

HURRICANE IRMA IMPACTS TO SOUTHWEST FLORIDA LEE – CHARLOTTE BARRIERS NOVEMBER 6, 2017





OUTLINE

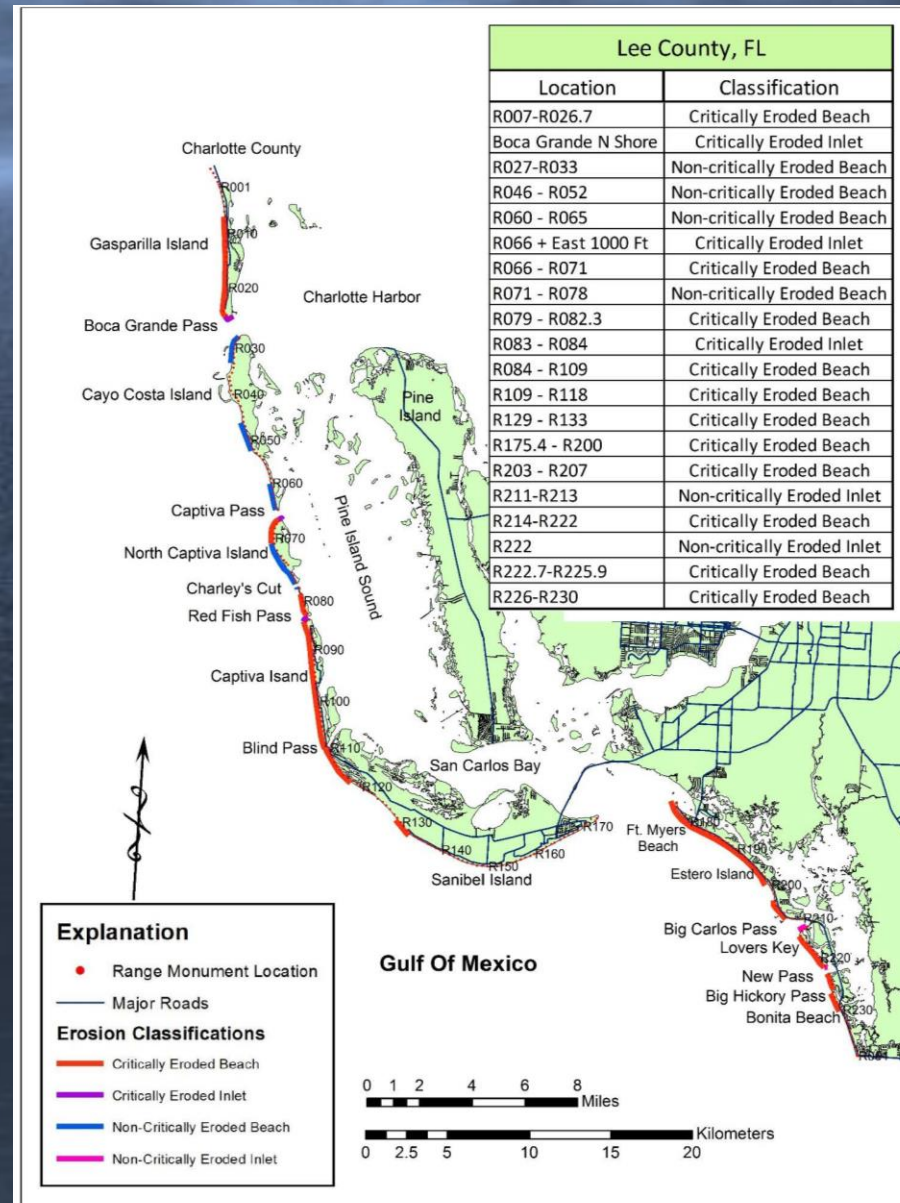
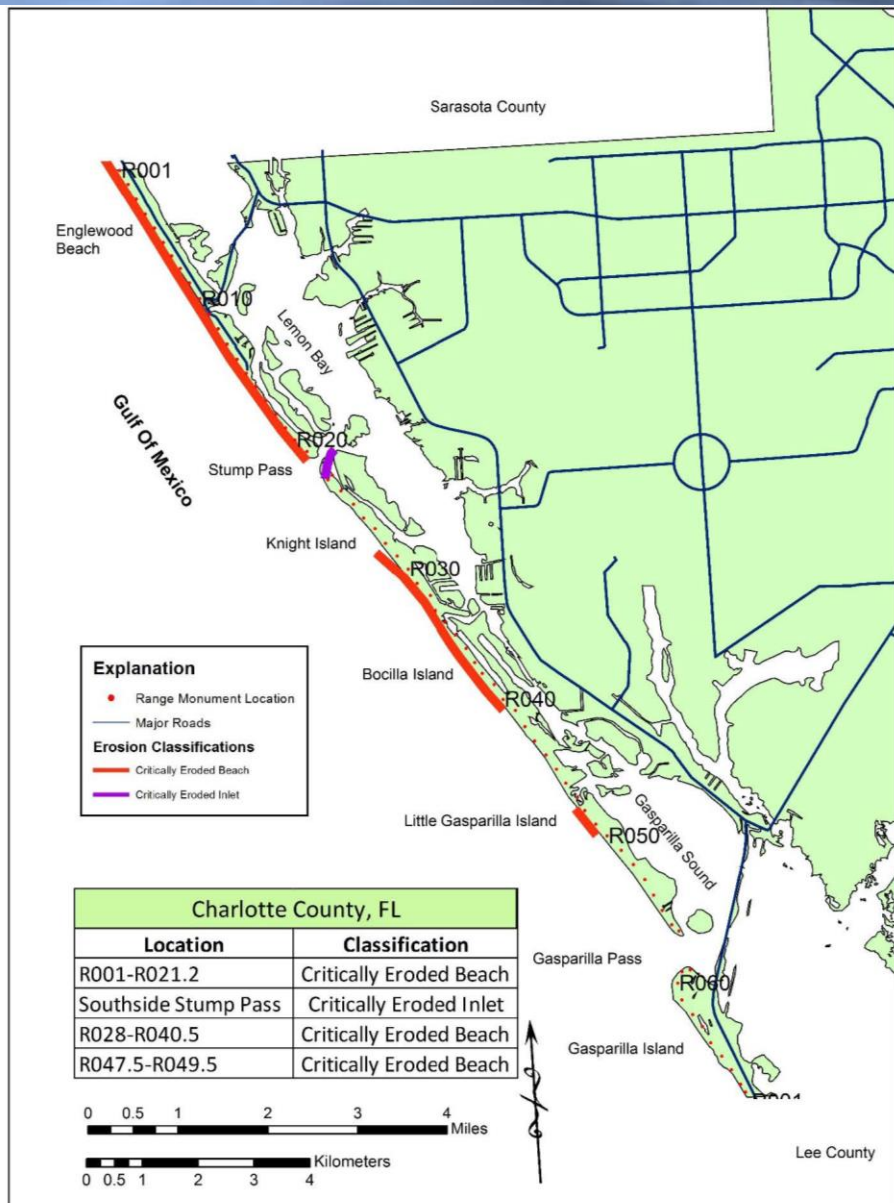
- Charlotte County Beach and Inlet Management Projects
- South Lee County Beach and Inlet Management Projects
- Hurricane Irma
- Post-Irma Assessments

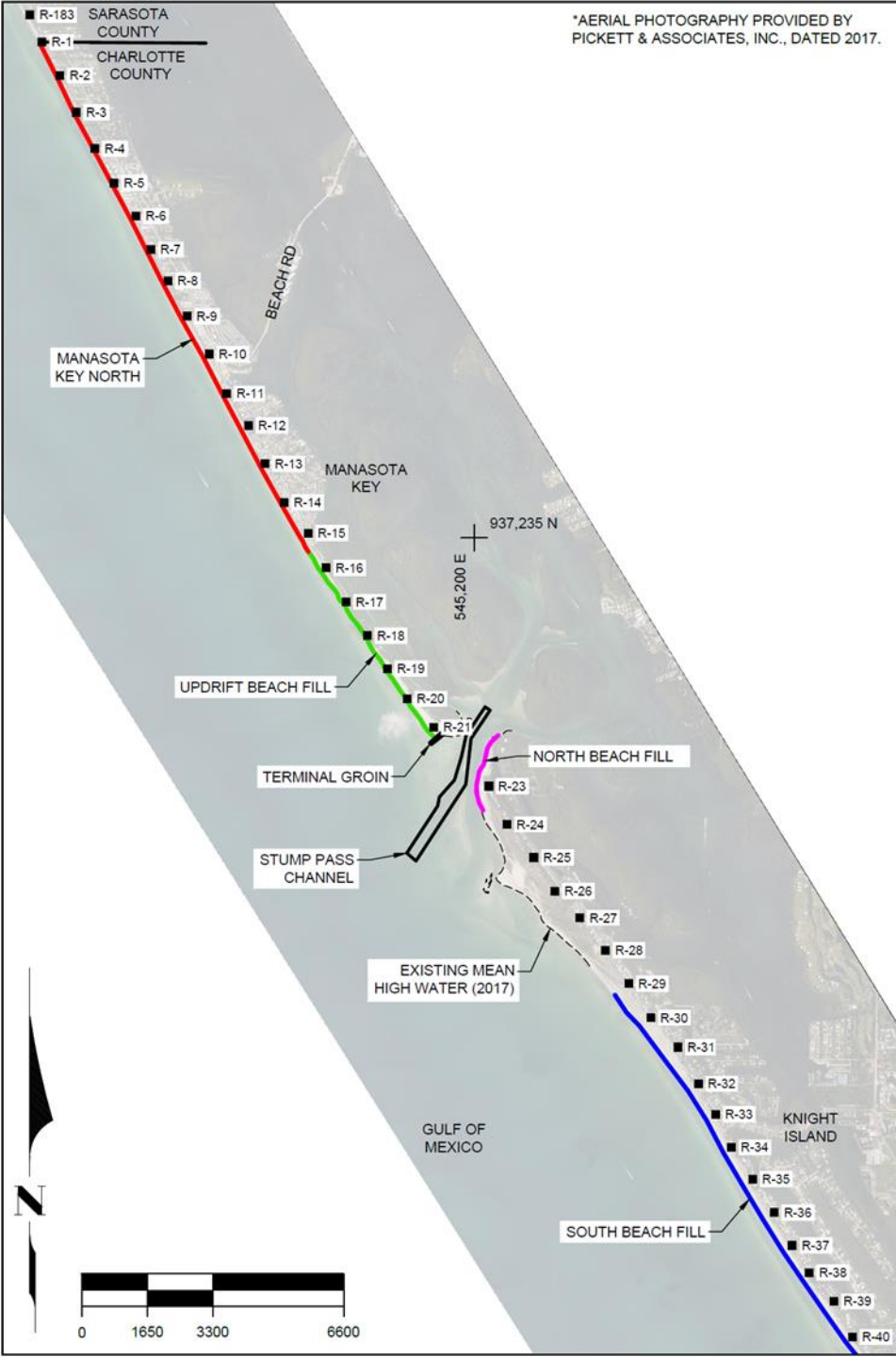


ACKNOWLEDGEMENTS



LOCATION MAPS





CHARLOTTE BARRIERS

- MANASOTA KEY
- STUMP PASS
- KNIGHT-DON PEDRO ISLANDS

MANASOTA KEY 10-YR BEACH MANAGEMENT PLAN



- Sarasota-Charlotte County Line to Englewood Beach Park (R-1 to R10.5)
- Overlaps With County's Existing Erosion Control Project from Englewood Beach Park to State Park
- Partnering with Sarasota County

A LOOK BACK

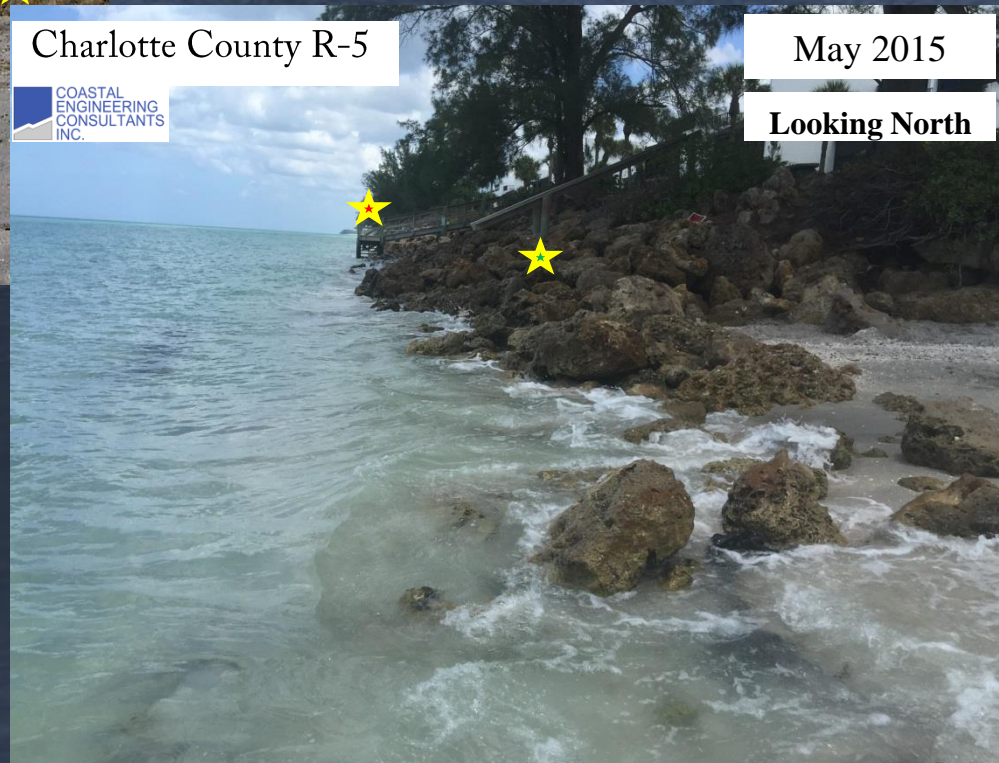


Charlotte County R-5

November 2001

Looking North

2001 Beach
Erosion Study
Conditions



Charlotte County R-5

May 2015

Looking North

2015 Beach
Erosion Update
Conditions

THEN AND NOW

Charlotte County R-5

November 2001
Looking South

2001 Beach
Erosion Study
Conditions



Charlotte County R-5

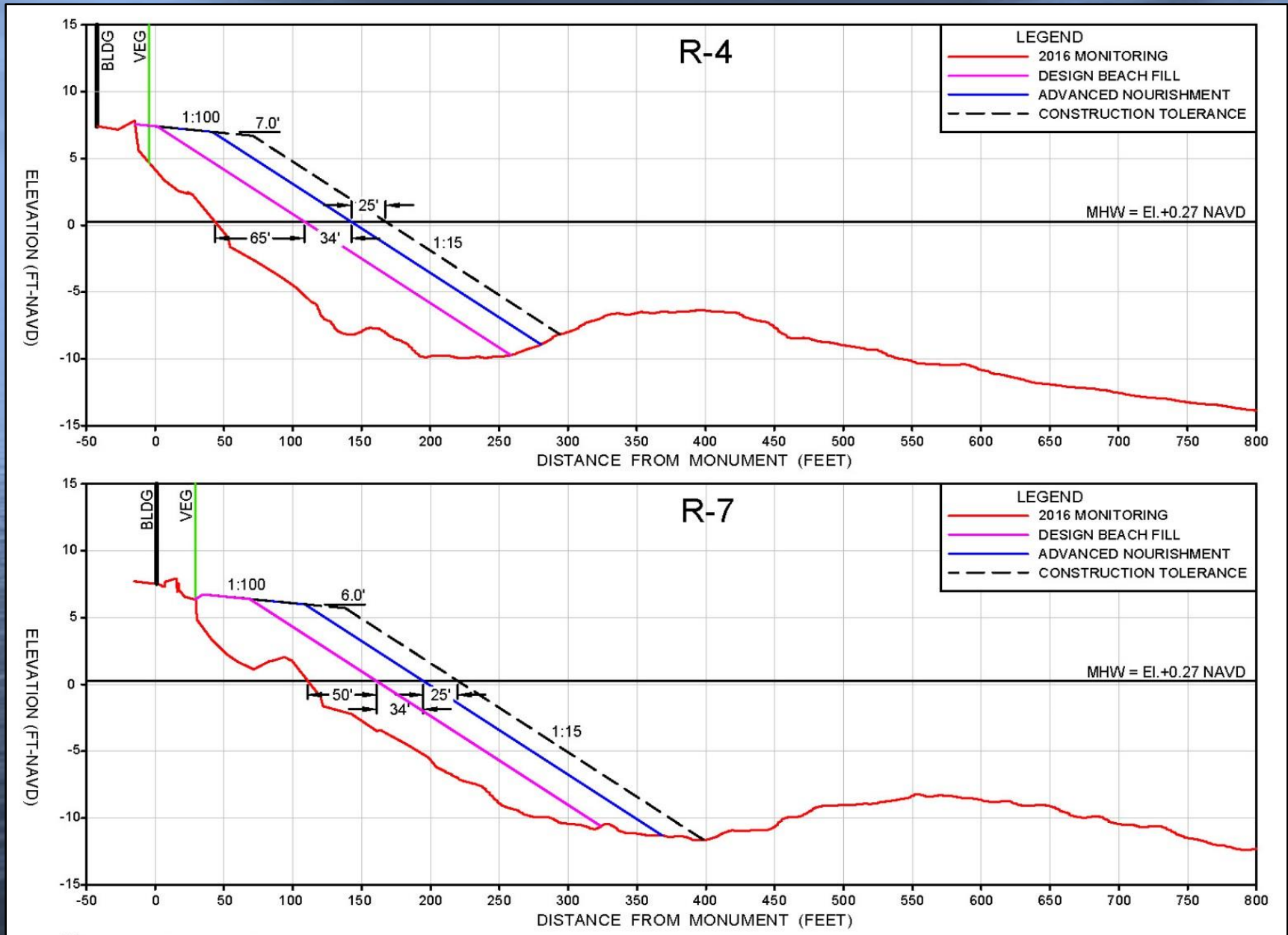
May 2015
Looking South

2015 Beach
Erosion Update
Conditions



New Armoring

RECOMMENDED PLAN



STUMP PASS MAINTENANCE DREDGING

- 4-Year Cycle
- Focus:
 - Navigation
 - Stabilizing Adjacent Shorelines
- Dr. Vadim Alymov's Talk

■ R-20

■ R-21

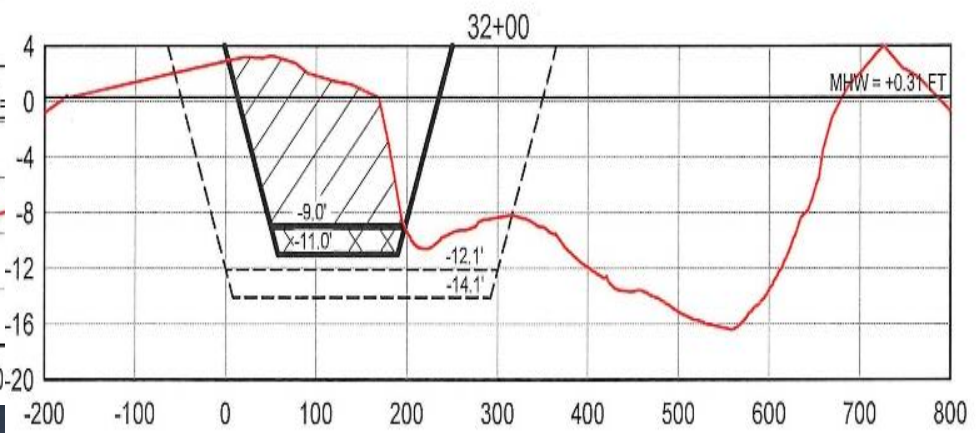
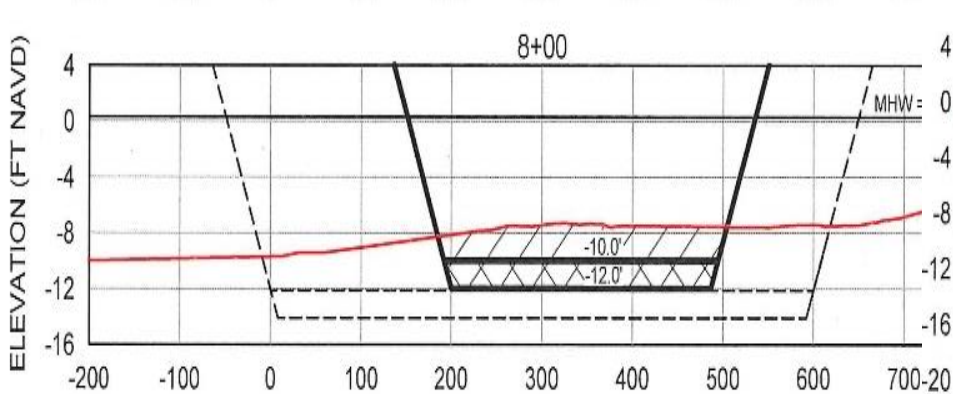
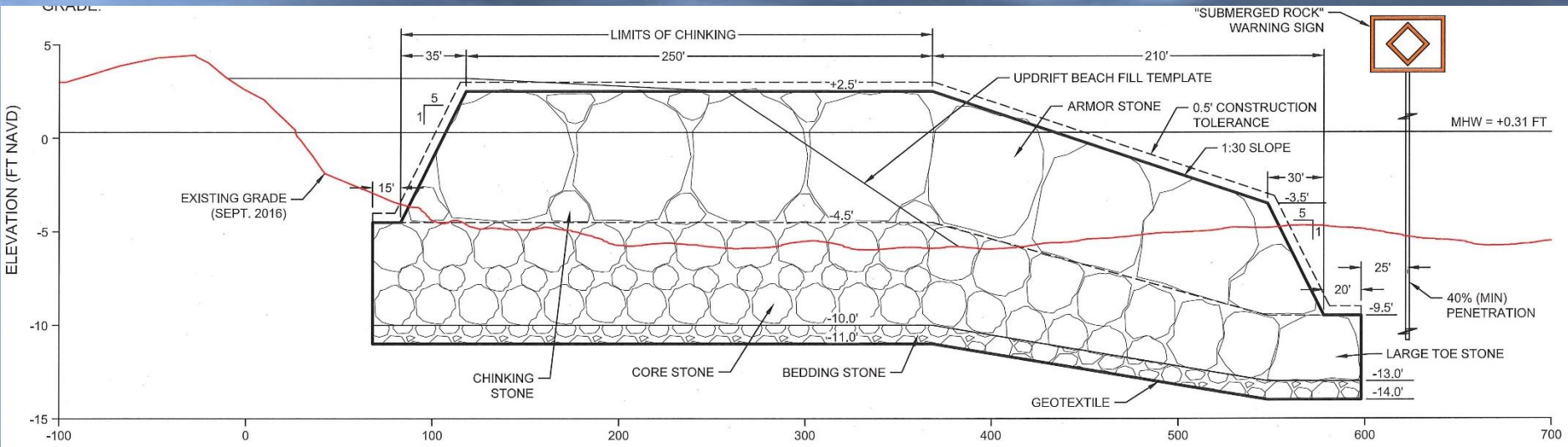
R-22

■ R-23

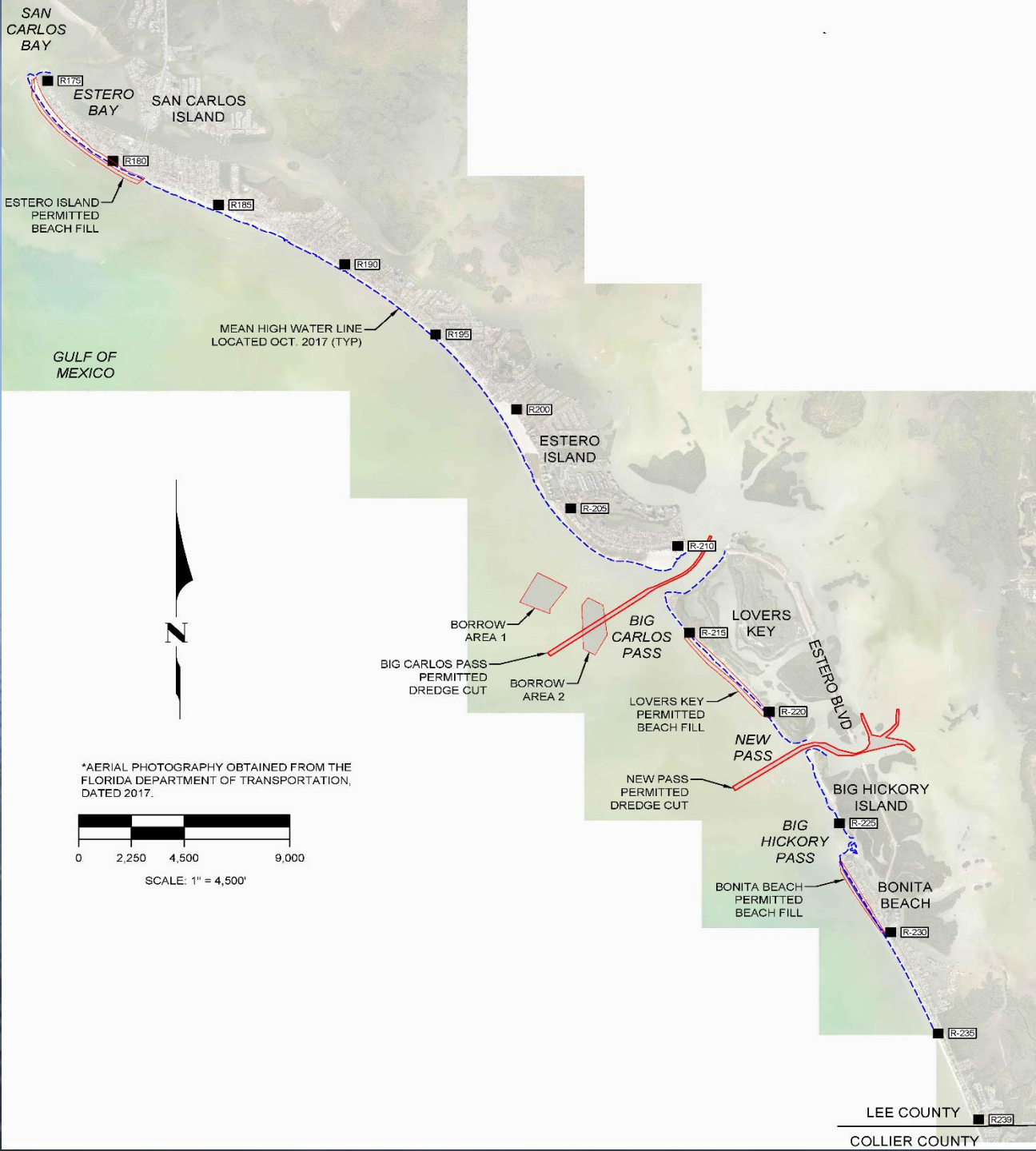
■ R-24

July 2017

DESIGN TEMPLATES



SOUTH LEE COUNTY BARRIERS



*AERIAL PHOTOGRAPHY OBTAINED FROM THE FLORIDA DEPARTMENT OF TRANSPORTATION, DATED 2017.



SCALE: 1" = 4,500'

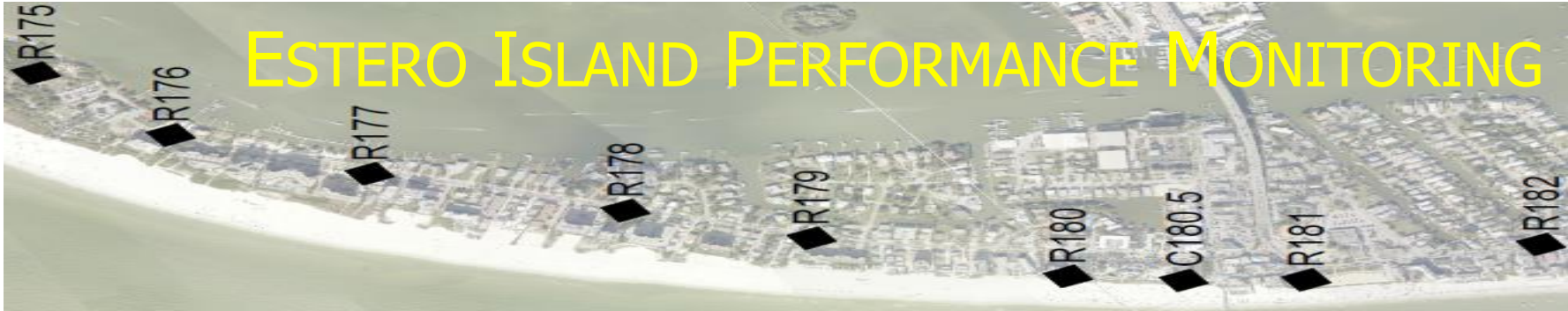
ESTERO ISLAND

- Project Fun Facts

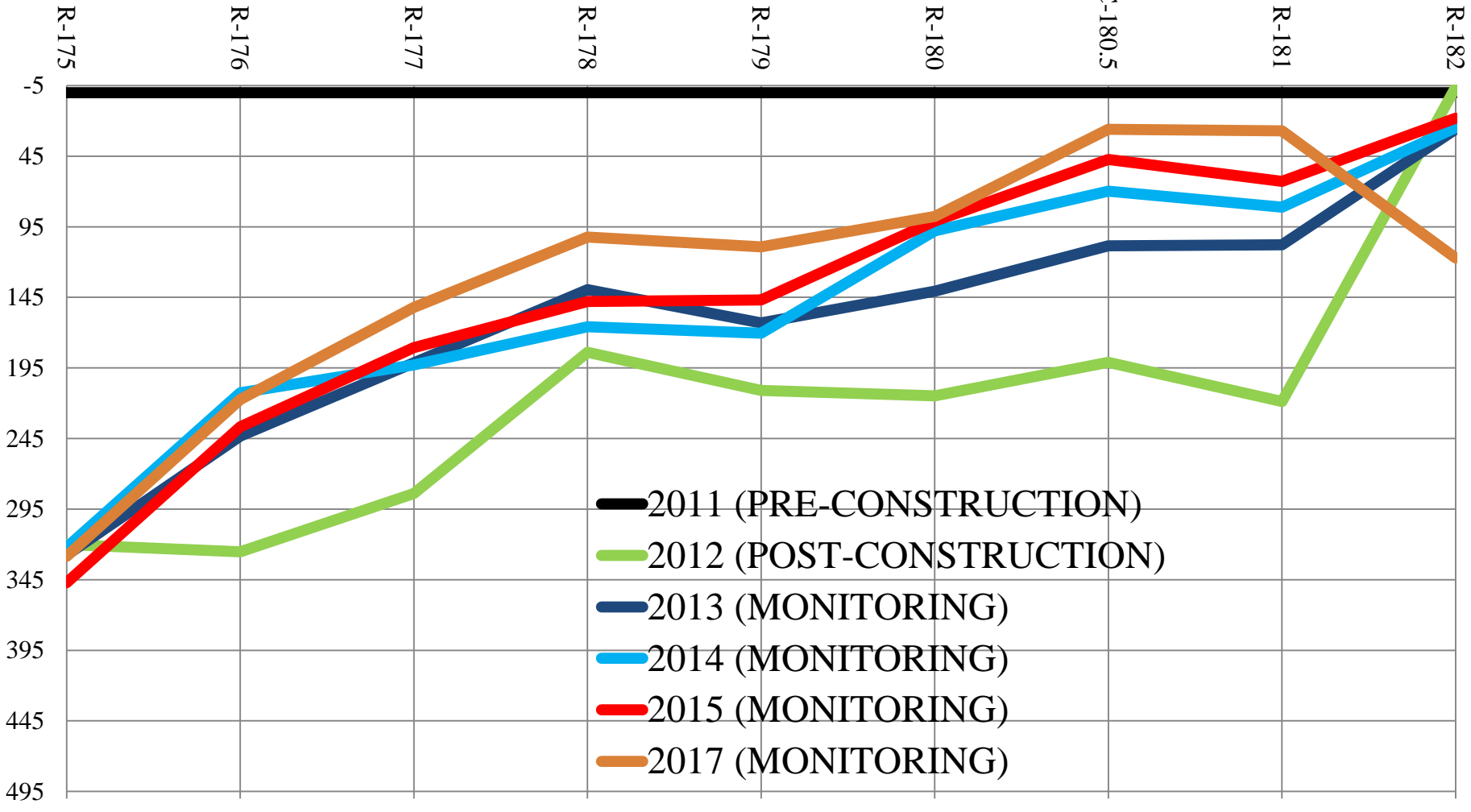
- 2011 Initial Restoration (403K CY)
- North-Central Segment (6,700 LF)
- Ebb Shoal Borrow Area
- Terminal Groin (North End ~ Transport Reversal)



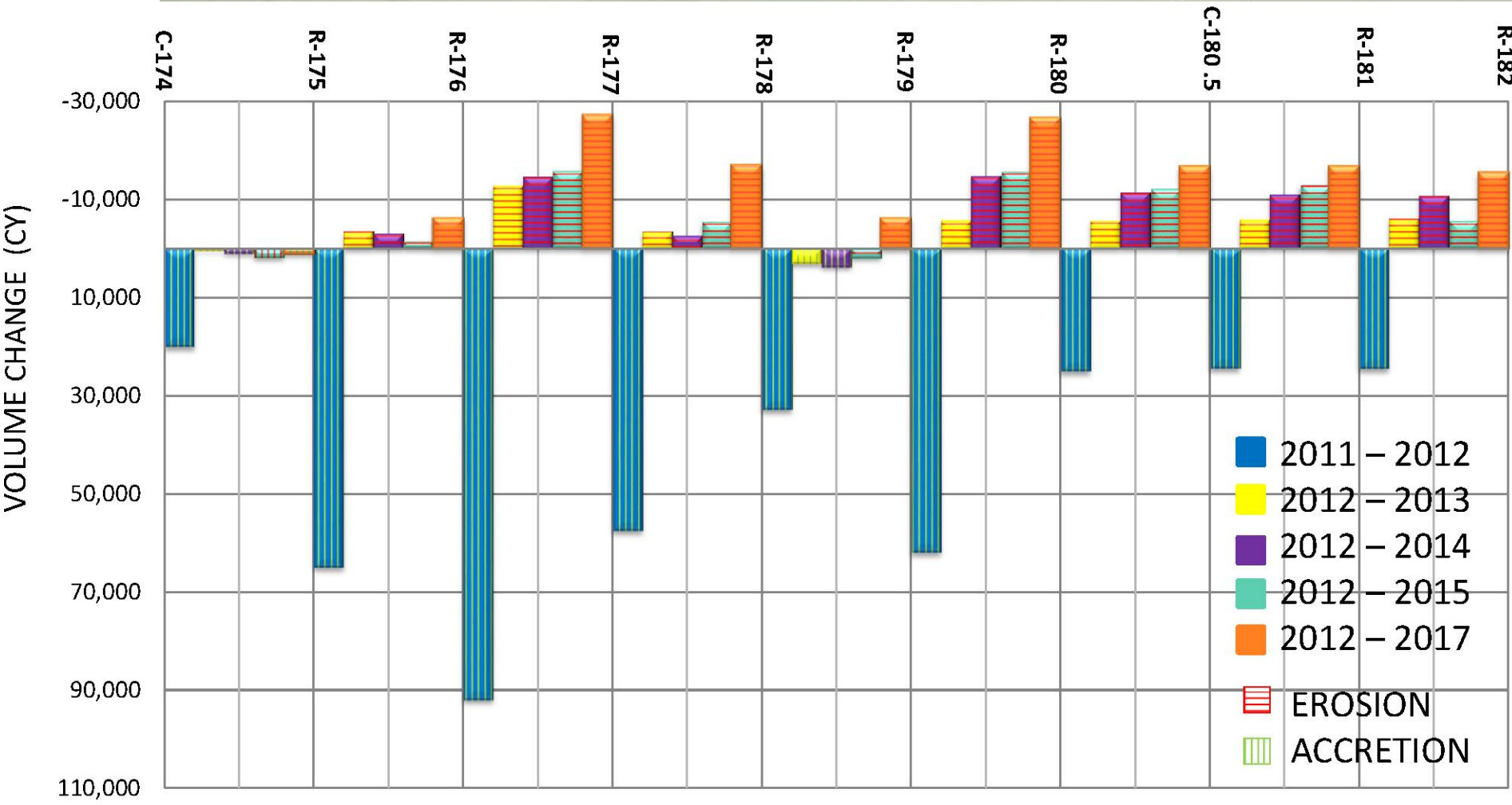
ESTERO ISLAND PERFORMANCE MONITORING



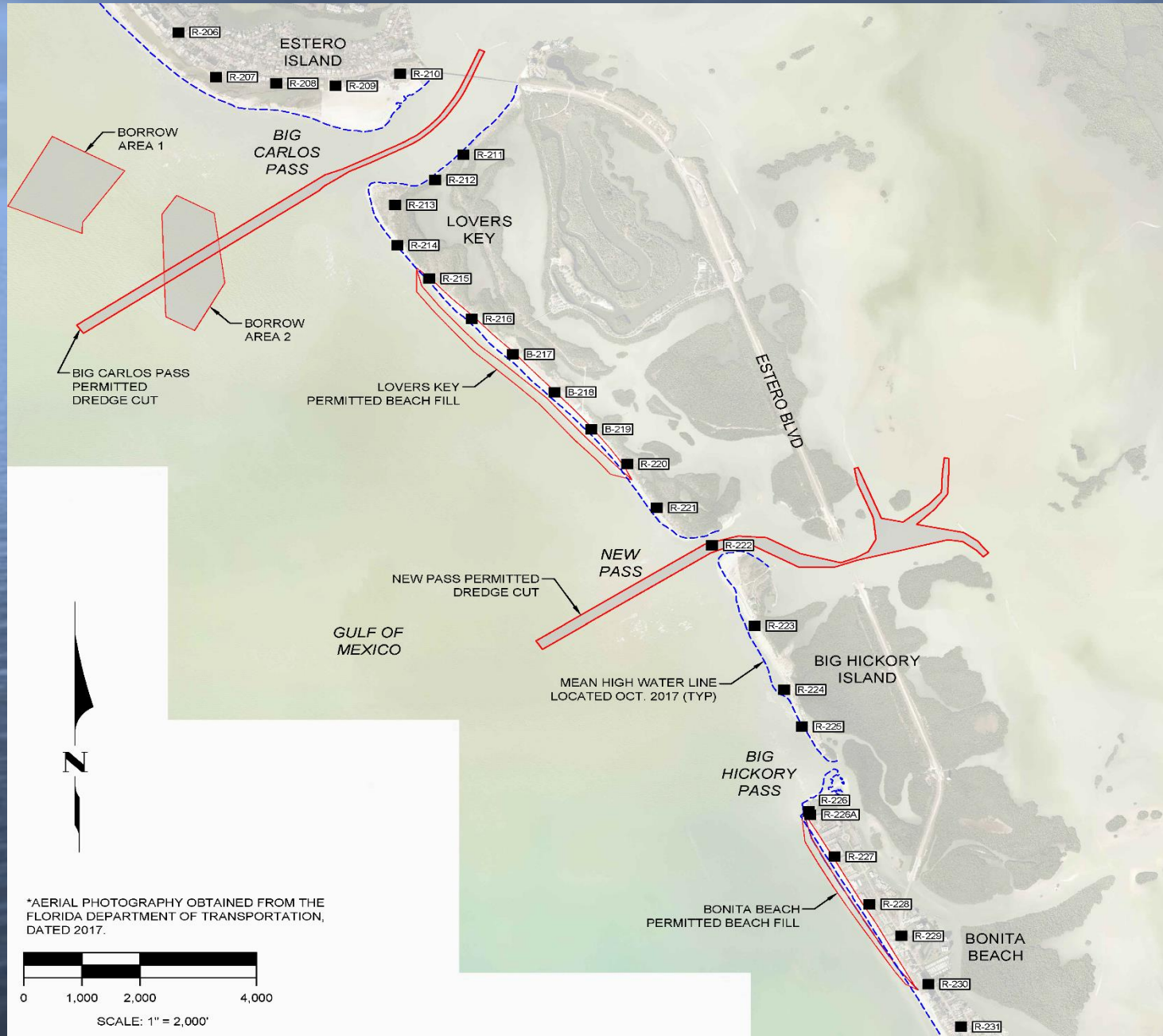
SHORELINE POSITION RELATIVE TO 2011 POSITION (FT)



ESTERO ISLAND PERFORMANCE MONITORING

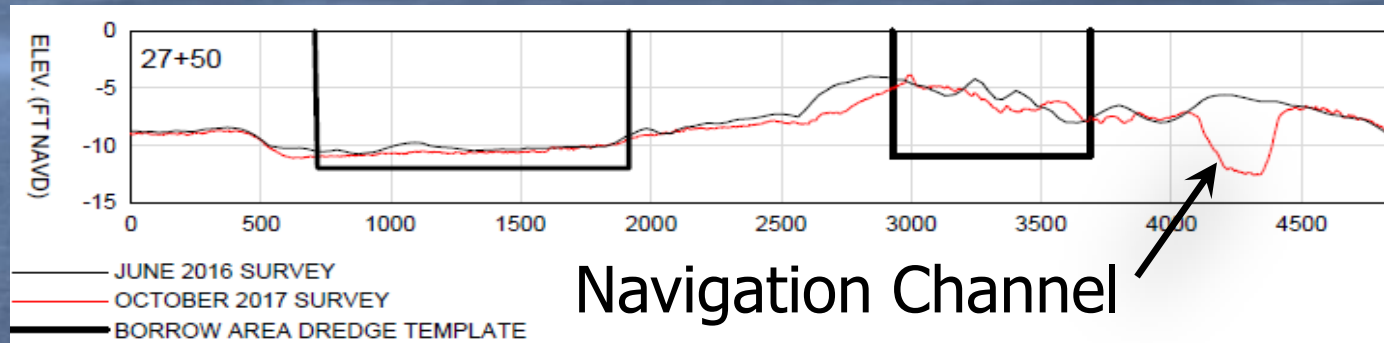


LOVERS KEY & BONITA BEACH



PROJECT FUN FACTS

- **Big Carlos Pass Navigation Channel**
 - 2017 Initial Dredging (56K CY)
 - Backpass to South Estero Island



• **Lovers Key**

- 2004 Initial Restoration (570K CY)
- 5,800 Ft
- Ebb Shoal Borrow Area (Big Carlos Pass)
- 2014 First Maintenance (334K CY)



PROJECT FUN FACTS

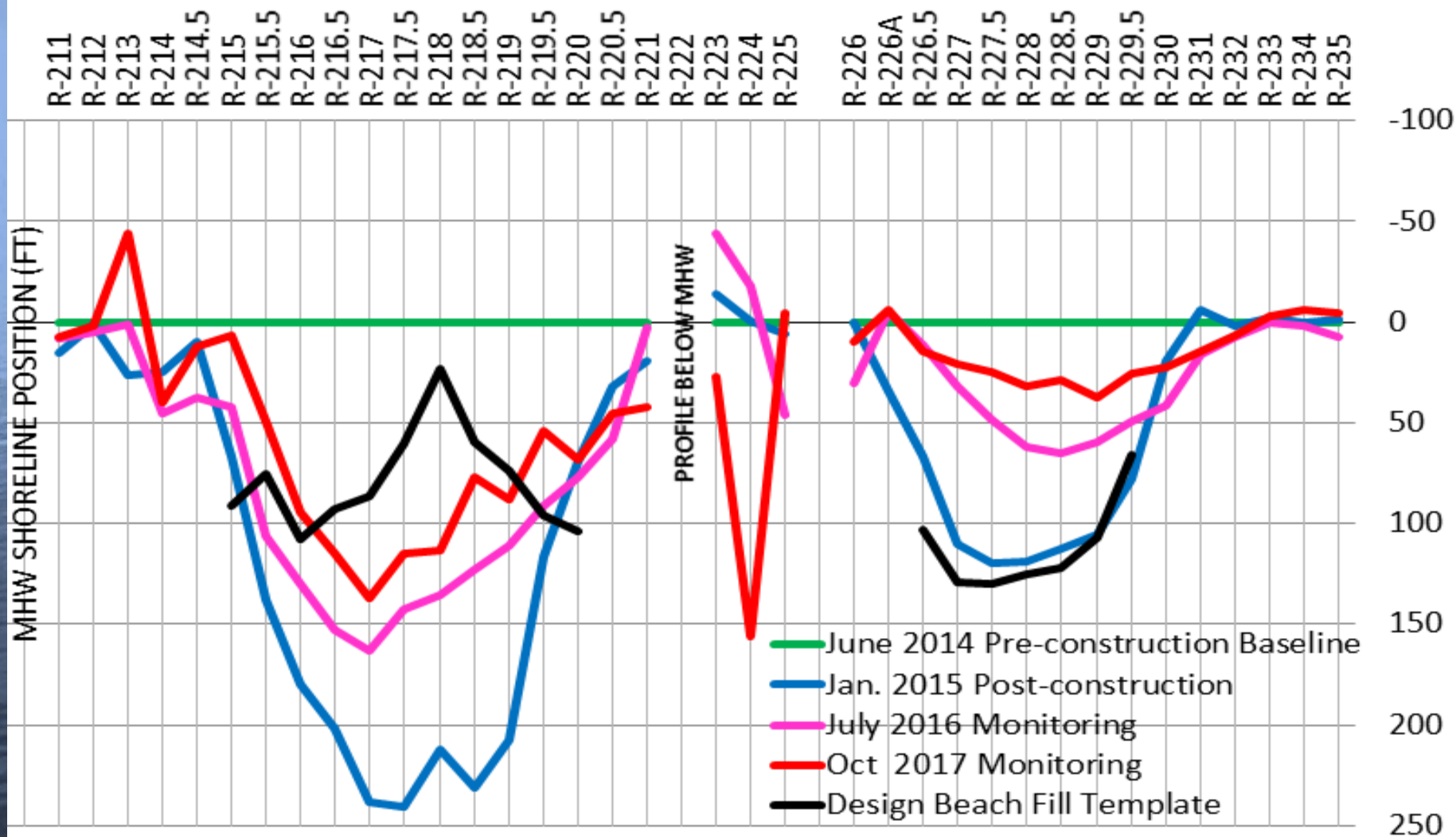
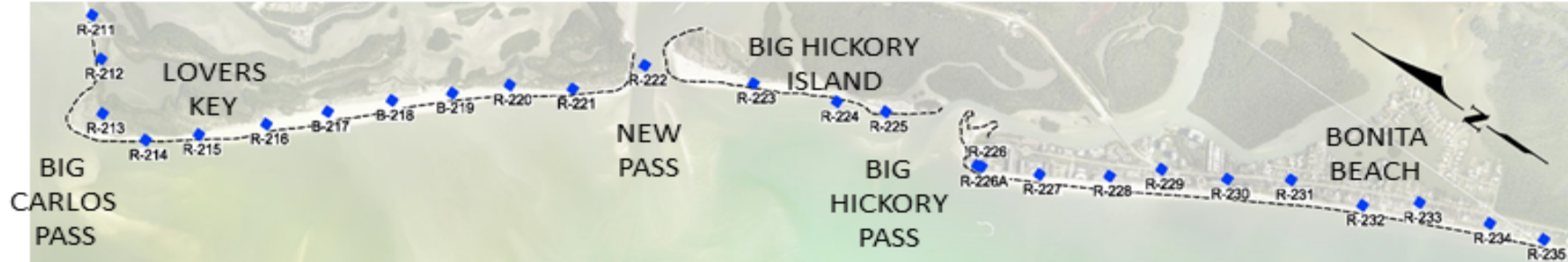
- **New Pass Navigation Channel**
 - 2017 Initial Dredging (73K CY)
 - Bypass To Big Hickory Island



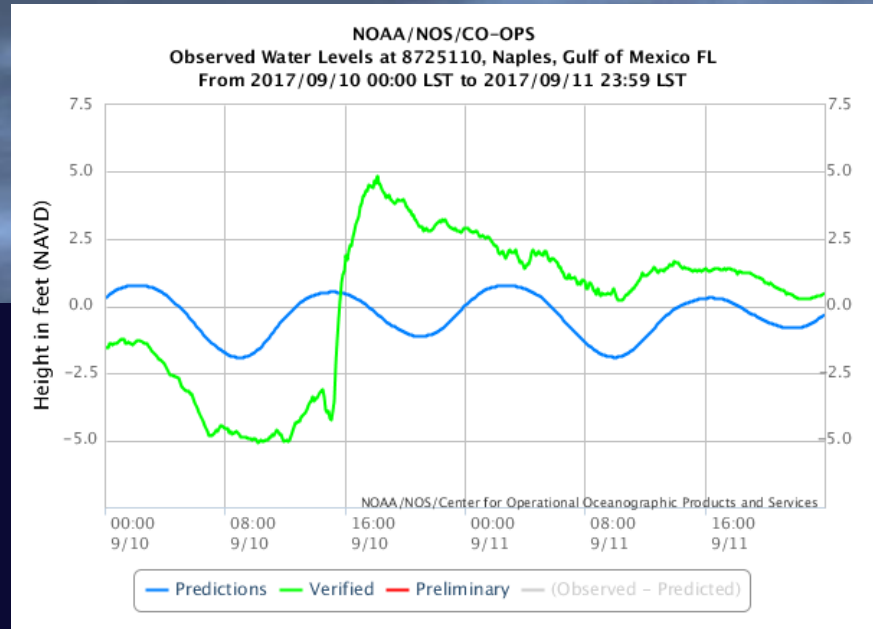
- **Bonita Beach**

- 1995 Initial Restoration (217K CY)
- 4,100 Ft / Two Terminal Groins (North)
- Ebb Shoal Borrow Area (New Pass)
- 2004 First Maintenance (143K CY)
- 2014 Second Maintenance (135K CY)
- Ebb Shoal Borrow Area (Big Carlos Pass)





HURRICANE IRMA



Saffir-Simpson scale	
Category	Wind speeds
Five	≥70 m/s, ≥137 knots, ≥157 mph, ≥252 km/h
Four	58–70 m/s, 113–136 knots, 130–156 mph, 209–251 km/h
Three	50–58 m/s, 96–112 knots, 111–129 mph, 178–208 km/h
Two	43–49 m/s, 83–95 knots, 96–110 mph, 154–177 km/h
One	33–42 m/s, 64–82 knots, 74–95 mph, 119–153 km/h
Related classifications	
Tropical storm	18–32 m/s, 34–63 knots, 39–73 mph, 63–118 km/h
Tropical depression	≤17 m/s, ≤33 knots, ≤38 mph, ≤62 km/h



ACKNOWLEDGEMENTS



Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.



65W
Potential TC
9 mph
M > 110 mph

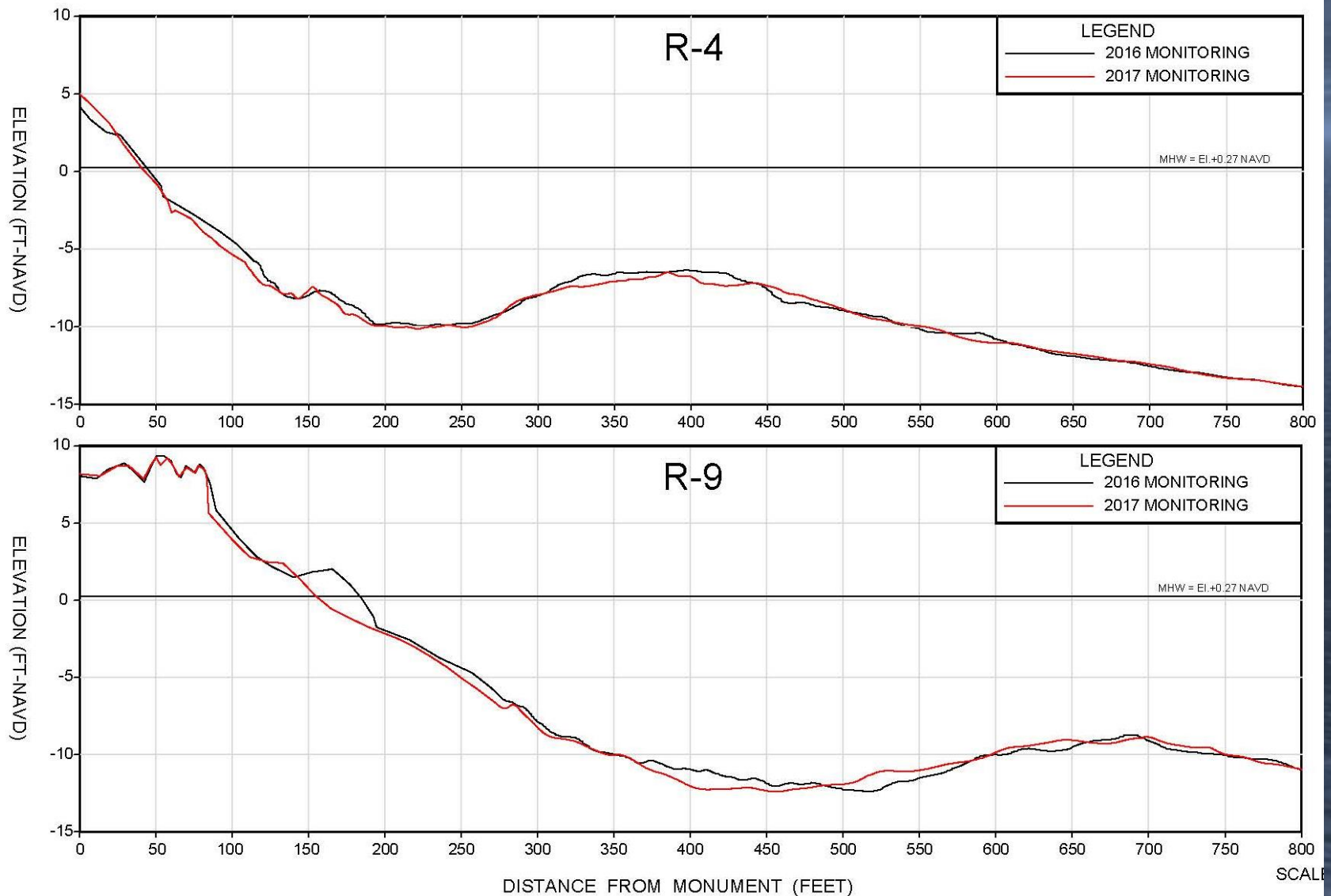
MANASOTA KEY POST-IRMA CONDITIONS



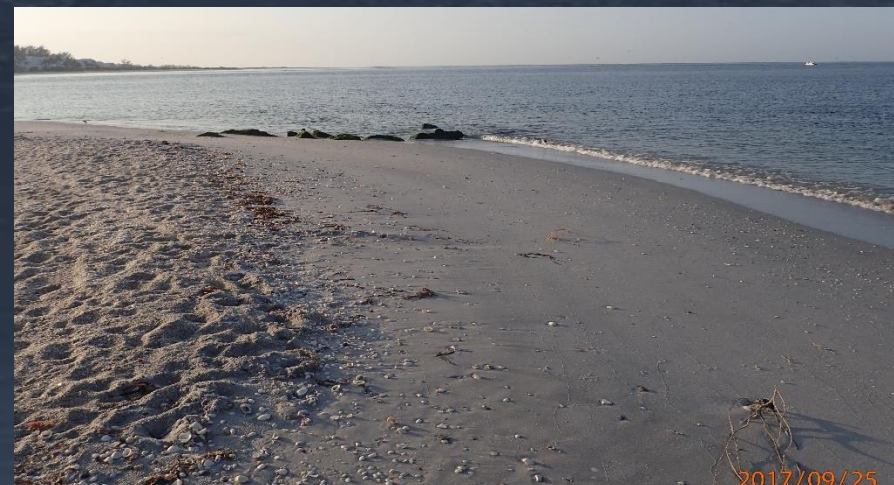
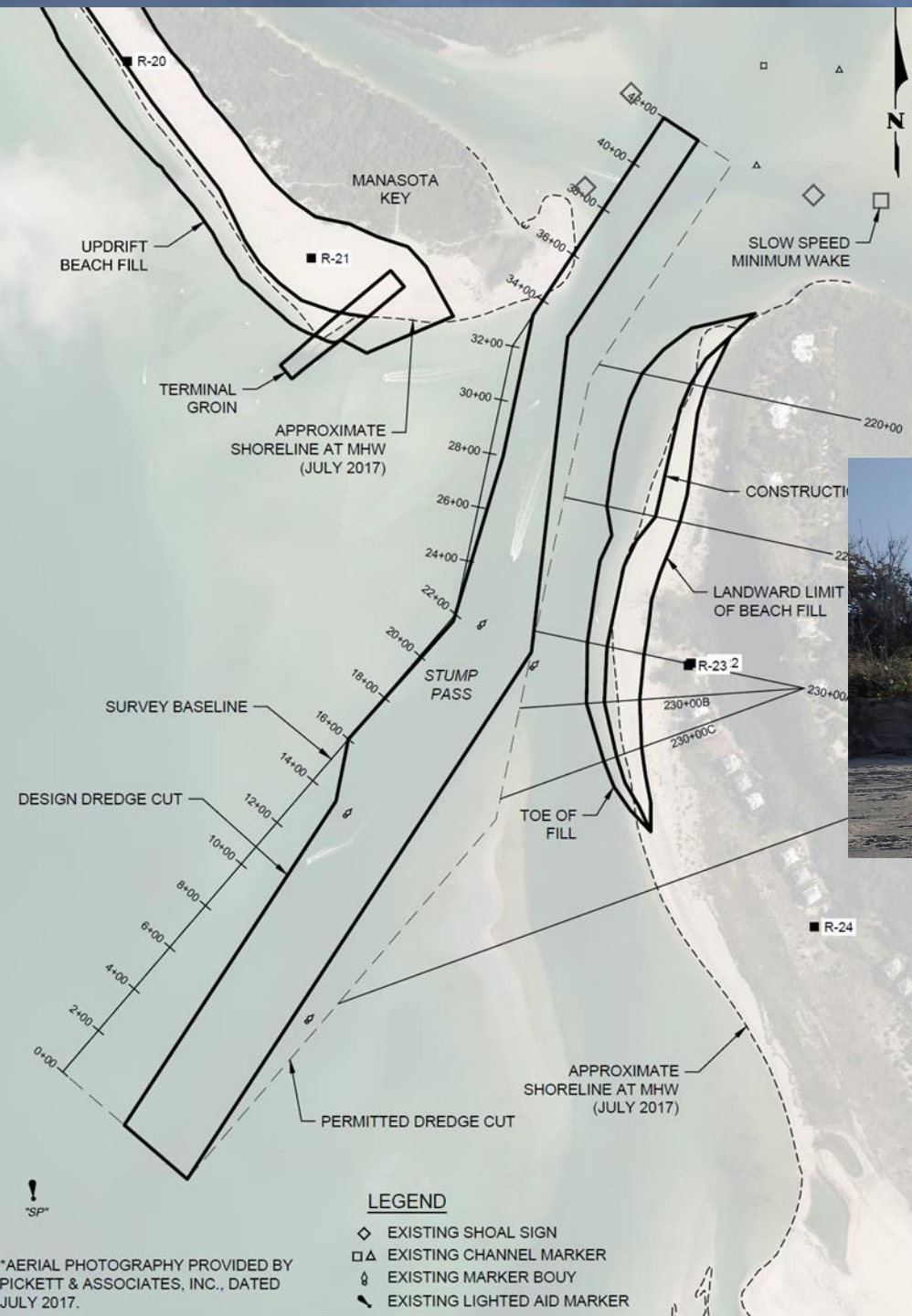
- Some Segments Experienced Erosion While Other Segments Experienced Accretion
- Minor Flanking of Armoring Structures
- No Net Increase in Design Quantities for Restoration Plan



MANASOTA KEY PROFILE COMPARISONS



STUMP PASS POST-IRMA CONDITIONS

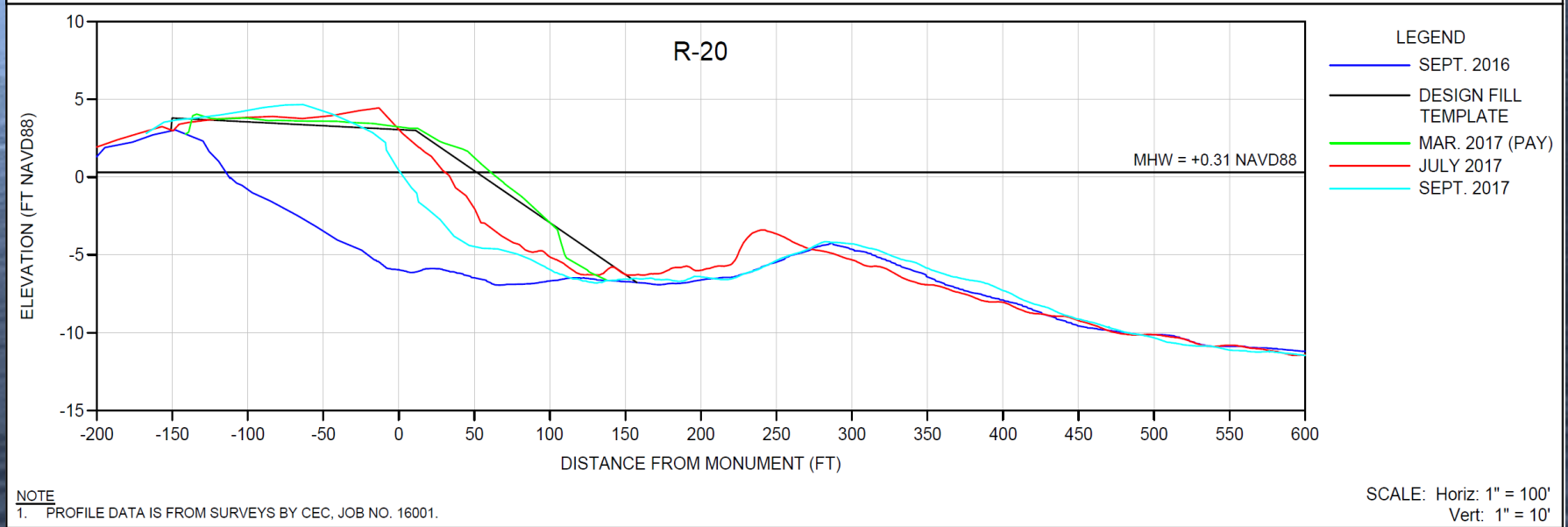
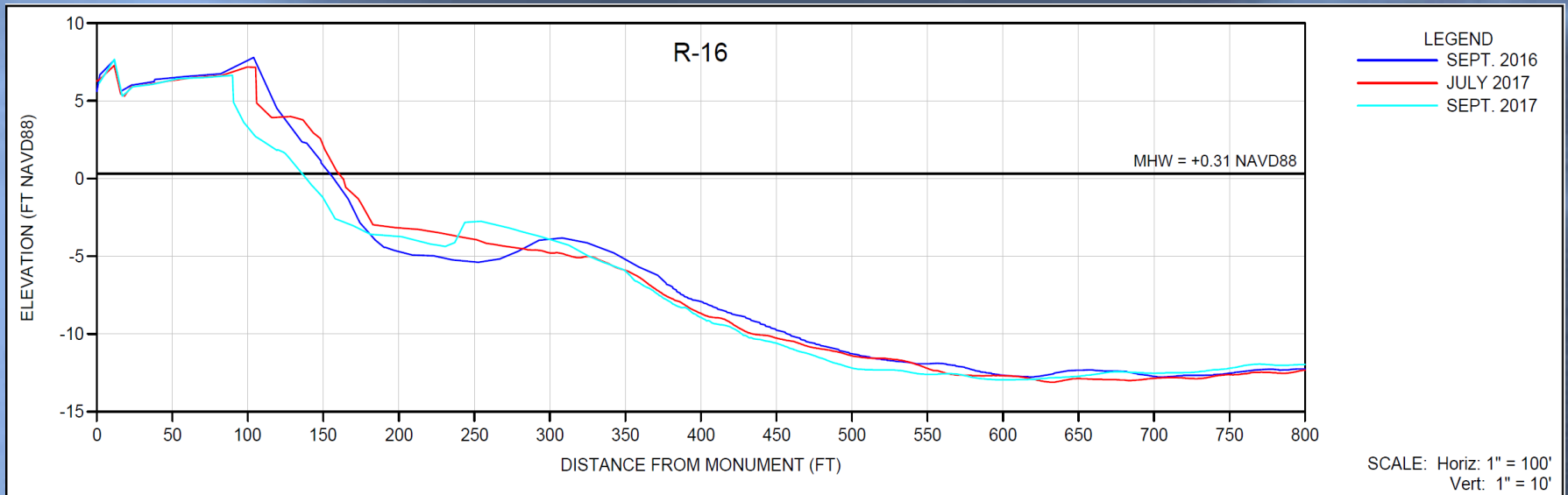


STUMP PASS 10-11-17



COURTESY OF CIVIL AIR PATROL

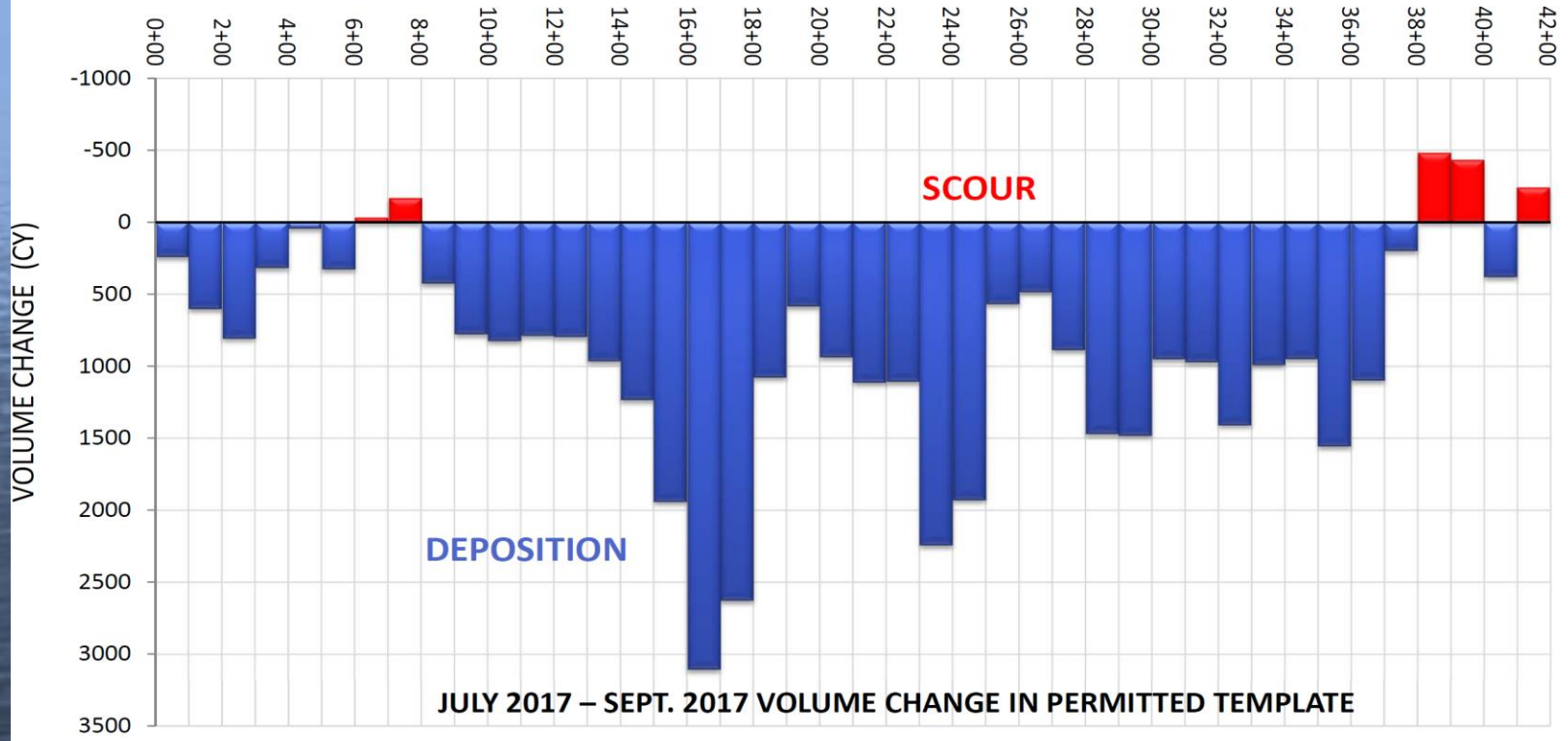
UPDRIFT BEACH PROFILE COMPARISONS



NOTE
1. PROFILE DATA IS FROM SURVEYS BY CEC, JOB NO. 16001.

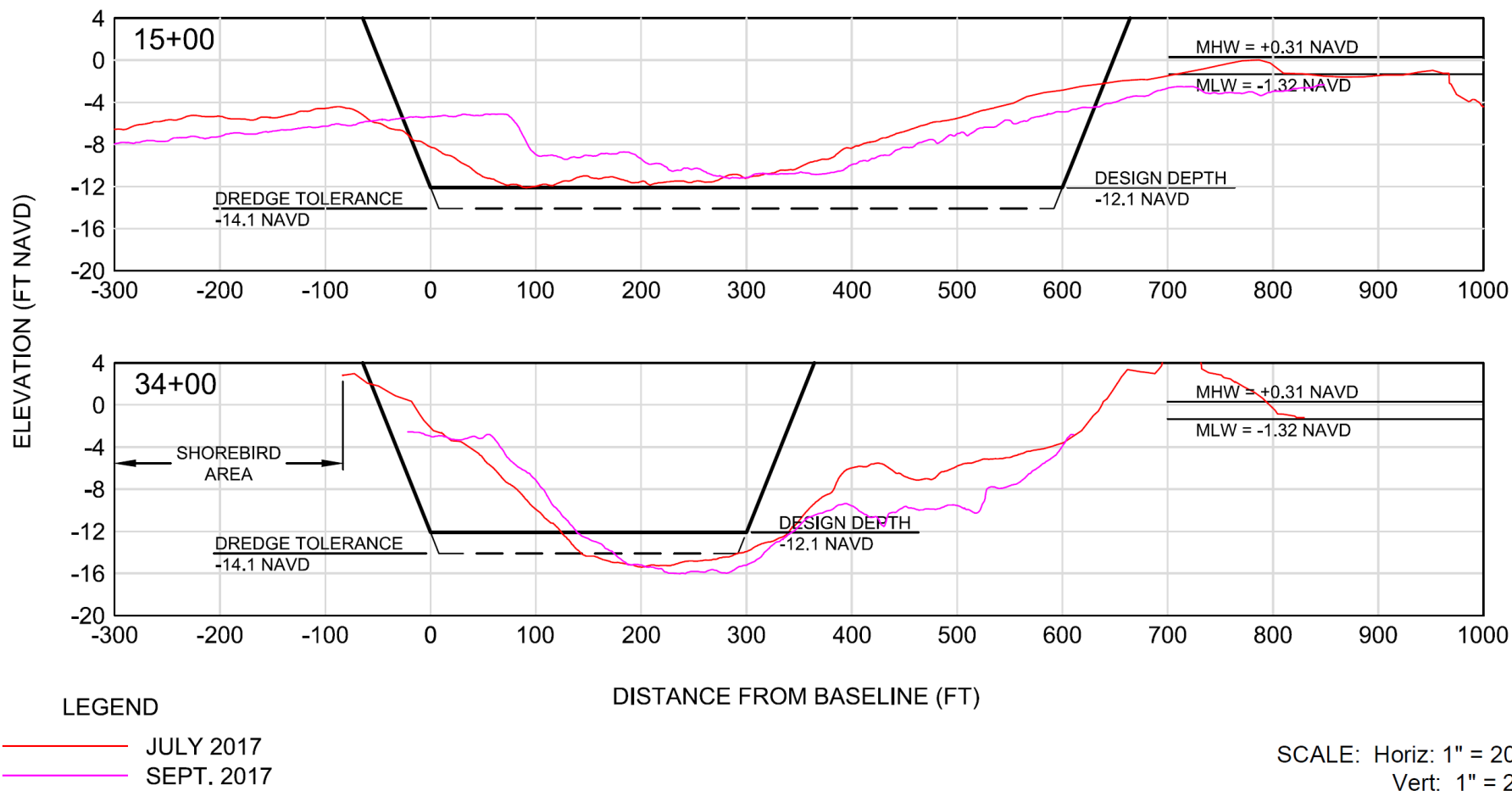
EROSION VOLUME = 29,670 CY

STUMP PASS NAVIGATION CHANNEL



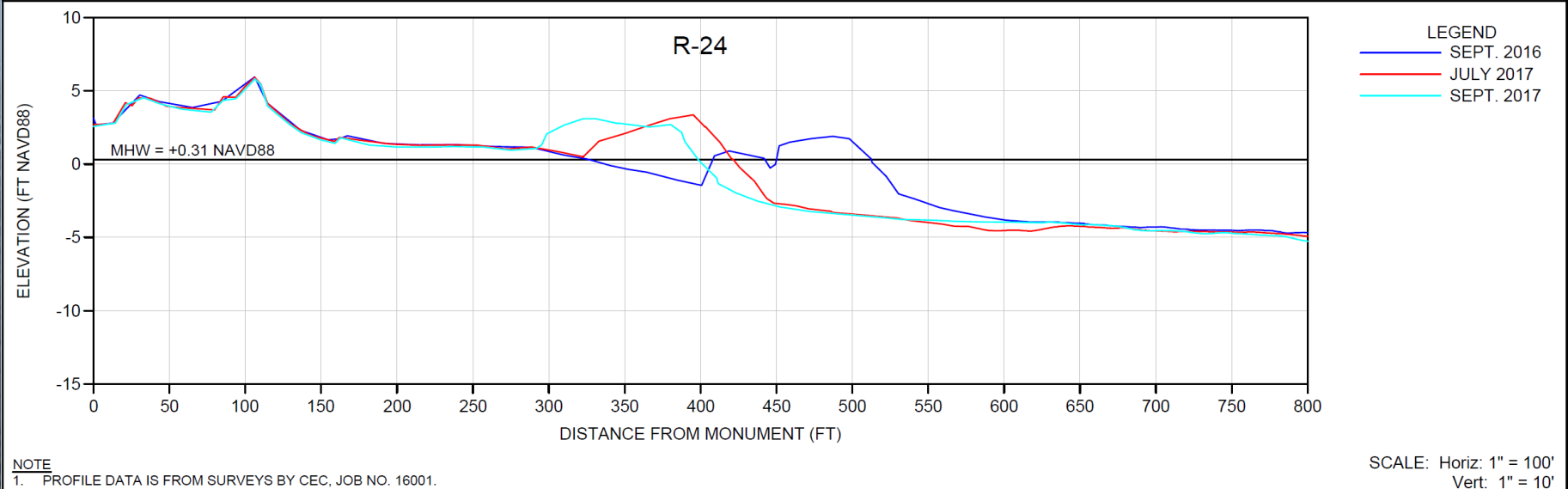
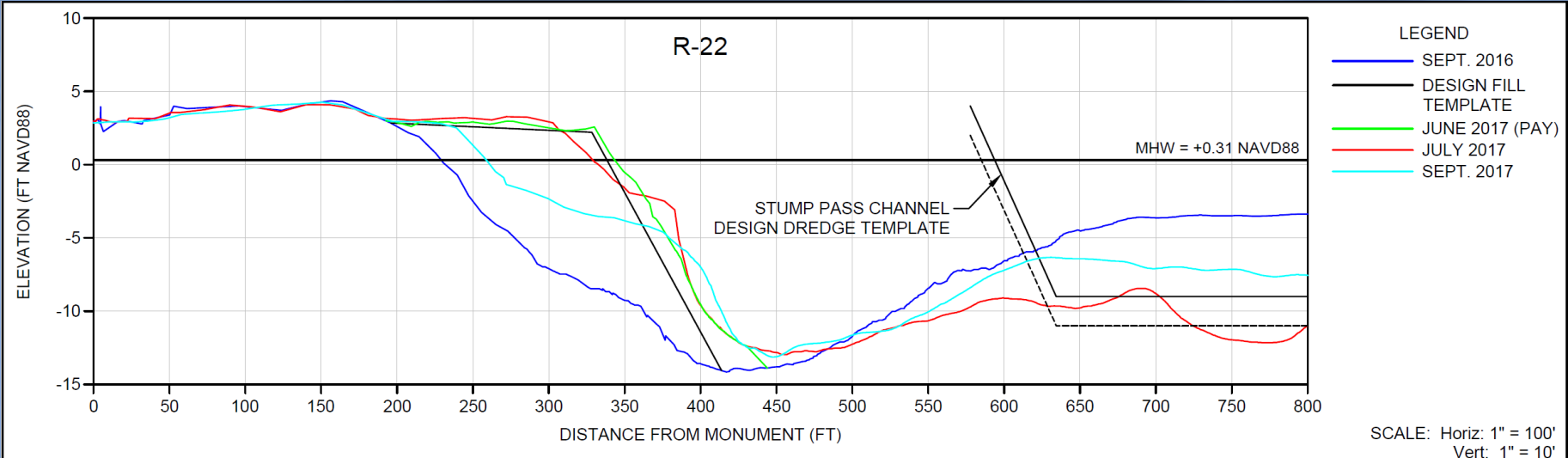
INFILL VOLUME = 36,820 CY

NAVIGATION CHANNEL TYPICAL SECTIONS



CONTROL DEPTH REDUCED TO 5.4 FT. MLW

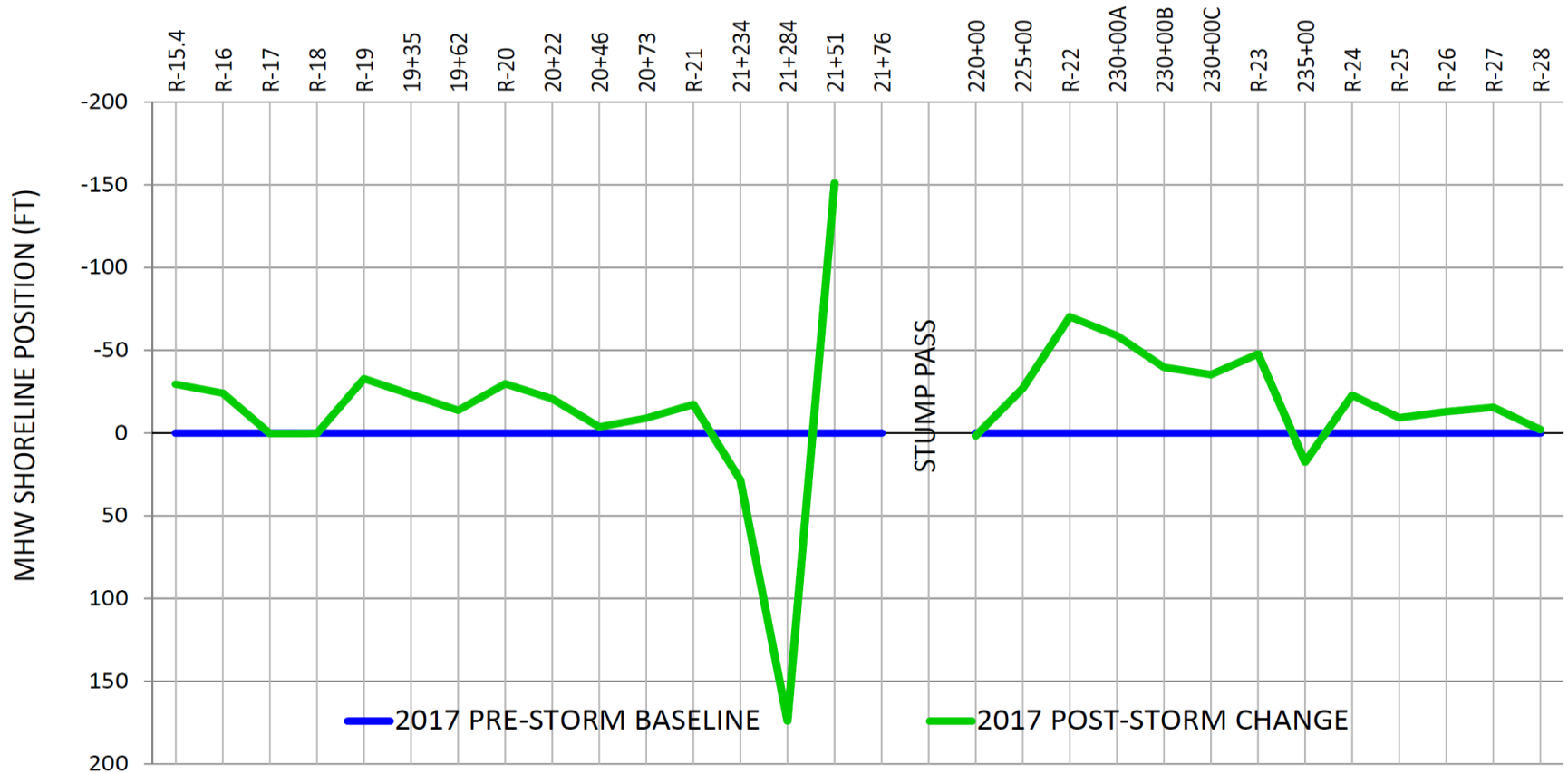
DOWNDRIFT BEACH PROFILE COMPARISONS



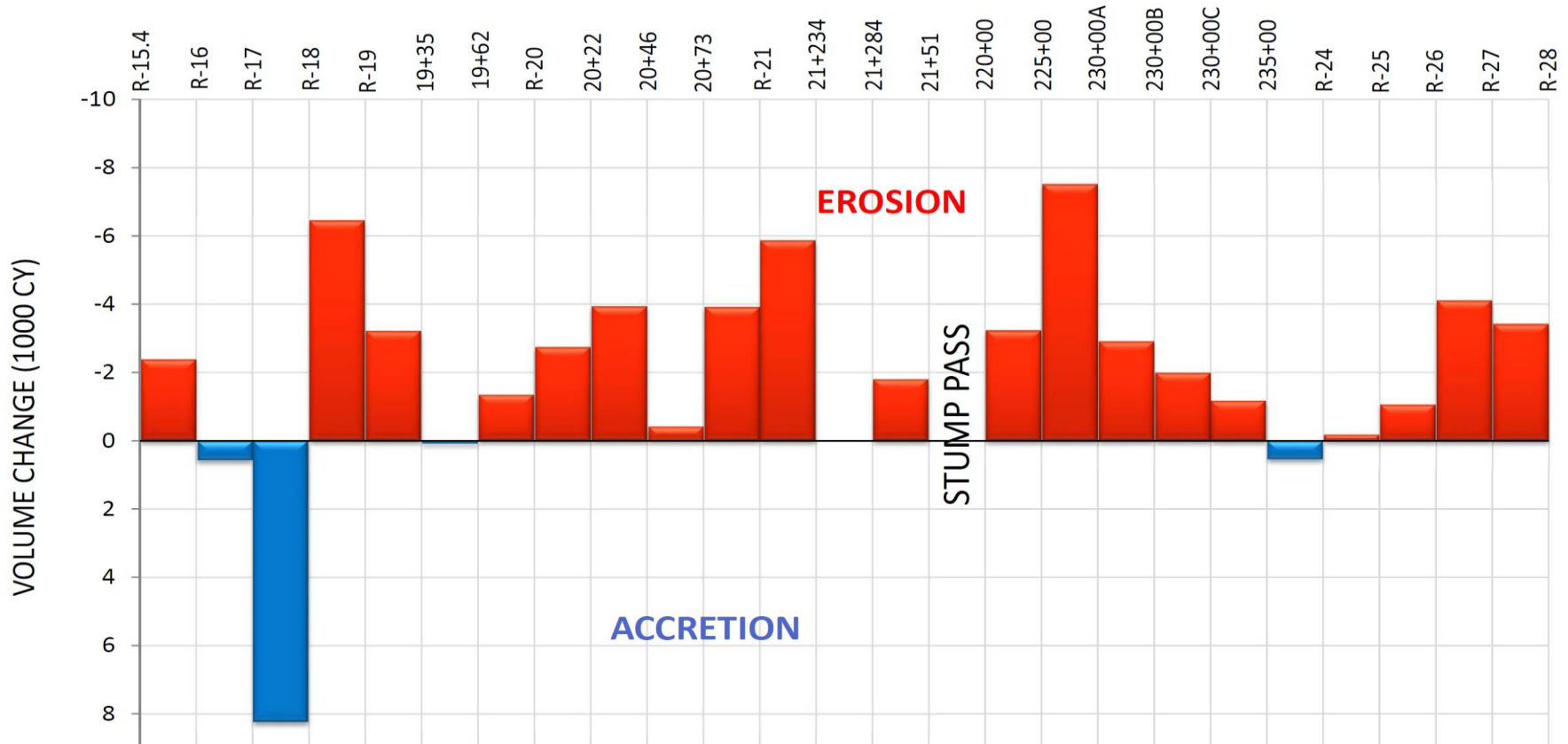
NOTE
1. PROFILE DATA IS FROM SURVEYS BY CEC, JOB NO. 16001.

EROSION VOLUME = 16,840 CY

PRE- VS. POST-STORM MEAN HIGH WATER SHORELINE POSITIONS



PRE- VS POST-STORM VOLUME CHANGES ABOVE DEPTH OF CLOSURE

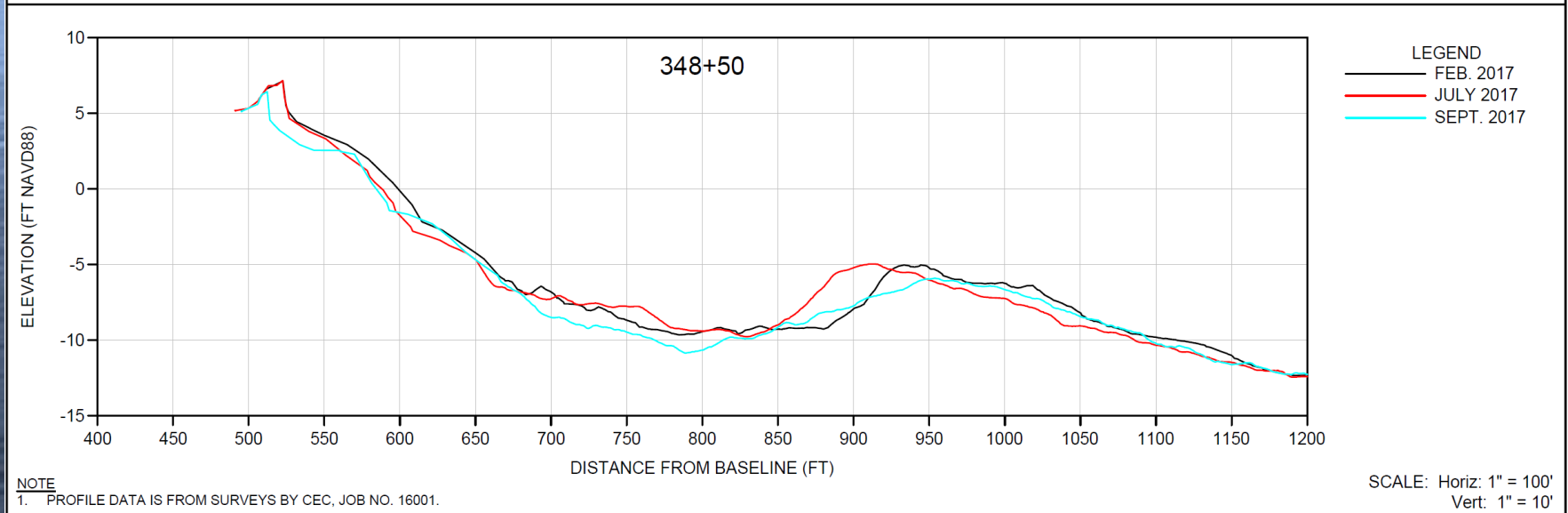
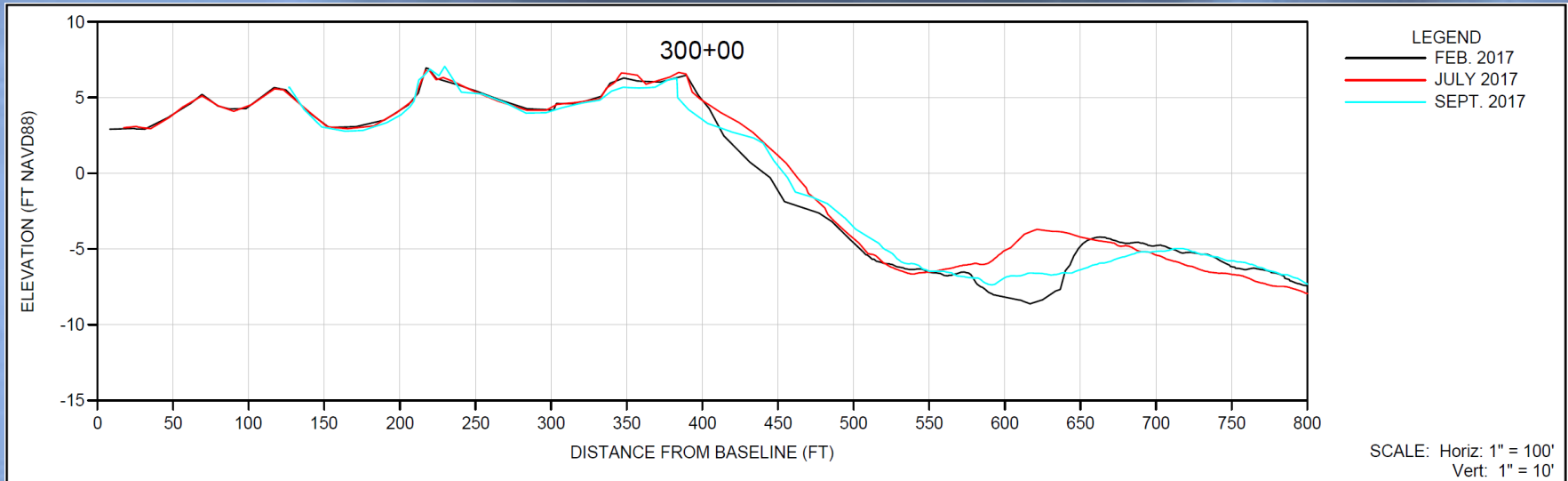


KNIGHT ISLAND – DON PEDRO ISLAND EROSION ATTRIBUTED TO HURRICANE IRMA



*AERIAL PHOTOGRAPHY PROVIDED BY
PICKETT & ASSOCIATES, INC., DATED
JULY 2017.

KI-DPI PROFILE COMPARISONS



NOTE
1. PROFILE DATA IS FROM SURVEYS BY CEC, JOB NO. 16001.

EROSION VOLUME = 65,200 CY

ESTERO ISLAND POST-IRMA CONDITIONS

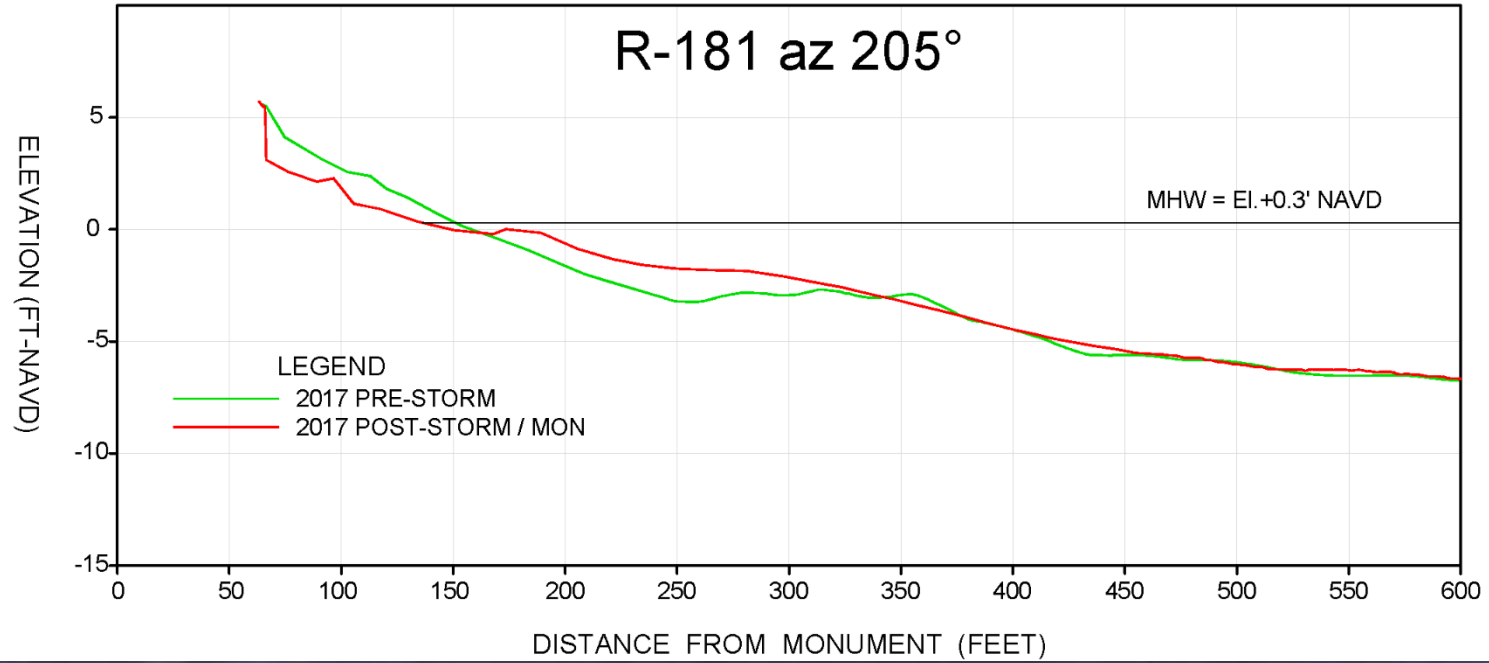
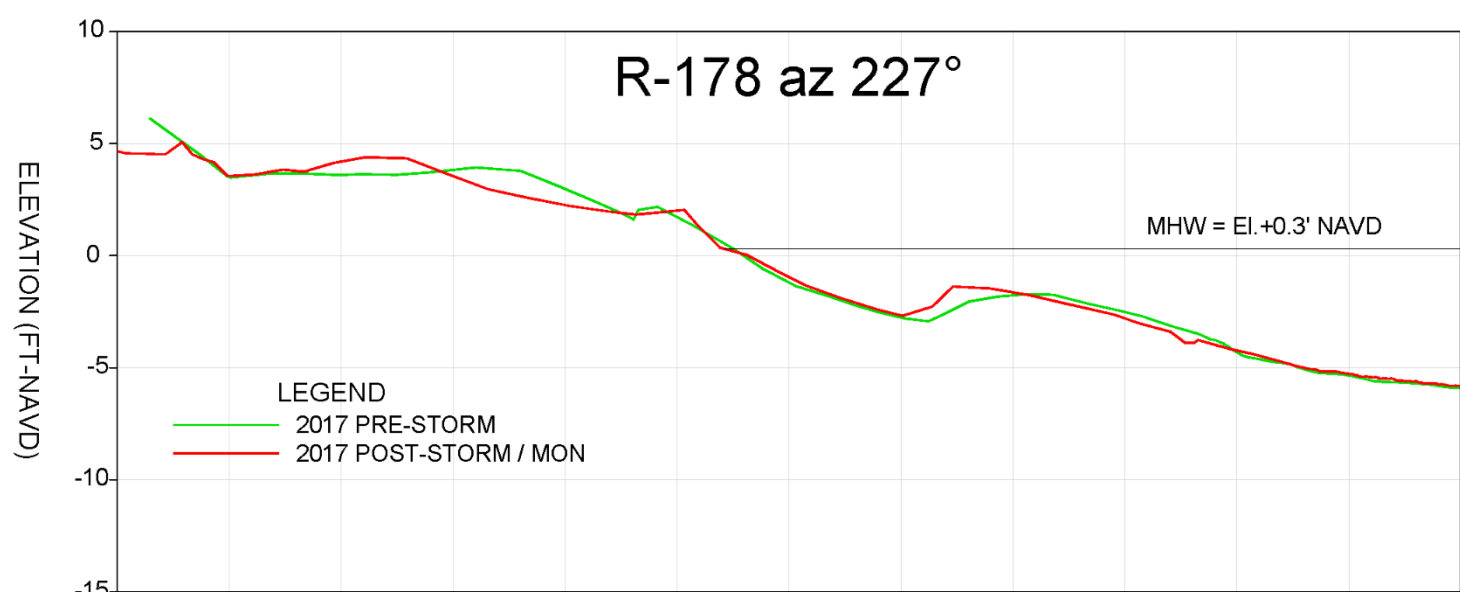


- Dune Overwash
- Significant Erosion of Dry Beach (Above MHW)
- Minimal "Net" Volume Gains when computed to Depth of Closure

BEACH PROJECT NET VOLUME CHANGE (DoC) = +3,100 CY

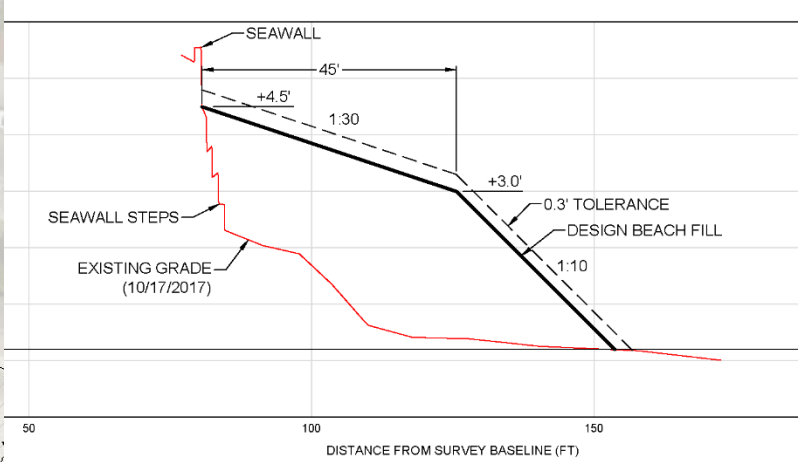
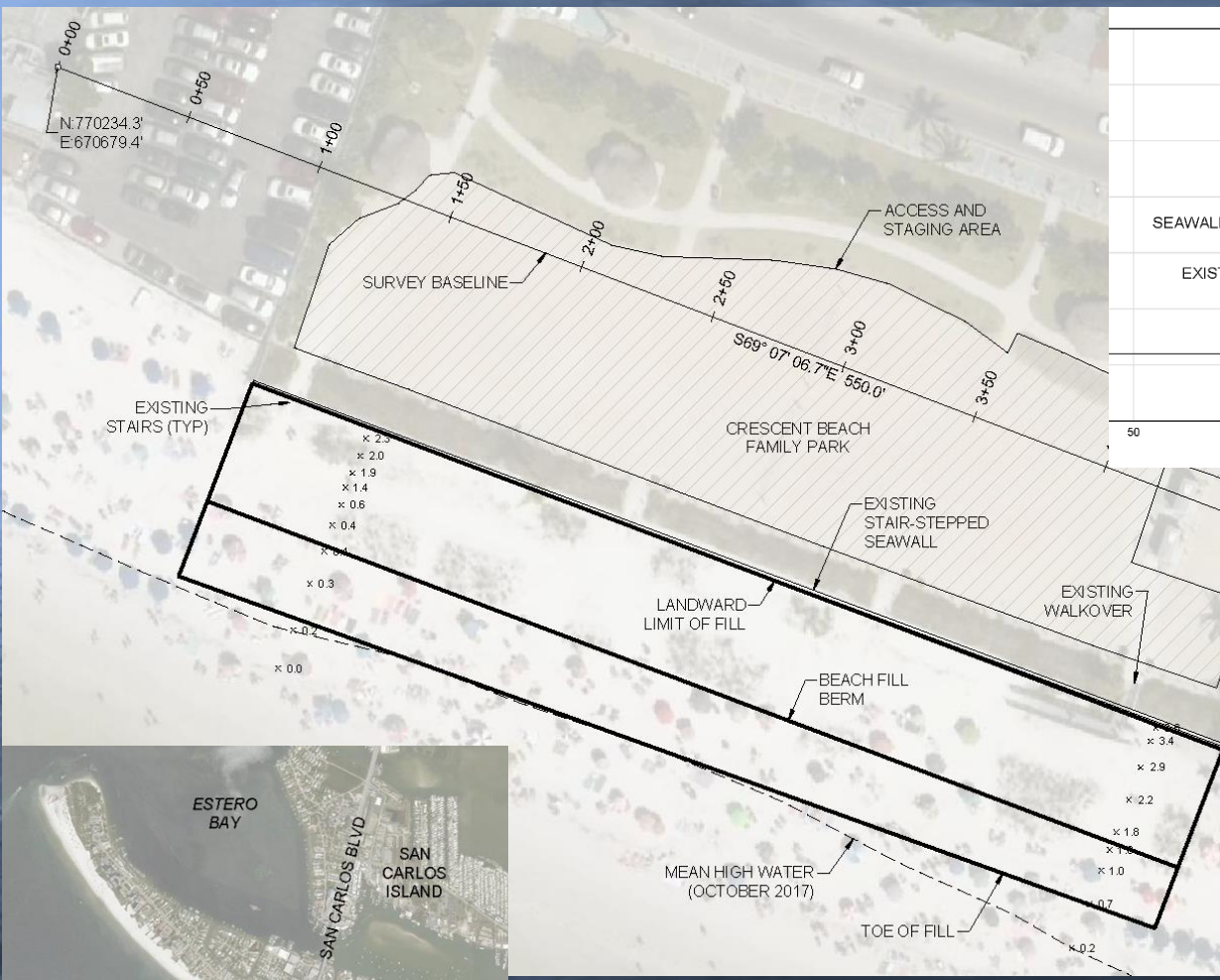
BEACH PROJECT EROSION VOLUME (>MHW) = -12,700 CY

ESTERO ISLAND PROFILE COMPARISONS

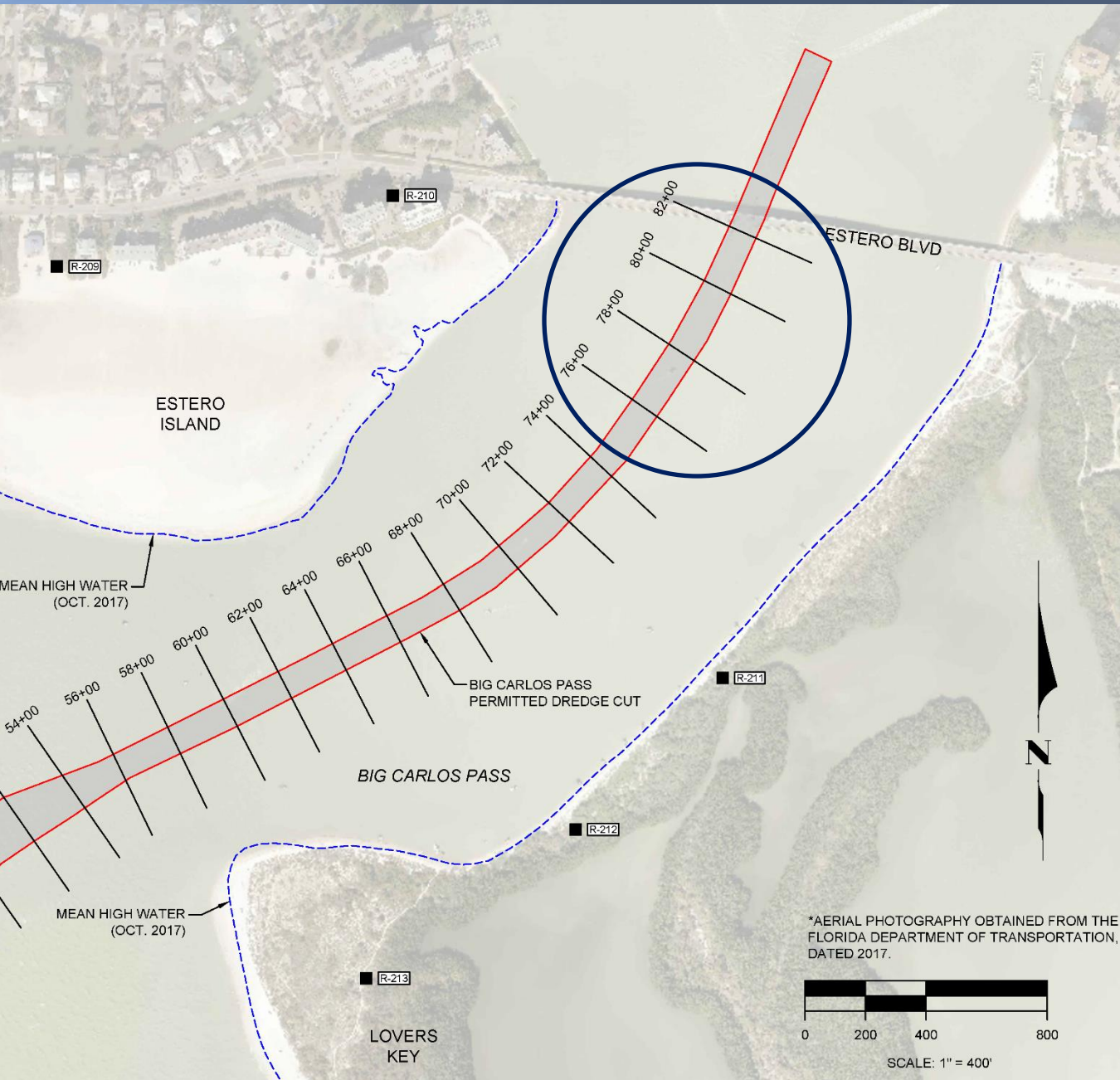


HOT SPOT MAINTENANCE VIA TRUCK HAUL

LEE COUNTY PARKS & NAT'L RESOURCES

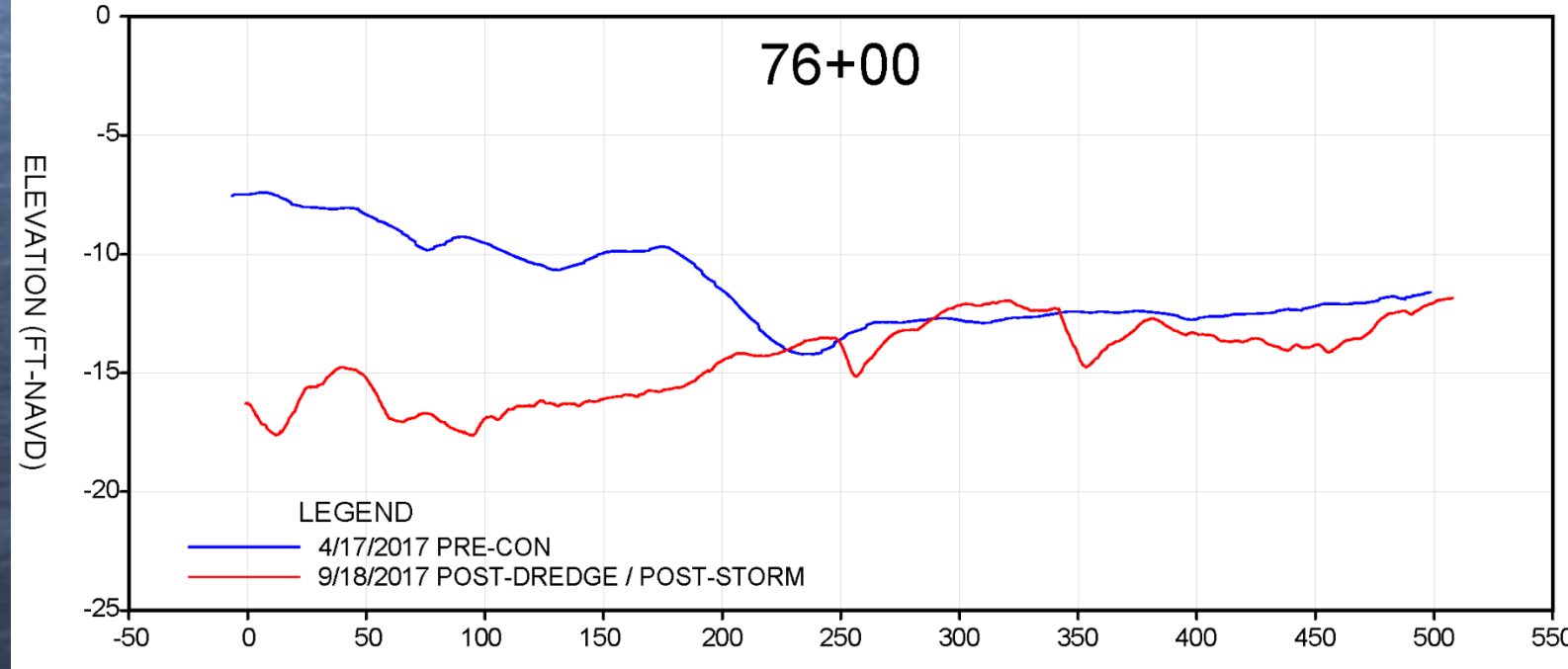
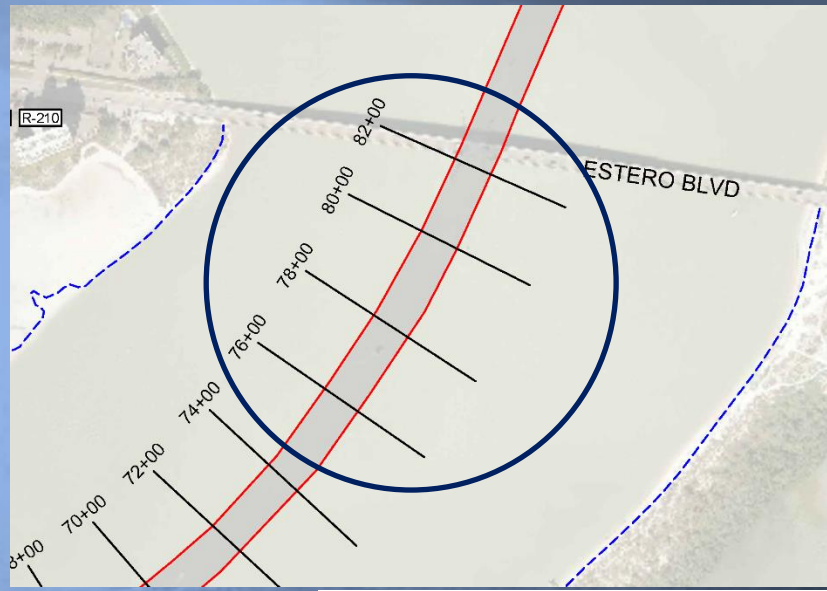


BIG CARLOS PASS POST-IRMA CONDITIONS

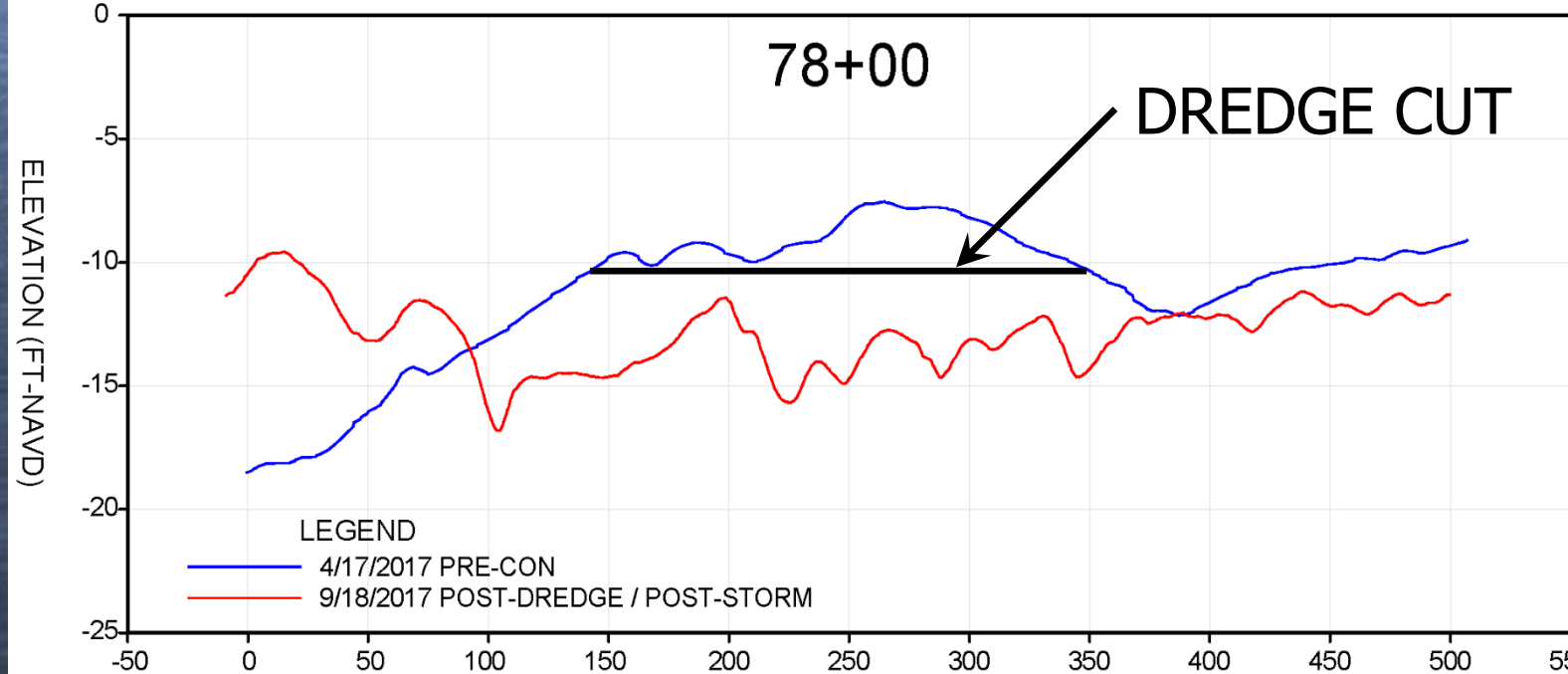
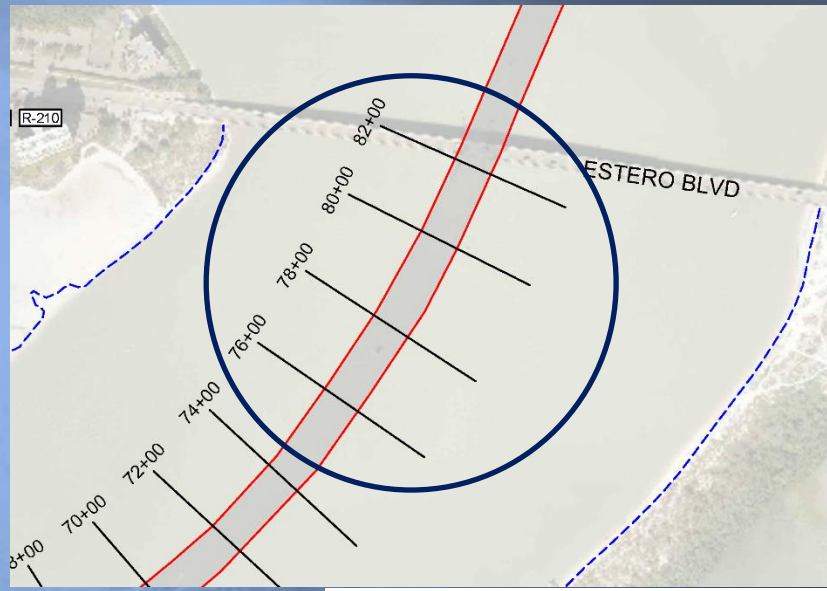


- Inlet Shoreline Erosion
- Channel Deposition
- Scour at Bridge Piles

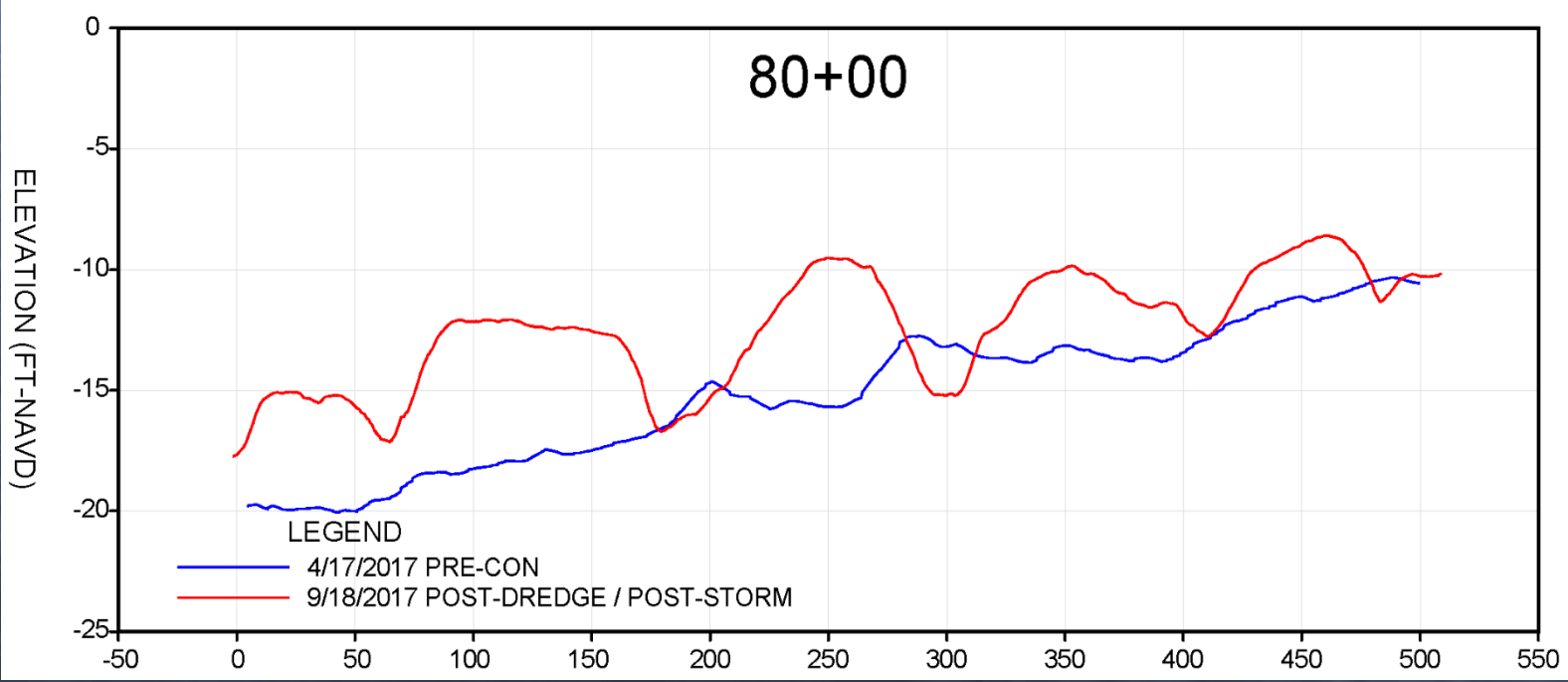
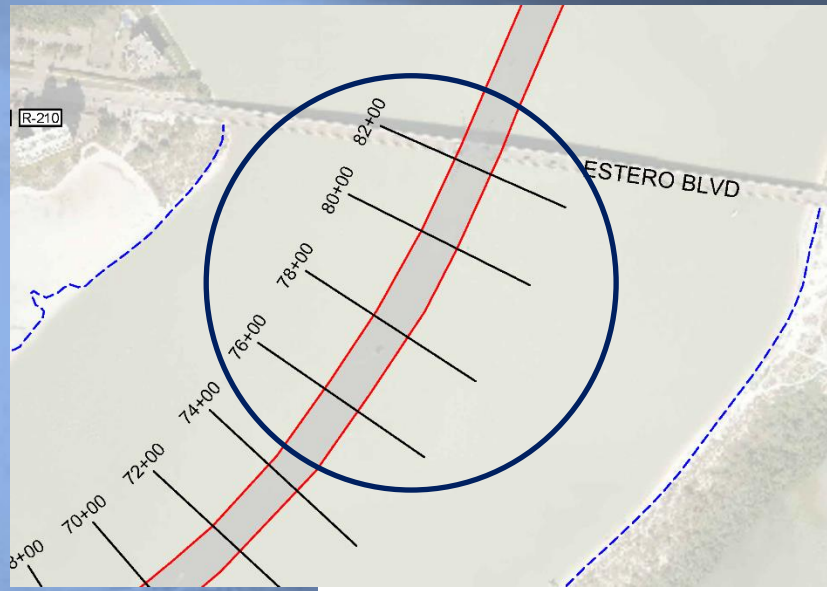
BIG CARLOS PASS POST-IRMA CONDITIONS



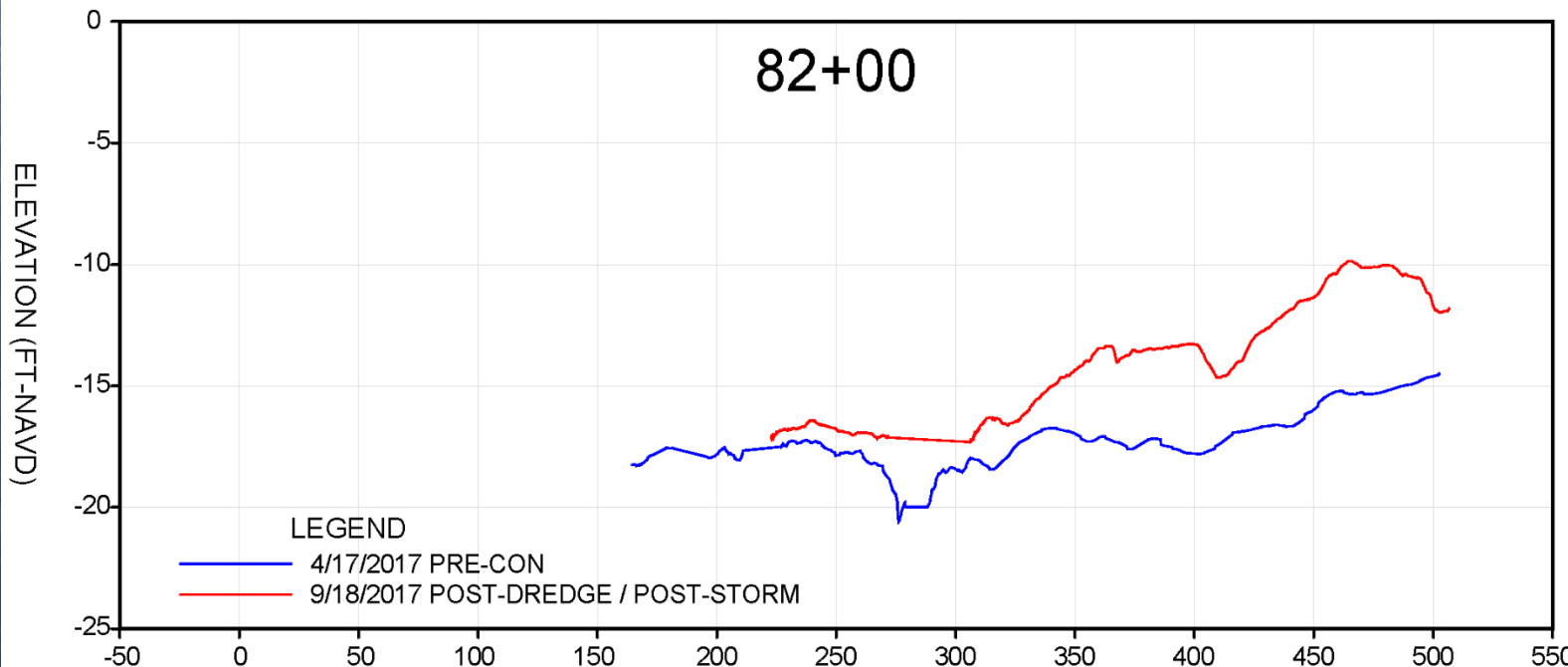
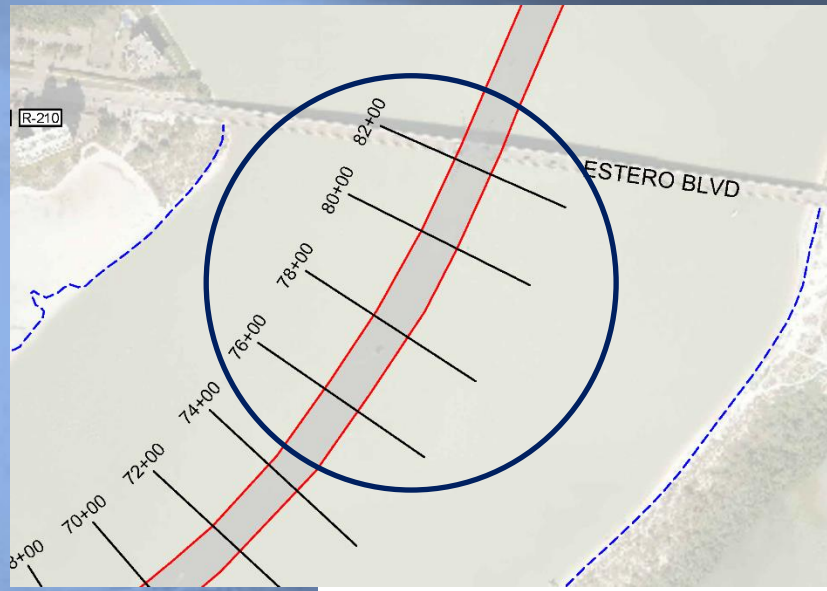
BIG CARLOS PASS POST-IRMA CONDITIONS



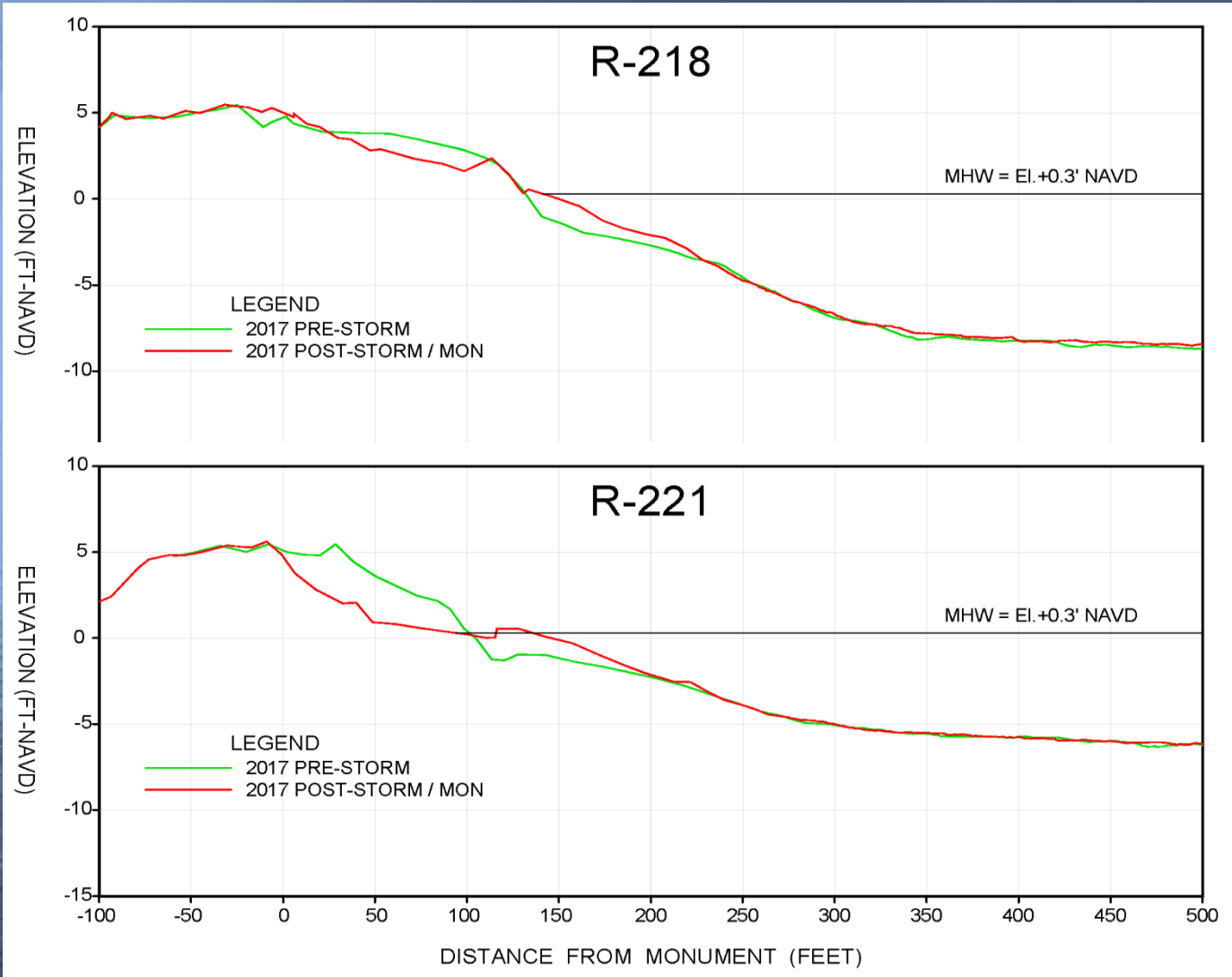
BIG CARLOS PASS POST-IRMA CONDITIONS



BIG CARLOS PASS POST-IRMA CONDITIONS



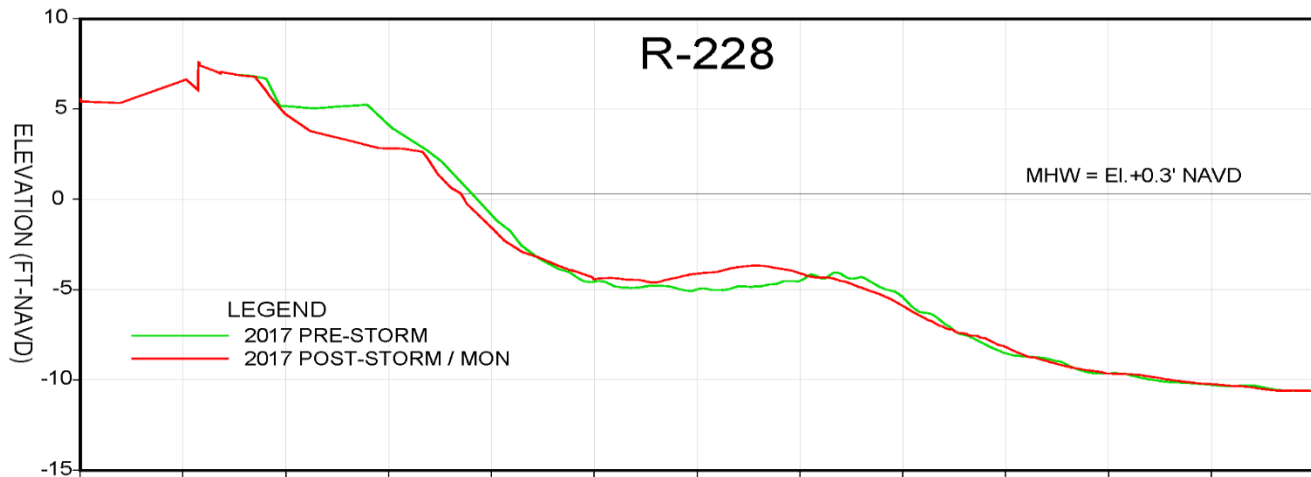
LOVERS KEY POST-IRMA CONDITIONS



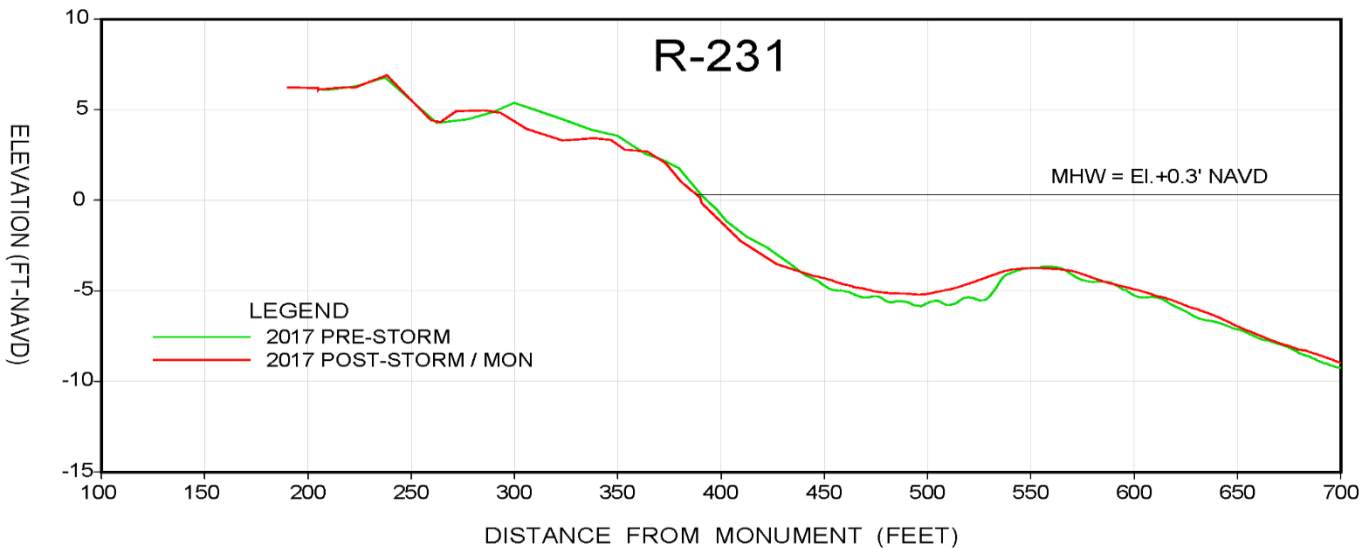
- Dune Overwash
- Significant Erosion of Dry Beach (Above MHW)
- Minimal "Net" Volume Gains (Depth of Closure)

BEACH PROJECT NET VOLUME CHANGE (DoC) = +8,600 CY
BEACH PROJECT EROSION VOLUME (>MHW) = -14,500 CY

BONITA BEACH POST-IRMA CONDITIONS



- Significant Erosion of Dry Beach (Above MHW)
- Net Erosion (Depth of Closure)



BEACH PROJECT EROSION LOSSES (DoC) = -6,400 CY
BEACH PROJECT EROSION VOLUME (>MHW) = -15,200 CY



SUMMARY

- Charlotte Barriers
 - Manasota Key North: No Net Erosion within Proposed Fill Limits
 - Erosion Control Project: 112K CY of Erosion (38K CY Infilling ~ Stump Pass Channel)
- South Lee Barriers {Beach Project Limits}
 - Estero Beach Project: Minimal Net Gains to DofC, 12,700 CY of Erosion Above MHW
 - Lovers Key Beach Project: Minimal Net Gains to DofC, 14,500 CY of Erosion Above MHW
 - Bonita Beach: Minor Net Erosion to DofC, 15,200 CY of Erosion Above MHW



ACKNOWLEDGEMENTS

