

HURRICANE IAN'S IMPACTS TO SOUTHWEST FLORIDA'S BARRIER ISLANDS

Presentation for:

Florida Shore and Beach Preservation Association

February 1, 2023

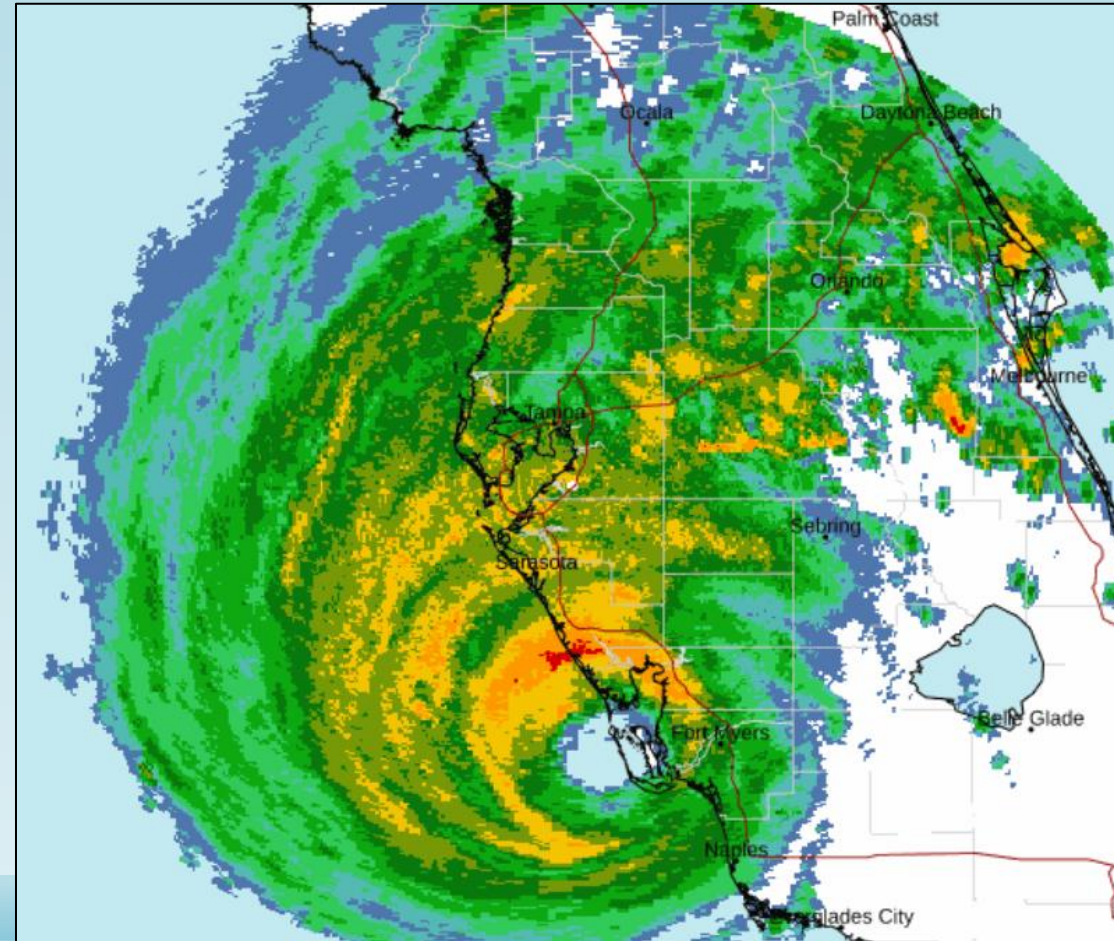


Presented by:
Coastal Engineering Consultants



OUTLINE

- **Introduction**
- **Hurricane Ian**
- **Lessons Learned**
- **Impacts to SWFL Barrier Islands and Inlets**



HURRICANE IAN

- Fifth-strongest hurricane on record to strike the U.S.
- Cat 4 with maximum sustained winds of 155 mph, just shy of a Cat 5
- Made landfall near Cayo Costa on Sep. 28, 2022 at 3:05 PM EDT with maximum sustained winds of 150 mph



LEE COUNTY

Hurricane
Ian Landfall



NOAA
Ft. Myers (River)

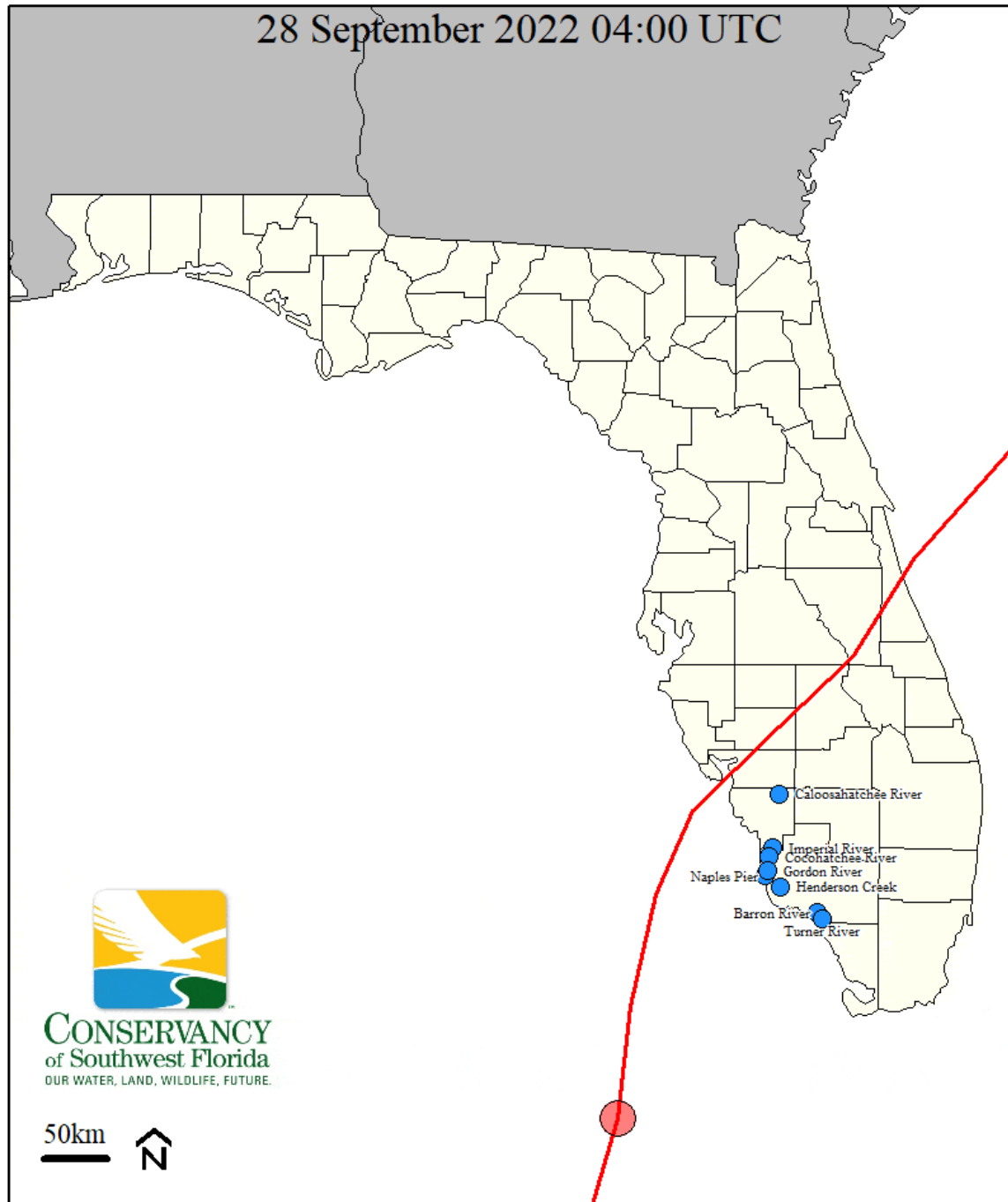


Luminary
Hotel

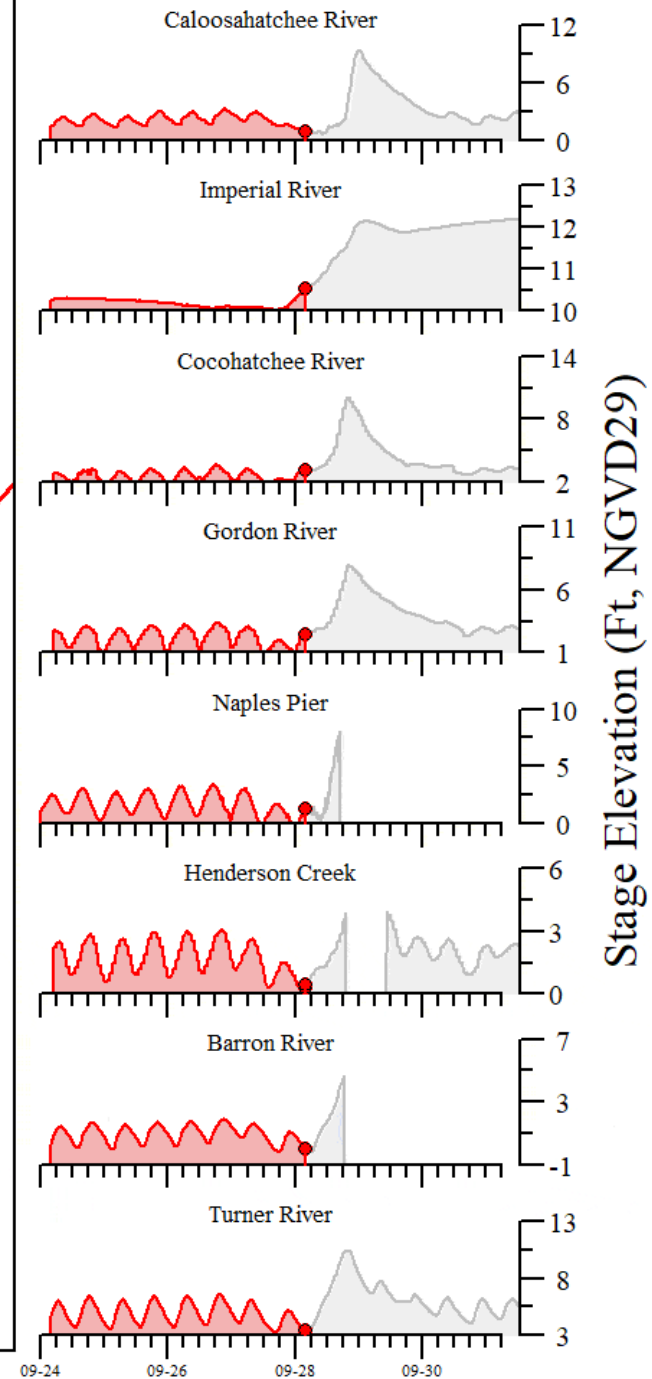
USGS
Ten Mile Canal

USGS
Spring Creek

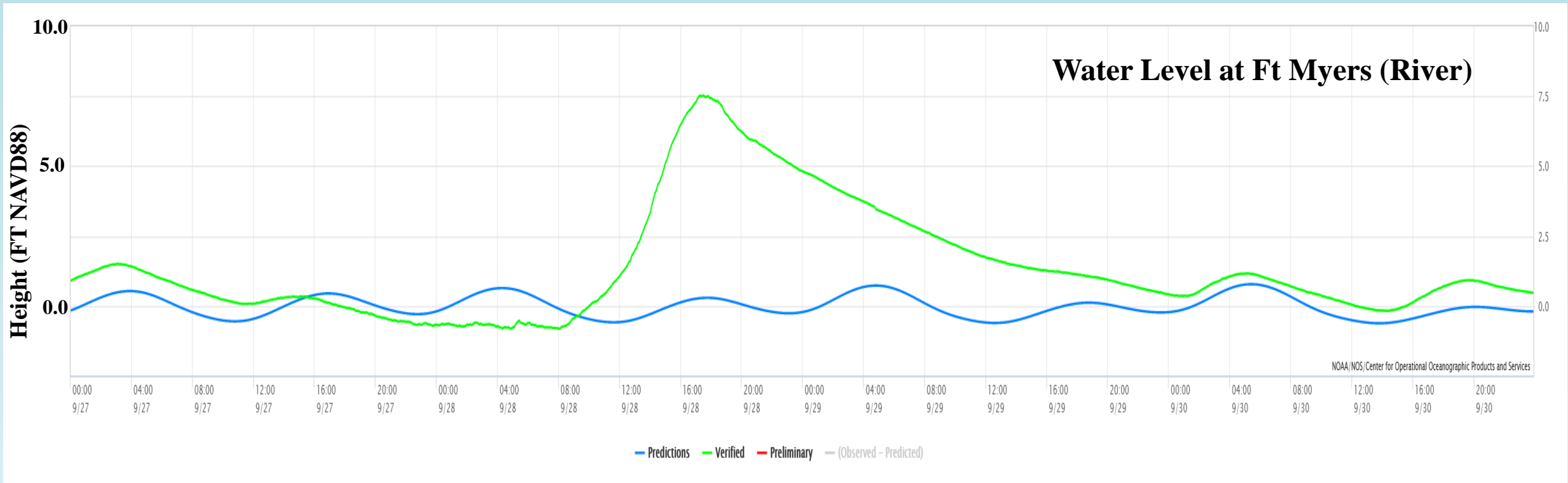
28 September 2022 04:00 UTC



50km

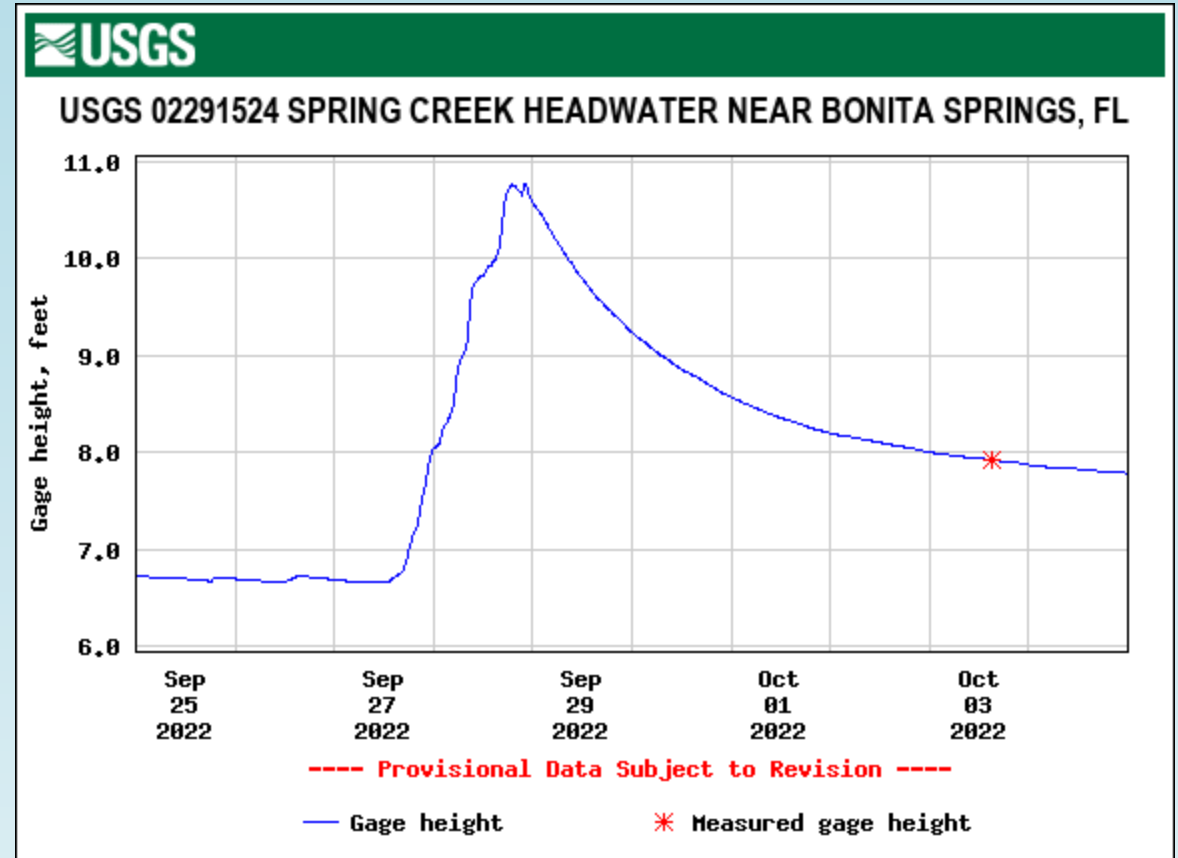
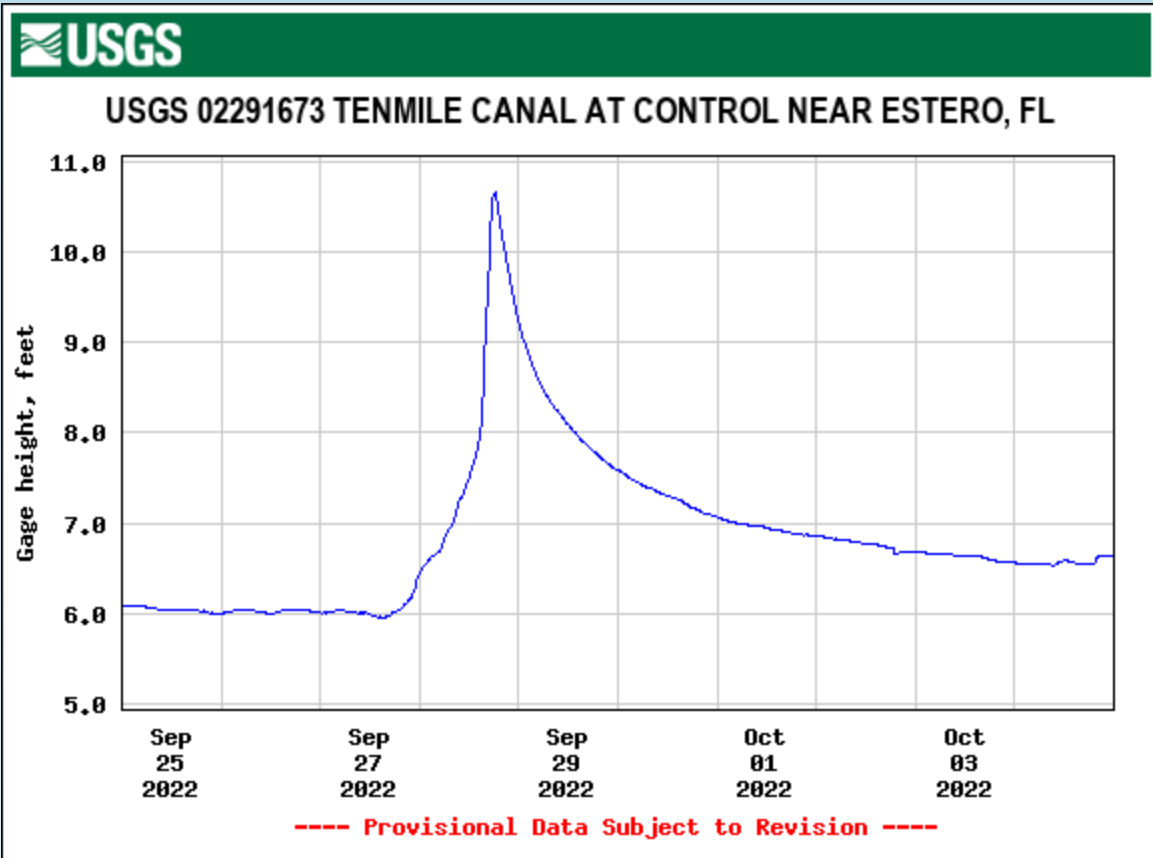


Water Levels



➤ Storm surge with inundation reported from 12 to 18 feet above ground level

Water Levels

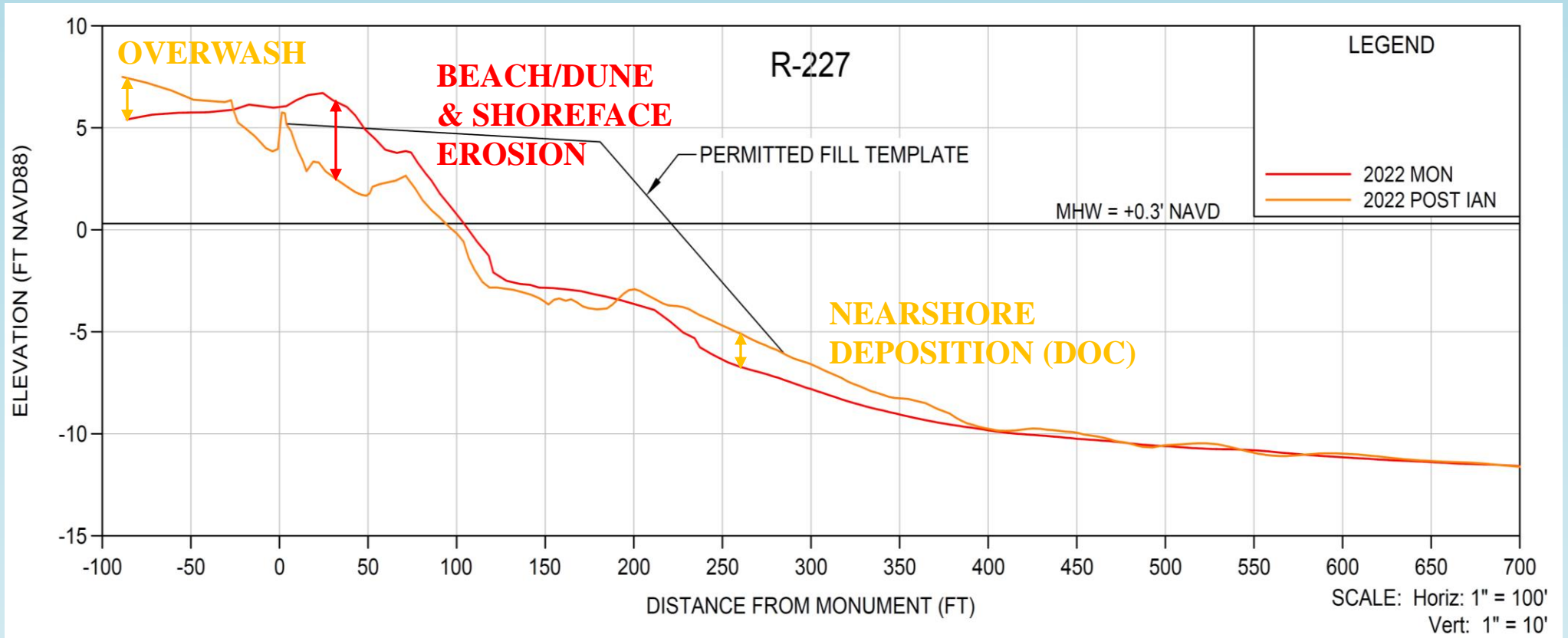


IMPACTS TO SOUTHWEST FLORIDA

Lee County



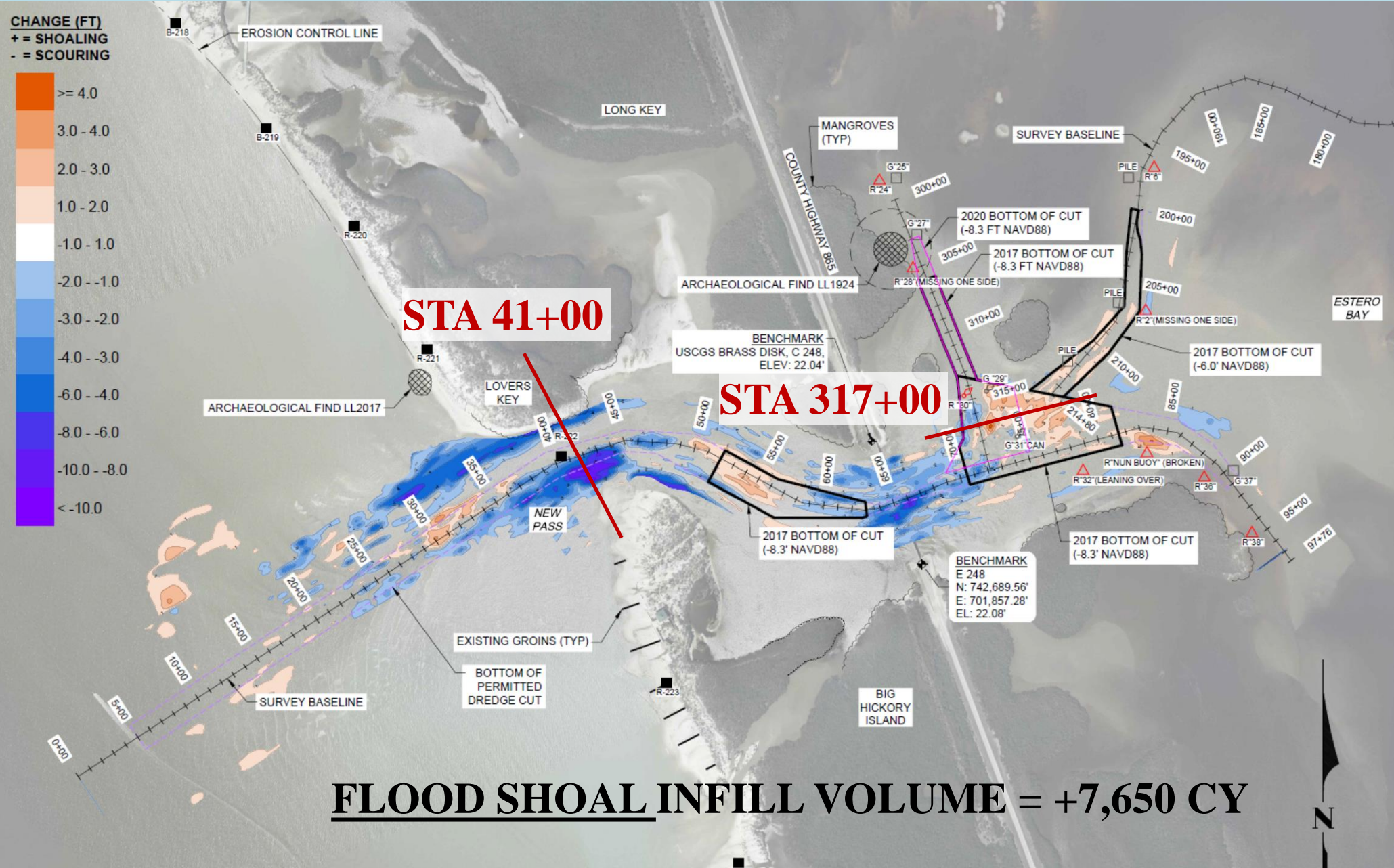
Bonita Beach



SEGMENT	DESCRIPTION *	EROSION (CY)	DENSITY (CY/LF)
North	Managed-Cat G	9,810	-2.5
North	Managed-Template	37,720	-9.6
South	Natural	70,900	-7.4

* Cat G calculation to depth of closure (with background erosion)
 Template calculation within permitted template (with pro-rata background erosion)
 Natural beach calculation to MHW (with background erosion [net accretion])

New Pass



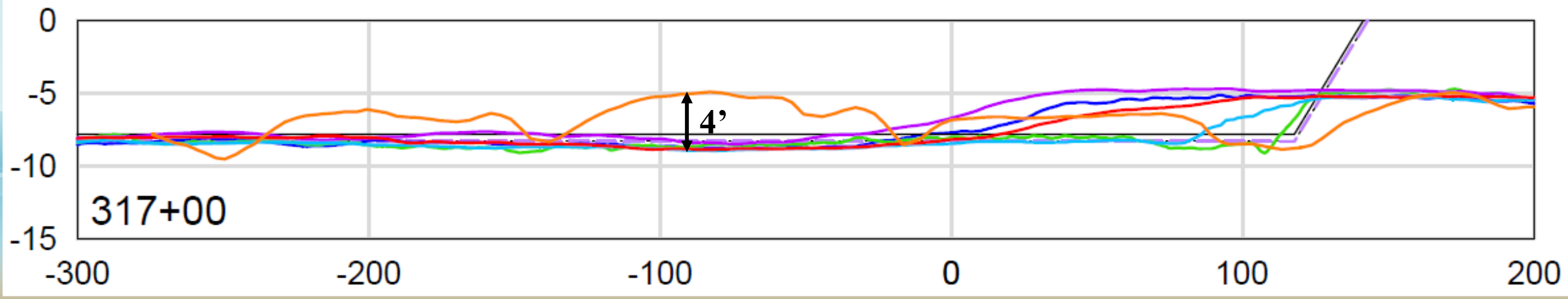
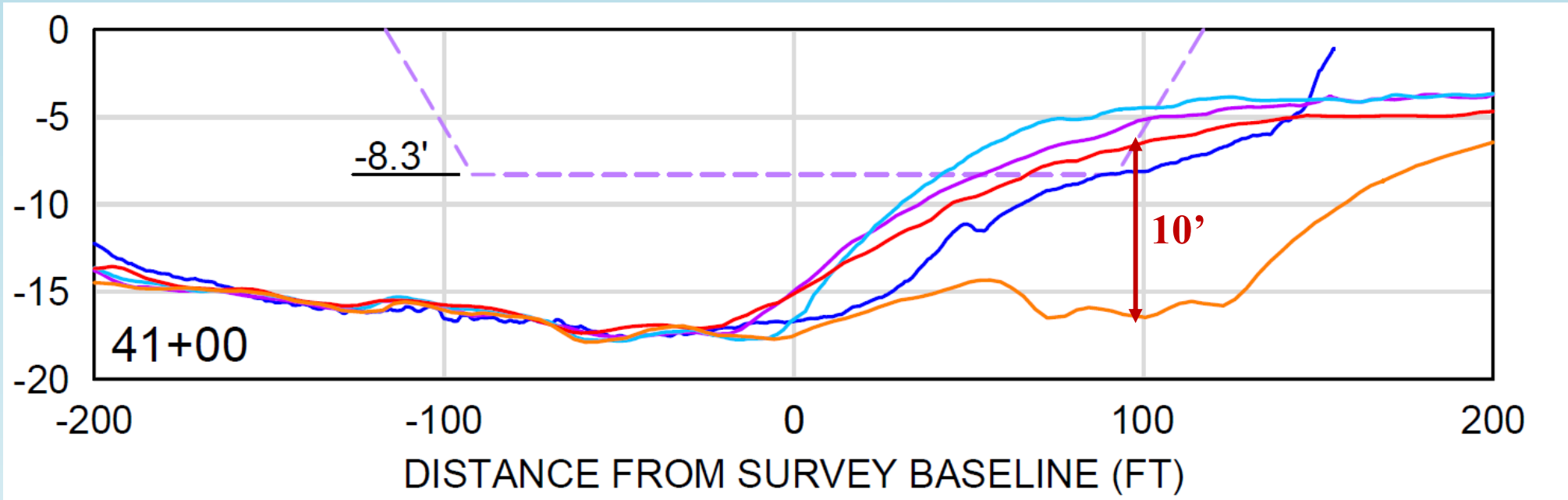
New Pass

LEGEND

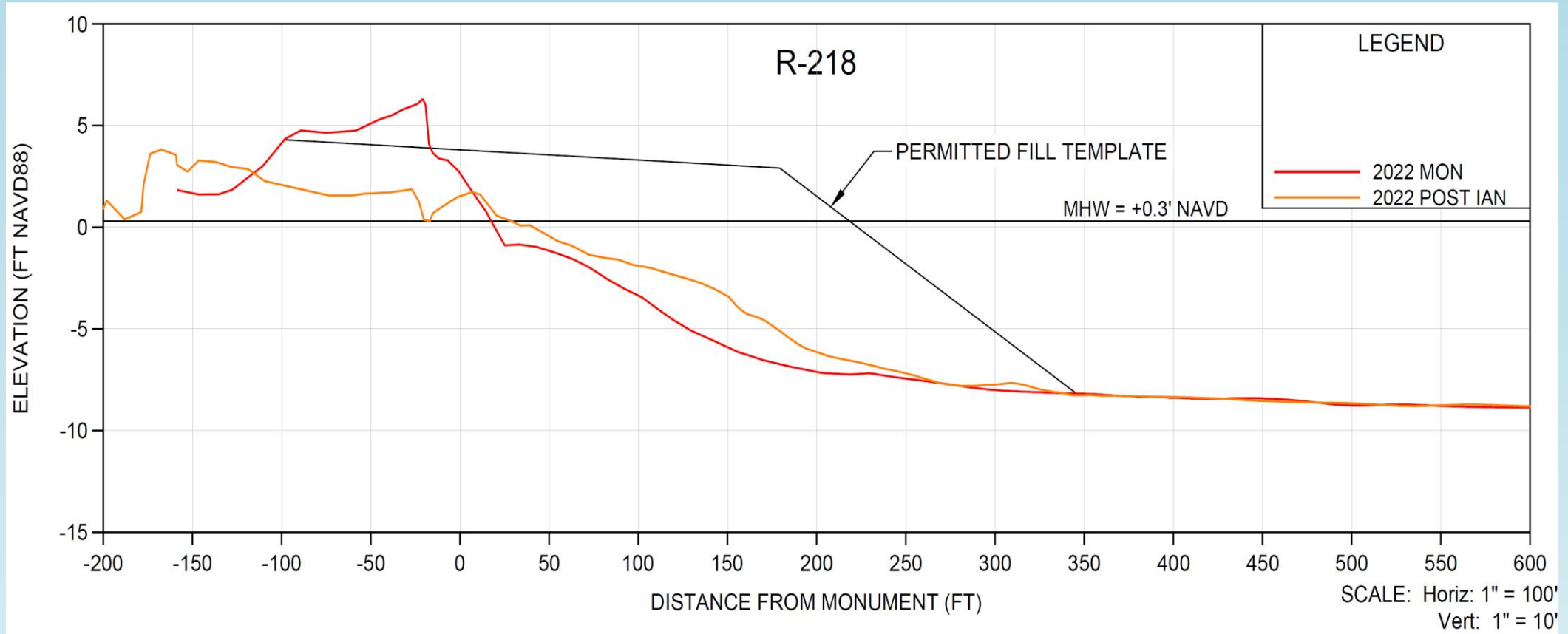
- = 8/7/2018 MON SURVEY
- = 10/17/2022 AND 10/28/2022 POST IAN SURVEY
- = 7/7/2020 MON SURVEY
- = 7/28/2021 MON SURVEY
- = 8/31/2022 AND 9/8/2022 MON SURVEY
- - - = PERMITTED DREDGE CUT
- ♂ ♀ = EXISTING BUOY LOCATION (N.T.S.)

SCALE

- H: 1" = 100'
- V: 1" = 20'



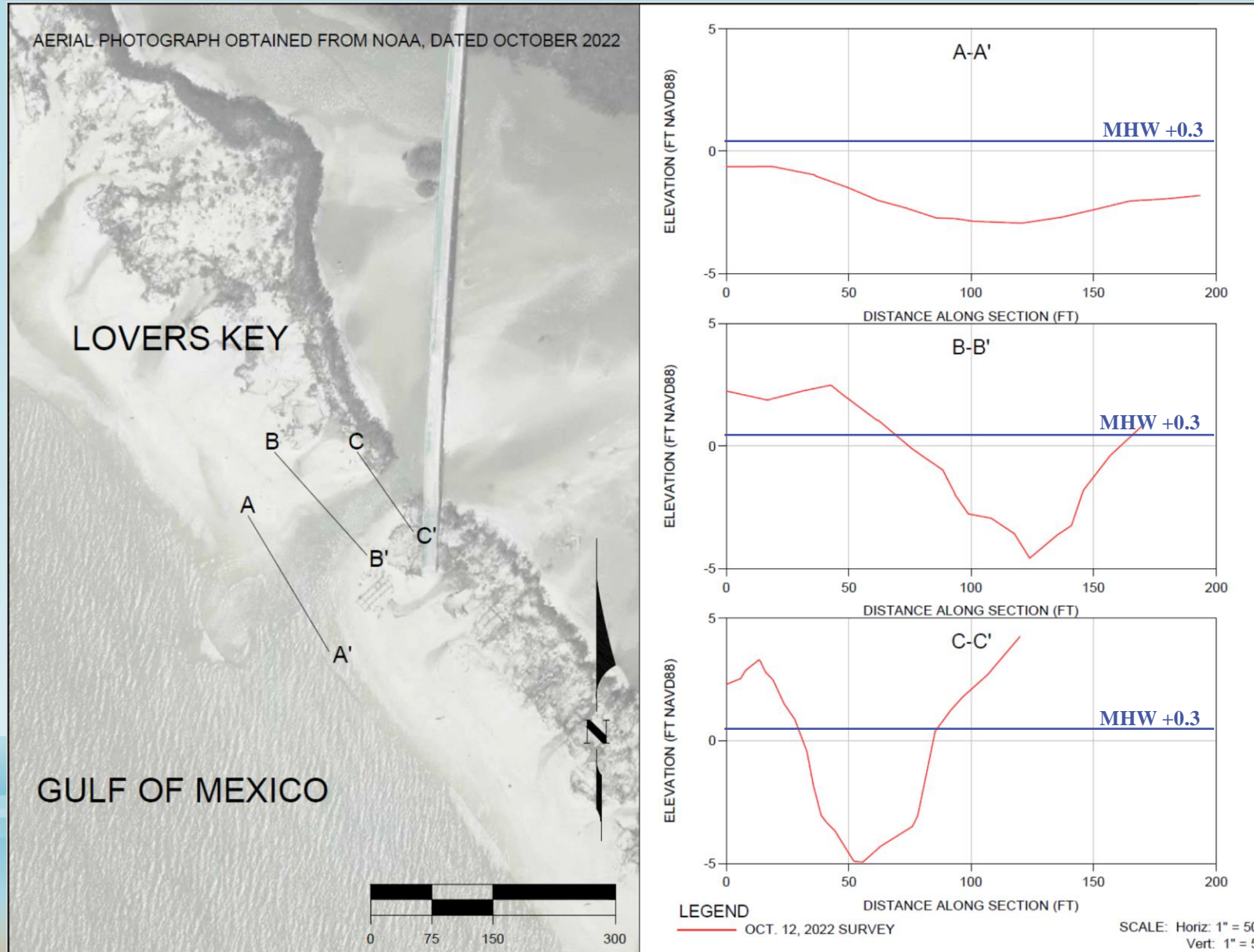
Lovers Key



SEGMENT	DESCRIPTION *	EROSION (CY)	DENSITY (CY/LF)
Fill Limits	Managed-Cat G	27,540	-4.2
Breach		15,240	
Total		42,780	-6.6

* Cat G calculation to depth of closure (with background erosion)

Lovers Key Breach



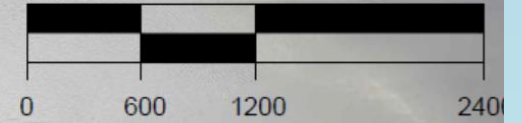
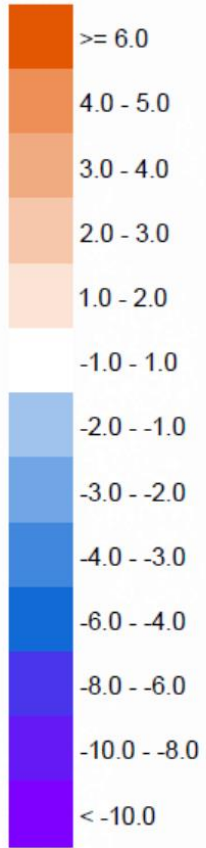
Lovers Key

SEGMENT	DESCRIPTION *	EROSION (CY)	DENSITY (CY/LF)
Fill Limits	Managed-Cat G	27,540	-4.2
Breach		15,240	
Total		42,780	-6.6

* Cat G denotes FEMA calculation to depth of closure (with background erosion)

Big Carlos Pass

CHANGE (FT)
+ = SHOALING
- = SCOURING



BENCHMARK
USGS Z246 1965
N: 752,530.04'
E: 696,072.84'
EL: 15.41'

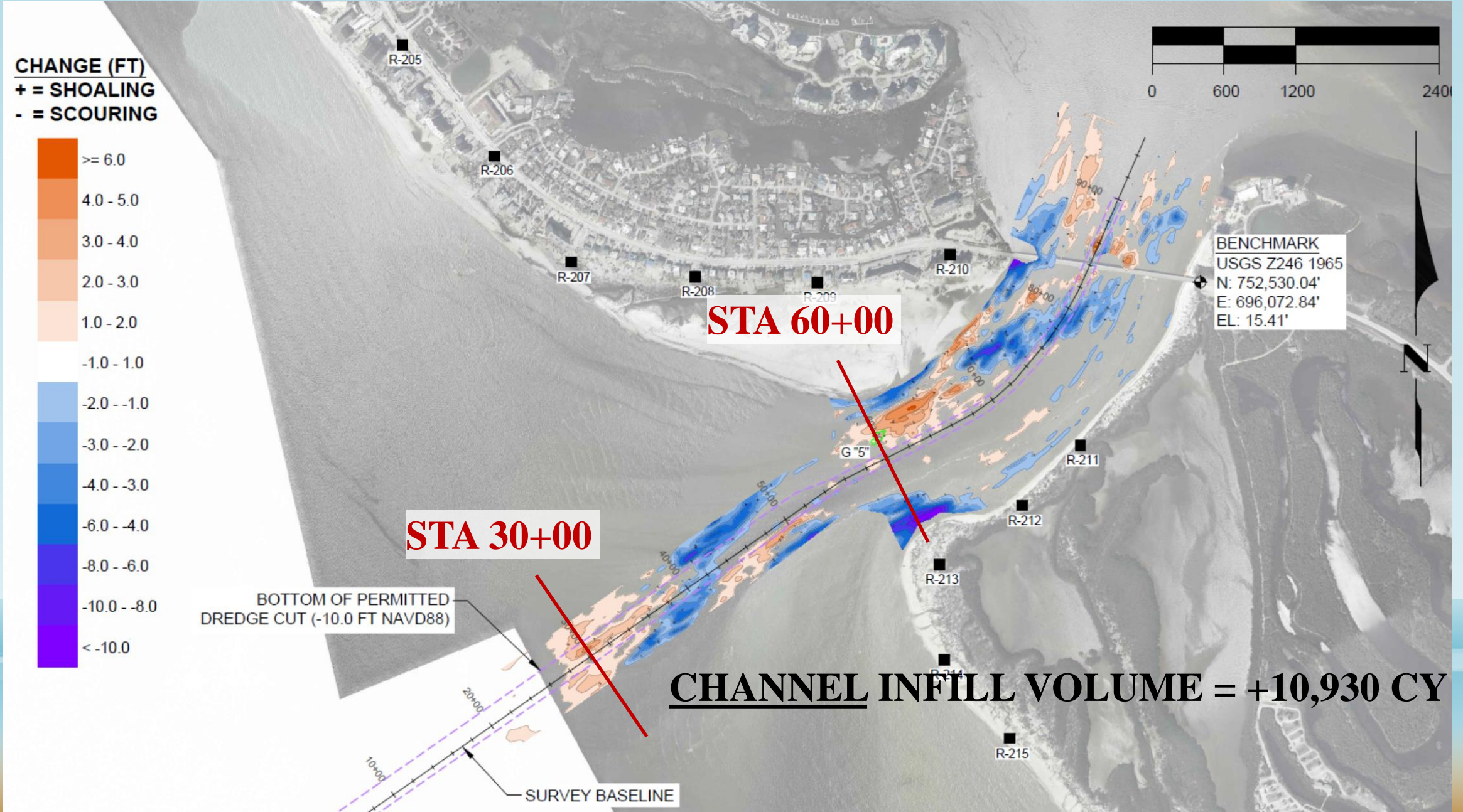
STA 60+00

STA 30+00

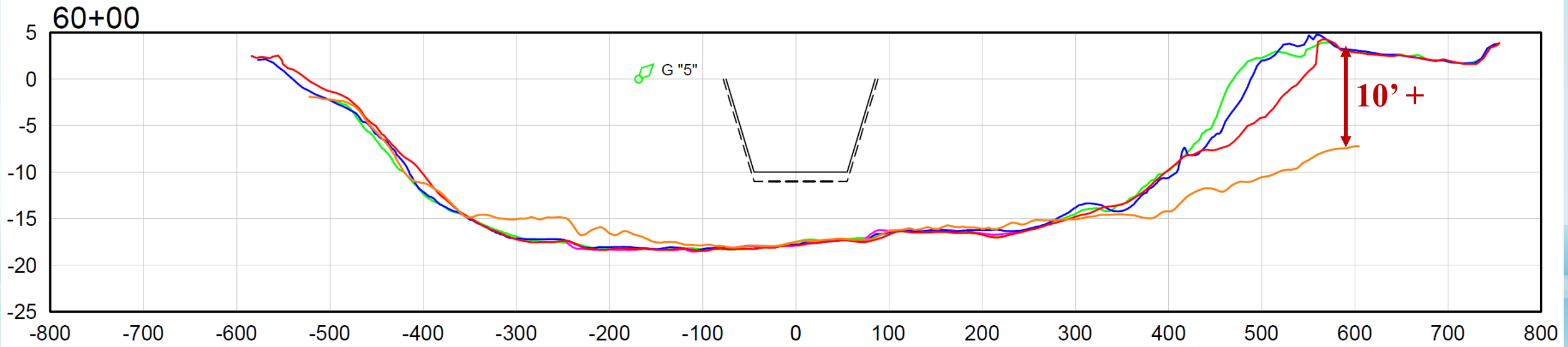
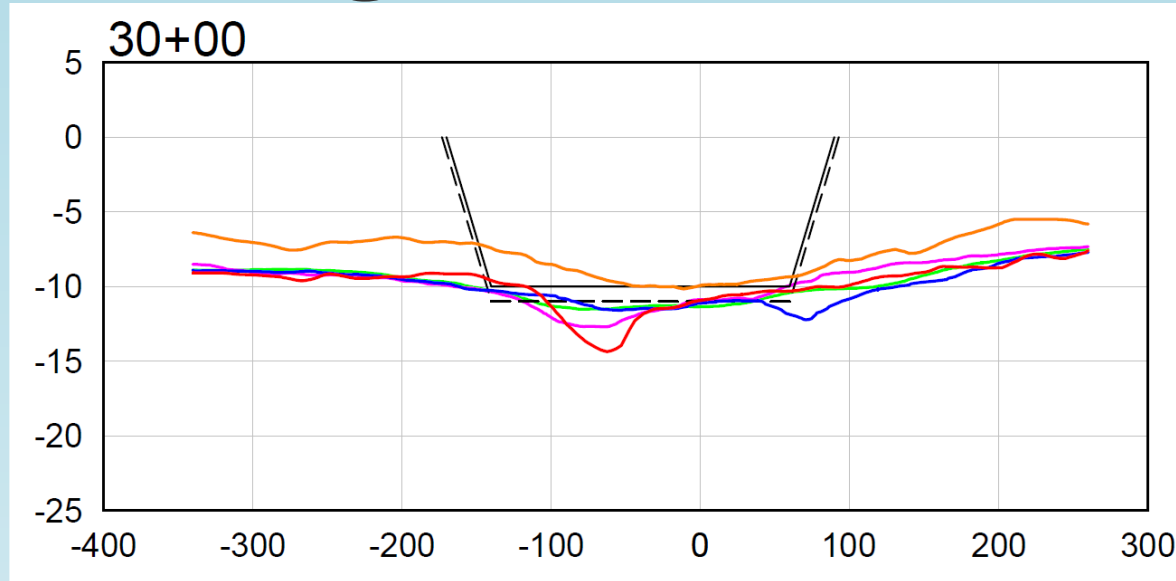
BOTTOM OF PERMITTED
DREDGE CUT (-10.0 FT NAVD88)

CHANNEL INFILL VOLUME = +10,930 CY

SURVEY BASELINE



Big Carlos Pass

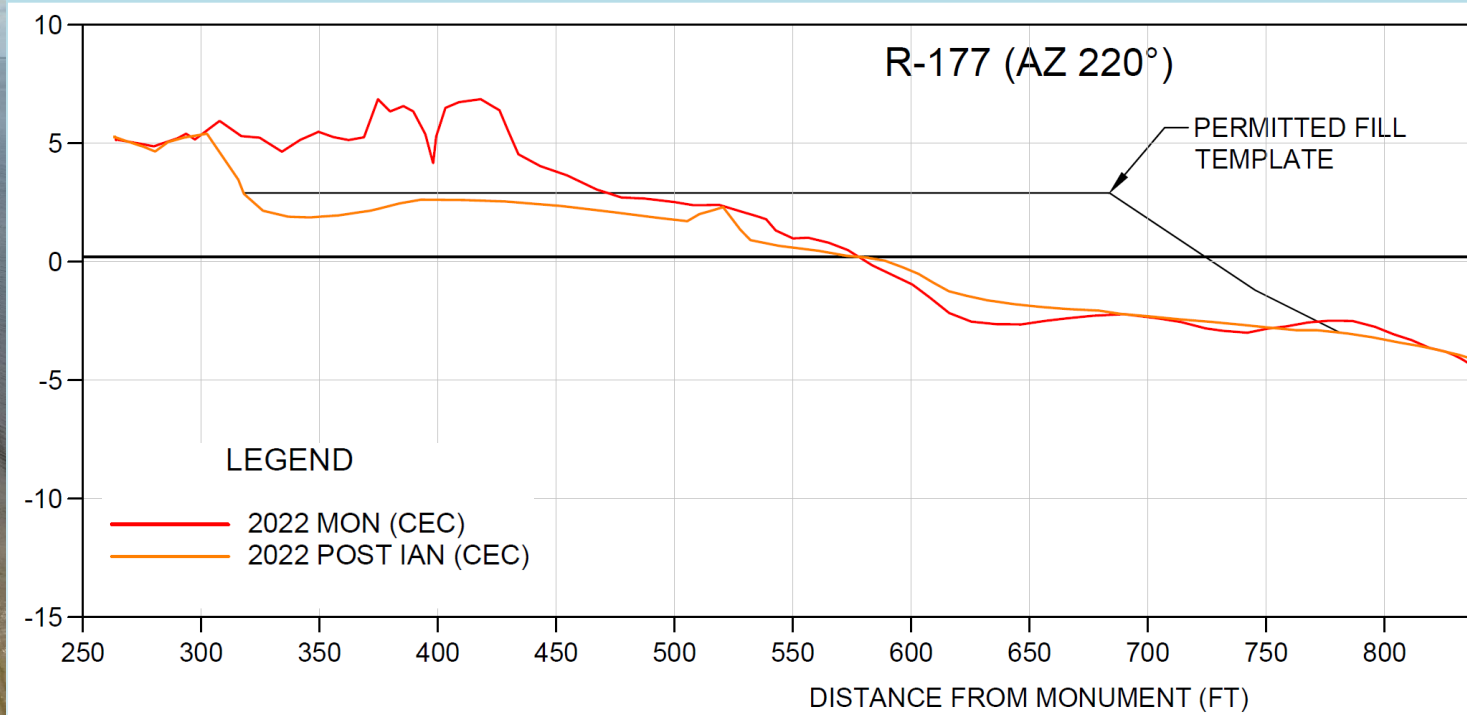


LEGEND

— (magenta) = JULY 2019 SURVEY	— (green) = JULY 2020 SURVEY	— (blue) = AUG. 2021 SURVEY	— (red) = AUG. 2022 SURVEY
— (dashed) = PERMITTED DREDGE CUT	— (dashed) = PERMITTED DREDGE CUT TOLERANCE		— (orange) = OCT. 2022 POST IAN SURVEY

Estero Island

North

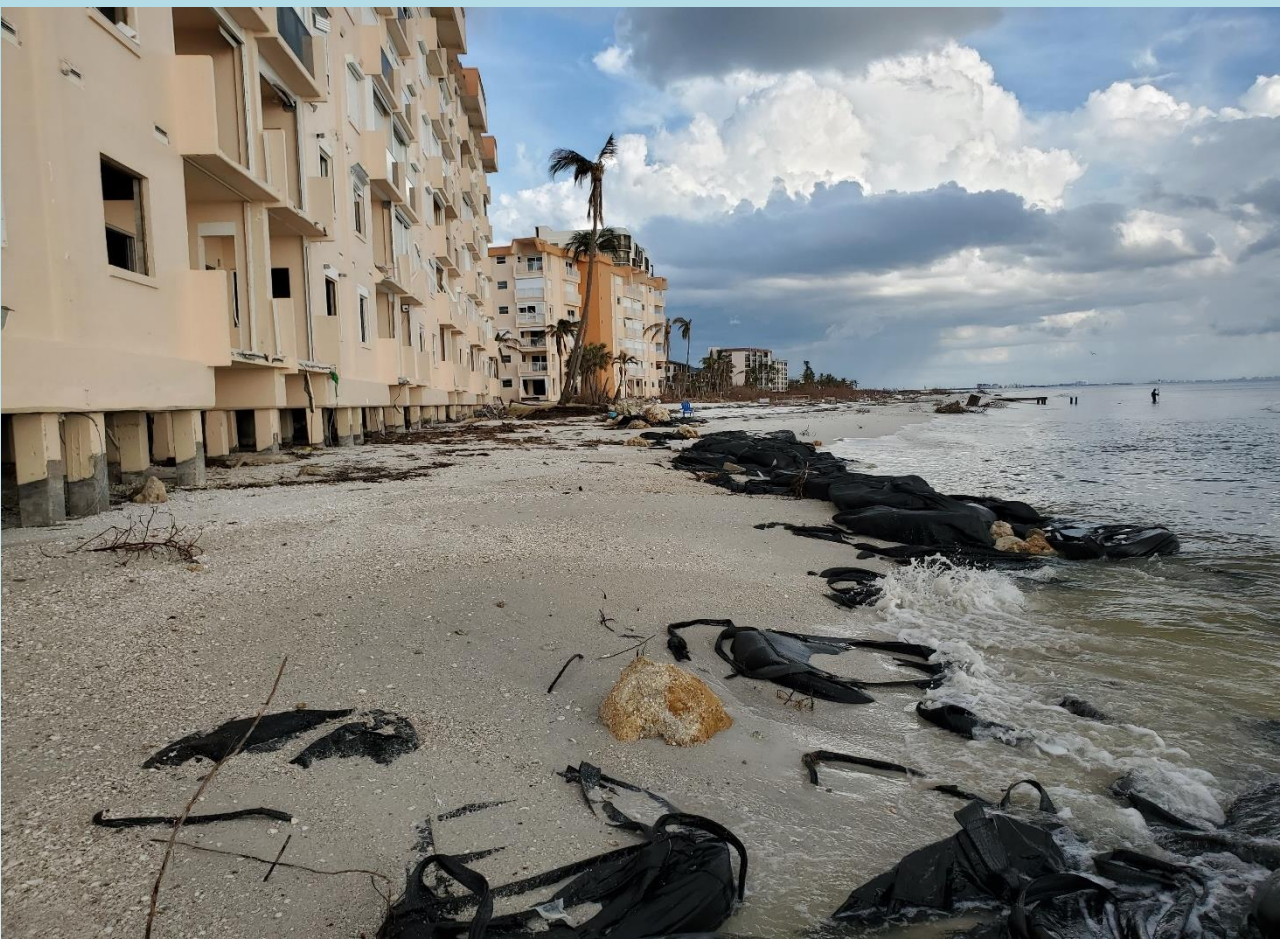


SEGMENT	DESCRIPTION *	EROSION (CY)	DENSITY (CY/LF)
North	Managed-Cat G	56,845	-7.8
Central-South	Natural	163,576	-5.5
Central-South	Cat B Emer Berm	89,406	-3.0

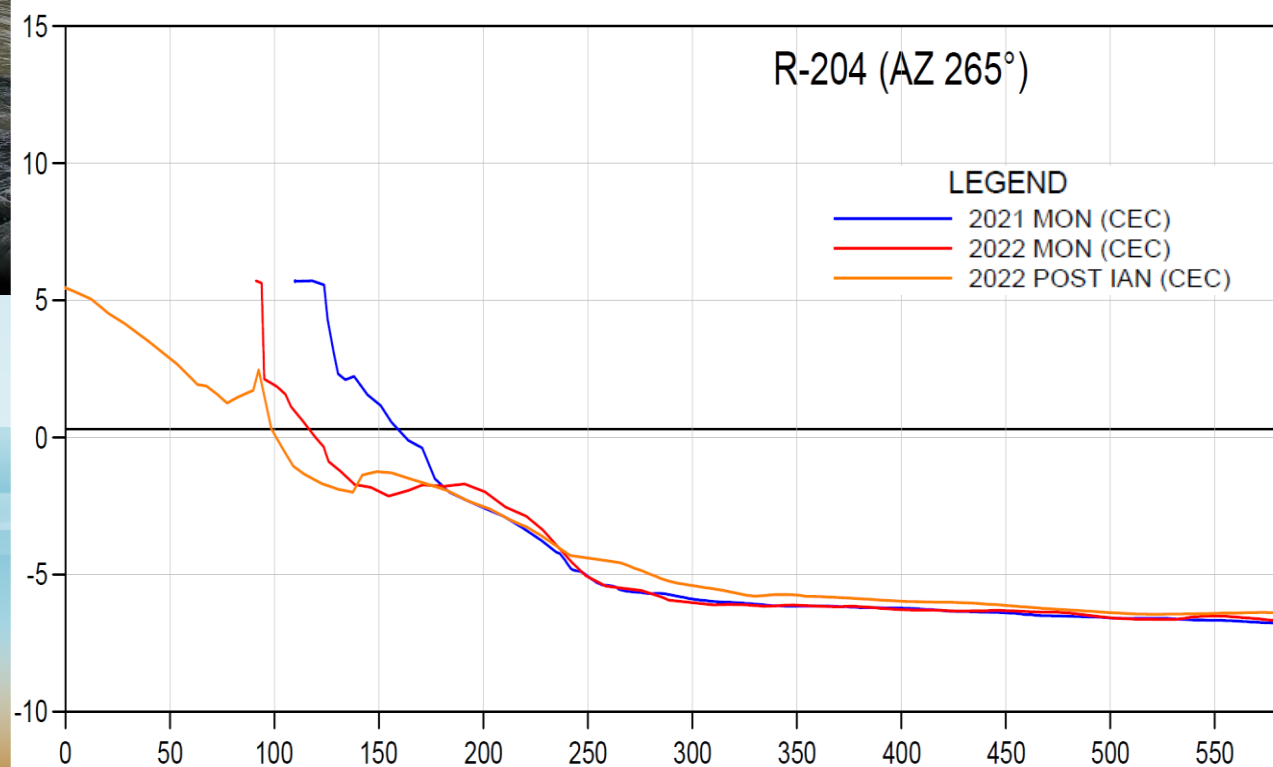
* Cat G calculation to depth of closure (with background erosion)

Natural beach calculation to intersection of pre-/post-storm (no background erosion)

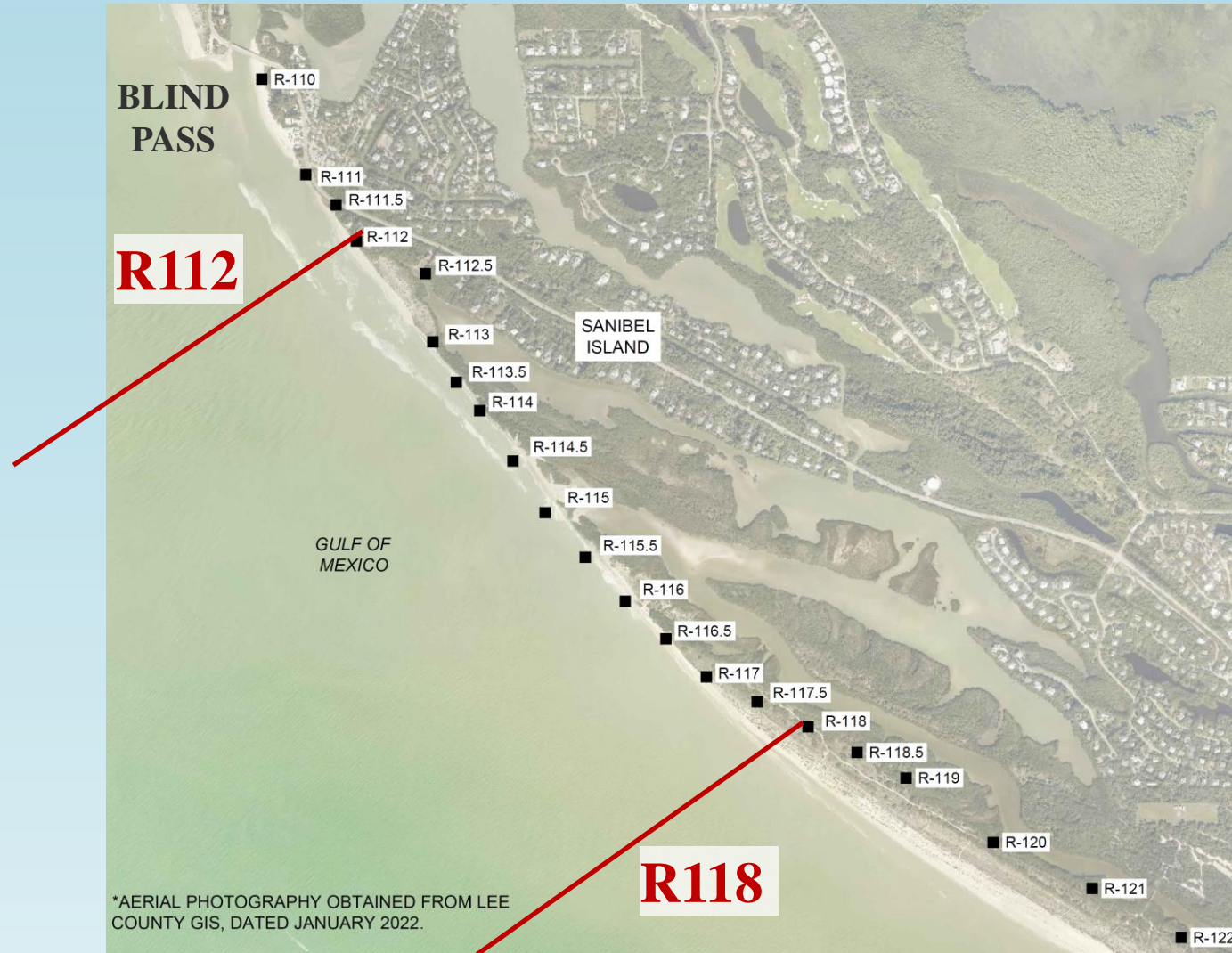
Emergency Berm computed for erosion losses above 5-Yr SWL (up to 6.0 CY/LF) plus scour



Estero Island (South)



North Sanibel (R110-R122)

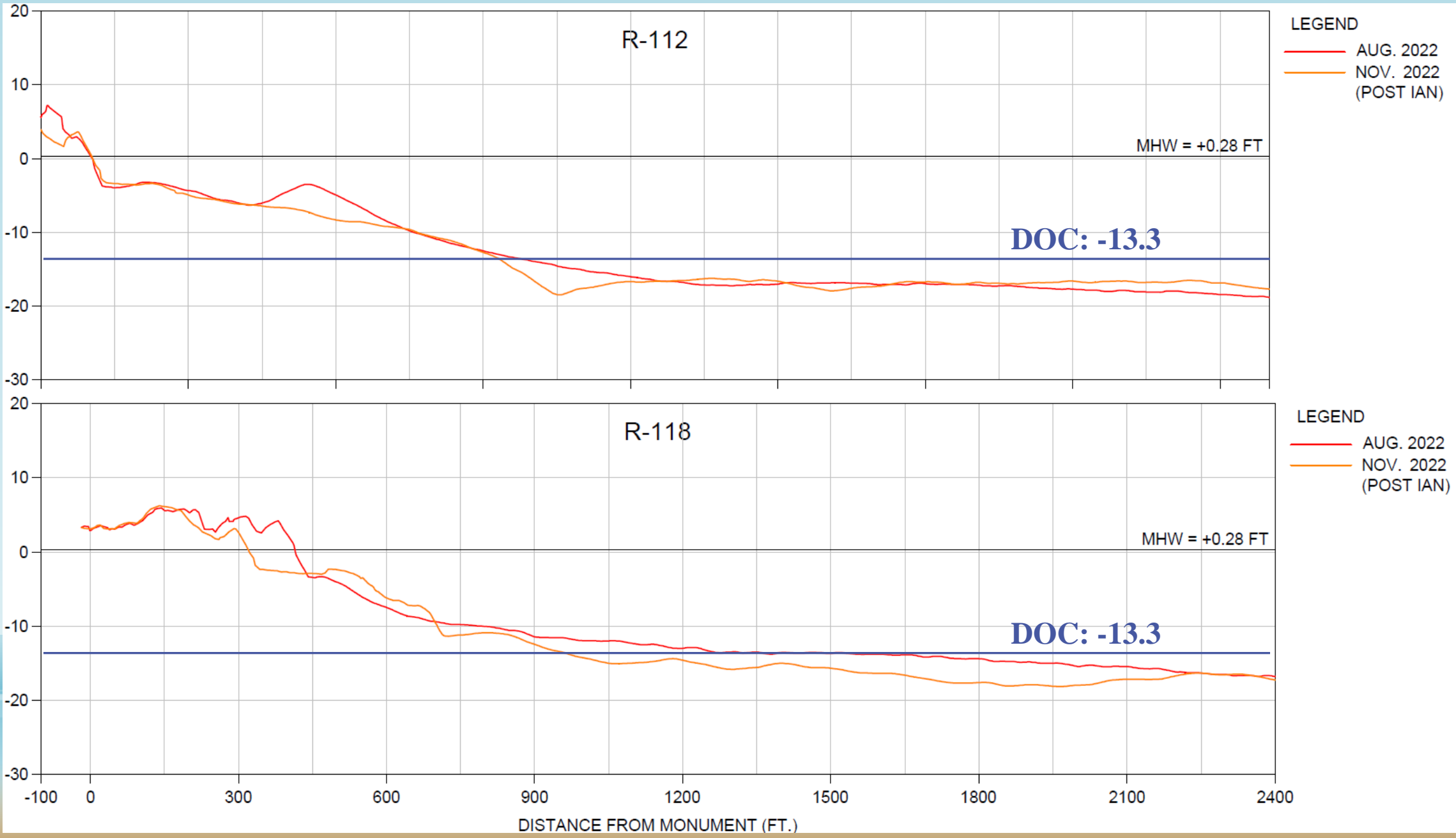


SEGMENT *	DESCRIPTION **	EROSION (CY)	DENSITY (CY/LF)
Beach Disposal	Natural	211,980	-16.9

* Blind Pass Disposal Site

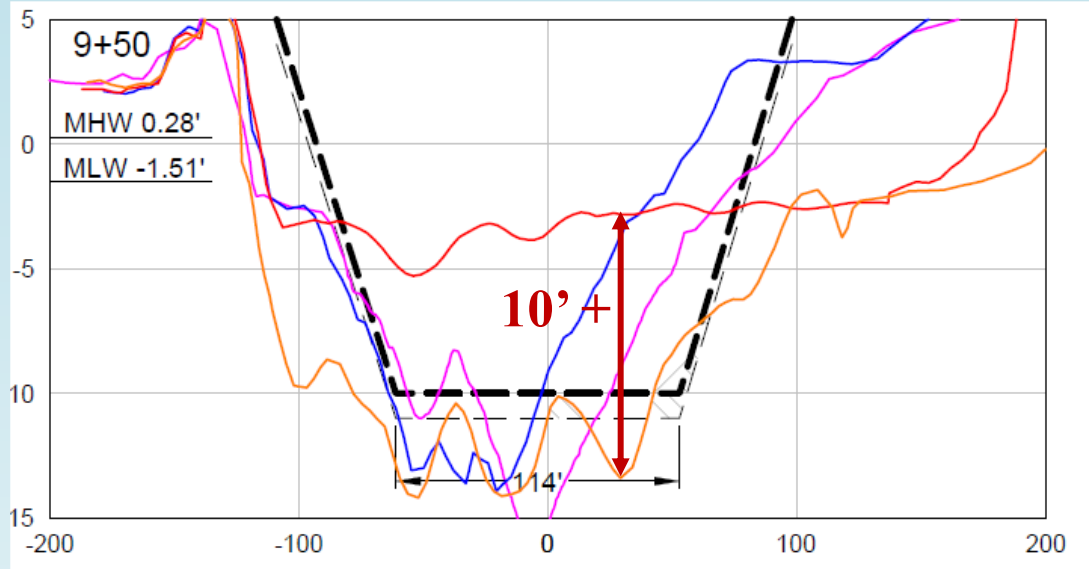
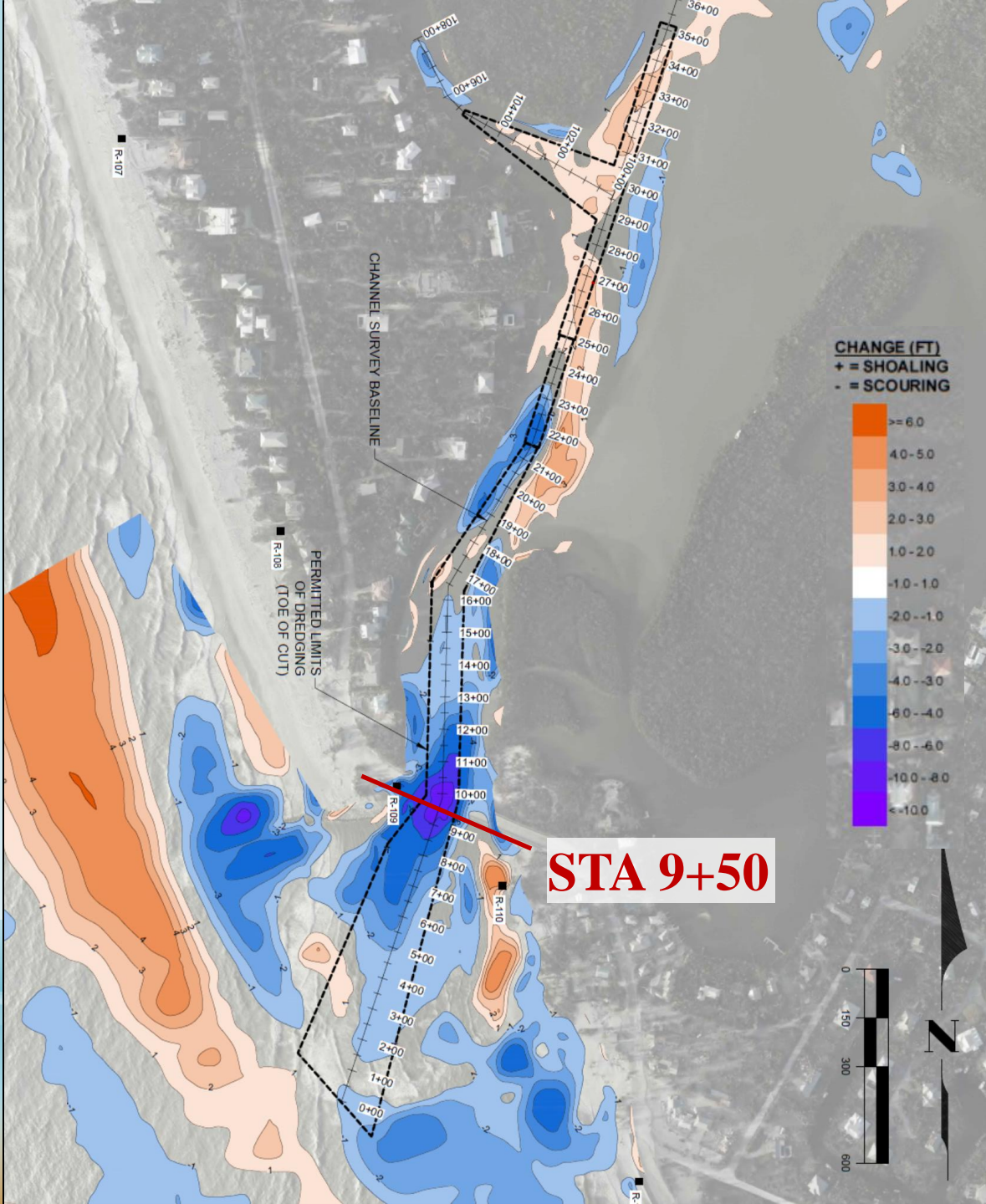
** Natural beach calculation to depth of closure (no background erosion [Aug-Oct])

North Sanibel



Blind Pass

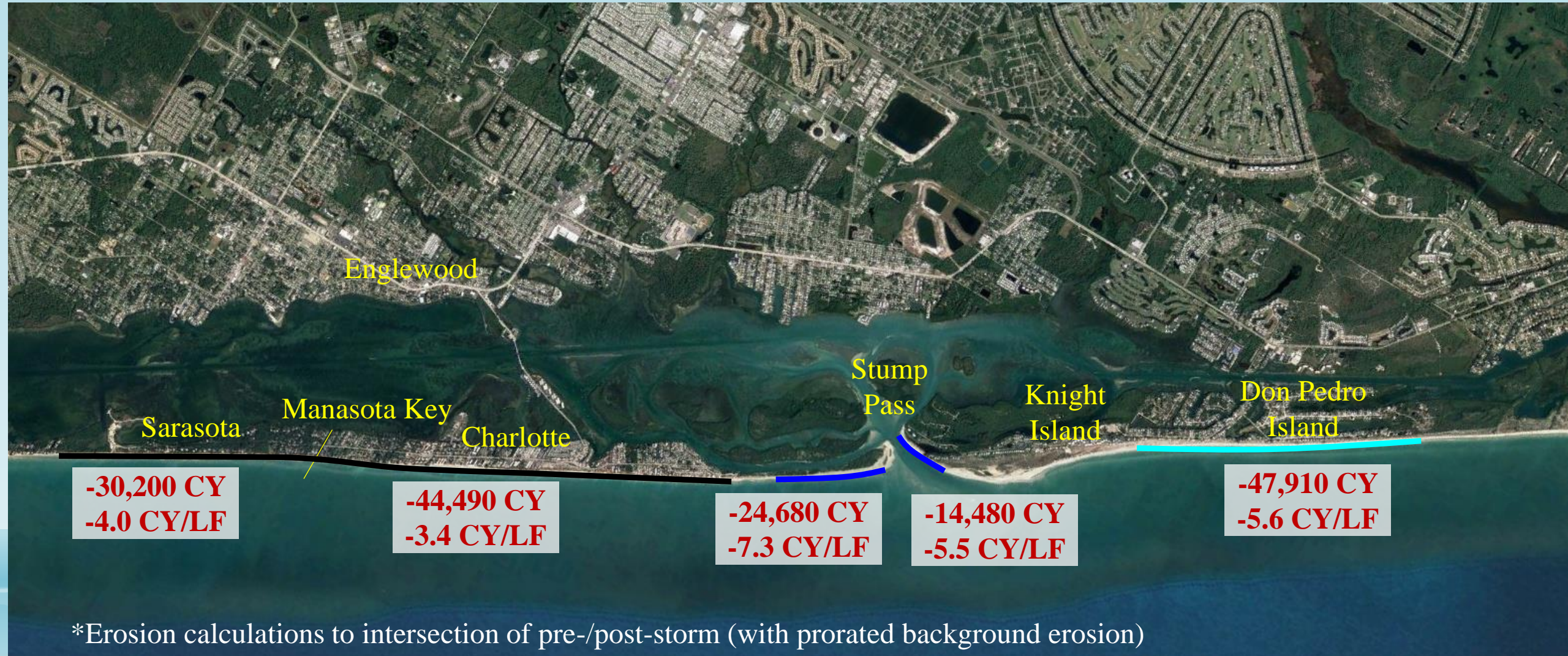
CHANNEL SCOUR VOLUME = -22,750 CY



LEGEND:

- = AUG. 2020 SURVEY
- = SEP. 2021 SURVEY
- = JULY/AUG. 2022 SURVEY
- = NOV. 2022 (POST IAN)

CHARLOTTE COUNTY EROSION CONTROL PROJECT AND MANASOTA KEY



*Erosion calculations to intersection of pre-/post-storm (with prorated background erosion)

— 2020 Restoration

— 2022 Nourishment (Stump Pass)

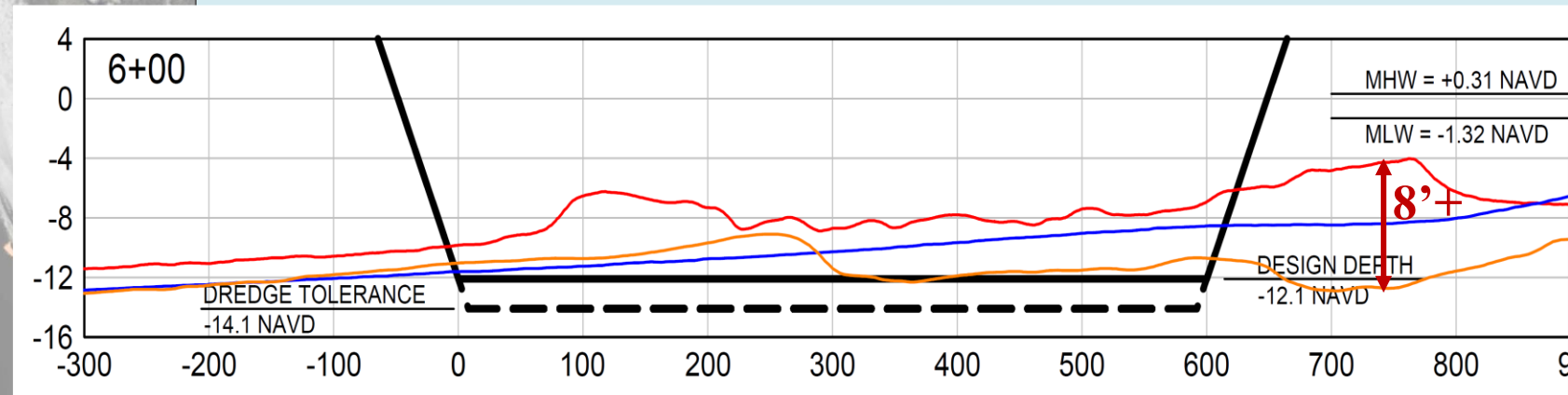
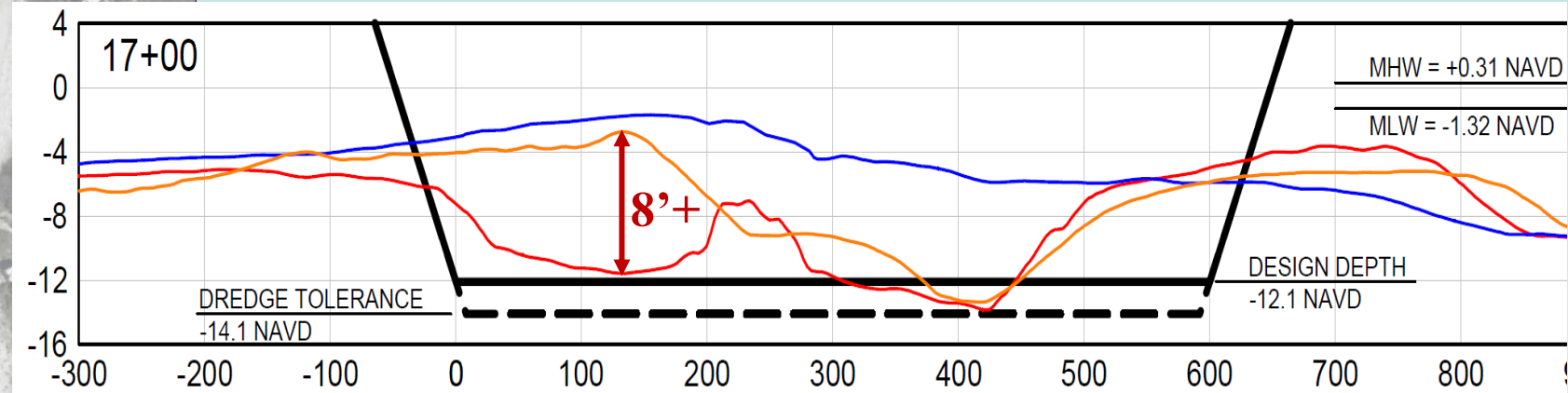
— 2020 Nourishment

Stump Pass

CHANNEL SCOUR VOLUME = -15,630 CY

LEGEND

- DEC. 2, 2021 (PRE-CON)
- JUNE 28-29, 2022 (MON)
- OCT. 8, 2022 (POST IAN)



- ### NOTES
1. SURVEYS CONDUCTED BY COASTAL ENGINEERING CONSULTANTS, INC ON JUNE 28-29, 2022 AND OCTOBER 8, 2022.
 2. PLANE COORDINATES ARE BASED ON THE TRANSVERSE MERCATOR PROJECTION FOR THE WEST ZONE OF FLORIDA AND REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83).
 3. INFORMATION SHOWN HEREON REFLECTS CONDITIONS AS THEY EXISTED ON THE SURVEY DATE SHOWN AND CAN ONLY BE CONSIDERED INDICATIVE OF CONDITIONS AT THAT TIME.
 4. AERIAL PHOTOGRAPHY OBTAINED FROM NOAA DATED OCTOBER 2022.

PUBLISHED TIDAL INFORMATION

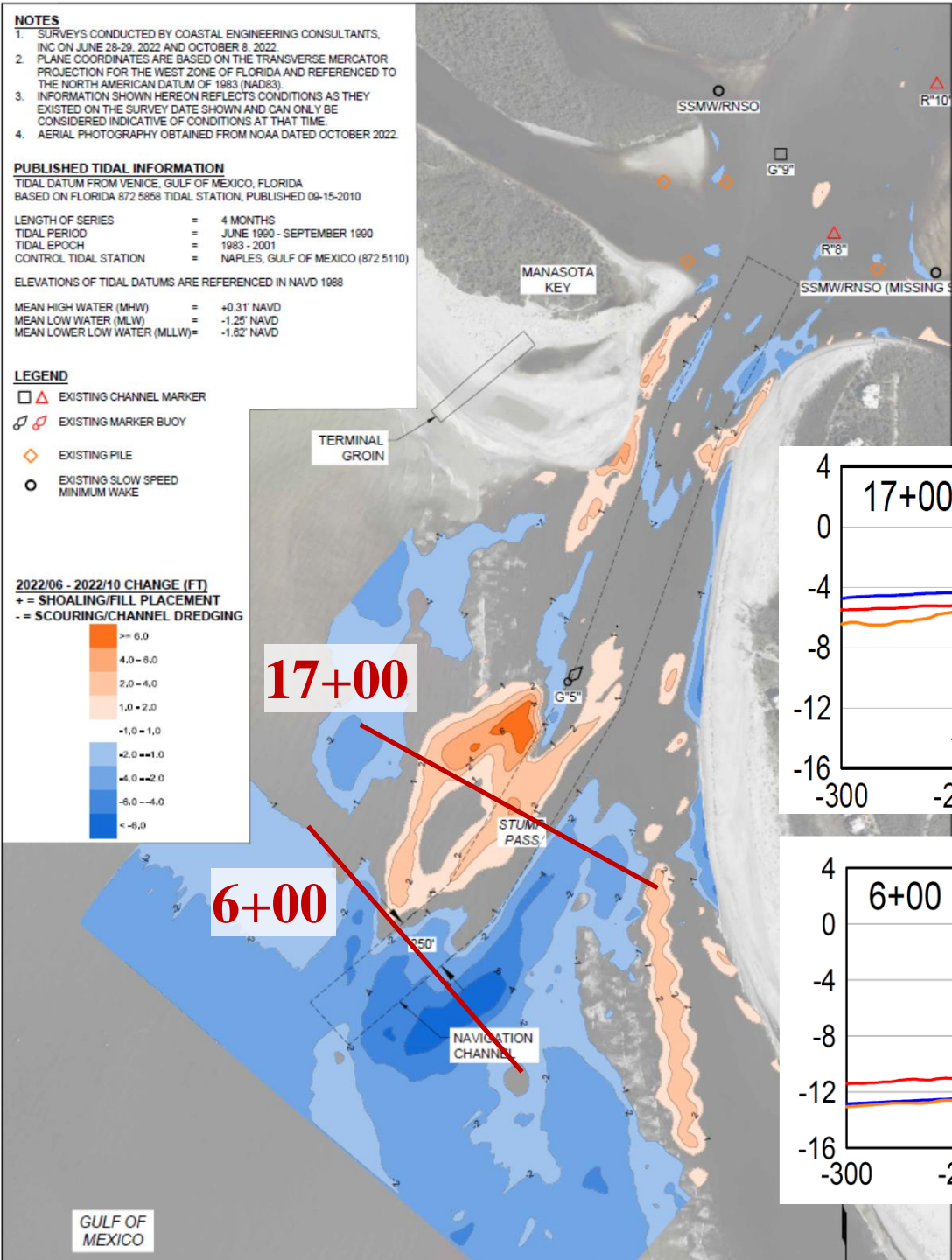
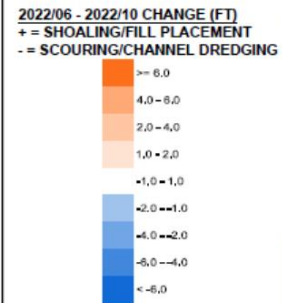
TIDAL DATUM FROM VENICE, GULF OF MEXICO, FLORIDA
BASED ON FLORIDA 872 5858 TIDAL STATION, PUBLISHED 09-15-2010

LENGTH OF SERIES = 4 MONTHS
TIDAL PERIOD = JUNE 1960 - SEPTEMBER 1960
TIDAL EPOCH = 1983 - 2001
CONTROL TIDAL STATION = NAPLES, GULF OF MEXICO (872 5110)

ELEVATIONS OF TIDAL DATUMS ARE REFERENCED IN NAVD 1988

MEAN HIGH WATER (MHW) = +0.31' NAVD
MEAN LOW WATER (MLW) = -1.25' NAVD
MEAN LOWER LOW WATER (MLLW) = -1.62' NAVD

- ### LEGEND
- ▲ EXISTING CHANNEL MARKER
 - ⊕ EXISTING MARKER BUOY
 - ◇ EXISTING PILE
 - EXISTING SLOW SPEED MINIMUM WAKE



ACKNOWLEDGEMENTS

- Bob Glassen & Dillon Irwin ~ FEMA
- Greg Garis, Sean Green, Rachel Grundl & Madison Williams ~ FDEP
- Stephen Fleming ~ USACE
- Jessica Mallindine, Jennifer Steele, & Brian Cameron ~ BOEM
- Matt Feeney ~ City of Bonita Springs
- Chadd Chustz ~ Town of Ft. Myers Beach
- Steve Boutelle & Mike Campbell ~ Lee County
- Matt Logan ~ Charlotte County
- Joe Kraus & Patti Wilken ~ Sarasota County
- Cast and Crew of CEC

