

**JUPITER ISLAND
BEACH RENOURISHMENT
PROJECT**



**BEACH AND NEARSHORE
MONITORING SURVEY REPORT**

July 2020 – July 2021

- Shoreline Changes
- Erosion / Accretion Volumes
- Beach Profile Overlays
- Survey Drawings

PREPARED FOR

Town of Jupiter Island, FL

**FDEP #0186991-008-JC
USACE #199201740(MOD-LCK)**

BY



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1.0 INTRODUCTION AND SCOPE

1.1 BACKGROUND

The Town of Jupiter Island (the Town) is a barrier island located off the east coast of Florida, bounded on the north by the St. Lucie Inlet and on the south by the Jupiter Inlet. The opening of the St. Lucie Inlet, and subsequent jetty construction and improvements, has interrupted the flow of the sand along the coastline and has resulted in accelerated erosion of the Island's beachfront. The erosion potential along this section of shoreline is greater than at many other locations in Florida because the continental shelf narrows continuously from northern Florida to southern Florida. Once south of Jupiter Inlet, the effects of a narrower shelf are offset partly by wave sheltering by the Bahama Banks offshore. Jupiter Island lacks this sheltering, leading to a relatively higher potential for sediment transport and erosion.

The Town has maintained a long history of attempts to mitigate the severe erosion of the beaches along the developed portions of its shoreline. These efforts have consisted of various forms of shoreline armoring and beach restoration through artificial renourishment. After many years of research, studies and field investigations, and considering the environmental and economic factors involved, the Town of Jupiter Island has concluded that a long-term program of artificial beach renourishment is the only viable means to combat the erosion of its shoreline.

The current beach nourishment program began in 1973. From 1973 to 1989 various nearshore borrow areas were dredged for placement of sand on the beach. In 1989, the Town performed a sand search for high quality borrow material for the Jupiter Island beaches, resulting in the delineation of two significant borrow sites directly offshore of the Island. The northern site is a 290-acre tract approximately 11,000 feet offshore of the public beach at the northern portion of the Town, and the southern site is a 562-acre tract approximately 10,000 feet offshore of the Island at the Town's southern limits. These borrow sites have been used on the previous beach restoration projects performed since 1989. The northern site, Borrow Site A, has been exhausted. Limited material remains in the southern site, Borrow Site B. Another sand search was completed in 2017 and a new borrow site containing over 10 million cubic yards of beach compatible sand has been permitted. The new site is an easterly expansion of Borrow Site B and is therefore referred to as Borrow Site B Expansion. A project location map is provided as Figure 1-1.

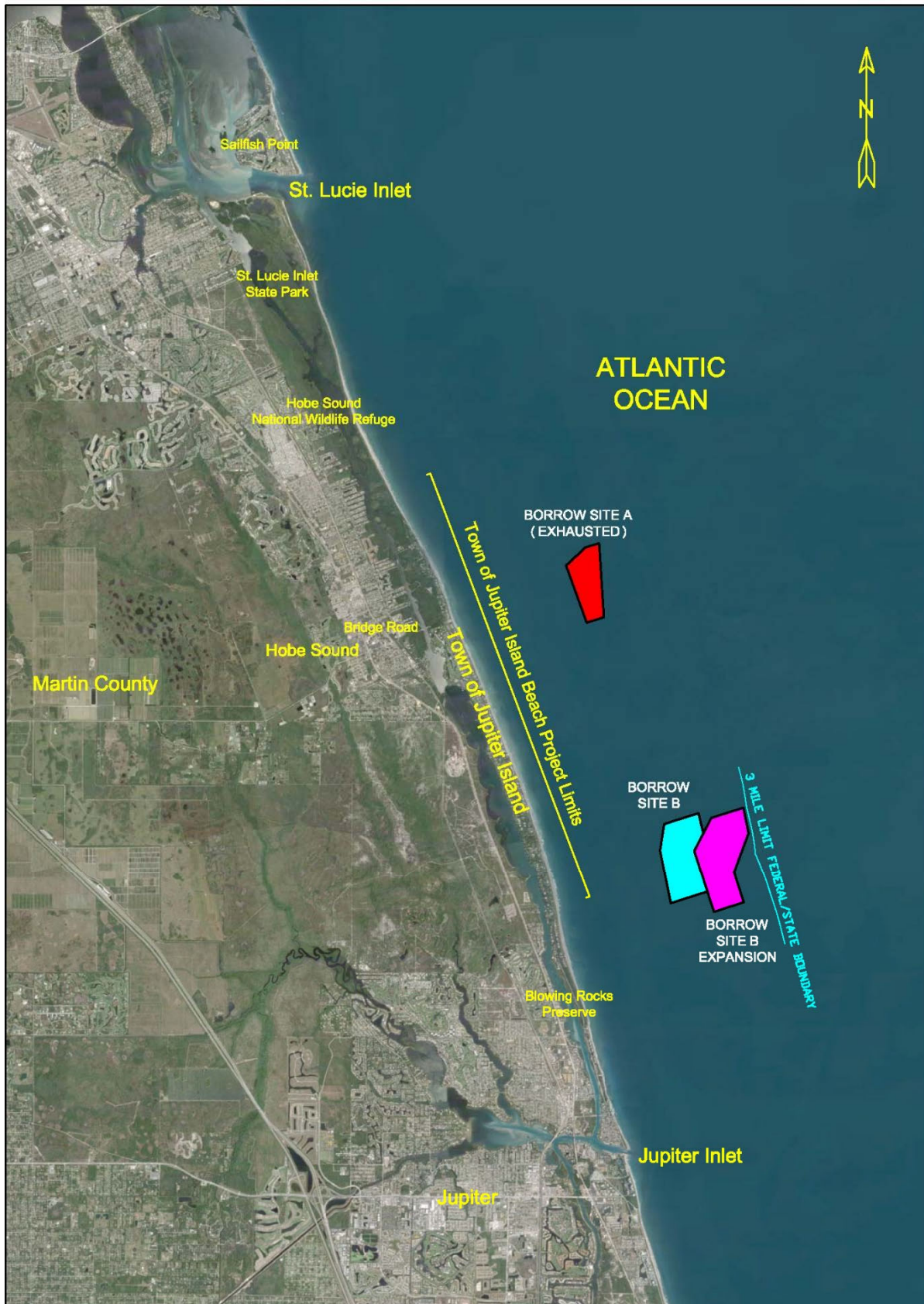


Figure 1-1: Beach Project Location Map

1.2 PREVIOUS BEACH NOURISHMENT PROJECTS

Fourteen Town sponsored beach nourishment projects have been completed since 1973, including the recent beach nourishment project completed in 2021. Over 19,000,000 cubic yards have been placed on the beach since 1973 along an average project length of nearly 4 miles. These projects are listed in Table 1-1.

Table 1-1: Beach Nourishment Projects

Town of Jupiter Island Beach Nourishment Projects				
Year	Borrow Site	Volume Placed (cy)	Fill Length (ft)	Density Placed (cy/ft)
1973	Nearshore Borrow Areas	2,612,000	26,000	144
1974	Nearshore Borrow Areas	1,126,200		
July 1977 - Aug. 1977	Nearshore Borrow Areas	630,519	13,000	114
1978	Nearshore Borrow Areas	847,223		
1983	Nearshore Borrow Areas	1,000,000	9,000	111
May 1987 - June 1987	Nearshore Borrow Areas	2,234,869	16,200	138
Feb. 1990 - Apr. 1990	Borrow Site "B"	585,308	9,600	61
1991	Borrow Site "B"	414,812	8,800	47
1993	Borrow Site "B"	203,736	4,200	49
1995-1996	Borrow Site "B"	1,741,134	26,000	67
Mar. 2002 - Apr. 2002	Borrow Sites "A" & "B"	611,594	30,500	50
Nov. 2002 - Apr. 2003	Borrow Sites "A" & "B"	907,968		
Feb. - Apr. 2006	Borrow Sites "A" & "B"	733,186	27,000	63
Nov. - Dec. 2006	Borrow Site "A"	317,263		
Jan. - Apr. 2007	Borrow Sites "A" & "B"	656,262		
Jan. - Apr. 2012	Borrow Site "B"	1,150,858	22,700	51
Jan. - Apr. 2016	Borrow Site "B"	1,670,455	27,300	61
Jan. - Apr. 2019	Borrow Sites "B" & "B Expansion"	1,174,512	32,000	37
Jan. - Mar. 2021	Borrow Site "B Expansion"	667,873	20,500	33
SUMMARY 1973-2021		19,285,772	19,486	73

In addition to the above listed beach nourishment projects, there was a County inlet dredging project that placed sand on the beach during the years 1998 and 1999. Also, there were two USACE inlet dredging projects, during the years 2000/2001 and 2002 that placed material in nearshore areas, from ranges 800 feet to 1800 feet as measured from the Erosion Control Line (ECL). These are all included in Table 1-2.

Table 1-2: Inlet Dredging Projects

USACE / Martin County Beach and Nearshore Nourishment Projects		
Year	Borrow Site	Volume Placed (cy)
1998-1999	St. Lucie Inlet	500,000 (Beach)
2000 - 2001	St. Lucie Inlet	221,000 (Nearshore)
2002	St. Lucie Inlet	292,000 (Nearshore)
TOTAL		1,013,000

1.3 SCOPE OF MONITORING SERVICES AND REPORT

Gahagan and Bryant Associates, Inc. (GBA) has been retained to provide surveys and engineering services in fulfillment of the requirements for the physical monitoring plan for the Town's USACE #199201740(MOD-LCK) and FDEP #0186991-008-JC permits. These services include topographic and hydrographic surveys of the beach, nearshore and offshore areas, as well as the borrow sites. These surveys are measured in U.S. Feet and are horizontally referenced to the U.S. State Plane Coordinate System, Florida East, North American Datum of 1983 (NAD83), and vertically referenced to the North American Vertical Datum of 1988 (NAVD88). This report summarizes and discusses the data and the performance of the beach nourishment project, and identifies erosion and accretion patterns within the monitored area. Results are analyzed for patterns, trends, or changes between annual surveys and cumulatively since project construction. In compliance with the permit, this report specifically includes:

- A record of the volume and location of all beach fill or inlet sand bypassing material placed within the project area;
- The volume and percentage of remaining fill since the last beach nourishment project;
- The most recent MHW shoreline positions (ft) in comparison with the design profile at each individual monument location (represented as the 0.0' contour NAVD88);
- The MHW shoreline position changes (ft) relative to the pre-construction survey at each individual monument location for all the monitoring periods (represented as the 0.0' contour NAVD88); and,
- Other shoreline position and volumetric analyses deemed useful in assessing, with quantitative measurements, the performance of the project, including historical trend analyses.

The basis of these evaluations are the annual physical monitoring surveys. This monitoring period utilizes the surveys completed in July 2020 and July 2021. Appendix H includes superimposed plots of these two beach profile surveys, the December 2020 preconstruction survey, the April 2021 postconstruction survey, and the beach fill design template.

2.0 PROJECT INFORMATION

2.1 PHYSICAL MONITORING SURVEYS

A beach profile monitoring survey was performed during July 2021 at the Town of Jupiter Island, FL, covering the limits of the recent Jupiter Island beach nourishment projects, in accordance with requirements of the Town's USACE #199201740(MOD-LCK) and FDEP #0186991-008-JC permits. The survey encompassed 59 profiles of the beach and nearshore areas located between DNR Monuments R-68 to R-121. Profile lines were surveyed at a typical spacing of 800 feet and extended from the landward limit of the beach/dune to 4,000 feet offshore. Most of these profiles have been surveyed annually since 1995 and provide for a consistent comparison with the historical surveys. This report includes comparisons and accretion/erosion analyses between the July 2021 survey and the previous summer physical monitoring survey completed during July 2020, as well as the December 2020 preconstruction survey and the April 2021 postconstruction survey, both completed during this monitoring period. The results are divided into five sections: Hobe Sound National Wildlife Refuge (Refuge), North, Middle, South, and Blowing Rocks. The results are similarly divided into four ranges as measured from the ECL/Baseline: Beach (-200'-300'), Nearshore (300'-800'), Offshore (800'-1800'), and Offshore (1800'-2800'). In addition, this report includes accretion/erosion trend analyses based on the annual surveys since 1995. These historical trends do not include the Refuge section, as this section was added to the physical monitoring surveys in 2018. The beach profile locations are shown in Figure 2-1 and listed in Table 2-1: Beach Profile Monitoring Survey Line Locations.



Figure 2-1: Physical Monitoring Survey Profile Locations and Volume Sections

Table 2-1: Beach Profile Monitoring Survey Line Locations

	PROFILE STATION	BASELINE P.I.	
		Northing	Easting
1	R-68	1,009,215.41	936,801.18
2	R-69	1,008,432.59	937,191.18
3	R-70	1,007,587.85	937,597.57
4	R-71	1,006,748.58	937,964.94
5	R-72	1,006,013.97	938,419.69
6	R-73	1,005,193.03	938,793.41
7	R-74	1,004,464.96	939,110.85
8	R-75	1,003,565.01	939,576.70
9	R-76A	1,002,767.30	940,063.35
10	1,002,364	1,002,527.53	940,378.01
11	1,001,686	1,001,849.53	940,832.28
12	1,000,977	1,001,140.53	941,210.04
13	1,000,258	1,000,421.53	941,563.86
14	999,543	999,706.53	941,927.08
15	998,829	998,992.53	942,295.13
16	998,122	998,285.53	942,676.36
17	997,400	997,563.53	943,024.64
18	996,663	996,826.53	943,335.66
19	995,908	996,071.53	943,604.58
20	995,131	995,294.52	943,819.55
21	994,364	994,527.52	944,059.30
22	993,615	993,778.52	944,342.31
23	992,902	993,065.52	944,708.51
24	992,183	992,346.52	945,063.35
25	991,458	991,621.52	945,402.65
26	990,730	990,893.52	945,735.80
27	989,997	990,160.52	946,058.33
28	989,265	989,428.52	946,380.41
29	988,526	988,689.52	946,686.04
30	987,770	987,933.52	946,952.74

	PROFILE STATION	BASELINE P.I.	
		Northing	Easting
31	987,014	987,177.51	947,219.78
32	986,263	986,426.51	947,496.97
33	985,519	985,682.51	947,789.97
34	984,778	984,941.51	948,091.81
35	984,039	984,202.51	948,399.29
36	983,302	983,465.51	948,709.82
37	982,559	982,722.51	949,006.41
38	981,814	981,977.51	949,300.08
39	981,078	981,241.51	949,612.75
40	980,328	980,491.51	949,892.18
41	979,566	979,729.51	950,145.18
42	978,429	978,592.50	950,534.82
43	977,664	977,827.50	950,779.62
44	976,899	977,062.50	951,023.12
45	976,130	976,293.50	951,259.20
46	975,362	975,525.50	951,494.99
47	974,589	974,752.50	951,720.10
48	973,812	973,975.50	951,935.60
49	973,025	973,188.49	952,128.53
50	972,232	972,395.49	952,306.17
51	971,439	971,602.49	952,483.80
52	970,641	970,804.49	952,650.64
53	969,838	970,001.48	952,804.29
54	969,019	969,182.47	952,917.73
55	968,204	968,367.47	953,042.67
56	967,417	967,580.46	953,235.49
57	966,631	966,794.45	953,428.06
58	965,844	966,007.45	953,620.88
59	965,058	965,221.44	953,813.45

Notes:

- 1) Stationing refers to the Y coordinate of the intersection line and the Erosion Control Line (ECL), historically referenced to NAD '27. Lines R-68 to R-72 are referenced to the respective R-Monument coordinates (project baseline). Lines R-73 to R-75 and lines 968,204 to 965,058 are referenced to the project baseline. All other lines are referenced to the ECL.
- 2) The ECL and project baseline are referenced at range 0, with range values increasing seaward.
- 3) Profile azimuths for R-68 to R-76A are 69° grid. All other profile azimuths are 67°17'54" grid.
- 4) Coordinates refer to Florida State Plane, East Zone, NAD '83
- 5) Profile lines are approximately 800' spacing with the exception of lines 9 and 10 which are 340' apart and lines 41 and 42 which are 1200' apart. Profile lines extend offshore to range 4000.

2.2 PREVIOUS 2019 BEACH NOURISHMENT PROJECT

The 2019 Jupiter Island Beach Restoration Project resulted in the placement of 1,174,512 cubic yards of sand on 6.1 miles of beachfront within three fill segments located between DNR Monuments R-73 to R-84 (Profile 995,908), and R-87 (Profile 993,615) to R-107 (Profile 976,899), and R-111 (Profile 973,812) to R-115 (Profile 969,838). The beach was constructed with a typical berm width of 100 to 150 feet at elevation +8.4 feet NAVD88. The berm was constructed with a slight seaward slope of 1 vertical on 100 horizontal slope. The foreshore slope was constructed on a 1 vertical on 10 horizontal slope. The dredging and beach fill were performed by Weeks Marine during a 3-month period between January 21 through April 28, 2019. The 2019 project beach fill areas are shown in Figure 2-2.

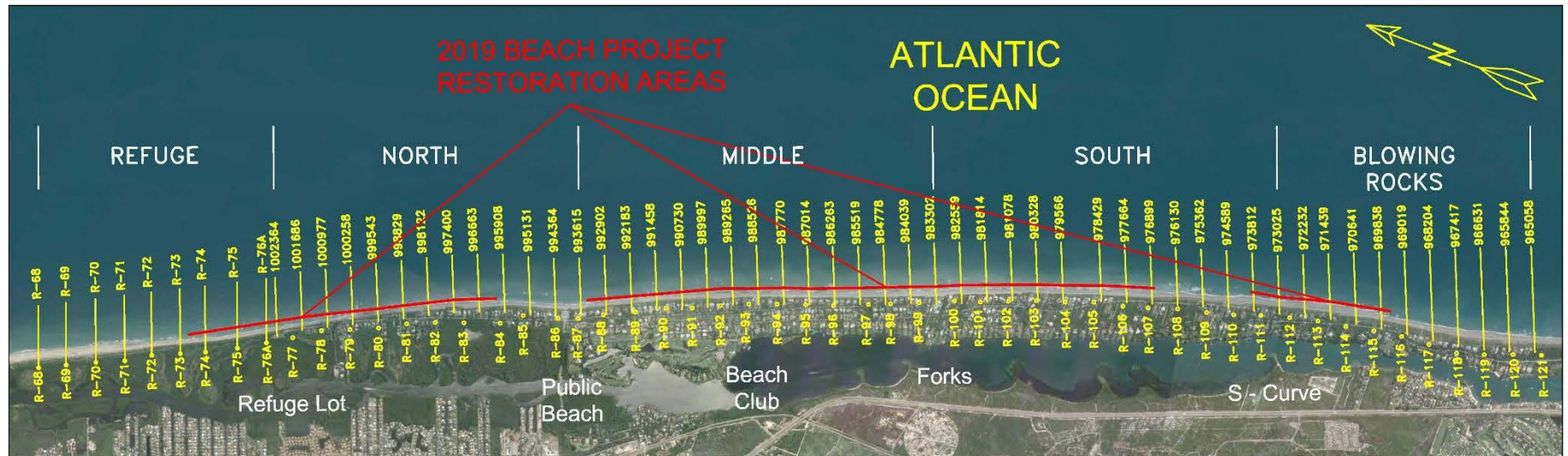


Figure 2-2: 2019 Beach Project Restoration Areas

2.3 2021 BEACH NOURISHMENT PROJECT

The 2021 Jupiter Island Beach Restoration Project resulted in the placement of 667,873 cubic yards of sand on approximately 4.0 miles of beachfront. This relatively small renourishment project was performed only 2 years following the prior restoration event, due to the pending expiration of a FEMA funding grant. Beach quality fill sands were placed in two segments. 365,668 Cubic yards were placed in Sector A between DNR Monuments R-74 to R-84 (Profile 995,908), and 302,205 cubic yards were placed in Sector B between DNR Monuments R-92 (Profile 989,265) to R-105 (Profile 978,429). The beach was constructed with a typical berm width of 50 to 100 feet at elevation +8.4 feet NAVD88. The berm was constructed with a slight seaward slope of 1 vertical on 100 horizontal slope. The foreshore slope was constructed on a 1 vertical on 10 horizontal slope. The dredging and beach fill were performed by Weeks Marine during a 2-month period between January 12 through March 20, 2021. The 2021 project beach fill areas are shown in Figure 2-3.



Near Profile 983302 looking south (3/23/2021)



Near Profile 981078 looking north (3/23/2021)

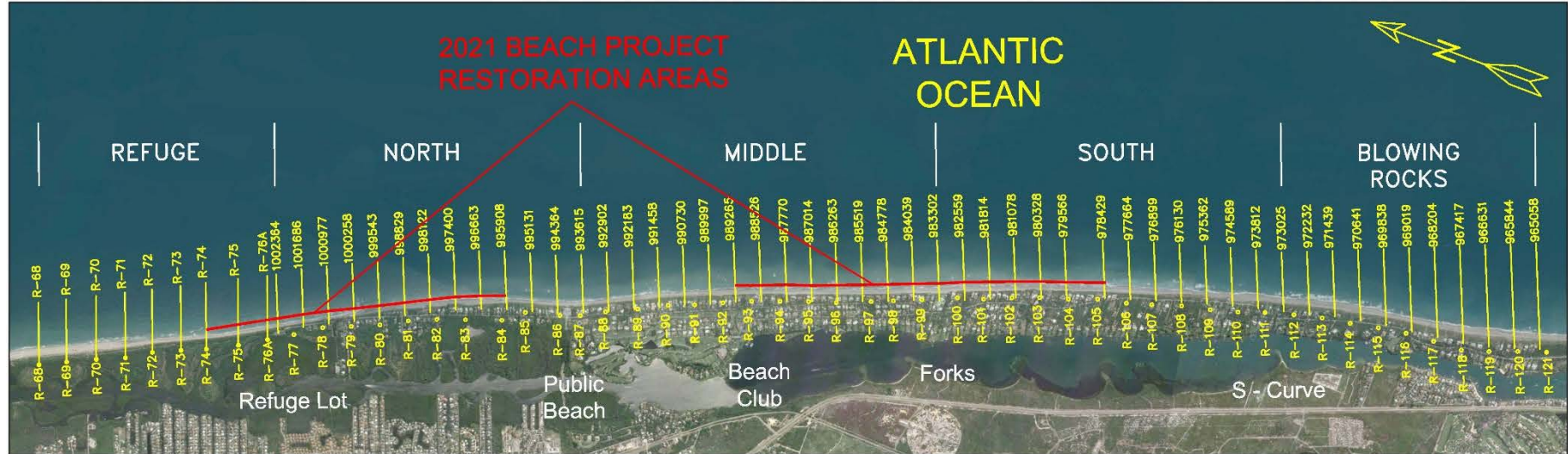


Figure 2-3: 2021 Beach Project Restoration Areas

The borrow site utilized for the 2021 beach nourishment project was Borrow Site B Expansion. Borrow site surveys were performed before and after the beach nourishment project completed in March 2021. Survey transects were conducted at 200' spacing over both borrow site limits. A total of 751,598 cubic yards were dredged during the project, leaving a residual available borrow site quantity of 7,516,000 cubic yards. The borrow sites are identified in Figure 2-4 and Figure 2-5.

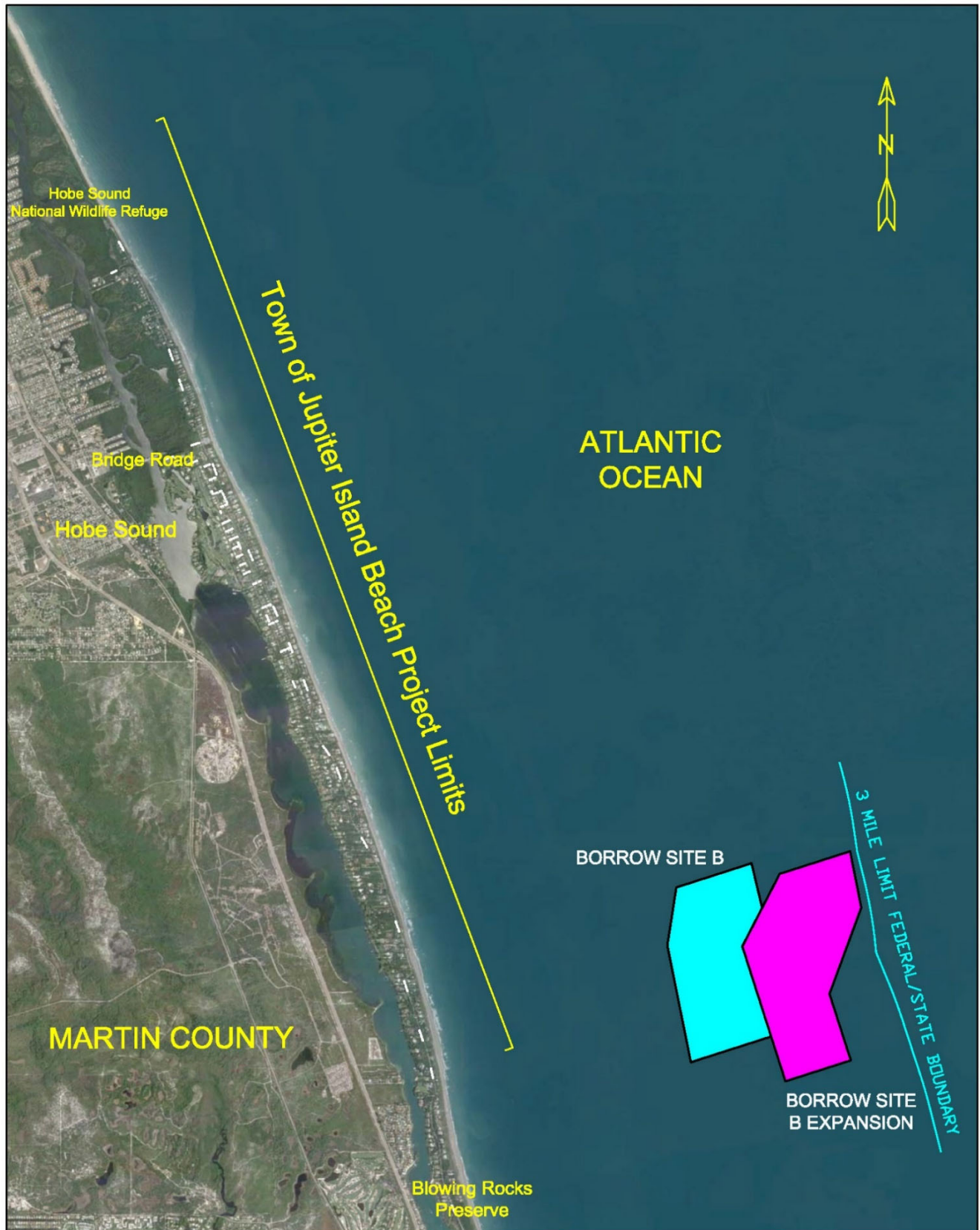


Figure 2-4: 2021 Beach Project Borrow Site B Expansion Location

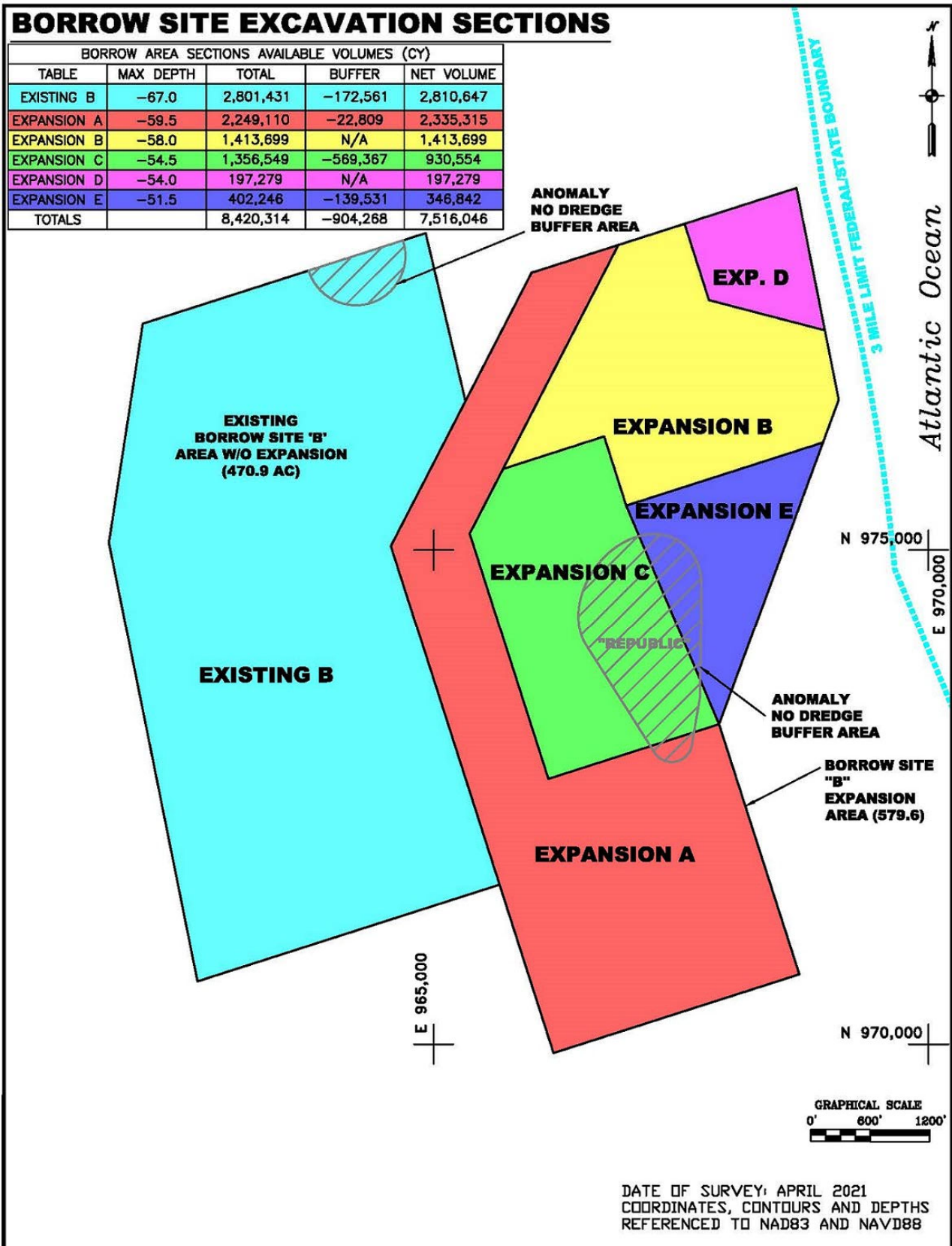


Figure 2-5: 2021 Beach Project Borrow Site Sections and Available Volumes

3.0 WEATHER IMPACTS (July 2020– July 2021)

During this past year monitoring period, the Town’s beaches were directly impacted by two named storms and one significant unnamed storm. Tropical Storm Isaias moved northward offshore in the Atlantic Ocean in a path parallel to the Florida coast. Isaias passed by Jupiter Island on August 2, 2020 raising waves offshore to over 12 feet. An unnamed storm impacted the island on September 21 and 22, 2020 raising wave heights offshore to almost 11 feet. On November 8 and 9, 2020 Tropical Storm Eta passed across the southern tip of Florida, but was large enough to severely impact the coastline of southeast Florida with strong east winds, raising waves to nearly 14 feet offshore. These three storms all occurred before the 2021 beach project began in January 2021.

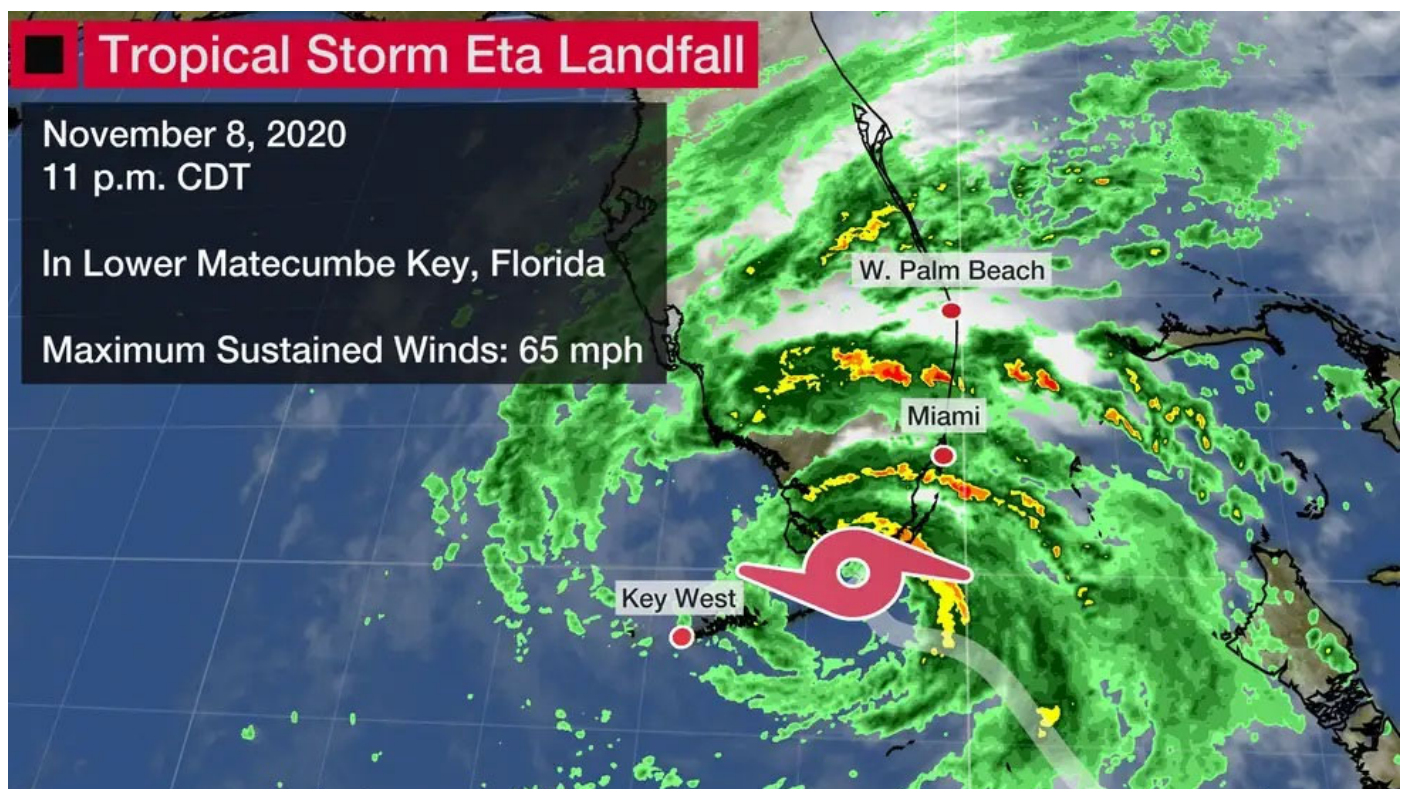


Figure 3-1: Tropical Storm Eta - November 2021 (Source: weather.com)

The Town’s beaches were also impacted by the passage of several cold fronts and northeasters during the fall/winter season. The following graph, Figure 3-2, presents the recorded wave heights, from July 1, 2020 to June 30, 2021, as recorded by the NOAA Station 41114 Waverider Buoy, located offshore of Ft. Pierce, FL during the past year. The figure indicates that at least 17 storm events exceeded a 6-foot significant wave height, with three events surpassing wave heights of 10 feet. These storms contributed to accretional/erosional variations throughout the sand system (beach/nearshore/offshore) during this monitoring period.

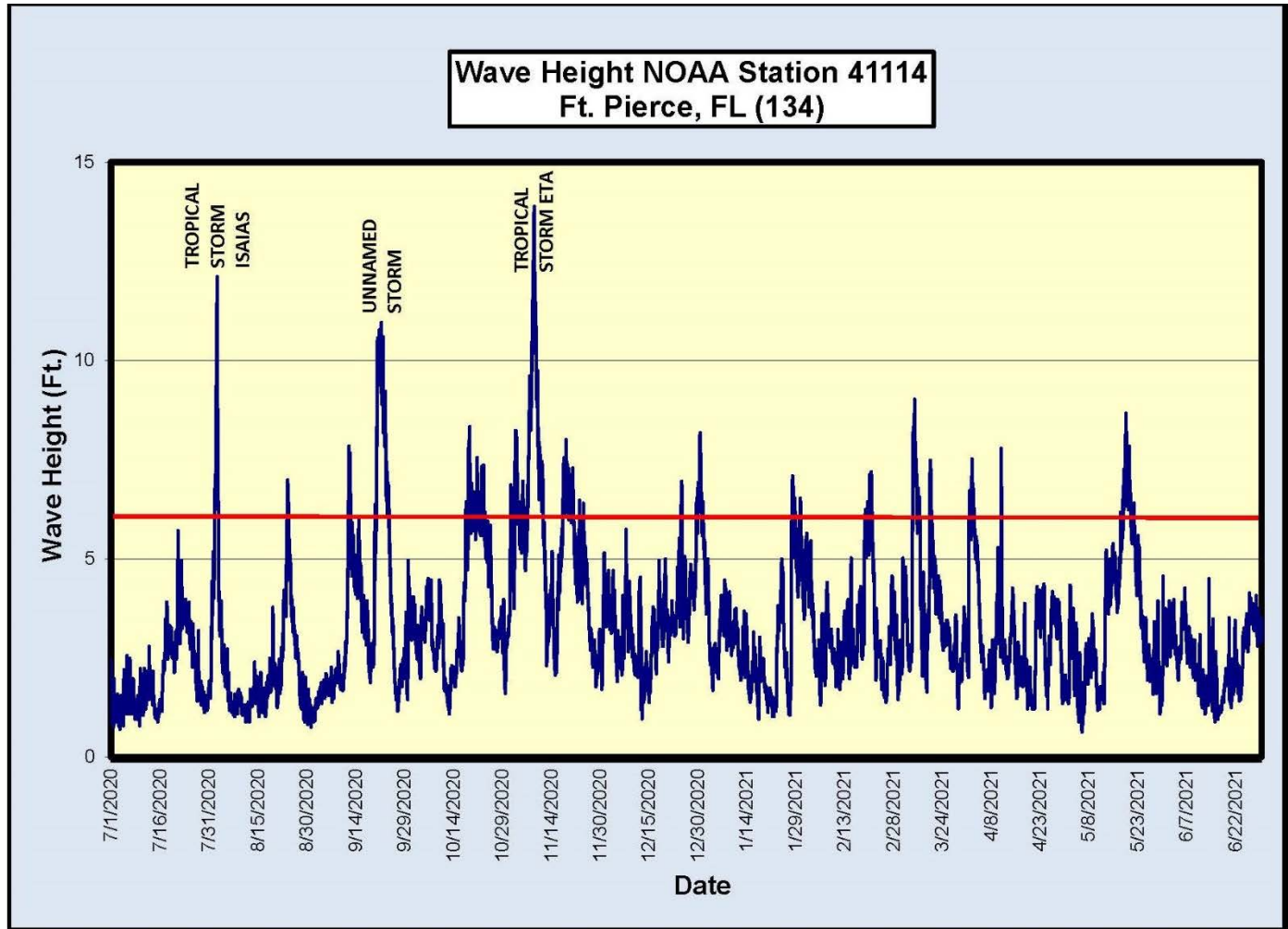


Figure 3-2: Wave Heights (July 2020 – July 2021)

4.0 JULY 2020 TO PRECONSTRUCTION SURVEY (DECEMBER 2020)

The following data analyses are based on the annual physical monitoring survey completed in July 2020 and the preconstruction survey completed in December 2020. These surveys were performed in the same manner and for the same profiles and ranges providing for suitable comparisons and accurate calculations.

4.1 ACCRETION / EROSION VOLUMES

Table 4-1 summarizes the accretion/erosion volumes (cubic yards) for the 5-month period between the July 2020 annual physical monitoring survey and the December 2020 preconstruction survey. The data is summarized for each section and survey range of the entire project area.

Table 4-1: Accretion/Erosion Volumes July 2020 to December 2020

SECTION	ACCRETION/EROSION BY SURVEY RANGE (Cubic Yards)				NET VOLUME CHANGE (CY)
	Beach -200' – 300'	Nearshore 300' – 800'	Offshore 800' – 1800'	Offshore 1800' – 2800'	
Refuge	(18,138)	8,816	45,780	(809)	35,649
North	(86,178)	(17,067)	63,653	22,702	(16,889)
Middle	(78,969)	18,356	84,444	17,013	40,844
South	(94,007)	55,662	(20,264)	(52,756)	(111,364)
Blowing Rocks	(81,271)	28,516	26,756	2,324	(23,676)
TOTALS	(358,562)	94,282	200,369	(11,524)	(75,436)

Note: Volumes in parenthesis () indicate erosion.

It is apparent from this data that all five sections experienced significant losses on the beach (Range -200' – 300'), largely due to the effects of the tropical storms and the early winter storm season. However, during this period, the nearshore area (Range 300' – 800') and the offshore area (Range 800' – 1800') of the survey profiles benefitted from accretional gains in four of the five sections. These gains are likely the result of the losses on the beach shifting to the nearshore and offshore areas. Overall, the entire system, through all sections and ranges had a net loss of just over 75,000 cubic yards during this period.

5.0 PRECONSTRUCTION SURVEY (DECEMBER 2020) TO POSTCONSTRUCTION SURVEY (April 2021)

The following data analyses are based on the preconstruction survey completed in December 2020 and the postconstruction survey completed in April 2021. These surveys were performed in the same manner and for the same profiles and ranges providing for suitable comparisons and accurate calculations.

5.1 ACCRETION / EROSION VOLUMES

Table 5-1 summarizes the accretion/erosion volumes (cubic yards) for the 4-month period between the December 2020 preconstruction survey and the April 2021 postconstruction survey. The data is summarized for each section and survey range of the entire project area. The resulting volumes include the fill material placed on the beach in the sections previously described as well as the impacts of erosional forces on the entire system during this timeframe.

Table 5-1: Accretion/Erosion Volumes December 2020 to April 2021

SECTION	ACCRETION/EROSION BY SURVEY RANGE (Cubic Yards)				NET VOLUME CHANGE (CY)
	Beach -200' – 300'	Nearshore 300' – 800'	Offshore 800' – 1800'	Offshore 1800' – 2800'	
Refuge	63,201	55,909	(114,893)	(45,206)	(40,989)
North	265,284	56,320	(62,298)	(76,351)	182,956
Middle	61,769	102,391	(77,764)	(18,680)	67,716
South	222,438	117,353	(24,944)	1,891	316,738
Blowing Rocks	6,427	49,324	(35,538)	(25,707)	(5,493)
TOTALS	619,119	381,298	(315,437)	(164,053)	520,926

Note: Volumes in parenthesis () indicate erosion.

It is apparent from this data that during this period the beach (Range -200 - 300) experienced significant gains from the beach restoration project. The nearshore area (Range 300' – 800') also experienced significant gains in all of the sections. However, the offshore areas (Range 800' – 1800') and (Range 1800' – 2800') suffered significant losses during this period in all of the sections but one. Overall, the entire system, through all sections and ranges showed a net gain of just over 520,000 cubic yards during this period.

6.0 POSTCONSTRUCTION SURVEY (April 2021) TO JULY 2021

The following data analyses are based on the postconstruction survey completed in April 2021 and the July 2021 annual physical monitoring survey. These surveys were performed in the same manner and for the same profiles and ranges providing for suitable comparisons and accurate calculations.

6.1 ACCRETION / EROSION VOLUMES

Table 5-1 summarizes the accretion/erosion volumes (cubic yards) for the 3-month period between the April 2021 survey and the July 2021 survey. The data is summarized for each section and survey range of the entire project area.

Table 6-1: Accretion/Erosion Volumes April 2021 to July 2021

SECTION	ACCRETION/EROSION BY SURVEY RANGE (Cubic Yards)				NET VOLUME CHANGE (CY)
	Beach -200' – 300'	Nearshore 300' – 800'	Offshore 800' – 1800'	Offshore 1800' – 2800'	
Refuge	15,064	(15,533)	7,120	16,527	23,179
North	(34,569)	36,378	23,724	45,636	71,169
Middle	(116)	49,849	(50,596)	(20,773)	(21,636)
South	(38,260)	47,293	(38,893)	2,889	(26,971)
Blowing Rocks	560	29,347	(267)	35,484	65,124
TOTALS	(57,320)	147,334	(58,911)	79,762	110,866

Note: Volumes in **parenthesis ()** indicate erosion.

It is apparent from this data that during this period the beach (Range -200 - 300) experienced moderate erosion through the north and south sections. However, the nearshore area (Range 300' – 800') benefitted from accretional gains in all but the Refuge section. The offshore areas (Ranges 800' – 1800') experienced a moderate overall erosional loss, but the farther offshore areas (Ranges 1800' – 2800') experienced an overall gain. Overall, the entire system, through all sections and ranges showed a net gain of just over 110,000 cubic yards during this period.

7.0 CURRENT ANNUAL PHYSICAL MONITORING PERIOD (July 2020 – July 2021)

The following data analyses are based on the July 2020 annual physical monitoring survey and the July 2021 annual physical monitoring survey. These surveys were performed in the same manner and for the same profiles and ranges providing for suitable comparisons and accurate calculations.

7.1 ACCRETION / EROSION VOLUMES

The following table summarizes the accretion/erosion volumes (cubic yards) for the 1-year period between the July 2020 and the July 2021 surveys. The data is summarized for each section and survey range of the entire project area in Table 7-1.

Table 7-1: Accretion/Erosion Volumes July 2020 to July 2021

SECTION	ACCRETION/EROSION BY SURVEY RANGE (Cubic Yards)				NET VOLUME CHANGE (CY)
	Beach -200' – 300'	Nearshore 300' – 800'	Offshore 800' – 1800'	Offshore 1800' – 2800'	
Refuge	60,128	49,192	(61,993)	(29,488)	17,839
North	144,538	75,631	25,080	(8,013)	237,236
Middle	(17,316)	170,596	(43,916)	(22,440)	86,924
South	90,171	220,309	(84,102)	(47,976)	178,402
Blowing Rocks	(74,284)	107,187	(9,049)	12,102	35,956
TOTALS	203,237	622,914	(173,979)	(95,815)	556,356

Note: Volumes in parenthesis () indicate erosion.

It is apparent from this data that the Refuge, North and South sections experienced significant gains on the beach (Range -200' – 300' as a result of the beach fill project completed during this monitoring period. Likewise, the nearshore area (Range 300' – 800') experienced significant gains in all of the sections. However, the offshore areas (Range 800' – 1800' and Range 1800' – 2800') experienced losses in most of the sections. Overall, the entire system, through all sections and ranges had a net gain of 556,356 cubic yards during this period.

7.2 HISTORICAL ACCRETION / EROSION ANNUALIZED RATES

Table 7-2 summarizes the accretion/erosion annual average volumetric change (cubic yards per year) for each section and survey range of the project area, with renourishment project fill volumes included.

Table 7-2: Accretion/Erosion Annual Averages (fill included)

SECTION	AVERAGE ANNUAL VOLUME CHANGE BY SURVEY RANGE, JUNE 1995 – JULY 2021 (CY/YR) (project fill volumes included)			TOTAL VOLUME CHANGE (CY/YR)
	Beach -200' – 300'	Nearshore 300' – 800'	Offshore 800' – 1800'	
North	36,862	18,811	(7,115)	48,558
Middle	35,874	13,016	(16,496)	32,394
South	42,213	2,990	(23,006)	22,197
Blowing Rocks	25,410	12,859	5,414	43,684
TOTALS	142,694	49,588	(43,611)	148,671

Note: Volumes in parenthesis () indicate erosion.

These annual volume changes since June 1995 are graphically represented in the following chart, Figure 7-1, with trend lines shown and renourishment events noted.

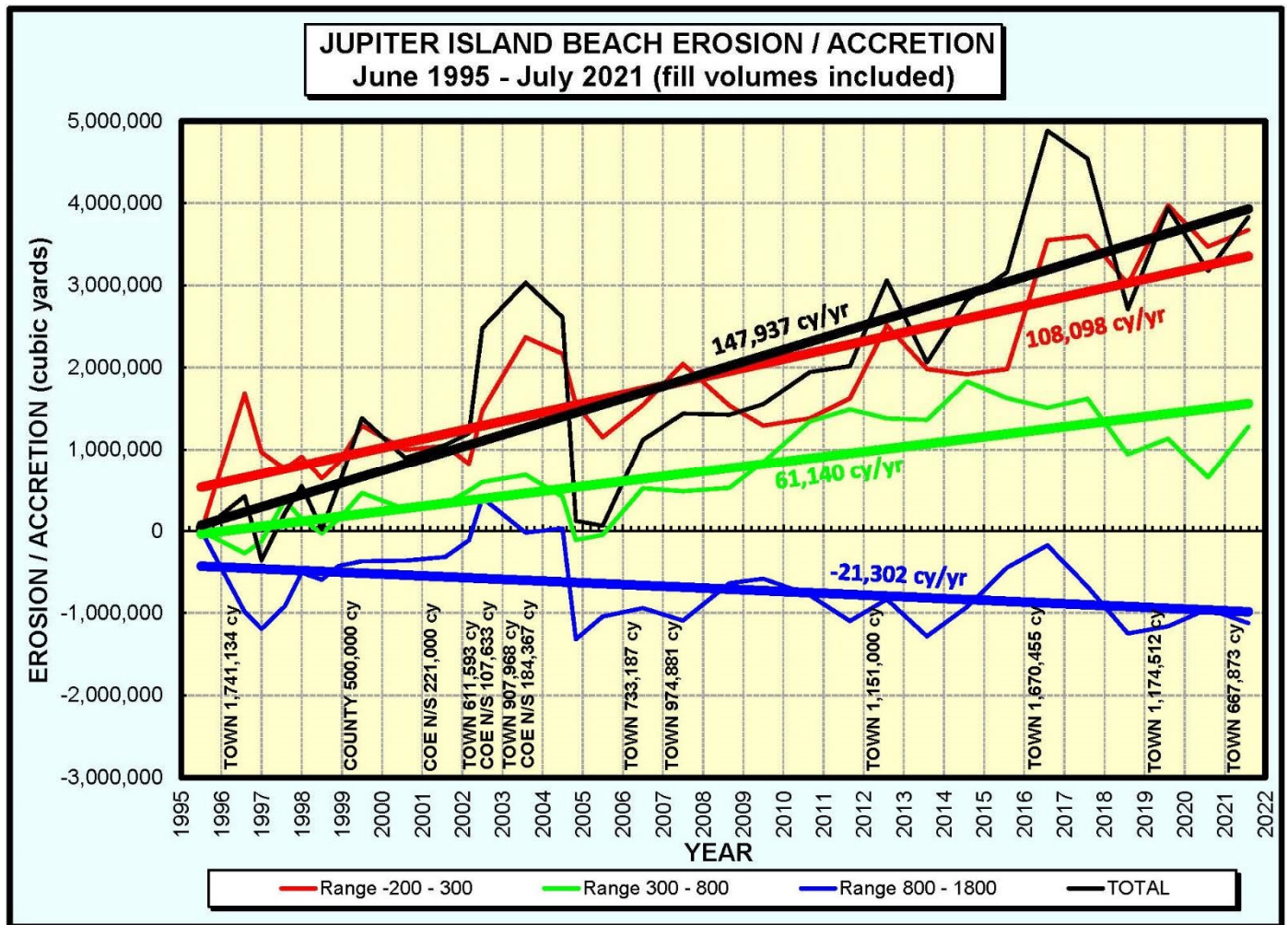


Figure 7-1: Beach Erosion/Accretion June 1995 through July 2021 (fill volumes included)

Upon review of Table 7-2 and Figure 7-1, with fill volumes included, it is apparent that the beach and overall system has benefitted from the renourishment projects, overcoming the predominate erosional forces that regularly impact the coast. However, the offshore area (Range 800' – 1800') has suffered moderate erosional losses, primarily in response to severe hurricane swells.

Table 7-3 summarizes the accretion/erosion annual average volumetric change (cubic yards per year) for the total for all sections by survey range of the project area, but with renourishment fill volumes removed to better represent the natural changes only. The data is also represented in Figure 7-2 with the fill volumes removed. The following list of projects were removed:

- 6/1995-7/1996 Range -200 - 300 adjusted by -1,741,134 for renourishment project
- 11/1998 - 6/1999 Range -200 - 300 adjusted by -500,000cy for renourishment project (70% of bin measured volume of 714,000cy)
- 7/2000 - 7/2001 Range 800-1800 adjusted by -221,000cy for offshore disposal from inlet project
- 2/2002 - 6/2002 Range -200 - 300 adjusted by -611,594cy for beginning of renourishment project

- 2/2002 - 6/2002 Range 800-1800 adjusted by -107,633cy for beginning of offshore disposal from inlet project
- 6/2002 - 7/2003 Range -200 - 300 adjusted by -907,968 for remainder of renourishment project
- 6/2002 - 7/2003 Range 800-1800 adjusted by -184,367cy for remainder of offshore disposal from inlet project
- 6/2005 - 7/2006 Range -200 - 300 adjusted by -733,186cy for beginning of renourishment project
- 7/2006 - 6/2007 Range -200 - 300 adjusted by -973,525cy for remainder of renourishment project
- 8/2011 - 7/2012 Range -200 - 300 adjusted by -1,150,858cy for renourishment project
- 7/2015 - 7/2016 Range -200 - 300 adjusted by -1,670,455cy for renourishment project
- 7/2018 - 7/2019 Range -200 - 300 adjusted by -1,174,512cy for renourishment project
- 7/2020 - 7/2021 Range -200 - 300 adjusted by -667,873cy for renourishment project

Table 7-3: Accretion/Erosion Annual Averages (fill removed)

SECTION	AVERAGE ANNUAL VOLUME CHANGE BY SURVEY RANGE, JUNE 1995 – JULY 2021 (CY/YR) (project fill volumes removed)			TOTAL VOLUME CHANGE (CY/YR)
	Beach -200' – 300'	Nearshore 300' – 800'	Offshore 800' – 1800'	
TOTALS	(252,030)	49,588	(63,541)	(265,984)

Note: Volumes in parenthesis () indicate erosion.

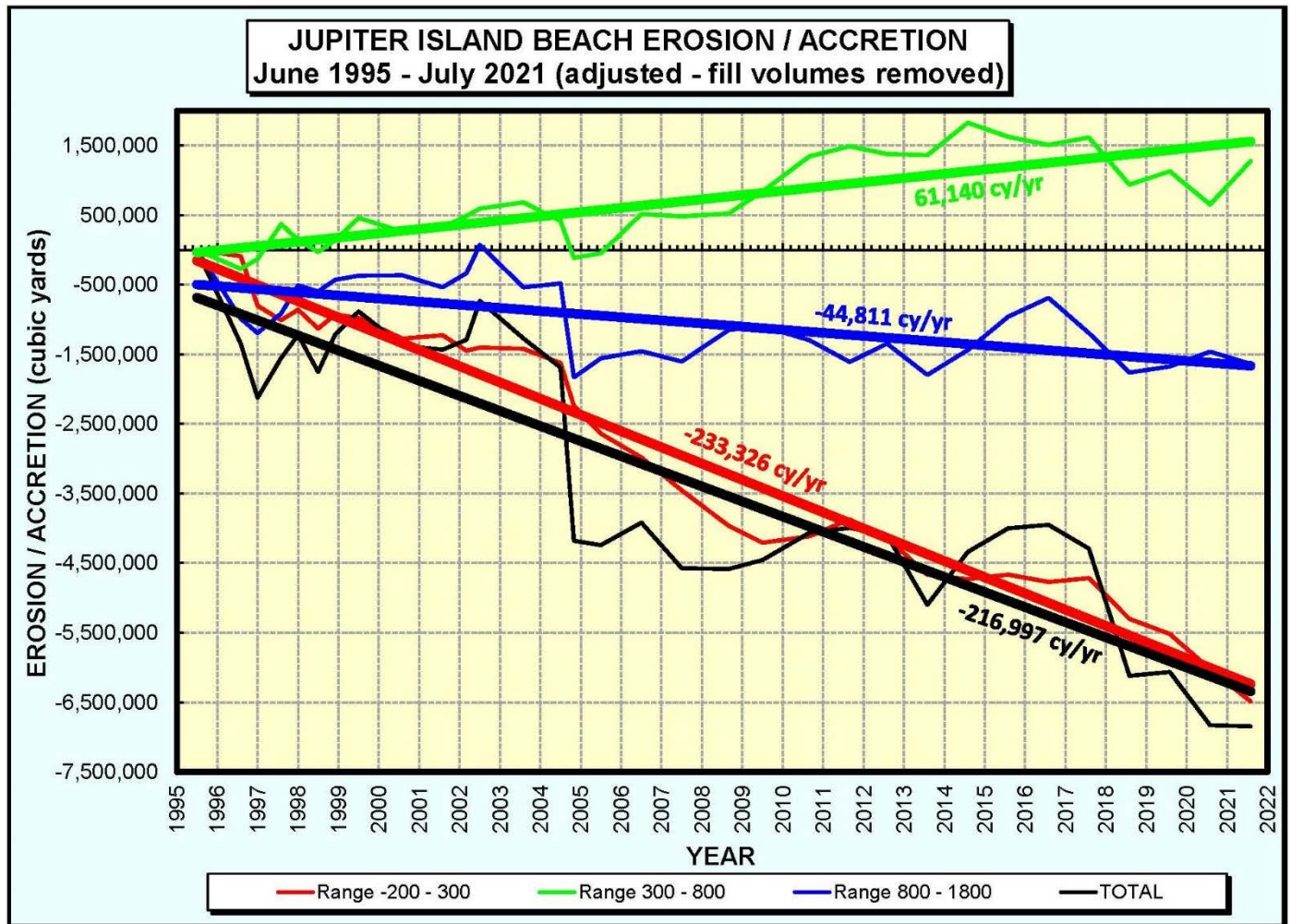


Figure 7-2: Beach Erosion/Accretion June 1995 through July 2021 (fill volumes removed)

The above annualized rates in Figure 7-2 are based on a trendline analysis. Upon review of Table 7-3 and Figure 7-2, with the fill volumes removed, it is apparent that frequent and continuous natural erosional forces are causing detrimental impacts to the beach, exhibiting an average annual loss of approximately 250,000 cubic yards per year on the beach. However, the significant losses are attributable to hurricanes. In particular, during 2004, Hurricanes Frances and Jeanne struck the east coast of Florida, in the direct vicinity of the island, causing severe sand losses to the beaches and offshore regime. To better understand and quantify the impacts of these storms, the previous volume table and chart were adjusted by subtracting the volumes lost during the time period based on before and after storm surveys and substituting the average of the previous years to the 3-month period. In addition, Hurricane Matthew passed by in 2016, Hurricane Irma passed by in 2017, and Hurricane Dorian passed by in 2019 causing substantial erosional impacts to the beach. The volume changes calculated from these post-storm surveys were used to adjust the volume table. The resulting averages better represent a typical average year with no renourishment projects and no major hurricane impacts. These results are presented in Table 7-4 and Figure 7-3.

Table 7-4: Accretion/Erosion Annual Averages (fill and hurricane events removed)

SECTION	AVERAGE ANNUAL VOLUME CHANGE BY SURVEY RANGE, JUNE 1995 – JULY 2021 (CY/YR) (fill volumes removed) (2004, 2016, 2017 hurricanes removed)			TOTAL VOLUME CHANGE (CY/YR)
	Beach -200' – 300'	Nearshore 300' – 800'	Offshore 800' – 1800'	
TOTALS	(182,045)	79,238	32,606	(70,200)

Note: Volumes in **parenthesis ()** indicate erosion.

Without the hurricane impacts the average annual loss on the beach is reduced by roughly 70,000 cubic yards to approximately 180,000 cubic yards per year. The annual volumes since June 1995 without the renourishment event fill volumes and without the 2004, 2016, 2017, and 2019 hurricane impacts are graphically represented in Figure 7-3, and suggest an annualized erosion trend on the beach of approximately 175,000 cubic yards, neglecting those significant hurricane events and fill projects.

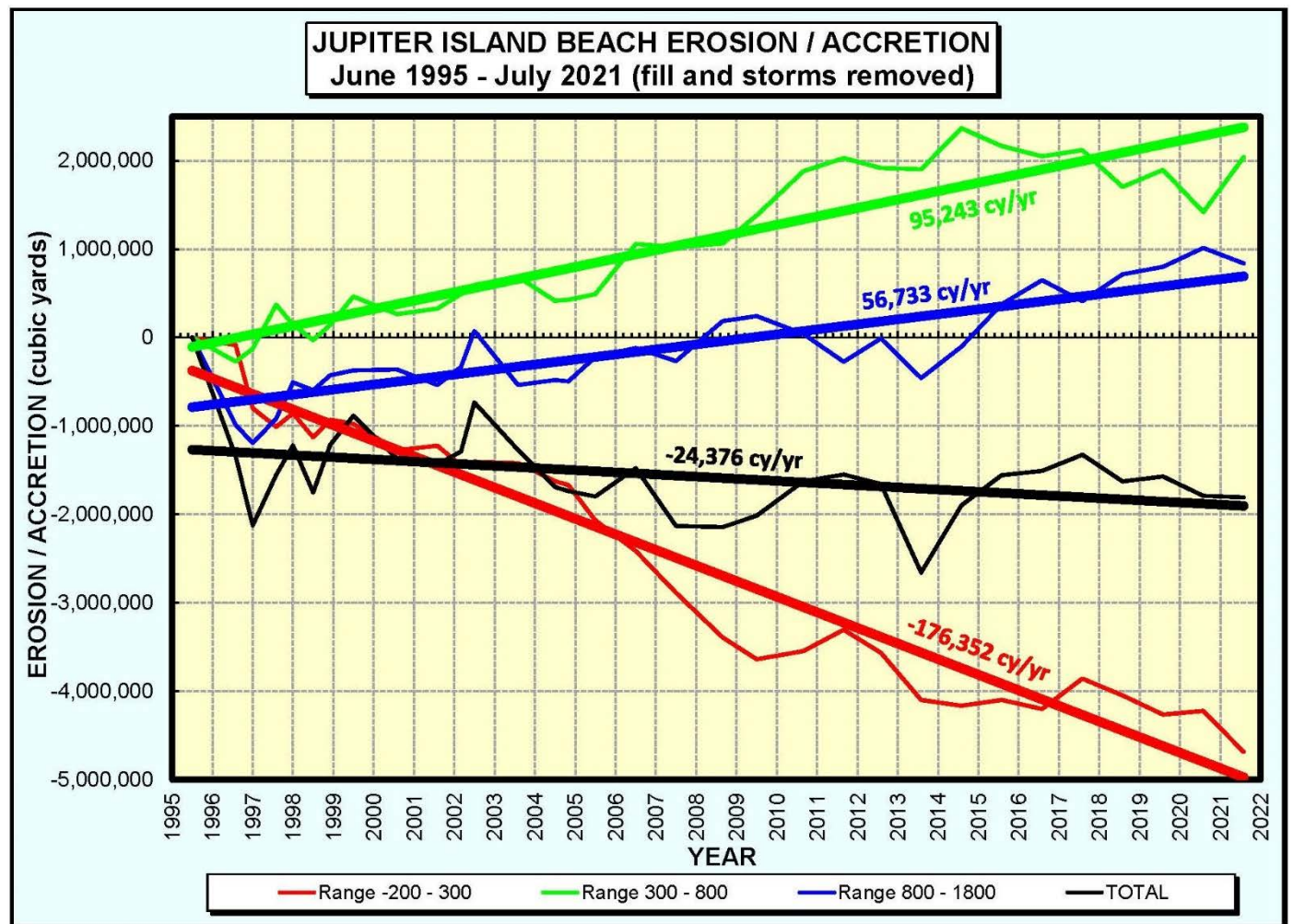


Figure 7-3: Beach Erosion/Accretion June 1995 through July 2021 (fill and hurricane events removed)

7.3 CUMULATIVE VOLUMETRIC CHANGE

Figure 7-4 graphically represents the cumulative volumetric changes (cubic yards) for the 6-year period between the July 2015 and the July 2021 surveys. The data is summarized for each survey range (Beach, Nearshore, Offshore, and Total) of the entire project area.

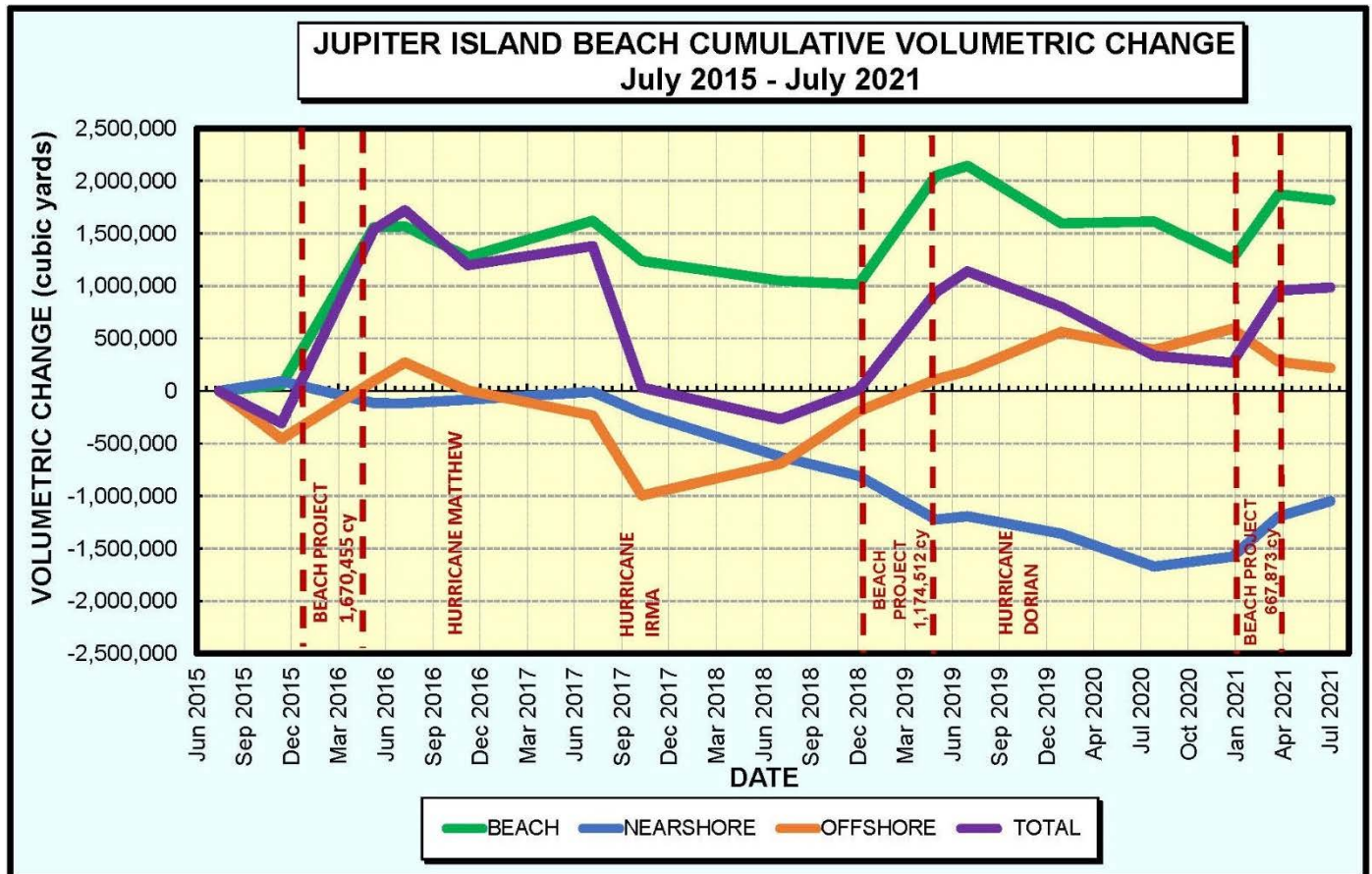


Figure 7-4: Cumulative Volumetric Change Since 2015

It is apparent from this chart that the beach and overall system have benefitted from the 2016, 2019 and 2021 renourishment projects, overcoming the effects of hurricanes Matthew and Irma. Without these fill events the beach would have suffered from continual erosion. However, Hurricane Dorian caused rather severe erosional losses on the beach and nearshore reaches following the 2019 renourishment. Apparently, much of these losses were moved to the offshore region. The 2021 renourishment project restored the beach from the effects of Hurricane Dorian and other tropical storms. Figure 7-4 shows that 1.8 million cubic yards remain of the 3.5 million cubic yards placed (51%) within the upper beach region of the profiles.

7.4 2021 BEACH PROJECT RESIDUAL VOLUMES (April 2021 to July 2021)

The most recent beach renourishment project was completed during January to March 2021. Approximately 667,873 cubic yards of sand was placed on approximately 4.0 miles of the beach in two segments. Sector A was filled with 365,668 cubic yards between DNR Monuments R-74 to R-84 (Profile 995,908). As of this July 2021 condition survey, approximately 68%, or 249,992 cubic yards remain in place on the beach within this

fill area, indicating erosional losses of roughly one-third of the placed fill volume. Sector B was filled with 302,205 cubic yards between DNR Monuments R-92 (Profile 989,265) to R-105 (Profile 978,429). As of this July 2021 condition survey, approximately 70%, or 211,462 cubic yards remain in place on the beach within this fill area. Net erosional losses in both segments combined total approximately 206,419 cubic yards or 31% of the total volume placed on the beach in early 2021. These losses include an estimated 136,975 cubic yards lost during the project construction time period from January 2021 to the postconstruction survey in April 2021. Since the postconstruction survey in April 2021, a span of 3 months, an additional 69,444 cubic yards has eroded from the beach within the project fill limits. These volumes are also presented in Table 7-5 and Figure 7-5.

Table 7-5: 2021 Project Residual Fill Volumes

Jupiter Island Residual Fill Volumes - 2021 Restoration Project					
Fill Section	Jan-Apr 2019 Project Fill	Remaining Volumes as of AD Survey April 2021	Gains / Losses April 2021 - July 2021	July 2021 Residual Volumes	%
SECTOR A R-74 to 995,908	365,668	290,180	(40,188)	249,992	68%
SECTOR B 989,265 to 978,429	302,205	240,718	(29,256)	211,462	70%
Total	667,873	530,898	(69,444)	461,454	69%

Note: Volumes in parenthesis () indicate erosion.



Figure 7-5: 2021 Beach Project residual fill volumes

7.5 SHORELINE CHANGES

Table 7-6 summarizes the average and range of net shoreline changes for the 12-month period between the July 2020 and the July 2021 annual physical monitoring surveys. The data is summarized for each section of the project, and is based on the position of the shoreline referenced at 0.0' NAVD88. A full tabulation of shoreline changes for each section is included in Appendix F.

Table 7-6: Shoreline Change July 2020 to July 2021

SECTION	AVG. SHORELINE CHANGE (ft.)	MAX. SHORELINE RETREAT (ft.)	MAX. SHORELINE ADVANCE (ft.)
Refuge	5	(31)	64
North	19	(13)	73
Middle	(8)	(35)	16
South	4	(39)	63
Blowing Rocks	(33)	(95)	16

Note: A **negative** net change indicates erosion, or landward movement of shoreline.

The Refuge, North and South sections of the Town's beachfront benefitted from the beach renourishment project that was completed during this period. The Middle section also benefitted in part with an average shoreline retreat of only -8 feet. Blowing Rocks section exhibited a moderately retreating shoreline as this section is well south of the project fill areas. The shoreline changes are graphically represented in Figure 7-6 and Figure 7-8 depicting the positions of the 0.0' contour (NAVD88) from the July 2020 and July 2021 monitoring surveys and the net shoreline changes between the two surveys.

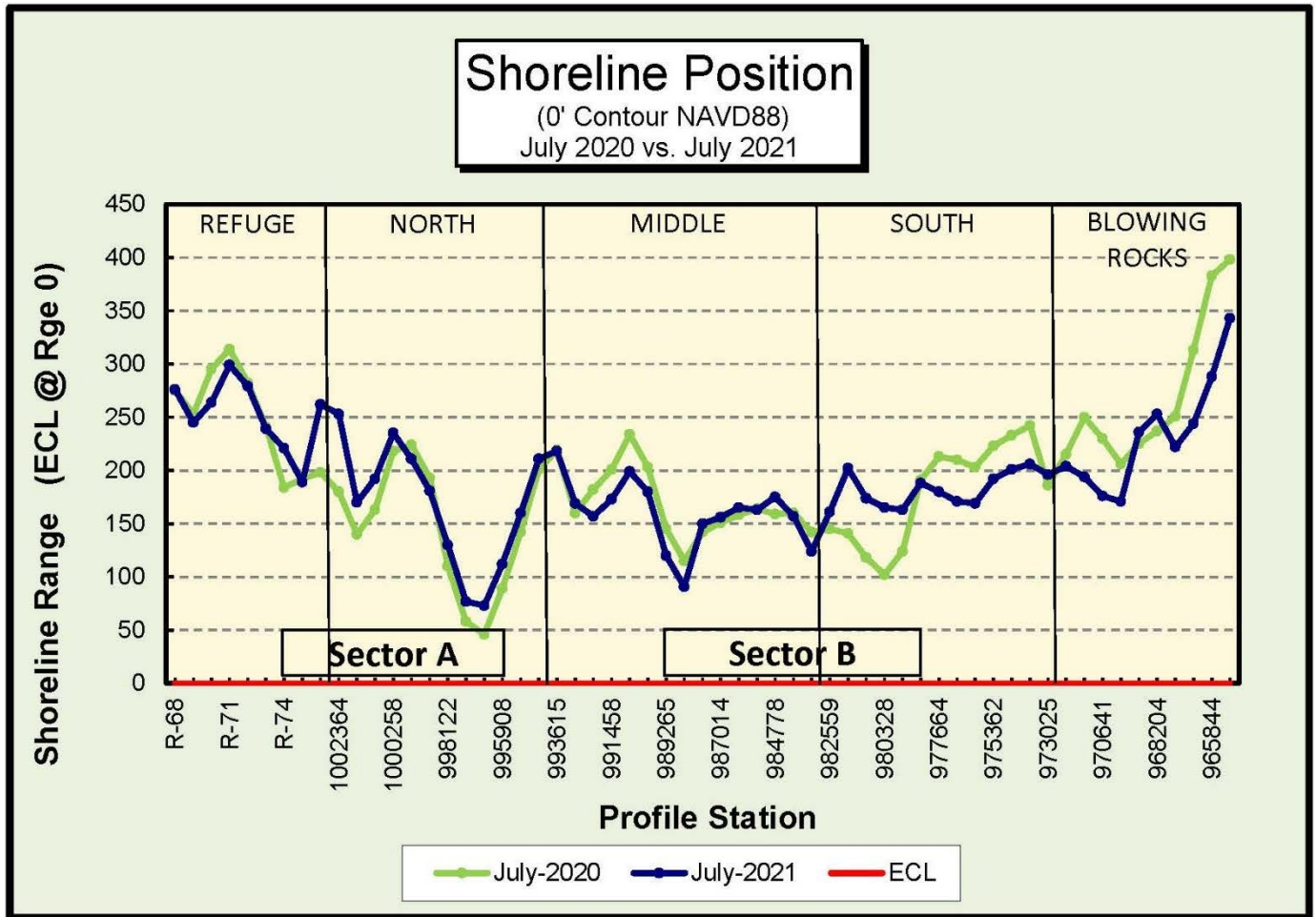


Figure 7-6: Shoreline Position July 2020 vs. July 2021

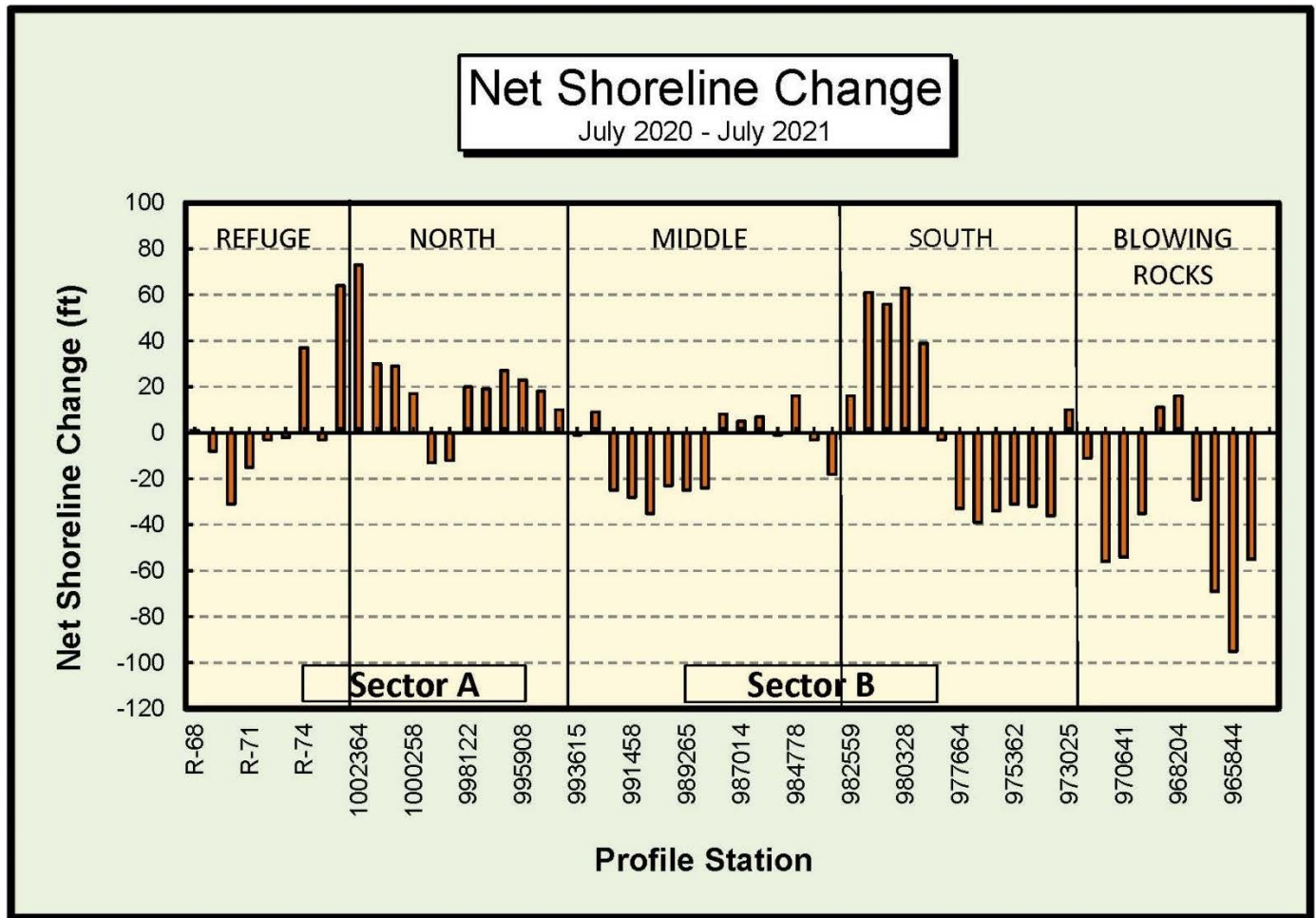


Figure 7-7: Shoreline Position Change July 2020 vs. July 2021

Figure 7-6 and Figure 7-7 indicate that the shoreline has advanced in most of the areas in which beach fill was placed, while the rest of the beachfront areas retreated an average of 22 feet over the past year. The July 2021 survey recorded that new maximum shoreline advance positions were achieved at 4 beach profile stations in the North section, based on measurements since 1995. This analysis presents an average shoreline advance of 123 feet in 2021 as compared to 1995, and an annual average position of 135 feet seaward of the shoreline of 1995 since then. A summary representation is presented in Figure 7-8. Detailed drawings exhibiting the historical shoreline range since 1995 are included in Appendix G, with the July 2021 positions included.

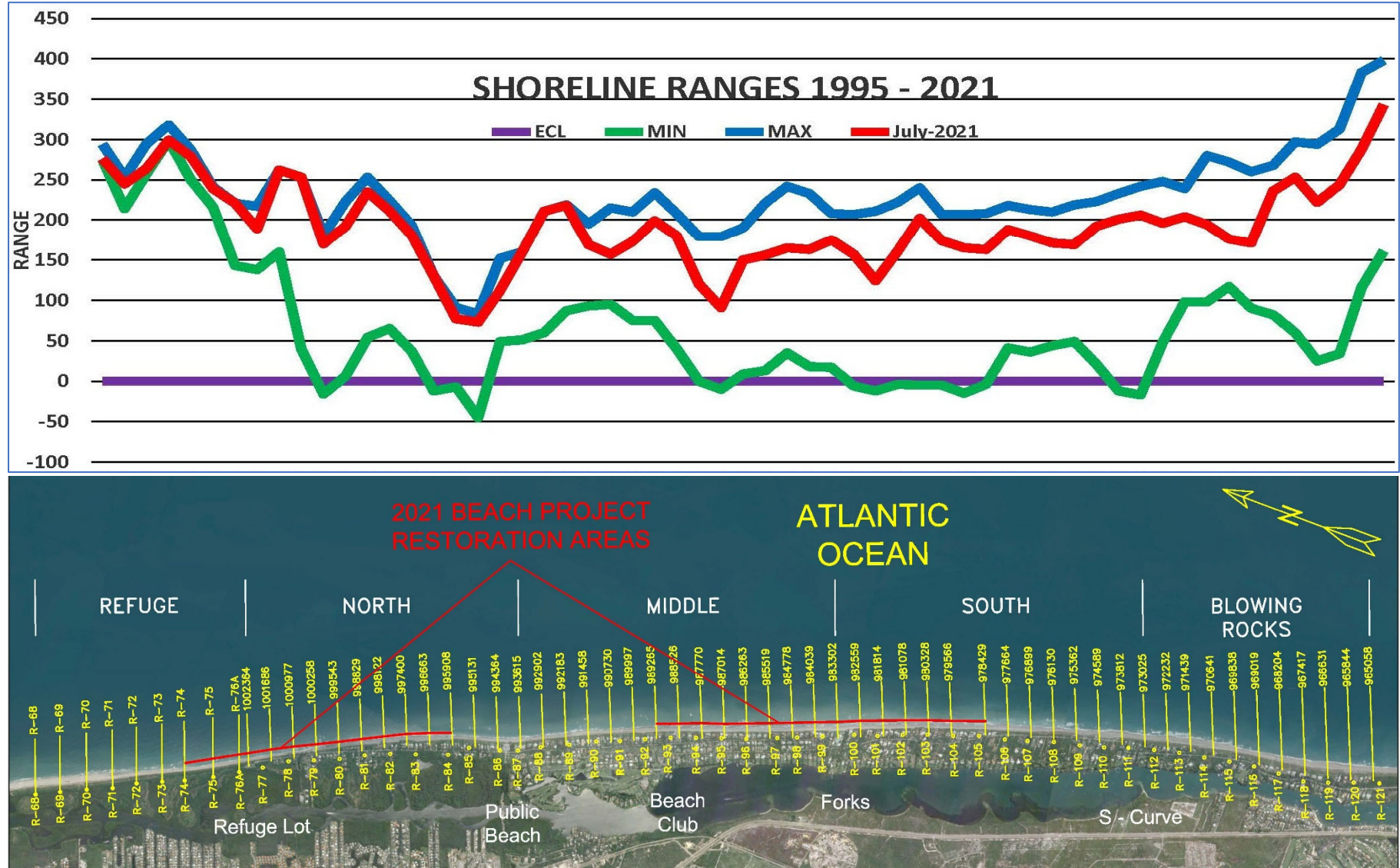


Figure 7-8: Minimum and Maximum Shoreline Ranges 1995 – 2021

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APPENDIX A
Accretion / Erosion Volume Tabulation
July 2020 – December 2020 (Preconstruction)

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - December 2020
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>Refuge Section</u>					
R-68 (Refuge)					
	(2,705)	765	14,386	(2,090)	10,355
R-69 (Refuge)					
	(7,482)	(1,074)	4,535	(11,587)	(15,608)
R-70 (Refuge)					
	(6,114)	(5,748)	(4,306)	(10,465)	(26,633)
R-71 (Refuge)					
	(1,684)	5,688	(703)	2,627	5,929
R-72 (Refuge)					
	(6,545)	(1,650)	2,890	10,010	4,705
R-73 (Refuge)					
	(864)	(1,769)	2,468	5,463	5,298
R-74 (Refuge)					
	6,974	13,253	5,786	3,527	29,540
R-75 (Refuge)					
	1,469	3,124	11,693	1,299	17,586
R-76A (Refuge)					
	(1,187)	(3,773)	9,030	408	4,478
1,002,364 (Refuge)					
Section Total	(18,138)	8,816	45,780	(809)	35,649

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - December 2020
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
North Section					
1,002,364 (Refuge)					
	(8,964)	(5,182)	18,880	4,618	9,351
1,001,686 (161 N Beach Rd.)					
	(12,298)	(3,356)	8,080	3,018	(4,556)
1,000,977 (147 N Beach Rd.)					
	(13,058)	(2,484)	5,440	2,956	(7,147)
1,000,258 (130 N Beach Rd.)					
	(12,498)	5,627	(1,102)	2,062	(5,911)
999,543 (113 N Beach Rd.)					
	(15,973)	191	(1,516)	4,267	(13,031)
998,829 (99 N Beach Rd.)					
	(11,613)	(4,671)	4,000	4,338	(7,947)
998,122 (Coast Guard)					
	(6,560)	(7,200)	7,404	3,084	(3,271)
997,400 (67 N Beach Rd.)					
	(9,489)	(9,053)	8,707	4,156	(5,680)
996,663 (53 N Beach Rd.)					
	(7,098)	(4,640)	5,920	(58)	(5,876)
995,908 (35 N Beach Rd.)					
	40	(31)	2,871	(4,009)	(1,129)
995,131 (19 N Beach Rd.)					
	5,809	3,329	1,284	(4,036)	6,387
994,364 (Public Beach)					
	5,524	10,404	3,684	2,307	21,920
993,615 (9 S Beach Rd.)					
Section Total	(86,178)	(17,067)	63,653	22,702	(16,889)

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - December 2020
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
Middle Section					
993,615 (9 S Beach Rd.)					
	7,316	5,893	8,200	8,071	29,480
992,902 (21 S Beach Rd.)					
	1,382	(2,276)	8,471	6,093	13,671
992,183 (39 S Beach Rd.)					
	(8,764)	547	5,547	4,916	2,244
991,458 (51 S Beach Rd.)					
	(9,324)	978	4,284	1,742	(2,320)
990,730 (67 S Beach Rd.)					
	(5,493)	3,076	3,471	(582)	471
989,997 (81 S Beach Rd.)					
	(4,476)	3,044	809	98	(524)
989,265 (97 S Beach Rd.)					
	(11,156)	(2,236)	1,853	4,898	(6,640)
988,526 (Beach Club)					
	(14,969)	(6,124)	3,200	6,516	(11,378)
987,770 (127 S Beach Rd.)					
	(10,960)	484	8,142	3,951	1,618
987,014 (143 S Beach Rd.)					
	(6,360)	12,627	10,747	560	17,573
986,263 (157 S Beach Rd.)					
	(4,418)	8,689	9,893	(3,853)	10,311
985,519 (169 S Beach Rd.)					
	(6,093)	(10,413)	11,022	(2,631)	(8,116)
984,778 (185 S Beach Rd.)					
	(1,391)	(1,867)	6,511	(5,004)	(1,751)
984,039 (203 S Beach Rd.)					
	(4,262)	5,933	2,293	(7,760)	(3,796)
983,302 (215 S Beach Rd.)					
Section Total	(78,969)	18,356	84,444	17,013	40,844

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - December 2020

(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>South Section</u>					
983,302 (215 S Beach Rd.)					
	(11,658)	(12,240)	3,098	(3,049)	(23,849)
982,559 (231S Beach Rd.)					
	(1,791)	2,187	2,907	2,191	5,493
981,814 (241 S Beach Rd.)					
	4,209	13,751	(1,240)	818	17,538
981,078 (249 S Beach Rd.)					
	(1,187)	3,427	(5,120)	(5,676)	(8,556)
980,328 (259 S Beach Rd.)					
	(1,418)	1,982	(5,284)	(9,036)	(13,756)
979,566 (275 S Beach Rd.)					
	(7,407)	8,160	(2,567)	(6,080)	(7,893)
978,429 (299 S Beach Rd.)					
	(10,289)	7,080	1,747	707	(756)
977,664 (318 S Beach Rd.)					
	(11,822)	2,778	2,333	(4,711)	(11,422)
976,899 (330 S Beach Rd.)					
	(13,196)	3,782	(871)	(8,107)	(18,391)
976,130 (355 S Beach Rd.)					
	(11,742)	8,378	(4,600)	(5,458)	(13,422)
975,362 (365 S Beach Rd.)					
	(9,573)	8,427	(2,582)	(4,324)	(8,053)
974,589 (384 S Beach Rd.)					
	(5,907)	396	(3,600)	(3,587)	(12,698)
973,812 (404 S Beach Rd.)					
	(12,227)	7,556	(4,484)	(6,444)	(15,600)
973,025 (417 S Beach Rd.)					
Section Total	(94,007)	55,662	(20,264)	(52,756)	(111,364)

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - December 2020

(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>Blowing Rocks</u>					
973,025 (417 S Beach Rd.)					
	(14,929)	18,533	(4,089)	(8,071)	(8,556)
972,232 (427 S Beach Rd.)					
	(10,858)	8,329	(3,311)	(3,920)	(9,760)
971,439 (439 S Beach Rd.)					
	(11,156)	7,409	(2,169)	(3,307)	(9,222)
970,641 (447 S Beach Rd.)					
	(12,671)	8,853	(1,764)	(2,227)	(7,809)
969,838 (461 S Beach Rd.)					
	(7,800)	2,724	2,587	400	(2,089)
969,019 (473 S Beach Rd.)					
	(3,658)	8,898	5,862	2,031	13,133
968,204 (481S Beach Rd.)					
	(8,071)	12,622	5,818	5,182	15,551
967,417 (491 S Beach Rd.)					
	(7,969)	2,191	5,520	3,658	3,400
966,631 (Nature Conservancy)					
	(4,147)	(15,711)	7,858	3,169	(8,831)
965,844 (517 S Beach Rd.)					
	(13)	(25,333)	10,444	5,409	(9,493)
965,058 (Blowing Rocks)					
Section Total	(81,271)	28,516	26,756	2,324	(23,676)
GRAND TOTAL	(358,562)	94,282	200,369	(11,524)	(75,436)

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

APPENDIX B
Accretion / Erosion Volume Tabulation
December 2020 (Preconstruction) – April 2021 (Postconstruction)

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

December 2020 - April 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>Refuge Section</u>					
R-68 (Refuge)					
	581	465	(19,418)	(6,716)	(25,090)
R-69 (Refuge)					
	2,652	6,336	(20,097)	(6,455)	(17,564)
R-70 (Refuge)					
	5,525	15,812	(14,456)	(3,488)	3,392
R-71 (Refuge)					
	4,264	8,731	(12,490)	9	514
R-72 (Refuge)					
	9,690	14,300	(10,065)	(3,220)	10,705
R-73 (Refuge)					
	4,861	6,518	(4,718)	(3,872)	2,789
R-74 (Refuge)					
	4,518	(5,638)	(8,175)	(7,258)	(16,553)
R-75 (Refuge)					
	17,302	(186)	(15,740)	(10,342)	(8,966)
R-76A (Refuge)					
	13,810	9,572	(9,734)	(3,864)	9,783
1,002,364 (Refuge)					
Section Total	63,201	55,909	(114,893)	(45,206)	(40,989)

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

December 2020 - April 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
North Section					
1,002,364 (Refuge)					
	41,480	11,564	(20,876)	(9,516)	22,653
1,001,686 (161 N Beach Rd.)					
	44,187	22	(8,676)	(7,462)	28,071
1,000,977 (147 N Beach Rd.)					
	44,018	8,738	(858)	(6,427)	45,471
1,000,258 (130 N Beach Rd.)					
	24,347	(3,684)	(4,791)	(13,396)	2,476
999,543 (113 N Beach Rd.)					
	8,867	(3,013)	(4,969)	(12,271)	(11,387)
998,829 (99 N Beach Rd.)					
	12,564	7,231	(1,329)	(5,591)	12,876
998,122 (Coast Guard)					
	27,404	16,280	(2,351)	(6,502)	34,831
997,400 (67 N Beach Rd.)					
	31,067	15,013	(3,880)	(6,600)	35,600
996,663 (53 N Beach Rd.)					
	20,618	3,978	(3,569)	(3,618)	17,409
995,908 (35 N Beach Rd.)					
	10,338	(262)	(742)	(573)	8,760
995,131 (19 N Beach Rd.)					
	849	1,867	(1,960)	(320)	436
994,364 (Public Beach)					
	(453)	(1,413)	(8,298)	(4,076)	(14,240)
993,615 (9 S Beach Rd.)					
Section Total	265,284	56,320	(62,298)	(76,351)	182,956

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

December 2020 - April 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>Middle Section</u>					
993,615 (9 S Beach Rd.)					
	2,578	11,493	(13,000)	(4,778)	(3,707)
992,902 (21 S Beach Rd.)					
	1,156	22,311	(15,142)	(2,360)	5,964
992,183 (39 S Beach Rd.)					
	1,489	13,293	(12,662)	(5,178)	(3,058)
991,458 (51 S Beach Rd.)					
	542	6,120	(7,591)	(6,044)	(6,973)
990,730 (67 S Beach Rd.)					
	(4,676)	3,964	(6,262)	(3,827)	(10,800)
989,997 (81 S Beach Rd.)					
	(382)	8,569	(3,756)	(4,293)	138
989,265 (97 S Beach Rd.)					
	8,444	13,009	(3,551)	(3,293)	14,609
988,526 (Beach Club)					
	14,436	11,662	(3,631)	(1,244)	21,222
987,770 (127 S Beach Rd.)					
	11,840	3,947	(3,951)	2,293	14,129
987,014 (143 S Beach Rd.)					
	9,196	(5,573)	(4,018)	2,853	2,458
986,263 (157 S Beach Rd.)					
	5,778	(4,867)	(3,520)	(498)	(3,107)
985,519 (169 S Beach Rd.)					
	(204)	11,271	(3,533)	653	8,187
984,778 (185 S Beach Rd.)					
	511	8,378	(124)	3,991	12,756
984,039 (203 S Beach Rd.)					
	11,062	(1,187)	2,978	3,044	15,898
983,302 (215 S Beach Rd.)					
Section Total	61,769	102,391	(77,764)	(18,680)	67,716

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

December 2020 - April 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>South Section</u>					
983,302 (215 S Beach Rd.)					
	24,538	11,596	2,156	(298)	37,991
982,559 (231S Beach Rd.)					
	25,649	8,836	1,240	(1,387)	34,338
981,814 (241 S Beach Rd.)					
	26,253	(1,084)	(1,053)	(2,587)	21,529
981,078 (249 S Beach Rd.)					
	36,822	3,431	(3,813)	(2,436)	34,004
980,328 (259 S Beach Rd.)					
	34,987	7,676	(2,751)	1,636	41,547
979,566 (275 S Beach Rd.)					
	31,407	12,447	(7,780)	1,233	37,307
978,429 (299 S Beach Rd.)					
	9,929	4,173	(10,293)	(3,222)	587
977,664 (318 S Beach Rd.)					
	5,876	8,262	(5,600)	(902)	7,636
976,899 (330 S Beach Rd.)					
	8,022	9,484	(1,329)	(729)	15,449
976,130 (355 S Beach Rd.)					
	8,853	8,498	(613)	(1,329)	15,409
975,362 (365 S Beach Rd.)					
	2,724	18,156	(2,333)	1,671	20,218
974,589 (384 S Beach Rd.)					
	(1,938)	16,569	(187)	5,071	19,516
973,812 (404 S Beach Rd.)					
	9,316	9,311	7,413	5,169	31,209
973,025 (417 S Beach Rd.)					
Section Total	222,438	117,353	(24,944)	1,891	316,738

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

December 2020 - April 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
Blowing Rocks					
973,025 (417 S Beach Rd.)					
	12,644	7,640	1,107	(1,013)	20,378
972,232 (427 S Beach Rd.)					
	(3,382)	3,978	(5,587)	(2,338)	(7,329)
971,439 (439 S Beach Rd.)					
	(9,889)	8,600	(7,244)	(2,467)	(11,000)
970,641 (447 S Beach Rd.)					
	(3,956)	18,271	(6,120)	(2,738)	5,458
969,838 (461 S Beach Rd.)					
	4,169	11,742	(2,787)	(98)	13,027
969,019 (473 S Beach Rd.)					
	9,009	9,453	(6,982)	(1,258)	10,222
968,204 (481S Beach Rd.)					
	4,596	10,840	(6,031)	(2,471)	6,933
967,417 (491 S Beach Rd.)					
	(3,587)	2,787	(164)	(2,684)	(3,649)
966,631 (Nature Conservancy)					
	(3,764)	(9,422)	(116)	(4,787)	(18,089)
965,844 (517 S Beach Rd.)					
	587	(14,564)	(1,613)	(5,853)	(21,444)
965,058 (Blowing Rocks)					
Section Total	6,427	49,324	(35,538)	(25,707)	(5,493)
GRAND TOTAL	619,119	381,298	(315,437)	(164,053)	520,926

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

APPENDIX C
Accretion / Erosion Volume Tabulation
April 2021 (Postconstruction) – July 2021

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

April 2021 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>Refuge Section</u>					
R-68 (Refuge)					
	2,357	484	(3,595)	(1,229)	(1,984)
R-69 (Refuge)					
	2,345	(1,365)	(5,926)	1,910	(3,035)
R-70 (Refuge)					
	(619)	(4,494)	(3,864)	2,585	(6,393)
R-71 (Refuge)					
	85	(3,240)	1,387	1,486	(283)
R-72 (Refuge)					
	805	(5,635)	5,630	5,055	5,855
R-73 (Refuge)					
	3,649	(2,709)	2,999	2,629	6,567
R-74 (Refuge)					
	2,157	(583)	1,636	(1,698)	1,512
R-75 (Refuge)					
	3,444	1,691	5,681	3,207	14,023
R-76A (Refuge)					
	842	318	3,173	2,584	6,917
1,002,364 (Refuge)					
Section Total	15,064	(15,533)	7,120	16,527	23,179

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

April 2021 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
North Section					
1,002,364 (Refuge)					
	(6,289)	4,182	5,413	6,716	10,022
1,001,686 (161 N Beach Rd.)					
	(9,578)	7,004	2,778	2,933	3,138
1,000,977 (147 N Beach Rd.)					
	(12,622)	2,698	2,316	3,827	(3,782)
1,000,258 (130 N Beach Rd.)					
	(7,098)	4,644	7,716	10,493	15,756
999,543 (113 N Beach Rd.)					
	3,431	2,258	7,089	9,889	22,667
998,829 (99 N Beach Rd.)					
	1,342	1,396	(49)	4,764	7,453
998,122 (Coast Guard)					
	(6,844)	2,258	(1,578)	3,449	(2,716)
997,400 (67 N Beach Rd.)					
	(7,053)	1,462	(613)	1,733	(4,471)
996,663 (53 N Beach Rd.)					
	(1,920)	2,924	(98)	(2,524)	(1,618)
995,908 (35 N Beach Rd.)					
	2,809	1,236	133	(80)	4,098
995,131 (19 N Beach Rd.)					
	5,876	751	(1,533)	2,471	7,564
994,364 (Public Beach)					
	3,378	5,564	2,151	1,964	13,058
993,615 (9 S Beach Rd.)					
Section Total	(34,569)	36,378	23,724	45,636	71,169

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

April 2021 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
Middle Section					
993,615 (9 S Beach Rd.)					
	422	5,093	1,076	(618)	5,973
992,902 (21 S Beach Rd.)					
	2,738	6,071	(2,031)	(2,431)	4,347
992,183 (39 S Beach Rd.)					
	898	12,573	671	1,360	15,502
991,458 (51 S Beach Rd.)					
	(2,262)	8,911	(4,453)	2,680	4,876
990,730 (67 S Beach Rd.)					
	267	2,636	(3,942)	2,809	1,769
989,997 (81 S Beach Rd.)					
	(3,538)	1,804	(2,604)	2,867	(1,471)
989,265 (97 S Beach Rd.)					
	(4,840)	6,791	(3,524)	1,640	67
988,526 (Beach Club)					
	578	3,956	(4,000)	(956)	(422)
987,770 (127 S Beach Rd.)					
	(689)	(4,938)	(3,453)	(3,858)	(12,938)
987,014 (143 S Beach Rd.)					
	(3,964)	(7,022)	(1,689)	(2,924)	(15,600)
986,263 (157 S Beach Rd.)					
	(924)	(2,813)	(4,178)	(3,382)	(11,298)
985,519 (169 S Beach Rd.)					
	8,773	1,809	(5,867)	(6,507)	(1,791)
984,778 (185 S Beach Rd.)					
	7,213	6,867	(8,916)	(7,653)	(2,489)
984,039 (203 S Beach Rd.)					
	(4,787)	8,111	(7,684)	(3,800)	(8,160)
983,302 (215 S Beach Rd.)					
Section Total	(116)	49,849	(50,596)	(20,773)	(21,636)

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

April 2021 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>South Section</u>					
983,302 (215 S Beach Rd.)					
	(8,369)	4,378	(2,018)	(53)	(6,062)
982,559 (231S Beach Rd.)					
	(5,542)	(333)	(1,684)	(533)	(8,093)
981,814 (241 S Beach Rd.)					
	(1,924)	484	(2,449)	240	(3,649)
981,078 (249 S Beach Rd.)					
	(3,916)	1,947	(1,760)	1,262	(2,467)
980,328 (259 S Beach Rd.)					
	(5,431)	(596)	(5,000)	(1,511)	(12,538)
979,566 (275 S Beach Rd.)					
	(5,433)	7,507	(5,867)	(2,880)	(6,673)
978,429 (299 S Beach Rd.)					
	(3,151)	8,960	(964)	2,080	6,924
977,664 (318 S Beach Rd.)					
	(4,080)	5,858	(2,587)	2,236	1,427
976,899 (330 S Beach Rd.)					
	(3,427)	6,080	(2,689)	1,356	1,320
976,130 (355 S Beach Rd.)					
	(3,480)	3,938	(1,862)	2,480	1,076
975,362 (365 S Beach Rd.)					
	489	4,529	(2,387)	907	3,538
974,589 (384 S Beach Rd.)					
	2,529	5,364	(4,036)	(933)	2,924
973,812 (404 S Beach Rd.)					
	3,476	(822)	(5,591)	(1,760)	(4,698)
973,025 (417 S Beach Rd.)					
Section Total	(38,260)	47,293	(38,893)	2,889	(26,971)

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

April 2021 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
Blowing Rocks					
973,025 (417 S Beach Rd.)					
	5,324	(3,080)	1,280	3,418	6,942
972,232 (427 S Beach Rd.)					
	3,836	4,667	4,742	6,907	20,151
971,439 (439 S Beach Rd.)					
	644	6,116	1,347	6,502	14,609
970,641 (447 S Beach Rd.)					
	(1,378)	(1,249)	587	4,400	2,360
969,838 (461 S Beach Rd.)					
	(467)	(2,284)	(387)	1,880	(1,258)
969,019 (473 S Beach Rd.)					
	(538)	(1,764)	(320)	3,382	760
968,204 (481S Beach Rd.)					
	764	4,809	(3,071)	4	2,507
967,417 (491 S Beach Rd.)					
	(1,596)	8,044	(2,862)	(391)	3,196
966,631 (Nature Conservancy)					
	(3,636)	5,262	(427)	5,231	6,431
965,844 (517 S Beach Rd.)					
	(2,396)	8,827	(1,156)	4,151	9,427
965,058 (Blowing Rocks)					
Section Total	560	29,347	(267)	35,484	65,124
GRAND TOTAL	(57,320)	147,334	(58,911)	79,762	110,866

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

APPENDIX D
Accretion / Erosion Volume Tabulation
July 2020 – July 2021

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>Refuge Section</u>					
R-68 (Refuge)					
	232	1,713	(8,628)	(10,036)	(16,718)
R-69 (Refuge)					
	(2,485)	3,897	(21,487)	(16,132)	(36,208)
R-70 (Refuge)					
	(1,209)	5,570	(22,627)	(11,369)	(29,634)
R-71 (Refuge)					
	2,665	11,179	(11,806)	4,122	6,160
R-72 (Refuge)					
	3,950	7,015	(1,545)	11,845	21,265
R-73 (Refuge)					
	7,646	2,041	749	4,219	14,654
R-74 (Refuge)					
	13,649	7,031	(753)	(5,429)	14,498
R-75 (Refuge)					
	22,215	4,630	1,634	(5,836)	22,643
R-76A (Refuge)					
	13,465	6,117	2,470	(873)	21,178
1,002,364 (Refuge)					
Section Total	60,128	49,192	(61,993)	(29,488)	17,839

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
North Section					
1,002,364 (Refuge)					
	26,227	10,564	3,418	1,818	42,027
1,001,686 (161 N Beach Rd.)					
	22,311	3,671	2,182	(1,511)	26,653
1,000,977 (147 N Beach Rd.)					
	18,338	8,951	6,898	356	34,542
1,000,258 (130 N Beach Rd.)					
	4,751	6,587	1,822	(840)	12,320
999,543 (113 N Beach Rd.)					
	(3,676)	(564)	604	1,884	(1,751)
998,829 (99 N Beach Rd.)					
	2,293	3,956	2,622	3,511	12,382
998,122 (Coast Guard)					
	14,000	11,338	3,476	31	28,844
997,400 (67 N Beach Rd.)					
	14,524	7,422	4,213	(711)	25,449
996,663 (53 N Beach Rd.)					
	11,600	2,262	2,253	(6,200)	9,916
995,908 (35 N Beach Rd.)					
	13,187	942	2,262	(4,662)	11,729
995,131 (19 N Beach Rd.)					
	12,533	5,947	(2,209)	(1,884)	14,387
994,364 (Public Beach)					
	8,449	14,556	(2,462)	196	20,738
993,615 (9 S Beach Rd.)					
Section Total	144,538	75,631	25,080	(8,013)	237,236

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>Middle Section</u>					
993,615 (9 S Beach Rd.)					
	10,316	22,480	(3,724)	2,676	31,747
992,902 (21 S Beach Rd.)					
	5,276	26,107	(8,702)	1,302	23,982
992,183 (39 S Beach Rd.)					
	(6,378)	26,413	(6,444)	1,098	14,689
991,458 (51 S Beach Rd.)					
	(11,044)	16,009	(7,760)	(1,622)	(4,418)
990,730 (67 S Beach Rd.)					
	(9,902)	9,676	(6,733)	(1,600)	(8,560)
989,997 (81 S Beach Rd.)					
	(8,396)	13,418	(5,551)	(1,329)	(1,858)
989,265 (97 S Beach Rd.)					
	(7,551)	17,564	(5,222)	3,244	8,036
988,526 (Beach Club)					
	44	9,493	(4,431)	4,316	9,422
987,770 (127 S Beach Rd.)					
	191	(507)	738	2,387	2,809
987,014 (143 S Beach Rd.)					
	(1,129)	31	5,040	489	4,431
986,263 (157 S Beach Rd.)					
	436	1,009	2,196	(7,733)	(4,093)
985,519 (169 S Beach Rd.)					
	2,476	2,667	1,622	(8,484)	(1,720)
984,778 (185 S Beach Rd.)					
	6,333	13,378	(2,529)	(8,667)	8,516
984,039 (203 S Beach Rd.)					
	2,013	12,858	(2,413)	(8,516)	3,942
983,302 (215 S Beach Rd.)					
Section Total	(17,316)	170,596	(43,916)	(22,440)	86,924

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
<u>South Section</u>					
983,302 (215 S Beach Rd.)					
	4,511	3,733	3,236	(3,400)	8,080
982,559 (231S Beach Rd.)					
	18,316	10,689	2,462	271	31,738
981,814 (241 S Beach Rd.)					
	28,538	13,151	(4,742)	(1,529)	35,418
981,078 (249 S Beach Rd.)					
	31,720	8,804	(10,693)	(6,849)	22,982
980,328 (259 S Beach Rd.)					
	28,138	9,062	(13,036)	(8,911)	15,253
979,566 (275 S Beach Rd.)					
	18,567	28,113	(16,213)	(7,727)	22,740
978,429 (299 S Beach Rd.)					
	(3,511)	20,213	(9,511)	(436)	6,756
977,664 (318 S Beach Rd.)					
	(10,027)	16,898	(5,853)	(3,378)	(2,360)
976,899 (330 S Beach Rd.)					
	(8,600)	19,347	(4,889)	(7,480)	(1,622)
976,130 (355 S Beach Rd.)					
	(6,369)	20,813	(7,076)	(4,307)	3,062
975,362 (365 S Beach Rd.)					
	(6,360)	31,111	(7,302)	(1,747)	15,702
974,589 (384 S Beach Rd.)					
	(5,316)	22,329	(7,822)	551	9,742
973,812 (404 S Beach Rd.)					
	564	16,044	(2,662)	(3,036)	10,911
973,025 (417 S Beach Rd.)					
Section Total	90,171	220,309	(84,102)	(47,976)	178,402

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT

BEACH EROSION / ACCRETION

July 2020 - July 2021
(Volume in Cubic Yards)

SURVEY PROFILE	SURVEY RANGE				NET CHANGE
	-200 - 300	300 - 800	800 - 1800	1800 - 2800	
Blowing Rocks					
973,025 (417 S Beach Rd.)					
	3,040	23,093	(1,702)	(5,667)	18,764
972,232 (427 S Beach Rd.)					
	(10,404)	16,973	(4,156)	649	3,062
971,439 (439 S Beach Rd.)					
	(20,400)	22,124	(8,067)	729	(5,613)
970,641 (447 S Beach Rd.)					
	(18,004)	25,876	(7,298)	(564)	9
969,838 (461 S Beach Rd.)					
	(4,098)	12,182	(587)	2,182	9,680
969,019 (473 S Beach Rd.)					
	4,813	16,587	(1,440)	4,156	24,116
968,204 (481S Beach Rd.)					
	(2,711)	28,271	(3,284)	2,716	24,991
967,417 (491 S Beach Rd.)					
	(13,151)	13,022	2,493	582	2,947
966,631 (Nature Conservancy)					
	(11,547)	(19,871)	7,316	3,613	(20,489)
965,844 (517 S Beach Rd.)					
	(1,822)	(31,071)	7,676	3,707	(21,511)
965,058 (Blowing Rocks)					
Section Total	(74,284)	107,187	(9,049)	12,102	35,956
GRAND TOTAL	203,237	622,914	(173,979)	(95,815)	556,356

*Volumes in parenthesis indicate erosion.

**The Erosion Control Line is referenced at Range 0.

APPENDIX E
Historic Accretion / Erosion Summary
1995-2021

JUPITER ISLAND BEACH RESTORATION PROJECT

HISTORICAL BEACH EROSION / ACCRETION
with Blowing Rocks included

June 1995 - July 2021

JUPITER ISLAND BEACH RESTORATION PROJECT
BEACH EROSION / ACCRETION
NORTH SECTION
June 1995 - July 2021
(Volumes in Cubic Yards)

June 1995 - July 2021 SURVEY PERIOD	SURVEY RANGE			NET CHANGE
	-200 - 300	300 - 800	800 - 1800	
6/95	0	0	0	0
6/95-7/96	515,944	28,902	(276,784)	268,062
7/96-1/97	(184,495)	(49,822)	11,767	(222,550)
1/97-7/97	(76,679)	111,225	87,212	121,758
7/97-1/98	19,892	(18,178)	189,529	191,243
1/98-6/98	(86,647)	(38,277)	(45,969)	(170,893)
6/98-11/98	49,816	60,950	53,236	164,001
11/98-6/99	155,526	71,936	17,647	245,109
6/99-7/00	(90,280)	(41,237)	(44,116)	(175,633)
7/00-7/01	(46,916)	(65,853)	(51,200)	(163,969)
7/01-2/02	(51,987)	45,724	37,528	31,265
2/02-6/02	167,520	22,581	111,730	301,831
6/02-7/03	177,197	39,254	(96,313)	120,138
7/03-6/04	(78,084)	130,820	(28,354)	24,382
7/04-10/04	(114,011)	(23,180)	(47,898)	(185,089)
10/04-6/05	(73,983)	(71,664)	(34,191)	(179,838)
6/05-7/06	111,845	81,293	75,844	268,982
7/06-6/07	33,359	105,281	(49,516)	89,124
6/07-8/08	(76,484)	(87,054)	11,692	(151,846)
8/08-6/09	(85,946)	30,350	67,305	11,709
6/09-8/10	4,234	92,597	(33,404)	63,427
8/10-8/11	72,317	(11,953)	(136,168)	(75,804)
8/11-7/12	231,554	(30,734)	45,460	246,280
7/12-7/13	(191,762)	(62,090)	(51,843)	(305,695)
7/13-7/14	(23,739)	113,904	57,560	147,725
7/14-7/15	20,366	(201)	55,412	75,577
7/15-7/16	338,051	(2,457)	23,529	359,124
7/16-7/17	(46,061)	18,802	(124,715)	(151,975)
7/17-7/18	(126,538)	(108,778)	(88,071)	(323,387)
7/18-7/19	344,311	151,920	34,378	530,609
7/19-7/20	(84,031)	(85,493)	20,498	(149,027)
7/20-7/21	144,538	75,631	25,080	245,249
NET VOLUME CHANGE June 1995 - July 2021	948,827	484,199	(183,138)	1,249,889
ANNUAL AVERAGE	36,862	18,811	(7,115)	48,558

-Volumes in parenthesis indicate erosion
-The Erosion Control Line is referenced at range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT
BEACH EROSION / ACCRETION
MIDDLE SECTION
June 1995 - July 2021
(Volumes in Cubic Yards)

June 1995 - July 2021 SURVEY PERIOD	SURVEY RANGE			NET CHANGE
	-200 - 300	300 - 800	800 - 1800	
6/95	0	0	0	0
6/95-7/96	704,271	(98,110)	(385,788)	220,373
7/96-1/97	(187,172)	95,473	(87,631)	(179,330)
1/97-7/97	(144,204)	163,701	119,776	139,273
7/97-1/98	52,276	(111,893)	137,196	77,579
1/98-6/98	(30,062)	3,679	(18,799)	(45,182)
6/98-11/98	(5,003)	40,652	(8,621)	27,028
11/98-6/99	235,708	104,279	62,966	402,953
6/99-7/00	(119,446)	(72,985)	(21,791)	(214,222)
7/00-7/01	(38,188)	(54,813)	76,812	(16,189)
7/01-2/02	(111,314)	70,355	88,142	47,183
2/02-6/02	3,146	52,507	184,189	239,842
6/02-7/03	378,194	(30,012)	(86,518)	261,664
7/03-6/04	(78,084)	(130,820)	(28,354)	(237,258)
7/04-10/04	(176,538)	(262,817)	(534,679)	(974,034)
10/04-6/05	(220,886)	152,188	(89,260)	(157,958)
6/05-7/06	334,983	274,470	(8,759)	600,694
7/06-6/07	(83,458)	(32,128)	(68,929)	(184,515)
6/07-8/08	(201,694)	114,883	163,909	77,098
8/08-6/09	(136,134)	(4,207)	48,222	(92,119)
6/09-8/10	23,292	153,002	132,956	309,250
8/10-8/11	44,179	190,894	53,917	288,990
8/11-7/12	372,623	(135,861)	213,375	450,137
7/12-7/13	(23,996)	(45,316)	(217,155)	(286,467)
7/13-7/14	15,350	117,622	110,401	243,373
7/14-7/15	68,832	(49,435)	141,366	160,763
7/15-7/16	348,189	(95,542)	91,947	344,593
7/16-7/17	29,249	12,740	(191,651)	(149,661)
7/17-7/18	(232,342)	(251,009)	(136,542)	(619,893)
7/18-7/19	299,244	42,173	(81,902)	259,516
7/19-7/20	(180,307)	(49,222)	(39,498)	(269,027)
7/20-7/21	(17,316)	170,596	(43,916)	109,364
NET VOLUME CHANGE June 1995 - July 2021	923,393	335,044	(424,618)	833,818
ANNUAL AVERAGE	35,874	13,016	(16,496)	32,394

-Volumes in parenthesis indicate erosion
-The Erosion Control Line is referenced at range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT
BEACH EROSION / ACCRETION
SOUTH SECTION
June 1995 - July 2021
(Volumes in Cubic Yards)

June 1995 - July 2021 SURVEY PERIOD	SURVEY RANGE			NET CHANGE
	-200 - 300	300 - 800	800 - 1800	
6/95	0	0	0	0
6/95-7/96	433,230	(220,963)	(332,901)	(120,634)
7/96-1/97	(120,557)	66,587	(149,278)	(203,248)
1/97-7/97	(64,790)	181,699	29,576	146,485
7/97-1/98	(5,330)	(33,380)	80,087	41,377
1/98-6/98	(107,912)	(99,933)	(33,170)	(241,015)
6/98-11/98	93,425	23,454	100,986	217,865
11/98-6/99	(6,790)	77,319	2,874	73,403
6/99-7/00	25,010	(154,226)	(47,007)	(176,223)
7/00-7/01	44,495	167,074	25,611	237,180
7/01-2/02	(84,556)	41,125	9,388	(34,043)
2/02-6/02	393,004	33,138	166,381	592,523
6/02-7/03	249,876	22,223	(120,420)	151,679
7/03-6/04	(153,299)	(187,409)	72,516	(268,192)
7/04-10/04	(271,257)	(217,396)	(643,668)	(1,132,321)
10/04-6/05	(147,510)	21,481	217,121	91,092
6/05-7/06	(60,143)	134,722	42,809	117,388
7/06-6/07	518,350	(122,858)	(14,433)	381,059
6/07-8/08	(310,400)	49,277	133,945	(127,178)
8/08-6/09	(120,761)	118,022	(58,686)	(61,425)
6/09-8/10	(10,566)	199,812	(155,970)	33,276
8/10-8/11	135,060	(80,785)	(122,461)	(68,187)
8/11-7/12	252,178	34,089	(27,855)	258,412
7/12-7/13	(271,937)	128,503	(130,625)	(274,059)
7/13-7/14	(108,782)	180,855	130,394	202,467
7/14-7/15	(58,547)	(82,938)	222,742	81,256
7/15-7/16	852,262	(40,951)	155,220	966,532
7/16-7/17	35,644	4,844	(169,711)	(129,223)
7/17-7/18	(167,609)	(159,602)	(80,231)	(407,442)
7/18-7/19	243,058	(55,536)	89,776	277,298
7/19-7/20	(208,453)	(171,593)	98,911	(281,136)
7/20-7/21	90,171	220,309	(84,102)	226,378
NET VOLUME CHANGE June 1995 - July 2021	1,086,563	76,962	(592,182)	571,344
ANNUAL AVERAGE	42,213	2,990	(23,006)	22,197

-Volumes in parenthesis indicate erosion
-The Erosion Control Line is referenced at range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT
BEACH EROSION / ACCRETION
BLOWING ROCKS
June 1995 - July 2021
(Volumes in Cubic Yards)

June 1995 - July 2021 SURVEY PERIOD	SURVEY RANGE			NET CHANGE
	-200 - 300	300 - 800	800 - 1800	
6/95	0	0	0	0
6/95-7/96^	27,660	18,581	8,710	54,950
7/96-1/97	(220,849)	30,350	17,293	(173,206)
1/97-7/97	77,324	43,584	42,539	163,447
7/97-1/98	84,507	(62,209)	219	22,517
1/98-6/98	(44,948)	(39,353)	11,650	(72,651)
6/98-11/98	60,831	45,868	21,387	128,086
11/98-6/99	66,053	66,828	(26,037)	106,844
6/99-7/00	(111,016)	68,591	121,077	78,652
7/00-7/01	90,850	17,222	(5,124)	102,948
7/01-2/02	24,437	7,030	68,796	100,263
2/02-6/02	92,043	(3,887)	52,780	140,936
6/02-7/03	84,451	58,810	(122,316)	20,945
7/03-6/04	106,164	(83,490)	38,572	61,247
7/04-10/04	(51,515)	(22,756)	(122,675)	(196,946)
10/04-6/05	42,785	(37,608)	180,761	185,938
6/05-7/06	1,154	75,608	(8,202)	68,560
7/06-6/07	35,592	15,086	(16,282)	34,395
6/07-8/08	81,243	(36,291)	144,902	189,855
8/08-6/09	97,917	173,716	(1,615)	270,018
6/09-8/10	73,878	55,392	(144,962)	(15,693)
8/10-8/11	(9,810)	48,125	(109,473)	(71,158)
8/11-7/12	34,587	22,047	32,125	88,759
7/12-7/13	(46,796)	(37,198)	(49,703)	(133,698)
7/13-7/14	53,344	52,819	58,974	165,138
7/14-7/15	33,656	(68,680)	59,125	24,101
7/15-7/16	28,801	21,155	449	50,406
7/16-7/17	34,466	72,334	(17,796)	89,004
7/17-7/18	(57,404)	(158,533)	(263,760)	(479,698)
7/18-7/19	70,462	51,893	42,796	165,151
7/19-7/20	(31,520)	(171,227)	134,209	(68,538)
7/20-7/21	(74,284)	107,187	(9,049)	23,854
NET VOLUME CHANGE June 1995 - July 2021	654,062	330,996	139,368	1,124,426
ANNUAL AVERAGE	25,410	12,859	5,414	43,684

^Volumes for Blowing Rocks unavailable for 6/95-7/96 - average of all other periods applied

-Volumes in parenthesis indicate erosion

-The Erosion Control Line is referenced at range 0.

JUPITER ISLAND BEACH RESTORATION PROJECT
BEACH EROSION / ACCRETION (fill volumes included)
ALL SECTIONS (incl. Blowing Rocks)
June 1995 - July 2021
(Volumes in Cubic Yards)

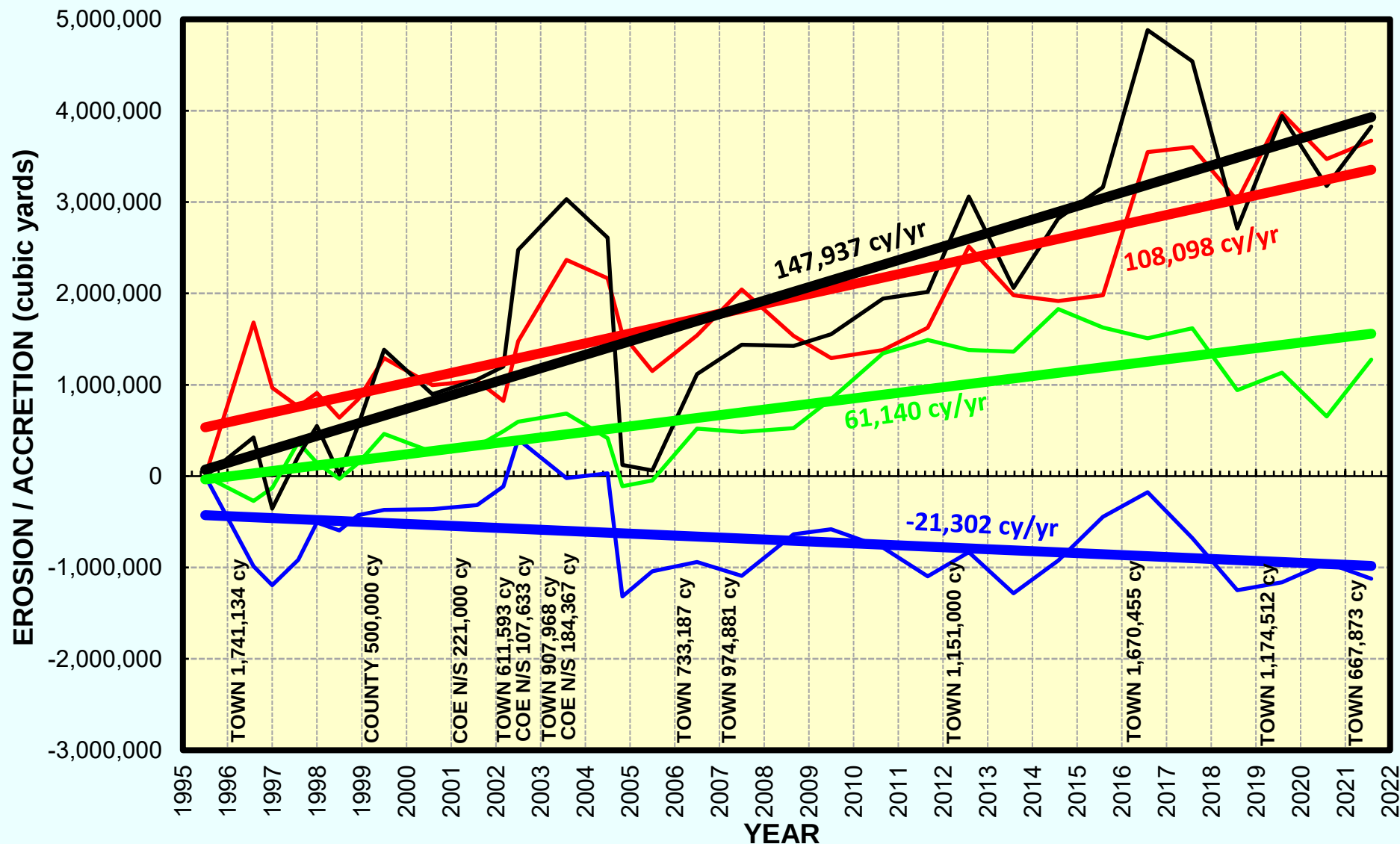
June 1995 - July 2021 SURVEY PERIOD	SURVEY RANGE			NET CHANGE
	-200 - 300	300 - 800	800 - 1800	
6/95	0	0	0	0
6/95-7/96^	1,681,105	(271,590)	(986,763)	422,751
7/96-1/97	(713,073)	142,588	(207,849)	(778,334)
1/97-7/97	(208,349)	500,209	279,103	570,963
7/97-1/98	151,345	(225,660)	407,031	332,716
1/98-6/98	(269,569)	(173,884)	(86,288)	(529,741)
6/98-11/98	199,069	170,923	166,988	536,981
11/98-6/99	450,497	320,362	57,450	828,309
6/99-7/00	(295,732)	(199,857)	8,163	(487,426)
7/00-7/01	50,241	63,630	46,099	159,970
7/01-2/02	(223,420)	164,234	203,854	144,668
2/02-6/02	655,713	104,339	515,080	1,275,132
6/02-7/03	889,718	90,275	(425,567)	554,426
7/03-6/04	(203,303)	(270,899)	54,380	(419,821)
7/04-10/04	(613,321)	(526,149)	(1,348,920)	(2,488,390)
10/04-6/05	(399,594)	64,397	274,431	(60,766)
6/05-7/06	387,839	566,093	101,692	1,055,624
7/06-6/07	503,843	(34,619)	(149,160)	320,063
6/07-8/08	(507,335)	40,815	454,448	(12,071)
8/08-6/09	(244,924)	317,881	55,226	128,183
6/09-8/10	90,838	500,803	(201,381)	390,260
8/10-8/11	241,746	146,281	(314,186)	73,840
8/11-7/12	890,942	(110,459)	263,105	1,043,588
7/12-7/13	(534,491)	(16,101)	(449,327)	(999,919)
7/13-7/14	(63,827)	465,201	357,330	758,704
7/14-7/15	64,306	(201,254)	478,645	341,697
7/15-7/16	1,567,304	(117,795)	271,144	1,720,654
7/16-7/17	53,298	108,721	(503,873)	(341,855)
7/17-7/18	(583,893)	(677,922)	(568,604)	(1,830,420)
7/18-7/19	957,076	190,451	85,047	1,232,573
7/19-7/20	(504,311)	(477,536)	214,120	(767,727)
7/20-7/21	203,237	622,914	(173,979)	652,172
NET VOLUME CHANGE June 1995 - July 2021	3,672,973	1,276,393	(1,122,562)	3,826,804
ANNUAL AVERAGE	142,694	49,588	(43,611)	148,671

^Volumes for Blowing Rocks unavailable for 6/95-7/96 - average of all other periods applied

-Volumes in parenthesis indicate erosion

-The Erosion Control Line is referenced at range 0.

JUPITER ISLAND BEACH EROSION / ACCRETION June 1995 - July 2021 (fill volumes included)



JUPITER ISLAND BEACH RESTORATION PROJECT ADJUSTED BEACH EROSION / ACCRETION (fill volumes removed) ALL SECTIONS (incl. Blowing Rocks) June 1995 - July 2021 (Volumes in Cubic Yards)				
June 1995 - July 2021 SURVEY PERIOD	SURVEY RANGE			NET CHANGE
	-200 - 300	300 - 800	800 - 1800	
6/95	0	0	0	0
6/95-7/96^*	(87,689)	(271,590)	(986,763)	(1,346,042)
7/96-1/97	(713,073)	142,588	(207,849)	(778,334)
1/97-7/97	(208,349)	500,209	279,103	570,963
7/97-1/98	151,345	(225,660)	407,031	332,716
1/98-6/98	(269,569)	(173,884)	(86,288)	(529,741)
6/98-11/98	199,069	170,923	166,988	536,981
11/98-6/99*	(49,503)	320,362	57,450	328,309
6/99-7/00	(295,732)	(199,857)	8,163	(487,426)
7/00-7/01*	50,241	63,630	(174,901)	(61,030)
7/01-2/02	(223,420)	164,234	203,854	144,668
2/02-6/02*	44,120	104,339	407,447	555,906
6/02-7/03*	(18,250)	90,275	(609,934)	(537,909)
7/03-6/04	(203,303)	(270,899)	54,380	(419,821)
7/04-10/04	(613,321)	(526,149)	(1,348,920)	(2,488,390)
10/04-6/05	(399,594)	64,397	274,431	(60,766)
6/05-7/06*	(345,347)	566,093	101,692	322,438
7/06-6/07*	(471,038)	(34,619)	(149,160)	(654,818)
6/07-8/08	(507,335)	40,815	454,448	(12,071)
8/08-6/09	(244,924)	317,881	55,226	128,183
6/09-8/10	90,838	500,803	(201,381)	390,260
8/10-8/11	241,746	146,281	(314,186)	73,840
8/11-7/12*	(260,058)	(110,459)	263,105	(107,412)
7/12-7/13	(534,491)	(16,101)	(449,327)	(999,919)
7/13-7/14	(63,827)	465,201	357,330	758,704
7/14-7/15	64,306	(201,254)	478,645	341,697
7/15-7/16*	(103,151)	(117,795)	271,144	50,199
7/16-7/17	53,298	108,721	(503,873)	(341,855)
7/17-7/18	(583,893)	(677,922)	(568,604)	(1,830,420)
7/18-7/19*	(217,436)	190,451	85,047	58,061
7/19-7/20	(504,311)	(477,536)	214,120	(767,727)
7/20-7/21	(464,636)	622,914	(173,979)	(15,701)
NET VOLUME CHANGE June 1995 - July 2021	(6,487,288)	1,276,393	(1,635,562)	(6,846,458)
ANNUAL AVERAGE	(252,030)	49,588	(63,541)	(265,984)

^Volumes for Blowing Rocks unavailable for 6/95-7/96 - average of all other periods applied

*Volumes adjusted - fill project volumes removed.

-Volumes in parenthesis indicate erosion

-The Erosion Control Line is referenced at range 0.

Notes on volume adjustments:

6/95-7/96 Rge -200 - 300 adjusted by -1,741,134 for renourishment project

11/98 - 6/99 Rge -200 - 300 adjusted by -500,000cy for renourishment project (70% of bin measured \

7/00 - 7/01 Rge 800 - 1800 adjusted by -221,000cy for nearshore disposal from inlet project

2/02 - 6/02 Rge -200 - 300 adjusted by -611,593cy for beginning of renourishment project

2/02 - 6/02 Rge 800 - 1800 adjusted by -107,633cy for beginning of nearshore disposal from inlet pro

6/02 - 7/03 Rge -200 - 300 adjusted by -907,968 for remainder of renourishment project

6/02 - 7/03 Rge 800 - 1800 adjusted by -184,367cy for remainder of nearshore disposal from inlet proj

6/05 - 7/06 Rge -200 - 300 adjusted by -733,186cy for beginning of renourishment project

7/06 - 6/07 Rge -200 - 300 adjusted by -974,881cy for remainder of renourishment project

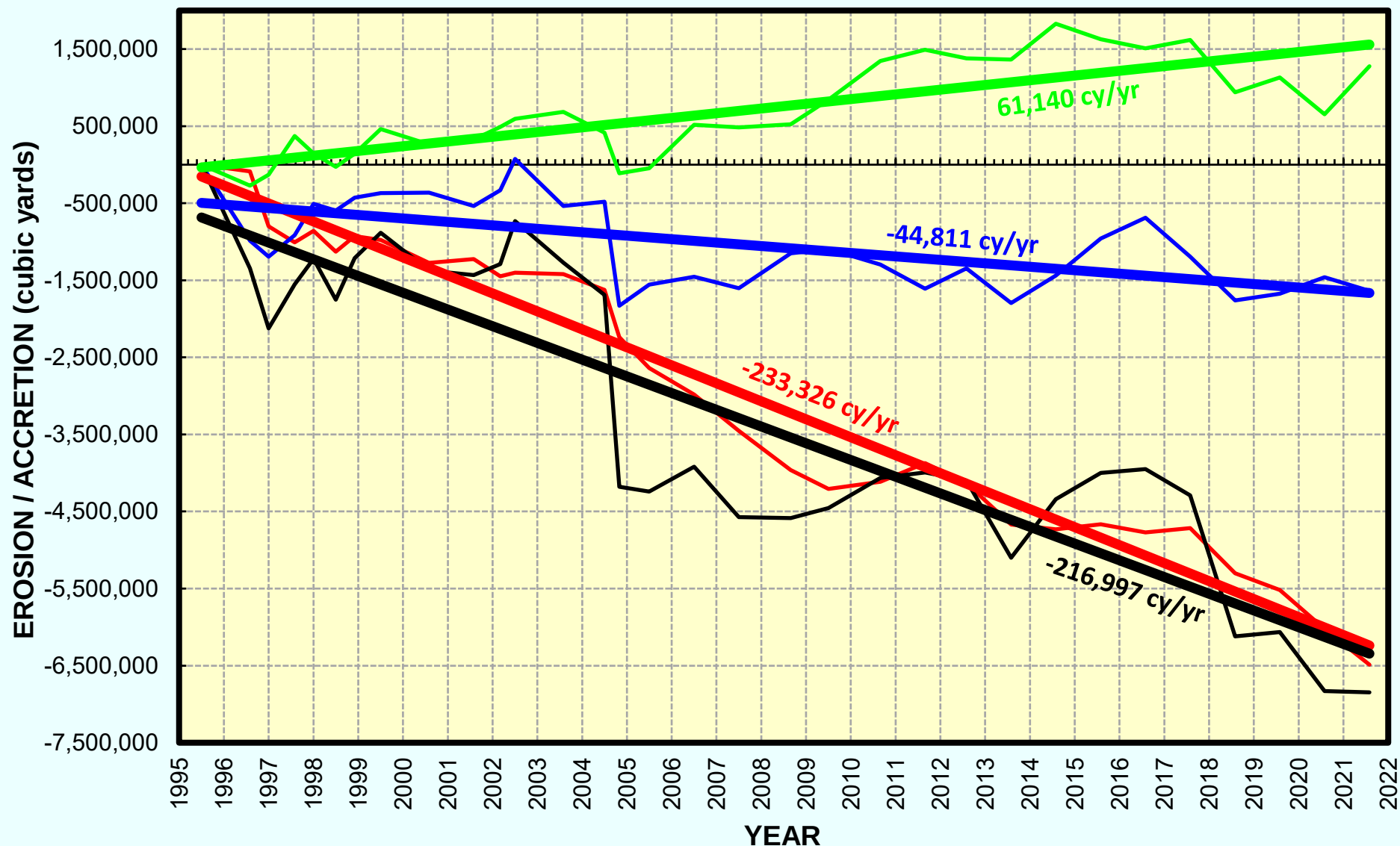
8/11 - 7/12 Rge -200 - 300 adjusted by -1,151,000cy for renourishment project

7/15 - 7/16 Rge -200 - 300 adjusted by -1,670,455cy for renourishment project

7/18 - 7/19 Rge -200 - 300 adjusted by -1,174,512cy for renourishment project

7/20 - 7/21 Rge -200 - 300 adjusted by -667,873cy for renourishment project

JUPITER ISLAND BEACH EROSION / ACCRETION June 1995 - July 2021 (adjusted - fill volumes removed)



— Range -200 - 300
 — Range 300 - 800
 — Range 800 - 1800
 — TOTAL

JUPITER ISLAND BEACH RESTORATION PROJECT ADJUSTED BEACH EROSION / ACCRETION (fill and storm volumes removed) ALL SECTIONS (incl. Blowing Rocks) June 1995 - July 2021 (Volumes in Cubic Yards)				
June 1995 - July 2021 SURVEY PERIOD	SURVEY RANGE			NET CHANGE
	-200 - 300	300 - 800	800 - 1800	
6/95	0	0	0	0
6/95-7/96*	(87,689)	(271,590)	(986,763)	(1,346,042)
7/96-1/97	(713,073)	142,588	(207,849)	(778,334)
1/97-7/97	(208,349)	500,209	279,103	570,963
7/97-1/98	151,345	(225,660)	407,031	332,716
1/98-6/98	(269,569)	(173,884)	(86,288)	(529,741)
6/98-11/98	199,069	170,923	166,988	536,981
11/98-6/99*	(49,503)	320,362	57,450	328,309
6/99-7/00	(295,732)	(199,857)	8,163	(487,426)
7/00-7/01*	50,241	63,630	(174,901)	(61,030)
7/01-2/02	(223,420)	164,234	203,854	144,668
2/02-6/02*	44,120	104,339	407,447	555,906
6/02-7/03*	(18,250)	90,275	(609,934)	(537,909)
7/03-6/04	(203,303)	(270,899)	54,380	(419,821)
7/04-10/04**	(44,700)	11,413	(13,247)	(46,535)
10/04-6/05	(399,594)	64,397	274,431	(60,766)
6/05-7/06*	(345,347)	566,093	101,692	322,438
7/06-6/07*	(471,038)	(34,619)	(149,160)	(654,818)
6/07-8/08	(507,335)	40,815	454,448	(12,071)
8/08-6/09	(244,924)	317,881	55,226	128,183
6/09-8/10	90,838	500,803	(201,381)	390,260
8/10-8/11	241,746	146,281	(314,186)	73,840
8/11-7/12*	(260,058)	(110,459)	263,105	(107,412)
7/12-7/13	(534,491)	(16,101)	(449,327)	(999,919)
7/13-7/14	(63,827)	465,201	357,330	758,704
7/14-7/15	64,306	(201,254)	478,645	341,697
7/15-7/16*	(103,151)	(117,795)	271,144	50,199
7/16-7/17***	344,967	72,759	(237,038)	180,687
7/17-7/18****	(189,506)	(416,306)	303,738	(302,075)
7/18-7/19*	(217,436)	190,451	85,047	58,061
7/19-7/20*****	42,436	(477,536)	214,120	(220,980)
7/20-7/21	(464,636)	622,914	(173,979)	(15,701)
NET VOLUME CHANGE June 1995 - July 2021	(4,685,864)	2,039,609	839,287	(1,806,968)
ANNUAL AVERAGE	(182,045)	79,238	32,606	(70,200)

*Volumes adjusted - fill project volumes removed.

**2004 Storms removed - previous years average applied to 3 month period.

***2016 Hurricane Matthew removed - Post-storm survey volumes used

****2017 Hurricane Irma removed - Post-storm survey volumes used

*****2019 Hurricane Dorian removed - Post-storm survey volumes used

-The Erosion Control Line is referenced at range 0.

^Volumes for Blowing Rocks unavailable for 6/95-7/96 - average of all other periods applied

-Volumes in parenthesis indicate erosion

Notes on volume adjustments:

6/95-7/96 Rge -200 - 300 adjusted by -1,741,134 for renourishment project

11/98 - 6/99 Rge -200 - 300 adjusted by -500,000cy for renourishment project (70% of bin measured

7/00 - 7/01 Rge 800 - 1800 adjusted by -221,000cy for nearshore disposal from inlet project

2/02 - 6/02 Rge -200 - 300 adjusted by -611,593cy for beginning of renourishment project

2/02 - 6/02 Rge 800 - 1800 adjusted by -107,633cy for beginning of nearshore disposal from inlet prc

6/02 - 7/03 Rge -200 - 300 adjusted by -907,968 for remainder of renourishment project

6/02 - 7/03 Rge 800 - 1800 adjusted by -184,367cy for remainder of nearshore disposal from inlet prc

6/05 - 7/06 Rge -200 - 300 adjusted by -733,186cy for beginning of renourishment project

7/06 - 6/07 Rge -200 - 300 adjusted by -974,881cy for remainder of renourishment project

8/11 - 7/12 Rge -200 - 300 adjusted by -1,151,000cy for renourishment project

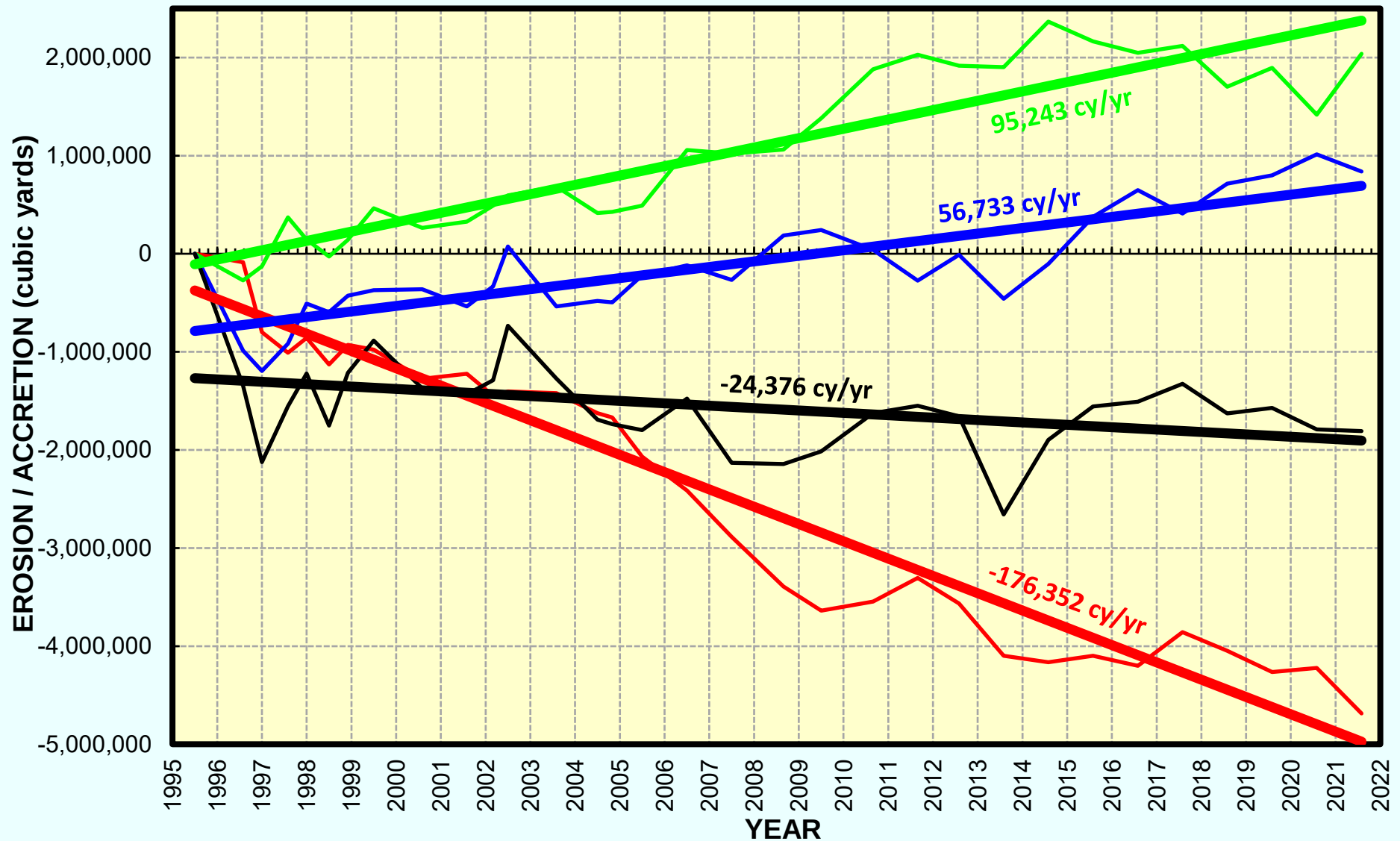
7/15 - 7/16 Rge -200 - 300 adjusted by -1,670,455cy for renourishment project

7/18 - 7/19 Rge -200 - 300 adjusted by -1,174,512cy for renourishment project

7/20 - 7/21 Rge -200 - 300 adjusted by -667,873cy for renourishment project

JUPITER ISLAND BEACH EROSION / ACCRETION

June 1995 - July 2021 (fill and storms removed)



— Range -200 - 300
 — Range 300 - 800
 — Range 800 - 1800
 — TOTAL

APPENDIX F
Shoreline Changes Tabulation
July 2020 – July 2021

JUPITER ISLAND BEACH RESTORATION PROJECT

NET SHORELINE CHANGES

July 2020 - July 2021
(Change in Feet)

SURVEY PROFILE Refuge Section	SURVEY RANGE OF SHORELINE		NET CHANGE
	July-2020	July-2021	
R-68 (Refuge)	275	276	1
R-69 (Refuge)	253	245	(8)
R-70 (Refuge)	295	264	(31)
R-71 (Refuge)	314	299	(15)
R-72 (Refuge)	282	279	(3)
R-73 (Refuge)	241	239	(2)
R-74 (Refuge)	184	221	37
R-75 (Refuge)	192	189	(3)
R-76A (Refuge)	198	262	64

*Changes in parenthesis indicate landward movement of shoreline.

**The Erosion Control Line is referenced at range 0.

***The position of the shoreline is referenced at 0.0' NAVD.

JUPITER ISLAND BEACH RESTORATION PROJECT

NET SHORELINE CHANGES

July 2020 - July 2021
(Change in Feet)

SURVEY PROFILE North Section	SURVEY RANGE OF SHORELINE		NET CHANGE
	July-2020	July-2021	
1,002,364 (Refuge)	180	253	73
1,001,686 (161 N Beach Rd.)	140	170	30
1,000,977 (147 N Beach Rd.)	163	192	29
1,000,258 (130 N Beach Rd.)	218	235	17
999,543 (113 N Beach Rd.)	224	211	(13)
998,829 (99 N Beach Rd.)	193	181	(12)
998,122 (Coast Guard)	110	130	20
997,400 (67 N Beach Rd.)	58	77	19
996,663 (53 N Beach Rd.)	46	73	27
995,908 (35 N Beach Rd.)	89	112	23
995,131 (19 N Beach Rd.)	142	160	18
994,364 (Public Beach)	201	211	10

*Changes in parenthesis indicate landward movement of shoreline.

**The Erosion Control Line is referenced at range 0.

***The position of the shoreline is referenced at 0.0' NAVD.

JUPITER ISLAND BEACH RESTORATION PROJECT

NET SHORELINE CHANGES

July 2020 - July 2021
(Change in Feet)

SURVEY PROFILE Middle Section	SURVEY RANGE OF SHORELINE		NET CHANGE
	July-2020	July-2021	
993,615 (9 S Beach Rd.)	219	218	(1)
992,902 (21 S Beach Rd.)	160	169	9
992,183 (39 S Beach Rd.)	182	157	(25)
991,458 (51 S Beach Rd.)	201	173	(28)
990,730 (67 S Beach Rd.)	234	199	(35)
989,997 (81 S Beach Rd.)	203	180	(23)
989,265 (97 S Beach Rd.)	145	120	(25)
988,526 (Beach Club)	115	91	(24)
987,770 (127 S Beach Rd.)	142	150	8
987,014 (143 S Beach Rd.)	151	156	5
986,263 (157 S Beach Rd.)	158	165	7
985,519 (169 S Beach Rd.)	164	163	(1)
984,778 (185 S Beach Rd.)	159	175	16
984,039 (203 S Beach Rd.)	160	157	(3)
983,302 (215 S Beach Rd.)	142	124	(18)

*Changes in parenthesis indicate landward movement of shoreline.

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JUPITER ISLAND BEACH RESTORATION PROJECT

NET SHORELINE CHANGES

July 2020 - July 2021
(Change in Feet)

SURVEY PROFILE South Section	SURVEY RANGE OF SHORELINE		NET CHANGE
	July-2020	July-2021	
982,559 (231S Beach Rd.)	145	161	16
981,814 (241 S Beach Rd.)	141	202	61
981,078 (249 S Beach Rd.)	118	174	56
980,328 (259 S Beach Rd.)	102	165	63
979,566 (275 S Beach Rd.)	124	163	39
978,429 (299 S Beach Rd.)	191	188	(3)
977,664 (318 S Beach Rd.)	213	180	(33)
976,899 (330 S Beach Rd.)	210	171	(39)
976,130 (355 S Beach Rd.)	203	169	(34)
975,362 (365 S Beach Rd.)	223	192	(31)
974,589 (384 S Beach Rd.)	233	201	(32)
973,812 (404 S Beach Rd.)	242	206	(36)
973,025 (417 S Beach Rd.)	186	196	10

*Changes in parenthesis indicate landward movement of shoreline.

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JUPITER ISLAND BEACH RESTORATION PROJECT

NET SHORELINE CHANGES

July 2020 - July 2021
(Change in Feet)

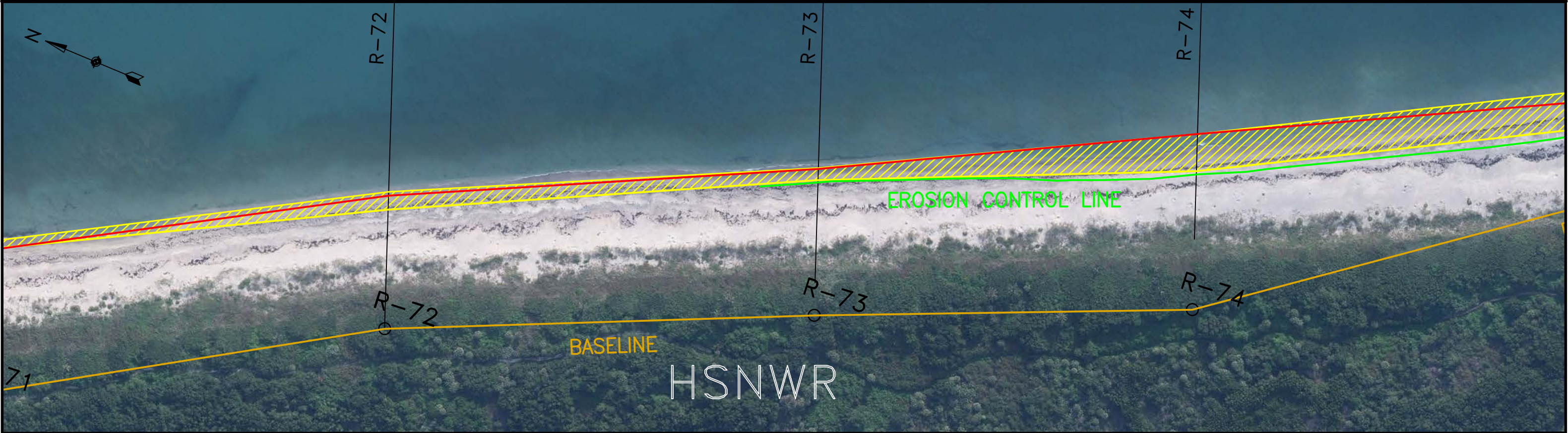
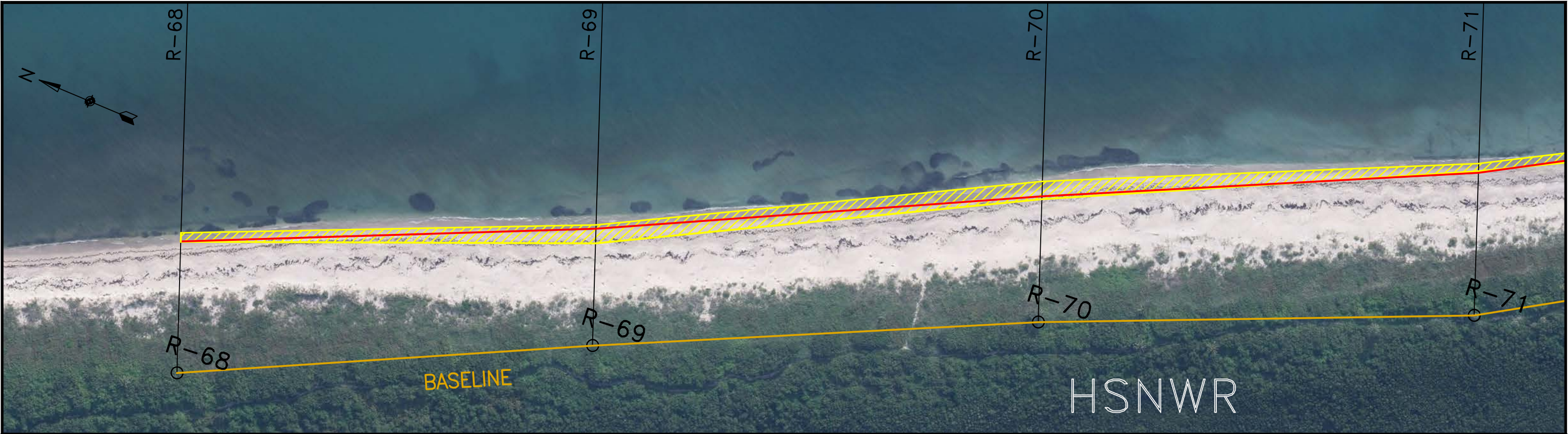
SURVEY PROFILE Blowing Rocks	SURVEY RANGE OF SHORELINE		NET CHANGE
	July-2020	July-2021	
972,232 (427 S Beach Rd.)	215	204	(11)
971,439 (439 S Beach Rd.)	250	194	(56)
970,641 (447 S Beach Rd.)	230	176	(54)
969,838 (461 S Beach Rd.)	206	171	(35)
969,019 (473 S Beach Rd.)	225	236	11
968,204 (481S Beach Rd.)	237	253	16
967,417 (491 S Beach Rd.)	251	222	(29)
966,631 (Nature Conservancy)	313	244	(69)
965,844 (517 S Beach Rd.)	383	288	(95)
965,058 (Blowing Rocks)	398	343	(55)

*Changes in parenthesis indicate landward movement of shoreline.

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APPENDIX G
Historical Shoreline Range Maps
1995 – 2021



REV	REVISIONS	DATE	APP

GENERAL NOTES:

1. ALL ELEVATIONS ARE FEET AND TENTHS AND REFER TO N.A.V.D. 88
2. ALL ELEVATIONS ARE BELOW THE REFERENCE PLANE UNLESS PRECEDED BY A PLUS (+) SIGN.
3. COORDINATES ARE BASED ON THE STATE PLANE COORDINATE SYSTEM FOR THE EAST ZONE OF FLORIDA, NAD 1983.
4. THE INFORMATION DEPICTED ON THESE MAPS REPRESENTS THE RESULTS OF THE SURVEYS MADE ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING GENERAL CONDITIONS EXISTING AT THAT TIME.
5. SHORELINES REPRESENTED AT EL. 0' NAVD'88 AT SURVEY PROFILES.
6. DATE OF SURVEY: JULY 2021.
7. DATE OF AERIAL PHOTOGRAPHY: JUNE 2020.

LEGEND:

- R-# D.E.P. MONUMENT
- EROSION CONTROL LINE
- BASELINE
- SHORELINE POSITION 1995
- SHORELINE POSITION JULY 2021
- AVERAGE SHORELINE POSITION 1995 TO 2021
- ▨ SHORELINE RANGE 1995 TO 2021

0 100' 200' GRAPHIC SCALE

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND N.A.V.D. 88

MHW	NAVD 88	0.3 FT
1.5 FT		
2.90 FT		
1.1 FT		
MLW	NGVD 29	

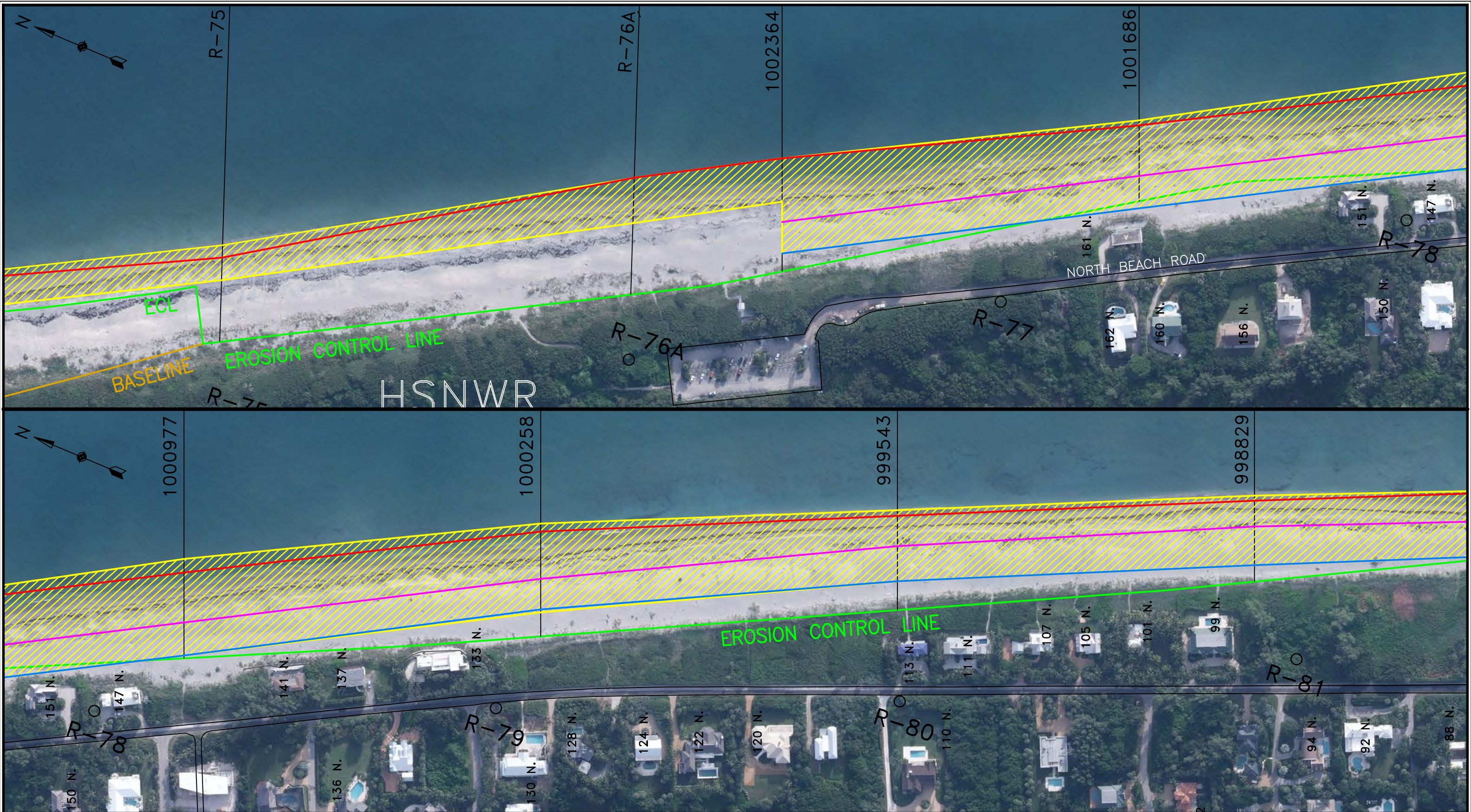
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CONDITION SURVEY	
SURVEY DATE:	JULY 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	N.A.V.D. 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RESOLUTION
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

CLAY W. BRYANT
FL P.E. NO. 43882

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FAX: 813.831.4216
WWW.GBA-INC.COM
FL CERTIFICATE OF AUTHORIZATION
NO. 2247

TOWN OF JUPITER ISLAND			
SHORELINE LOCATIONS 1995 - 2021			
PLANVIEW			
DWG DATE:	OCTOBER 2021	DWG NAME:	SHORELINE CHANGE 1995-2021 WITH AVERAGE
DRAWN:	M. FORD	CHECKED:	C. BRYANT
SCALE:	AS SHOWN	SHEET:	1 OF 8
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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7. DATE OF AERIAL PHOTOGRAPHY: JUNE 2020.

LEGEND:

- R-# D.E.P. MONUMENT
- EROSION CONTROL LINE
- BASELINE
- SHORELINE POSITION 1995
- SHORELINE POSITION JULY 2021
- AVERAGE SHORELINE POSITION 1995 TO 2021
- ▨ SHORELINE RANGE 1995 TO 2021

0 100' 200'
GRAPHIC SCALE

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND N.G.V.D. 88

MHW NAVD 88	0.3 FT
1.5 FT	2.90 FT
1.1 FT	
MLW NGVD 29	

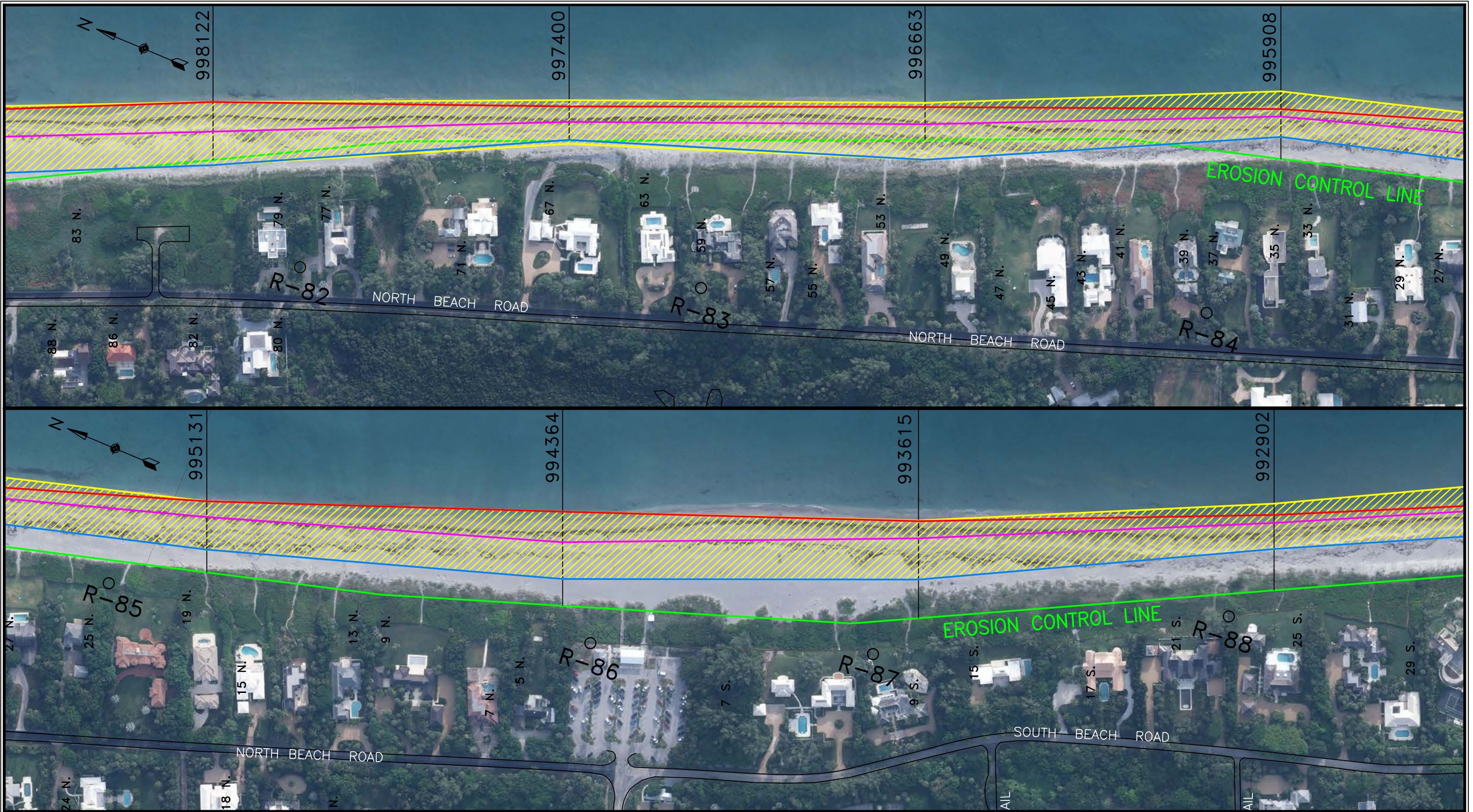
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CONDITION SURVEY	
SURVEY DATE:	JULY 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	N.A.V.D. 88
SURVEY UNITS:	U.S. SURVEY FEET
VESEL:	RESOLUTION
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS481 RTK GPS

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TOWN OF JUPITER ISLAND			
SHORELINE LOCATIONS 1995 - 2021			
PLANVIEW			
DWG DATE:	OCTOBER 2021	DWG NAME:	SHORELINE CHANGE 1995-2021 WITH AVERAGE
DRAWN:	M. FORD	CHECKED:	C. BRYANT
SCALE:	AS SHOWN	SHEET:	2 OF 8
		ENGR:	C. BRYANT
		REV:	0

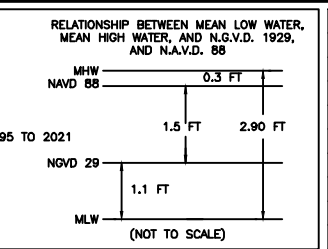


REV	REVISIONS	DATE	APP

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LEGEND:
○ R-# D.E.P. MONUMENT
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— BASELINE
— SHORELINE POSITION 1995
— SHORELINE POSITION JULY 2021
— AVERAGE SHORELINE POSITION 1995 TO 2021
▨ SHORELINE RANGE 1995 TO 2021

0 100' 200'
GRAPHIC SCALE

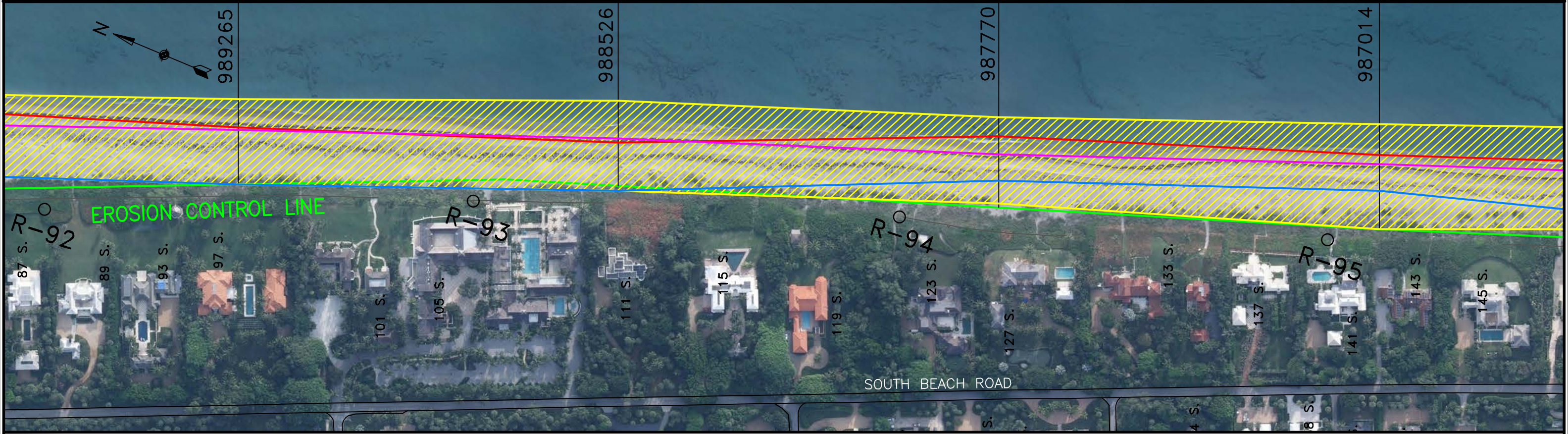
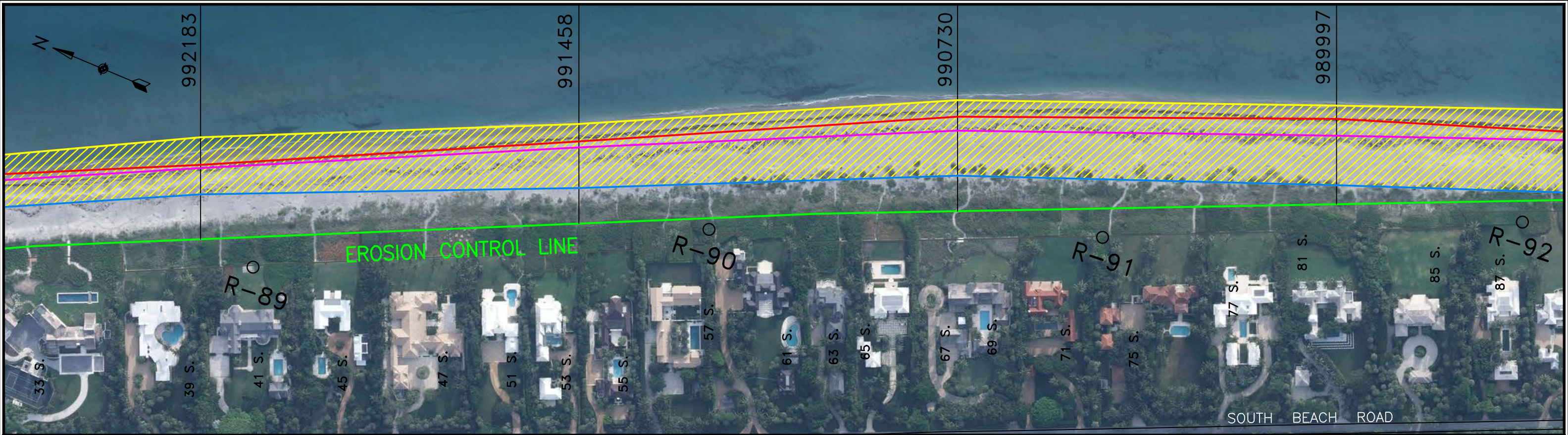


CONDITION SURVEY	
SURVEY DATE:	JULY 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	N.A.V.D. 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RESOLUTION
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SP5461 RTK GPS

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FL P.E. NO. 43882

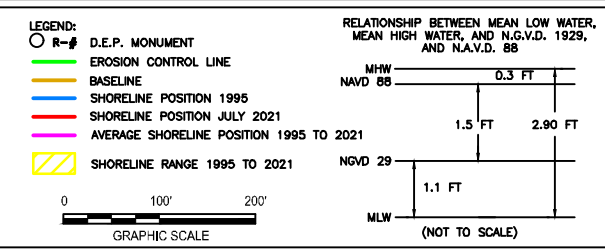
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TOWN OF JUPITER ISLAND			
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PLANVIEW			
DWG DATE:	OCTOBER 2021	DWG NAME:	SHORELINE CHANGE 1995-2021 WITH AVOID
DRAWN:	M. FORD	CHECKED:	C. BRYANT
SCALE:	AS SHOWN	SHEET:	3 OF 8
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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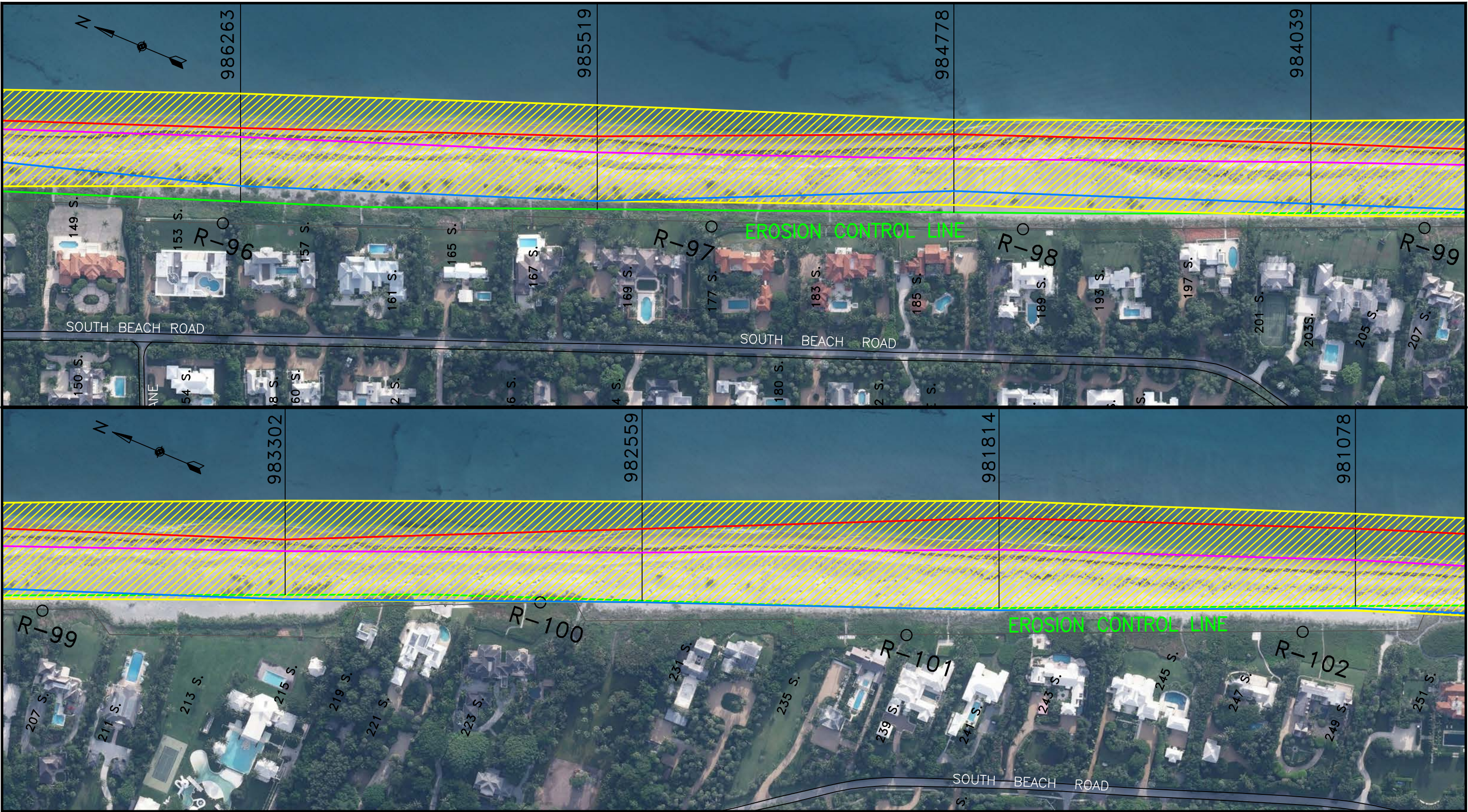


CONDITION SURVEY	
SURVEY DATE:	JULY 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	N.A.V.D. 88
SURVEY UNITS:	U.S. SURVEY FEET
VESEL:	RESOLUTION
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS481 RTK GPS

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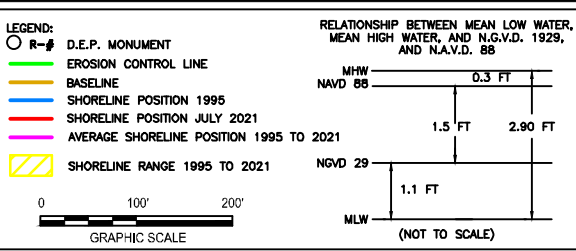
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TOWN OF JUPITER ISLAND			
SHORELINE LOCATIONS 1995 - 2021			
PLANVIEW			
DWG DATE:	OCTOBER 2021	DWG NAME:	SHORELINE CHANGE 1995-2021 WITH AVERAGE
DRAWN:	M. FORD	CHECKED:	C. BRYANT
SCALE:	AS SHOWN	SHEET:	4 OF 8
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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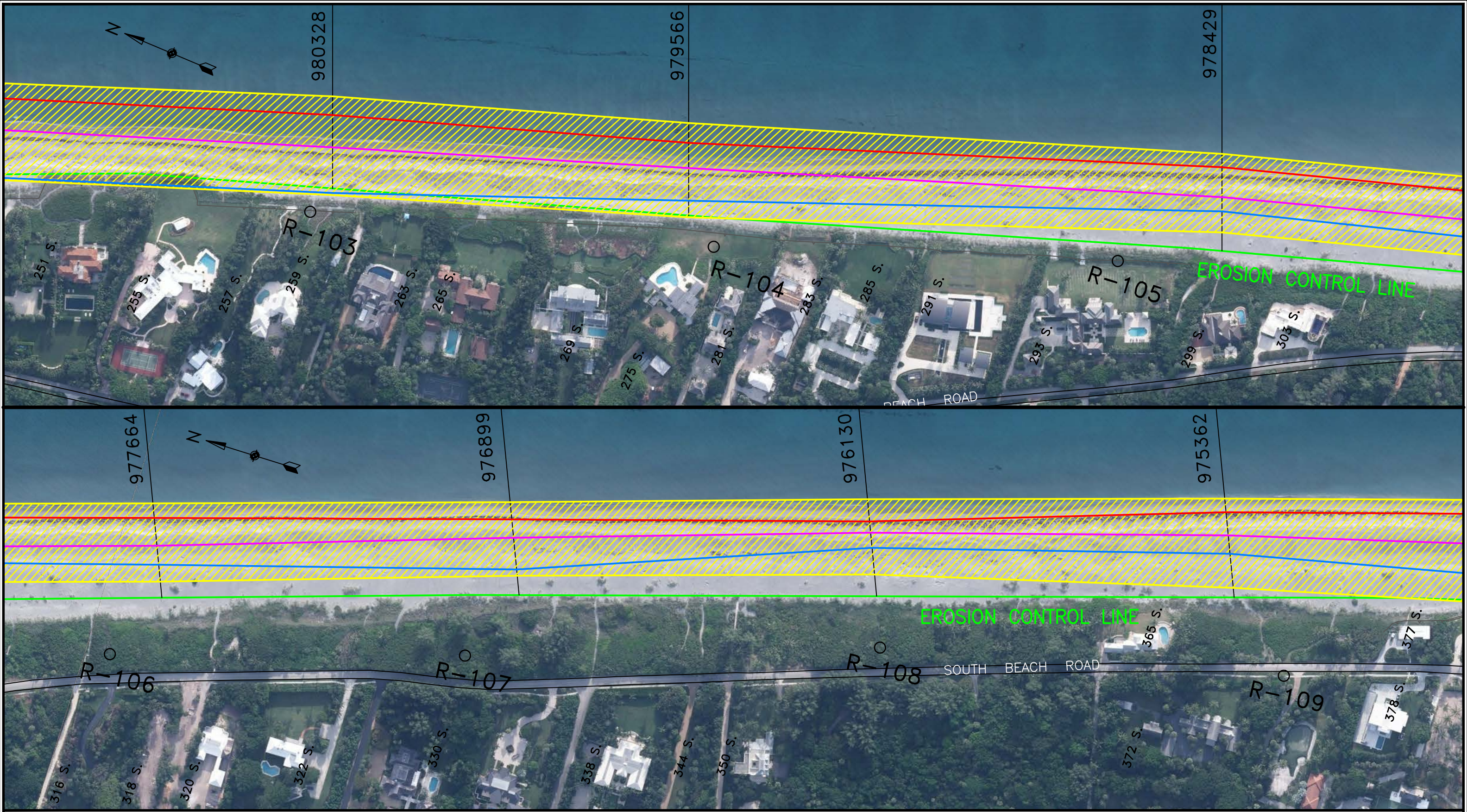


CONDITION SURVEY	
SURVEY DATE:	JULY 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	N.A.V.D. 88
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PLANVIEW			
DWG DATE:	OCTOBER 2021	DWG NAME:	SHORELINE CHANGE 1995-2021 WITH AVG.DWG
DRAWN:	M. FORD	CHECKED:	C. BRYANT
SCALE:	AS SHOWN	SHEET:	5 OF 8
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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5. SHORELINES REPRESENTED AT EL. 0' NAVD'88 AT SURVEY PROFILES.
6. DATE OF SURVEY: JULY 2021.
7. DATE OF AERIAL PHOTOGRAPHY: JUNE 2020.

LEGEND:

- R-# D.E.P. MONUMENT
- EROSION CONTROL LINE
- BASELINE
- SHORELINE POSITION 1995
- SHORELINE POSITION JULY 2021
- AVERAGE SHORELINE POSITION 1995 TO 2021
- ▨ SHORELINE RANGE 1995 TO 2021

0 100' 200'

GRAPHIC SCALE

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND N.A.V.D. 88

MHW	0.3 FT
NAVD 88	
1.5 FT	
2.90 FT	
1.1 FT	
MLW	

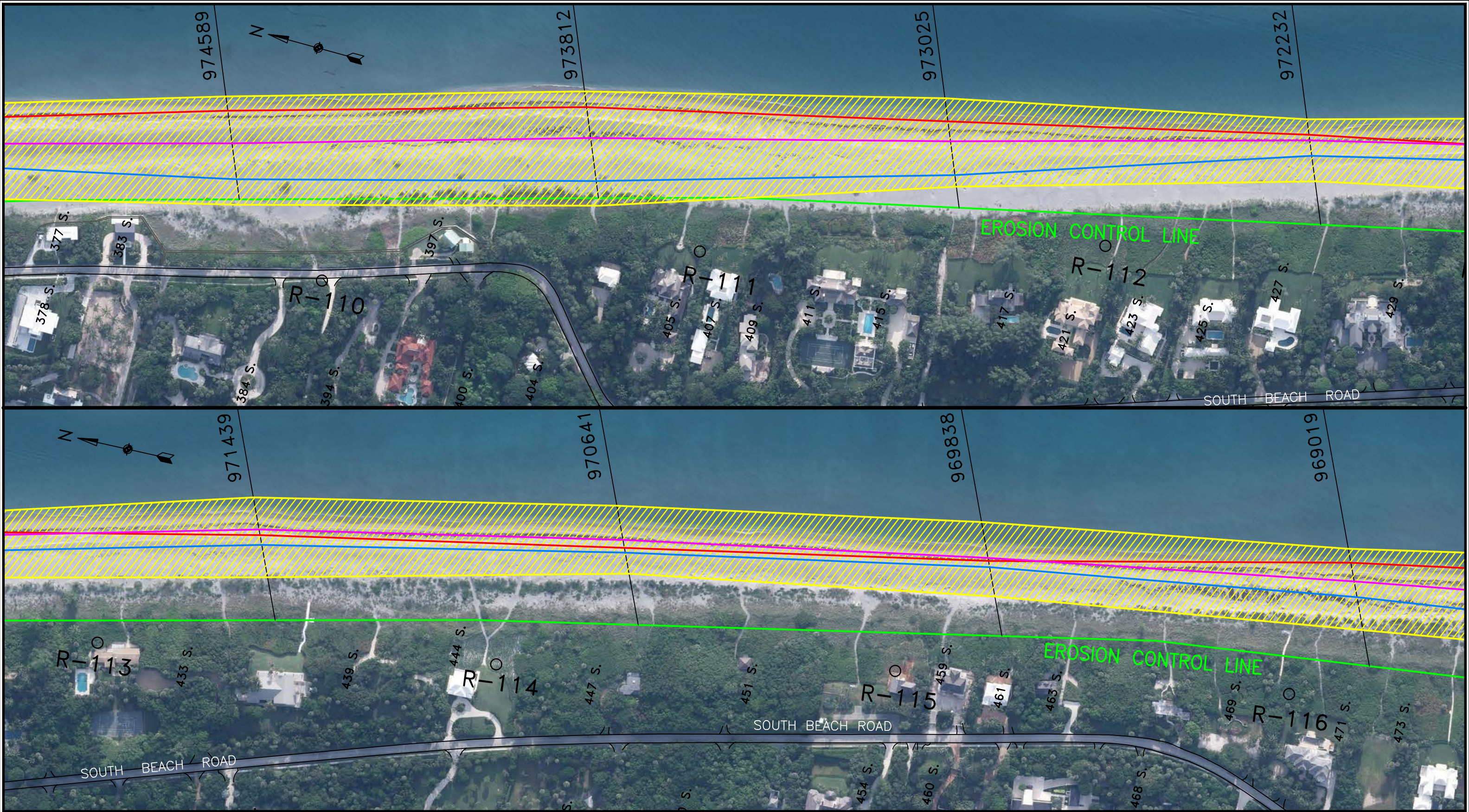
(NOT TO SCALE)

CONDITION SURVEY	
SURVEY DATE:	JULY 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	N.A.V.D. 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RESOLUTION
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS481 RTK GPS

CLAY W. BRYANT
FL P.E. NO. 43882

GBA
ENGINEERS ★ SURVEYORS
GAHAGAN & BRYANT ASSOCIATES, INC.
3802 W. BAY TO BAY BOULEVARD
TAMPA, FLORIDA 33629
TEL: 813.831.4408
FAX: 813.831.4216
WWW.GBA-INC.COM
FL CERTIFICATE OF AUTHORIZATION
NO. 2247

TOWN OF JUPITER ISLAND			
SHORELINE LOCATIONS 1995 - 2021			
PLANVIEW			
DWG DATE:	OCTOBER 2021	DWG NAME:	SHORELINE CHANGE 1995-2021 WITH AVERAGE
DRAWN:	M. FORD	CHECKED:	C. BRYANT
SCALE:	AS SHOWN	SHEET:	6 OF 8
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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0 100' 200'
GRAPHIC SCALE

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND N.A.V.D. 88

NAVD 88	MLW	MHW
0.3 FT	1.1 FT	1.5 FT

(NOT TO SCALE)

CONDITION SURVEY

SURVEY DATE:	JULY 2021
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VERT. REFERENCE:	N.A.V.D. 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RESOLUTION
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS481 RTK GPS

CLAY M. BRYANT
FL P.E. NO. 43882

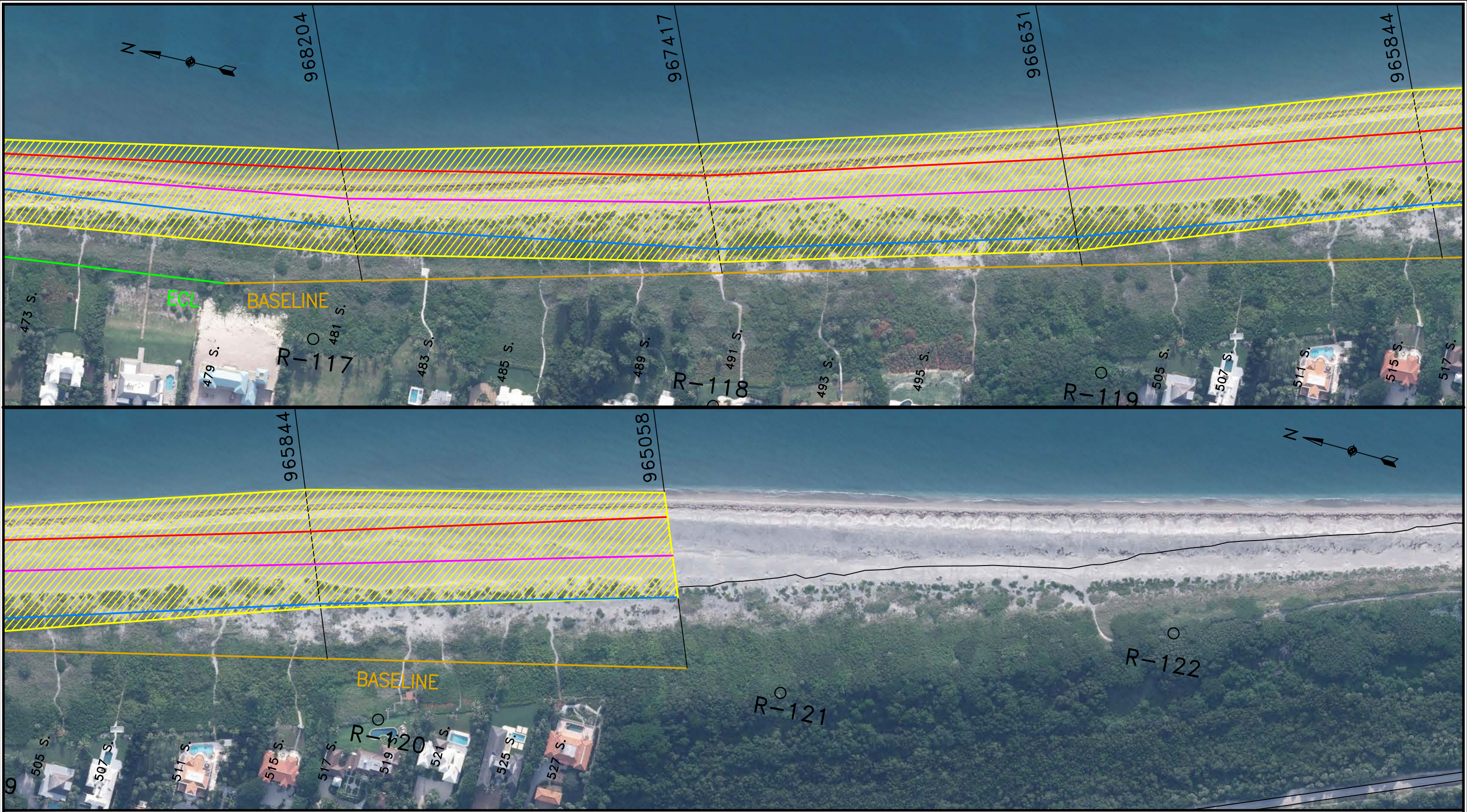
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TOWN OF JUPITER ISLAND

SHORELINE LOCATIONS 1995 - 2021

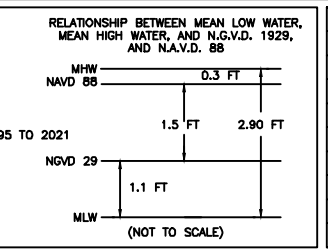
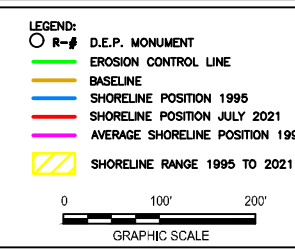
PLANVIEW

DWG DATE:	OCTOBER 2021	DWG NAME:	SHORELINE CHANGE 1995-2021 WITH AVG
DRAWN:	M. FORD	CHECKED:	C. BRYANT
SCALE:	AS SHOWN	SHEET:	7 OF 8
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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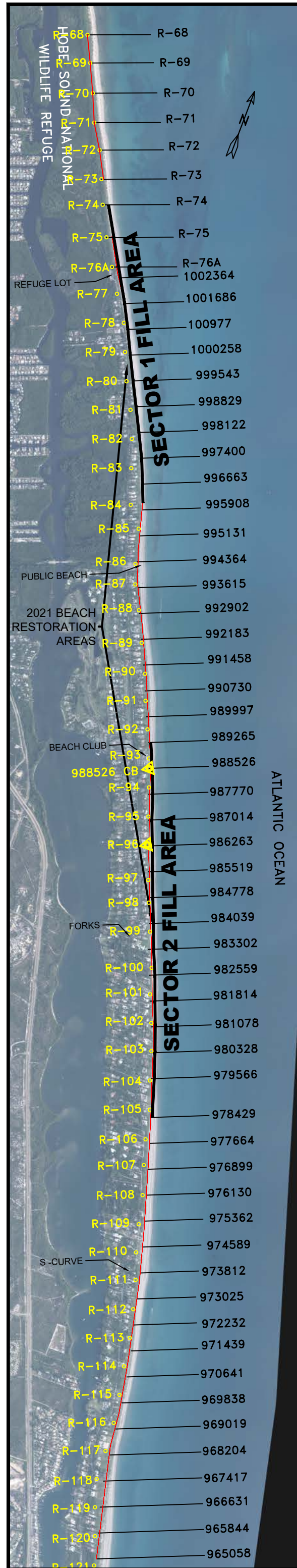
CONDITION SURVEY	
SURVEY DATE:	JULY 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	N.A.V.D. 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RESOLUTION
SOUNDER:	ODOM ECHOTRAC CV200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS481 RTK GPS

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TOWN OF JUPITER ISLAND			
SHORELINE LOCATIONS 1995 - 2021			
PLANVIEW			
DWG DATE:	OCTOBER 2021	DWG NAME:	SHORELINE CHANGE 1995-2021 WITH AVG.DWG
DRAWN:	M. FORD	CHECKED:	C. BRYANT
SCALE:	AS SHOWN	SHEET:	8 OF 8
		ENGR:	C. BRYANT
		REV:	0

APPENDIX H
Survey Drawings
July 2021



Town of Jupiter Island

BEACH AND NEARSHORE

SUMMER MONITORING SURVEY

JULY 2021

Jupiter Island Beach Profiles

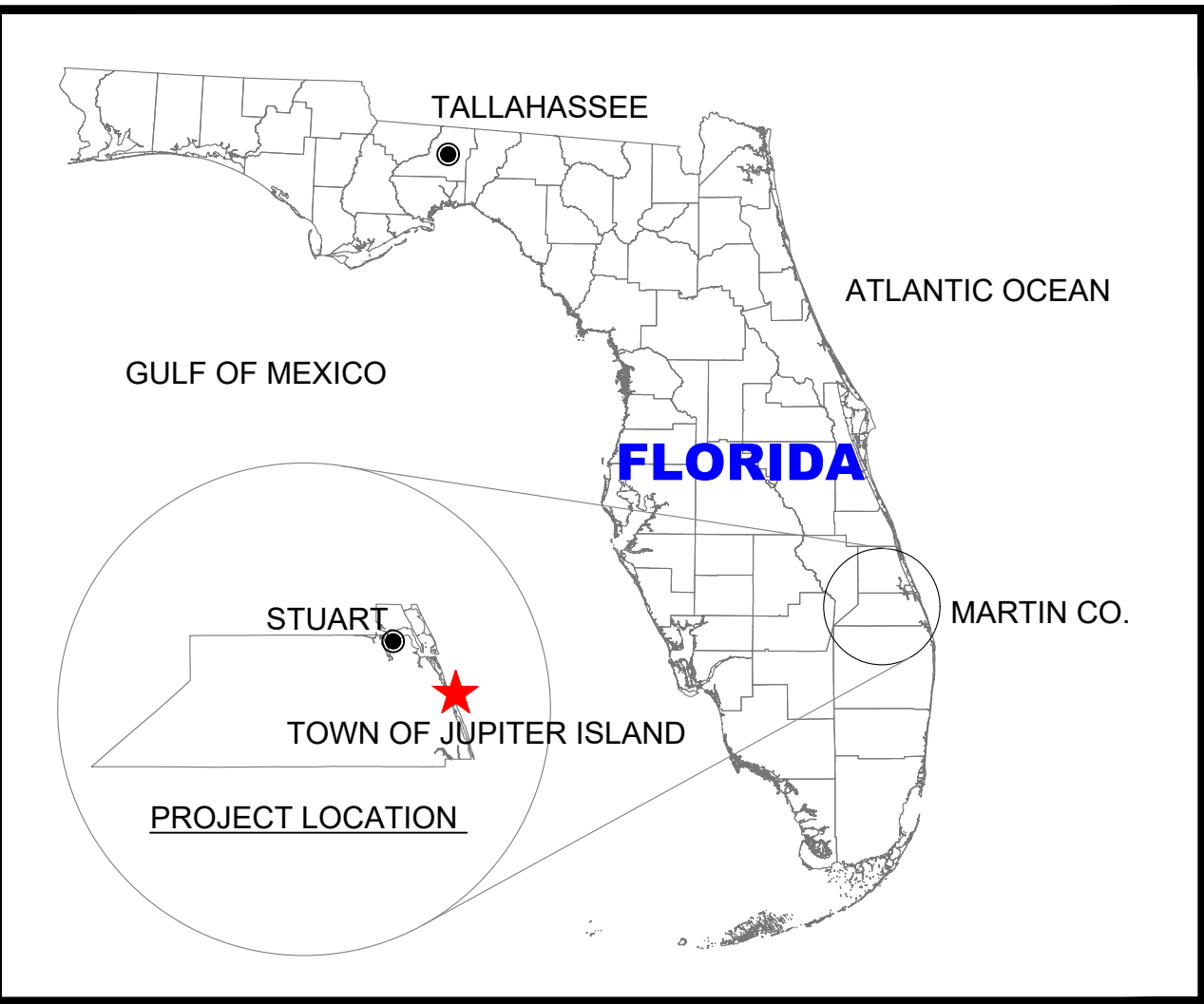
	PROFILE STATION	BASELINE P.I.	
		Northing	Easting
1	R-68	1,009,215.41	936,801.18
2	R-69	1,008,432.59	937,191.18
3	R-70	1,007,587.85	937,597.57
4	R-71	1,006,748.58	937,964.94
5	R-72	1,006,013.97	938,419.69
6	R-73	1,005,218.11	938,856.30
7	R-74	1,004,518.56	939,248.05
8	R-75	1,003,629.89	939,745.72
9	R-76A	1,002,820.36	940,199.06
10	1,002,364	1,002,527.53	940,378.01
11	1,001,686	1,001,849.53	940,832.28
12	1,000,977	1,001,140.53	941,210.04
13	1,000,258	1,000,421.53	941,563.86
14	999,543	999,706.53	941,927.08
15	998,829	998,992.53	942,295.13
16	998,122	998,285.53	942,676.36
17	997,400	997,563.53	943,024.64
18	996,663	996,826.53	943,335.66
19	995,908	996,071.53	943,604.58
20	995,131	995,294.52	943,819.55
21	994,364	994,527.52	944,059.30
22	993,615	993,778.52	944,342.31
23	992,902	993,065.52	944,708.51
24	992,183	992,346.52	945,063.35
25	991,458	991,621.52	945,402.65
26	990,730	990,893.52	945,735.80
27	989,997	990,160.52	946,058.33
28	989,265	989,428.52	946,380.41
29	988,526	988,689.52	946,686.04
30	987,770	987,933.52	946,952.74

	PROFILE STATION	BASELINE P.I.	
		Northing	Easting
31	987,014	987,177.51	947,219.78
32	986,263	986,426.51	947,496.97
33	985,519	985,682.51	947,789.97
34	984,778	984,941.51	948,091.81
35	984,039	984,202.51	948,399.29
36	983,302	983,465.51	948,709.82
37	982,559	982,722.51	949,006.41
38	981,814	981,977.51	949,300.08
39	981,078	981,241.51	949,612.75
40	980,328	980,491.51	949,892.18
41	979,566	979,729.51	950,145.18
42	978,429	978,592.50	950,534.82
43	977,664	977,827.50	950,779.62
44	976,899	977,062.50	951,023.12
45	976,130	976,293.50	951,259.20
46	975,362	975,525.50	951,494.99
47	974,589	974,752.50	951,720.10
48	973,812	973,975.50	951,935.60
49	973,025	973,188.49	952,128.53
50	972,232	972,395.49	952,306.17
51	971,439	971,602.49	952,483.80
52	970,641	970,804.49	952,650.64
53	969,838	970,001.48	952,804.29
54	969,019	969,182.47	952,917.73
55	968,204	968,367.47	953,042.67
56	967,417	967,580.46	953,235.49
57	966,631	966,794.45	953,428.06
58	965,844	966,007.45	953,620.88
59	965,058	965,221.44	953,813.45

NOTES:

- 1) Stationing refers to the Y coordinate of the intersection of the profile line and the Erosion Control Line (ECL) historically referenced to NAD '27. Lines R-73 to R76A are referenced to the project baseline. Lines R-68 to R-72 are referenced to the respective R-Monument coordinates. All other lines are referenced to the ECL.
- 2) The ECL and baseline are referenced at range 0, with range values increasing seaward.
- 3) Profile azimuths for R-68 to R-76A are 69° grid. All other profile azimuths are 67°17'54" grid.
- 4) Coordinates refer to Florida State Plane, East Zone, NAD '83

VICINITY MAP



NOT TO SCALE

SHEET INDEX

DESCRIPTION	SHEET NO.
COVER	1
NEARSHORE BATHYMETRY	2 - 9
PROFILE CROSS-SECTIONS BEACH & NEARSHORE	10 - 16
PROFILE CROSS-SECTIONS BEACH TEMPLATE AREA	17 - 23
BORROW SITE B BATHYMETRY	24 - 25

SURVEY MONUMENTATION

PLANE COORDINATES NAD83			ELEVATION NAVD88
MONUMENT	NORTHING	EASTING	
DET4RM2	998,449.63	942,293.85	7.78'
988526 CB	988,675.21	946,651.34	11.76'
R-96	986,444.36	947,437.22	16.17'

STATE OF FLORIDA SURVEYOR & MAPPER BUSINESS LICENSE #LB7959

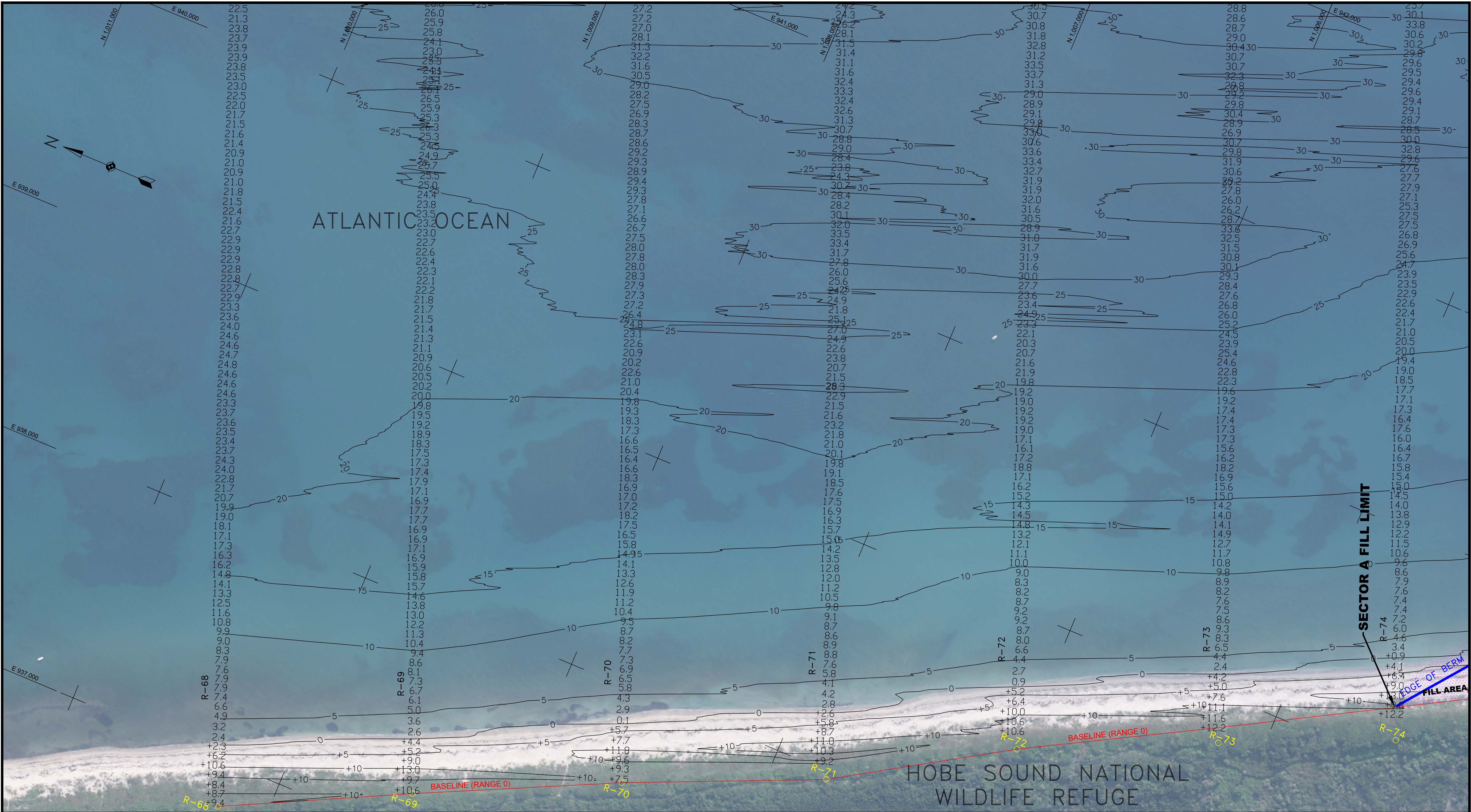


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P. SEABOLDT
FLORIDA PSM #6879

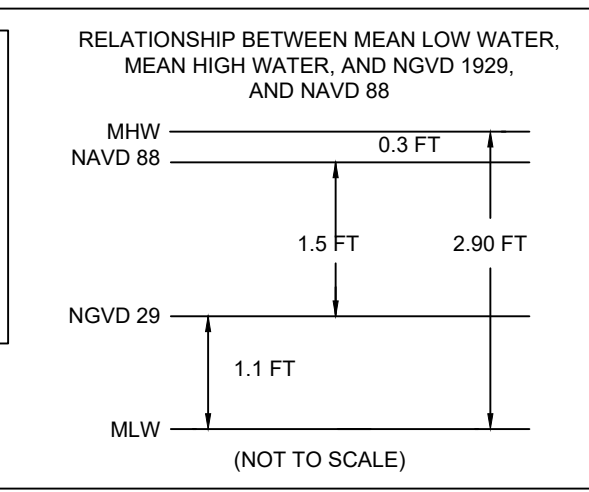
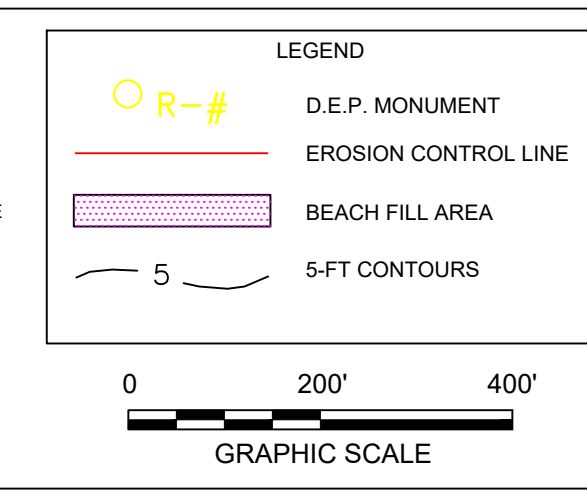
THIS DOCUMENT IS NOT CERTIFIED WITHOUT SIGNED & SEALED SURVEY REPORT TITLED "TOWN OF JUPITER ISLAND BEACH AND NEARSHORE SUMMER MONITORING SURVEY REPORT JULY 2021".

FDEP PERMIT # 0186991-008-JC



REV	REVISIONS	DATE	APP

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9. SCALE IS 1" = 200' WHEN PLOTTED AT 34"x22".



CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
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SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

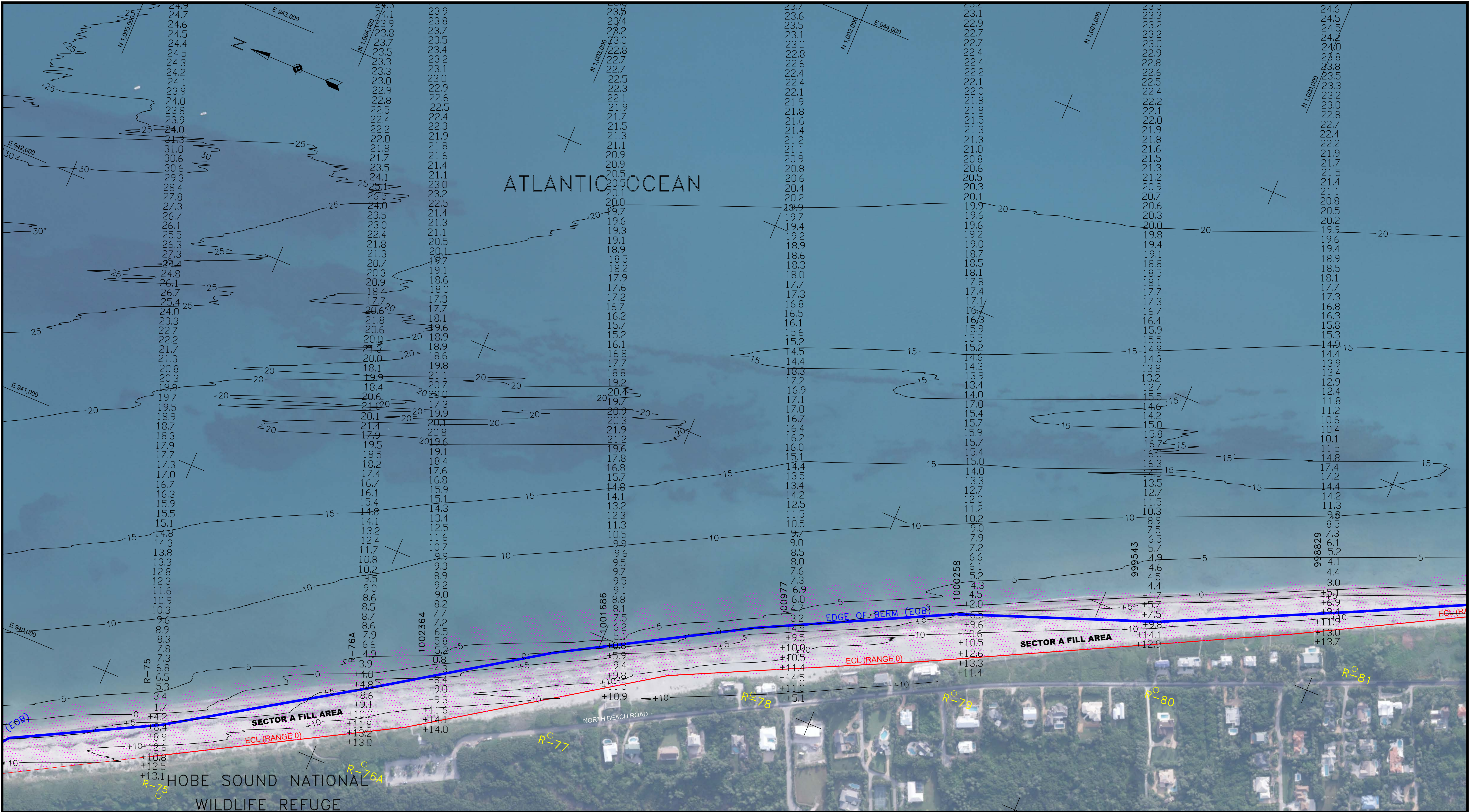
PAUL SEABOLDT
FLORIDA PSM #6879

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GBA
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#LB7959

TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY			
NEARSHORE BATHYMETRY			
R-68 TO R-74			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	2 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

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LEGEND

- R-# D.E.P. MONUMENT
- EROSION CONTROL LINE
- BEACH FILL AREA
- 5 5-FT CONTOURS

0 200' 400'

GRAPHIC SCALE

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND NAVD 88

MHW NAVD 88 0.3 FT

1.5 FT

2.90 FT

NGVD 29 1.1 FT

MLW

(NOT TO SCALE)

CONDITION SURVEY

SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
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VERT. REFERENCE:	NAVD 88
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VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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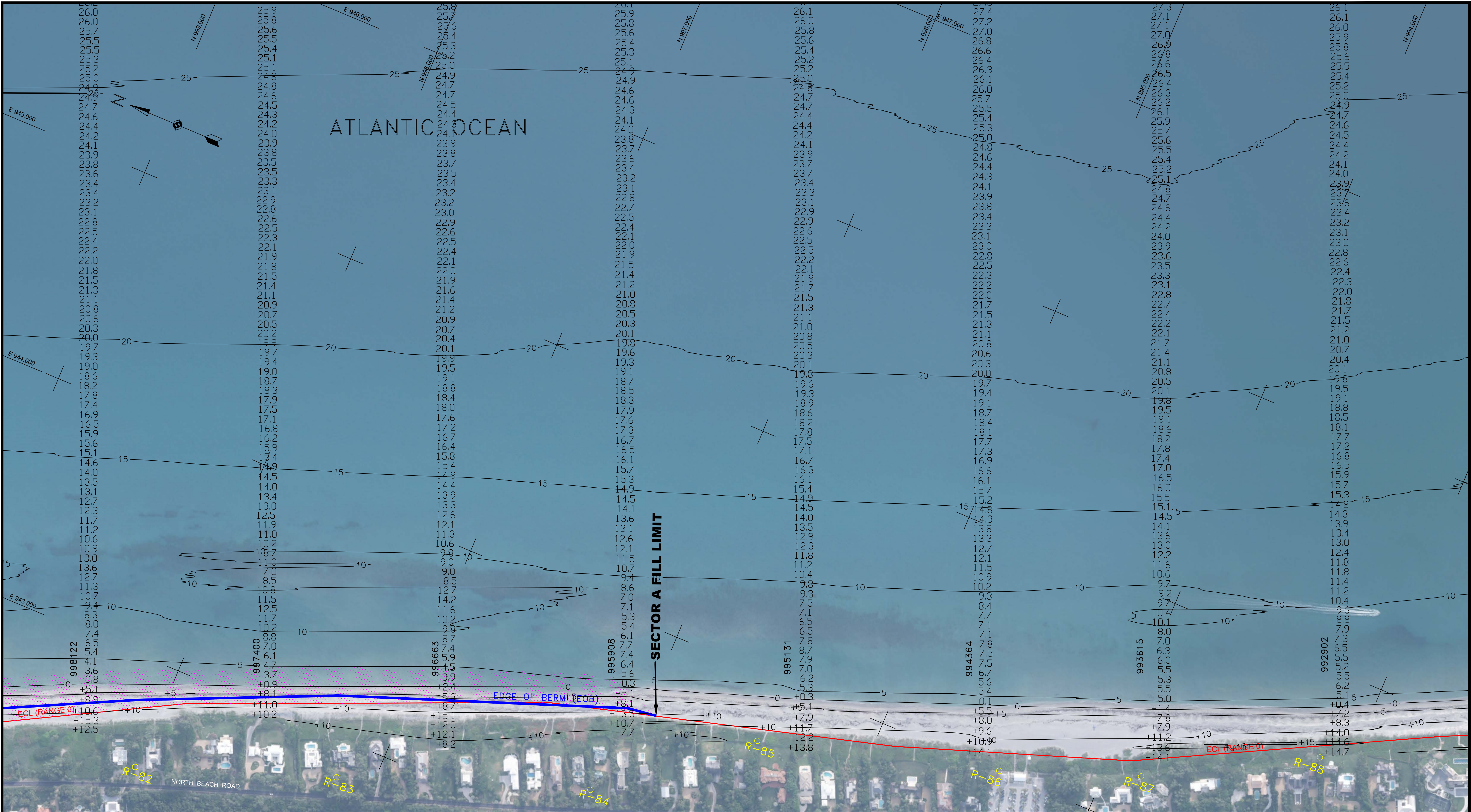
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FL SURVEYOR & MAPPER BUSINESS LICENSE #LB7959

TOWN OF JUPITER ISLAND

2021 SUMMER MONITORING SURVEY
NEARSHORE BATHYMETRY

R-75 TO 998,829

DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	3 OF 25
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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○ R-#

— D.E.P. MONUMENT

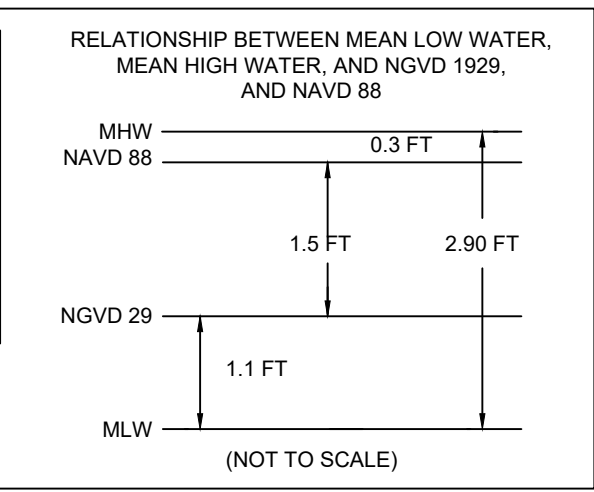
— EROSION CONTROL LINE

▨ BEACH FILL AREA

— 5 — 5-FT CONTOURS

0200'400'

GRAPHIC SCALE



CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
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PAUL SEABOLDT
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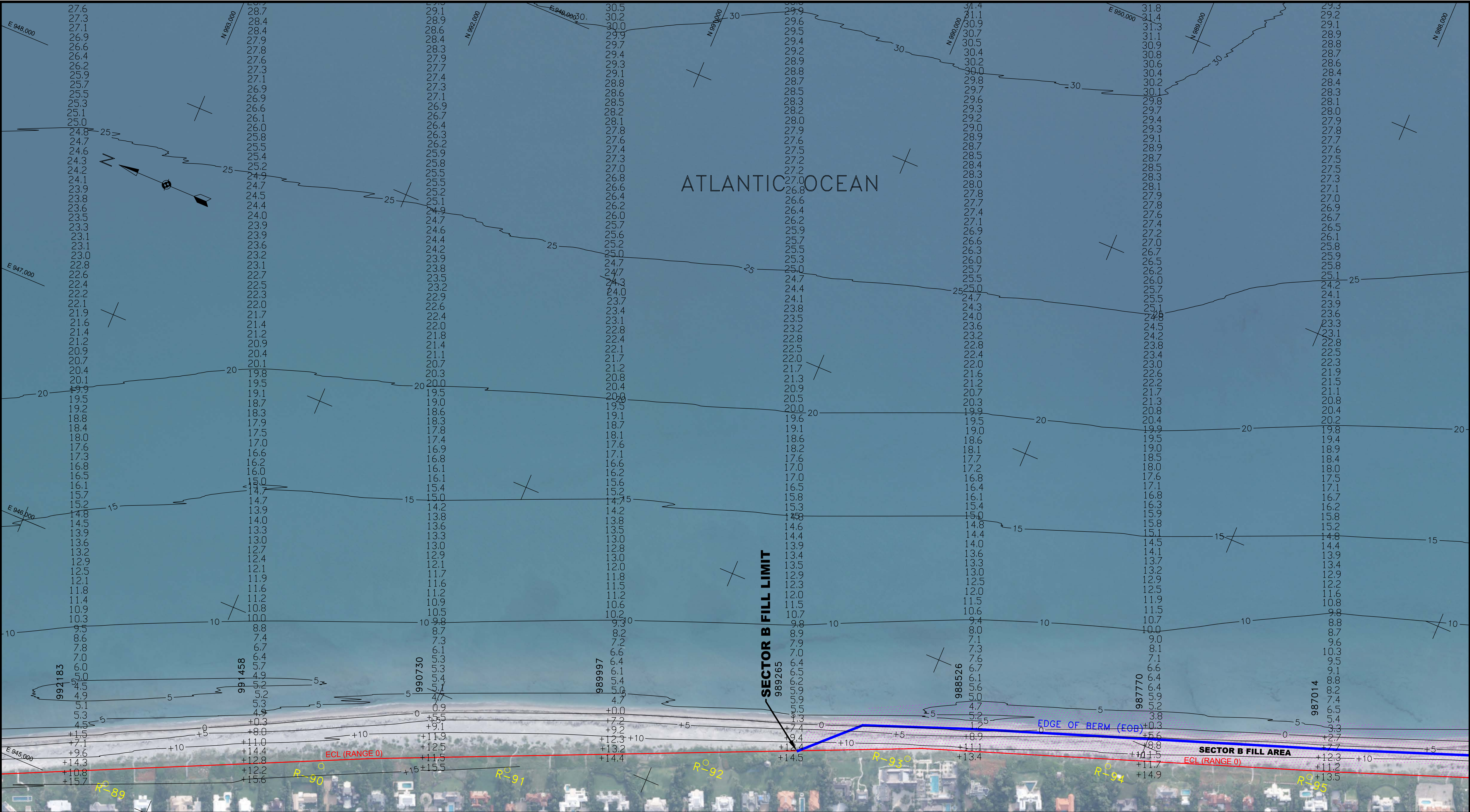
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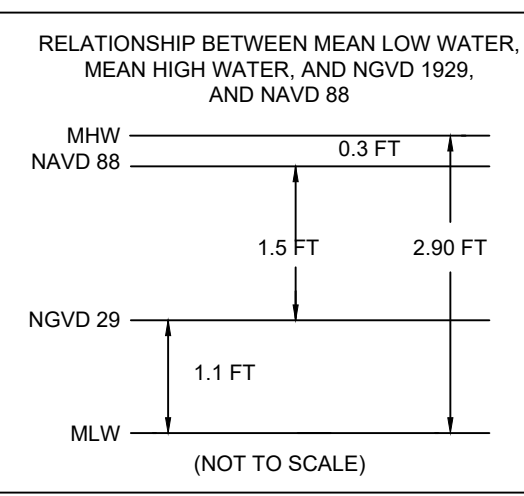
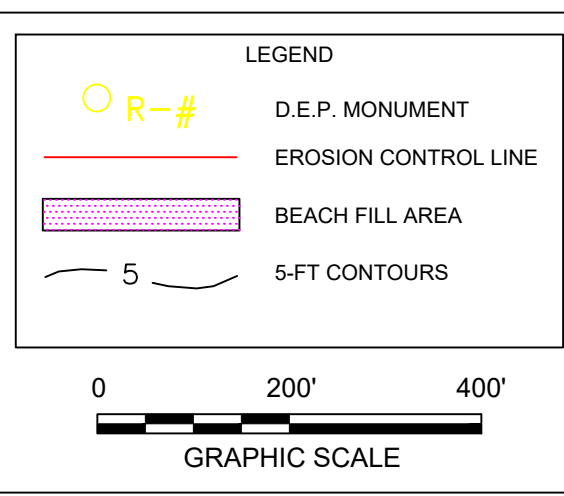
FL SURVEYOR & MAPPER BUSINESS LICENSE #LB7959

TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY NEARSHORE BATHYMETRY			
998,122 TO 992,902			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	4 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

GENERAL NOTES:
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7. PROFILE AZIMUTHS ARE 69° GRID FOR R-88 TO R-76A. ALL OTHER PROFILE AZIMUTHS ARE 67°1754" GRID.
8. AERIAL IMAGERY IS FROM MARTIN COUNTY COASTAL AERIALS DATED AUGUST 2020.
9. SCALE IS 1" = 200' WHEN PLOTTED AT 34"x22".



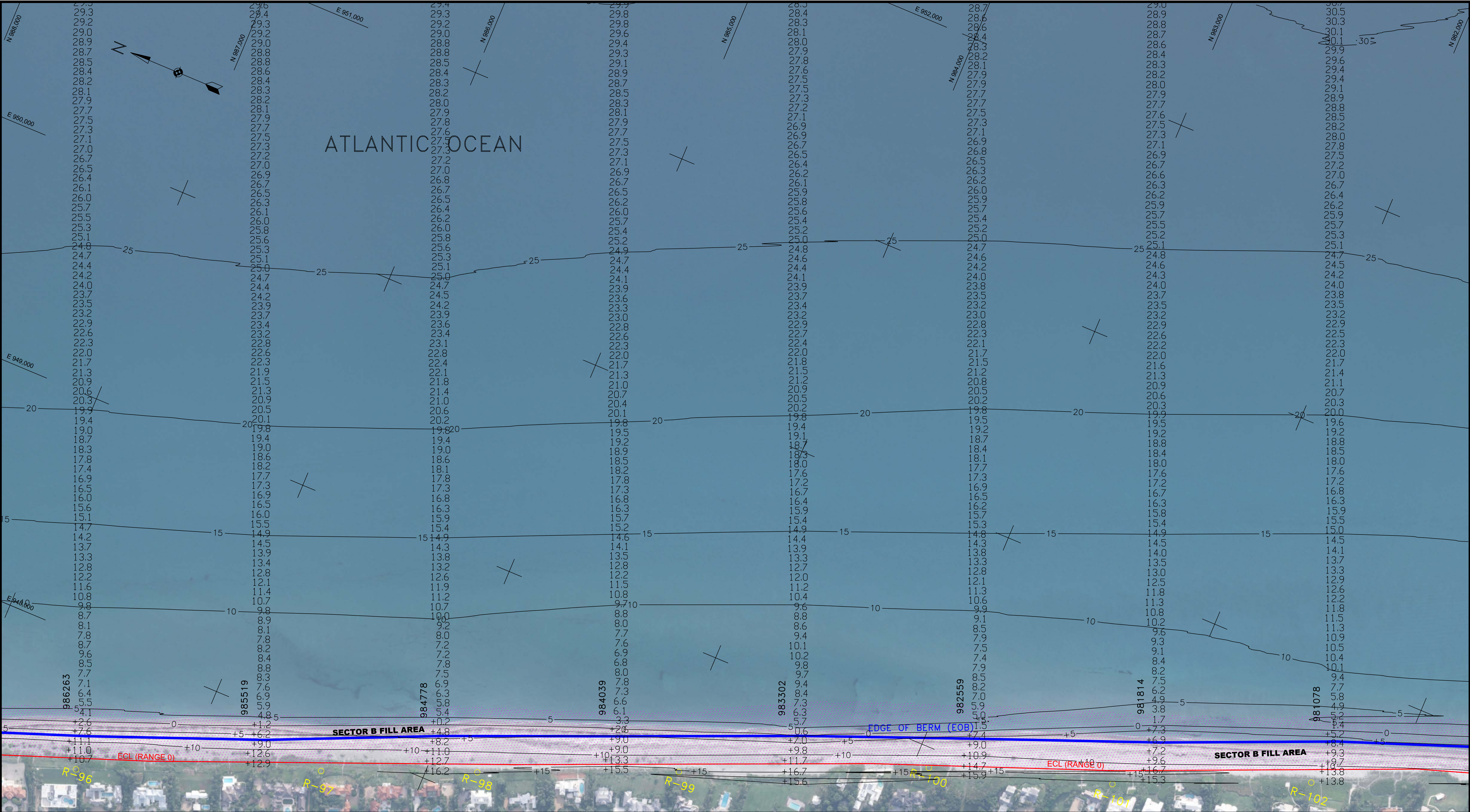
CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

* THIS DOCUMENT IS NOT CERTIFIED WITHOUT A SIGNED & SEALED SURVEY REPORT TITLED 'TOWN OF JUPITER ISLAND BEACH AND NEARSHORE SUMMER MONITORING SURVEY REPORT JULY 2021'.

GBA
ENGINEERS ★ SURVEYORS
GAHAGAN & BRYANT ASSOCIATES, INC.
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TAMPA, FLORIDA 33629
TEL: (813) 831-4408
FAX: (813) 831-4216
WWW.GBA-INC.COM
FL SURVEYOR & MAPPER BUSINESS LICENSE #LB7959

TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY NEARSHORE BATHYMETRY			
992,183 TO 987,104			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	5 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

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9. SCALE IS 1" = 200' WHEN PLOTTED AT 34"x22".

LEGEND

- R-# D.E.P. MONUMENT
- EROSION CONTROL LINE
- BEACH FILL AREA
- 5 5-FT CONTOURS

GRAPHIC SCALE

0 200' 400'

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND NAVD 88

MHW NAVD 88 0.3 FT

1.5 FT

2.90 FT

NGVD 29 1.1 FT

MLW

(NOT TO SCALE)

CONDITION SURVEY

SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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GBA
ENGINEERS ★ SURVEYORS

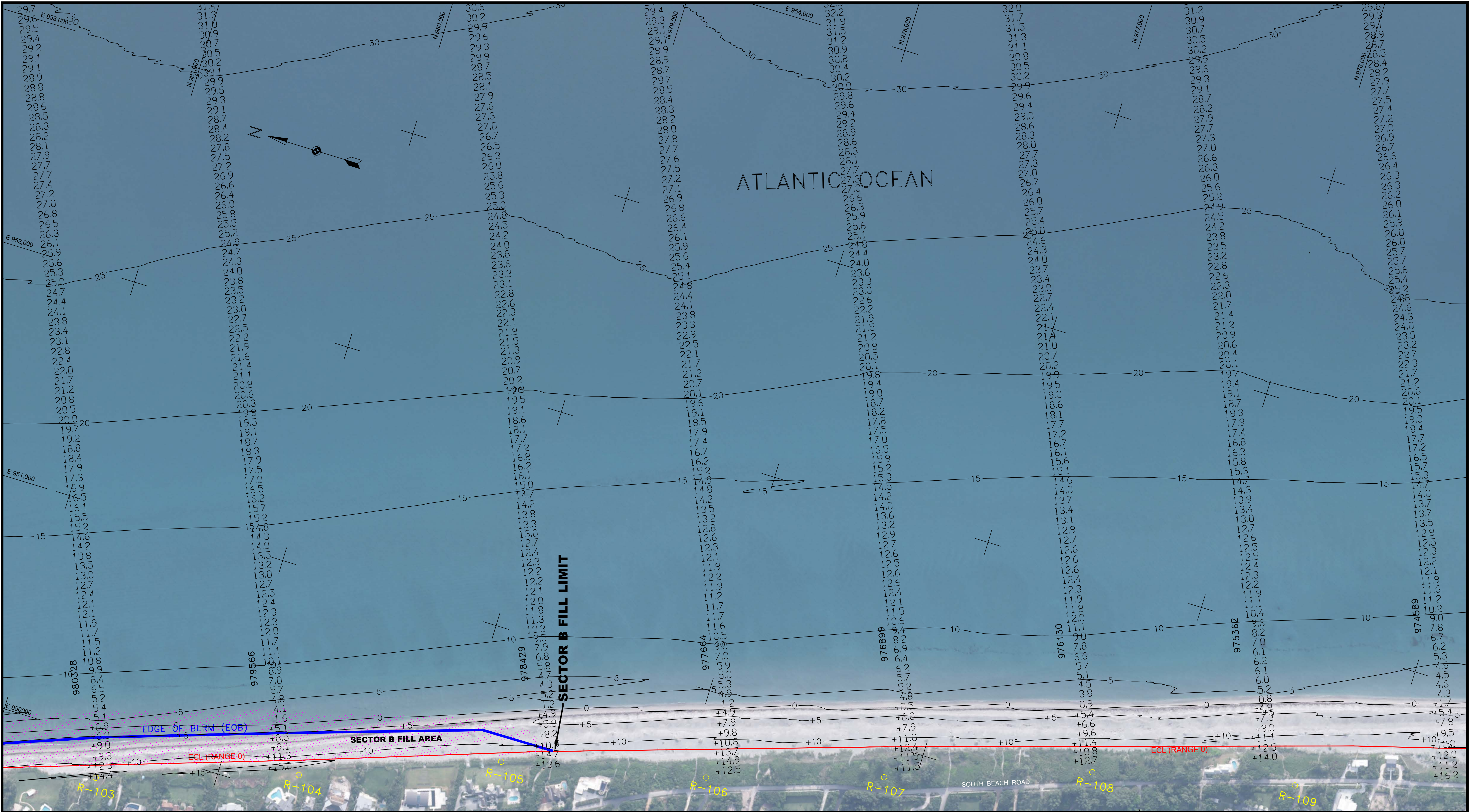
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TOWN OF JUPITER ISLAND

2021 SUMMER MONITORING SURVEY
NEARSHORE BATHYMETRY

986,263 TO 981,078

DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	6 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

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LEGEND

○ R-# D.E.P. MONUMENT

— EROSION CONTROL LINE

■ BEACH FILL AREA

— 5 5-FT CONTOURS

0 200' 400'

GRAPHIC SCALE

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND NAVD 88

MHW NAVD 88 0.3 FT

1.5 FT

2.90 FT

NGVD 29 1.1 FT

MLW

(NOT TO SCALE)

CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

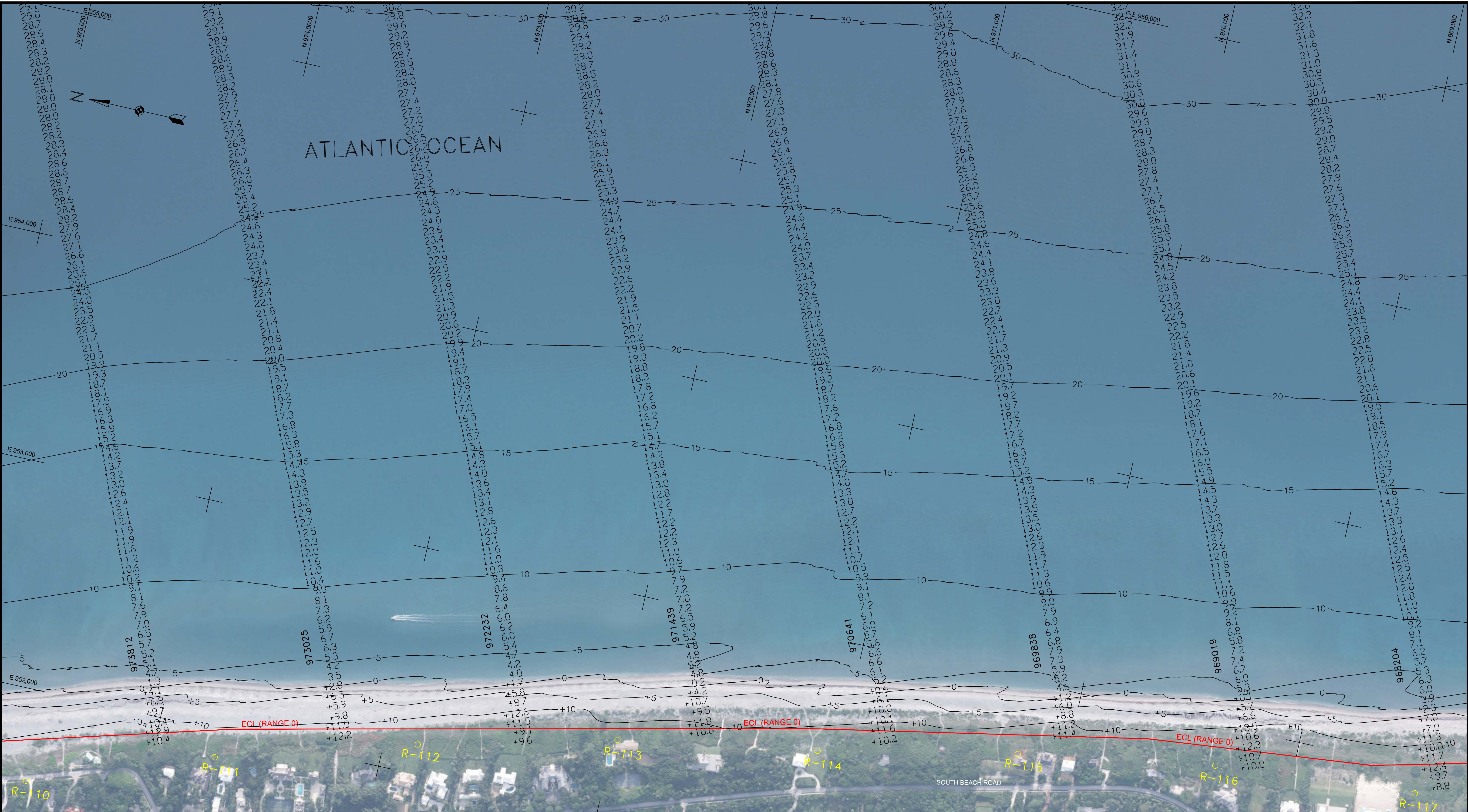
PAUL SEABOLDT
FLORIDA PSM #6879

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FL SURVEYOR & MAPPER BUSINESS LICENSE #LB7959

TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY NEARSHORE BATHYMETRY			
980,328 to 974,589			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	7 OF 25
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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R-#

D.E.P. MONUMENT

Erosion Control Line

BEACH FILL AREA

5

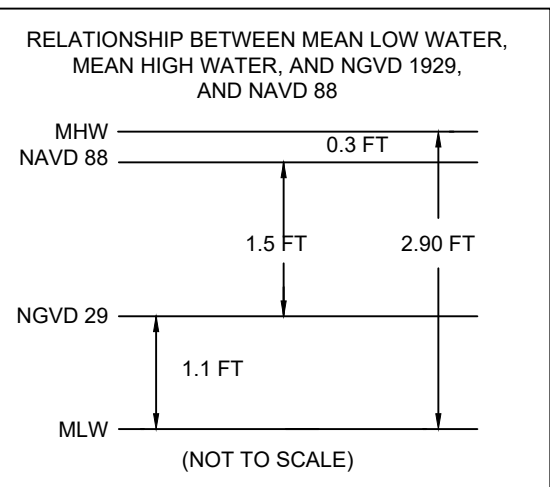
5-FT CONTOURS

0

200'

400'

GRAPHIC SCALE



CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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GBA

ENGINEERS ★ SURVEYORS

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FAX: (813) 831-4216

WWW.GBA-INC.COM

FL SURVEYOR & MAPPER BUSINESS LICENSE

#LB7959

TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY			
NEARSHORE BATHYMETRY			
973,812 TO 968,204			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	8 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

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LEGEND

○ R-# D.E.P. MONUMENT

— EROSION CONTROL LINE

— 5 — 5-FT CONTOURS

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND NAVD 88

MHW NAVD 88 0.3 FT

1.5 FT

2.90 FT

NGVD 29 1.1 FT

MLW

(NOT TO SCALE)

CONDITION SURVEY

SURVEY DATE: JULY 27-31, 2021

HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83

ZONE: FLORIDA - EAST ZONE 0901

VERT. REFERENCE: NAVD 88

SURVEY UNITS: U.S. SURVEY FEET

VESSEL: RISING TIDE

SOUNDER: ODOM CV 200

SOUNDER FREQ.: 200KHz

POSITIONING: TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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ENGINEERS ★ SURVEYORS

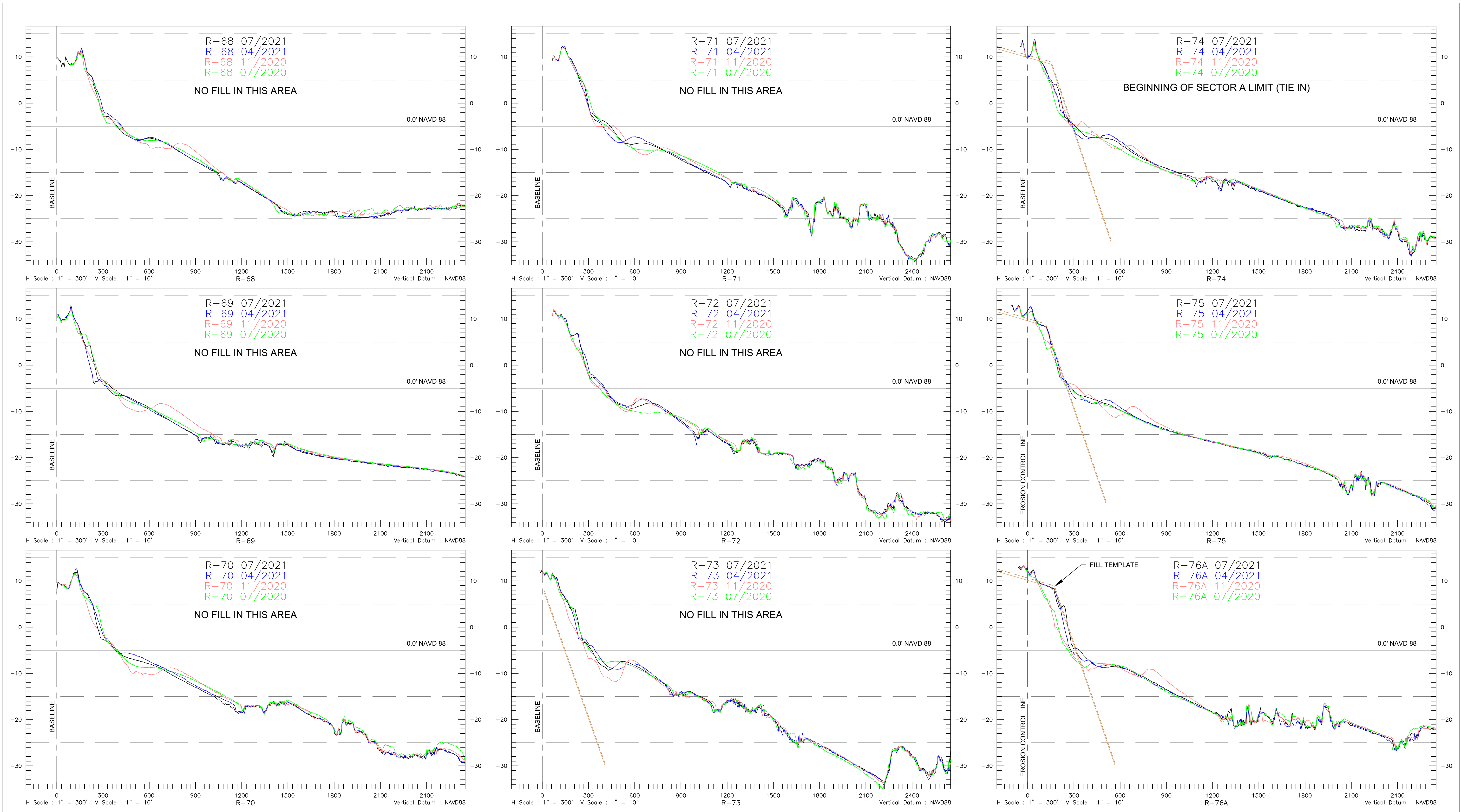
GAHAGAN & BRYANT ASSOCIATES, INC.
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TAMPA, FLORIDA 33629
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FL SURVEYOR & MAPPER BUSINESS LICENSE #LB7959

TOWN OF JUPITER ISLAND

2021 SUMMER MONITORING SURVEY NEARSHORE BATHYMETRY

967,417 TO 965,058

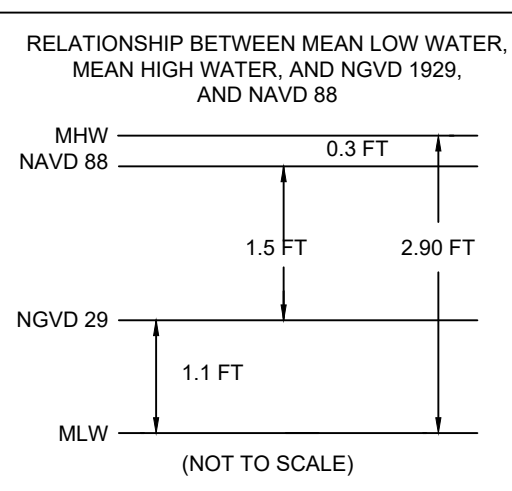
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg	
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT
SCALE: AS SHOWN	SHEET: 9 OF 25	REV: 0



REV	REVISIONS	DATE	APP

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LEGEND	
---	EROSION CONTROL LINE
---	GRADE FILL TEMPLATE
- - -	+0.5' FILL TOLERANCE
---	JULY 2021 (MONITORING)
---	APRIL 2021 (POST-CON)
---	NOV 2020 (PRE-CON)
---	JULY 2020 (MONITORING)



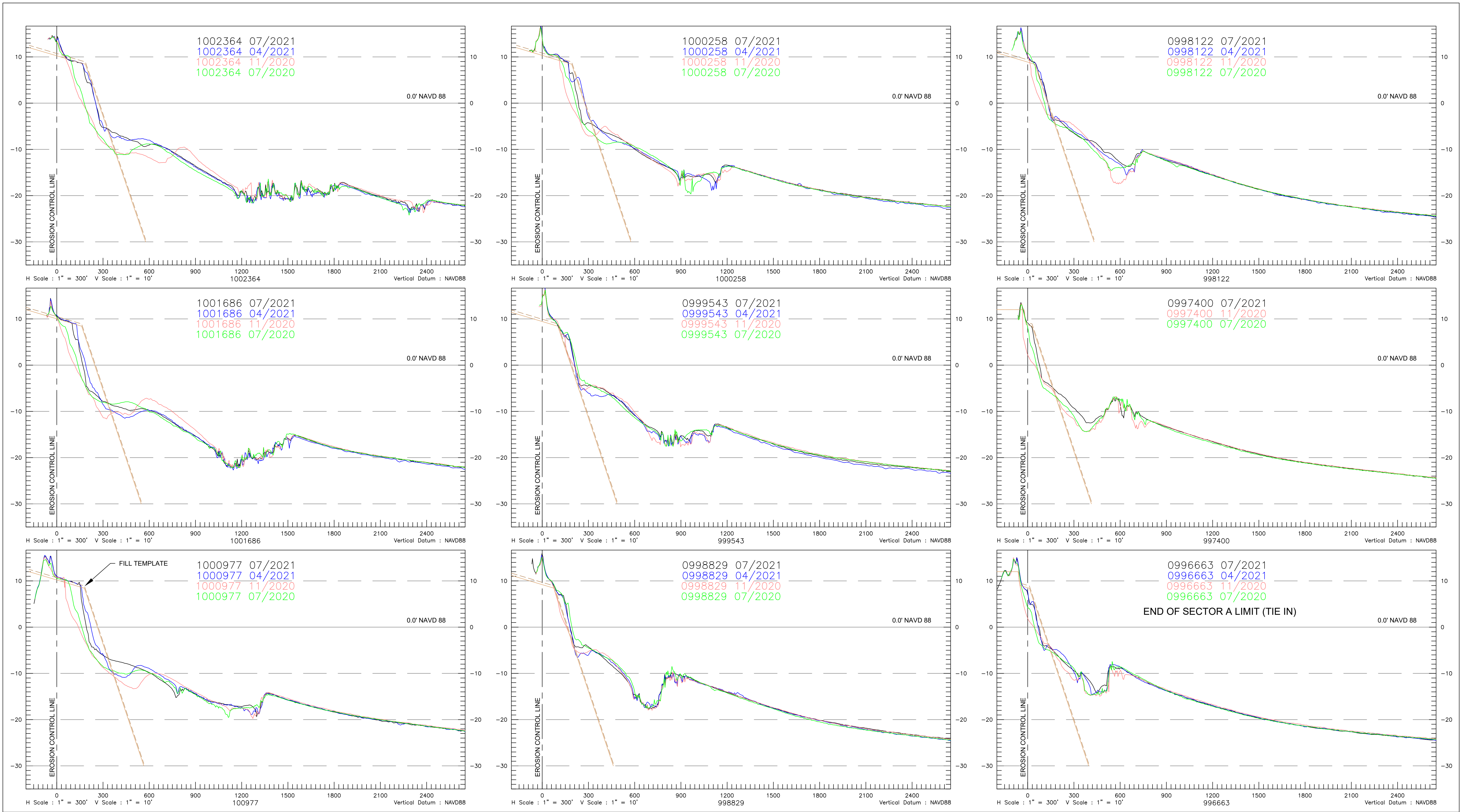
CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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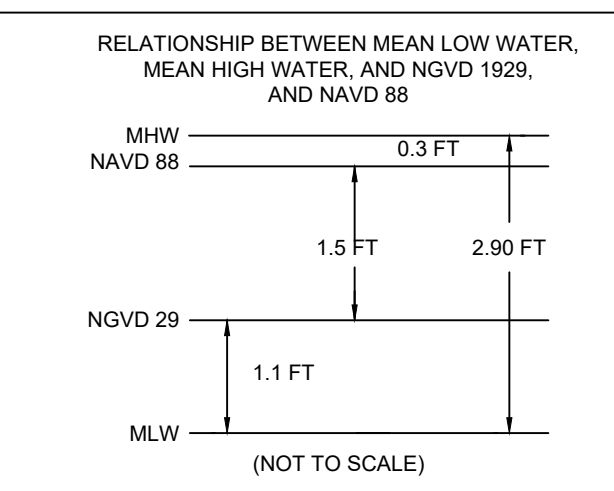
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
R-68 TO R-76A			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	10 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

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LEGEND
--- EROSION CONTROL LINE
--- GRADE FILL TEMPLATE
- - - +0.5' FILL TOLERANCE
--- JULY 2021 (MONITORING)
--- APRIL 2021 (POST-CON)
--- NOV 2020 (PRE-CON)
--- JULY 2020 (MONITORING)



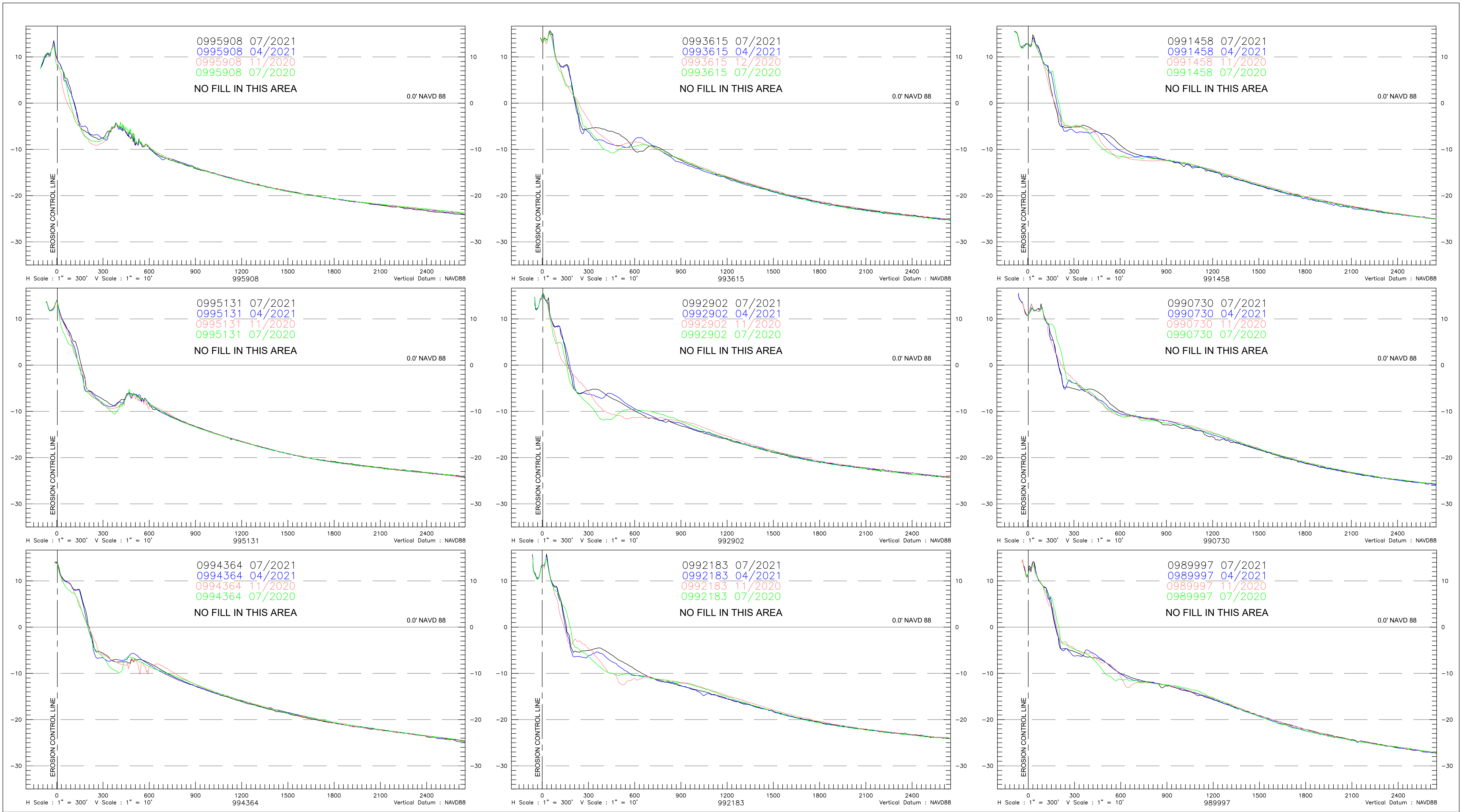
CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RISEING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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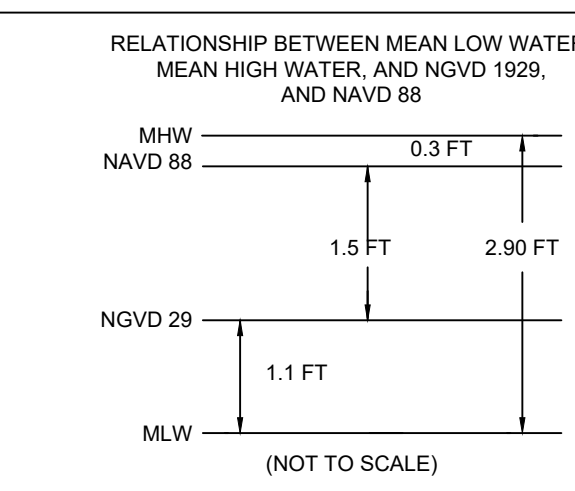
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
996,663 TO 1,002,364			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	11 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

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LEGEND
--- EROSION CONTROL LINE
--- GRADE FILL TEMPLATE
- - - +0.5' FILL TOLERANCE
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--- JULY 2020 (MONITORING)



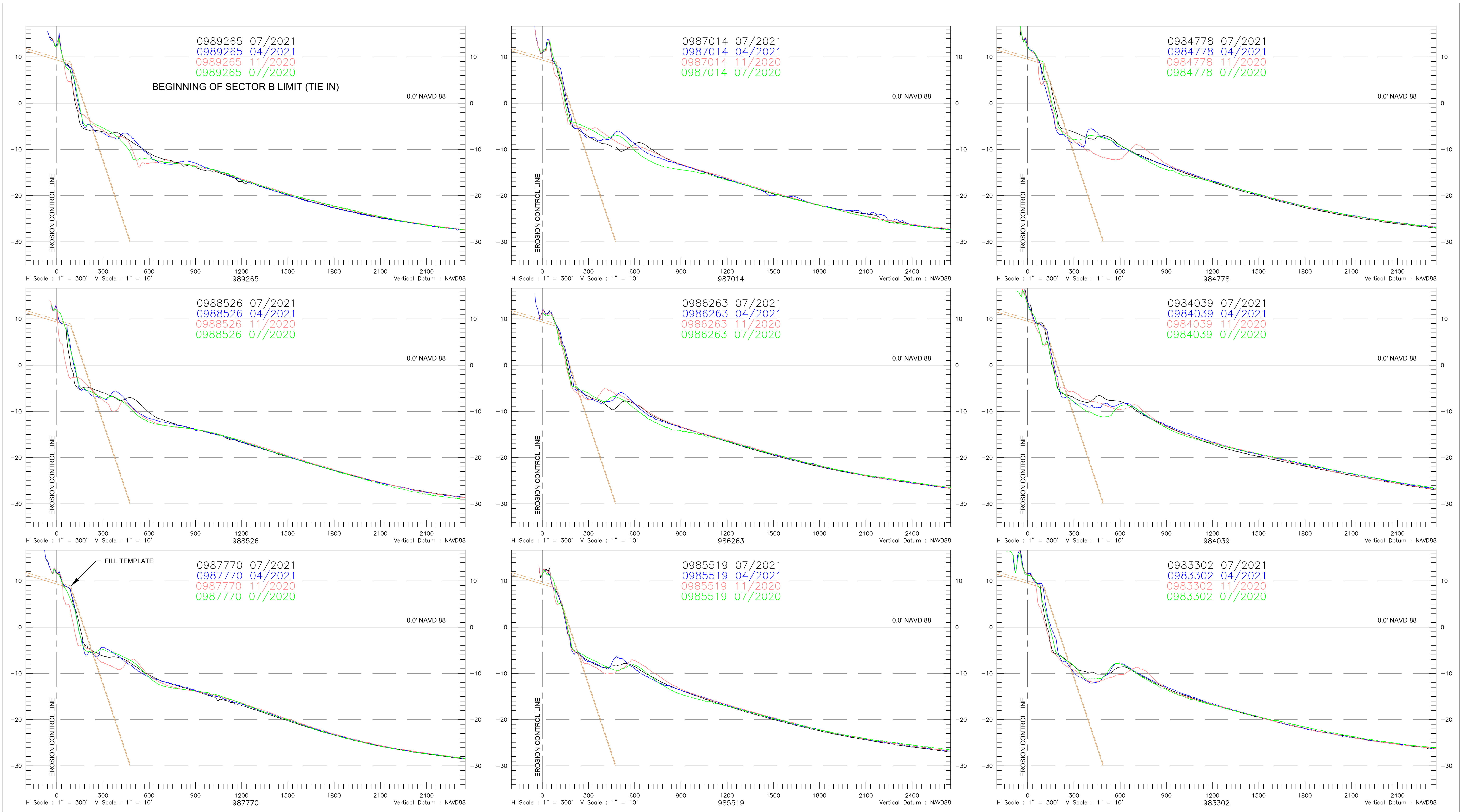
CONDITION SURVEY
SURVEY DATE: JULY 27-31, 2021
HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83
ZONE: FLORIDA - EAST ZONE 0901
VERT. REFERENCE: NAVD 88
SURVEY UNITS: U.S. SURVEY FEET
VESSEL: RISING TIDE
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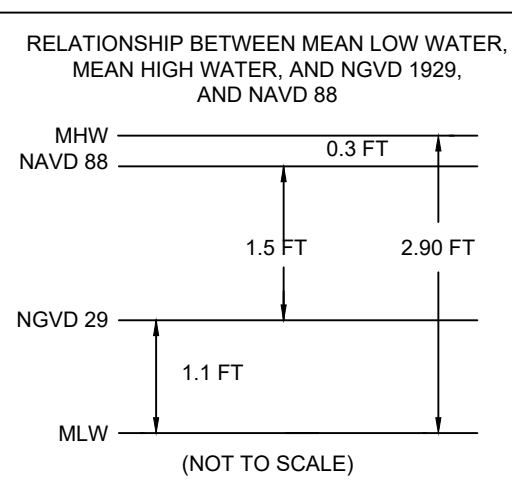
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
989,997 TO 995,908			
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg		
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT	
SCALE: AS SHOWN	SHEET: 12 OF 25	REV: 0	



REV	REVISIONS	DATE	APP

GENERAL NOTES:
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3. ELEVATIONS ARE IN U.S. FEET AND ARE REFERENCED TO NAVD88.
4. HYDROGRAPHIC DATA WAS ACQUIRED USING AN ODOM CV200 ECHOSOUNDER. TOPOGRAPHIC DATA WAS ACQUIRED USING TRIMBLE REAL-TIME KINEMATIC (RTK) EQUIPMENT.
5. PROFILE AZIMUTHS ARE 69° GRID FOR R-68 TO R-76A. ALL OTHER PROFILE AZIMUTHS ARE 67° 17'54" GRID.

LEGEND
--- EROSION CONTROL LINE
--- GRADE FILL TEMPLATE
- - - +0.5' FILL TOLERANCE
--- JULY 2021 (MONITORING)
--- APRIL 2021 (POST-CON)
--- NOV 2020 (PRE-CON)
--- JULY 2020 (MONITORING)



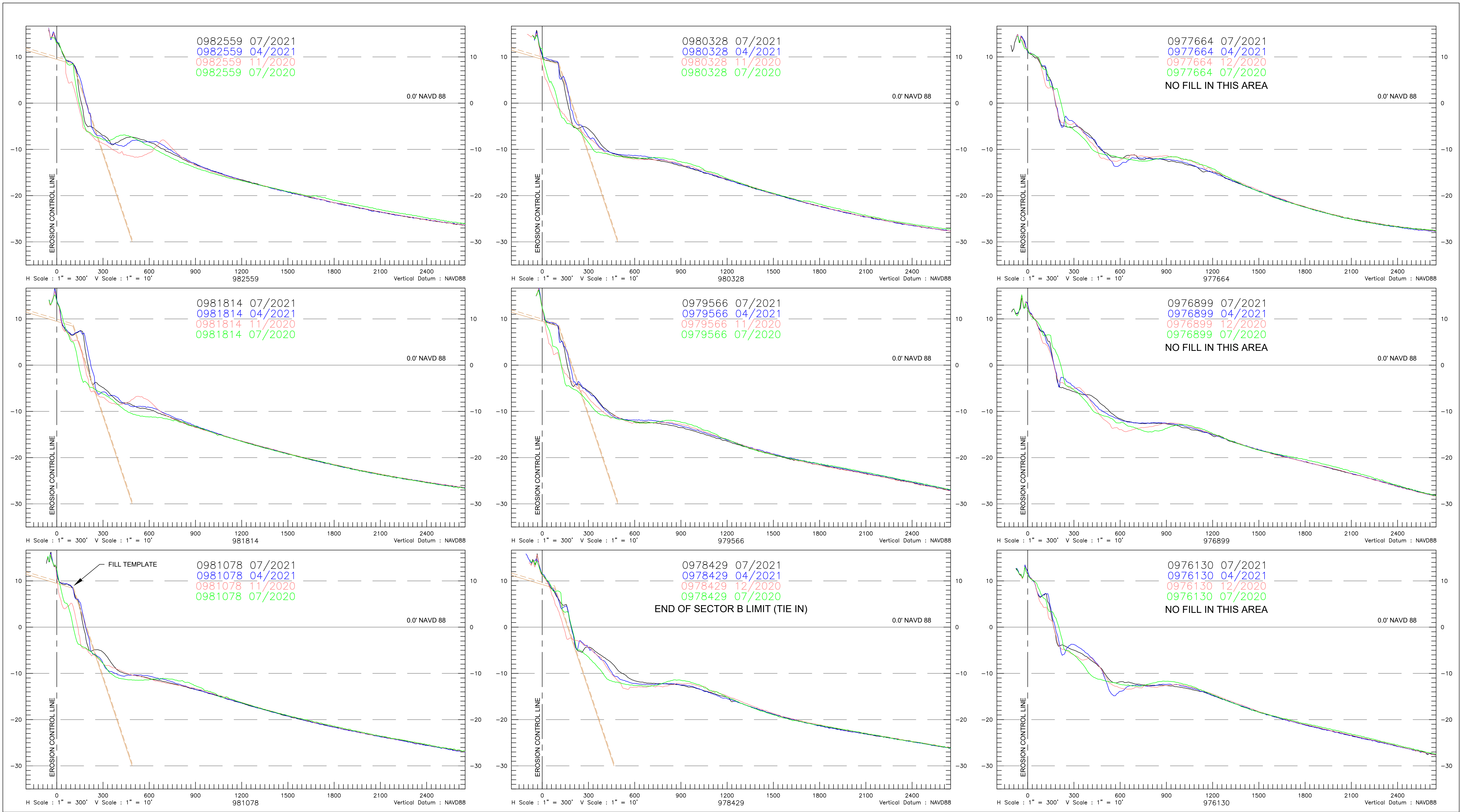
CONDITION SURVEY
SURVEY DATE: JULY 27-31, 2021
HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83
ZONE: FLORIDA - EAST ZONE 0901
VERT. REFERENCE: NAVD 88
SURVEY UNITS: U.S. SURVEY FEET
VESSEL: RISING TIDE
SOUNDER: ODOM CV 200
SOUNDER FREQ.: 200KHz
POSITIONING: TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

* THIS DOCUMENT IS NOT CERTIFIED WITHOUT A SIGNED & SEALED SURVEY REPORT TITLED 'TOWN OF JUPITER ISLAND BEACH AND NEARSHORE SUMMER MONITORING SURVEY REPORT JULY 2021'.

GBA
ENGINEERS ★ SURVEYORS
GAHAGAN & BRYANT ASSOCIATES, INC.
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TEL: (813) 831-4408
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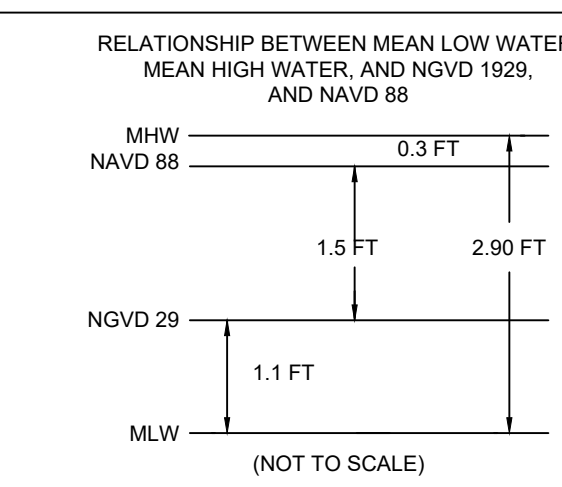
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
983,302 TO 989,265			
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg		
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT	
SCALE: AS SHOWN	SHEET: 13 OF 25	REV: 0	



REV	REVISIONS	DATE	APP

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LEGEND
--- EROSION CONTROL LINE
--- GRADE FILL TEMPLATE
- - - +0.5' FILL TOLERANCE
--- JULY 2021 (MONITORING)
--- APRIL 2021 (POST-CON)
--- NOV 2020 (PRE-CON)
--- JULY 2020 (MONITORING)



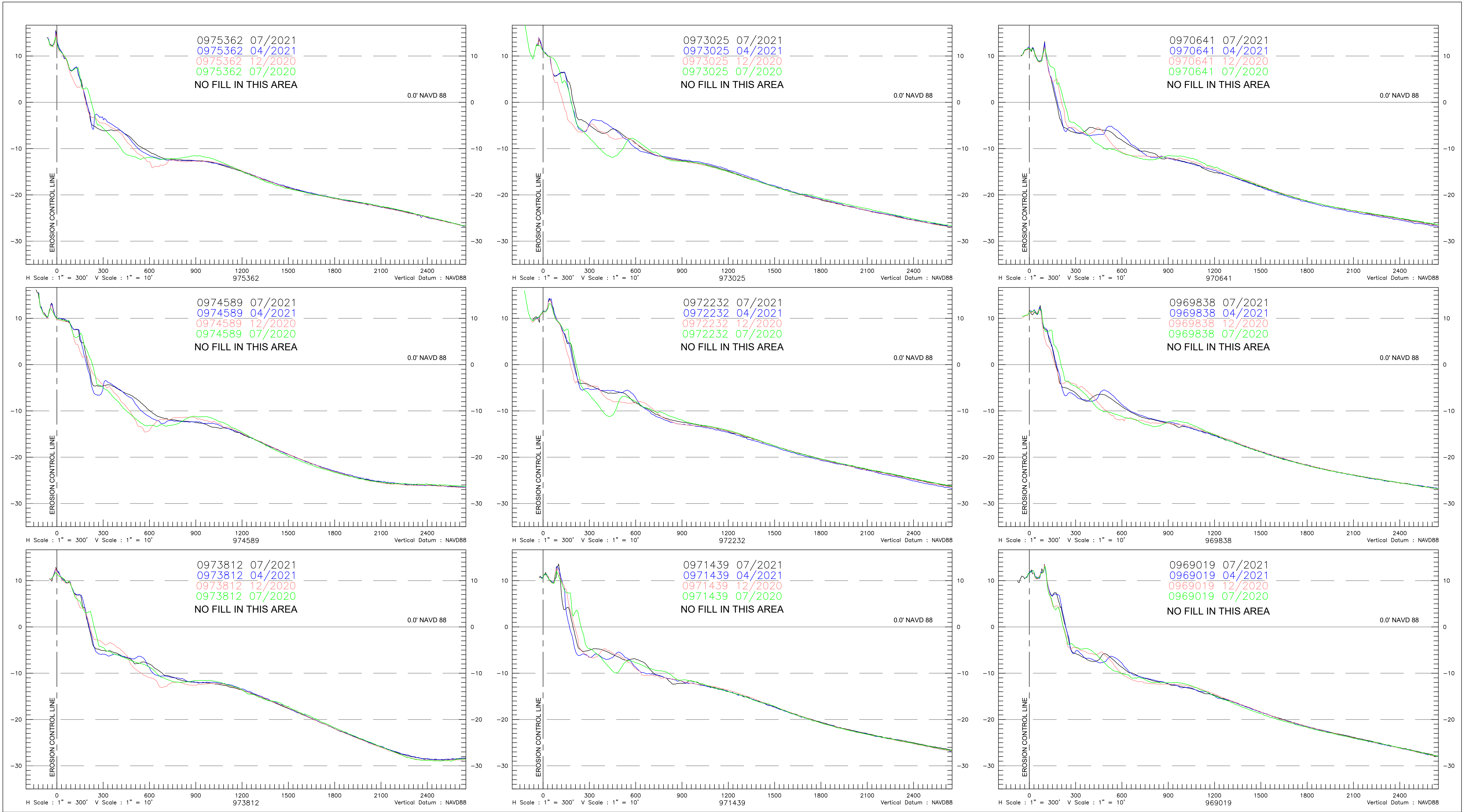
CONDITION SURVEY
SURVEY DATE: JULY 27-31, 2021
HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83
ZONE: FLORIDA - EAST ZONE 0901
VERT. REFERENCE: NAVD 88
SURVEY UNITS: U.S. SURVEY FEET
VESSEL: RISING TIDE
SOUNDER: ODOM CV 200
SOUNDER FREQ.: 200KHz
POSITIONING: TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
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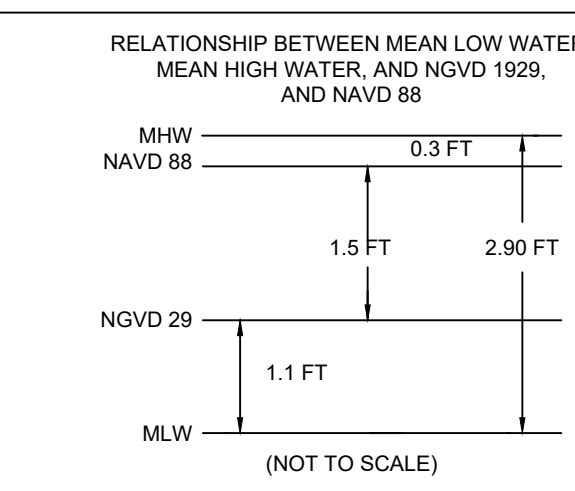
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
976,130 TO 982,559			
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg		
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT	
SCALE: AS SHOWN	SHEET: 14 OF 25	REV: 0	



REV	REVISIONS	DATE	APP

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LEGEND
--- EROSION CONTROL LINE
--- GRADE FILL TEMPLATE
- - - +0.5' FILL TOLERANCE
--- JULY 2021 (MONITORING)
--- APRIL 2021 (POST-CON)
--- NOV 2020 (PRE-CON)
--- JULY 2020 (MONITORING)



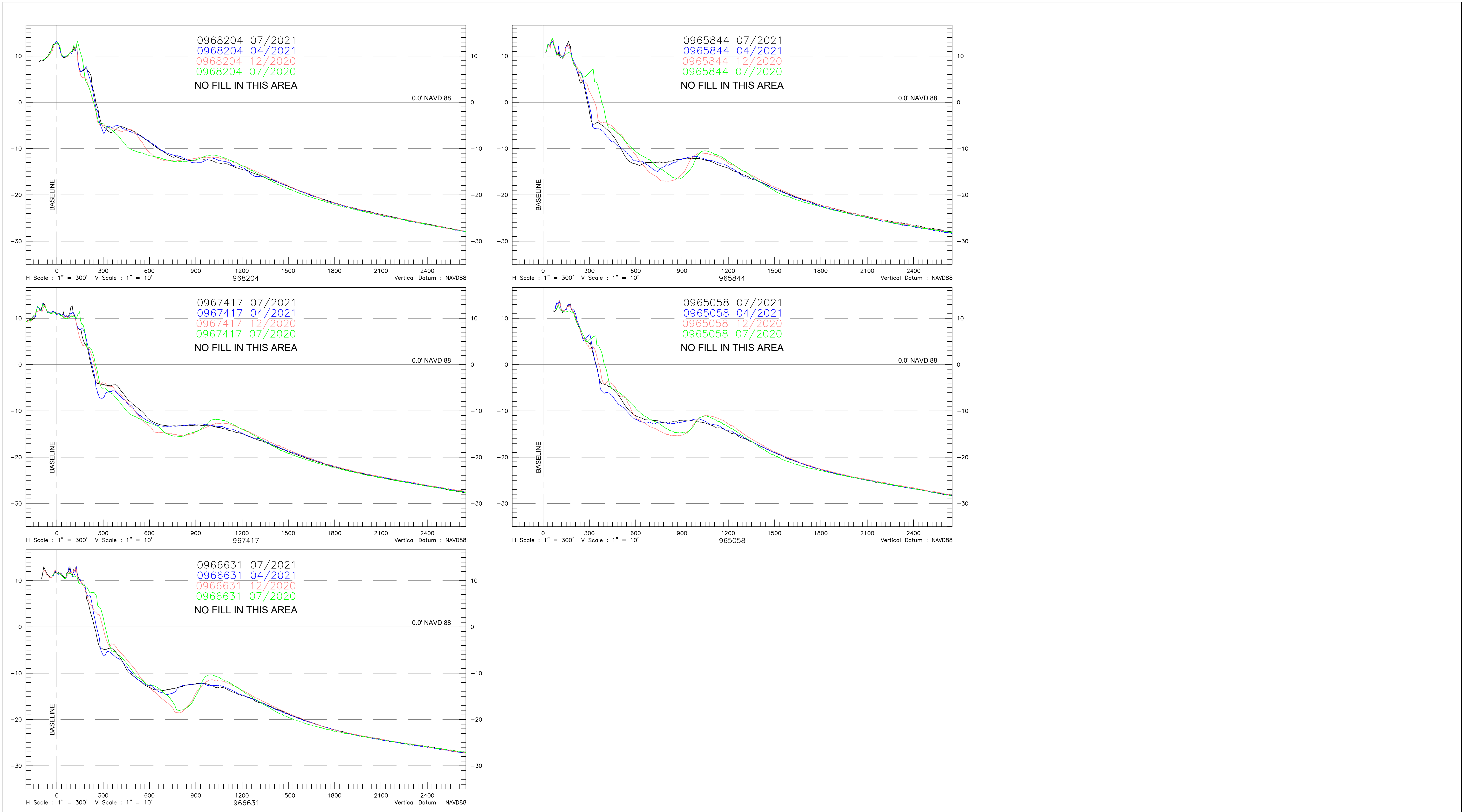
CONDITION SURVEY
SURVEY DATE: JULY 27-31, 2021
HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83
ZONE: FLORIDA - EAST ZONE 0901
VERT. REFERENCE: NAVD 88
SURVEY UNITS: U.S. SURVEY FEET
VESSEL: RISING TIDE
SOUNDER: ODOM CV 200
SOUNDER FREQ.: 200KHz
POSITIONING: TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
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TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
969,019 TO 975,362			
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg		
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT	
SCALE: AS SHOWN	SHEET: 15 OF 25	REV: 0	



REV	REVISIONS	DATE	APP

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LEGEND

- EROSION CONTROL LINE
- GRADE FILL TEMPLATE
- - - +0.5' FILL TOLERANCE
- JULY 2021 (MONITORING)
- APRIL 2021 (POST-CON)
- NOV 2020 (PRE-CON)
- JULY 2020 (MONITORING)

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND NAVD 88

CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

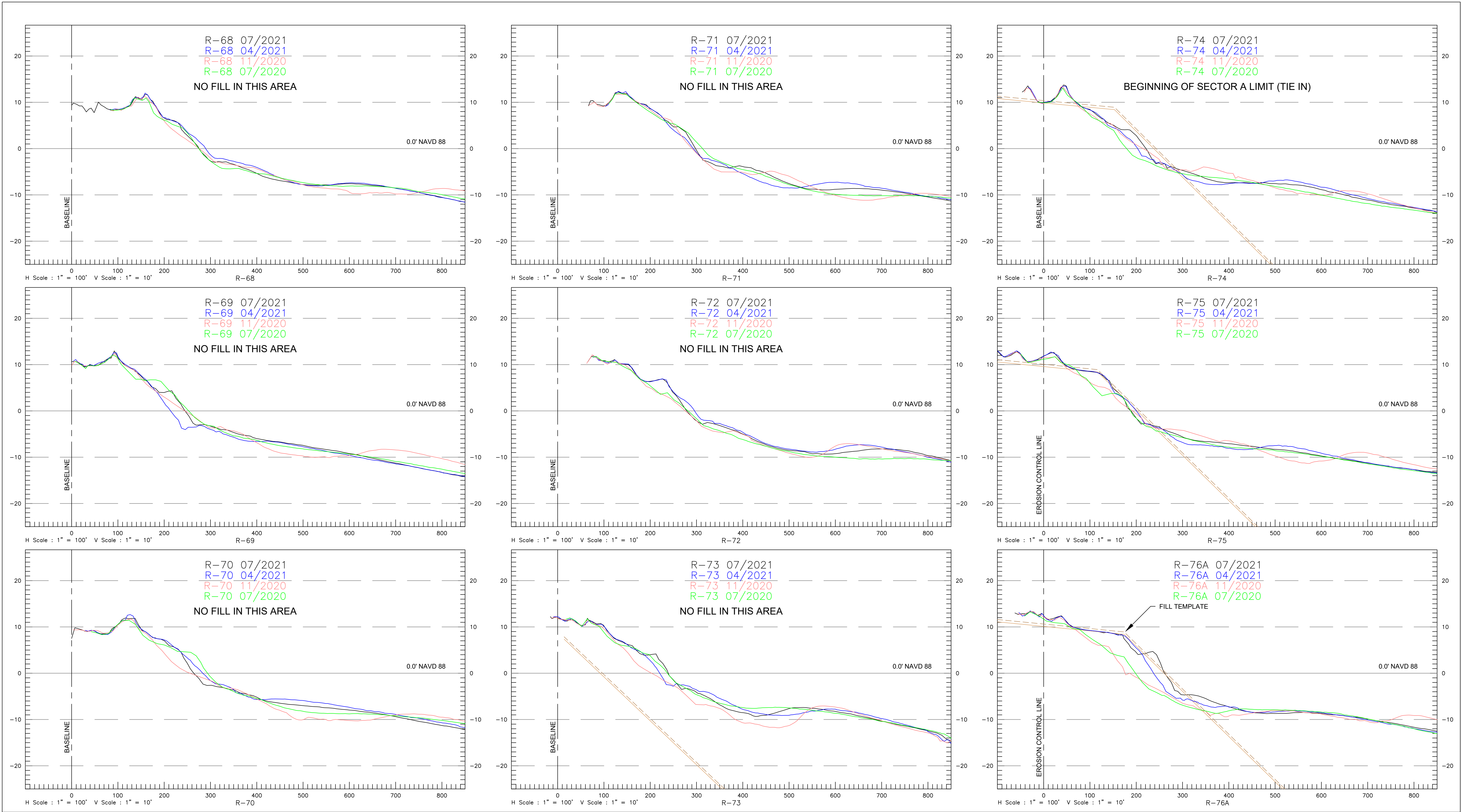
PAUL SEABOLDT
FLORIDA PSM #6879

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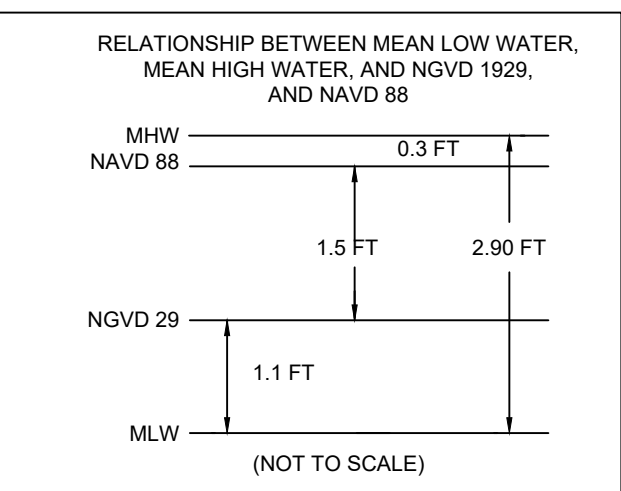
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
965,058 TO 968,204			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	16 OF 25
		ENGR:	C. BRYANT
		REV:	0



REV	REVISIONS	DATE	APP

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LEGEND
--- EROSION CONTROL LINE
--- GRADE FILL TEMPLATE
- - - +0.5' FILL TOLERANCE
--- JULY 2021 (MONITORING)
--- APRIL 2021 (POST-CON)
--- NOV 2020 (PRE-CON)
--- JULY 2020 (MONITORING)



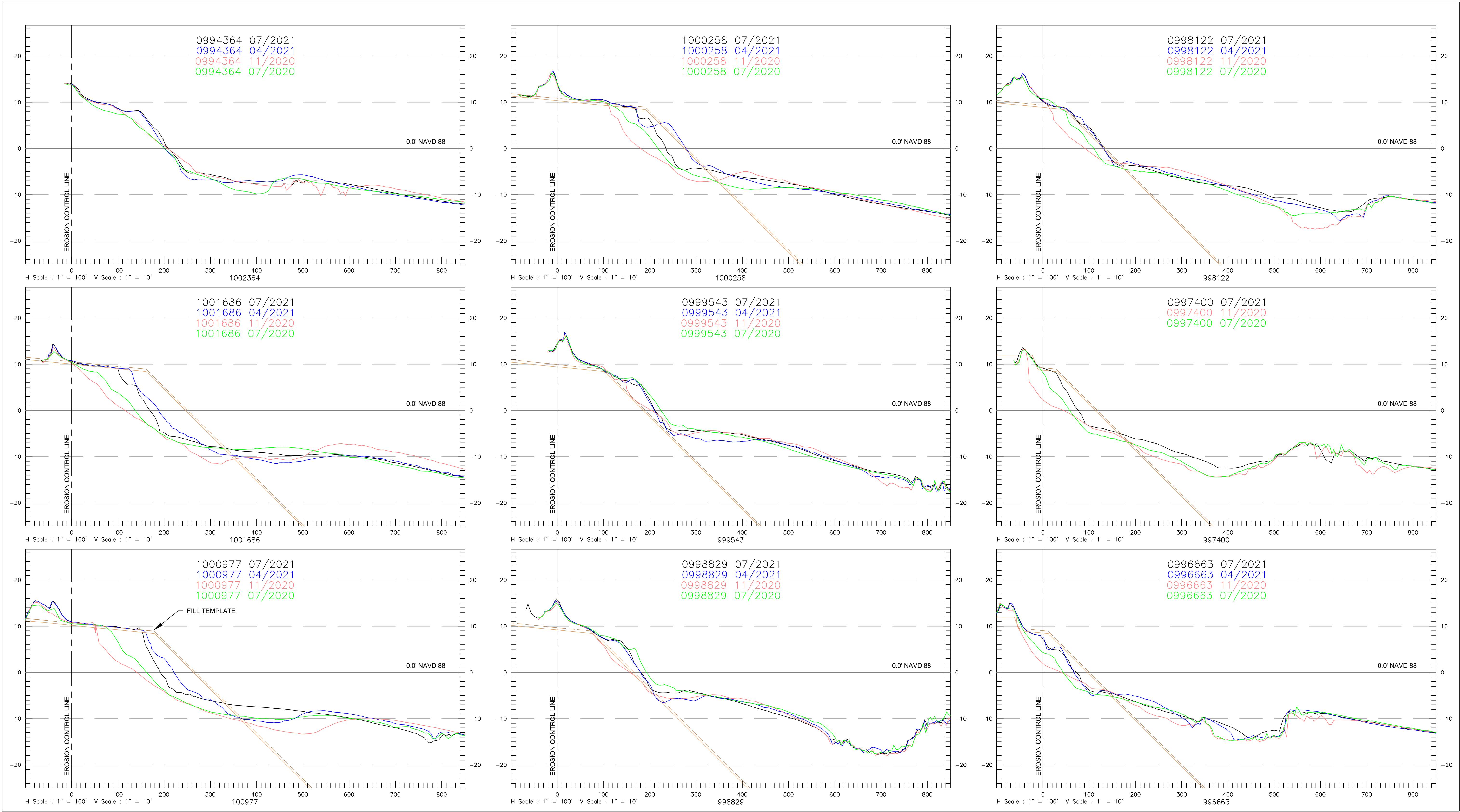
CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RISEING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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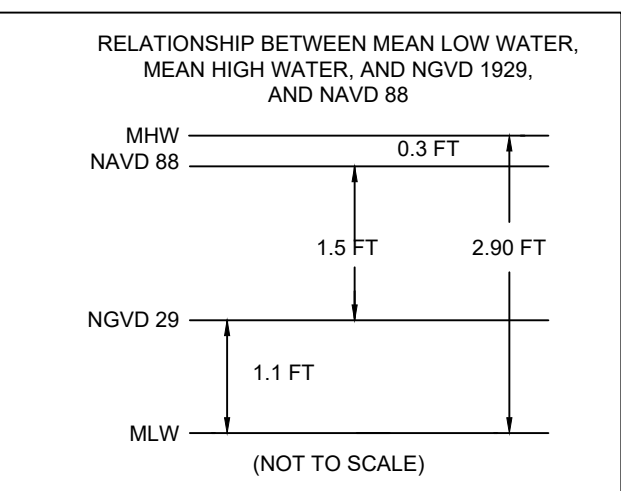
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
R-68 TO R-76A			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	17 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

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LEGEND
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- - - +0.5' FILL TOLERANCE
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— APRIL 2021 (POST-CON)
— NOV 2020 (PRE-CON)
— JULY 2020 (MONITORING)



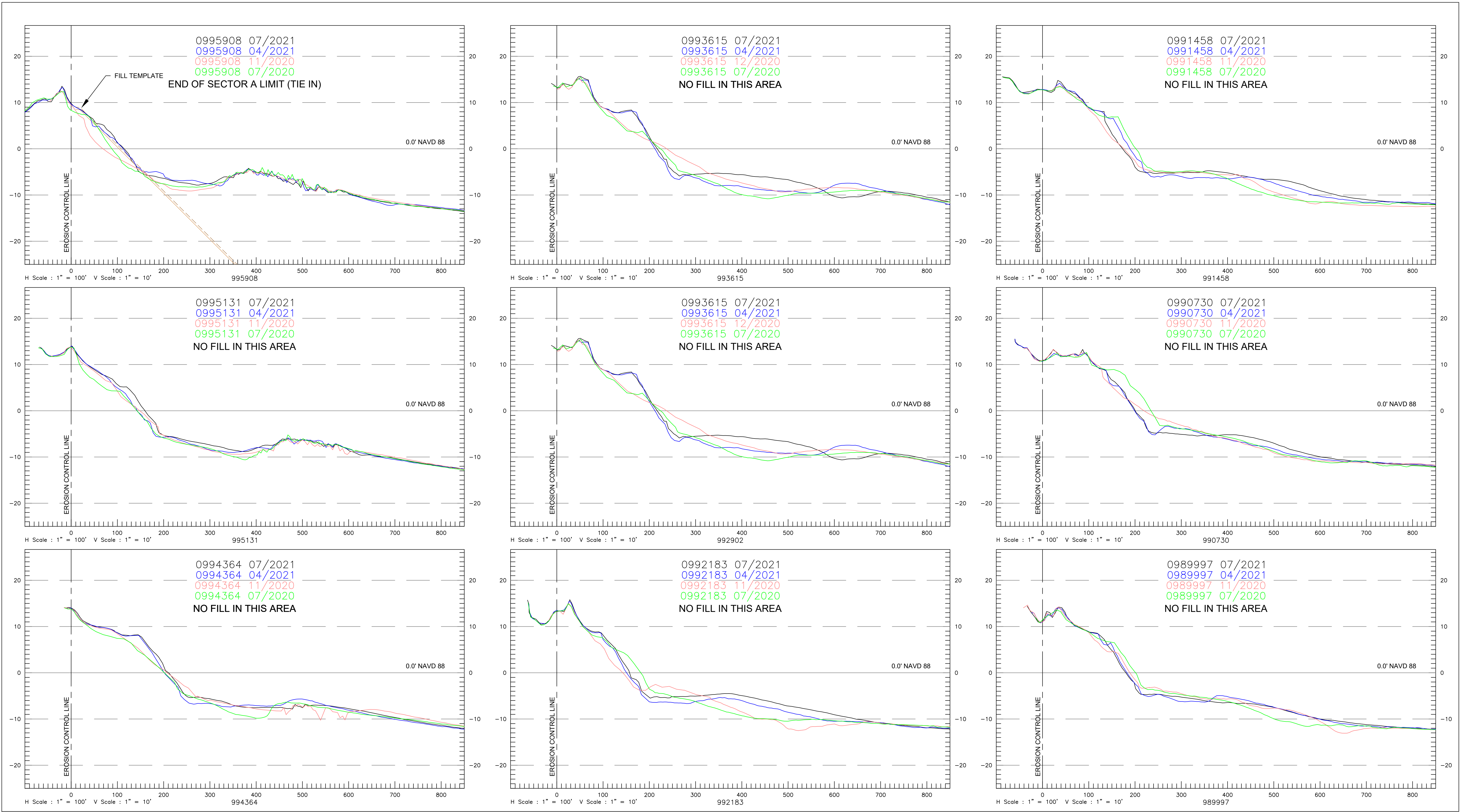
CONDITION SURVEY
SURVEY DATE: JULY 27-31, 2021
HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83
ZONE: FLORIDA - EAST ZONE 0901
VERT. REFERENCE: NAVD 88
SURVEY UNITS: U.S. SURVEY FEET
VESSEL: RISING TIDE
SOUNDER: ODOM CV 200
SOUNDER FREQ.: 200KHz
POSITIONING: TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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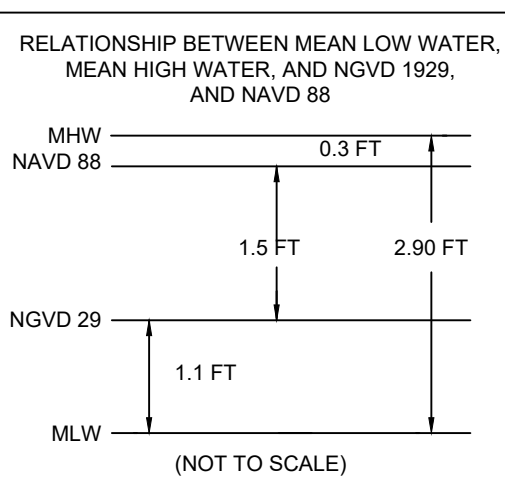
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
996,663 TO 1,002,364			
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg		
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT	
SCALE: AS SHOWN	SHEET: 18 OF 25	REV: 0	



REV	REVISIONS	DATE	APP

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LEGEND	
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---	GRADE FILL TEMPLATE
---	+0.5' FILL TOLERANCE
---	JULY 2021 (MONITORING)
---	APRIL 2021 (POST-CON)
---	NOV 2020 (PRE-CON)
---	JULY 2020 (MONITORING)



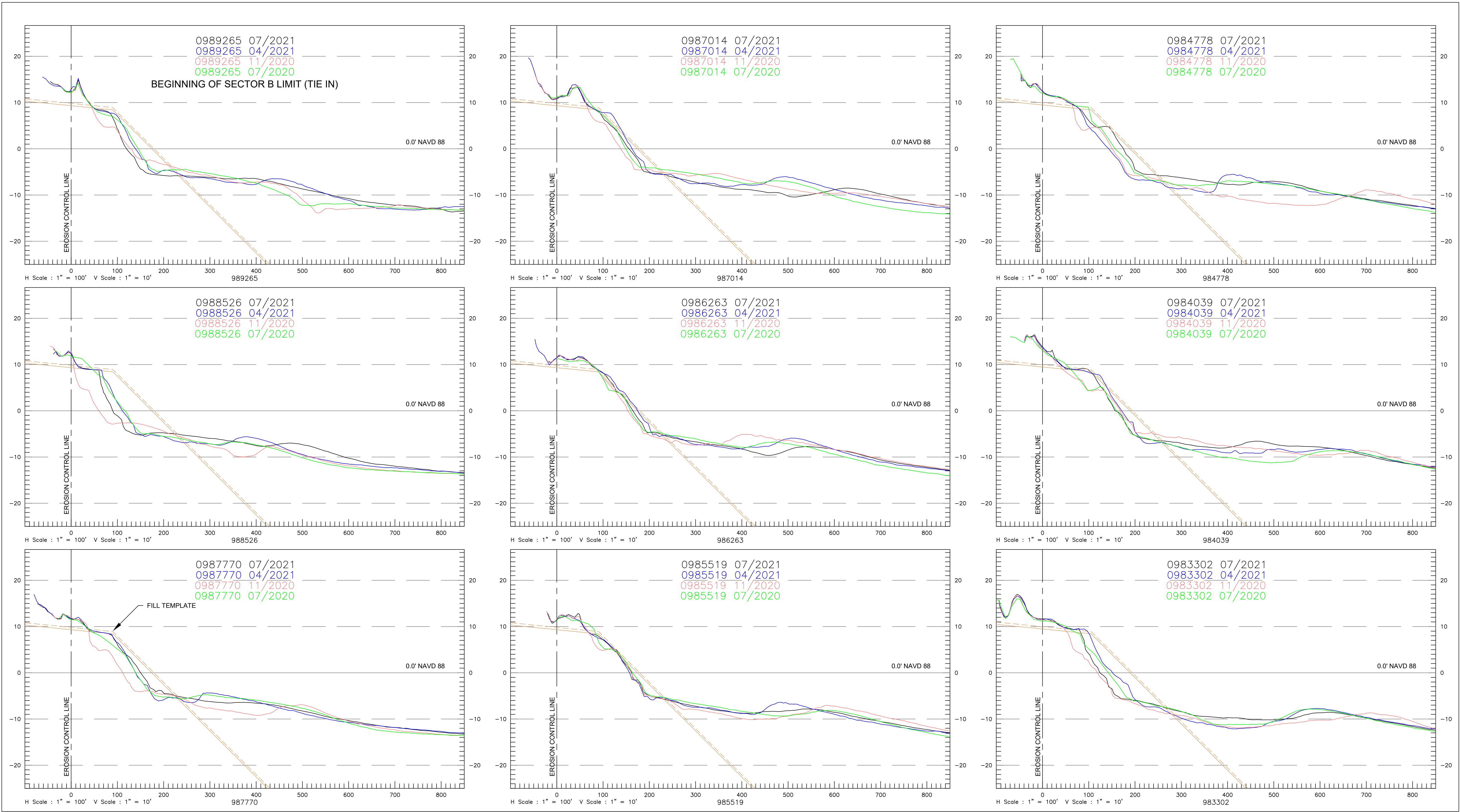
CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

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FLORIDA PSM #6879

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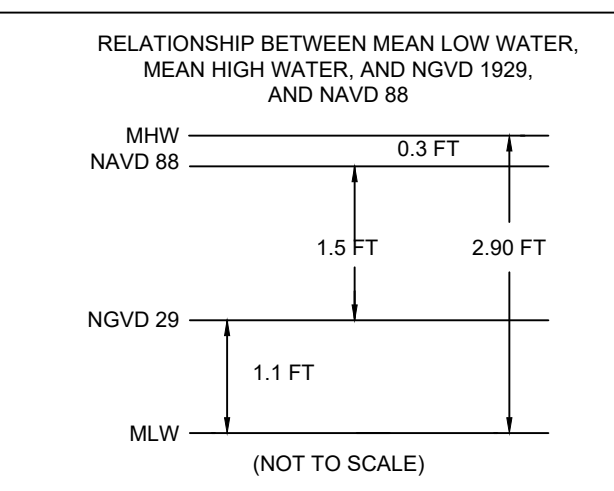
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
989,997 TO 995,908			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	19 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

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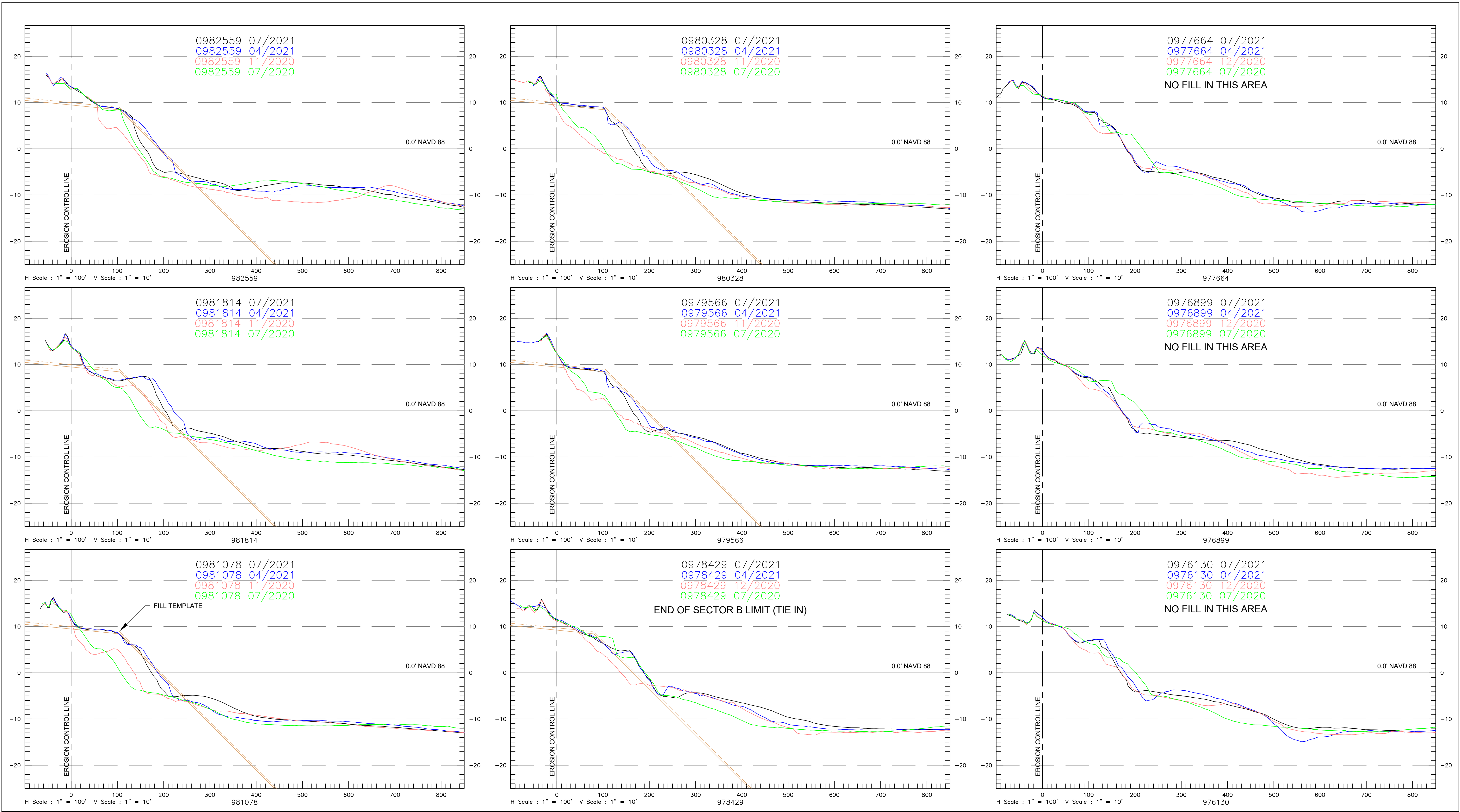
CONDITION SURVEY
SURVEY DATE: JULY 27-31, 2021
HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83
ZONE: FLORIDA - EAST ZONE 0901
VERT. REFERENCE: NAVD 88
SURVEY UNITS: U.S. SURVEY FEET
VESSEL: RISING TIDE
SOUNDER: ODOM CV 200
SOUNDER FREQ.: 200KHz
POSITIONING: TRIMBLE SPS461 RTK GPS

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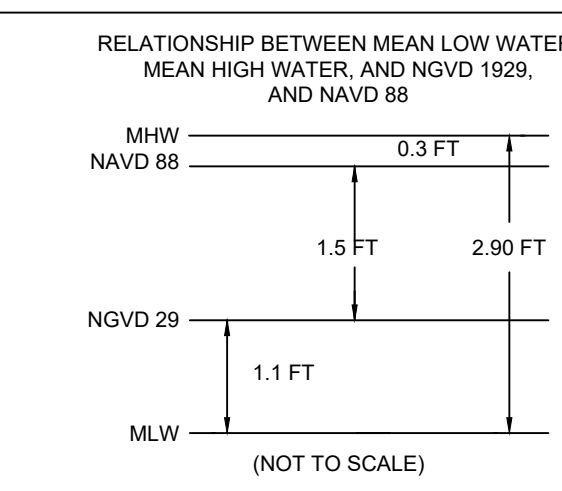
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
983,302 TO 989,265			
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg		
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT	
SCALE: AS SHOWN	SHEET: 20 OF 25	REV: 0	



REV	REVISIONS	DATE	APP

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3. ELEVATIONS ARE IN U.S. FEET AND ARE REFERENCED TO NAVD88.
4. HYDROGRAPHIC DATA WAS ACQUIRED USING AN ODOM CV200 ECHOSOUNDER. TOPOGRAPHIC DATA WAS ACQUIRED USING TRIMBLE REAL-TIME KINEMATIC (RTK) EQUIPMENT.
5. PROFILE AZIMUTHS ARE 69° GRID FOR R-68 TO R-76A. ALL OTHER PROFILE AZIMUTHS ARE 67° 17'54" GRID.

LEGEND
EROSION CONTROL LINE
GRADE FILL TEMPLATE
+0.5' FILL TOLERANCE
JULY 2021 (MONITORING)
APRIL 2021 (POST-CON)
NOV 2020 (PRE-CON)
JULY 2020 (MONITORING)



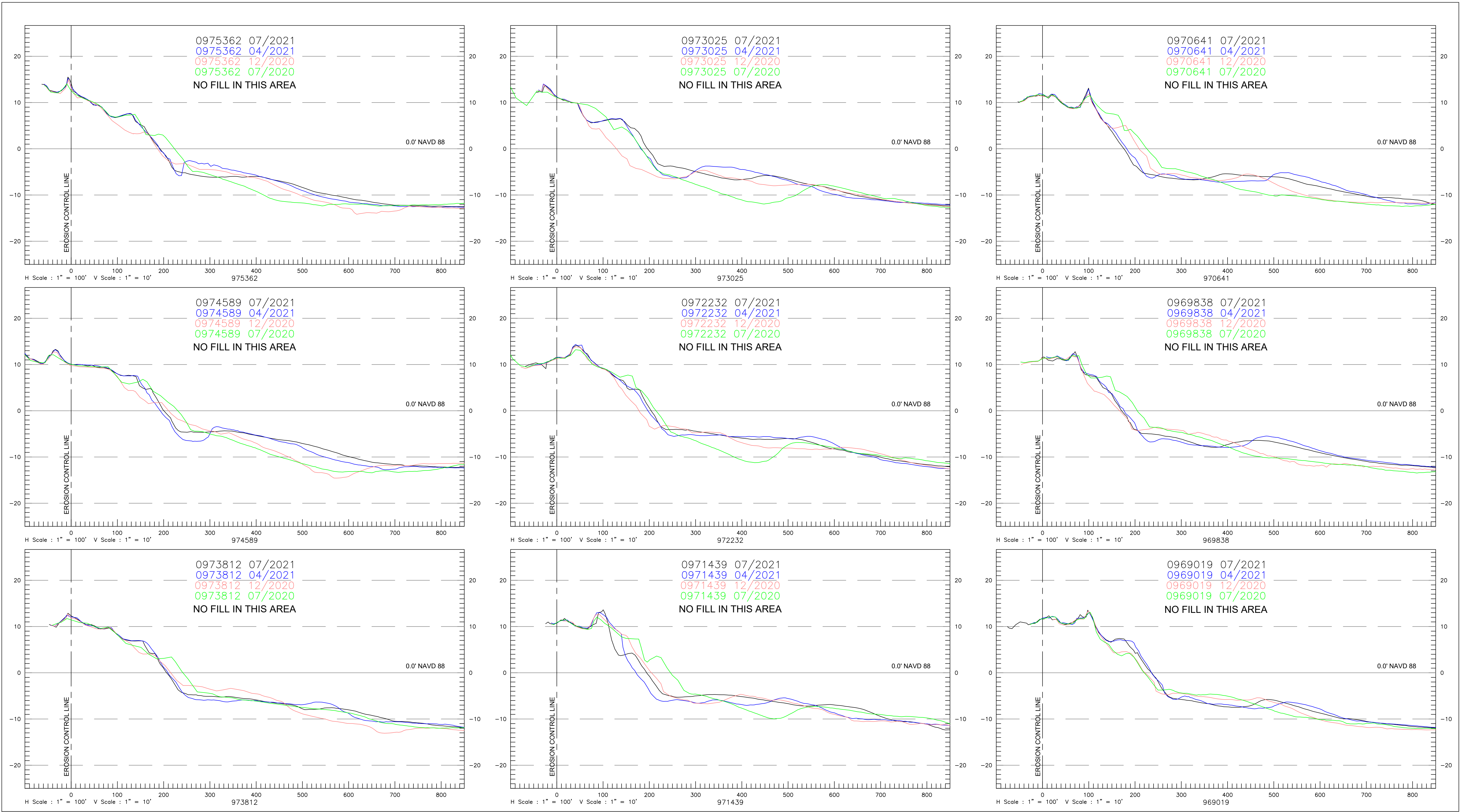
CONDITION SURVEY
SURVEY DATE: JULY 27-31, 2021
HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83
ZONE: FLORIDA - EAST ZONE 0901
VERT. REFERENCE: NAVD 88
SURVEY UNITS: U.S. SURVEY FEET
VESSEL: RISING TIDE
SOUNDER: ODOM CV 200
SOUNDER FREQ.: 200KHz
POSITIONING: TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

* THIS DOCUMENT IS NOT CERTIFIED WITHOUT A SIGNED & SEALED SURVEY REPORT TITLED 'TOWN OF JUPITER ISLAND BEACH AND NEARSHORE SUMMER MONITORING SURVEY REPORT JULY 2021'.

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FL SURVEYOR & MAPPER BUSINESS LICENSE #LB7959

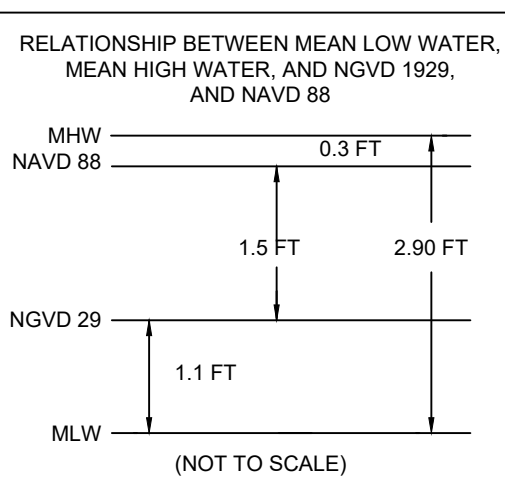
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
976,130 TO 982,559			
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg		
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT	
SCALE: AS SHOWN	SHEET: 21 OF 25	REV: 0	



REV	REVISIONS	DATE	APP

GENERAL NOTES:
1. THE INFORMATION DEPICTED HERE REPRESENTS THE RESULTS OF SURVEYS MADE BETWEEN JULY 27-31, 2021, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.
2. HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET AND ARE REFERENCED TO U.S. STATE PLANE FLORIDA EAST (901), NAD 83.
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5. PROFILE AZIMUTHS ARE 69° GRID FOR R-68 TO R-76A. ALL OTHER PROFILE AZIMUTHS ARE 67° 17'54" GRID.

LEGEND	
---	EROSION CONTROL LINE
---	GRADE FILL TEMPLATE
---	+0.5' FILL TOLERANCE
---	JULY 2021 (MONITORING)
---	APRIL 2021 (POST-CON)
---	NOV 2020 (PRE-CON)
---	JULY 2020 (MONITORING)



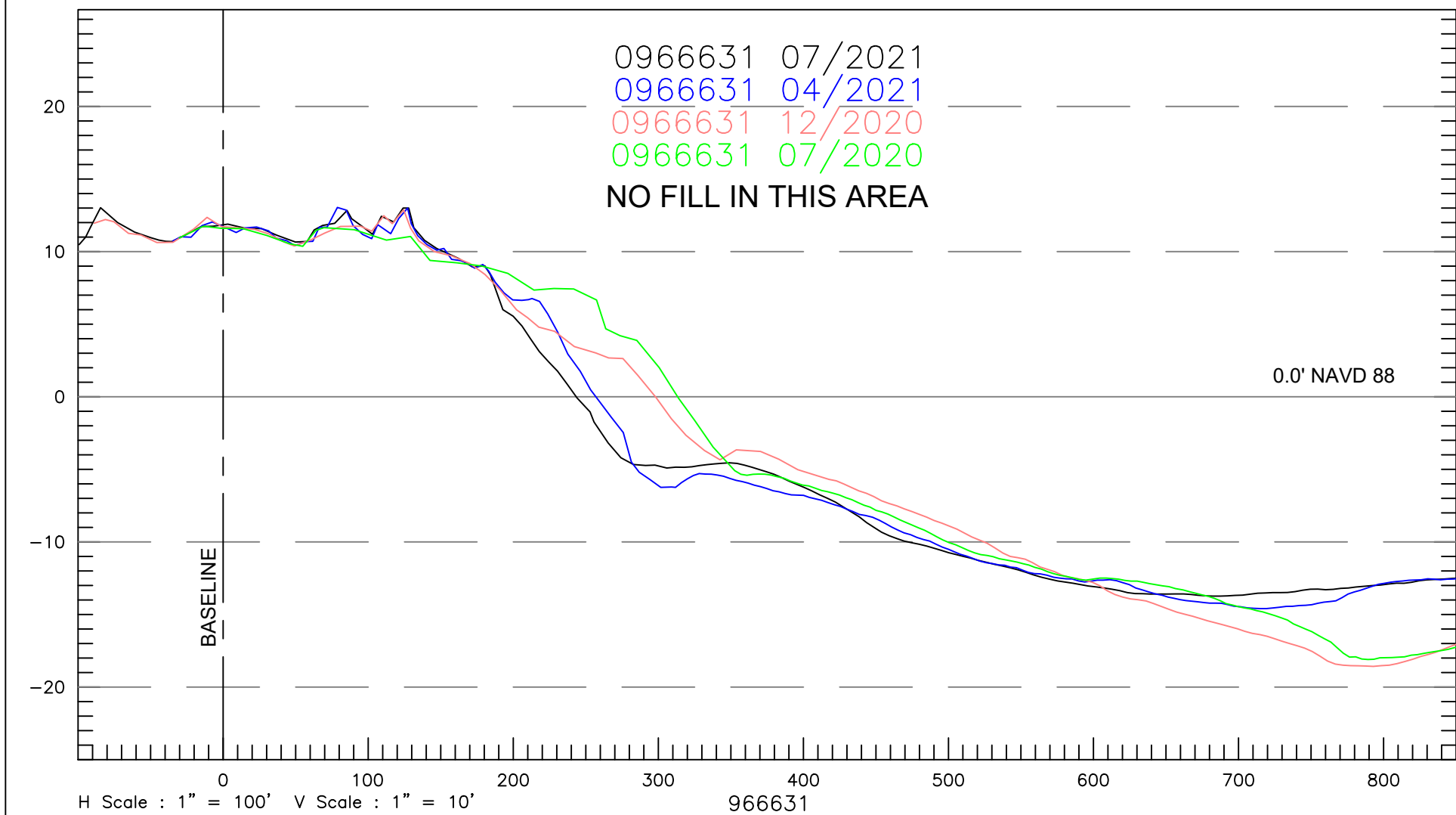
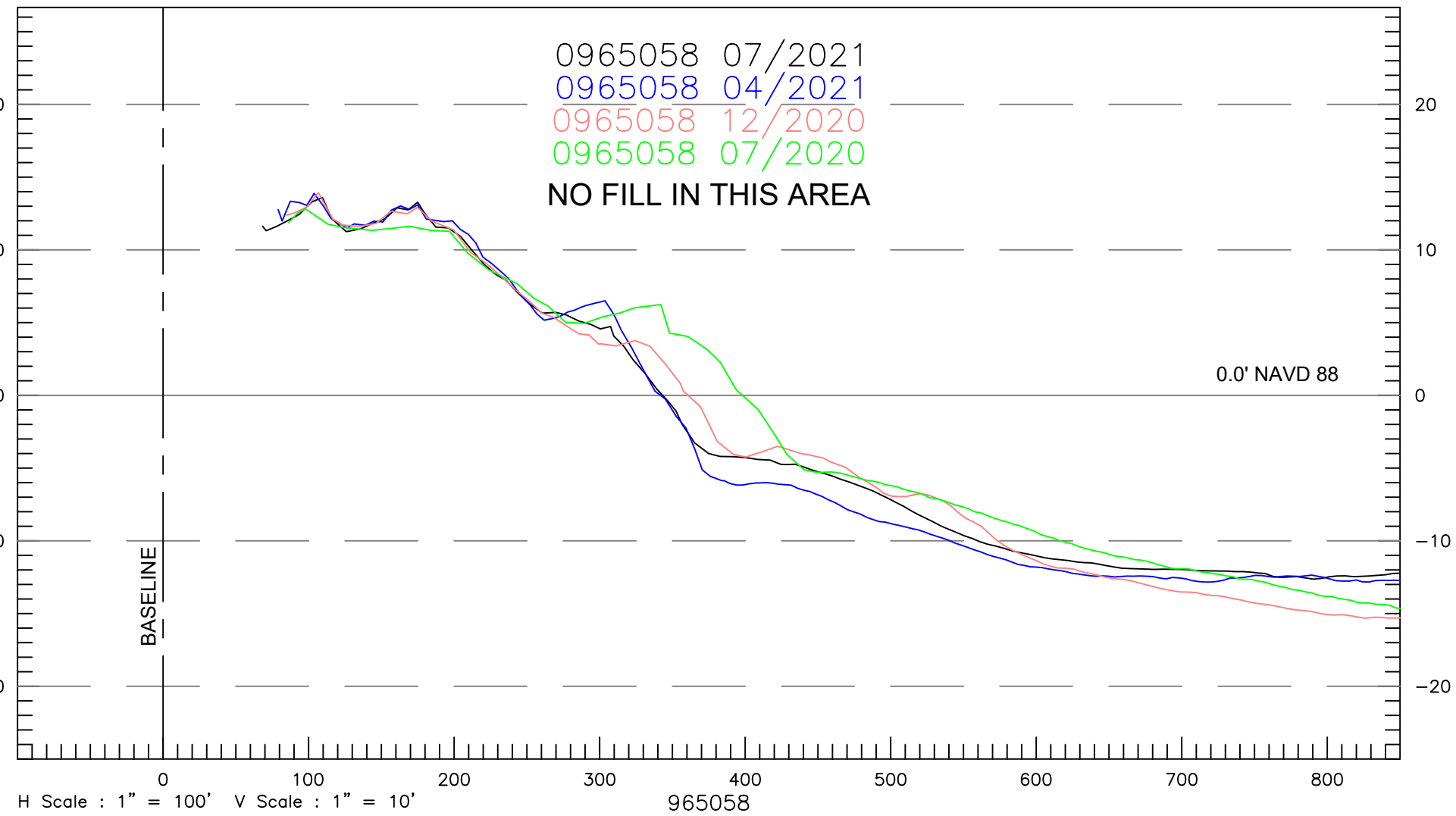
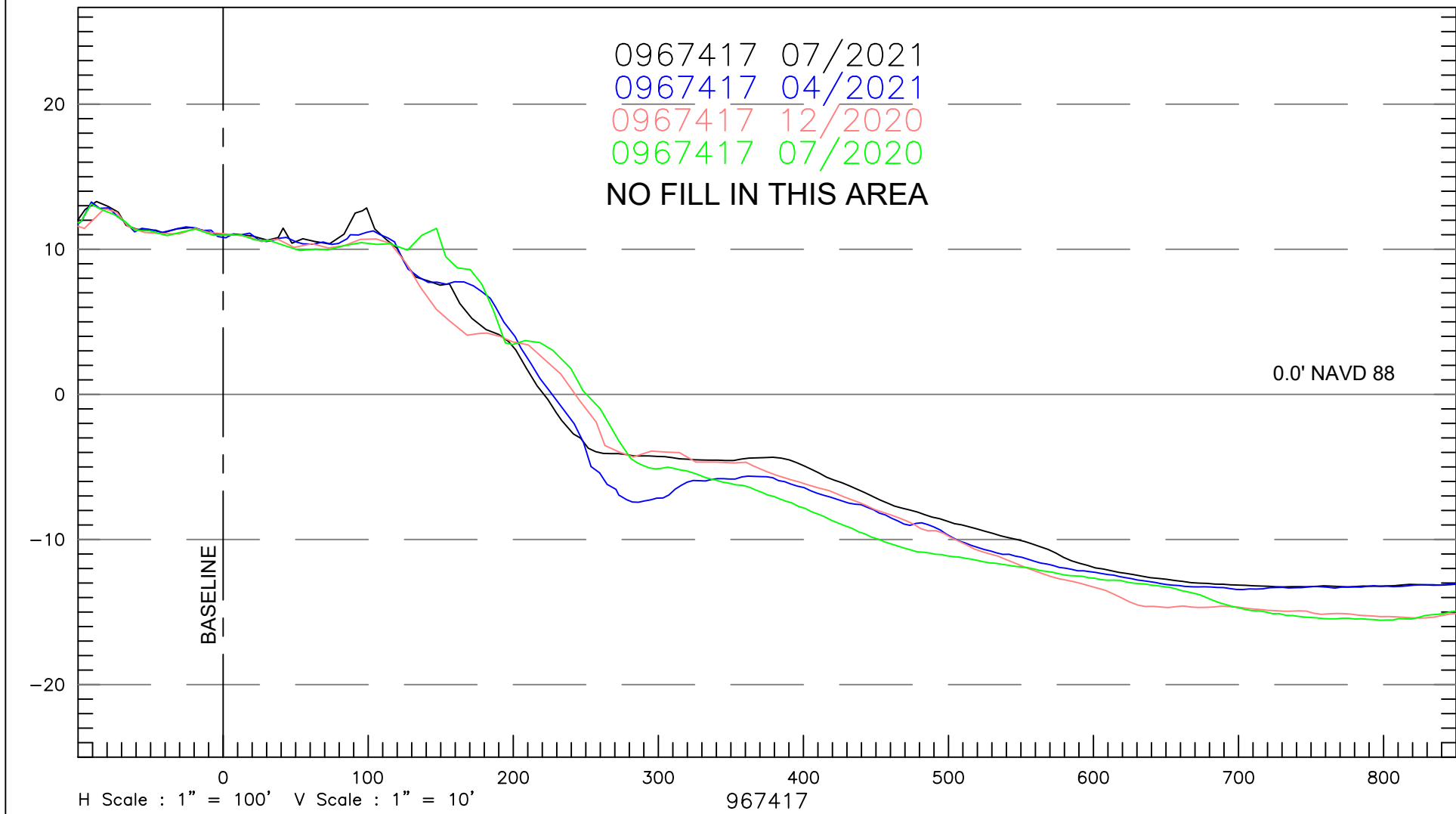
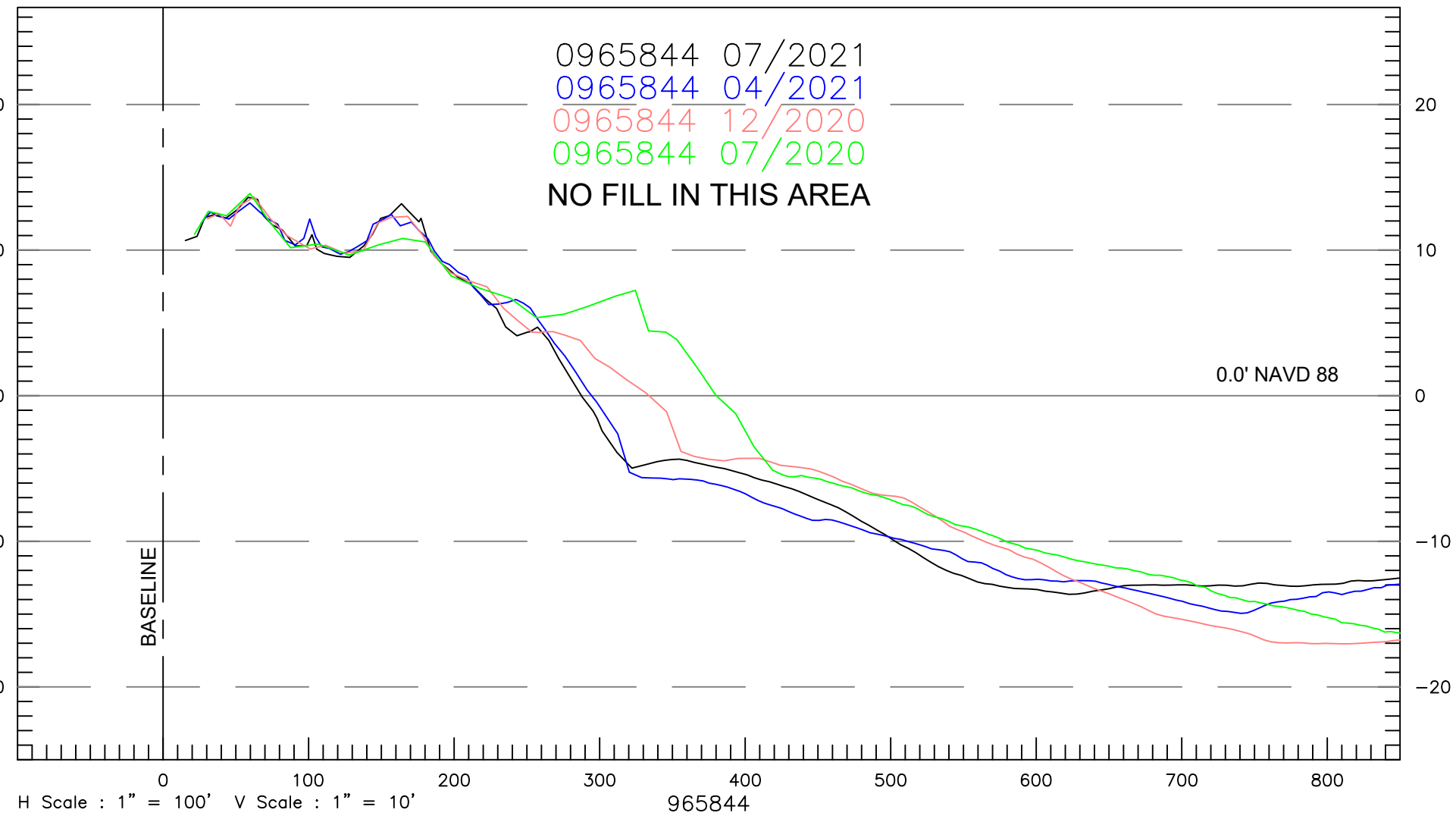
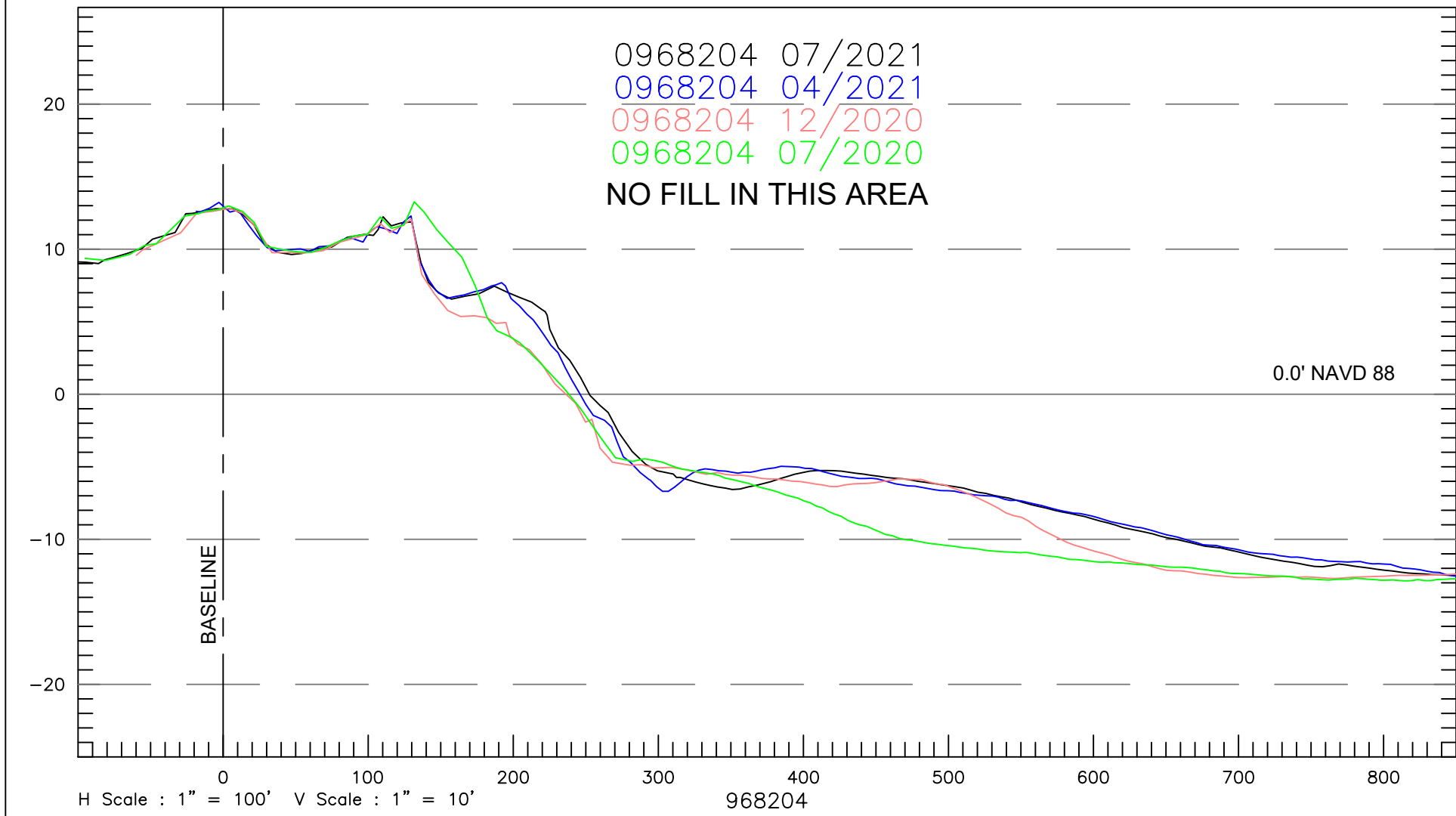
CONDITION SURVEY	
SURVEY DATE:	JULY 27-31, 2021
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHz
POSITIONING:	TRIMBLE SPS461 RTK GPS

PAUL SEABOLDT
FLORIDA PSM #6879

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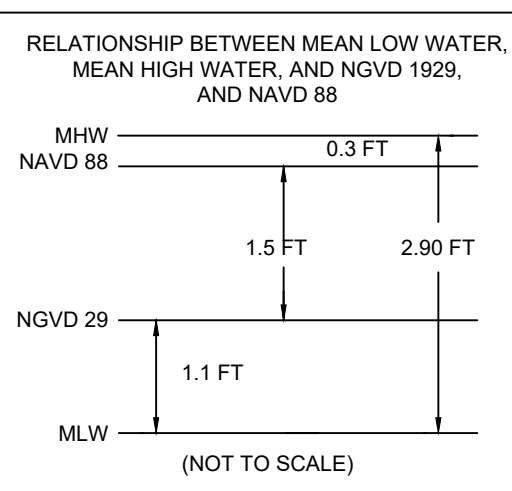
TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
969,019 TO 975,362			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLDT
SCALE:	AS SHOWN	SHEET:	22 OF 25
ENGR:	C. BRYANT	REV:	0



REV	REVISIONS	DATE	APP

GENERAL NOTES:
1. THE INFORMATION DEPICTED HERE REPRESENTS THE RESULTS OF SURVEYS MADE BETWEEN JULY 27-31, 2021, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.
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5. PROFILE AZIMUTHS ARE 69° GRID FOR R-68 TO R-76A. ALL OTHER PROFILE AZIMUTHS ARE 67° 17'54" GRID.

LEGEND
--- EROSION CONTROL LINE
--- GRADE FILL TEMPLATE
- - - +0.5' FILL TOLERANCE
--- JULY 2021 (MONITORING)
--- APRIL 2021 (POST-CON)
--- NOV 2020 (PRE-CON)
--- JULY 2020 (MONITORING)



CONDITION SURVEY
SURVEY DATE: JULY 27-31, 2021
HORIZ. PROJECTION: U.S. STATE PLANE, NAD 83
ZONE: FLORIDA - EAST ZONE 0901
VERT. REFERENCE: NAVD 88
SURVEY UNITS: U.S. SURVEY FEET
VESSEL: RISING TIDE
SOUNDER: ODOM CV 200
SOUNDER FREQ.: 200KHz
POSITIONING: TRIMBLE SPS461 RTK GPS

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TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY CROSS-SECTIONS			
965,058 TO 968,204			
DWG DATE: SEPTEMBER 21, 2021	DWG NAME: 2021 Jupiter Island_Monitoring Survey.dwg		
DRAWN: G. FALL	CHECKED: P. SEABOLDT	ENGR: C. BRYANT	
SCALE: AS SHOWN	SHEET: 23 OF 25	REV: 0	



REV	REVISIONS	DATE	APP

GENERAL NOTES:

1. THE INFORMATION DEPICTED HERE REPRESENTS THE RESULTS OF SURVEYS MADE ON APRIL 25 & MAY 1, 2021, AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME.
2. HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET AND ARE REFERENCED TO U.S. STATE PLANE FLORIDA EAST (901), NAD 83.
3. ELEVATIONS ARE IN U.S. FEET AND ARE REFERENCED TO NAVD83.
4. ELEVATIONS ARE ROUNDED TO THE NEAREST TENTH AND ARE BELOW THE REFERENCE PLANE UNLESS PRECEDED BY A PLUS (+) SIGN.
5. ELEVATIONS SHOWN ARE PART OF A LARGER DATA SET, WHICH HAS BEEN REDUCED FOR CLARITY ON THIS MAP.
6. HYDROGRAPHIC DATA WAS ACQUIRED USING AN ODOM CV200 DUAL FREQUENCY ECHOSOUNDER OPERATING AT 200KHZ.
7. PROFILE AZIMUTHS ARE 73°21'36" GRID.

LEGEND

— 5 —

5-FT CONTOURS

— — —

BORROW SITE EXPANSION AREA

HORIZONTAL

0 300' 600'

SCALE 1" = 300'

RELATIONSHIP BETWEEN MEAN LOW WATER, MEAN HIGH WATER, AND N.G.V.D. 1929, AND N.A.V.D. 88

MHW
NAVD 88

0.3 FT

1.5 FT

2.90 FT

NGVD 29

MLW

(NOT TO SCALE)

CONDITION SURVEY	
APRIL 25 & MAY 1, 2021	
HORIZ. PROJECTION:	U.S. STATE PLANE, NAD 83
ZONE:	FLORIDA - EAST ZONE 0901
VERT. REFERENCE:	NAVD 88
SURVEY UNITS:	U.S. SURVEY FEET
VESSSEL:	RIISING TIDE
SOUNDER:	ODOM CV 200
SOUNDER FREQ.:	200KHZ
POSITIONING:	TRIMBLE SP5461 RTK GPS

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TOWN OF JUPITER ISLAND			
2021 SUMMER MONITORING SURVEY			
BORROW SITE "B"			
BATHYMETRY			
DWG DATE:	SEPTEMBER 21, 2021	DWG NAME:	2021 Jupiter Island_Monitoring Survey.dwg
DRAWN:	G. FALL	CHECKED:	P. SEABOLD
SCALE:	AS SHOWN	SHEET:	24 OF 25
ENGR:	C. BRYANT	REV:	0

