

COLLIER COUNTY BEACH NOURISHMENT PROJECT 2022 POST-CONSTRUCTION ANNUAL MONITORING SUMMARY

April 2022

**DEP PERMIT 0331817-005-JC
USACOE PERMIT SAJ-2003-12405 MOD (MOD-KS)**

COLLIER COUNTY

PREPARED BY
HUMISTON & MOORE ENGINEERS
HM File No. 25026



SUBMITTED TO:
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



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**COLLIER COUNTY BEACH NOURISHMENT PROJECT
2022 POST-CONSTRUCTION AND ANNUAL MONITORING SUMMARY
DEP PERMIT 0331817-005-JM
USACOE Permit SAJ-2003-12405 Mod (MOD-KS)**

COLLIER COUNTY

PREPARED BY
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I. INTRODUCTION

This report by Humiston & Moore Engineers (H&M) presents the analysis of an annual monitoring survey conducted in January and February of 2022, and comparison of data from previous surveys on behalf of Collier County, Coastal Zone Management (CZM). The survey was conducted by Hyatt Survey Services, Inc. (HSS), and Sea Diversified, Inc. (SDI) between January 19th and February 2nd, 2022, and is provided as a post-construction monitoring survey for the recent nourishment of segments of Vanderbilt, Pelican Bay, and Naples Beaches conducted from November 1, 2021 to January 24, 2022.¹ The survey scope is consistent with the requirements of the State of Florida Department of Environmental Protection (DEP) permit number 0331817-001-JM dated October 2, 2015, U.S. Army Corps of Engineers (USACOE) permit number SAJ-2003-12405 (MOD-KS), and the approved Monitoring Plan dated August 2017 included in **Appendix A**. Recent DEP permit history is summarized in **Table 1**.

Table 1. Permit History for DEP Permit Number 0331817-001

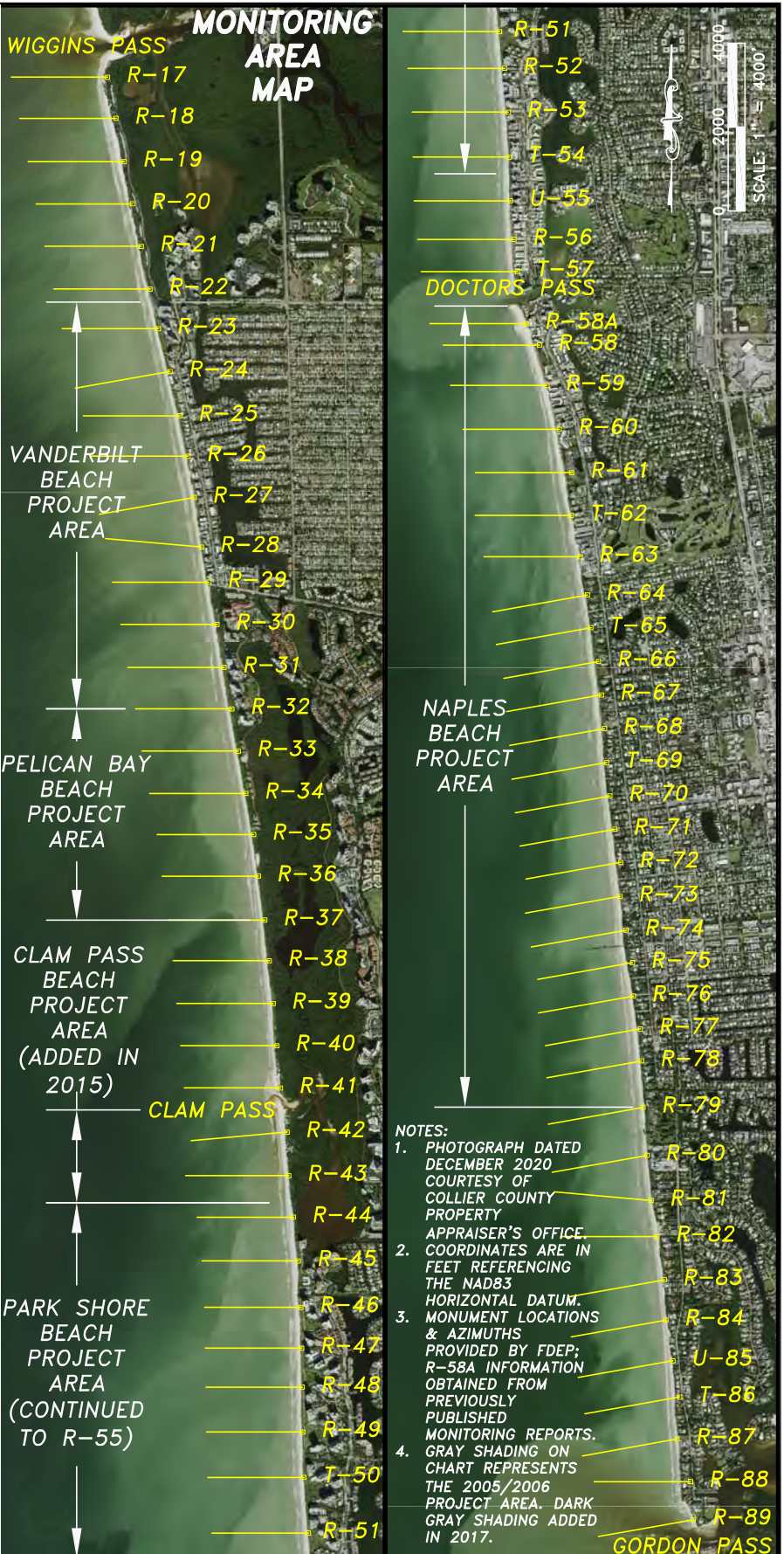
Permit Modification Number	Date of Issuance	Description of Modification
-001	October 2, 2015	Original Permit
-002	October 23, 2015	Revised Biological Monitoring Plan
-003	January 8, 2016	Authorizes Dune Vegetation Planting
-004	November 20, 2017	Major Modification Adding Clam Pass Park to the Project Area
-005	July 23, 2018	Revised Hardbottom Biological Monitoring Plan

Collier County, located on the southwest coast of Florida, includes 148 DEP reference monuments from Barefoot Beach south to Marco Island. The monitoring area for this report shown in **Figure 1**, overlaid on an aerial image acquired in December 2020, includes DEP reference monuments R-17 located south of Wiggins Pass in Delnor-Wiggins Pass State Park, south to R-84, one mile north of Gordon Pass in Naples.



¹ Although conducted from November 2021 to January 2022 the project will be referenced in this report as the 2021 project.

CONTROL INFORMATION & PROJECT DESIGNATION				
FDEP MON	NORTHING (Feet)	EASTING (Feet)	AZIMUTH (Degrees)	PROJECT LOCATION
R-17	710889.5	383927.4	270	
R-18	709906.7	384127.0	270	DELNOR-WIGGINS
R-19	708878.0	384326.0	270	PARK BEACH
R-20	707866.6	384517.5	270	SOUTH OF
R-21	706858.3	384728.9	270	WIGGINS PASS
R-22	705839.5	384938.9	270	
R-23	704891.6	385137.3	270	
R-24	703871.6	385417.1	260	
R-25	702813.9	385647.5	270	
R-26	701850.5	385847.4	270	VANDERBILT
R-27	700866.9	385990.2	260	BEACH PROJECT
R-28	699684.0	386161.7	275	AREA
R-29	698847.1	386341.5	270	
R-30	697837.4	386537.6	270	
R-31	696813.6	386705.3	270	
R-32	695824.5	386891.1	270	
R-33	694818.9	387046.2	270	
R-34	693808.1	387226.5	270	PELICAN BAY
R-35	692827.8	387408.2	270	BEACH PROJECT
R-36	691835.2	387522.6	270	AREA
R-37	690789.1	387678.2	270	
R-38	689818.1	387783.7	270	
R-39	688799.5	387874.7	270	PELICAN BAY
R-40	687793.8	387963.8	270	BEACH NORTH OF
R-41	686785.6	388051.6	270	CLAM PASS
R-42	685731.0	388209.4	265	CLAM PASS PARK
R-43	684692.3	388248.5	270	BEACH
R-44	683701.5	388359.1	270	
R-45	682660.0	388478.9	270	
R-46	681554.5	388538.8	270	
R-47	680581.0	388553.8	270	
R-48	679648.1	388568.5	270	PARK SHORE
R-49	678581.0	388583.3	270	BEACH PROJECT
T-50	677495.2	388612.9	270	AREA
R-51	676169.5	388714.1	270	
R-52	675291.9	388834.0	270	
R-53	674247.9	388929.6	270	
T-54	673177.4	388951.4	270	
U-55	672131.1	388974.6	270	PARK SHORE
R-56	671211.8	389065.2	270	BEACH NORTH OF
T-57	670447.6	389142.0	270	DOCTORS PASS
R-58A	389353.6	669202.4	270	
R-58	668693.6	389668.6	270	NORTH NAPLES
R-59	667728.9	389847.3	270	BEACH PROJECT
R-60	666685.1	390145.2	270	AREA
R-61	665648.5	390438.0	270	
T-62	664628.1	390431.8	270	
R-63	663641.5	390641.5	270	
R-64	662732.0	390814.4	260	
T-65	661954.0	390899.0	260	
R-66	661148.1	391078.4	260	
R-67	660351.0	391148.4	260	
R-68	659545.1	391220.2	260	
T-69	658735.7	391274.6	260	
R-70	657941.3	391351.4	260	NAPLES BEACH
R-71	657147.2	391469.6	260	PROJECT AREA
R-72	656356.0	391609.0	260	
R-73	655544.4	391593.8	260	
R-74	654741.2	391736.2	260	
R-75	653966.1	391888.5	260	
R-76	653165.9	391908.9	260	
R-77	652384.9	392074.4	260	
R-78	651619.7	392106.6	260	
R-79	650514.4	392141.7	260	
R-80	649367.2	392232.4	260	
R-81	648294.8	392335.7	275	
R-82	647432.1	392476.3	270	BEACH NORTH OF
R-83	646399.6	392651.2	260	GORDON PASS
R-84	645439.8	392689.3	260	



- NOTES:
1. PHOTOGRAPH DATED DECEMBER 2020 COURTESY OF COLLIER COUNTY PROPERTY APPRAISER'S OFFICE.
 2. COORDINATES ARE IN FEET REFERENCING THE NAD83 HORIZONTAL DATUM.
 3. MONUMENT LOCATIONS & AZIMUTHS PROVIDED BY FDEP; R-58A INFORMATION OBTAINED FROM PREVIOUSLY PUBLISHED MONITORING REPORTS.
 4. GRAY SHADING ON CHART REPRESENTS THE 2005/2006 PROJECT AREA. DARK GRAY SHADING ADDED IN 2017.

<p>HUMISTON & MOORE ENGINEERS COASTAL ENGINEERING DESIGN AND PERMITTING</p>	COLLIER COUNTY MONITORING MAP FDEP REFERENCE MONUMENTS & AZIMUTHS		5679 STRAND COURT NAPLES, FL 34110 FAX: (239) 594-2025 PHONE: (239) 594-2021 www.humistonandmoore.com
	FOR: COLLIER COUNTY		
DATE: 3/30/22	FILE: MAP	SCALE: 1"=4000'	
JOB: 25026	DATUM: NAD83	FIGURE: 1	

II. BACKGROUND

Permitting

The Department issued permit 11-254473-9 for the construction of the Collier County Beach Restoration Project in 1996 authorizing the placement of approximately 1.2 million cubic yards of sand between monuments R-21 and R-79; this permit expired in April 2006. In January 2005, JCP Permit 0222355-001-JC was issued to maintain the restored beach authorizing the distribution of 670,000 cubic yards of sand. In July 2013, a DEP permit modification (-012) was issued for the placement of sand in five areas experiencing high erosion along Collier County Beaches, and in September 2013, a permit modification (-013) was issued for the placement of sand on Pelican Bay Beaches. A 15-year multi-use permit was issued on October 2, 2015, superseding permit 0222355-001-JC, authorizing periodic nourishment of the Collier project area beach including the: Clam Pass Park beach from R-42 south to R-43.5 (2017), and the beach south of Doctors Pass utilizing an offshore borrow area, sand dredged from Doctors Pass, or sand obtained from an upland source. Since the construction of the 2006 nourishment project, sand has been placed within the monitoring area from dredging of three inlets (Wiggins, Clam and Doctors Passes) as well as emergency truck-haul projects from 2010 through 2021. A chronological summary of the sand placed within the monitoring area from 2005 to 2021 is shown in **Table 2b** while **Table 2a** provides contractor information for the 2006-2021 Collier Beach nourishment projects.

Nourishment (Truck Haul Projects)

After the 2006 restoration there were emergency truck haul projects from 2010 to 2012 for Vanderbilt, Park Shore, and Naples beaches utilizing relatively smaller quantities of fill than previous hydraulic renourishment projects. The December 2013 project distributed 225,000 cubic yards of sand on Vanderbilt, Pelican Bay, North Park Shore, Park Shore and Naples Beaches while the December 2014 project renourished only Naples Beach with 52,350 cubic yards of sand. No sand was placed in 2015. As part of the December 2016 project approximately 76,000 cubic yards of sand were placed on Vanderbilt, Pelican Bay and Park Shore beaches. The Park Shore reach was nourished with approximately 130,000 cubic yards of truck hauled sand from October to December 2019, and Naples Beach from October 28 to December 28, 2020 was nourished with approximately 37,400 cubic yards² of sand from the south jetty of Doctors Pass to approximately R-60. Most recently Vanderbilt, Pelican Bay and Naples Beaches were nourished with approximately 155,000 cubic yards³ of sand in November 2021 through January 2022 as described in the completion documents provided in **Appendix B**. Specific quantities, locations and timing of the maintenance beach fill projects are presented in **Figures 2a, 2b, and 2c; and Tables 6b, 7b, and 8b** of this report. The sand for all Collier Beach nourishment projects (2013-2021) was supplied from an upland source, distributed by truck and grading equipment.

Table 2a. Collier County Beach Nourishment Project Contractor History

Project	Type of Project	Contractor
2006	Hopper Dredge	Great Lakes Dredge & Dock Co., LLC
2013	Truck Haul	Eastman Aggregate Ent., LLC and Phillips & Jordan, Inc.
2014	Truck Haul	Earthtech Ent. Inc. and Phillips & Jordan, Inc.
2016	Truck Haul	Earthtech Enterprises Inc.
2019	Truck Haul	Earthtech Enterprises Inc.
2020	Truck Haul	Earthtech Enterprises Inc.
2021	Truck Haul	Phillips and Jordan, Inc.

² The pay quantity was 63,978 tons of truck hauled sand. Discrepancies between pay quantity and the volume determined by the pre and post surveys is largely due to Tropical Storm Eta redistributing material during construction.

³ Based on preliminary quantities provided by CPE.

Table 2b. Collier County Beach Nourishment History (R-17 to R-84 for 2005 thru 2020)

Date	Project	Project Type	Sand Placement	Volume (CY)
2005	Collier Beach Restoration	Offshore Dredge	R-21 to R-79	667,620
2005	Wiggins Pass Dredging - Nearshore Disposal	Inlet Dredge	R-11 to R-14	68,500
2006	Doctors Pass Dredging - Nearshore Disposal	Inlet Dredge	R-60 to R-62	53,600
2007	Wiggins Pass Dredging	Inlet Dredge	R-18 to R-19.5	48,400
2007	Clam Pass Dredging	Inlet Dredge	R-42 to R-43.5	20,600
2009	Wiggins Pass Dredging - Nearshore Disposal	Inlet Dredge	R-11 to R-14	50,000
2009	Doctors Pass Dredging - Nearshore Disposal	Inlet Dredge	R-60 to R-62	32,500
2010	Naples Beach - Emergency Truck Haul	Truck Haul	R-58A to R-58	3,000
2011	Park Shore Beach -Emergency Truck Haul	Truck Haul	R-45 to R-46	7,800
2011	Naples Beach -Emergency Truck Haul	Truck Haul	R-58A to R-58	22,400
2011	Wiggins Pass Dredging - Nearshore Disposal	Inlet Dredge	R-11 to R-14	50,000
2012	Vanderbilt Beach - Emergency Truck Haul	Truck Haul	R-26 to R-30	11,000
2012	Naples Beach - Emergency Truck Haul	Truck Haul	R-61 to R-63.5	12,000
2013	Wiggins Pass Dredging (Partial Nearshore)	Inlet Dredge	R-12 to Inlet	66,000
2013	Clam Pass Dredging	Inlet Dredge	R-40 to Inlet	10,400
2013	Clam Pass Dredging	Inlet Dredge	Inlet to R-44	9,600
2013	Doctors Pass Dredging	Inlet Dredge	Inlet to R-58	44,000
2013	Vanderbilt Beach	Truck Haul	R-23 to R-30	68,370
2013	Pelican Bay	Truck Haul	R-31 to R-36	24,760
2013	Park Shore (Segmented Fill Template)	Truck Haul	R-44 to R-55	66,090
2013	Naples Beach (Segmented Fill Template)	Truck Haul	Inlet to R-69	65,850
2014	Naples Beach (Segmented Fill Template)	Truck Haul	Inlet to R-78	52,350
2015	Wiggins Pass Dredging (Nearshore)	Inlet Dredge	R-16 (N. of Inlet)	13,000
2016	Clam Pass Dredging	Inlet Dredge	R-42 to R-43.5	14,300
2016	Vanderbilt Beach	Truck Haul	R-24 to R-30	35,470
2016	Pelican Bay	Truck Haul	R-34.6 to R-36.4	8,500
2016	Park Shore (Segmented Fill Template)	Truck Haul	R-43.6 to R-53	31,820
2017	Clam Pass Dredging	Inlet Dredge	R-40.5 to Inlet	3,000
2017	Clam Pass Dredging	Inlet Dredge	Inlet to R-43	2,400
2018	Clam Pass Dredging	Inlet Dredge	R-42 to R-43	8,500
2018	Wiggins Pass Dredging - Nearshore Disposal	Inlet Dredge	R-12 to R-14	37,700
2018	Wiggins Pass Dredging - Nearshore Disposal	Inlet Dredge	R-16 (N. of Inlet)	4,500
2018	Wiggins Pass Dredging - Nearshore Disposal	Inlet Dredge	R-18 to R-20	56,280
2018	Doctors Pass Dredging - Nearshore Disposal	Inlet Dredge	Jetty to R-58.5	5,800
2018	Doctors Pass Dredging - Nearshore Disposal	Inlet Dredge	R-60 to R-62	25,000
2019	Clam Pass	Truck Haul	R-42 to R-43.5	20,000
2019	Park Shore	Truck Haul	R-43.5 to R-54.4	110,000
2020	Water Turkey Bay Dredging - Nearshore Disposal	Inlet Dredge	R-12 to R-14	26,650
2020	Wiggins Pass Dredging - Nearshore Disposal	Inlet Dredge	R-12 to R-14	21,400
2020	Naples Beach (Segmented Fill Template)	Truck Haul	Inlet to R-60	37,440
2020	Clam Pass Dredging	Inlet Dredge	R-40 to R-41	3,900
2021	Vanderbilt Beach	Truck Haul	R-22 to R-32	77,340
2021	Pelican Bay	Truck Haul	R-33 to R-36	20,000
2021	Naples Beach	Truck Haul	R-62 to R-74	57,330
2022	Wiggins Pass Dredging	Inlet Dredge	R-12 to R-14	No Data
2022	Wiggins Pass Dredging	Inlet Dredge	R-18 to R-20	No Data
2022	Doctors Pass Dredging	Inlet Dredge	R-60 to R-62	No Data
Total Volumes (Cubic Yards)				
Beach Placement in the Collier Beach Project Area (Offshore Dredge):				667,620
Beach Placement in the Collier Beach Project Area (Truck Haul):				731,520
Beach Placement in the Collier Beach Project Area (Inlet Dredge):				116,700
Nearshore Disposal Doctors Pass Dredging (Jetty to R-62):				116,900
Delnor-Wiggins - Beach & Nearshore Disposal within Monitoring Area (North of Project):				104,680
Delnor Wiggins - Sand Placement Outside of Monitoring Area (North of Wiggins Pass):				337,750
Total Project Area Sand Placement:				1,632,740
Total Monitoring Area Sand Placement:				2,075,170

The volumes in cubic yards (CY) have been rounded for clarity.
 No Data – quantities not available at time of report.

Wiggins Pass

The 2018 Wiggins Pass project placed sand both north, outside of the monitoring area; and south of the inlet along Delnor-Wiggins State Park within the monitoring area. The 2019 dredging of Wiggins Pass and Water Turkey Bay placed sand in the nearshore, north of the inlet and outside of this monitoring area. Most recently, in February 2022 during the writing of this report, after the January 2002 monitoring survey, the pass was dredged and sand was placed on the beach north (R-12 to R-14) and south (R-18 to R-20) of the inlet.

Clam Pass

Although sand was placed both north and south of the Clam Pass inlet in 2017 as part of the maintenance dredging project, the only sand placed in the project area for 2017 was approximately 2,400 cubic yards placed south of the inlet to monument R-43, the reach added to the project as part of the 2017 permit modification. In 2018 another 8,500 cubic yards of sand, dredged from the inlet, was placed in the project area from Clam Pass south to monument R-43. In April 2020 both sides of the inlet were regraded, and in December 2020 approximately 3,900 cubic yards were removed mechanically from the inlet while another 6,400 cubic yards of sand were regraded; the material was placed on the adjacent banks and in the vicinity of R-41. Most recently, the pass was dredged in March/April 2022 with sand placed on the beach to the north and south of the inlet during the writing of this report, and after the January 2022 monitoring survey.

Doctors Pass

The Doctors Pass project conducted in August/September 2018 placed sand in two areas south of the pass within the project limits. Approximately 5,800 cubic yards⁴ of the sand dredged from the pass were placed immediately south of the inlet within the Doctors Pass Erosion Control Structures Project (0338231-002-JN) area after construction of the structures was completed in June 2018. The majority of the dredged sand, approximately 25,000 cubic yards⁵, was placed further south near Lowdermilk Park. In both cases, the sand was placed in the nearshore. Most recently, in March/April 2022 during the writing of this report and after the January 2022 monitoring survey, the pass was dredged; sand was placed south of the inlet on the beach in the vicinity of Lowdermilk Park between R-60 and R-62.

Major Storms

Six major storms have impacted Collier County since 2004: Hurricane Charlie (2004), Hurricane Katrina (2005), Hurricane Wilma (2005), Tropical Storm Fay (2008), Tropical Storm Debby (2012) and Hurricane Irma (2017). Storm tracks and a brief description of each are included in **Appendix C**. The City of Naples experienced a meteotsunami⁶ in January 2016 and again on December 20, 2018. A graph of the observed water levels at the Naples Tide Station on those days documenting the meteostunami is also included in **Appendix C**. Additionally, in 2016 west and southwest Florida were impacted by Tropical Storm Colin (June), Hurricane Hermine (September), and in 2020 by Tropical Storm Eta (November).

⁴ Based on volume change calculations from the Doctors Pass Erosion Control Structures Project 2018 Post-Construction Monitoring Summary, H&M Engineers, December 2018

⁵ Based on volume change calculations from the Doctors Pass Erosion Control Structures Project 2018 Post-Construction Monitoring Summary, H&M Engineers, December 2018

⁶ Meteotsunamis have the characteristics similar to earthquake-generated tsunamis, but are caused by air pressure disturbances often associated with fast moving weather systems, such as squall lines. These disturbances can generate waves in the ocean that travel at the same speed as the overhead weather system. Development of a meteotsunami depends on several factors such as the intensity, direction, and speed of the disturbance as it travels over a water body with a depth that enhances wave magnification. NOAA 2015

III. SURVEY INFORMATION – MAJOR RENOURISHMENT PROJECTS

Monitoring surveys were conducted annually from 2006 to 2022. Representative surveys presented in this report are listed in **Table 3** showing the approximate date of survey, type of survey (pre-construction, post-construction, or monitoring) and the surveyor. The monitoring survey analyzed in this report was conducted by Hyatt Survey Services, Inc. (HSS), and Sea Diversified, Inc. (SDI) between January 19th and February 2nd, 2022. HSS surveyed monuments R-17 south to R-41, and R-58A to R-80; while SDI surveyed from R-42 south to R-57, and from R-81 to R-84. The certifications for these surveys are provided in **Appendix D-1**. The January 2022 post-construction survey also serves as the monitoring survey for the recent Vanderbilt, Pelican Bay, and Naples Beach nourishment projects conducted in late 2021 and early 2022. This report analyzes the most recent survey in comparison to the January 2021 monitoring survey, pre/post 2006 project survey, and to the post-construction monitoring surveys for the most recent nourishment projects not included in the 2021 nourishment: March 2020 (Park Shore), and December 2014 survey (South Naples Beach). Also included in this report as a separate analysis, due to the limited scope of the survey, is the immediate post-construction survey dated December 2019 for the 2019 Park Shore nourishment project. The beach profiles provided in **Appendix D-2** compare the surveys listed in **Table 3**, and are shown in **Figure 1**, a plan view of the monitoring area depicting DEP reference monument locations and azimuths overlaid on an aerial image of Collier County.

Table 3. Survey Dates and Description for the Collier Beach Nourishment Project

Survey Date	Survey Description	Surveyor
*2005-November	Pre Construction	CP&E
2006-June	Post Construction	CP&E
2014-December (South Naples Shown)	Post-Construction Monitoring	HSS
2019-December (Park Shore Shown)	Post-Construction	Oceanside Solutions
2020-March (Park Shore Shown)	Post-Construction Monitoring	SDI
2021-January	Post-Construction Monitoring	SDI
2022-January	Post-Construction Monitoring	SDI and HSS

*Survey for monuments R-17 thru R-21 dated September 2005 by DEP used to complete survey scope.

Surveys were conducted and reported annually from 2007 to 2019 but not all presented as part of this report.

The December 2019 survey was used to document beach fill during construction and consequently has a limited scope.

Surveys used for the determination of as-built quantities for the 2006 nourishment project were conducted immediately pre and post-construction and at intermediate stations along the beach extending to the limits of fill while monitoring surveys analyzed in this report were conducted according to the scope outlined in the monitoring plan. The 2005/2006 nourishment project was interrupted by Hurricane Wilma in October 2005, consequently, there are two pre-construction surveys following the scope outlined in the monitoring plan to document changes by Wilma: one conducted in September by DEP and another in November by CPE, both are referenced in this report. Reviewing the post-construction report it was noted the September survey more accurately represents as-built information for shoreline change while the November survey more accurately represents as-built information for volume change. The majority of the analysis in this report utilizes the November survey with the exception of monuments R-17 to R-21 not surveyed in November, and a portion of the shoreline change summary at the end of the report. The information from the October 2006 Collier County Beach Nourishment Post-Construction Engineering Report is included in **Appendix E**.

IV. ANALYSIS DESCRIPTION

The volume and shoreline change for Vanderbilt, Park Shore, and Naples Beaches are presented in four analyses summarized as follows and further described below. The four analyses described in this section of the report (A, B, C, and D) are shown in following section, Section V.

- A. Shoreline Change.
- B. Volume Change over the active portion of the beach profile.
- C. Volume Change over the upland portion of the beach profile.
- D. Advance Nourishment losses.

A & B. Shoreline & Volume Change (Active Beach Profile)

Project limits for this report were based on the monument range information provided in **Table 4** and are illustrated in **Figures 2a through 2c**, comparing the horizontal limits of the beach fill for the 2006, 2013, 2014, 2016, 2019, 2020 and 2021 projects. Vanderbilt Beach/Pelican Bay and Park Shore Beaches were each nourished by one continuous fill operation in 2006. The fill was “segmented” in 2013 so the truck haul program could incrementally address the area(s) in most need of fill. The same was done in 2016, and no fill was placed from 2014-2015 or 2017-2019 on Vanderbilt and Pelican Bay Beaches. Park Shore Beach was nourished from October to December 2019 with one continuous fill template. Naples Beach was nourished with a segmented fill in 2013 and 2014 to address hot spots, while no fill was placed from 2015-2019. Erosion control structures were constructed along the south side of Doctors Pass in 2018 to address an area of chronic erosion, and this northern portion of Naples Beach was nourished with a continuous template spanning from the Doctors Pass south jetty to R-60 in late 2020. Most recently, from November 2021 to January 2022 Vanderbilt, Pelican Bay and Naples Beach were nourished, one fill segment⁷ for each beach. In addition to the nourishment projects, inlet dredging and disposal projects at Wiggins, Clam, and Doctors Pass were conducted as referenced in **Table 2b** during the writing of this report after the January 2022 monitoring survey.



⁷ Although considered continuous for report purposes, the 2021 Vanderbilt Beach project fill template has a break at R-24. See **Figure 2**.

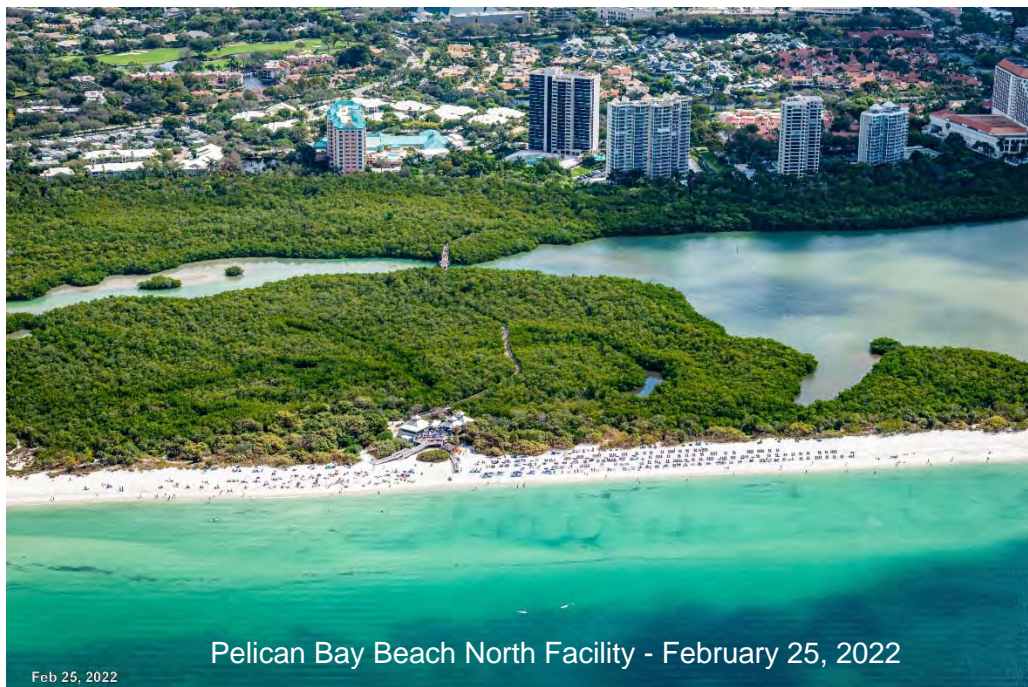
A *Design Standard* beach width (shown in the last column of **Table 4**) and a corresponding fixed *Baseline* (shown in **Figures 2a through 2c**) were established in 2003. The *Baseline* was set at the seawall, edge of vegetation, building line or equivalent, at each monument, and the beach width was determined by the distance from the *Baseline* to the mean high water elevation of +0.33 NAVD (+1.61 NGVD) at each DEP reference monument. The January 2022 mean high water line (MHWL) and 2003 *Baseline* are shown in **Figures 2a-2c**. This dry sandy beach width, including the dunes and vegetation, was then compared to the *Design Standard* for each project area. (The distance from the monuments to the *Baseline* is shown in **Table 5**.) Although the 2003 *Baseline* runs throughout the entire monitoring area from monument R-17 south to R-84 the *Design Standard* only applies to those critically eroded beaches within the 2005/2006 original permitted project area as shown in **Table 4**.

Table 4. Project Monument Range

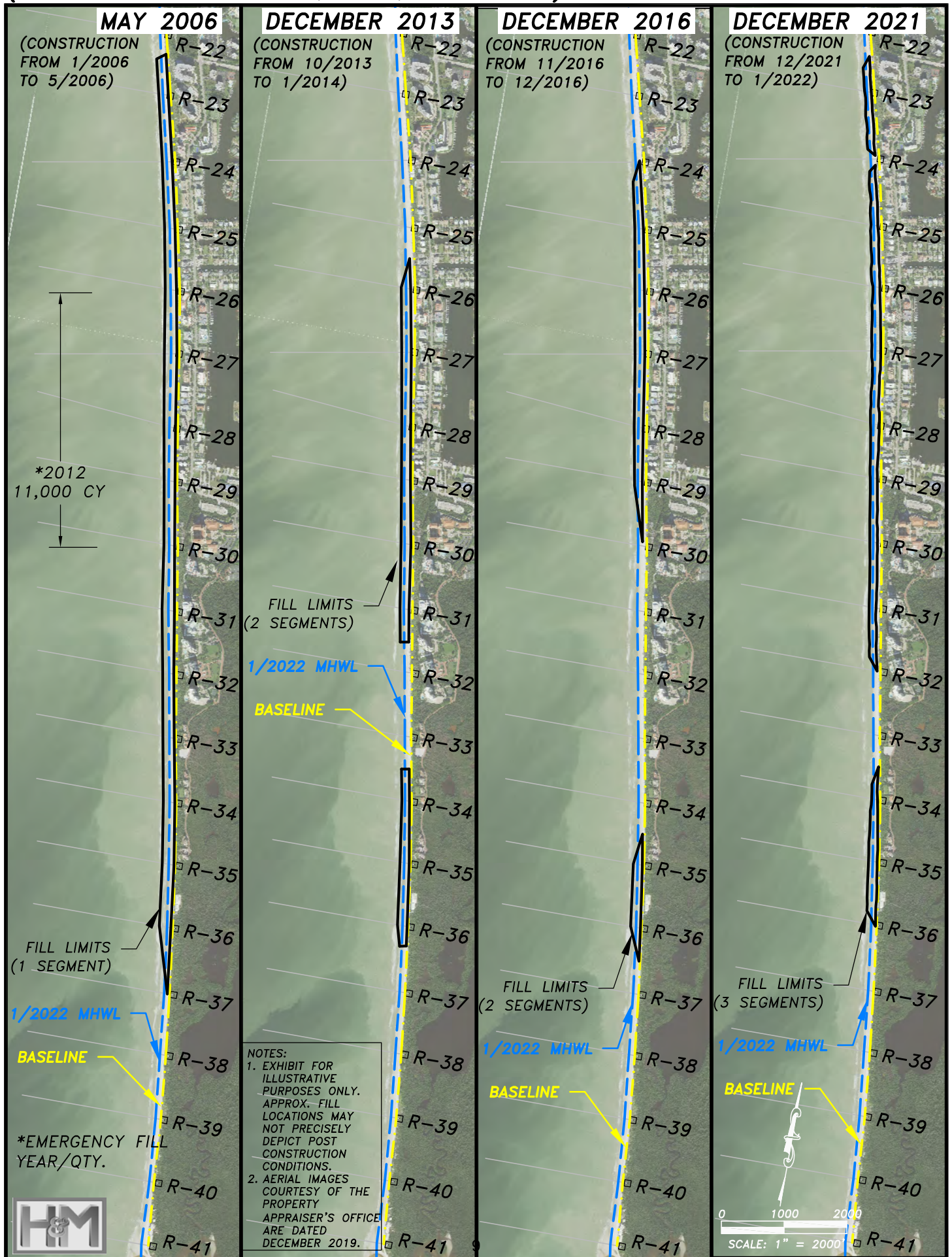
Project Area Beach	North Limit of Project (Monument)	South Limit of Project (Monument)	Design Standard (Ft)
Vanderbilt	R-22	R-32	100
Pelican Bay	R-32	R-37	100
Clam Pass Park*	R-42	R-43.3	85
North Park Shore	R-44	R-48	85
Park Shore	R-48	R-54	85
Naples	R-58A	R-79	100

*The beach in Clam Pass Park from R-42 south to R-43.5 was added in 2017 and was not part of the original project design.

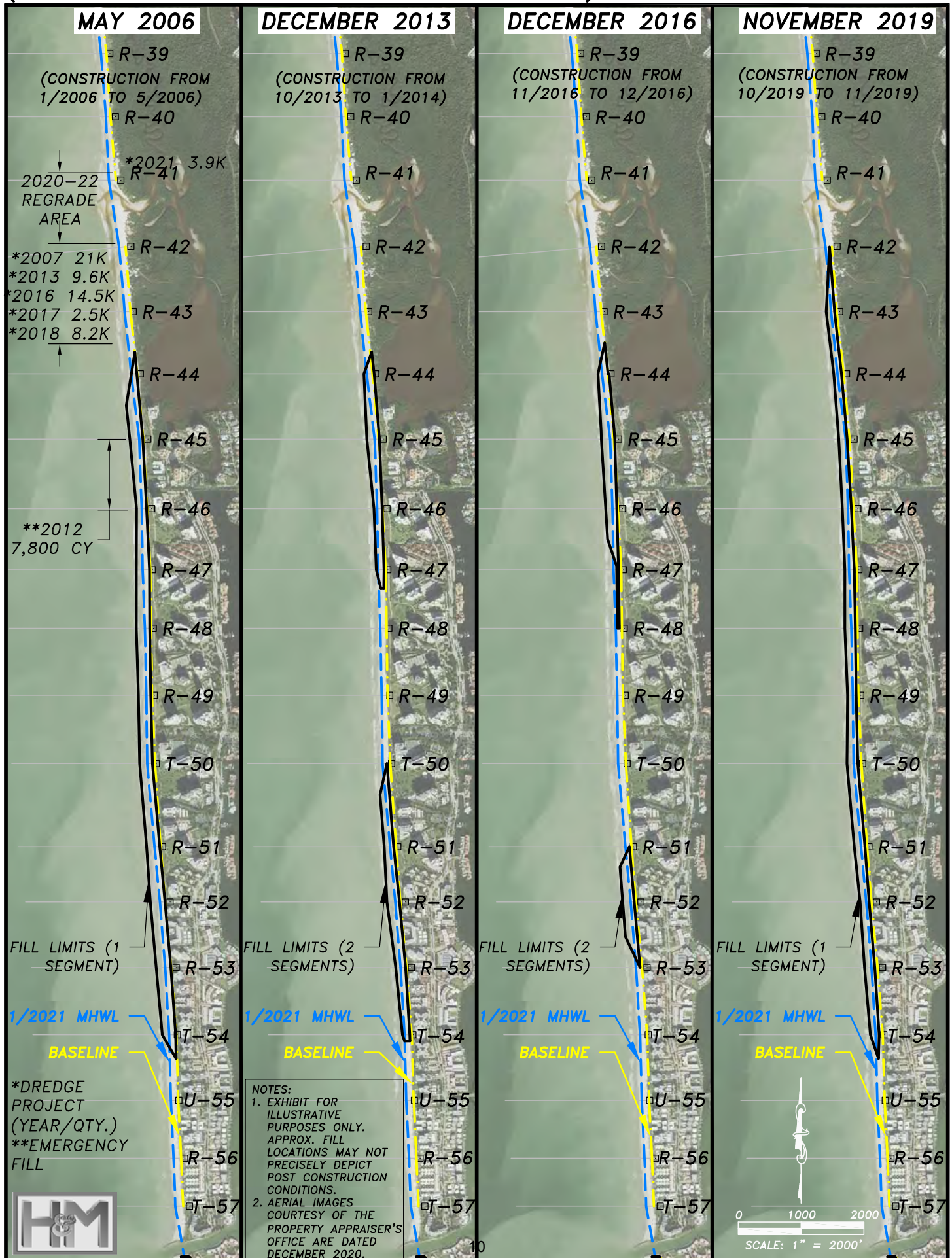
Appendix F presents information for the beach width measured from the *Baseline* to the MHW for each year from 2005 (pre-construction) to the most recent survey conducted in January 2022. A tabular summary is shown at the beginning of the appendix followed by information for each monument located within the monitoring area. Monuments not included in the project monument range shown in **Table 4** will not include the 2003 *Baseline* on the associated graph.



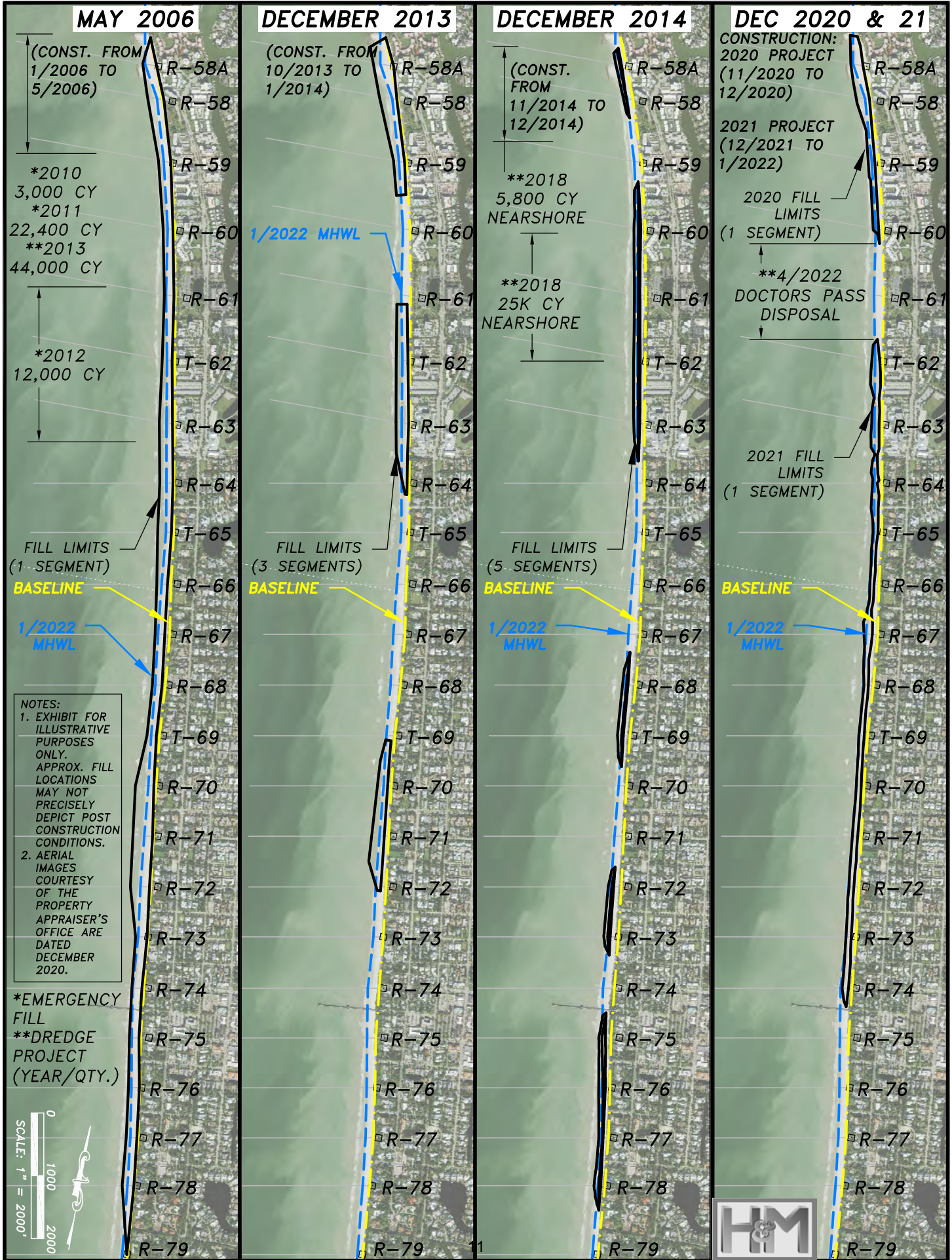
**FIGURE 2a: FILL LIMITS FOR VANDERBILT & PELICAN BAY BEACH
(NO FILL PLACED IN 2014, 2015, 2017-2020)**



**FIGURE 2b: FILL LIMITS FOR PARK SHORE BEACH
(NO FILL PLACED IN 2014-2015 OR 2017-2018)**



**FIGURE 2c: FILL LIMITS FOR NAPLES BEACH
(NO FILL PLACED ON THE BEACH FROM 2015 TO 2019)**



Relative shoreline and volumetric change were determined for the surveys conducted in 2005, 2006, 2014 (South Naples), 2020 (Park Shore), 2021, and the most recent survey in January 2022 for this analysis.⁸ Shoreline change is the distance between the mean high water elevation for different surveys while volumetric change compares the change in the volume of sand between surveys (by convention positive values indicate accretion and/or beach fill and negative values indicate erosion). The nearshore limit used for the determination of the volume of sand was the *Baseline* while the offshore limit was the -11.3 NAVD (-10.0 NGVD) approximate depth of closure⁹ (DOC) used in previous monitoring reports. Alterations in the DOC were made as appropriate to account for unusual volumetric changes occurring such as movement of the nearshore bar causing significant change beyond the previously used DOC. The effective distance used to compute volume is the distance along the beach between beach profiles, and is consistent with those used in the October 2006 CP&E Post-Construction Engineering Report shown in **Appendix E**.¹⁰ The volumetric change was computed utilizing the average end area method. **Table 5** shows the distance from the DEP reference monument to the shore-normal limits used for the volumetric analysis determined by the *Baseline* and the estimated DOC. These volumetric limits are also shown graphically on the beach profiles provided in **Appendix D-2**.

Shoreline change is shown in **Tables 6a, 7a and 8a**. The volumetric changes discussed in this report (and shown in **Tables 6b, 6c, 7b, 7c, 8b, 8c, and 9b**) are not representative of design quantities for future beach nourishment projects; they are rather an indication of erosion or accretion occurring since the previous nourishment within the monitoring area. Design quantities for fill projects consider other factors as well as erosion or accretion, including but not limited to the existing beach width, advance nourishment requirements, consider sea level rise, predicted erosion prior to construction, storm losses, tapers, gaps, berm height, and design life.

The November 2005 pre-construction survey and June 2006 post-construction survey document changes to the beach profiles before and after construction. Consequently, there can be significant differences between the as-built quantities and the quantity computed from the 2005 and 2006 monitoring surveys. As-built volumes are based on interim surveys conducted during construction usually for the determination of acceptance sections and related payment on nourishment projects. The same is true more recent monitoring surveys and nourishment projects such as the 2019 Park Shore, and 2021 Vanderbilt, Pelican Bay and Naples Beach Nourishment Projects.



⁸ The beach widths and volumes for the December 2014 survey are only shown for the portion of Naples Beach excluded from the 2021 project. The December 2019 survey was excluded from the volume change analysis and associated shoreline change shown in Tables 7a and 7b due to the limited scope of the post fill survey data.

⁹ Depth of closure (DOC) in coastal engineering terminology typically means the depth beyond which no change in bottom elevation is seen from normal coastal processes measured by monitoring surveys. The depth of -11.3 feet NAVD was established early as part of the monitoring of Collier County beaches. There are cases of sand accumulation or loss beyond -11.3 feet NAVD and in those cases the analysis is extended further offshore to ensure analysis of data within profile closure.

¹⁰ Exceptions include fill template taper locations at the ends of fill segments.

Table 5. Shore Normal Limits for the Volumetric Analysis (Surveys 2005 to 2020)

DEP Ref. Mon. ID	Distance from Monument to Baseline (Ft)	Distance from Monument to Closure Depth (Ft)	DEP Ref. Mon. ID	Distance from Monument to Baseline (Ft)	Distance from Monument to Closure Depth (Ft)
Wiggins Pass			R-51	30	600
R-17	187*	400	R-52	80	700
R-18	100*	1,100	R-53	79	700
R-19	50	600	T-54	18	700
R-20	44	600	U-55	10	600
R-21	50	500	R-56	55	700
R-22	30	600	T-57	100	800
R-23	-6	600	Doctors Pass		
R-24	20	700	R-58A	40*	800
R-25	23	600	R-58	159	800
R-26	20	600	R-59	25	500
R-27	0	600	R-60	85	700
R-28	-15	700	R-61	185	900
R-29	29	700	T-62	8	900
R-30	33	700	R-63	54	700
R-31	35	600	R-64	68	700
R-32	55	700	T-65	20	800
R-33	45	700	R-66	100	900
R-34	40	700	R-67	50	800
R-35	66	700	R-68	52	900
R-36	46	700	T-69	57	900
R-37	65	700	R-70	50	900
R-38	62	700	R-71	70	800
R-39	53	800	R-72	110	800
R-40	78	700	R-73	0	800
R-41	80	800	R-74	65	1,000
Clam Pass			R-75	135	1,000
R-42	84	700	R-76	30	900
R-43	46	700	R-77	84	900
R-44	49	700	R-78	40	900
R-45	73	700	R-79	-10	900
R-46	72	700	R-80	0	900
R-47	34	700	R-81	-20	800
R-48	36	600	R-82	10	800
R-49	35	600	R-83	70	900
T-50	19	600	R-84	0	700

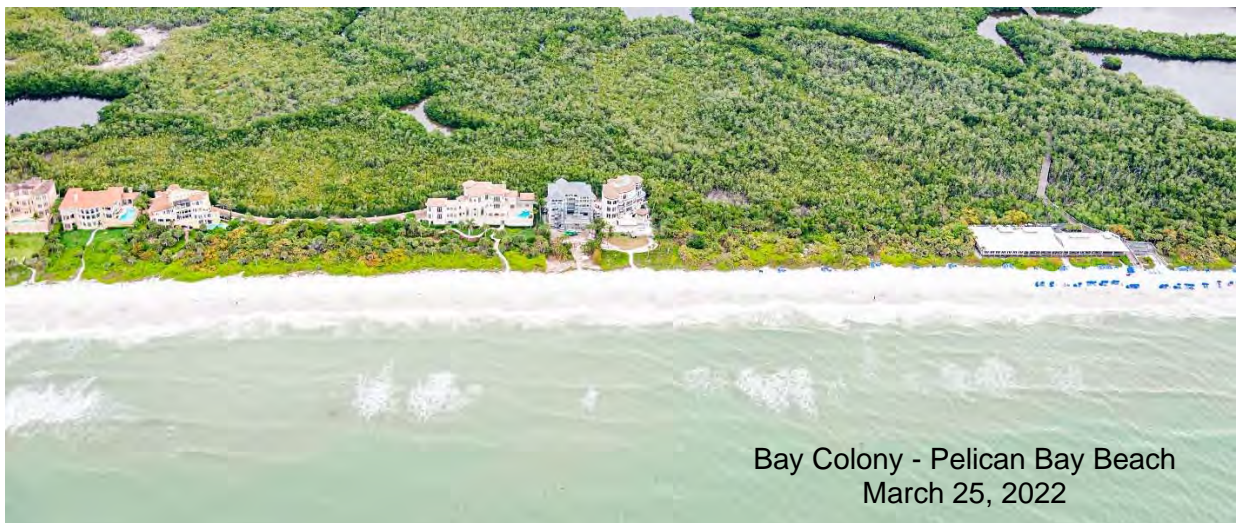
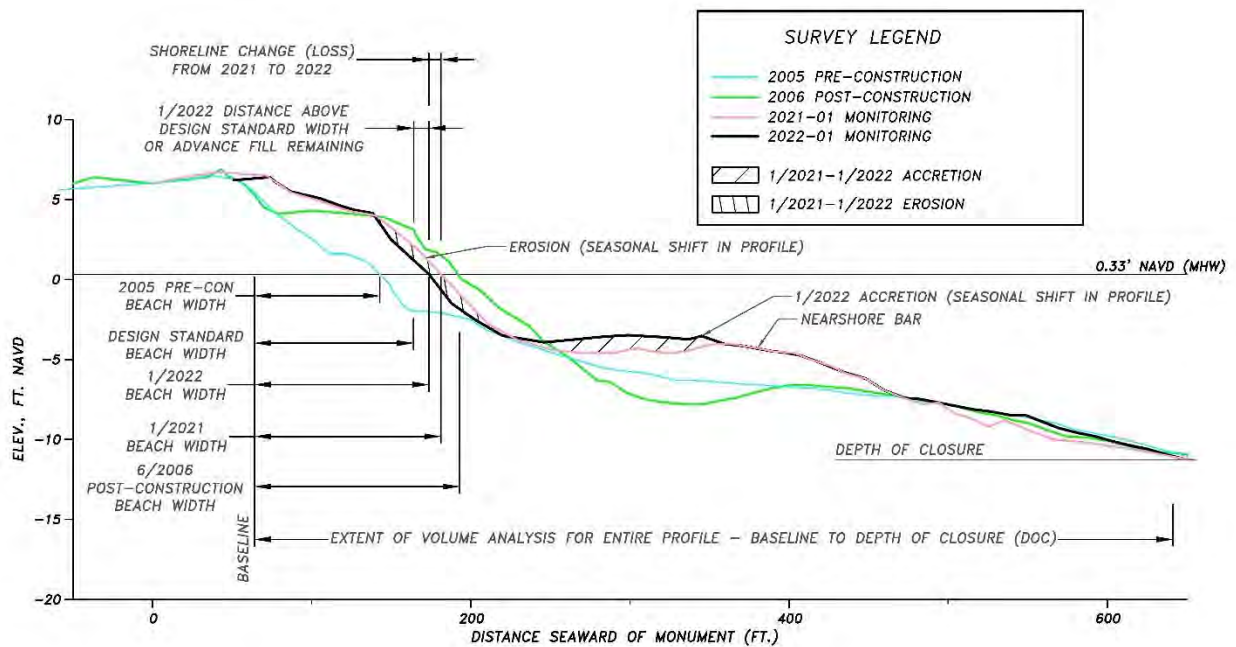
Light shading portion of chart represents 2005/2006 project area.

Dark shading portion of chart represents project area added in 2017.

* Monuments R-17 and R-18, adjacent to Wiggins Pass, are in a highly dynamic area and the landward limits were adjusted accordingly to measure changes along the active beach profile to 0 and 80 feet respectively; similarly, with R-58A adjacent to Doctors Pass the distance was adjusted to 0 feet for the analysis.

Figure 3a shows a typical beach profile comparison for surveys conducted in 2005, 2006, 2021 and most recently in January 2022 with the elevation (referencing the NAVD vertical datum) on the vertical axis and the distance from monument (in feet) on the horizontal axis. The bounds of the shore-normal limits for the volume analysis described in **Table 5** along with the corresponding beach widths and *Design Standard* width are depicted. The area of change at this monument from the January 2021 to 2022 survey, denoting accretion, and erosion, averaged with the area of change at each adjacent monument is multiplied by the distance between the monuments to obtain the net volume change between adjacent monuments. Although the beach width is an indicator considered for nourishment requirements, changes in bathymetry such as a temporary shift in the nearshore bar due to weather conditions possibly combined with elevated water levels, or other factors such as seasonal changes as shown in **Figure 3a** are quantified as volumetric change and analyzed in conjunction with shoreline change.

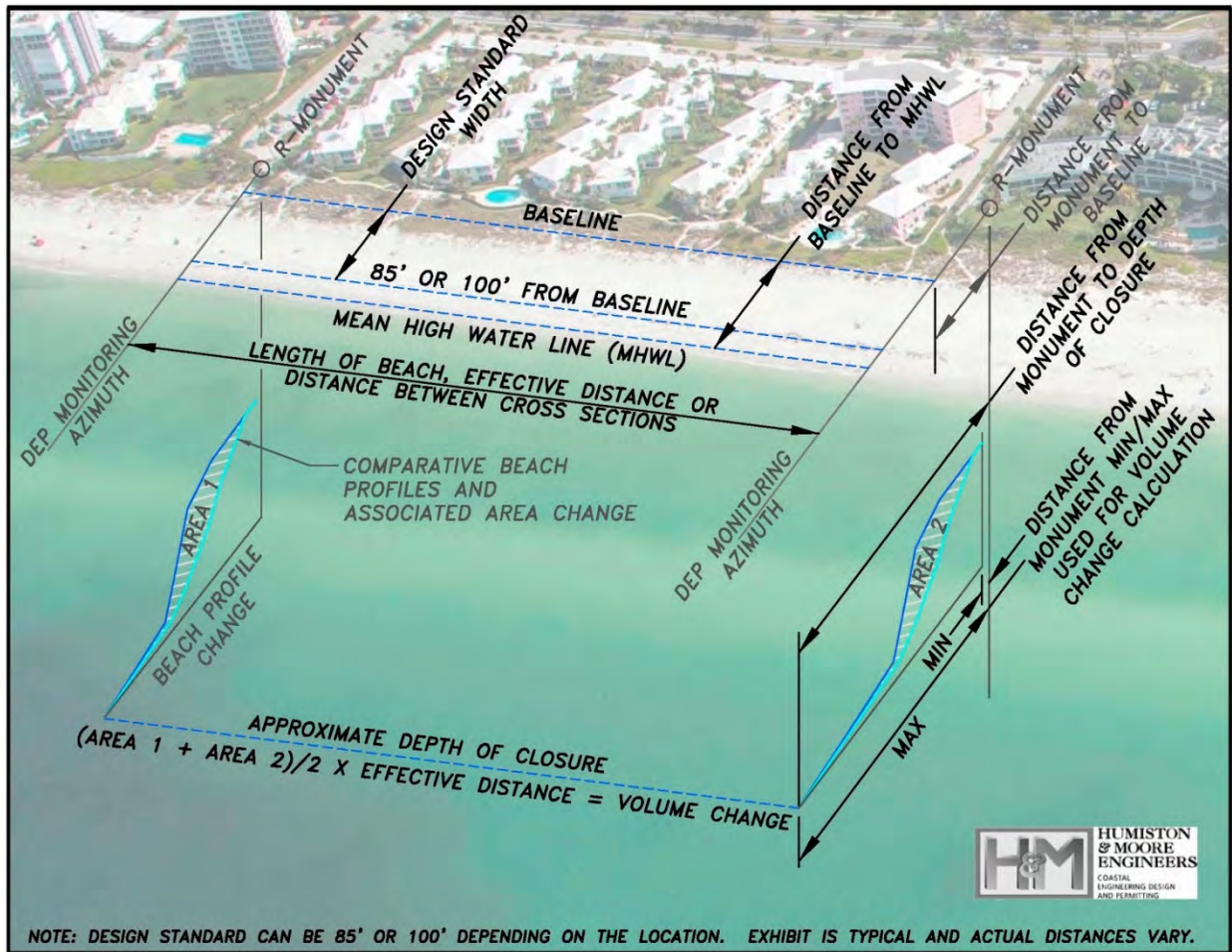
Figure 3a. Typical Beach Profile Comparison



Bay Colony - Pelican Bay Beach
March 25, 2022

Figure 3b is a schematic depiction of the elements involved in the analysis of shoreline and volume change in this report. (This particular case shows a beach width greater than the *Design Standard*.) Two adjacent DEP reference monuments and associated monitoring azimuths are shown along with the *Baseline*, *Design Standard* width (85 or 100 feet), mean high water line, and approximate DOC. Also shown are comparative beach profiles at the adjacent monuments and the associated area change between the monitoring surveys to be compared. Shoreline change is the difference in the "Distance from the *Baseline* to MHWL" for different monitoring surveys. Volumetric change, determined by the formula shown (at the bottom of the figure) for the average end area method, utilizes the cross sectional area change for different monitoring surveys at adjacent monuments and the length of beach between those monuments. The comparative profiles are analyzed at a minimum offset from the *Baseline* to the approximate DOC as shown in the figure and **Table 5**.

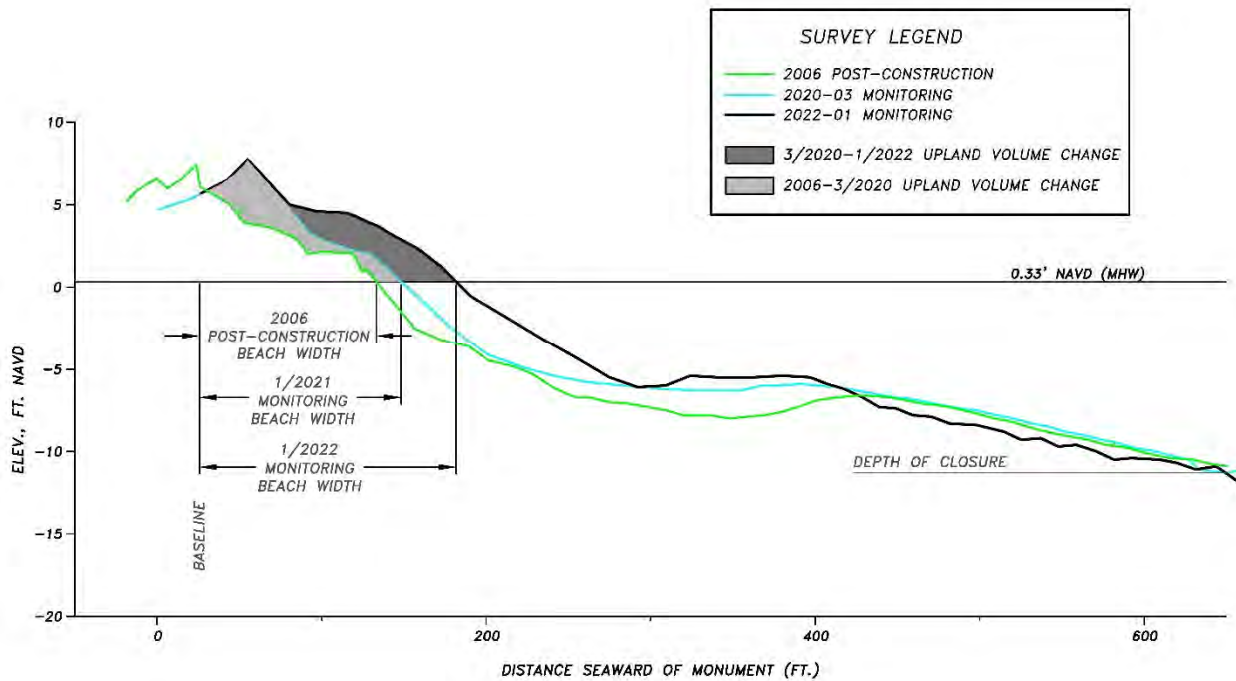
Figure 3b. Schematic Diagram for Typical Shoreline and Volumetric Analysis



C. Volume Change (Upland Beach Profile)

The *Design Standard* used for the Collier Beach Project pertains to the upland portion of the beach without consideration to changes in the nearshore as shown in **Tables 6b, 7b, and 8b** containing volumetric changes offshore to the DOC. In order to isolate upland volumetric changes to complement the information provided by changes in beach width, the limits of the volumetric analysis were computed between the 2003 *Baseline* and the MHWL for the area above the MHW elevation. **Figure 3c** shows a typical cross section containing three beach profiles: The 2006 post-construction, March 2020 and January 2022 monitoring surveys. The upland volume change for the period from the 2006 to the March 2020 is the area shaded in light gray. The upland volume change from March 2020 to January 2022 is shaded in dark gray, and the change from 2006 to 2022 would be a combination of both the light and dark gray areas. Similarly, upland volume change was calculated for surveys from 2005 through 2022, analyzed for the monitoring area, and shown in **Tables 6c, 7c, and 8c**. Negative values indicate volumetric losses or erosion.

Figure 3c. Beach Profile Showing Shoreline and Volumetric Accretion

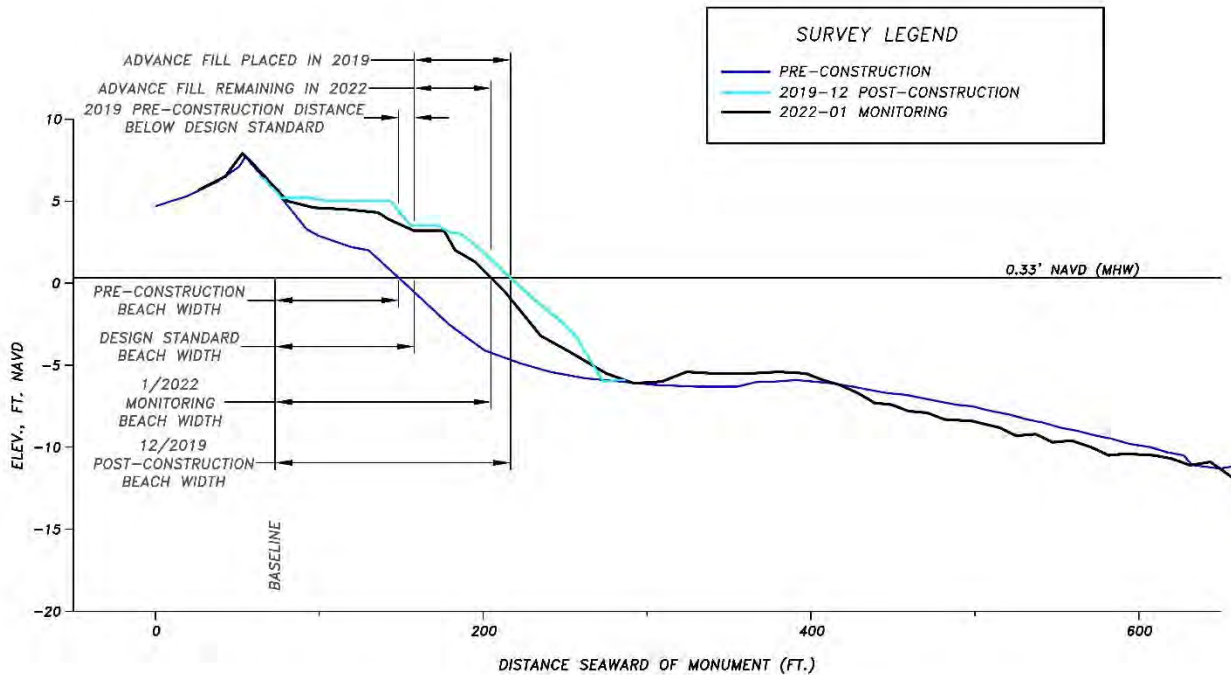


D. Advance Nourishment Losses

Advance nourishment is the amount of fill placed seaward of the *Design Standard* width. This sand is placed to maintain the *Design Standard* width as sand erodes from the beach over time in ‘advance’ of the Design Template. **Figure 3d** shows the December 2019 and January 2022 monitoring surveys as well a pre-construction survey for a typical cross section located within the Park Shore fill template. The fill placed seaward of the *Design Standard* width, as shown by the December 2019 profile, represents the advance fill, while the January 2022 beach profile shows the equilibration of the fill post-construction.

Tables 6d, 7d, and 8d show the post-construction width of the beach in June 2006, December 2014 or December 2019 (the last continuous fill template constructed in the area) and the January 2021 and 2022 beach widths. Erosion into the fill template is noted along with the amount of beach width remaining above the *Design Standard* of 85 or 100 feet. Profiles within the tapered portion of the fill template, graded to transition with the existing adjacent beach, were not included in the analysis.

Figure 3d. Typical Beach Cross Section



While Vanderbilt, Pelican Bay and the majority of Naples Beach were nourished recently in December 2021, Park Shore was last nourished in December 2019, North Naples Beach (R-58A to 60)¹¹ in December 2020, and south Naples Beach in December 2014 (R-75 to R-79). **Tables 6d, 7d, and 8d** compare post-construction beach widths for Vanderbilt, Pelican Bay and Naples Beaches. Beach widths less than the *Design Standard* are noted.

In the following sections of this report, corresponding values between those shown in the Tables and report text are highlighted in blue for ease of reference. The volumes in cubic yards (CY) shown in the tables were rounded to the nearest value of 10, distances are shown in feet rounded to the nearest whole number.

¹¹ During construction, Tropical Storm Eta impacted the project area, causing a stoppage of work on November 7th, 2020. Impacts from the storm included redistribution of some of the previously placed fill above the permitted template and corresponding tolerance limits along the north end of the project. Once construction activities resumed on November 16, 2020, the fill was graded and redistributed to meet the design template and additional fill was placed to address the storm impacts. Source: Completion and Certification by Taylor Engineering, January 13, 2021.

V. ANALYSIS

Vanderbilt Beach & Pelican Bay Beaches

This portion of Collier County bounded on the north by Wiggins Pass (between R-16 and R-17) and to the south by Clam Pass (between R-41 and R-42) was renourished as part of the Collier Beach project in 2013, 2016 and 2021 as shown in **Figure 2a**. Nourishment history for the monitoring area from 2005 to the present is shown in **Table 2b**; recently the following projects were conducted within the reach:

- In Delnor-Wiggins State Park, sand dredged from Wiggins Pass was placed south of the inlet on in the nearshore in 2018.
- In December 2020, approximately 3,900 cubic yards were removed mechanically from Clam Pass and 6,400 cubic yards were regraded. The sand excavated from the inlet was placed on the adjacent banks and in the vicinity of R-41.
- The Vanderbilt Beach reach from R-22 south to R-32 was nourished with over 77,000 cubic yards (77,340), and the Pelican Bay Beach reach from R-33 to R-36 was nourished with approximately 20,000 cubic yards (20,000) of truck hauled sand in late 2021.

The following were not analyzed in this report due to project timing after the January 2022 survey.

- Sand dredged from Wiggins Pass was placed north (outside of the monitoring area) and south of the inlet on the beach between R-18 and R-20 in February 2022.
- Clam Pass was excavated mechanically in March/April 2022, and grading was conducted to reshape the inlet mouth. Sand was placed north and south of the inlet.

Table 6a shows the beach width from the *Baseline* at each monument for the 2005 pre-construction, 2006 post-construction, January 2021 monitoring, and the most recent monitoring survey conducted in January 2022. The table also shows the corresponding average beach width for the four different reaches between Wiggins and Clam Pass, denoted as; Delnor-Wiggins, Vanderbilt Beach, Pelican Bay Beach, and North of Clam Pass. **Table 6b** shows the as-built volumes for the 2006 through 2021 nourishment projects as well as the volume change along the entire profile from the *Baseline* to the DOC. **Table 6c** shows the upland volume change or the volume change above the MHWL, while **Table 7d** shows the advance nourishment remaining for the monuments located within the 2006 project continuous fill template.

The reach south of Wiggins Pass in Delnor-Wiggins State Park from monument R-17 to R-21 was nourished in 2018 with over 56,000 cubic yards (56,280) of sand dredged from Wiggins Pass and subsequently placed in the nearshore between R-18 to R-20. The placement of sand in the vicinity of R-18 and R-20 appears to be equilibrating as indicated by the loss of over 18,000 cubic yards (-10,070; -8,270) of sand from the disposal area in the most recent monitoring period. The reach generally shows erosion as the average beach width lost 13 feet (-13) in the most recent monitoring period, a corresponding volume loss of almost 27,000 cubic yards (-26,780) over the entire profile from the *Baseline* to the DOC, and a loss of over 3,000 cubic yard (-3,330) in the upland portion of the profile above the MHWL. The inlet effects on the adjacent area to the south is evident losing almost 38,000 cubic yards (-37,780) and 185 feet (-185) since the 2006 project. Excluding the losses at R-17 the reach has an average beach width of 78 feet.

Vanderbilt Beach represented by monuments R-22 south to R-32 has beach widths greater than the *Design Standard* of 100 feet throughout the reach due to the recent nourishment project placing approximately 77,000 cubic yards (77,340) of sand within the reach. The reach has an average width of 132 feet, and an average gain of 25 feet (25) of width in this most recent monitoring period. Considering the changes along the entire profile, from the *Baseline* to the DOC, the volumetric change in the most recent monitoring period shows a gain of over 44,000 cubic yards (44,440); the volumetric change above the MHWL shows a gain over 41,000 cubic yards (41,110). The average advanced nourishment remaining for the reach from R-22 south to R-32 is one foot less than the 2006 condition (34 vs. 35). Vanderbilt Beach retained over 211,000 cubic yards (211,220) of the fill placed from 2005 to 2021 totaling over 322,000 cubic yards (130,460+114,840+77,340) or approximately 65%, although some of the sand may be attributed to beach adjustment and spreading of sand from Delnor-Wiggins State Park.

Pelican Bay Beach represented by monuments R-33 south to R-37 have beach widths greater than the *Design Standard* of 100 feet with the exception of R-36 and R-37, having widths of 88 and 89 feet, respectively. Monument R-36 is located at the terminus of the 2021/2022 project taper and R-37 the 2005/2006 taper. Pelican Bay Beach was recently nourished with approximately 20,000 cubic yards (20,000) of sand during the 2021 project. The reach has an average width of 98 feet, an average gain of 18 feet (18) in width in this most recent monitoring period. Considering the changes along the entire profile, from the *Baseline* to the DOC, the volumetric change in the most recent monitoring period shows a loss of over 23,000 cubic yards (-23,460) due to changes along the nearshore bar, notable on the beach profiles provided in **Appendix D-2**. The volumetric change above the MHWL shows a gain of over 16,500 cubic yards (16,560) mainly due to the recent nourishment project. Pelican Bay Beach retained over 67,000 cubic yards (67,760) of the fill placed from 2005 to 2021 totaling over 100,000 cubic yards (47,990+33,260+20,000) or approximately 67%.

The dynamic reach **North of Clam Pass** represented by monuments R-38 south to R-41 has beach widths ranging from 72 to 110 feet, an average width of 90 feet, and an average loss of 14 feet (-14) in width in this most recent monitoring period. Considering the changes along the entire profile, from the *Baseline* to the DOC, the volumetric change in the most recent monitoring period shows a loss of 30,000 cubic yards (-30,700) as every monument within the reach lost volume. These losses are partially along the nearshore bar (see profiles in **Appendix D-2**) and due to the dynamic nature of the reach near the inlet. Monument R-41 immediately adjacent to the inlet lost 68 feet (-68) in width while the active profile from R-40 to R-41 lost over 11,000 cubic yards (-11,420) of sand in 2021. Conversely, the volumetric change above the MHWL shows a relatively moderate gain of over 500 cubic yards (530).

The majority of the reach from R-17 south to R-41 was nourished in 2021, gaining almost 55,000 cubic yards (54,870) of sand in the upland portion of the reach for 2021. Over the same period of time the reach had a net loss of 36,500 cubic yards (-36,500) of sand over the entire active beach profile due to changes in the nearshore bar and losses near Clam Pass.

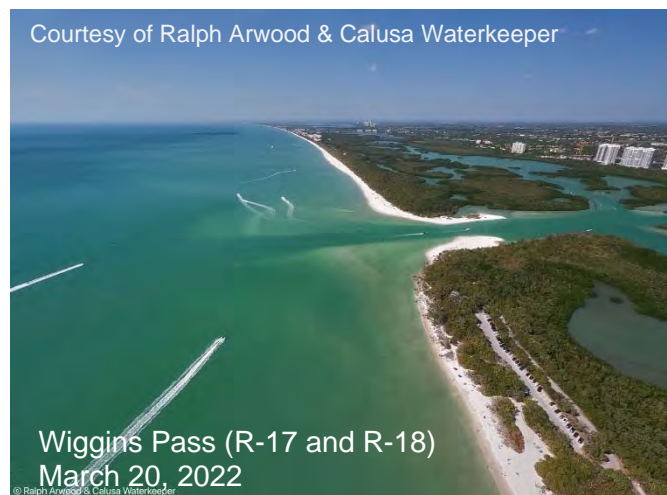


Table 6a. Shoreline Change R-17 thru R-41 (Vanderbilt, Pelican Bay, North Clam Pass)

DEP Mon.	Design Standard (Ft)	Beach Width from Baseline (Ft)				Shoreline Change (Ft)		
		11/2005	6/2006	1/2021	1/2022	2005 to 1/2022	2006 to 1/2022	1/2021 to 1/2022
Wiggins Pass								
R-17	-	51	77	-93	-107	-159	-185	-14
R-18	-	97	108	80	56	-41	-51	-24
R-19	-	111	99	126	104	-7	5	-22
R-20	-	98	104	80	78	-20	-26	-2
R-21	-	88	103	77	74	-14	-29	-3
R-22	100	106	106	109	102	-4	-3	-7
R-23	100	100	121	115	127	27	6	12
R-24	100	114	130	112	136	22	5	24
R-25	100	94	135	108	130	36	-5	22
R-26	100	109	148	116	149	39	0	33
R-27	100	79	121	93	128	49	7	35
R-28	100	96	138	89	139	43	1	50
R-29	100	86	144	103	135	49	-9	32
R-30	100	109	142	112	142	33	0	30
R-31	100	109	132	111	140	30	8	29
R-32	100	107	138	107	120	13	-18	13
R-33	100	90	103	90	103	13	0	13
R-34	100	80	103	80	106	26	4	26
R-35	100	79	103	78	104	25	1	26
R-36	100	81	96	68	88	6	-8	20
R-37	100	99	92	83	89	-10	-3	6
R-38	-	106	87	84	94	-12	6	10
R-39	-	97	93	96	86	-11	-7	-10
R-40	-	71	80	59	72	1	-9	13
R-41	-	104	108	178	110	6	2	-68
Clam Pass								
Reach	Average Beach Width (Ft)				Average Shoreline Change (Ft)			
Delnor-Wiggins R-17 to R-21	89	98	54	41	-48	-57	-13	
Vanderbilt Beach R-22 to R-32	101	132	107	132	31	-1	25	
Pelican Bay Beach R-33 to R-37	86	99	80	98	12	-2	18	
N. of Clam Pass R-38 to R-41	94	92	104	90	-4	-2	-14	
Monitoring Area R-17 to R-41	94	112	90	100	6	-12	10	

Shaded portion of chart represents 2005/2006 project area; darker shading represents the 2021 project area.

Table 6b. Volume Change R-17 through R-41 (Vanderbilt, Pelican Bay, North Clam Pass)

DEP Reference Monument	Effective Distance (Ft)	As-Built Volume (CY)					Volume Change (CY)			
		2005 to 2006	2010 to 2012	2013	2016	2021	2005 to 1/2022	2006 to 1/2022	1/2021 to 1/2022	
Wiggins Pass										
R-17 to R-18	1,003						-31,480	-37,780	-3,240	
R-18 to R-19	1,048		48,400		56,280		790	-1,740	-10,070	
R-19 to R-20	1,029		(2007)		(2018)		10,580	12,660	-8,270	
R-20 to R-21	1,030						2,940	890	-3,880	
R-21 to R-22	1,040						6,160	4,550	-1,320	
R-22 to R-23	968	4,520					8,720	7,530	1,090	
R-23 to R-24	1,058	8,340					23,470	17,520	3,430	
R-24 to R-25	1,083	13,700					24,160	12,920	1,810	
R-25 to R-26	984	15,890		3,810			25,120	9,730	5,610	
R-26 to R-27	994	18,430		18,240	35,470	77,340	29,110	12,410	10,500	
R-27 to R-28	1,195	22,520	11,000	15,900			31,060	12,940	10,490	
R-28 to R-29	856	14,380		8,360			19,360	5,350	6,030	
R-29 to R-30	1,029	14,660		8,090			17,670	3,570	4,820	
R-30 to R-31	1,037	9,060		11,340			15,710	11,150	1,480	
R-31 to R-32	1,006	8,960		2,630			16,840	8,120	-820	
R-32 to R-33	1,017	9,090					12,820	-1,080	-7,200	
R-33 to R-34	1,027	10,880		1,440			16,600	2,350	-9,980	
R-34 to R-35	997	11,280		6,280		20,000	19,660	3,940	-2,710	
R-35 to R-36	999	12,990		13,600	8,500		13,820	-320	-40	
R-36 to R-37	1,058	3,750		3,440			4,860	-3,960	-3,530	
R-37 to R-38	977						3,140	1,430	-3,940	
R-38 to R-39	1,023						4,690	2,120	-6,510	
R-39 to R-40	1,010				(2017 & 20)		6,070	-1,690	-8,830	
R-40 to R-41	1,012			10,400	6,900		12,510	3,080	-11,420	
Total Volume Change (CY)		Clam Pass								
Delnor-Wiggins R-17 to R-22				104,680		-	-11,010	-21,420	-26,780	
Vanderbilt Beach R-22 to R-32		130,460		114,840		77,340	211,220	101,240	44,440	
Pelican Bay Beach R-32 to R-37		47,990		33,260		20,000	67,760	930	-23,460	
N. of Clam Pass R-37 to R-41				17,300		-	26,410	4,940	-30,700	
Monitoring Area R-17 to R-41		178,450		270,080		97,340	294,380	85,690	-36,500	

Shaded portion of chart represents 2005/2006 project area; darker shading represents the 2021 project area.

Volumetric change quantities are not representative of design quantities for future beach renourishment projects rather an indication of erosion (negative value) or accretion (positive value) in the monitoring area.

Table 6c. Upland Volume Change R-17 through R-41 (Vanderbilt, Pelican Bay, North Clam Pass)

DEP Reference Monument			Upland Volume Change (CY)		
			2005 to 1/2022	2006 to 1/2022	1/2021 to 1/2022
			Wiggins Pass		
R-17	to	R-18	-11,220	-12,800	-2,160
R-18	to	R-19	-4,070	-4,210	-1,880
R-19	to	R-20	-1,750	-1,690	-520
R-20	to	R-21	-2,940	-3,780	350
R-21	to	R-22	530	-210	880
R-22	to	R-23	3,100	1,960	1,200
R-23	to	R-24	7,070	3,620	3,150
R-24	to	R-25	7,260	2,270	2,720
R-25	to	R-26	8,190	1,830	3,670
R-26	to	R-27	9,110	1,920	4,840
R-27	to	R-28	10,390	900	6,690
R-28	to	R-29	7,760	140	4,790
R-29	to	R-30	8,940	1,610	5,160
R-30	to	R-31	7,730	3,980	5,180
R-31	to	R-32	6,750	2,910	3,710
R-32	to	R-33	4,890	140	2,350
R-33	to	R-34	5,500	670	2,680
R-34	to	R-35	6,810	1,150	4,240
R-35	to	R-36	4,880	-370	4,360
R-36	to	R-37	2,090	-670	2,930
R-37	to	R-38	1,570	1,150	1,760
R-38	to	R-39	2,570	1,550	950
R-39	to	R-40	3,180	1,140	1,290
R-40	to	R-41	4,670	3,130	-3,470
Total Volume Change (CY)			Clam Pass		
Delnor-Wiggins R-17 to R-22			-19,450	-22,690	-3,330
Vanderbilt Beach R-22 to R-30.8			76,300	21,140	41,110
Pelican Bay Beach R-30.8 to R-37			24,170	920	16,560
N. of Clam Pass R-37 to R-41			11,990	6,970	530
Monitoring Area R-17 to R-41			93,010	6,340	54,870

Shaded portion of chart represents 2005/2006 project area; darker shading represents the 2021 project area.

Table 6d. Advance Nourishment Remaining R-22 through R-37 (Vanderbilt, Pelican Bay)

Monument	Beach Width			Advance Nourishment Remaining			Eroded into Design Template
	2006 (Feet)	2021 (Feet)	2022 (Feet)	2006 (Feet)	2021 (Feet)	2022 (Feet)	
R-22	106	109	102	Taper			Taper
R-23	121	115	127	21	15	27	-
R-24	130	112	136	30	12	36	-
R-25	135	108	130	35	8	30	-
R-26	148	116	149	48	16	49	-
R-27	121	93	128	21	0	28	-
R-28	138	89	139	38	0	39	-
R-29	144	103	135	44	3	35	-
R-30	142	112	142	42	12	42	-
R-31	132	111	140	32	11	40	-
R-32	138	107	120	38	7	20	-
R-33	103	90	103	3	0	3	-
R-34	103	80	106	3	0	6	-
R-35	103	78	104	3	0	4	-
R-36	96	68	88	0	0	Taper	Taper
R-37	92	83	89	Taper			Taper
Average Vanderbilt Beach R-22 to R-32:				35	8	34	
Average Pelican Bay Beach R-33 to R-37:				2	0	4	

“Taper” indicates a monument located with the fill template taper to the existing beach. Gray shading shows the most recent nourishment of the reach or the 2021 segmented filling extents.

Park Shore and Clam Pass Beaches

This portion of Collier County is bounded on the north by Clam Pass (located between R-41 and R-42) and to the south by Doctors Pass (located between R-57 and R-58A). It was renourished with sand as part of the Collier Beach project in 2013, 2016, and 2019 as shown in **Figure 2b**. Nourishment history for the monitoring area from 2005 to the present is shown in **Table 2b**; recently the following projects were conducted within the reach:

- In the winter of 2019 approximately 130,000 cubic yards of truck-hauled sand were placed from R-42 south to T-54+400.
- Clam Pass was excavated mechanically in April 2020 and grading was conducted to reshape the inlet mouth after sand migrated toward the inlet from the south. In December 2020, approximately 3,900 cubic yards were removed mechanically from the inlet and 6,400 cubic yards were regraded; the excavated material was placed on the adjacent banks and in the vicinity of R-41.

The following were not analyzed in this report due to project timing after the January 2022 survey.

- Clam Pass was excavated mechanically in March/April 2022 and grading was conducted to reshape the inlet mouth. Sand was placed north and south of the inlet.

Table 7a shows the beach width from the *Baseline* at each monument for the 2005 pre-construction, 2006 post-construction, March 2020, January 2021, and most recent monitoring survey conducted in January 2022; along with the corresponding average beach width for the four different reaches between Clam Pass and Doctors Pass denoted as; South of Clam Pass, North Park Shore, Park Shore, and North of Doctors Pass. **Table 7b** shows the as-built volumes for the 2006 through 2019 nourishment projects as well as the volume change along the entire profile from the *Baseline* to the DOC, while **Table 7c** shows the upland volume change or the volume change above the MHWL. **Table 7d** shows the advance nourishment remaining for the monuments located within the 2006 and 2019 project continuous fill templates¹².

Clam Pass County Park Beach represented by monuments R-42 and R-43, was regraded twice in 2020, and has an average width of 95 feet, 10 feet above the 85 foot *Design Standard*, and an average 12 foot (-12) loss in 2021. The reach shows a relatively moderate gain of 200 cubic yards of sand (210) over the entire profile from the *Baseline* to the DOC, and relatively moderate loss of 700 cubic yards (-700) above the MHWL in the most recent monitoring period. The reach retains 40% (10 vs. 24) of the beach width gained by the 2019 nourishment project placing sand from R-42 south to T-54, and is within the inlet influence of Clam Pass.

North Park Shore Beach represented by monuments R-44 south to R-48 was nourished with approximately 68,000 cubic yards of sand in the winter of 2019. The average width of the reach is 99 feet, a negligible change in width (1) for the most recent monitoring period, and all profiles in the reach have a width above the *Design Standard* width of 85 feet with the exception of R-46 having a width of 84 feet. Considering the changes along the entire profile, from the *Baseline* to the DOC, the volumetric change in the most recent monitoring period shows a loss of 2,000 cubic yards (-1,950) due to changes along the nearshore bar, noted on the beach profiles provided in **Appendix D-2**. The volumetric change above the MHWL shows a gain of 4,900 cubic yards (4,900) mainly from R-43 to R-45 as the dynamic beach located south of the pass adjusts to changes near the inlet experiencing shoaling at the entrance following the 2019 nourishment. Approximately 50% (14 vs. 26) of the average advanced nourishment remains for the reach from R-44 south to R-48. The North Park Shore Beach was nourished with almost 187,000 cubic yards (27,710+159,200) of sand from 2005 to 2019 retaining over 90,000 cubic yards (91,070), or approximately 50%.

Park Shore Beach represented by monuments R-49 south to R-54 was nourished with approximately 44,000 cubic yards of sand in the winter of 2019. The average width of the reach is 100 feet, with an average decrease of 3 feet (-3) in the most recent monitoring period, while all profiles in the reach have a width above the *Design Standard* width of 85 feet with the exception of R-52 having a width of 82 feet (82). Considering the changes along the entire profile, from the *Baseline* to the DOC, the volumetric change in the most recent monitoring show a loss of over 12,000 cubic yards (-12,260) mainly due to changes along the nearshore bar, noted on the beach profiles provided in **Appendix D-2**. The volumetric change above the MHWL shows a relatively moderate gain of over 700 cubic yards (730). Almost 60% (16 vs. 27) of the average advanced nourishment remains for the reach from R-48 south to T-54. This segment of beach was nourished with over 200,000 cubic yards (114,040+ 86,220) of sand from 2005 to 2019, retaining 175,000 cubic yards (175,290), or 88%.

¹² Monuments R-42 and R-43 were added to the permitted project scope in 2017. The December 2019 survey represents the immediate post-construction survey for the 2019 project and was used for this analysis in lieu of the March 2020 monitoring survey.

The beach north of Doctors Pass represented by monuments U-55 south to T-57 (adjacent to Doctors Pass) has an average beach width of 120 feet, a decrease of 3 feet (-3) in 2021, and shows a net total volumetric loss of approximately 10,000 cubic yards (-9,680) for the most recent monitoring period likely due to changes in the nearshore bar in the shadow of the north jetty. The reach has not been nourished since 2005, losing 950 cubic yards (-950) of sand from the upland in the most recent monitoring period, yet shows a net total volumetric gain in the upland of almost 18,000 cubic yards (17,810) of sand since 2005.

Table 7a. Shoreline Change R-42 through R-57 (Clam Pass to Doctors Pass)

DEP Mon.	Design Standard (Ft)	Beach Width from Baseline (Ft)					Shoreline Change (Ft)							
		11/2005	6/2006	3/2020	1/2021	1/2022	2005 to 1/2022	2006 to 1/2022	3/2020 to 1/2022	1/2021 to 1/2022				
		Clam Pass												
R-42	85	103	96	108	108	101	-2	5	-7	-7				
R-43	85	66	52	66	106	90	25	39	24	-16				
R-44	85	72	84	91	85	95	23	11	4	10				
R-45	85	76	66	132	103	97	20	30	-36	-7				
R-46	85	88	84	97	89	84	-4	1	-13	-5				
R-47	85	104	115	116	116	121	17	6	5	5				
R-48	85	81	99	109	98	99	18	0	-10	1				
R-49	85	98	96	104	98	92	-6	-4	-12	-6				
T-50	85	88	117	128	113	123	35	6	-5	10				
R-51	85	64	127	111	103	96	31	-32	-16	-8				
R-52	85	59	126	113	93	82	23	-44	-31	-11				
R-53	85	63	113	99	95	95	32	-18	-4	0				
T-54	85	83	125	121	118	114	31	-11	-7	-4				
U-55	-	96	77	138	126	118	22	41	-20	-8				
R-56	-	102	91	145	134	119	17	27	-26	-15				
T-57	-	110	122	152	111	124	15	2	-28	13				
Reach		Doctors Pass					Average Beach Width (Ft)				Average Shoreline Change (Ft)			
S. of Clam Pass R-42 to R-43		84	74	87	107	95	11	22	8	-12				
N. Park Shore Beach R-44 to R-48		84	90	109	98	99	15	10	-10	1				
Park Shore Beach R-49 to R-54		76	117	113	103	100	24	-17	-13	-3				
N. of Doctors Pass R-55 to R-57		103	97	145	124	120	18	24	-25	-3				
Monitoring Area R-42 to R-57		85	99	114	106	103	19	4	-11	-3				

Shaded portion of chart represents 2019 project area.

R-42 and R-43 added to the project area as part of a 2017 permit modification.

Table 7b: Volume Change R-42 to R-57 (Clam Pass to Doctors Pass)

DEP Reference Monument Range	Effective Distance (FT)	As-Built Volume (CY)					Volume Change (CY)			
		2005 to 2006	2010 to 2012	2013	2014 to 2016	2019	2005 to 1/2022	2006 to 1/2022	3/2020 to 1/2022	1/2021 to 1/2022
Clam Pass										
R-42 to R-43	1,039		55,400 *			20,000	14,030	21,150	6,610	210
R-43 to R-44	997			1,210			23,320	23,410	10,310	300
R-44 to R-45	1,048			9,710	20,430		21,690	22,440	1,110	-70
R-45 to R-46	1,107	8,480	7,800	10,180		68,000	15,090	20,190	-890	-2,190
R-46 to R-47	974	10,040	(2011)	11,290			12,250	13,560	5,590	-1,150
R-47 to R-48	933	9,190		1,240	1,630		18,720	14,040	5,890	1,160
R-48 to R-49	1,067	11,600					19,490	14,340	2,070	1,590
R-49 to T-50	1,086	11,610					26,710	17,470	1,370	800
T-50 to R-51	1,330	26,750		8,510			43,560	16,450	-370	-1,950
R-51 to R-52	886	23,960		4,790	9,760	44,000	22,030	940	-4,190	-3,910
R-52 to R-53	1,048	24,720		12,520			18,830	1,410	-5,680	-4,250
R-53 to T-54	1,071	13,410		6,590			20,130	10,600	-930	-2,530
T-54 to U-55	1,047	1,990		50			24,540	20,810	-1,220	-2,010
U-55 to R-56	924						21,860	24,300	-6,990	-5,810
R-56 to T-57	768						13,400	11,090	-8,460	-3,870
Doctors Pass										
Total Volume Change (CY)										
South of Clam Pass Pass to R-43			* 75,400				14,030	21,150	6,610	210
North Park Shore Beach R-43 to R-48		27,710	159,200				91,070	93,640	22,010	-1,950
Park Shore Beach R-48 to R-55		114,040	86,220				175,290	82,020	-8,950	-12,260
North of Doctors Pass U-55 to T-57		0	0				35,260	35,390	-15,450	-9,680
Monitoring Area R-42 to T-57		141,750	320,820				315,650	232,200	4,220	-23,680

Shaded portion of chart represents 2019 project area.

R-42 and R-43 added to the project area as part of a 2017 permit modification.

*20,600 cy, 2007; 9,600 cy, 2013; 14,300 cy 2016; 2,400 cy, 2017; 8,500 cy from R-42 to R-43.5. The 14,300 cubic yards placed from R-42 to R-43 was part of the 2016 Clam Pass project and not part of the 2016 truck haul project as-built volume.

Volumetric change quantities are not representative of design quantities for future beach renourishment projects rather an indication of erosion (negative value) or accretion (positive value) in the monitoring area.

Table 7c: Upland Volume Change R-42 to R-57 (Clam Pass to Doctors Pass)

DEP Reference Monument Range	Upland Volume Change (CY)			
	2005 to 1/2022	2006 to 1/2022	3/2020 to 1/2022	3/2021 to 1/2022
	Clam Pass			
R-42 to R-43	4,970	5,000	690	-700
R-43 to R-44	8,020	6,860	2,540	1,120
R-44 to R-45	7,950	7,550	-550	1,960
R-45 to R-46	6,120	5,320	-1,650	450
R-46 to R-47	6,050	3,730	960	550
R-47 to R-48	6,870	4,260	710	820
R-48 to R-49	5,650	2,770	-640	310
R-49 to T-50	8,640	3,420	-320	970
T-50 to R-51	15,290	1,750	-100	1,080
R-51 to R-52	8,500	-2,460	-1,660	-360
R-52 to R-53	8,120	-2,810	-2,050	-520
R-53 to T-54	9,980	2,300	-290	-240
T-54 to U-55	11,590	8,910	-530	-510
U-55 to R-56	9,940	10,020	-1,890	-1,410
R-56 to T-57	7,870	6,280	-2,650	460
Total Volume Change (CY)	Doctors Pass			
South of Clam Pass Pass to R-43	4,970	5,000	690	-700
North Park Shore Beach R-43 to R-48	35,010	27,720	2,010	4,900
Park Shore Beach R-48 to R-55	67,770	13,880	-5,590	730
North of Doctors Pass U-55 to T-57	17,810	16,300	-4,540	-950
Monitoring Area R-42 to T-57	125,560	62,900	-7,430	3,980

Shaded portion of chart represents 2019 project area.

R-42 and R-43 added to the project area as part of a 2017 permit modification.

Table 7d. Advance Nourishment Remaining R-42 through R-54 (Clam Pass and Park Shore)

Monument	Beach Width				Advance Nourishment Remaining				Eroded into Design Template
	2006 (Feet)	2019 (Feet)	2021 (Feet)	2022 (Feet)	2006 (Feet)	2019 (Feet)	2021 (Feet)	2022 (Feet)	
R-42	96	111	108	101	11	26	23	16	-
R-43	52	107	106	90	0	22	21	5	-
R-44	84	93	85	95	0	8	0	10	-
R-45	66	144	103	97	0	59	18	12	-
R-46	84	106	89	84	0	21	4	0	Yes
R-47	115	110	116	121	30	25	31	36	-
R-48	99	104	98	99	14	19	13	14	-
R-49	96	95	98	92	11	10	13	7	-
T-50	117	129	113	123	32	44	28	38	-
R-51	127	106	103	96	42	21	18	11	-
R-52	126	99	93	82	41	14	8	0	Yes
R-53	113	128	95	95	28	43	10	10	-
T-54	125	117	118	114	40	32	33	29	-
Average S. of Clam Pass Beach R-42 to R-43:					5	24	22	10	
Average Park Shore Beach R-44 to R-48:					9	26	13	14	
Average Park Shore Beach R-48 to T-54:					32	27	18	16	

Gray shading shows the most recent nourishment of the reach or the November 2019 nourishment extents.

Naples Beaches

Portions of Collier County *Naples Beaches* bounded on the north by Doctors Pass (located between R-57 and R-58A) and to the south by DEP reference monument R-84 located approximately one mile north of Gordon Pass (located between R-89 and R-90) were renourished as part of the Collier Beach project with sand in both 2013 and 2014 as shown in **Figure 2c**. Nourishment history for the monitoring area from 2005 to the present is shown in **Table 2b**; recently the following projects were conducted within the reach:

- Doctors Pass was dredging in October 2013, and approximately 44,000 cubic yards of sand were placed on the beach from the jetty south to R-58.
- The existing jetty and groin south of the pass were rehabilitated along with the construction of a breakwater and detached groin between the two existing structures as part of the Doctors Pass Erosion Control Structures Project (DEP Permit 0338231-001) completed in July 2018. The fourth annual monitoring report will be submitted later this year and will address this segment of the Collier Beach Project in more detail.
- Doctors Pass was dredged in August/September 2018, and sand was placed in the nearshore immediately south of the pass to R-58.5 (north disposal), and near Lowdermilk Park from R-60 to R-61.8 (south disposal). Volume change calculations based on the pre and post-construction surveys indicate an approximate 5,800 and 25,000 cubic yard gain in the two disposal areas, north and south respectively¹³.
- The reach from the jetty south of Doctors Pass south to R-60 was nourished with approximately 37,500 cubic yards (37,440) of truck hauled sand in late 2020.
- The reach from T-62 south to R-74 was nourished with over 57,000 cubic yards of truck hauled sand (57,330) in late 2021.

¹³ Doctors Pass Maintenance Dredging 2018 Post-Construction Monitoring Summary, H&M Engineers, December 2018.

- In March/April 2022 during the writing of this report Doctors Pass was dredged and sand was placed on the beach in the vicinity of Lowdermilk Park located near R-61. This project occurred after the January 2022 survey discussed in this report.

Table 8a shows the beach width from the *Baseline* at each monument for the 2005 pre-construction, 2006 post-construction, December 2014 post-construction (R-75 to R-84 only), January 2021 monitoring survey and most recent survey conducted in January 2022; and the corresponding average beach widths for the three different reaches denoted as Naples Beach R-58A to R-60, Naples Beach R-60 to R-79 and North of Gordon Pass R-79 to R-84. **Table 8b** shows the volume change from the pre to post-construction surveys for the 2006 nourishment project as well as the volume change along the entire profile from the *Baseline* to the DOC. **Table 8c** shows the upland volume change or the volume change above the MHWL, while **Table 8d** shows the advance nourishment remaining for the monuments located within the 2006 project continuous fill template.

Naples Beach represented by monuments R-58A south to R-79 is broken into two areas: The beach immediately south of Doctors Pass, influenced by the effects of the jettied inlet from monument R-58A to R-60, and the beach beyond the immediate inlet impacts from monument R-61 south to R-79. The segment from R-58A to R-60 was one of the highest eroding areas within the Collier Beach Project requiring frequent fill placement. Erosion control structures were constructed immediately south of Doctors Pass in 2018 prior to maintenance dredging later in the year.

The reach immediately south of the inlet, **Naples Beach (north)**, is represented by four beach profiles: R-58A south to R-60, all have beach widths above the *Design Standard* of 100 feet with the exception of R-58 losing 34 feet (-34) in 2021 and having a width of 90 feet (90) located in the dynamic area immediately north of the rehabilitated groin. The average width of the reach is 127 feet, a loss of 17 feet (-17) from last year. Considering the changes along the entire profile, from the *Baseline* to the DOC, the volumetric change in the most recent monitoring period shows a loss of almost 1,500 cubic yards (-1,460) while the volumetric change above the MHWL shows a loss of over 4,600 cubic yards (-4,610) due to the equilibration of the fill placed in late 2020. All of the average advanced nourishment remains for the reach from R-58A south to R-60 (29 vs. 22). This segment of beach was nourished with almost 210,000 cubic yards (61,200+148,650) of sand from 2005 to 2020, retaining almost 75,000 cubic yards (74,590), or approximately 36%. This includes approximately 50,000 cubic yards of sand placed on the beach and nearshore between 2013 and 2018 as part of the maintenance dredging of Doctors Pass.

The beach profiles in the reach from R-61 south to R-79, **Naples Beach (south)**, have beach widths larger than the *Design Standard* for Naples Beach of 100 feet with the exception of monument R-79 located at the southernmost terminus of the project taper having a width of 88 feet (88). Approximately 57,000 cubic yards (57,330) were placed on the beach from R-62 to R-74 in late 2021. The reach shows an average width of 139 feet, and an average shoreline gain of 16 feet (16) in the most recent monitoring period. Considering the changes along the entire profile, from the *Baseline* to the DOC, the volumetric gain in the most recent monitoring period was over 63,000 cubic yards (63,100) due to changes along the nearshore bar, noted on the beach profiles provided in **Appendix D-2**, and the recent nourishment project; the volumetric change above the MHWL shows a gain of over 58,000 cubic yards (58,720). Due to the recent nourishment almost all of the average advanced nourishment remains for the reach from R-62 south to R-74 (40 vs. 41). Naples Beach from R-60 south to R-79 has a net gain over 80,000 cubic yards (81,250) of sand since the 2006 project was completed while retaining almost 346,700 cubic yards (346,690) of the almost 550,000 cubic yards (286,220 + 262,620) placed on the beach or in the nearshore since 2005 or approximately 63%.

Although not part of the 2021 nourishment project for Naples Beach (south), the reach south of the pier from R-75 south to R-79, last nourished in 2014, shows a negligible average change in width (-1) and volume (1,160) over the entire beach profile in the most recent monitoring period, but shows an average gain in width of 13 feet (13) and a total gain of over 10,000 cubic yards of sand (10,340) since the December 2014 post-construction survey. Furthermore, the upland portion of the profiles indicate a gain of almost 18,000 cubic yards of sand (17,830) since 2014 as the reach benefits for the southerly net sediment transport.

The beach North of Gordon Pass is partially represented by monuments R-80 south to R-84 located outside of the project area. Beach widths vary from 55 feet at R-84 to 100 feet at R-81. The reach gained 2 feet (2) on average since last year, but lost almost 28,000 cubic yards of sand (-27,760) over the entire beach profile due to changes in the nearshore portion of the profile.



Table 8a. Shoreline Change R-58A through R-84 (Naples Beaches)

DEP Mon.	Design Standard (Ft)	Beach Width from Baseline (Ft)					Shoreline Change (Ft)			
		11/2005	6/2006	12/2014	1/2021	1/2022	2005 to 1/2022	2006 to 1/2022	2014 to 1/2022	1/2021 to 1/2022
R-58A	100	12	78	-	179	178	165	100	-	-1
R-58	100	70	134	-	124	90	20	-44	-	-34
R-59	100	70	146	-	152	124	54	-22	-	-28
R-60	100	65	108	-	119	115	50	7	-	-4
R-61	100	83	129	-	141	153	70	23	-	12
T-62	100	57	122	-	106	125	69	3	-	19
R-63	100	87	120	-	95	124	37	4	-	29
R-64	100	102	119	-	108	121	19	2	-	13
T-65	100	106	136	-	98	124	18	-13	-	26
R-66	100	112	148	-	130	149	37	1	-	19
R-67	100	154	184	-	160	187	33	3	-	27
R-68	100	144	145	-	140	161	18	16	-	21
T-69	100	107	140	-	113	134	27	-6	-	21
R-70	100	68	167	-	100	123	55	-44	-	23
R-71	100	62	178	-	121	147	85	-31	-	26
R-72	100	73	196	-	146	167	94	-29	-	21
R-73	100	82	129	-	142	157	76	28	-	15
R-74	100	67	157	-	146	182	115	25	-	36
R-75	100	84	135	100	125	140	56	5	<div style="display: inline-block; vertical-align: middle;"> $\left. \begin{array}{l} 40 \\ 16 \\ 3 \\ 13 \\ -9 \end{array} \right\} 13$ </div>	<div style="display: inline-block; vertical-align: middle;"> $\left. \begin{array}{l} 15 \\ 19 \\ -12 \\ -6 \\ -17 \end{array} \right\} -1$ </div>
R-76	100	60	137	116	113	132	72	-6		
R-77	100	78	137	120	135	123	45	-14		
R-78	100	86	124	97	116	110	24	-14		
R-79	100	80	80	97	105	88	8	8		
R-80	-	86	100	107	97	87	1	-13	-20	-10
R-81	-	92	98	111	89	100	7	2	-12	11
R-82	-	63	57	87	62	75	12	19	-12	13
R-83	-	41	43	45	62	67	26	24	22	5
R-84	-	23	34	49	66	55	32	21	6	-11
Reach		Average Beach Width (Ft)					Average Shoreline Change (Ft)			
Naples Beach R-58A to R-60		55	117	-	144	127	72	10	-	-17
Naples Beach R-61 to R-79		89	141	106	123	139	50	-2	13	16
N. of Gordon Pass R-80 to R-84		61	66	80	75	77	16	10	-3	2
Monitoring Area R-58A to R-84		79	124	93	118	126	47	2	5	9

Shaded portion of chart represents 2005/2006 project area; darker shading represents the 2021 project area.

Table 8b. Volumetric Change R-58A through R-84 (Naples Beaches)

DEP Reference Monument	Effective Distance (Ft)	As-Built Volume (CY)					Volume Change (CY)			
		2005 to 2006	2010 to 2012	2013	2014 to 2016	2018-21	2005 to 1/2022	2006 to 1/2022	12/2014 to 1/2022	1/2021 to 1/2022
Pass to R-58A	473	21,740	25,400	6,480	5,800 (2018)	37,440 (2018)	27,250	27,110	-	3,250
R-58A to R-58	540			6,540			15,420	11,010	-	1,440
R-58 to R-59	985	22,220	44,000	10,380	25,000 (2018)	26,790	11,920	-7,120	-	-3,440
R-59 to R-60	1,085	17,240	(R58A-R60) * 86,100	3,920			8,690	20,000	2,740	-
R-60 to R-61	1,077	8,360	12,000	4,080	20,330	31,300	26,790	8,710	-	100
R-61 to T-62	1,020	7,040					11,860	4,570	-	3,140
T-62 to R-63	1,008	18,620	9,410	60	23,530	17,820	520	-	10,310	
R-63 to R-64	926	18,920					17,820	6,070	-	9,740
R-64 to T-65	782	8,690	19,270	6,040	19,270	26,690	5,090	-	5,220	
T-65 to R-66	825	10,420					19,270	6,040	-	5,530
R-66 to R-67	800	12,850	20,220	9,560	20,220	26,690	10,010	-	7,530	
R-67 to R-68	809	8,880					20,220	9,560	-	7,060
R-68 to T-69	811	9,550	2,630	4,540	57,330 (2021)	6,340	-1,700	-	2,630	
T-69 to R-70	798	16,950					-570	-12,010	-	460
R-70 to R-71	802	32,220	6,350	3,930	8,710	12,870	-5,360	-	2,070	
R-71 to R-72	803	33,310					3,930	5,010	-	3,180
R-72 to R-73	811	22,800	210	8,710	28,830	28,740	10,300	-	1,950	
R-73 to R-74	815	14,980					210	10,300	-	3,020
R-74 to R-75	789	13,120	15,290	6,200	15,290	6,600	6,200	2,150	1,080	
R-75 to R-76	800	15,110					6,600	-1,780	-650	-3,040
R-76 to R-77	798	18,150	10,080	21,760	16,740	21,760	6,590	3,590	350	
R-77 to R-78	765	12,200					16,740	8,980	5,540	2,540
R-78 to R-79	1,105	4,050	2,230	980	2,230	2,230	980	90	230	
R-79 to R-80	1,150						-15,720	-14,860	-13,750	-8,240
R-80 to R-81	1,077		-8,440	-14,230	-5,120	-8,370				
R-81 to R-82	874		6,490	1,550	6,620	-2,580				
R-82 to R-83	1,047		8,290	7,470	5,870	-4,720				
R-83 to R-84	960		12,890	12,820	5,070	-3,850				
Total Volume Change (CY)		South End of Monitoring Area								
Naples Beach Pass to R-60		61,200	148,650			74,590	33,740	-	-1,460	
Naples Beach R-60 to R-79		286,220	262,620			346,690	81,250	10,720	63,100	
North of Gordon Pass R-79 to R-84		0	-			3,510	-7,250	-1,310	-27,760	
Monitoring Area Pass to R-84		347,420	411,270			424,790	107,740	-	33,880	

Shaded portion of chart represents 2005/2006 project area; darker shading represents the 2021 project area. The 44,000 cubic yards (R58A-R60) project date was October 2013.

*Doctors Pass dredge volume placed in the nearshore from R-60 to R-62: 53,600 in 2006 and 32,500 in 2009.

Volumetric change quantities are not representative of design quantities for future beach renourishment projects rather an indication of erosion (negative value) or accretion (positive value) in the monitoring area.

Table 8c. Upland Volumetric Change R-58A through R-84 (Naples Beaches)

DEP Reference Monument			Upland Volume Change (CY)			
			2005 to 1/2022	2006 to 1/2022	1/2014 to 1/2022	1/2021 to 1/2022
			Doctors Pass			
Pass	to	R-58A	10,470	6,580	-	-10
R-58A	to	R-58	8,300	3,030	-	-1,030
R-58	to	R-59	11,380	-130	-	-3,010
R-59	to	R-60	15,690	5,920	-	-560
R-60	to	R-61	17,410	11,440	-	2,330
R-61	to	T-62	16,570	10,190	-	4,760
T-62	to	R-63	12,750	6,090	-	6,870
R-63	to	R-64	8,960	3,990	-	5,530
R-64	to	T-65	6,150	2,410	-	3,810
T-65	to	R-66	8,340	2,910	-	4,000
R-66	to	R-67	12,120	4,810	-	4,460
R-67	to	R-68	12,000	5,410	-	4,960
R-68	to	T-69	8,750	3,130	-	4,270
T-69	to	R-70	7,870	0	-	3,900
R-70	to	R-71	10,190	-900	-	3,500
R-71	to	R-72	13,650	1,550	-	2,860
R-72	to	R-73	14,600	5,600	-	2,960
R-73	to	R-74	15,570	7,460	-	4,100
R-74	to	R-75	12,680	3,540	2,010	2,590
R-75	to	R-76	9,420	110	2,870	-20
R-76	to	R-77	11,210	1,990	3,160	-390
R-77	to	R-78	8,410	2,000	5,370	-620
R-78	to	R-79	5,630	1,820	4,420	-1,150
R-79	to	R-80	2,300	880	-1,960	-700
R-80	to	R-81	1,160	-470	-100	1,020
R-81	to	R-82	1,550	1,020	-40	1,150
R-82	to	R-83	2,070	1,740	-1,770	-230
R-83	to	R-84	2,110	1,350	-460	-1,240
Total Volume Change (CY)			South End of Monitoring Area			
Naples Beach Doctors Pass to R-60			45,840	15,400	-	-4,610
Naples Beach R-60 to R-79			212,280	73,550	17,830	58,720
North of Gordon Pass R-79 to R-84			9,190	4,520	-4,330	0
Monitoring Area Pass to R-84			267,310	93,470	13,500	54,110

Shaded portion of chart represents 2005/2006 project area; darker shading represents the 2021 project area.

Table 8d. Advance Nourishment Remaining R-58A through R-79 (Naples Beach)

Monument	Beach Width				Advance Nourishment Remaining				Eroded into Design Template
	2006 (Feet)	2014 (Feet)	2021 (Feet)	2022 (Feet)	2006 (Feet)	2014 (Feet)	2021 (Feet)	2022 (Feet)	
R-58A	78	71	179	178	0	0	79	78	-
R-58	134	124	124	90	34	24	24	0	Yes
R-59	146	111	152	124	46	11	52	24	-
R-60	108	126	119	115	8	26	19	15	-
R-61	129	158	141	153	29	58	41	53	-
T-62	122	136	106	125	22	36	6	25	-
R-63	120	87	95	124	20	-13	-5	24	-
R-64	119	103	108	121	19	3	8	21	-
T-65	136	122	98	124	36	22	-2	24	-
R-66	148	119	130	149	48	19	30	49	-
R-67	184	171	160	187	84	71	60	87	-
R-68	145	163	140	161	45	63	40	61	-
T-69	140	149	113	134	40	49	13	34	-
R-70	167	124	100	123	67	24	0	23	-
R-71	178	129	121	147	78	29	21	47	-
R-72	196	158	146	167	96	58	46	67	-
R-73	129	158	142	157	29	58	42	57	-
R-74	157	145	146	182	57	45	46	82	-
R-75	135	100	125	140	35	0	25	40	-
R-76	137	116	113	132	37	16	13	32	-
R-77	137	120	135	123	37	20	35	23	-
R-78	124	97	116	110	24	-3	16	10	-
R-79	80	97	105	88	-20	-3	5	0	Taper
Average Naples Beach (North) R-58A to R-60:					22	15	44	29	
Average Naples Beach R-61 to R-79:					41	29	23	40	

“Taper” indicates a monument located with the fill template taper to the existing beach. Gray shading shows the most recent nourishment of the reach or the December 2014 segmented filling extents.



VI. SUMMARY

A minimum beach width standard established in 2003 was applied to design the 2006 project. This standard distance represented the minimum total beach design width at each reference monument, and was measured from a fixed *Baseline* set at the seawall, edge of vegetation, building line or an equivalent feature representing the landward limit of sandy beach in 2003. The distance varied throughout the project from 85 feet at Park Shore and Clam Pass Beach to 100 feet at Vanderbilt, Pelican Bay, and Naples Beaches. **Figures 4a through 4c** plot the beach width at each reference monument for the five segments of the project area (Vanderbilt, Pelican Bay, Clam Pass Park, Park Shore, and Naples) with the corresponding *Design Standard* beach width. The graph also shows the project area, associated average beach width, and highlights the portions of the beach below the *Design Standard* during the January 2022 monitoring survey in a darker shade of gray.

In addition to **Figures 4a through 4c**, **Appendix F** provides an accounting of beach width by DEP monuments relative to the *Design Standard* on an annual basis. The relative width over time provides an illustration of the trend in beach width over time. These trends are also considered when evaluating areas for recommended nourishment.

Figures 4a through 4c also show, as a black dashed line, the average beach width within each segment of the project area for comparison to the *Design Standard*. It is important to consider this localized variability in erosional areas in planning beach management strategies because localized erosional areas may simply be temporary features tending to migrate along the coast as sand waves (or sand-deficit waves), and the performance of the beach fill should not be expected to be uniform throughout the project area from one survey to the next. Additionally, erosion may appear concerning following weather events and should be monitored to evaluate recovery or determine if there is a sand deficit. Erosional areas persisting for long periods of time or covering a majority of the project area, may become problematic and should be investigated to determine the cause and addressed accordingly.

Monuments R-17 through R-21 shown in the left side of **Figure 4a** are within the State Park Boundary and not part of the Collier Beach Nourishment project. Wiggins Pass was dredged in 2018 and sand was placed in the nearshore both north and south of the inlet as evidenced by the spike in beach width at monument R-19 in **Figure 4a**. The balance of the park remains below the Vanderbilt Beach *Design Standard* of 100' as the sand placed near R-19 continues to equilibrate. Wiggins Pass was dredged in February 2022, after the January 2022 monitoring survey and therefore not analyzed as part of this report, and sand was placed on the beach north and south of the inlet offsetting losses.

Nourished in 2021, all the monuments in Vanderbilt Beach have widths above the *Design Standard*, as well as the majority of monuments within Pelican Bay Beach as shown in **Figure 4a**. Although within the fill template monument R-36 is located at the south end of the fill template taper and monument R-37 is located at the terminus of the permitted template. The reach from R-36 to R-37 should benefit from the north to south net sediment transport as the fill placed from R-33 to R-36 equilibrates.

The dynamic reach located on either side of Clam Pass, from monuments R-38 south to R-43, have widths varying from 72 to 110 feet ([Tables 6a,7a](#)). The beach south of the inlet was nourished in late 2019, and both sides of the inlet were regraded in 2020. In March/April 2022 during the writing of this report, the pass was dredged with sand placed to the north and south of the inlet. This portion of the beach adjacent to Clam Pass will be monitored and addressed along with the management of the inlet.

Figure 4a. Shoreline Analysis R-17 to R-41

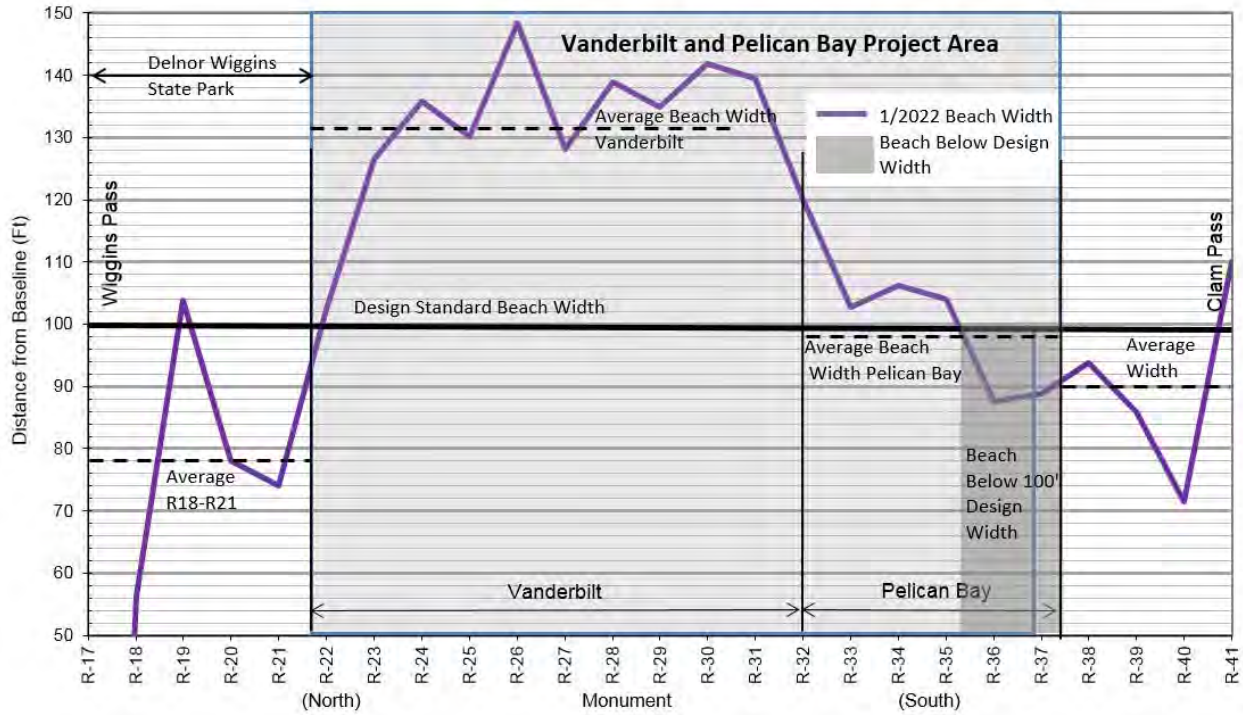
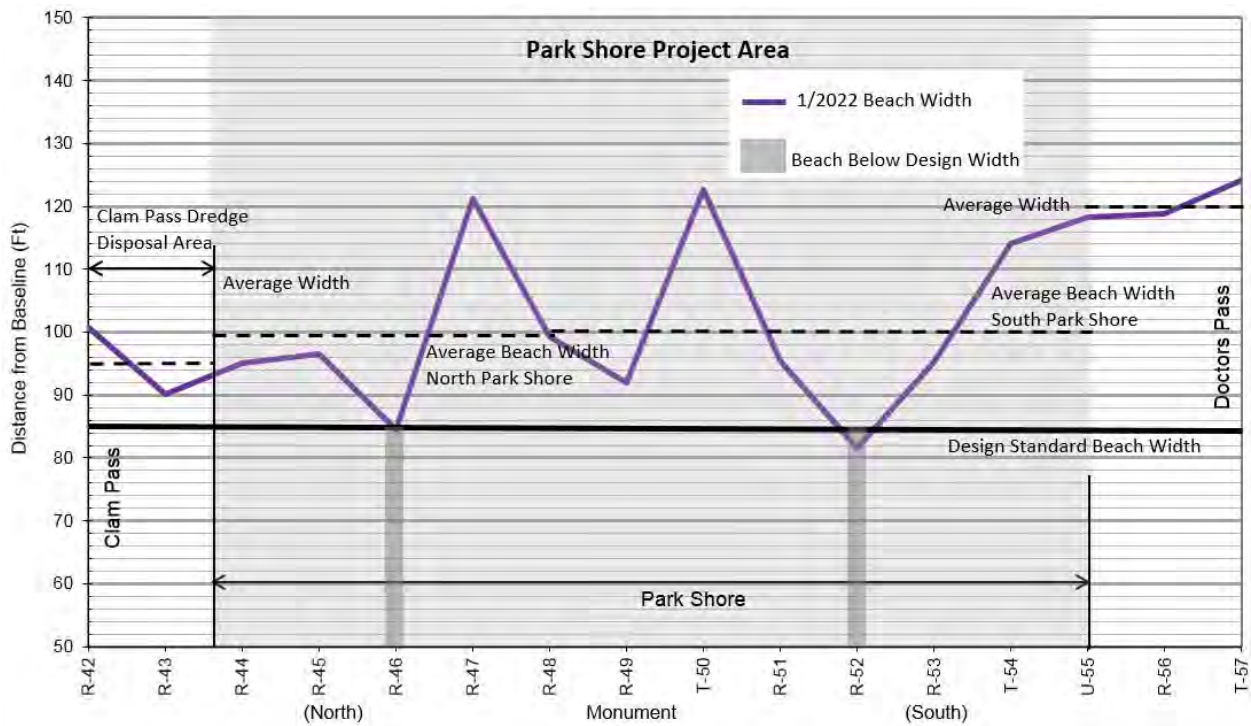


Figure 4b. Shoreline Analysis R-42 to R-57

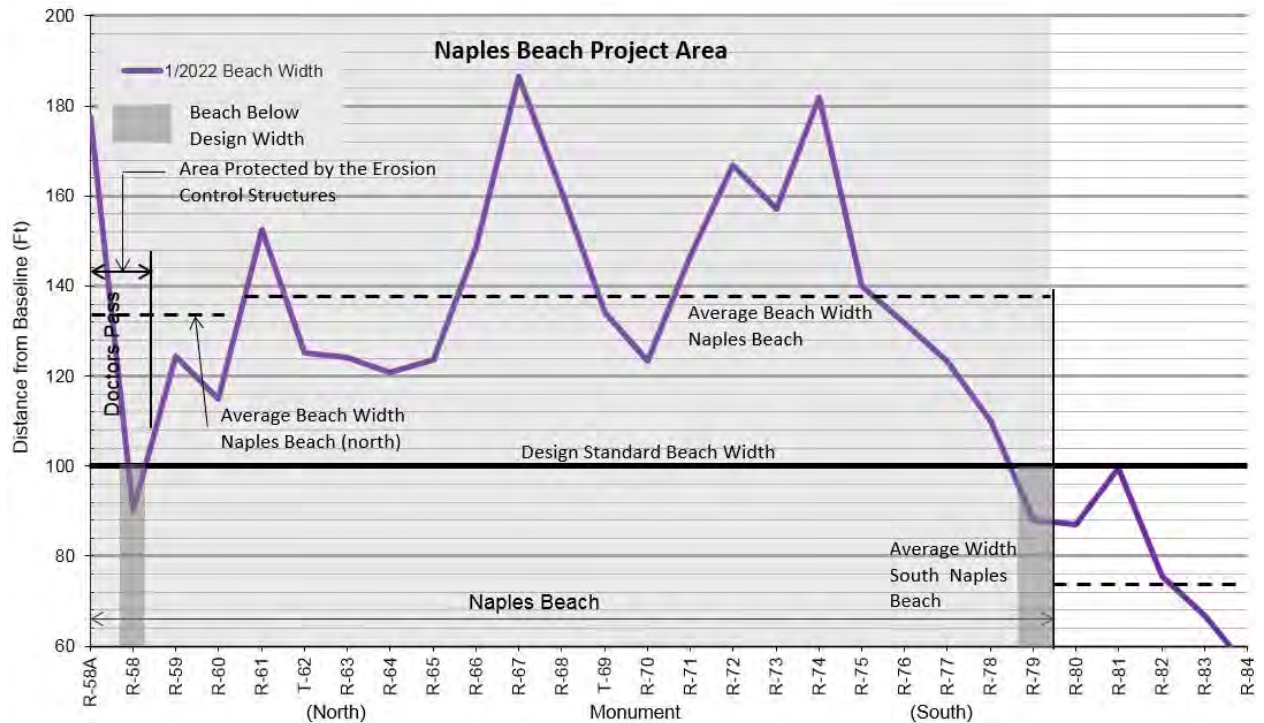


Park Shore Beach, shown in **Figure 4b**, was nourished in late 2019 and has an average width approximately 15 feet above the *Design Standard* width of 85 feet with two monuments just below the *Design Standard*. Although the reach lost volume over the entire active profile in 2021, the reach has generally gained volume in the upland during the same time period. The reach adjacent to Doctors Pass, south of Park Shore, shows erosion in the most recent monitoring period, and has an average width of almost 20 feet above the *Design Standard* for Park Shore Beach.

Shoreline analysis for Naples Beach is shown in **Figure 4c**. The north end of Naples Beach was nourished in late 2020, and has an average width approximately 27 feet above the *Design Standard*, with one monument below the *Design Standard* in the dynamic area adjacent to the rehabilitated groin. The reach retained on average 75% (22 vs. 29; Table 8d) of the advance fill. This area includes erosion control structures designed to gradually release sand to the south, and will be reviewed under a separate, more detailed monitoring survey to be collected in October 2022. Naples Beach from R-61 south to R-79, partially nourished in 2021, has an average width almost 40 feet (139; Table 8a) above the *Design Standard* with only the southernmost monument below the *Design Standard*. During the writing of this report, the reach from R-60 to R-62 was nourished with sand dredged from Doctors Pass.

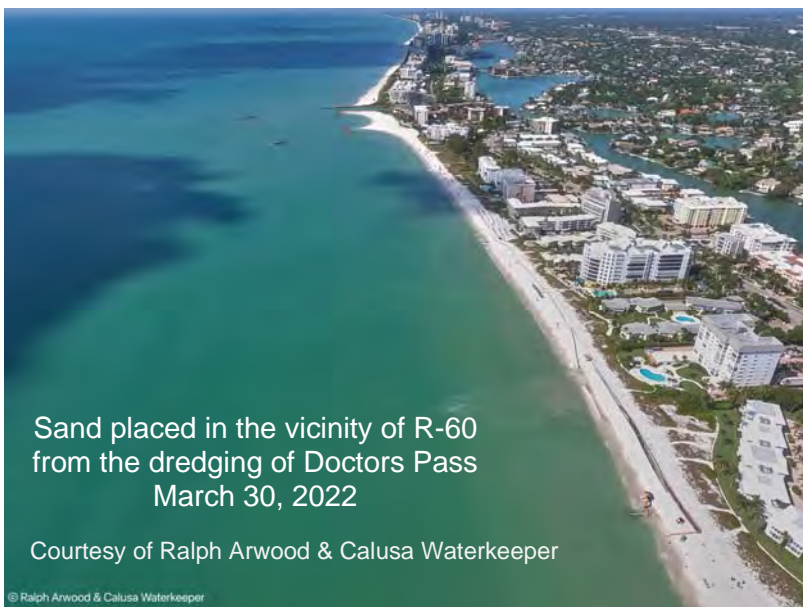
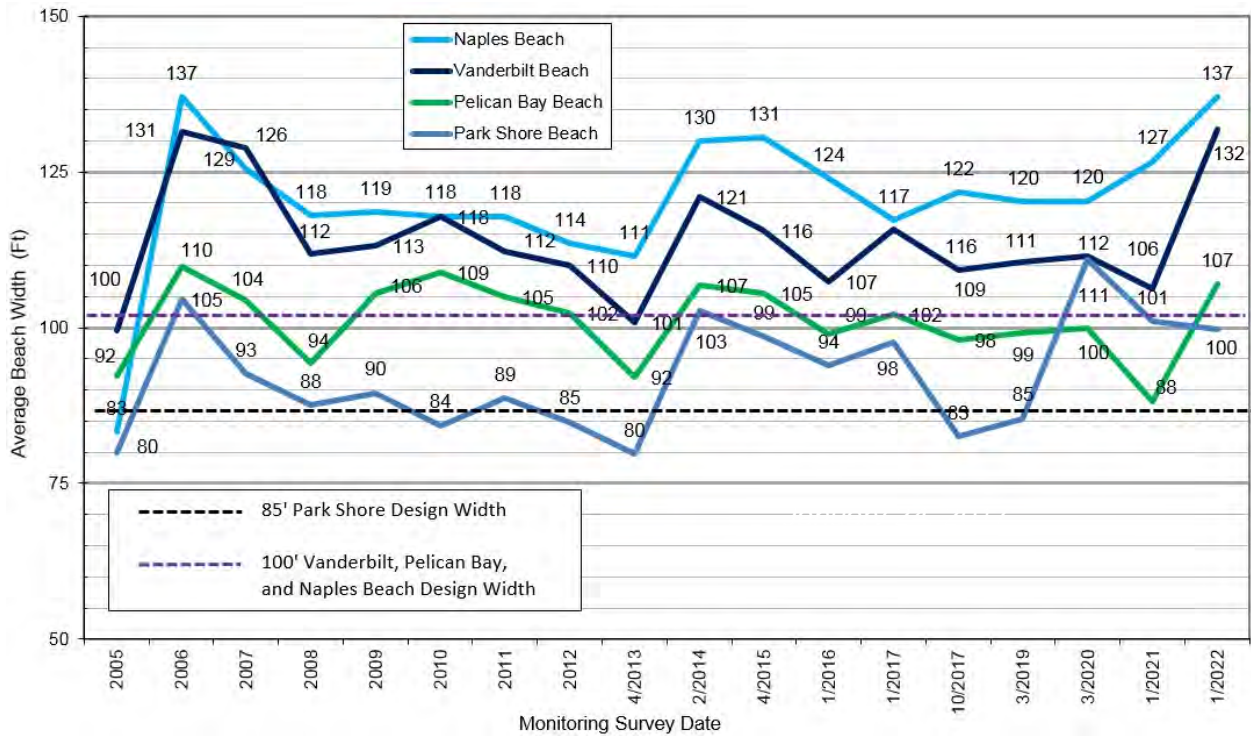
Although the reach south of the project area, from R-80 to R-84 shows a negligible change in beach width in the most recent monitoring period, the average width is 23 feet below (77; Table 8a) the 100 foot *Design Standard* to the north. The reach lost volume over the entire profile in the most recent monitoring period likely due to changes in the nearshore bar.

Figure 4c. Shoreline Analysis R-58A to R-84



The average beach width for each project area was plotted vs. time in **Figure 5**. The general recession of the post-construction beach is evident in the section of the lines from 2006 to 2013 and the subsequent rise due to the 2014 and 2016 renourishment for Vanderbilt Pelican Bay, and Park Shore Beaches. Naples Beach has maintained an average width well above the 100 foot *Design Standard* since the 2006 project was constructed, Vanderbilt shows the same trend, while Pelican Bay Beach currently has an average width above the 100 foot *Design Standard*, it has been above and below the standard in the past. As a consequence of the 2019 nourishment project, Park Shore Beach has an average width approximately 15 feet higher than the 85 foot *Design Standard*.

Figure 5. Average Beach Width & Design Standard vs. Time



Volume change and volumetric as-built information are summarized in **Table 9**. Column C4, *Total Volume Added*, is the addition of Columns C2 and C3 showing the as-built volume for projects constructed from 2005 to 2021. Column C5 shows the volume change from 2005 to 2022 based on the monitoring surveys. Column C6 shows Column C5 vs. Column C4 to show the percent of volume remaining over the entire beach profile from the *Baseline* to DOC. Approximately 60% (**62%**) of the fill placed since 2005 remains in the active beach profile. In areas such as Park Shore much of the volume is due to the shifting of the nearshore bar and seasonal changes as evidenced on the beach profiles shown in **Appendix D**.

Table 9. Volume Change Summary 2005-2022

C1	C2	C3	C4	C5	C6
Project Area	Volume (CY)				Total Volume Remaining from All Nourishment Projects 2005-2021 (%)
	Volume As-Built	Volume As-Built	Tot. Vol. Added	Tot. Vol. Change	
	2005 to 2006	2006 to 1/2022	2005 to 1/2022	2005 to 1/2022	
Vanderbilt	130,460	192,180	322,640	211,220	65%
Pelican Bay	47,990	53,260	101,250	67,760	67%
North Park Shore	27,710	159,200	186,910	91,070	49%
Park Shore	114,040	86,220	200,260	175,290	88%
Naples (R58A-R60)	61,200	148,650	209,850	74,590	36%
Naples (R60-R79)	286,220	262,620	548,840	346,690	63%
Totals:	667,620	902,130	1,569,750	966,620	62%

Volumetric change quantities are not representative of design quantities for future beach renourishment projects rather an indication of erosion (negative value) or accretion (positive value) in the monitoring area.

As-Built Volume for the 2006 project based on Tables by CPE shown in **Appendix E** and **Tables 6b, 7b, and 8b**.

The highly dynamic Clam Pass Park beaches, added to the project in 2017, are not considered in this Table.

Vanderbilt, Pelican Bay and Naples were nourished in 2021 having a percentage remaining of over 60% (**65, 67, 63**), while North Naples has the lowest total volume remaining, 36% (**36**). It should be noted North Naples Beach is located immediately south of the Doctors Pass and sand bypasses this area and attaches to the shoreline further south. The erosion control structures placed in 2018 south of Doctors Pass will help to manage release of sand from this area to the south. This is worth considering in management strategy because sand placed in the northernmost reach will tend to feed the beaches in the more southern project reaches. This area should be considered for beach fill in future maintenance dredging of Doctors Pass. The north to south net sediment transport is evident in Park Shore Beach as North Park Shore (**49%**) feeds South Park Shore (**88%**).

VII. AERIAL IMAGES

The 2021 rectified aerial image files required under the monitoring plan and provided by the Collier County Property Appraiser’s Office, in Mr. Sid format referenced to the NAD83 datum in feet Florida East Zone, and were submitted to the Department on March 23, 2021. The rectified images for 2022 will be submitted upon availability at the Appraiser’s office.

VIII. ENVIRONMENTAL

The permittee has reviewed the specific Reasonable and Prudent Measures (RPMs) and Terms and Conditions in the Revised Statewide Programmatic Biological Opinion (SPBO) dated 13 March 2015 and the Piping Plover Programmatic Biological Opinion (P3BO) dated 22 May 2013, and agreed to follow the measures included to minimize impacts to nesting sea turtles and the piping plover. Collier County (permittee) is currently conducting the sea turtle nesting monitoring program headed by Maura Kraus (MauraKraus@colliergov.net) and the shorebird monitoring program headed by Christopher D'Arco (ChristopherDarco@colliergov.net). The programs include the following:

- Sea turtle nesting monitoring is an ongoing program with the County including escarpment surveys.
- Shorebird monitoring will be conducted by the County including breeding and non-breeding birds, piping plovers and red knots. Annual shorebird data reports for the County are anticipated to be submitted by fall of 2021.
- Compaction testing and subsequent tilling is conducted by the County.
- Results of the surveys are submitted to the appropriate agencies.
- Educational material including signage, flyers, kiosks, etc. are continually reviewed and improved in part by County staff.
- Pre-construction meetings are held prior to the start of any project. Shorebird and sea turtle monitoring procedures during construction are discussed and implemented accordingly.
- In 2013 the County adopted and implemented a hardbottom biological monitoring plan (modified in 2018) including annual reporting and agency submittal.
- The County continues to make every effort to maintain compliance with the conditions of the SPBO and the P3BO, and the conditions of the associated Corps and DEP permits.

Sea turtle monitoring reports, lighting guidelines, and Fish and Wildlife Conservation Commission Codes and Technical Reports are posted on the County website:

<http://www.colliergov.net/your-government/divisions-f-r/parks-and-recreation/sea-turtle-protection/publications-reports>

The Collier County Coastal Zone Management provides information to the public on a wide variety of coastal programs and projects:

<http://www.colliergov.net/your-government/divisions-a-e/coastal-zone-management>

And information on protected species:

<http://www.colliergov.net/your-government/divisions-a-e/environmental-services/protected-species>

Although the protection measures for the eastern indigo snake will be incorporated into the project during the pre-construction phase, there is no vegetation removal or clearing involved in this beach nourishment project.

The 2021 Collier Beach Nourishment project was constructed from November 2021 to January 2022 from the upland, with truck hauled sand. There were no impacts to seagrass, hardbottom reef habitat, historical/archeological/cultural materials, shorebirds or manatees.

IX. CONCLUSIONS

The following conclusions are presented for the Collier County beach segment from Wiggins Pass south to north of Gordon Pass.

Although shoreline recession continues at monument R-17 located in the reach south of Wiggins Pass in Delnor-Wiggins State Park, the reach continues to equilibrate from the placement of sand in 2018 showing a loss of 18,000 cubic yards from the disposal area. Excluding the shoreline recession at R-17, the reach has an average width just under 80 feet and an associated volumetric loss of almost 38,000 cubic yards in this most recent monitoring period over the entire active beach profile. Wiggins Pass was dredged in February 2022, after the January 2022 survey for this report, sand was placed on the beach north and south of the inlet. Additionally, the County is in the process of modifying the permit to allow upland placement of sand in the vicinity of R-17 as well as other reaches within the preserve to the north, and the park to the south.

Vanderbilt Beach has beach widths above the *Design Standard* throughout the reach from R-22 south to R-32, and an average width 30 feet higher than the 100-foot standard, gaining 25 feet on average since last year due to the recent nourishment project. The reach shows a volumetric gain of over 77,000 cubic yards over the entire profile from the *Baseline* to the DOC, and shows a volumetric gain above the MHWL of 41,000 cubic yards. **Based on the January 2022 monitoring data, Vanderbilt Beach is not recommended for nourishment this year.**

Pelican Bay Beach from R-33 to R-37 has three monuments above the standard width and two monuments below, averaging 98 feet in width and gaining 18 feet on average since last year due to the recent nourishment project. Monuments R-36 representing the southern terminus of the 2021 fill template and R-37 the southern end of the permitted fill template have widths below the *Design Standard*, but will likely benefit from the north to south net sediment transport in the area as the fill placed from R-33 to R-36 equilibrates. **Based on the January 2022 monitoring data, Pelican Bay Beach is not recommended for nourishment this year.**

Clam Pass Beach was regraded on both the north and south side in April and December 2020 and more recently the pass was dredged with sand placed to the north and south in March 2022 after the January 2022 survey for this report. Also, the beach on the south side of the pass was nourished as part of the 2019 Park Shore Nourishment Project. **Although nourishment is not recommended, the dynamic beaches north and south of Clam Pass are monitored as part of the Clam Pass maintenance dredging permit (0296087-001-JC) under the purview of the Pelican Bay Service Division of Collier County.**

Park Shore Beach from R-44 to T-54 was nourished with approximately 130,000 cubic yards of sand as part of the 2019 truck-haul project. Two of the eleven monuments in the reach are below the *Design Standard*, and considering the entire active beach profile there have been volumetric losses in the most recent monitoring period. Generally, the *Design Standard* beach width is being maintained in this reach averaging 100 feet in width, as well as the beach north of Doctors Pass averaging 120 feet in width. **Based on the January 2022 monitoring data, Park Shore Beach is not recommended for nourishment this year.**

Naples Beach (north) from R-58A to R-60, not nourished as part of the 2016, 2019 or 2021 truck haul projects, received approximately 30,000 cubic yards of sand dredged from Doctors Pass in 2018 placed in the nearshore. (The majority of the sand was placed near Lowdermilk Park at R-60 and the balance placed near the south jetty at Doctors Pass.) The reach from the Doctors Pass south jetty to R-60 was nourished with sand in late 2020, and during the writing of this report the reach from R-60 to R-62 was nourished with sand dredged from Doctors Pass. In spite of having one monument below the *Design Standard*, R-58 located in a dynamic area near the rehabilitated groin, the average width of the reach is 27 feet above the *Design Standard* and the volumetric change for the reach, considering the entire profile, shows a moderate loss of 1,500 cubic yards. **Based on the January 2022 monitoring data, Naples Beach (north) is not recommended for nourishment this year.**

Naples Beach from R-61 south to R-79 has one monument below the standard width at the southern terminus of the permitted fill template, an average width almost 40 feet above the 100-foot standard, while gaining an average of 16 feet in width since last year due to the recent nourishment project. The reach shows a gain in volume over the entire active profile from the *Baseline* to the DOC of just over 63,000 cubic yards and an associated gain in volume above the MHWL of almost 59,000 cubic yards. The reach from R-75 south to R-79 generally shows stability in the most recent monitoring period, with a negligible change in average width and volume of the entire active beach profile. **Based on the January 2022 monitoring data, Naples Beach is not recommended for nourishment this year.**

The reach south of the project area has 4 of 5 monuments below the *100-foot Design Standard* and lost volume over the entire profile in the most recent monitoring period. Stability of this segment is important in anchoring the south end of the Naples project at R-79. **Monitoring of the reach from R-79 to R-84 is recommended.**

Including the inlet dredging projects, over 2.0 million cubic yards (2,075,170; Table 1) of sand were placed in the monitoring area since 2005 with over 1.6 million (1,632,740; Table 1) in the project area. In January 2022 approximately 1,034,820¹⁴ cubic yards of sand remain in the monitoring area or approximately 50%.

¹⁴ Volume Change 2005 to 2022: 1,034,820=294,380+315,650+424,790; Tables 6b,7b,8b

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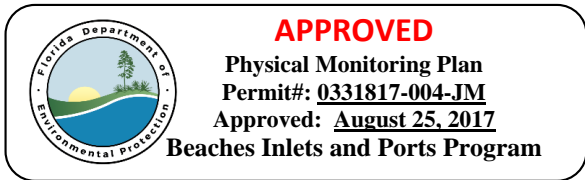
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Appendix A
Monitoring Plan – August 2017



Attachment No. 37-1
Physical Monitoring Plan
August 2017

Physical monitoring of the Collier County Beach Renourishment Project requires the acquisition of project-specific data to include, at a minimum, topographic/bathymetric surveys of the beach, offshore, and borrow site areas. The monitoring data is necessary in order for both the project sponsor(s) and the Department to regularly observe and assess, with quantitative measurements, the performance of the project, any adverse effects which have occurred (e.g. to adjacent shorelines), and the need for any adjustments, modifications, or mitigative response to the project. The scientific monitoring process also provides the project sponsor(s) and the Department, information necessary to plan, design, and optimize subsequent follow-up projects; potentially reducing the need for and costs of unnecessary work, as well as potentially reducing any environmental impacts that may have occurred or be expected.

This plan is a detailed Monitoring Plan required by FDEP (Permit No. 0331817-004-JM). Dredging of Doctors Pass is anticipated to occur every 4 years. Specific requirements are as follows:

- a. Pre-construction topographic and bathymetric profile surveys of the beach and offshore shall be conducted within 90 days prior to commencement of construction. Surveys conducted for purposes of construction bidding and contracting may be used to provide pre-construction conditions. When only a partial project is constructed, pre-construction surveys can be limited to the construction area plus 5,000 feet north and south or to the edge of the nearest inlet.

Post-construction topographic and bathymetric profile surveys of the beach and offshore shall be conducted within 60 days following completion of construction of the project. Surveys conducted for purposes of construction contracting and payment may be used to provide immediate post-construction conditions. When only a partial project is constructed, post-construction surveys can be limited to the construction area plus 5,000 feet north and south or to the edge of the nearest inlet.

Thereafter, topographic and bathymetric monitoring surveys shall be conducted biennially until the next beach nourishment event or the expiration of the project design life, whichever occurs first. The monitoring surveys shall be conducted during a winter or spring month and repeated as close as practicable during that same month of the year. If the time period between the immediate post-construction survey and the first annual monitoring survey is less than six months, then Collier County may request a postponement of the first monitoring survey until the following winter or spring. If the monitoring survey falls within 6 months of construction, it may substitute for the pre-construction survey. In the event that a post-storm survey of the project monitoring area is conducted, this post-storm survey may serve as a biennial monitoring survey.

The monitoring area shall include profile surveys at each of the Department of Environmental Protection's reference monuments within the bounds of the beach fill area

and along up to 5,000 feet on the adjacent shoreline on both sides of the beach fill area. For this project, this will include DEP reference monuments in Collier County from R-17 to R-84 inclusive. An intermediate profile is established south of Doctors Pass, and labeled R-58A.

FDEP profile lines R-58A, R-58, R-59, R-60, R-60+518, R-61, R-61+408, R-61+816, and R-62 shall be surveyed within 90 days prior to commencement of a Doctors Pass dredging operation and within 60 days following the completion of a dredging operation. Only the profiles associated with the disposal area used and one profile to the south needs to be surveyed. These profiles shall be integrated with annual monitoring where practical.

Additional lines are to be surveyed within 90 days prior to commencement of a renourishment project in the Park Shore extension area (near Clam Pass between R-42 to R-43+500) and within 60 days following the completion of placement. Bathymetric and topographic surveys in the vicinity of Clam Pass in support of nourishment of the extended Park Shore placement area (near Clam Pass) will take place in Segments A and B at approximately 100 foot intervals and at intermediate points between existing R-monuments. Special survey lines shall be surveyed in the vicinity of Clam Pass Park to document the potential impact to inlet stability by beach nourishment in the extended Park Shore reach, inlet dredging disposal within the south Clam Pass disposal area, or natural forces. Additional beach profile surveys will be taken at R-41+470, R-42-250 and R-42+500. The cross sections in Segment A (inlet throat) include station 0+00, 1+00, 2+00 and 3+00. Segment B consists of Stations 4+10, 5+10 and 6+10. These segments should be the first to show instability in the inlet due to various causes. The survey will occur pre- and post-construction and 1-year and 2- year post construction of the Nourishment Project in Clam Pass Park north of R-44+500, or until the next maintenance dredging of Clam Pass, whichever occurs first.

Profile surveys shall extend landward to the seawalls or 50 feet landward of the 5.0' contour line. Profile surveys will extend seaward to the -14.3' NAVD contour or 2,000 feet from the shoreline, whichever is the greater distance. All work activities and deliverables shall be conducted in accordance with the Department's May 2014 *Monitoring Standards for Beach Erosion Control Projects, Sections 01000 - Beach Profile Topographic Surveying* and *01100 - Offshore Profile Surveying*.

b. Bathymetric surveys of borrow area T1 are not required. Borrow Area T1 is located approximately thirty-three (33) miles to the northwest and offshore of the placement area, outside of State waters, and is not covered under the State permit requirements. No post-construction survey of Borrow Area T1 is planned, other than the survey performed by the dredger using a registered Florida surveyor.

c. Bathymetric surveys of Doctors Pass are required pre- and post-construction as well as annually for monitoring purposes. A pre-construction bathymetric profile survey of Doctors Pass and Moorings Bay shall be conducted within 90 days prior to

commencement of a dredging operation. A post-construction bathymetric profile survey shall be conducted within 60 days following the completion of a dredging operation. If the Contractor's pay survey of the inlet meets the requirements of post-construction survey as stated below, Contractor's pay survey(s) will be submitted as the post-dredge survey. These surveys can be integrated with annual monitoring where required. Between dredging operations, monitoring surveys shall be conducted biennially until the permit expires. The monitoring surveys shall be conducted during the same month that the previous post-construction survey was taken. The monitoring area shall include channel profile surveys at the lines appearing in Figure 1 and on Tables 1-5. As a minimum, profile surveys shall extend to the limits indicated in Figure 1 and on Tables 1-5. All work activities and deliverables shall be conducted in accordance with the Department's May 2014 *Monitoring Standards for Beach Erosion Control Projects, Sections 01000 – Beach Profile Topographic Surveying* and *01100 – Offshore Profile Surveying*.

d. The Permittee shall submit electronically an engineering report and the monitoring data to the Division of Water Resource Management within 90 days following completion of the post-construction survey or biennial monitoring survey. The survey data and control information shall be submitted electronically in accordance with the Department's paperless initiative, in an ASCII format stored as specified in the Department's May 2014 *Monitoring Standards for Beach Erosion Control Projects, Sections 01000 - Beach Profile Topographic Surveying* and *01100 - Offshore Profile Surveying*.

The report will summarize and discuss the data, the performance of the beach fill project, and identify erosion and accretion patterns within the monitored area. Results should be analyzed for patterns, trends, or changes between surveys and cumulatively since project construction. In addition, the report shall include a comparative review of project performance to performance expectations and identification of adverse impacts attributable to the project. The report shall specifically include:

- The record of volume and location of beach nourishment and beach placement of inlet sand bypassing material.
- The volume and percentage of advance nourishment lost since the last beach nourishment project as measured landward of the MHW line of the most recent survey;
- The most recent MHW shoreline positions (feet) in comparison with the design beach width at each individual monument location;
- The MHW shoreline position changes (feet) relative to the pre-construction survey at each individual monument location for all the monitoring periods;
- The total measured remaining volume (cy) in comparison with the total predicted remaining volume (cy) above the MHW line and above the Depth of Closure for the entire project area over the successive monitoring periods; and,
- Other shoreline position and volumetric analysis the Permittee or engineer deem useful in assessing, with quantitative measurements, the performance of the project.

The report shall include computations, tables and graphic illustrations of volumetric and shoreline position changes for the monitoring area. An appendix shall include superimposed plots of the two most recent beach profile surveys, the design profile and pre- and post-construction beach profile at each individual monument location.

The approved Monitoring Plan can be revised at any later time by written request of Collier County and with the written approval of the Department. If the project is constructed in separable reaches or if one or more reach is eliminated, the monitoring limits shall be modified, accordingly.

When evaluating the performance of beach renourishment in the extended Park Shore Placement Area (near Clam Pass) the following should be taken into consideration: The purpose of nourishment in Clam Pass Park is to restore erosion losses since 1999 by maintaining a beach width from the baseline of 80 feet, while the purpose of Clam Pass dredging is to restore the alignment of Clam Pass to the previously approved location and to conduct periodic maintenance dredging of a portion of the Clam Pass Channel in order to maintain tidal exchange between Clam Bay and the Gulf of Mexico. A number of parameters are provided in the NRPA Management Plan (2014) for consideration for determining whether to consider maintenance dredging. These include tidal range data, cross sectional areas in Sections A, B and C of the inlet and flood shoal, volume of shoaled material, inlet length and ebb shoal location. The amount of sand to be dredged during each maintenance dredge event will be based on a pre-construction survey conducted prior to each maintenance event. The inlet throat (Segment A) will be graded as necessary to shape the inlet so that it closely mimics the natural inlet cross section at stable inlet conditions. The beach-compatible sand will be placed north of the Pass, along Pelican Bay Beach, and south of the Pass, along Clam Pass Park Beaches. Analysis of post-nourishment physical monitoring data will evaluate shoaling rates within the Clam Pass dredging template including Sections A, B and C. The shoaling rates and inlet stability parameters will be compared to critical conditions as identified in the Clam Pass NRPA Management Plan.

f. Monitoring reports and data will be submitted to the FDEP, Division of Water Resources Management, JCP Compliance Officer, in Tallahassee. The report and individual submittals will be labeled at the top of each page: "This monitoring information is submitted in accordance the approved Monitoring Plan for Permit No. [XXXXX-XXX-JC] for the monitoring period [XX]."

Physical Monitoring Summary

Monitoring Task	Pre-Project	Post-Project	1st Year	2nd Year	3rd Year	4th Year
Beach Profile Surveys ^{1,2} R-17 to R-84	X	X ⁴		X		X
Bathymetric Surveys ³ Borrow Area T1		X				
Bathymetric Surveys Doctors Pass	X	X				
Bathymetric Surveys ⁵ Clam Pass	X	X	X	X		
Monitoring Report		X		X		X

¹Surveys from R-17 to R-21 may be conducted as part of the Wiggins Pass Maintenance Dredging Project during years when surveys are required by both projects.

²Intermediate profile R-58A included.

³Borrow Area T1 resides in Federal Waters, and the County requires the Contractor to conduct a post-construction survey by a Florida registered surveyor.

⁴When only a partial project is constructed, pre- and post-construction surveys can be limited to the construction area plus 5,000 feet north and south or to the edge of the nearest inlet.

⁵Clam Pass is surveyed when sand is placed by nourishment activities north of R-44+500

Reference

Bureau of Beaches and Coastal Systems (BBCS), *Monitoring Standards for Beach Erosion Control Projects*, May 2014.

Turrell, Hall & Associates, Inc., 2014. Clam Bay NRPA Management Plan, Version 6.5, November 2014.

Appendix B
2021 Nourishment
Completion and Certification

February 23, 2022

Submitted via email to: JCPCompliance@dep.state.fl.us

JCP Compliance Officer
Florida Department of Environmental Protection
Division of Water Resource Management
2600 Blair Stone Road, MS 3544
Tallahassee, Florida 32399-2400

**Subject: Completion and Certification Statement for 2021-2022 Collier County Beach
Renourishments: Naples, Vanderbilt, & Pelican Bay Beaches, Collier County, FL
FDEP Permit No. 0331817-004-JM**

Dear JCP Compliance:

This letter is being provided in compliance with General Condition No. 11 of the subject FDEP permit. Construction of the 2021-2022 Collier County Beach Renourishments of Naples, Vanderbilt, and Pelican Bay beaches via truck haul methods commenced on November 1, 2021, and was completed, including demobilization of construction equipment from the project site, on January 24, 2022. This letter is a statement of final project completion and certification for sand placement and is based upon periodic site visits by the engineer, construction observations by Collier County (County) inspectors, the contractor's construction reports, and review of before- and after-placement surveys.

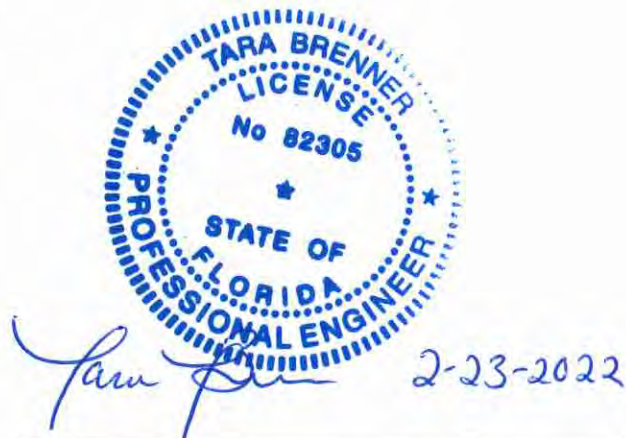
All constructed locations and elevations have been verified to be within limits specified by the permit including a + 0.5 ft vertical construction tolerance and deviations along the submerged portion of the template slope or back beach were reviewed and waived. The activities authorized by the permit have been performed in compliance with the plans and specifications approved as part of the permit and all conditions of the permit. During construction, the distribution of fill within the planned project reaches was modified within the limits of the permitted template to address changes in the beach that occurred since the pre-construction survey as approved by the County.

The post-construction surveys have been collected and the post-construction report is forthcoming in compliance with the project permits. Profile plots showing the comparison of before-placement, after-placement and permitted limits referenced to the project baseline are provided in Enclosure A.

If you have any questions, please contact Collier County or me.



Sincerely,

A circular blue ink seal for Tara Brenner, License No. 82305, State of Florida Professional Engineer. The seal is stamped over a handwritten signature in blue ink that reads "Tara Brenner" and the date "2-23-2022".

TARA BRENNER
LICENSE
No 82305
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Tara Brenner 2-23-2022

Tara Brenner, PG, PE Date

FL P.E. No. 82305

Senior Coastal Engineer

Coastal Protection Engineering LLC

Mobile: 631-896-9137

tbrenner@coastalprotectioneng.com

Coastal Protection Engineering LLC

5301 N. Federal Hwy, Suite 335

Boca Raton, FL 33487

C.O.A. FL# 33370

cc: Andy Miller, PE, Collier County
 Chris D'Arco, Collier County
 Farron Bevard, Collier County
 Thomas Pierro, PE, D.CE, CPE
 Lauren Floyd, CPE
 Chelsea Maly, EI, CPE

Appendix C
Major Storm Information

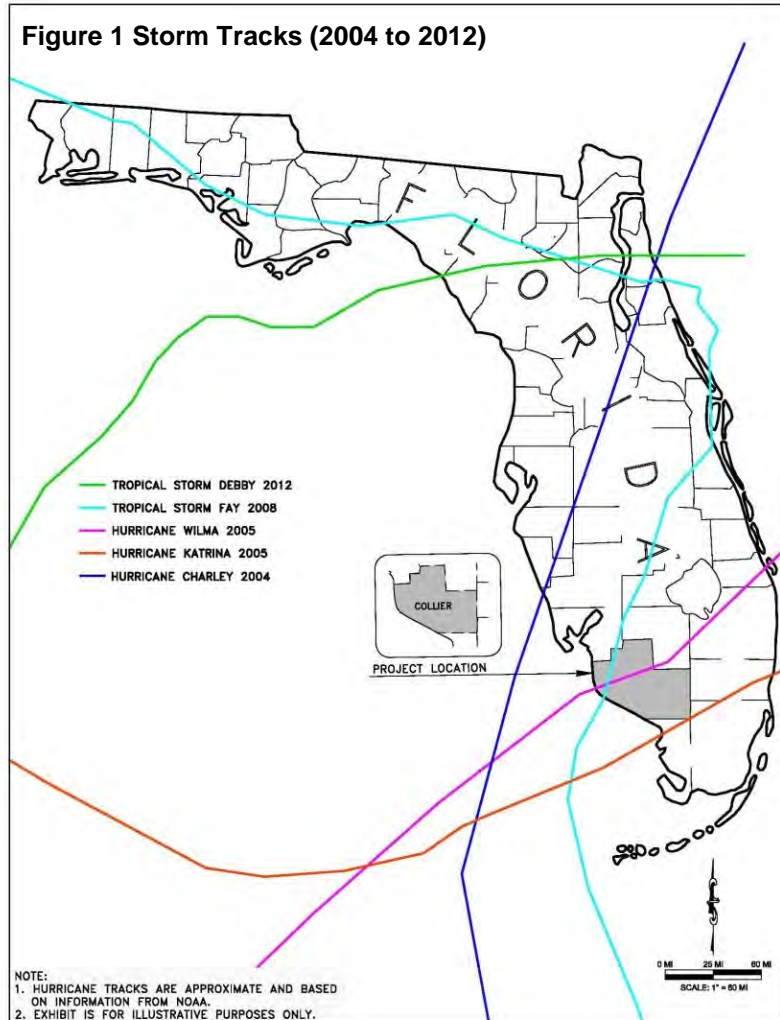
Major Storm Events near Collier County

From 2004 to 2015, five major storms have made landfall near Collier County having the potential to disrupt coastal processes and change the beach topography in the project vicinity. Each storm's track can be seen in **Figure 1**.

¹Hurricane Charley (9-15 August 2004) Charley was the strongest hurricane to hit Florida since Hurricane Andrew in 1992. Before Charley made landfall on August 13 near Cayo Costa, which is just north of Captiva, it had made landfall in Cuba as a category 2. The storm decreased to a category 1 while making landfall in Cuba but then increased steadily as it made its way to Florida's southwest coast. Charley hit Florida as a category 4 hurricane with maximum sustainable winds of 150 mph. Hurricane Charley was a small storm in size but caused great damage to Florida's southwest coast.

²Hurricane Katrina (23-30 August 2005) Hurricane Katrina is one of the most devastating hurricanes making landfall in the United States. Katrina was the making of three storms in the Atlantic Ocean and made landfall over the Bahamas as a Tropical Storm. While heading to Florida's east coast the storm strengthened to a category 1 hurricane just before making landfall near Miami-Dade County. The storm weakened to a tropical storm while passing over the peninsula. After spending six hours on land with winds estimated up to 70 mph, the storm entered the Gulf of Mexico just north of Cape Sable on August 26. Not soon after entering the Gulf, Hurricane Katrina grew in size and ultimately hitting the United States again in Louisiana as a category 5.

³Hurricane Wilma (15-25 October 2005) Hurricane Wilma was the strongest hurricane recorded for 2005 with winds up to 185 mph. Forming in the Caribbean Sea, Hurricane Wilma reached a category 5 hurricane over open waters. Wilma then decreased to a category 4 just before hitting the Yucatan Peninsula of Mexico. After passing over land, the winds decreased to 100 mph. After a brief increase over the Gulf of Mexico, Wilma entered the U.S. near Cape Romano (just south of the project area) as a category 3 hurricane on October 24. Wilma caused ten tornadoes while making landfall in the U.S. and caused damage to the surrounding coastline.

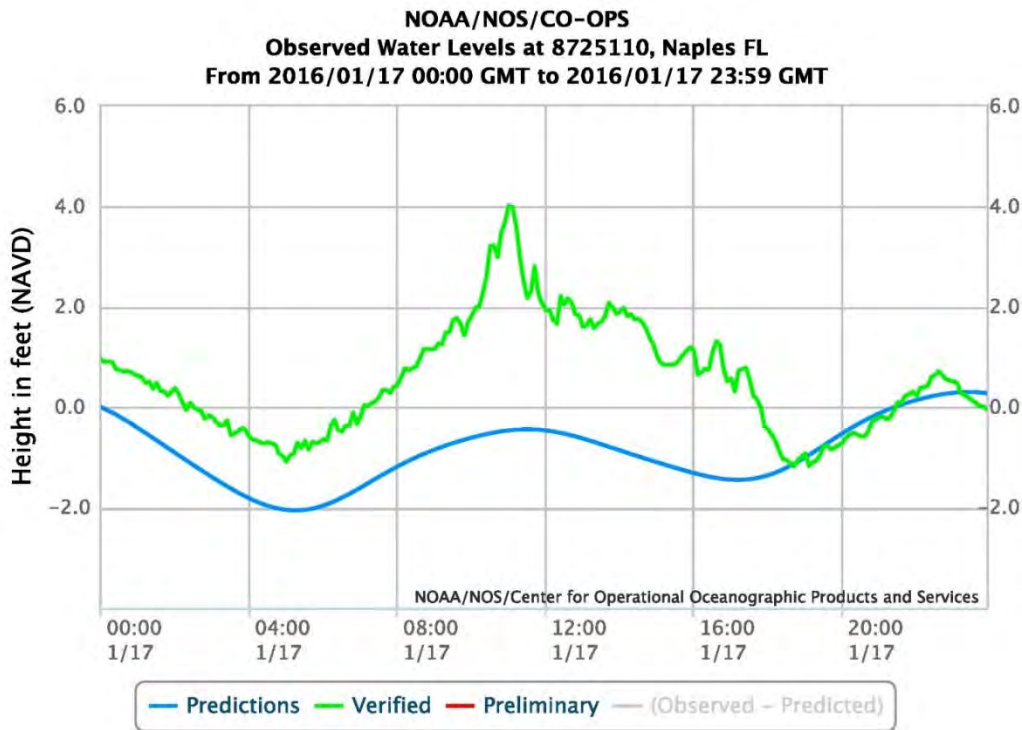


4Tropical Storm Fay (15-26 August 2008) Tropical storm Fay made landfall in Florida a record setting four times. After passing over the Florida Keys with winds up to 50 mph the storm slightly increased to 65 mph winds before making landfall just south of Marco Island on August 19. Rainfall estimates in Florida reached over 27 inches causing severe flooding. Storm surge and prevailing winds by the slow moving storm caused moderate coastline erosion along southwest Florida.

5Tropical Storm Debby (23-27 June 2012) Tropical Storm Debby reached a peak wind speed of 65 mph while in the Gulf of Mexico. After forming in the middle of the Gulf of Mexico, the storm headed north. After influence from a low pressure, the storm then turned west and eventually made landfall in Florida near Steinhatchee on August 26. Winds were recorded at 40 mph when making landfall on Florida’s west coast. Although the storm hit northern end of the peninsula, it is recorded that Pinellas and Charlotte Counties’ beaches lost 10 to 15 feet of shoreline.

The City of Naples experienced a meteotsunami¹ in January 2016. A graph of the observed water levels at the Naples Tide Station on January 17, 2016 documenting the meteotsunami is shown in **Figure 2**.

Figure 2. Observed Water Level in Naples Florida on January 17, 2016.



5 Hurricane Irma (August 30-September 11, 2017) Tropical Storm Irma formed in the far eastern Atlantic Ocean, just west of the Cape Verde Islands, on the morning of August 30th. Over the

¹ Meteotsunamis have the characteristics similar to earthquake-generated tsunamis, but are caused by air pressure disturbances often associated with fast moving weather systems, such as squall lines. These disturbances can generate waves in the ocean that travel at the same speed as the overhead weather system. Development of a meteotsunami depends on several factors such as the intensity, direction, and speed of the disturbance as it travels over a water body with a depth that enhances wave magnification. NOAA 2015

following 30 hours Irma intensified into a major hurricane with highest sustained winds of 115 MPH, a category-3 storm on the Saffir-Simpson Hurricane Wind Scale.

As Irma began to approach the northern Leeward Islands on September 4th and 5th, the hurricane rapidly intensified while moving over warmer water and into a more moist atmosphere. The storm became a rare category-5 hurricane on September 5th, with maximum sustained winds of 185 MPH. This made Irma the strongest hurricane ever observed in the open Atlantic Ocean, and one of only 5 hurricanes with measured winds of 185 MPH or higher in the entire Atlantic basin. Over the next few days Irma continued moving west, passing through the northeast Leeward Islands, Virgin Islands, and just north of the islands of Puerto Rico and Hispaniola, while maintaining its category-5 winds.

The storm finally “weakened” to a category-4 hurricane on September 8th, but still had devastating winds of 155 MPH while moving through the southern Bahamas. Irma intensified to a category-5 level once again that evening, with top winds of 160 MPH, as it approached the northern coast of Cuba. Irma moved west along or just inland from the northern coast of Cuba on September 9th. This interaction with land disrupted Irma’s structure a bit, as a hurricane requires plenty of deep warm water beneath the storm’s center to maintain the extremely low pressure and strong winds. Thus Irma weakened slightly to a category-3 hurricane with winds of 125 MPH.

Resilient Irma made a final attempt to re-intensify while crossing the open waters of the Florida Straits. The storm quickly reached category-4 intensity with 130 MPH winds early in the morning of September 10th, while approaching the vulnerable Florida Keys.

The major hurricane made landfall near Marco Island in southwest Florida around 3 pm EDT on September 10th, as a category-3 storm with 115 MPH. Naples, Florida reported a peak wind gust of 142 MPH. Irma moved quickly northward, just inland from the west coast of Florida on September 10th and 11th. When Irma first developed in the far eastern Atlantic, despite its strength, its wind field was quite small. As the storm approached Florida, however, its wind field expanded dramatically. As Irma hit Florida, tropical storm force winds extended outward up to 400 miles from the center, and hurricane force winds extended up to 80 miles. Hurricane force wind gusts (i.e. 74 MPH or more) were reported along much of the east coast of Florida, from Jacksonville to Miami. In addition to the long periods of heavy rain and strong winds, storm surge flooding also occurred well away from the storm center, including the Jacksonville area, where strong and persistent onshore winds had been occurring for days before Irma’s center made its closest approach.

By the time the minimal hurricane reached northwest Florida (on the morning of September 11th), the wind gusts across south Georgia and northwest Florida were generally in the 45 to 60 MPH range (Fig. 8). Conditions improved rapidly once the storm center passed by as strong, dry southwest winds aloft made the system asymmetric, with nearly all of the rain and most of the strongest winds being along and north of the poorly-defined center. Irma weakened to a tropical storm in south Georgia in the afternoon, and further into a tropical depression while moving north across central Georgia in the evening. See the **Figure 3** in this section showing the 2017 storm tracks.

According to the National Weather Service, wind gusts over 50 mph and heavy rain impacted the Naples area on Thursday December 20, 2018. At approximately 1:30 pm another meteotsunami hit the Naples area with wave heights momentarily increasing by 3 feet over the projected level and decreasing rapidly over the next hour. **Figure 4** shows the predicted and actual water levels on December 20, 2018.

Figure 3. Hurricane Tracking Chart for 2017.

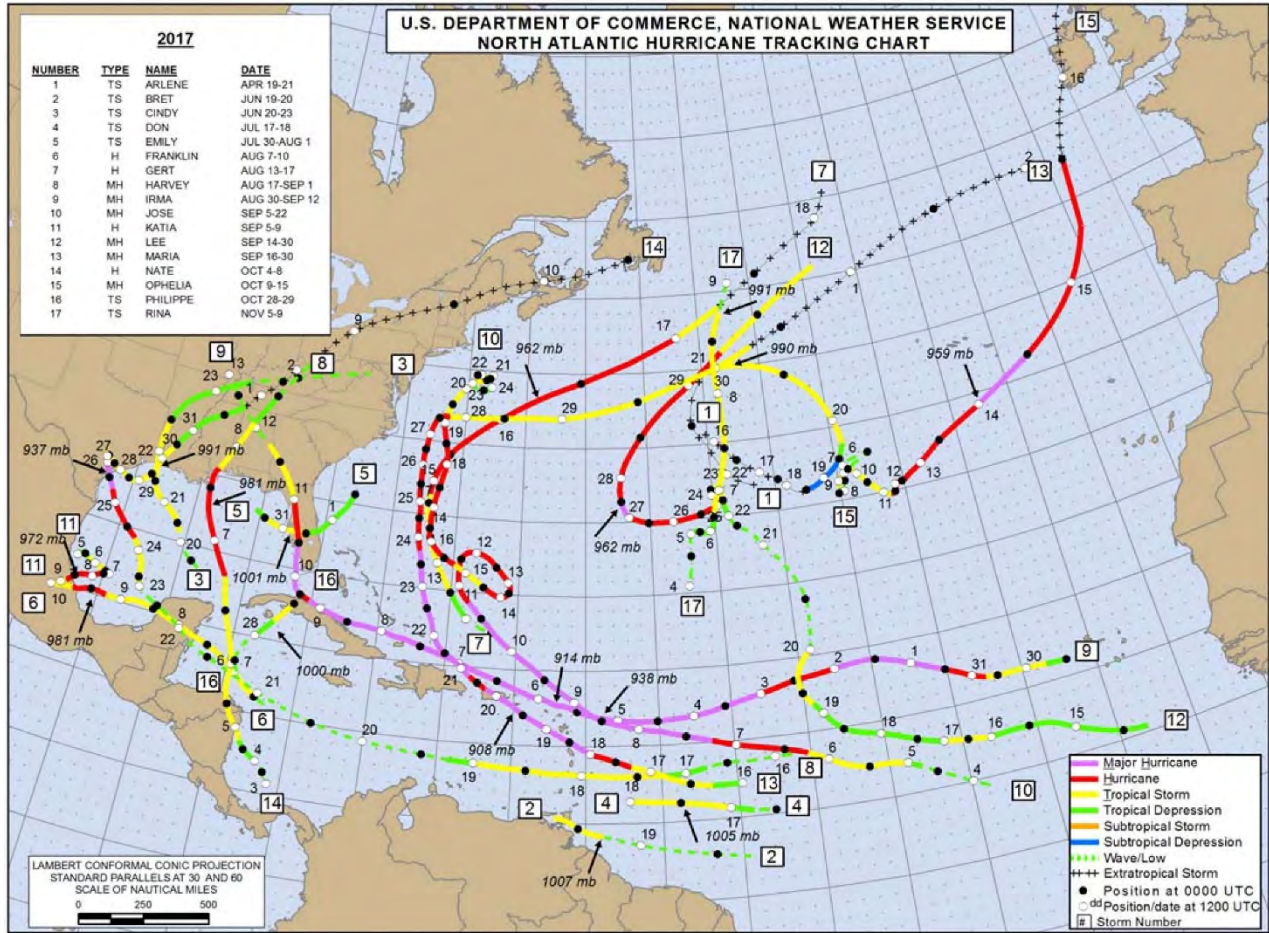
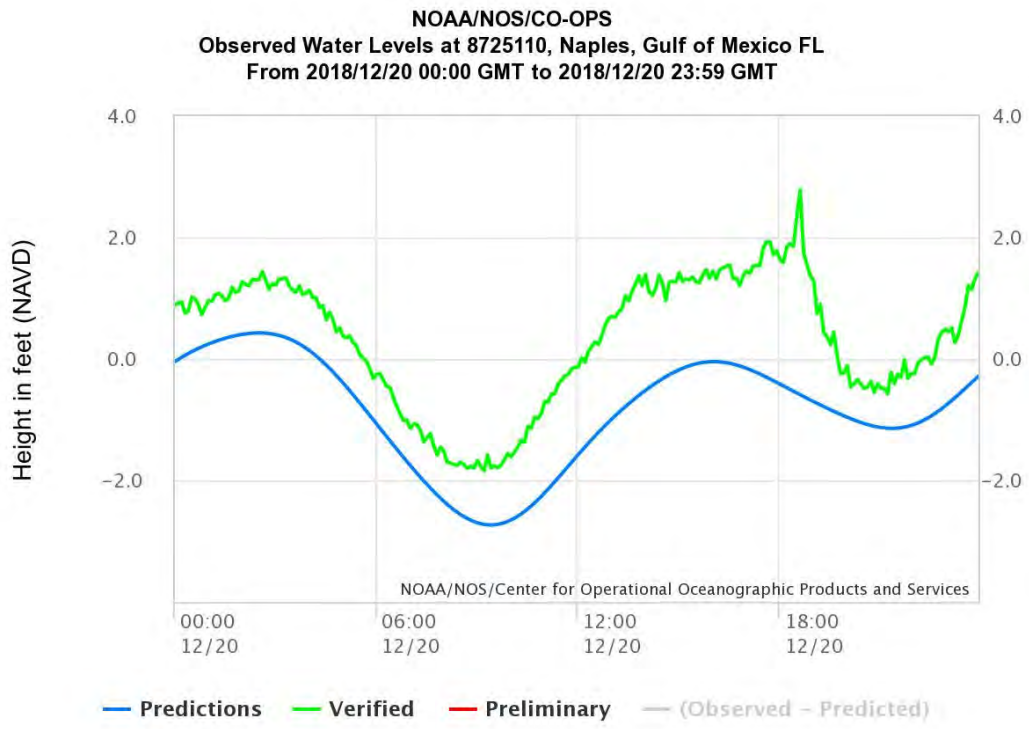


Figure 4. Observed Water Level in Naples Florida on December 20, 2018.



References

¹ Blake E.R., D.P. Brown, R.J. Pasch, "Tropical Cyclone Report Hurricane Charley," National Hurricane Center, September 2011, <http://www.nhc.noaa.gov/>.

² Brown D.P., R.D. Knabb, and J.R. Rhome, "Tropical Cyclone Report Hurricane Katrina," National Hurricane Center, December 2005, <http://www.nhc.noaa.gov/>.

³ Blake E.R. and H.D Cobb III et. al, "Tropical Cyclone Report Hurricane Wilma," National Hurricane Center, January 2006, <http://www.nhc.noaa.gov/>.

⁴ Beven, J.L. and S.R Stewart, "Tropical Cyclone Report Tropical Storm Fay," National Hurricane Center, February 2009, <http://www.nhc.noaa.gov/>.

⁵ Kimberlain T.B., "Tropical Cyclone Report Tropical Storm Debby," National Hurricane Center, January 2013, <http://www.nhc.noaa.gov/>.

⁶ National Oceanic and Atmospheric Administration, "Detailed Meteorological Summary on Hurricane Irma, Hurricane Irma Synopsis" National Weather Service, January 2018, <https://www.weather.gov>

Naples Daily News, Scientists: Waves that surprised SWFL beachgoers last week caused by rare meteotsunami, December 27, 2018

Appendix D-1
Survey Certification(s)

SURVEYOR'S REPORT

Project Title: Naples Vanderbilt and Pelican Bay Beaches
 Hyatt Project No.: 21-2652
 County: Collier County

Prepared By: Steven Long

Address: Hyatt Survey Services, Inc.
 2012 Lena Rd
 Bradenton, Florida 34211

Phone No.: (941) 748-4693
 Licensed Business No. 7203

Requesting Agency: Coastal Protection Engineering LLC

Point-of-Contact: Tara Brenner

Address: 5301 N Federal Hwy Ste 33
 Boca Raton, FL 33487

Technical Requirements: Florida Administrative Code 5J-17
 USACE Hydrographic Survey Manual
 FDEP Monitoring Standards for Beach Erosion Control Projects

INTRODUCTION

Purpose: To obtain topographic and hydrographic survey data along pre determined Lines supplied by the client. For post construction monitoring.

Survey Type: Hydrographic Topographic

Horizontal Datum: NAD 83(2011) - Florida West

Vertical Datum: NAVD 1988

Geoid: 2012B

Units: US Survey Feet

CONTROL

Source: National Geodetic Survey (NOAA)

Other (Specify Source):

--

Designation	Northing	Easting	Elevation	ΔN	ΔE	ΔZ	Notes
3	705579.00	385127.00	2.46				872 5222 C (Verical Only)
4	705484.90	384980.01	6.43				Iron Rod & Cap BASE (Pelican & Vanderbilt)
5	714437.08	393430.50	11.16	0.06	0.25	-0.05	K 416 (QC)
12	665416.88	390408.08	4.94				Iron Rod & Cap BASE (Naples)
16	666685.14	390145.41	4.68	0.02	-0.02	-0.04	R-60 (QC Naples)

Site Calibration:

No

SURVEY EQUIPMENT

RTK GPS:

Trimble R10

Survey Vessel:

MISS EMILY

Data Collector:

TSC3

Positioning:

Applanix POS M/V Surfmaster

Alternative

Kawasaki Mule

Sound Velocity:

AML BaseX2

Transportation:

ATV

Tide Corrections:

RTK GPS

Echosounder:

Odom E-20

SOFTWARE

Drafting:

N/A

Bathymetric Data Processing:

Hypack 2021

Side Scan Data Processing:

N/A

Survey Date(s):

1/19/2022-1/23/2022

Field Book(s):

21-2652 HYDRO/FB 489

Comments:

N/A

Delays:

N/A

Rights of Entry: General rights of entry were granted under FL Statute Title XXXII, Ch. 472.029.

Project Issues: N/A

Files Submitted: 2652_POST CON COMBINE and Individual XYZ files

Appendix: N/A

Certification: This is to certify that this report and survey have been performed in accordance with the Standards of Practice as set forth by the Florida Board of Surveyors and Mappers per Florida Administrative Code 5J-17 and USACE project requirements.

**Russell P
Hyatt**

Digitally signed by
Russell P Hyatt
Date: 2022.02.04
13:34:45 -05'00'

Signed: _____

Russell Hyatt, P.S.M. No. 5303

Date: _____



SURVEYOR’S CERTIFICATION & NOTES

Survey Title: Collier County 2022 Physical Monitoring
Topographic & Hydrographic Survey
Date of Report: February 18, 2022
Prepared for: Humiston & Moore Engineers
Prepared by: Sea Diversified, Inc.
(SDI Project Number 20-2898)
Date of Survey: January 26, 2022 – February 2, 2022
Survey Location: FDEP Range Monuments R-42 to R-57
and R-81 to R-89, totaling 25 profiles

Notes:

1. This survey report was prepared to accompany the digital data files (ASCII X, Y, Z) submitted to Humiston and Moore Engineers pertaining to the Collier County 2022 Physical Monitoring Survey “Collier Beach” Topographic & Hydrographic Survey. The purpose of the survey was to collect topographic and bathymetric data at Florida Department of Environmental Protection (FDEP) profile control points R-42 to R-57 and R-81 to R-89, totaling 25 profiles.
2. This survey report is not valid without the signature and the original raised seal of a Florida Licensed Surveyor and Mapper.
3. The information depicted herein represents the results of the survey on the dates indicated and can only be considered as indicating the general conditions existing at the time.
4. Horizontal data are in feet and relative to the Florida State Plane Coordinate System based on the Transverse Mercator Projection for Florida, East Zone (0901), North American Datum (NAD) of 1983, 1990 Adjustment. Vertical data are in feet and relative to the North American Vertical Datum of 1988 (NAVD 88).
5. Bathymetric data was collected using a Trimble Real-Time Kinematic (RTK) Global Positioning System (GPS) and an Odom Echotrac CV100 sounder with integrated TSS Model DMS-05 motion sensor. Horizontal position accuracy was verified using published profile control points. The sounder was calibrated prior to the start of the survey following manufacturer recommended procedures.
6. RTK tides were applied in real-time during bathymetric data collection. For redundancy tides were observed at a tide staff(s) set to 0.0 feet relative to NAVD 88. The tide staffs were attached to steel pipes located near and relative to FDEP Range Monuments and “A” Control Monuments with the following published elevations; “X352 (R-52), elevation 5.81 feet as resurveyed by the FDEP circa 2006”, “R-83, elevation 6.94 feet” NAVD 88.
7. Topographic data was collected using a combination of Real-Time Kinematic (RTK) GPS and level, rod and chain methodologies.
8. Onshore / offshore profile surveys were collected in accordance with the Monitoring Standards for Beach Erosion Control Projects prepared by the Florida Department of Environmental Protection (FDEP), Bureau of Beaches and Coastal Systems (BBCS), dated October 2014.

I hereby certify that the Topographic / Hydrographic survey is based on a recent field survey conducted under my personal direction and is true and accurate to the best of my knowledge and belief and meets the Standards of Practice set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 5J-17, Florida Administrative Code, pursuant to Section 472.027, Florida Statutes.

William T. Sadler Jr., P.E., P.S.M.
Florida Registration Number 5859
Sea Diversified Inc. LB Number 7342

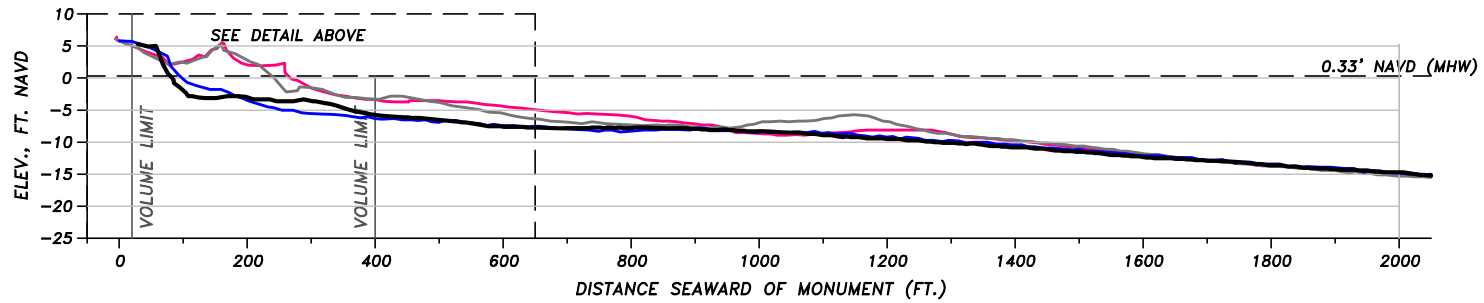
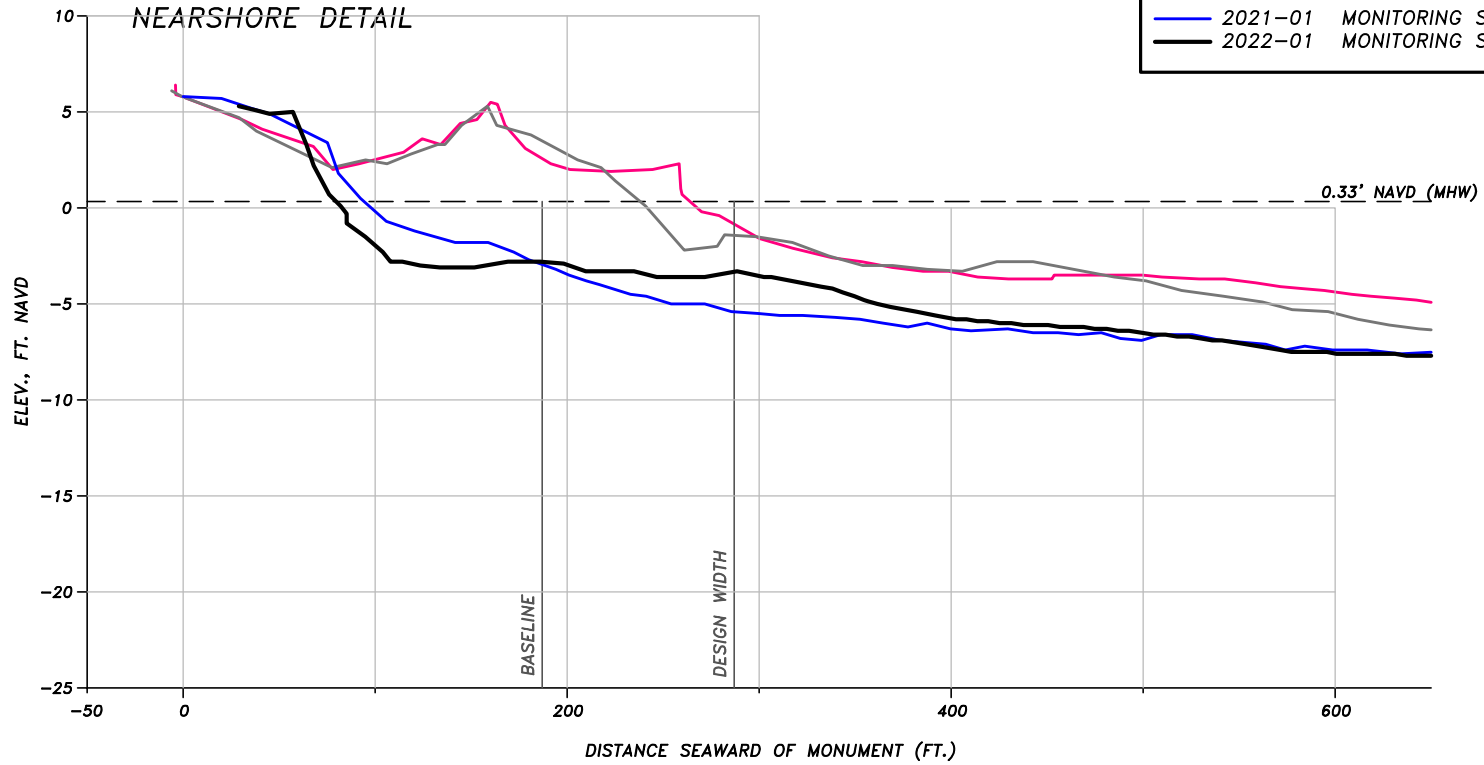
Date

Appendix D-2

Beach Profiles R-17 through R-84

BEACH PROFILE: R-17

SURVEY LEGEND	
— 2005-09	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

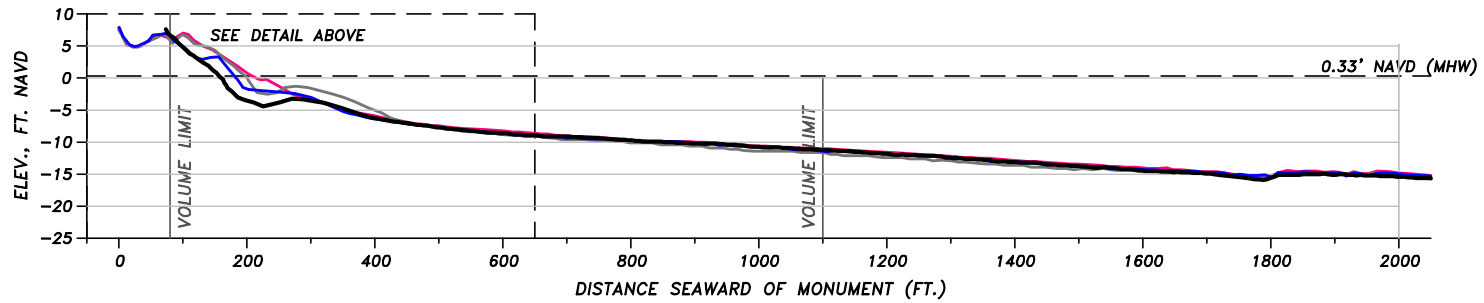
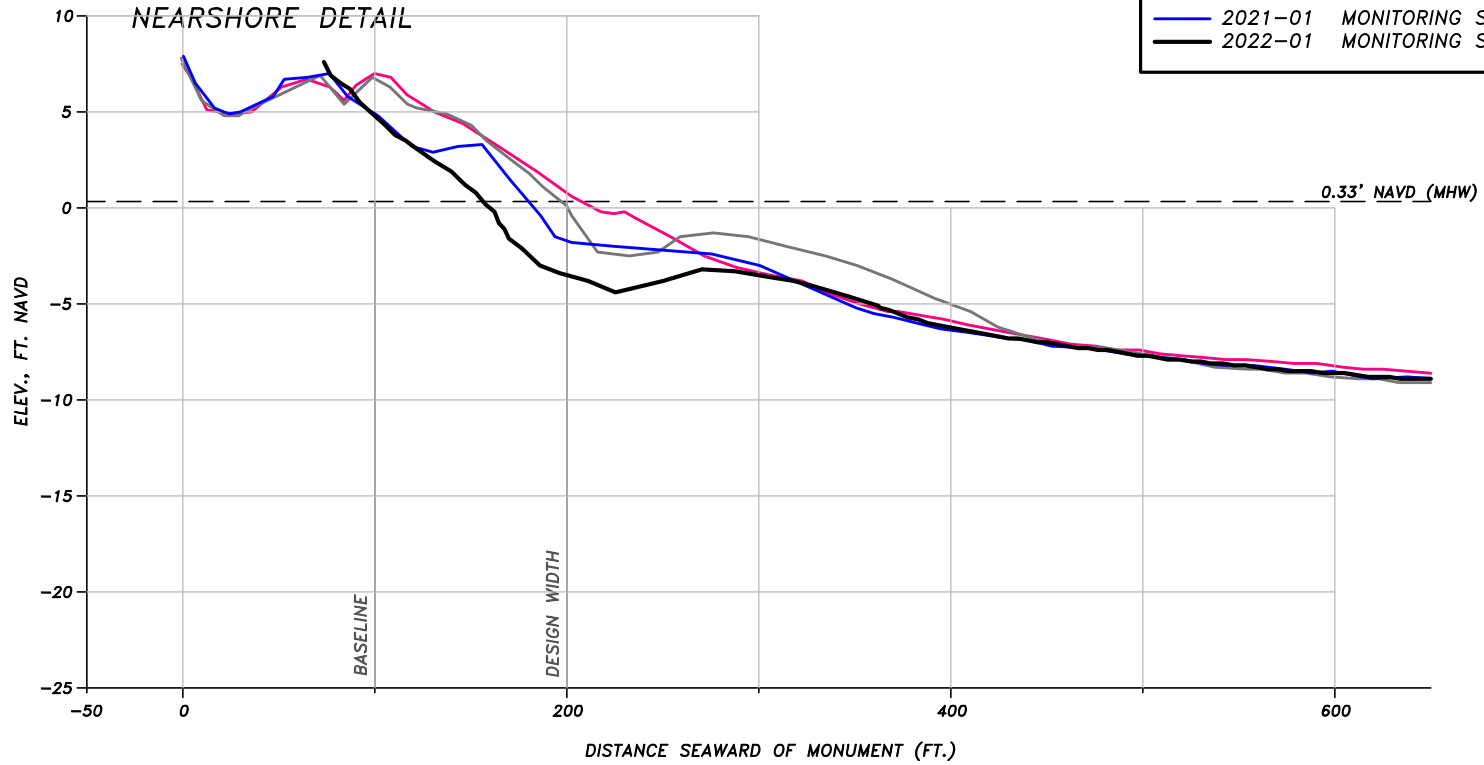


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
 NAPLES, FL 34110
 FAX: (239) 594-2025
 PHONE: (239) 594-2021
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BEACH PROFILE: R-18

SURVEY LEGEND	
—	2005-09 PRE CONSTRUCTION CP&E
—	2006-06 POST CONSTRUCTION CP&E
—	2021-01 MONITORING SDI
—	2022-01 MONITORING SDI

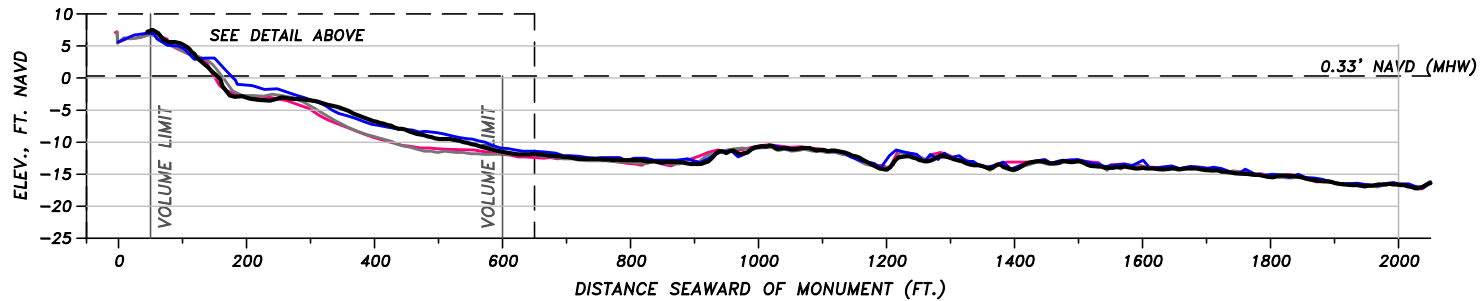
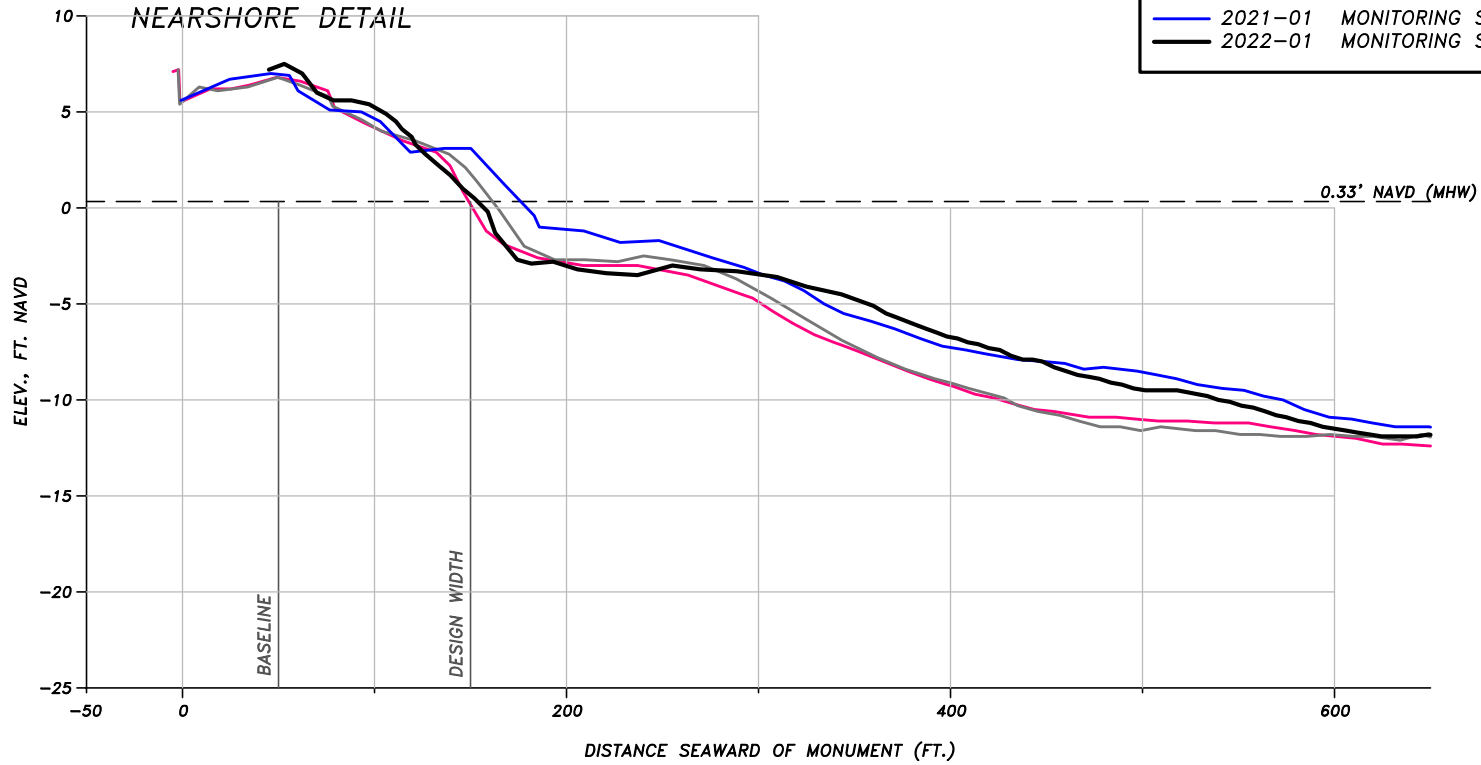


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-19

SURVEY LEGEND	
—	2005-09 PRE CONSTRUCTION CP&E
—	2006-06 POST CONSTRUCTION CP&E
—	2021-01 MONITORING SDI
—	2022-01 MONITORING SDI

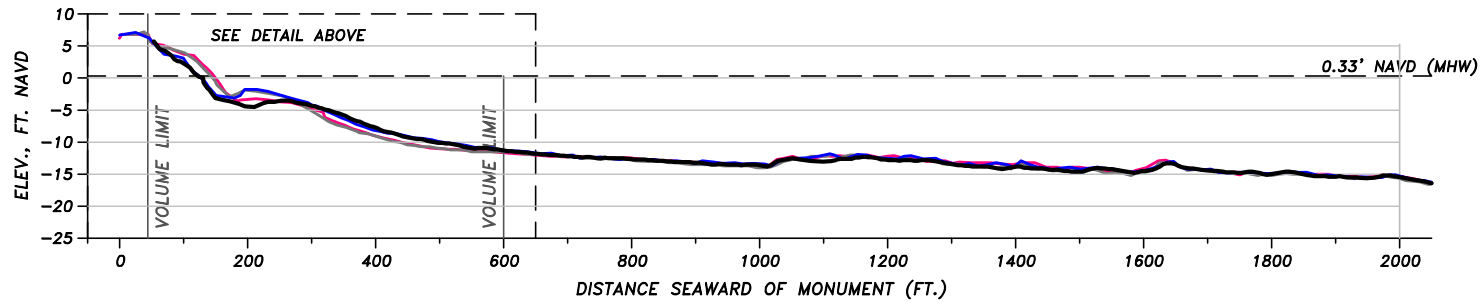
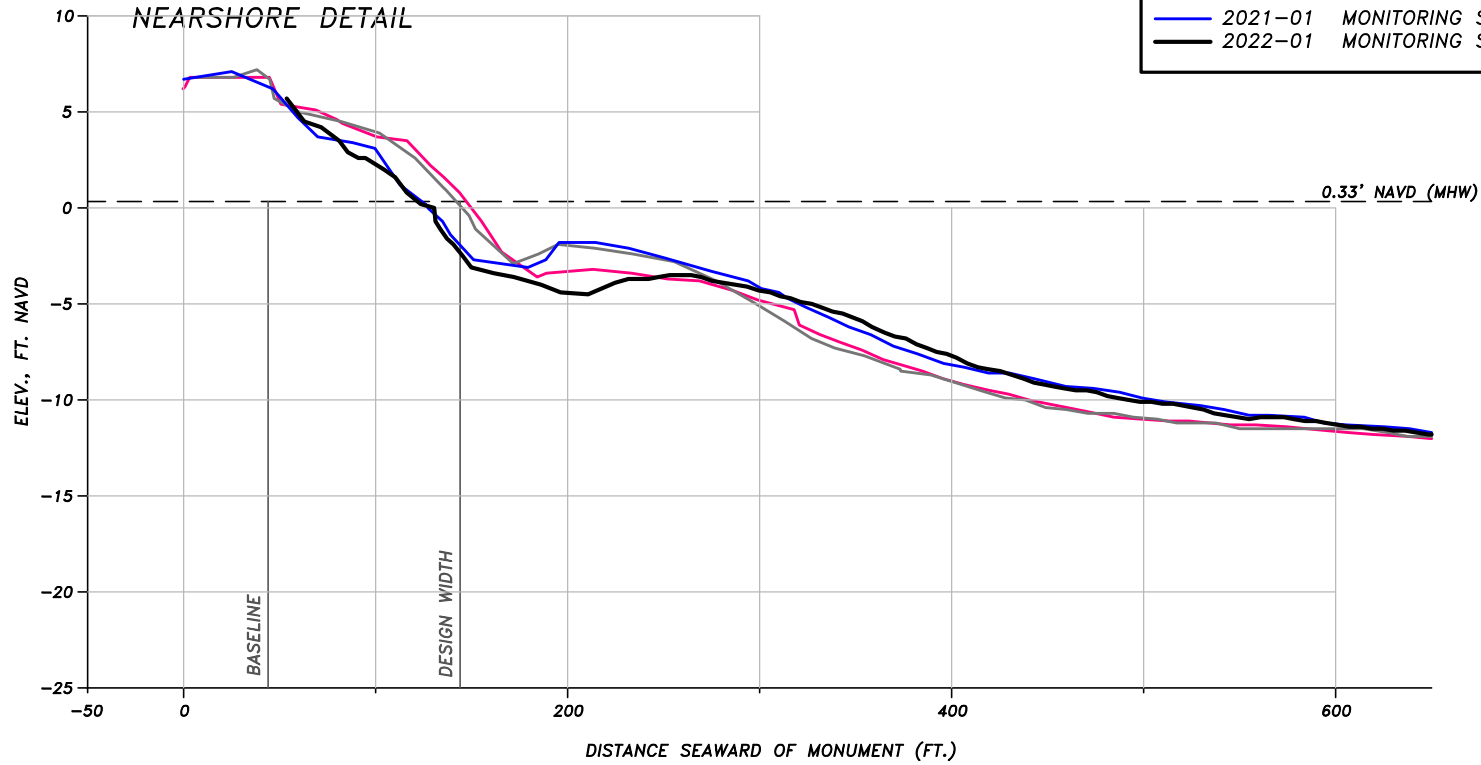


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-20

SURVEY LEGEND	
— 2005-09	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

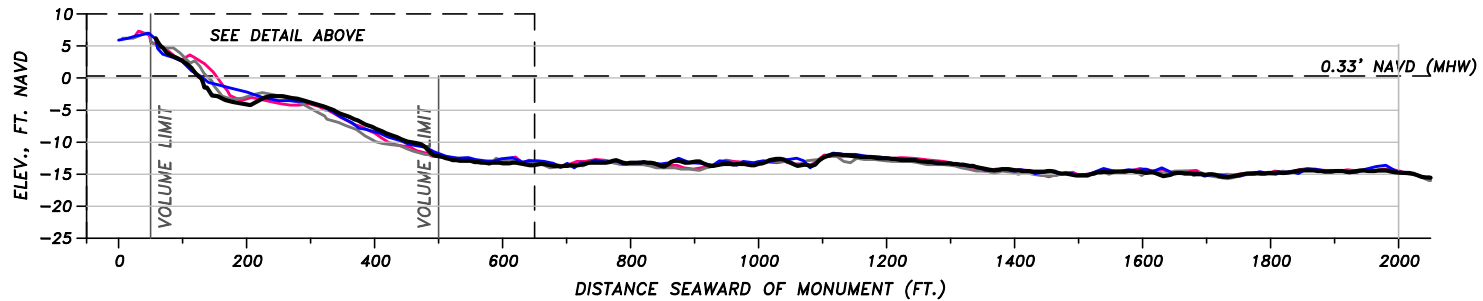
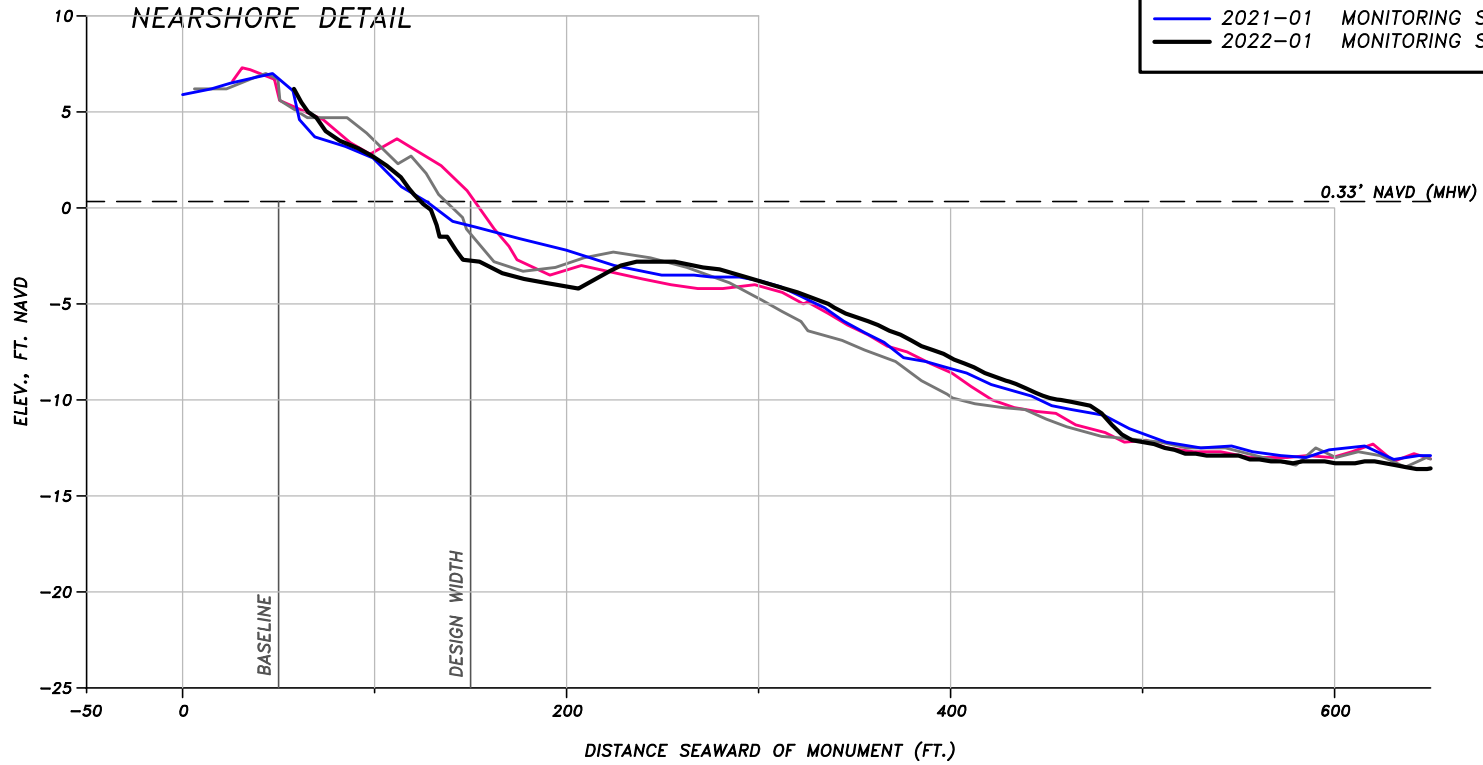


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-21

SURVEY LEGEND	
— 2005-09	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

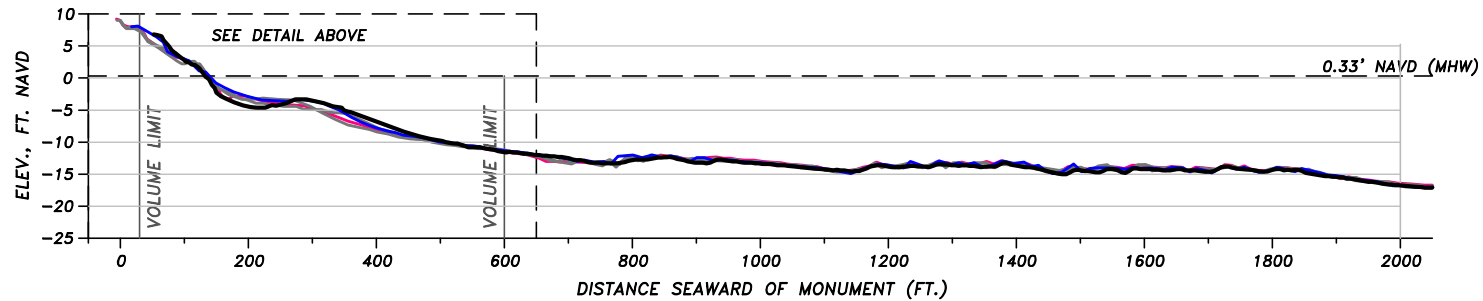
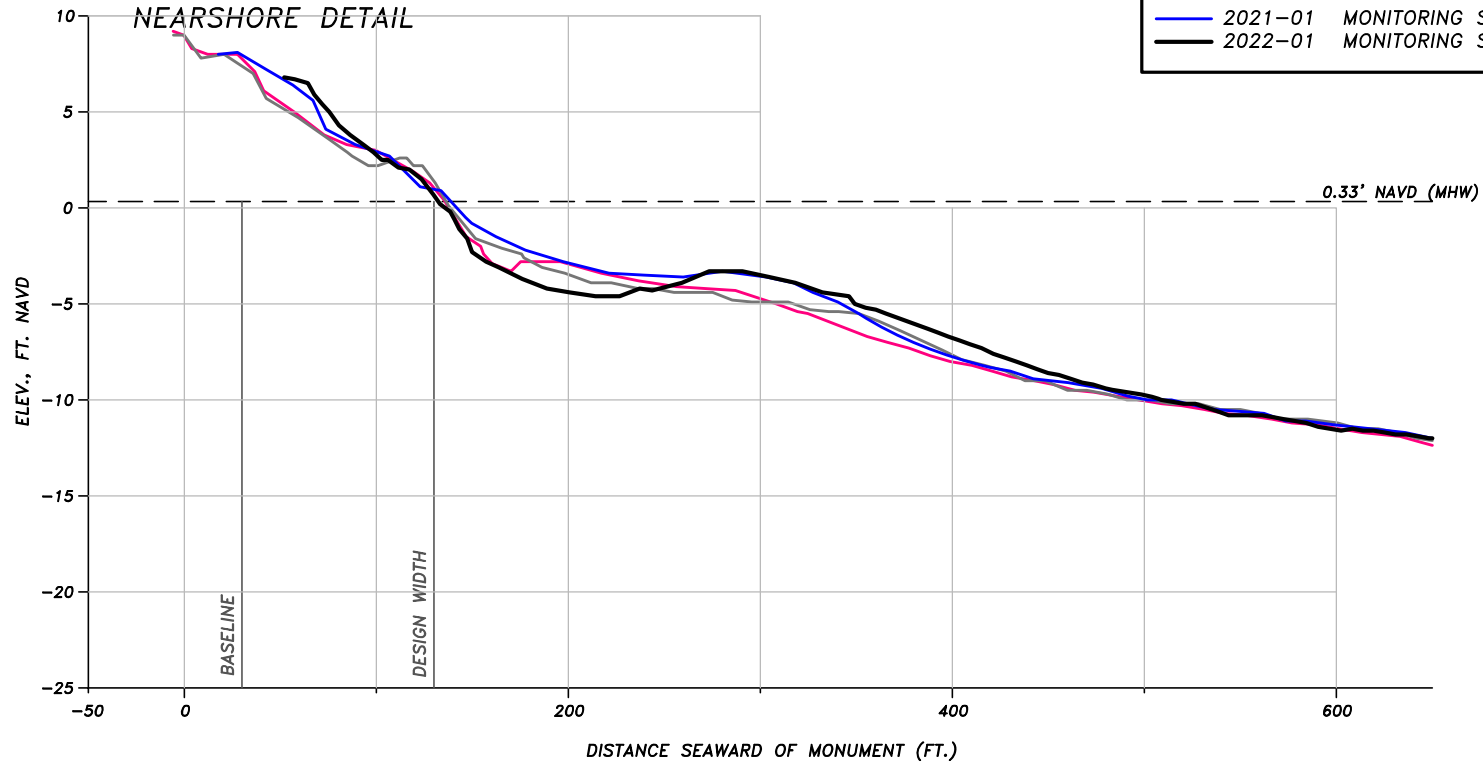


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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FAX: (239) 594-2025
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BEACH PROFILE: R-22

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

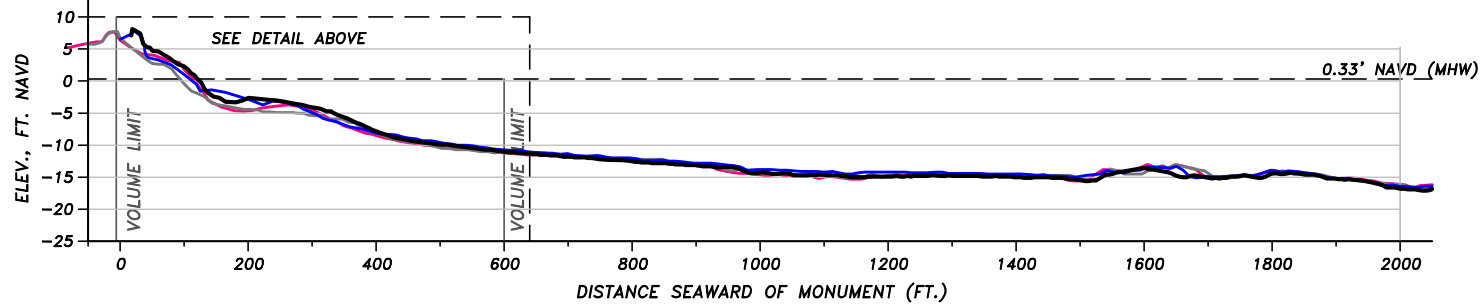
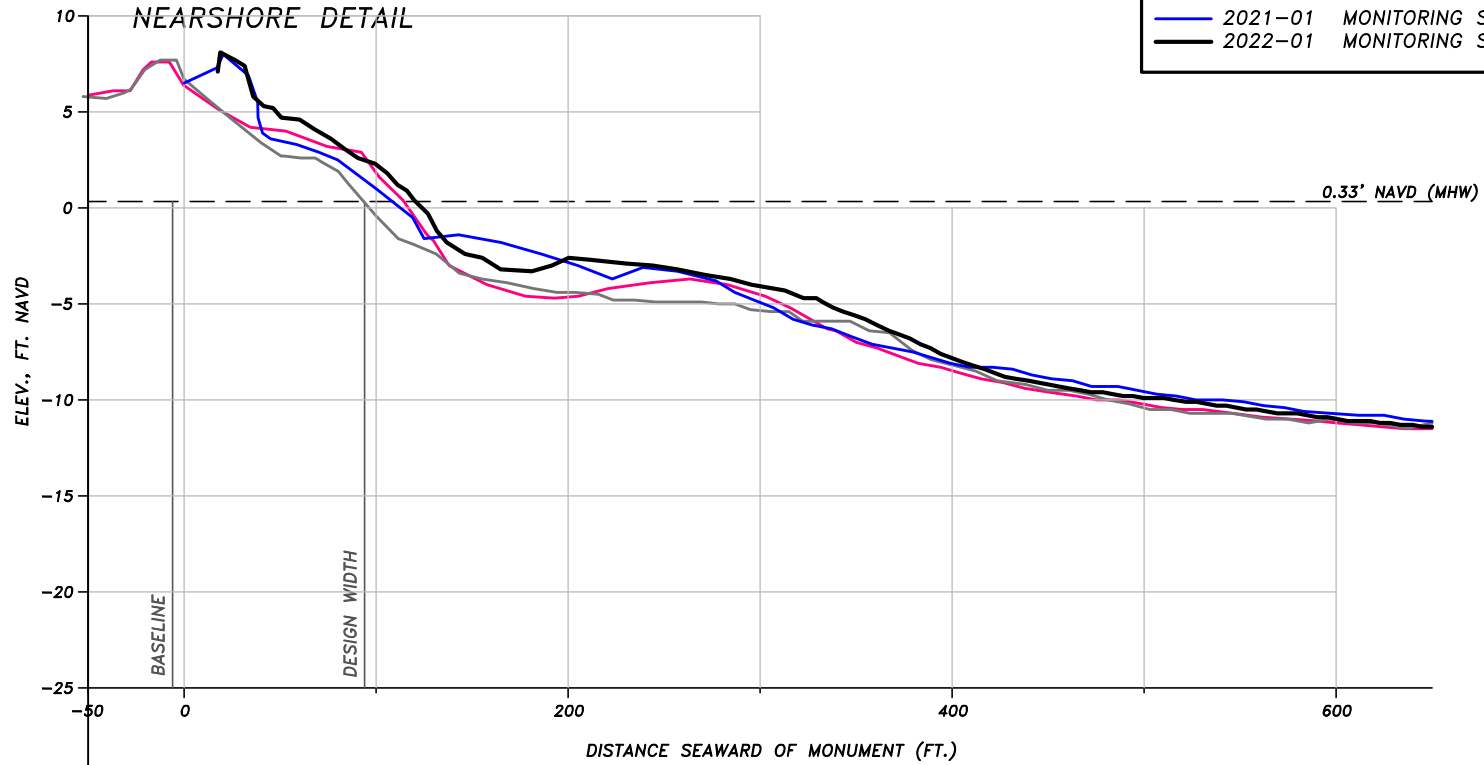


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FOR: COLLIER COUNTY		
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JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-23

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

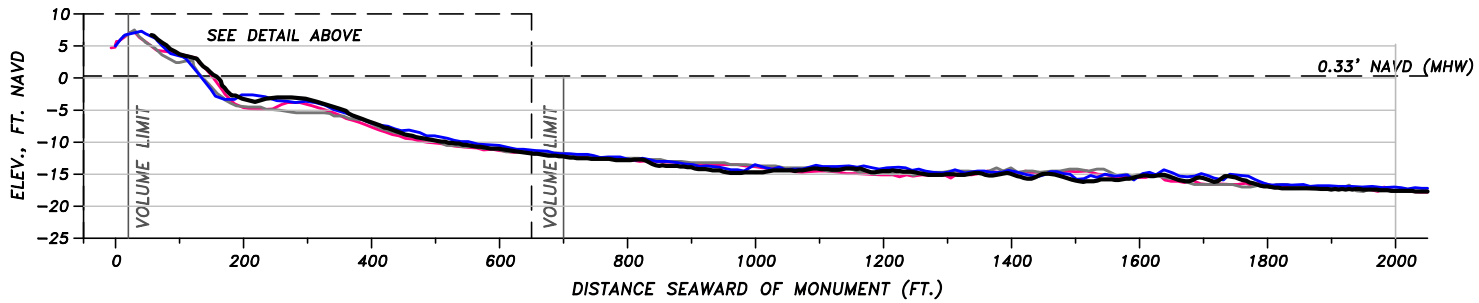
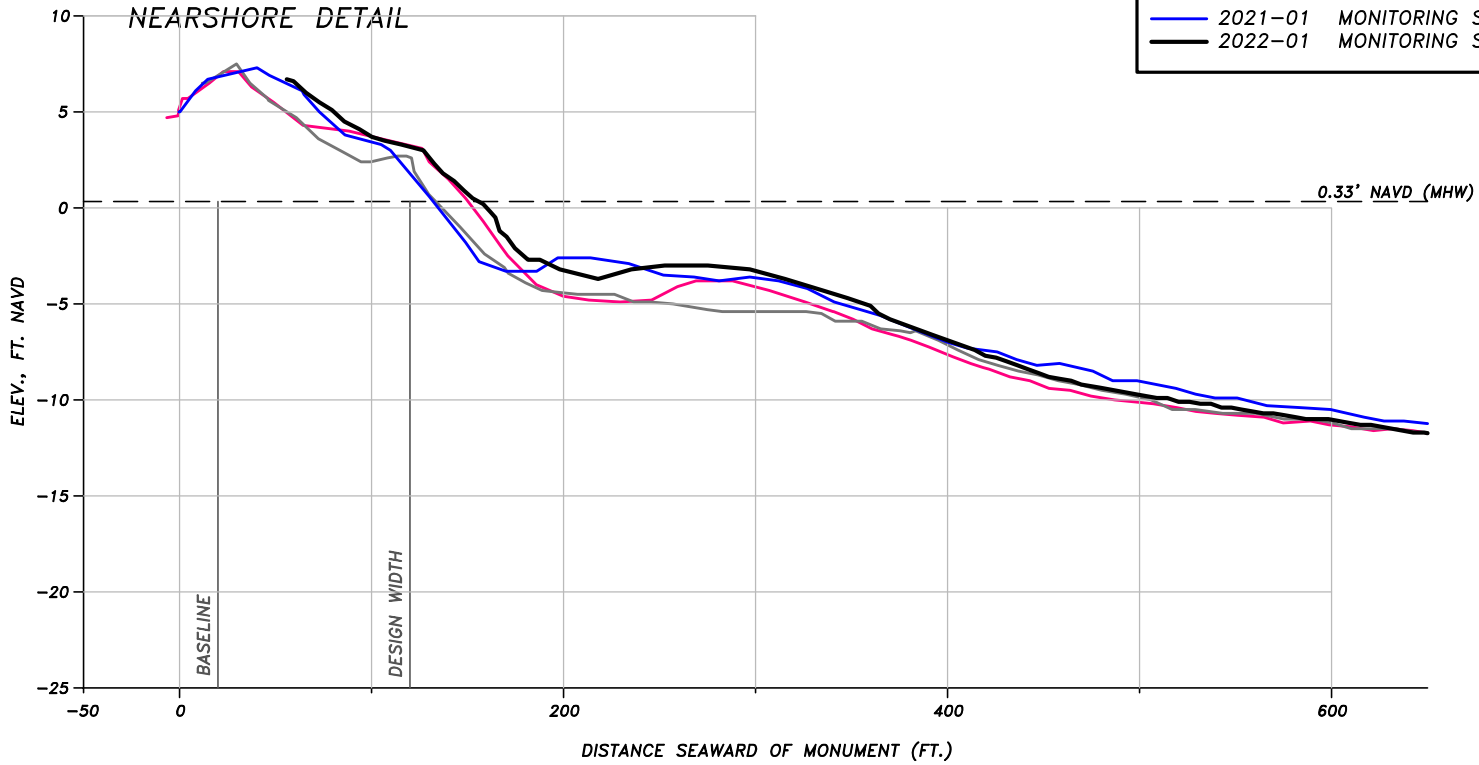


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
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JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-24

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

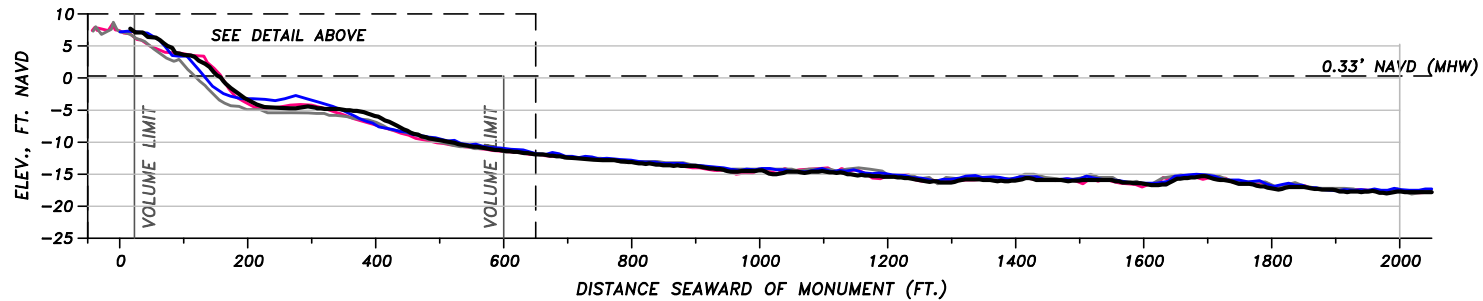
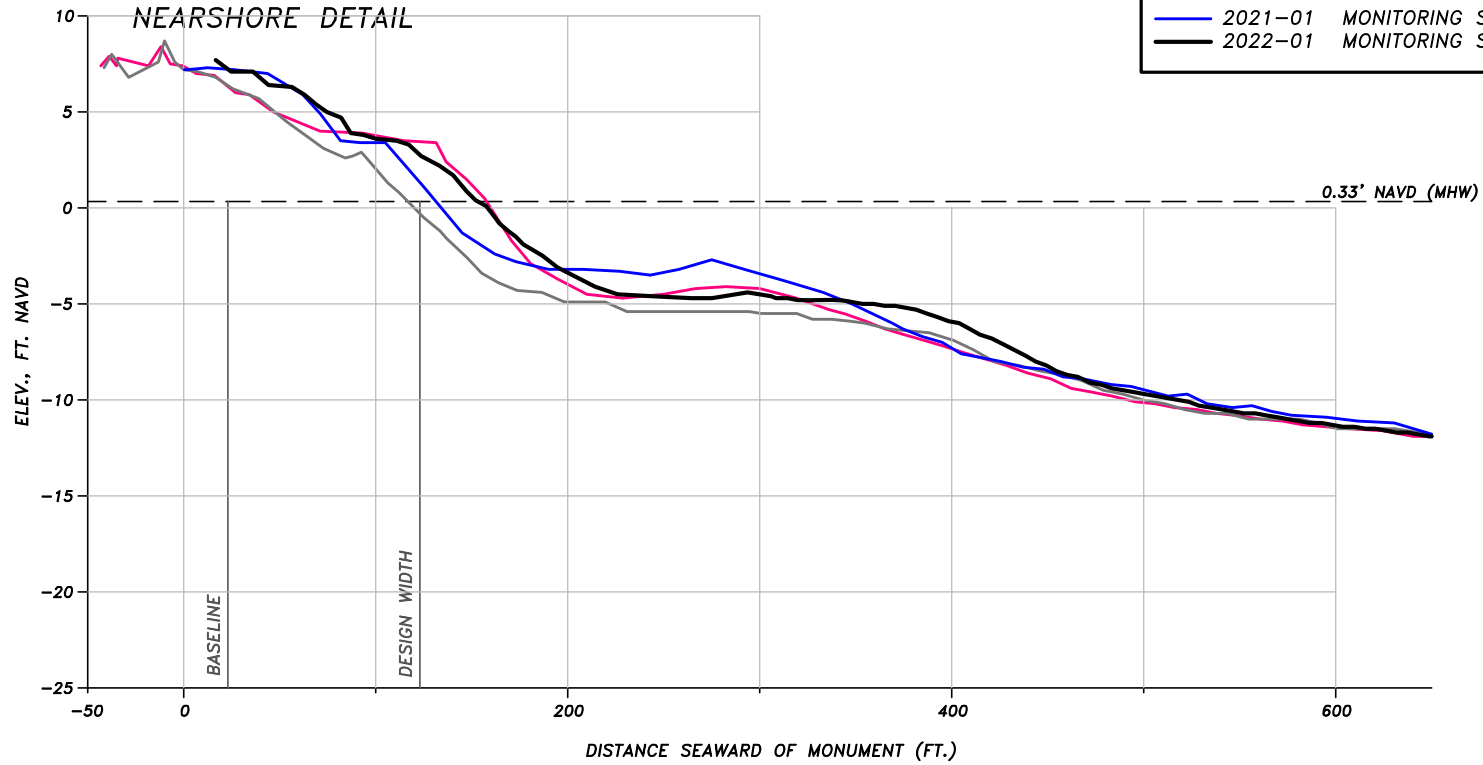


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-25

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

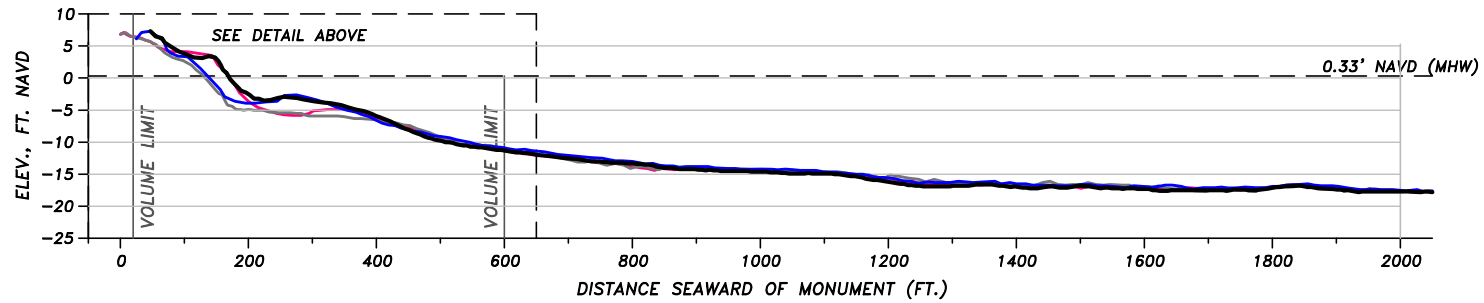
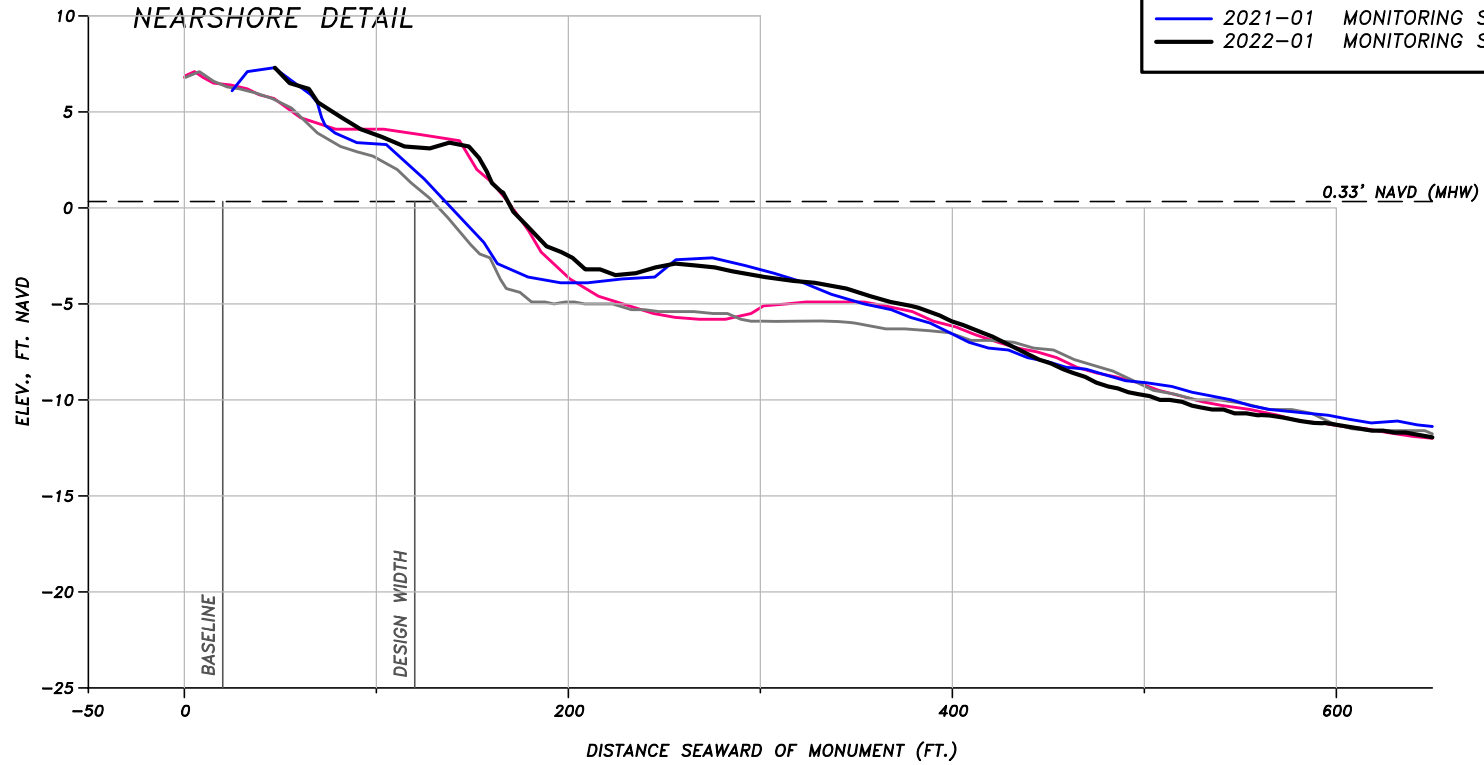


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
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BEACH PROFILE: R-26

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

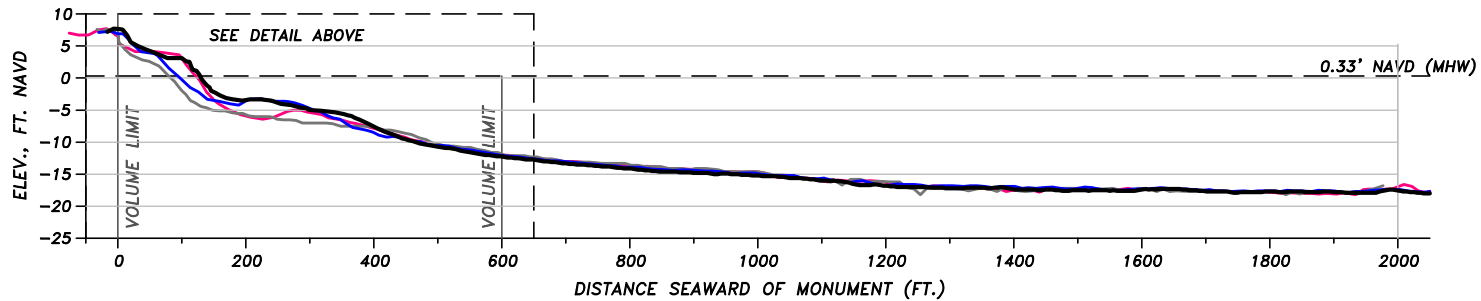
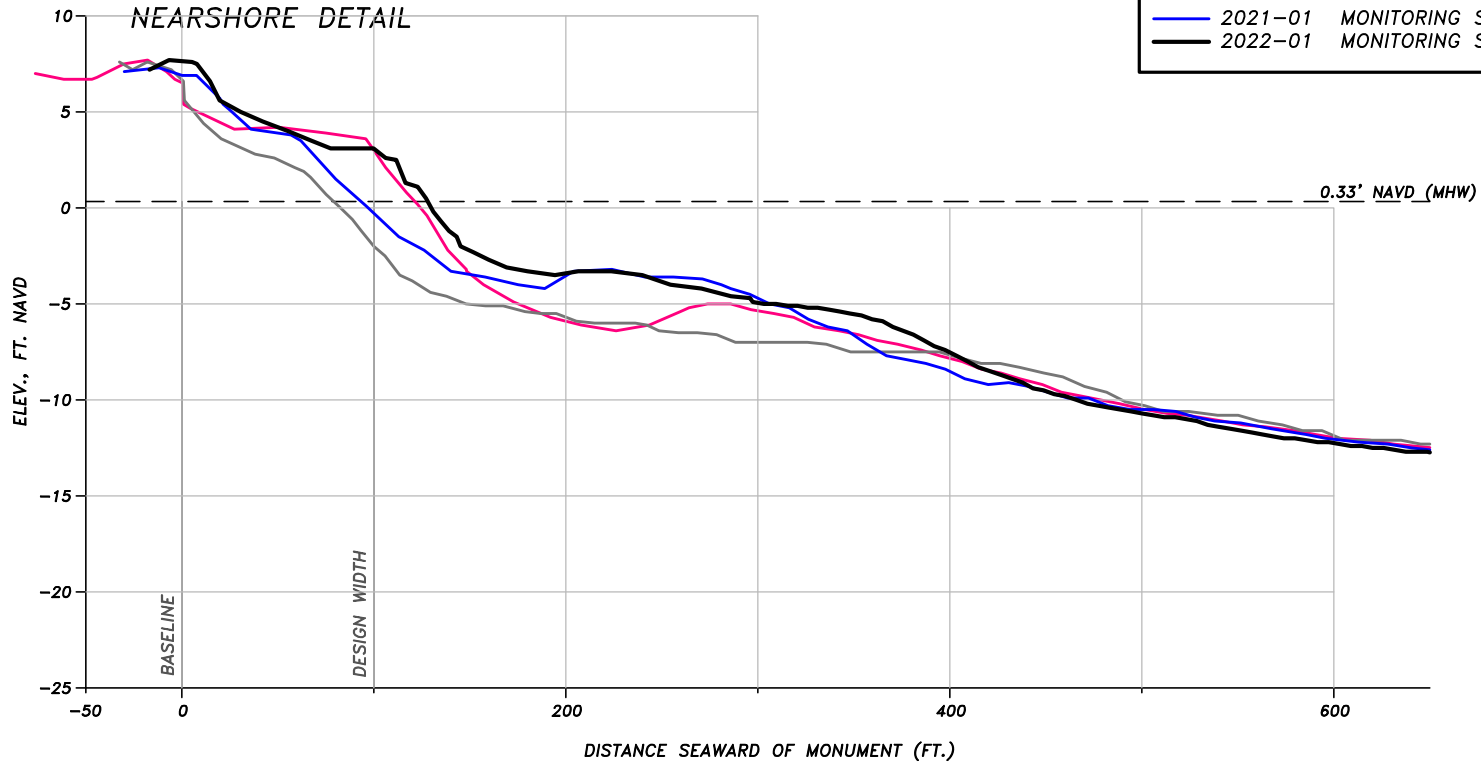


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
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JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-27

SURVEY LEGEND	
—	2005-11 PRE CONSTRUCTION CP&E
—	2006-06 POST CONSTRUCTION CP&E
—	2021-01 MONITORING SDI
—	2022-01 MONITORING SDI

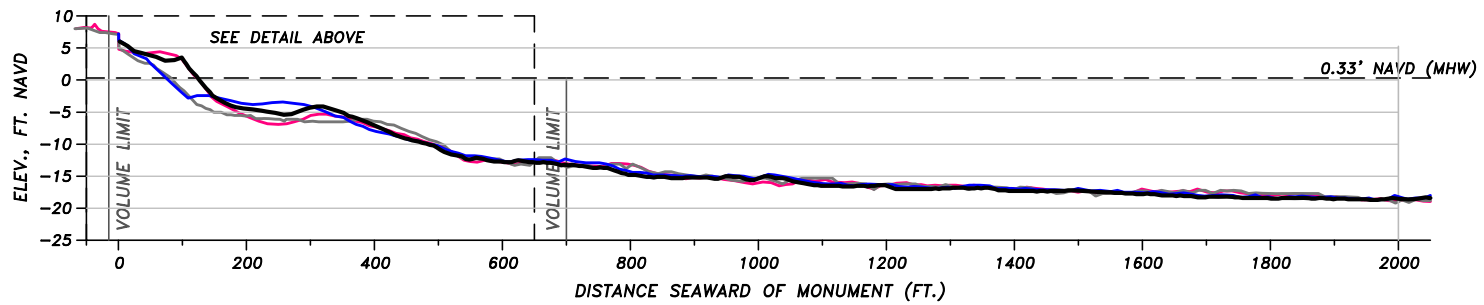
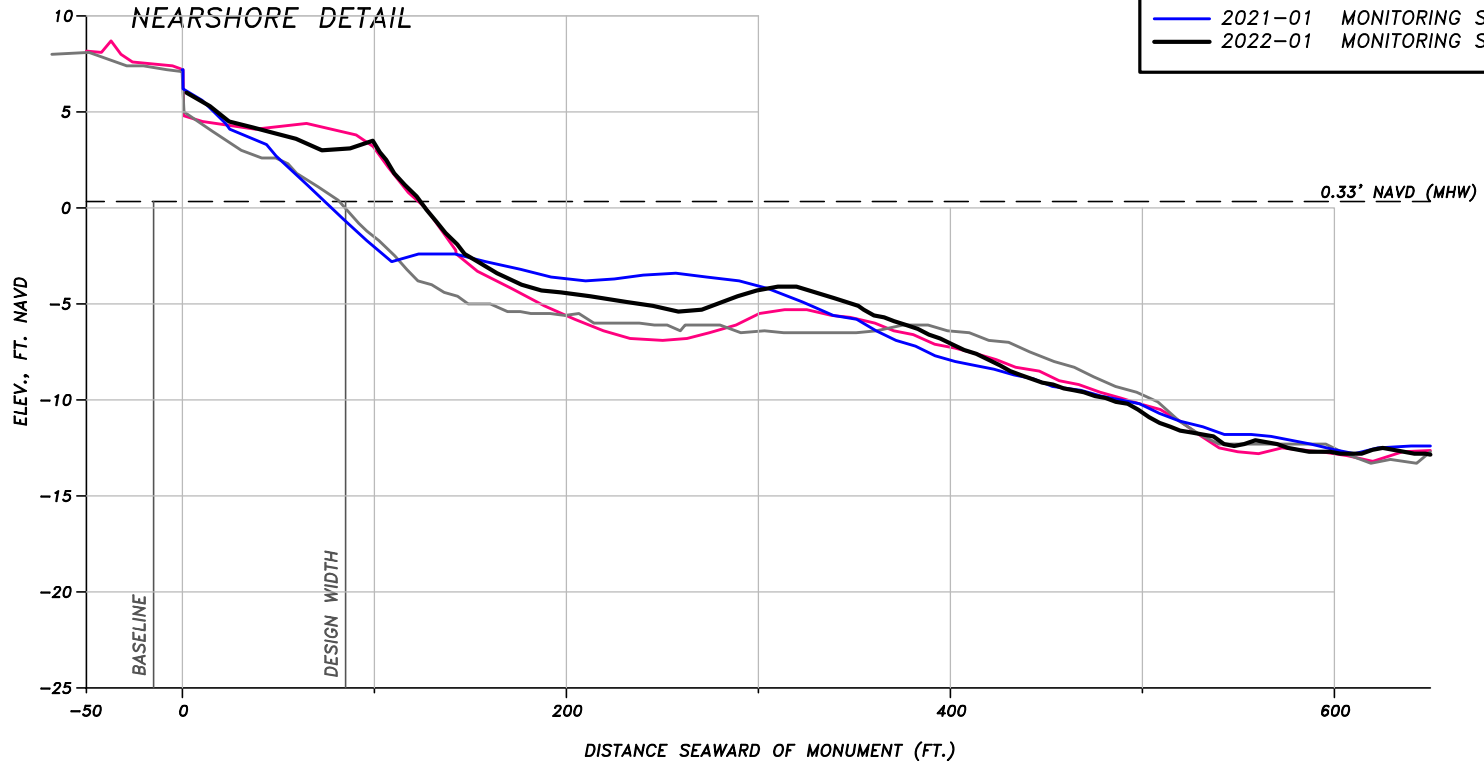


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-28

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

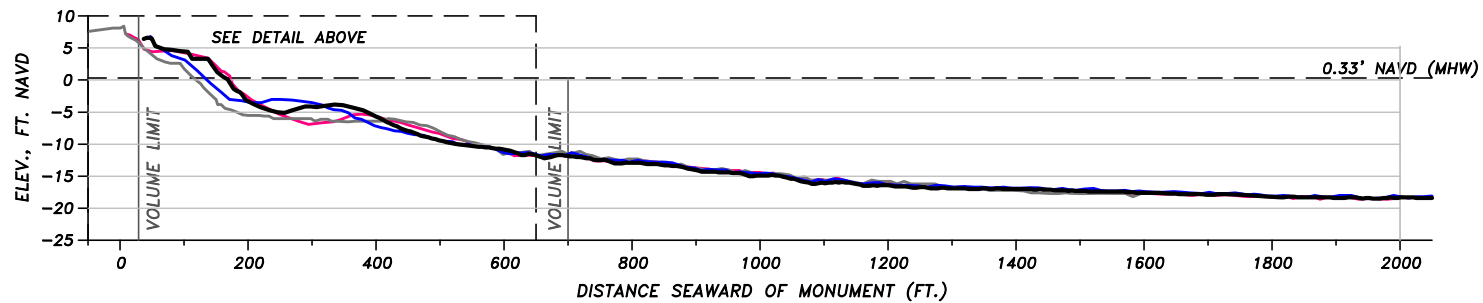
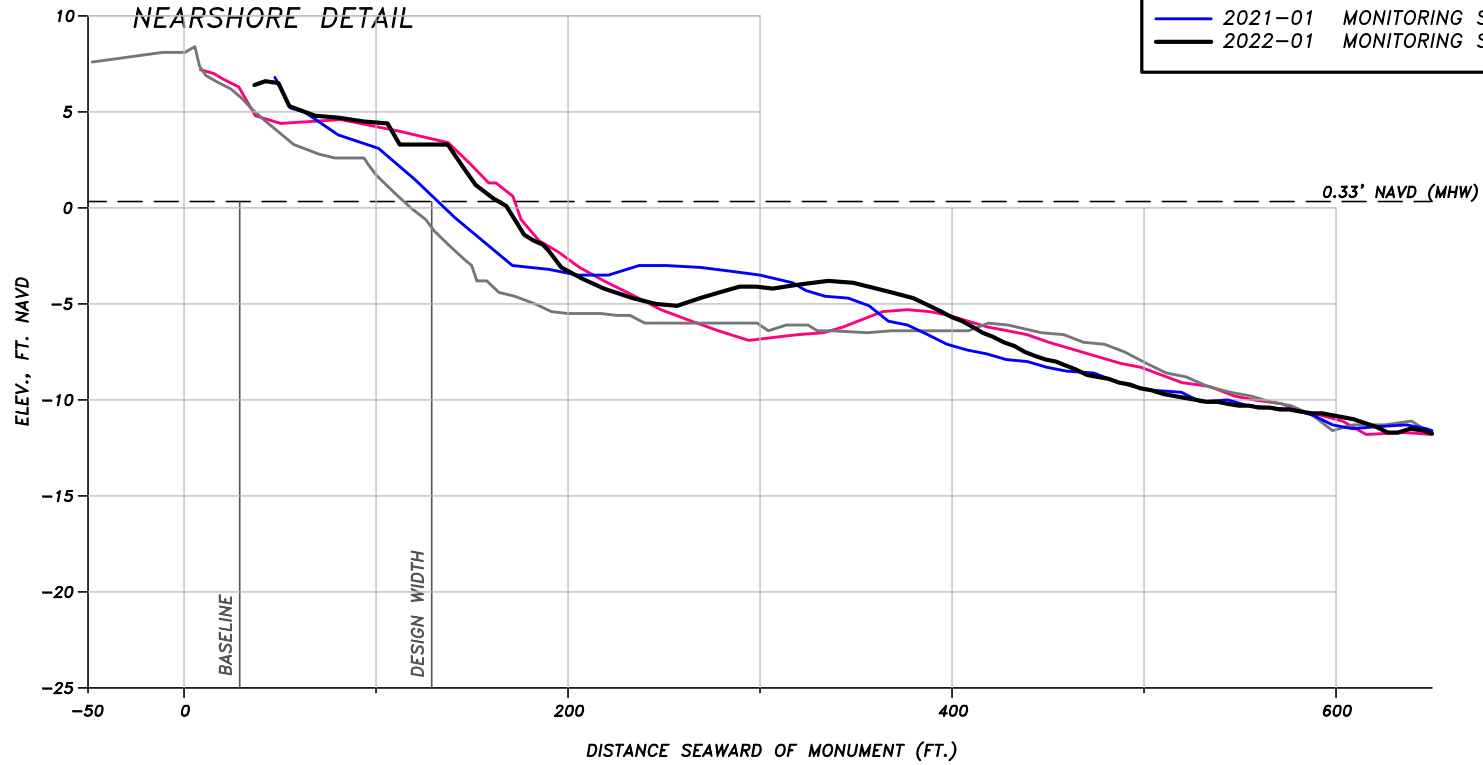


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-29

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

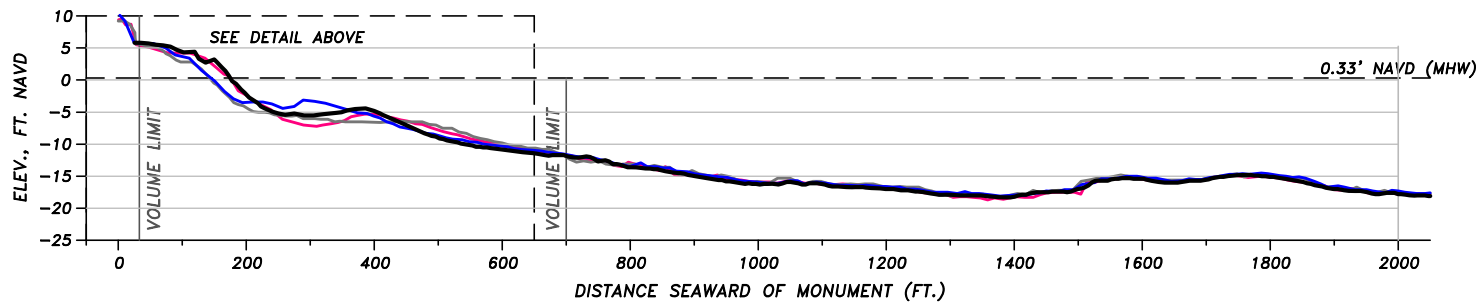
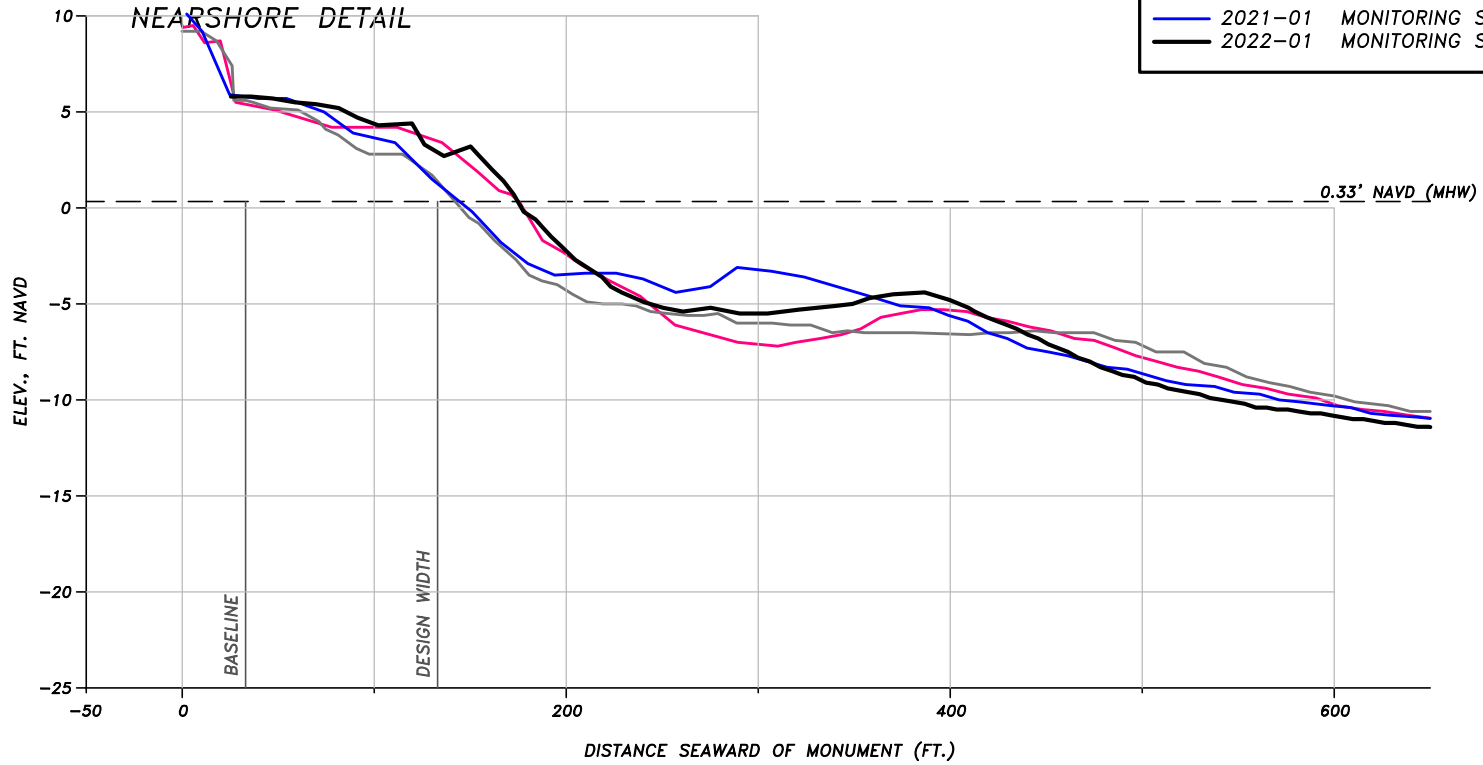


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-30

SURVEY LEGEND	
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— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

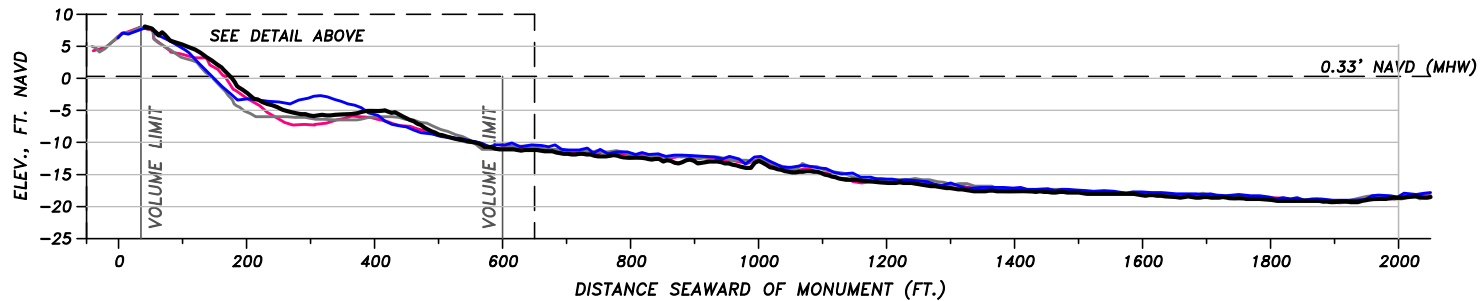
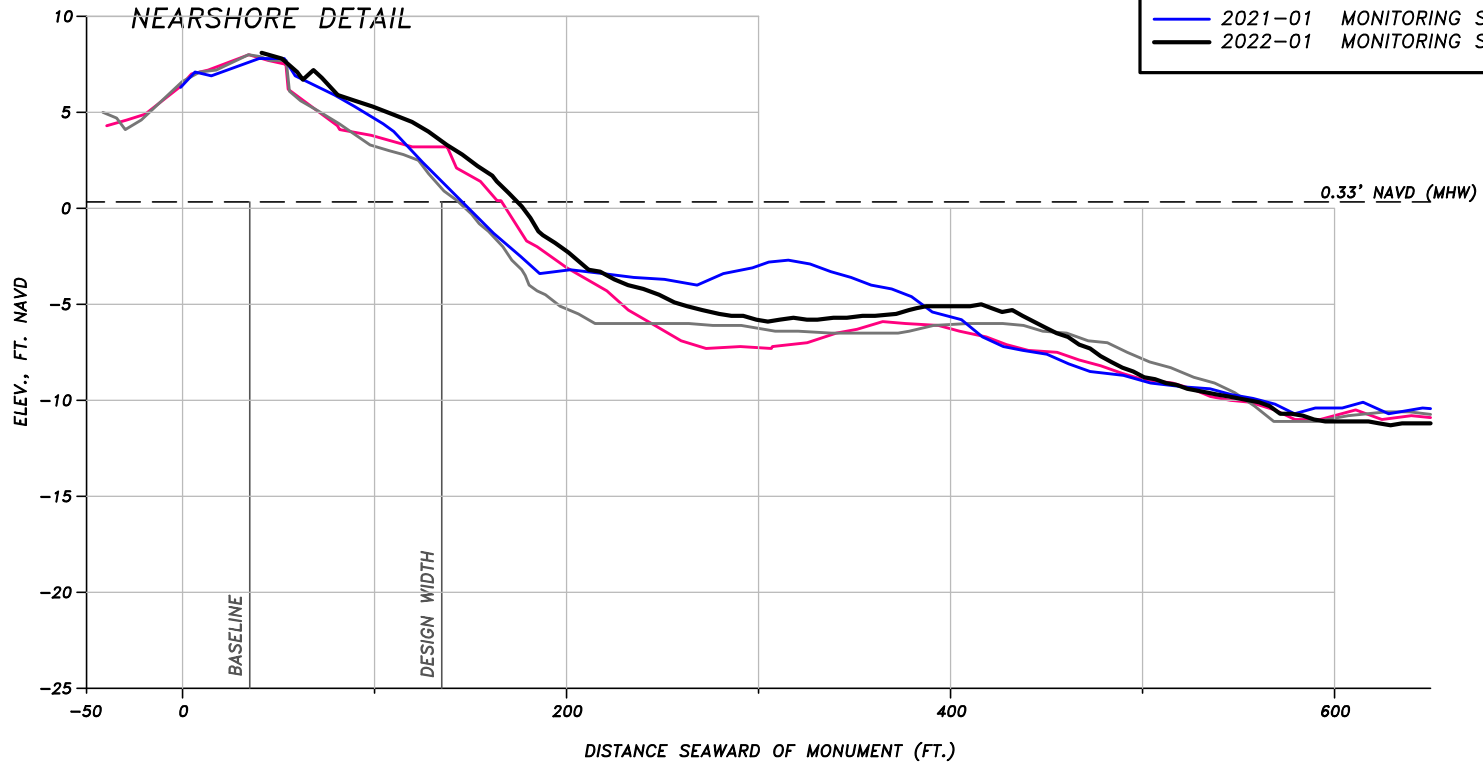


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-31

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI



**HUMISTON
& MOORE
ENGINEERS**
COASTAL
ENGINEERING DESIGN
AND PERMITTING

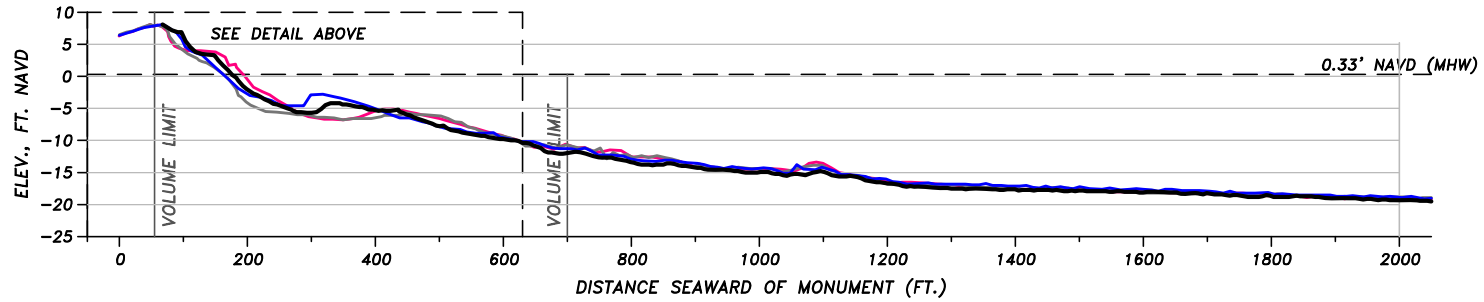
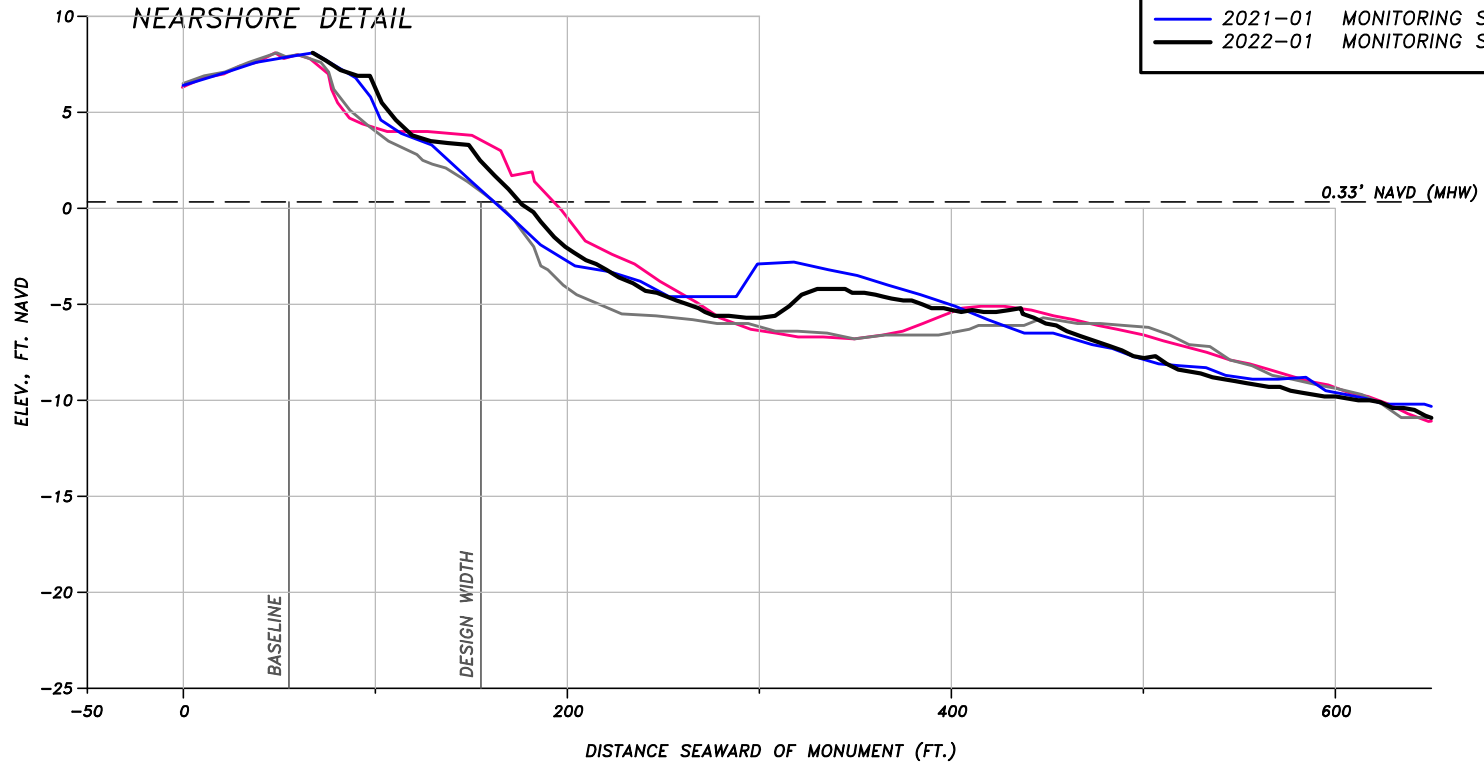
COLLIER COUNTY BEACH MONITORING
BEACH PROFILE

FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-32

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

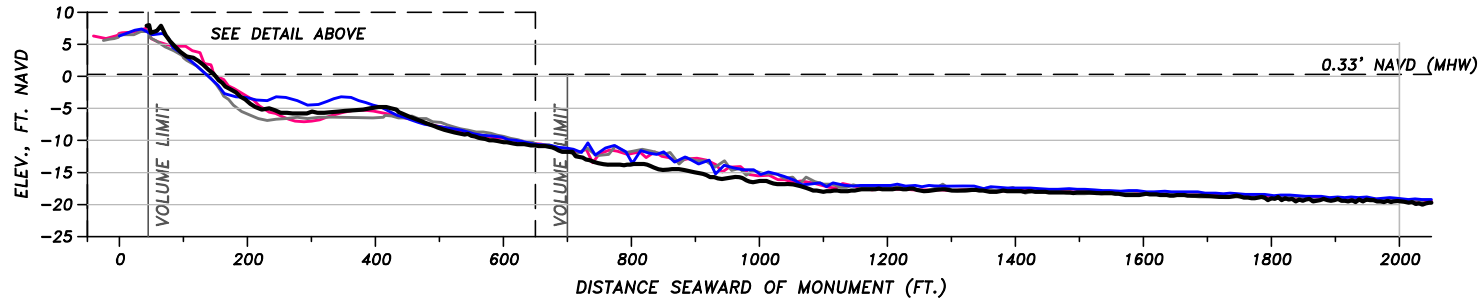
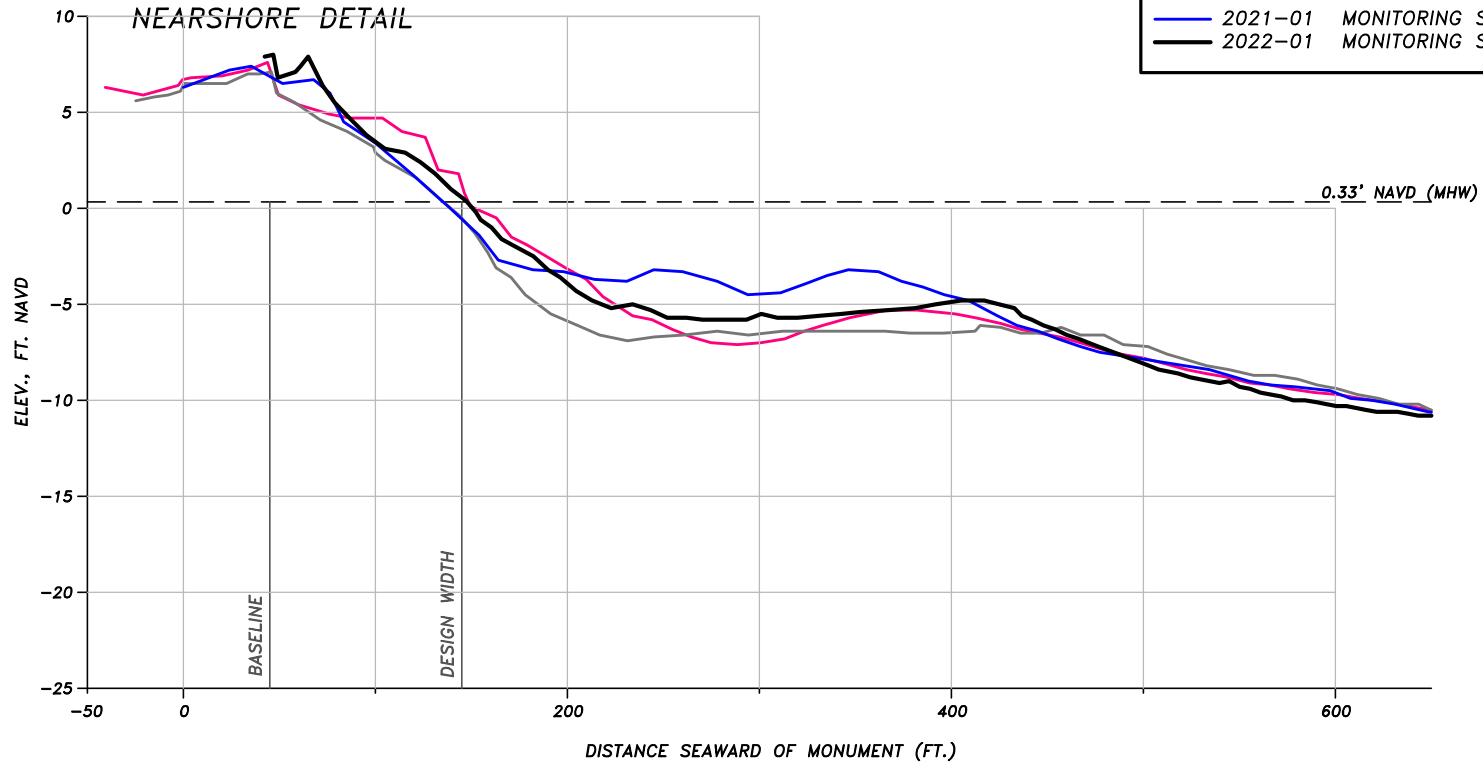


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-33

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

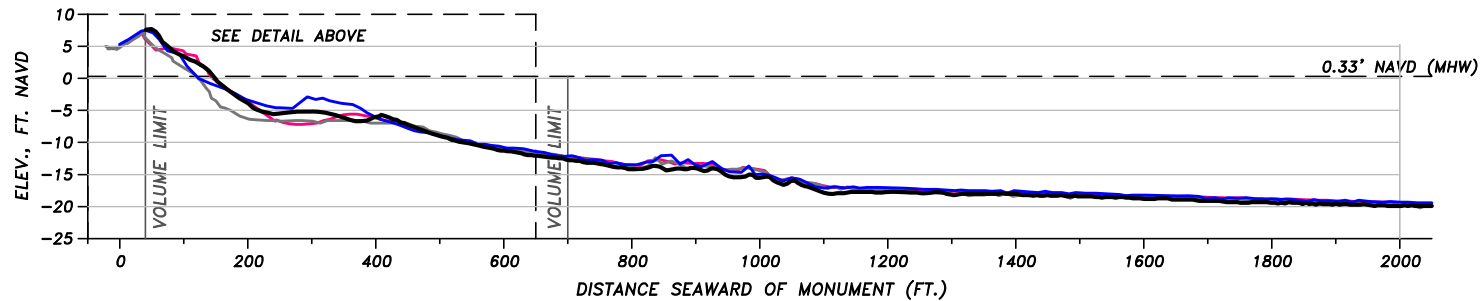
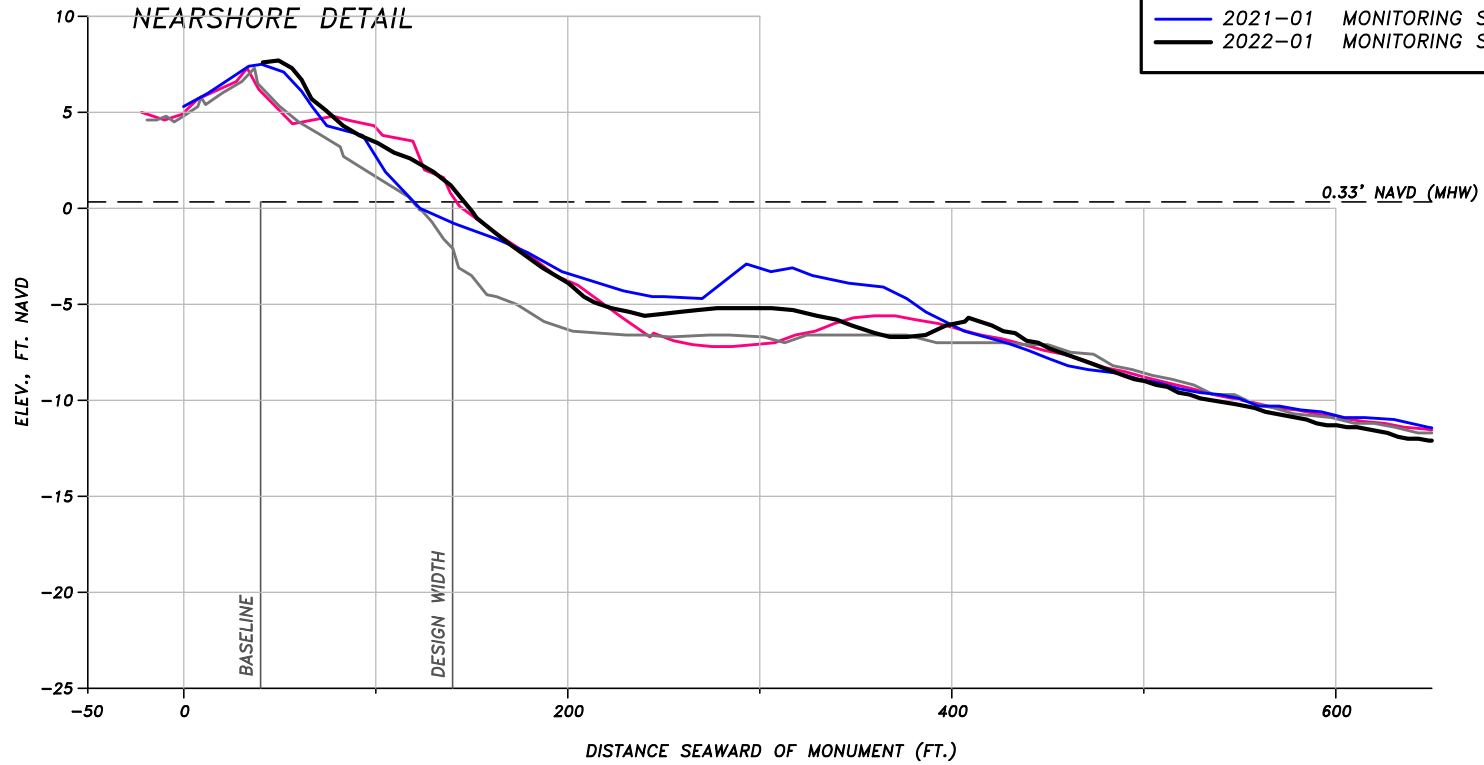


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-34

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

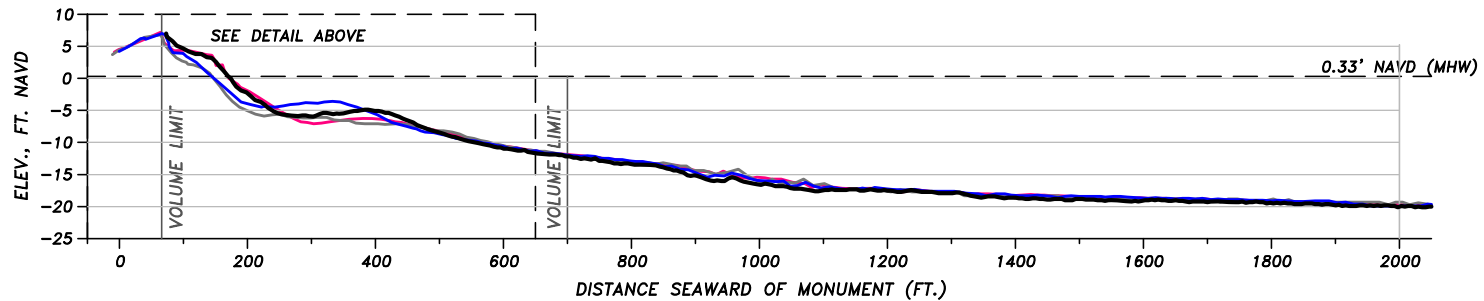
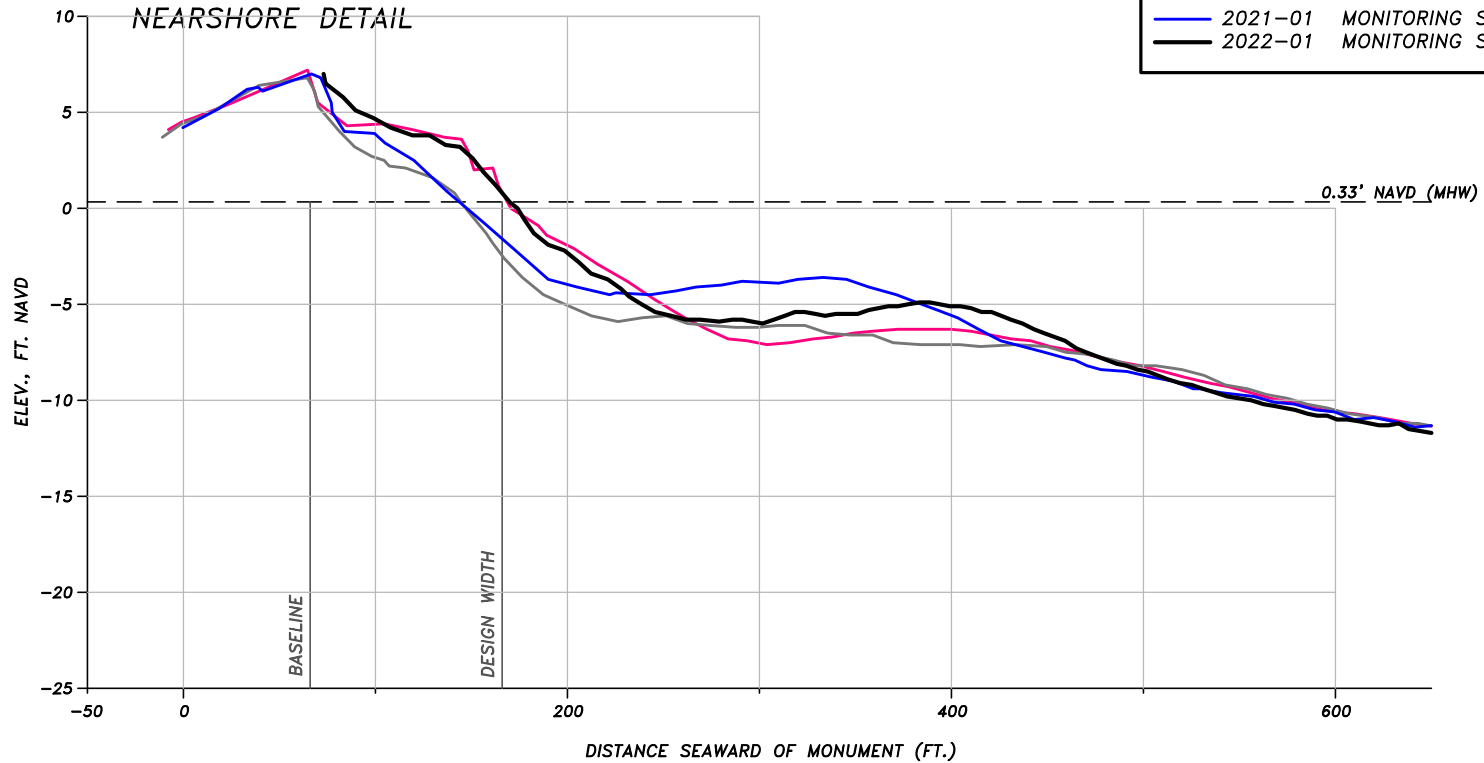


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-35

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI

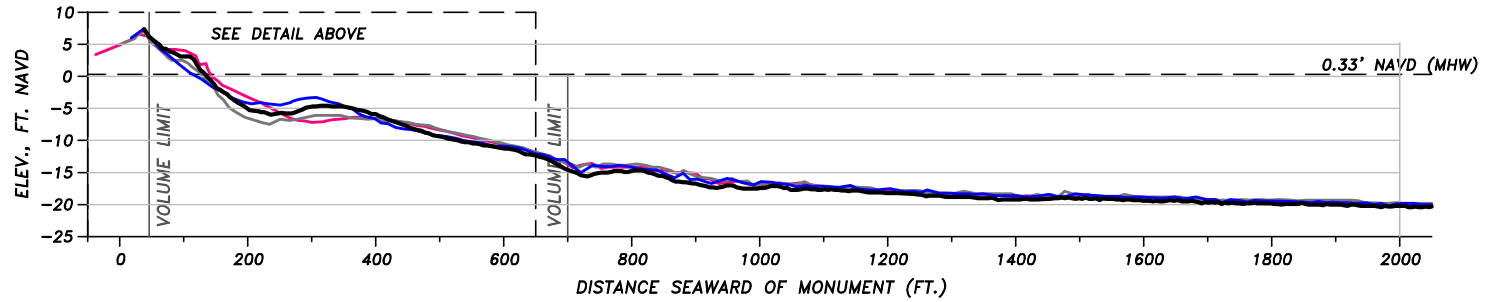
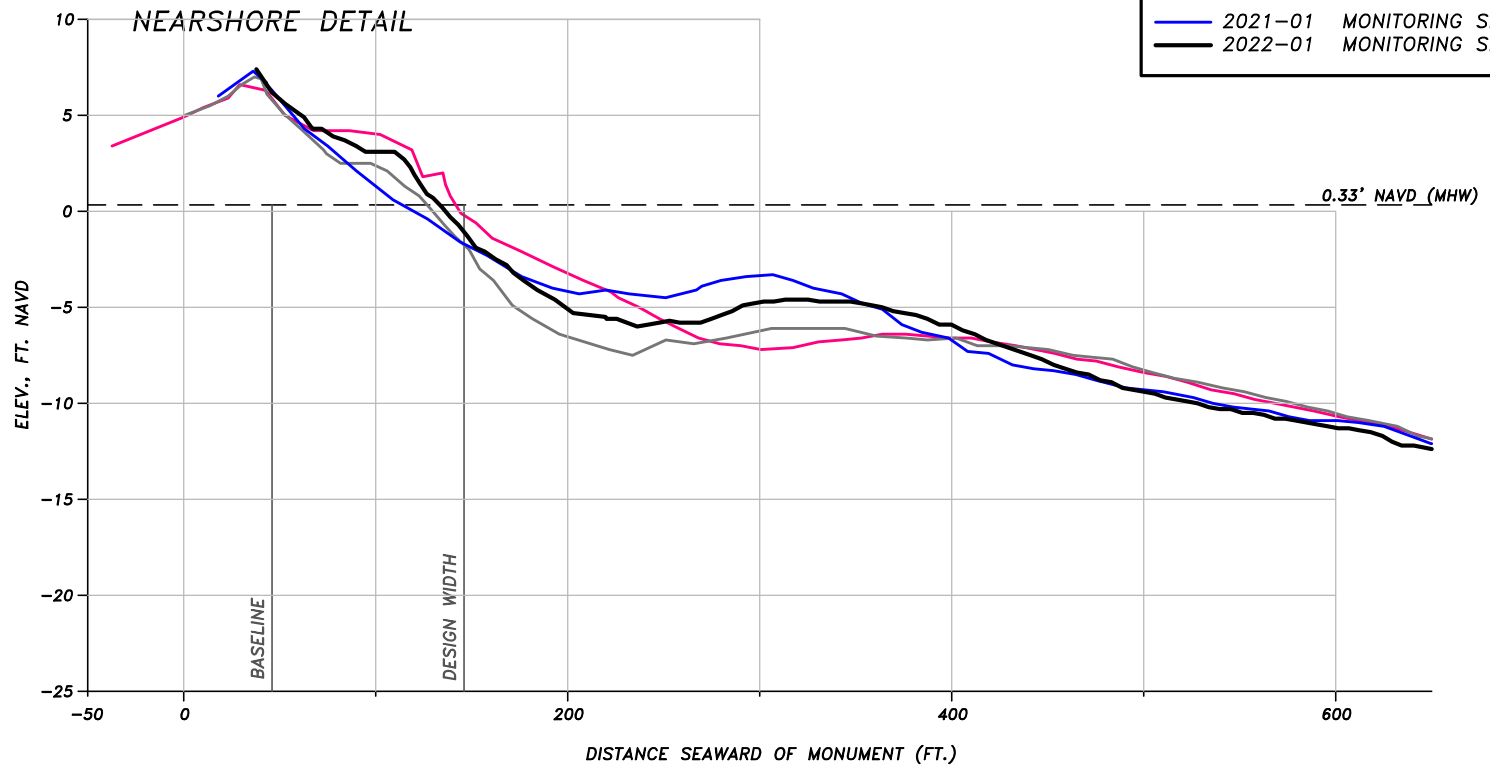


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-36

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

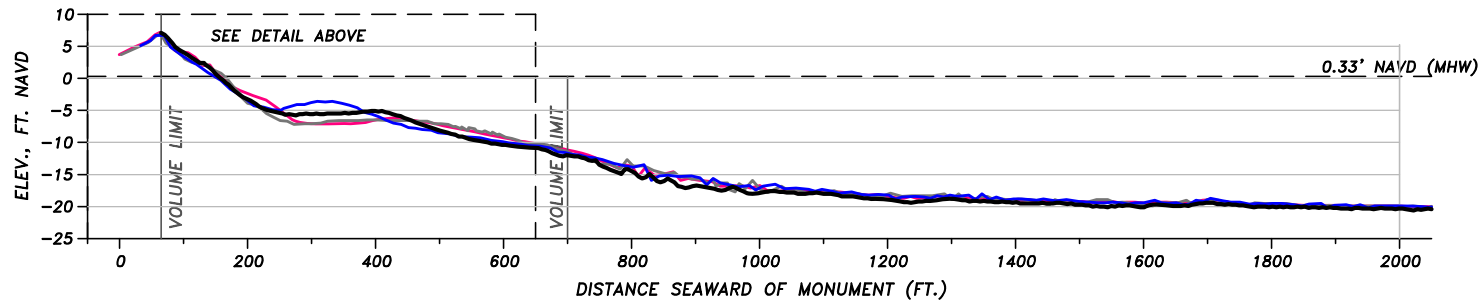
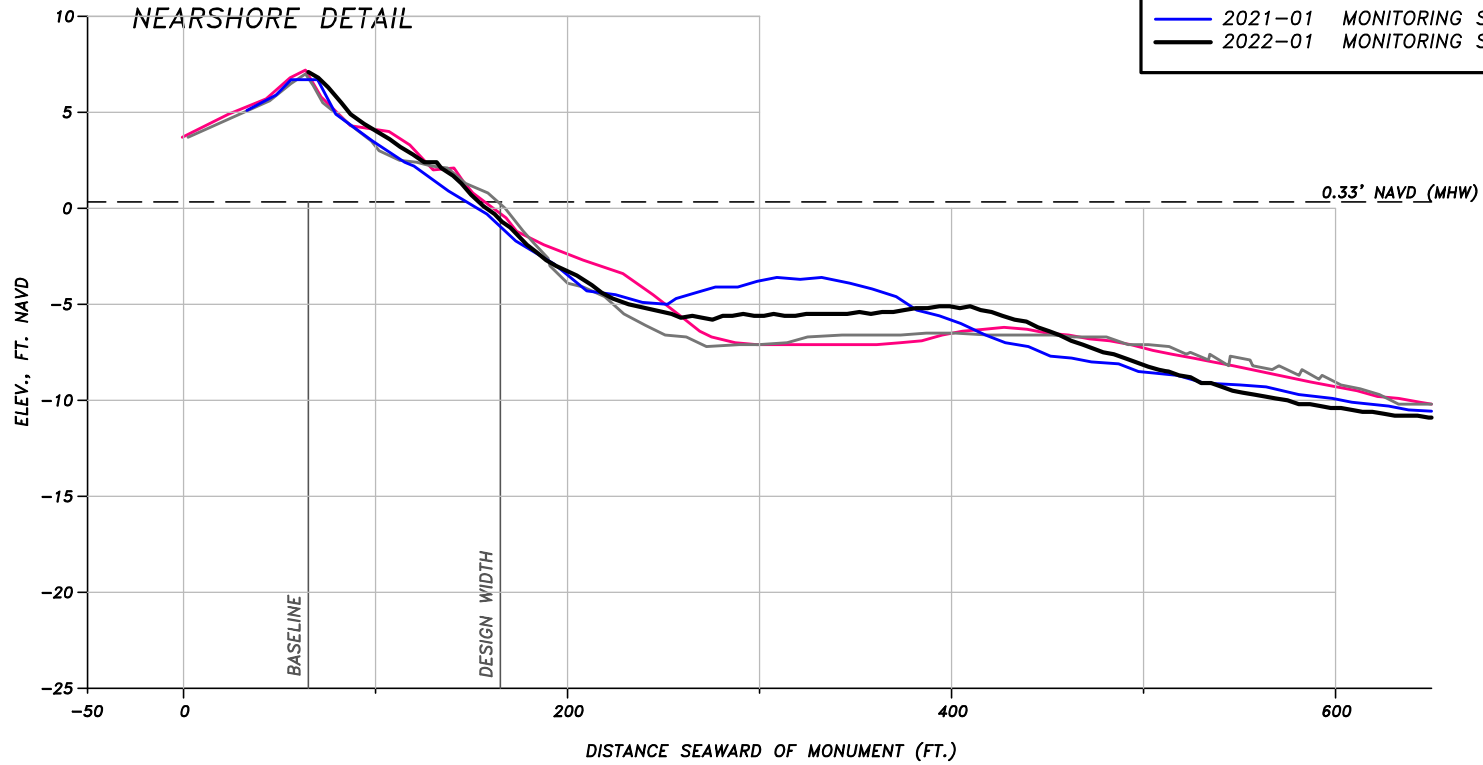


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-37

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI

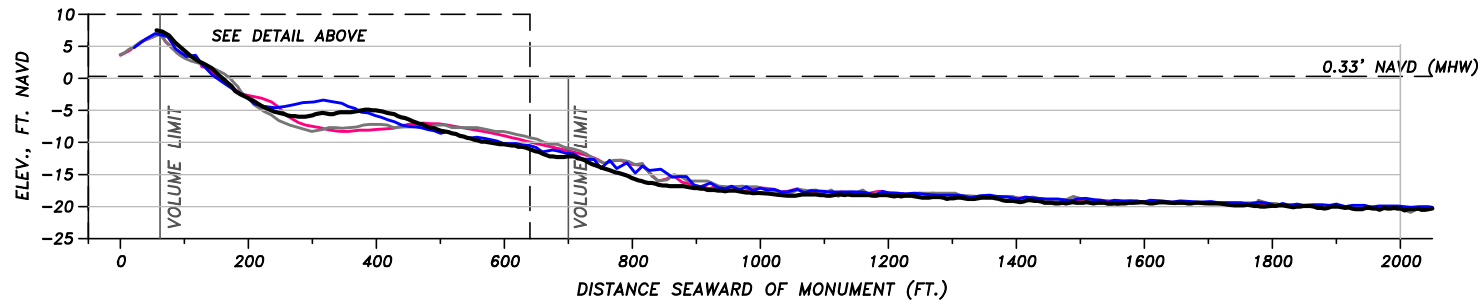
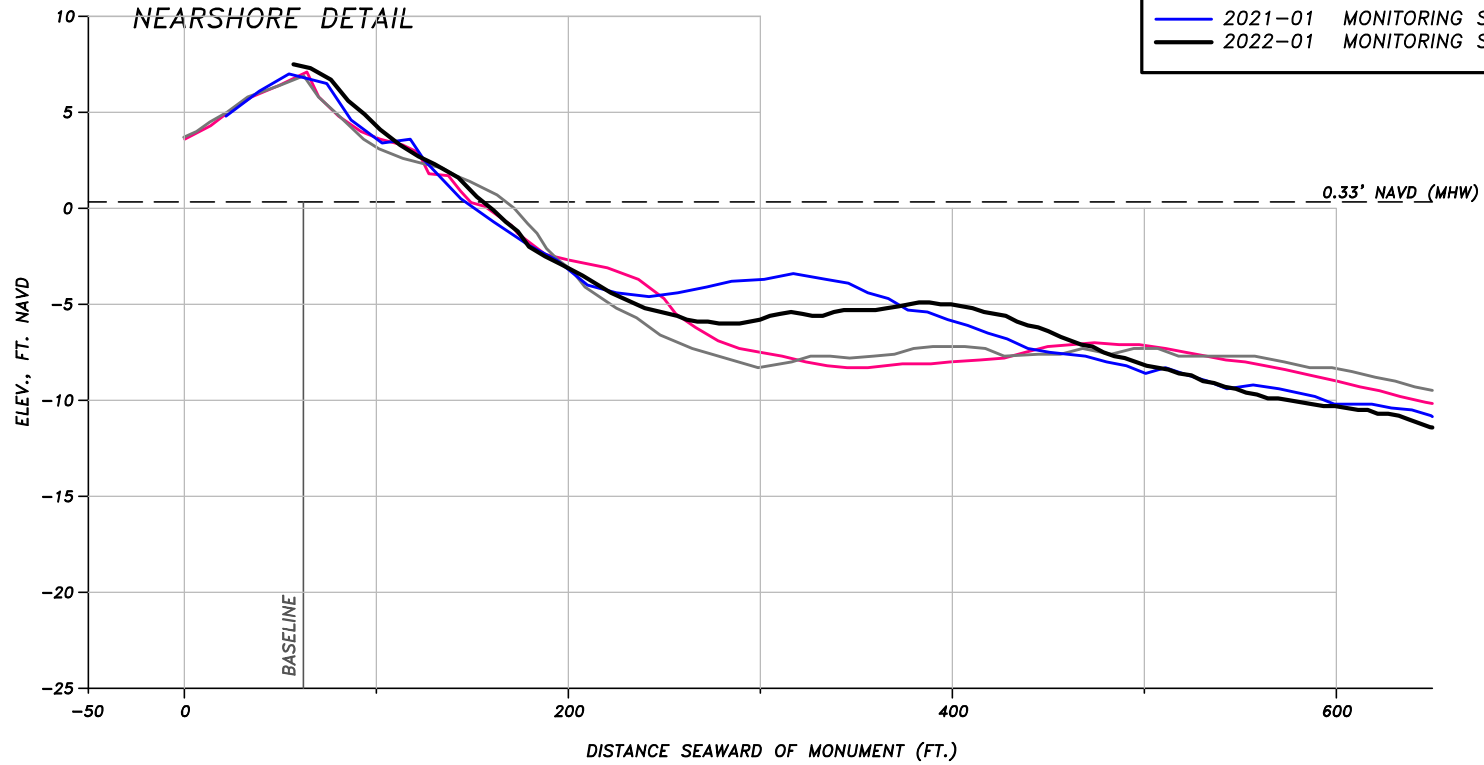


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-38

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

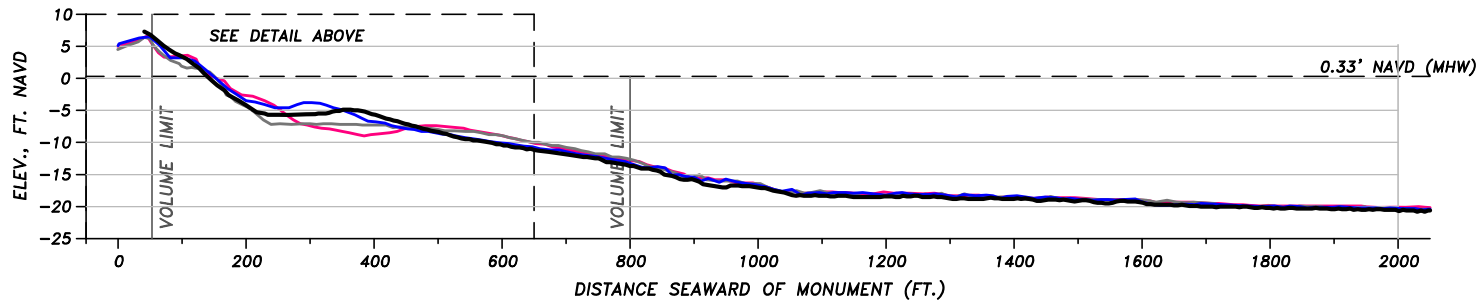
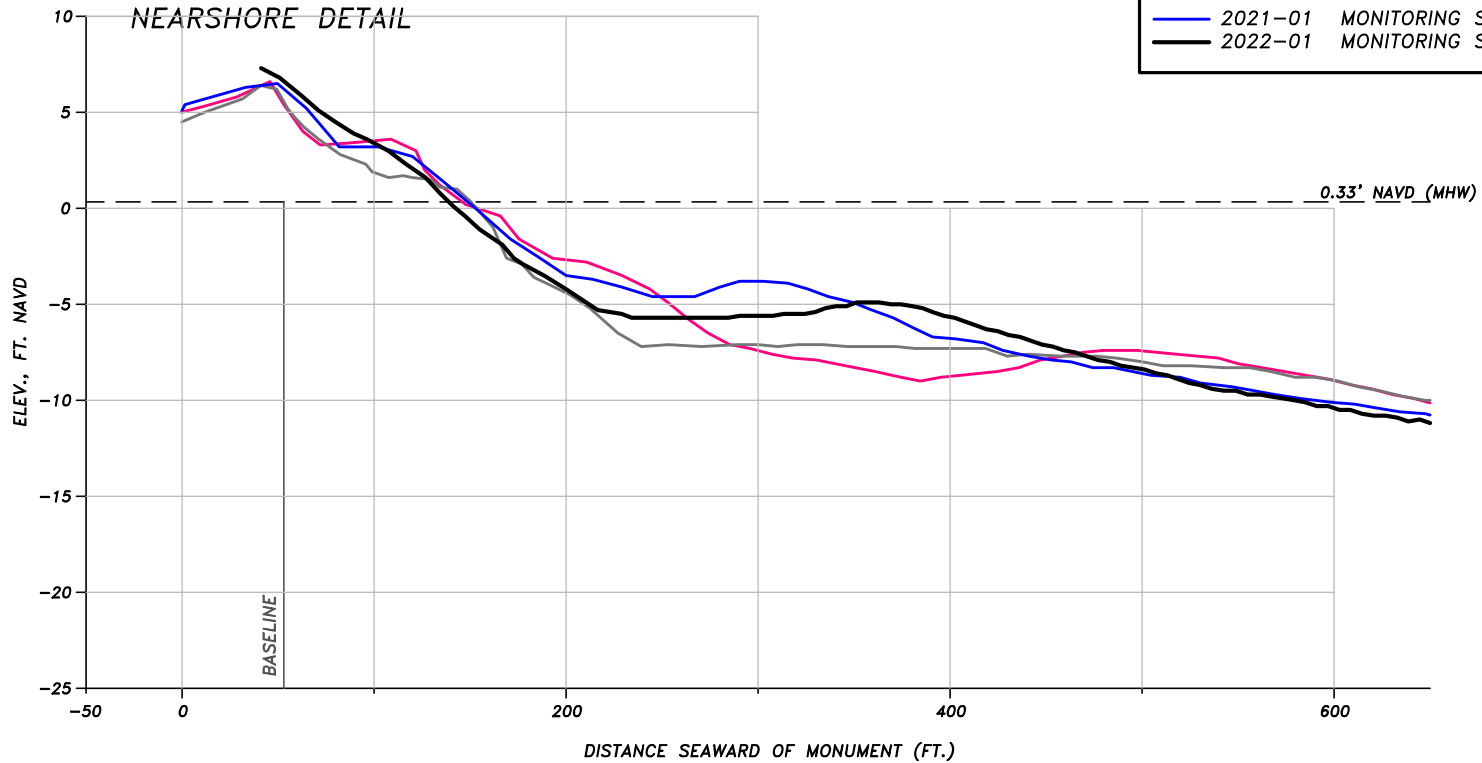


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-39

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

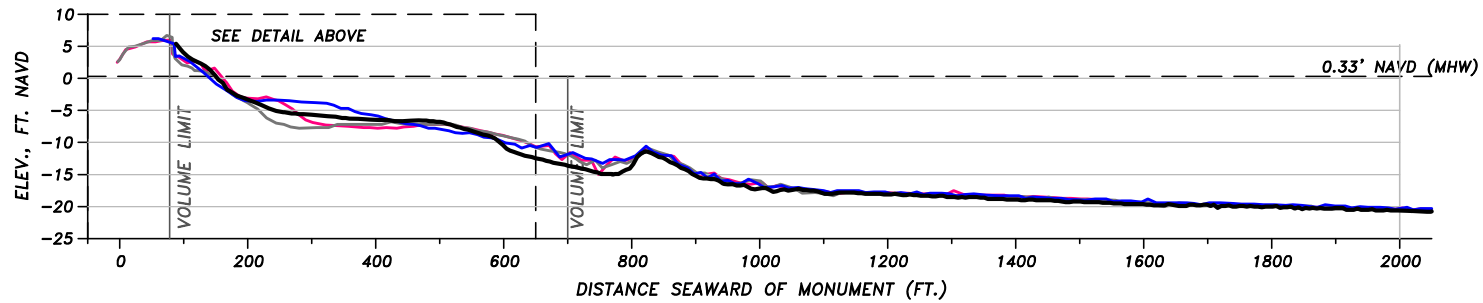
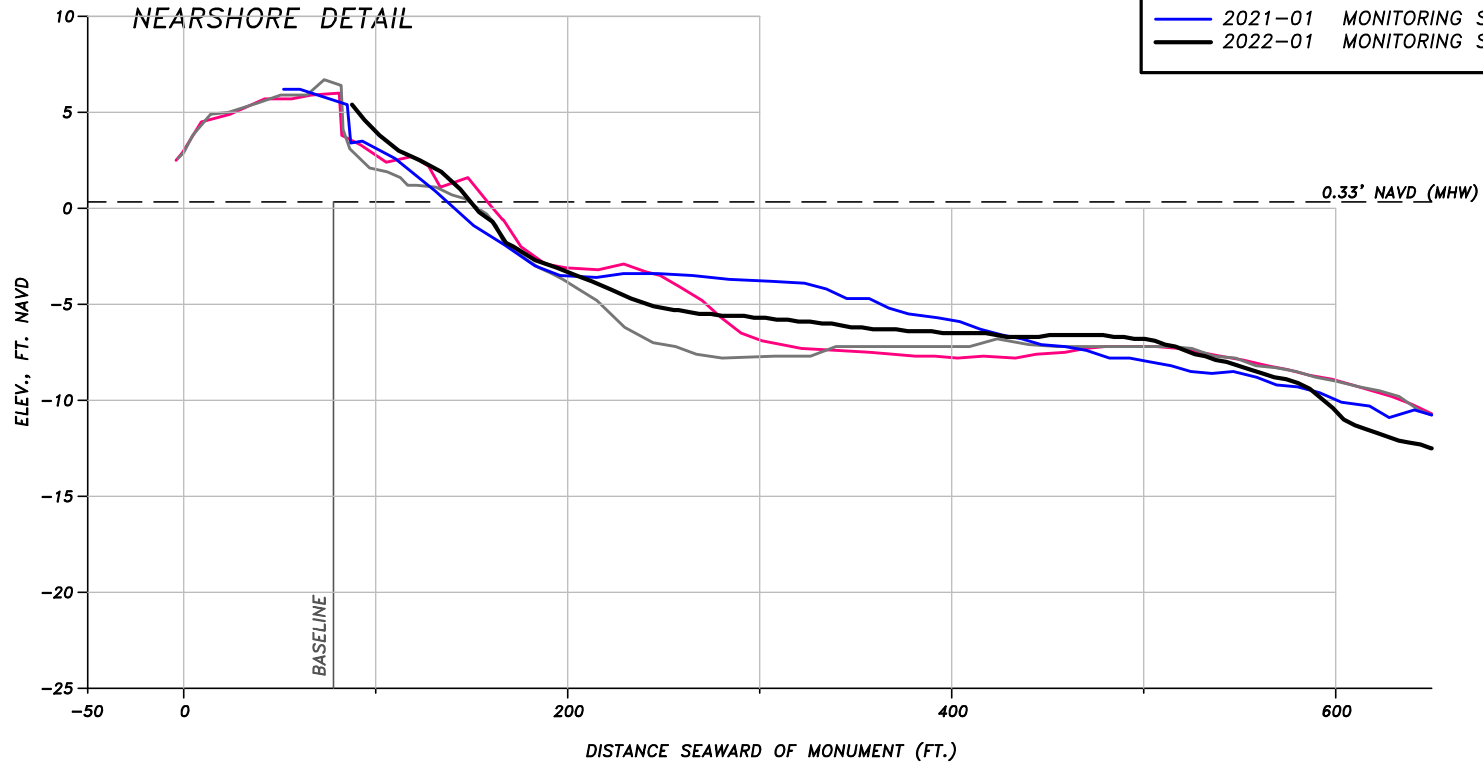


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-40

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI

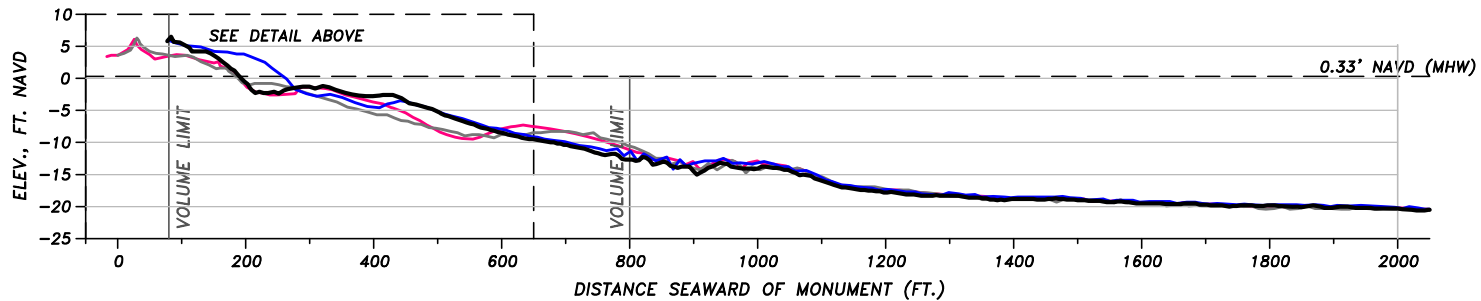
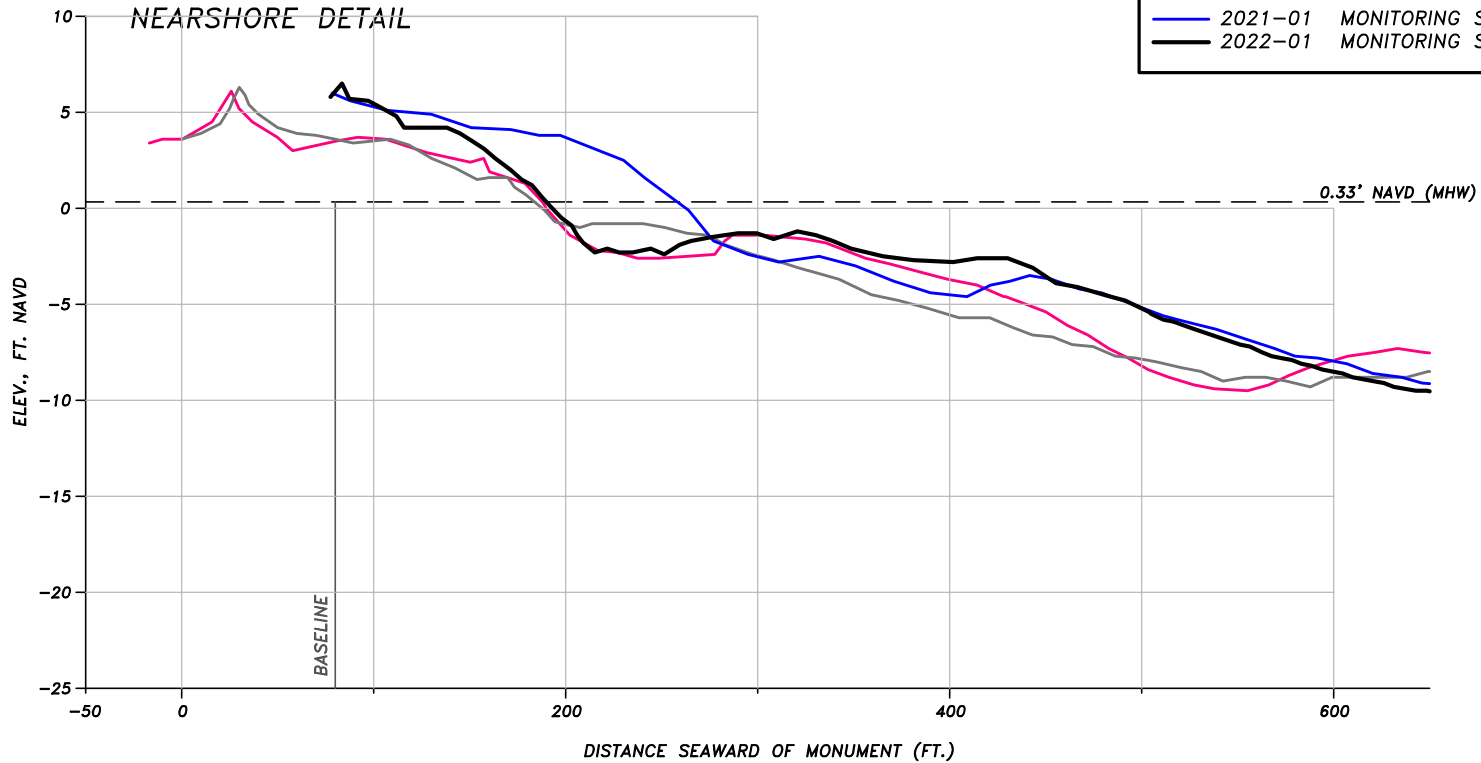


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-41

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

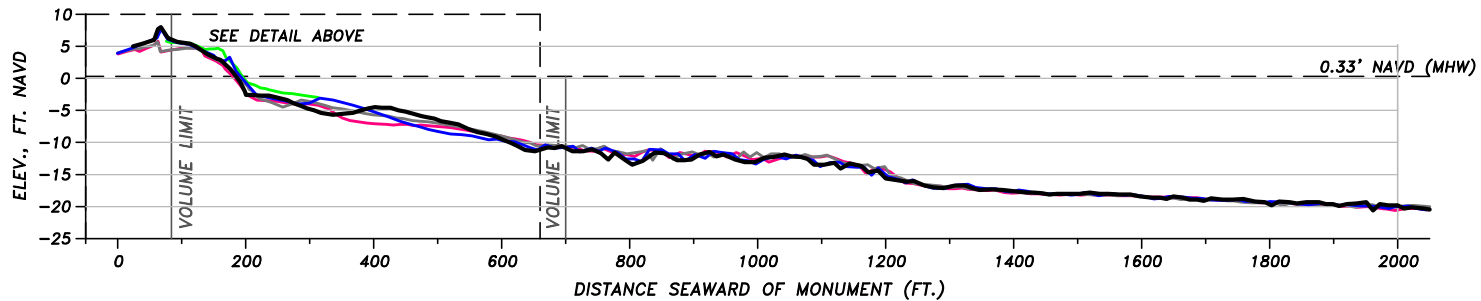
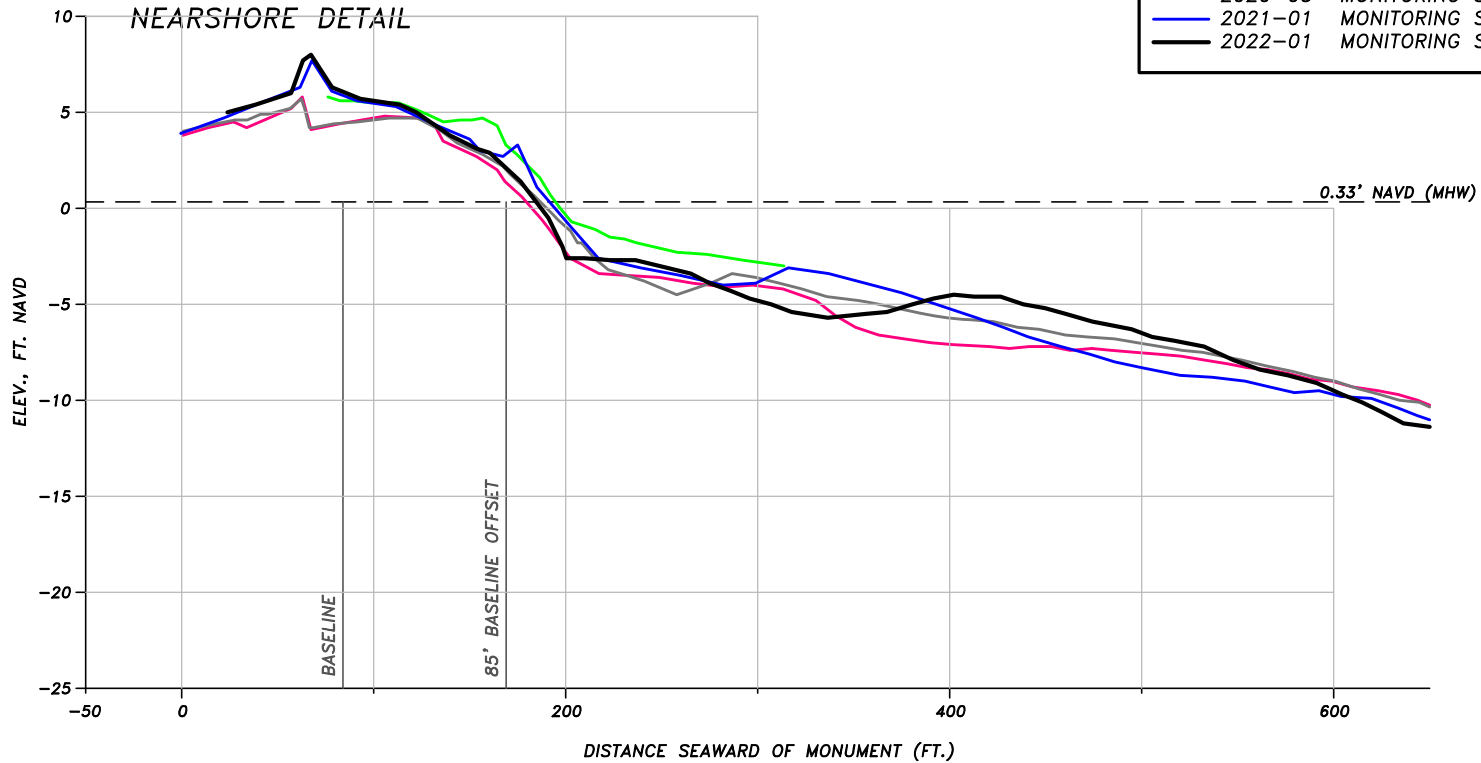


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-42

SURVEY LEGEND	
—	2005-11 PRE CONSTRUCTION CP&E
—	2006-06 POST CONSTRUCTION CP&E
—	2019-12 POST OCEANSIDE
—	2020-03 MONITORING SDI
—	2021-01 MONITORING SDI
—	2022-01 MONITORING SDI

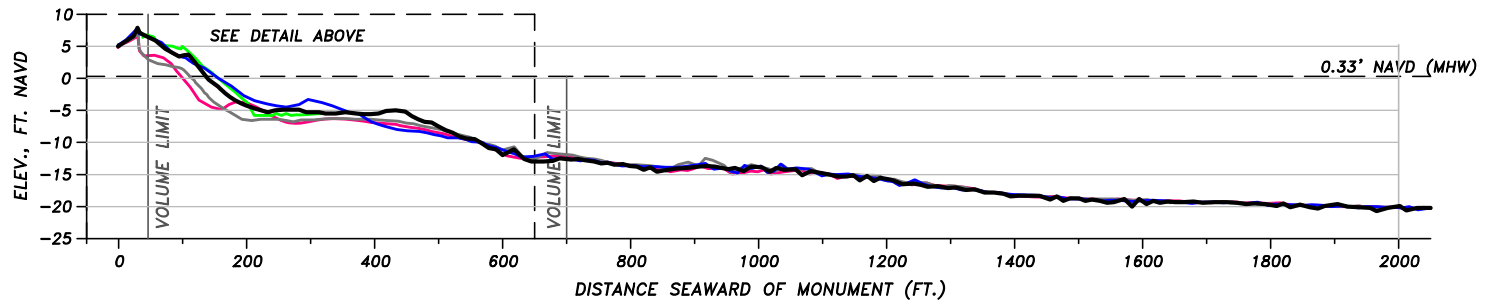
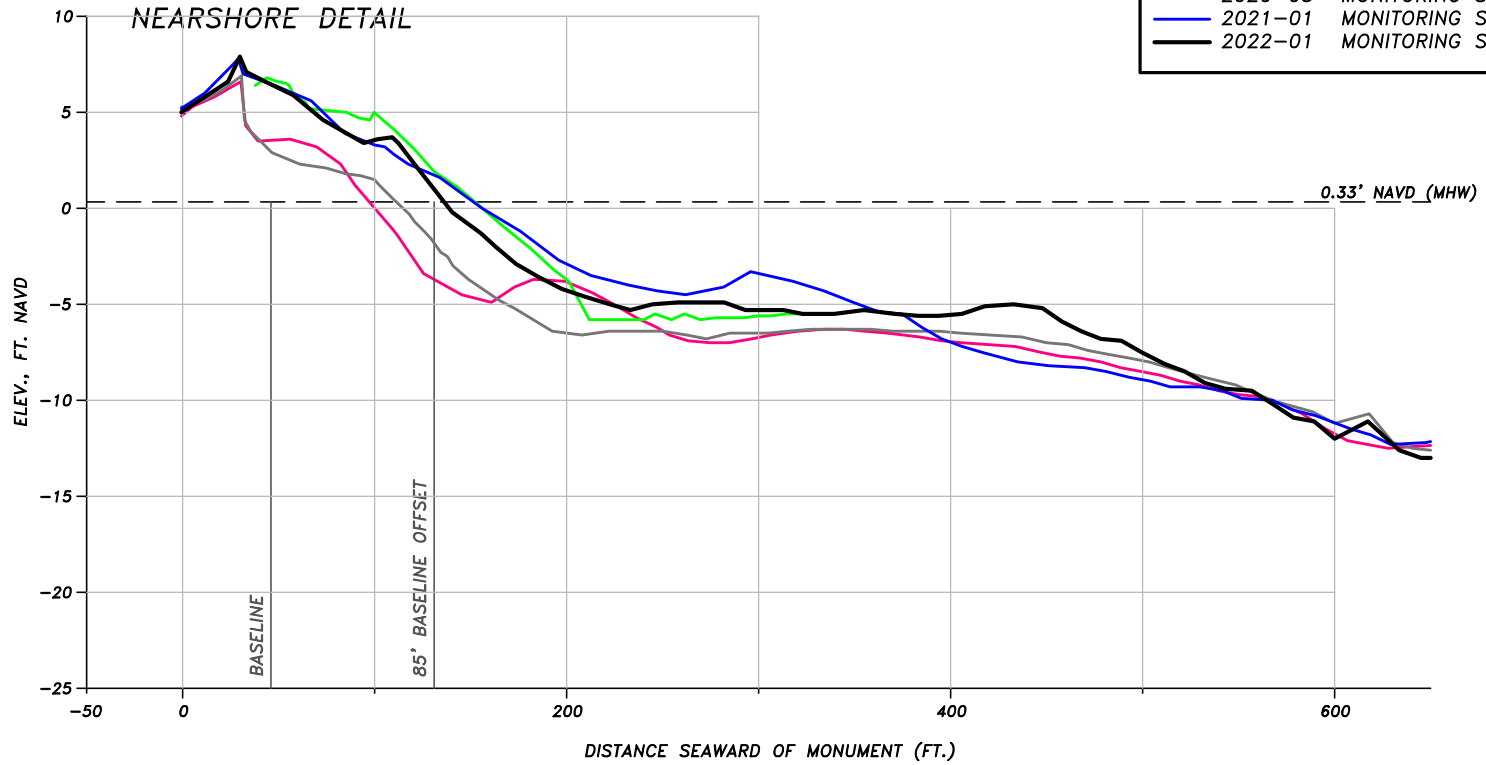


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-43

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2019-12	POST OCEANSIDE
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

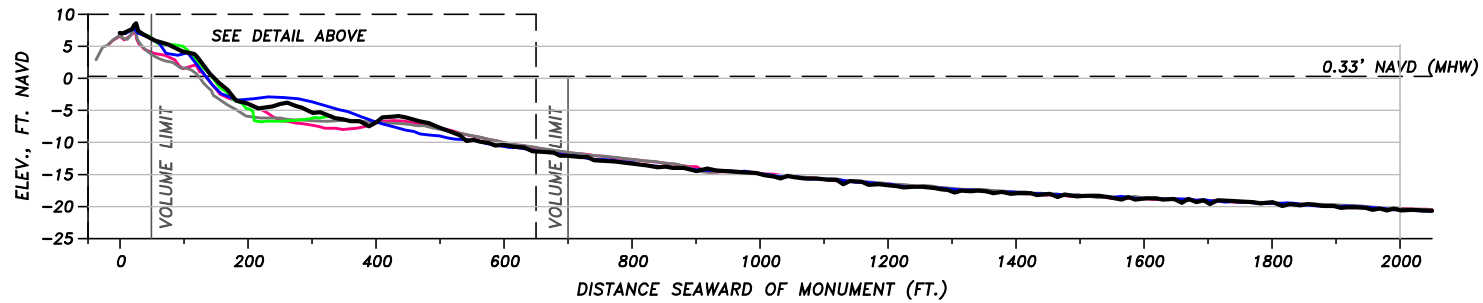
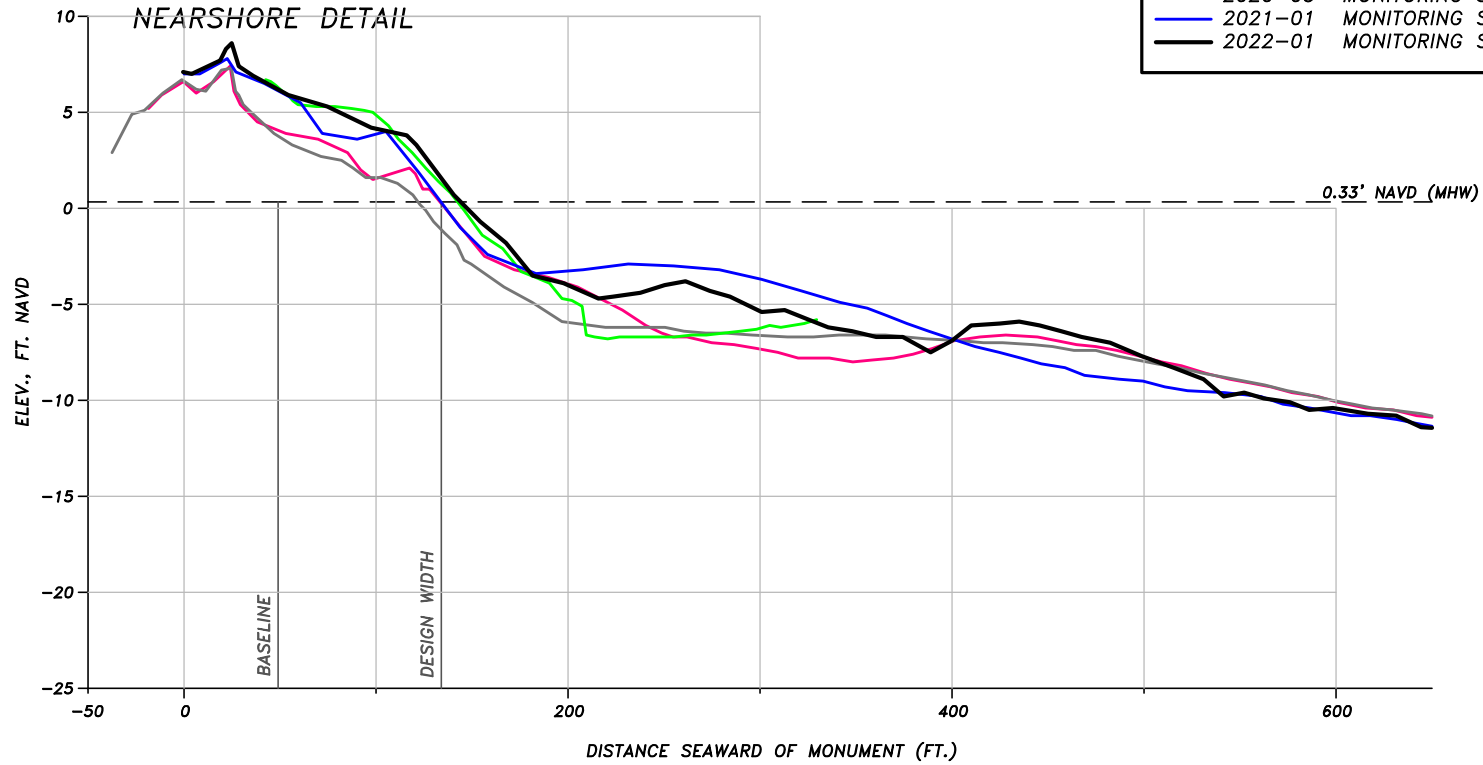


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
 NAPLES, FL 34110
 FAX: (239) 594-2025
 PHONE: (239) 594-2021
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BEACH PROFILE: R-44

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2019-12	POST OCEANSIDE
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

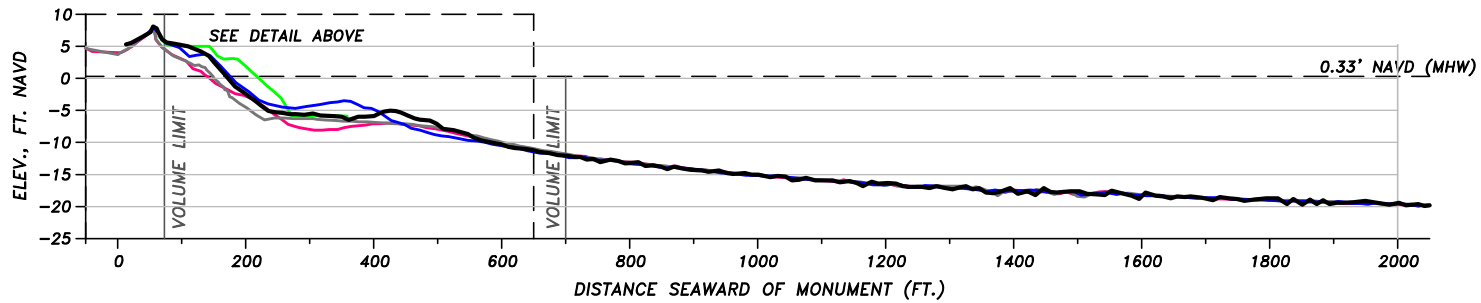
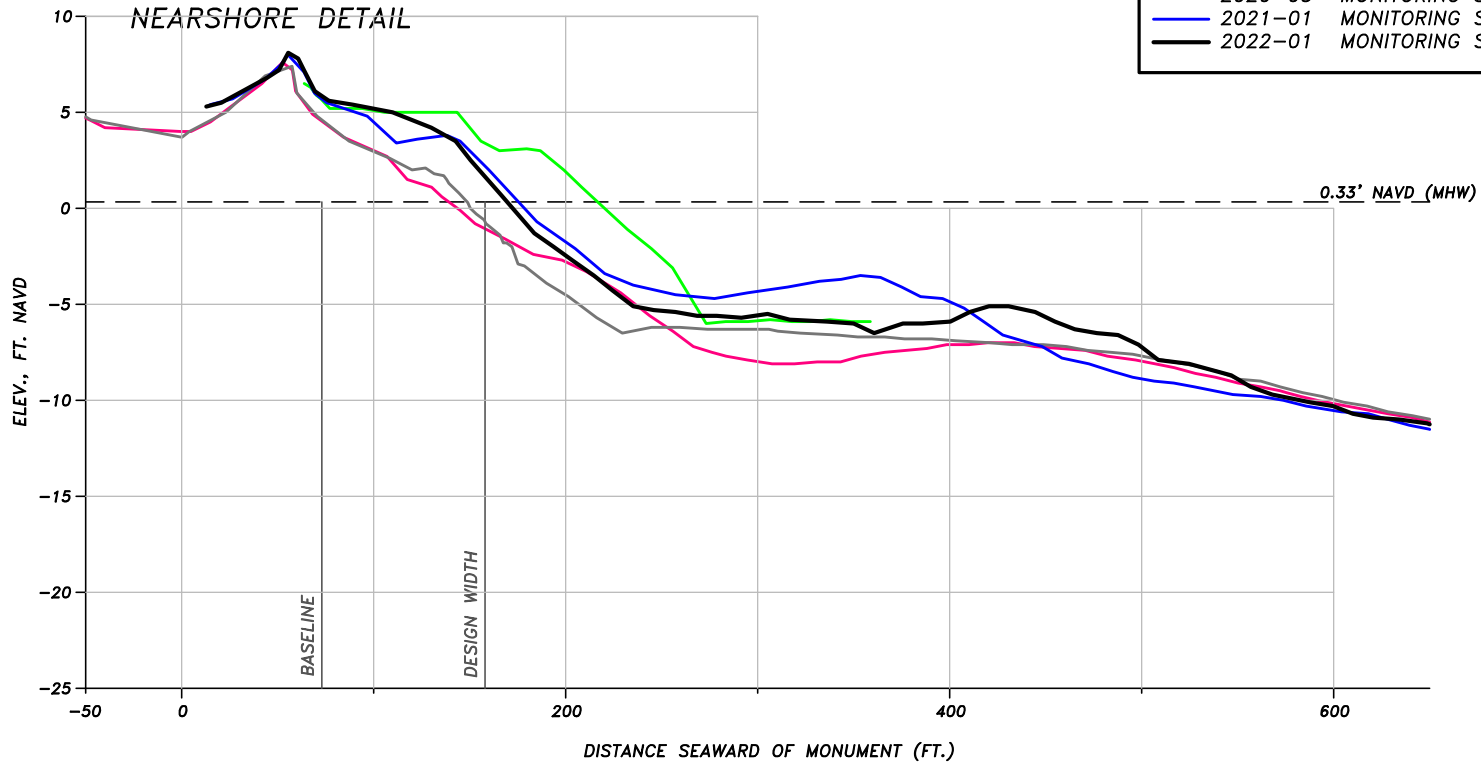


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-45

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2019-12	POST OCEANSIDE
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

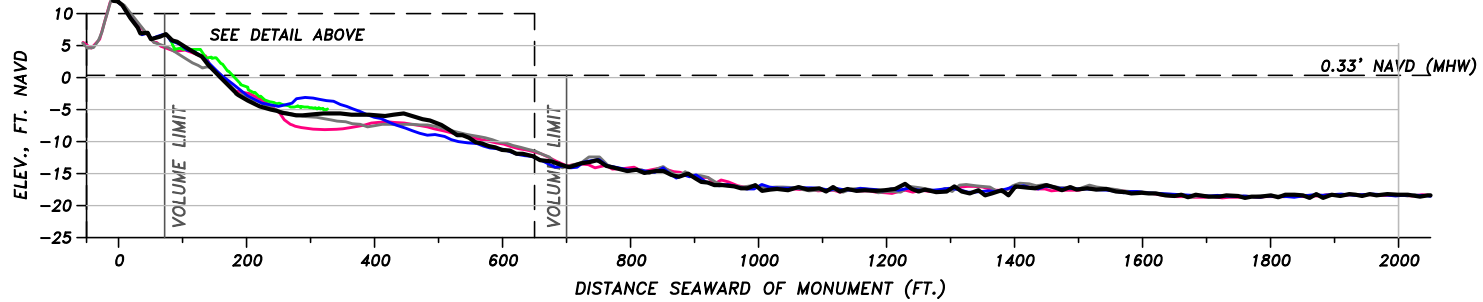
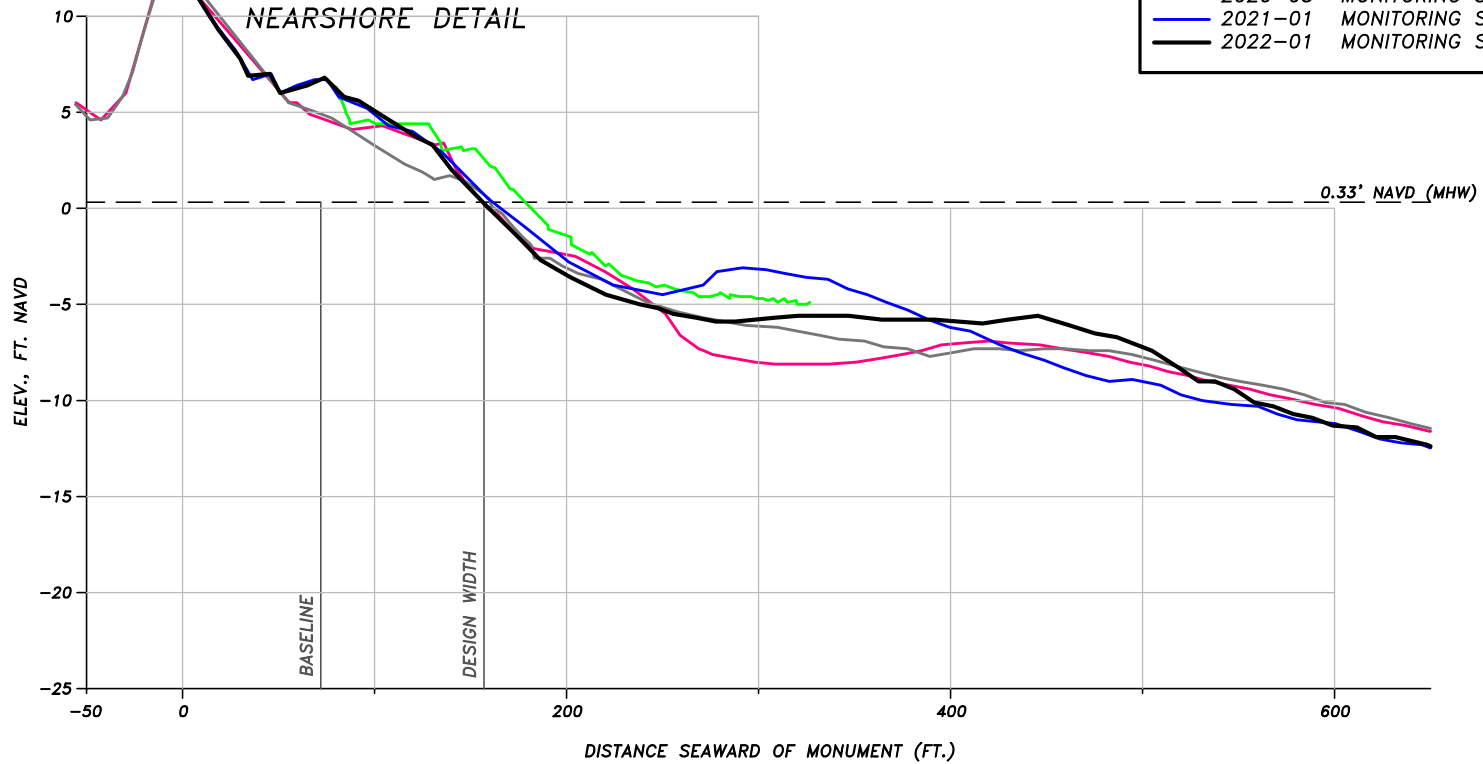


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
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FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-46

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2019-12	POST OCEANSIDE
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

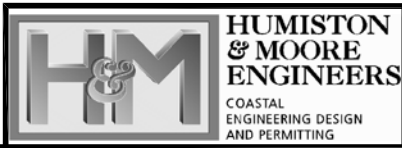
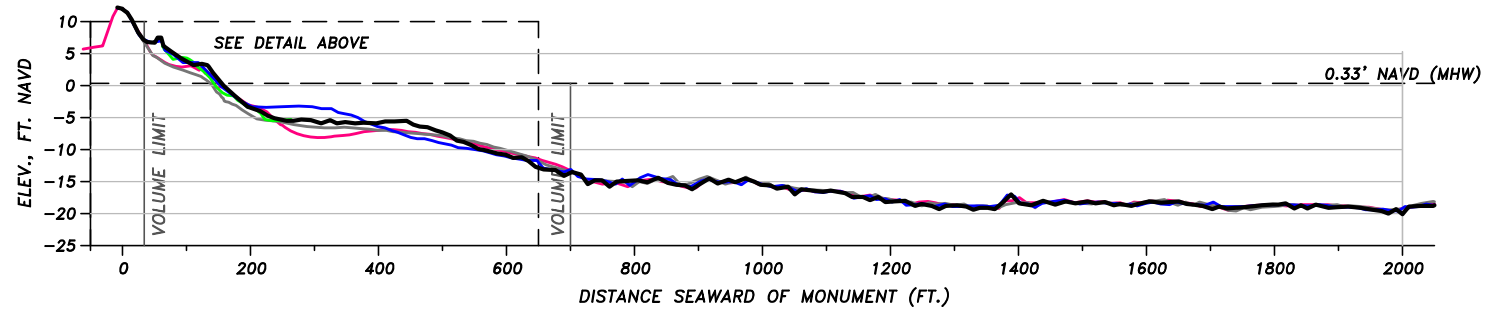
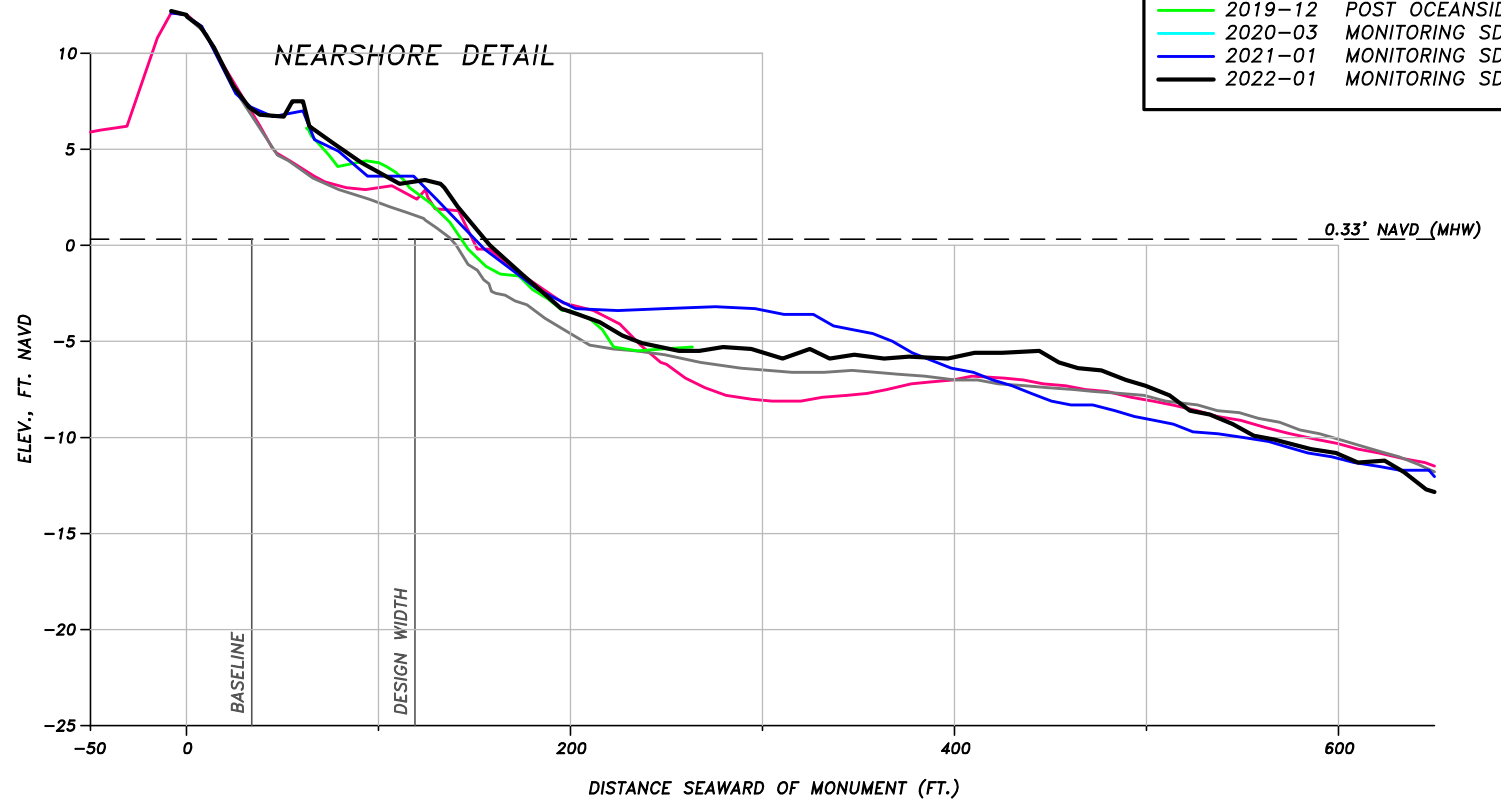


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
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BEACH PROFILE: R-47

SURVEY LEGEND	
—	2005-11 PRE CONSTRUCTION CP&E
—	2006-06 POST CONSTRUCTION CP&E
—	2019-12 POST OCEANSIDE
—	2020-03 MONITORING SDI
—	2021-01 MONITORING SDI
—	2022-01 MONITORING SDI

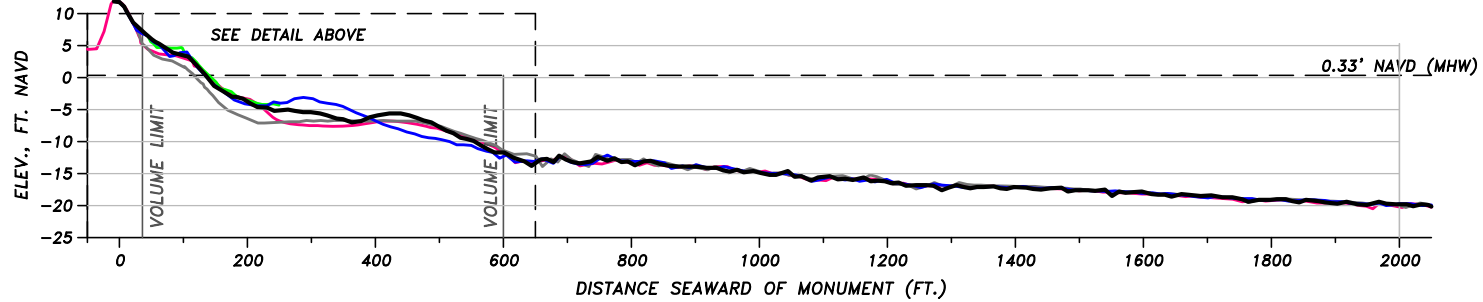
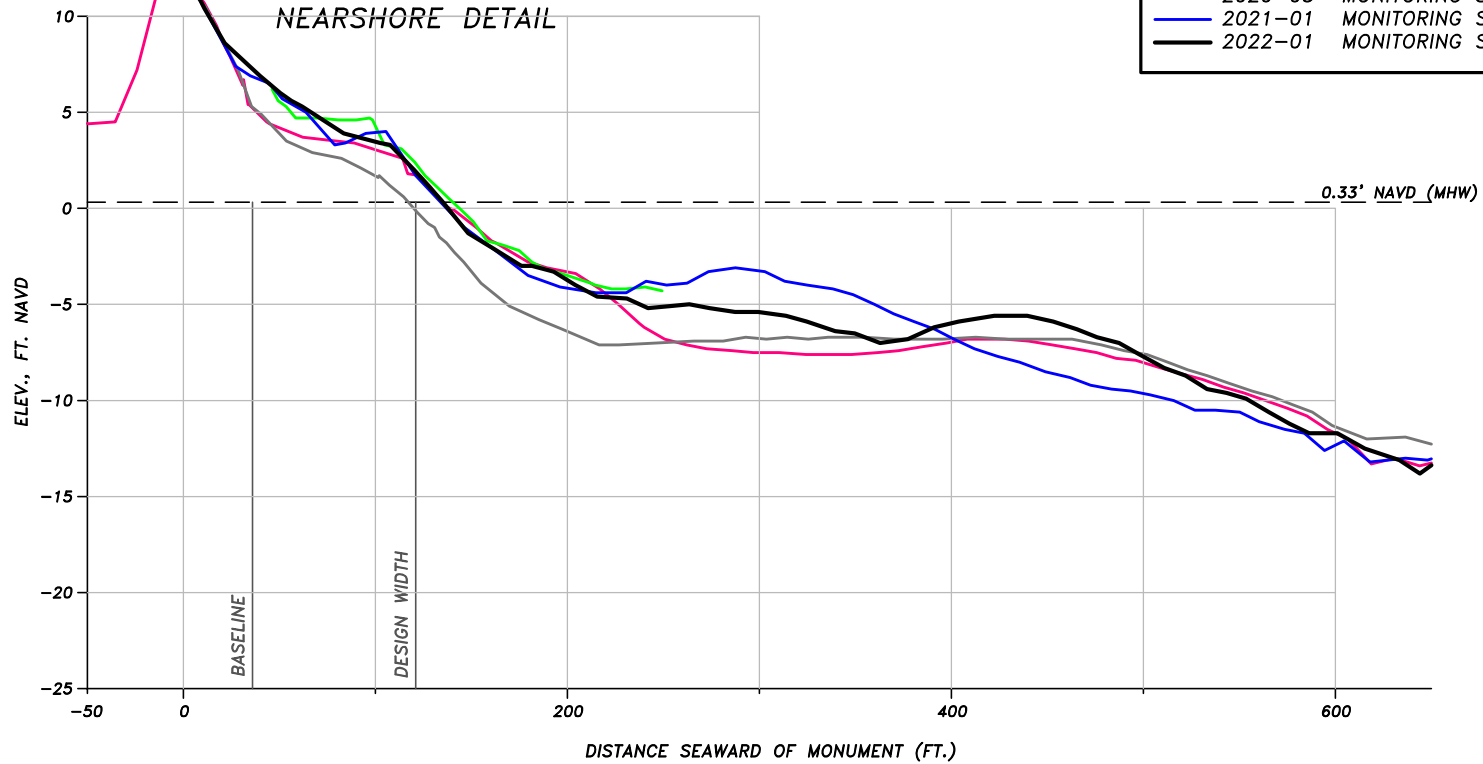


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-48

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2019-12	POST OCEANSIDE
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

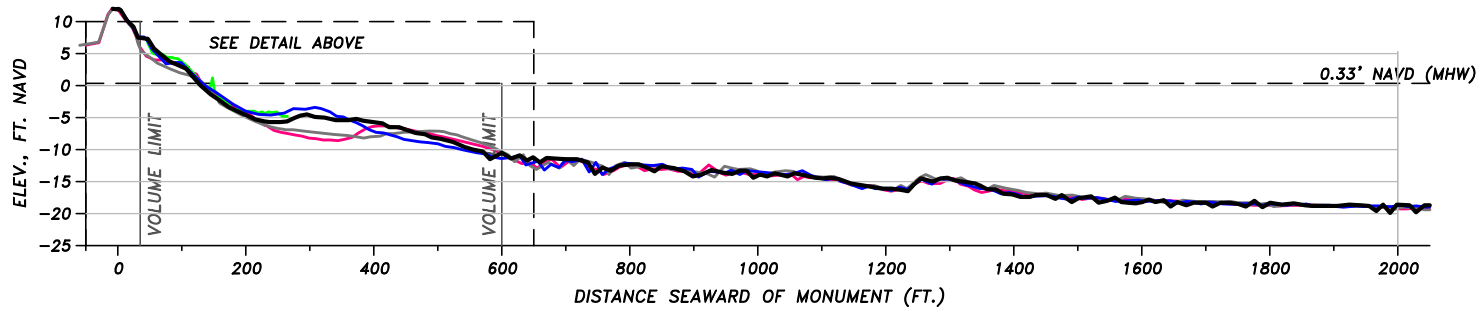
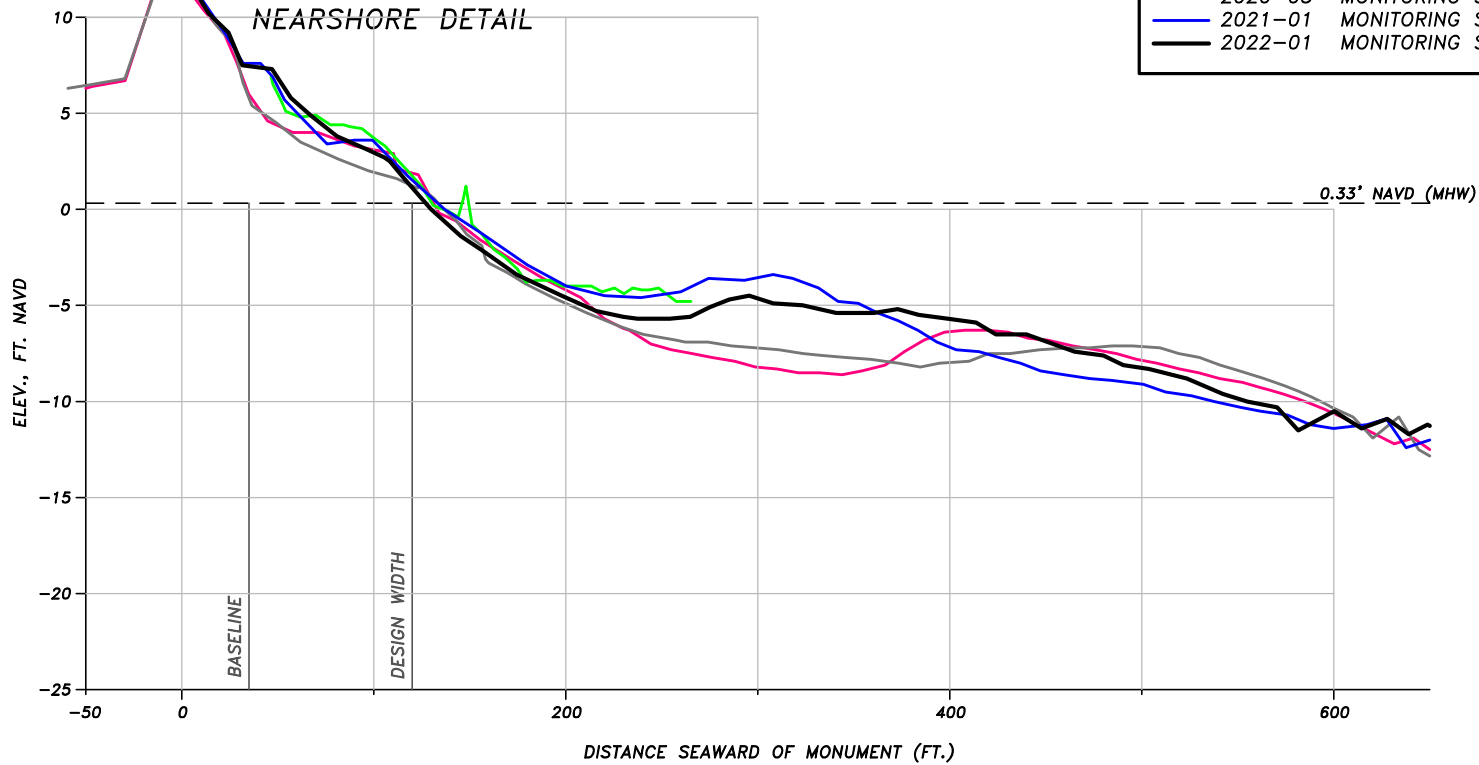


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-49

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2019-12	POST OCEANSIDE
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

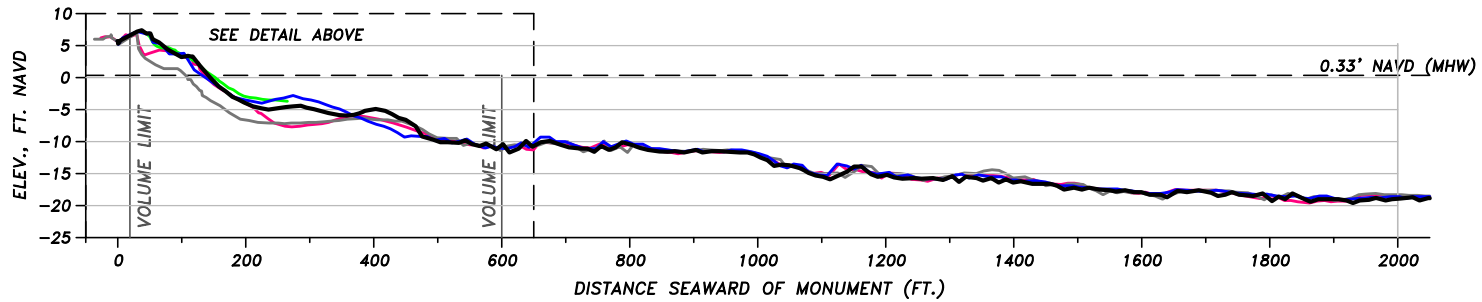
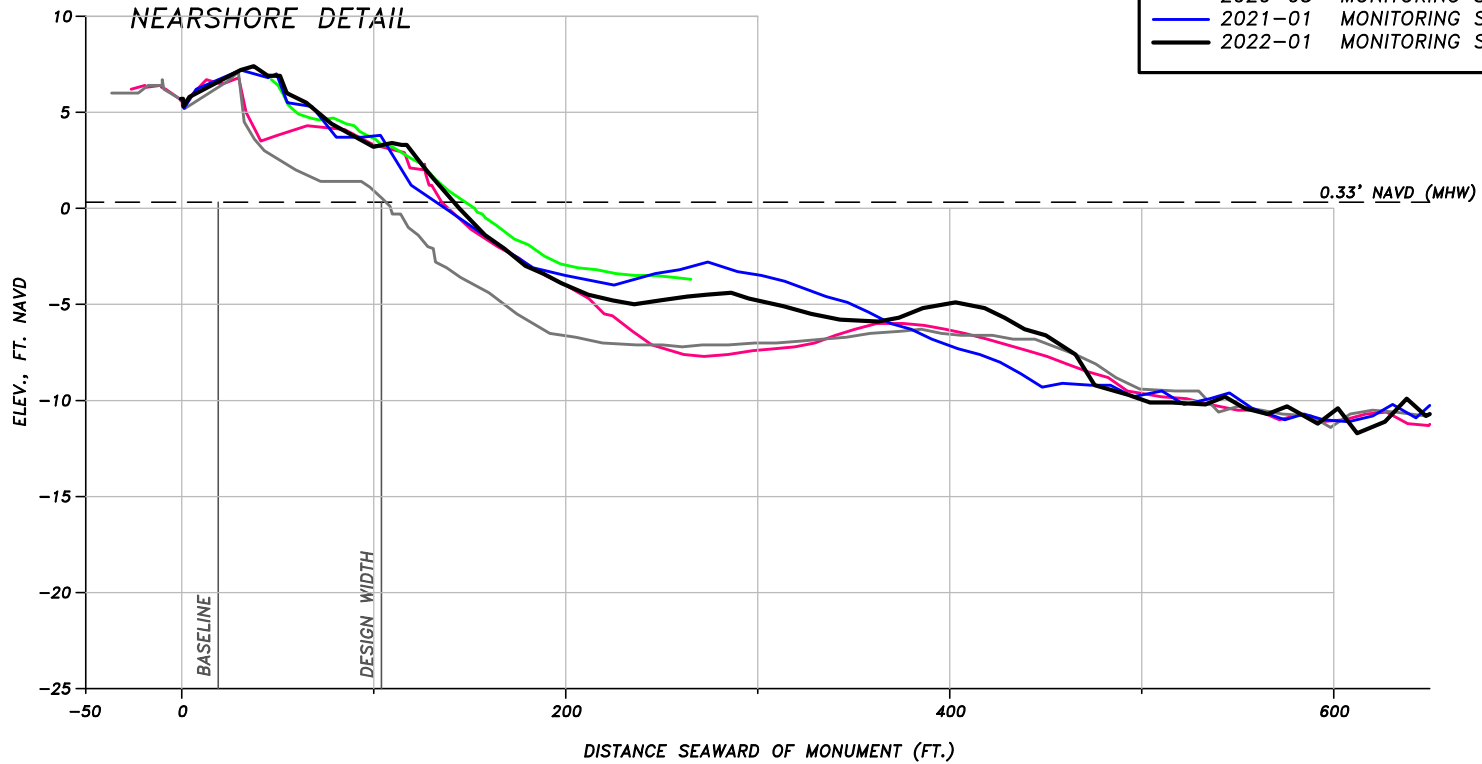


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
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BEACH PROFILE: R-50

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Green)	2019-12 POST OCEANSIDE
— (Cyan)	2020-03 MONITORING SDI
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI

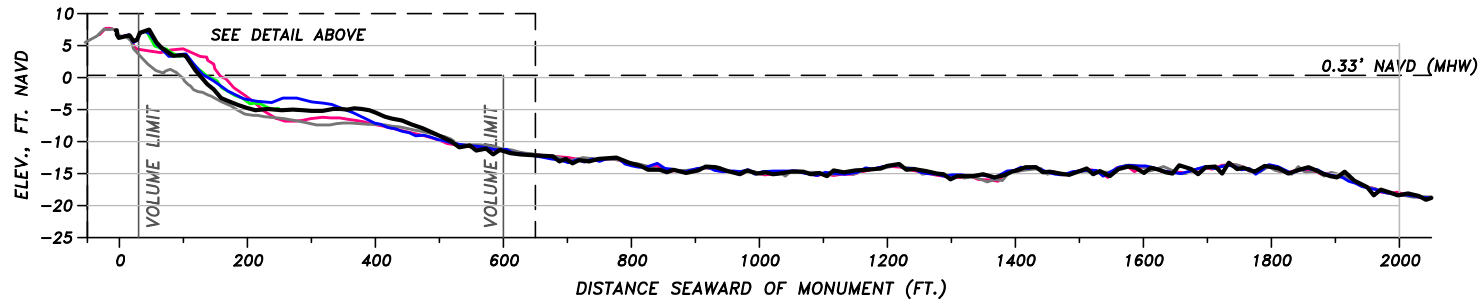
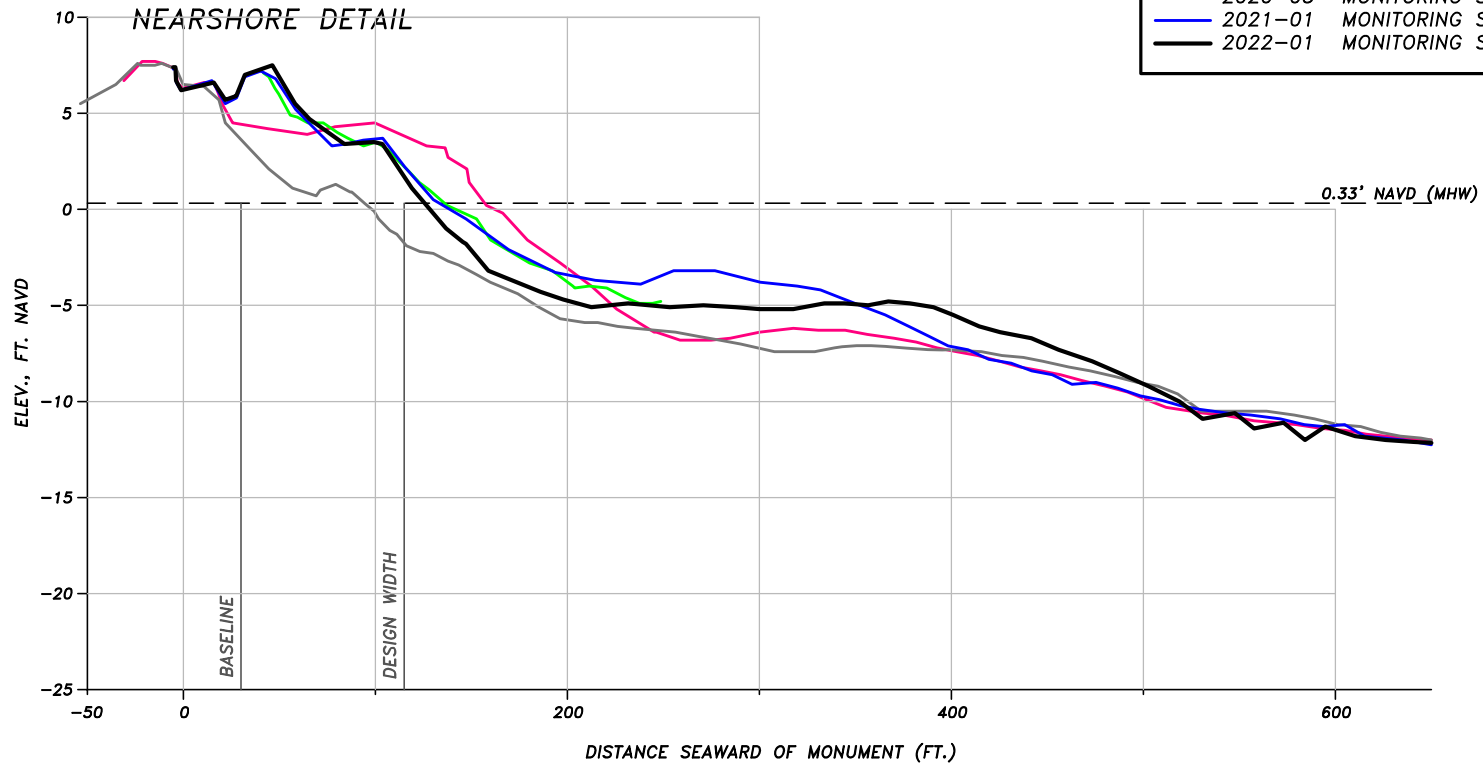


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
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BEACH PROFILE: R-51

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2019-12	POST OCEANSIDE
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

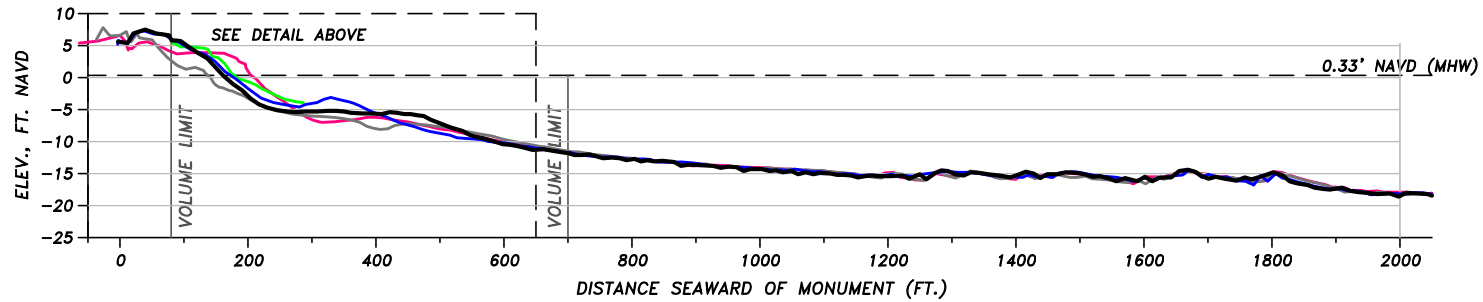
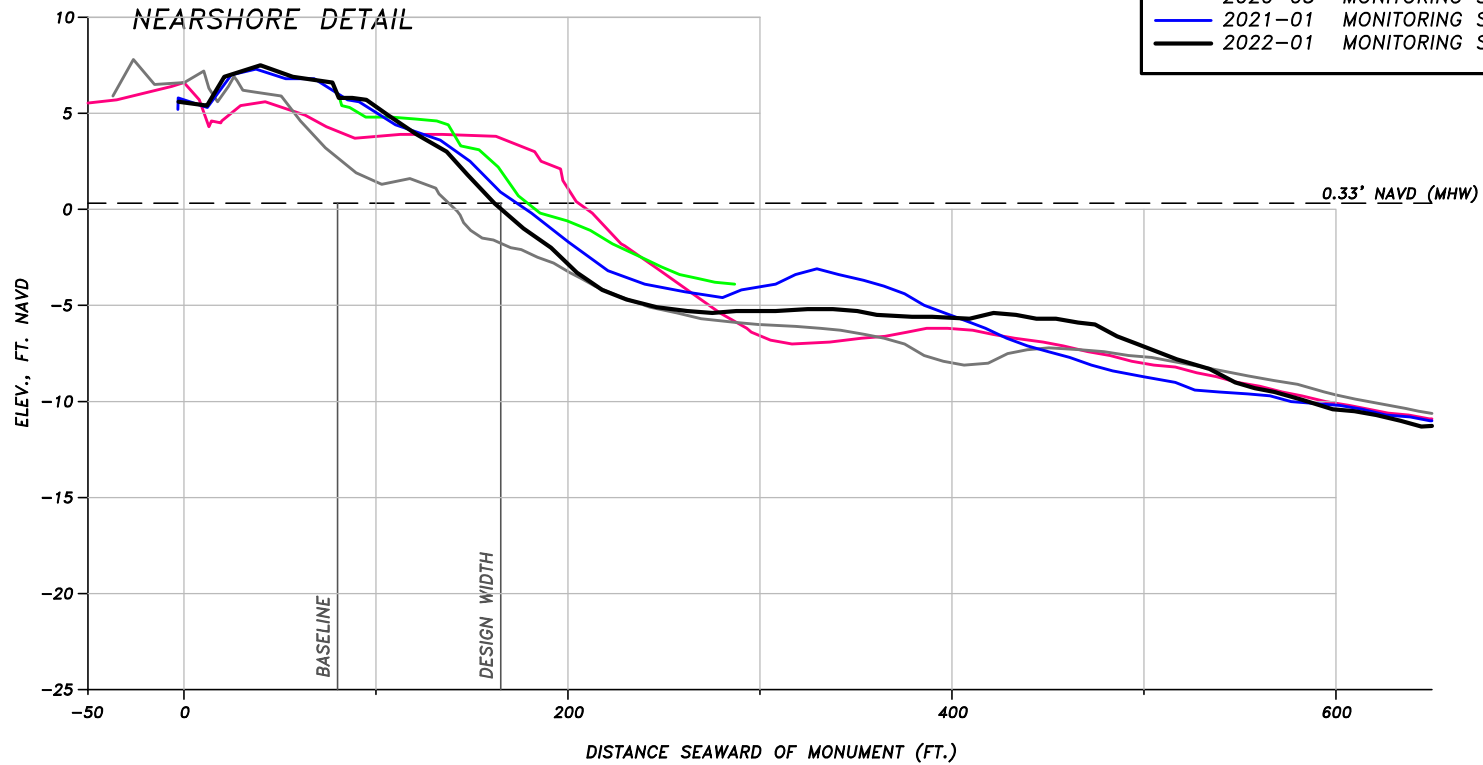


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
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PHONE: (239) 594-2021
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BEACH PROFILE: R-52

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2019-12	POST OCEANSIDE
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

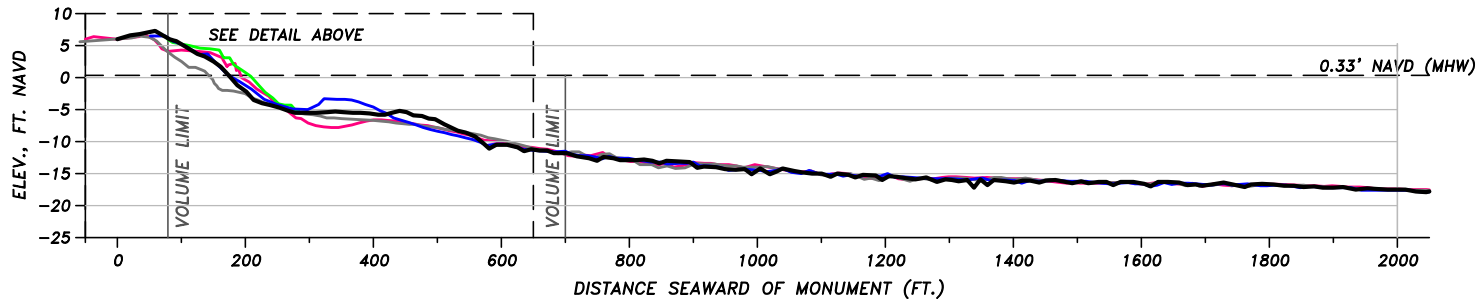
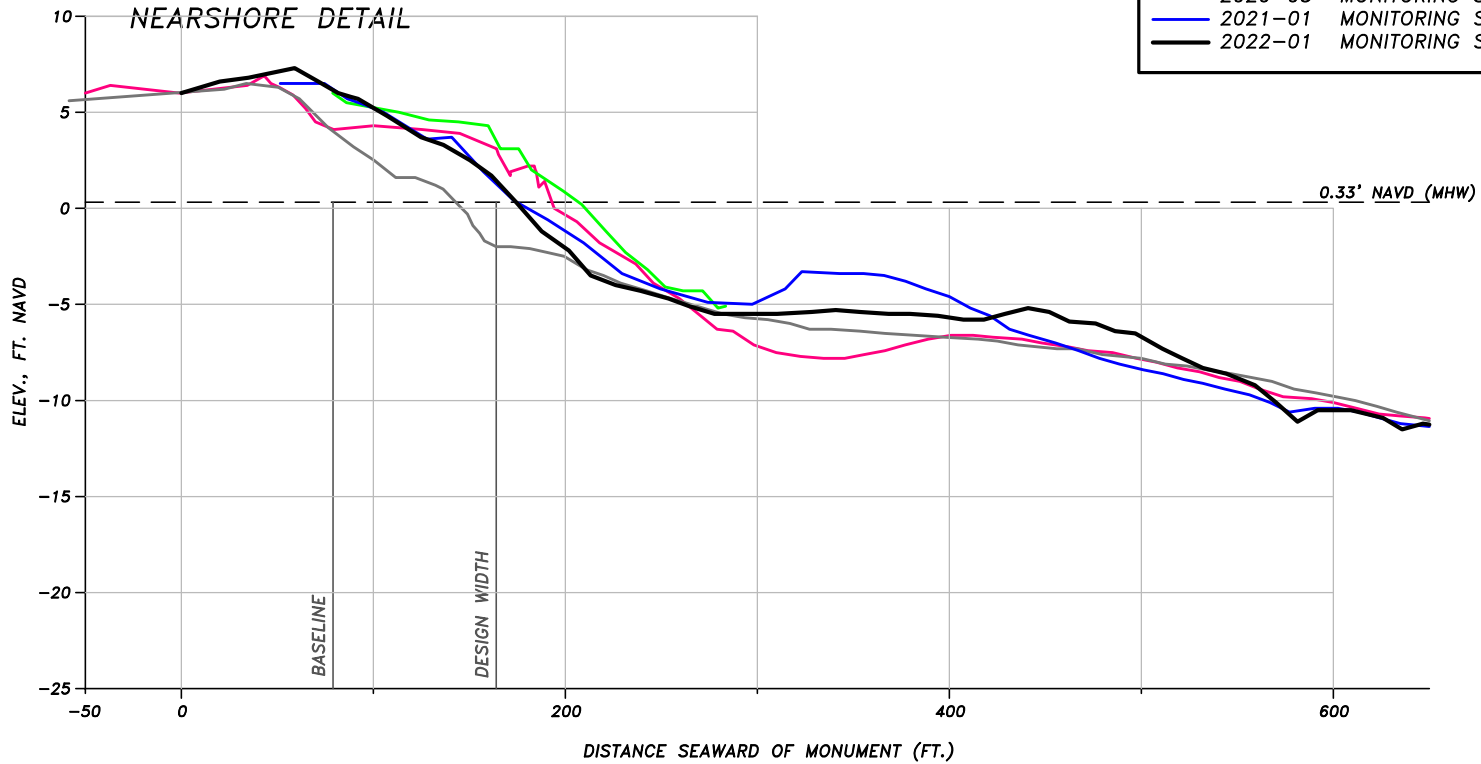


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
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BEACH PROFILE: R-53

SURVEY LEGEND	
—	2005-11 PRE CONSTRUCTION CP&E
—	2006-06 POST CONSTRUCTION CP&E
—	2019-12 POST OCEANSIDE
—	2020-03 MONITORING SDI
—	2021-01 MONITORING SDI
—	2022-01 MONITORING SDI

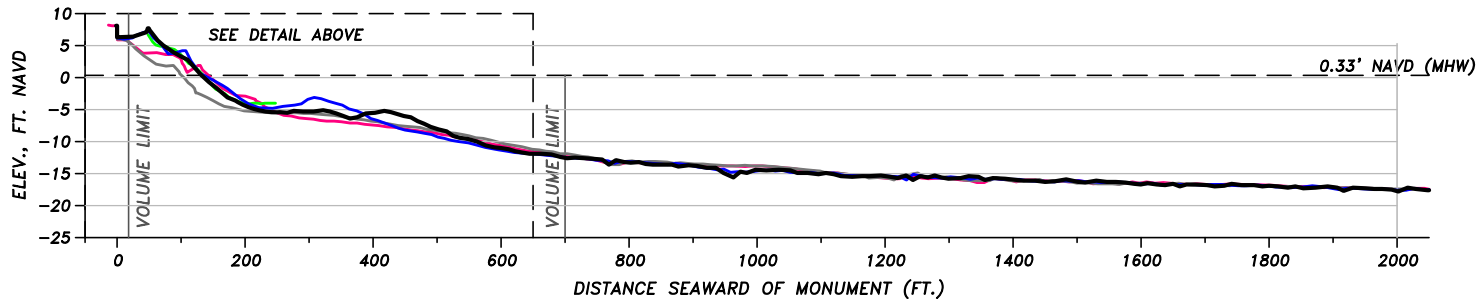
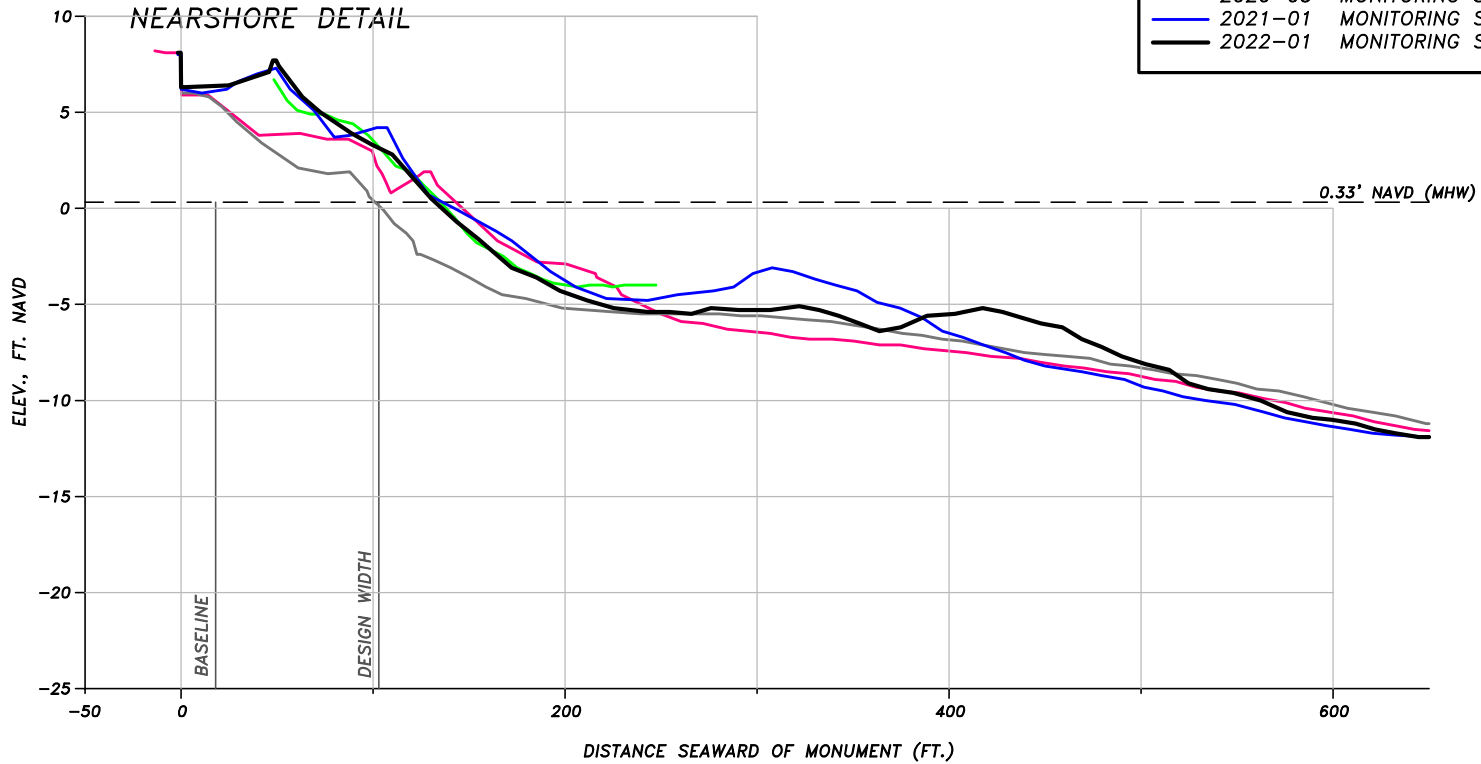


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
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PHONE: (239) 594-2021
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BEACH PROFILE: T-54

SURVEY LEGEND	
—	2005-11 PRE CONSTRUCTION CP&E
—	2006-06 POST CONSTRUCTION CP&E
—	2019-12 POST OCEANSIDE
—	2020-03 MONITORING SDI
—	2021-01 MONITORING SDI
—	2022-01 MONITORING SDI

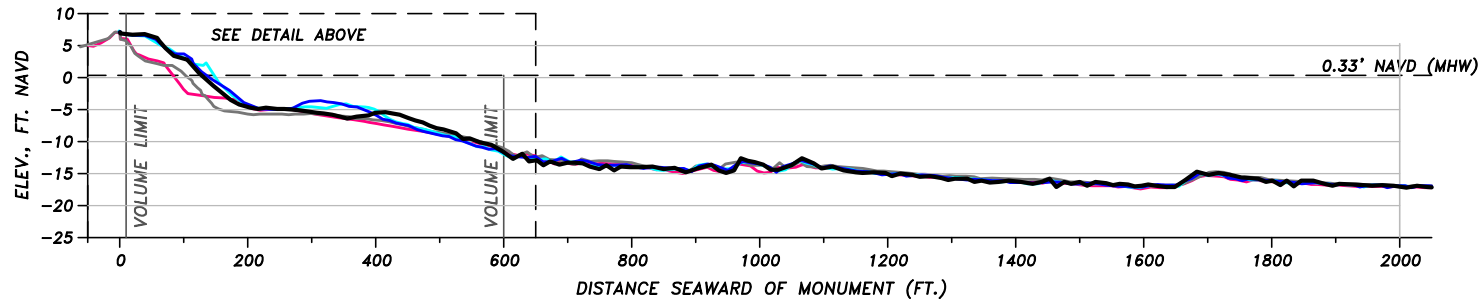
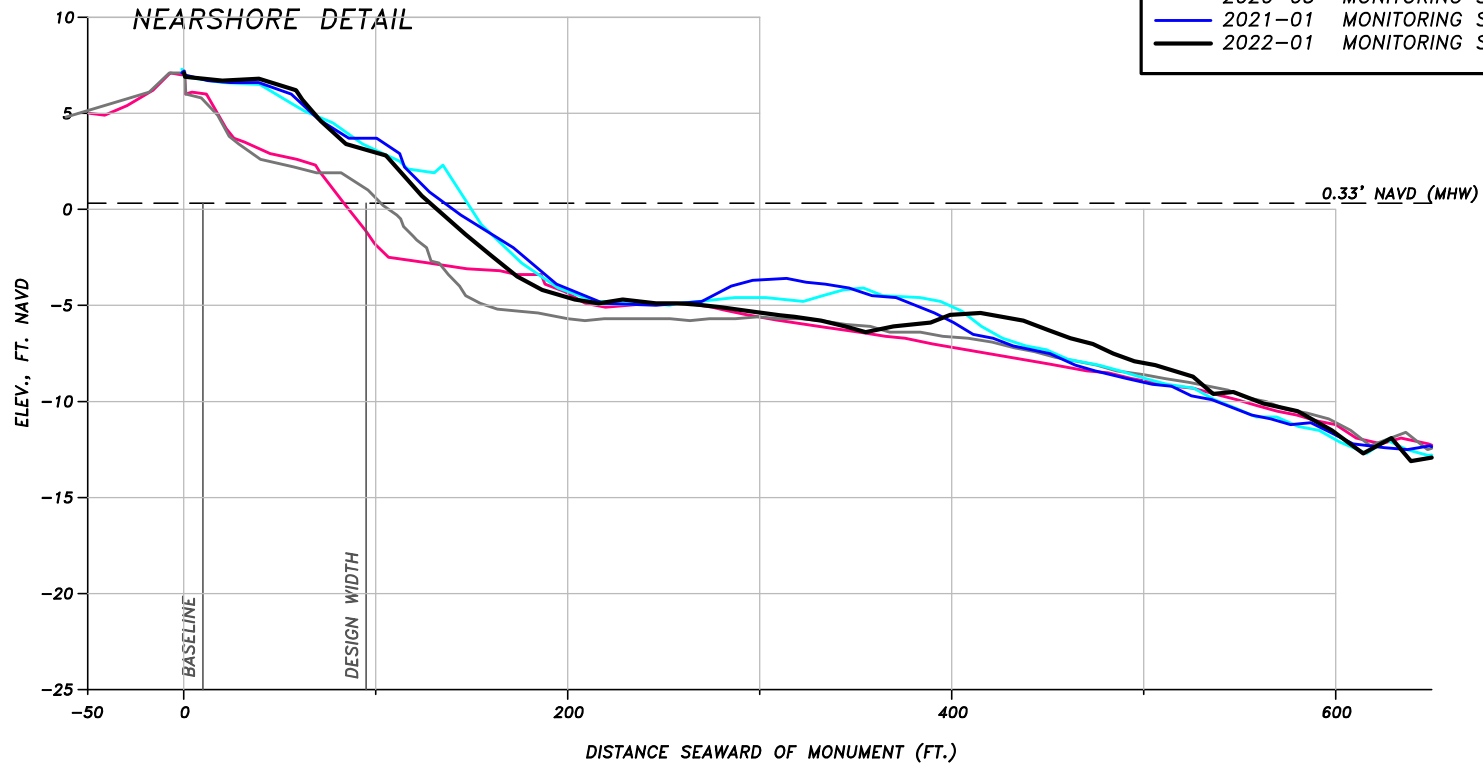


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
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BEACH PROFILE: U-55

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

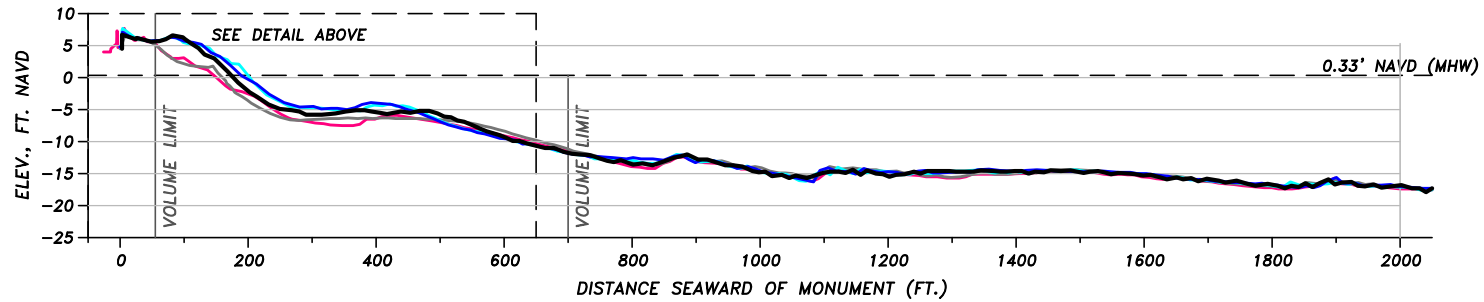
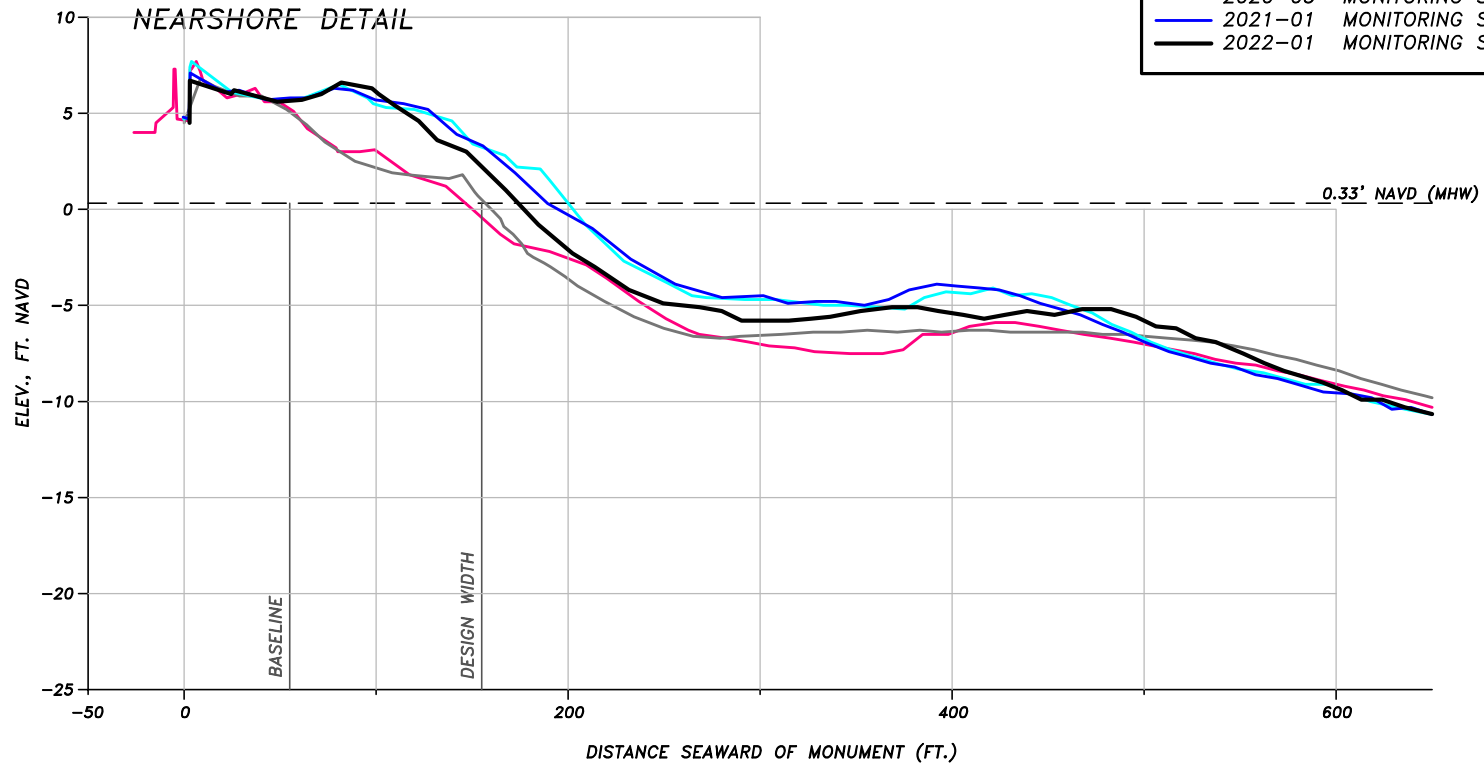


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
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BEACH PROFILE: R-56

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

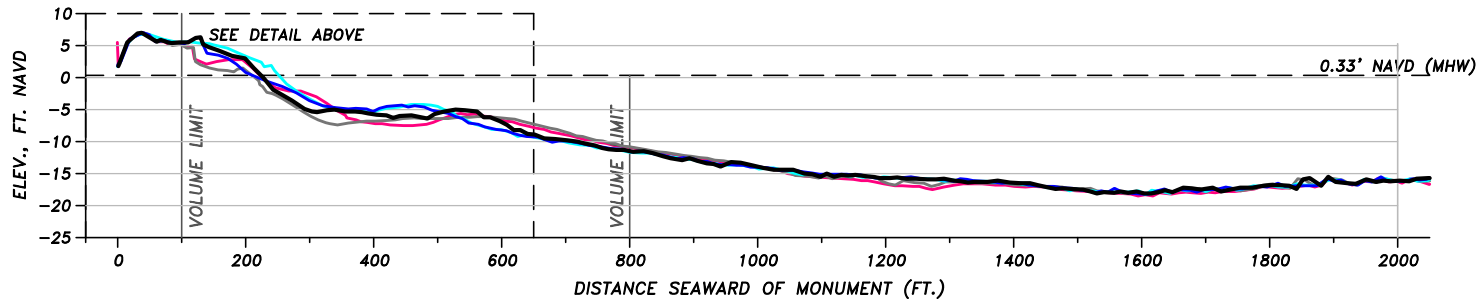
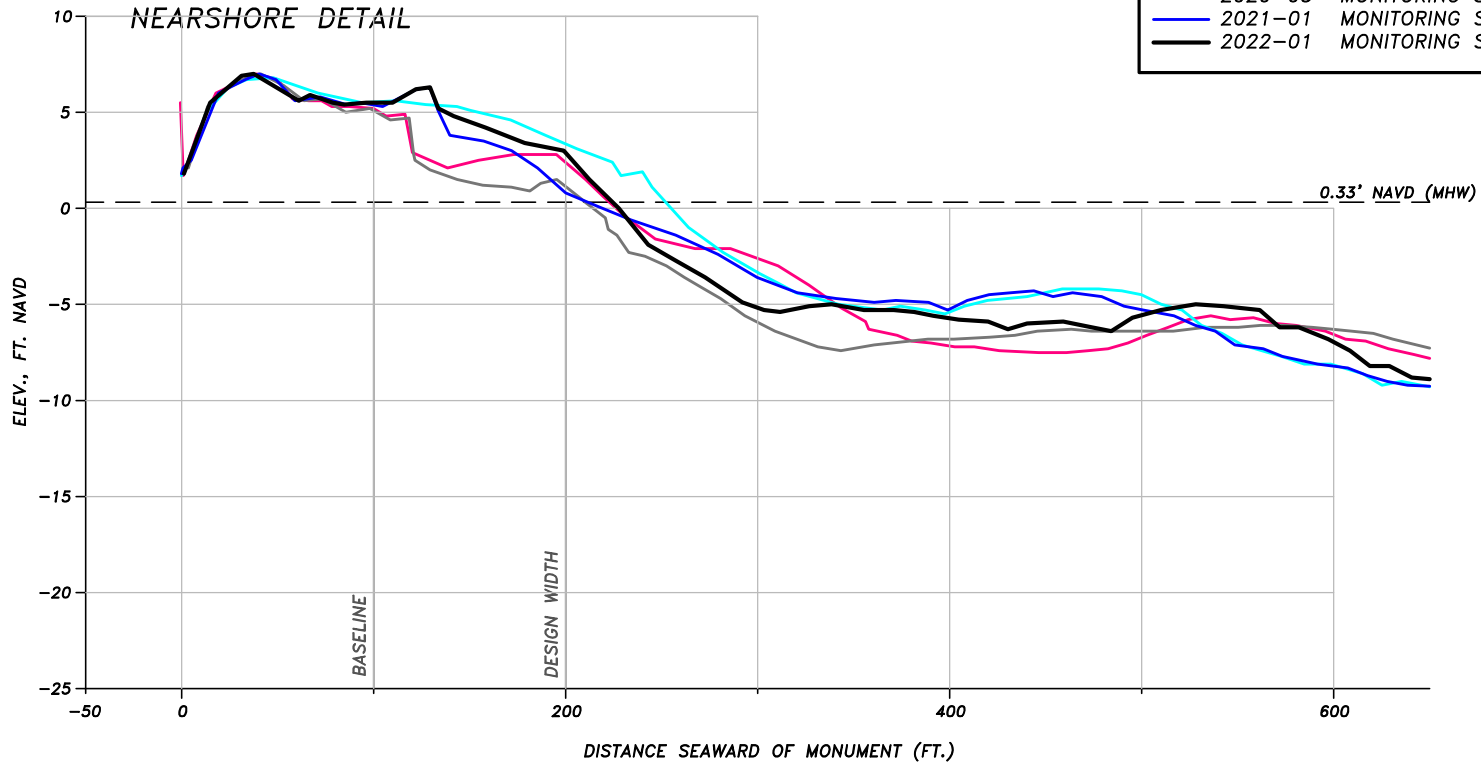


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
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JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: T-57

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2020-03	MONITORING SDI
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

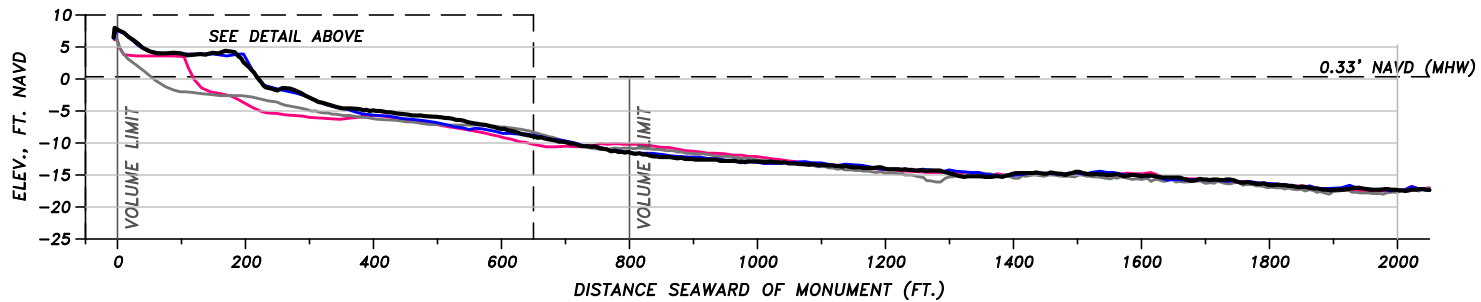
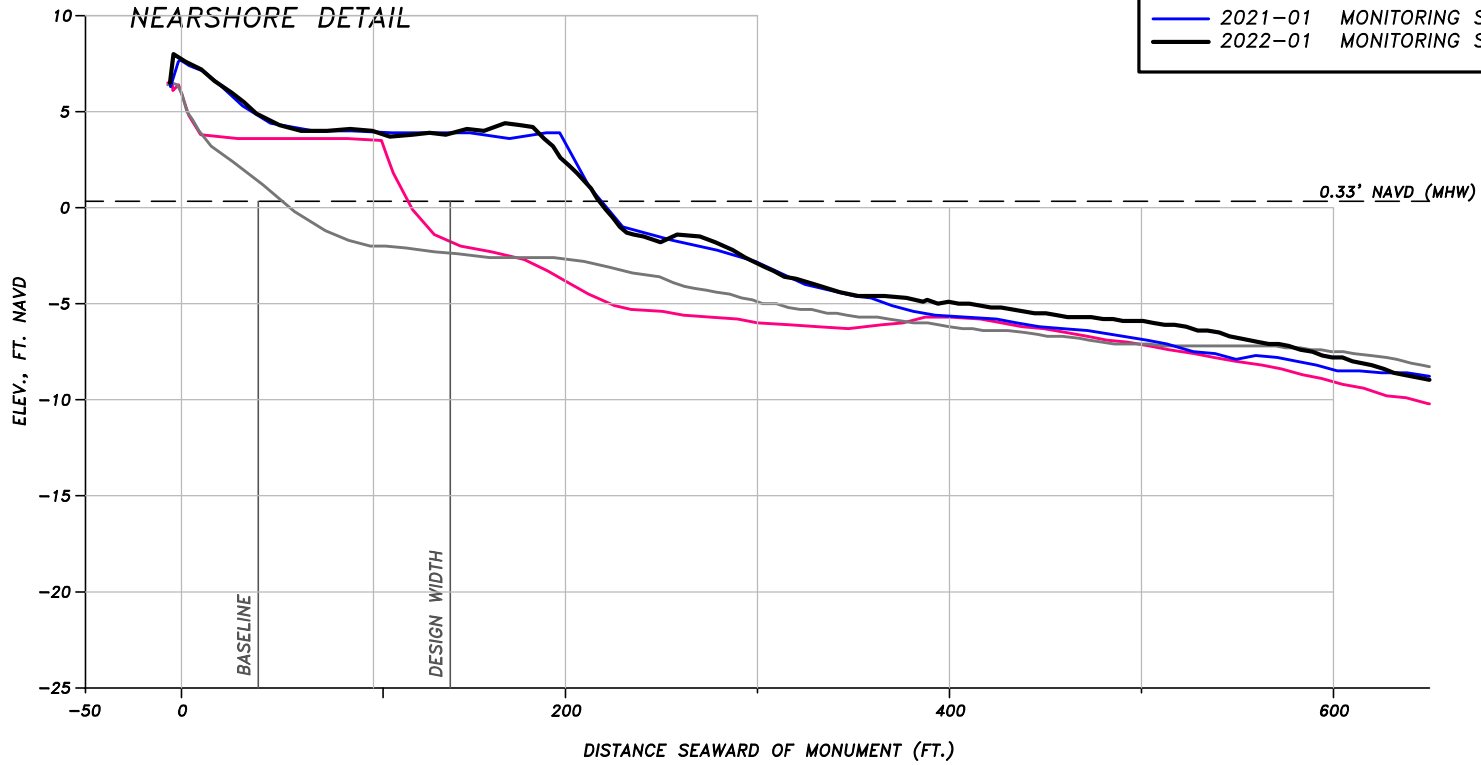


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-58A

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI

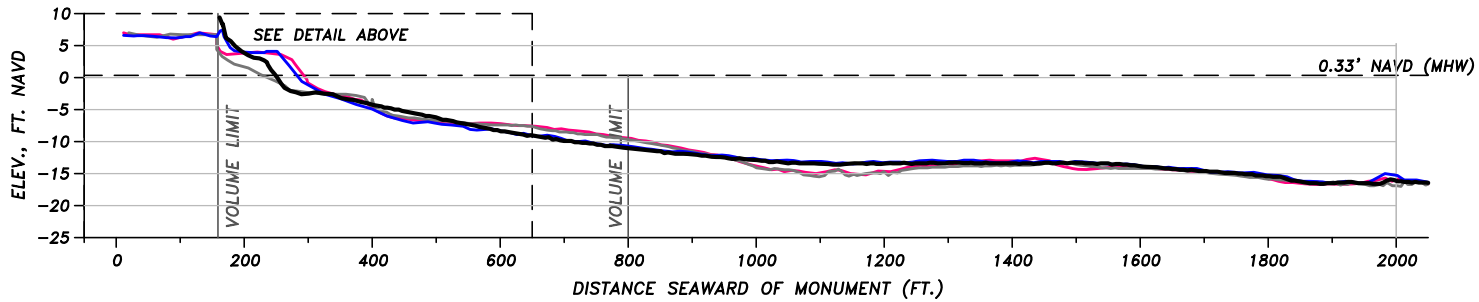
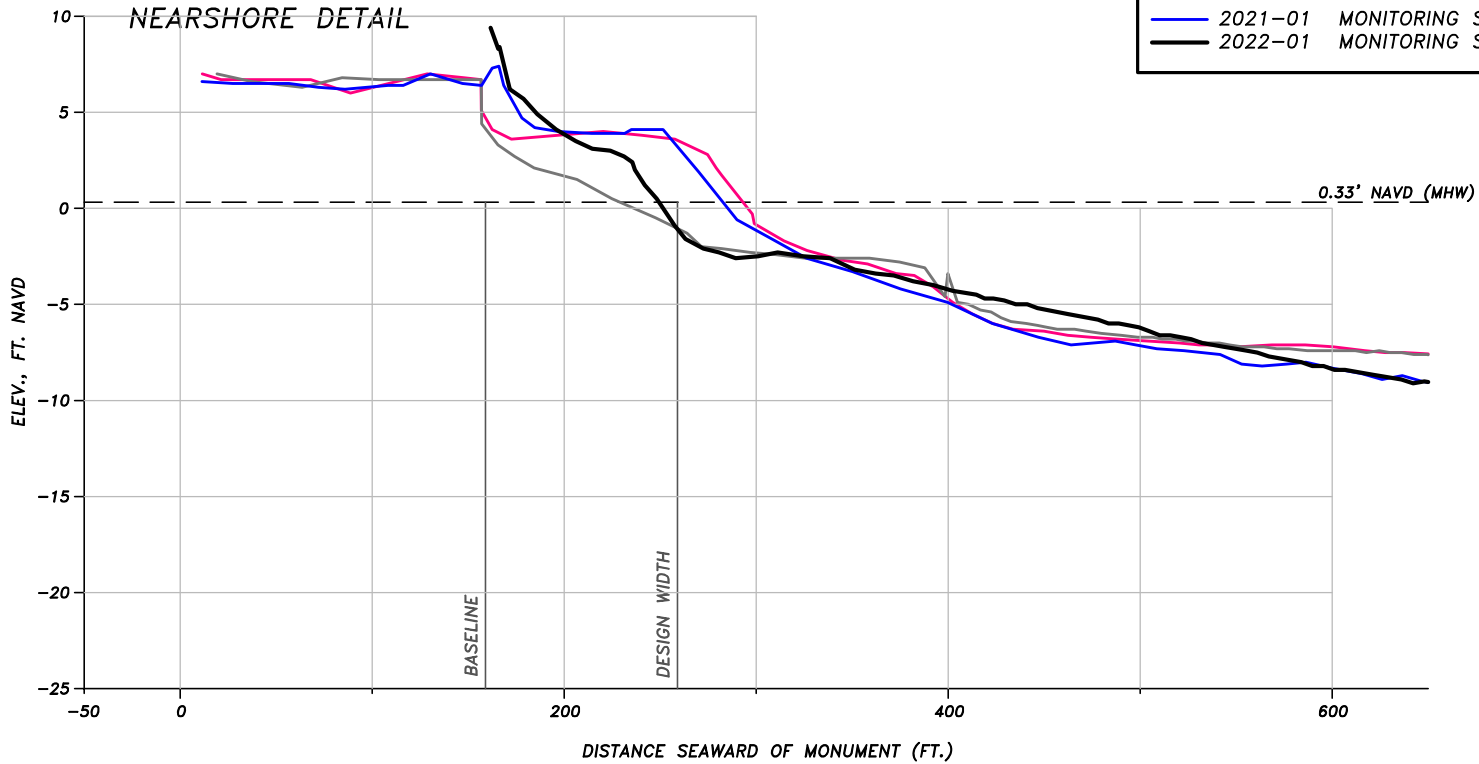


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: T-58

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

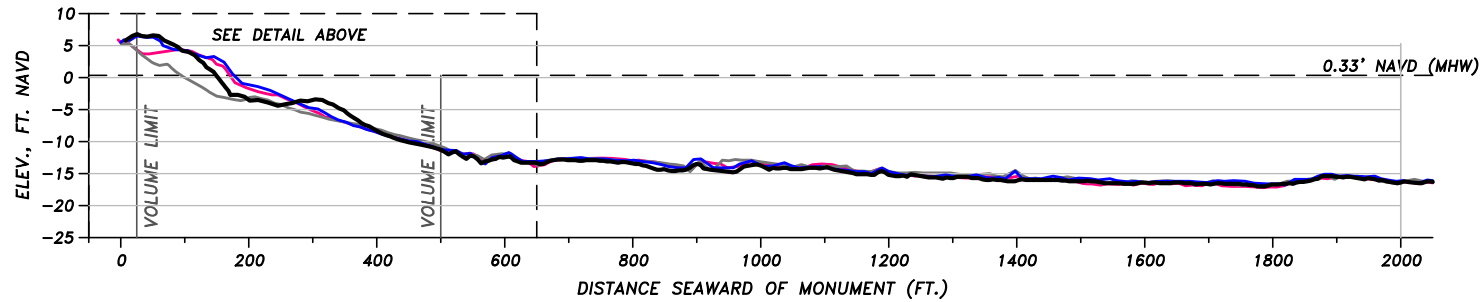
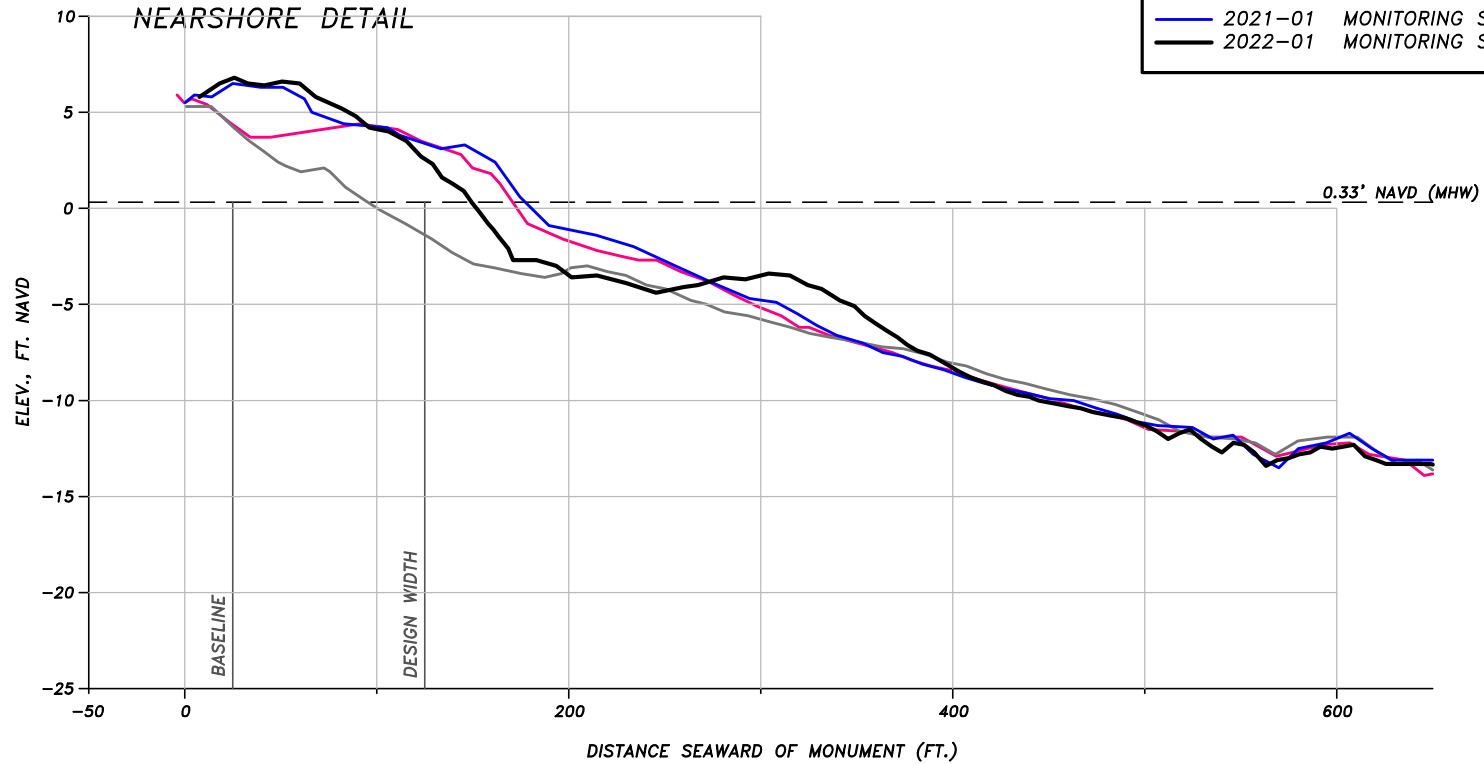


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-59

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

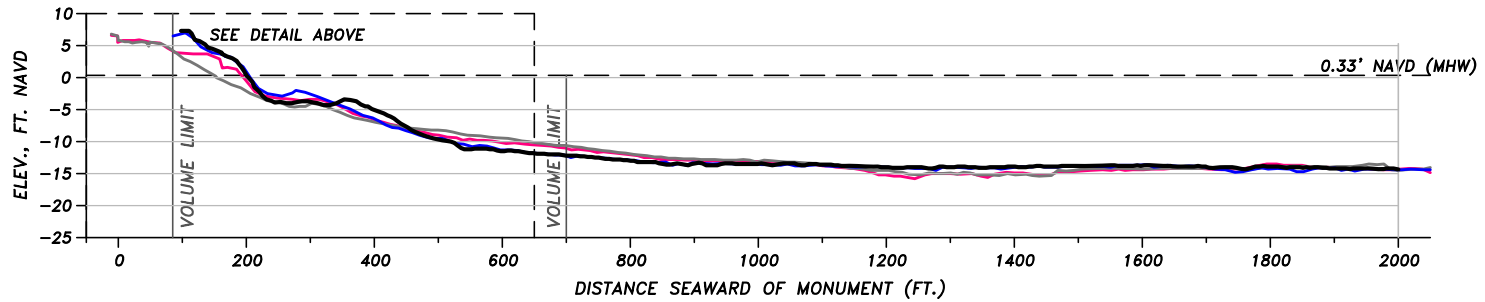
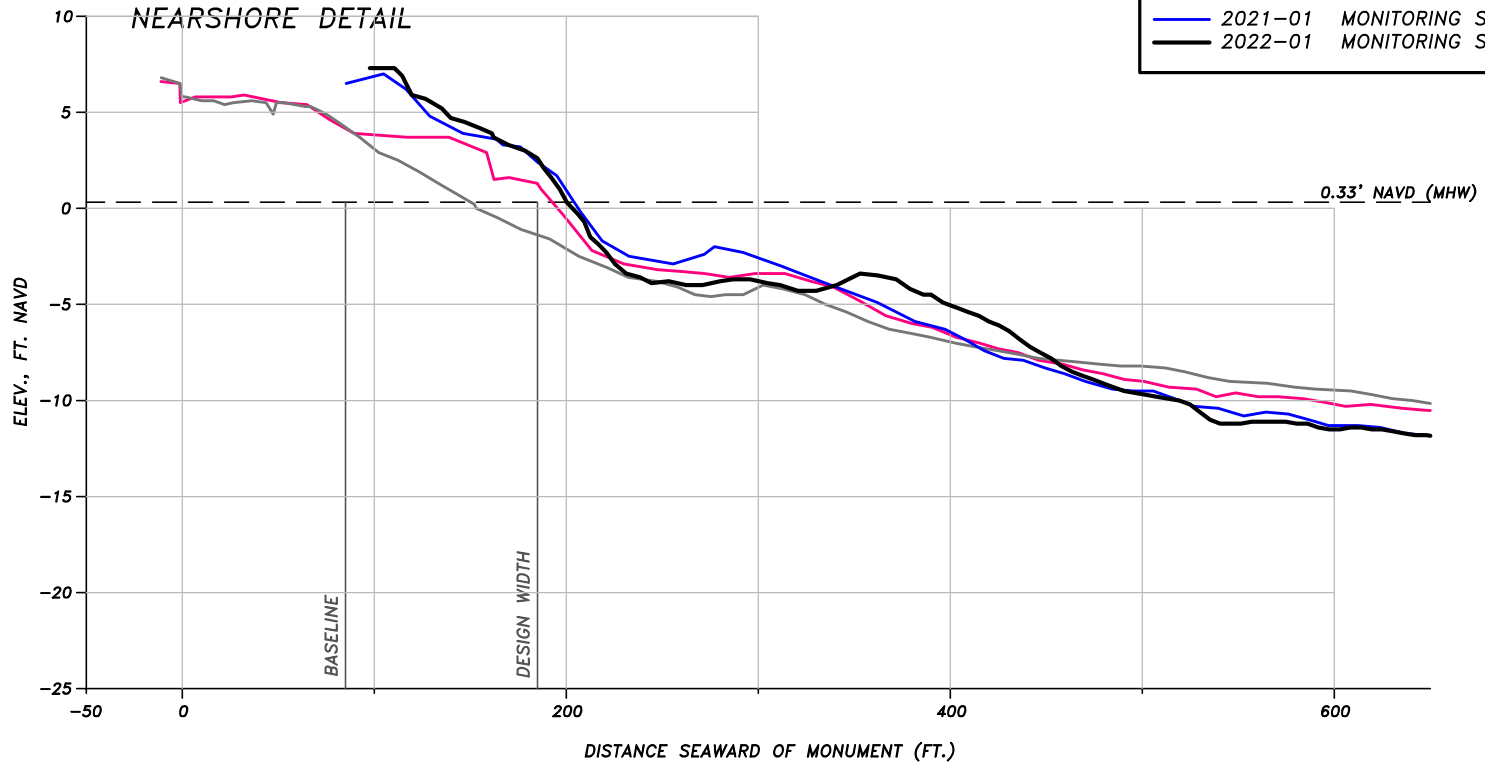


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-60

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

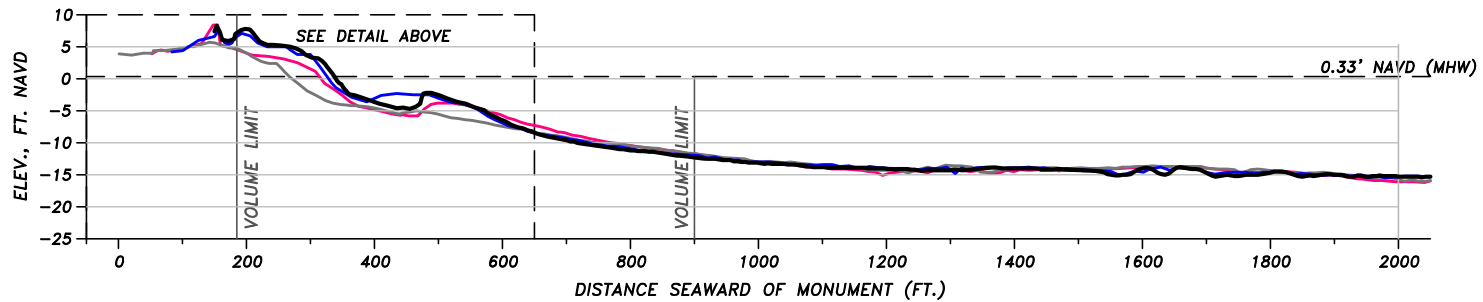
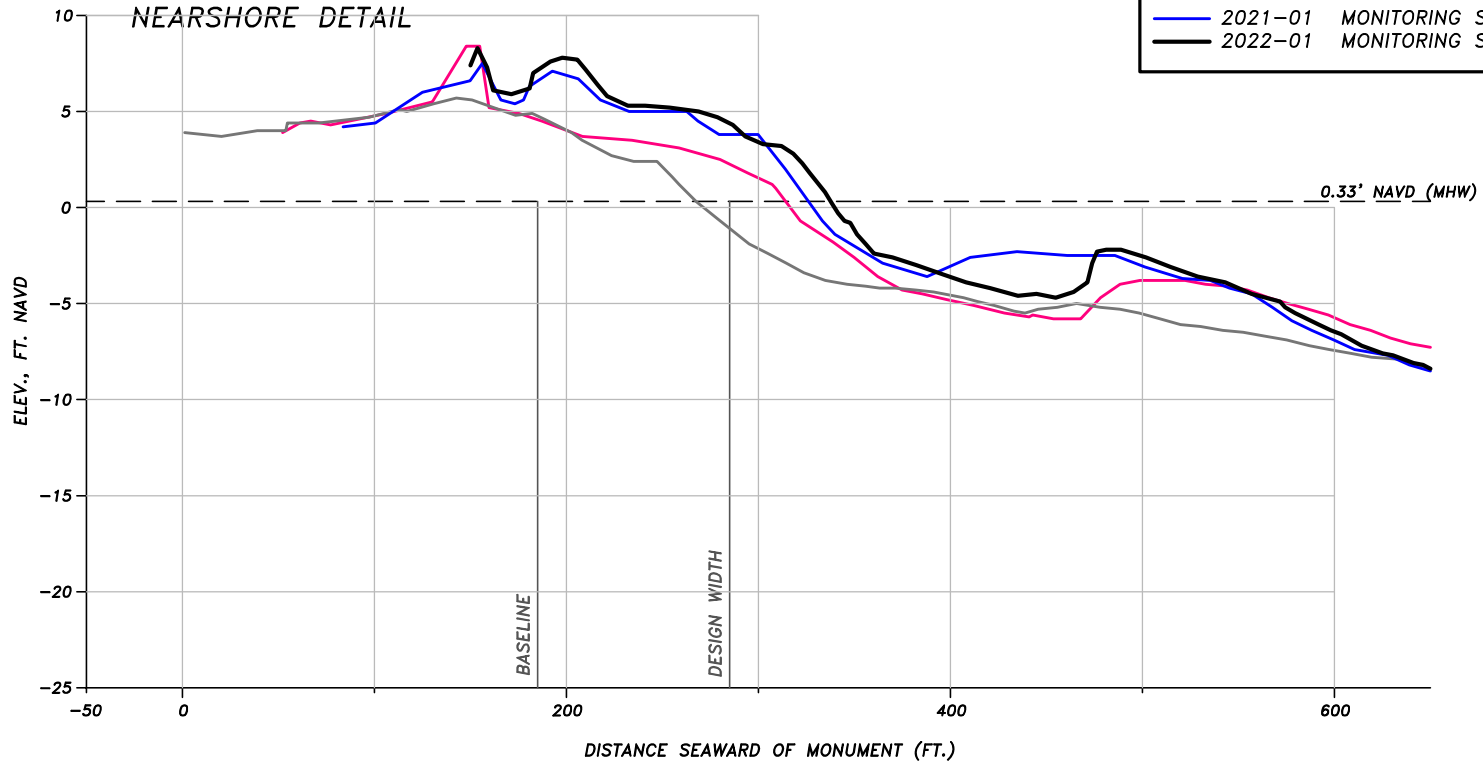


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
 NAPLES, FL 34110
 FAX: (239) 594-2025
 PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-61

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI

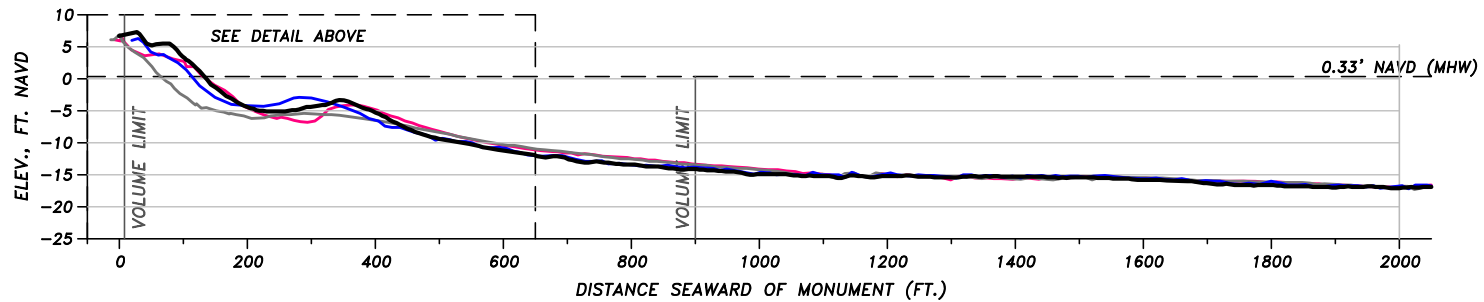
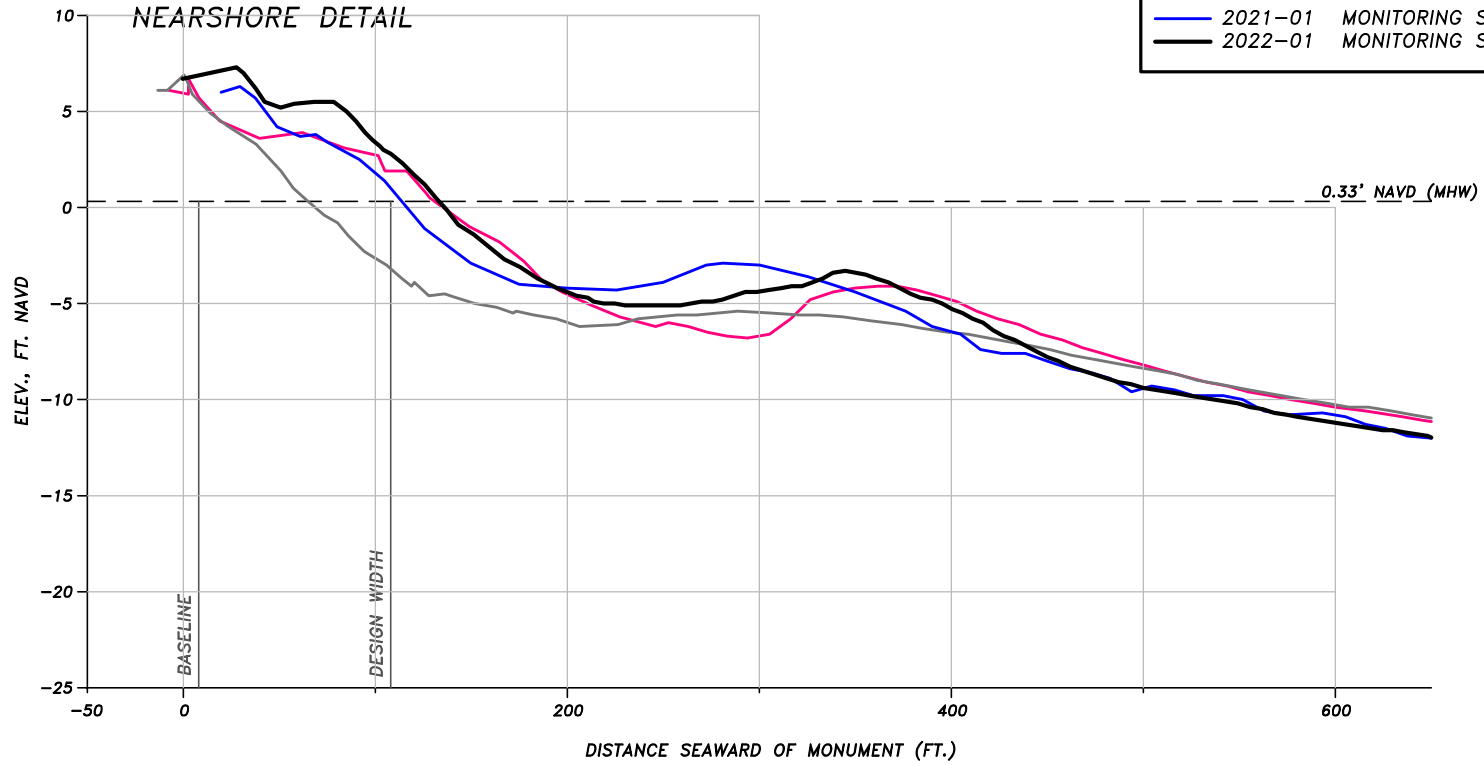


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: T-62

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

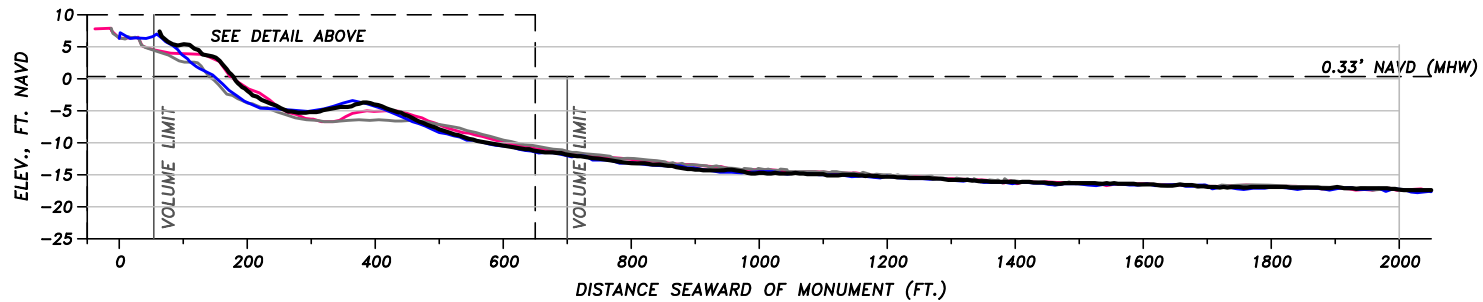
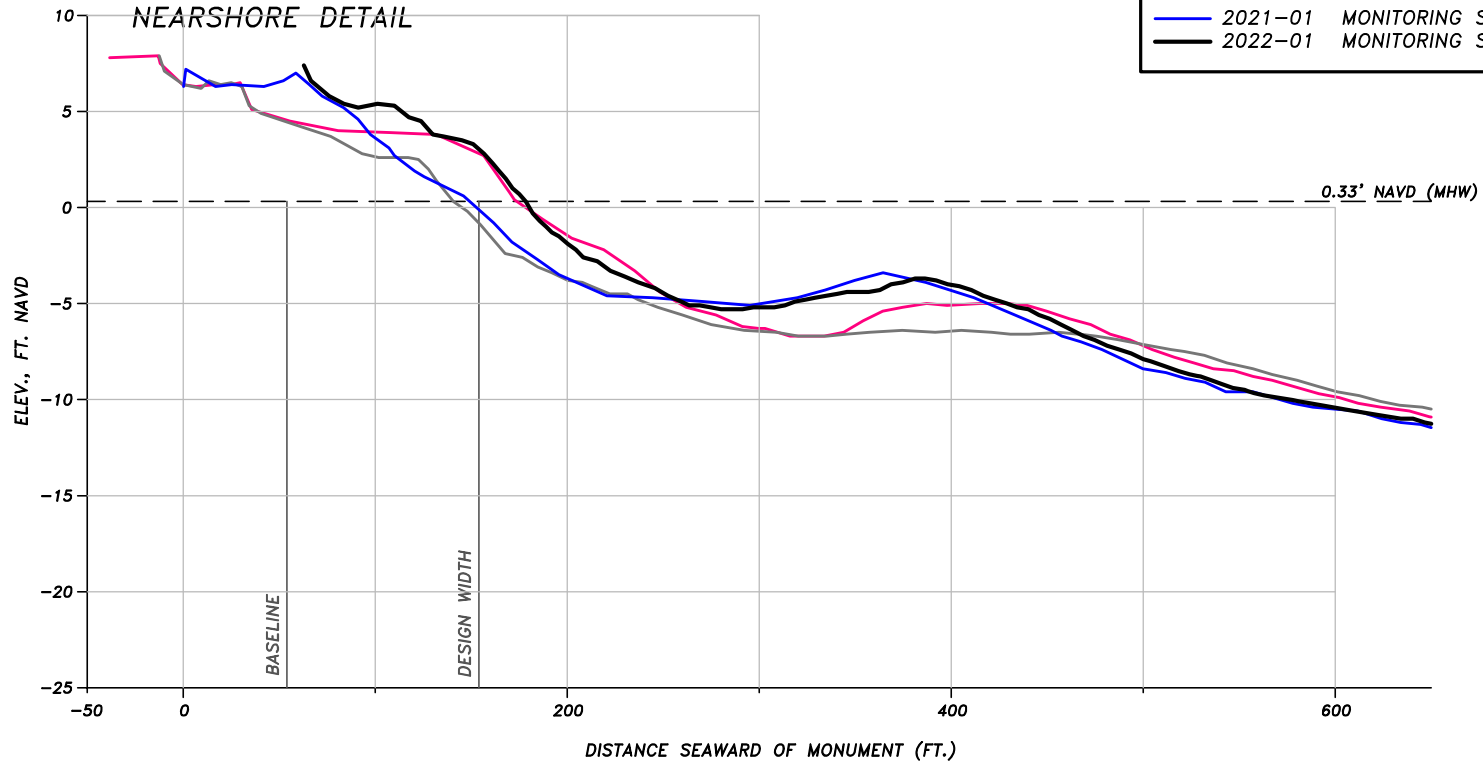


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
 NAPLES, FL 34110
 FAX: (239) 594-2025
 PHONE: (239) 594-2021
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BEACH PROFILE: R-63

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

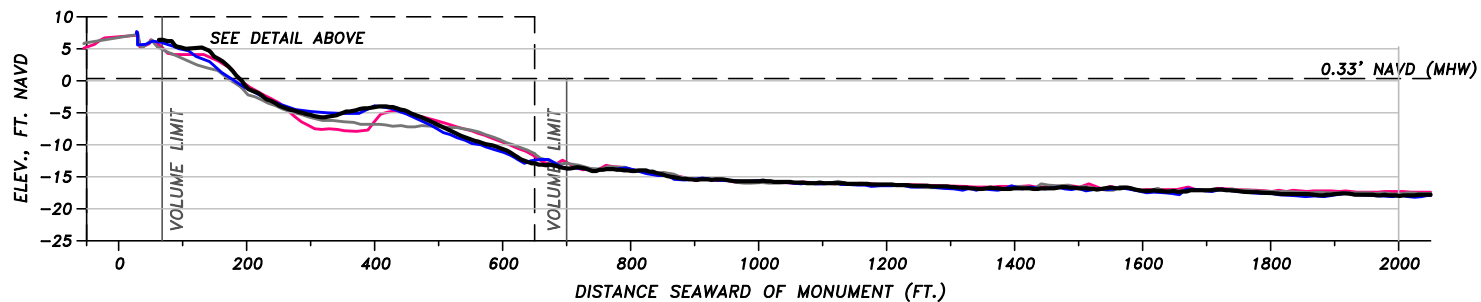
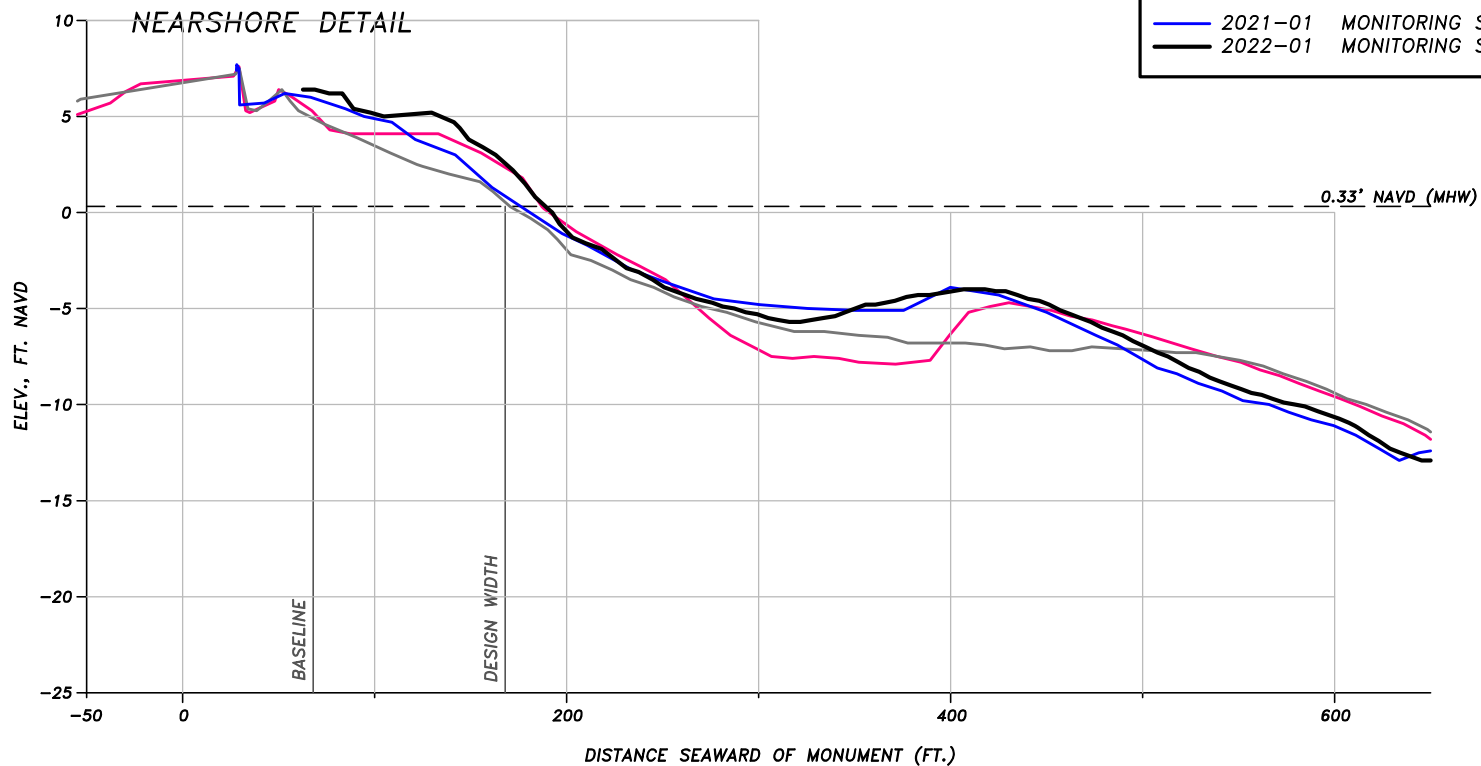


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-64

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

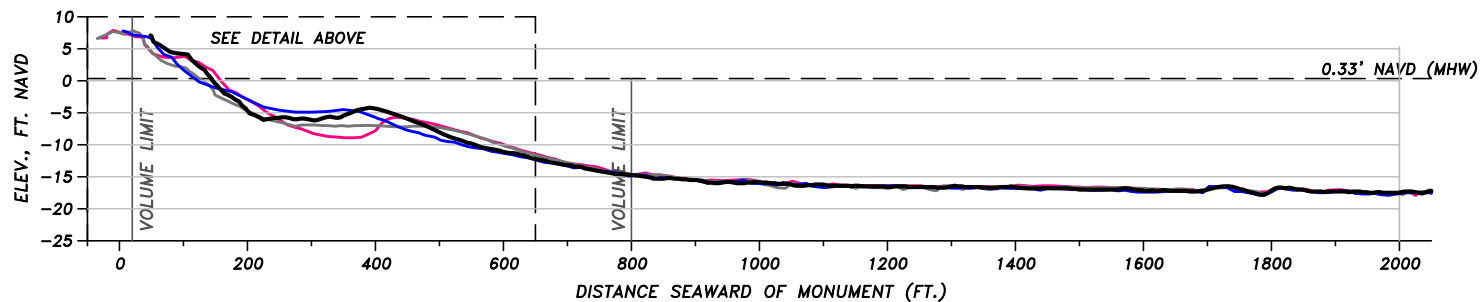
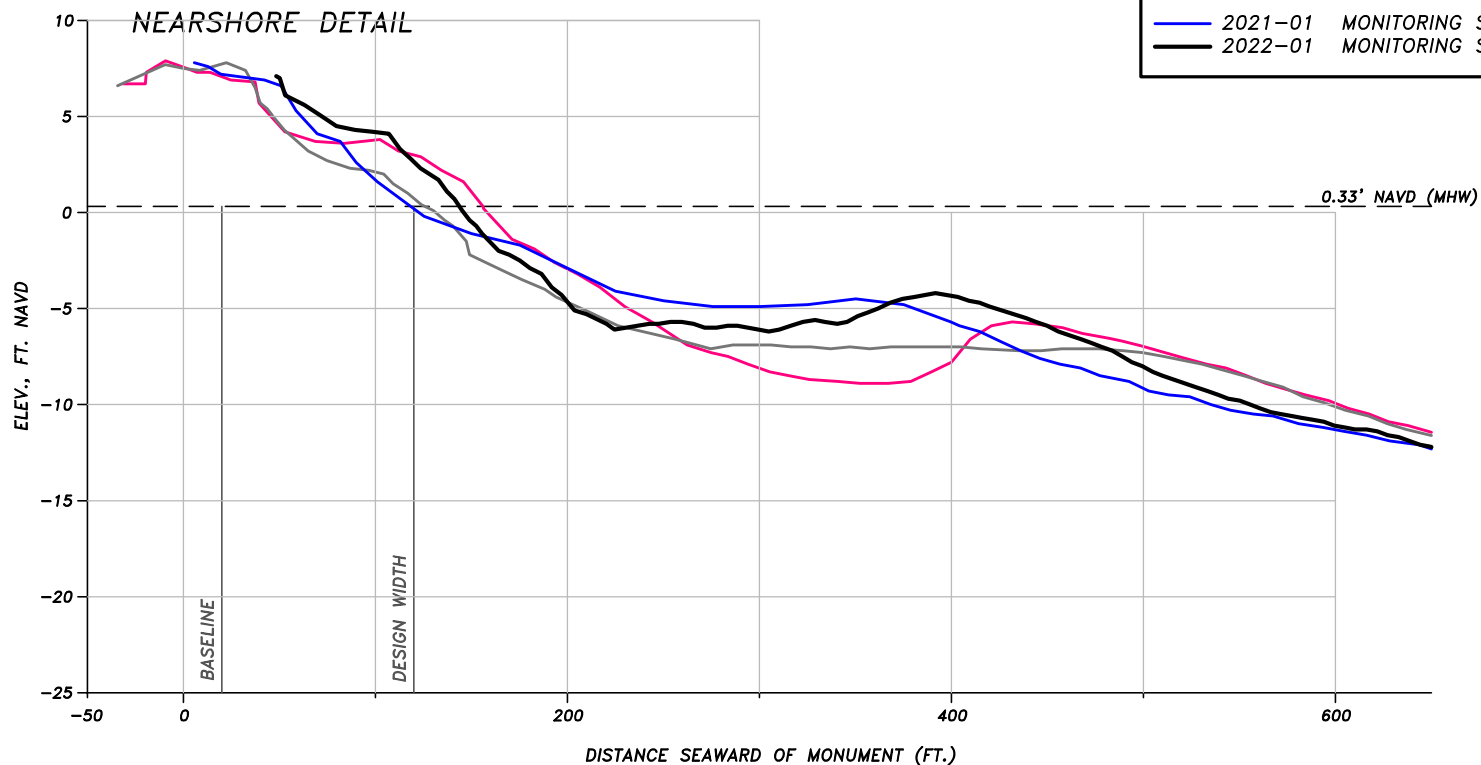


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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FAX: (239) 594-2025
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BEACH PROFILE: T-65

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

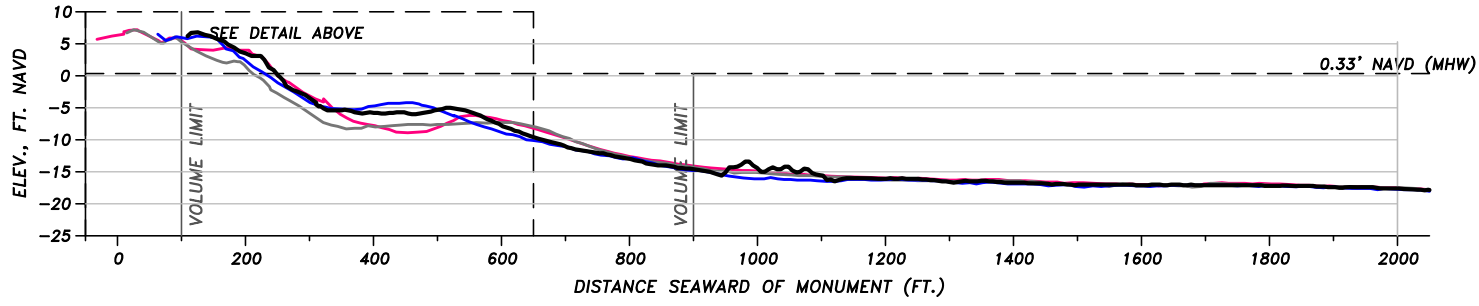
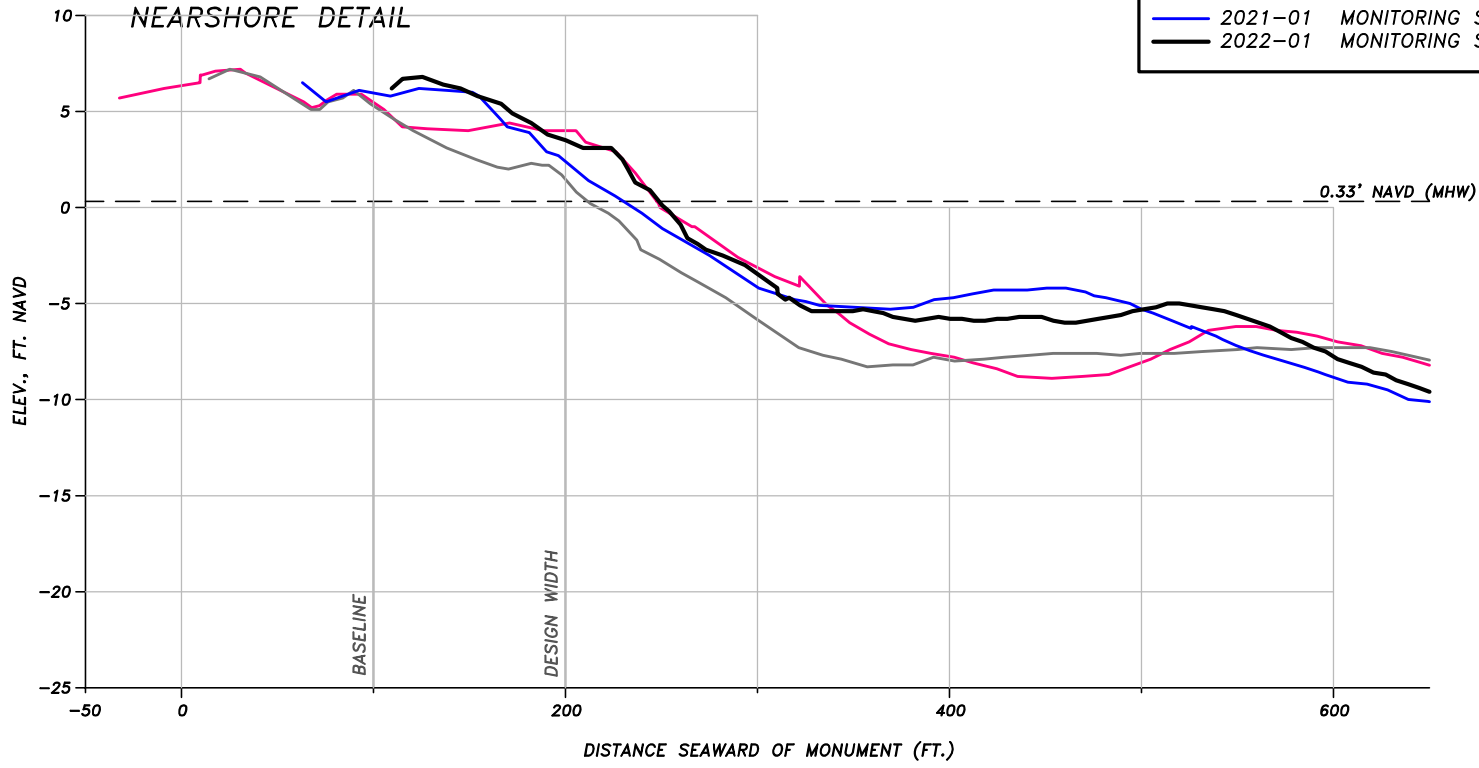


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-66

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

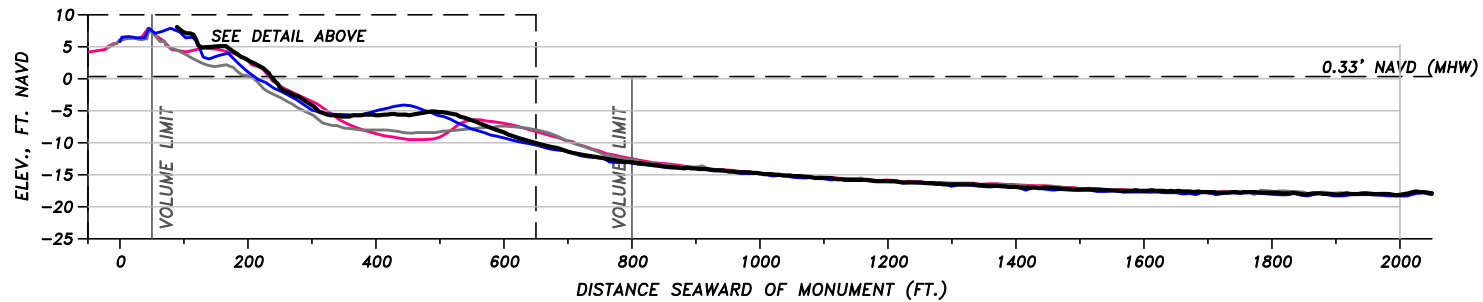
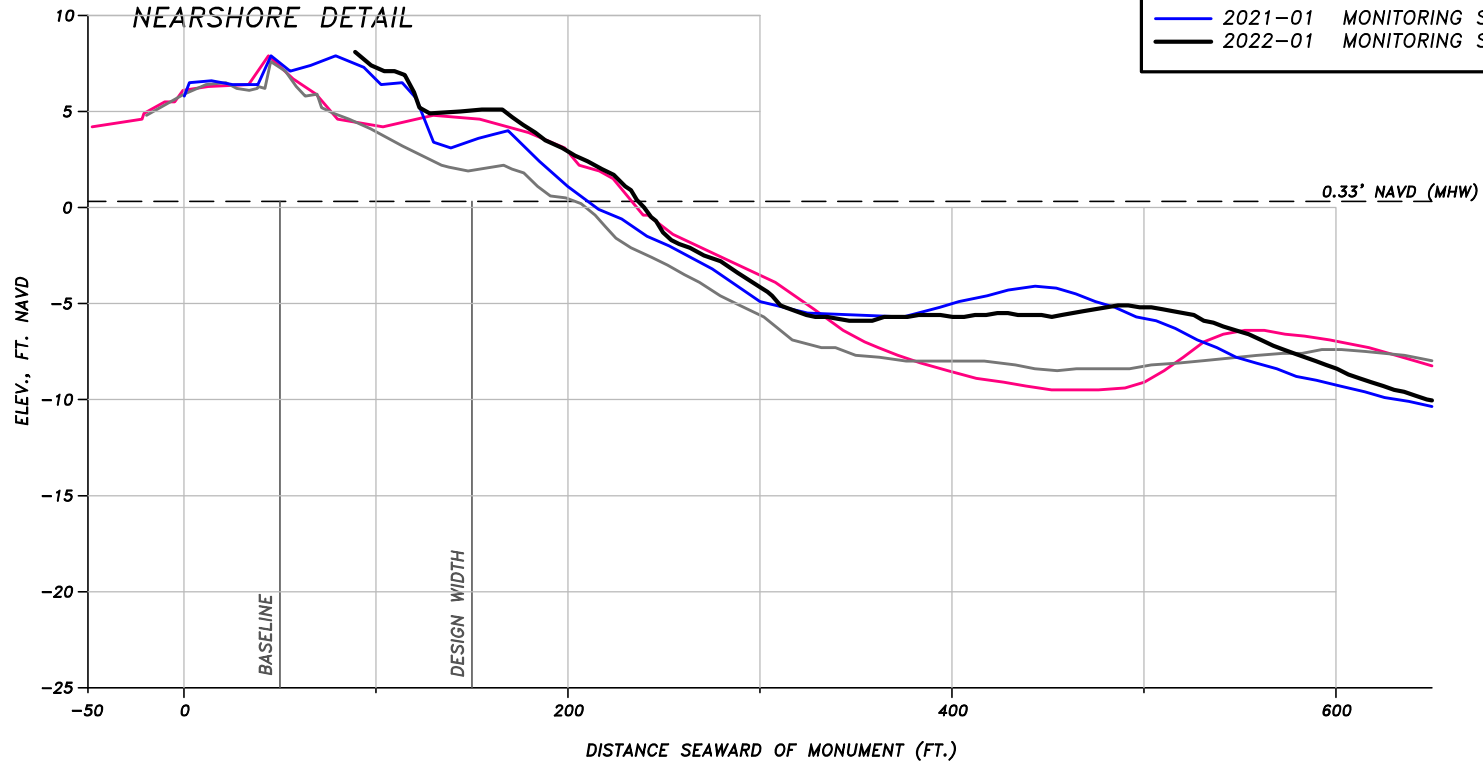


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-67

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

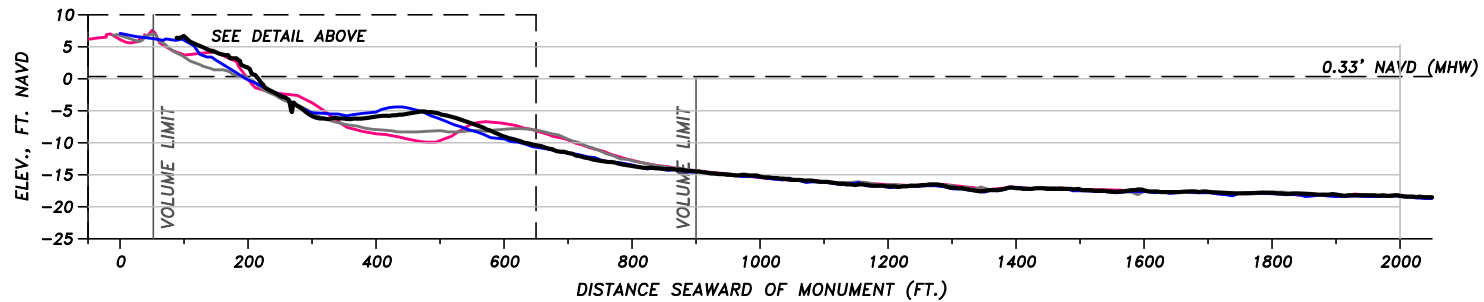
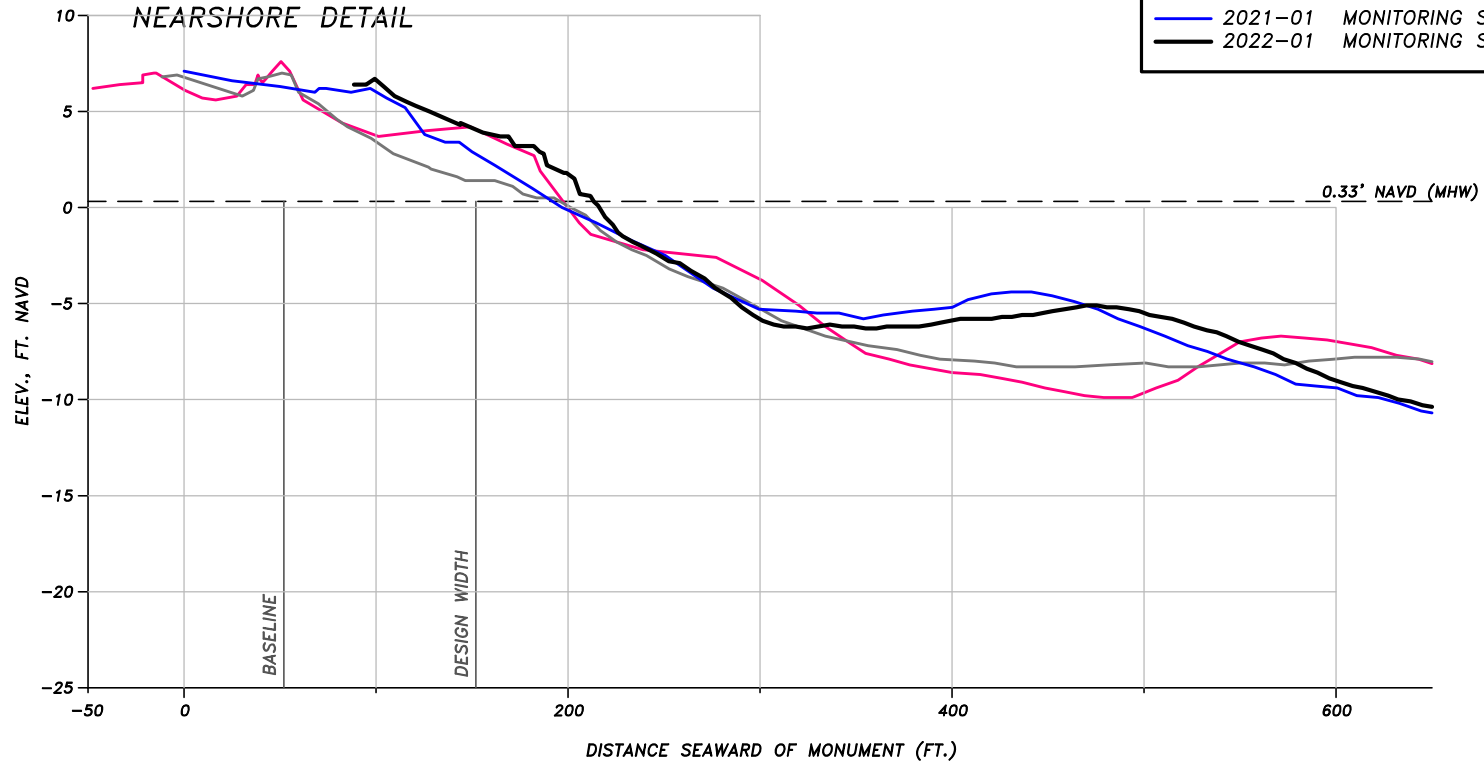


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-68

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

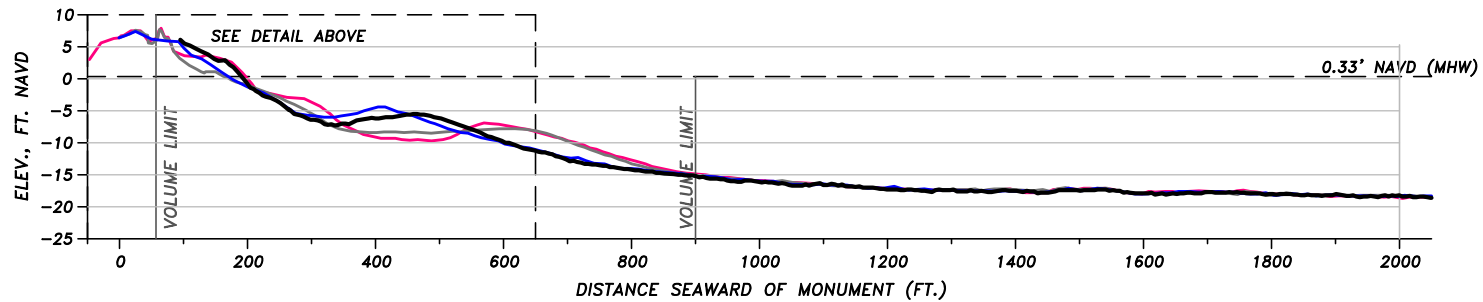
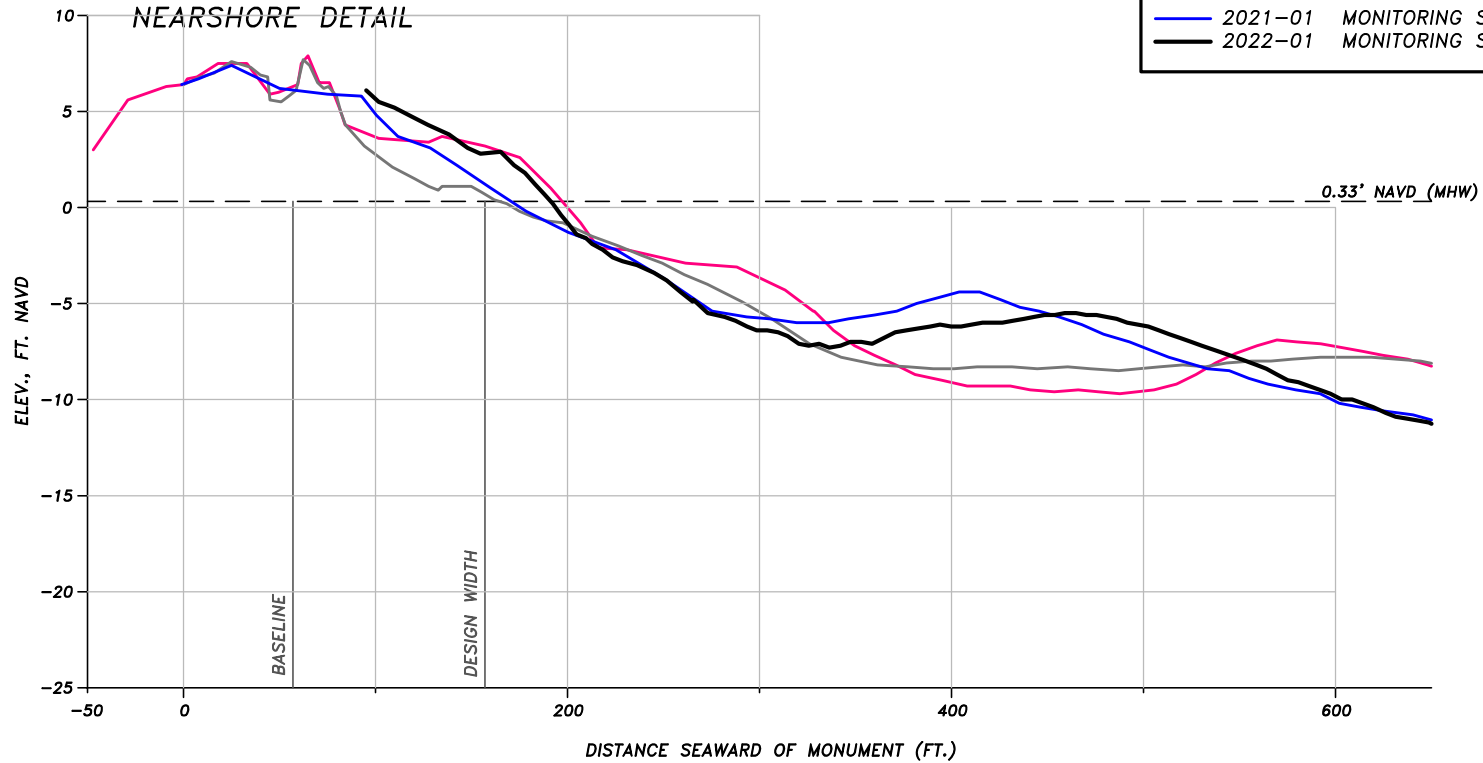


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: T-69

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

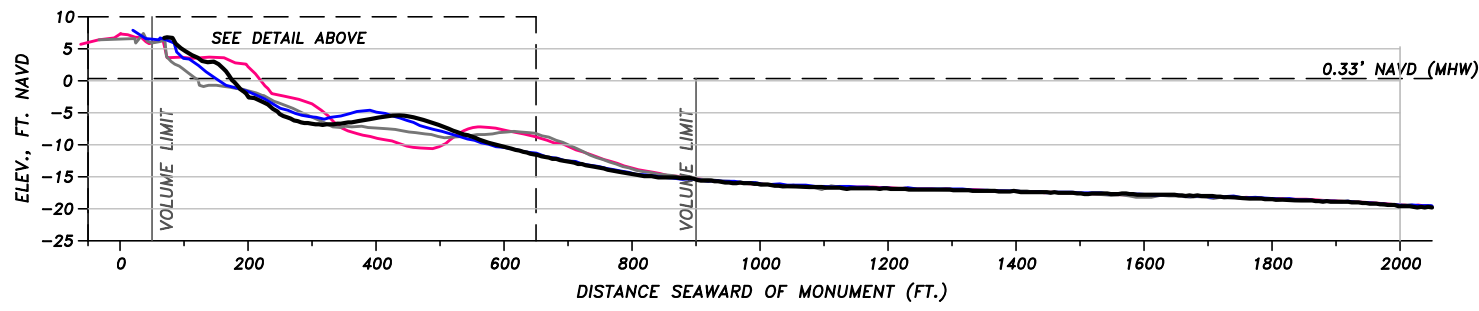
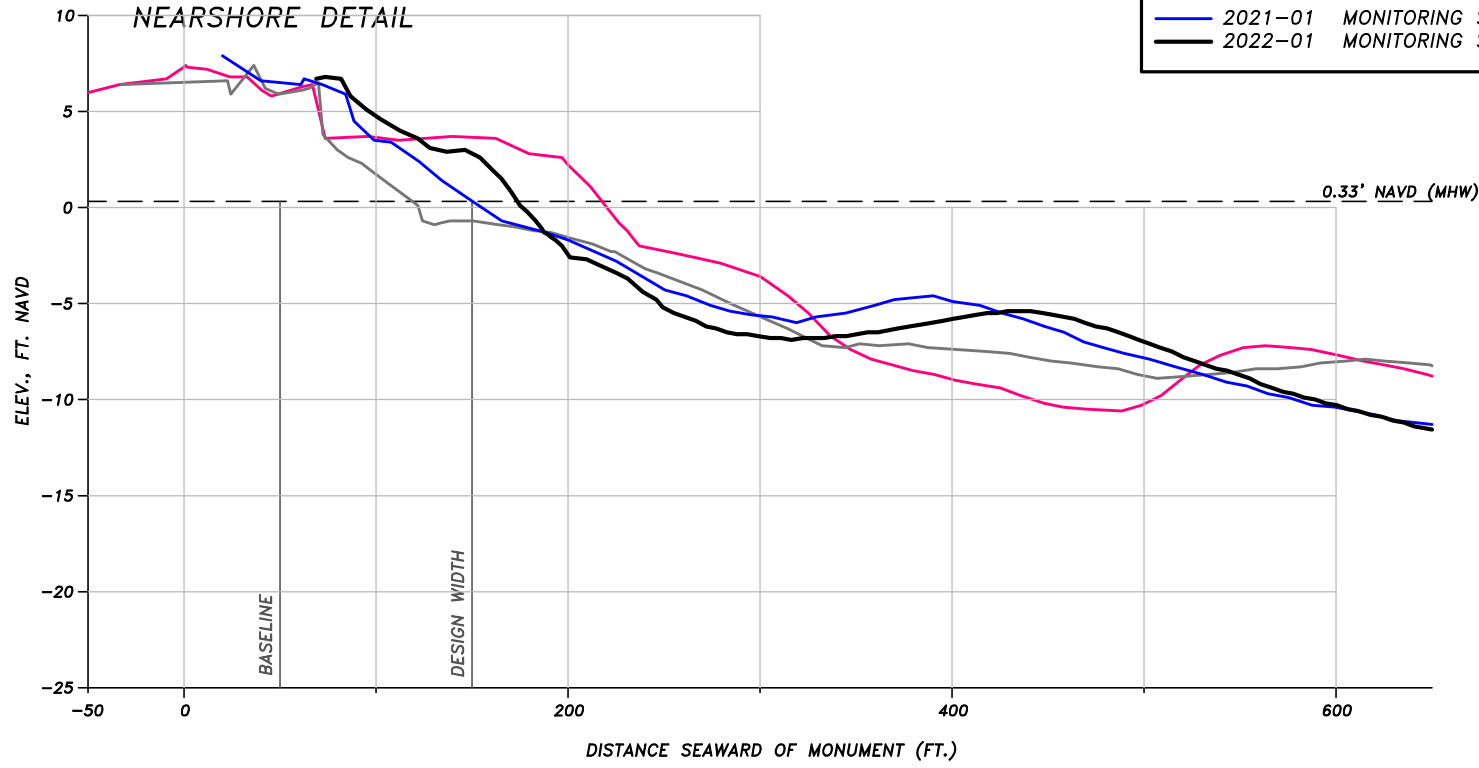


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-70

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

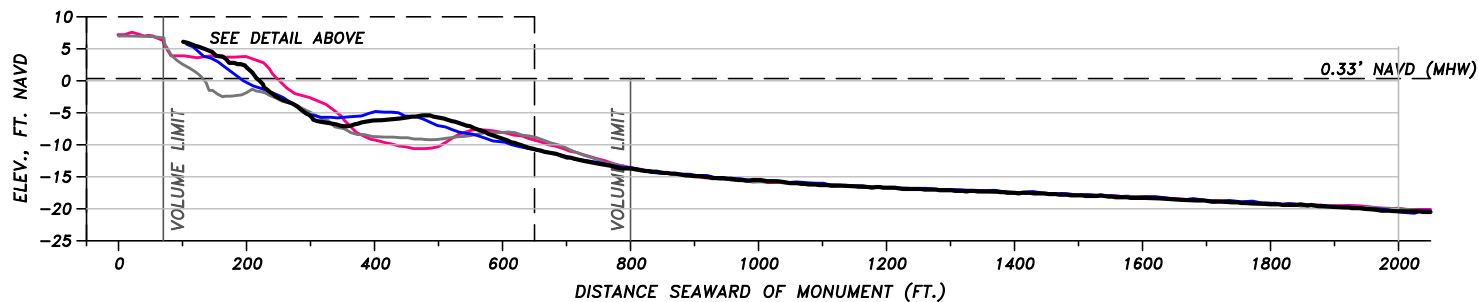
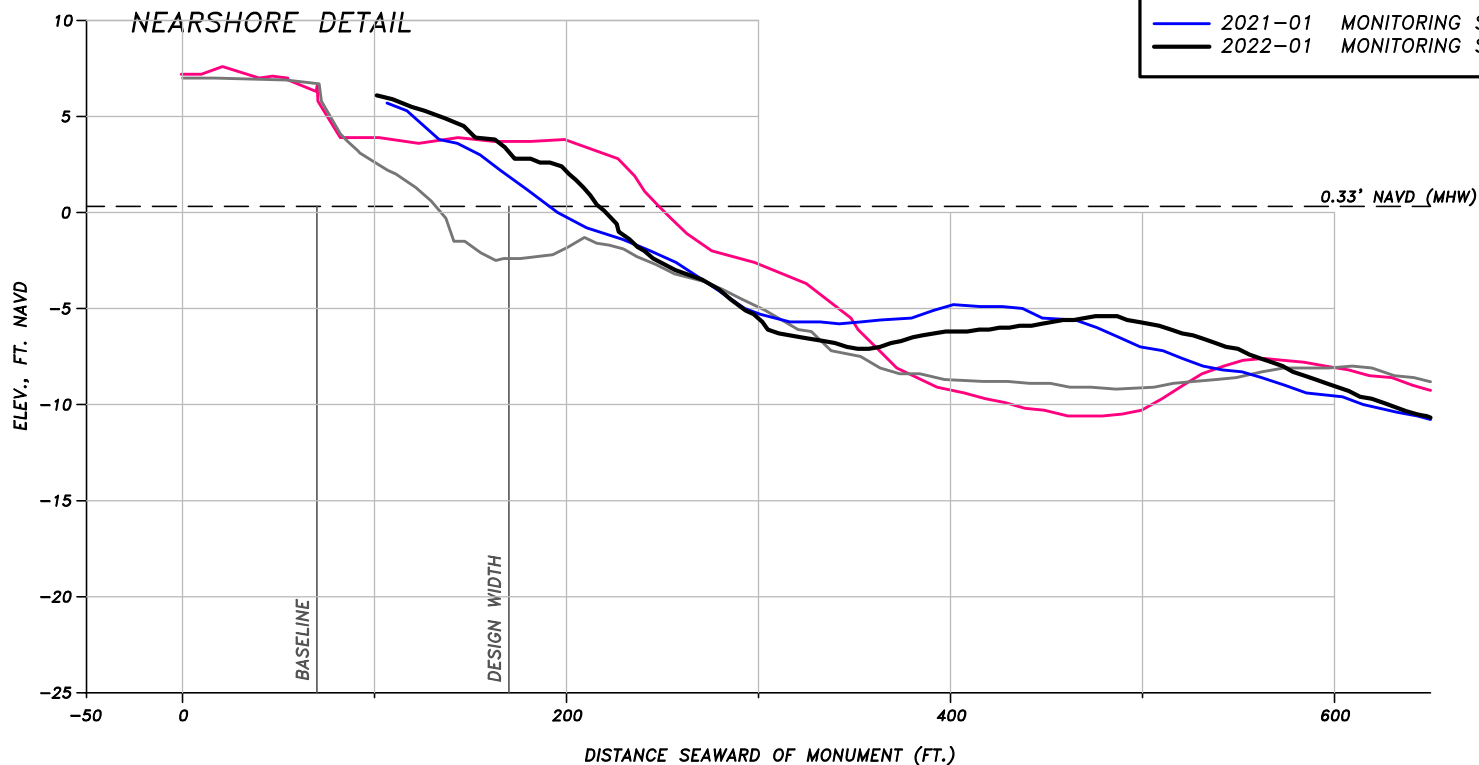


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
 NAPLES, FL 34110
 FAX: (239) 594-2025
 PHONE: (239) 594-2021
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BEACH PROFILE: R-71

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI



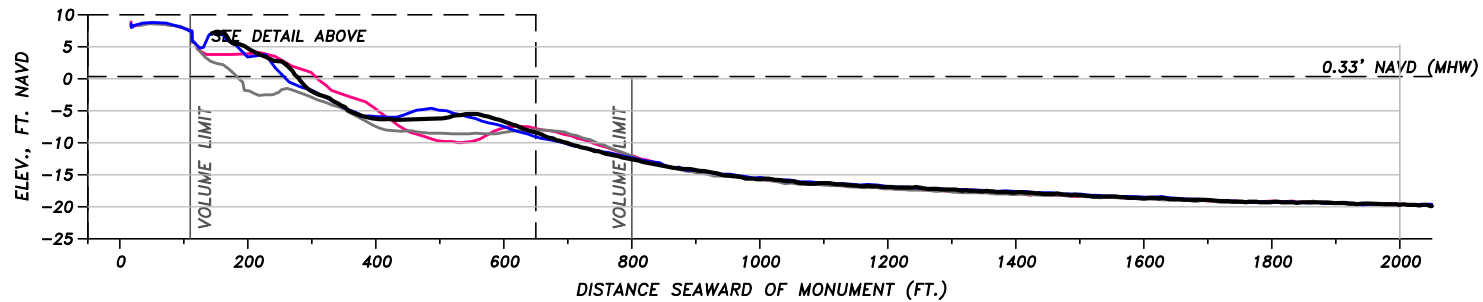
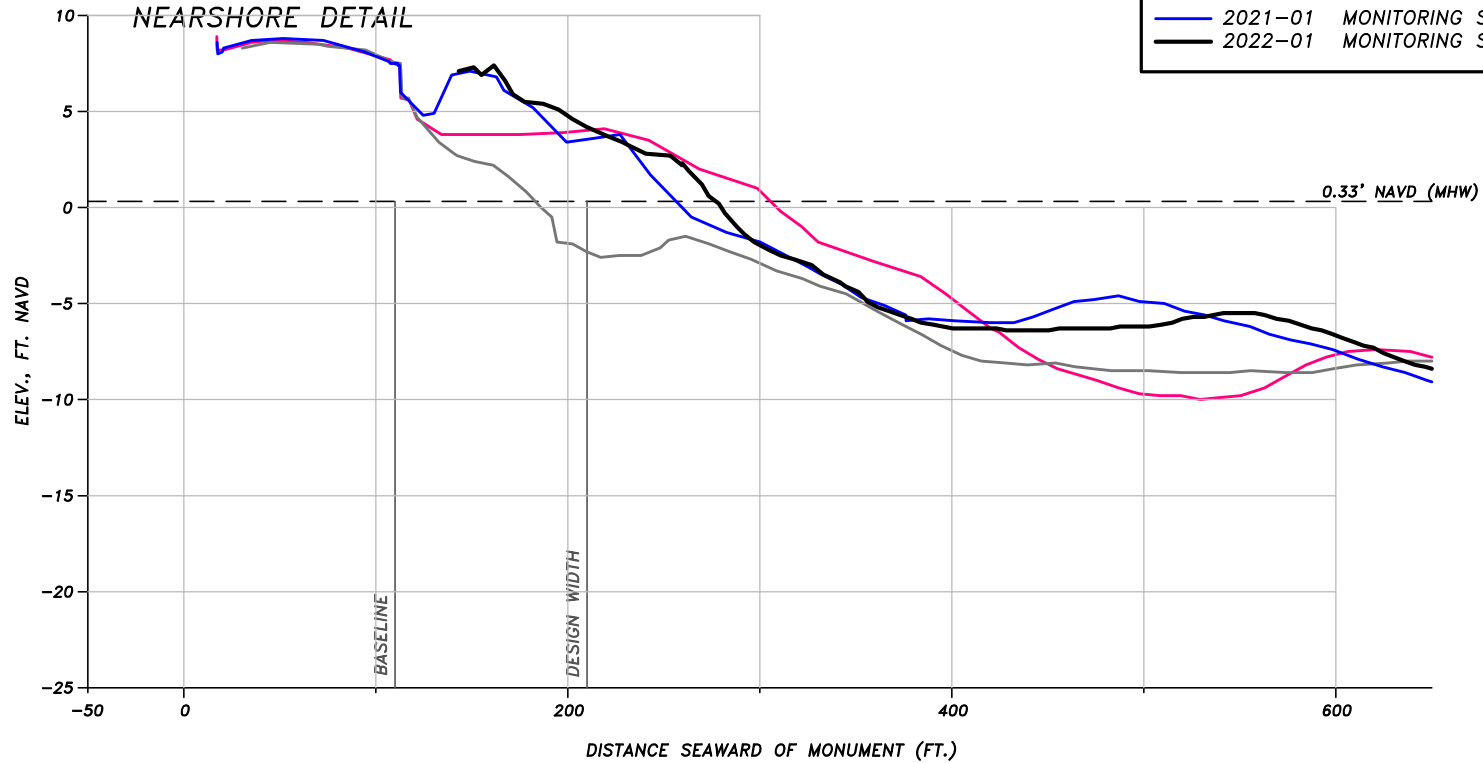
**HUMISTON
& MOORE
ENGINEERS**
COASTAL
ENGINEERING DESIGN
AND PERMITTING

COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-72

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

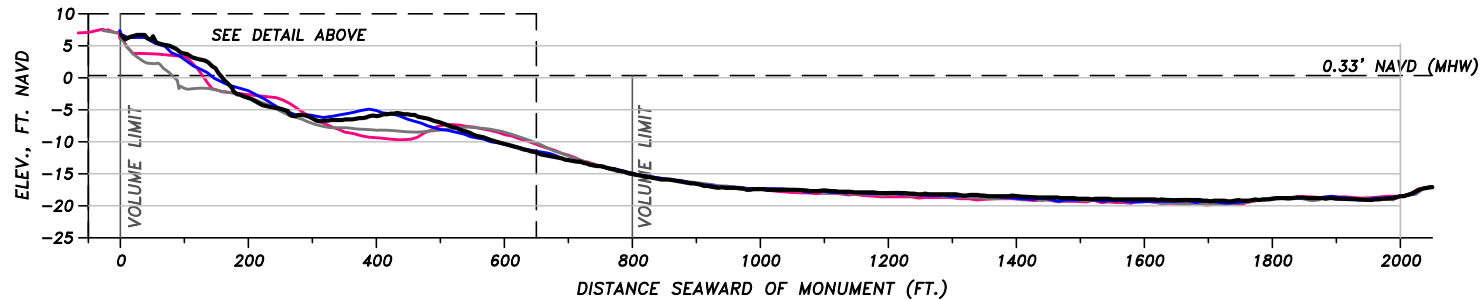
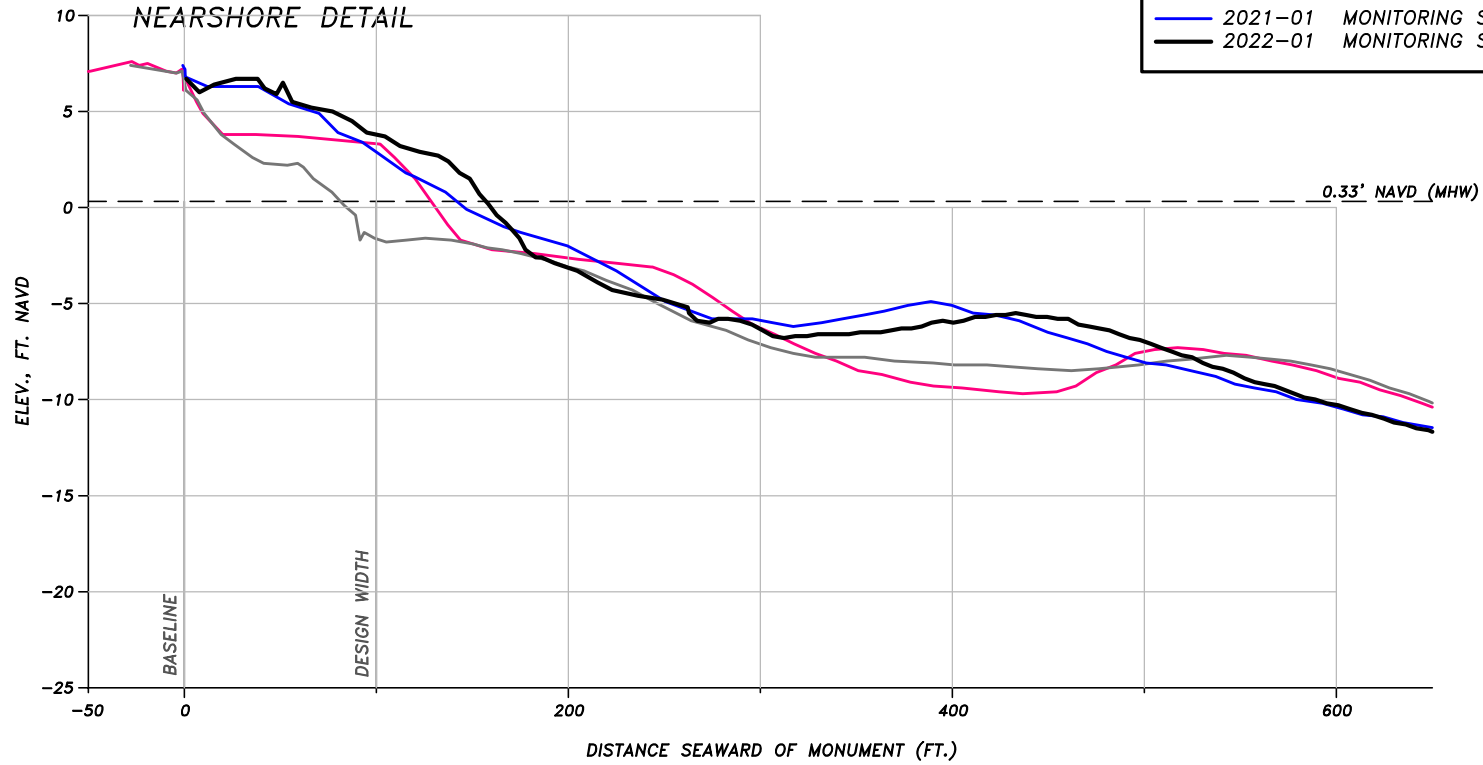


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-73

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

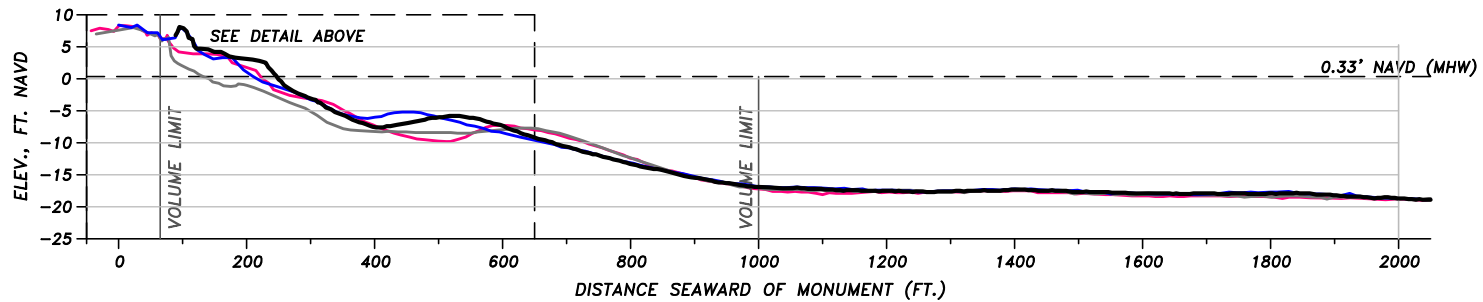
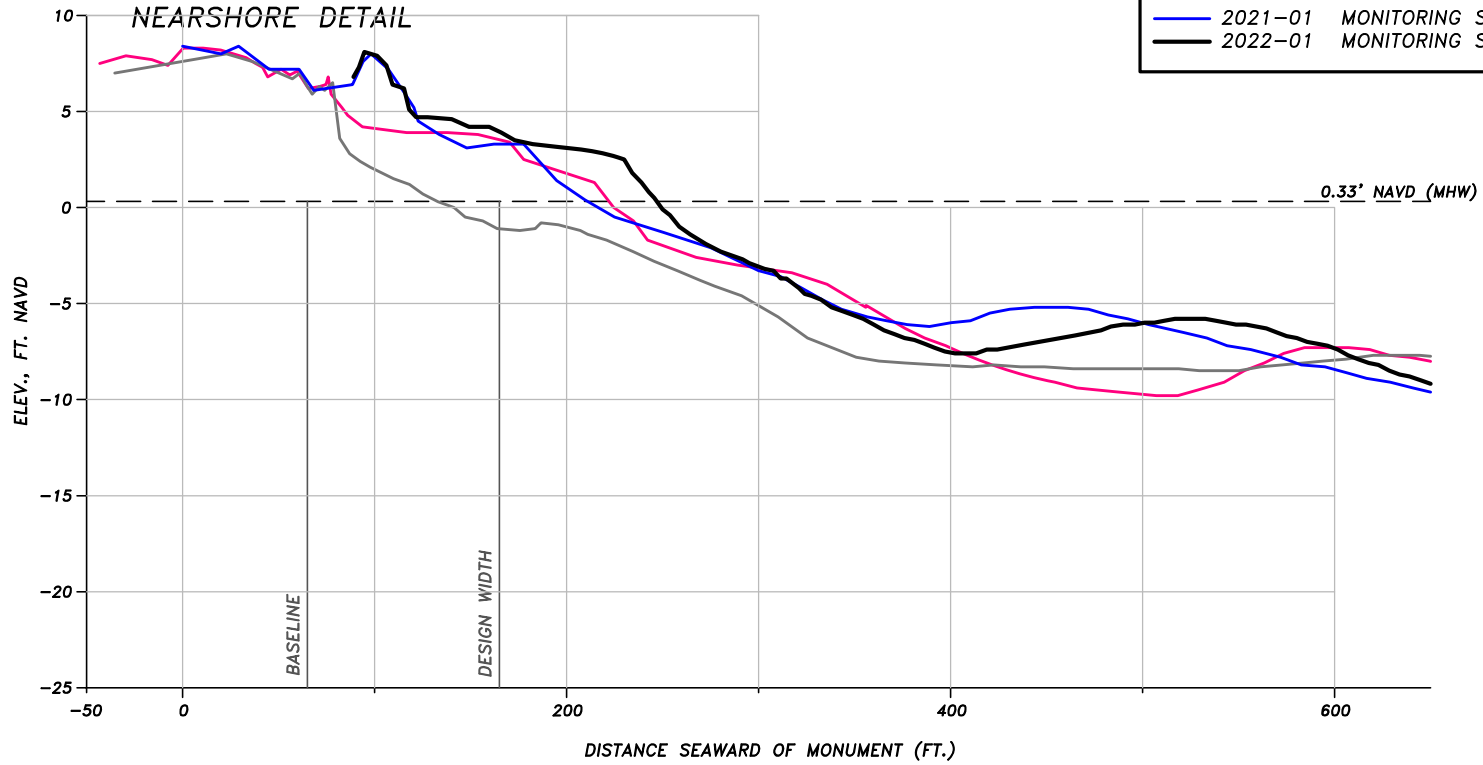


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
 NAPLES, FL 34110
 FAX: (239) 594-2025
 PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-74

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

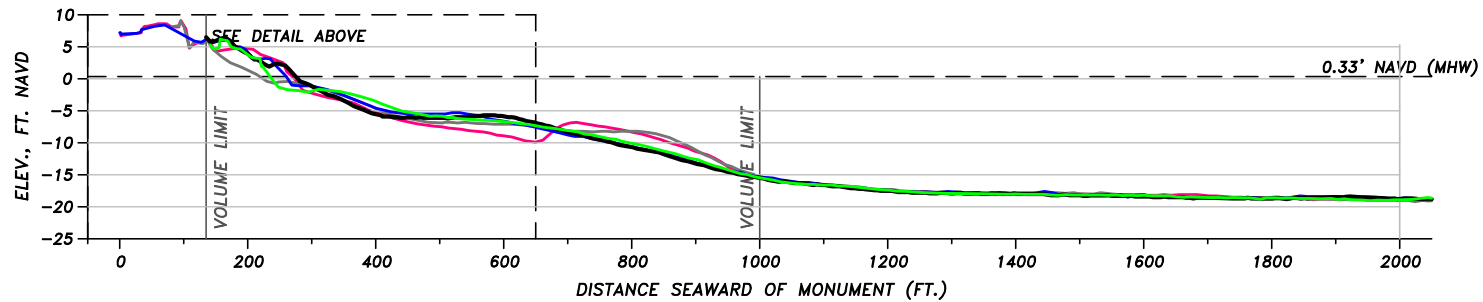
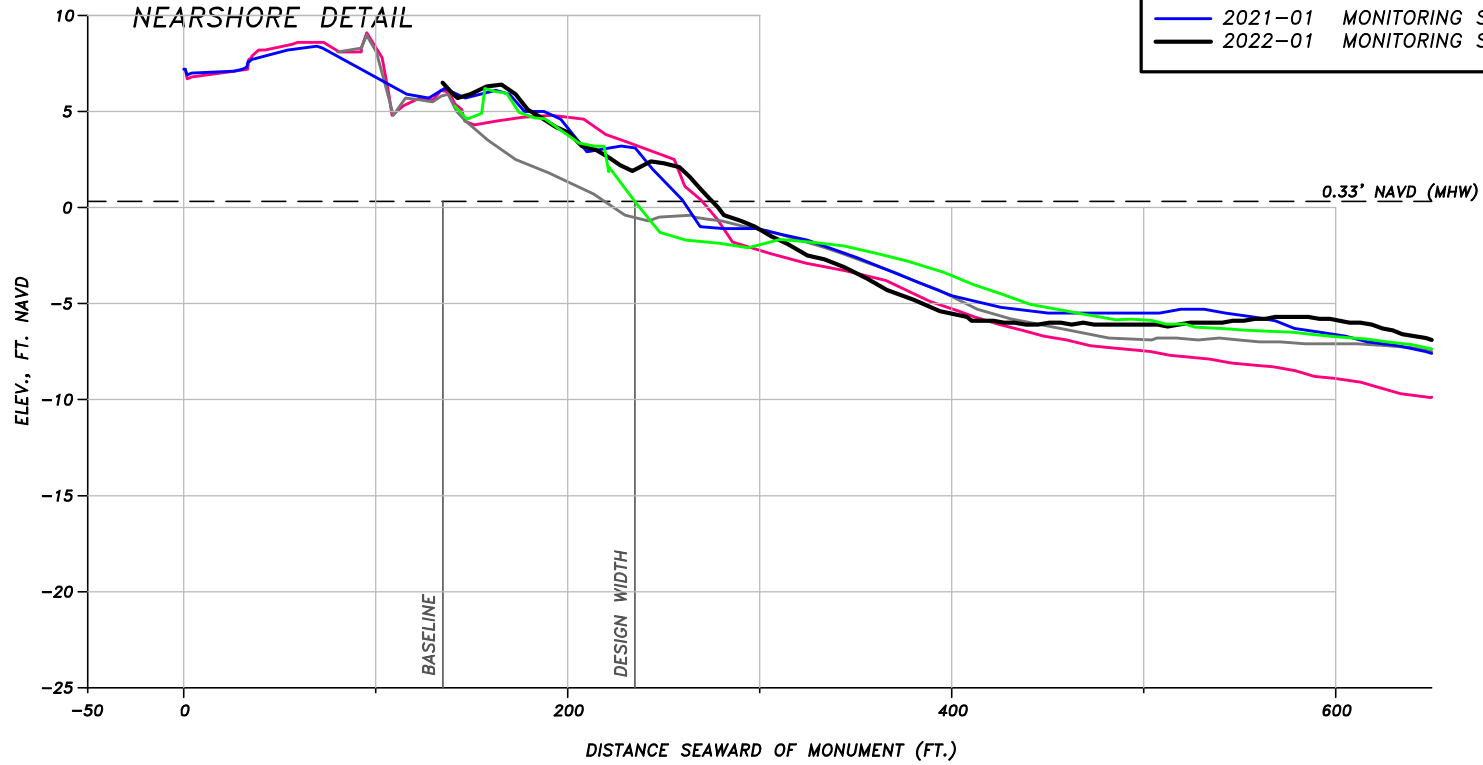


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
www.humistonandmoore.com

BEACH PROFILE: R-75

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2014-12	POST CONSTRUCTION ATKINS
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

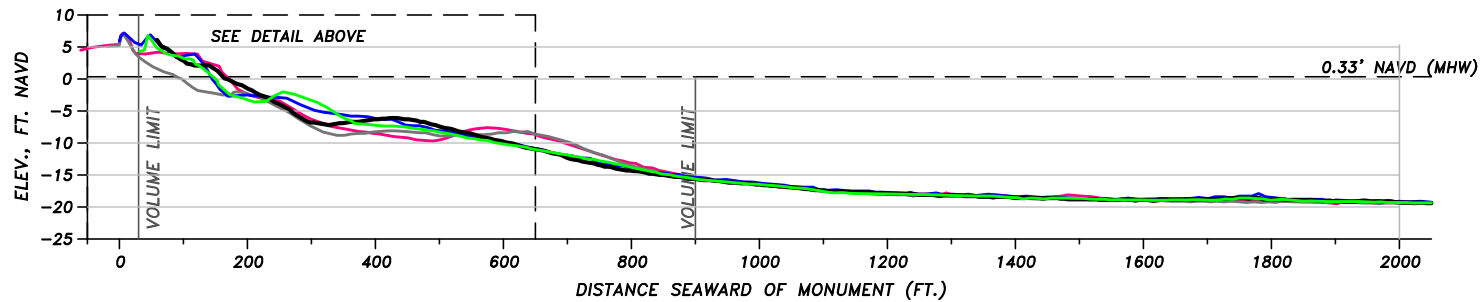
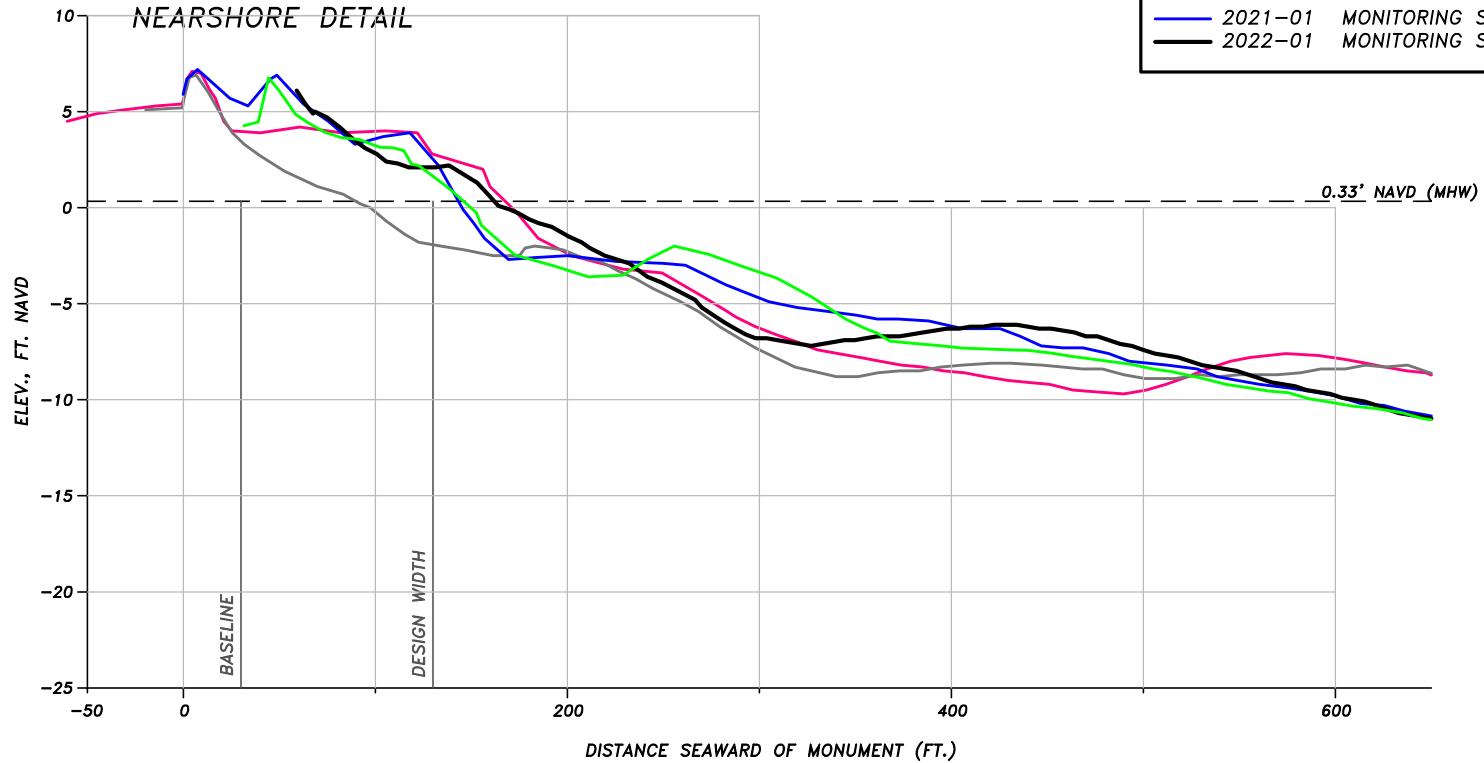


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-76

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Green)	2014-12 POST CONSTRUCTION ATKINS
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI

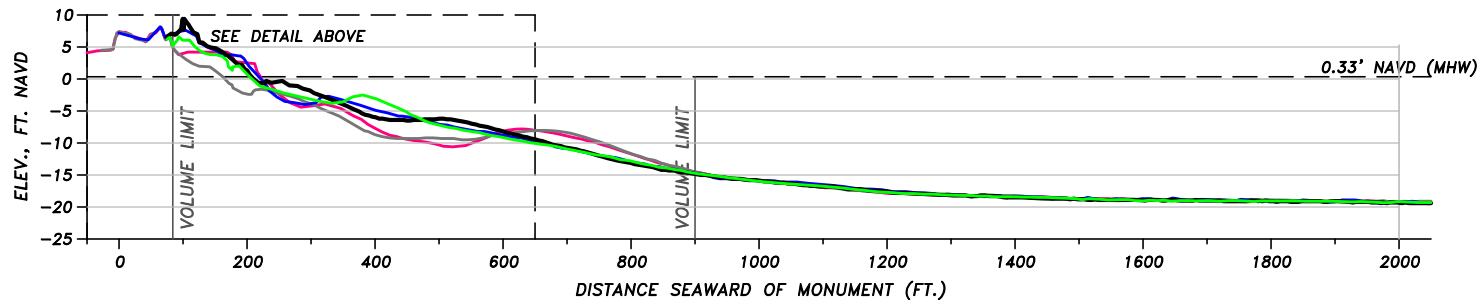
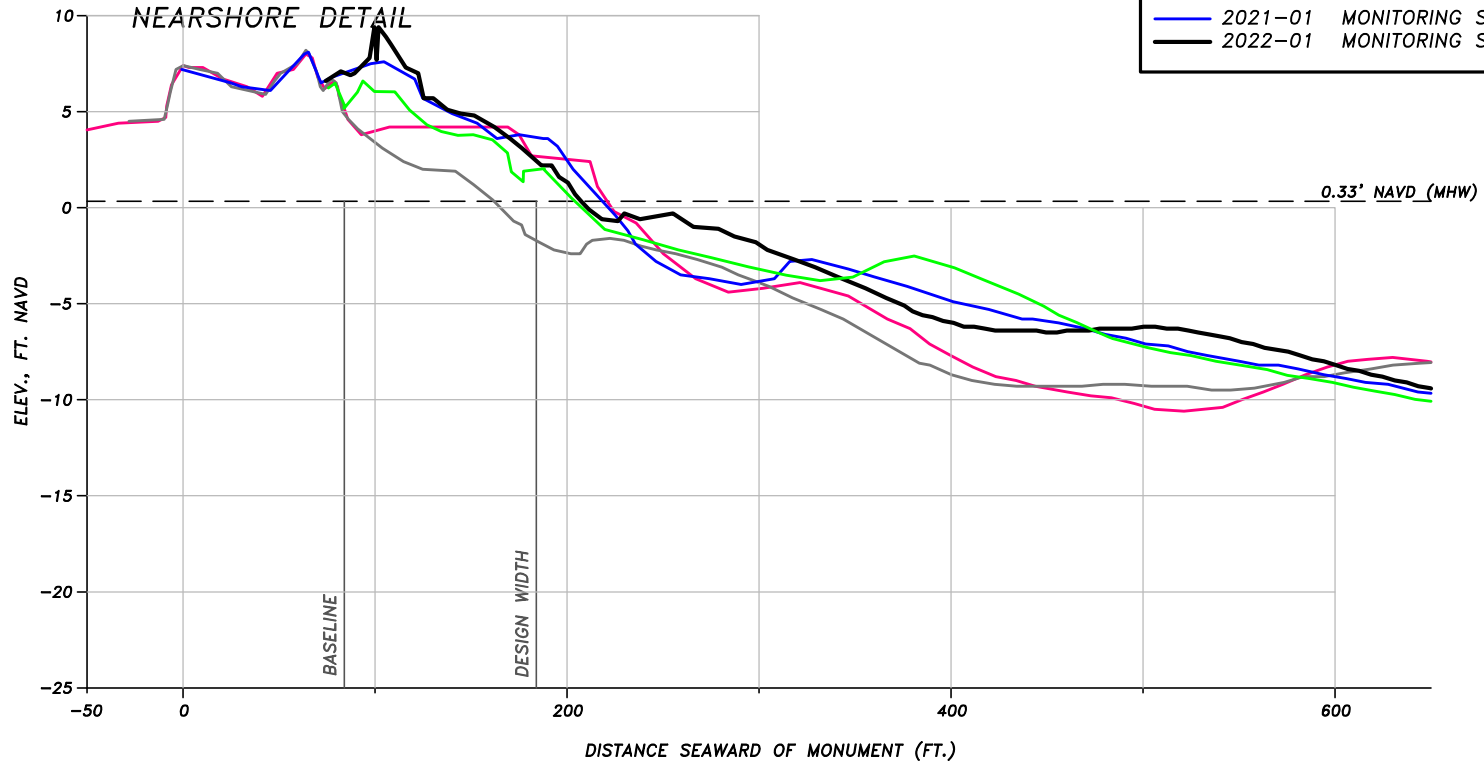


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
FAX: (239) 594-2025
PHONE: (239) 594-2021
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BEACH PROFILE: R-77

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2014-12	POST CONSTRUCTION ATKINS
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

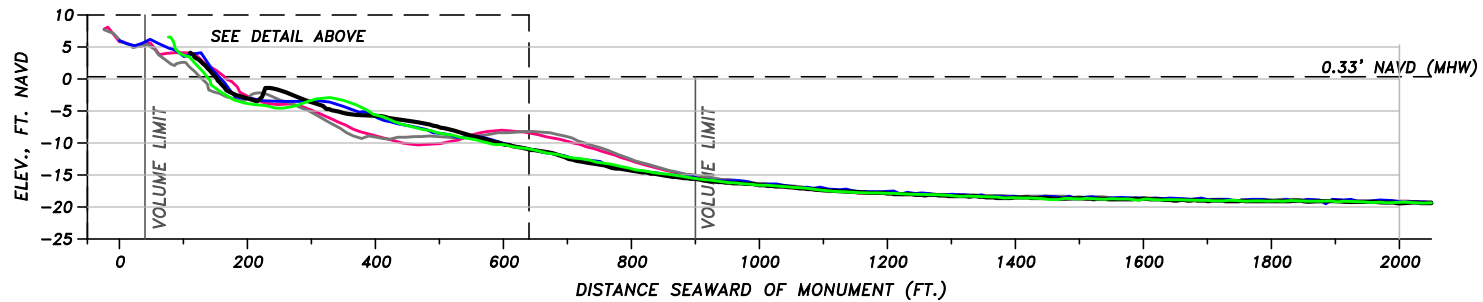
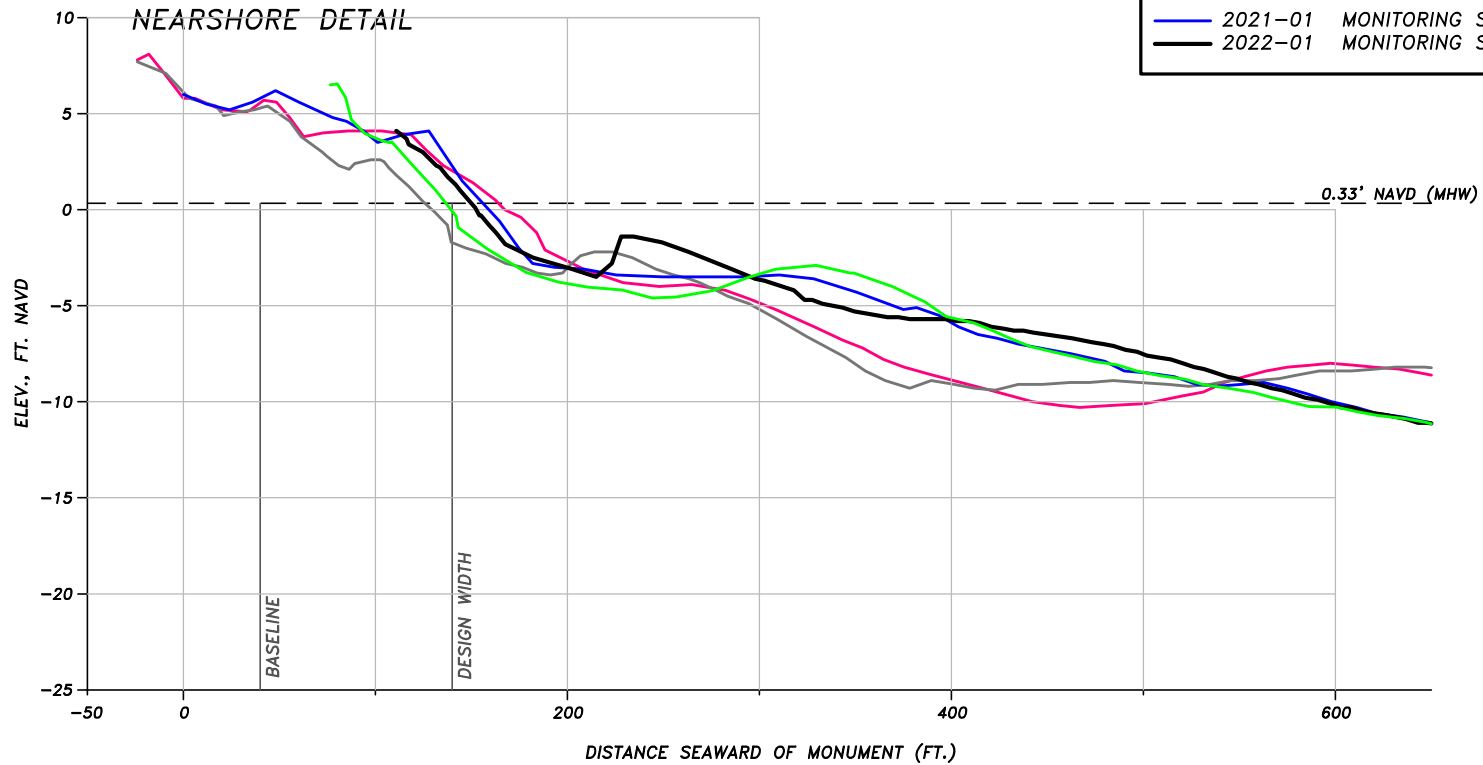


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
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 PHONE: (239) 594-2021
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BEACH PROFILE: R-78

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2014-12	POST CONSTRUCTION ATKINS
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

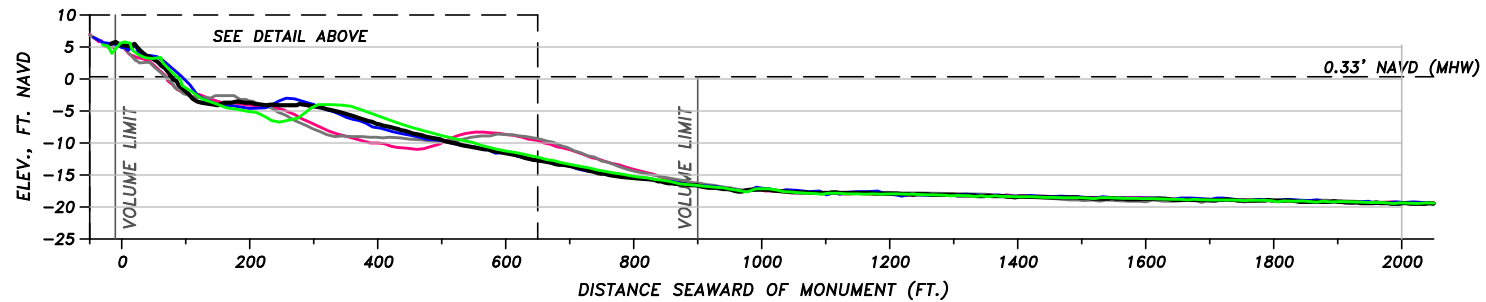
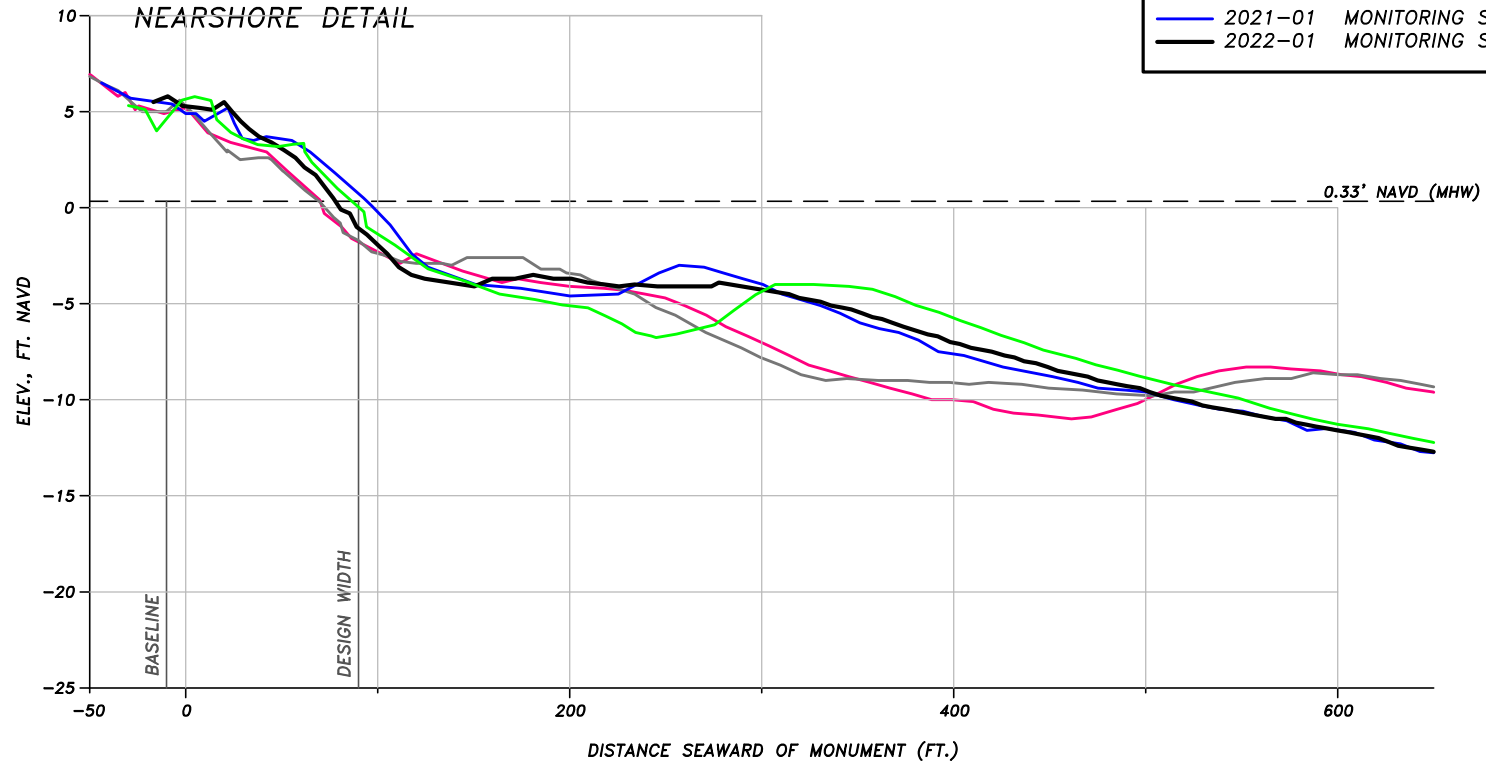


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-79

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2014-12	POST CONSTRUCTION ATKINS
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

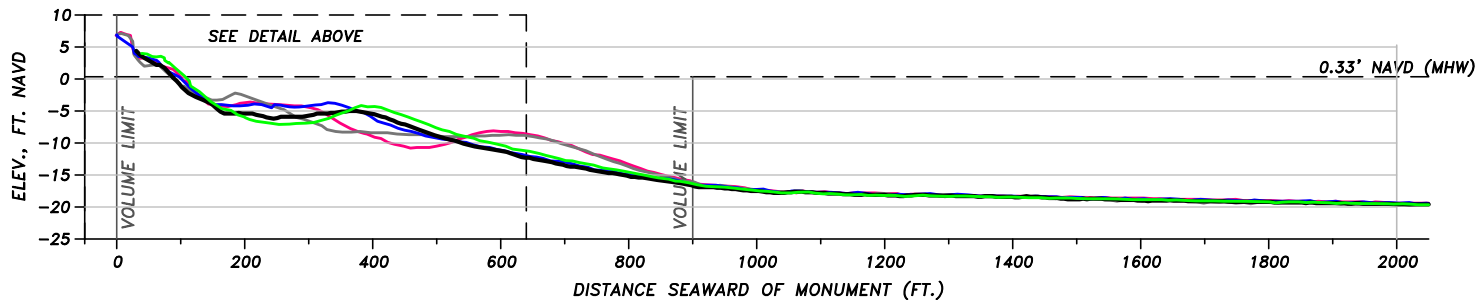
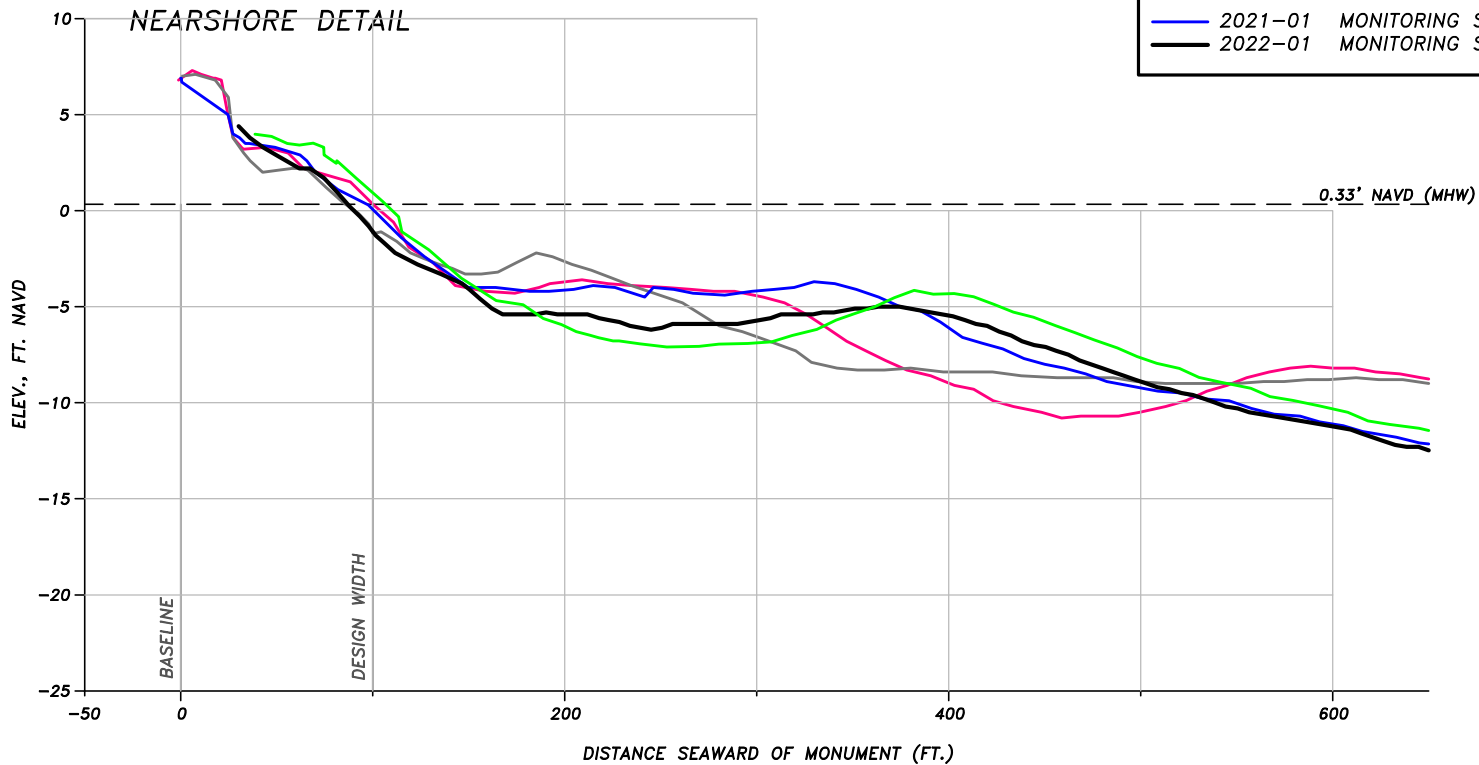


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
 NAPLES, FL 34110
 FAX: (239) 594-2025
 PHONE: (239) 594-2021
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BEACH PROFILE: R-80

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Green)	2014-12 POST CONSTRUCTION ATKINS
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI



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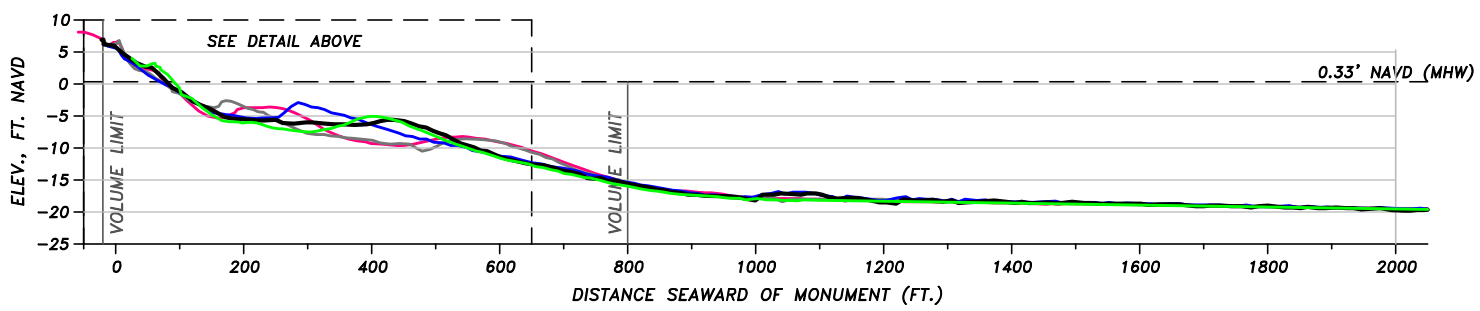
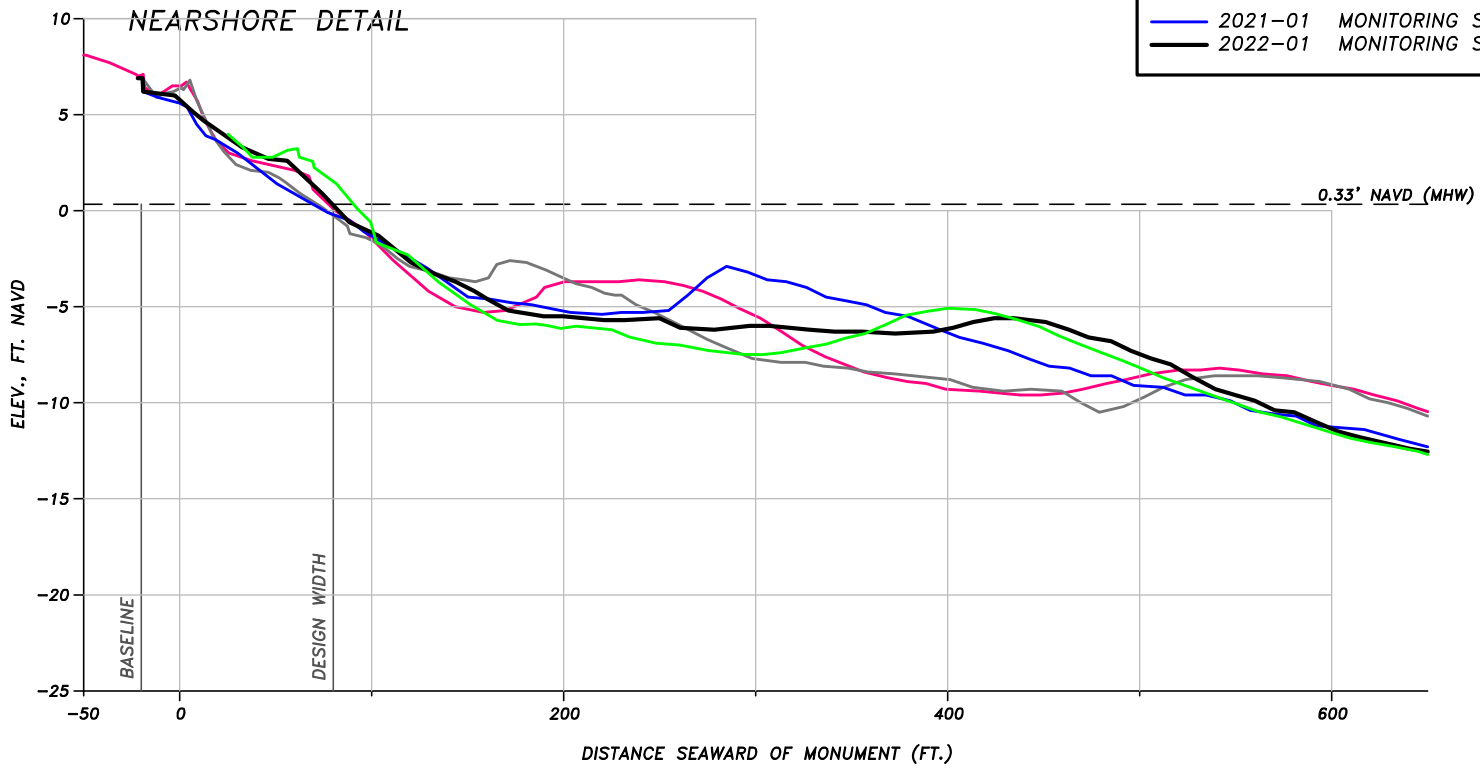
COLLIER COUNTY BEACH MONITORING
BEACH PROFILE

FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

5679 STRAND COURT
NAPLES, FL 34110
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BEACH PROFILE: R-81

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2014-12	POST CONSTRUCTION ATKINS
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

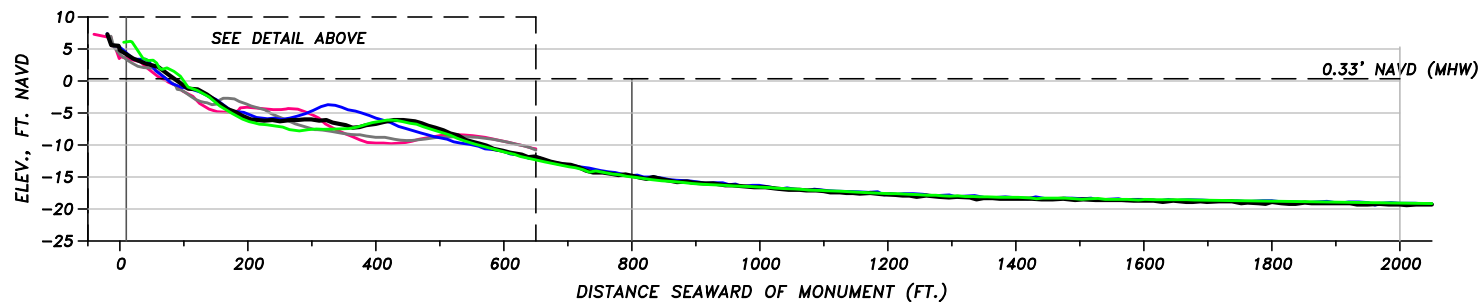
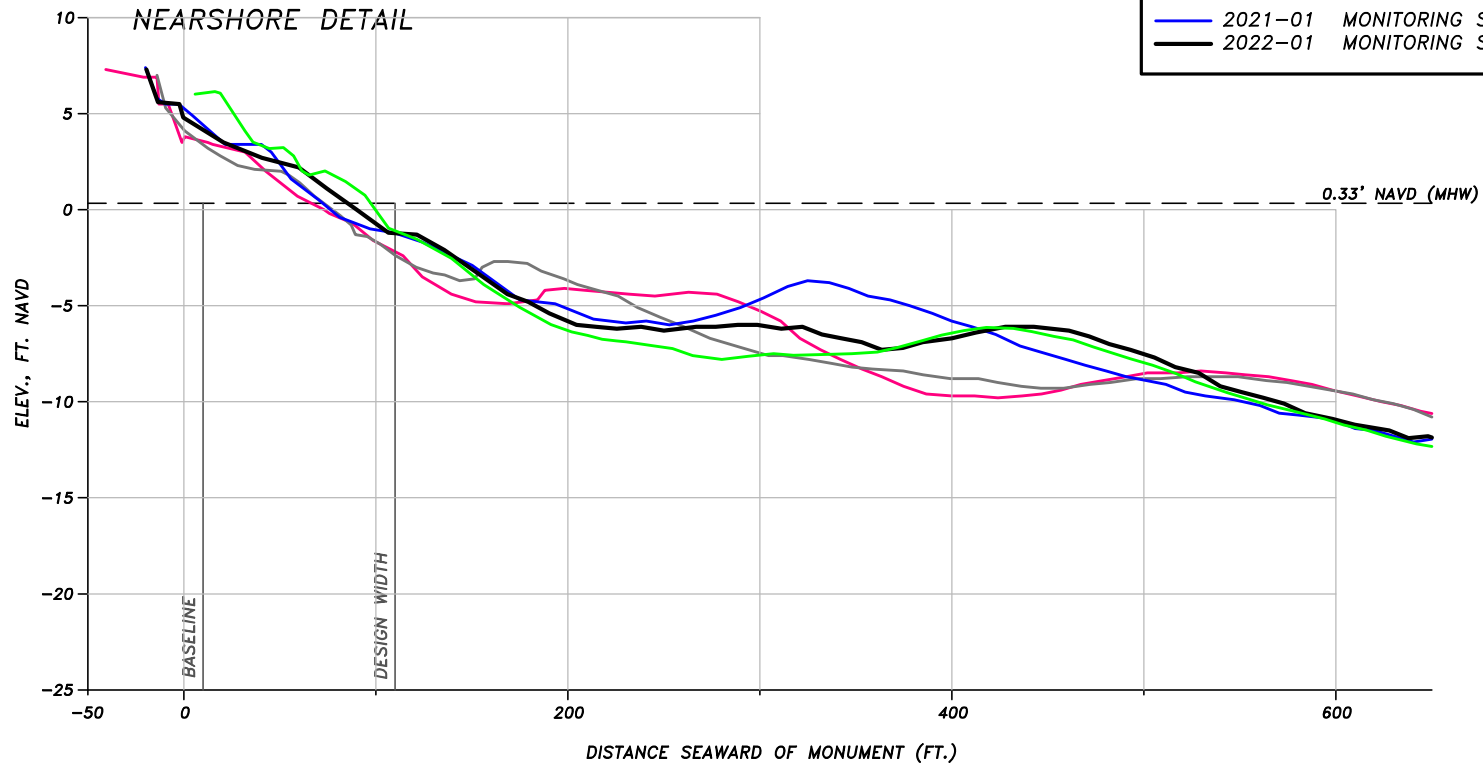


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-82

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2014-12	POST CONSTRUCTION ATKINS
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI

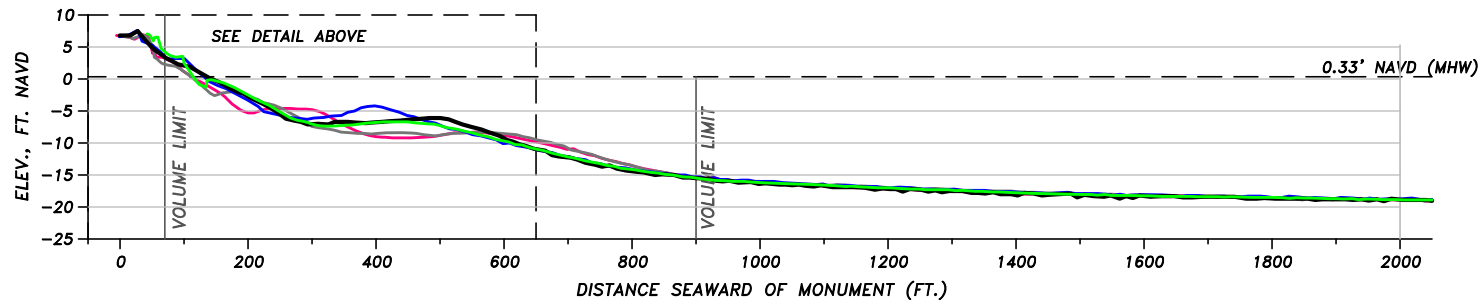
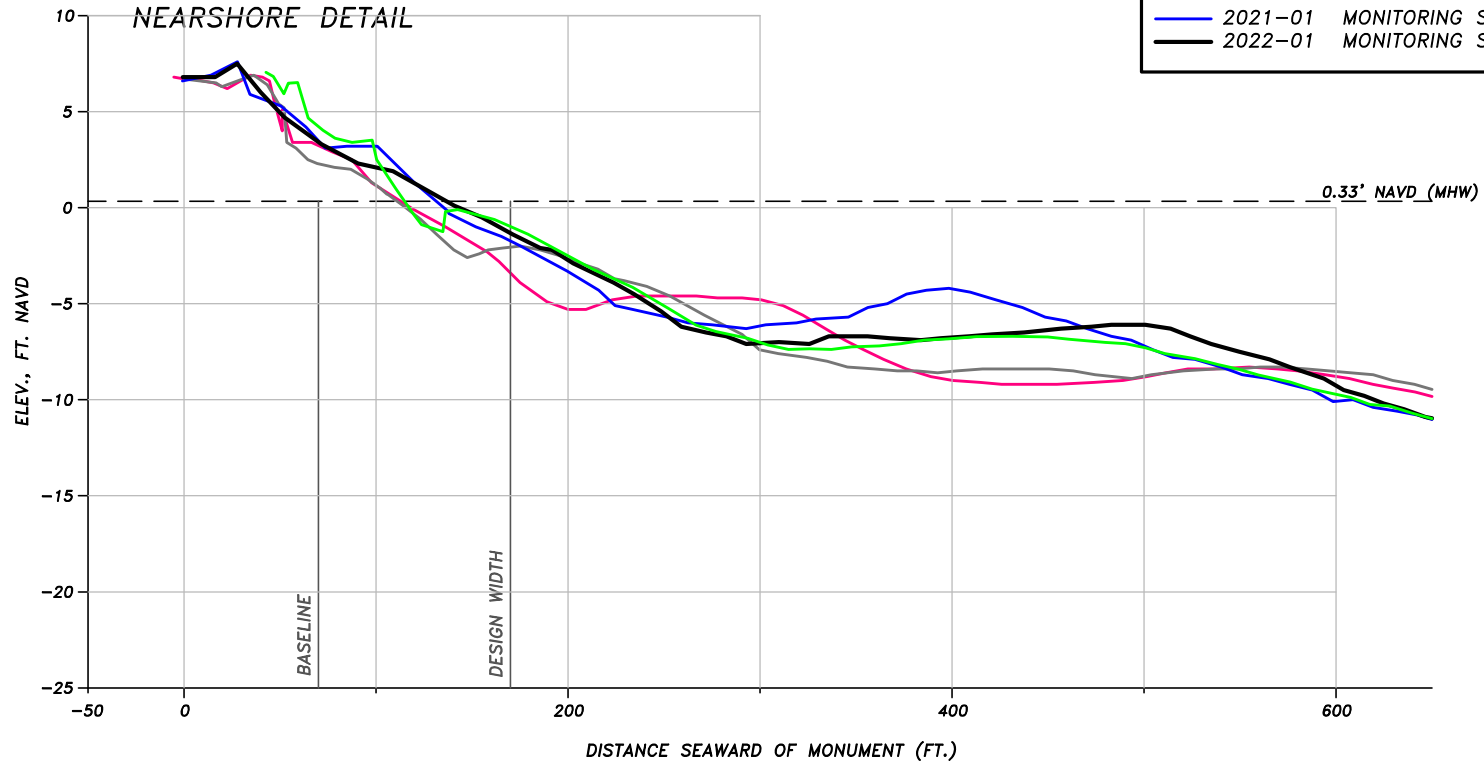


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-83

SURVEY LEGEND	
— (Grey)	2005-11 PRE CONSTRUCTION CP&E
— (Pink)	2006-06 POST CONSTRUCTION CP&E
— (Green)	2014-12 POST CONSTRUCTION ATKINS
— (Blue)	2021-01 MONITORING SDI
— (Black)	2022-01 MONITORING SDI

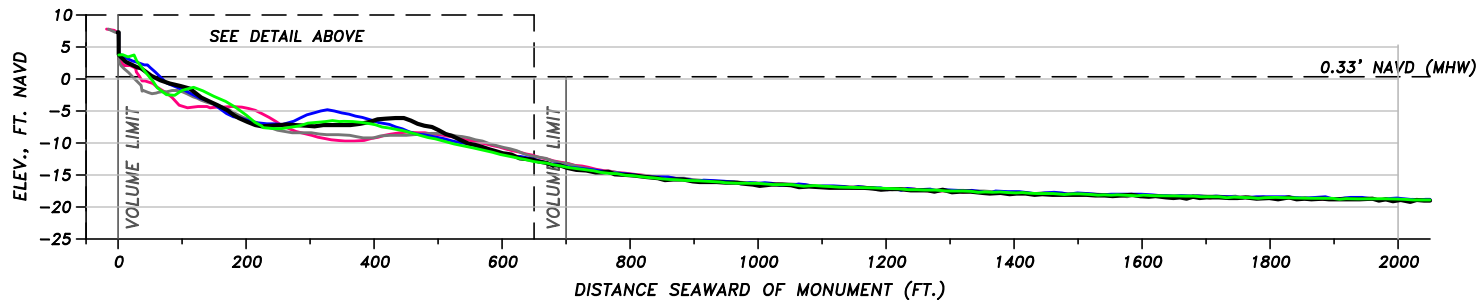
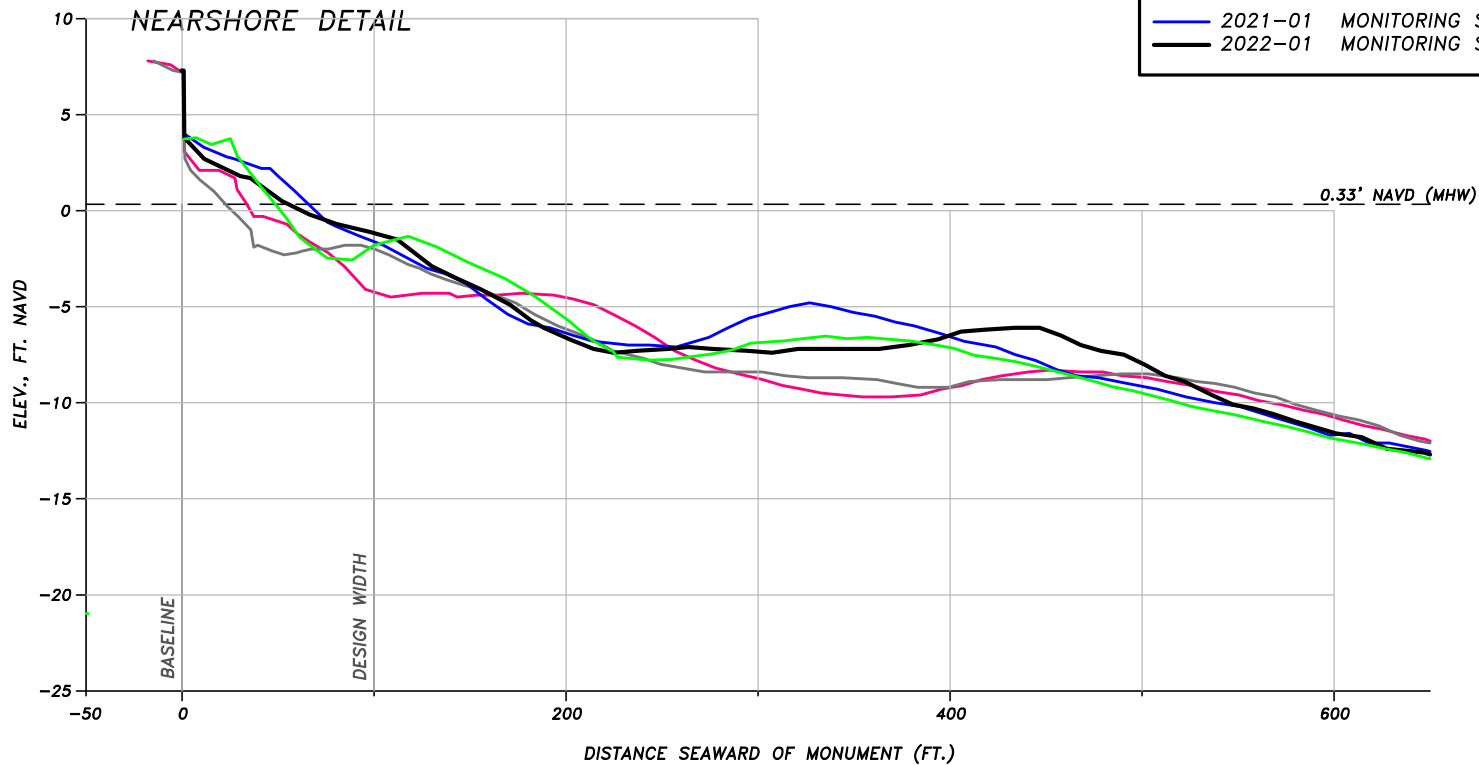


COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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BEACH PROFILE: R-84

SURVEY LEGEND	
— 2005-11	PRE CONSTRUCTION CP&E
— 2006-06	POST CONSTRUCTION CP&E
— 2014-12	POST CONSTRUCTION ATKINS
— 2021-01	MONITORING SDI
— 2022-01	MONITORING SDI



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COLLIER COUNTY BEACH MONITORING BEACH PROFILE		
FOR: COLLIER COUNTY		
DATE: 2/2/22	FILE: SECTION	SCALE: SHOWN
JOB: 18022	DATUM: NAVD	FIGURE:

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Appendix E

2006 Post Construction Volume and Shoreline Change (CP&E)

TABLE 3
VANDERBILT BEACH AND PELICAN BAY
MHW SHORELINE CHANGES AND ADDED BEACH WIDTH

PROFILE AREA	AS BUILT	SEPT. 05 to JUN. 06	NOV. 05 to JUN. 06
WIGGINS PASS			
R-17		26.6	
R-18		7.6	
R-19		-11.0	
R-20		5.8	
R-21		16.3	
R-22		-1.2	1.3
R-23	24.6	25.4	23.3
R-24	32.7	14.5	19.0
R-25	45.3	49.4	43.9
R-26	57.0	42.7	44.4
R-27	66.2	53.2	44.9
R-28	51.7	44.8	48.1
R-29	67.0	67.3	61.1
R-30	39.7	35.1	33.9
R-31	36.4	25.2	27.4
R-32	44.2	37.3	28.3
R-33	38.0	14.7	12.0
R-34	47.3	31.5	20.8
R-35	43.1	33.6	22.3
R-36	40.7	21.3	12.2
R-37		10.7	-9.6
R-38		-3.0	-22.4
R-39		18.3	-4.2
R-40		21.6	6.3
R-41		-7.3	2.0
CLAM PASS			
VANDERBILT	48.0	41.6	39.8
R-22 TO R-31			
PELICAN BAY	41.6	27.3	20.5
R-31 TO R-37			
MONITORING AREA		23.2	20.8
R-17 TO R-41			

TABLE 4
NORTH PARK SHORE AND PARK SHORE
MHW SHORELINE CHANGES AND ADDED BEACH WIDTH

PROFILE AREA	AS BUILT	SEPT. 05 to JUN. 06	NOV. 05 to JUN. 06
CLAM PASS			
R-42		-4.6	-7.1
R-43		-8.7	-13.0
R-44		26.2	12.3
R-45		0.6	-7.8
R-46	44.5	-0.6	-3.7
R-47	30.7	12.4	10.7
R-48	46.5	19.0	17.7
R-49	43.3	6.4	-2.7
R-50	57.0	40.4	30.0
R-51	86.4	68.8	63.7
R-52	99.2	88.6	69.1
R-53	45.7	49.3	49.8
R-54	48.3	43.5	42.3
R-55		-5.9	-20.7
R-56		-5.2	-9.3
R-57		39.7	12.7
DOCTORS PASS			
PROJECT AREA R-46 TO R-54	55.7	36.4	30.8
MONITORING AREA R-42 TO R-57		23.1	15.3

**TABLE 5
NAPLES BEACH
MHW SHORELINE CHANGES AND ADDED BEACH WIDTH**

PROFILE AREA	AS BUILT	SEPT. 05 to JUN. 06	NOV. 05 to JUN. 06
DOCTORS PASS			
R-58A	118.4	66.7	63.3
R-58	96.8	77.5	59.4
R-59	59.9	86.9	71.5
R-60	41.9	51.1	44.5
R-61	12.6	41.3	48.9
R-62	49.9	68.3	70.1
R-63	93.7	49.7	38.7
R-64	47.9	19.9	14.8
R-65	36.0	50.5	30.5
R-66	60.6	53.6	36.2
R-67	43.8	67.7	30.7
R-68	35.2	38.0	2.2
R-69	51.4	43.3	31.6
R-70	109.9	106.7	100.2
R-71	123.5	123.4	120.7
R-72	136.3	127.8	126.2
R-73	54.7	53.7	50.0
R-74	76.8	78.3	86.4
R-75	52.4	70.4	51.4
R-76	64.5	93.2	76.3
R-77	47.7	59.6	61.3
R-78	40.6	54.3	44.0
R-79	2.6	4.1	0.8
R-80		28.5	17.8
R-81		10.4	9.2
R-82		15.7	0.7
R-83		16.0	8.8
R-84		15.4	18.5
PROJECT AREA R-58A TO R-78	66.1	67.4	57.2
MONITORING AREA R-58A TO R-84		56.1	47.0

**TABLE 6
VANDERBILT BEACH AND PELICAN BAY VOLUMETRIC CHANGES (CY)**

PROFILE AREA	EFFECTIVE			SEPT. 05	NOV. 05
FROM / TO	DISTANCE(FT)	DESIGN	AS-BUILT	to JUN. 06	to JUN. 06
WIGGINS PASS					
R-17 TO R-18	1,002			2,229	
R-18 TO R-19	1,047			-258	
R-19 TO R-20	1,029			-3,088	
R-20 TO R-21	1,030			1,896	
R-21 TO R-22	1,040			2,489	
R-22 TO R-23	568	3,706	4,515	3,790	2,986
R-23 TO R-24	1,057	8,662	8,336	5,557	7,007
R-24 TO R-25	1,082	12,893	13,698	9,690	12,529
R-25 TO R-26	983	15,963	15,892	15,819	16,983
R-26 TO R-27	993	18,856	18,425	16,754	18,293
R-27 TO R-28	1,195	23,327	22,519	19,783	19,538
R-28 TO R-29	855	14,093	14,383	14,833	15,215
R-29 TO R-30	1,028	13,436	14,662	15,549	15,122
R-30 TO R-31	1,037	10,753	9,057	8,372	5,083
R-31 TO R-32	1,006	10,207	8,957	11,916	9,931
R-32 TO R-33	1,017	10,174	9,093	14,588	15,641
R-33 TO R-34	1,026	10,799	10,881	13,058	15,598
R-34 TO R-35	997	11,177	11,277	16,466	16,440
R-35 TO R-36	999	11,245	12,993	13,544	14,369
R-36 TO R-37	1,057	3,623	3,754	8,014	9,132
R-37 TO R-38	976			-350	1,977
R-38 TO R-39	1,022			-2,089	3,417
R-39 TO R-40	1,009			2,255	8,839
R-40 TO R-41	1,012			-1,032	9,435
CLAM PASS					
VANDERBILT	8,798	121,689	121,487	110,147	112,756
R-22 TO R-31					
PELICAN BAY	6,102	57,225	56,955	77,586	81,111
R-31 TO R-37					
MONITORING AREA	24,067			189,785	217,535
R-17 TO R-41					

**TABLE 7
NORTH PARK SHORE AND PARK SHORE VOLUMETRIC CHANGES**

PROFILE AREA	EFFECTIVE			SEPT. 05	NOV. 05
FROM / TO	DISTANCE(FT)	DESIGN	AS-BUILT	to JUN. 06	to JUN. 06
CLAM PASS					
R-42 TO R-43	1,039			-5,456	-6,534
R-43 TO R-44	997			-690	1,022
R-44 TO R-45	1,048			3,178	-320
R-45 TO R-46	1,106	6,551	8,478	-2,357	-5,071
R-46 TO R-47	973	11,890	10,040	-3,011	-1,948
R-47 TO R-48	933	9,337	9,187	2,982	4,122
R-48 TO R-49	1,067	11,040	11,604	2,770	4,770
R-49 TO R-50	1,086	12,062	11,608	6,150	9,768
R-50 TO R-51	1,329	26,096	26,745	24,038	28,411
R-51 TO R-52	885	23,669	23,960	21,004	20,654
R-52 TO R-53	1,048	24,766	24,719	19,332	16,803
R-53 TO R-54	1,070	13,220	13,412	11,757	10,173
R-54 TO R-55	1,046	1,593	1,986	6,710	3,941
R-55 TO R-56	923			-1,950	-2,338
R-56 TO R-57	768			-23	2,647
DOCTORS PASS					
N. PARK SHORE	3,012	27,778	27,705	-2,386	-2,897
R-45 TO R-48					
PARK SHORE	7,531	112,446	114,034	91,761	94,520
R-48 TO R-55					
MONITORING AREA	15,318	140,224	141,739	84,434	86,100
R-42 TO R-57					

**TABLE 8
NAPLES BEACH VOLUMETRIC CHANGES**

PROFILE AREA	EFFECTIVE			SEPT. 05	NOV. 05
FROM / TO	DISTANCE(FT)	DESIGN	AS-BUILT	to JUN. 06	to JUN. 06
DOCTORS PASS					
R-58A TO R-58	521	22,602	21,736	6,838	4,747
R-58 TO R-59	985	23,123	22,219	22,905	18,219
R-59 TO R-60	1,085	17,447	17,238	16,723	16,192
R-60 TO R-61	1,077	9,591	8,356	21,169	19,194
R-61 TO R-62	1,020	6,192	7,037	24,388	27,401
R-62 TO R-63	1,008	18,303	18,615	20,628	22,986
R-63 TO R-64	926	19,227	18,918	11,100	12,282
R-64 TO R-65	782	9,586	8,688	5,438	6,052
R-65 TO R-66	825	10,404	10,419	11,509	11,201
R-66 TO R-67	800	11,404	12,854	13,959	15,865
R-67 TO R-68	809	8,334	8,879	8,538	10,789
R-68 TO R-69	811	9,378	9,548	3,630	7,166
R-69 TO R-70	798	18,059	16,945	10,186	10,899
R-70 TO R-71	802	31,932	32,220	18,091	18,652
R-71 TO R-72	803	33,727	33,305	21,132	25,950
R-72 TO R-73	811	22,423	22,798	15,331	18,544
R-73 TO R-74	815	16,037	14,982	7,388	14,346
R-74 TO R-75	789	10,498	13,124	10,498	8,505
R-75 TO R-76	800	14,614	15,105	13,492	7,992
R-76 TO R-77	798	16,766	18,147	8,390	14,859
R-77 TO R-78	765	11,433	12,199	2,843	8,279
R-78 TO R-79	1,105	4,203	4,049	-5,264	2,100
R-79 TO R-80	1,150			-8,438	-1,570
R-80 TO R-81	1,077			-2,809	3,070
R-81 TO R-82	874			-1,676	2,774
R-82 TO R-83	1,047			-2,640	194
R-83 TO R-84	960			-5,118	395
NAPLES BEACH	18,935	345,283	347,381	268,912	302,220
R-58A TO R-79					
MONITORING AREA	24,043			248,231	307,083
R-58A TO R-84					

Appendix F

Historical Shoreline Change for R-17 through R-84

(Beach Width Comparisons)

DEP Mon.	Design Standard	Beach Width (Feet)																	
		2005	2006	2007	2008	2009	2010	2011	2012	4/2013	2/2014	4/2015	1/2016	1/2017	10/2017	3/2019	3/2020	1/2021	1/2022
Wiggins Pass																			
R-17	-	51	77	44	78		180		113	172	127	68	-13	17	-19	-79	-95	-93	-107
R-18	-	97	108	172	148		130		106	102	87	94	67	46	52	64	90	80	56
R-19	-	112	99	182	149	No Data	127	No Data	90	103	94	81	83	77	78	140	136	126	104
R-20	-	98	103	107	118		107		75	72	81	81	71	67	63	67	79	80	78
R-21	-	87	102	99	108		99		83	94	94	93	85	69	67	63	79	77	74
R-22	100	107	107	120	112	112	124	118	108	118	120	112	105	103	101	96	109	109	102
R-23	100	100	121	129	116	118	113	122	116	110	117	114	107	105	106	106	112	115	127
R-24	100	114	130	138	119	116	135	124	125	99	114	112	112	117	116	123	124	112	136
R-25	100	95	135	136	112	112	124	112	113	93	108	106	98	116	111	114	114	108	130
R-26	100	109	147	148	123	123	135	121	123	107	140	127	117	133	124	122	117	116	149
R-27	100	79	121	117	98	96	97	89	91	90	123	109	98	115	94	107	99	93	128
R-28	100	97	138	123	112	108	112	111	99	88	120	119	108	119	110	102	105	89	139
R-29	100	86	143	120	105	108	107	106	98	93	123	119	109	119	106	109	110	103	135
R-30	100	110	141	131	109	125	113	108	117	110	125	123	113	116	116	117	114	112	142
R-31	100	109	132	121	117	136	131	124	117	102	130	131	123	125	115	121	123	111	140
R-32	100	107	139	123	109	127	126	131	120	115	122	129	119	118	119	117	122	107	120
R-33	100	91	104	96	99	108	111	113	105	95	103	105	102	105	103	100	90	90	103
R-34	100	80	104	103	87	93	110	100	102	89	100	95	94	95	89	105	101	80	106
R-35	100	79	103	98	79	94	97	94	87	82	104	94	83	89	84	78	85	78	104
R-36	100	81	96	92	79	82	92	90	90	78	96	90	81	87	83	87	80	68	88
R-37	100	99	92	99	92	98	95	83	95	85	93	95	91	96	93	87	98	83	89
R-38	-	106	88	116	104	104	101	77	109	93	101	104	102	110	104	94	111	84	94
R-39	-	97	93	104	88	80	111	94	107	97	107	110	107	111	95	93	84	96	86
R-40	-	71	80	81	76	73	107	118	83	114	98	125	115	93	87	87	73	59	72
R-41	-	104	108	112	138	173	99	131	80	158	157	193	146	141	118	101	75	178	110
Clam Pass																			
S. of Wiggins Pass																			
Avg. Beach Width R-17 to R-21		89	98	121	120	-	129	-	93	109	97	83	59	55	48	51	58	54	41
Vanderbilt Beach																			
Avg. Beach Width R-22 to R-32		101	132	128	112	116	120	115	112	102	122	118	110	117	111	112	114	107	132
Pelican Bay Beach																			
Avg. Beach Width R-32 to R-37		86	100	97	87	95	101	96	96	86	99	96	90	94	90	91	91	80	98
N. of Clam Pass																			
Avg. Beach Width R-38 to R-41		95	92	103	101	107	105	105	95	115	116	133	118	114	101	94	86	104	90

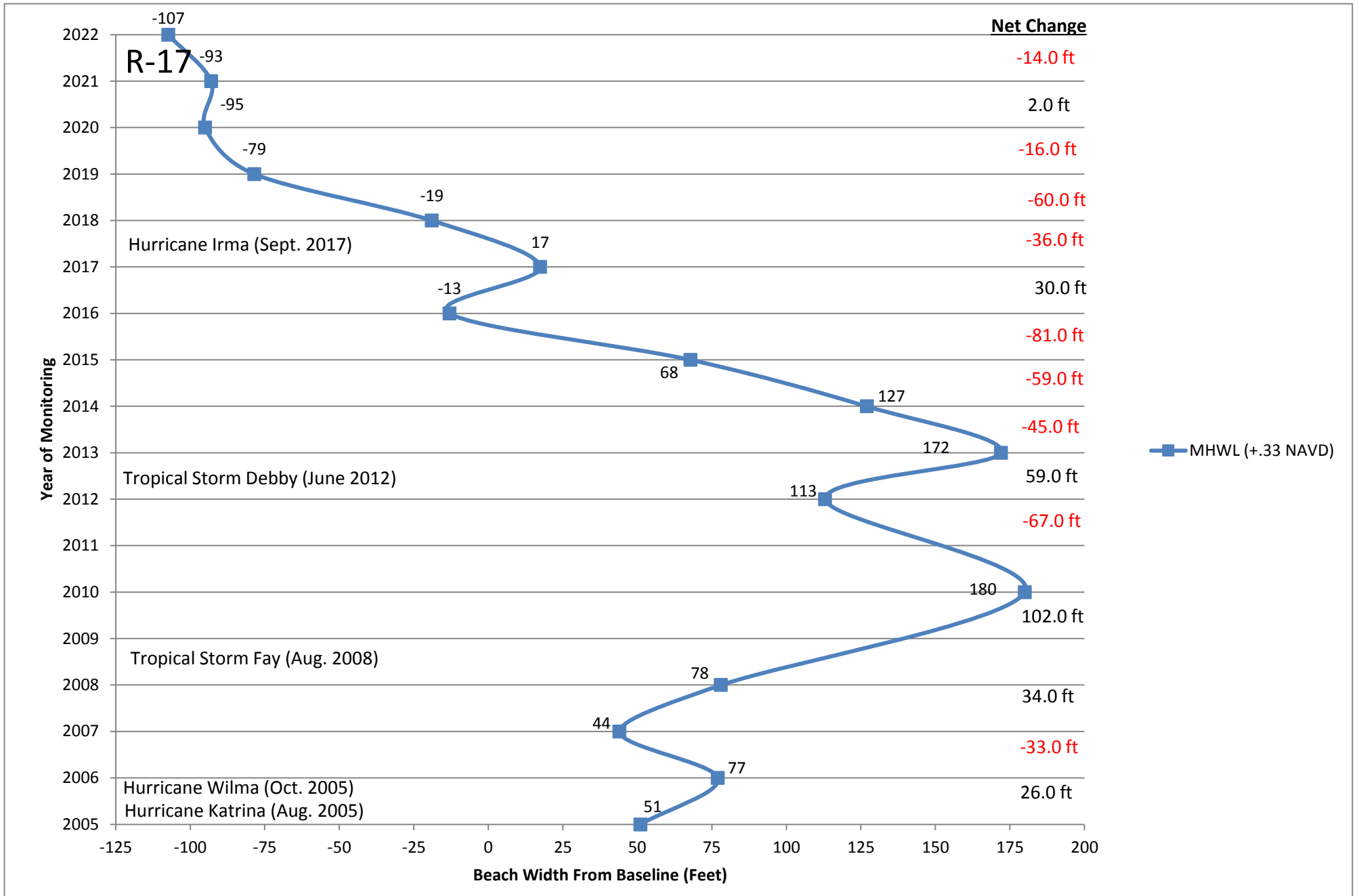
DEP Mon.	Design Standard	Beach Width (Feet)																	
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2/2014	4/2015	1/2016	1/2017	10/2017	3/2019	3/2020	1/2021	1/2022
Clam Pass																			
R-42	85	103	97	79	63	82	87	52	88	47	73	33	53	46	78	108	108	108	101
R-43	85	64	52	79	67	73	57	55	61	39	73	54	47	62	63	69	66	106	90
R-44	85	74	84	64	67	65	63	62	35	60	76	80	70	75	59	64	91	85	95
R-45	85	76	67	61	65	69	63	74	30	78	99	96	84	96	67	75	132	103	97
R-46	85	88	84	64	71	84	67	78	82	61	98	88	82	87	72	76	97	89	84
R-47	85	103	114	99	99	103	88	80	97	84	101	105	104	113	98	102	116	116	121
R-48	85	82	99	101	89	91	88	88	104	82	84	98	96	99	79	88	109	98	99
R-49	85	99	96	97	90	93	104	106	108	92	97	88	90	99	93	80	104	98	92
T-50	85	87	116	129	108	123	126	143	122	97	120	117	115	110	101	114	128	113	123
R-51	85	64	126	112	102	96	97	108	90	90	123	106	97	93	84	87	111	103	96
R-52	85	59	125	94	84	85	57	76	79	56	110	100	86	91	68	69	113	93	82
R-53	85	64	114	97	89	83	80	64	84	83	99	95	96	94	78	85	99	95	95
T-54	85	83	126	101	99	93	94	98	104	95	124	113	114	118	109	100	121	118	114
U-55	-	93	73	93	91	98	99	105	115	111	108	122	121	125	120	125	138	126	118
R-56	-	103	91	101	108	115	113	129	123	108	113	151	153	147	138	136	145	134	119
T-57	-	110	123	109	109	103	109	138	99	146	150	198	167	163	126	143	152	111	124
Doctors Pass																			
S. of Clam Pass																			
Avg. Beach Width R-42 to R-43		84	74	79	65	77	72	53	75	43	73	44	50	54	71	88	87	107	95
Park Shore Beach																			
Avg. Beach Width R-44 to R-55		80	105	93	88	90	84	89	85	80	103	99	94	98	83	85	111	101	100
N. of Doctors Pass																			
Avg. Beach Width R-56 to R-57		102	95	101	102	105	107	124	112	121	124	157	147	145	128	135	145	124	120

DEP Mon.	Design Standard	Beach Width (Feet)																	
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2/2014	4/2015	1/2016	1/2017	10/2017	3/2019	3/2020	1/2021	1/2022
Doctors Pass																			
R-58A	100	13	78	24	21	35	50	57	6	12	140	52	40	32	55	104	105	179	178
R-58	100	70	134	105	82	75	74	79	54	83	144	125	103	90	82	58	61	124	90
R-59	100	71	146	124	103	99	97	101	84	101	121	122	115	107	97	104	94	152	124
R-60	100	68	108	115	103	115	112	109	100	104	109	107	98	102	99	108	106	119	115
R-61	100	82	129	127	118	150	138	140	132	111	125	139	138	153	133	164	141	141	153
T-62	100	57	123	111	90	100	86	103	104	97	105	145	102	118	98	104	122	106	125
R-63	100	87	120	96	99	106	88	89	106	72	116	106	113	98	102	91	104	95	124
R-64	100	103	119	110	112	122	110	107	122	96	107	96	91	102	99	77	86	108	121
R-65	100	106	135	116	115	122	115	103	127	128	125	120	112	108	105	104	99	98	124
R-66	100	112	147	136	129	131	124	115	131	122	129	126	127	124	126	143	114	130	149
R-67	100	153	184	177	160	152	151	152	164	172	174	172	171	163	157	173	160	160	187
R-68	100	144	146	165	163	150	152	152	151	151	162	167	166	143	147	138	138	140	161
T-69	100	107	140	151	140	124	130	132	116	136	149	156	137	128	136	112	108	113	134
R-70	100	69	168	140	139	123	130	120	109	130	140	136	133	122	124	107	99	100	123
R-71	100	62	178	145	139	129	132	125	112	123	144	147	139	124	137	125	129	121	147
R-72	100	73	195	167	156	154	150	149	128	122	155	172	170	147	155	145	151	146	167
R-73	100	85	129	155	157	150	150	147	125	127	153	186	178	145	156	154	156	142	157
R-74	100	68	157	155	147	138	142	145	136	140	144	176	187	149	157	158	164	146	182
R-75	100	84	135	111	126	140	140	128	135	134	116	147	115	121	152	145	136	125	140
R-76	100	60	138	117	110	98	108	100	104	78	113	94	111	103	113	127	135	113	132
R-77	100	78	137	124	116	108	111	124	132	108	116	111	119	114	127	142	162	135	123
R-78	100	86	124	118	109	110	115	134	126	92	100	103	101	106	135	105	115	116	110
R-79	100	80	82	100	81	100	110	101	109	126	105	99	89	98	108	79	82	105	88
R-80	-	86	101	96	90	88	117	111	105	117	112	100	99	93	94	76	84	97	87
R-81	-	92	99	95	86	92	89	97	98	117	115	107	111	102	99	89	84	89	100
R-82	-	63	58	70	69	81	60	64	73	89	83	89	85	75	78	63	76	62	75
R-83	-	41	43	51	62	67	58	45	51	71	56	81	79	70	75	54	79	62	67
R-84	-	23	34	43	45	53	52	67	44	59	53	72	67	47	68	57	58	66	55
R-85	-	Not Analyzed as Part of This Report - Shown for Reference Only																	
R-86	-																		
R-87	-																		
R-88	-																		
R-89	-																		
Gordon Pass																			
Naples Beach Avg. Beach Width R-58A to R-79		83	137	126	118	119	118	118	114	111	130	131	124	117	122	120	120	127	137
Naples Beach Avg. Beach Width R-80 to R-84		61	67	71	70	76	75	77	74	91	84	90	88	77	83	68	76	75	77

R-17

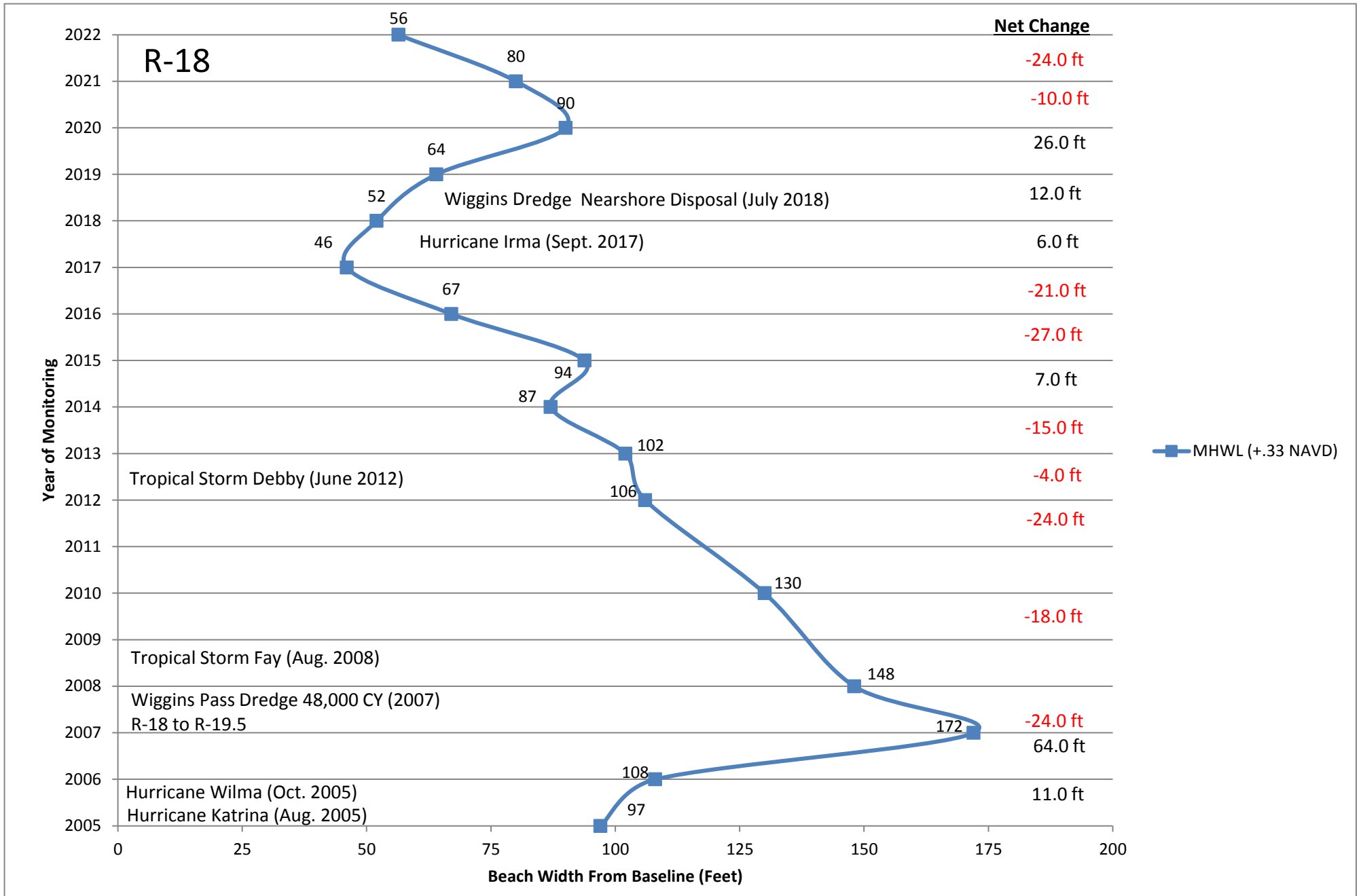
2005 Beach Width= 51

2006	Beginning Width=		2014	Beginning Width=	172
	Annual Erosion=			Annual Erosion=	-45
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	77		End Beach Width=	127
2007	Beginning Width=	77	2015	Beginning Width=	127
	Annual Erosion=	-33		Annual Erosion=	-59
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	44		End Beach Width=	68
2008	Beginning Width=	44	2016	Beginning Width=	68
	Annual Erosion=			Annual Erosion=	-81
	Annual Accretion=	34		Annual Accretion=	
	End Beach Width=	78		End Beach Width=	-13
2009	Beginning Width=	78	2017	Beginning Width=	-13
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=			Annual Accretion=	30
	End Beach Width=	78		End Beach Width=	17
2010	Beginning Width=	78	2018	Beginning Width=	17
	Annual Erosion=			Annual Erosion=	-36
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	180		End Beach Width=	-19
2011	Beginning Width=	180	2019	Beginning Width=	-19
	Annual Erosion=			Annual Erosion=	-60
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	180		End Beach Width=	-79
2012	Beginning Width=	180	2020	Beginning Width=	-79
	Annual Erosion=	-67		Annual Erosion=	-16
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	113		End Beach Width=	-95
2013	Beginning Width=	113	2021	Beginning Width=	-95
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	59		Annual Accretion=	2
	End Beach Width=	172		End Beach Width=	-93
			2022	Beginning Width=	-93
				Annual Erosion=	-14
				Annual Accretion=	
				End Beach Width=	-107



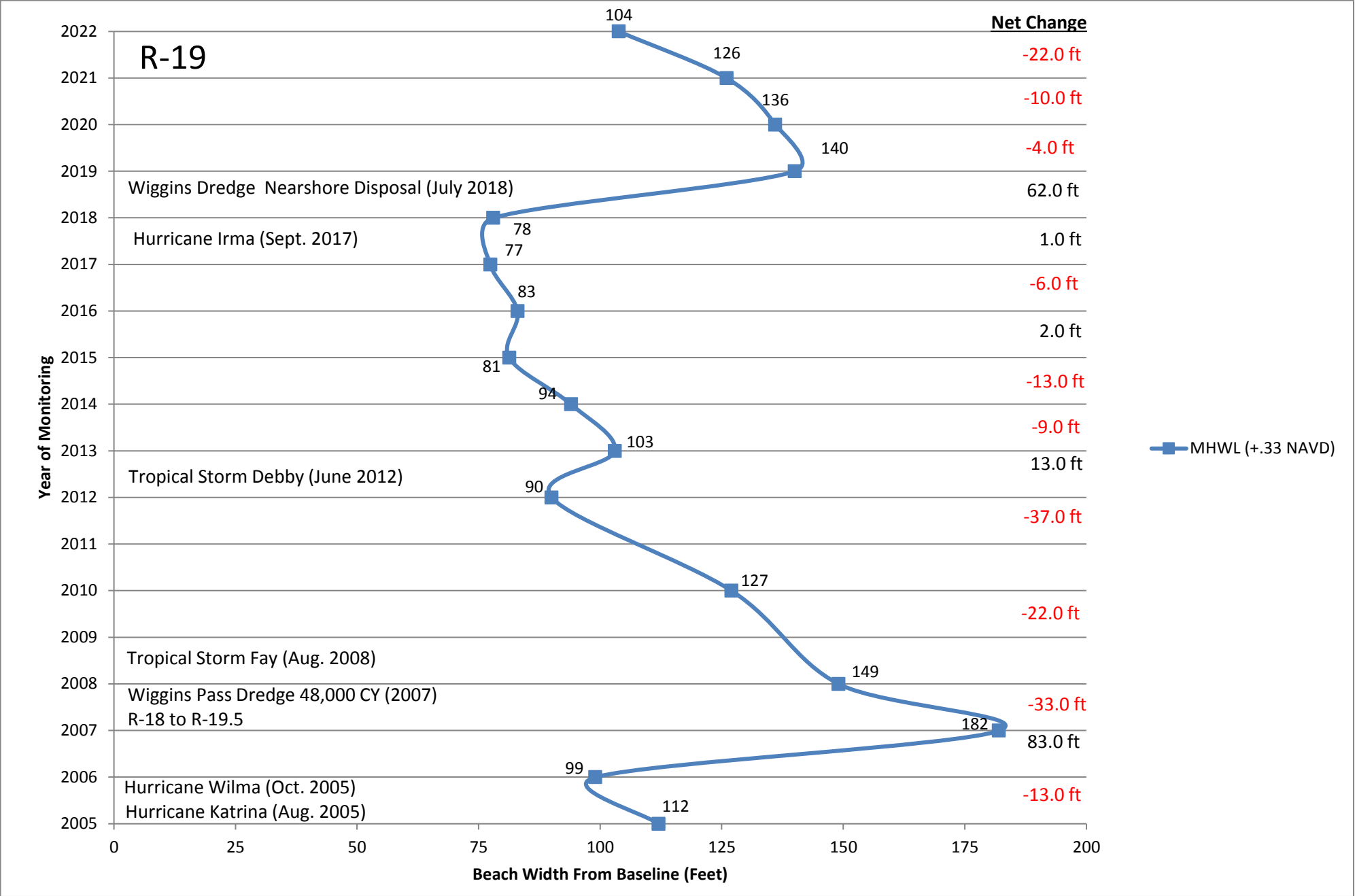
R-18

	2005 Beach Width=	97			
2006	Beginning Width=	97	2014	Beginning Width=	102
	Annual Erosion=			Annual Erosion=	-15
	Annual Accretion=	11		Annual Accretion=	
	End Beach Width=	108		End Beach Width=	87
2007	Beginning Width=	108	2015	Beginning Width=	87
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	64		Annual Accretion=	7
	End Beach Width=	172		End Beach Width=	94
2008	Beginning Width=	172	2016	Beginning Width=	94
	Annual Erosion=	-24		Annual Erosion=	-27
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	148		End Beach Width=	67
2009	Beginning Width=	148	2017	Beginning Width=	67
	Annual Erosion=			Annual Erosion=	-21
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	148		End Beach Width=	46
2010	Beginning Width=	148	2018	Beginning Width=	46
	Annual Erosion=	-18		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	6
	End Beach Width=	130		End Beach Width=	52
2011	Beginning Width=	130	2019	Beginning Width=	52
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	10		Annual Accretion=	12
	End Beach Width=	140		End Beach Width=	64
2012	Beginning Width=	130	2020	Beginning Width=	64
	Annual Erosion=	-24		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	26
	End Beach Width=	106		End Beach Width=	90
2013	Beginning Width=	106	2021	Beginning Width=	90
	Annual Erosion=	-4		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	102		End Beach Width=	80
			2022	Beginning Width=	80
				Annual Erosion=	-24
				Annual Accretion=	
				End Beach Width=	56



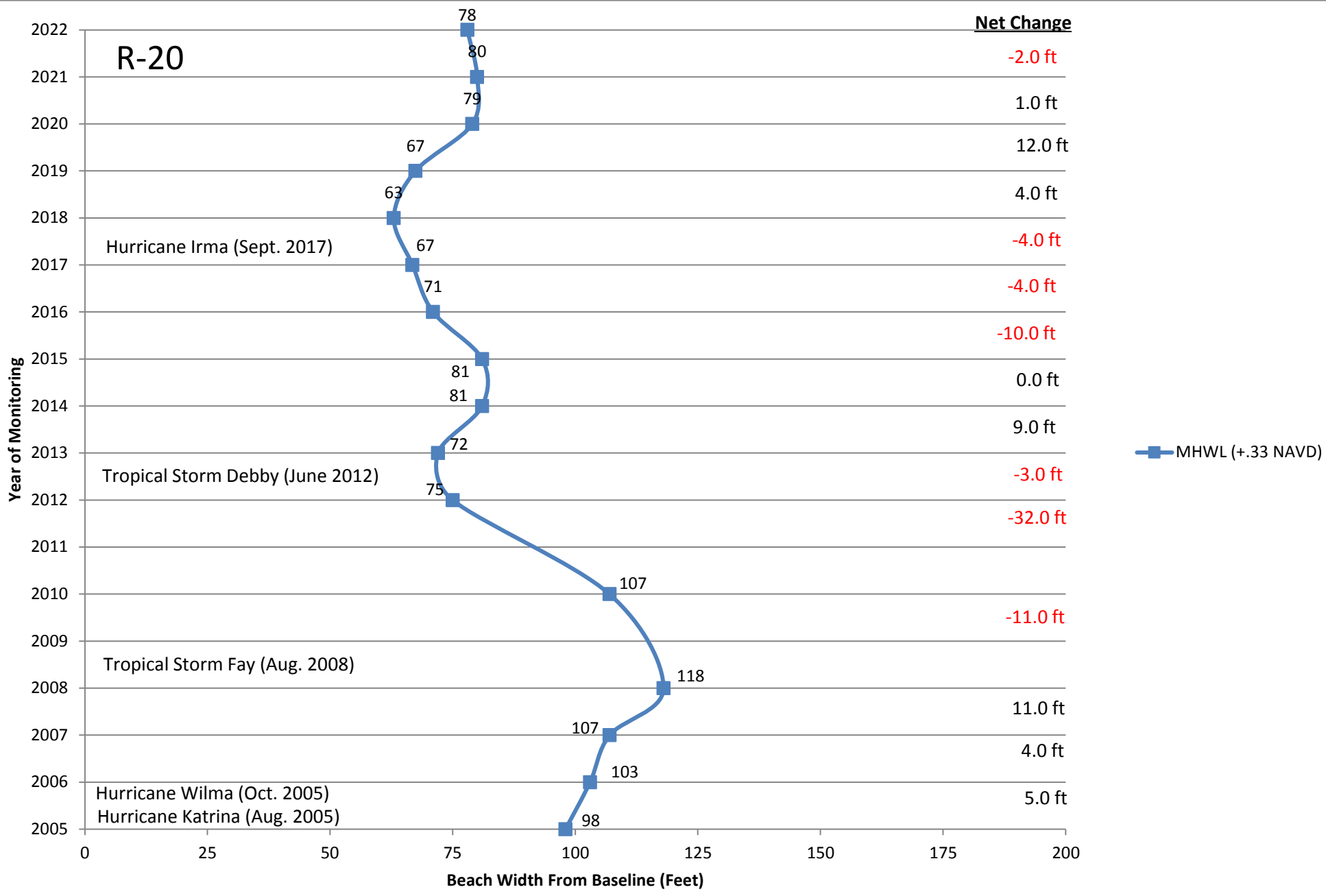
R-19

	2005 Beach Width=	112			
2006	Beginning Width=	112	2014	Beginning Width=	103
	Annual Erosion=	-13		Annual Erosion=	-9
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	99		End Beach Width=	94
2007	Beginning Width=	99	2015	Beginning Width=	94
	Annual Erosion=			Annual Erosion=	-13
	Annual Accretion=	83		Annual Accretion=	
	End Beach Width=	182		End Beach Width=	81
2008	Beginning Width=	182	2016	Beginning Width=	81
	Annual Erosion=	-33		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	2
	End Beach Width=	149		End Beach Width=	83
2009	Beginning Width=	149	2017	Beginning Width=	83
	Annual Erosion=			Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	149		End Beach Width=	77
2010	Beginning Width=	149	2018	Beginning Width=	77
	Annual Erosion=	-22		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	127		End Beach Width=	78
2011	Beginning Width=	127	2019	Beginning Width=	78
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=			Annual Accretion=	62
	End Beach Width=	127		End Beach Width=	140
2012	Beginning Width=	127	2020	Beginning Width=	140
	Annual Erosion=	-37		Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	90		End Beach Width=	136
2013	Beginning Width=	90	2021	Beginning Width=	136
	Annual Erosion=			Annual Erosion=	-10
	Annual Accretion=	13		Annual Accretion=	
	End Beach Width=	103		End Beach Width=	126
			2022	Beginning Width=	126
				Annual Erosion=	-22
				Annual Accretion=	
				End Beach Width=	104



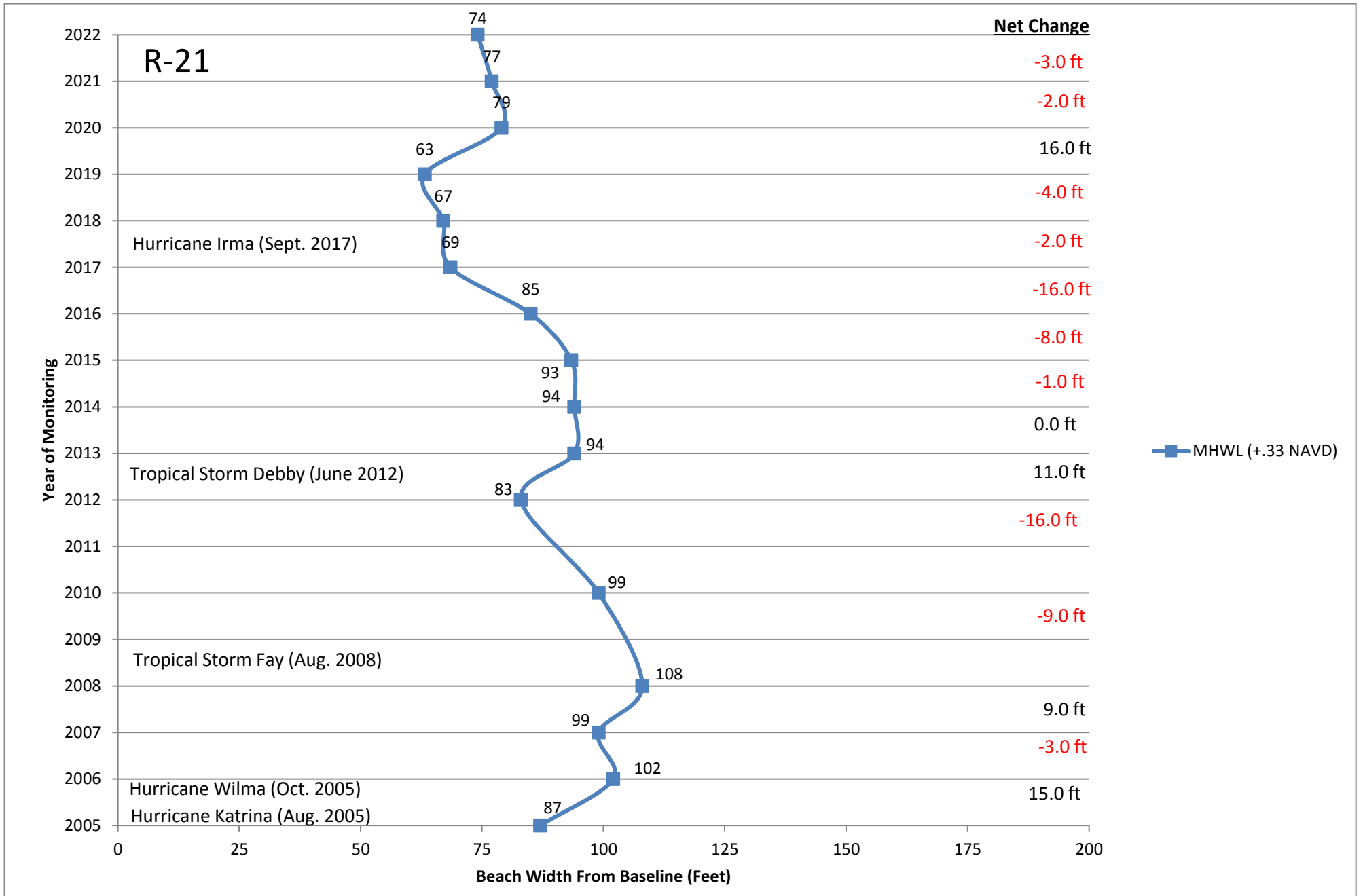
R-20

	2005 Beach Width=	98			
2006	Beginning Width=	98	2014	Beginning Width=	72
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	5		Annual Accretion=	9
	End Beach Width=	103		End Beach Width=	81
2007	Beginning Width=	103	2015	Beginning Width=	81
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	4		Annual Accretion=	
	End Beach Width=	107		End Beach Width=	81
2008	Beginning Width=	107	2016	Beginning Width=	81
	Annual Erosion=			Annual Erosion=	-10
	Annual Accretion=	11		Annual Accretion=	
	End Beach Width=	118		End Beach Width=	71
2009	Beginning Width=	118	2017	Beginning Width=	71
	Annual Erosion=			Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	118		End Beach Width=	67
2010	Beginning Width=	118	2018	Beginning Width=	67
	Annual Erosion=	-11		Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	107		End Beach Width=	63
2011	Beginning Width=	107	2019	Beginning Width=	63
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	107		End Beach Width=	67
2012	Beginning Width=	107	2020	Beginning Width=	67
	Annual Erosion=	-32		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	12
	End Beach Width=	75		End Beach Width=	79
2013	Beginning Width=	75	2021	Beginning Width=	79
	Annual Erosion=	-3		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	72		End Beach Width=	80
			2022	Beginning Width=	80
				Annual Erosion=	-2
				Annual Accretion=	
				End Beach Width=	78



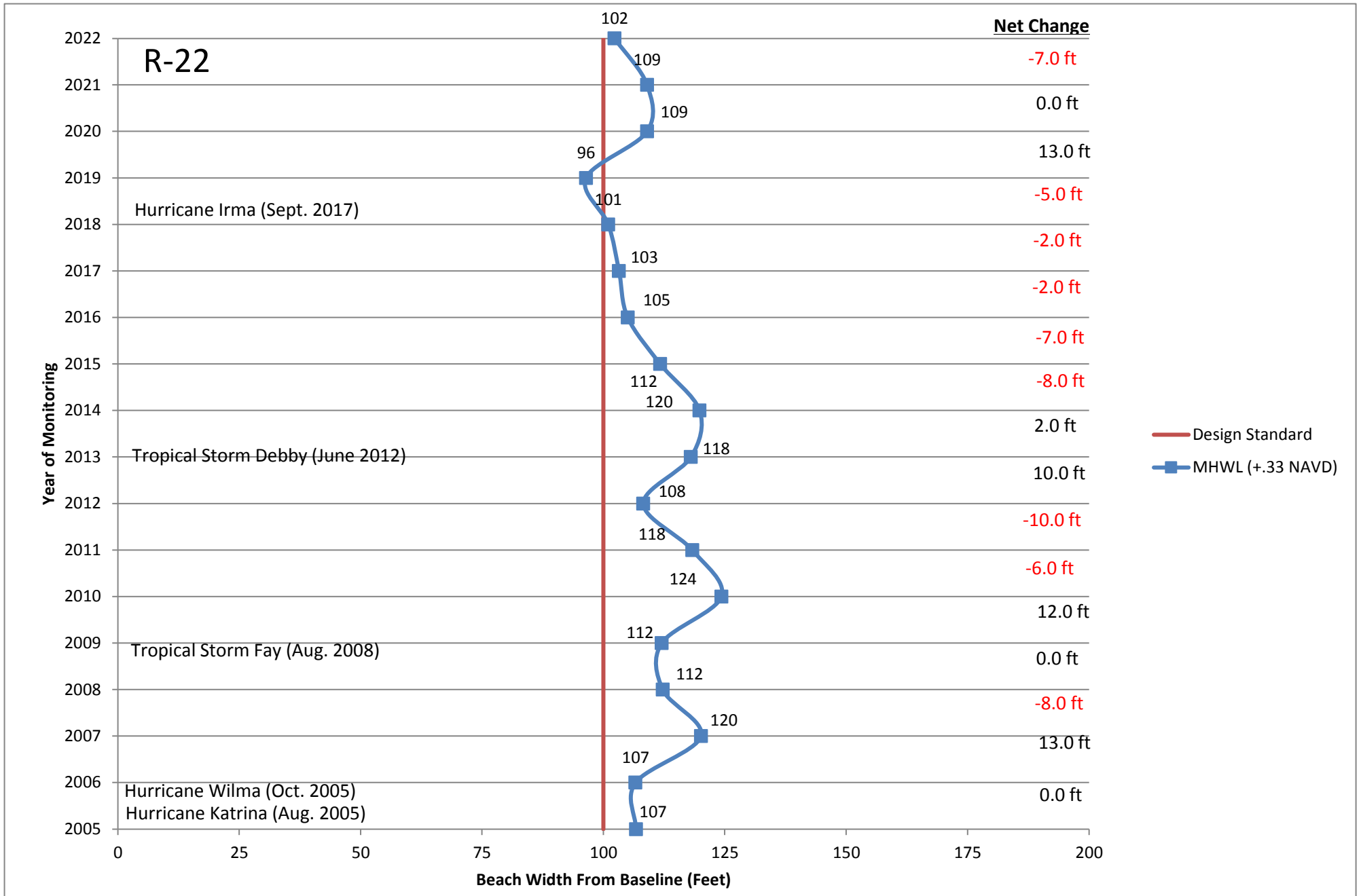
R-21

	2005 Beach Width=	87			
2006	Beginning Width=	87	2014	Beginning Width=	94
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	15		Annual Accretion=	
	End Beach Width=	102		End Beach Width=	94
2007	Beginning Width=	102	2015	Beginning Width=	94
	Annual Erosion=	-3		Annual Erosion=	-1
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	99		End Beach Width=	93
2008	Beginning Width=	99	2016	Beginning Width=	93
	Annual Erosion=			Annual Erosion=	-8
	Annual Accretion=	9		Annual Accretion=	
	End Beach Width=	108		End Beach Width=	85
2009	Beginning Width=	108	2017	Beginning Width=	85
	Annual Erosion=			Annual Erosion=	-17
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	108		End Beach Width=	69
2010	Beginning Width=	108	2018	Beginning Width=	69
	Annual Erosion=	-9		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	99		End Beach Width=	67
2011	Beginning Width=	99	2019	Beginning Width=	67
	Annual Erosion=			Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	99		End Beach Width=	63
2012	Beginning Width=	99	2020	Beginning Width=	63
	Annual Erosion=	-16		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	16
	End Beach Width=	83		End Beach Width=	79
2013	Beginning Width=	83	2021	Beginning Width=	79
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=	11		Annual Accretion=	
	End Beach Width=	94		End Beach Width=	77
			2022	Beginning Width=	77
				Annual Erosion=	-3
				Annual Accretion=	
				End Beach Width=	74



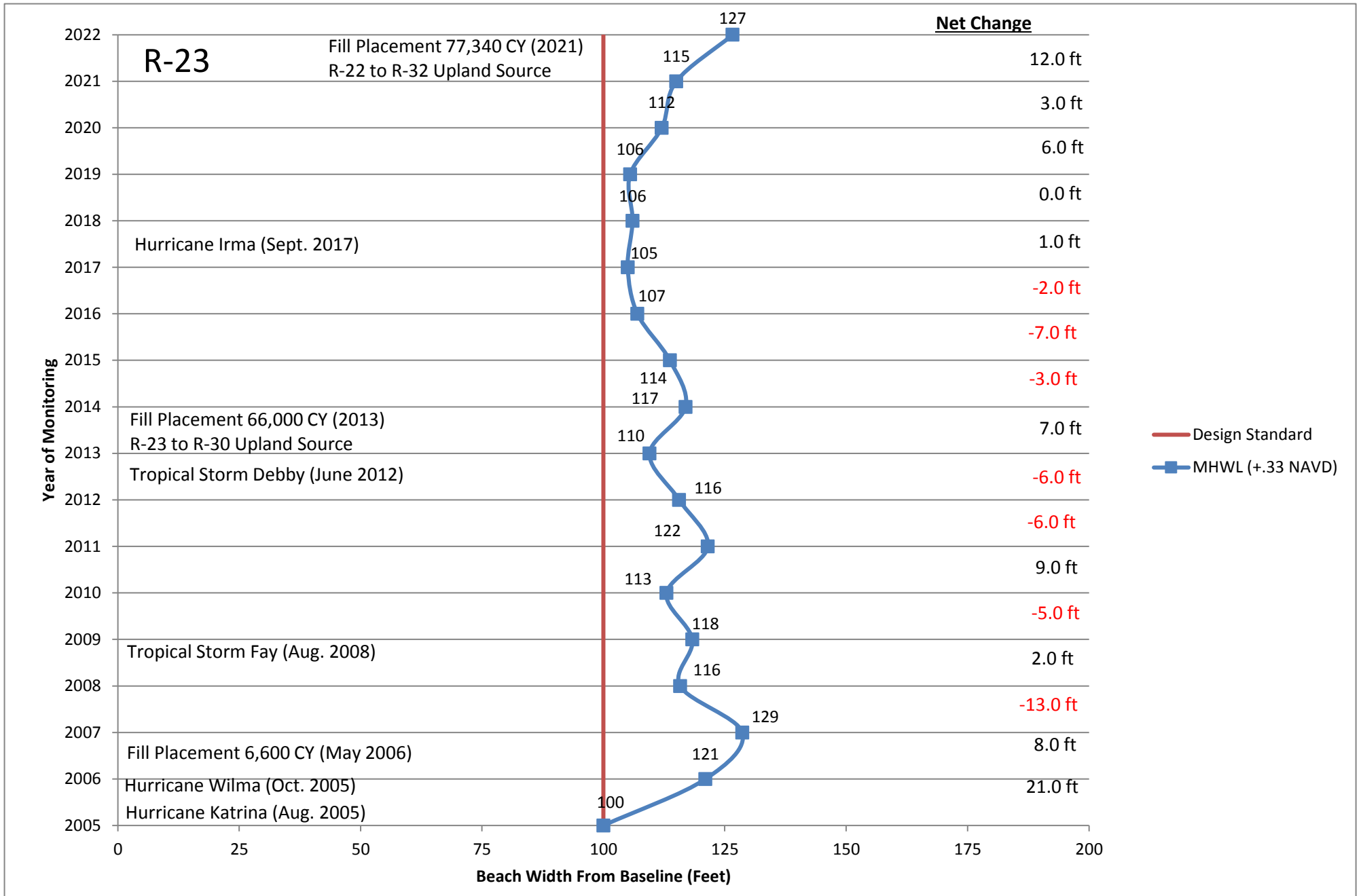
R-22

	2005 Beach Width=	107			
2006	Beginning Width=	107	2014	Beginning Width=	118
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=			Annual Accretion=	2
	End Beach Width=	107		End Beach Width=	120
2007	Beginning Width=	107	2015	Beginning Width=	120
	Annual Erosion=			Annual Erosion=	-8
	Annual Accretion=	13		Annual Accretion=	
	End Beach Width=	120		End Beach Width=	112
2008	Beginning Width=	120	2016	Beginning Width=	112
	Annual Erosion=	-8		Annual Erosion=	-7
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	112		End Beach Width=	105
2009	Beginning Width=	112	2017	Beginning Width=	105
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	112		End Beach Width=	103
2010	Beginning Width=	112	2018	Beginning Width=	103
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=	12		Annual Accretion=	
	End Beach Width=	124		End Beach Width=	101
2011	Beginning Width=	124	2019	Beginning Width=	101
	Annual Erosion=	-6		Annual Erosion=	-5
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	118		End Beach Width=	96
2012	Beginning Width=	118	2020	Beginning Width=	96
	Annual Erosion=	-10		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	13
	End Beach Width=	108		End Beach Width=	109
2013	Beginning Width=	108	2021	Beginning Width=	109
	Annual Erosion=			Annual Erosion=	0
	Annual Accretion=	10		Annual Accretion=	
	End Beach Width=	118		End Beach Width=	109
			2022	Beginning Width=	109
				Annual Erosion=	-7
				Annual Accretion=	
				End Beach Width=	102



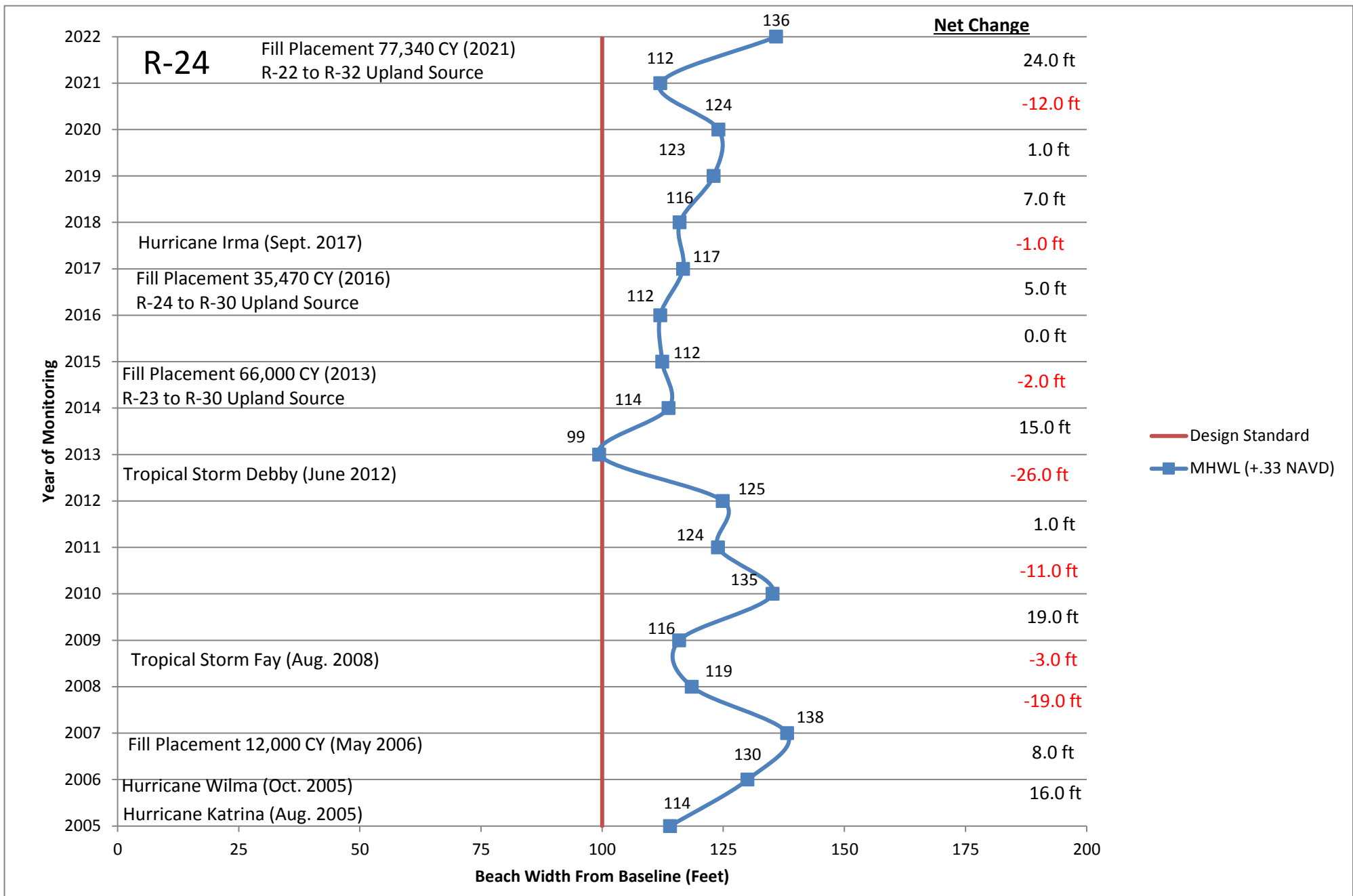
R-23

	2005 Beach Width=	100			
2006	Beginning Width=	100	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	110
	Annual Accretion=	21		Annual Accretion=	7
	End Beach Width=	121		End Beach Width=	
2007	Beginning Width=	121	2015	Beginning Width=	
	Annual Erosion=			Annual Erosion=	117
	Annual Accretion=	8		Annual Accretion=	-3
	End Beach Width=	129		End Beach Width=	
2008	Beginning Width=	129	2016	Beginning Width=	
	Annual Erosion=	-13		Annual Erosion=	114
	Annual Accretion=			Annual Accretion=	-7
	End Beach Width=	116		End Beach Width=	
2009	Beginning Width=	116	2017	Beginning Width=	
	Annual Erosion=			Annual Erosion=	107
	Annual Accretion=	2		Annual Accretion=	-2
	End Beach Width=	118		End Beach Width=	
2010	Beginning Width=	118	2018	Beginning Width=	
	Annual Erosion=	-5		Annual Erosion=	105
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	113		End Beach Width=	
2011	Beginning Width=	113	2019	Beginning Width=	
	Annual Erosion=			Annual Erosion=	106
	Annual Accretion=	9		Annual Accretion=	0
	End Beach Width=	122		End Beach Width=	
2012	Beginning Width=	122	2020	Beginning Width=	
	Annual Erosion=	-6		Annual Erosion=	106
	Annual Accretion=			Annual Accretion=	6
	End Beach Width=	116		End Beach Width=	
2013	Beginning Width=	116	2021	Beginning Width=	
	Annual Erosion=	-6		Annual Erosion=	112
	Annual Accretion=			Annual Accretion=	3
	End Beach Width=	110		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	115
				Annual Accretion=	12
				End Beach Width=	
				127	



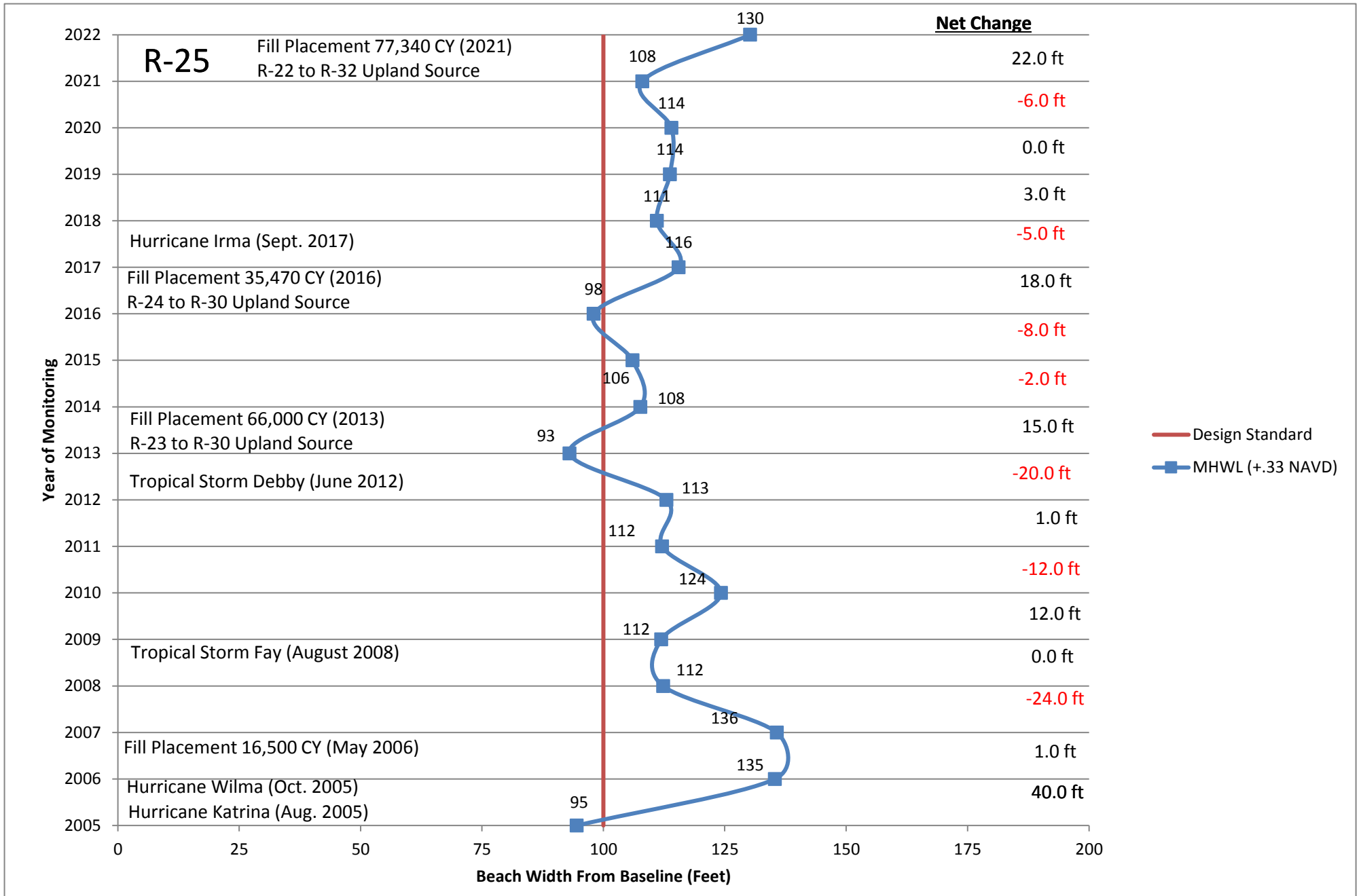
R-24

	2005 Beach Width=	114			
2006	Beginning Width=	114	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	99
	Annual Accretion=	16		Annual Accretion=	15
	End Beach Width=	130		End Beach Width=	
2007	Beginning Width=	130	2015	Beginning Width=	
	Annual Erosion=			Annual Erosion=	114
	Annual Accretion=	8		Annual Accretion=	-2
	End Beach Width=	138		End Beach Width=	
2008	Beginning Width=	138	2016	Beginning Width=	
	Annual Erosion=	-19		Annual Erosion=	112
	Annual Accretion=			Annual Accretion=	112
	End Beach Width=	119		End Beach Width=	
2009	Beginning Width=	119	2017	Beginning Width=	
	Annual Erosion=	-3		Annual Erosion=	112
	Annual Accretion=			Annual Accretion=	5
	End Beach Width=	116		End Beach Width=	
2010	Beginning Width=	116	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	117
	Annual Accretion=	19		Annual Accretion=	-1
	End Beach Width=	135		End Beach Width=	
2011	Beginning Width=	135	2019	Beginning Width=	
	Annual Erosion=	-11		Annual Erosion=	116
	Annual Accretion=			Annual Accretion=	7
	End Beach Width=	124		End Beach Width=	
2012	Beginning Width=	124	2020	Beginning Width=	
	Annual Erosion=			Annual Erosion=	123
	Annual Accretion=	1		Annual Accretion=	1
	End Beach Width=	125		End Beach Width=	
2013	Beginning Width=	125	2021	Beginning Width=	
	Annual Erosion=	-26		Annual Erosion=	124
	Annual Accretion=			Annual Accretion=	-12
	End Beach Width=	99		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	112
				Annual Accretion=	24
				End Beach Width=	
				136	



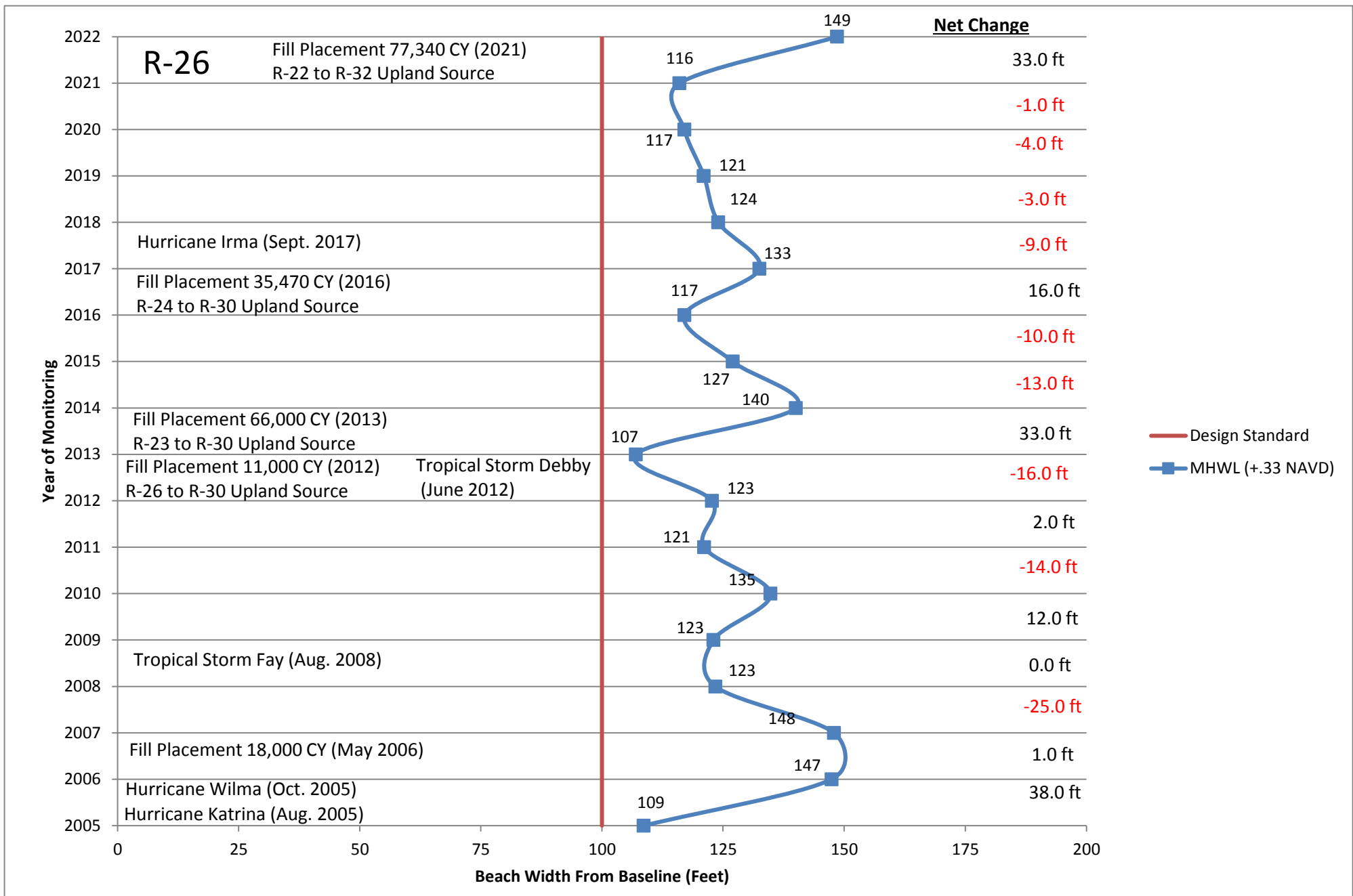
R-25

	2005 Beach Width=	95			
2006	Beginning Width=	95	2014	Beginning Width=	93
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	40		Annual Accretion=	15
	End Beach Width=	135		End Beach Width=	108
2007	Beginning Width=	135	2015	Beginning Width=	108
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	136		End Beach Width=	106
2008	Beginning Width=	136	2016	Beginning Width=	106
	Annual Erosion=	-24		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	112		End Beach Width=	98
2009	Beginning Width=	112	2017	Beginning Width=	98
	Annual Erosion=			Annual Erosion=	18
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	112		End Beach Width=	116
2010	Beginning Width=	112	2018	Beginning Width=	116
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	12		Annual Accretion=	
	End Beach Width=	124		End Beach Width=	111
2011	Beginning Width=	124	2019	Beginning Width=	111
	Annual Erosion=	-12		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	3
	End Beach Width=	112		End Beach Width=	114
2012	Beginning Width=	112	2020	Beginning Width=	114
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	1		Annual Accretion=	0
	End Beach Width=	113		End Beach Width=	114
2013	Beginning Width=	113	2021	Beginning Width=	114
	Annual Erosion=	-20		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	93		End Beach Width=	108
			2022	Beginning Width=	108
				Annual Erosion=	
				Annual Accretion=	22
				End Beach Width=	130



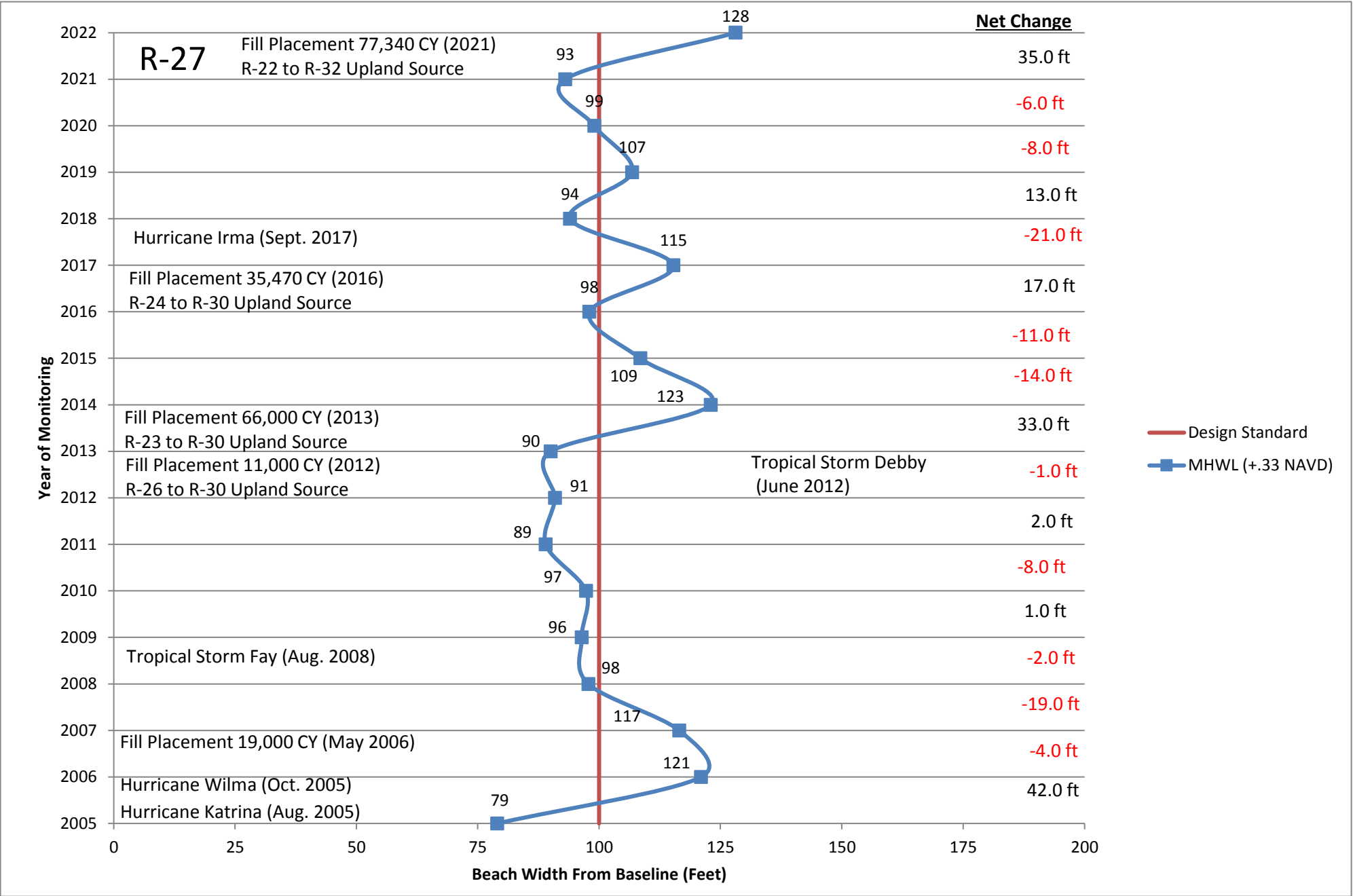
R-26

	2005 Beach Width=	109			
2006	Beginning Width=	109	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	107
	Annual Accretion=	38		Annual Accretion=	33
	End Beach Width=	147		End Beach Width=	
				140	
2007	Beginning Width=	147	2015	Beginning Width=	
	Annual Erosion=			Annual Erosion=	140
	Annual Accretion=	1		Annual Accretion=	-13
	End Beach Width=	148		End Beach Width=	
				127	
2008	Beginning Width=	148	2016	Beginning Width=	
	Annual Erosion=	-25		Annual Erosion=	127
	Annual Accretion=			Annual Accretion=	-10
	End Beach Width=	123		End Beach Width=	
				117	
2009	Beginning Width=	123	2017	Beginning Width=	
	Annual Erosion=			Annual Erosion=	117
	Annual Accretion=			Annual Accretion=	16
	End Beach Width=	123		End Beach Width=	
				133	
2010	Beginning Width=	123	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	133
	Annual Accretion=	12		Annual Accretion=	-9
	End Beach Width=	135		End Beach Width=	
				124	
2011	Beginning Width=	135	2019	Beginning Width=	
	Annual Erosion=	-14		Annual Erosion=	124
	Annual Accretion=			Annual Accretion=	-3
	End Beach Width=	121		End Beach Width=	
				121	
2012	Beginning Width=	121	2020	Beginning Width=	
	Annual Erosion=			Annual Erosion=	121
	Annual Accretion=	2		Annual Accretion=	-4
	End Beach Width=	123		End Beach Width=	
				117	
2013	Beginning Width=	123	2021	Beginning Width=	
	Annual Erosion=	-16		Annual Erosion=	117
	Annual Accretion=			Annual Accretion=	-1
	End Beach Width=	107		End Beach Width=	
				116	
			2022	Beginning Width=	
				Annual Erosion=	116
				Annual Accretion=	33
				End Beach Width=	
				149	



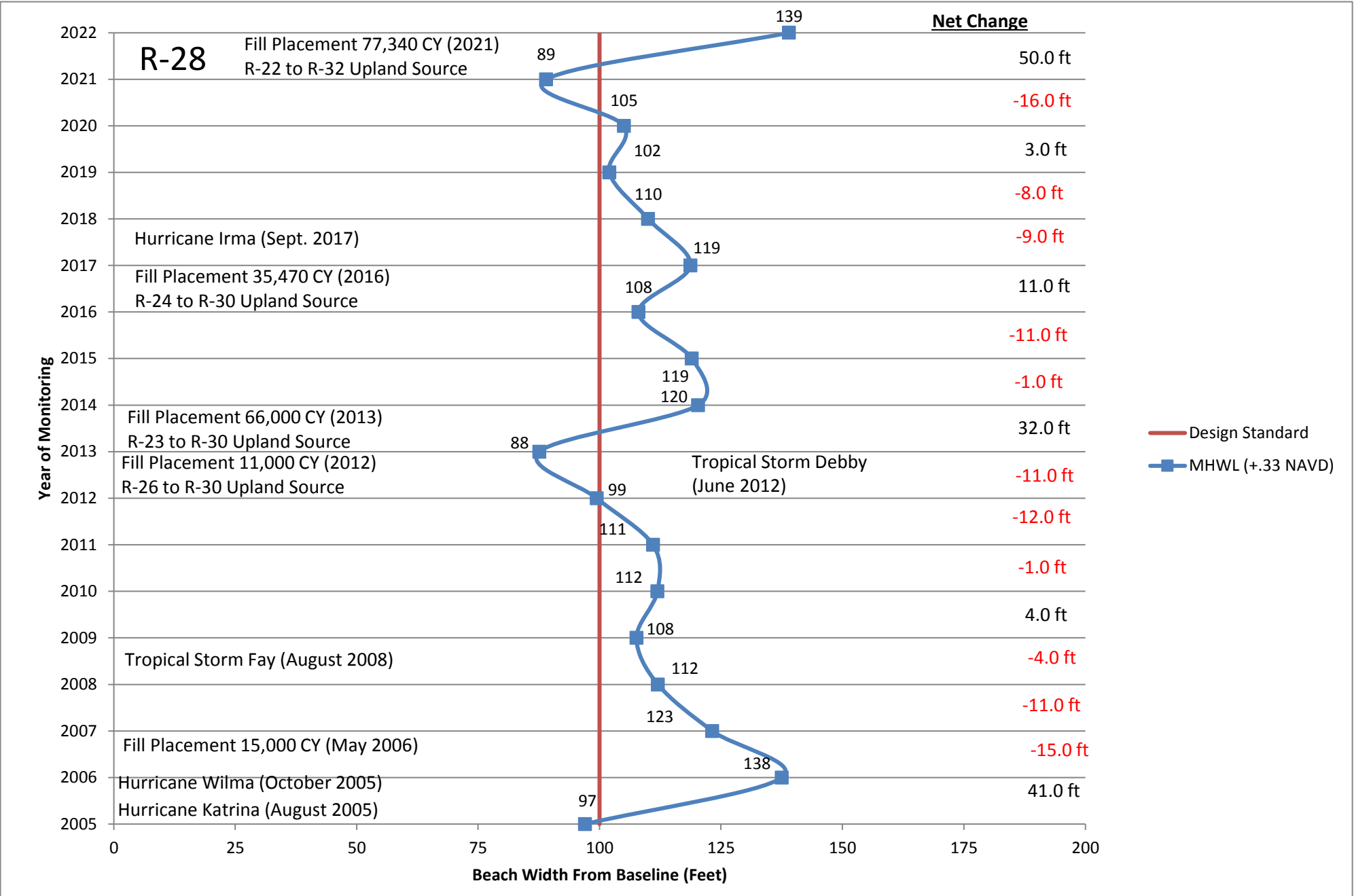
R-27

	2005 Beach Width=	79			
2006	Beginning Width=	79	2014	Beginning Width=	90
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	42		Annual Accretion=	33
	End Beach Width=	121		End Beach Width=	123
2007	Beginning Width=	121	2015	Beginning Width=	123
	Annual Erosion=	-4		Annual Erosion=	-14
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	117		End Beach Width=	109
2008	Beginning Width=	117	2016	Beginning Width=	109
	Annual Erosion=	-19		Annual Erosion=	-11
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	98		End Beach Width=	98
2009	Beginning Width=	98	2017	Beginning Width=	98
	Annual Erosion=	-2		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	17
	End Beach Width=	96		End Beach Width=	115
2010	Beginning Width=	96	2018	Beginning Width=	115
	Annual Erosion=			Annual Erosion=	-21
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	97		End Beach Width=	94
2011	Beginning Width=	97	2019	Beginning Width=	94
	Annual Erosion=	-8		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	13
	End Beach Width=	89		End Beach Width=	107
2012	Beginning Width=	89	2020	Beginning Width=	107
	Annual Erosion=			Annual Erosion=	-8
	Annual Accretion=	2		Annual Accretion=	
	End Beach Width=	91		End Beach Width=	99
2013	Beginning Width=	91	2021	Beginning Width=	99
	Annual Erosion=	-1		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	90		End Beach Width=	93
			2022	Beginning Width=	93
				Annual Erosion=	
				Annual Accretion=	35
				End Beach Width=	128



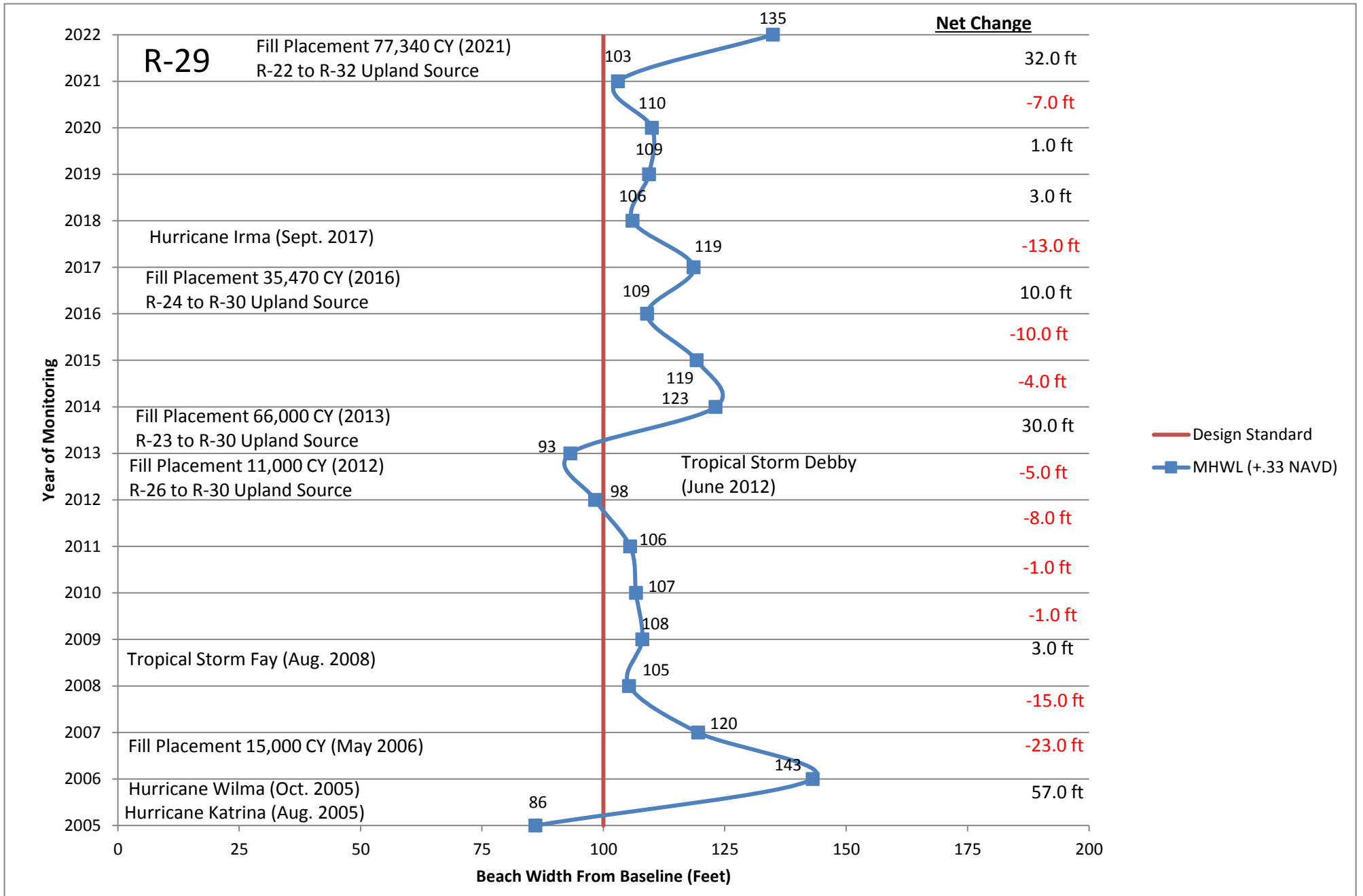
R-28

	2005 Beach Width=	97			
2006	Beginning Width=	97	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	88
	Annual Accretion=	41		Annual Accretion=	32
	End Beach Width=	138		End Beach Width=	
2007	Beginning Width=	138	2015	Beginning Width=	
	Annual Erosion=	-15		Annual Erosion=	120
	Annual Accretion=			Annual Accretion=	-1
	End Beach Width=	123		End Beach Width=	
2008	Beginning Width=	123	2016	Beginning Width=	
	Annual Erosion=	-11		Annual Erosion=	119
	Annual Accretion=			Annual Accretion=	-11
	End Beach Width=	112		End Beach Width=	
2009	Beginning Width=	112	2017	Beginning Width=	
	Annual Erosion=	-4		Annual Erosion=	108
	Annual Accretion=			Annual Accretion=	11
	End Beach Width=	108		End Beach Width=	
2010	Beginning Width=	108	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	119
	Annual Accretion=	4		Annual Accretion=	-9
	End Beach Width=	112		End Beach Width=	
2011	Beginning Width=	112	2019	Beginning Width=	
	Annual Erosion=	-1		Annual Erosion=	110
	Annual Accretion=			Annual Accretion=	-8
	End Beach Width=	111		End Beach Width=	
2012	Beginning Width=	111	2020	Beginning Width=	
	Annual Erosion=	-12		Annual Erosion=	102
	Annual Accretion=			Annual Accretion=	3
	End Beach Width=	99		End Beach Width=	
2013	Beginning Width=	99	2021	Beginning Width=	
	Annual Erosion=	-11		Annual Erosion=	105
	Annual Accretion=			Annual Accretion=	-16
	End Beach Width=	88		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	89
				Annual Accretion=	50
				End Beach Width=	
				139	



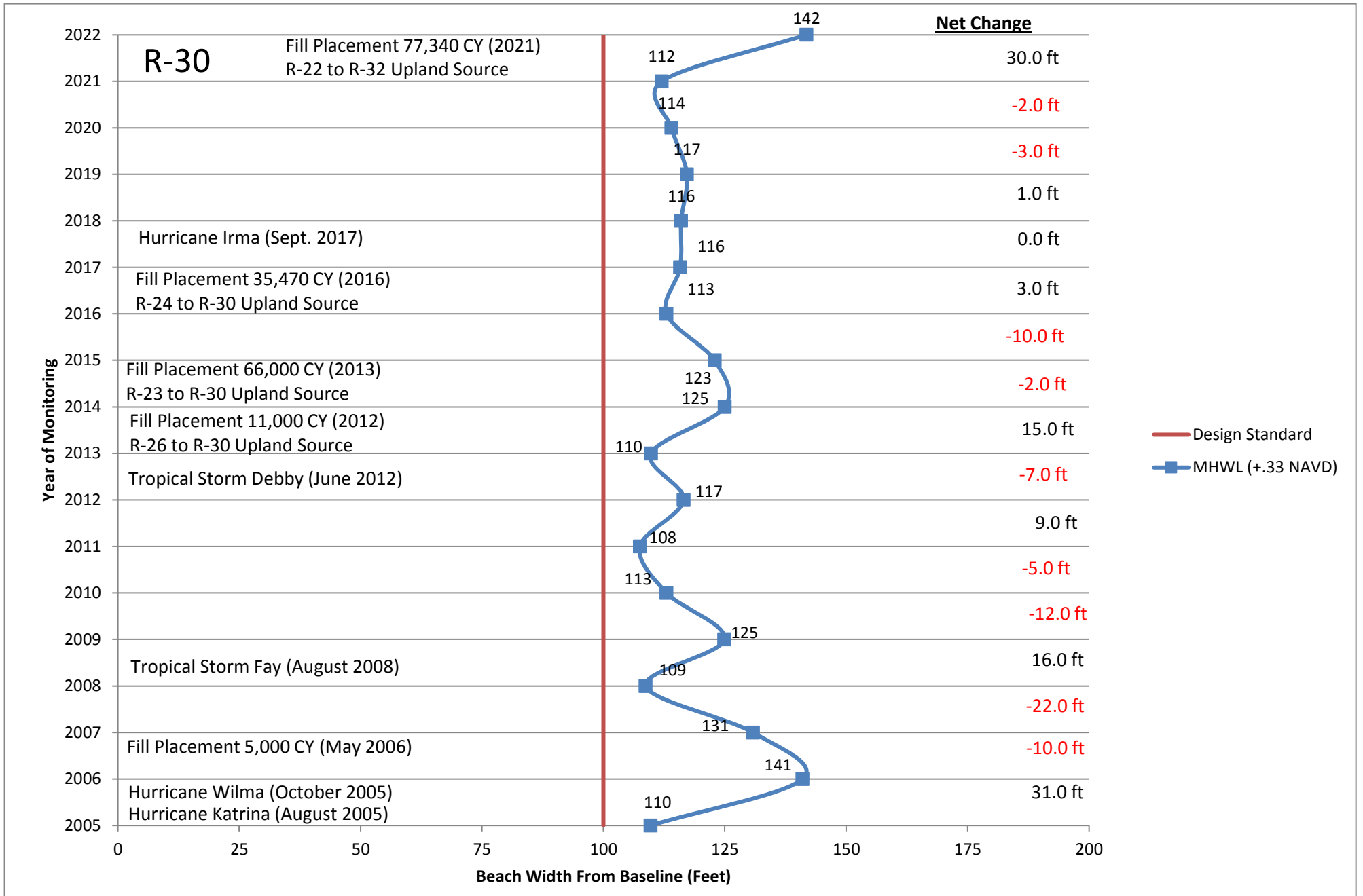
R-29

	2005 Beach Width=	86			
2006	Beginning Width=	86	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	93
	Annual Accretion=	57		Annual Accretion=	30
	End Beach Width=	143		End Beach Width=	
2007	Beginning Width=	143	2015	Beginning Width=	
	Annual Erosion=	-23		Annual Erosion=	123
	Annual Accretion=			Annual Accretion=	-4
	End Beach Width=	120		End Beach Width=	
2008	Beginning Width=	120	2016	Beginning Width=	
	Annual Erosion=	-15		Annual Erosion=	119
	Annual Accretion=			Annual Accretion=	-10
	End Beach Width=	105		End Beach Width=	
2009	Beginning Width=	105	2017	Beginning Width=	
	Annual Erosion=			Annual Erosion=	109
	Annual Accretion=	3		Annual Accretion=	10
	End Beach Width=	108		End Beach Width=	
2010	Beginning Width=	108	2018	Beginning Width=	
	Annual Erosion=	-1		Annual Erosion=	119
	Annual Accretion=			Annual Accretion=	-13
	End Beach Width=	107		End Beach Width=	
2011	Beginning Width=	107	2019	Beginning Width=	
	Annual Erosion=	-1		Annual Erosion=	106
	Annual Accretion=			Annual Accretion=	3
	End Beach Width=	106		End Beach Width=	
2012	Beginning Width=	106	2020	Beginning Width=	
	Annual Erosion=	-8		Annual Erosion=	109
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	98		End Beach Width=	
2013	Beginning Width=	98	2021	Beginning Width=	
	Annual Erosion=	-5		Annual Erosion=	110
	Annual Accretion=			Annual Accretion=	-7
	End Beach Width=	93		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	103
				Annual Accretion=	32
				End Beach Width=	
				135	



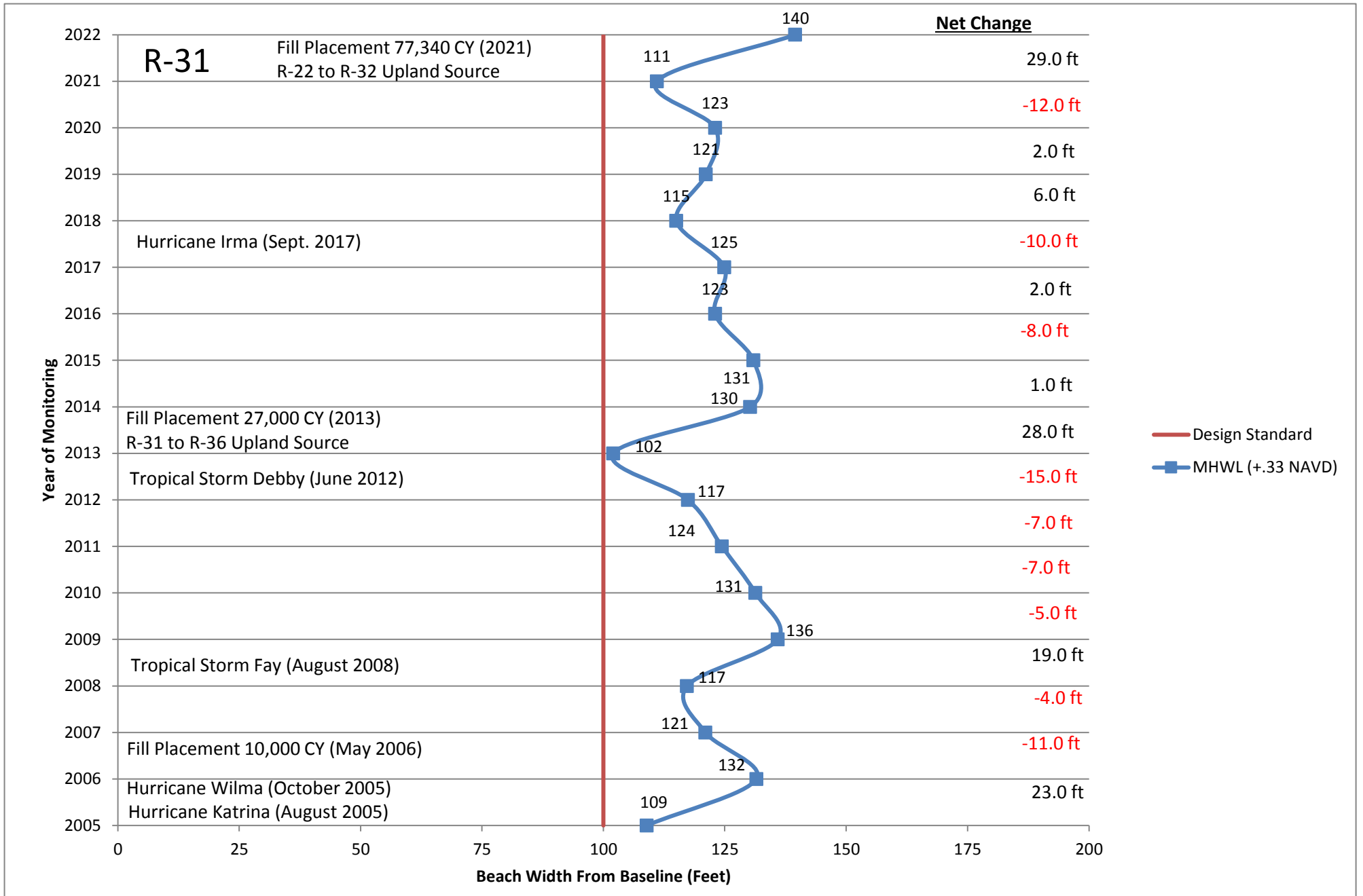
R-30

	2005 Beach Width=	110			
2006	Beginning Width=	110	2014	Beginning Width= 110	
	Annual Erosion=			Annual Erosion=	
	Annual Accretion= 31			Annual Accretion= 15	
	End Beach Width=	141		End Beach Width= 125	
2007	Beginning Width=	141	2015	Beginning Width= 125	
	Annual Erosion=	-10		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	131		End Beach Width= 123	
2008	Beginning Width=	131	2016	Beginning Width= 123	
	Annual Erosion=	-22		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	109		End Beach Width= 113	
2009	Beginning Width=	109	2017	Beginning Width= 113	
	Annual Erosion=			Annual Erosion=	
	Annual Accretion= 16			Annual Accretion= 3	
	End Beach Width=	125		End Beach Width= 116	
2010	Beginning Width=	125	2018	Beginning Width= 116	
	Annual Erosion=	-12		Annual Erosion=	0
	Annual Accretion=			Annual Accretion=	0
	End Beach Width=	113		End Beach Width= 116	
2011	Beginning Width=	113	2019	Beginning Width= 116	
	Annual Erosion=	-5		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	108		End Beach Width= 117	
2012	Beginning Width=	108	2020	Beginning Width= 117	
	Annual Erosion=			Annual Erosion=	-3
	Annual Accretion= 9			Annual Accretion=	
	End Beach Width=	117		End Beach Width= 114	
2013	Beginning Width=	117	2021	Beginning Width= 114	
	Annual Erosion=	-7		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	110		End Beach Width= 112	
			2022	Beginning Width= 112	
				Annual Erosion=	
				Annual Accretion= 30	
				End Beach Width= 142	



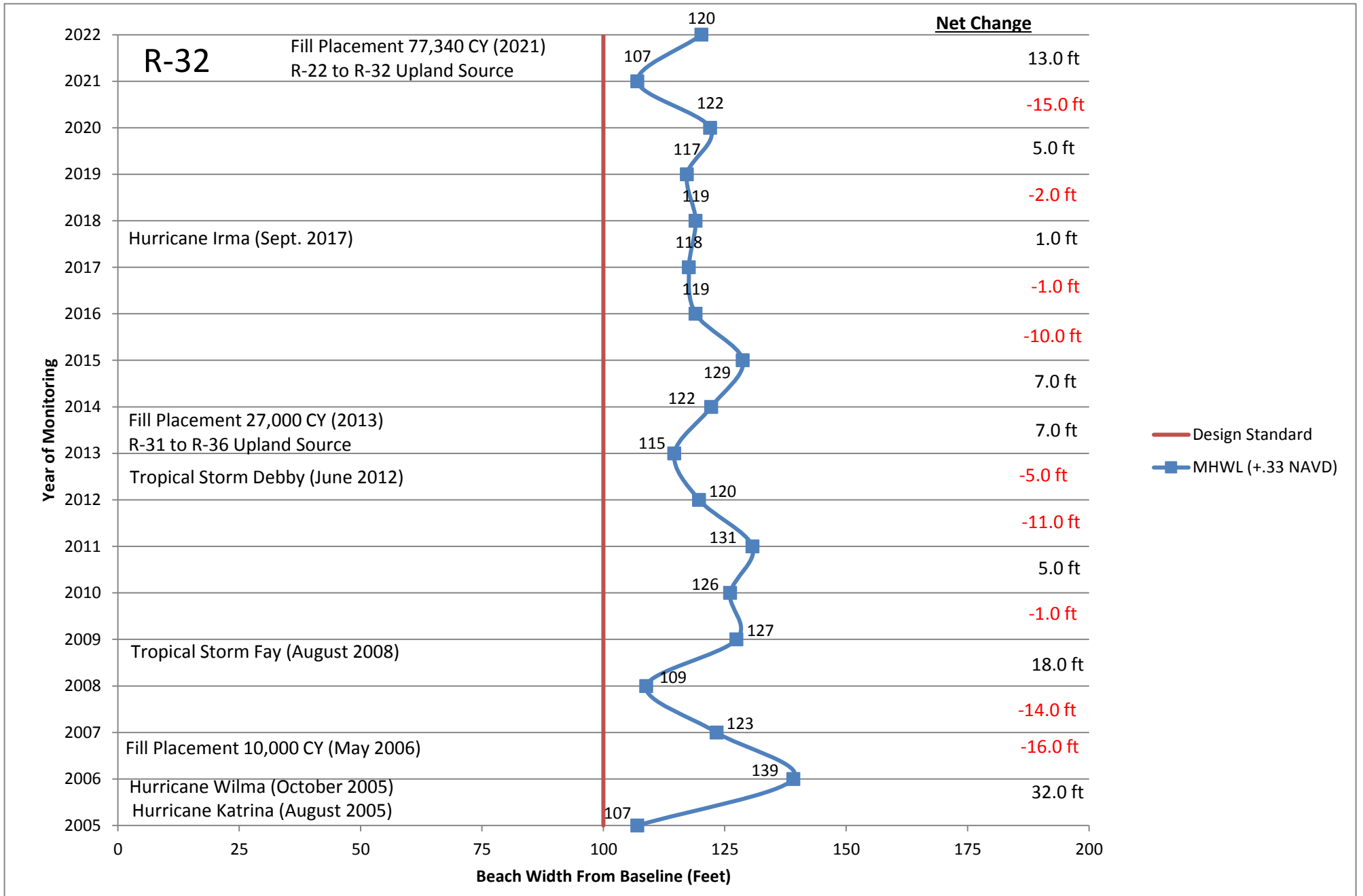
R-31

	2005 Beach Width=	109			
2006	Beginning Width=	109	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	23		Annual Accretion=	28
	End Beach Width=	132		End Beach Width=	
2007	Beginning Width=	132	2015	Beginning Width=	
	Annual Erosion=	-11		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	121		End Beach Width=	
2008	Beginning Width=	121	2016	Beginning Width=	
	Annual Erosion=	-4		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	117		End Beach Width=	
2009	Beginning Width=	117	2017	Beginning Width=	
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	19		Annual Accretion=	2
	End Beach Width=	136		End Beach Width=	
2010	Beginning Width=	136	2018	Beginning Width=	
	Annual Erosion=	-5		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	131		End Beach Width=	
2011	Beginning Width=	131	2019	Beginning Width=	
	Annual Erosion=	-7		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	6
	End Beach Width=	124		End Beach Width=	
2012	Beginning Width=	124	2020	Beginning Width=	
	Annual Erosion=	-7		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	2
	End Beach Width=	117		End Beach Width=	
2013	Beginning Width=	117	2021	Beginning Width=	
	Annual Erosion=	-15		Annual Erosion=	-12
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	102		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	
				Annual Accretion=	29
				End Beach Width=	
				140	



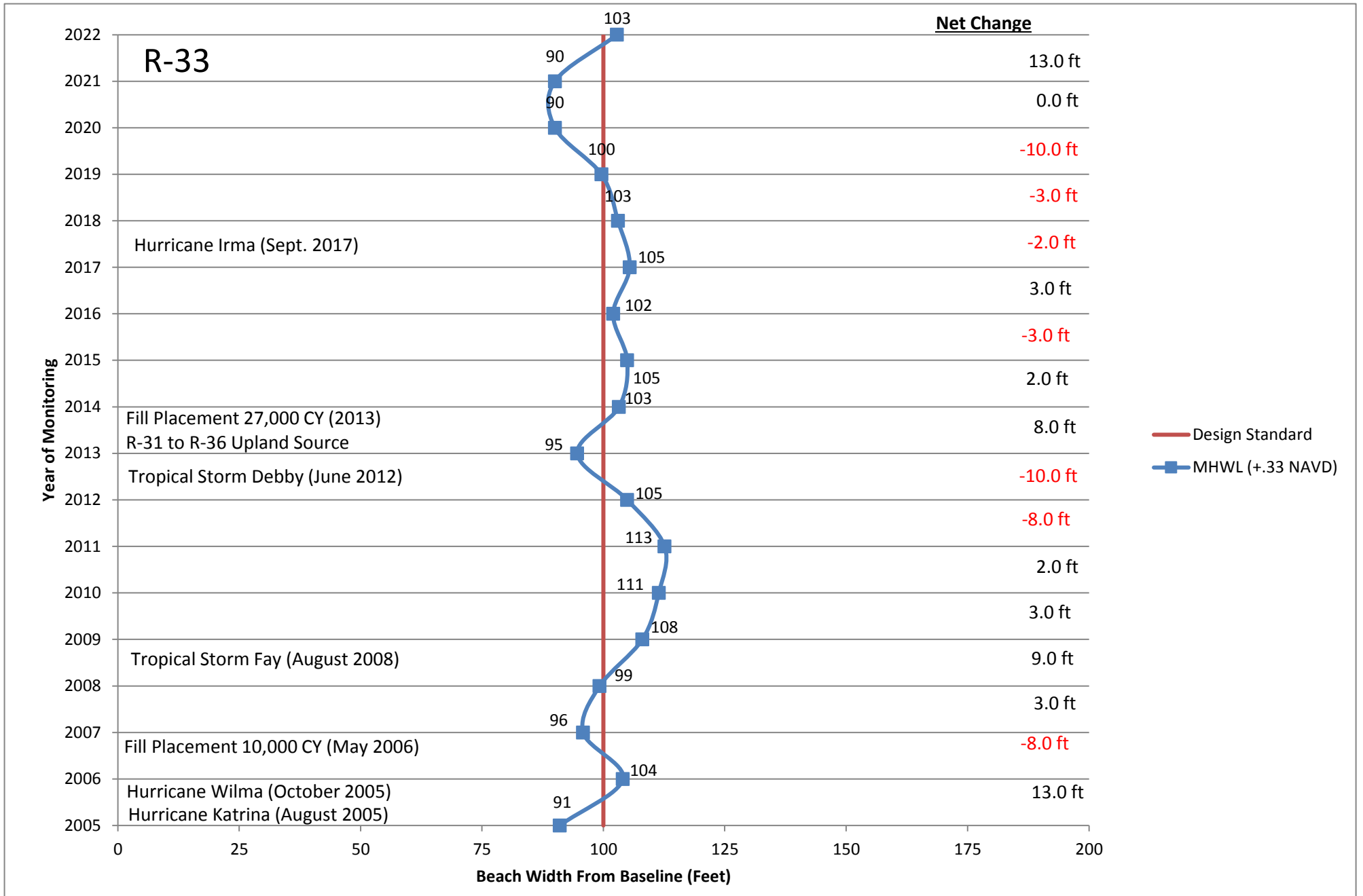
R-32

	2005 Beach Width=	107			
2006	Beginning Width=	107	2014	Beginning Width=	115
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	32		Annual Accretion=	7
	End Beach Width=	139		End Beach Width=	122
2007	Beginning Width=	139	2015	Beginning Width=	122
	Annual Erosion=	-16		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	7
	End Beach Width=	123		End Beach Width=	129
2008	Beginning Width=	123	2016	Beginning Width=	129
	Annual Erosion=	-14		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	109		End Beach Width=	119
2009	Beginning Width=	109	2017	Beginning Width=	119
	Annual Erosion=			Annual Erosion=	-1
	Annual Accretion=	18		Annual Accretion=	
	End Beach Width=	127		End Beach Width=	118
2010	Beginning Width=	127	2018	Beginning Width=	118
	Annual Erosion=	-1		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	126		End Beach Width=	119
2011	Beginning Width=	126	2019	Beginning Width=	119
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=	5		Annual Accretion=	
	End Beach Width=	131		End Beach Width=	117
2012	Beginning Width=	131	2020	Beginning Width=	117
	Annual Erosion=	-11		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	5
	End Beach Width=	120		End Beach Width=	122
2013	Beginning Width=	120	2021	Beginning Width=	122
	Annual Erosion=	-5		Annual Erosion=	-15
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	115		End Beach Width=	107
			2022	Beginning Width=	107
				Annual Erosion=	
				Annual Accretion=	13
				End Beach Width=	120



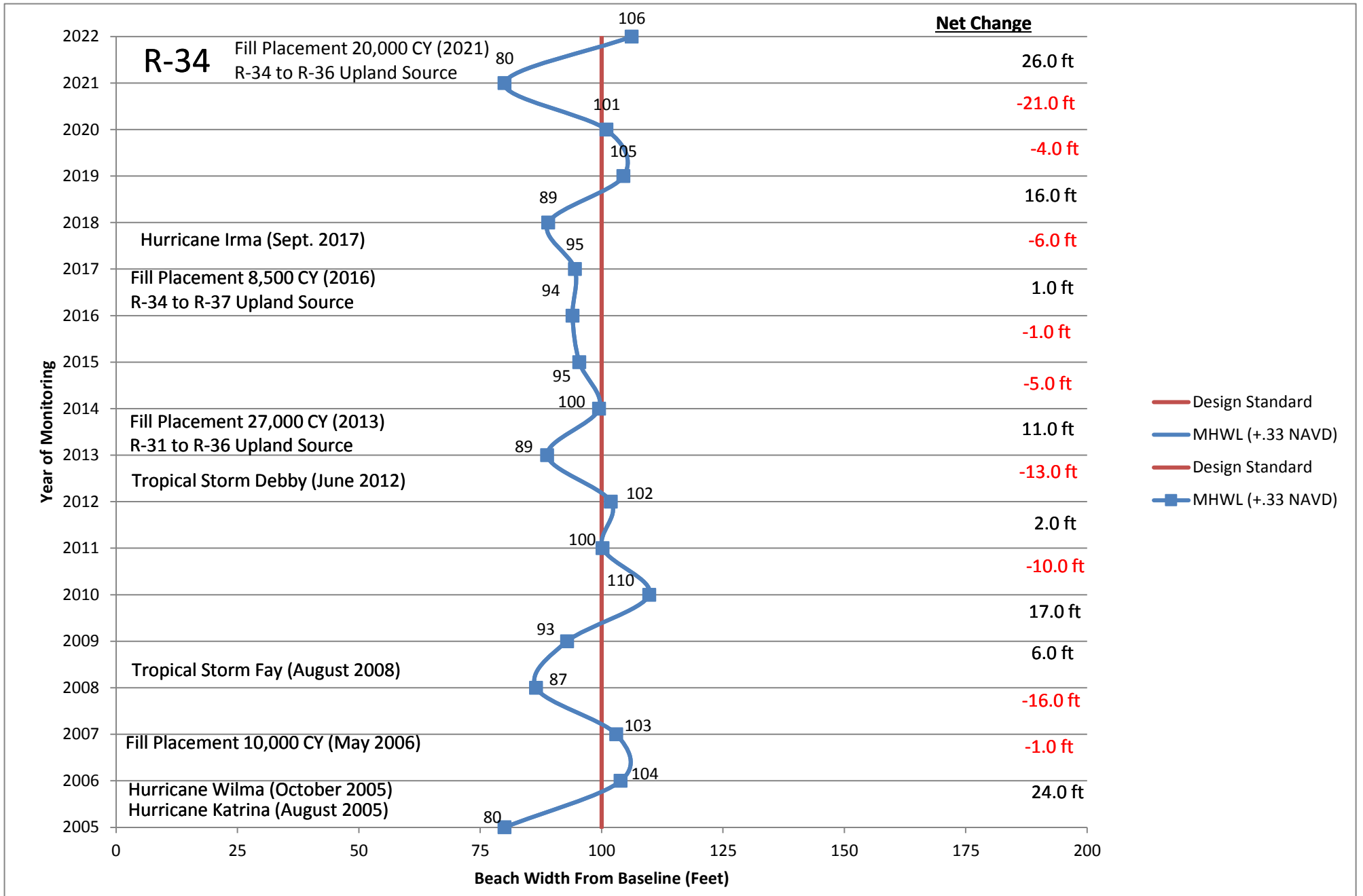
R-33

	2005 Beach Width=	91			
2006	Beginning Width=	91	2014	Beginning Width=	95
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	13		Annual Accretion=	8
	End Beach Width=	104		End Beach Width=	103
2007	Beginning Width=	104	2015	Beginning Width=	103
	Annual Erosion=	-8		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	2
	End Beach Width=	96		End Beach Width=	105
2008	Beginning Width=	96	2016	Beginning Width=	105
	Annual Erosion=			Annual Erosion=	-3
	Annual Accretion=	3		Annual Accretion=	
	End Beach Width=	99		End Beach Width=	102
2009	Beginning Width=	99	2017	Beginning Width=	102
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	9		Annual Accretion=	3
	End Beach Width=	108		End Beach Width=	105
2010	Beginning Width=	108	2018	Beginning Width=	105
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=	3		Annual Accretion=	
	End Beach Width=	111		End Beach Width=	103
2011	Beginning Width=	111	2019	Beginning Width=	103
	Annual Erosion=			Annual Erosion=	-3
	Annual Accretion=	2		Annual Accretion=	
	End Beach Width=	113		End Beach Width=	100
2012	Beginning Width=	113	2020	Beginning Width=	100
	Annual Erosion=	-8		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	105		End Beach Width=	90
2013	Beginning Width=	105	2021	Beginning Width=	90
	Annual Erosion=	-10		Annual Erosion=	0
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	95		End Beach Width=	90
			2022	Beginning Width=	90
				Annual Erosion=	
				Annual Accretion=	13
				End Beach Width=	103



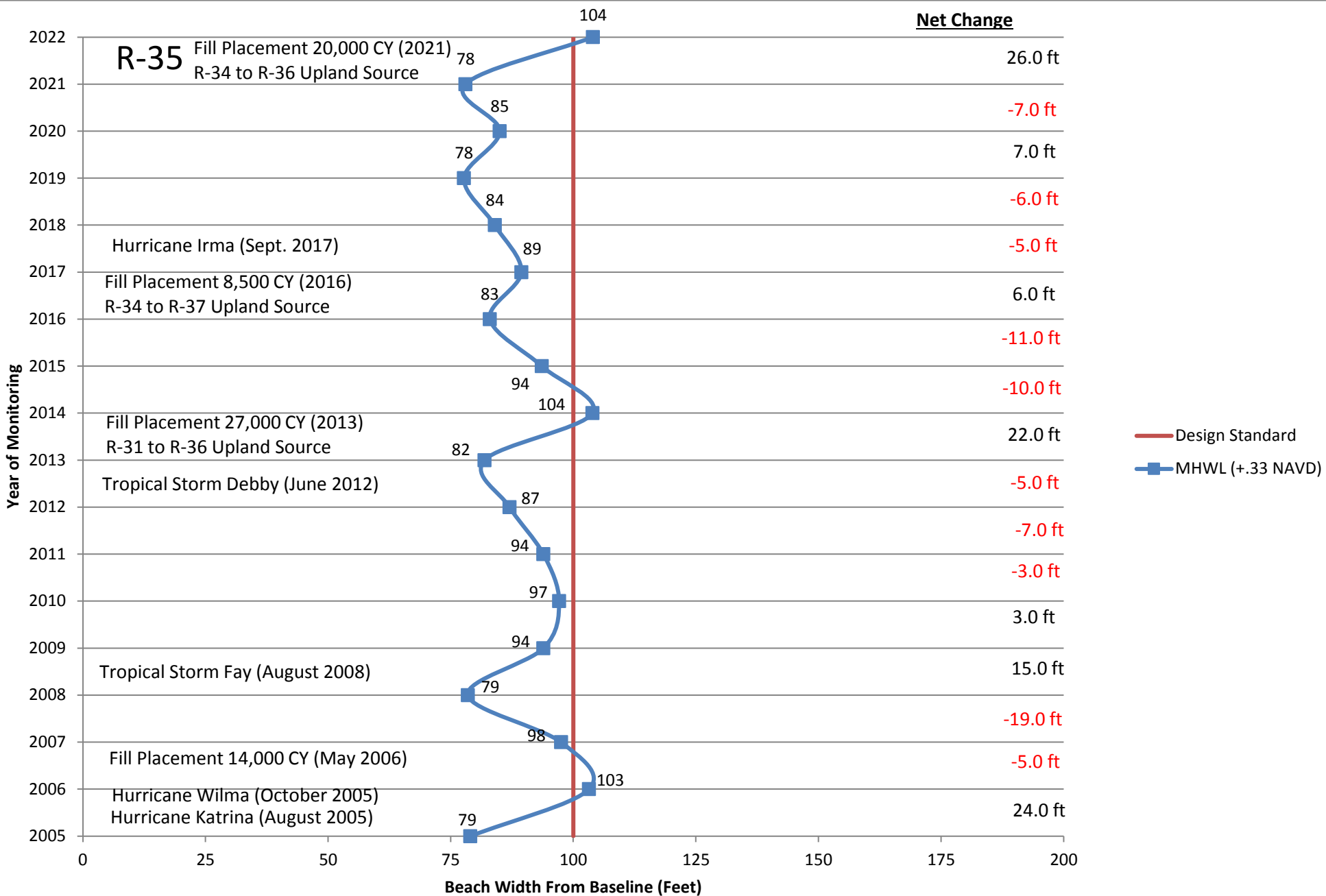
R-34

	2005 Beach Width=	80			
2006	Beginning Width=	80	2014	Beginning Width=	89
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	24		Annual Accretion=	11
	End Beach Width=	104		End Beach Width=	100
2007	Beginning Width=	104	2015	Beginning Width=	100
	Annual Erosion=	-1		Annual Erosion=	-5
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	103		End Beach Width=	95
2008	Beginning Width=	103	2016	Beginning Width=	95
	Annual Erosion=	-16		Annual Erosion=	-1
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	87		End Beach Width=	94
2009	Beginning Width=	87	2017	Beginning Width=	94
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	6		Annual Accretion=	1
	End Beach Width=	93		End Beach Width=	95
2010	Beginning Width=	93	2018	Beginning Width=	95
	Annual Erosion=			Annual Erosion=	-6
	Annual Accretion=	17		Annual Accretion=	
	End Beach Width=	110		End Beach Width=	89
2011	Beginning Width=	110	2019	Beginning Width=	89
	Annual Erosion=	-10		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	16
	End Beach Width=	100		End Beach Width=	105
2012	Beginning Width=	100	2020	Beginning Width=	105
	Annual Erosion=			Annual Erosion=	-4
	Annual Accretion=	2		Annual Accretion=	
	End Beach Width=	102		End Beach Width=	101
2013	Beginning Width=	102	2021	Beginning Width=	101
	Annual Erosion=	-13		Annual Erosion=	-21
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	89		End Beach Width=	80
			2022	Beginning Width=	80
				Annual Erosion=	
				Annual Accretion=	26
				End Beach Width=	106



R-35

2005 Beach Width= 79			
2006	Beginning Width= 79	2014	Beginning Width= 82
	Annual Erosion=		Annual Erosion=
	Annual Accretion= 24		Annual Accretion= 22
	End Beach Width= 103		End Beach Width= 104
2007	Beginning Width= 103	2015	Beginning Width= 104
	Annual Erosion= -5		Annual Erosion= -10
	Annual Accretion=		Annual Accretion=
	End Beach Width= 98		End Beach Width= 94
2008	Beginning Width= 98	2016	Beginning Width= 94
	Annual Erosion= -19		Annual Erosion= -11
	Annual Accretion=		Annual Accretion=
	End Beach Width= 79		End Beach Width= 83
2009	Beginning Width= 79	2017	Beginning Width= 83
	Annual Erosion=		Annual Erosion=
	Annual Accretion= 15		Annual Accretion= 6
	End Beach Width= 94		End Beach Width= 89
2010	Beginning Width= 94	2018	Beginning Width= 89
	Annual Erosion=		Annual Erosion= -5
	Annual Accretion= 3		Annual Accretion=
	End Beach Width= 97		End Beach Width= 84
2011	Beginning Width= 97	2019	Beginning Width= 84
	Annual Erosion= -3		Annual Erosion= -6
	Annual Accretion=		Annual Accretion=
	End Beach Width= 94		End Beach Width= 78
2012	Beginning Width= 94	2020	Beginning Width= 78
	Annual Erosion= -7		Annual Erosion=
	Annual Accretion=		Annual Accretion= 7
	End Beach Width= 87		End Beach Width= 85
2013	Beginning Width= 87	2021	Beginning Width= 85
	Annual Erosion= -5		Annual Erosion= -7
	Annual Accretion=		Annual Accretion=
	End Beach Width= 82		End Beach Width= 78
		2022	Beginning Width= 78
			Annual Erosion=
			Annual Accretion= 26
			End Beach Width= 104



R-35 Fill Placement 20,000 CY (2021)
R-34 to R-36 Upland Source

Hurricane Irma (Sept. 2017)

Fill Placement 8,500 CY (2016)
R-34 to R-37 Upland Source

Fill Placement 27,000 CY (2013)
R-31 to R-36 Upland Source

Tropical Storm Debby (June 2012)

Tropical Storm Fay (August 2008)

Fill Placement 14,000 CY (May 2006)

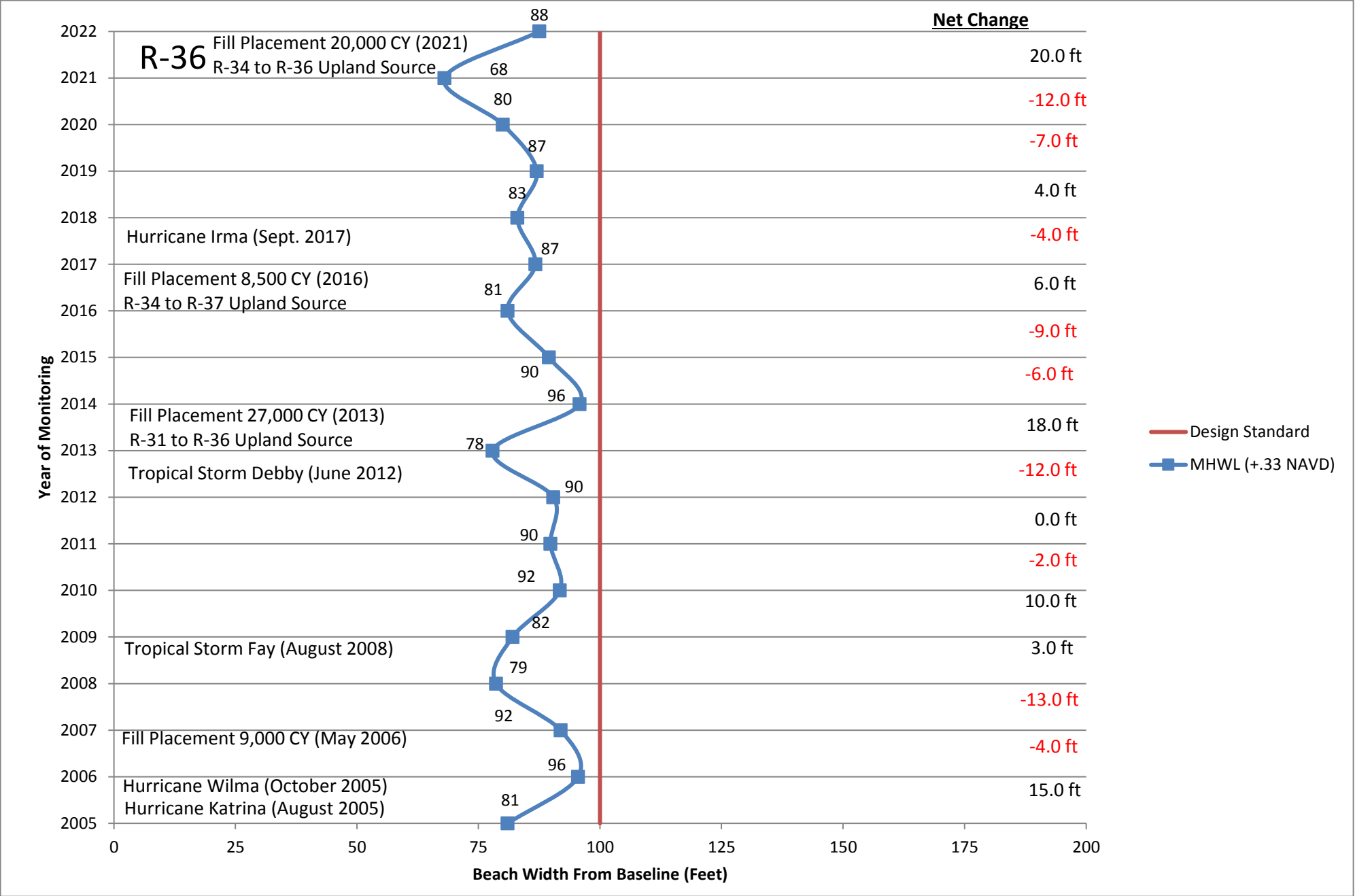
Hurricane Wilma (October 2005)
Hurricane Katrina (August 2005)

Net Change

— Design Standard
■ MHWL (+.33 NAVD)

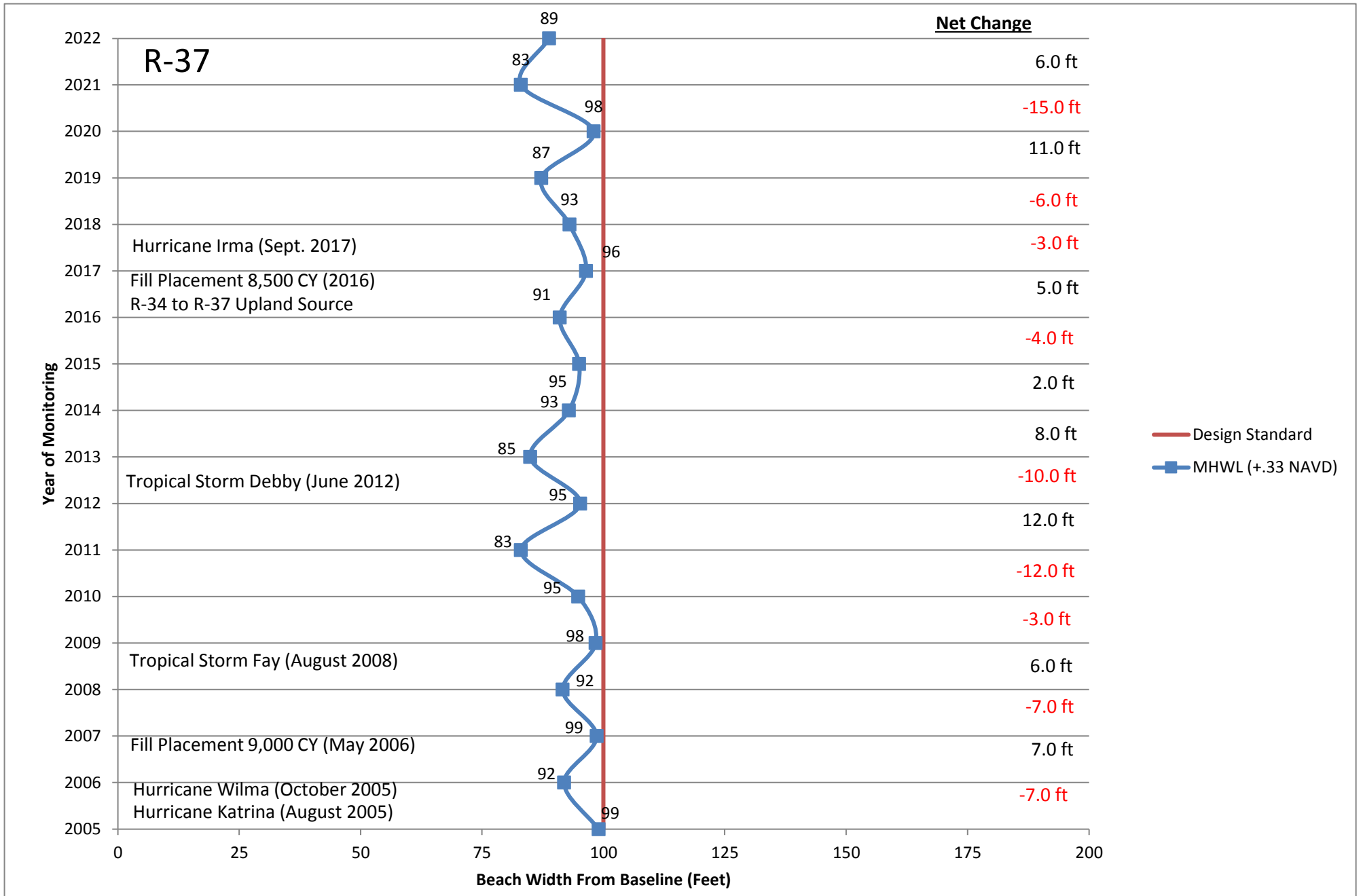
R-36

	2005 Beach Width=	81			
2006	Beginning Width=	81	2014	Beginning Width=	78
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	15		Annual Accretion=	18
	End Beach Width=	96		End Beach Width=	96
2007	Beginning Width=	96	2015	Beginning Width=	96
	Annual Erosion=	-4		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	92		End Beach Width=	90
2008	Beginning Width=	92	2016	Beginning Width=	90
	Annual Erosion=	-13		Annual Erosion=	-9
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	79		End Beach Width=	81
2009	Beginning Width=	79	2017	Beginning Width=	81
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	3		Annual Accretion=	6
	End Beach Width=	82		End Beach Width=	87
2010	Beginning Width=	82	2018	Beginning Width=	87
	Annual Erosion=			Annual Erosion=	-4
	Annual Accretion=	10		Annual Accretion=	
	End Beach Width=	92		End Beach Width=	83
2011	Beginning Width=	92	2019	Beginning Width=	83
	Annual Erosion=	-2		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	90		End Beach Width=	87
2012	Beginning Width=	90	2020	Beginning Width=	87
	Annual Erosion=			Annual Erosion=	-7
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	90		End Beach Width=	80
2013	Beginning Width=	90	2021	Beginning Width=	80
	Annual Erosion=	-12		Annual Erosion=	-12
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	78		End Beach Width=	68
			2022	Beginning Width=	68
				Annual Erosion=	
				Annual Accretion=	20
				End Beach Width=	88



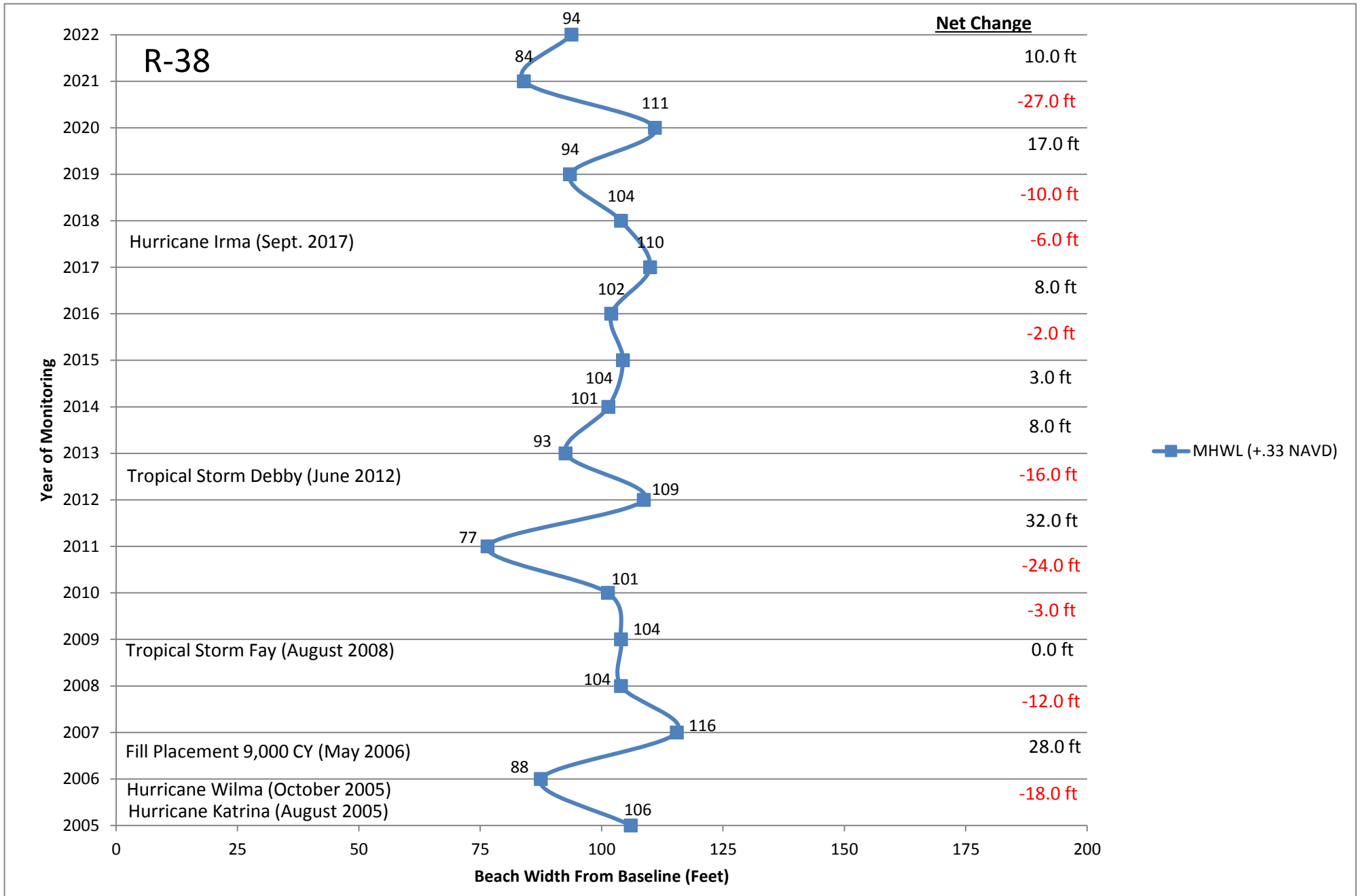
R-37

	2005 Beach Width=	99			
2006	Beginning Width=	99	2014	Beginning Width=	85
	Annual Erosion=	-7		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	8
	End Beach Width=	92		End Beach Width=	93
2007	Beginning Width=	92	2015	Beginning Width=	93
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	7		Annual Accretion=	2
	End Beach Width=	99		End Beach Width=	95
2008	Beginning Width=	99	2016	Beginning Width=	95
	Annual Erosion=	-7		Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	92		End Beach Width=	91
2009	Beginning Width=	92	2017	Beginning Width=	91
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	6		Annual Accretion=	5
	End Beach Width=	98		End Beach Width=	96
2010	Beginning Width=	98	2018	Beginning Width=	96
	Annual Erosion=	-3		Annual Erosion=	-3
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	95		End Beach Width=	93
2011	Beginning Width=	95	2019	Beginning Width=	93
	Annual Erosion=	-12		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	83		End Beach Width=	87
2012	Beginning Width=	83	2020	Beginning Width=	87
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	12		Annual Accretion=	11
	End Beach Width=	95		End Beach Width=	98
2013	Beginning Width=	95	2021	Beginning Width=	98
	Annual Erosion=	-10		Annual Erosion=	-15
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	85		End Beach Width=	83
			2022	Beginning Width=	83
				Annual Erosion=	
				Annual Accretion=	6
				End Beach Width=	89



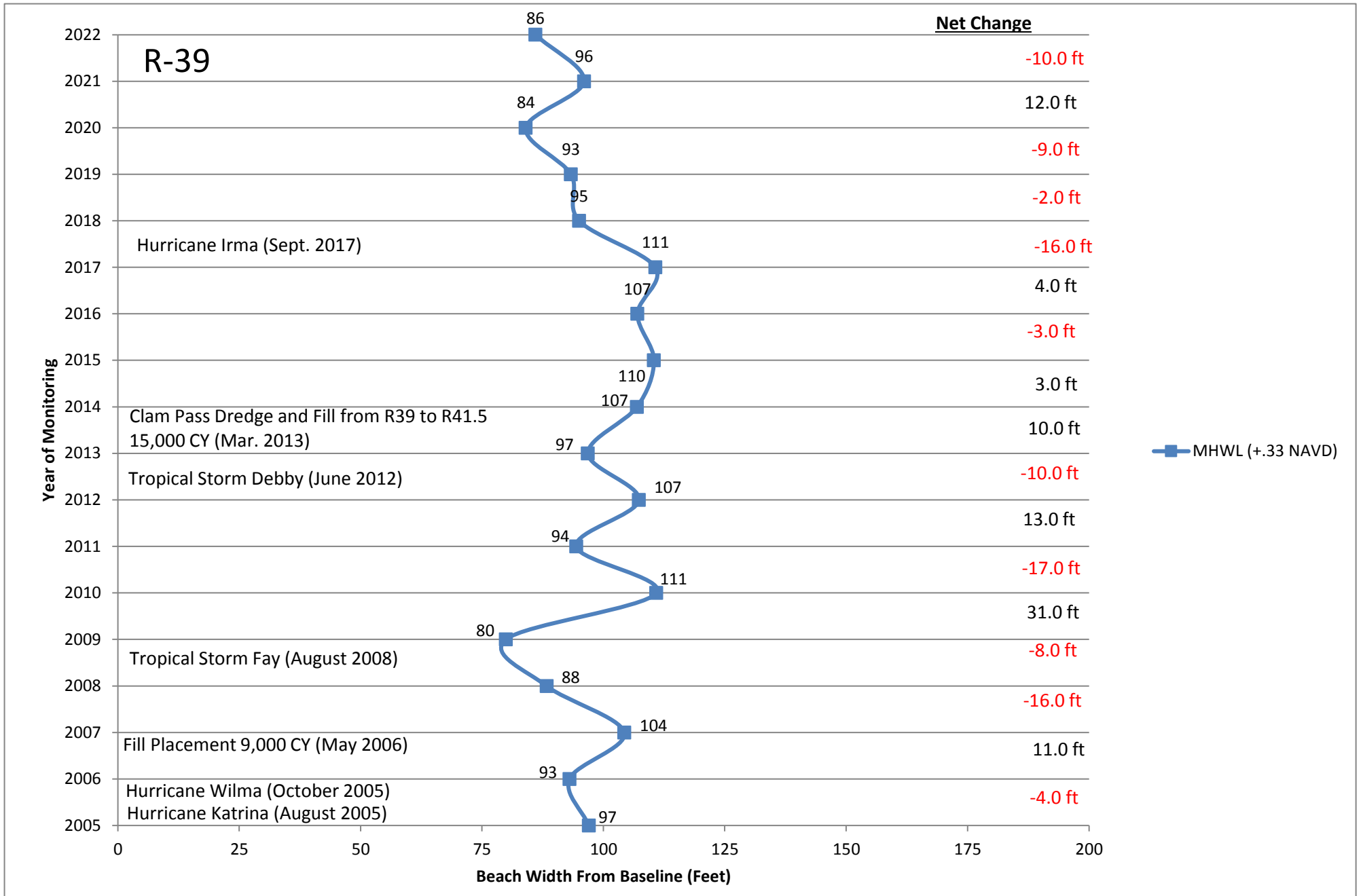
R-38

	2005 Beach Width=	106			
2006	Beginning Width=	106	2014	Beginning Width=	93
	Annual Erosion=	-18		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	8
	End Beach Width=	88		End Beach Width=	101
2007	Beginning Width=	88	2015	Beginning Width=	101
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	28		Annual Accretion=	3
	End Beach Width=	116		End Beach Width=	104
2008	Beginning Width=	116	2016	Beginning Width=	104
	Annual Erosion=	-12		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	104		End Beach Width=	102
2009	Beginning Width=	104	2017	Beginning Width=	102
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=			Annual Accretion=	8
	End Beach Width=	104		End Beach Width=	110
2010	Beginning Width=	104	2018	Beginning Width=	110
	Annual Erosion=	-3		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	101		End Beach Width=	104
2011	Beginning Width=	101	2019	Beginning Width=	104
	Annual Erosion=	-24		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	77		End Beach Width=	94
2012	Beginning Width=	77	2020	Beginning Width=	94
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	32		Annual Accretion=	17
	End Beach Width=	109		End Beach Width=	111
2013	Beginning Width=	109	2021	Beginning Width=	111
	Annual Erosion=	-16		Annual Erosion=	-27
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	93		End Beach Width=	84
			2022	Beginning Width=	84
				Annual Erosion=	
				Annual Accretion=	10
				End Beach Width=	94



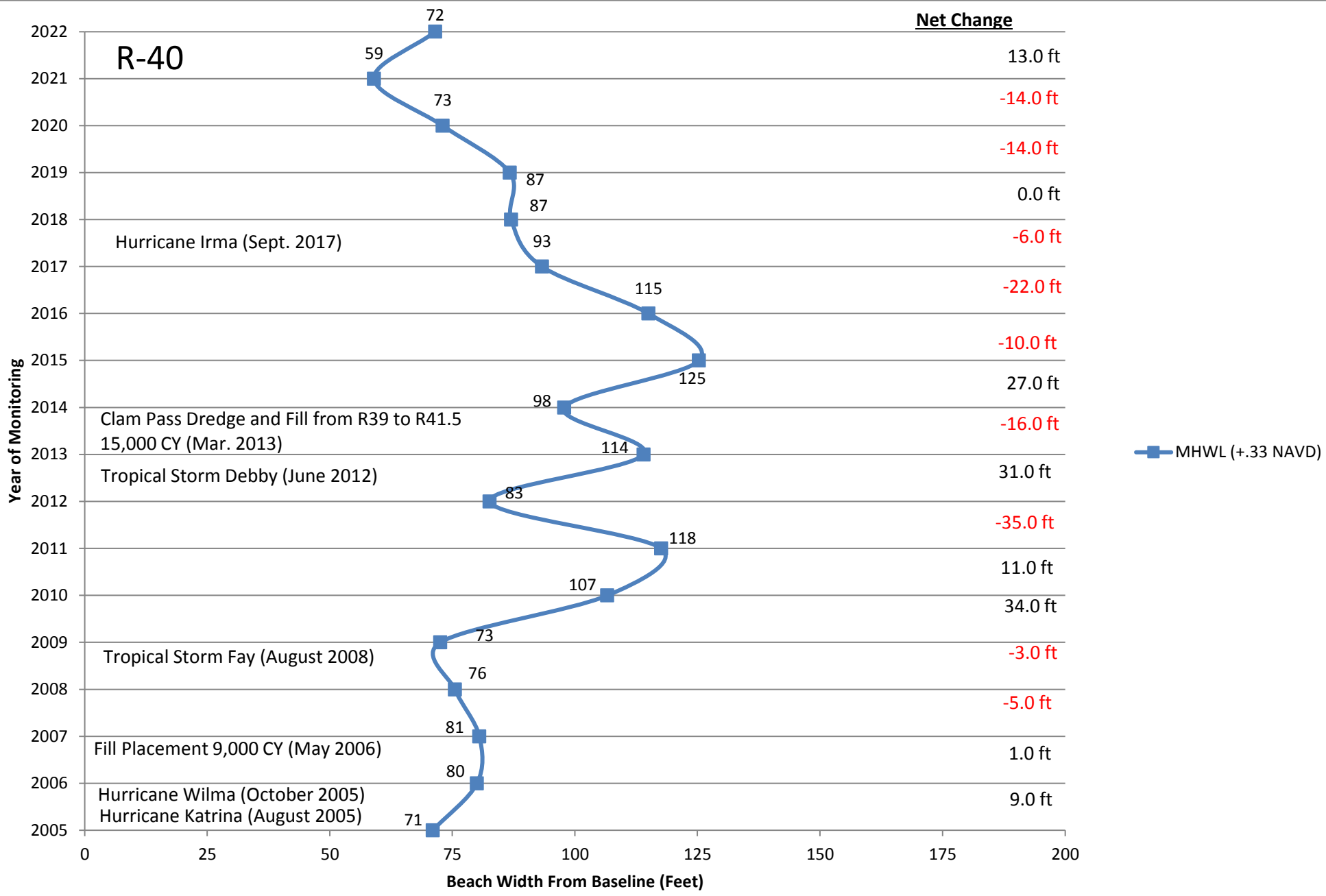
R-39

	2005 Beach Width=	97			
2006	Beginning Width=	97	2014	Beginning Width=	97
	Annual Erosion=	-4		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	10
	End Beach Width=	93		End Beach Width=	107
2007	Beginning Width=	93	2015	Beginning Width=	107
	Annual Erosion=			Annual Erosion=	3
	Annual Accretion=	11		Annual Accretion=	
	End Beach Width=	104		End Beach Width=	110
2008	Beginning Width=	104	2016	Beginning Width=	110
	Annual Erosion=	-16		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	-3
	End Beach Width=	88		End Beach Width=	107
2009	Beginning Width=	88	2017	Beginning Width=	107
	Annual Erosion=	-8		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	80		End Beach Width=	111
2010	Beginning Width=	80	2018	Beginning Width=	111
	Annual Erosion=			Annual Erosion=	-16
	Annual Accretion=	31		Annual Accretion=	
	End Beach Width=	111		End Beach Width=	95
2011	Beginning Width=	111	2019	Beginning Width=	95
	Annual Erosion=	-17		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	94		End Beach Width=	93
2012	Beginning Width=	94	2020	Beginning Width=	93
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	13		Annual Accretion=	
	End Beach Width=	107		End Beach Width=	84
2013	Beginning Width=	107	2021	Beginning Width=	84
	Annual Erosion=	-10		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	12
	End Beach Width=	97		End Beach Width=	96
			2022	Beginning Width=	96
				Annual Erosion=	-10
				Annual Accretion=	
				End Beach Width=	86



R-40

	2005 Beach Width=	71			
2006	Beginning Width=	71	2014	Beginning Width=	114
	Annual Erosion=			Annual Erosion=	-16
	Annual Accretion=	9		Annual Accretion=	98
	End Beach Width=	80		End Beach Width=	98
2007	Beginning Width=	80	2015	Beginning Width=	98
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	1		Annual Accretion=	27
	End Beach Width=	81		End Beach Width=	125
2008	Beginning Width=	81	2016	Beginning Width=	125
	Annual Erosion=	-5		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	76		End Beach Width=	115
2009	Beginning Width=	76	2017	Beginning Width=	115
	Annual Erosion=	-3		Annual Erosion=	-22
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	73		End Beach Width=	93
2010	Beginning Width=	73	2018	Beginning Width=	93
	Annual Erosion=			Annual Erosion=	-6
	Annual Accretion=	34		Annual Accretion=	87
	End Beach Width=	107		End Beach Width=	87
2011	Beginning Width=	107	2019	Beginning Width=	87
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	11		Annual Accretion=	0
	End Beach Width=	118		End Beach Width=	87
2012	Beginning Width=	118	2020	Beginning Width=	87
	Annual Erosion=	-35		Annual Erosion=	-14
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	83		End Beach Width=	73
2013	Beginning Width=	83	2021	Beginning Width=	73
	Annual Erosion=			Annual Erosion=	-14
	Annual Accretion=	31		Annual Accretion=	59
	End Beach Width=	114		End Beach Width=	59
			2022	Beginning Width=	59
				Annual Erosion=	
				Annual Accretion=	13
				End Beach Width=	72



R-40

Net Change

Year of Monitoring

Beach Width From Baseline (Feet)

■ MHWL (+.33 NAVD)

Hurricane Irma (Sept. 2017)

Clam Pass Dredge and Fill from R39 to R41.5
15,000 CY (Mar. 2013)

Tropical Storm Debby (June 2012)

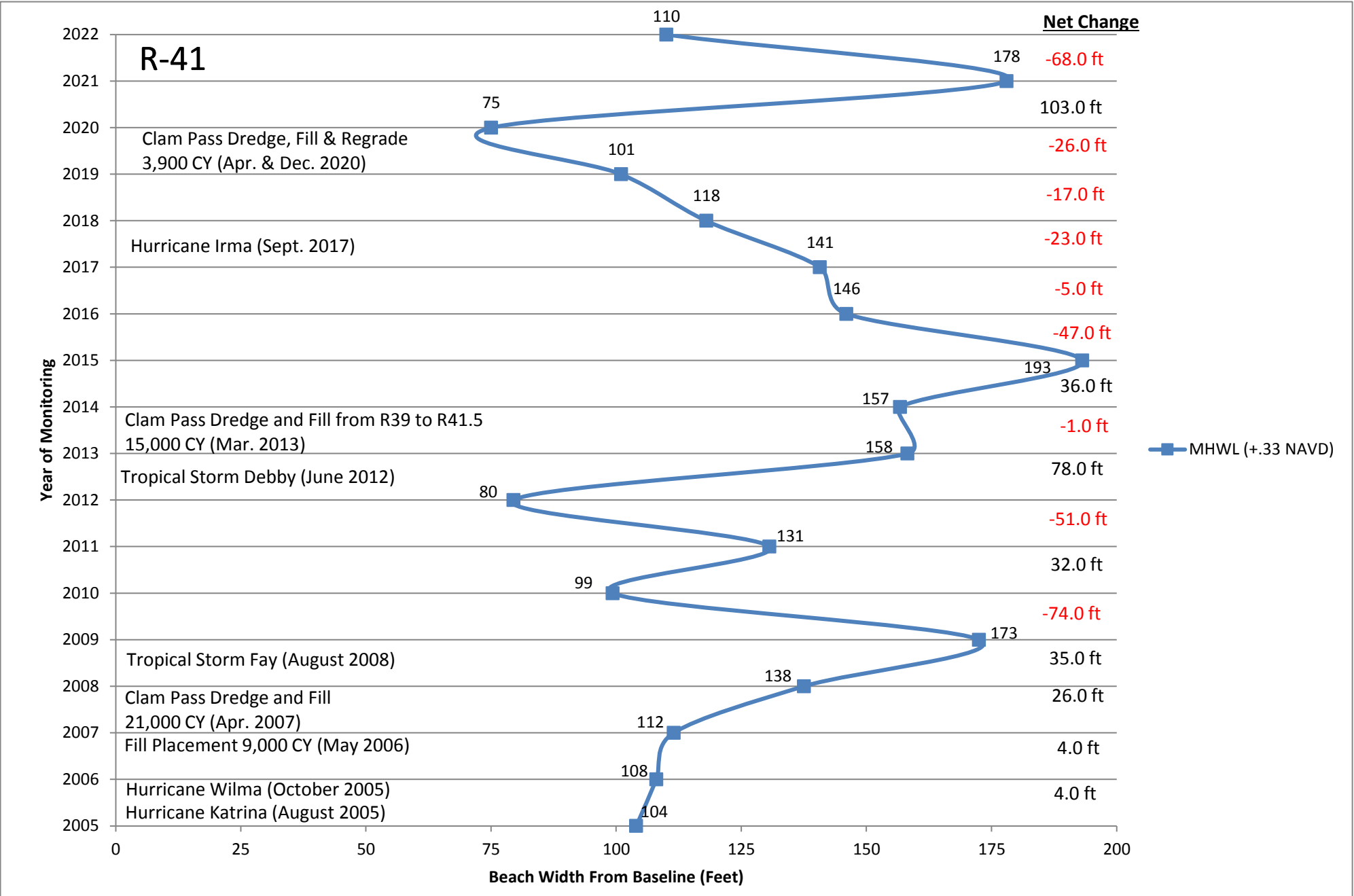
Tropical Storm Fay (August 2008)

Fill Placement 9,000 CY (May 2006)

Hurricane Wilma (October 2005)
Hurricane Katrina (August 2005)

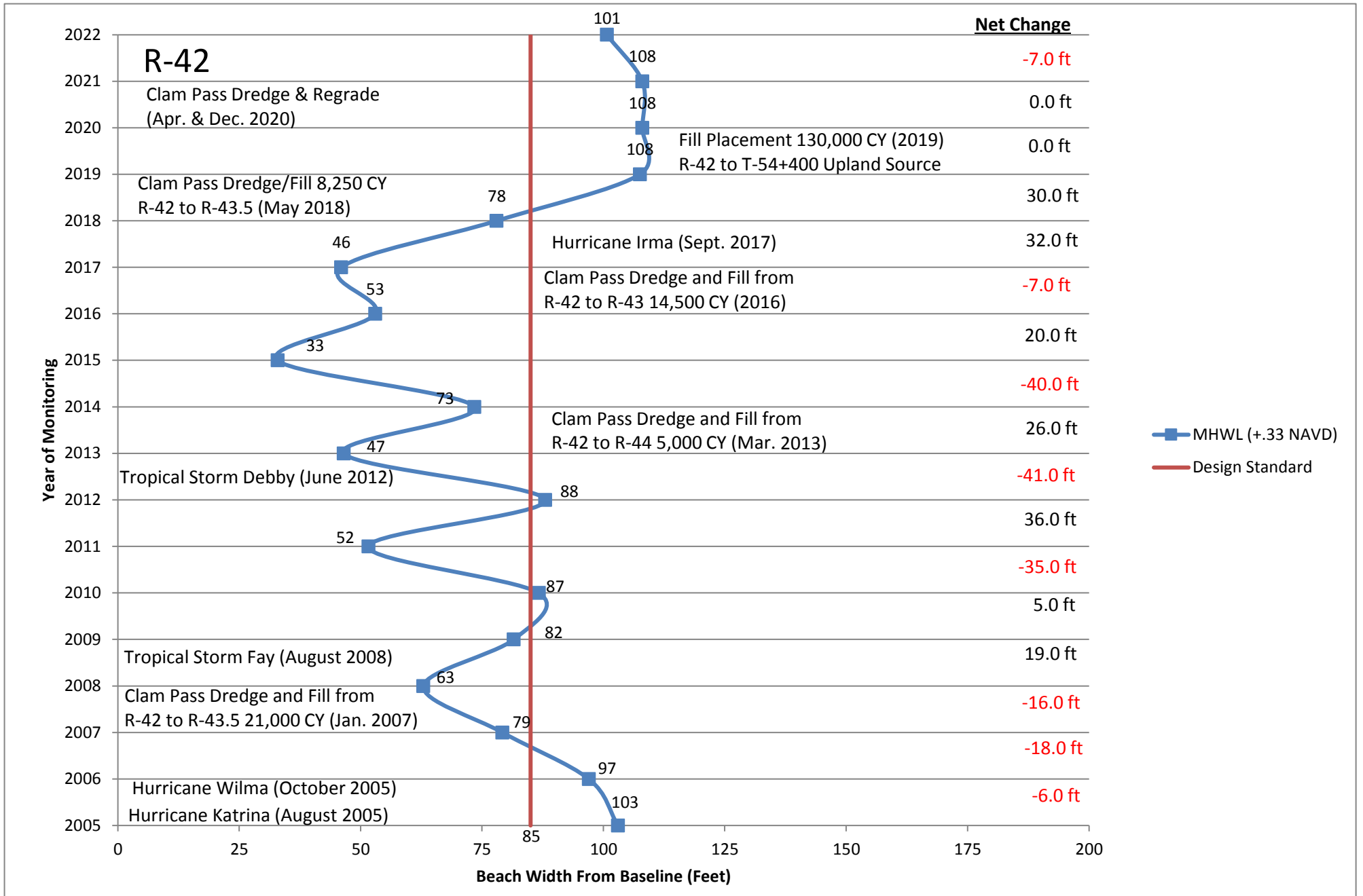
R-41

	2005 Beach Width=	104			
2006	Beginning Width=	104	2014	Beginning Width=	158
	Annual Erosion=			Annual Erosion=	-1
	Annual Accretion=	4		Annual Accretion=	
	End Beach Width=	108		End Beach Width=	157
2007	Beginning Width=	108	2015	Beginning Width=	157
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	4		Annual Accretion=	36
	End Beach Width=	112		End Beach Width=	193
2008	Beginning Width=	112	2016	Beginning Width=	193
	Annual Erosion=			Annual Erosion=	-47
	Annual Accretion=	26		Annual Accretion=	
	End Beach Width=	138		End Beach Width=	146
2009	Beginning Width=	138	2017	Beginning Width=	146
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	35		Annual Accretion=	
	End Beach Width=	173		End Beach Width=	141
2010	Beginning Width=	173	2018	Beginning Width=	141
	Annual Erosion=	-74		Annual Erosion=	-23
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	99		End Beach Width=	118
2011	Beginning Width=	99	2019	Beginning Width=	118
	Annual Erosion=			Annual Erosion=	-17
	Annual Accretion=	32		Annual Accretion=	
	End Beach Width=	131		End Beach Width=	101
2012	Beginning Width=	131	2020	Beginning Width=	101
	Annual Erosion=	-51		Annual Erosion=	-26
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	80		End Beach Width=	75
2013	Beginning Width=	80	2021	Beginning Width=	75
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	78		Annual Accretion=	103
	End Beach Width=	158		End Beach Width=	178
			2022	Beginning Width=	178
				Annual Erosion=	-68
				Annual Accretion=	
				End Beach Width=	110



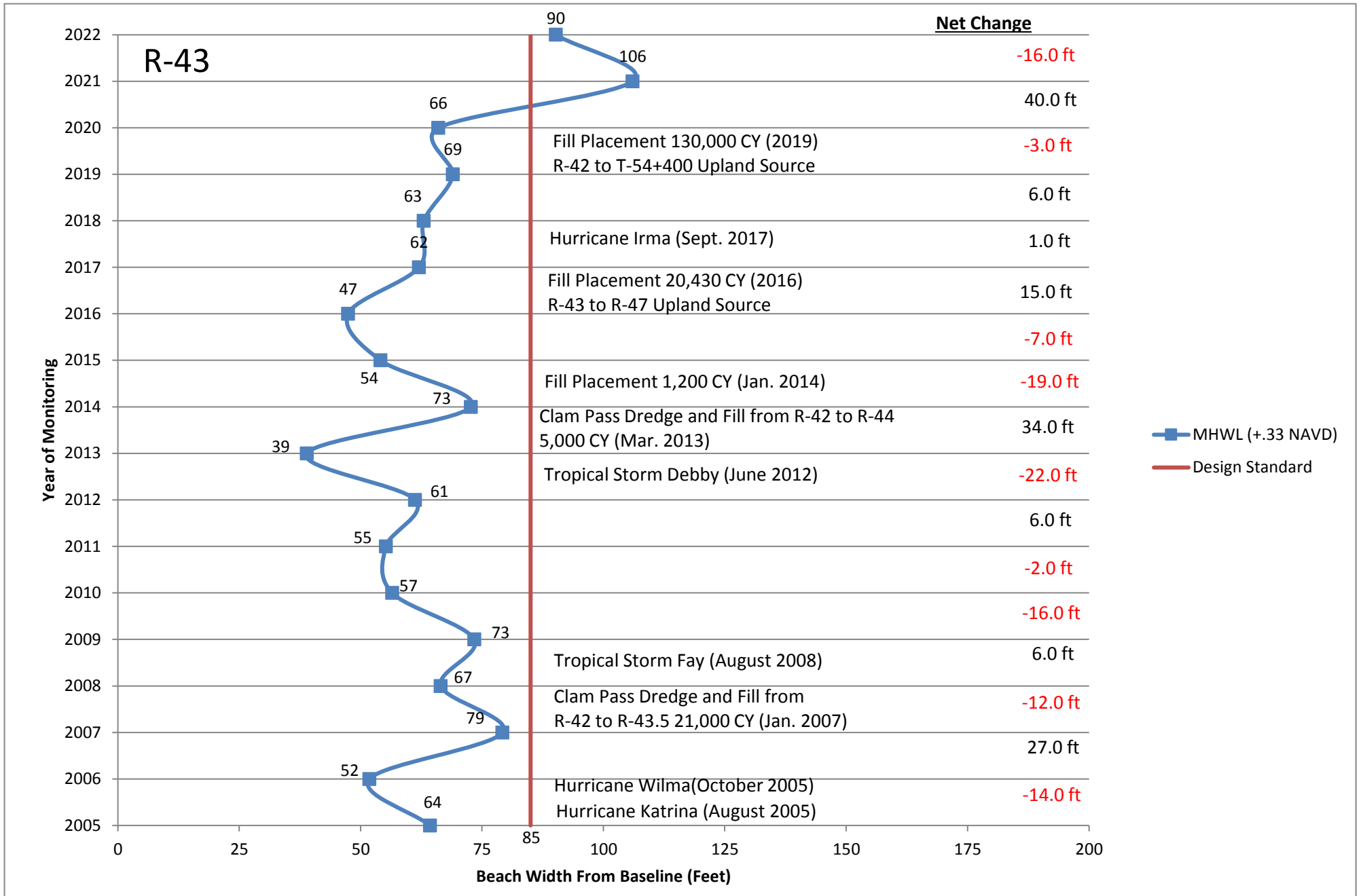
R-42

	2005 Beach Width=	103			
2006	Beginning Width=	103	2014	Beginning Width=	47
	Annual Erosion=	-6		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	26
	End Beach Width=	97		End Beach Width=	73
2007	Beginning Width=	97	2015	Beginning Width=	73
	Annual Erosion=	-18		Annual Erosion=	-40
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	79		End Beach Width=	33
2008	Beginning Width=	79	2016	Beginning Width=	33
	Annual Erosion=	-16		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	20
	End Beach Width=	63		End Beach Width=	53
2009	Beginning Width=	63	2017	Beginning Width=	53
	Annual Erosion=			Annual Erosion=	-7
	Annual Accretion=	19		Annual Accretion=	0
	End Beach Width=	82		End Beach Width=	46
2010	Beginning Width=	82	2018	Beginning Width=	46
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	5		Annual Accretion=	32
	End Beach Width=	87		End Beach Width=	78
2011	Beginning Width=	87	2019	Beginning Width=	78
	Annual Erosion=	-35		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	30
	End Beach Width=	52		End Beach Width=	108
2012	Beginning Width=	52	2020	Beginning Width=	108
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	36		Annual Accretion=	0
	End Beach Width=	88		End Beach Width=	108
2013	Beginning Width=	88	2021	Beginning Width=	108
	Annual Erosion=	-41		Annual Erosion=	0
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	47		End Beach Width=	108
			2022	Beginning Width=	108
				Annual Erosion=	-7
				Annual Accretion=	
				End Beach Width=	101



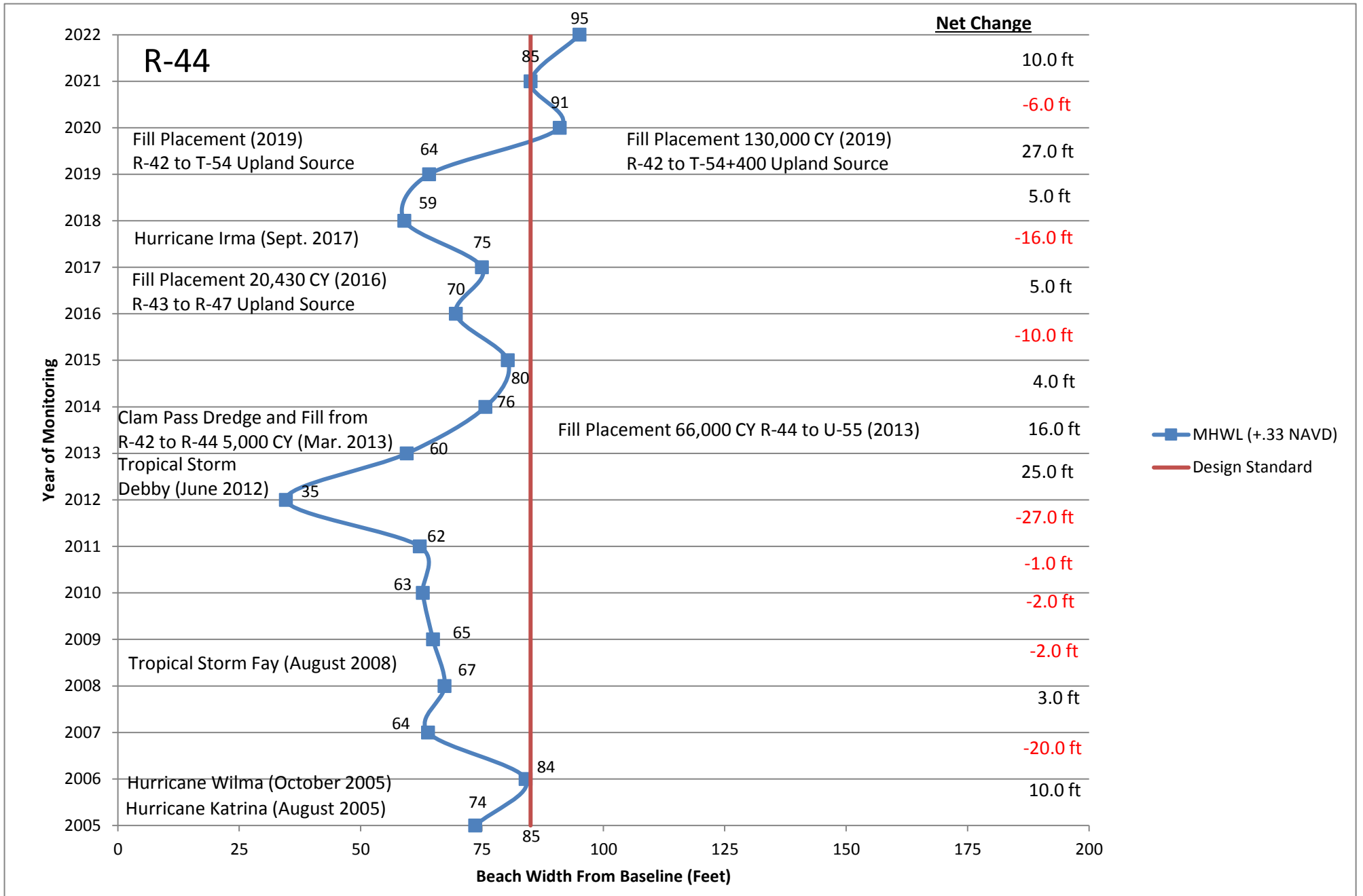
R-43

	2005 Beach Width=	64			
2006	Beginning Width=	64	2014	Beginning Width=	39
	Annual Erosion=	-12		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	34
	End Beach Width=	52		End Beach Width=	73
2007	Beginning Width=	52	2015	Beginning Width=	73
	Annual Erosion=			Annual Erosion=	-19
	Annual Accretion=	27		Annual Accretion=	
	End Beach Width=	79		End Beach Width=	54
2008	Beginning Width=	79	2016	Beginning Width=	54
	Annual Erosion=	-12		Annual Erosion=	-7
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	67		End Beach Width=	47
2009	Beginning Width=	67	2017	Beginning Width=	47
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	6		Annual Accretion=	15
	End Beach Width=	73		End Beach Width=	62
2010	Beginning Width=	73	2018	Beginning Width=	62
	Annual Erosion=	-16		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	57		End Beach Width=	63
2011	Beginning Width=	57	2019	Beginning Width=	63
	Annual Erosion=	-2		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	6
	End Beach Width=	55		End Beach Width=	69
2012	Beginning Width=	55	2020	Beginning Width=	69
	Annual Erosion=			Annual Erosion=	-3
	Annual Accretion=	6		Annual Accretion=	
	End Beach Width=	61		End Beach Width=	66
2013	Beginning Width=	61	2021	Beginning Width=	66
	Annual Erosion=	-22		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	40
	End Beach Width=	39		End Beach Width=	106
			2022	Beginning Width=	106
				Annual Erosion=	-16
				Annual Accretion=	
				End Beach Width=	90



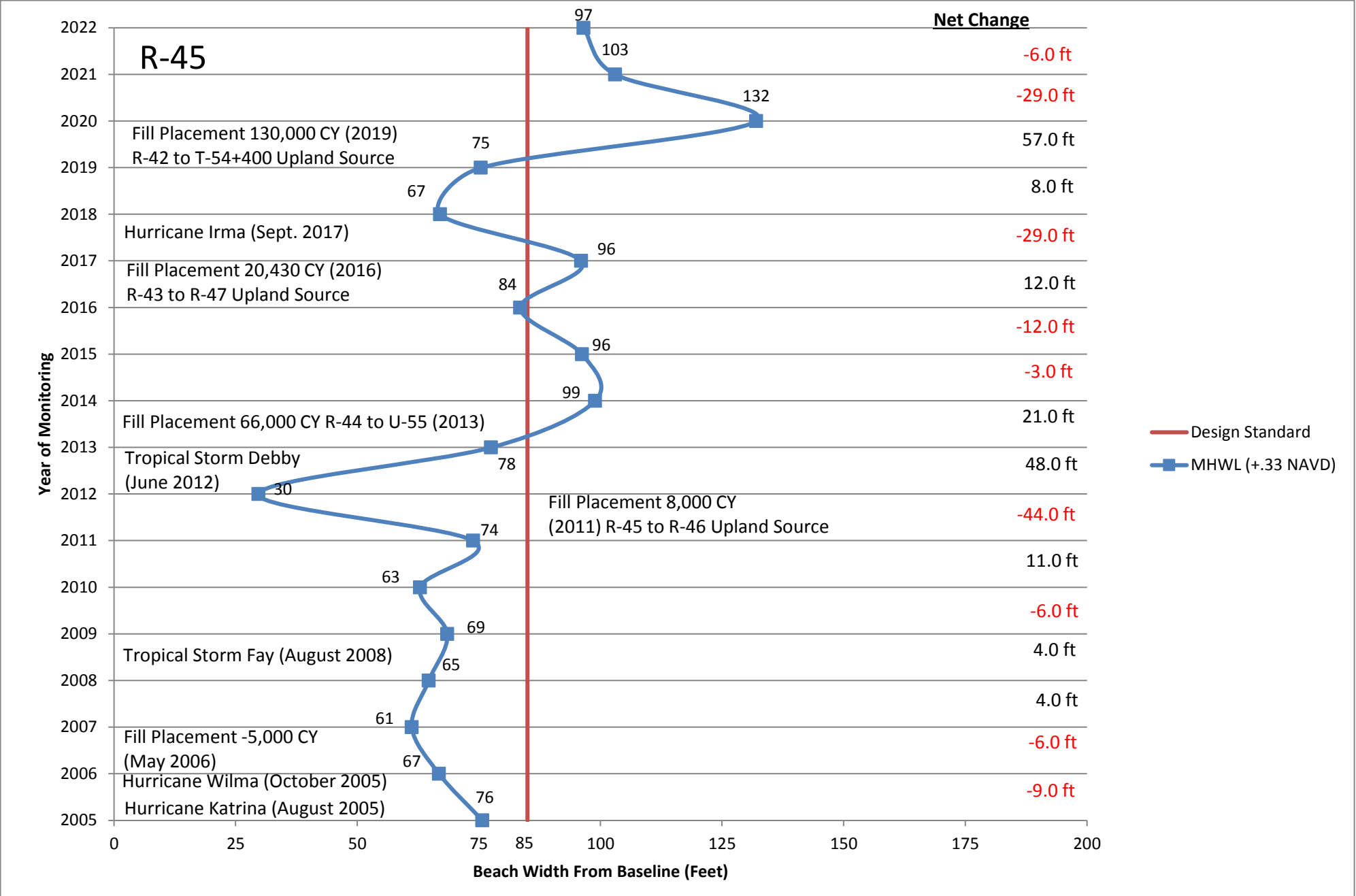
R-44

	2005 Beach Width=	74			
2006	Beginning Width=	74	2014	Beginning Width=	60
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	10		Annual Accretion=	16
	End Beach Width=	84		End Beach Width=	76
2007	Beginning Width=	84	2015	Beginning Width=	76
	Annual Erosion=	-20		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	64		End Beach Width=	80
2008	Beginning Width=	64	2016	Beginning Width=	80
	Annual Erosion=			Annual Erosion=	-10
	Annual Accretion=	3		Annual Accretion=	
	End Beach Width=	67		End Beach Width=	70
2009	Beginning Width=	67	2017	Beginning Width=	70
	Annual Erosion=	-2		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	5
	End Beach Width=	65		End Beach Width=	75
2010	Beginning Width=	65	2018	Beginning Width=	75
	Annual Erosion=	-2		Annual Erosion=	-16
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	63		End Beach Width=	59
2011	Beginning Width=	63	2019	Beginning Width=	59
	Annual Erosion=	-1		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	5
	End Beach Width=	62		End Beach Width=	64
2012	Beginning Width=	62	2020	Beginning Width=	64
	Annual Erosion=	-27		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	27
	End Beach Width=	35		End Beach Width=	91
2013	Beginning Width=	35	2021	Beginning Width=	91
	Annual Erosion=			Annual Erosion=	-6
	Annual Accretion=	25		Annual Accretion=	
	End Beach Width=	60		End Beach Width=	85
			2022	Beginning Width=	85
				Annual Erosion=	
				Annual Accretion=	10
				End Beach Width=	95



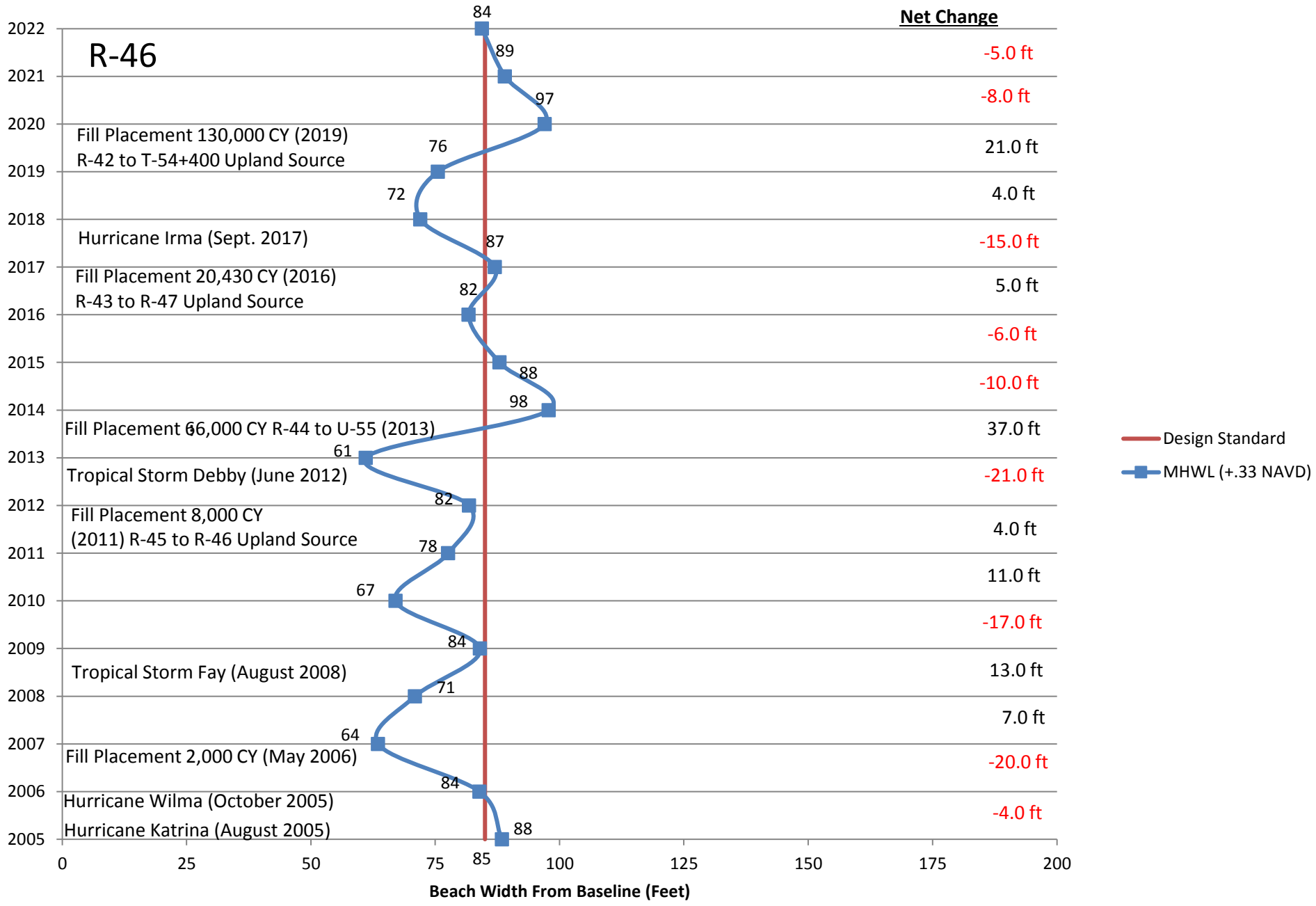
R-45

	2005 Beach Width=	76			
2006	Beginning Width=	76	2014	Beginning Width=	78
	Annual Erosion=	-9		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	21
	End Beach Width=	67		End Beach Width=	99
2007	Beginning Width=	67	2015	Beginning Width=	99
	Annual Erosion=	-6		Annual Erosion=	-3
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	61		End Beach Width=	96
2008	Beginning Width=	61	2016	Beginning Width=	96
	Annual Erosion=			Annual Erosion=	-12
	Annual Accretion=	4		Annual Accretion=	
	End Beach Width=	65		End Beach Width=	84
2009	Beginning Width=	65	2017	Beginning Width=	84
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	4		Annual Accretion=	12
	End Beach Width=	69		End Beach Width=	96
2010	Beginning Width=	69	2018	Beginning Width=	96
	Annual Erosion=	-6		Annual Erosion=	-29
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	63		End Beach Width=	67
2011	Beginning Width=	63	2019	Beginning Width=	67
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	11		Annual Accretion=	8
	End Beach Width=	74		End Beach Width=	75
2012	Beginning Width=	74	2020	Beginning Width=	75
	Annual Erosion=	-44		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	57
	End Beach Width=	30		End Beach Width=	132
2013	Beginning Width=	30	2021	Beginning Width=	132
	Annual Erosion=			Annual Erosion=	-29
	Annual Accretion=	48		Annual Accretion=	
	End Beach Width=	78		End Beach Width=	103
			2022	Beginning Width=	103
				Annual Erosion=	-7
				Annual Accretion=	
				End Beach Width=	96



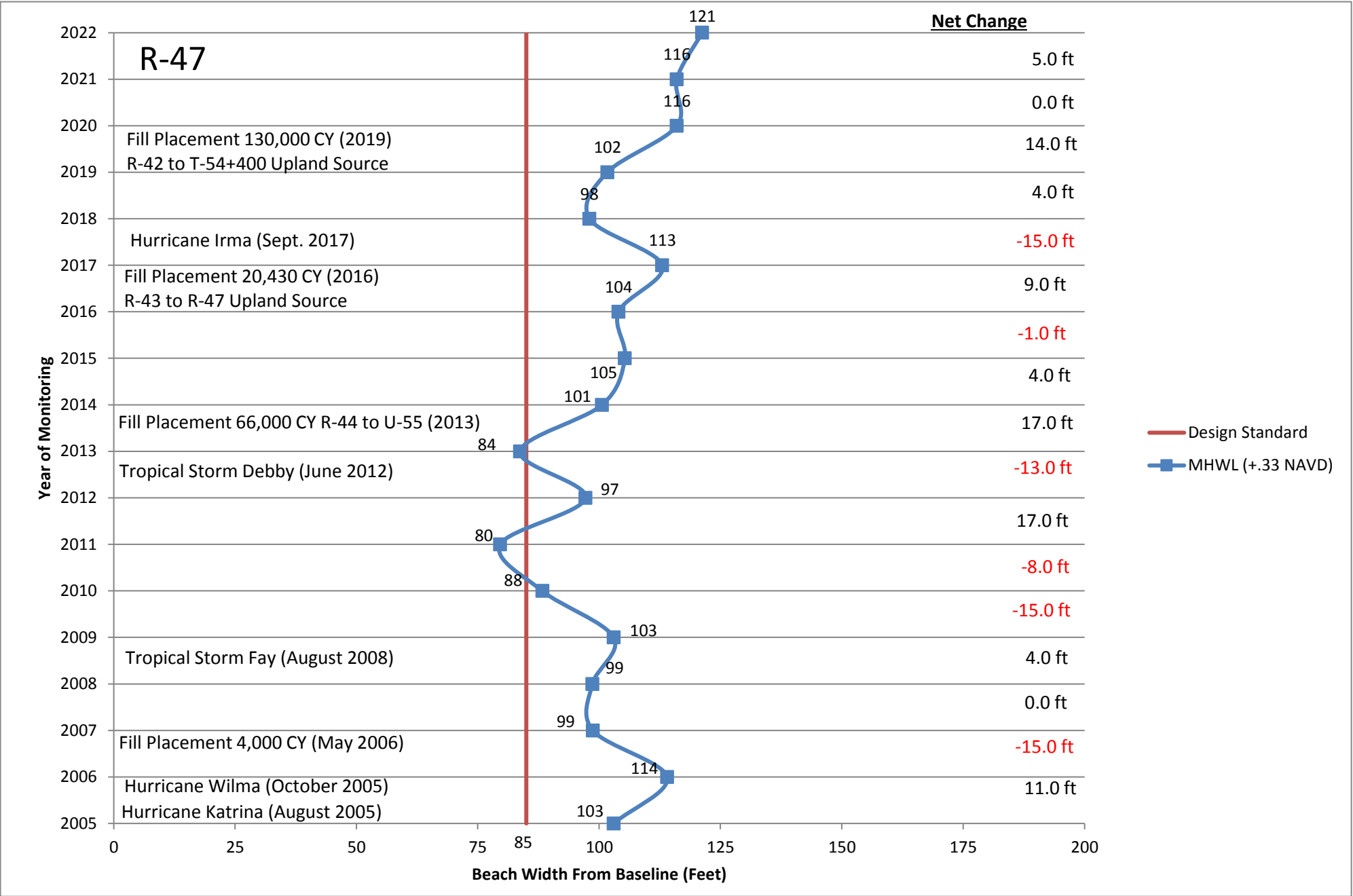
R-46

	2005 Beach Width=	88			
2006	Beginning Width=	88	2014	Beginning Width=	61
	Annual Erosion=	-4		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	37
	End Beach Width=	84		End Beach Width=	98
2007	Beginning Width=	84	2015	Beginning Width=	98
	Annual Erosion=	-20		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	64		End Beach Width=	88
2008	Beginning Width=	64	2016	Beginning Width=	88
	Annual Erosion=			Annual Erosion=	-6
	Annual Accretion=	7		Annual Accretion=	
	End Beach Width=	71		End Beach Width=	82
2009	Beginning Width=	71	2017	Beginning Width=	82
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	13		Annual Accretion=	5
	End Beach Width=	84		End Beach Width=	87
2010	Beginning Width=	84	2018	Beginning Width=	87
	Annual Erosion=	-17		Annual Erosion=	-15
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	67		End Beach Width=	72
2011	Beginning Width=	67	2019	Beginning Width=	72
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	11		Annual Accretion=	4
	End Beach Width=	78		End Beach Width=	76
2012	Beginning Width=	78	2020	Beginning Width=	76
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	4		Annual Accretion=	21
	End Beach Width=	82		End Beach Width=	97
2013	Beginning Width=	82	2021	Beginning Width=	97
	Annual Erosion=	-21		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	61		End Beach Width=	89
			2022	Beginning Width=	89
				Annual Erosion=	-5
				Annual Accretion=	
				End Beach Width=	84



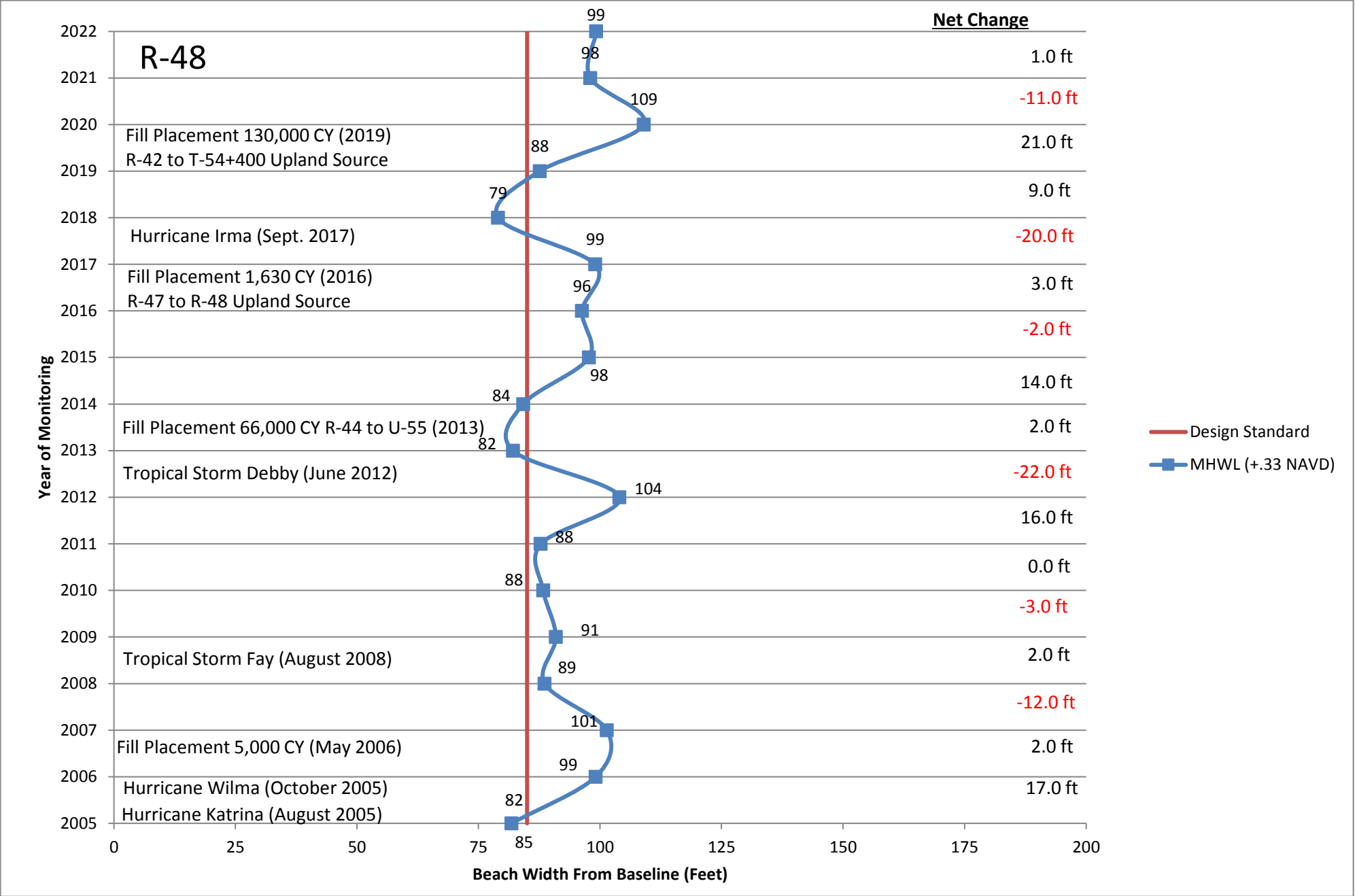
R-47

	2005 Beach Width=	103			
2006	Beginning Width=	103	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	84
	Annual Accretion=	11		Annual Accretion=	17
	End Beach Width=	114		End Beach Width=	
2007	Beginning Width=	114	2015	Beginning Width=	
	Annual Erosion=	-15		Annual Erosion=	101
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	99		End Beach Width=	
2008	Beginning Width=	99	2016	Beginning Width=	
	Annual Erosion=			Annual Erosion=	105
	Annual Accretion=			Annual Accretion=	-1
	End Beach Width=	99		End Beach Width=	
2009	Beginning Width=	99	2017	Beginning Width=	
	Annual Erosion=			Annual Erosion=	104
	Annual Accretion=	4		Annual Accretion=	9
	End Beach Width=	103		End Beach Width=	
2010	Beginning Width=	103	2018	Beginning Width=	
	Annual Erosion=	-15		Annual Erosion=	113
	Annual Accretion=			Annual Accretion=	-15
	End Beach Width=	88		End Beach Width=	
2011	Beginning Width=	88	2019	Beginning Width=	
	Annual Erosion=	-8		Annual Erosion=	98
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	80		End Beach Width=	
2012	Beginning Width=	80	2020	Beginning Width=	
	Annual Erosion=			Annual Erosion=	102
	Annual Accretion=	17		Annual Accretion=	14
	End Beach Width=	97		End Beach Width=	
2013	Beginning Width=	97	2021	Beginning Width=	
	Annual Erosion=	-13		Annual Erosion=	116
	Annual Accretion=			Annual Accretion=	0
	End Beach Width=	84		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	116
				Annual Accretion=	5
				End Beach Width=	
				121	



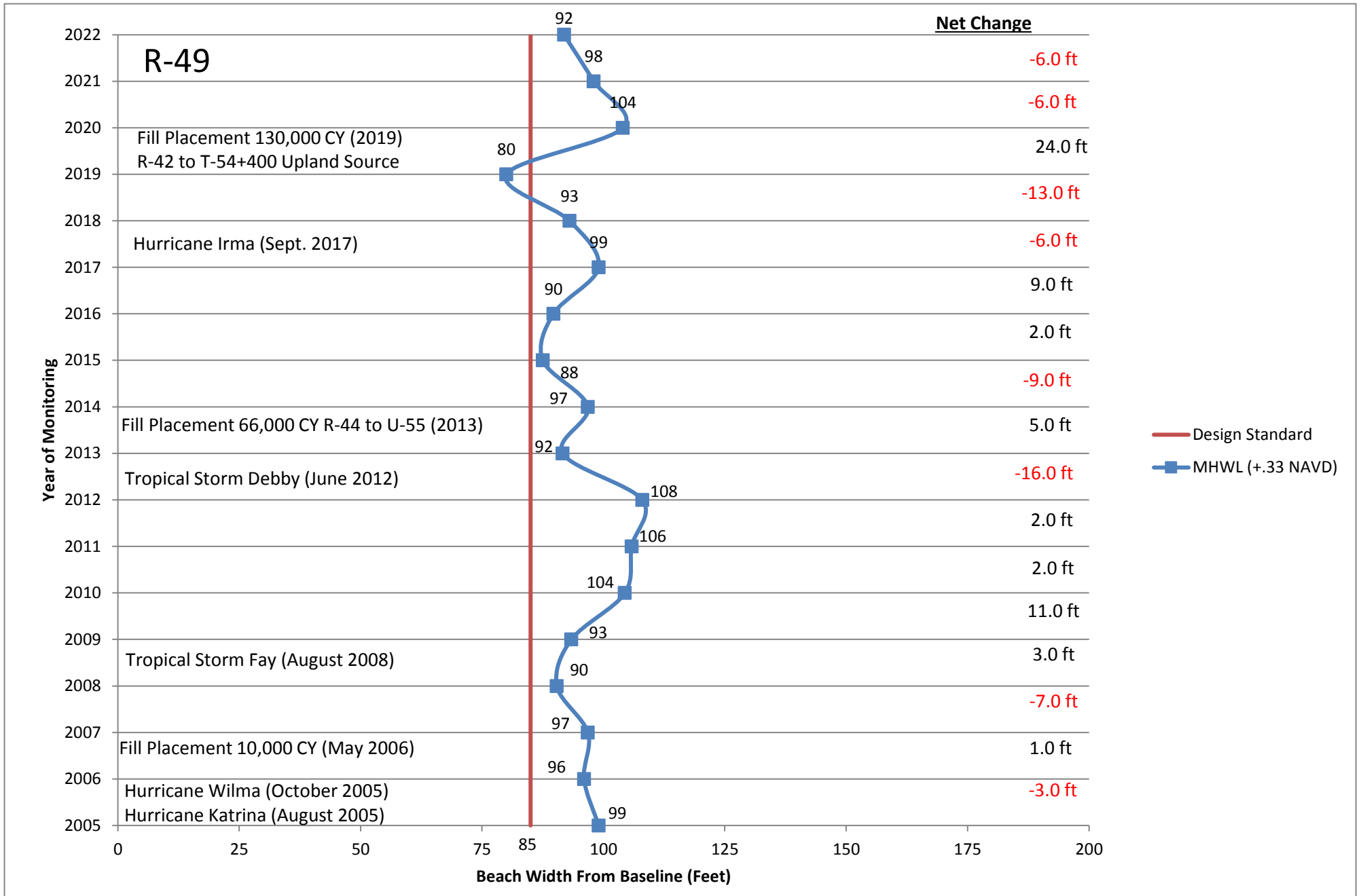
R-48

	2005 Beach Width=	82			
2006	Beginning Width=	82	2014	Beginning Width=	82
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	17		Annual Accretion=	2
	End Beach Width=	99		End Beach Width=	84
2007	Beginning Width=	99	2015	Beginning Width=	84
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	2		Annual Accretion=	14
	End Beach Width=	101		End Beach Width=	98
2008	Beginning Width=	101	2016	Beginning Width=	98
	Annual Erosion=	-12		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	89		End Beach Width=	96
2009	Beginning Width=	89	2017	Beginning Width=	96
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	2		Annual Accretion=	3
	End Beach Width=	91		End Beach Width=	99
2010	Beginning Width=	91	2018	Beginning Width=	99
	Annual Erosion=	-3		Annual Erosion=	-20
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	88		End Beach Width=	79
2011	Beginning Width=	88	2019	Beginning Width=	79
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=			Annual Accretion=	9
	End Beach Width=	88		End Beach Width=	88
2012	Beginning Width=	88	2020	Beginning Width=	88
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	16		Annual Accretion=	21
	End Beach Width=	104		End Beach Width=	109
2013	Beginning Width=	104	2021	Beginning Width=	109
	Annual Erosion=	-22		Annual Erosion=	-11
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	82		End Beach Width=	98
			2022	Beginning Width=	98
				Annual Erosion=	
				Annual Accretion=	1
				End Beach Width=	99



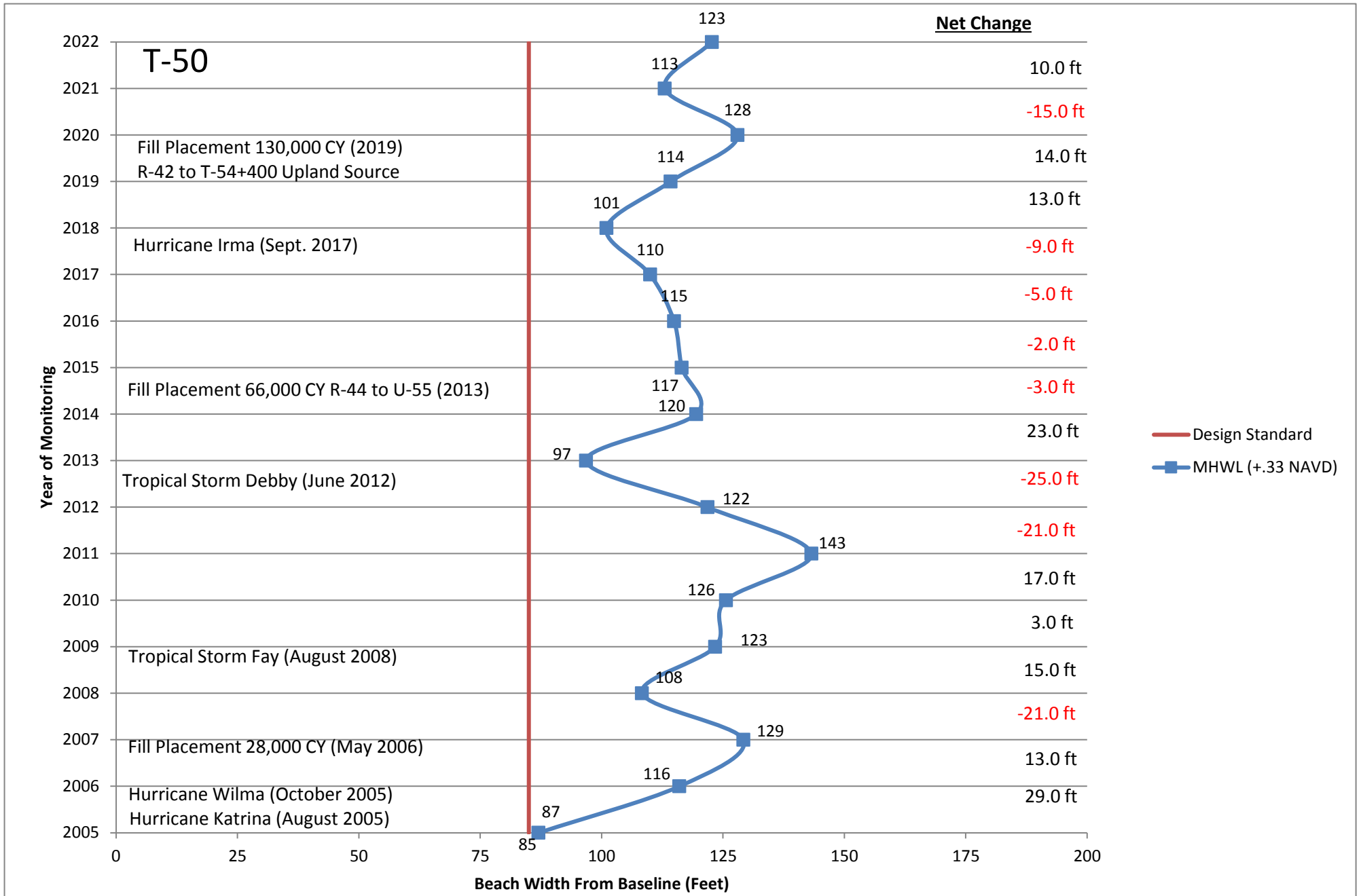
R-49

	2005 Beach Width=	99			
2006	Beginning Width=	99	2014	Beginning Width=	92
	Annual Erosion=	-3		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	5
	End Beach Width=	96		End Beach Width=	97
2007	Beginning Width=	96	2015	Beginning Width=	97
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	97		End Beach Width=	88
2008	Beginning Width=	97	2016	Beginning Width=	88
	Annual Erosion=	-7		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	2
	End Beach Width=	90		End Beach Width=	90
2009	Beginning Width=	90	2017	Beginning Width=	90
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	3		Annual Accretion=	9
	End Beach Width=	93		End Beach Width=	99
2010	Beginning Width=	93	2018	Beginning Width=	99
	Annual Erosion=			Annual Erosion=	-6
	Annual Accretion=	11		Annual Accretion=	
	End Beach Width=	104		End Beach Width=	93
2011	Beginning Width=	104	2019	Beginning Width=	93
	Annual Erosion=			Annual Erosion=	-13
	Annual Accretion=	2		Annual Accretion=	
	End Beach Width=	106		End Beach Width=	80
2012	Beginning Width=	106	2020	Beginning Width=	80
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	2		Annual Accretion=	24
	End Beach Width=	108		End Beach Width=	104
2013	Beginning Width=	108	2021	Beginning Width=	104
	Annual Erosion=	-16		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	92		End Beach Width=	98
			2022	Beginning Width=	98
				Annual Erosion=	-6
				Annual Accretion=	
				End Beach Width=	92



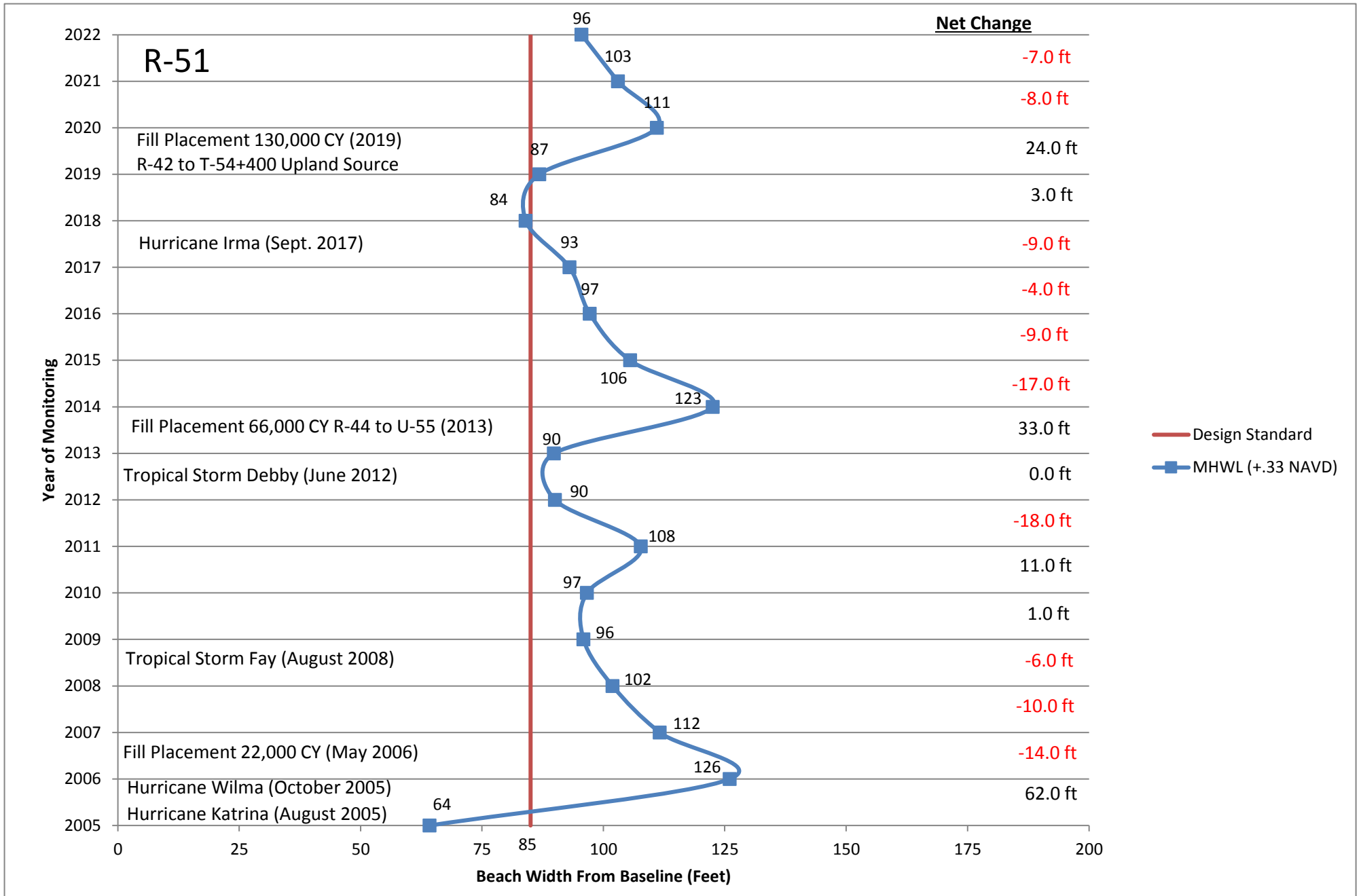
T-50

	2005 Beach Width=	87			
2006	Beginning Width=	87	2014	Beginning Width=	97
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	29		Annual Accretion=	23
	End Beach Width=	116		End Beach Width=	120
2007	Beginning Width=	116	2015	Beginning Width=	120
	Annual Erosion=			Annual Erosion=	-3
	Annual Accretion=	13		Annual Accretion=	
	End Beach Width=	129		End Beach Width=	117
2008	Beginning Width=	129	2016	Beginning Width=	117
	Annual Erosion=	-21		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	108		End Beach Width=	115
2009	Beginning Width=	108	2017	Beginning Width=	115
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	15		Annual Accretion=	
	End Beach Width=	123		End Beach Width=	110
2010	Beginning Width=	123	2018	Beginning Width=	110
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	3		Annual Accretion=	
	End Beach Width=	126		End Beach Width=	101
2011	Beginning Width=	126	2019	Beginning Width=	101
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	17		Annual Accretion=	13
	End Beach Width=	143		End Beach Width=	114
2012	Beginning Width=	143	2020	Beginning Width=	114
	Annual Erosion=	-21		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	14
	End Beach Width=	122		End Beach Width=	128
2013	Beginning Width=	122	2021	Beginning Width=	128
	Annual Erosion=	-25		Annual Erosion=	-15
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	97		End Beach Width=	113
			2022	Beginning Width=	113
				Annual Erosion=	
				Annual Accretion=	10
				End Beach Width=	123



R-51

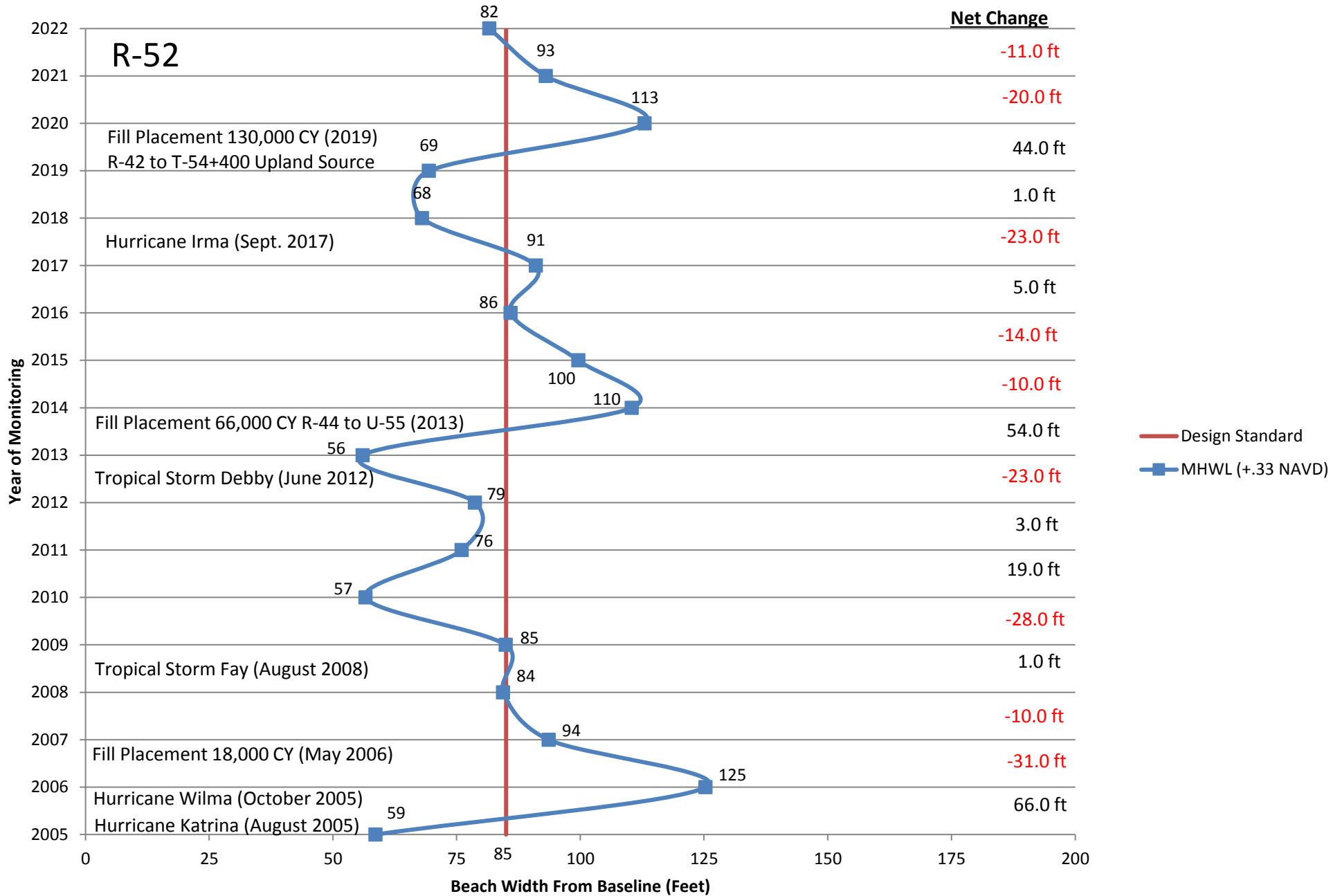
	2005 Beach Width=	64			
2006	Beginning Width=	64	2014	Beginning Width=	90
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	62		Annual Accretion=	33
	End Beach Width=	126		End Beach Width=	123
2007	Beginning Width=	126	2015	Beginning Width=	123
	Annual Erosion=	-14		Annual Erosion=	-17
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	112		End Beach Width=	106
2008	Beginning Width=	112	2016	Beginning Width=	106
	Annual Erosion=	-10		Annual Erosion=	-9
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	102		End Beach Width=	97
2009	Beginning Width=	102	2017	Beginning Width=	97
	Annual Erosion=	-6		Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	96		End Beach Width=	93
2010	Beginning Width=	96	2018	Beginning Width=	93
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	97		End Beach Width=	84
2011	Beginning Width=	97	2019	Beginning Width=	84
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	11		Annual Accretion=	3
	End Beach Width=	108		End Beach Width=	87
2012	Beginning Width=	108	2020	Beginning Width=	87
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	-18		Annual Accretion=	24
	End Beach Width=	90		End Beach Width=	111
2013	Beginning Width=	90	2021	Beginning Width=	111
	Annual Erosion=			Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	90		End Beach Width=	103
			2022	Beginning Width=	103
				Annual Erosion=	-8
				Annual Accretion=	
				End Beach Width=	95



R-52

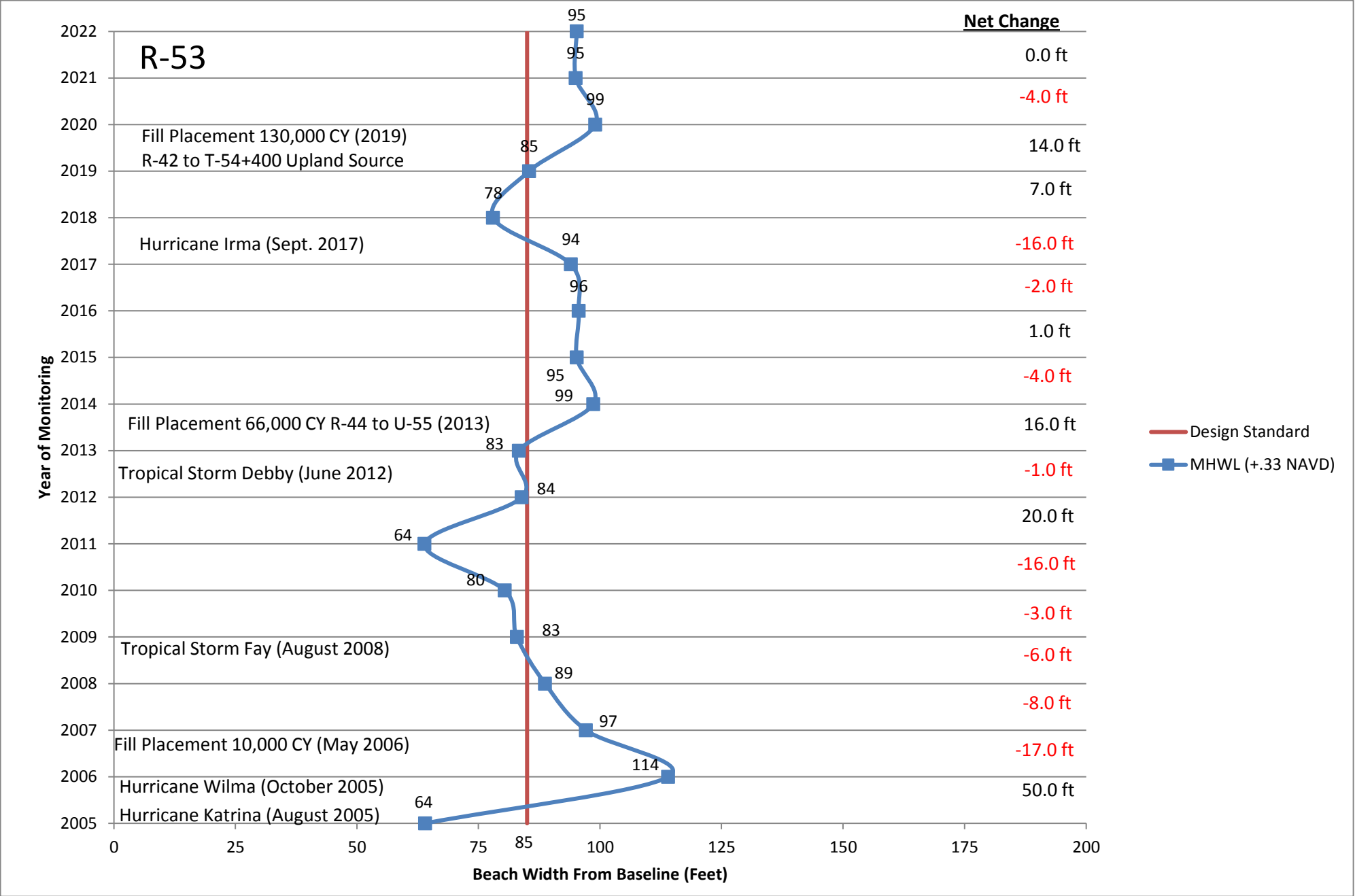
	2005 Beach Width=	59			
2006	Beginning Width=	59	2014	Beginning Width=	56
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	66		Annual Accretion=	54
	End Beach Width=	125		End Beach Width=	110
2007	Beginning Width=	125	2015	Beginning Width=	110
	Annual Erosion=	-31		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	94		End Beach Width=	100
2008	Beginning Width=	94	2016	Beginning Width=	100
	Annual Erosion=	-10		Annual Erosion=	-14
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	84		End Beach Width=	86
2009	Beginning Width=	84	2017	Beginning Width=	86
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	1		Annual Accretion=	5
	End Beach Width=	85		End Beach Width=	91
2010	Beginning Width=	85	2018	Beginning Width=	91
	Annual Erosion=	-28		Annual Erosion=	-23
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	57		End Beach Width=	68
2011	Beginning Width=	57	2019	Beginning Width=	68
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	19		Annual Accretion=	1
	End Beach Width=	76		End Beach Width=	69
2012	Beginning Width=	76	2020	Beginning Width=	69
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	3		Annual Accretion=	44
	End Beach Width=	79		End Beach Width=	113
2013	Beginning Width=	79	2021	Beginning Width=	113
	Annual Erosion=	-23		Annual Erosion=	-20
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	56		End Beach Width=	93
			2022	Beginning Width=	93
				Annual Erosion=	-11
				Annual Accretion=	
				End Beach Width=	82

R-52



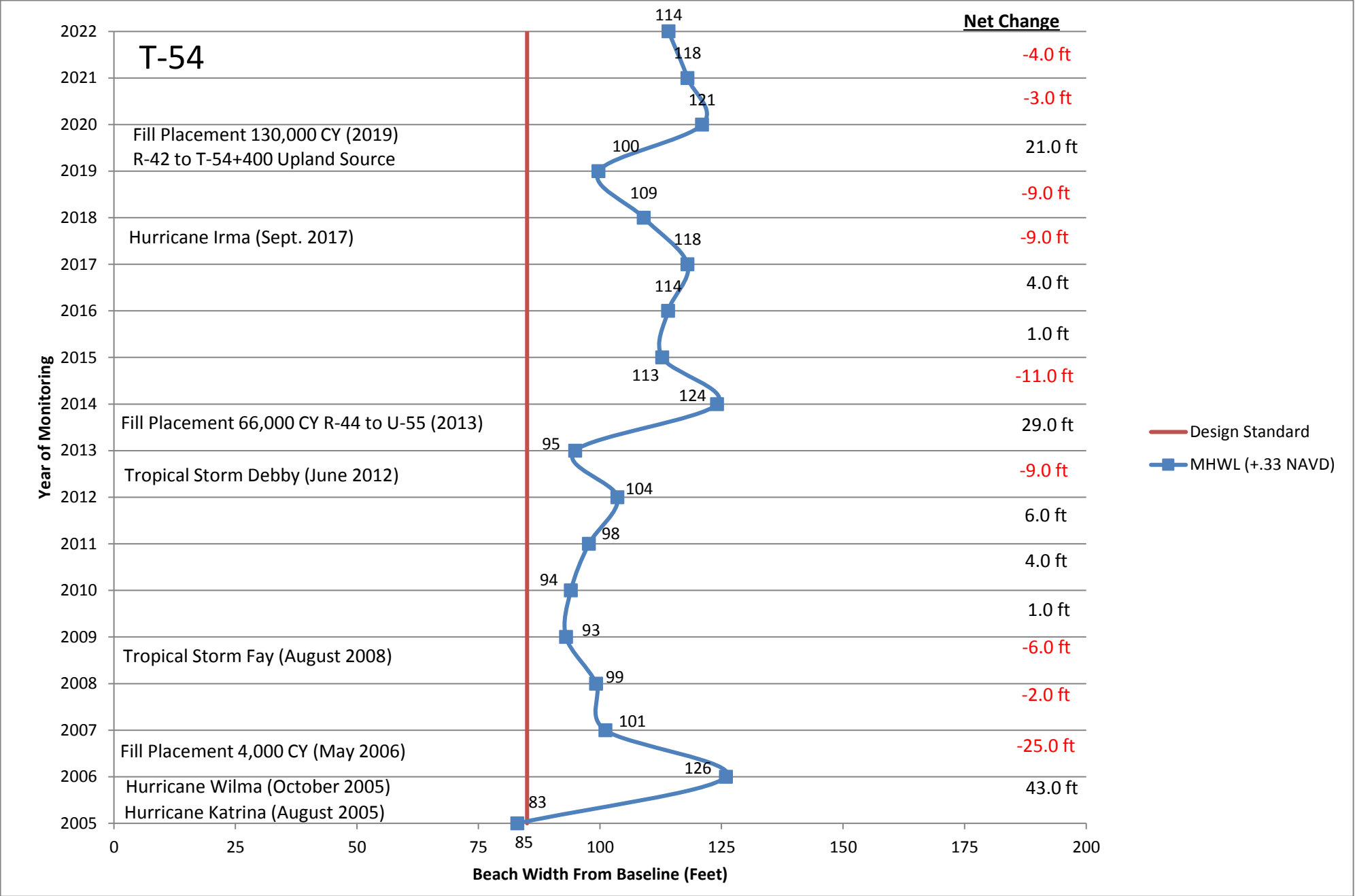
R-53

	2005 Beach Width=	64			
2006	Beginning Width=	64	2014	Beginning Width=	83
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	50		Annual Accretion=	16
	End Beach Width=	114		End Beach Width=	99
2007	Beginning Width=	114	2015	Beginning Width=	99
	Annual Erosion=	-17		Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	97		End Beach Width=	95
2008	Beginning Width=	97	2016	Beginning Width=	95
	Annual Erosion=	-8		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	89		End Beach Width=	96
2009	Beginning Width=	89	2017	Beginning Width=	96
	Annual Erosion=	-6		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	83		End Beach Width=	94
2010	Beginning Width=	83	2018	Beginning Width=	94
	Annual Erosion=	-3		Annual Erosion=	-16
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	80		End Beach Width=	78
2011	Beginning Width=	80	2019	Beginning Width=	78
	Annual Erosion=	-16		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	7
	End Beach Width=	64		End Beach Width=	85
2012	Beginning Width=	64	2020	Beginning Width=	85
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	20		Annual Accretion=	14
	End Beach Width=	84		End Beach Width=	99
2013	Beginning Width=	84	2021	Beginning Width=	99
	Annual Erosion=	-1		Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	83		End Beach Width=	95
			2022	Beginning Width=	95
				Annual Erosion=	0
				Annual Accretion=	
				End Beach Width=	95



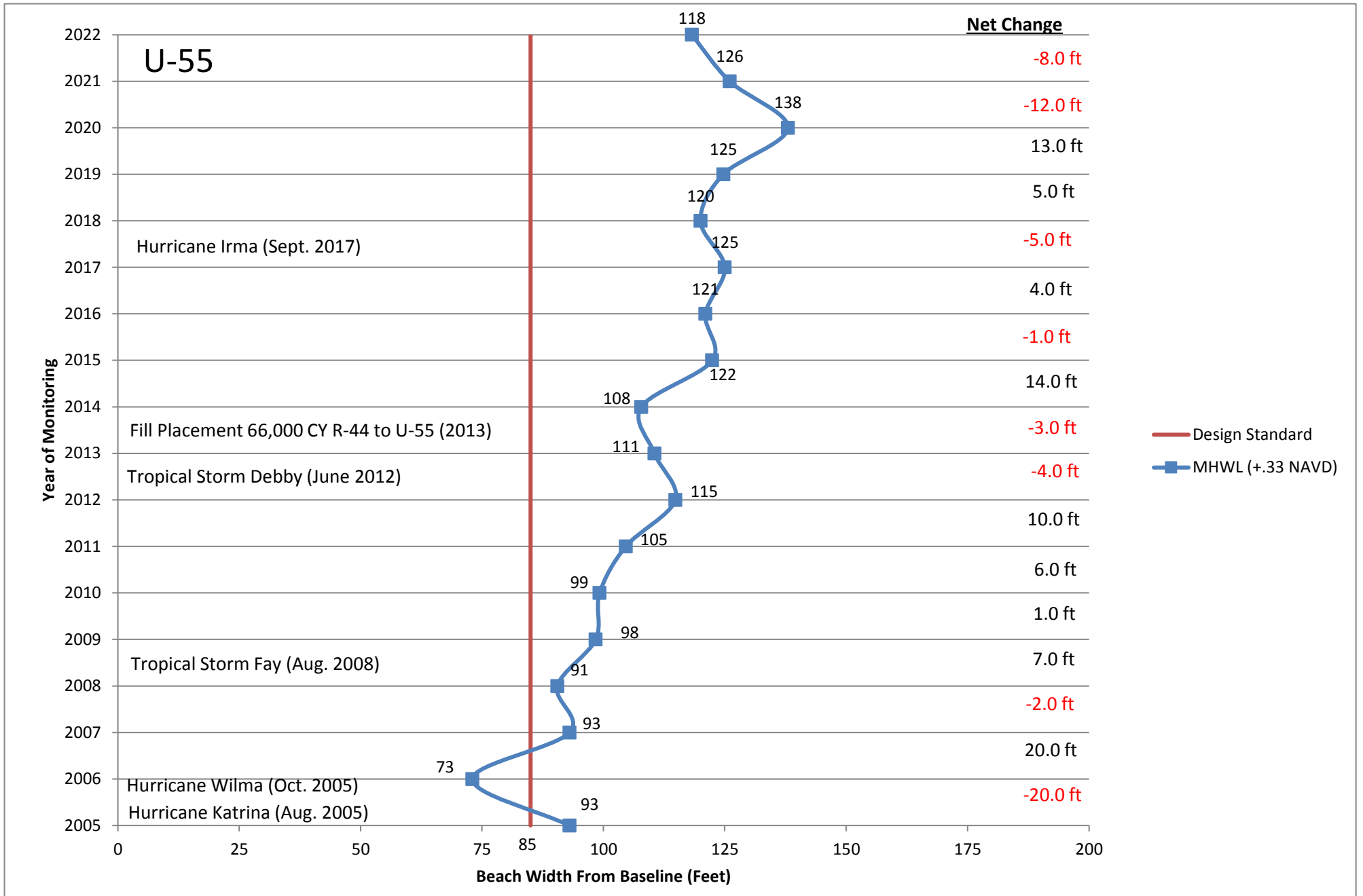
T-54

	2005 Beach Width=	83			
2006	Beginning Width=	83	2014	Beginning Width=	95
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	43		Annual Accretion=	29
	End Beach Width=	126		End Beach Width=	124
2007	Beginning Width=	126	2015	Beginning Width=	124
	Annual Erosion=	-25		Annual Erosion=	-11
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	101		End Beach Width=	113
2008	Beginning Width=	101	2016	Beginning Width=	113
	Annual Erosion=	-2		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	99		End Beach Width=	114
2009	Beginning Width=	99	2017	Beginning Width=	114
	Annual Erosion=	-6		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	93		End Beach Width=	118
2010	Beginning Width=	93	2018	Beginning Width=	118
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	94		End Beach Width=	109
2011	Beginning Width=	94	2019	Beginning Width=	109
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	4		Annual Accretion=	
	End Beach Width=	98		End Beach Width=	100
2012	Beginning Width=	98	2020	Beginning Width=	100
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	6		Annual Accretion=	21
	End Beach Width=	104		End Beach Width=	121
2013	Beginning Width=	104	2021	Beginning Width=	121
	Annual Erosion=	-9		Annual Erosion=	-3
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	95		End Beach Width=	118
			2022	Beginning Width=	118
				Annual Erosion=	-4
				Annual Accretion=	
				End Beach Width=	114



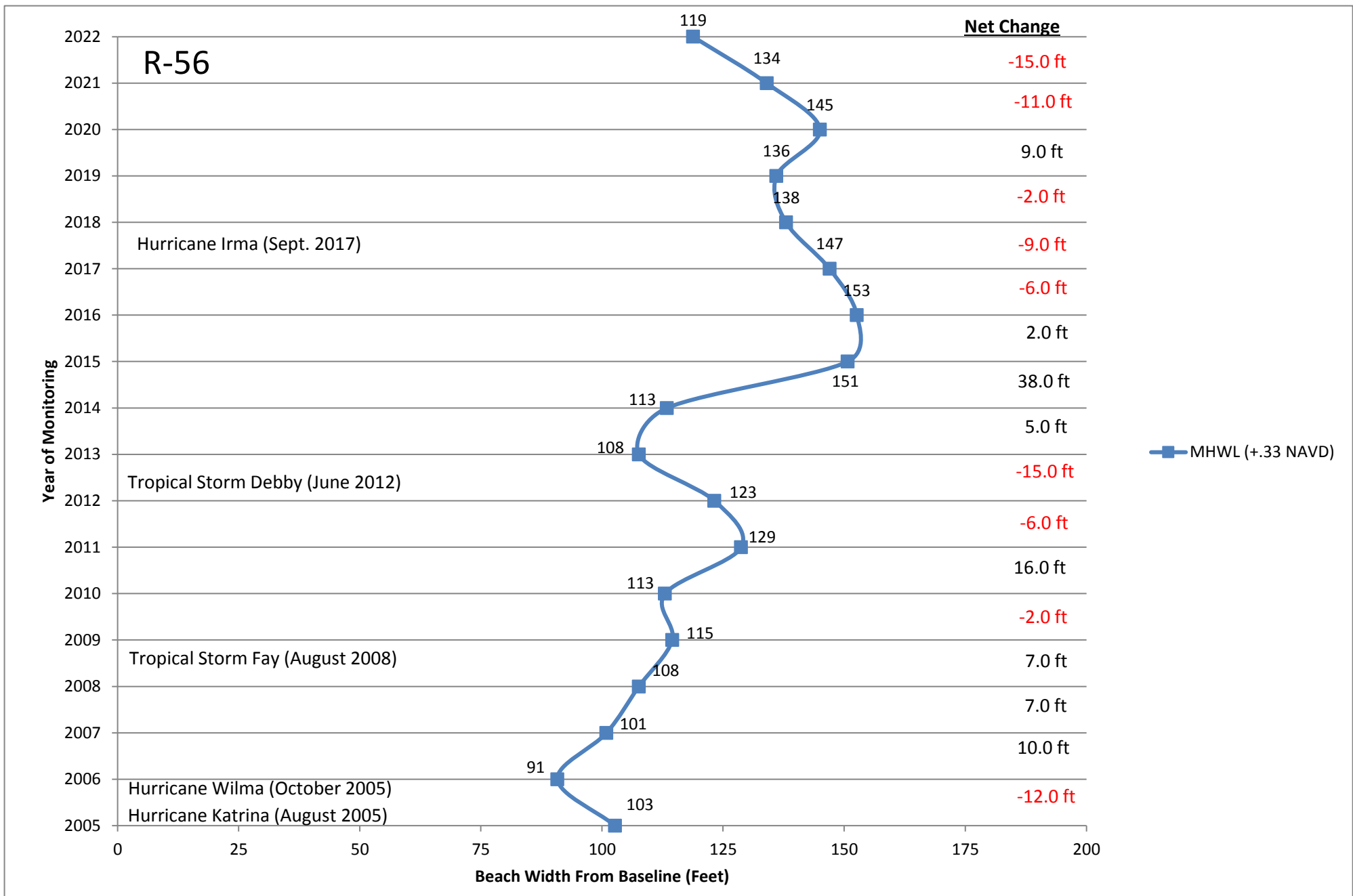
U-55

	2005 Beach Width=	93			
2006	Beginning Width=	93	2014	Beginning Width=	111
	Annual Erosion=	-20		Annual Erosion=	-3
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	73		End Beach Width=	108
2007	Beginning Width=	73	2015	Beginning Width=	108
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	20		Annual Accretion=	14
	End Beach Width=	93		End Beach Width=	122
2008	Beginning Width=	93	2016	Beginning Width=	122
	Annual Erosion=	-2		Annual Erosion=	-1
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	91		End Beach Width=	121
2009	Beginning Width=	91	2017	Beginning Width=	121
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	7		Annual Accretion=	4
	End Beach Width=	98		End Beach Width=	125
2010	Beginning Width=	98	2018	Beginning Width=	125
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	99		End Beach Width=	120
2011	Beginning Width=	99	2019	Beginning Width=	120
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	6		Annual Accretion=	5
	End Beach Width=	105		End Beach Width=	125
2012	Beginning Width=	105	2020	Beginning Width=	125
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	10		Annual Accretion=	13
	End Beach Width=	115		End Beach Width=	138
2013	Beginning Width=	115	2021	Beginning Width=	138
	Annual Erosion=	-4		Annual Erosion=	-12
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	111		End Beach Width=	126
			2022	Beginning Width=	126
				Annual Erosion=	-8
				Annual Accretion=	
				End Beach Width=	118



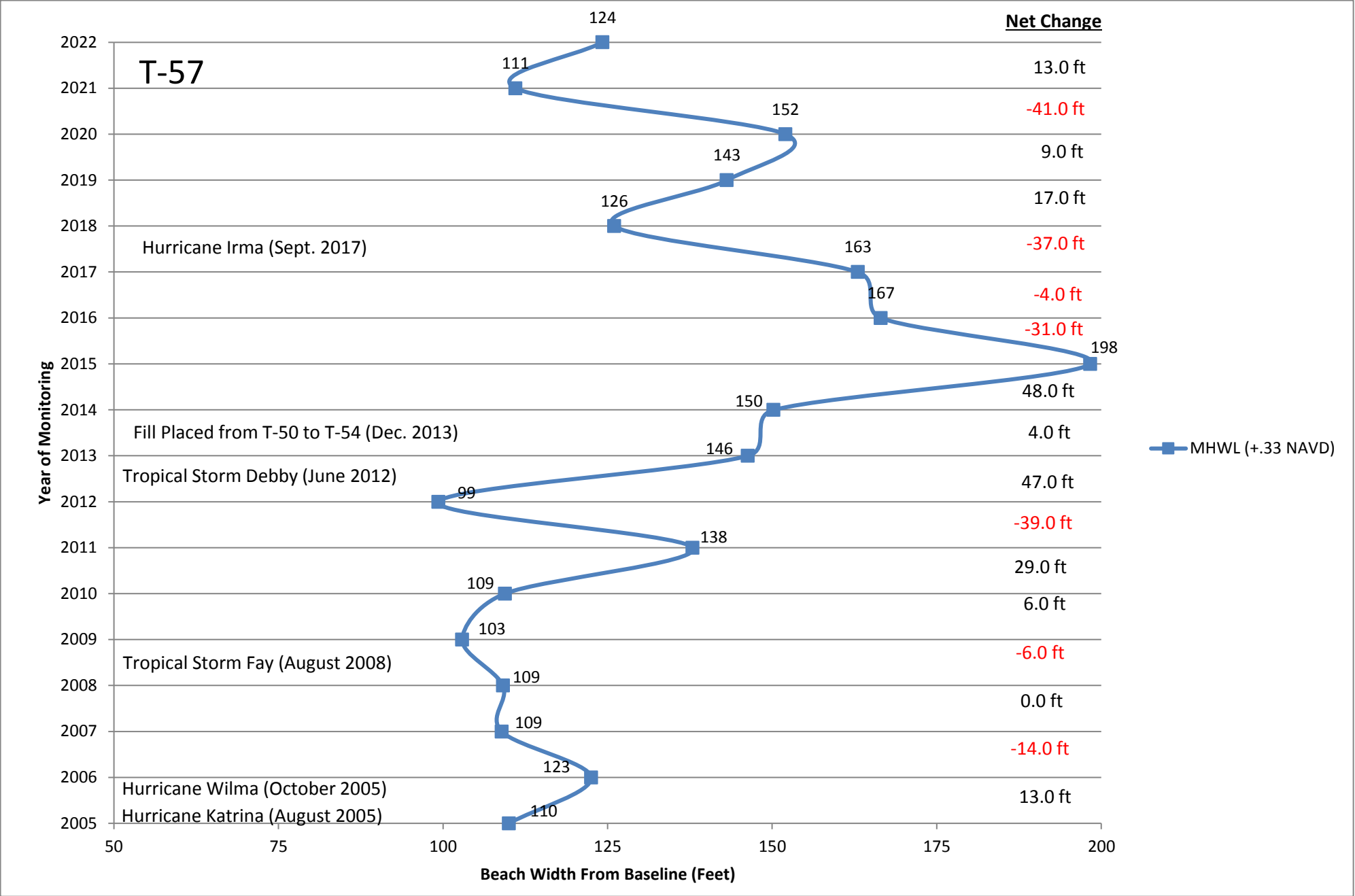
R-56

	2005 Beach Width=	103			
2006	Beginning Width=	103	2014	Beginning Width=	108
	Annual Erosion=	-12		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	5
	End Beach Width=	91		End Beach Width=	113
2007	Beginning Width=	91	2015	Beginning Width=	113
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	10		Annual Accretion=	38
	End Beach Width=	101		End Beach Width=	151
2008	Beginning Width=	101	2016	Beginning Width=	151
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	7		Annual Accretion=	2
	End Beach Width=	108		End Beach Width=	153
2009	Beginning Width=	108	2017	Beginning Width=	153
	Annual Erosion=			Annual Erosion=	-6
	Annual Accretion=	7		Annual Accretion=	
	End Beach Width=	115		End Beach Width=	147
2010	Beginning Width=	115	2018	Beginning Width=	147
	Annual Erosion=	-2		Annual Erosion=	-9
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	113		End Beach Width=	138
2011	Beginning Width=	113	2019	Beginning Width=	138
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=	16		Annual Accretion=	
	End Beach Width=	129		End Beach Width=	136
2012	Beginning Width=	129	2020	Beginning Width=	136
	Annual Erosion=	-6		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	9
	End Beach Width=	123		End Beach Width=	145
2013	Beginning Width=	123	2021	Beginning Width=	145
	Annual Erosion=	-15		Annual Erosion=	-11
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	108		End Beach Width=	134
			2022	Beginning Width=	134
				Annual Erosion=	-15
				Annual Accretion=	
				End Beach Width=	119



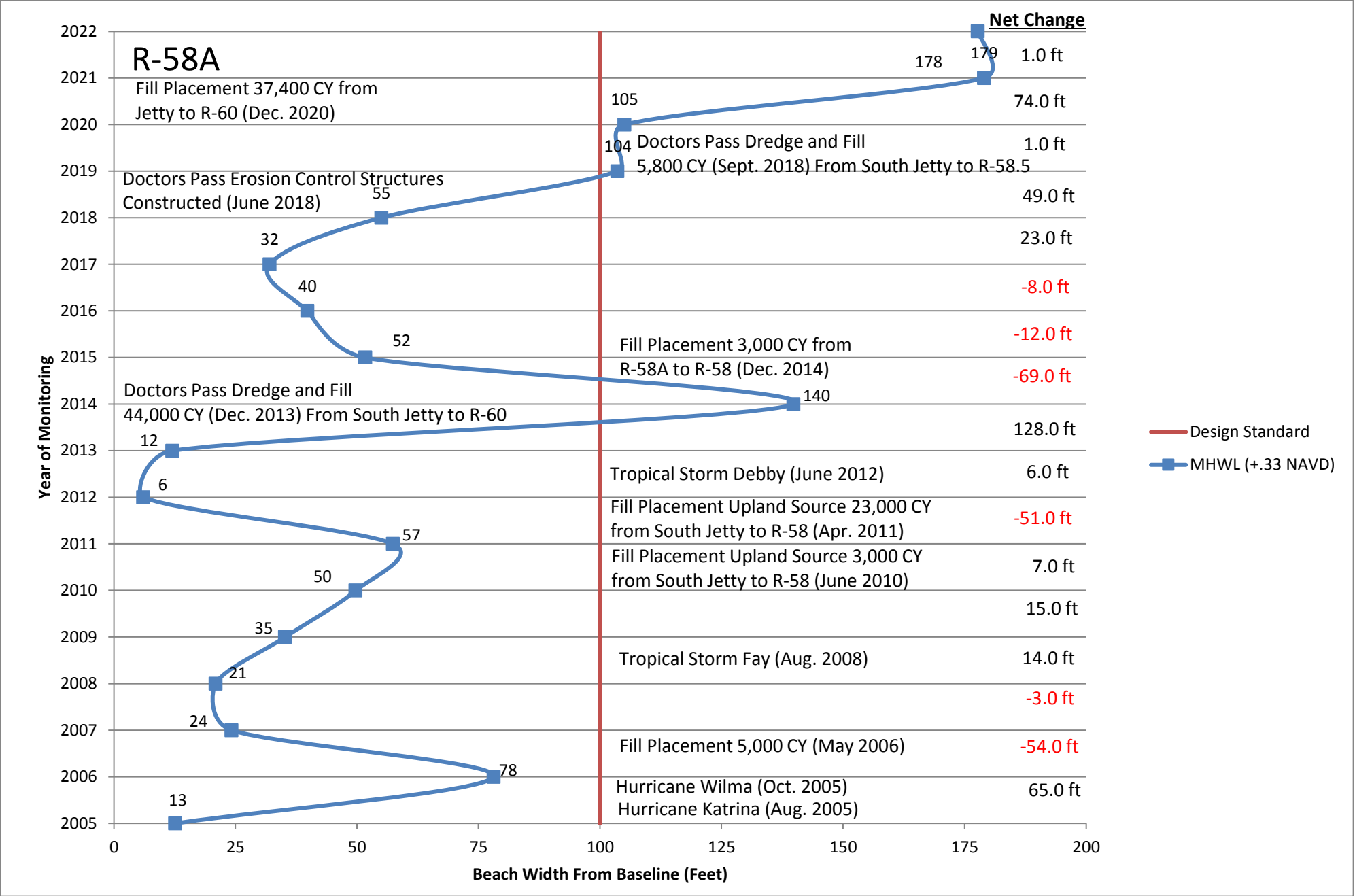
T-57

	2005 Beach Width=	110			
2006	Beginning Width=	110	2014	Beginning Width=	146
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	13		Annual Accretion=	4
	End Beach Width=	123		End Beach Width=	150
2007	Beginning Width=	123	2015	Beginning Width=	150
	Annual Erosion=	-14		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	48
	End Beach Width=	109		End Beach Width=	198
2008	Beginning Width=	109	2016	Beginning Width=	198
	Annual Erosion=			Annual Erosion=	-31
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	109		End Beach Width=	167
2009	Beginning Width=	109	2017	Beginning Width=	167
	Annual Erosion=	-6		Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	103		End Beach Width=	163
2010	Beginning Width=	103	2018	Beginning Width=	163
	Annual Erosion=			Annual Erosion=	-37
	Annual Accretion=	6		Annual Accretion=	
	End Beach Width=	109		End Beach Width=	126
2011	Beginning Width=	109	2019	Beginning Width=	126
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	29		Annual Accretion=	17
	End Beach Width=	138		End Beach Width=	143
2012	Beginning Width=	138	2020	Beginning Width=	143
	Annual Erosion=	-39		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	9
	End Beach Width=	99		End Beach Width=	152
2013	Beginning Width=	99	2021	Beginning Width=	152
	Annual Erosion=			Annual Erosion=	-41
	Annual Accretion=	47		Annual Accretion=	
	End Beach Width=	146		End Beach Width=	111
			2022	Beginning Width=	111
				Annual Erosion=	
				Annual Accretion=	13
				End Beach Width=	124



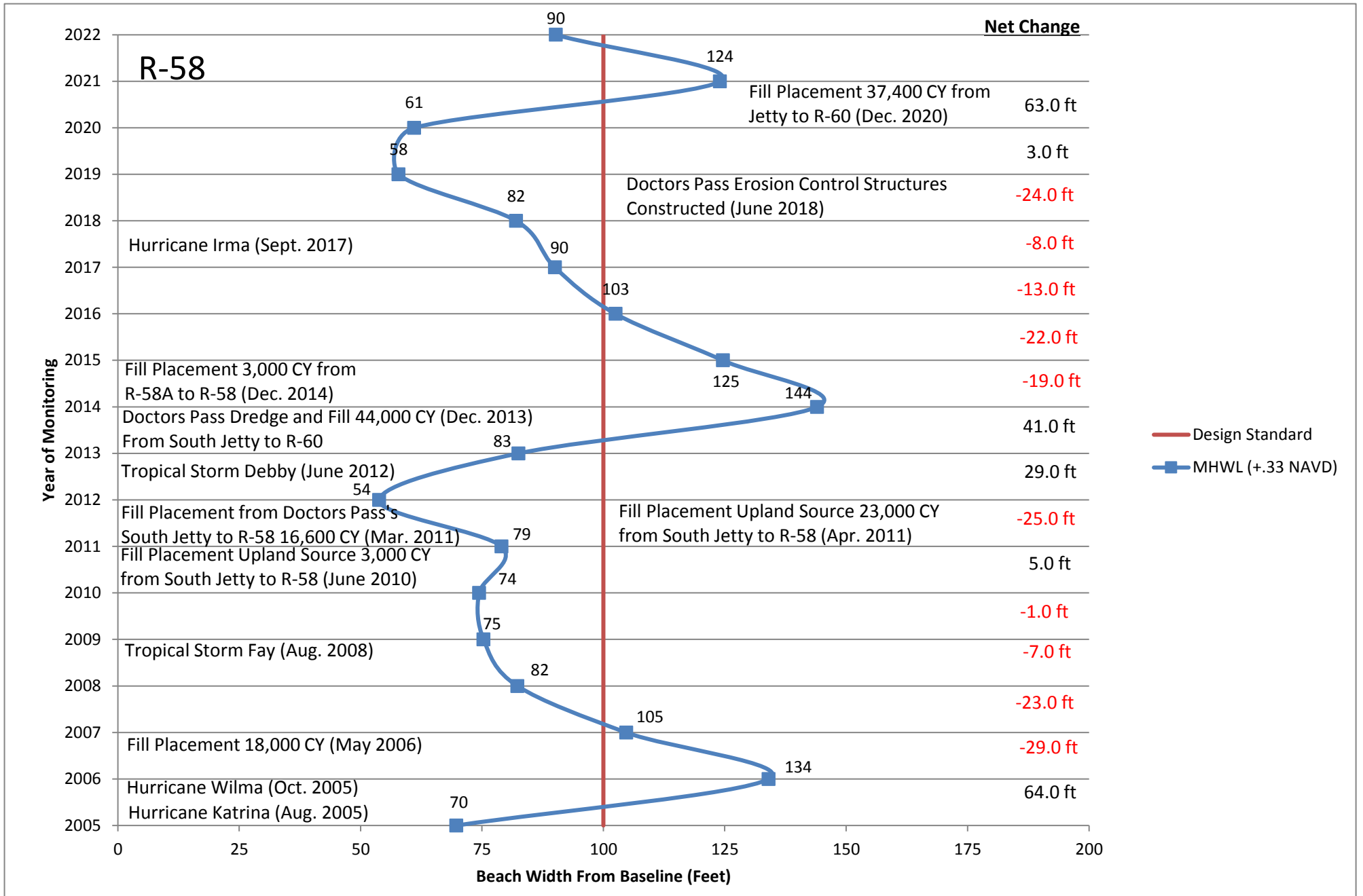
R-58A

	2005 Beach Width=	13			
2006	Beginning Width=	13	2014	Beginning Width=	12
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	65		Annual Accretion=	128
	End Beach Width=	78		End Beach Width=	140
2007	Beginning Width=	78	2015	Beginning Width=	140
	Annual Erosion=	-54		Annual Erosion=	-88
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	24		End Beach Width=	52
2008	Beginning Width=	24	2016	Beginning Width=	52
	Annual Erosion=	-3		Annual Erosion=	-12
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	21		End Beach Width=	40
2009	Beginning Width=	21	2017	Beginning Width=	40
	Annual Erosion=			Annual Erosion=	-8
	Annual Accretion=	14		Annual Accretion=	
	End Beach Width=	35		End Beach Width=	32
2010	Beginning Width=	35	2018	Beginning Width=	32
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	15		Annual Accretion=	23
	End Beach Width=	50		End Beach Width=	55
2011	Beginning Width=	50	2019	Beginning Width=	55
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	7		Annual Accretion=	49
	End Beach Width=	57		End Beach Width=	104
2012	Beginning Width=	57	2020	Beginning Width=	104
	Annual Erosion=	-51		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	6		End Beach Width=	105
2013	Beginning Width=	6	2021	Beginning Width=	105
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	6		Annual Accretion=	74
	End Beach Width=	12		End Beach Width=	179
			2022	Beginning Width=	179
				Annual Erosion=	
				Annual Accretion=	-1
				End Beach Width=	178



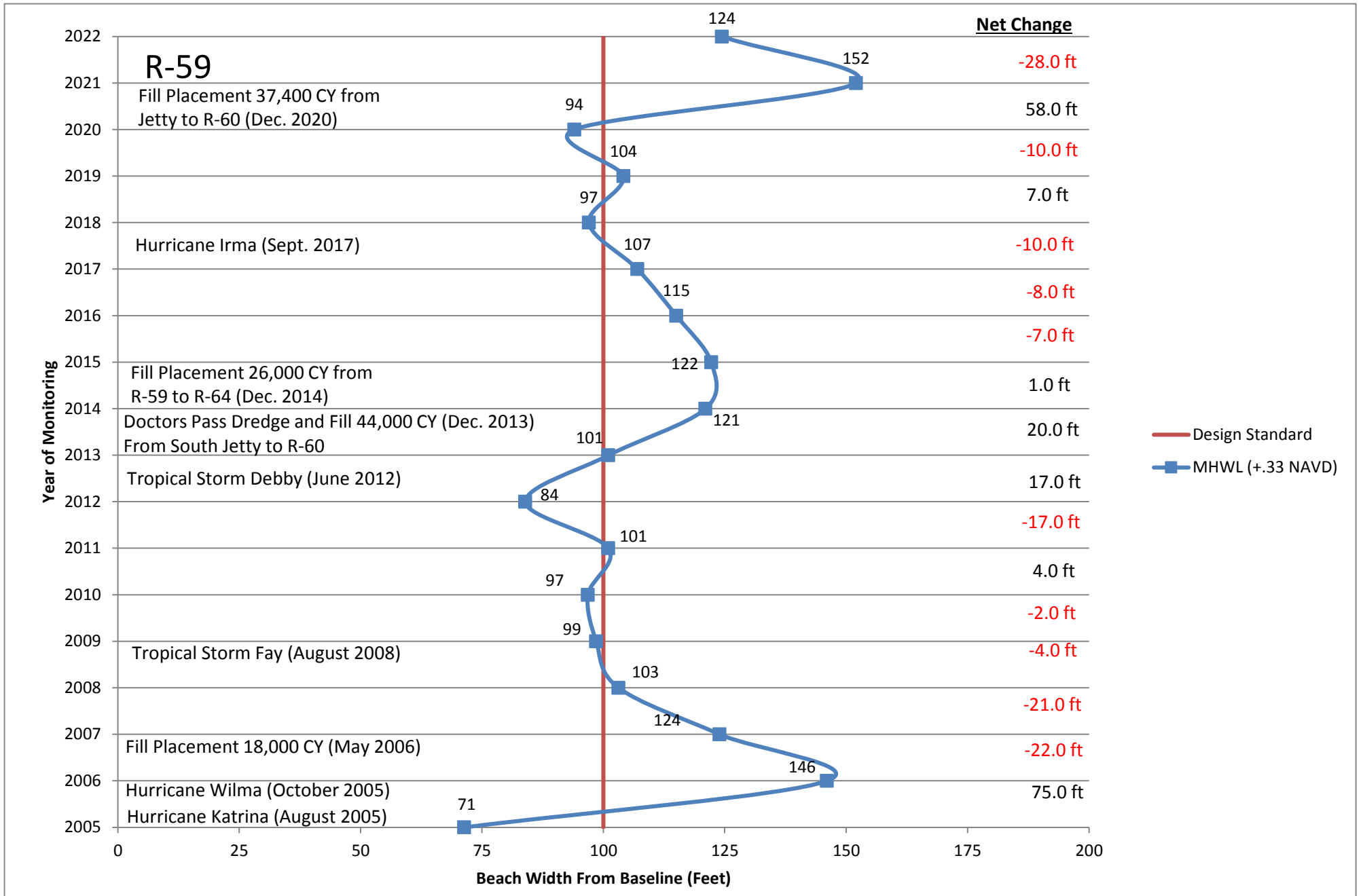
R-58

	2005 Beach Width=	70			
2006	Beginning Width=	70	2014	Beginning Width=	83
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	64		Annual Accretion=	41
	End Beach Width=	134		End Beach Width=	124
2007	Beginning Width=	134	2015	Beginning Width=	124
	Annual Erosion=	-29		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	105		End Beach Width=	125
2008	Beginning Width=	105	2016	Beginning Width=	125
	Annual Erosion=	-23		Annual Erosion=	-22
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	82		End Beach Width=	103
2009	Beginning Width=	82	2017	Beginning Width=	103
	Annual Erosion=	-7		Annual Erosion=	-13
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	75		End Beach Width=	90
2010	Beginning Width=	75	2018	Beginning Width=	90
	Annual Erosion=	-1		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	74		End Beach Width=	82
2011	Beginning Width=	74	2019	Beginning Width=	82
	Annual Erosion=			Annual Erosion=	-24
	Annual Accretion=	5		Annual Accretion=	
	End Beach Width=	79		End Beach Width=	58
2012	Beginning Width=	79	2020	Beginning Width=	58
	Annual Erosion=	-25		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	3
	End Beach Width=	54		End Beach Width=	61
2013	Beginning Width=	54	2021	Beginning Width=	61
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	29		Annual Accretion=	63
	End Beach Width=	83		End Beach Width=	124
			2022	Beginning Width=	124
				Annual Erosion=	-34
				Annual Accretion=	
				End Beach Width=	90



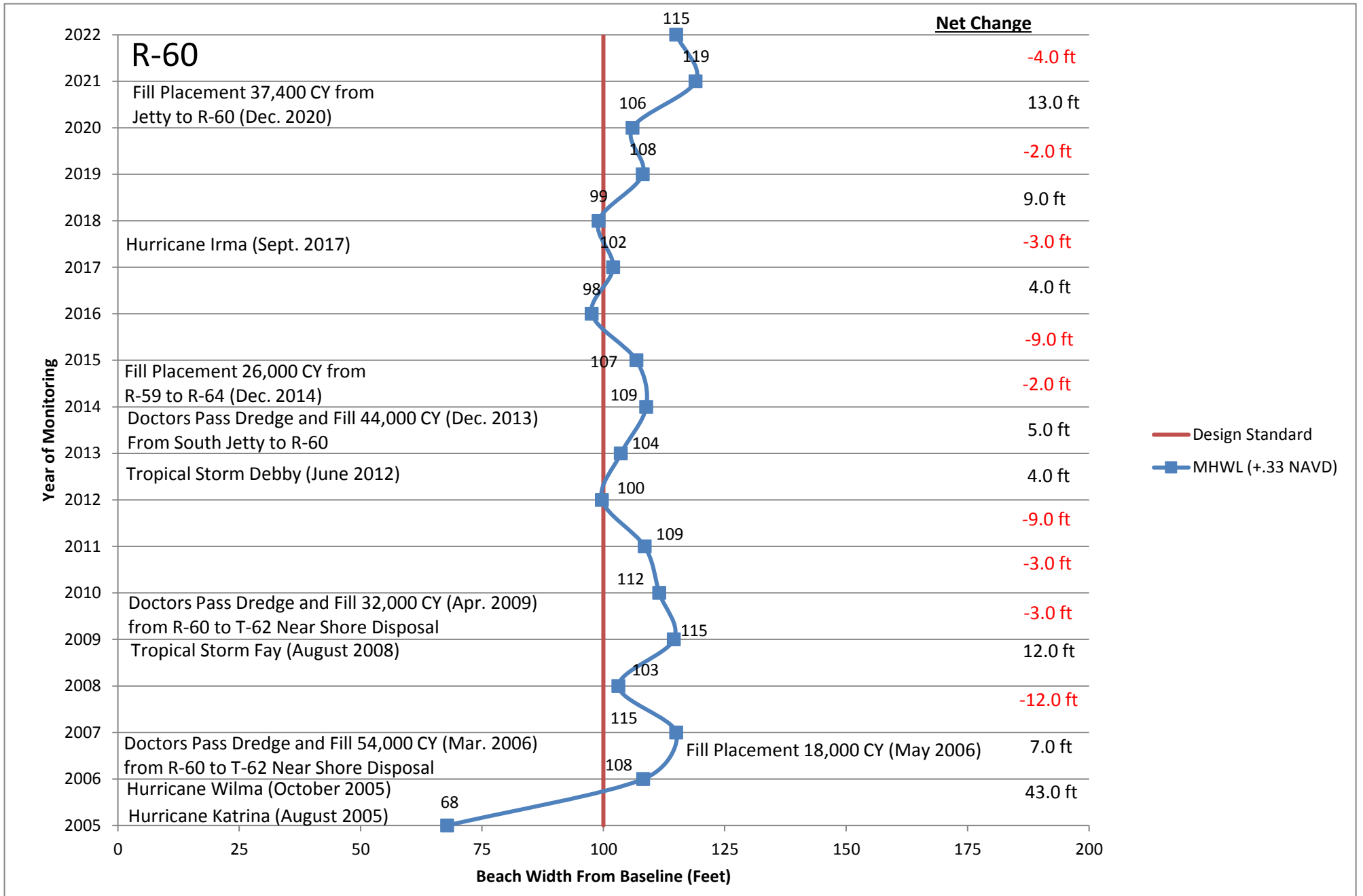
R-59

	2005 Beach Width=	71			
2006	Beginning Width=	71	2014	Beginning Width=	101
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	75		Annual Accretion=	20
	End Beach Width=	146		End Beach Width=	121
2007	Beginning Width=	146	2015	Beginning Width=	121
	Annual Erosion=	-22		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	124		End Beach Width=	122
2008	Beginning Width=	124	2016	Beginning Width=	122
	Annual Erosion=	-21		Annual Erosion=	-7
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	103		End Beach Width=	115
2009	Beginning Width=	103	2017	Beginning Width=	115
	Annual Erosion=	-4		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	99		End Beach Width=	107
2010	Beginning Width=	99	2018	Beginning Width=	107
	Annual Erosion=	-2		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	97		End Beach Width=	97
2011	Beginning Width=	97	2019	Beginning Width=	97
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	4		Annual Accretion=	7
	End Beach Width=	101		End Beach Width=	104
2012	Beginning Width=	101	2020	Beginning Width=	104
	Annual Erosion=	-17		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	84		End Beach Width=	94
2013	Beginning Width=	84	2021	Beginning Width=	94
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	17		Annual Accretion=	58
	End Beach Width=	101		End Beach Width=	152
			2022	Beginning Width=	152
				Annual Erosion=	-28
				Annual Accretion=	
				End Beach Width=	124



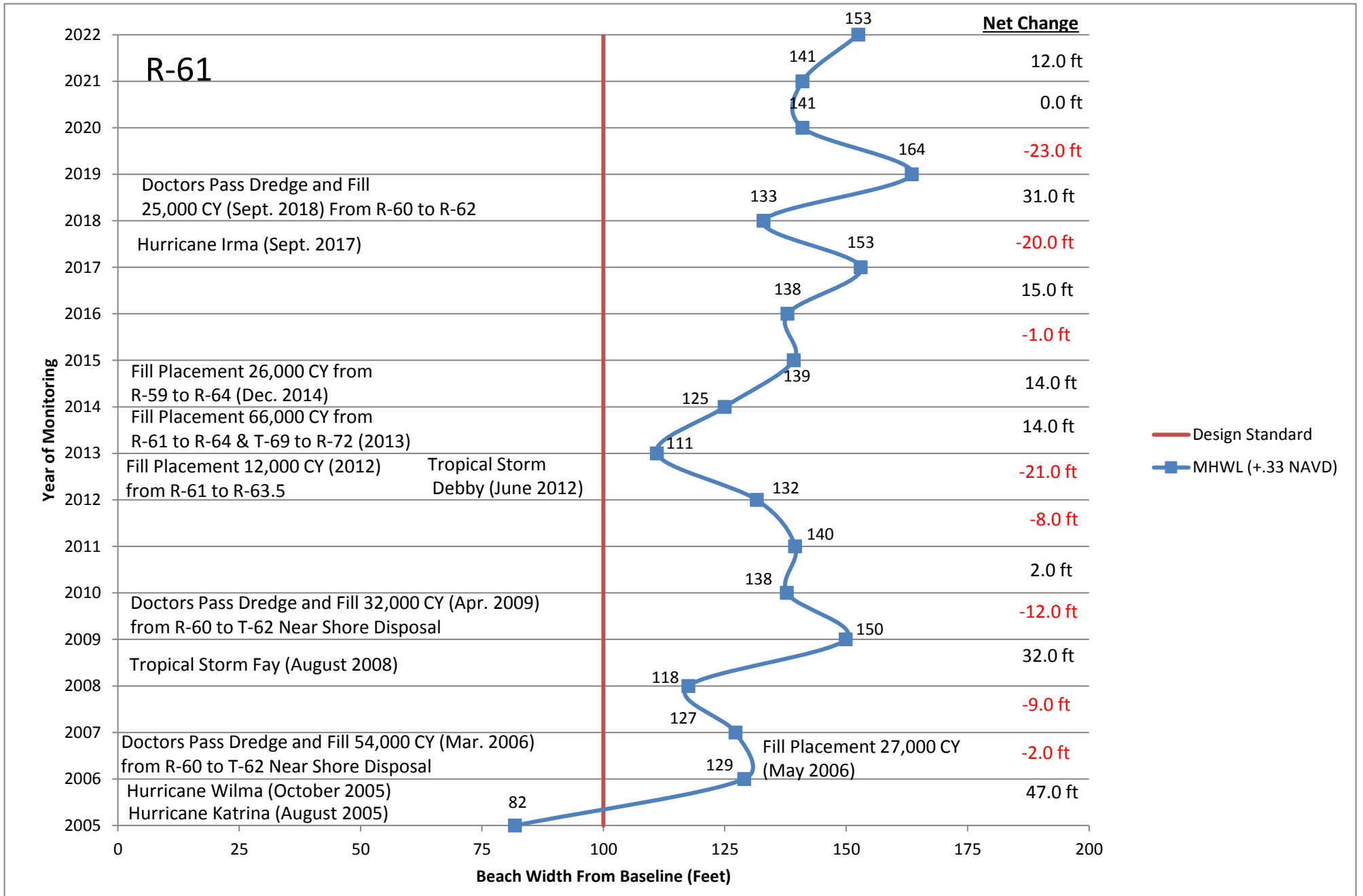
R-60

	2005 Beach Width= 68		
2006	Beginning Width= 68	2014	Beginning Width= 104
	Annual Erosion=		Annual Erosion=
	Annual Accretion= 40		Annual Accretion= 5
	End Beach Width= 108		End Beach Width= 109
2007	Beginning Width= 108	2015	Beginning Width= 109
	Annual Erosion=		Annual Erosion= -2
	Annual Accretion= 7		Annual Accretion=
	End Beach Width= 115		End Beach Width= 107
2008	Beginning Width= 115	2016	Beginning Width= 107
	Annual Erosion= -12		Annual Erosion= -9
	Annual Accretion=		Annual Accretion=
	End Beach Width= 103		End Beach Width= 98
2009	Beginning Width= 103	2017	Beginning Width= 98
	Annual Erosion=		Annual Erosion=
	Annual Accretion= 12		Annual Accretion= 4
	End Beach Width= 115		End Beach Width= 102
2010	Beginning Width= 115	2018	Beginning Width= 102
	Annual Erosion= -3		Annual Erosion= -3
	Annual Accretion=		Annual Accretion=
	End Beach Width= 112		End Beach Width= 99
2011	Beginning Width= 112	2019	Beginning Width= 99
	Annual Erosion= -3		Annual Erosion=
	Annual Accretion=		Annual Accretion= 9
	End Beach Width= 109		End Beach Width= 108
2012	Beginning Width= 109	2020	Beginning Width= 108
	Annual Erosion= -9		Annual Erosion= -2
	Annual Accretion=		Annual Accretion=
	End Beach Width= 100		End Beach Width= 106
2013	Beginning Width= 100	2021	Beginning Width= 106
	Annual Erosion=		Annual Erosion=
	Annual Accretion= 4		Annual Accretion= 13
	End Beach Width= 104		End Beach Width= 119
		2022	Beginning Width= 119
			Annual Erosion= -4
			Annual Accretion=
			End Beach Width= 115



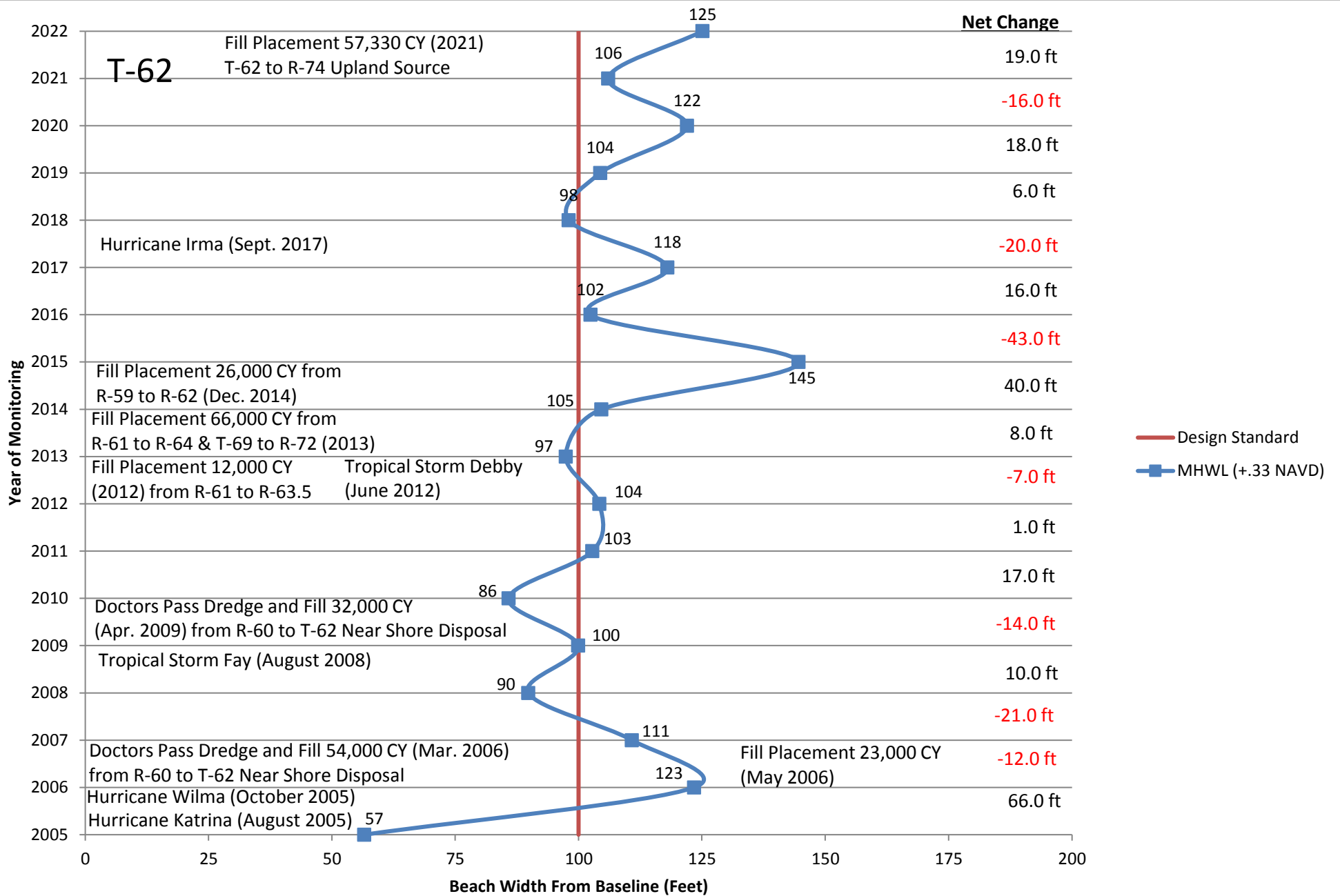
R-61

	2005 Beach Width=	82			
2006	Beginning Width=	82	2014	Beginning Width=	111
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	47		Annual Accretion=	14
	End Beach Width=	129		End Beach Width=	125
2007	Beginning Width=	129	2015	Beginning Width=	125
	Annual Erosion=	-2		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	14
	End Beach Width=	127		End Beach Width=	139
2008	Beginning Width=	127	2016	Beginning Width=	139
	Annual Erosion=	-9		Annual Erosion=	-1
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	118		End Beach Width=	138
2009	Beginning Width=	118	2017	Beginning Width=	138
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	32		Annual Accretion=	15
	End Beach Width=	150		End Beach Width=	153
2010	Beginning Width=	150	2018	Beginning Width=	153
	Annual Erosion=	-12		Annual Erosion=	-20
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	138		End Beach Width=	133
2011	Beginning Width=	138	2019	Beginning Width=	133
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	2		Annual Accretion=	31
	End Beach Width=	140		End Beach Width=	164
2012	Beginning Width=	140	2020	Beginning Width=	164
	Annual Erosion=	-8		Annual Erosion=	-23
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	132		End Beach Width=	141
2013	Beginning Width=	132	2021	Beginning Width=	141
	Annual Erosion=	-21		Annual Erosion=	0
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	111		End Beach Width=	141
			2022	Beginning Width=	141
				Annual Erosion=	
				Annual Accretion=	12
				End Beach Width=	153



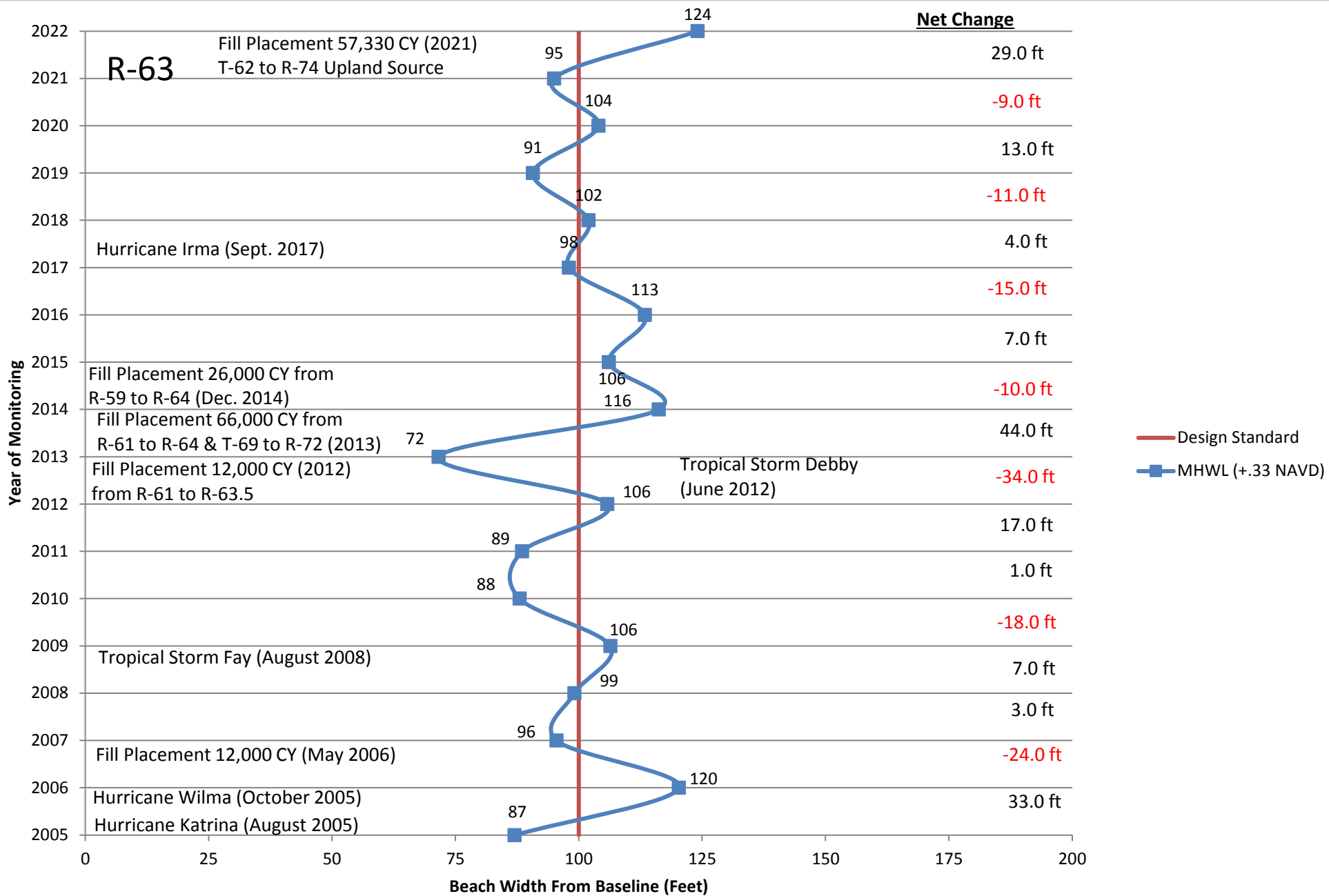
T-62

	2005 Beach Width=	57			
2006	Beginning Width=	57	2014	Beginning Width=	97
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	66		Annual Accretion=	8
	End Beach Width=	123		End Beach Width=	105
2007	Beginning Width=	123	2015	Beginning Width=	105
	Annual Erosion=	-12		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	40
	End Beach Width=	111		End Beach Width=	145
2008	Beginning Width=	111	2016	Beginning Width=	145
	Annual Erosion=	-21		Annual Erosion=	-43
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	90		End Beach Width=	102
2009	Beginning Width=	90	2017	Beginning Width=	102
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	10		Annual Accretion=	16
	End Beach Width=	100		End Beach Width=	118
2010	Beginning Width=	100	2018	Beginning Width=	118
	Annual Erosion=	-14		Annual Erosion=	-20
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	86		End Beach Width=	98
2011	Beginning Width=	86	2019	Beginning Width=	98
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	17		Annual Accretion=	6
	End Beach Width=	103		End Beach Width=	104
2012	Beginning Width=	103	2020	Beginning Width=	104
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	1		Annual Accretion=	18
	End Beach Width=	104		End Beach Width=	122
2013	Beginning Width=	104	2021	Beginning Width=	122
	Annual Erosion=	-7		Annual Erosion=	-16
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	97		End Beach Width=	106
			2022	Beginning Width=	106
				Annual Erosion=	19
				Annual Accretion=	
				End Beach Width=	125



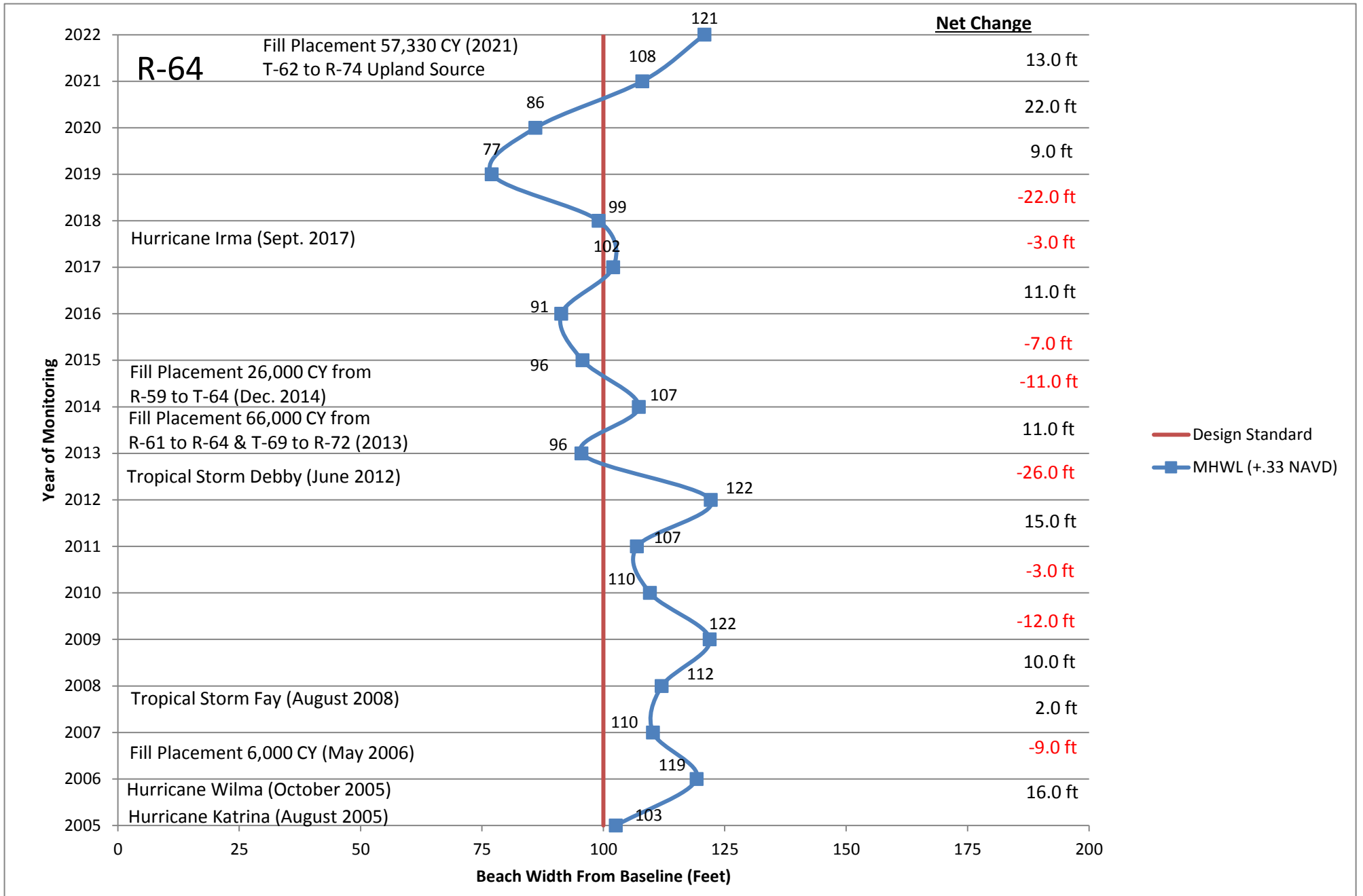
R-63

	2005 Beach Width=	87			
2006	Beginning Width=	87	2014	Beginning Width=	72
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	33		Annual Accretion=	44
	End Beach Width=	120		End Beach Width=	116
2007	Beginning Width=	120	2015	Beginning Width=	116
	Annual Erosion=	-24		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	96		End Beach Width=	106
2008	Beginning Width=	96	2016	Beginning Width=	106
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	3		Annual Accretion=	7
	End Beach Width=	99		End Beach Width=	113
2009	Beginning Width=	99	2017	Beginning Width=	113
	Annual Erosion=			Annual Erosion=	-15
	Annual Accretion=	7		Annual Accretion=	
	End Beach Width=	106		End Beach Width=	98
2010	Beginning Width=	106	2018	Beginning Width=	98
	Annual Erosion=	-18		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	88		End Beach Width=	102
2011	Beginning Width=	88	2019	Beginning Width=	102
	Annual Erosion=			Annual Erosion=	-11
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	89		End Beach Width=	91
2012	Beginning Width=	89	2020	Beginning Width=	91
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	17		Annual Accretion=	13
	End Beach Width=	106		End Beach Width=	104
2013	Beginning Width=	106	2021	Beginning Width=	104
	Annual Erosion=	-34		Annual Erosion=	-9
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	72		End Beach Width=	95
			2022	Beginning Width=	95
				Annual Erosion=	
				Annual Accretion=	29
				End Beach Width=	124



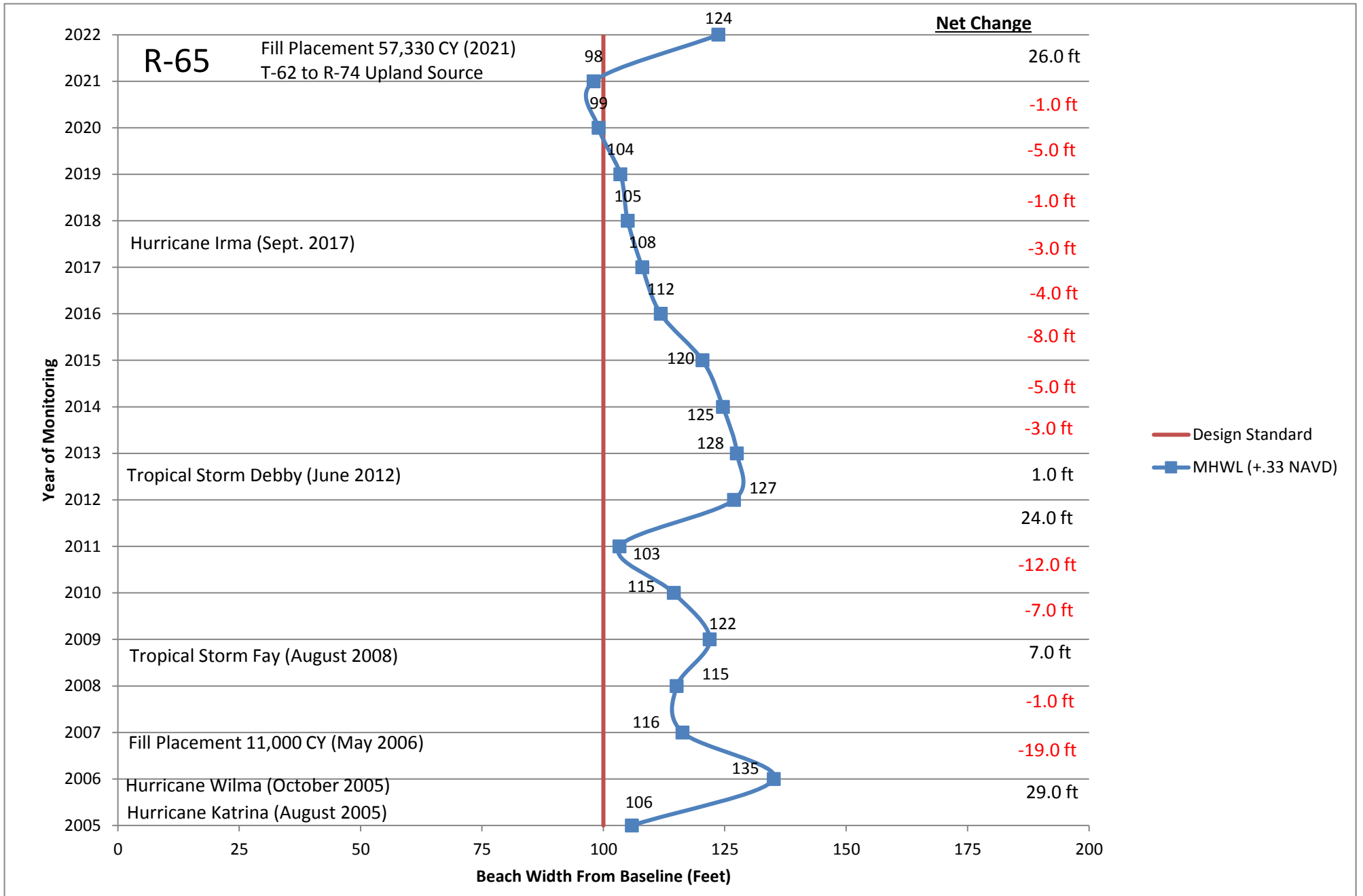
R-64

	2005 Beach Width=	103			
2006	Beginning Width=	103	2014	Beginning Width=	96
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	16		Annual Accretion=	11
	End Beach Width=	119		End Beach Width=	107
2007	Beginning Width=	119	2015	Beginning Width=	107
	Annual Erosion=	-9		Annual Erosion=	-11
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	110		End Beach Width=	96
2008	Beginning Width=	110	2016	Beginning Width=	96
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	2		Annual Accretion=	
	End Beach Width=	112		End Beach Width=	91
2009	Beginning Width=	112	2017	Beginning Width=	91
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	10		Annual Accretion=	11
	End Beach Width=	122		End Beach Width=	102
2010	Beginning Width=	122	2018	Beginning Width=	102
	Annual Erosion=	-12		Annual Erosion=	-3
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	110		End Beach Width=	99
2011	Beginning Width=	110	2019	Beginning Width=	99
	Annual Erosion=	-3		Annual Erosion=	-22
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	107		End Beach Width=	77
2012	Beginning Width=	107	2020	Beginning Width=	77
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	15		Annual Accretion=	9
	End Beach Width=	122		End Beach Width=	86
2013	Beginning Width=	122	2021	Beginning Width=	86
	Annual Erosion=	-26		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	22
	End Beach Width=	96		End Beach Width=	108
			2022	Beginning Width=	108
				Annual Erosion=	
				Annual Accretion=	13
				End Beach Width=	121



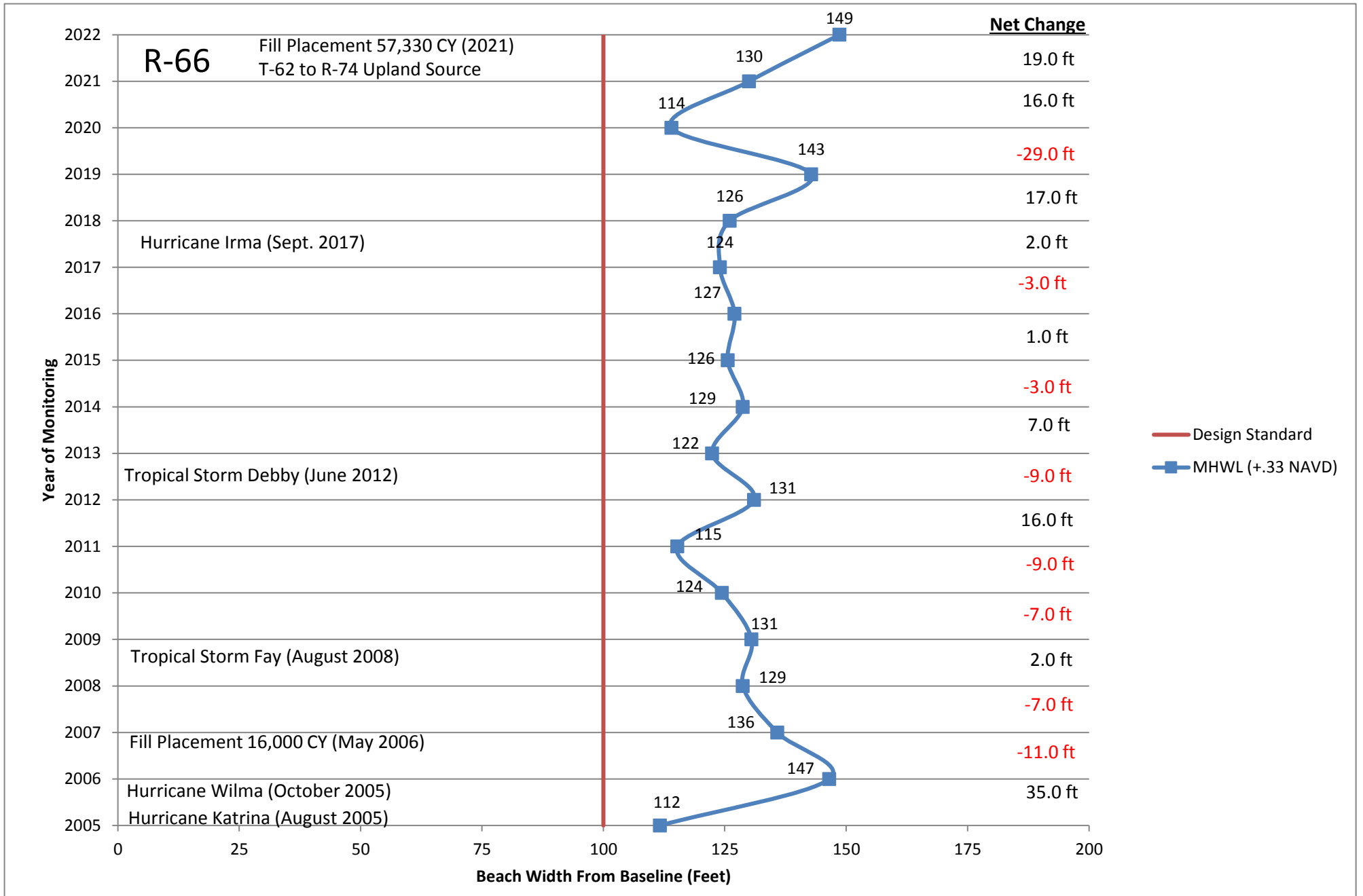
R-65

	2005 Beach Width=	106			
2006	Beginning Width=	106	2014	Beginning Width=	128
	Annual Erosion=			Annual Erosion=	-3
	Annual Accretion=	29		Annual Accretion=	
	End Beach Width=	135		End Beach Width=	125
2007	Beginning Width=	135	2015	Beginning Width=	125
	Annual Erosion=	-19		Annual Erosion=	-5
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	116		End Beach Width=	120
2008	Beginning Width=	116	2016	Beginning Width=	120
	Annual Erosion=	-1		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	115		End Beach Width=	112
2009	Beginning Width=	115	2017	Beginning Width=	112
	Annual Erosion=			Annual Erosion=	-4
	Annual Accretion=	7		Annual Accretion=	
	End Beach Width=	122		End Beach Width=	108
2010	Beginning Width=	122	2018	Beginning Width=	108
	Annual Erosion=	-7		Annual Erosion=	-3
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	115		End Beach Width=	105
2011	Beginning Width=	115	2019	Beginning Width=	105
	Annual Erosion=	-12		Annual Erosion=	-1
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	103		End Beach Width=	104
2012	Beginning Width=	103	2020	Beginning Width=	104
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	24		Annual Accretion=	
	End Beach Width=	127		End Beach Width=	99
2013	Beginning Width=	127	2021	Beginning Width=	99
	Annual Erosion=			Annual Erosion=	-1
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	128		End Beach Width=	98
			2022	Beginning Width=	98
				Annual Erosion=	
				Annual Accretion=	26
				End Beach Width=	124



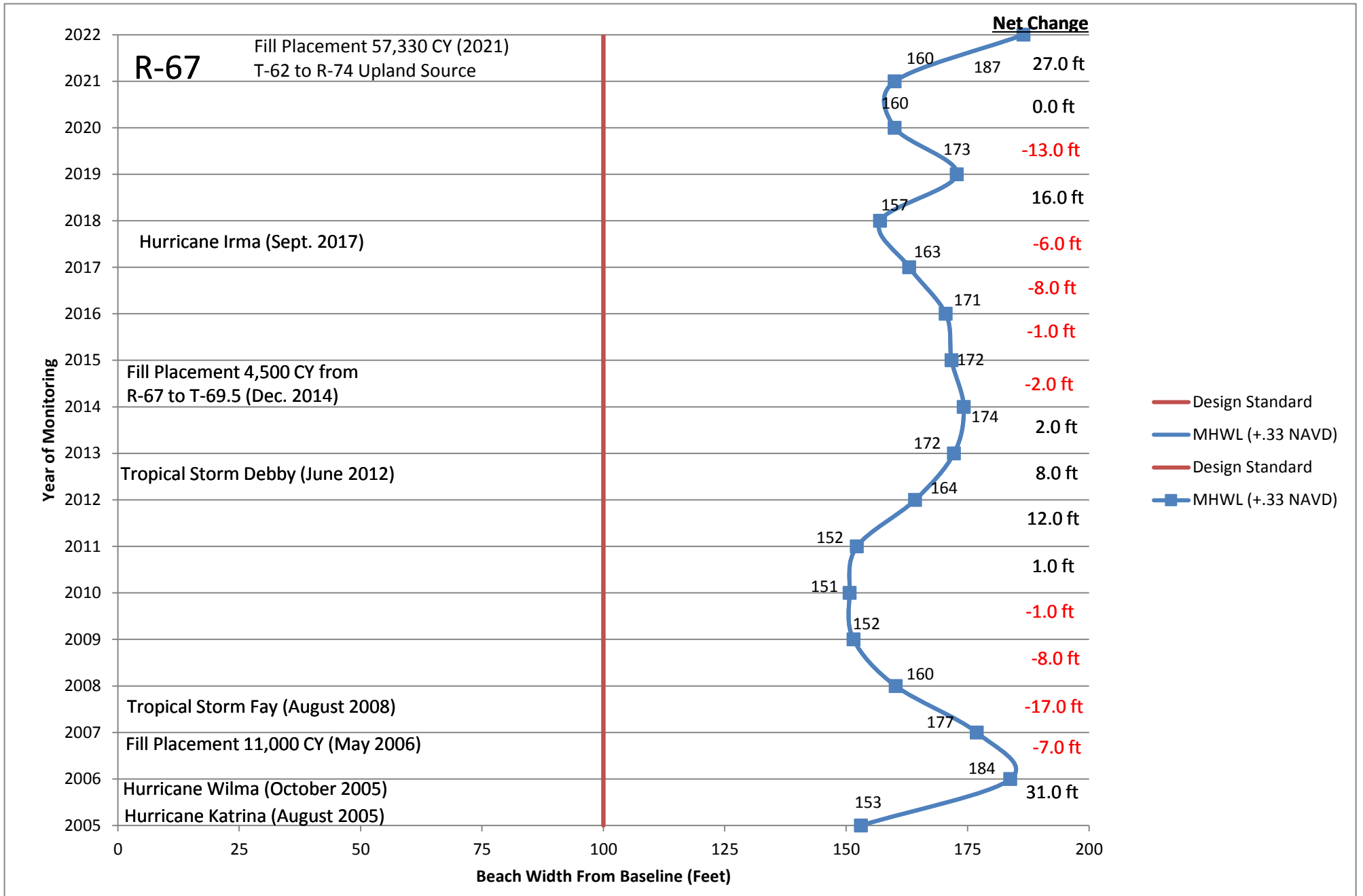
R-66

	2005 Beach Width=	112			
2006	Beginning Width=	112	2014	Beginning Width=	122
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	35		Annual Accretion=	7
	End Beach Width=	147		End Beach Width=	129
2007	Beginning Width=	147	2015	Beginning Width=	129
	Annual Erosion=	-11		Annual Erosion=	-3
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	136		End Beach Width=	126
2008	Beginning Width=	136	2016	Beginning Width=	126
	Annual Erosion=	-7		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	129		End Beach Width=	127
2009	Beginning Width=	129	2017	Beginning Width=	127
	Annual Erosion=			Annual Erosion=	-3
	Annual Accretion=	2		Annual Accretion=	
	End Beach Width=	131		End Beach Width=	124
2010	Beginning Width=	131	2018	Beginning Width=	124
	Annual Erosion=	-7		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	2
	End Beach Width=	124		End Beach Width=	126
2011	Beginning Width=	124	2019	Beginning Width=	126
	Annual Erosion=	-9		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	17
	End Beach Width=	115		End Beach Width=	143
2012	Beginning Width=	115	2020	Beginning Width=	143
	Annual Erosion=			Annual Erosion=	-29
	Annual Accretion=	16		Annual Accretion=	
	End Beach Width=	131		End Beach Width=	114
2013	Beginning Width=	131	2021	Beginning Width=	114
	Annual Erosion=	-9		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	16
	End Beach Width=	122		End Beach Width=	130
			2022	Beginning Width=	130
				Annual Erosion=	
				Annual Accretion=	19
				End Beach Width=	149



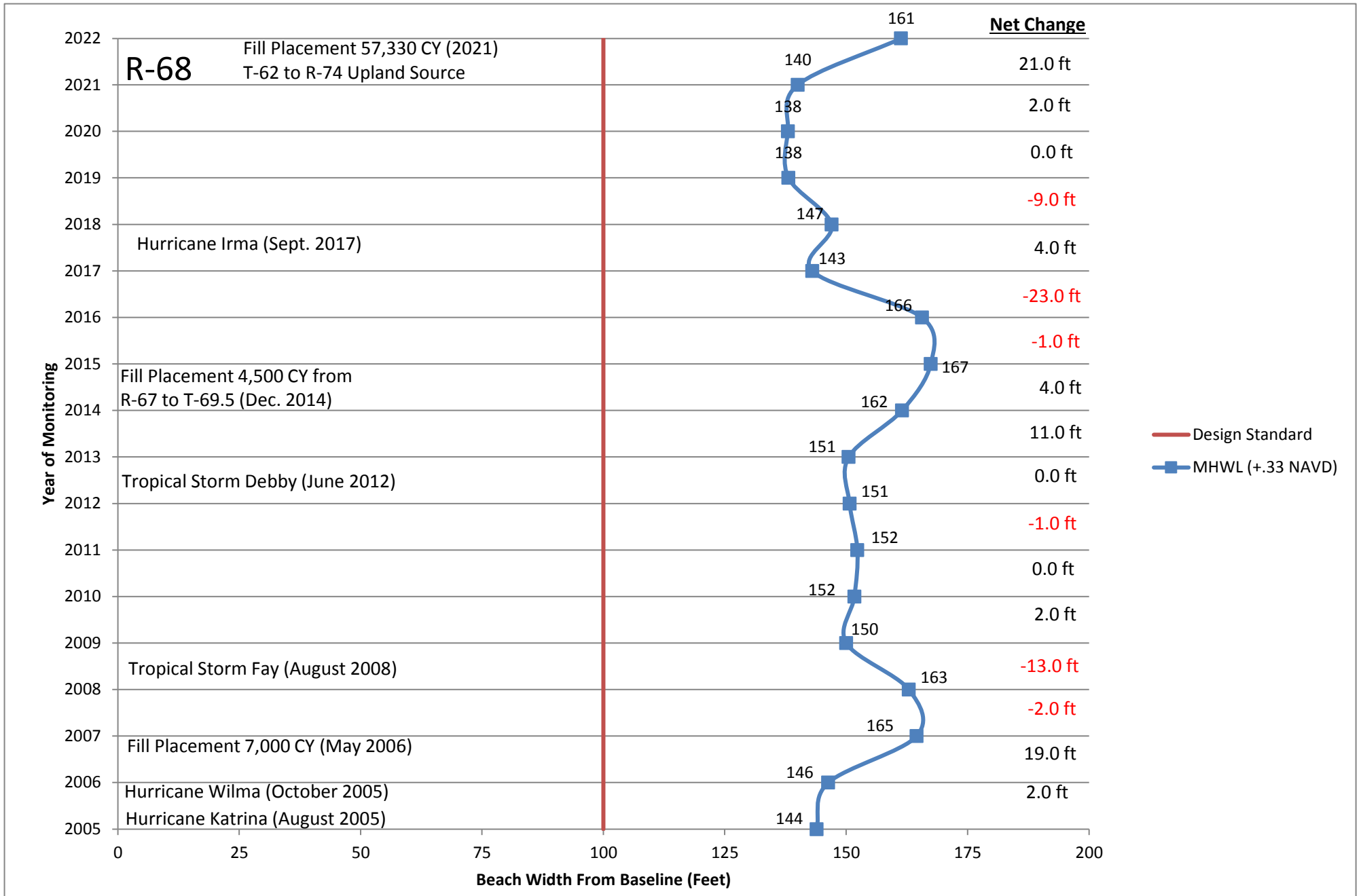
R-67

	2005 Beach Width=	153			
2006	Beginning Width=	153	2014	Beginning Width=	172
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	31		Annual Accretion=	2
	End Beach Width=	184		End Beach Width=	174
2007	Beginning Width=	184	2015	Beginning Width=	174
	Annual Erosion=	-7		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	177		End Beach Width=	172
2008	Beginning Width=	177	2016	Beginning Width=	172
	Annual Erosion=	-17		Annual Erosion=	-1
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	160		End Beach Width=	171
2009	Beginning Width=	160	2017	Beginning Width=	171
	Annual Erosion=	-8		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	152		End Beach Width=	163
2010	Beginning Width=	152	2018	Beginning Width=	163
	Annual Erosion=	-1		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	151		End Beach Width=	157
2011	Beginning Width=	151	2019	Beginning Width=	157
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	1		Annual Accretion=	16
	End Beach Width=	152		End Beach Width=	173
2012	Beginning Width=	152	2020	Beginning Width=	173
	Annual Erosion=			Annual Erosion=	-13
	Annual Accretion=	12		Annual Accretion=	
	End Beach Width=	164		End Beach Width=	160
2013	Beginning Width=	164	2021	Beginning Width=	160
	Annual Erosion=			Annual Erosion=	0
	Annual Accretion=	8		Annual Accretion=	
	End Beach Width=	172		End Beach Width=	160
			2022	Beginning Width=	160
				Annual Erosion=	
				Annual Accretion=	27
				End Beach Width=	187



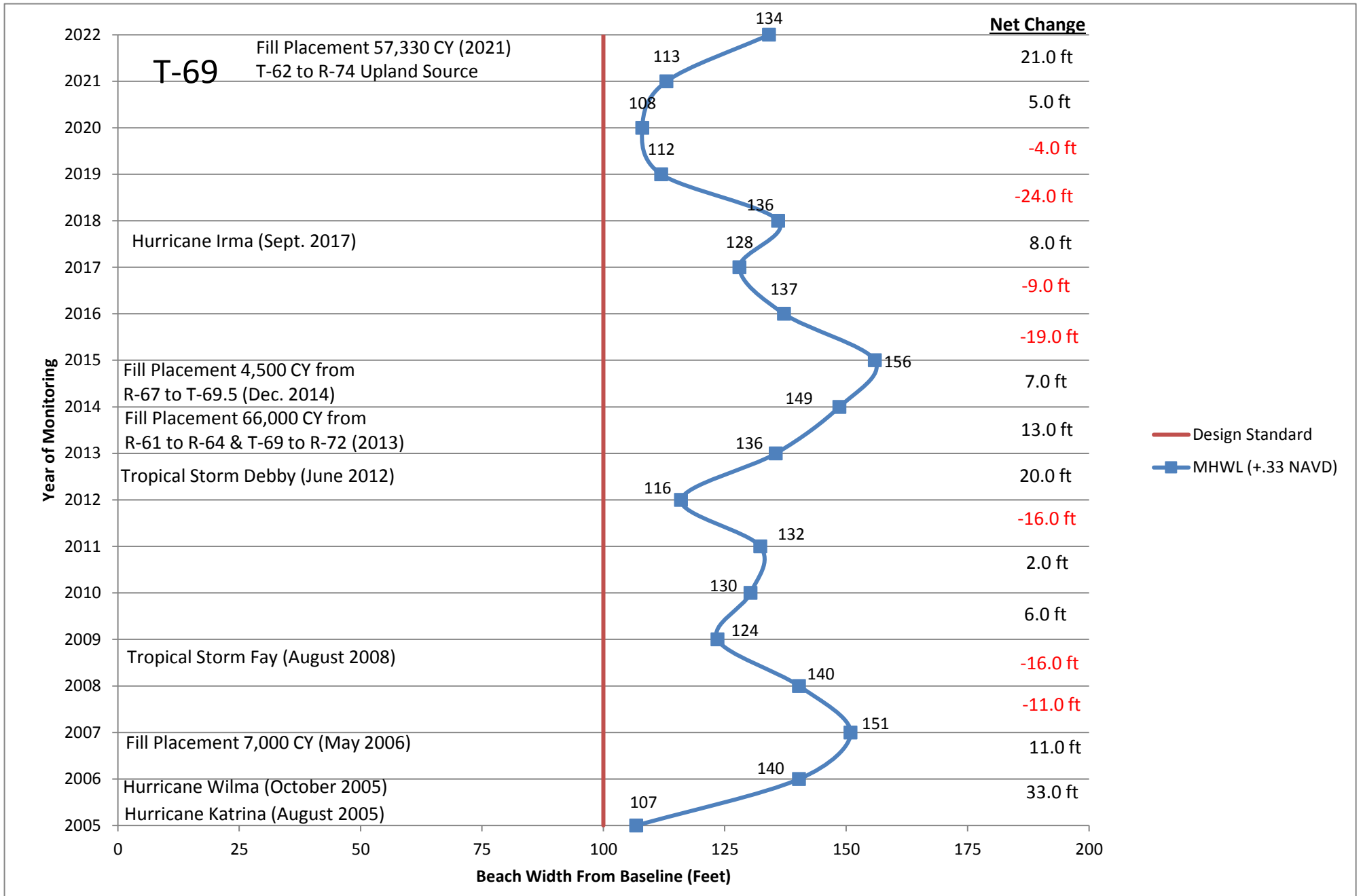
R-68

	2005 Beach Width=	144			
2006	Beginning Width=	144	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	151
	Annual Accretion=	2		Annual Accretion=	11
	End Beach Width=	146		End Beach Width=	
2007	Beginning Width=	146	2015	Beginning Width=	
	Annual Erosion=			Annual Erosion=	162
	Annual Accretion=	19		Annual Accretion=	5
	End Beach Width=	165		End Beach Width=	
2008	Beginning Width=	165	2016	Beginning Width=	
	Annual Erosion=	-2		Annual Erosion=	167
	Annual Accretion=			Annual Accretion=	-1
	End Beach Width=	163		End Beach Width=	
2009	Beginning Width=	163	2017	Beginning Width=	
	Annual Erosion=	-13		Annual Erosion=	166
	Annual Accretion=			Annual Accretion=	-23
	End Beach Width=	150		End Beach Width=	
2010	Beginning Width=	150	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	143
	Annual Accretion=	2		Annual Accretion=	4
	End Beach Width=	152		End Beach Width=	
2011	Beginning Width=	152	2019	Beginning Width=	
	Annual Erosion=			Annual Erosion=	147
	Annual Accretion=			Annual Accretion=	-9
	End Beach Width=	152		End Beach Width=	
2012	Beginning Width=	152	2020	Beginning Width=	
	Annual Erosion=	-1		Annual Erosion=	138
	Annual Accretion=			Annual Accretion=	0
	End Beach Width=	151		End Beach Width=	
2013	Beginning Width=	151	2021	Beginning Width=	
	Annual Erosion=			Annual Erosion=	138
	Annual Accretion=			Annual Accretion=	2
	End Beach Width=	151		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	140
				Annual Accretion=	21
				End Beach Width=	
				161	



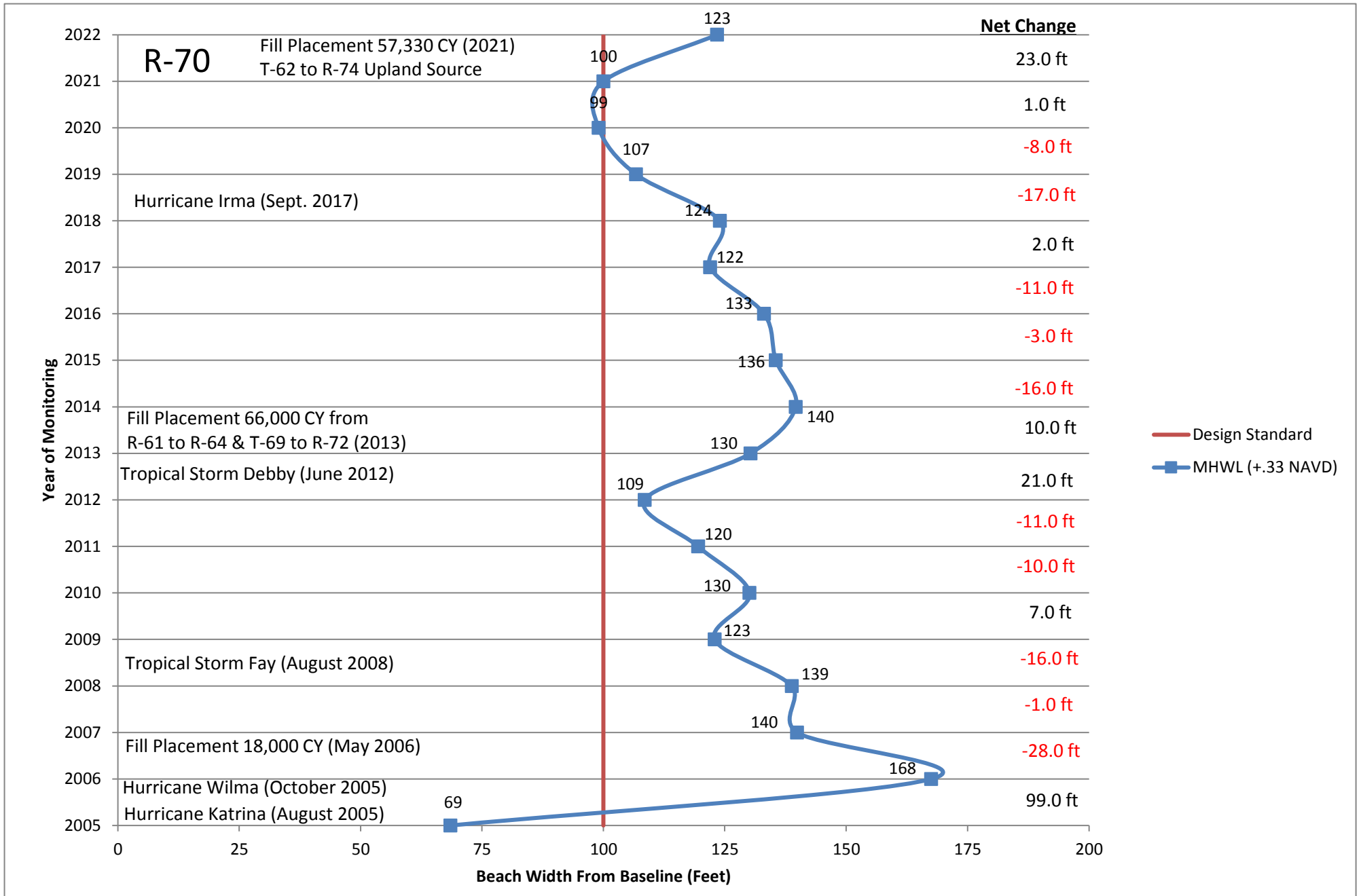
T-69

	2005 Beach Width=	107			
2006	Beginning Width=	107	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	136
	Annual Accretion=	33		Annual Accretion=	13
	End Beach Width=	140		End Beach Width=	
2007	Beginning Width=	140	2015	Beginning Width=	
	Annual Erosion=			Annual Erosion=	149
	Annual Accretion=	11		Annual Accretion=	7
	End Beach Width=	151		End Beach Width=	
2008	Beginning Width=	151	2016	Beginning Width=	
	Annual Erosion=	-11		Annual Erosion=	156
	Annual Accretion=			Annual Accretion=	-19
	End Beach Width=	140		End Beach Width=	
2009	Beginning Width=	140	2017	Beginning Width=	
	Annual Erosion=	-16		Annual Erosion=	137
	Annual Accretion=			Annual Accretion=	-9
	End Beach Width=	124		End Beach Width=	
2010	Beginning Width=	124	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	128
	Annual Accretion=	6		Annual Accretion=	8
	End Beach Width=	130		End Beach Width=	
2011	Beginning Width=	130	2019	Beginning Width=	
	Annual Erosion=			Annual Erosion=	136
	Annual Accretion=	2		Annual Accretion=	-24
	End Beach Width=	132		End Beach Width=	
2012	Beginning Width=	132	2020	Beginning Width=	
	Annual Erosion=	-16		Annual Erosion=	112
	Annual Accretion=			Annual Accretion=	-4
	End Beach Width=	116		End Beach Width=	
2013	Beginning Width=	116	2021	Beginning Width=	
	Annual Erosion=			Annual Erosion=	108
	Annual Accretion=	20		Annual Accretion=	5
	End Beach Width=	136		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	113
				Annual Accretion=	21
				End Beach Width=	
				134	



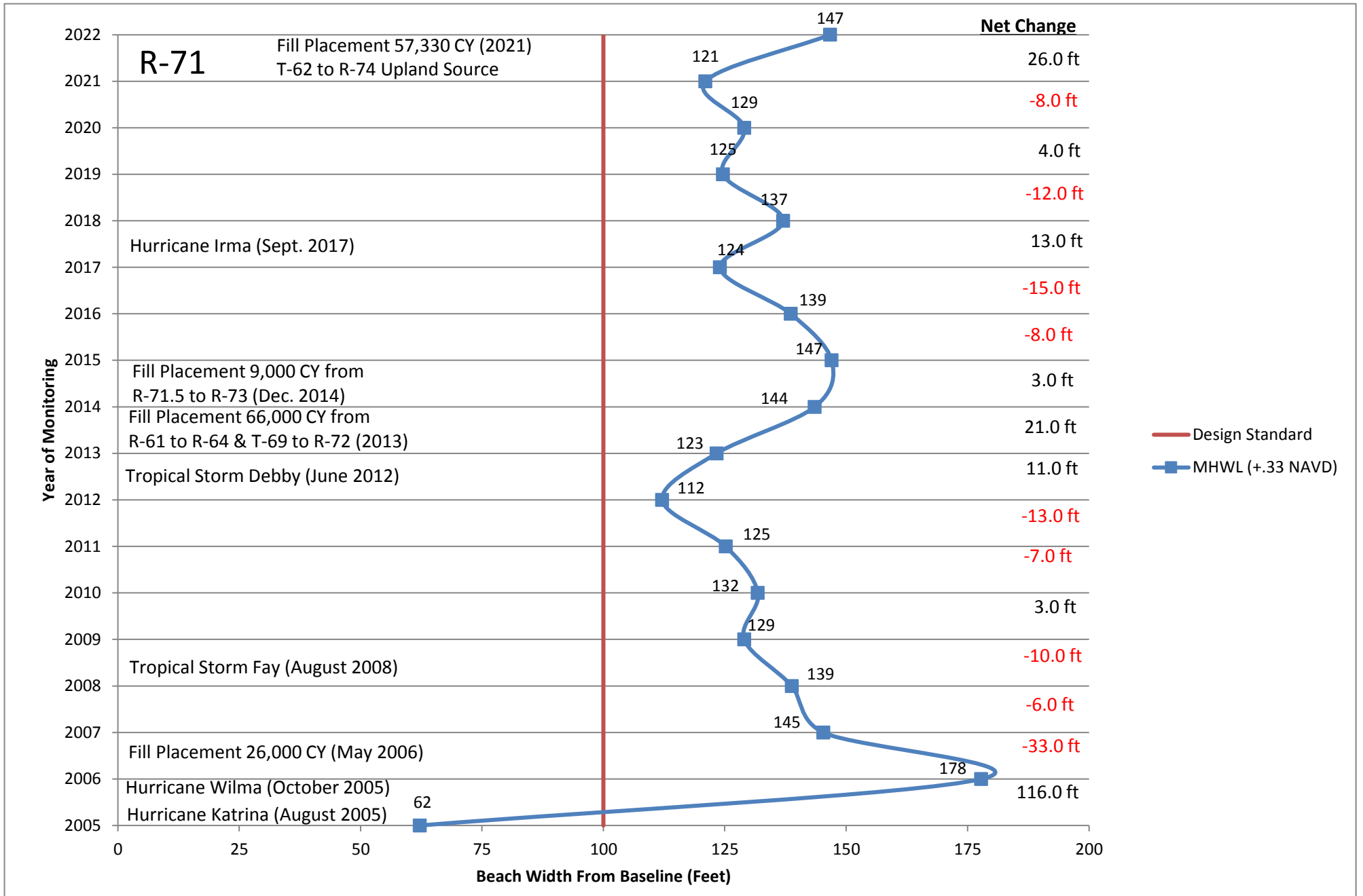
R-70

	2005 Beach Width=	69			
2006	Beginning Width=	69	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	130
	Annual Accretion=	99		Annual Accretion=	10
	End Beach Width=	168		End Beach Width=	
2007	Beginning Width=	168	2015	Beginning Width=	
	Annual Erosion=	-28		Annual Erosion=	140
	Annual Accretion=			Annual Accretion=	-4
	End Beach Width=	140		End Beach Width=	
2008	Beginning Width=	140	2016	Beginning Width=	
	Annual Erosion=	-1		Annual Erosion=	136
	Annual Accretion=			Annual Accretion=	-3
	End Beach Width=	139		End Beach Width=	
2009	Beginning Width=	139	2017	Beginning Width=	
	Annual Erosion=	-16		Annual Erosion=	133
	Annual Accretion=			Annual Accretion=	-11
	End Beach Width=	123		End Beach Width=	
2010	Beginning Width=	123	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	122
	Annual Accretion=	7		Annual Accretion=	2
	End Beach Width=	130		End Beach Width=	
2011	Beginning Width=	130	2019	Beginning Width=	
	Annual Erosion=	-10		Annual Erosion=	124
	Annual Accretion=			Annual Accretion=	-17
	End Beach Width=	120		End Beach Width=	
2012	Beginning Width=	120	2020	Beginning Width=	
	Annual Erosion=	-11		Annual Erosion=	107
	Annual Accretion=			Annual Accretion=	-8
	End Beach Width=	109		End Beach Width=	
2013	Beginning Width=	109	2021	Beginning Width=	
	Annual Erosion=			Annual Erosion=	99
	Annual Accretion=	21		Annual Accretion=	1
	End Beach Width=	130		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	100
				Annual Accretion=	23
				End Beach Width=	
				123	



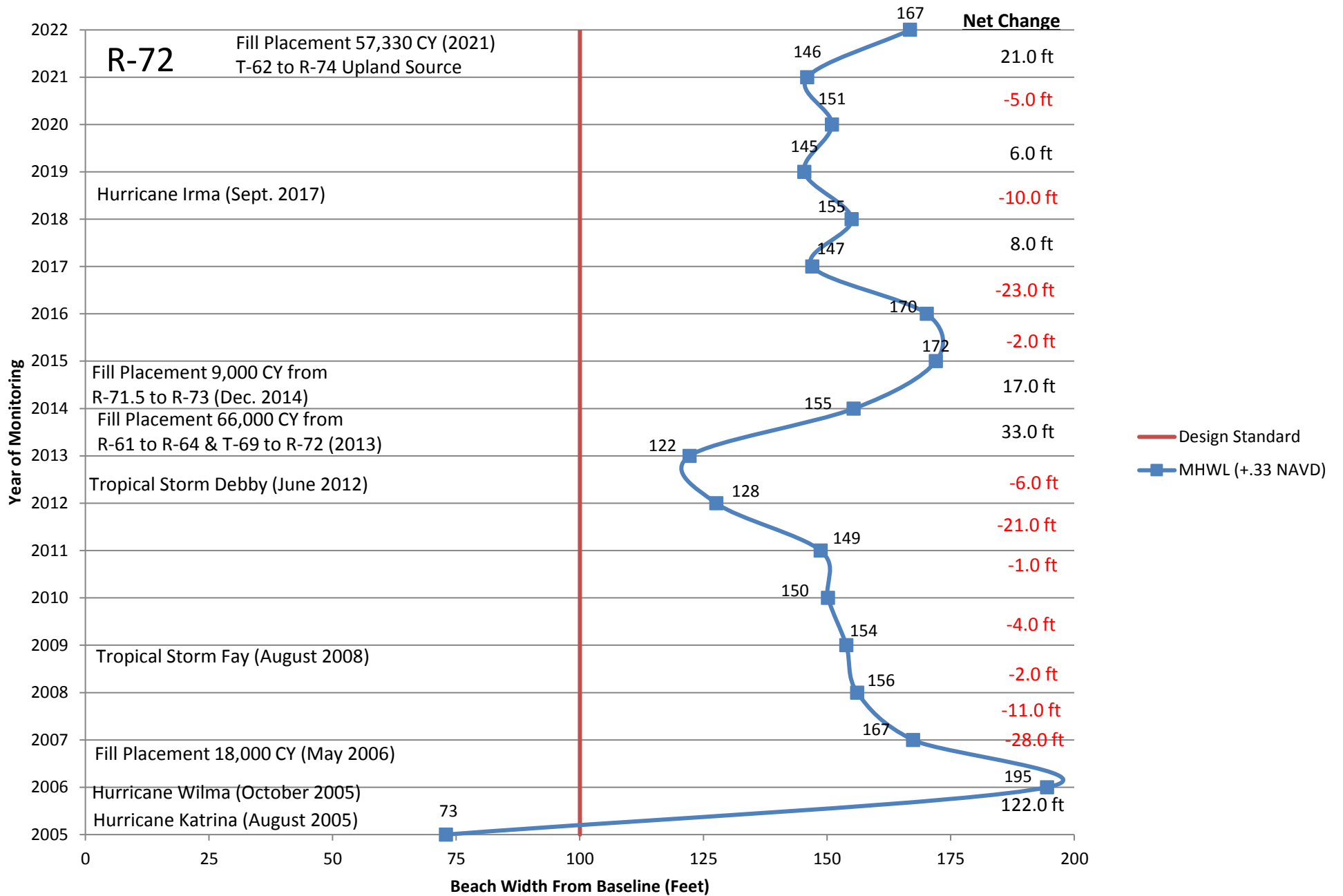
R-71

	2005 Beach Width=	62			
2006	Beginning Width=	62	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	123
	Annual Accretion=	116		Annual Accretion=	21
	End Beach Width=	178		End Beach Width=	
2007	Beginning Width=	178	2015	Beginning Width=	
	Annual Erosion=	-33		Annual Erosion=	144
	Annual Accretion=			Annual Accretion=	3
	End Beach Width=	145		End Beach Width=	
2008	Beginning Width=	145	2016	Beginning Width=	
	Annual Erosion=	-6		Annual Erosion=	147
	Annual Accretion=			Annual Accretion=	-8
	End Beach Width=	139		End Beach Width=	
2009	Beginning Width=	139	2017	Beginning Width=	
	Annual Erosion=	-10		Annual Erosion=	139
	Annual Accretion=			Annual Accretion=	-15
	End Beach Width=	129		End Beach Width=	
2010	Beginning Width=	129	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	124
	Annual Accretion=	3		Annual Accretion=	13
	End Beach Width=	132		End Beach Width=	
2011	Beginning Width=	132	2019	Beginning Width=	
	Annual Erosion=	-7		Annual Erosion=	137
	Annual Accretion=			Annual Accretion=	-12
	End Beach Width=	125		End Beach Width=	
2012	Beginning Width=	125	2020	Beginning Width=	
	Annual Erosion=	-13		Annual Erosion=	125
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	112		End Beach Width=	
2013	Beginning Width=	112	2021	Beginning Width=	
	Annual Erosion=			Annual Erosion=	129
	Annual Accretion=	11		Annual Accretion=	-8
	End Beach Width=	123		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	121
				Annual Accretion=	26
				End Beach Width=	
				147	



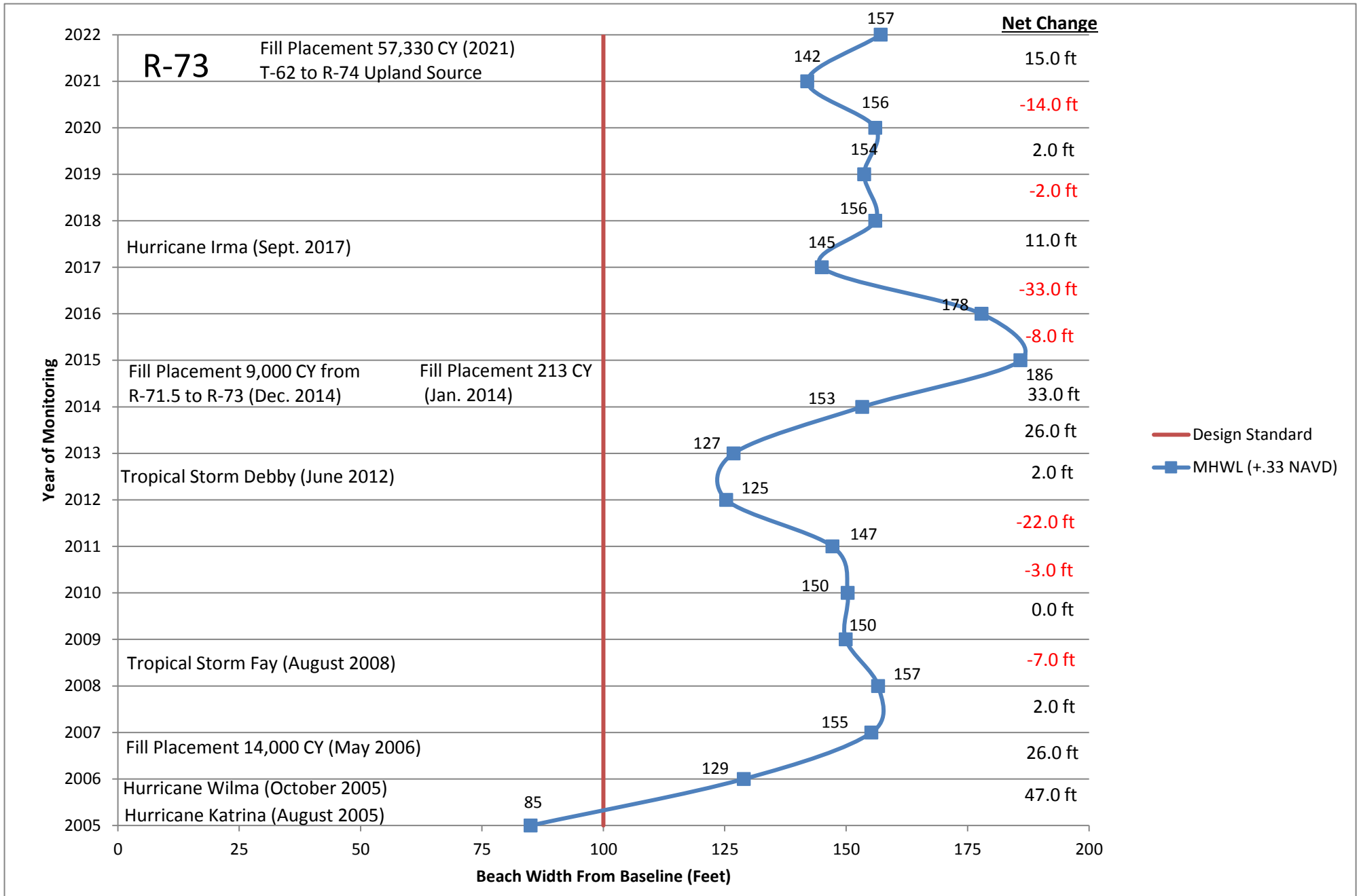
R-72

	2005 Beach Width=	73			
2006	Beginning Width=	73	2014	Beginning Width=	122
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	122		Annual Accretion=	33
	End Beach Width=	195		End Beach Width=	155
2007	Beginning Width=	195	2015	Beginning Width=	155
	Annual Erosion=	-28		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	17
	End Beach Width=	167		End Beach Width=	172
2008	Beginning Width=	167	2016	Beginning Width=	172
	Annual Erosion=	-11		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	156		End Beach Width=	170
2009	Beginning Width=	156	2017	Beginning Width=	170
	Annual Erosion=	-2		Annual Erosion=	-23
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	154		End Beach Width=	147
2010	Beginning Width=	154	2018	Beginning Width=	147
	Annual Erosion=	-4		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	8
	End Beach Width=	150		End Beach Width=	155
2011	Beginning Width=	150	2019	Beginning Width=	155
	Annual Erosion=	-1		Annual Erosion=	-10
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	149		End Beach Width=	145
2012	Beginning Width=	149	2020	Beginning Width=	145
	Annual Erosion=	-21		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	6
	End Beach Width=	128		End Beach Width=	151
2013	Beginning Width=	128	2021	Beginning Width=	151
	Annual Erosion=	-6		Annual Erosion=	-5
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	122		End Beach Width=	146
			2022	Beginning Width=	146
				Annual Erosion=	
				Annual Accretion=	21
				End Beach Width=	167



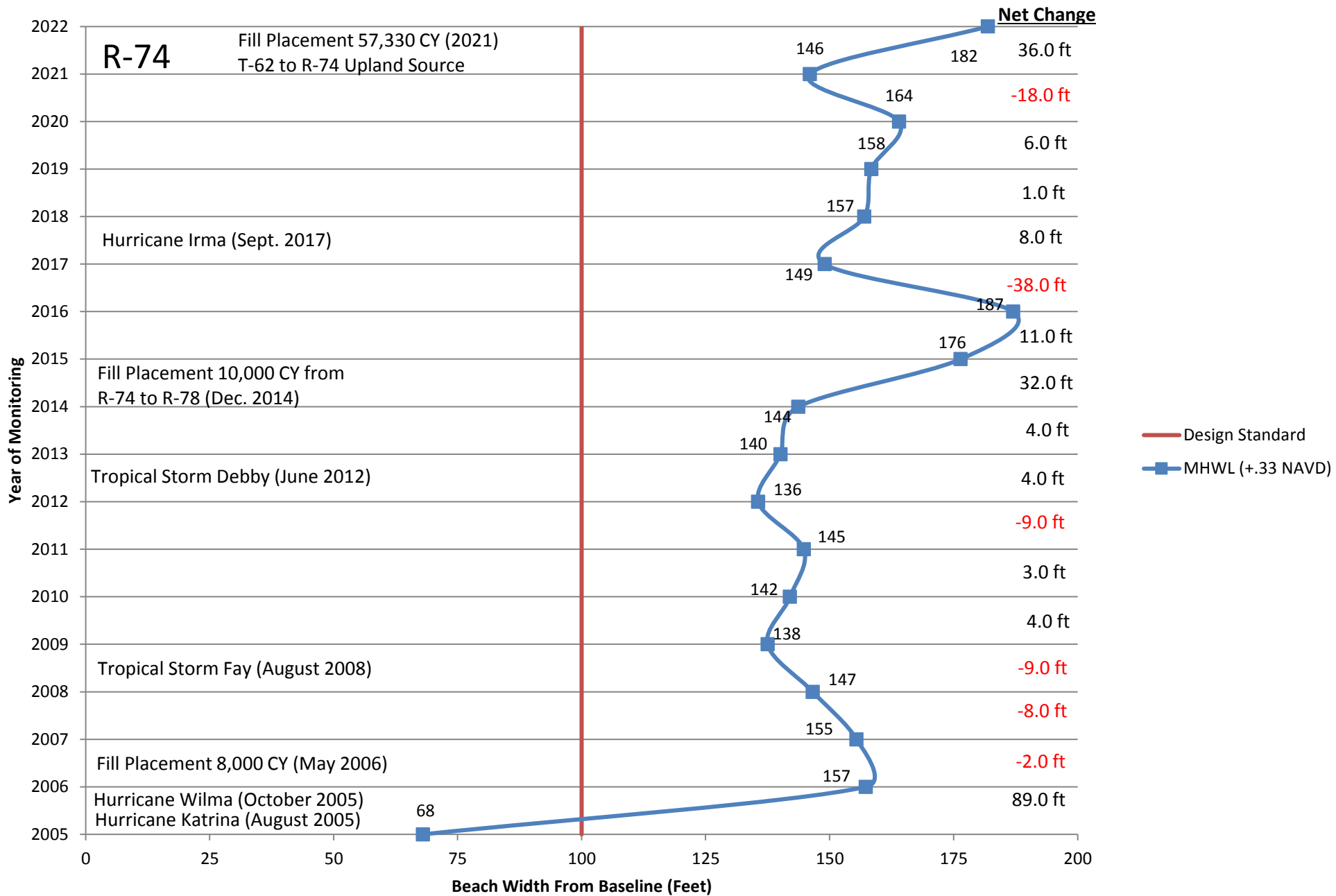
R-73

	2005 Beach Width=	85			
2006	Beginning Width=	85	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	127
	Annual Accretion=	44		Annual Accretion=	26
	End Beach Width=	129		End Beach Width=	
2007	Beginning Width=	129	2015	Beginning Width=	
	Annual Erosion=			Annual Erosion=	153
	Annual Accretion=	26		Annual Accretion=	33
	End Beach Width=	155		End Beach Width=	
2008	Beginning Width=	155	2016	Beginning Width=	
	Annual Erosion=			Annual Erosion=	186
	Annual Accretion=	2		Annual Accretion=	-8
	End Beach Width=	157		End Beach Width=	
2009	Beginning Width=	157	2017	Beginning Width=	
	Annual Erosion=	-7		Annual Erosion=	178
	Annual Accretion=			Annual Accretion=	-33
	End Beach Width=	150		End Beach Width=	
2010	Beginning Width=	150	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	145
	Annual Accretion=			Annual Accretion=	11
	End Beach Width=	150		End Beach Width=	
2011	Beginning Width=	150	2019	Beginning Width=	
	Annual Erosion=	-3		Annual Erosion=	156
	Annual Accretion=			Annual Accretion=	-2
	End Beach Width=	147		End Beach Width=	
2012	Beginning Width=	147	2020	Beginning Width=	
	Annual Erosion=	-22		Annual Erosion=	154
	Annual Accretion=			Annual Accretion=	2
	End Beach Width=	125		End Beach Width=	
2013	Beginning Width=	125	2021	Beginning Width=	
	Annual Erosion=			Annual Erosion=	156
	Annual Accretion=	2		Annual Accretion=	-14
	End Beach Width=	127		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	142
				Annual Accretion=	15
				End Beach Width=	
				157	



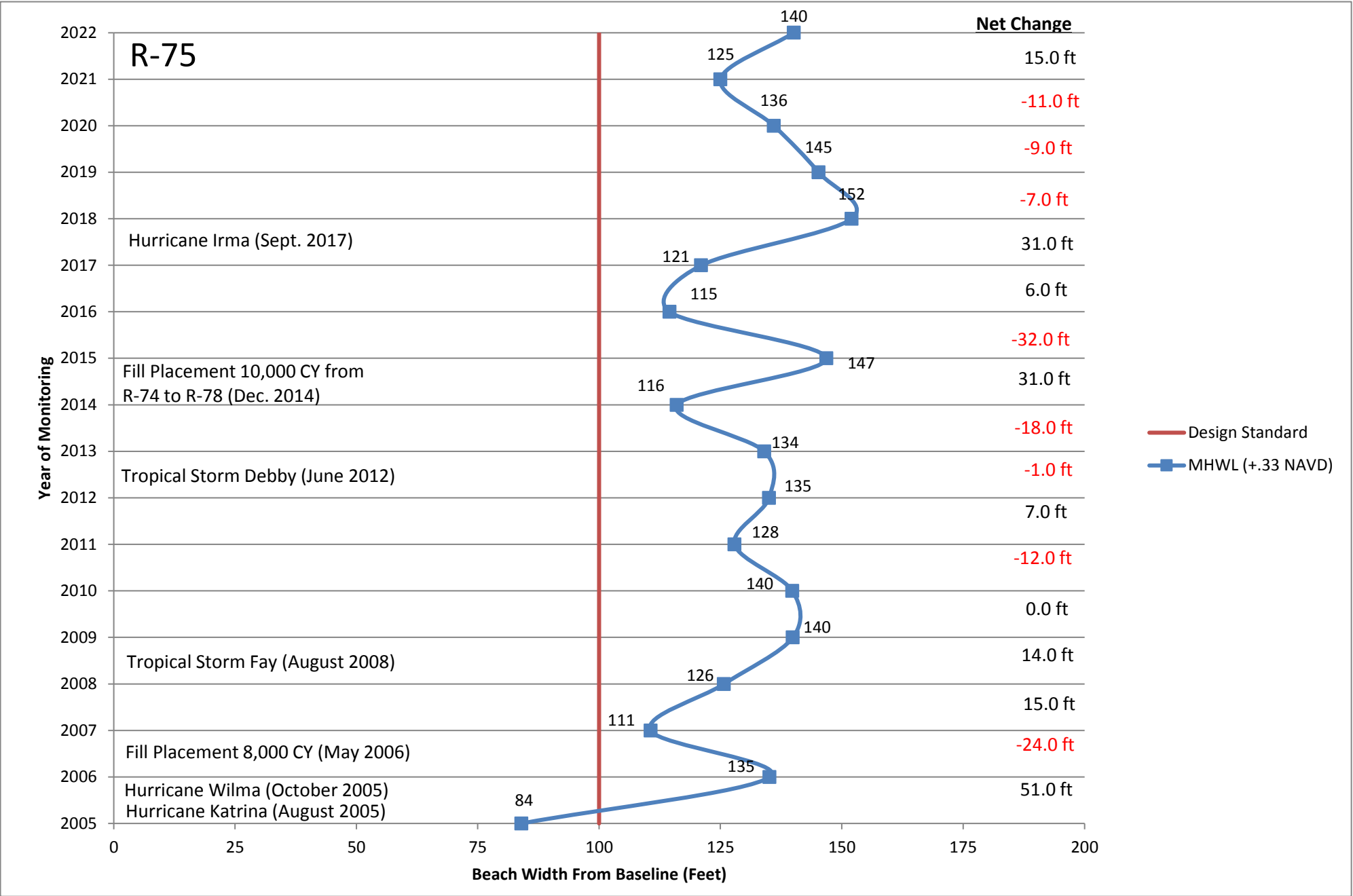
R-74

	2005 Beach Width=	68			
2006	Beginning Width=	68	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	140
	Annual Accretion=	89		Annual Accretion=	4
	End Beach Width=	157		End Beach Width=	
2007	Beginning Width=	157	2015	Beginning Width=	
	Annual Erosion=	-2		Annual Erosion=	144
	Annual Accretion=			Annual Accretion=	32
	End Beach Width=	155		End Beach Width=	
2008	Beginning Width=	155	2016	Beginning Width=	
	Annual Erosion=	-8		Annual Erosion=	176
	Annual Accretion=			Annual Accretion=	11
	End Beach Width=	147		End Beach Width=	
2009	Beginning Width=	147	2017	Beginning Width=	
	Annual Erosion=	-9		Annual Erosion=	187
	Annual Accretion=			Annual Accretion=	-38
	End Beach Width=	138		End Beach Width=	
2010	Beginning Width=	138	2018	Beginning Width=	
	Annual Erosion=	4		Annual Erosion=	149
	Annual Accretion=			Annual Accretion=	8
	End Beach Width=	142		End Beach Width=	
2011	Beginning Width=	142	2019	Beginning Width=	
	Annual Erosion=			Annual Erosion=	157
	Annual Accretion=	3		Annual Accretion=	1
	End Beach Width=	145		End Beach Width=	
2012	Beginning Width=	145	2020	Beginning Width=	
	Annual Erosion=	-9		Annual Erosion=	158
	Annual Accretion=			Annual Accretion=	6
	End Beach Width=	136		End Beach Width=	
2013	Beginning Width=	136	2021	Beginning Width=	
	Annual Erosion=			Annual Erosion=	164
	Annual Accretion=	4		Annual Accretion=	-18
	End Beach Width=	140		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	146
				Annual Accretion=	36
				End Beach Width=	
				182	



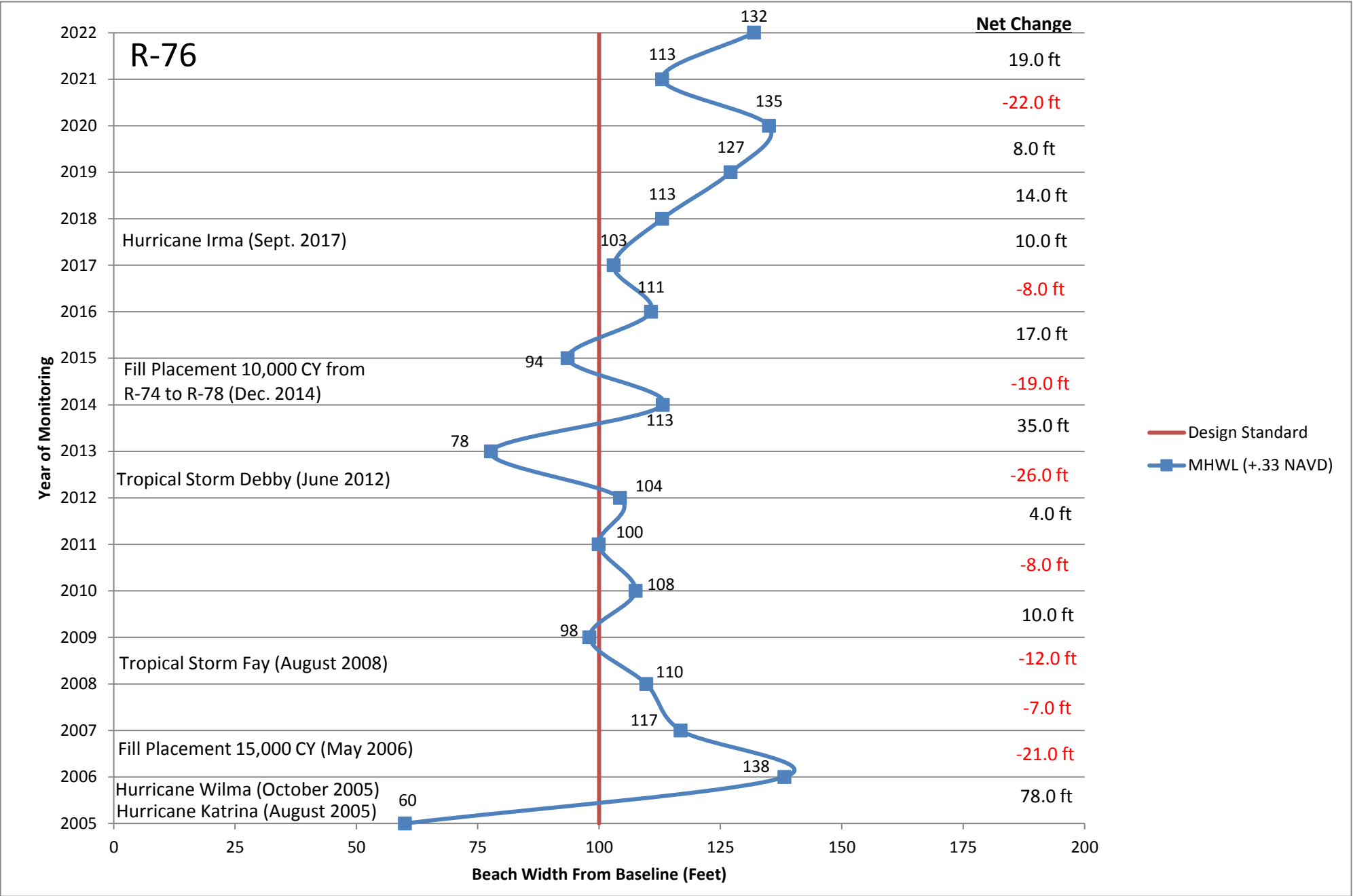
R-75

	2005 Beach Width=	84			
2006	Beginning Width=	84	2014	Beginning Width=	134
	Annual Erosion=			Annual Erosion=	-18
	Annual Accretion=	51		Annual Accretion=	
	End Beach Width=	135		End Beach Width=	116
2007	Beginning Width=	135	2015	Beginning Width=	116
	Annual Erosion=	-24		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	31
	End Beach Width=	111		End Beach Width=	147
2008	Beginning Width=	111	2016	Beginning Width=	147
	Annual Erosion=			Annual Erosion=	-32
	Annual Accretion=	15		Annual Accretion=	
	End Beach Width=	126		End Beach Width=	115
2009	Beginning Width=	126	2017	Beginning Width=	115
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	14		Annual Accretion=	6
	End Beach Width=	140		End Beach Width=	121
2010	Beginning Width=	140	2018	Beginning Width=	121
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=			Annual Accretion=	31
	End Beach Width=	140		End Beach Width=	152
2011	Beginning Width=	140	2019	Beginning Width=	152
	Annual Erosion=	-12		Annual Erosion=	-7
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	128		End Beach Width=	145
2012	Beginning Width=	128	2020	Beginning Width=	145
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	7		Annual Accretion=	
	End Beach Width=	135		End Beach Width=	136
2013	Beginning Width=	135	2021	Beginning Width=	136
	Annual Erosion=	-1		Annual Erosion=	-11
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	134		End Beach Width=	125
			2022	Beginning Width=	125
				Annual Erosion=	
				Annual Accretion=	15
				End Beach Width=	140



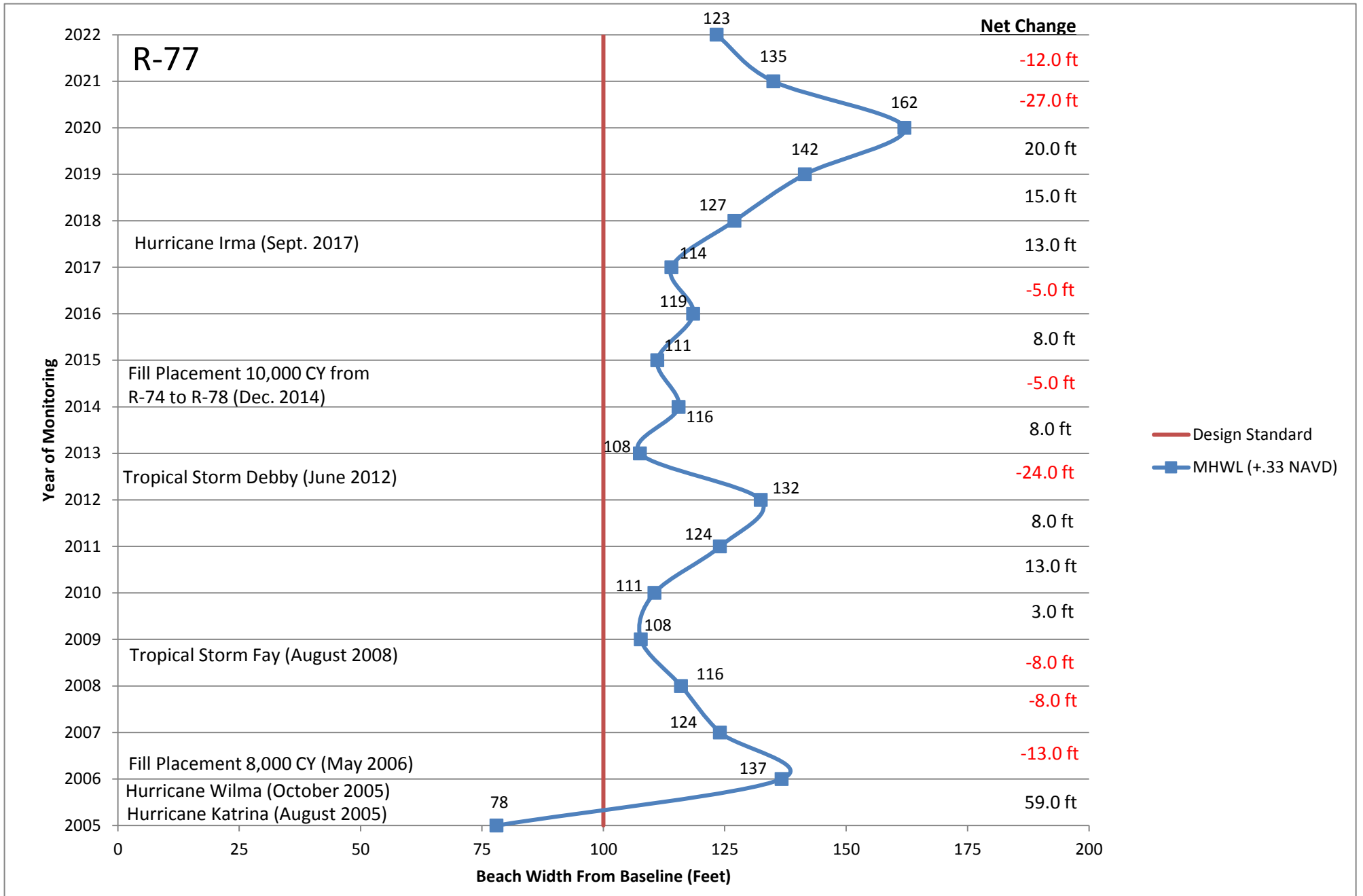
R-76

	2005 Beach Width=	60			
2006	Beginning Width=	60	2014	Beginning Width=	78
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	78		Annual Accretion=	35
	End Beach Width=	138		End Beach Width=	113
2007	Beginning Width=	138	2015	Beginning Width=	113
	Annual Erosion=	-21		Annual Erosion=	-19
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	117		End Beach Width=	94
2008	Beginning Width=	117	2016	Beginning Width=	94
	Annual Erosion=	-7		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	17
	End Beach Width=	110		End Beach Width=	111
2009	Beginning Width=	110	2017	Beginning Width=	111
	Annual Erosion=	-12		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	98		End Beach Width=	103
2010	Beginning Width=	98	2018	Beginning Width=	103
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	10		Annual Accretion=	10
	End Beach Width=	108		End Beach Width=	113
2011	Beginning Width=	108	2019	Beginning Width=	113
	Annual Erosion=	-8		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	14
	End Beach Width=	100		End Beach Width=	127
2012	Beginning Width=	100	2020	Beginning Width=	127
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	4		Annual Accretion=	8
	End Beach Width=	104		End Beach Width=	135
2013	Beginning Width=	104	2021	Beginning Width=	135
	Annual Erosion=	-26		Annual Erosion=	-22
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	78		End Beach Width=	113
			2022	Beginning Width=	113
				Annual Erosion=	
				Annual Accretion=	19
				End Beach Width=	132



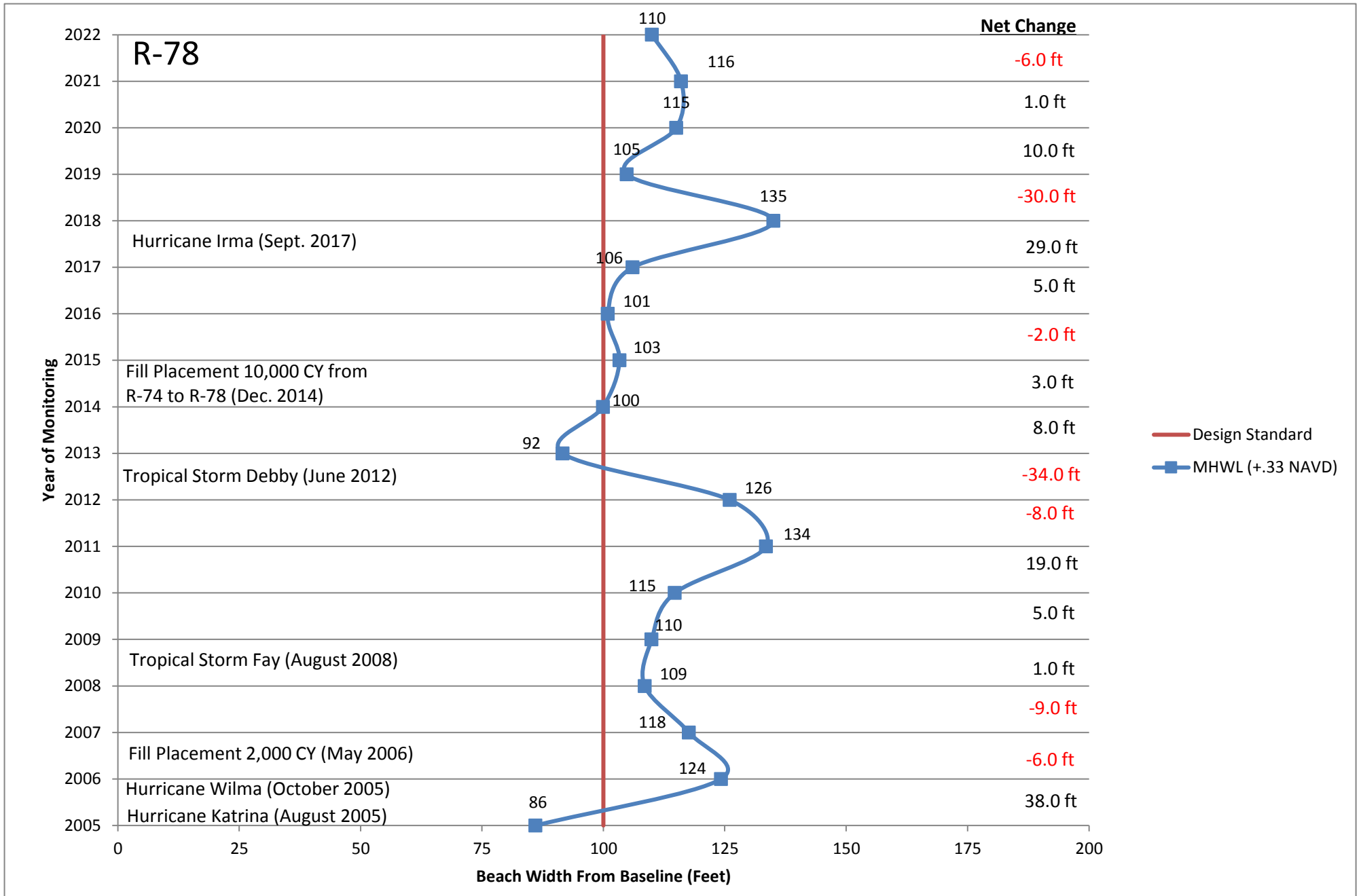
R-77

	2005 Beach Width=	78			
2006	Beginning Width=	78	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	108
	Annual Accretion=	59		Annual Accretion=	8
	End Beach Width=	137		End Beach Width=	
2007	Beginning Width=	137	2015	Beginning Width=	
	Annual Erosion=	-13		Annual Erosion=	116
	Annual Accretion=			Annual Accretion=	-5
	End Beach Width=	124		End Beach Width=	
2008	Beginning Width=	124	2016	Beginning Width=	
	Annual Erosion=	-8		Annual Erosion=	111
	Annual Accretion=			Annual Accretion=	8
	End Beach Width=	116		End Beach Width=	
2009	Beginning Width=	116	2017	Beginning Width=	
	Annual Erosion=	-8		Annual Erosion=	119
	Annual Accretion=			Annual Accretion=	-5
	End Beach Width=	108		End Beach Width=	
2010	Beginning Width=	108	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	114
	Annual Accretion=	3		Annual Accretion=	13
	End Beach Width=	111		End Beach Width=	
2011	Beginning Width=	111	2019	Beginning Width=	
	Annual Erosion=			Annual Erosion=	127
	Annual Accretion=	13		Annual Accretion=	15
	End Beach Width=	124		End Beach Width=	
2012	Beginning Width=	124	2020	Beginning Width=	
	Annual Erosion=			Annual Erosion=	142
	Annual Accretion=	8		Annual Accretion=	20
	End Beach Width=	132		End Beach Width=	
2013	Beginning Width=	132	2021	Beginning Width=	
	Annual Erosion=	-24		Annual Erosion=	162
	Annual Accretion=			Annual Accretion=	-27
	End Beach Width=	108		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	135
				Annual Accretion=	-12
				End Beach Width=	
				123	



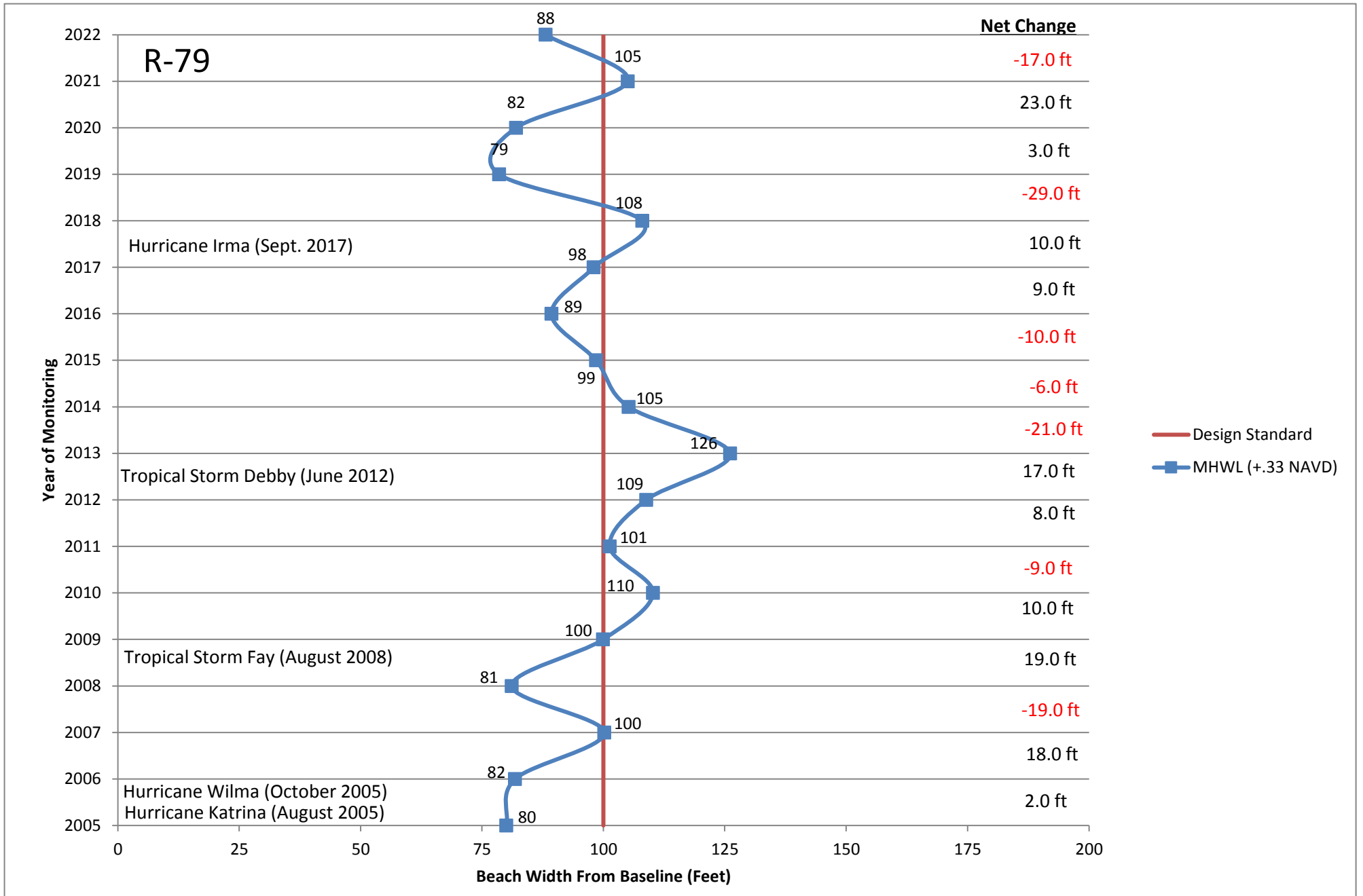
R-78

	2005 Beach Width=	86			
2006	Beginning Width=	86	2014	Beginning Width=	92
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	38		Annual Accretion=	8
	End Beach Width=	124		End Beach Width=	100
2007	Beginning Width=	124	2015	Beginning Width=	100
	Annual Erosion=	-6		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	3
	End Beach Width=	118		End Beach Width=	103
2008	Beginning Width=	118	2016	Beginning Width=	103
	Annual Erosion=	-9		Annual Erosion=	-2
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	109		End Beach Width=	101
2009	Beginning Width=	109	2017	Beginning Width=	101
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	1		Annual Accretion=	5
	End Beach Width=	110		End Beach Width=	106
2010	Beginning Width=	110	2018	Beginning Width=	106
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	5		Annual Accretion=	29
	End Beach Width=	115		End Beach Width=	135
2011	Beginning Width=	115	2019	Beginning Width=	135
	Annual Erosion=			Annual Erosion=	-30
	Annual Accretion=	19		Annual Accretion=	
	End Beach Width=	134		End Beach Width=	105
2012	Beginning Width=	134	2020	Beginning Width=	105
	Annual Erosion=	-8		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	10
	End Beach Width=	126		End Beach Width=	115
2013	Beginning Width=	126	2021	Beginning Width=	115
	Annual Erosion=	-34		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	92		End Beach Width=	116
			2022	Beginning Width=	116
				Annual Erosion=	-6
				Annual Accretion=	
				End Beach Width=	110



R-79

	2005 Beach Width=	80			
2006	Beginning Width=	80	2014	Beginning Width=	
	Annual Erosion=			Annual Erosion=	126
	Annual Accretion=	2		Annual Accretion=	-21
	End Beach Width=	82		End Beach Width=	
2007	Beginning Width=	82	2015	Beginning Width=	
	Annual Erosion=			Annual Erosion=	105
	Annual Accretion=	18		Annual Accretion=	-6
	End Beach Width=	100		End Beach Width=	
2008	Beginning Width=	100	2016	Beginning Width=	
	Annual Erosion=	-19		Annual Erosion=	99
	Annual Accretion=			Annual Accretion=	-10
	End Beach Width=	81		End Beach Width=	
2009	Beginning Width=	81	2017	Beginning Width=	
	Annual Erosion=			Annual Erosion=	89
	Annual Accretion=	19		Annual Accretion=	9
	End Beach Width=	100		End Beach Width=	
2010	Beginning Width=	100	2018	Beginning Width=	
	Annual Erosion=			Annual Erosion=	98
	Annual Accretion=	10		Annual Accretion=	10
	End Beach Width=	110		End Beach Width=	
2011	Beginning Width=	110	2019	Beginning Width=	
	Annual Erosion=	-9		Annual Erosion=	108
	Annual Accretion=			Annual Accretion=	-29
	End Beach Width=	101		End Beach Width=	
2012	Beginning Width=	101	2020	Beginning Width=	
	Annual Erosion=			Annual Erosion=	79
	Annual Accretion=	8		Annual Accretion=	3
	End Beach Width=	109		End Beach Width=	
2013	Beginning Width=	109	2021	Beginning Width=	
	Annual Erosion=			Annual Erosion=	82
	Annual Accretion=	17		Annual Accretion=	23
	End Beach Width=	126		End Beach Width=	
			2022	Beginning Width=	
				Annual Erosion=	105
				Annual Accretion=	-17
				End Beach Width=	
				88	



R-79

Net Change

— Design Standard
 ■ MHWL (+.33 NAVD)

Hurricane Irma (Sept. 2017)

Tropical Storm Debby (June 2012)

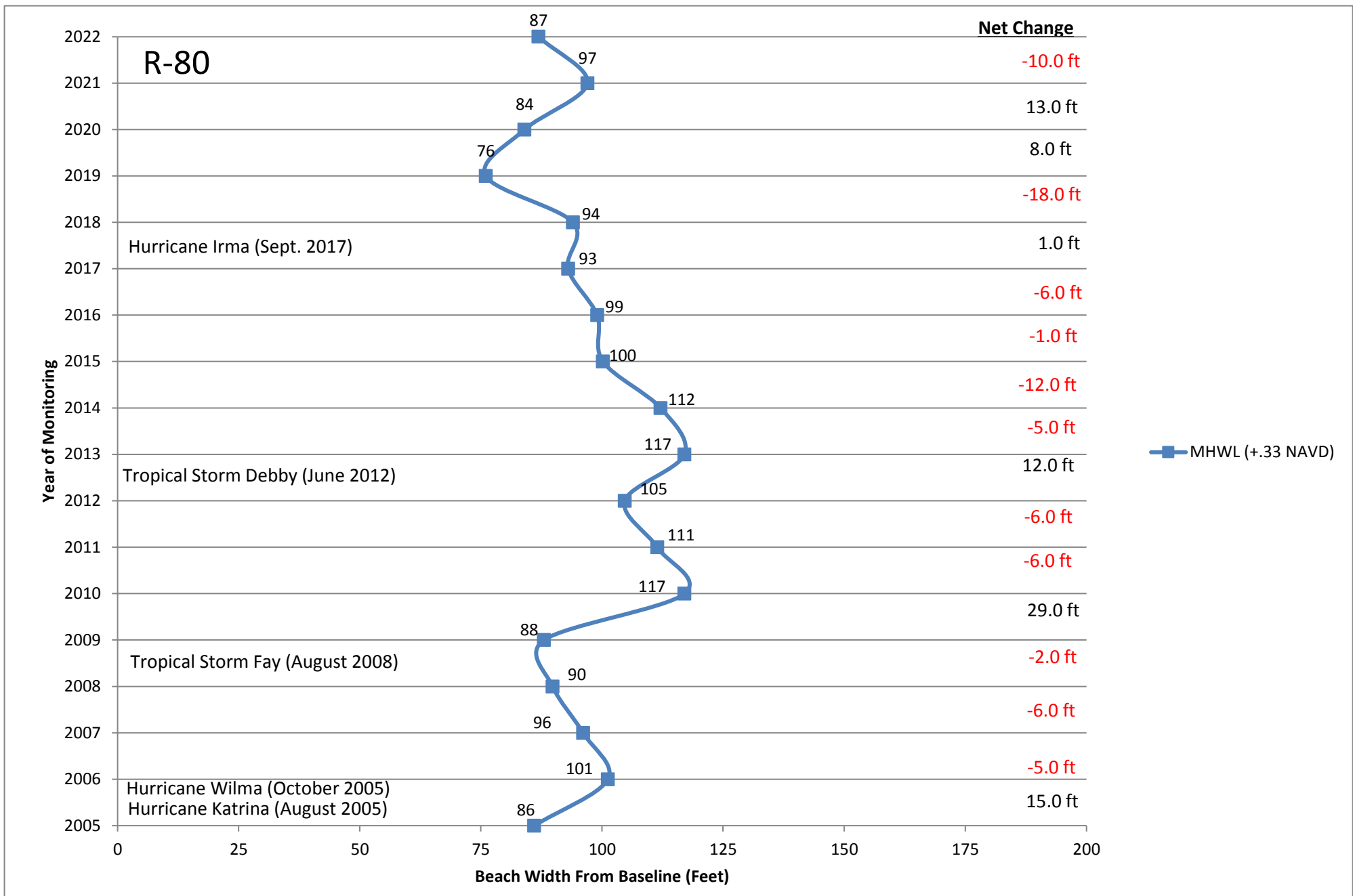
Tropical Storm Fay (August 2008)

Hurricane Wilma (October 2005)

Hurricane Katrina (August 2005)

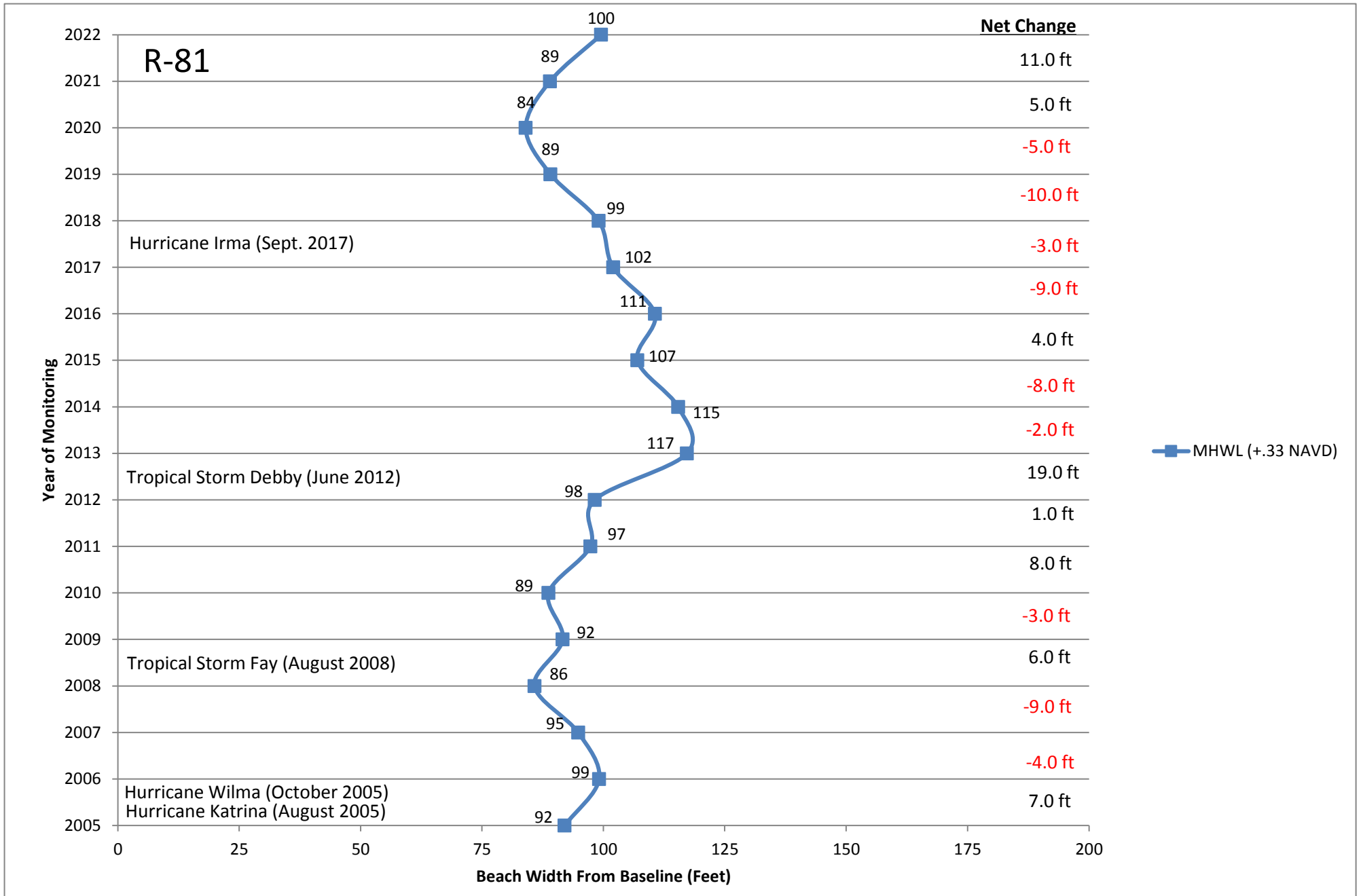
R-80

	2005 Beach Width=	86			
2006	Beginning Width=	86	2014	Beginning Width=	117
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	15		Annual Accretion=	
	End Beach Width=	101		End Beach Width=	112
2007	Beginning Width=	101	2015	Beginning Width=	112
	Annual Erosion=	-5		Annual Erosion=	-12
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	96		End Beach Width=	100
2008	Beginning Width=	96	2016	Beginning Width=	100
	Annual Erosion=	-6		Annual Erosion=	-1
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	90		End Beach Width=	99
2009	Beginning Width=	90	2017	Beginning Width=	99
	Annual Erosion=	-2		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	88		End Beach Width=	93
2010	Beginning Width=	88	2018	Beginning Width=	93
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	29		Annual Accretion=	1
	End Beach Width=	117		End Beach Width=	94
2011	Beginning Width=	117	2019	Beginning Width=	94
	Annual Erosion=	-6		Annual Erosion=	-18
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	111		End Beach Width=	76
2012	Beginning Width=	111	2020	Beginning Width=	76
	Annual Erosion=	-6		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	8
	End Beach Width=	105		End Beach Width=	84
2013	Beginning Width=	105	2021	Beginning Width=	84
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	12		Annual Accretion=	13
	End Beach Width=	117		End Beach Width=	97
			2022	Beginning Width=	97
				Annual Erosion=	-10
				Annual Accretion=	
				End Beach Width=	87



R-81

	2005 Beach Width=	92			
2006	Beginning Width=	92	2014	Beginning Width=	117
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=	7		Annual Accretion=	
	End Beach Width=	99		End Beach Width=	115
2007	Beginning Width=	99	2015	Beginning Width=	115
	Annual Erosion=	-4		Annual Erosion=	-8
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	95		End Beach Width=	107
2008	Beginning Width=	95	2016	Beginning Width=	107
	Annual Erosion=	-9		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	4
	End Beach Width=	86		End Beach Width=	111
2009	Beginning Width=	86	2017	Beginning Width=	111
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	6		Annual Accretion=	
	End Beach Width=	92		End Beach Width=	102
2010	Beginning Width=	92	2018	Beginning Width=	102
	Annual Erosion=	-3		Annual Erosion=	-3
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	89		End Beach Width=	99
2011	Beginning Width=	89	2019	Beginning Width=	99
	Annual Erosion=			Annual Erosion=	-10
	Annual Accretion=	8		Annual Accretion=	
	End Beach Width=	97		End Beach Width=	89
2012	Beginning Width=	97	2020	Beginning Width=	89
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	1		Annual Accretion=	
	End Beach Width=	98		End Beach Width=	84
2013	Beginning Width=	98	2021	Beginning Width=	84
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	19		Annual Accretion=	5
	End Beach Width=	117		End Beach Width=	89
			2022	Beginning Width=	89
				Annual Erosion=	
				Annual Accretion=	11
				End Beach Width=	100



R-81

Net Change

■ MHWL (+.33 NAVD)

Hurricane Irma (Sept. 2017)

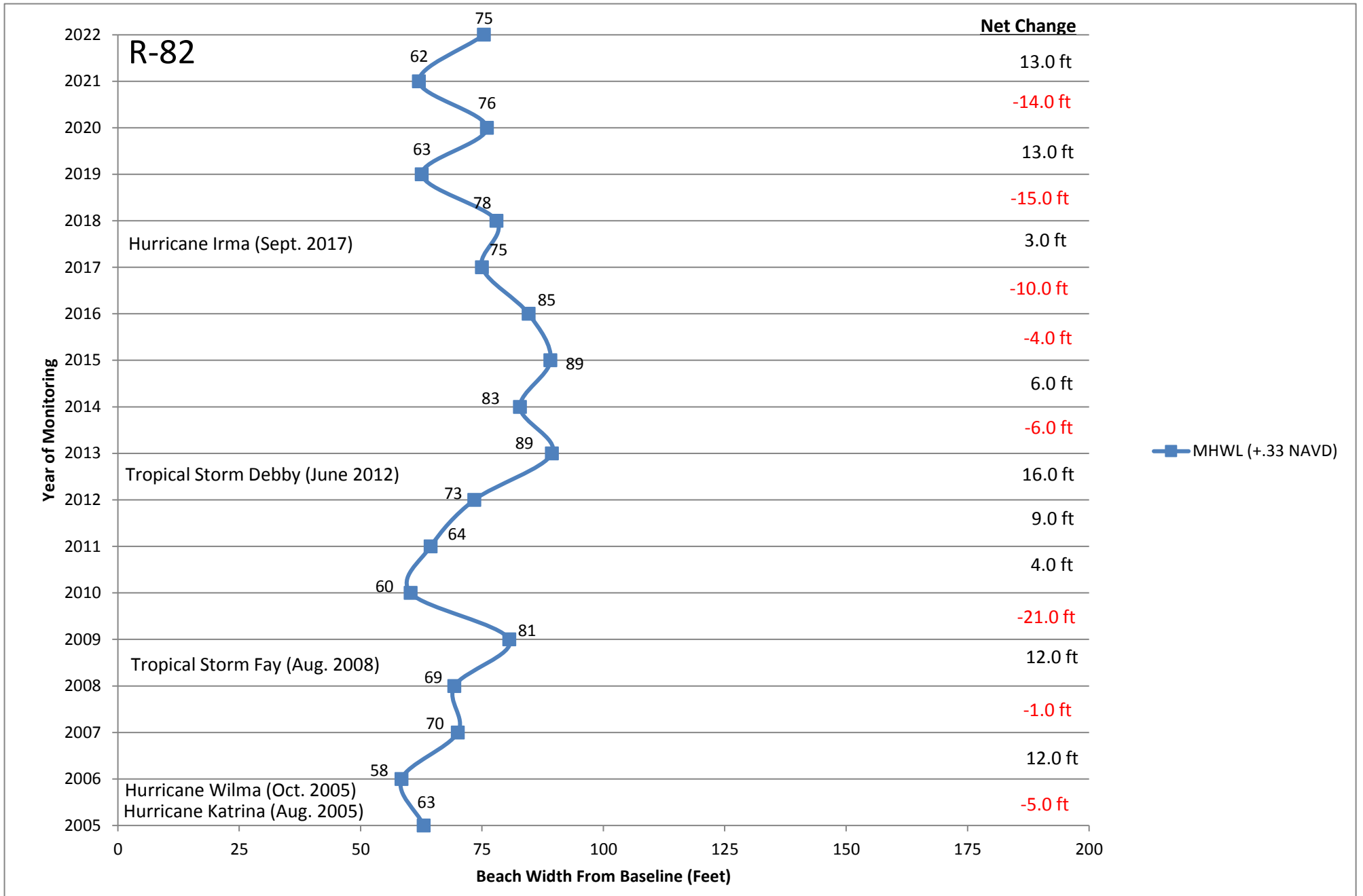
Tropical Storm Debby (June 2012)

Tropical Storm Fay (August 2008)

Hurricane Wilma (October 2005)
Hurricane Katrina (August 2005)

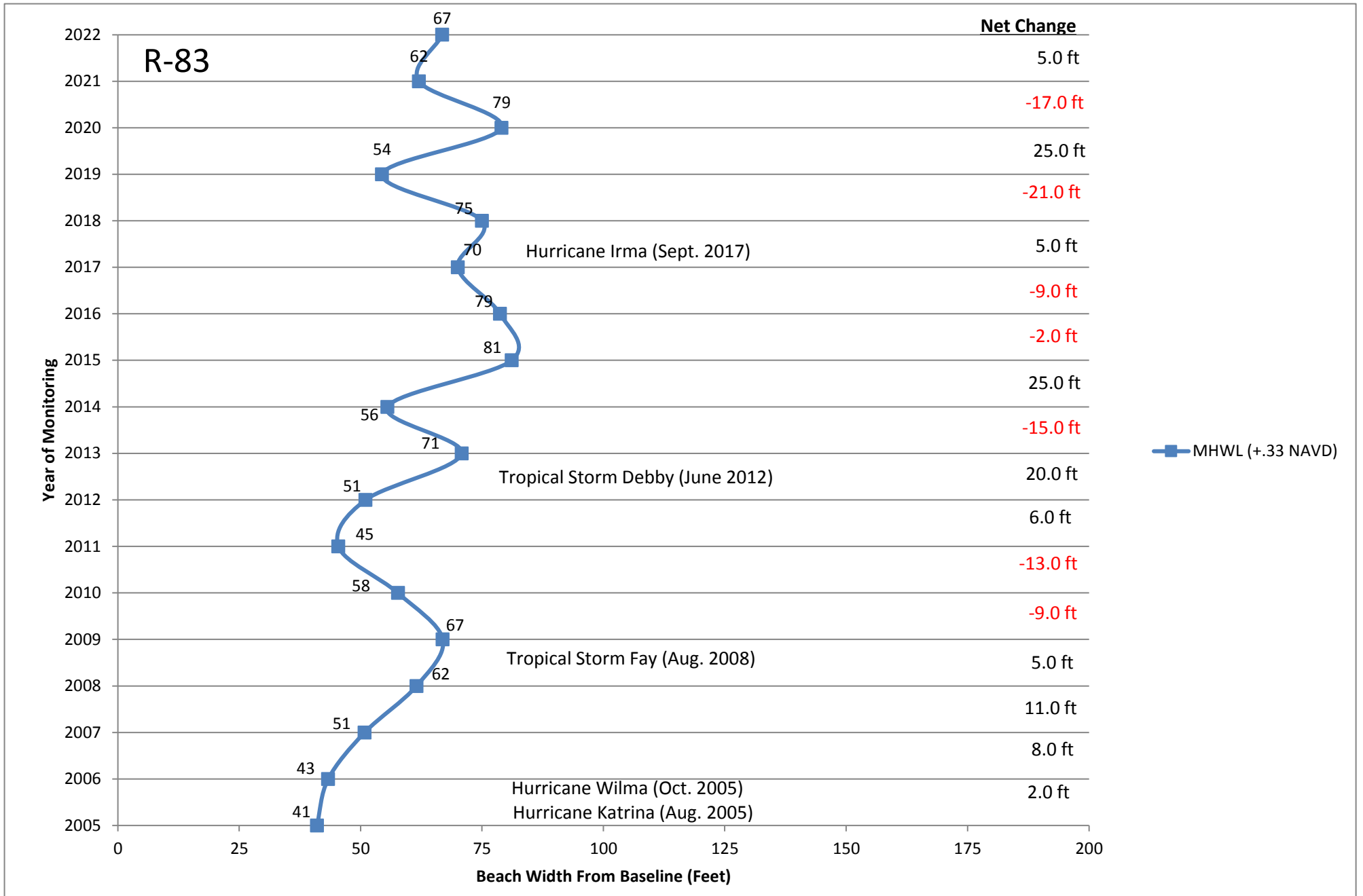
R-82

	2005 Beach Width=	63			
2006	Beginning Width=	63	2014	Beginning Width=	89
	Annual Erosion=	-5		Annual Erosion=	-6
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	58		End Beach Width=	83
2007	Beginning Width=	58	2015	Beginning Width=	83
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	12		Annual Accretion=	6
	End Beach Width=	70		End Beach Width=	89
2008	Beginning Width=	70	2016	Beginning Width=	89
	Annual Erosion=	-1		Annual Erosion=	-4
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	69		End Beach Width=	85
2009	Beginning Width=	69	2017	Beginning Width=	85
	Annual Erosion=			Annual Erosion=	-10
	Annual Accretion=	12		Annual Accretion=	
	End Beach Width=	81		End Beach Width=	75
2010	Beginning Width=	81	2018	Beginning Width=	75
	Annual Erosion=	-21		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	3
	End Beach Width=	60		End Beach Width=	78
2011	Beginning Width=	60	2019	Beginning Width=	78
	Annual Erosion=			Annual Erosion=	-15
	Annual Accretion=	4		Annual Accretion=	
	End Beach Width=	64		End Beach Width=	63
2012	Beginning Width=	64	2020	Beginning Width=	63
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	9		Annual Accretion=	13
	End Beach Width=	73		End Beach Width=	76
2013	Beginning Width=	73	2021	Beginning Width=	76
	Annual Erosion=			Annual Erosion=	-14
	Annual Accretion=	16		Annual Accretion=	
	End Beach Width=	89		End Beach Width=	62
			2022	Beginning Width=	62
				Annual Erosion=	
				Annual Accretion=	13
				End Beach Width=	75



R-83

	2005 Beach Width=	41			
2006	Beginning Width=	41	2014	Beginning Width=	71
	Annual Erosion=			Annual Erosion=	-15
	Annual Accretion=	2		Annual Accretion=	
	End Beach Width=	43		End Beach Width=	56
2007	Beginning Width=	43	2015	Beginning Width=	56
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	8		Annual Accretion=	25
	End Beach Width=	51		End Beach Width=	81
2008	Beginning Width=	51	2016	Beginning Width=	81
	Annual Erosion=			Annual Erosion=	-2
	Annual Accretion=	11		Annual Accretion=	
	End Beach Width=	62		End Beach Width=	79
2009	Beginning Width=	62	2017	Beginning Width=	79
	Annual Erosion=			Annual Erosion=	-9
	Annual Accretion=	5		Annual Accretion=	
	End Beach Width=	67		End Beach Width=	70
2010	Beginning Width=	67	2018	Beginning Width=	70
	Annual Erosion=	-9		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	5
	End Beach Width=	58		End Beach Width=	75
2011	Beginning Width=	58	2019	Beginning Width=	75
	Annual Erosion=	-13		Annual Erosion=	-21
	Annual Accretion=			Annual Accretion=	
	End Beach Width=	45		End Beach Width=	54
2012	Beginning Width=	45	2020	Beginning Width=	54
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	6		Annual Accretion=	25
	End Beach Width=	51		End Beach Width=	79
2013	Beginning Width=	51	2021	Beginning Width=	79
	Annual Erosion=			Annual Erosion=	-17
	Annual Accretion=	20		Annual Accretion=	
	End Beach Width=	71		End Beach Width=	62
			2022	Beginning Width=	62
				Annual Erosion=	
				Annual Accretion=	5
				End Beach Width=	67



R-84

	2005 Beach Width=	23			
2006	Beginning Width=	23	2014	Beginning Width=	59
	Annual Erosion=			Annual Erosion=	-6
	Annual Accretion=	11		Annual Accretion=	
	End Beach Width=	34		End Beach Width=	53
2007	Beginning Width=	34	2015	Beginning Width=	53
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	9		Annual Accretion=	19
	End Beach Width=	43		End Beach Width=	72
2008	Beginning Width=	43	2016	Beginning Width=	72
	Annual Erosion=			Annual Erosion=	-5
	Annual Accretion=	2		Annual Accretion=	
	End Beach Width=	45		End Beach Width=	67
2009	Beginning Width=	45	2017	Beginning Width=	67
	Annual Erosion=			Annual Erosion=	-20
	Annual Accretion=	8		Annual Accretion=	
	End Beach Width=	53		End Beach Width=	47
2010	Beginning Width=	53	2018	Beginning Width=	47
	Annual Erosion=	-1		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	21
	End Beach Width=	52		End Beach Width=	68
2011	Beginning Width=	52	2019	Beginning Width=	68
	Annual Erosion=			Annual Erosion=	-11
	Annual Accretion=	15		Annual Accretion=	
	End Beach Width=	67		End Beach Width=	57
2012	Beginning Width=	67	2020	Beginning Width=	57
	Annual Erosion=	-23		Annual Erosion=	
	Annual Accretion=			Annual Accretion=	1
	End Beach Width=	44		End Beach Width=	58
2013	Beginning Width=	44	2021	Beginning Width=	58
	Annual Erosion=			Annual Erosion=	
	Annual Accretion=	15		Annual Accretion=	8
	End Beach Width=	59		End Beach Width=	66
			2022	Beginning Width=	66
				Annual Erosion=	-11
				Annual Accretion=	
				End Beach Width=	55

