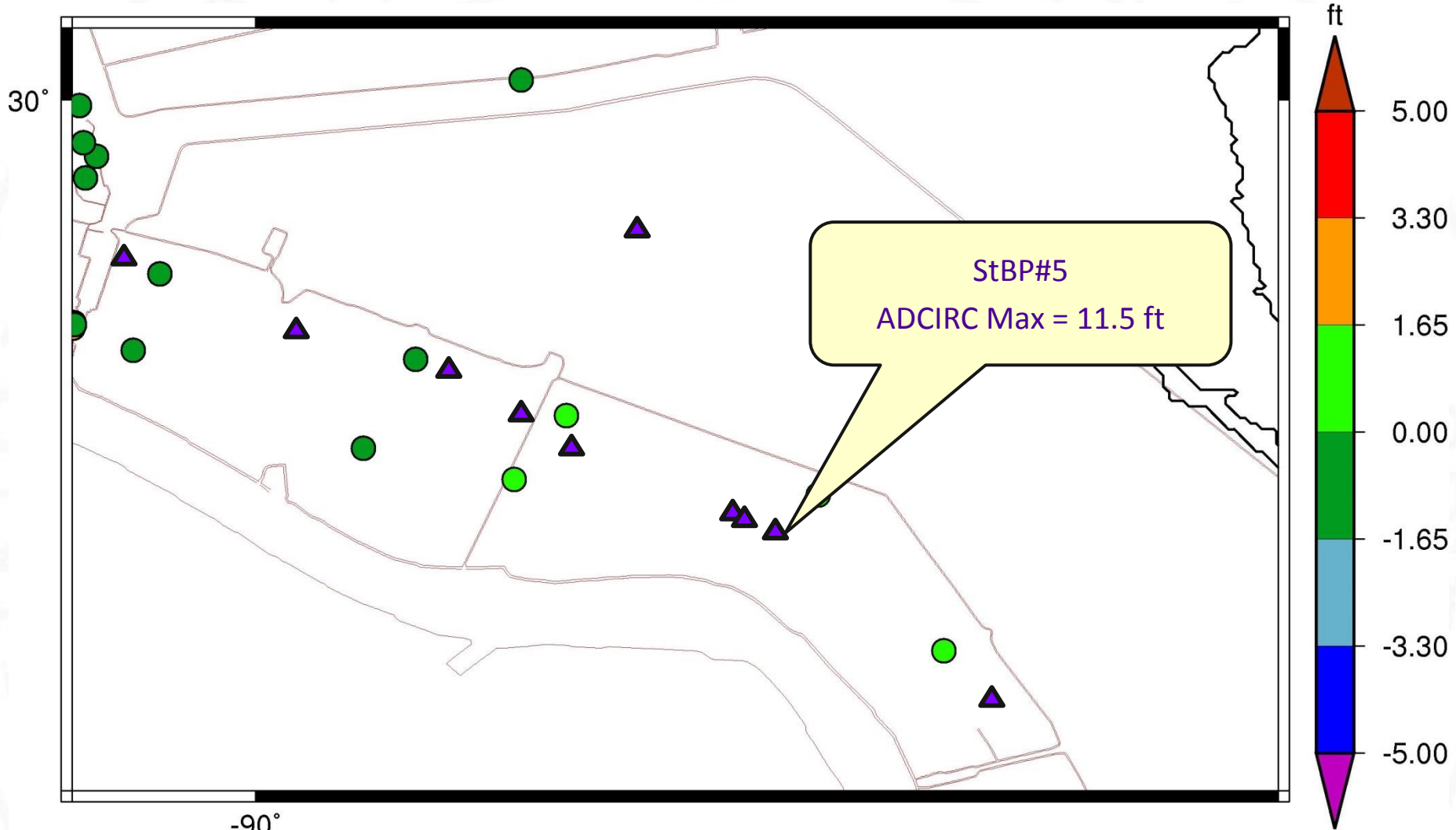


Figure 19zzg

▲ = Location of Plaintiff Property

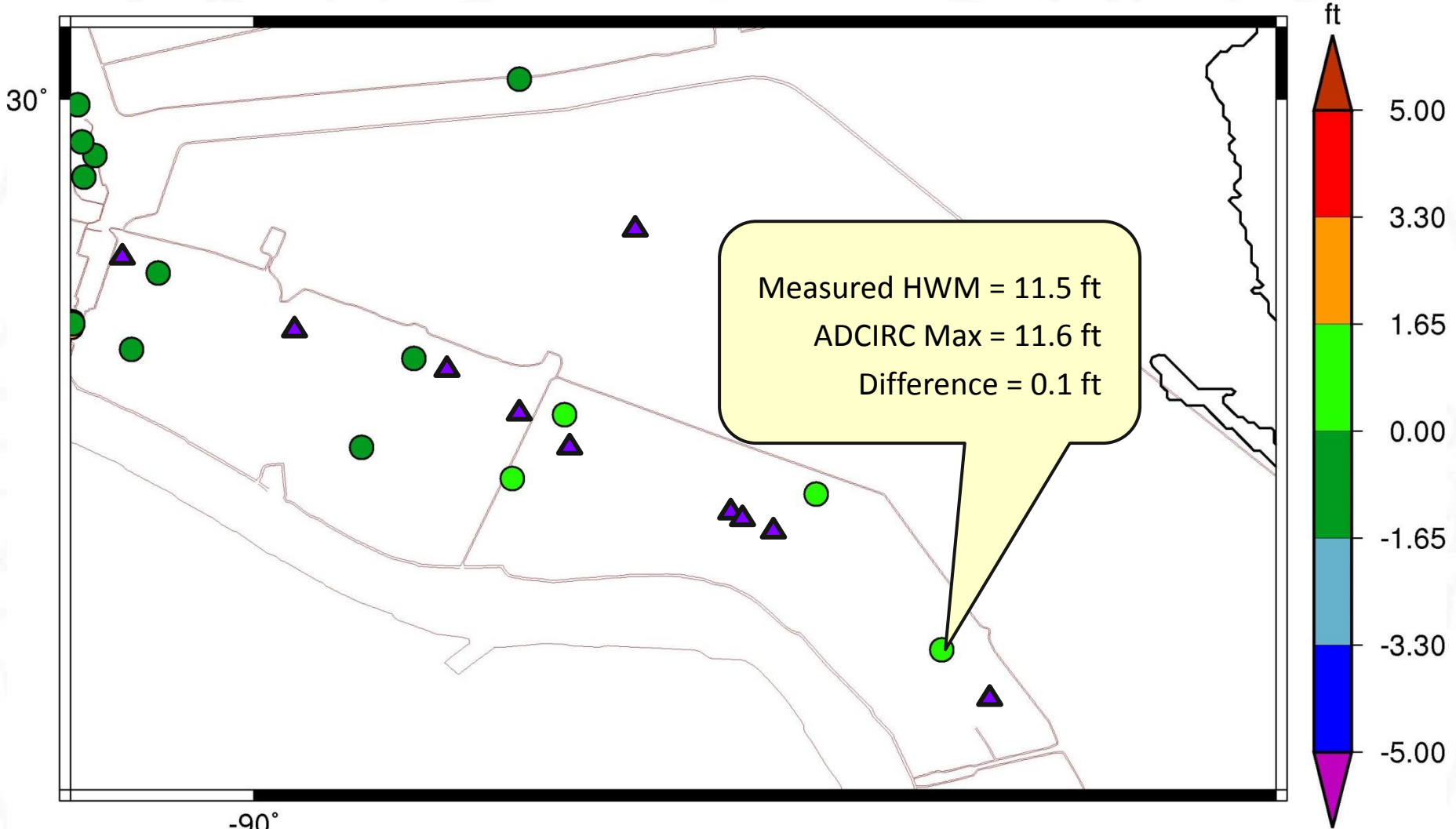


Figure 19zzh

▲ = Location of Plaintiff Property

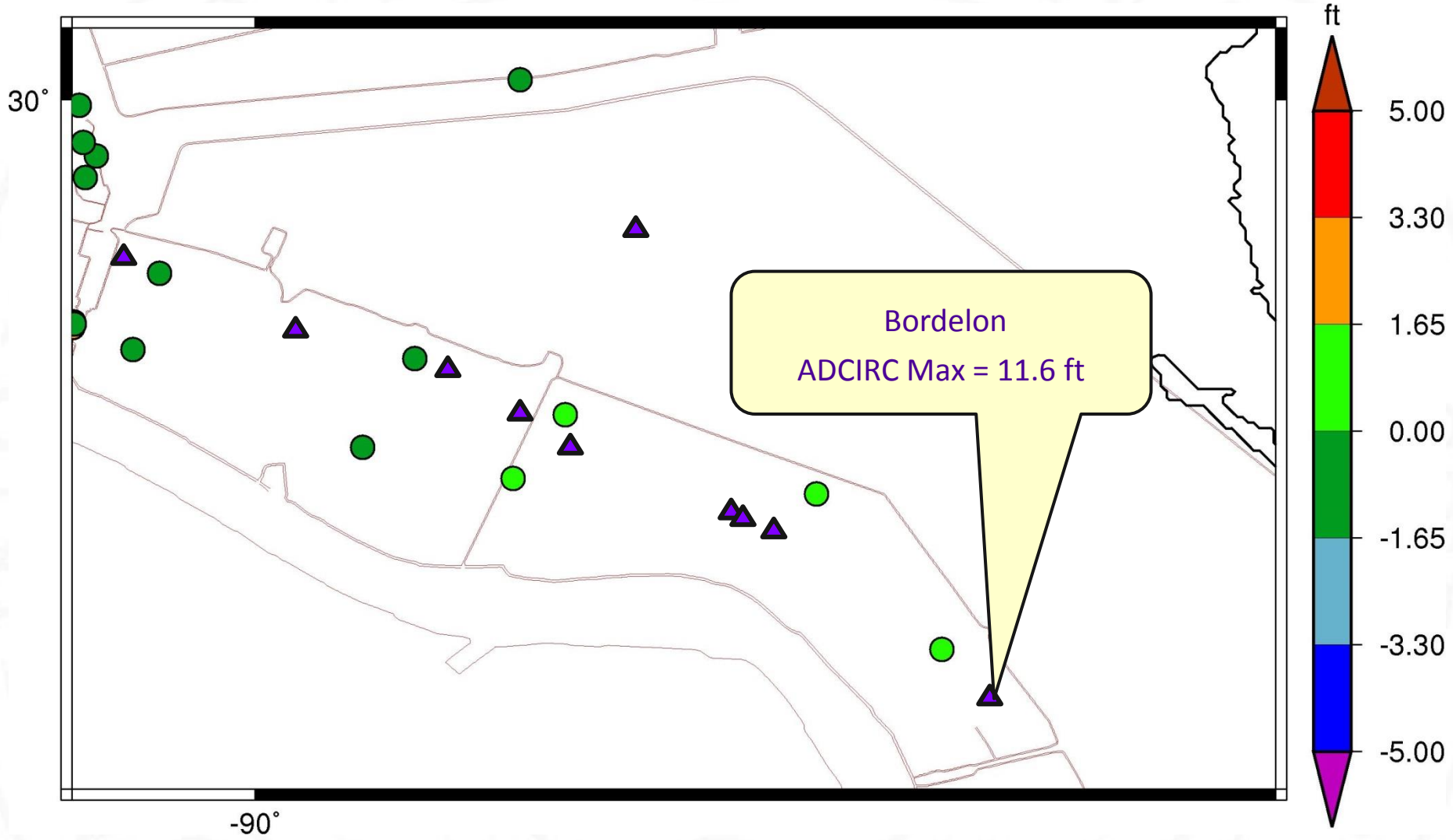


Figure 19zzi

▲ = Location of Plaintiff Property

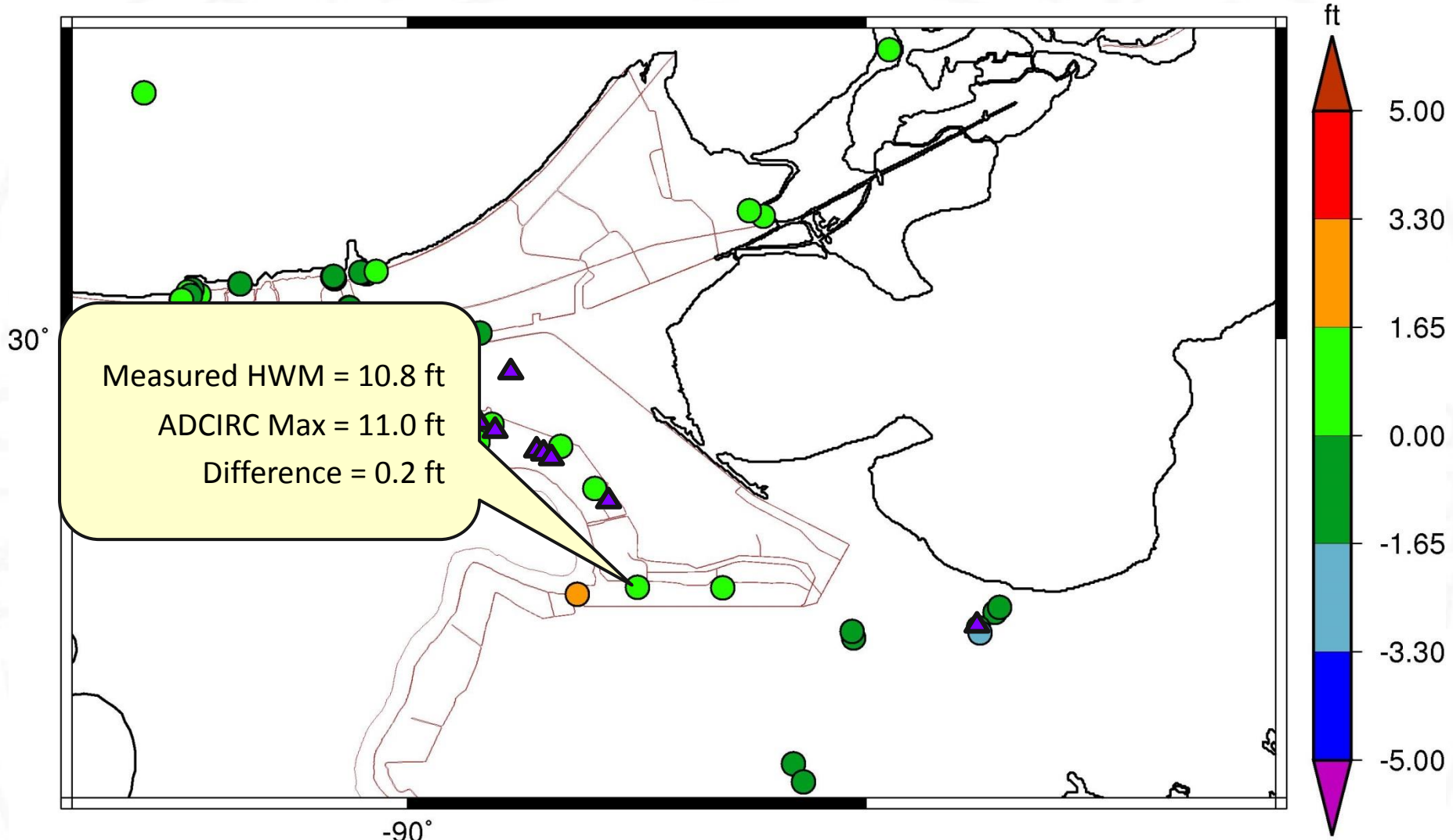


Figure 19zzj

▲ = Location of Plaintiff Property

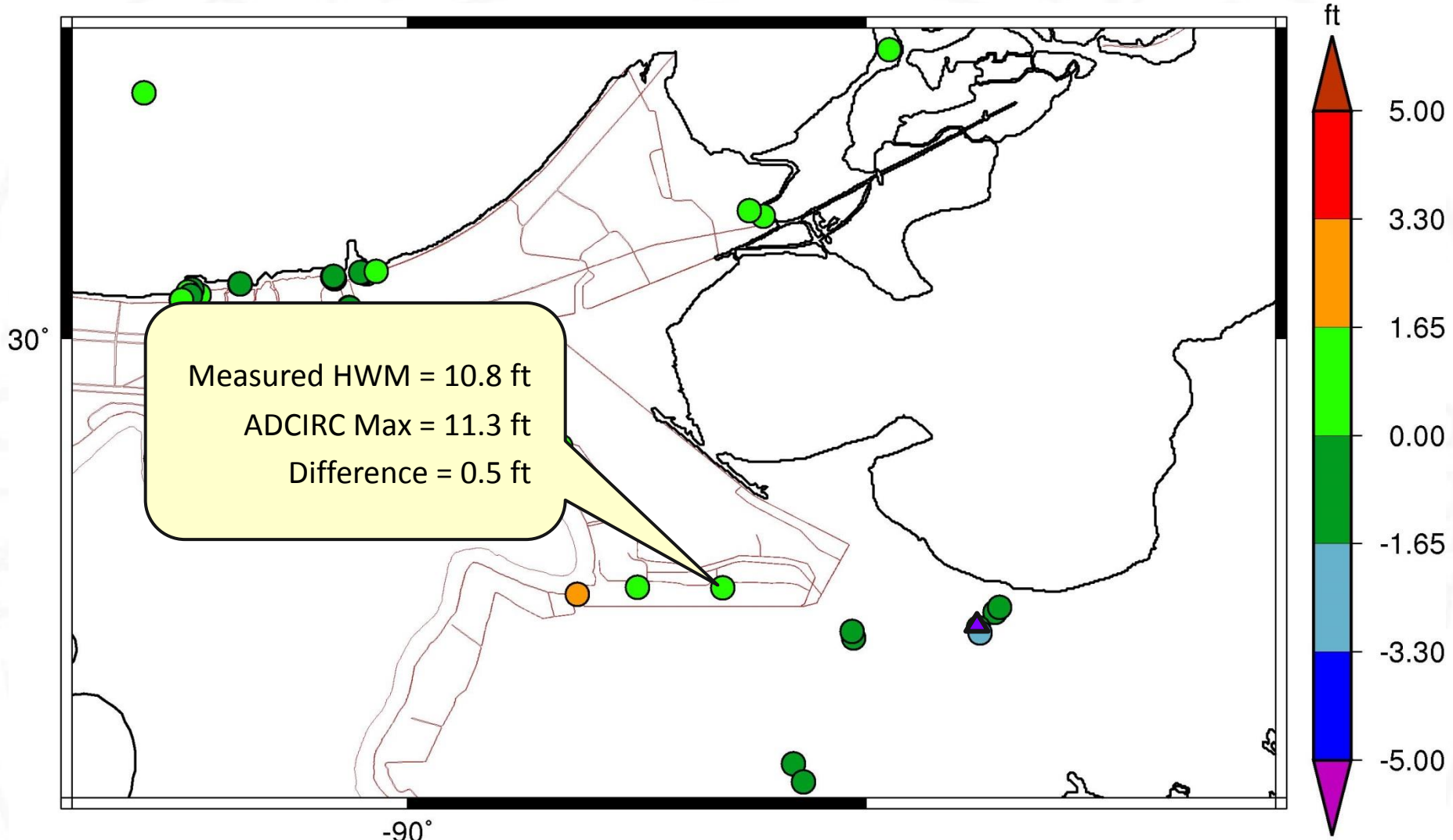


Figure 19zzk

▲ = Location of Plaintiff Property

- The A1 Scenario results also closely match water surface elevation time history data collected at exterior locations surrounding St. Bernard Polder.
- The time series hydrographs shown in the next series of slides (Figures 20, 21a-d) show the A1 Scenario **ADCIRC** results plotted against tidal gauges at four exterior locations: Little Irish Bayou, Lake Pontchartrain Midlake Causeway, the 17th Street Canal, and the IHNC Lock.
- In each instance, the **ADCIRC** model results closely match the shapes of the hydrographs depicting the exterior gauge data, matching both the rise and fall of Hurricane Katrina's storm surge as it was recorded in real time.

- Location Map of Available time series data near St. Bernard Parish

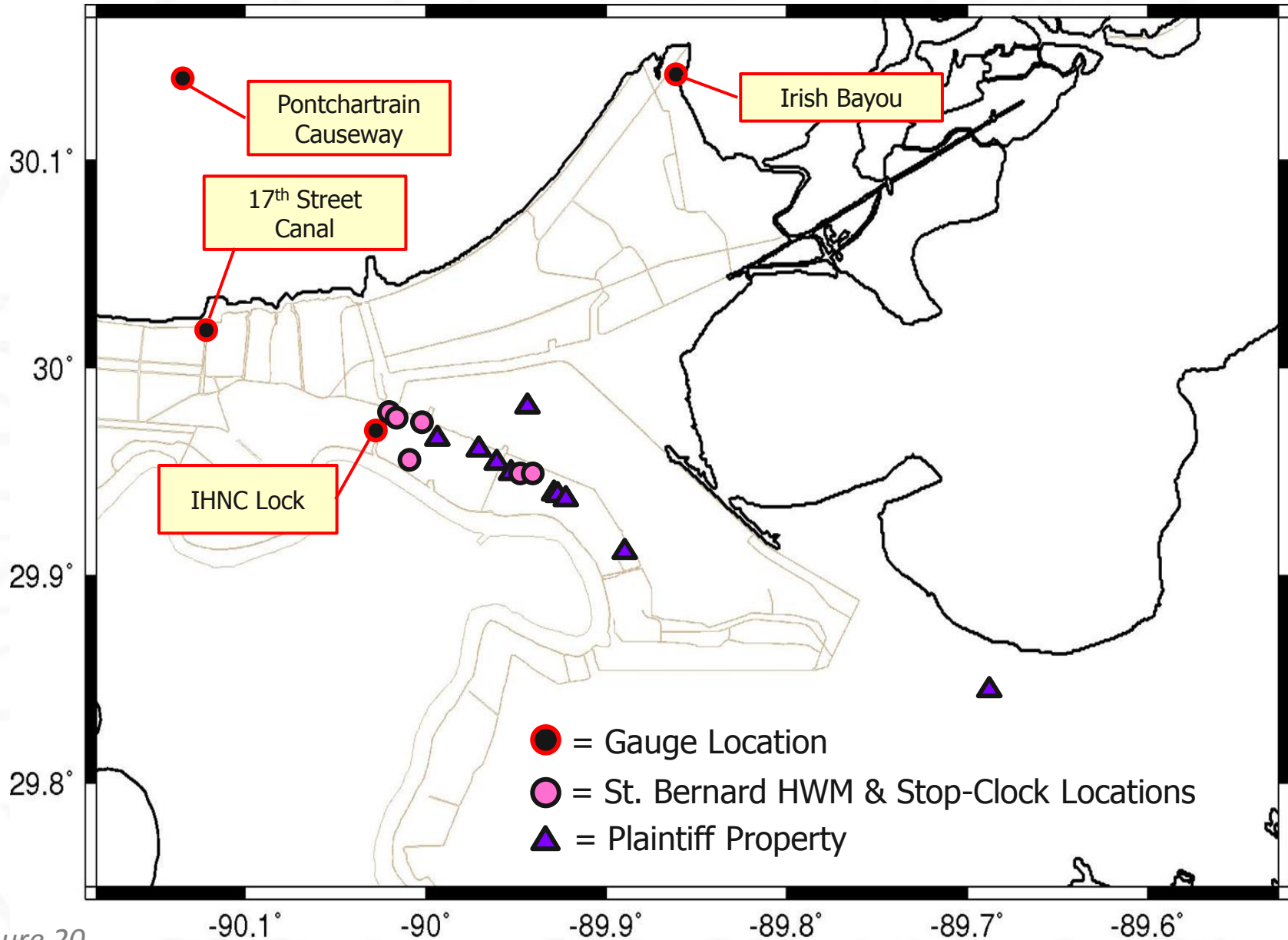


Figure 20

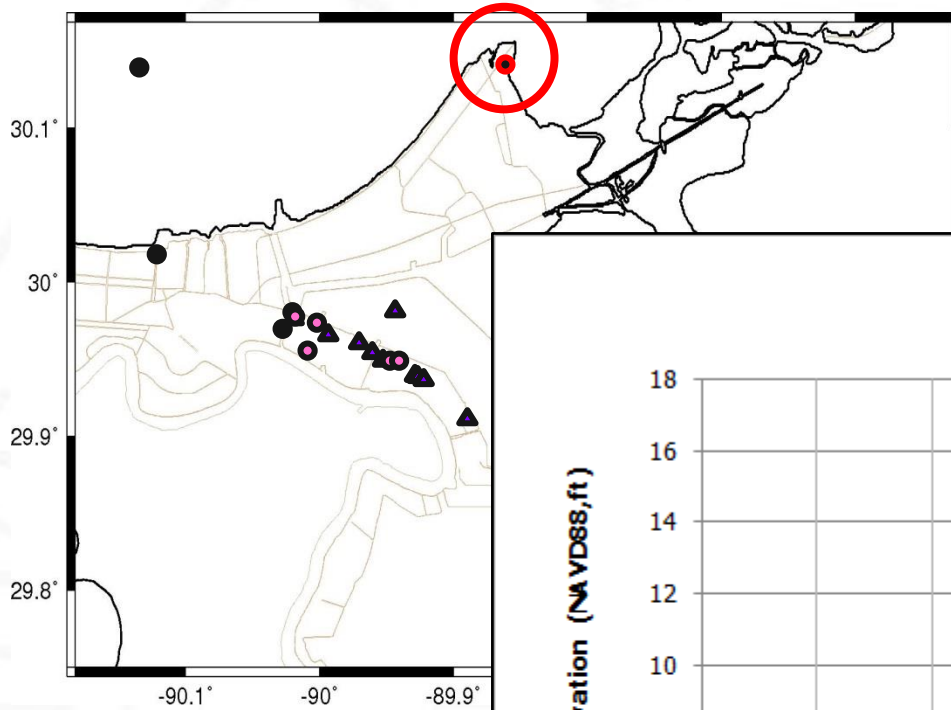
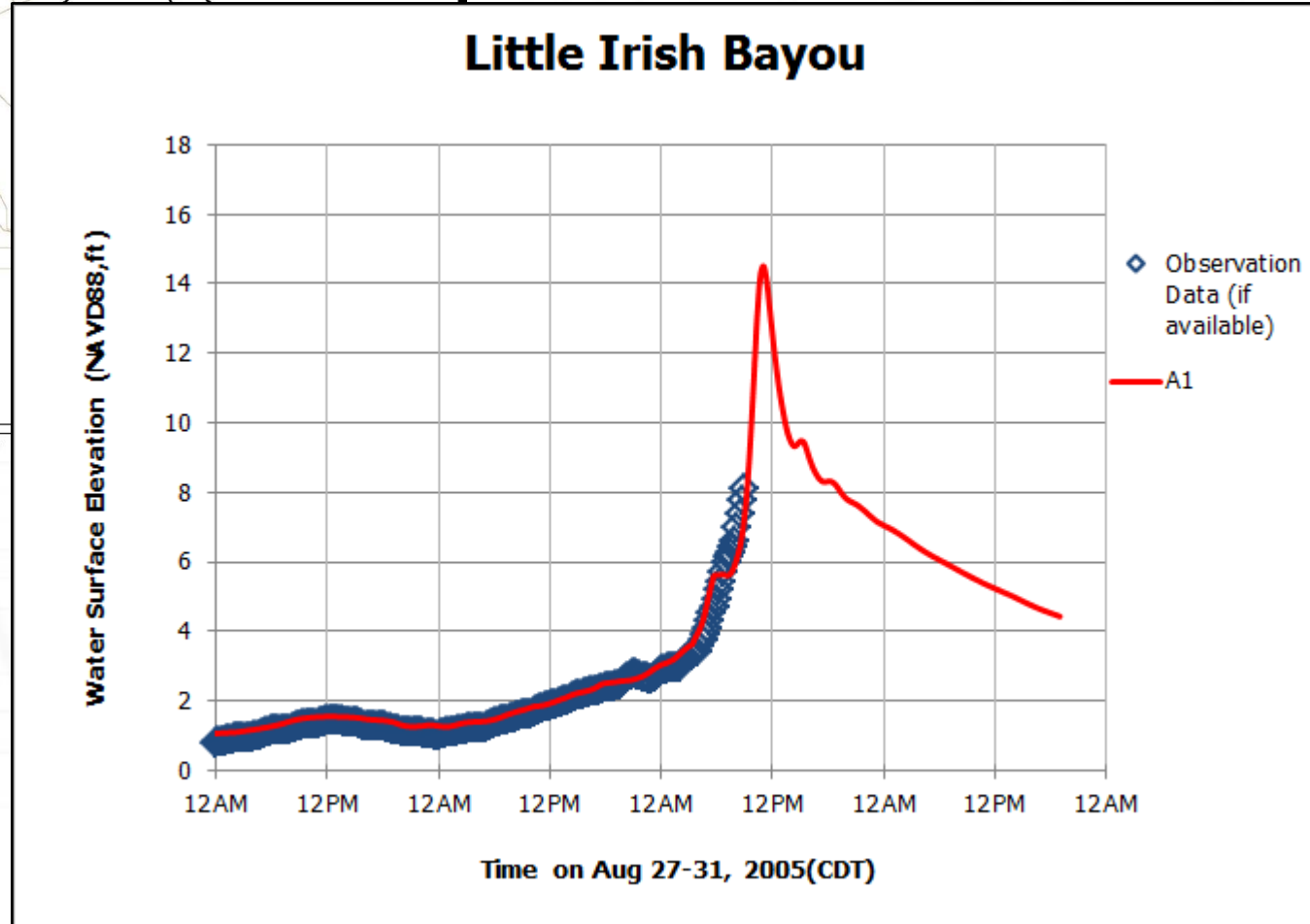


Figure 21a



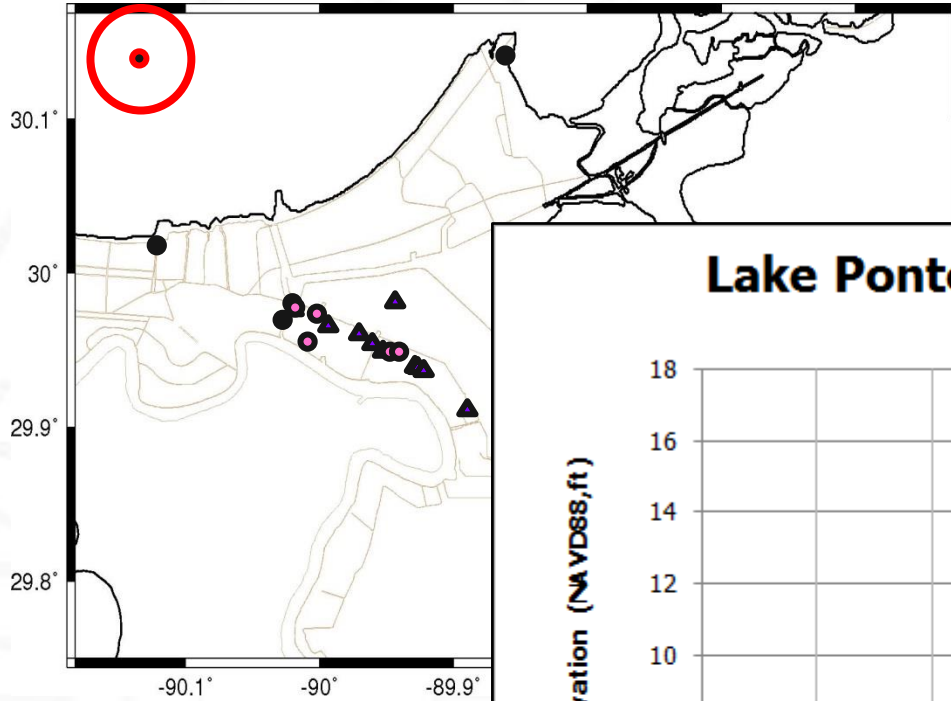
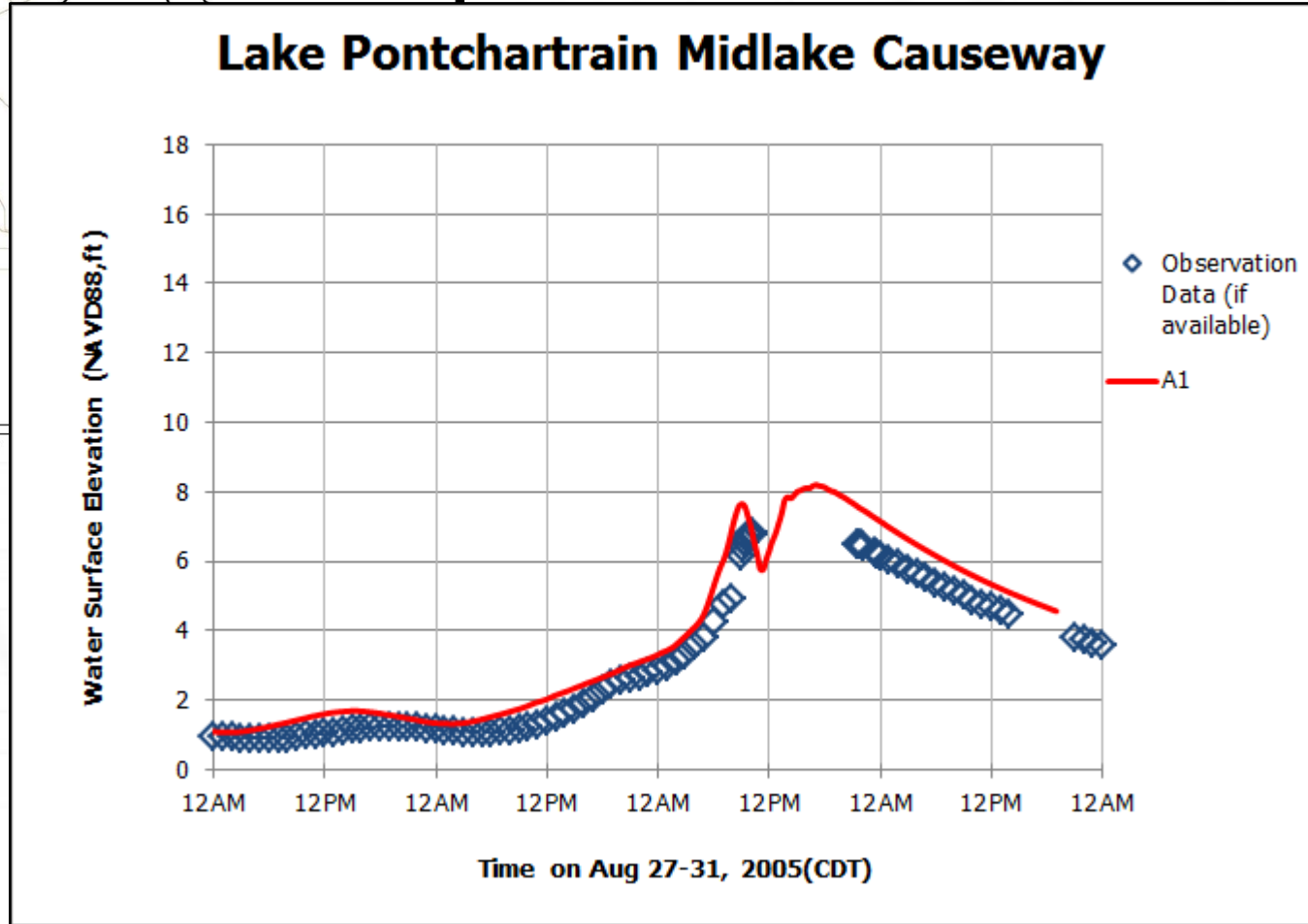


Figure 21b



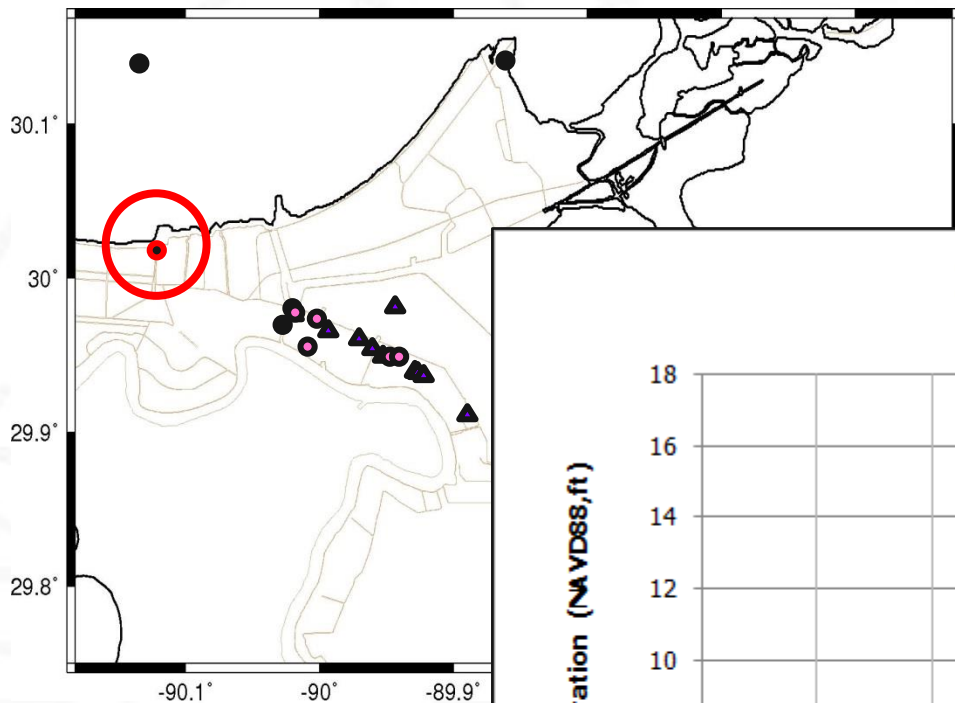
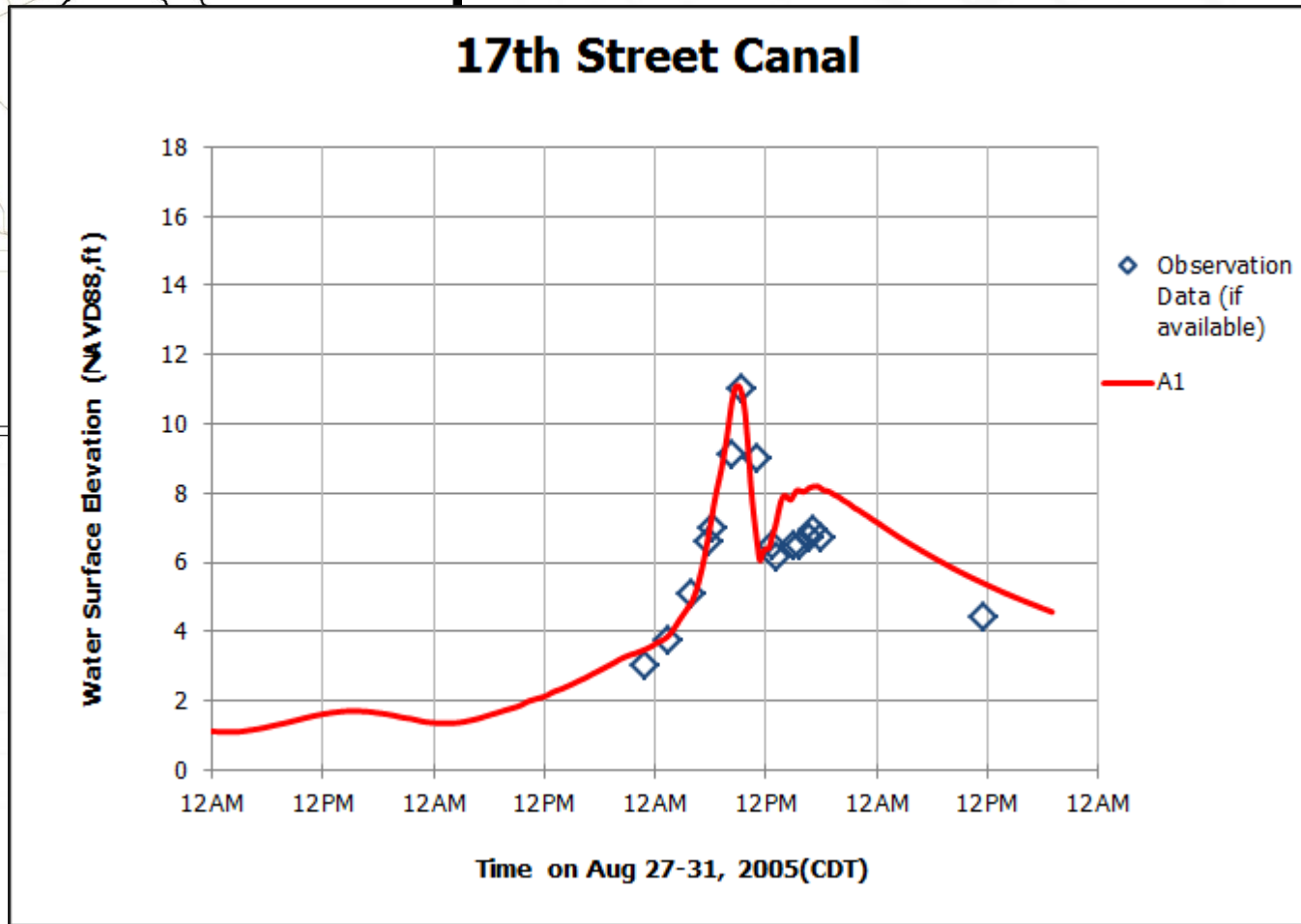


Figure 21c



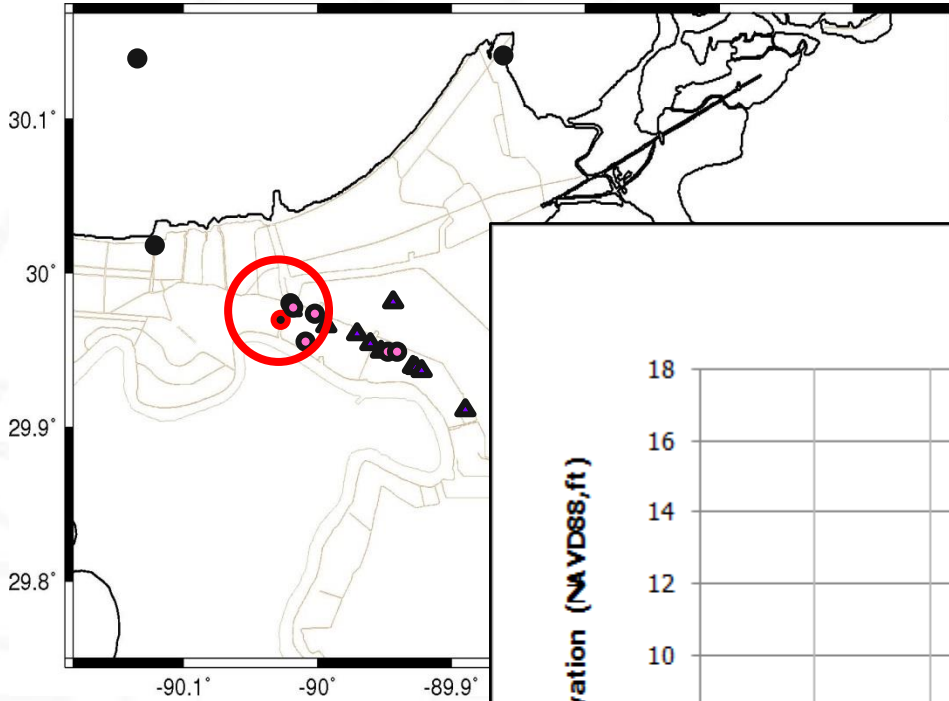
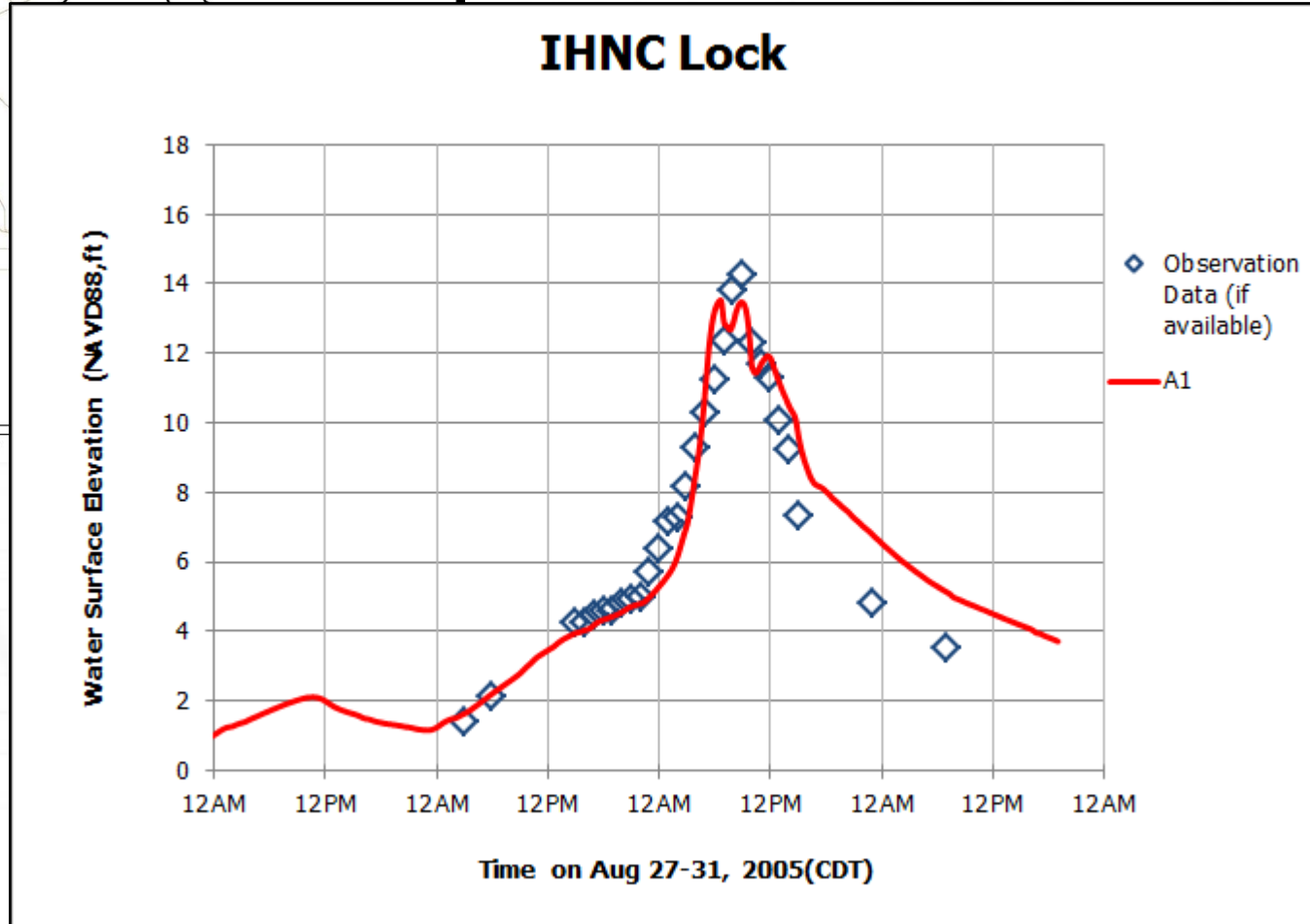


Figure 21d



- The next series of slides (Figures 22a-q) features hydrographs that show the flooding and timing of the flooding interior to St. Bernard Polder and on each Trial Property.
- Specifically, I have plotted hydrographs for the Scenario A1 modeling results at several additional non-Plaintiff Properties located in close proximity to the Plaintiff Properties.
 - The non-Plaintiff interior hydrographs are plotted against historic high water level data or stopped-clock data collected at each of these locations.
 - The Scenario A1 **ADCIRC** modeling accurately depicts flooding at each of these locations, closely matching both the elevations and *timing* of the high water data recorded during Hurricane Katrina.
 - These results further validate the **ADCIRC** modeling inside St. Bernard Polder, and confirm the accuracy of the results reached at each of the Plaintiff Properties.

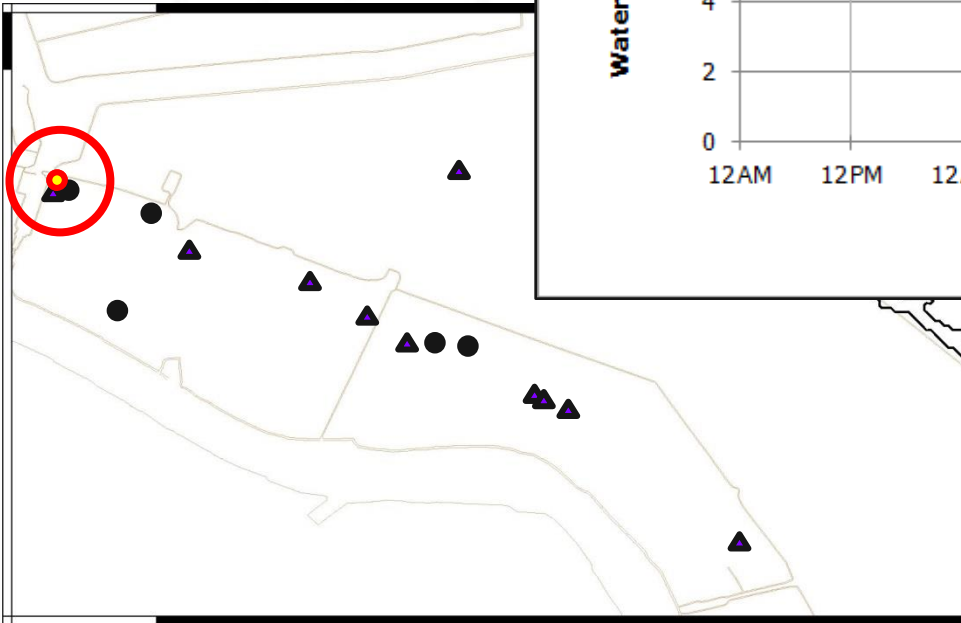
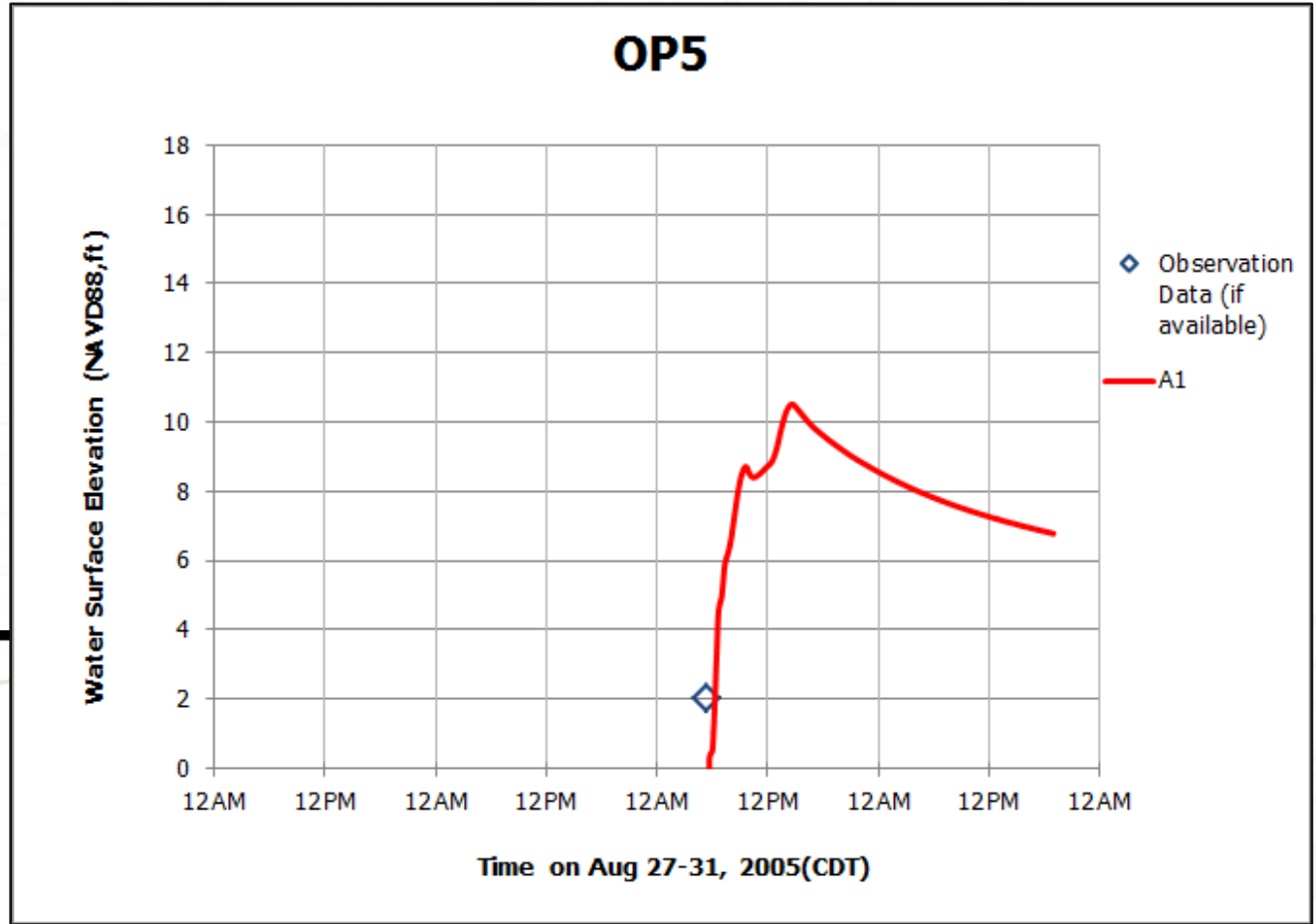


Figure 22a

Interior Data Location #1

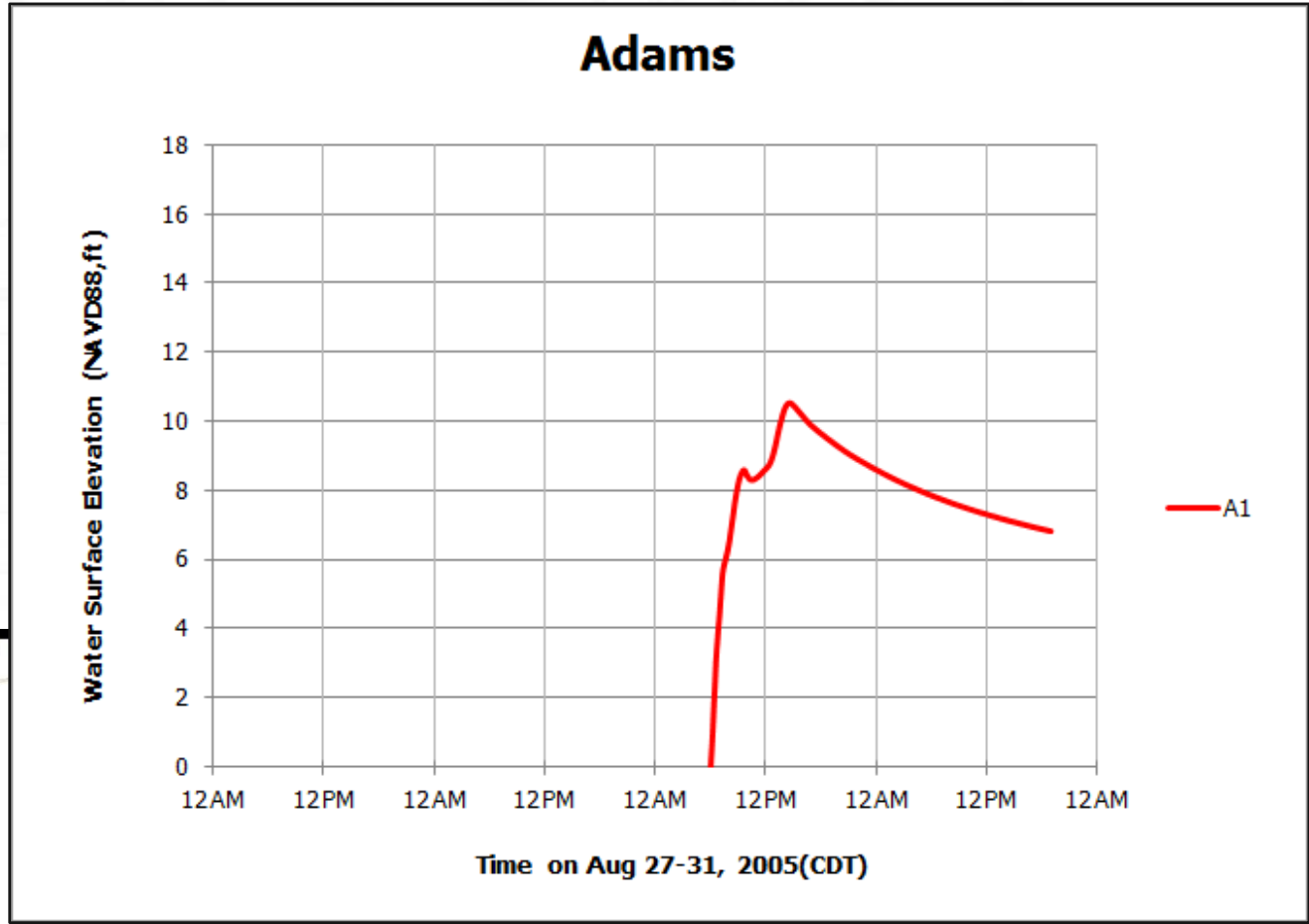
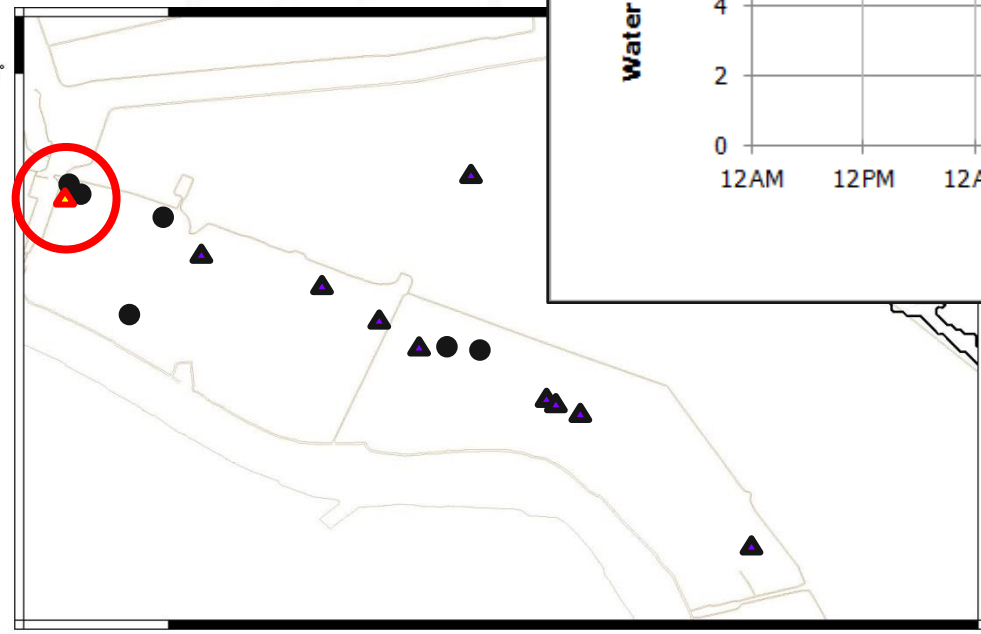


Figure 22b



Plaintiff Property "Adams"

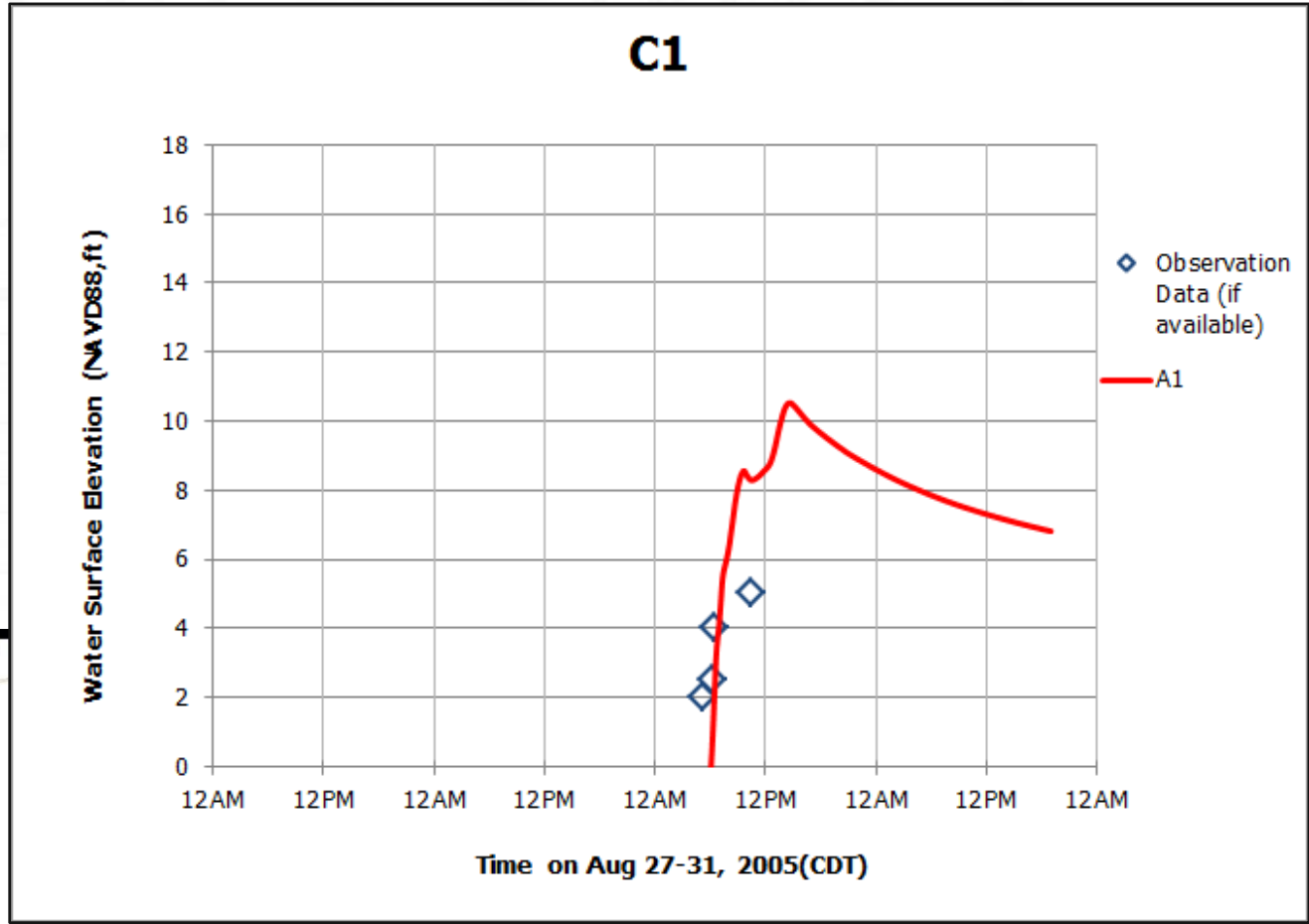


Figure 22c

Interior Data Location #2

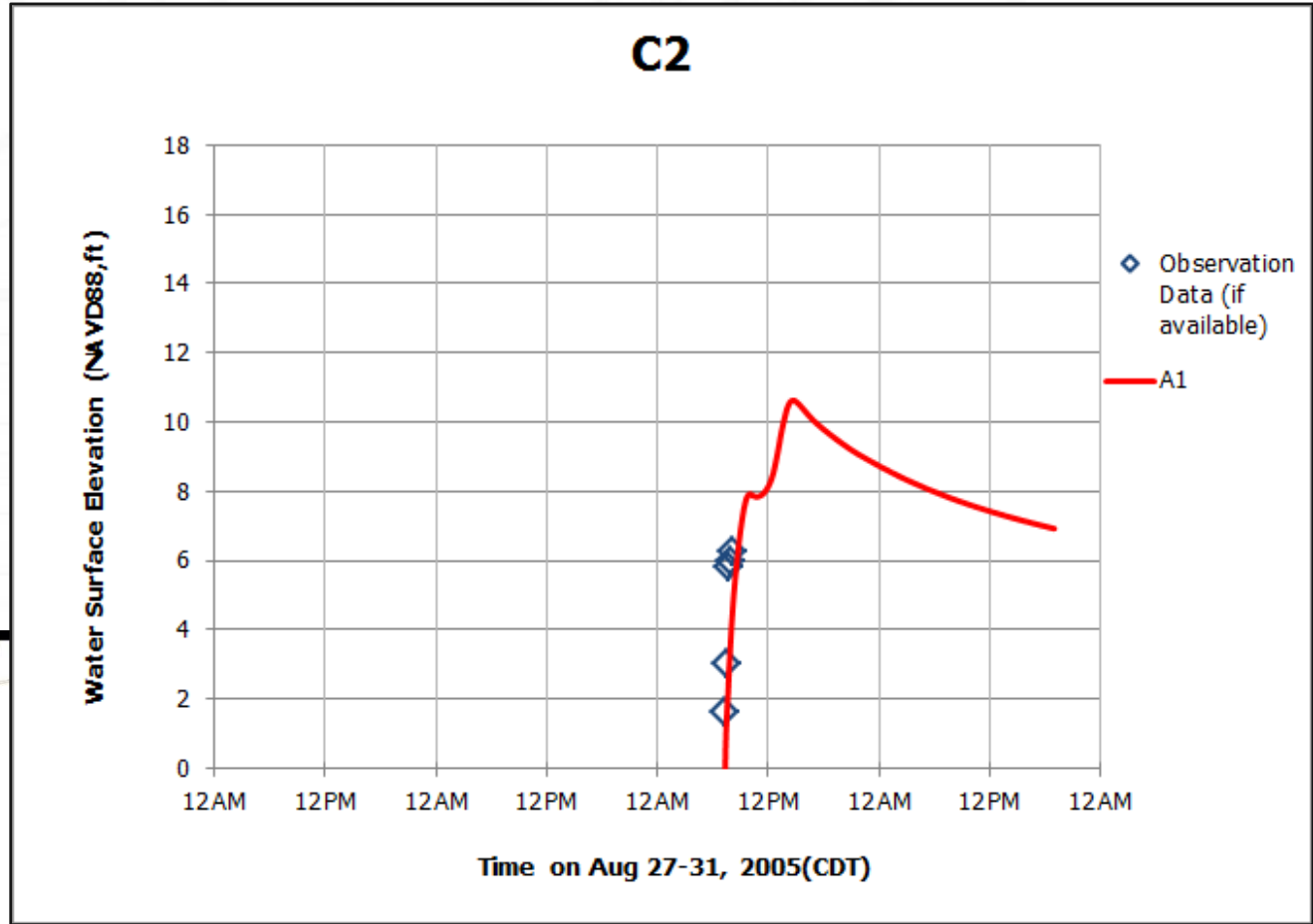
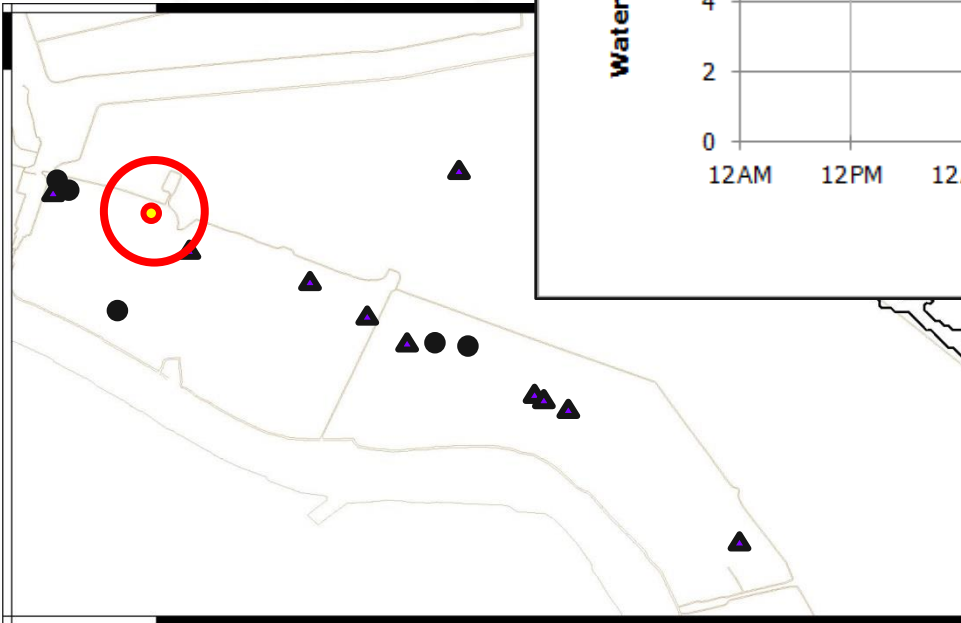


Figure 22d



Interior Data Location #3

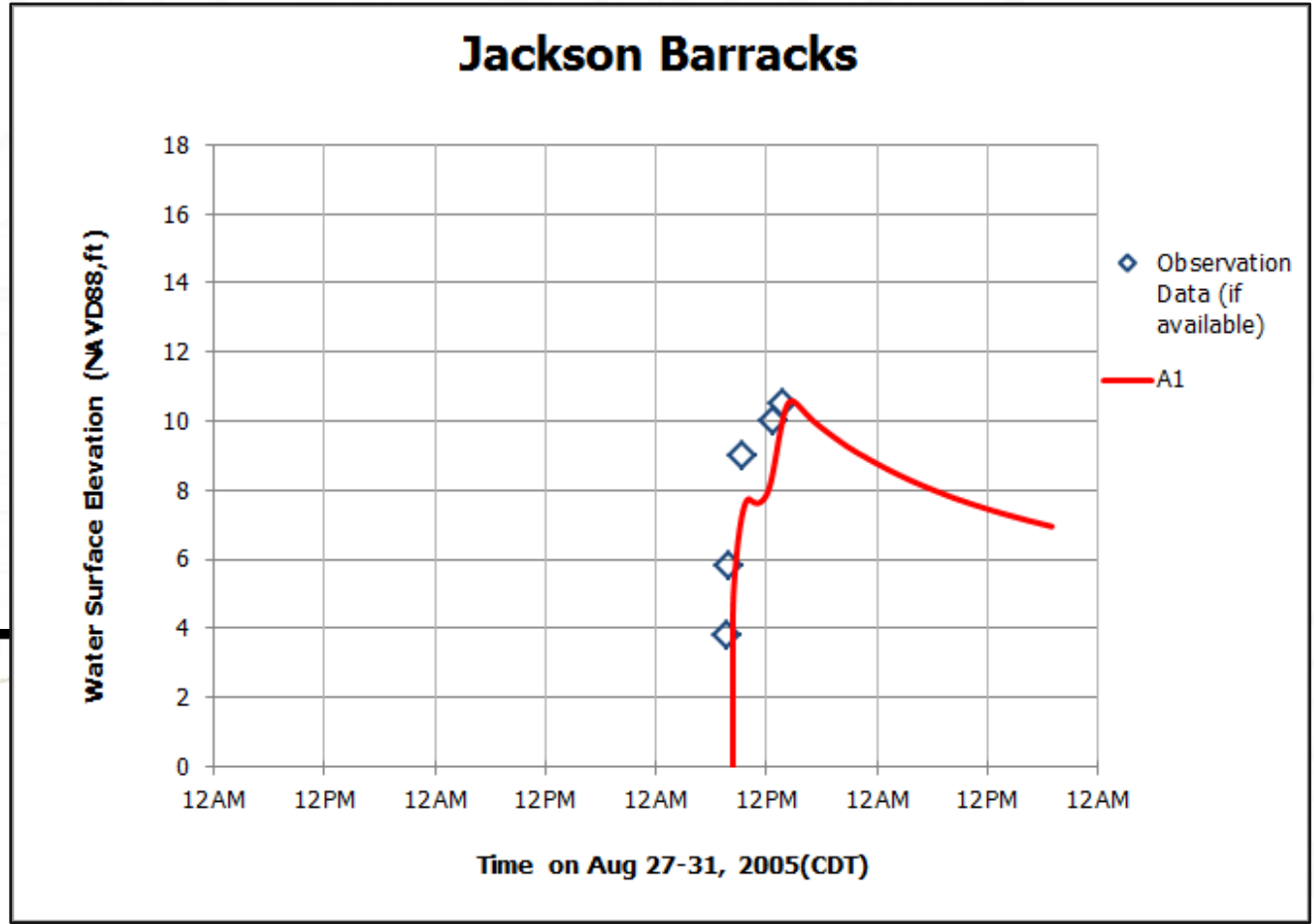


Figure 22e



Interior Data Location #4

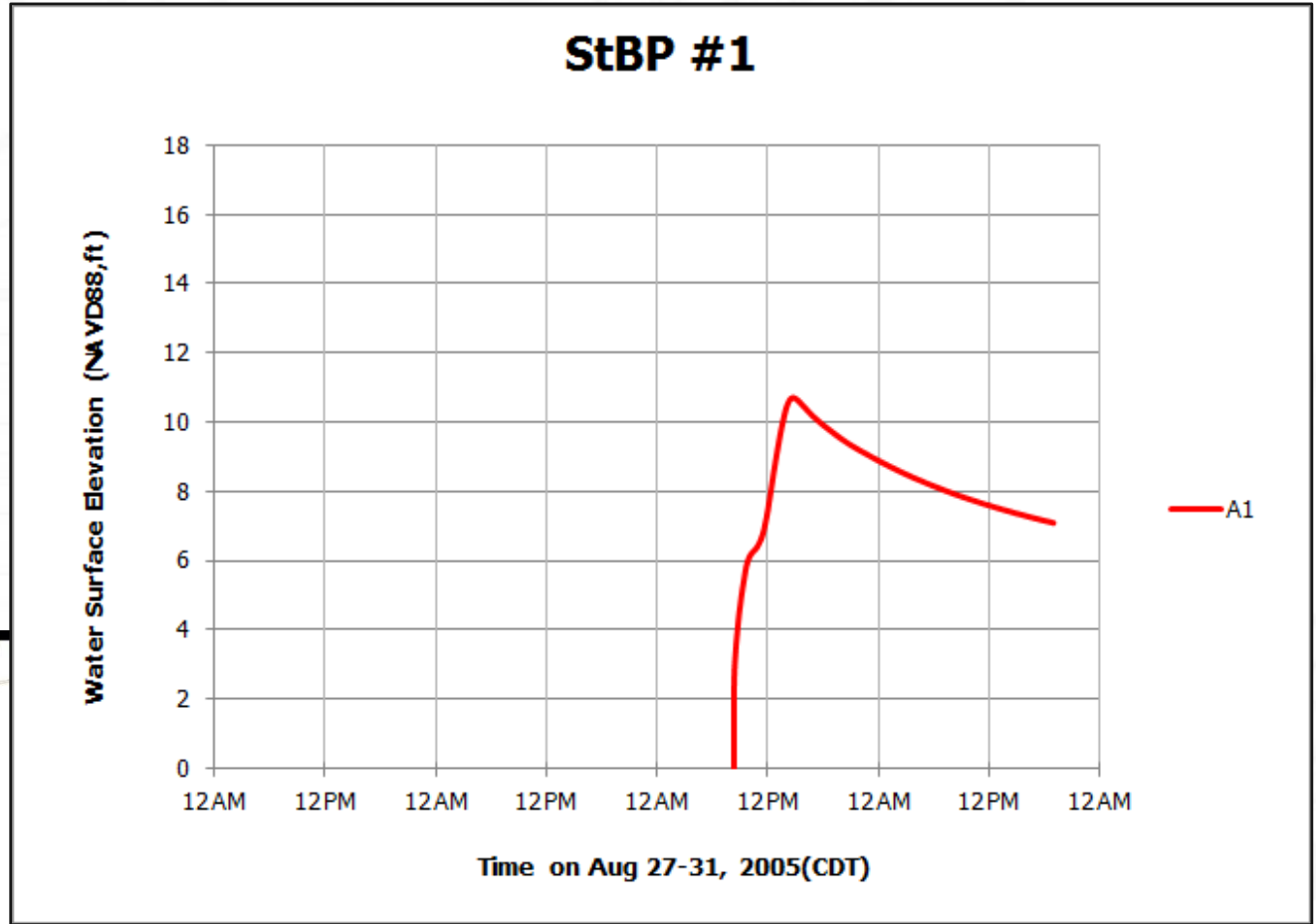
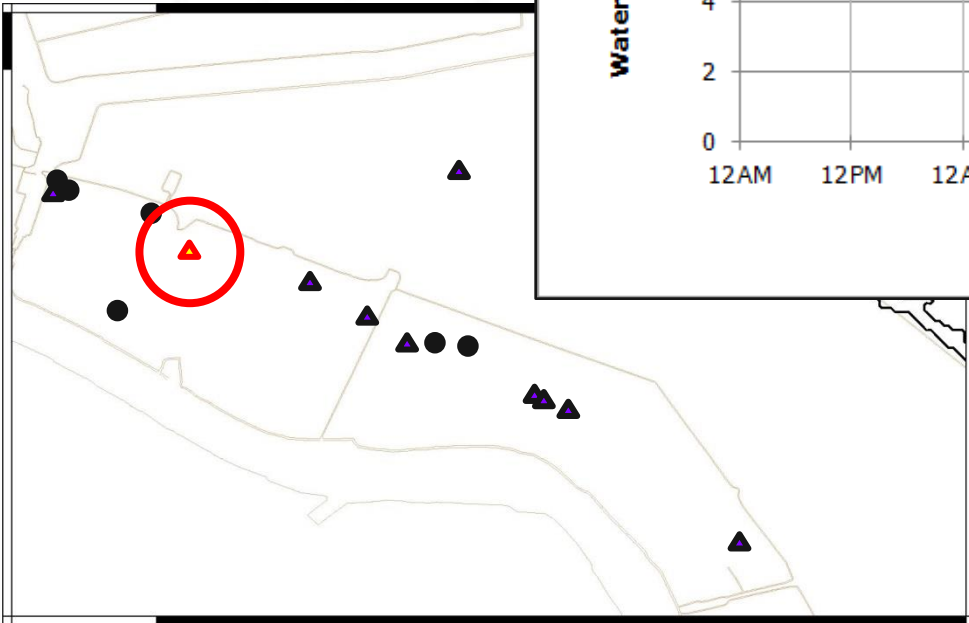


Figure 22f



Plaintiff Location "StBP#1"

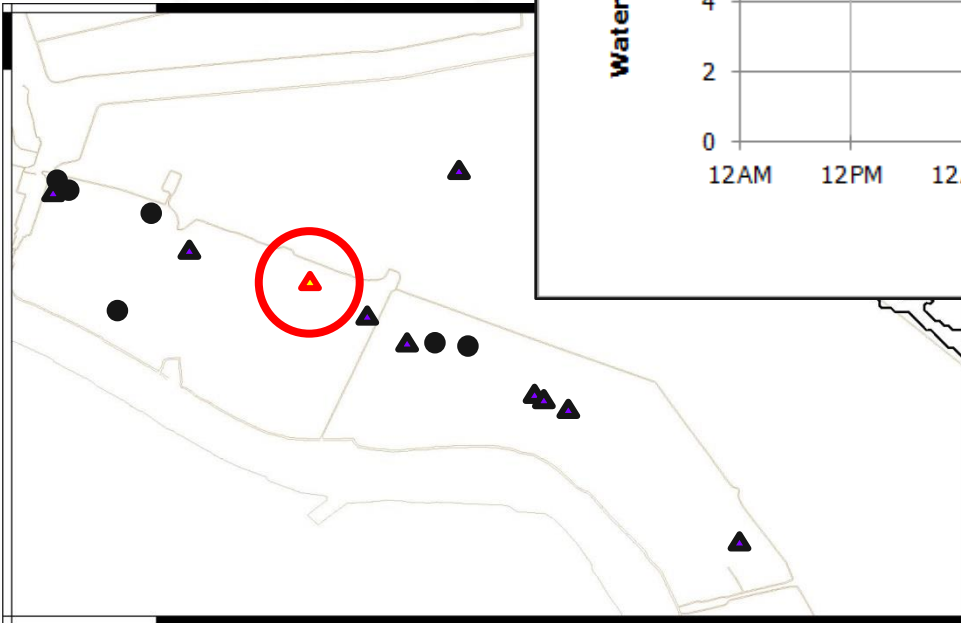
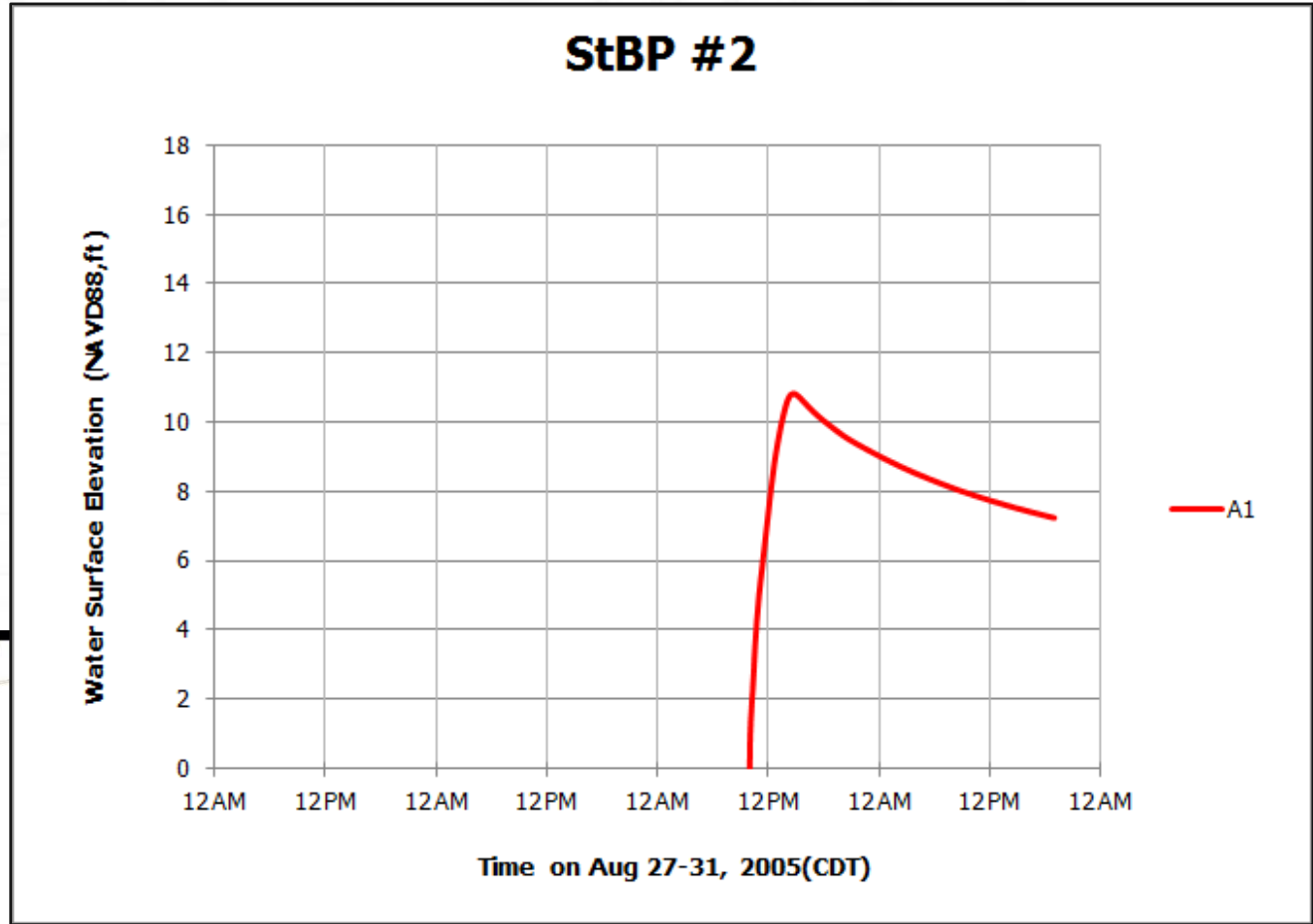


Figure 22g

Plaintiff Location "StBP#2"

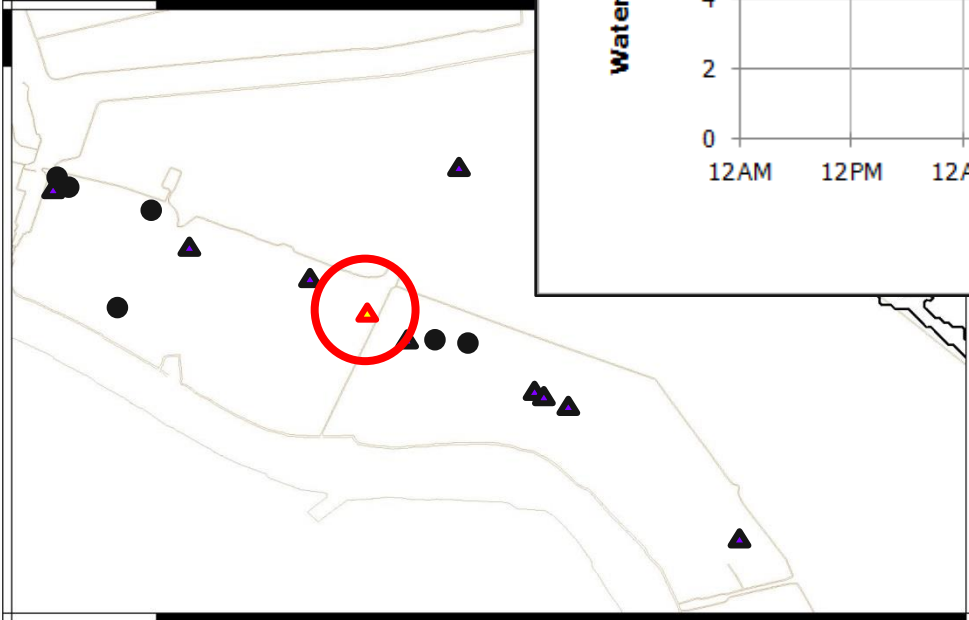
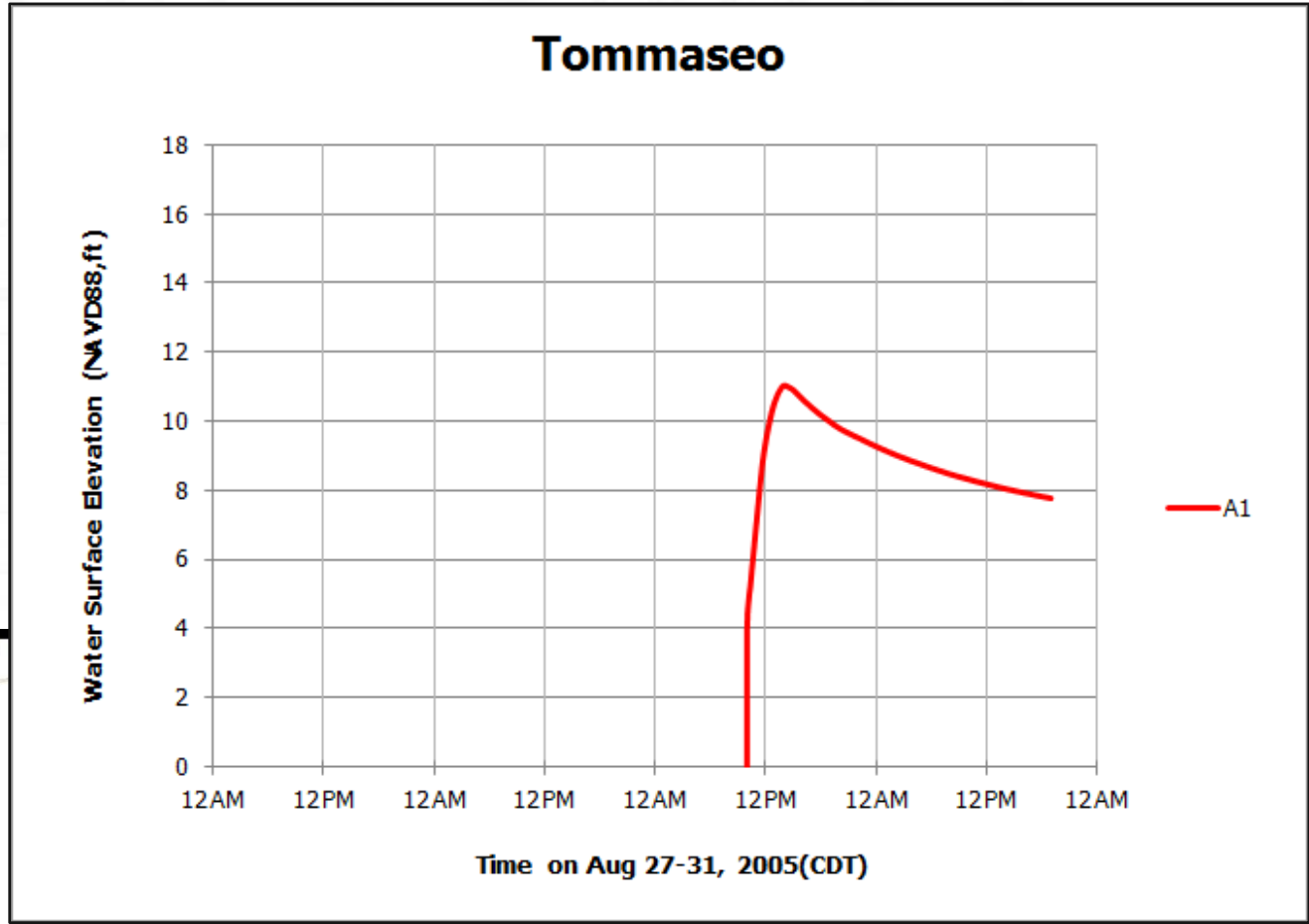


Figure 22h

Plaintiff Location "Tommaseo"

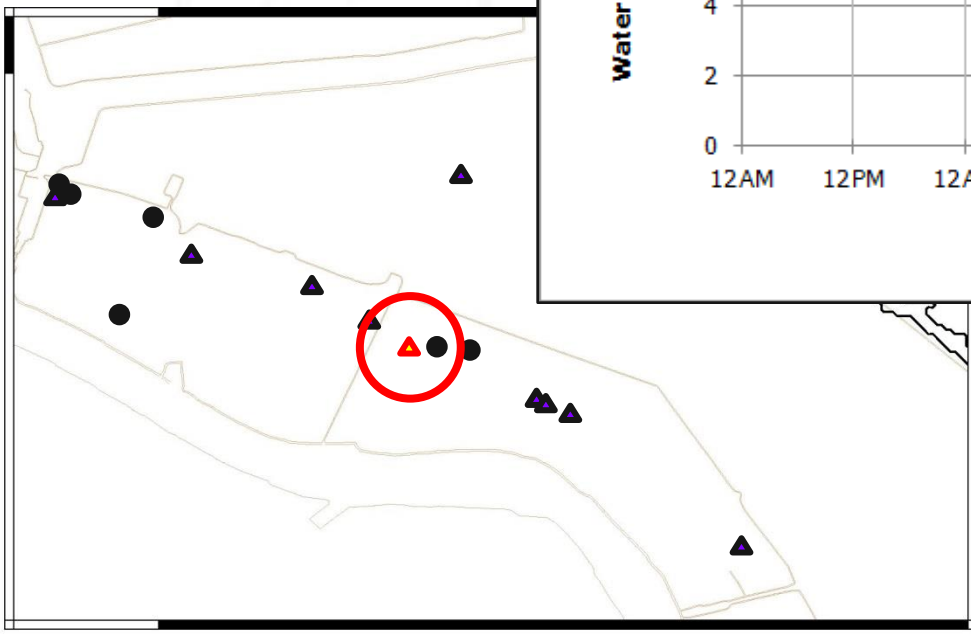
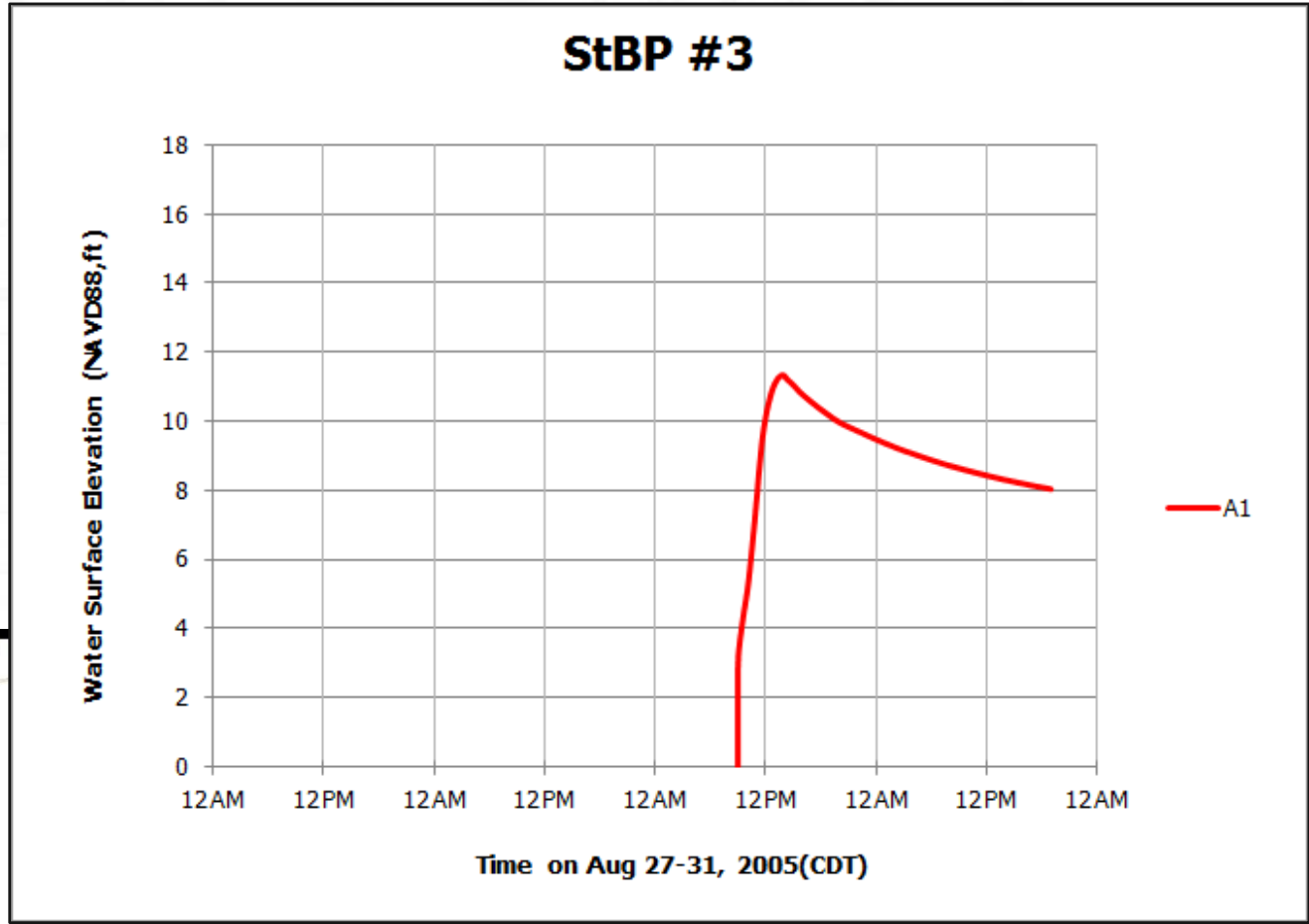


Figure 22i

Plaintiff Location "StBP#3"

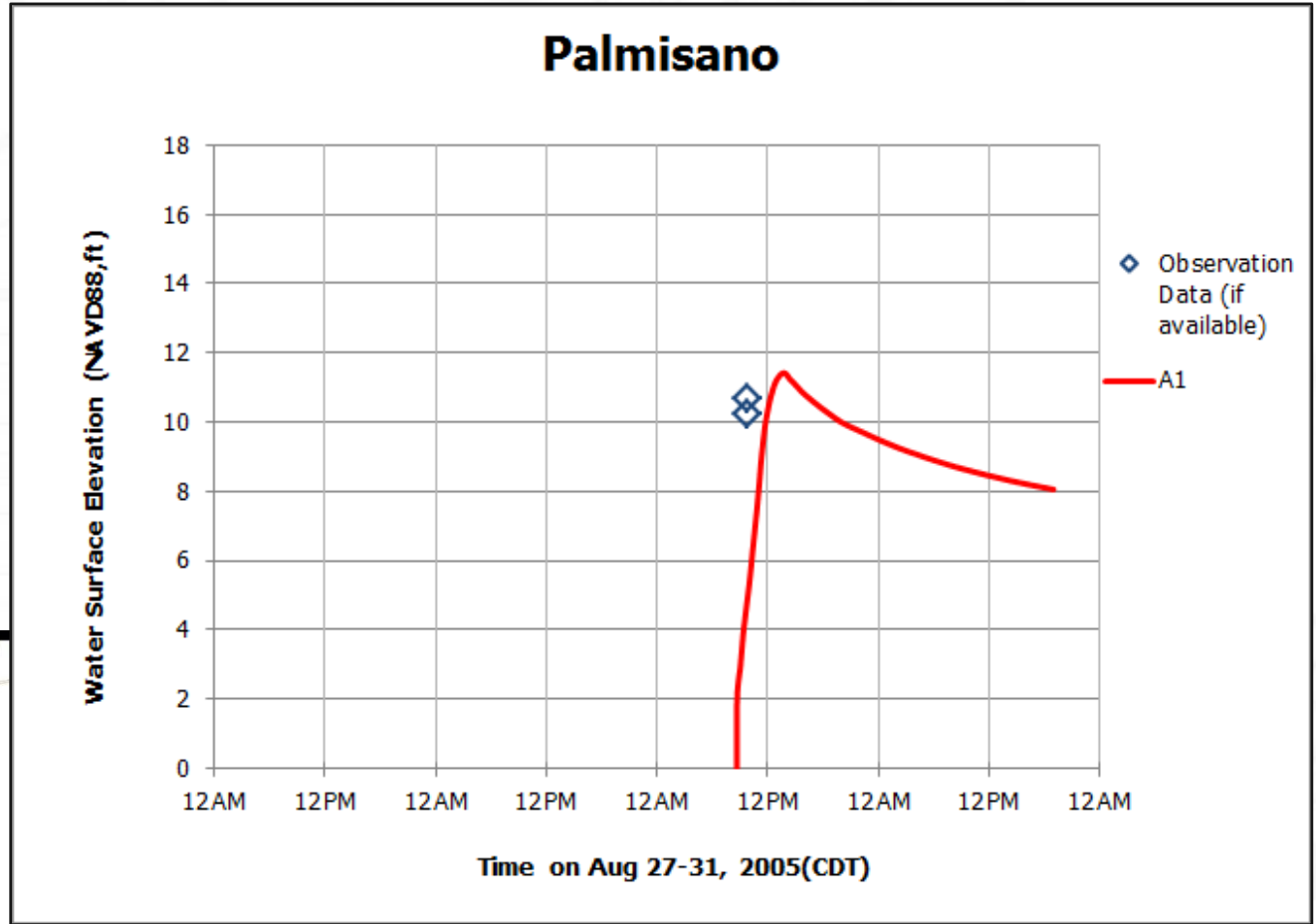
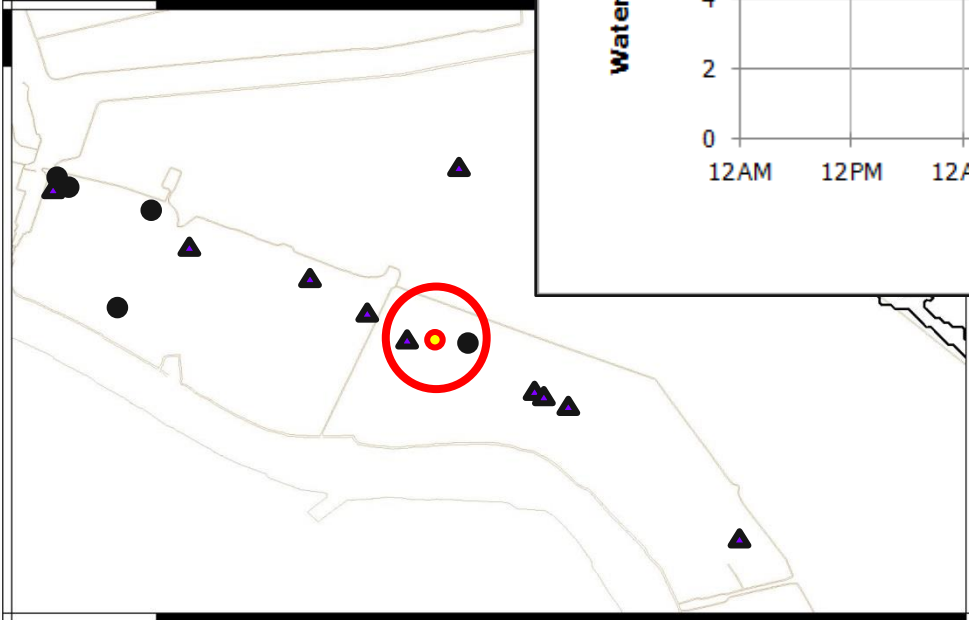


Figure 22j



Interior Data Location #5

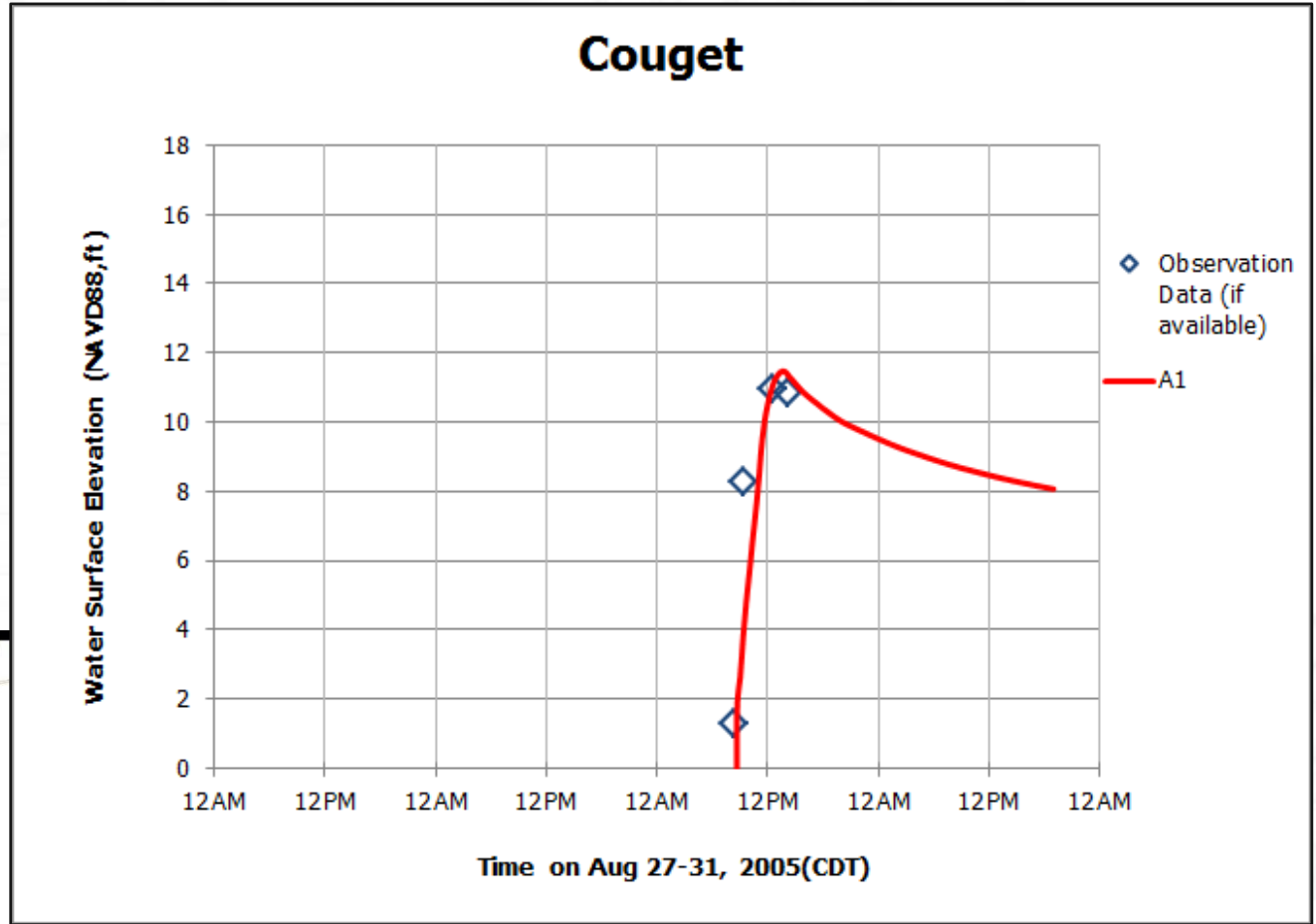
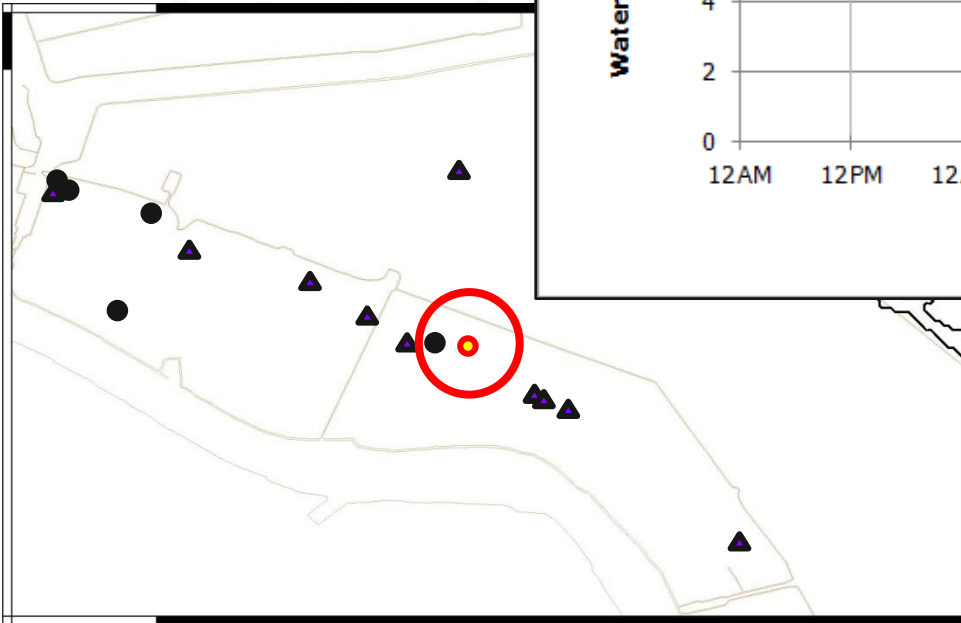


Figure 22k



Interior Data Location #6

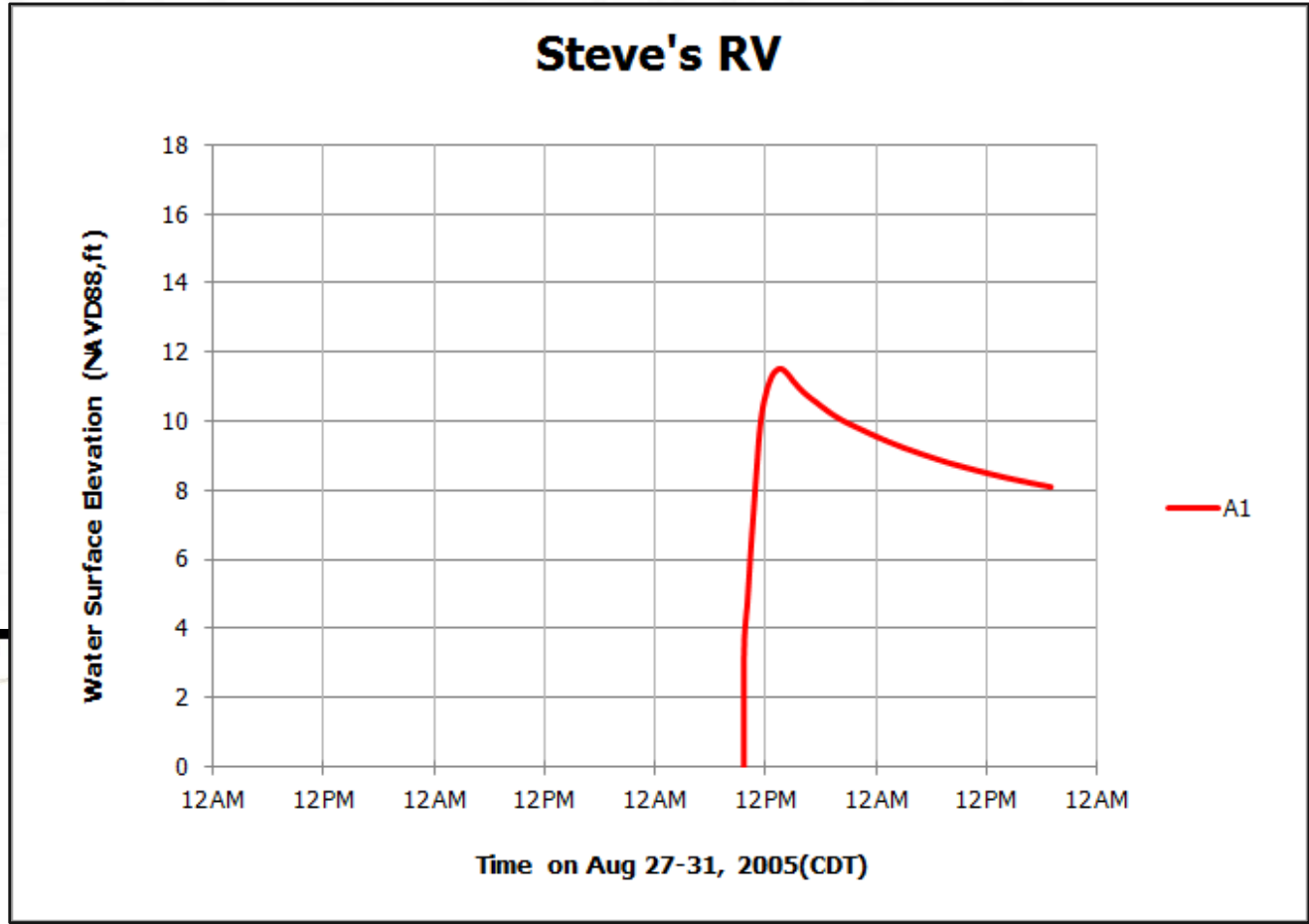
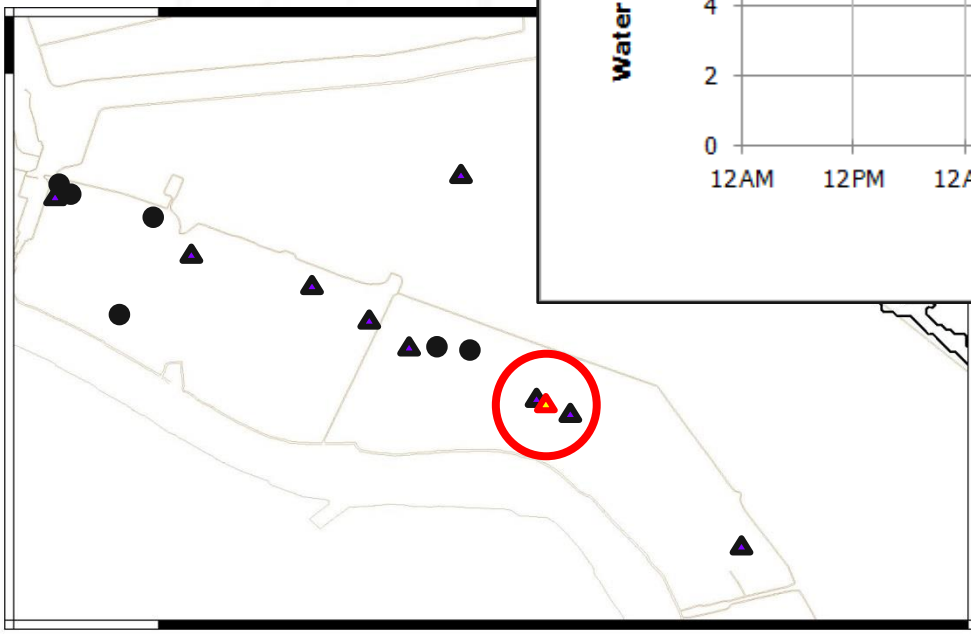


Figure 22m



Plaintiff Location "Steve's RV"

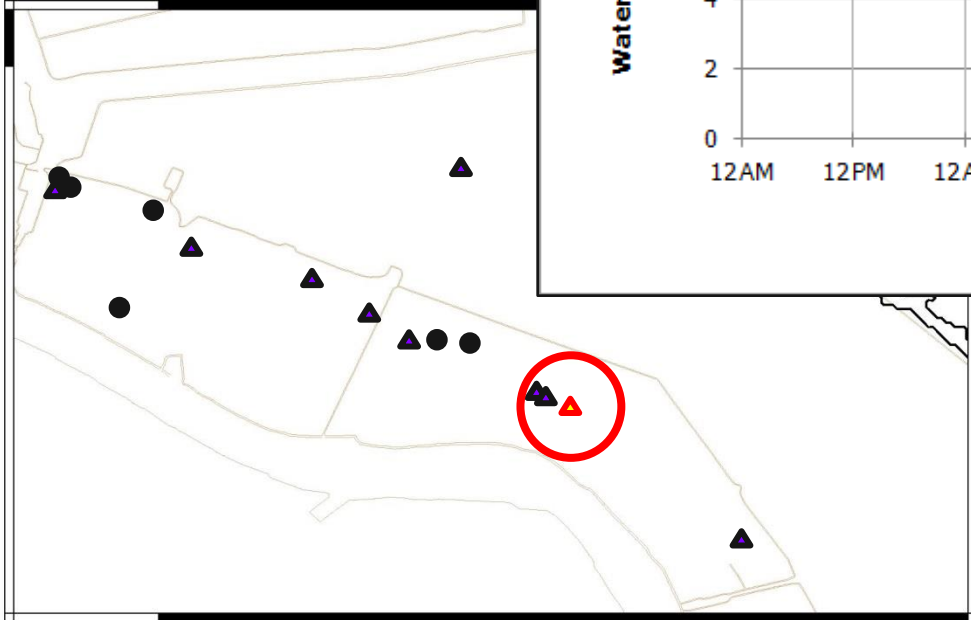
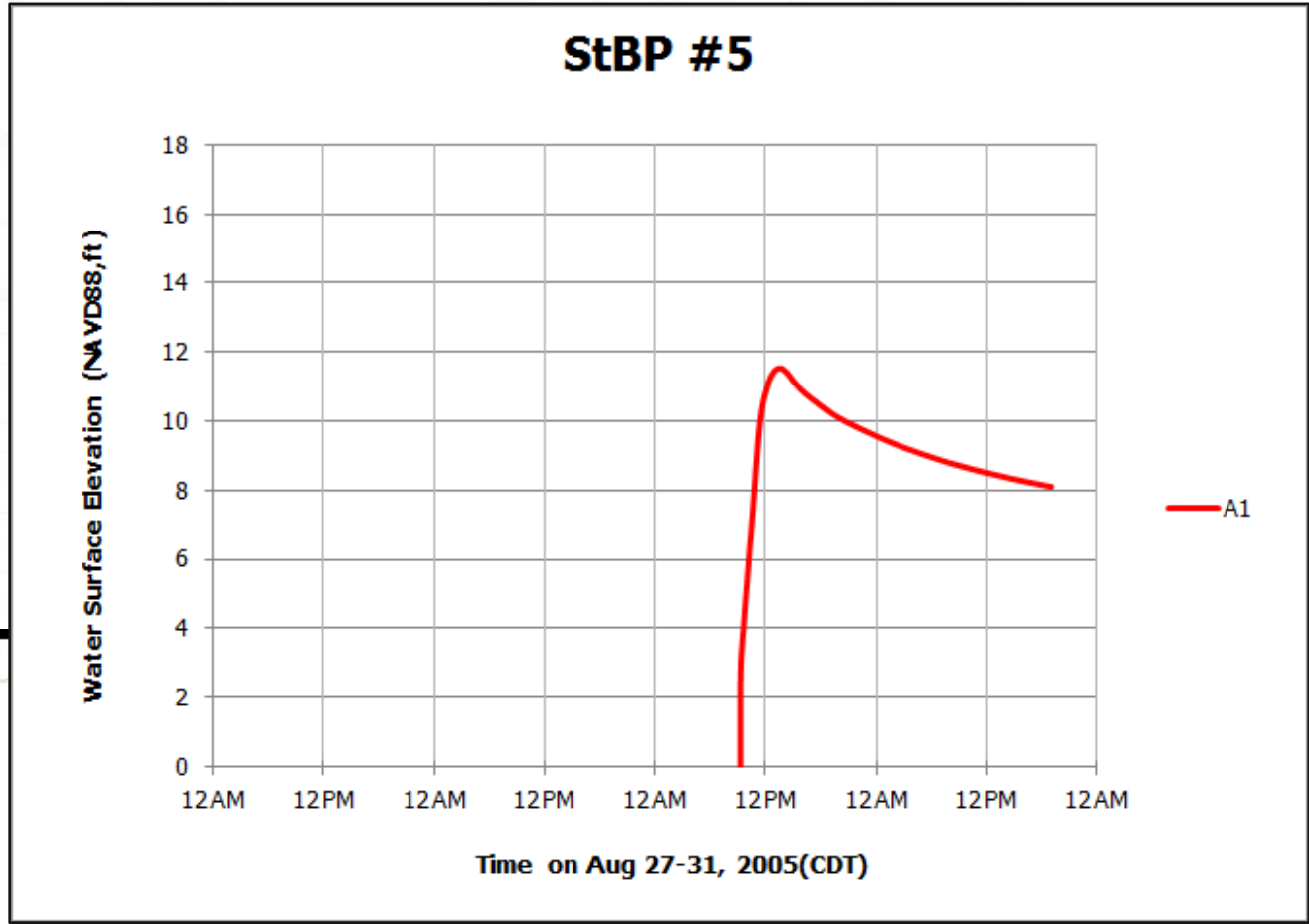


Figure 22n

Plaintiff Location "StBP#5"

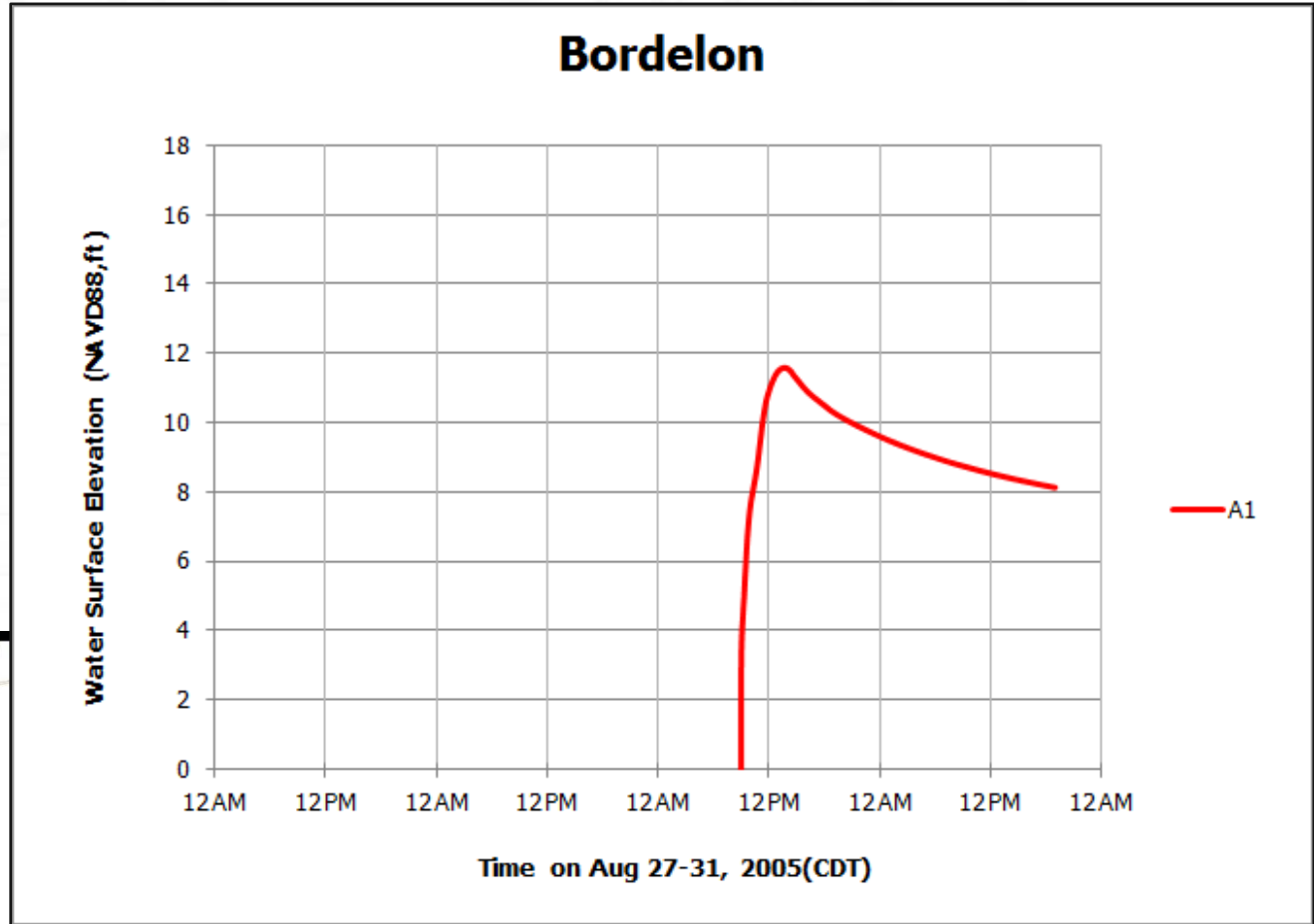
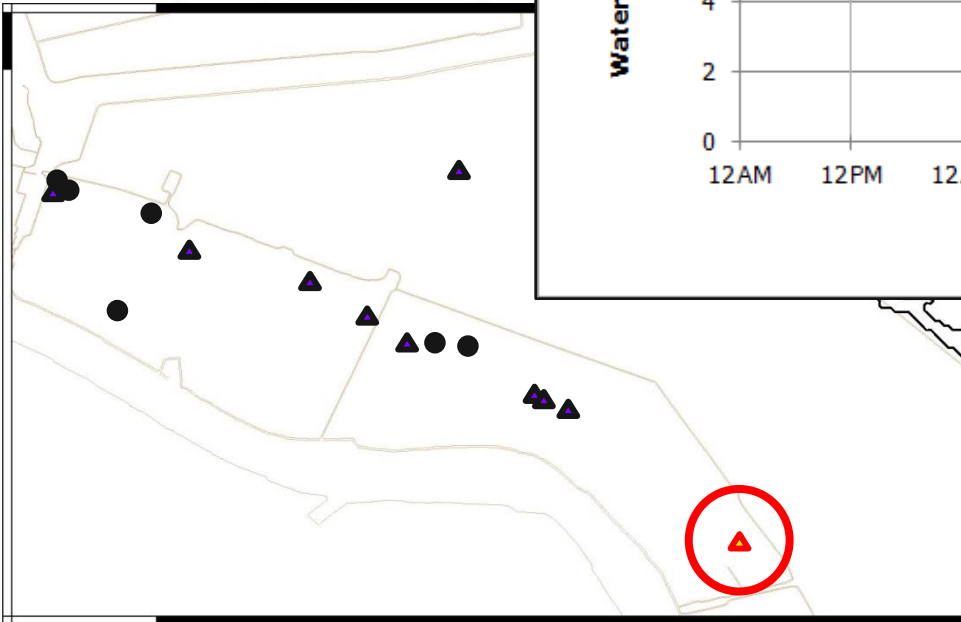


Figure 22o



Plaintiff Location "Bordelon"

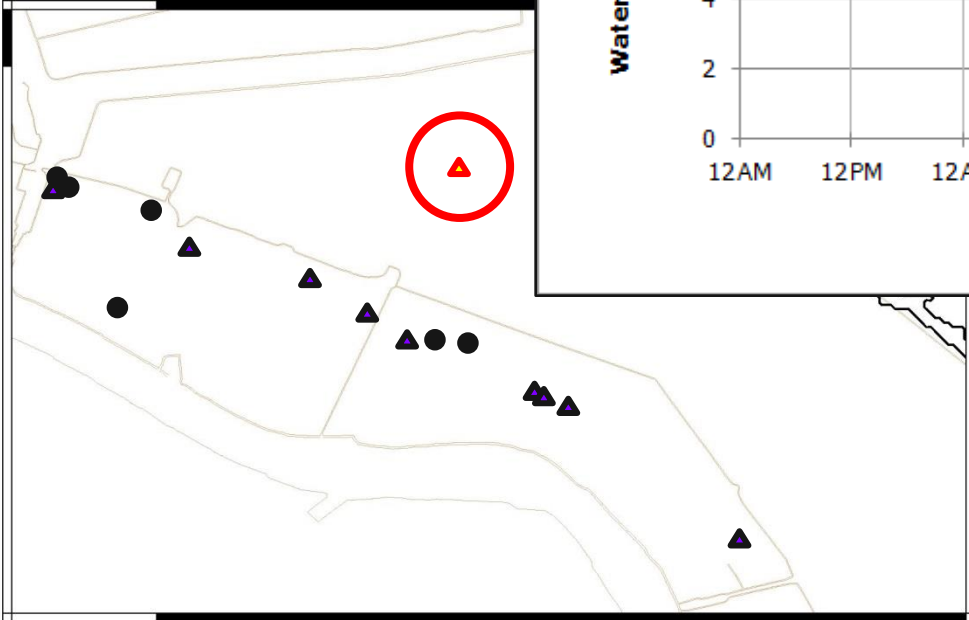
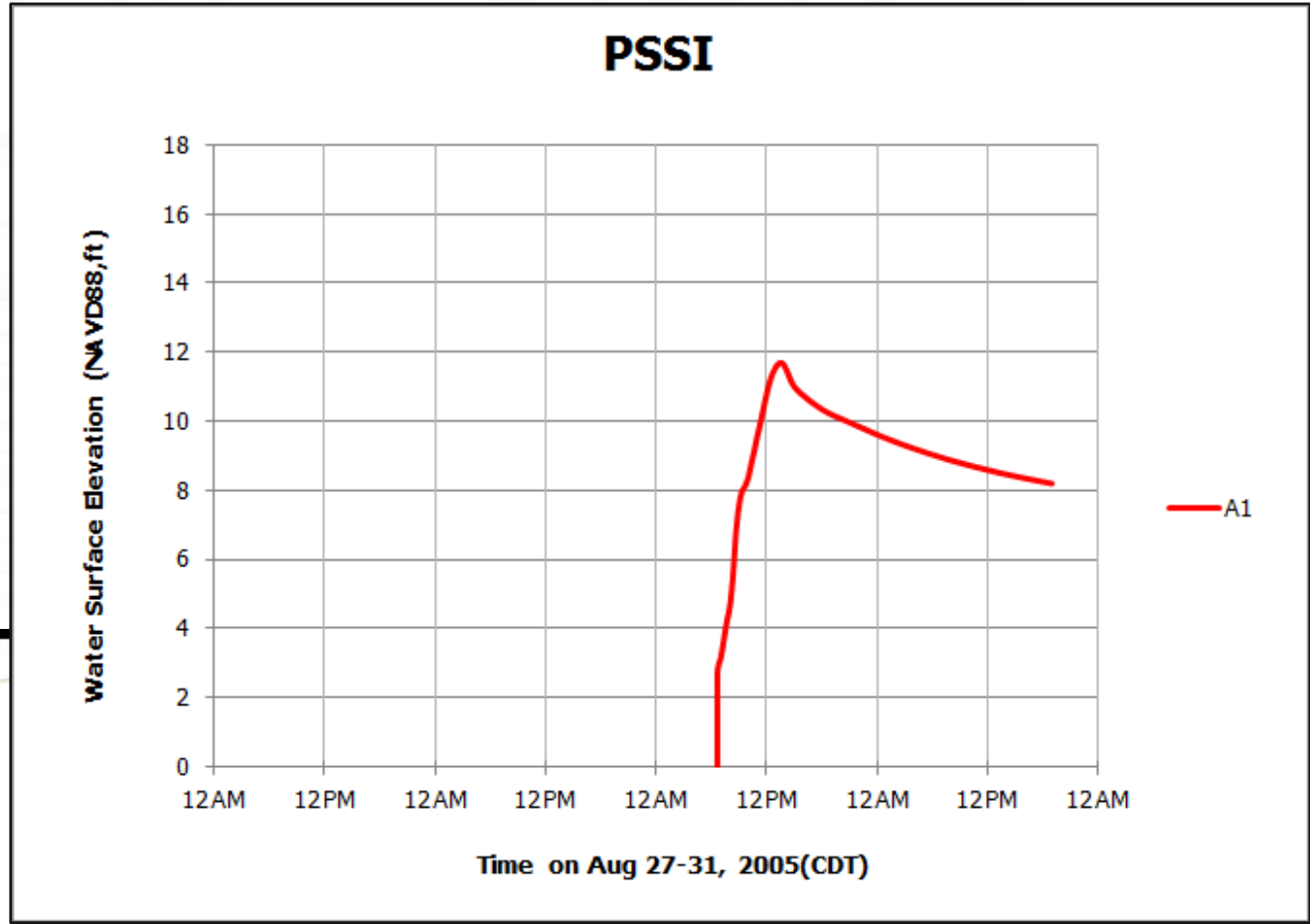


Figure 22p

Plaintiff Location "PSSI"

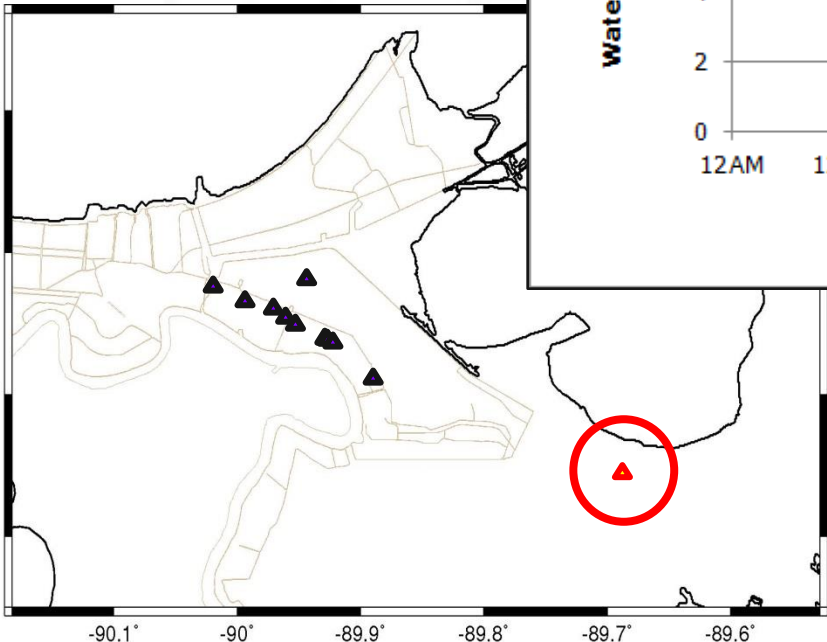
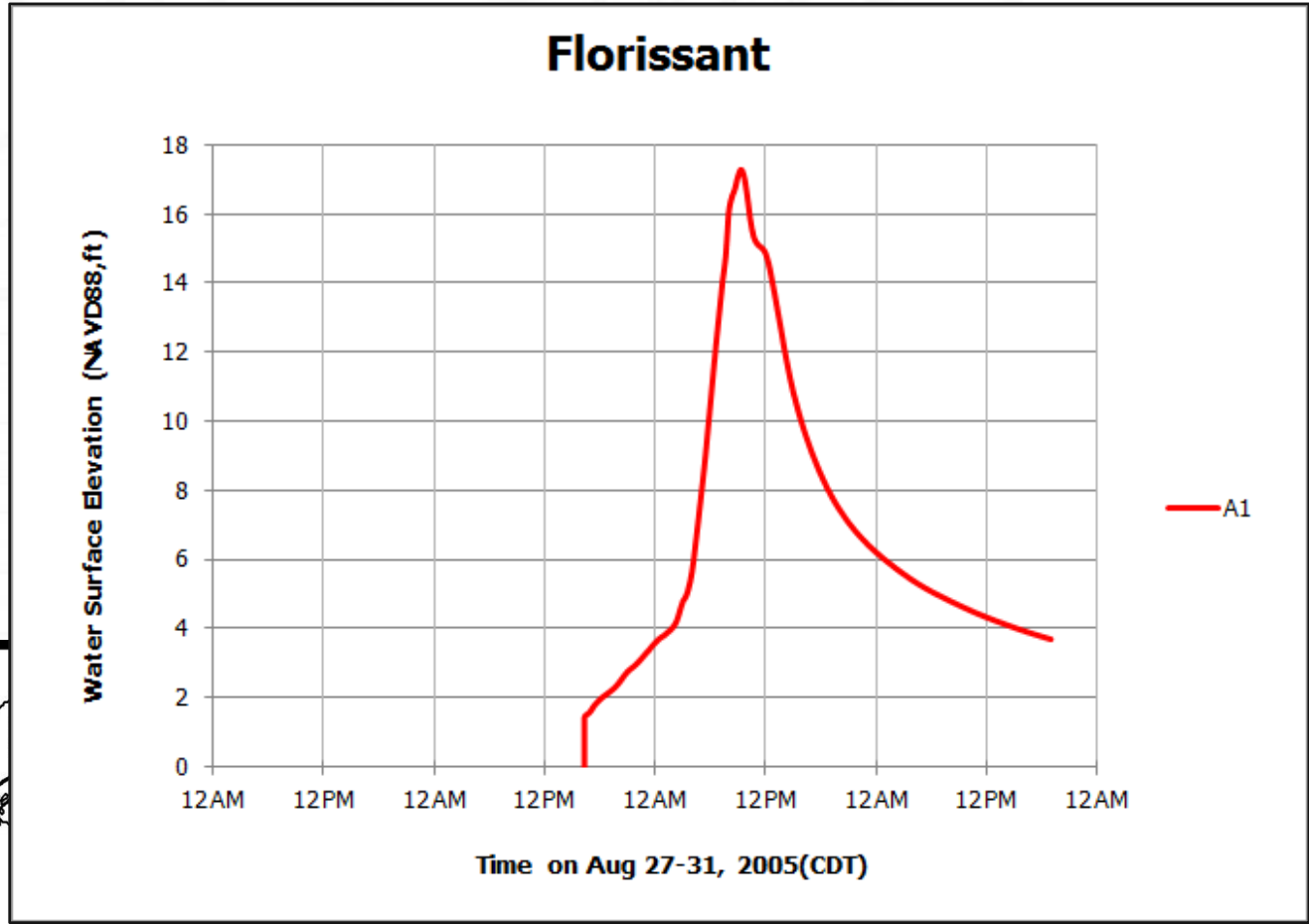


Figure 22q

Plaintiff Location "Florissant"

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Katrina Hindcast - Scenario A1: Flooding conclusions for Plaintiff Properties

- The maximum water surface elevations (in ft) on the Plaintiff Properties during the actual Hurricane Katrina event are summarized in the table below.

Location	Scenario A1
Adams	10.5
SBP #1	10.7
SBP #2	10.8
Tommaseo	11.0
SBP #3	11.3
SBP #4	11.5
Steve's RV	11.5
SBP #5	11.5
Bordelon	11.6
PSSI	11.7
Florissant	17.3

Table 4