

**TOWN OF HIGHLAND BEACH  
BEACH RESTORATION FEASIBILITY STUDY**

**Submitted to:  
The Town of Highland Beach**

**Submitted by:  
Coastal Planning & Engineering, Inc.  
A CB&I Company**

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## EXECUTIVE SUMMARY

The Town of Highland Beach requested that Coastal Planning & Engineering, Inc. (CPE) develop a feasibility report that evaluates options for protecting and restoring the beach within the Town. The beach is one of the Town's most valuable assets and the Town requested that CPE evaluate options that would protect the beach's natural resources, coastal property, and public health and safety.

CPE evaluated the Town's 2.84-mile beach. A site visit was conducted in January 2013 and shoreline data from 1975 to 2008 was reviewed. In summary, the beach along the southernmost mile of the Town is narrow and the berm is low. Scarping following the passage of Hurricane Sandy was evident. The shoreline in the southern section appears to be controlled by three rock outcrops, of which Yamato Rock at the southern extremity is the most prominent. The average shoreline retreat rate at the southern end of Town is 0.4 feet/year though the average shoreline change for the entire section of beach is an advance of 1.2 feet/year. The beach in the northern 1.85 miles of the Town has benefitted from repeated beach nourishments in Delray Beach. The beach in this area is wider, higher and has an established, vegetated dune system.

While the historic shoreline changes are a basis for optimism, there are two issues with the current state of the beach. The first is that while the shoreline is advancing within much of the Town and the shoreline retreat at the south end of Town is mild, the beach is susceptible to large fluctuations due to storm events. Large storm events can damage upland property, as experienced during Hurricane Sandy. While the shoreline will recover, the dunes that provide much of the protection are slower to recover and typically require the upland property owner to rebuild them by trucking in sand. The second issue is that the beach is too narrow in some areas to support the required recreational demand of the condominiums.

CPE evaluated several alternatives including a no action alternative, upland sand placement via truck haul, a larger scale beach nourishment project, and installation of coastal structures. It is recommended that a larger scale beach nourishment project be pursued. While there is no imminent need for this project, except for non-critical recreational purposes, these projects take several years to design and permit. Ideally, permits should be in place to reconstruct the beaches should a large storm or series of storms impact the Town.

A large scale beach nourishment project encompasses dredging sand from offshore and placing it along the southern 2 miles of the Town's beach. The cost of construction is estimated at \$9.5M, including inflation, assuming a project is constructed in 2015. The cost of dredge projects has been increasing faster than general inflation and we estimate that delaying project construction by an additional 5 years (to 2020) could inflate the cost to \$14M.

Limited public beach access will limit availability of County, State or Federal funding. It is recommended that other options be considered to fund a beach nourishment program, such as an Ad Valorem Tax, Erosion Prevention District, or Municipal Service Benefit Unit.

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# **1 INTRODUCTION**

The Town of Highland Beach requested that Coastal Planning & Engineering, Inc. (CPE) develop a feasibility report that evaluates options for protecting and restoring the Town's beach. The beach is one of the Town's most valuable assets and the Town requested that CPE evaluate options that would:

1. Maximize protection of the beach's natural resources, coastal property and development, and public health and safety;
2. Maximize the quality of the beach for both human activities and environmental needs;
3. Minimize economic losses that may result from a beach erosion event by being prepared;
4. To efficiently, economically, and responsibly respond to and restore the beach as soon as possible after sustaining any significant beach loss;
5. Minimize the potential negative impacts (visual, audio, environmental, and beach sand loss) of the proposed sand;
6. Maximize the potential benefits of any future renourishment activities.

This report will first present the coastal setting within the Town of Highland Beach, discussing the tides, storm events, history of shoreline and volumetric changes, and offshore resources. This will be followed by a general discussion of the current condition of the Town's beach. The next section, Problem Identification and Alternatives, will evaluate various alternatives available to address the beach condition. These include a No Action Alternative, upland placement of sand, strategic use of coastal structures, and a larger beach nourishment project. The costs of these various alternatives will be discussed along with an expected level of permitting effort. This discussion will be followed by an outline of the potential funding mechanisms. The last section will be CPE's recommendations.

## **2 COASTAL SETTING**

### **2.1 Winds**

Winds indirectly cause the littoral transport of sand by generating waves. Northeast winds events typically produce the largest waves due to a long, uninterrupted fetch and the duration of the winds. Winds from the east and southeast typically do not create large waves in the project area because of the limited fetch between southeast Florida and the Bahamas, and the limited duration of weather patterns from these directions.

Winds associated with tropical storms may also affect the shoreline. Due to the cyclonic nature of the winds associated with tropical storms and hurricanes, the winds can come from any direction. If the winds are in an onshore direction, a storm surge will be created and in conjunction with the higher waves will cause accelerated erosion of the beach.

## 2.2 Waves

One of the principal causes of beach erosion is waves breaking on the beach and washing sand into the ocean. Waves also cause littoral movement in the longshore direction, and the onshore-offshore direction. Due to the general north-south orientation of the project shoreline, waves from the east cause little longshore movement of sand. In contrast, waves from the north and northeast cause a net movement of sand to the south, whereas, waves from the south and southeast cause a net movement of sand to the north.

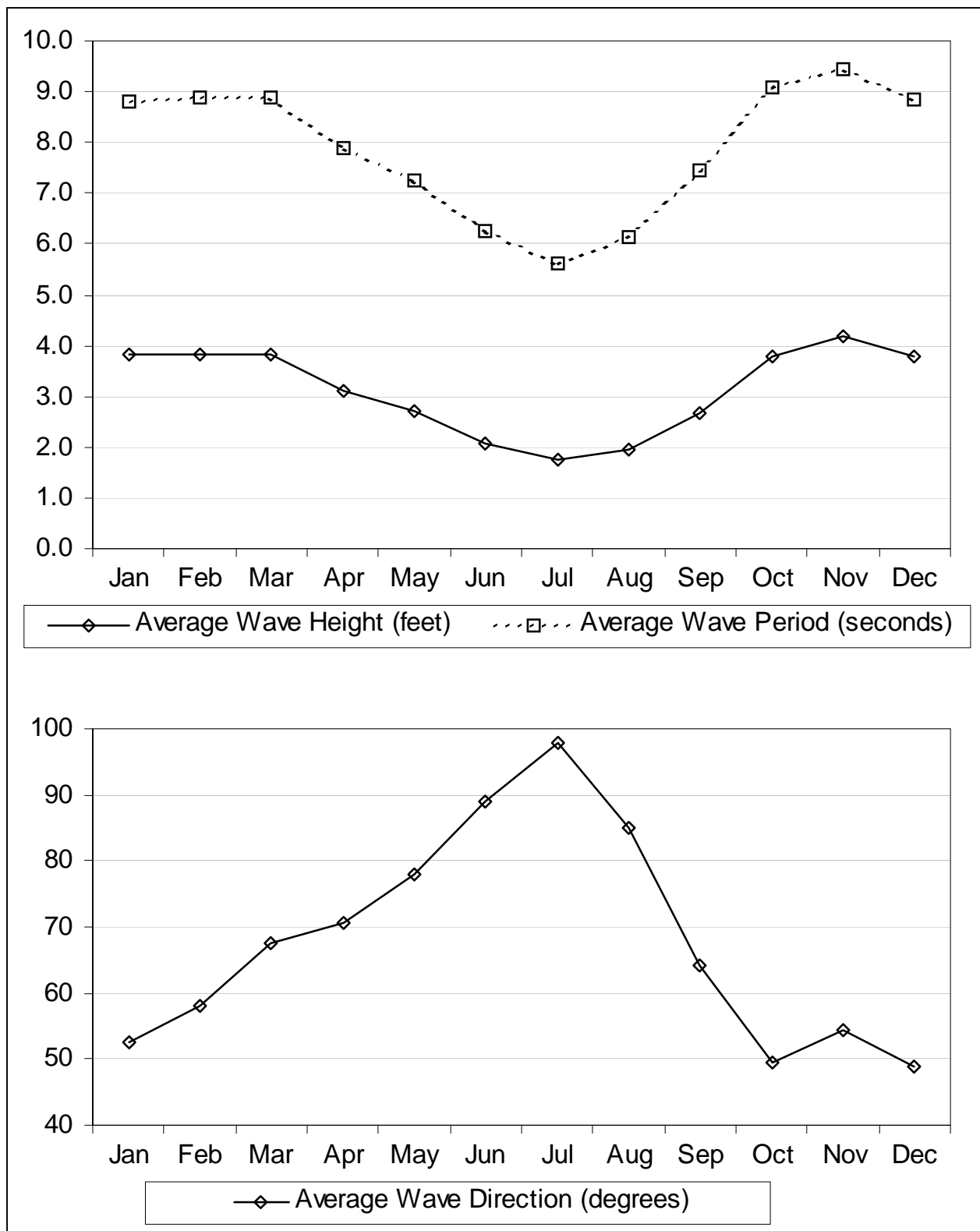
The distribution of wave heights and directions for the project area are provided in Figure 1. This data is based on wave data from the USACE (2004) Wave Information Study station 464 located at 26.33°N, 79.92°W. This is approximately 10 miles east-southeast of the Town of Highland Beach. The wave hindcast data covers a 20-year hindcast period from 1980 to 1999. In the Town of Highland Beach, the average onshore (005° to 185°) wave height is 3.1 feet, with a period of 4.8 seconds. These waves typically come from the east-northeast (068°). The highest wave hindcasted near the project area was approximately 24 feet.

One important factor that contributes to the wave climate observed within the Town of Highland Beach project area is the presence of the Bahama Banks. This geological formation limits the fetch for eastern, southeastern and some northeastern waves. Interpreting Figure 1 shows the effect the Bahama Banks has on the average wave height distribution patterns by the limited time (only July) that the average wave approaches from the south (>090°). Since most waves affecting the project area are from the northeast, the annual net movement of sand is to the south.

Extreme wave statistics for the project area are based on data of tropical storm events prior to 1980 (Dean, 1992), and the 1980-1999 wave hindcast for WIS Station 464 (USACE, 2004), which includes the effects of tropical and extratropical storms. Table 1 shows the expected return period frequency of the wave period and wave height. A Weibull distribution was used to estimate the return frequencies.

**Table 1. Extreme Wave Analysis for WIS Station 464**

Return Period (years)	Wave Height $H_{mo}$ (feet)		Wave Period $T_p$ (seconds)	
	Mean	+/- $\sigma$	Mean	+/- $\sigma$
2	10.6	1.1	8.3	0.3
5	19.9	1.4	10.1	0.4
10	25.2	2.0	11.4	0.6
20	29.8	2.6	12.7	0.9
25	31.1	2.8	13.2	1.0
50	35.0	3.3	14.5	1.3
100	38.6	3.8	15.8	1.6
200	41.9	4.3	17.2	1.9
500	46.0	4.8	19.0	2.3



**Figure 1. Offshore Wave Data for WIS Station 464.**

## 2.3 Storms

Surges and waves caused by extratropical and tropical storms (including hurricanes) are major threats to the shoreline of Highland Beach. The hurricane season extends from June 1 through November 30. Palm Beach County has averaged 1.0 land-falling tropical storms per 10 nautical miles of shoreline from 1871 to 1973 (USACE, 1987). Extratropical storms that generate waves out of the northeast also have a significant effect on the Town's shoreline. These storms are characterized by strong winds of long duration (several days) that generate swell waves. Northeaster storms typically cause more beach erosion along the coast of Highland Beach than any other event. One example of this was the northeast storm of November 1996. This storm resulted in shoreline recession of up to 22 feet (CPE, 1998).

Table 2 gives a summary of historical tropical storms affecting Highland Beach after 1975. Storm events prior to 1980 are based on data from Dean (1992). Storm events between 1980 and 1999 are based on WIS data (USACE, 2004). Storm events after 1999 were calculated from pressure, forward velocity, radius to maximum winds, and distance to the center of the Town.

**Table 2. Summary of Tropical Storms Impacting the Town of Highland Beach**

Date	Name	Deep Water Wave Height (feet)	Wave Period (sec)	Storm Surge (feet)	Wind Speed (mph)
9/3/1979	David	22.3	10.1	3.9	92
09/27/84	Isidore	24.3	12.5	4.4	43
11/19/85	Kate	17.1	11.1	3.5	35
08/24/92	Andrew	18.0	10.0	3.5	39
11/14/94	Gordon	23.3	12.5	4.2	41
08/02/95	Erin	15.1	10.0	3.2	34
11/05/98	Mitch	15.4	10.0	3.2	41
09/15/99	Floyd	24.3	12.5	4.4	42
10/15/99	Irene	21.7	10.0	3.8	56
09/05/04	Frances	33.9	9.9	4.7	104
09/26/04	Jeanne	32.0	10.9	4.3	115
8/26/2005	Katrina	12.0	8.2	1.8	59
9/20/2005	Rita	11.2	7.6	1.4	34
10/24/2005	Wilma	20.9	8.5	3.7	72
5/8/2007	Andrea	13.7	12.5	1.0	18
10/31/2007	Noel	14.5	9.7	1.1	25
8/27/2012	Isaac	13.4	8.5	0.8	43
10/27/2012	Sandy	13.8	10.2	2.0	43

## 2.4 Tides

The closest tide gauge to the project area is located at the Lake Worth Pier. The tides are semi-diurnal with a mean tidal range of 2.9 feet. Tidal datums appear in Table 3.

**Table 3. Tidal Datums at the Lake Worth Pier**

	<b>Elevation (feet, NAVD)</b>
Mean Higher High Water (MHHW)	0.58
Mean High Water (MHW)	0.44
Mean Sea Level (MSL)	-0.92
Mean Low Water (MLW)	-2.29
Mean Lower Low Water (MLLW)	-2.42

Source: NOAA (2013), <http://www.co-ops.nos.noaa.gov/benchmarks/8722670.html>

## **2.5 Storm Surge**

Storm surge is defined as the rise of the sea surface above its astronomical tide level due to storm forces. The elevation that the storm surge reaches is known as its storm stage. The increased elevation is attributable to a variety of factors including waves, wind shear stress, and atmospheric pressure. Dean et al (1992) estimated the storm stage along Palm Beach County for varying return periods. Table 4 summarizes these estimates.

**Table 4. Estimated Storm Stage**

<b>Return Period (years)</b>	<b>Storm Stage Level (feet, NAVD)</b>
50	8.2
20	6.1
10	4.2
5	1.9

## **2.6 Sea Level Rise**

The global sea level has both risen and fallen throughout geological history. Recent trends in local sea level changes can be used as indicators of what will occur in the near future. Experience indicates that as the relative sea level rises, the shoreline will be subjected to increased flooding, shoreline recession, and profile erosion. The National Ocean Service (NOS) has published sea level trends for regions along the United States coasts based on measured yearly mean sea level records. Based on tide gage records from a gage at Miami Beach, NOAA has estimated that sea level is rising along the southeast Florida coast at 2.39mm/year ([http://tidesandcurrents.noaa.gov/sltrends/sltrends\\_station.shtml?stnid=8723170](http://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=8723170)). This is equivalent to 0.78 feet/century.

Bruun (1962) proposed a formula for estimating the rate of shoreline recession based on the local rate of relative sea level rise. This methodology also includes consideration of local topography and bathymetry. Bruun's approach assumes that with a rise in sea level, the beach profile will attempt to reestablish the same bottom depths relative to the previous sea level. As a result, the beach profile shape relative to the mean water level will re-establish itself. If the longshore littoral transport in and out of a given shoreline area is equal, the quantity of material required to

re-establish the nearshore slope must be derived from shoreline recession. The effects of sea level rise on the shoreline recession can be approximated using Bruun's (1962) relationship:

$$R = LS / (h+b) \quad \text{[Equation 1]}$$

where R = shoreline recession,

S = sea level rise,

b = berm height,

h = depth of the limit of the active profile,

L = horizontal distance from the beach to the limit of the active profile.

The annual limit of the depth of the active profile, h, has been estimated using cross-shore beach profiles collected by the State (Appendix C). The profiles closed at an average depth of -28 feet, NAVD. Review of the post-hurricane surveys (Frances and Jeanne) also suggested that -28 feet, NAVD is a fair estimate of the depth of the active profile.

The estimate of shoreline recession due to relative sea level rise used -28 feet, NAVD as the depth of closure. The distance, L, from the mean high water line (+0.44 feet, NAVD) to the depth of closure is estimated to be 1,500 feet (an average value was calculated from surveys collected along FDEP survey monuments R-191 through R-204). Using a berm height, B, of 8 feet and a sea level rise rate of 0.0078 feet/year, the shoreline recession due to sea level rise is calculated to be 0.33 feet/year using Bruun's rule.

The National Research Council (1987) has estimated that sea level rise may accelerate in the future to a rate of approximately 0.04 feet/year. For this extreme rate of sea level rise, Equation 1 yields a recession rate of 1.67 feet/year. However, until a higher rate of sea level rise is documented, it is recommended that any plans use the observed sea level rise rate.

### **3 HISTORIC CONDITIONS**

This section discusses the historic shoreline and volumetric changes within the Town of Highland Beach. This data and analysis, along with observations documented in Section 4, will be used to evaluate the need and extent of coastal protection alternatives.

#### **3.1 Data**

This analysis was performed using the latest available beach profile data. No field data collection was performed as part of this work beyond a site visit conducted in January 2013 to document the existing conditions, which will be discussed in Section 4.

The Florida Department of Environmental Protection (FDEP) and Palm Beach County have collected beach surveys over the last several decades. These have been collected at FDEP monuments, which are shown on Figure 2 through Figure 6. The northern limit of the Town of Highland Beach is located approximately 950 north of R-191 and 200 feet south of R-190. The southern limit of the Town of Highland Beach is located approximately 175 feet south of R-204.

The earliest available beach profile data set was collected in January 1975 (FDEP, 2013). Other available data sets that included the entire beach profile from the dune crest out to the depth of closure include October 1990 and October 2008 surveys. Profiles were also collected before and after Hurricane Jeanne (April 2004 and November 2004).

No pre or post-Hurricane Sandy data was available during the drafting of this report. No rectified aerial photographs were collected in 2012 either, which could have been used to determine shoreline location. Thus, no quantifiable impacts to the coastal system (shoreline and/or volume changes) from Hurricane Sandy could be included in this report.

Annual surveys of exposed hard bottom (rock outcrops) have been collected from 1993 through 2009 by Palm Beach County Environmental Resource Management.

### **3.2 Shoreline Change Analysis**

A shoreline change analysis was performed using the available data. The shoreline change data is summarized in Table 5 while the annualized shoreline change is shown in Table 6. The shoreline locations from the 1975, 1990 and 2008 surveys have been plotted on Figure 2 through Figure 6.

These figures and tables highlight that the beach throughout most of the Town of Highland Beach is advancing and actually moving seaward. The average shoreline advance is 1.2 feet/year between January 1975 and October 2008. The tables and figures also show that the beach to the north is advancing more relative to the beach at the center of the Town while the beach at the southern end of the Town is receding.

This trend can be directly related to the beach nourishment program in Delray Beach. There have been six beach nourishment projects in Delray Beach since 1973 (1973, 1978, 1984, 1992, 2002, and 2005). A seventh project is currently under construction (March 2013). The sand placed during these projects is working its way south along the coast through natural coastal processes causing an average shoreline advance within the Town of Highland Beach. This trend is expected to continue into the future assuming that Delray Beach continues to conduct through periodic beach renourishment projects.

Comparing the 1975 to 1990 and the 1990 to 2004 could suggest that the trend of shoreline retreat at the southern end of the Town could be switching from one of retreat to one of shoreline advance. This trend was drastically reversed by Hurricanes Frances and Jeanne, which both impacted the project area in September 2004 and caused substantial shoreline retreat. The higher rate of shoreline advance observed between November 2004 and October 2008 is attributed to recovery of the shoreline following these events. A similar type of shoreline recovery was observed following Hurricane Sandy.

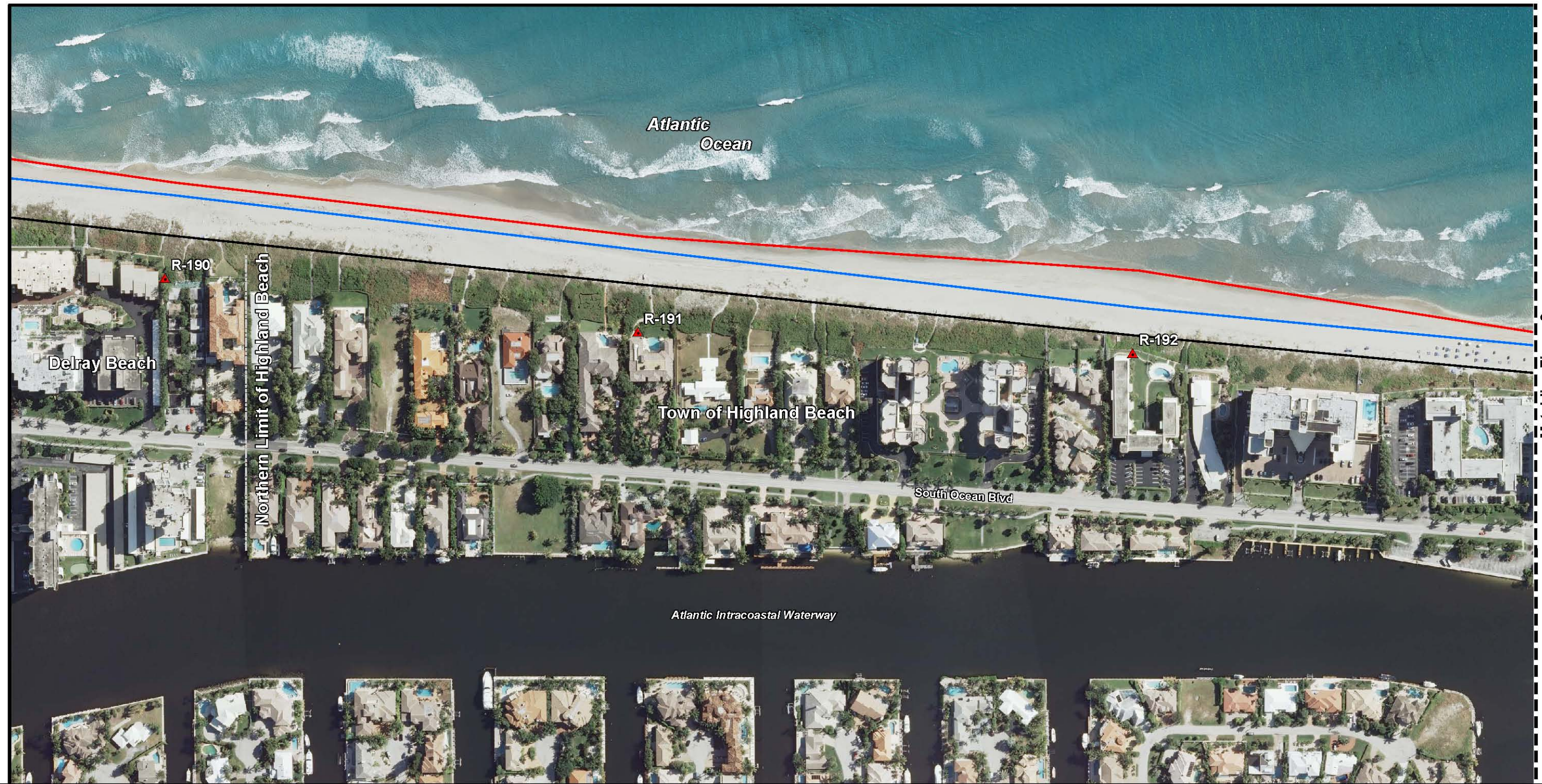
The analysis of shoreline impacts from Hurricanes Frances and Jeanne reveals the susceptibility of the shoreline location to large storm events. The average shoreline retreat between April 2004 and November 2004 was approximately 34 feet throughout the Town though it was as high as 79 feet (at R-194). In some areas, the distance from the mean high water line to the base of the dune is only 30 to 40 feet.

**Table 5. Shoreline Change Summary**

Profile	Shoreline Change (feet)				
	Jan 1975 to Oct 1990	Oct 1990 to Apr 2004	Apr 2004 to Nov 2004	Nov 2004 to Oct 2008	Jan 1975 to Oct 2008
<b>R-191</b>	83.1	5.3	-24.7	53.2	116.9
<b>R-192</b>	68.1	34.7	-26.6	82.1	158.3
<b>R-193</b>	68.0	55.4	-55.2	14.4	82.6
<b>R-194</b>	49.3	62.5	-79.3	33.4	65.9
<b>R-195</b>	10.8	49.1	-29.8	22.2	52.3
<b>R-196</b>	50.5	-10.0	-15.8	19.0	43.7
<b>R-197</b>	28.2	13.2	-18.9	5.0	27.5
<b>R-198</b>	8.4	19.4	-45.8	35.3	17.3
<b>R-199</b>	-14.9	3.5	2.6	-1.6	-10.4
<b>R-200</b>	-33.7	12.7	-38.6	31.1	-28.5
<b>R-201</b>	5.9	0.3	-15.3	28.4	19.3
<b>R-202</b>	-18.7	1.3	-27.7	24.3	-20.8
<b>T-203</b>	-27.0	24.3	-56.2	26.8	-32.1
<b>R-204</b>	43.0	20.2	-42.2	32.0	53.0
<b>Average</b>	<b>22.9</b>	<b>20.9</b>	<b>-33.8</b>	<b>29.0</b>	<b>38.9</b>

**Table 6. Annualized Shoreline Change Summary**

Profile	Annualized Shoreline Change (feet/year)				
	Jan 1975 to Oct 1990	Oct 1990 to Apr 2004	Apr 2004 to Nov 2004	Nov 2004 to Oct 2008	Jan 1975 to Oct 2008
<b>R-191</b>	5.3	0.4	-41.2	13.6	3.5
<b>R-192</b>	4.3	2.6	-44.3	21.1	4.7
<b>R-193</b>	4.3	4.1	-92.0	3.7	2.5
<b>R-194</b>	3.1	4.6	-132.2	8.6	2.0
<b>R-195</b>	0.7	3.6	-49.7	5.7	1.6
<b>R-196</b>	3.2	-0.7	-26.3	4.9	1.3
<b>R-197</b>	1.8	1.0	-31.5	1.3	0.8
<b>R-198</b>	0.5	1.4	-76.3	9.1	0.5
<b>R-199</b>	-0.9	0.3	4.3	-0.4	-0.3
<b>R-200</b>	-2.1	0.9	-64.3	8.0	-0.8
<b>R-201</b>	0.4	0.0	-25.5	7.3	0.6
<b>R-202</b>	-1.2	0.1	-46.2	6.2	-0.6
<b>T-203</b>	-1.7	1.8	-93.7	6.9	-1.0
<b>R-204</b>	2.7	1.5	-70.3	8.2	1.6
<b>Average</b>	<b>1.5</b>	<b>1.5</b>	<b>-56.4</b>	<b>7.4</b>	<b>1.2</b>



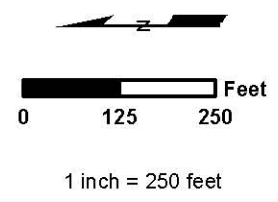
Matchline Figure 3

**Notes:**

1. Coordinates are in feet based on the Florida State Plane Coordinate System, East Zone, North American Datum of 1983 (NAD 83).
2. November 2010 aerial photography was downloaded from the U.S. Geological Survey.

**Legend:**

- ▲ FDEP Monuments
- MHW - January 1975
- MHW - October 1990
- MHW - October 2008



**Figure 2. Shoreline and Hardbottom Map, R-190 to R-192**

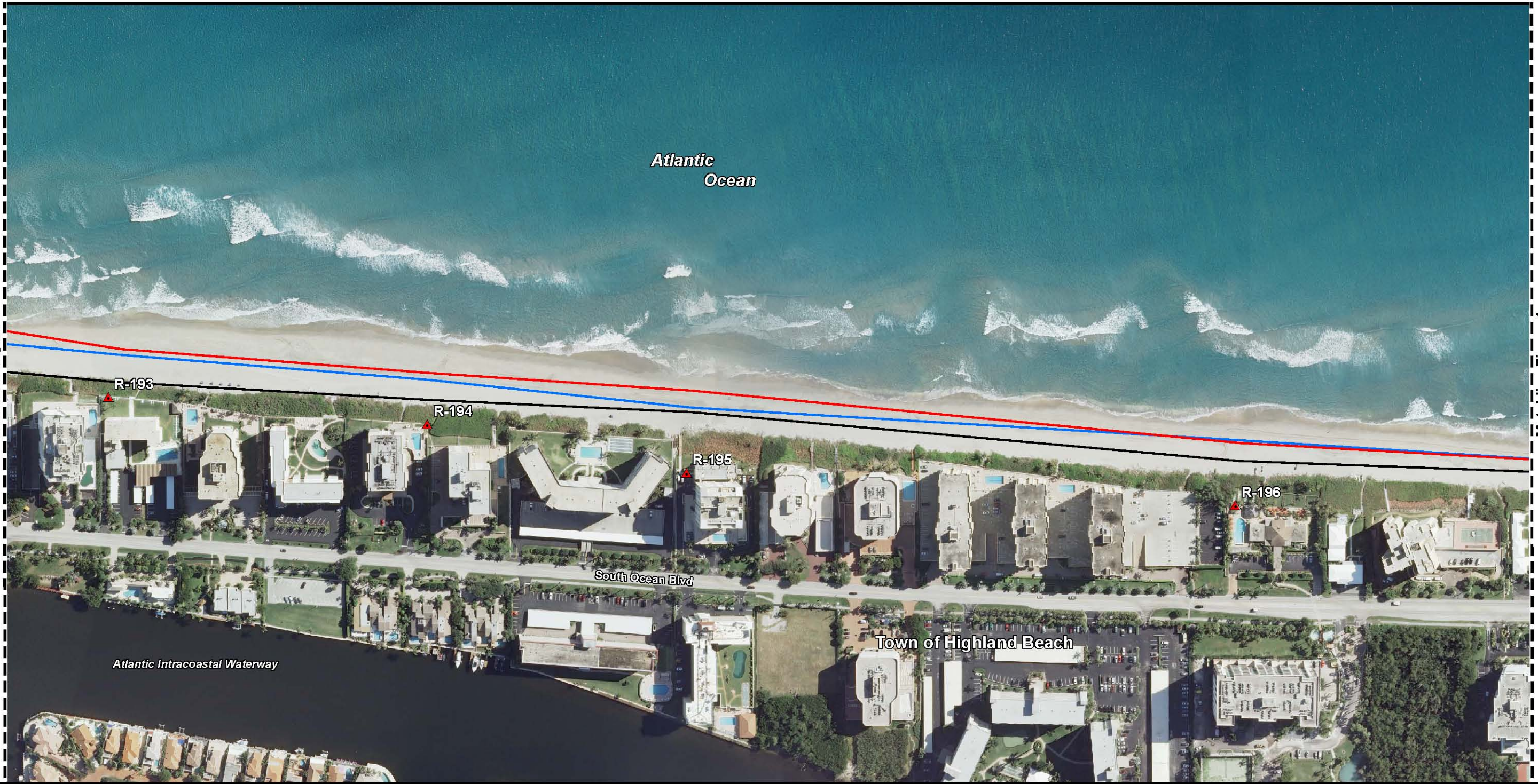


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Date: 02/27/13	By: HMV	Comm No. : 148901	<b>Figure No. 2</b>
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Matchline Figure 2



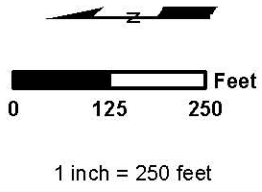
Matchline Figure 4

**Notes:**

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2. November 2010 aerial photography was downloaded from the U.S. Geological Survey.

**Legend:**

- ▲ FDEP Monuments
- MHW - January 1975
- MHW - October 1990
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**Figure 3. Shoreline and Hardbottom Map, R-193 to R-196**

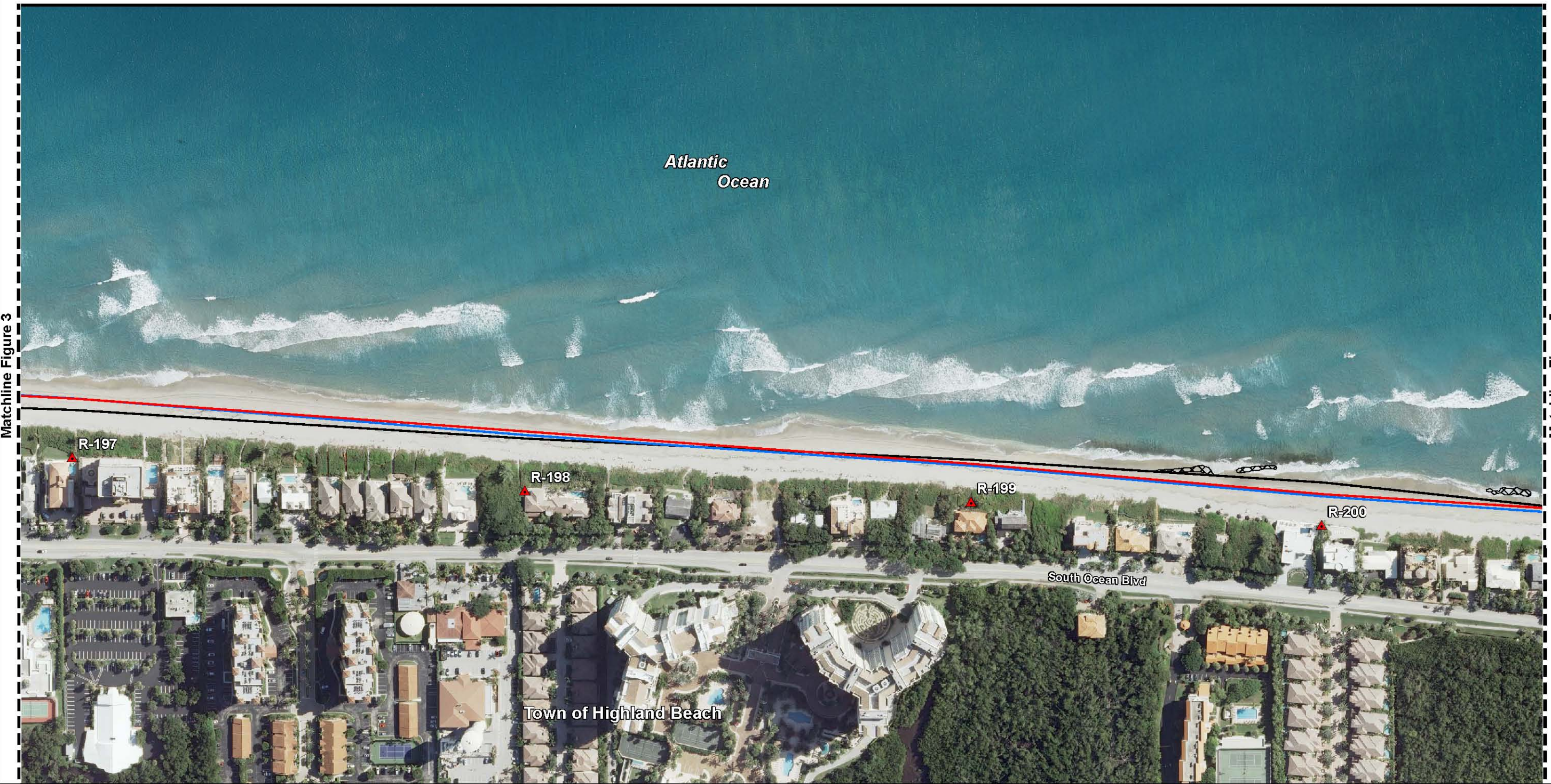


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Matchline Figure 3

Matchline Figure 5

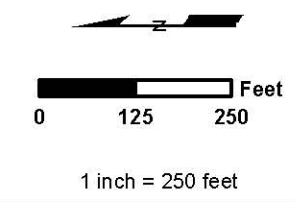


**Notes:**

1. Coordinates are in feet based on the Florida State Plane Coordinate System, East Zone, North American Datum of 1983 (NAD 83).
2. November 2010 aerial photography was downloaded from the U.S. Geological Survey.
3. The 2009 hardbottom was delineated by Palm Beach County Environmental Resource Management.

**Legend:**

- ▲ FDEP Monuments
- MHW - January 1975
- MHW - October 1990
- MHW - October 2008
- ⊗ Hardbottom (2009)



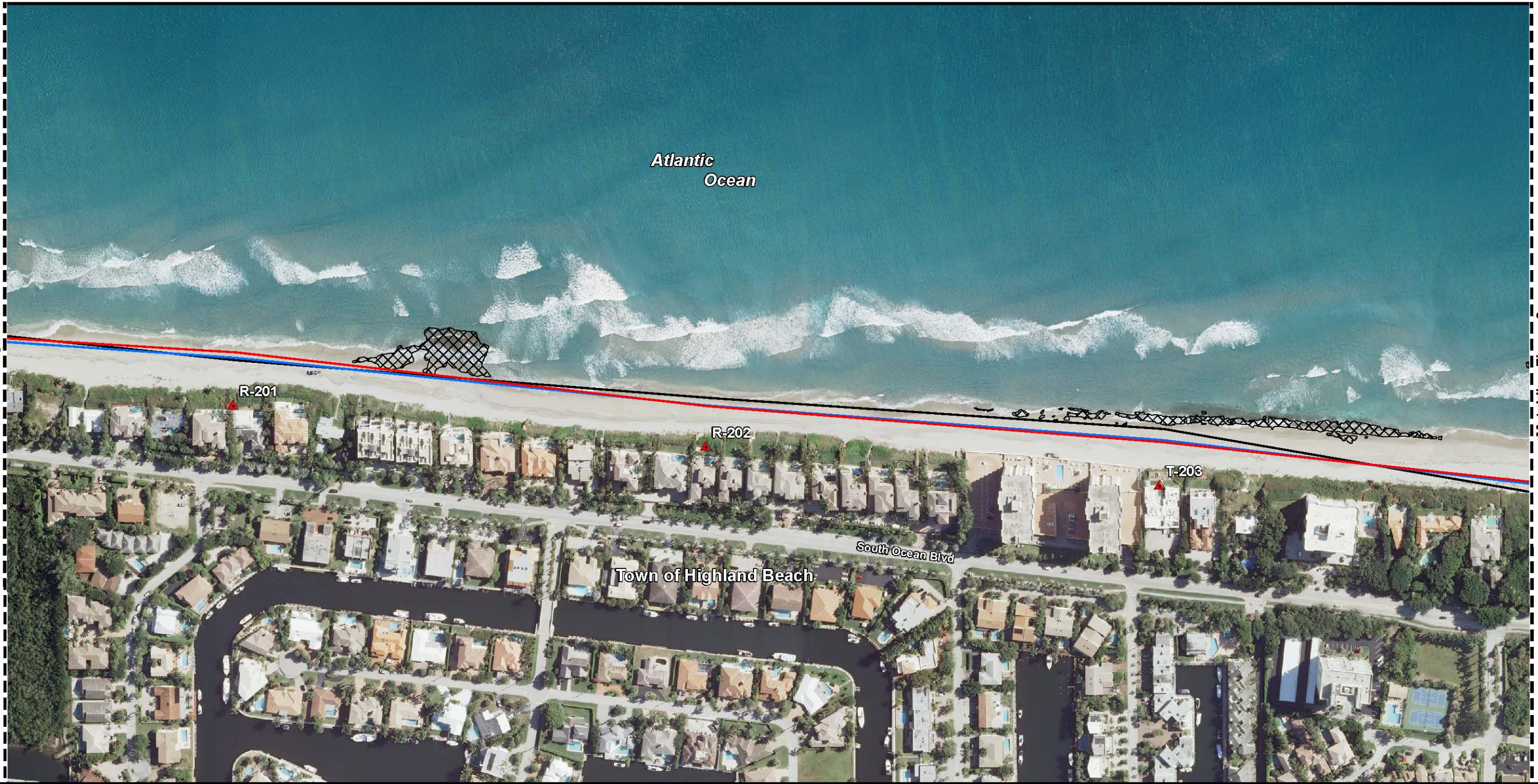
**Figure 4. Shoreline and Hardbottom Map, R-197 to R-200**



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Matchline Figure 4



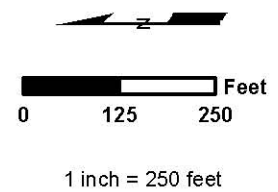
Matchline Figure 6

**Notes:**

1. Coordinates are in feet based on the Florida State Plane Coordinate System, East Zone, North American Datum of 1983 (NAD 83).
2. November 2010 aerial photography was downloaded from the U.S. Geological Survey.
3. The 2009 hardbottom was delineated by Palm Beach County Environmental Resource Management.

**Legend:**

- ▲ FDEP Monuments
- MHW - January 1975
- MHW - October 1990
- MHW - October 2008
- ⊗ Hardbottom (2009)



**Figure 5. Shoreline and Hardbottom Map, R-201 to R-203**

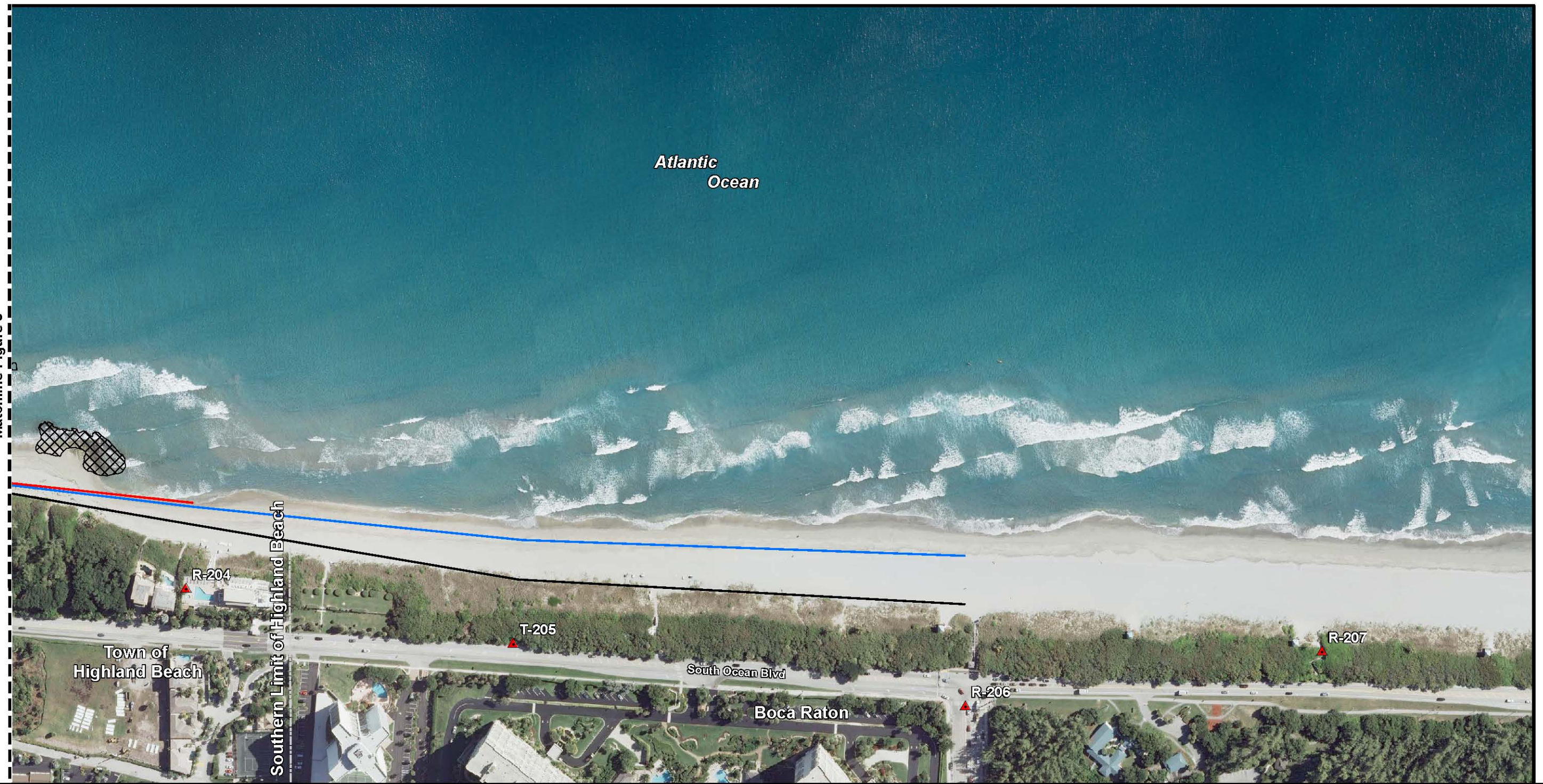


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Date: 02/27/13 By: HMV Comm No. : 148901 **Figure No. 5**

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Matchline Figure 5

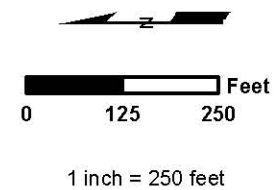


**Notes:**

1. Coordinates are in feet based on the Florida State Plane Coordinate System, East Zone, North American Datum of 1983 (NAD 83).
2. November 2010 aerial photography was downloaded from the U.S. Geological Survey.
3. The 2009 hardbottom was delineated by Palm Beach County Environmental Resource Management.

**Legend:**

- ▲ FDEP Monuments
- MHW - January 1975
- MHW - October 1990
- MHW - October 2008
- ⊗ Hardbottom (2009)



**Figure 6. Shoreline and Hardbottom Map, R-204 to R-207**



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Date: 02/27/13 By: HMV Comm No. : 148901 **Figure No. 6**

### 3.3 Volumetric Change Analysis

The shoreline can be indicative of the condition of the entire beach profile but a better representation of the beach condition is the volume within the beach profile. Natural onshore and offshore movement of sand will occur throughout the year causing the shoreline to move though the beach is still in a healthy condition. A volumetric change analysis from the dune out to -28.0 feet, NAVD shows how the entire beach profile is performing. Unfortunately, not all of the January 1975 profiles extended seaward to -28.0 feet, NAVD so this analysis was performed using only the profiles that extended this far (approximately every third 1975 profile line).

Table 7 shows that all of the profiles within the Town of Highland Beach (THB) accreted sand between 1975 and 2008. As with the shoreline change, there is a general trend of greater accretion at the north end of the Town and less accretion at the south end of Town. This again suggests that the volumetric increase is a function of sand migrating south into the Town from Delray Beach. Delray Beach has placed in excess of 6.25M cubic yards of sand on their beach since 1973 so approximately 1/3 of this volume has moved into the Town of Highland Beach.

**Table 7. Volumetric Change Summary above -28.0 feet, NAVD**

Profile		Distance between Profiles (feet)	Volumetric Change above -28.0 feet, NAVD (cubic yards)		
From	To		Jan 1975 to Oct 1990	Oct 1990 to Oct 2008	Jan 1975 to Oct 2008
Limit of THB	R-191	955	80,000	88,400	168,400
R-191	R-192	1,209	101,200	111,900	213,100
R-192	R-195	2,662	254,900	224,300	479,200
R-195	R-198	3,300	294,400	242,500	536,900
R-198	R-201	3,052	228,700	170,800	399,500
R-201	R-204	3,627	233,100	127,200	360,300
R-204	Limit of THB	175	8,700	5,100	13,800
<b>Total</b>		<b>14,980</b>	<b>1,201,000</b>	<b>970,200</b>	<b>2,171,200</b>

Examining the beach profiles in Appendix A suggests that the majority of this sediment has stayed in the offshore portion of the profile. This would be expected as finer sediments can be transported more easily from the Delray Beach project and will tend to accumulate in the deeper portion of the beach profile. While sand in the offshore profile still provides storm protection to the Town, the greatest value this profile provides is in stabilizing any fill placed above mean high water by upland property owners.

Although the Town's beach has benefited from this accumulation of sediment, the natural offshore transport has not resulted in year-over-year shoreline advance to facilitate natural dune build-up. A volumetric analysis was performed that showed the volumetric gain above mean high water (0.44 feet, NAVD) was only 122,700 cubic yards between 1975 and 2008 (Table 8), which is less than 6% of the total volumetric gain. A further analysis of volume change above +

5 feet, NAVD showed a gain of only 16,300 cubic yards, some or all of which may be attributed to sand placement by upland property owners.

**Table 8. Volumetric Change Summary above Mean High Water (+0.44 feet, NAVD)**

Profile		Distance between Profiles (feet)	Volumetric Change above +0.44 feet, NAVD (cubic yards)		
From	To		Jan 1975 to Oct 1990	Oct 1990 to Oct 2008	Jan 1975 to Oct 2008
Limit of HB	R-191	955	19,900	15,600	35,500
R-191	R-192	1,209	17,800	24,100	41,900
R-192	R-193	1,238	1,600	18,100	19,700
R-193	R-194	781	2,100	7,600	9,700
R-194	R-195	643	8,000	11,100	19,100
R-195	R-196	1,341	13,800	17,800	31,600
R-196	R-197	851	5,600	2,700	8,300
R-197	R-198	1,108	3,900	5,500	9,400
R-198	R-199	1,090	-9,800	6,600	-3,200
R-199	R-200	858	-11,600	3,500	-8,100
R-200	R-201	1,105	-5,000	4,600	-400
R-201	R-202	1,157	-25,300	3,800	-21,500
R-202	T-203	1,111	-23,200	-2,400	-25,600
T-203	R-204	1,358	-200	4,200	4,000
R-204	Limit of HB	175	200	2,100	2,300
<b>Total</b>		<b>14,980</b>	<b>-2,200</b>	<b>124,900</b>	<b>122,700</b>

### 3.4 Environmental Resources

There are numerous rock out crops (hardbottom) throughout the Town of Highland Beach. The nearshore hardbottom resources within Highland Beach are part of the Nearshore Ridge Complex (NRC), a combination of shallow colonized pavement and ridges of relatively flat, low-relief carbonate rock (Walker, 2012). Most of the exposed rock is located at the south end of the Town, the most prominent being Yamato Rock.

The NRC potentially serves a variety of ecosystem functions, including settlement and nursery areas, spawning sites, feeding areas, and shelter for hundreds of species of macroalgae, fish and invertebrates such as stony corals and octocorals (Lindeman *et al.*, 2009; Lindeman and Snyder, 1999). The hardbottom resources adjacent to Highland Beach are located in the intertidal and subtidal zones and are subject to high wave energy and constant sand movement. The benthic community is generally dominated by turf algae and macroalgae, with invertebrates including tunicates and sponges. It is characterized by a low-density coral community, predominantly of small colonies of *Siderastrea* spp. (less than 2 cm), a species that dominates the nearshore habitat of south Florida and is considered relatively sediment-tolerant (Lirman *et al.*, 2002).

Much of this hardbottom is ephemeral in nature but is important for the environmental system and must be considered when evaluating beach restoration alternatives within the Town. The latest available data outlining the extent of the hardbottom is a survey conducted by Palm Beach County Environmental Resource Management in 2009. These hardbottom extents are shown in Figures 2 through 7 and total approximately 1.2 acres.

#### **4 EXISTING CONDITIONS**

A site visit was conducted in January 2013 to document the condition of the visible portion of the beach.

The beach in the northernmost quarter mile of the Town is backed by single family homes (2355 to 2545 S Ocean Blvd). There is a well-developed, vegetated dune system with the crest elevation of the dune approaching 20 feet, NAVD. The beach was wide with a berm and a mild foreshore slope (Photo 1). No impacts following Hurricane Sandy were apparent. Profile R-191 is representative of this stretch of beach. Profiles comparing the beach condition in January 1975, October 1990, and October 2008 can be found in Appendix A.



**Photo 1. View Looking north from the Carlton House Condominium. Note the wide beach, vegetated dune and overall setback of property from the shoreline.**

The next mile of beach (2565 to 3407 S Ocean Blvd, Townhouses of Highland Beach Condominium to the Clarendon Condominium) is composed primarily of condominiums with

the Holiday Inn being the one exception. Again, there is a vegetated dune throughout this area though it varied from 75 to 100 feet wide in the northern section to as narrow as 40 feet wide in front of the Ambassadors Condominium. The beach in front of the vegetated dune varied from 60 to 90 feet though this will vary depending on the time of year (Photo 2). The beach had a berm and relatively flat foreshore slope indicative of a healthy beach profile. Profiles R-192 through R-196 show the historic beach cross-sections in this section of the beach.



**Photo 2. View looking north along the beach in front of the Holiday Inn. Note the berm and mild foreshore slope.**

A study by the Florida Department of Natural Resources (2002) determined that 200 square feet of dry beach is required for normal beach activity by the average person. Given a daily turnover rate of 2, this corresponds to 100 square feet per person per day. Thus, the beach in front of the Holiday Inn's property (400 feet long with a 100-foot wide beach on average) will support 400 visitors per day. With 115 rooms, the existing beach should provide sufficient recreational area to support hotel guest needs. While a similar analysis of all the condominiums in this section of beach was not performed, it can be assumed that beach usage at a hotel will be higher than adjacent condominiums and similar building densities apply. Thus the beach in this area should support the recreational demand.

All of the observed properties had a seawall protecting the main structure though the seawall was typically buried or level with the top of dune. The seawall at the Holiday Inn (Photo 3) appeared to be at an elevation typical of other seawalls through this section. The condition of the seawalls was not reviewed during the development of this report and it is assumed that they were constructed per Florida building codes and statutes. As such, they should protect the upland

structure from up to a 50-year return period storm event, if be designed, constructed and maintained per the code.



**Photo 3. View looking north at the Holiday Inn. Note the seawall at the left side of the photo and vegetated dune in front of the seawall.**

The next section of beach from 3419 to 3907 S Ocean Blvd is approximately 0.55 miles long and is mostly composed of single family homes except for a few condos at the north end (Villanova, Villas at Highland Beach and Ocean Reef Condo). This section also contains the beach club for Toscana and the beach access of the Highland Beach Club. Thus, while it's mostly single family homes along the beach side, there is still a high recreational value for the beach in this section.

Mr. Berman, Toscana Homeowner's Association Community Association Manager, indicated that there were approximately 850 residents of the Toscana properties (personal communication, 2012) during peak season. He estimated that 130 to 140 residents visit the beach per day during the peak season. The beach should have a dry width of 90 feet to provide optimal recreational benefit for this usage, assuming 100 square feet of beach needed per visit/day, and the Toscana property length of 160 feet. The beach width observed in January 2013 was only half this width (50 feet).

Along this section of the Town's shoreline, impacts from Hurricane Sandy started to become evident. Sections of dune vegetation had been damaged and undermined (Photo 4) and scarping was visible along the shoreline. The elevation of the dune seemed sufficient and a review of Profiles R-197 and R-198 suggest that the dune has sufficient elevation at +18 feet, NAVD to +20 feet, NAVD. Profile R-199 had a lower dune elevation at +12 feet, NAVD, which provides

limited protection. For example, a typical lower grade beam elevation would be +14 feet, NAVD in this section of Palm Beach County.



**Photo 4. View looking north from the Toscana Beach Club. Note the narrow beach width and steep face at the toe of vegetation indicative of storm damage.**

The next 0.6-mile section of beach (3912 S Ocean Blvd to 11 Ocean Place, Regency Highland Club to Ocean Place Estates) was grouped because it consisted primarily of single family homes and low density condominiums (Ocean Place Villas and Coco-de-Mer Condominium). The Regency Highland Club also has a beach access in this reach, which is almost 200 feet long. The beach is sufficiently wide to provide recreational benefits to the club's 210 units.

Only two homes do not have a vegetated dune in front of their property (3921 and 4001 S Ocean Blvd). All the other properties have a vegetated dune though the width and height vary. The beach is too narrow to support a sustainable dune, and impacts to the dune during a major storm event should be expected. It was apparent that residents had truck hauled sand to rebuild the dune following the passage of Hurricane Sandy (Photo 5). However, the beach in this section will provide storm damage protection benefits to the homes under higher frequency, low intensity storms.



**Photo 5. View Looking north from the Ambassadors Condominium. Note the rock outcrop and newly rebuilt dune in front of Ocean Place Estates.**

All of the homes appear to have a seawall buried within the dune and it is our understanding that the Ocean Place Estates have one continuous seawall. Therefore, the beach in this section is adequate to serve the current needs of the residents though rebuilding of the dune may periodically be necessary following a large storm event.

Persistent hard bottom first appears in this reach (Figures 3 and 4). This environmental resource appears to pin the shoreline as there is a small bulge in the shoreline in the immediate vicinity of exposed hard bottom (Photo 5). The shoreline is set further back between the rock outcrops.

The 0.3 miles at the south end of the Town extending from the Ambassadors Condominium (4505 S Ocean Blvd) to Yamato Rock are the most critical sections of beach within the Town limits. The beach is narrow (less than 25 feet) and the berm is scarped and low (Photo 6). Scarping of the dune due to the passage of Hurricane Sandy was evident as was damage to property (Photo 7). It appeared that the Ambassador's Condominium had rebuilt the staircase from the pool deck to the beach following Hurricane Sandy. Other properties also needed to bring sand to prevent further undermining of their property (Photo 8). Examining the profile R-203 suggests that the dune is substantial in this area (+20 feet, NAVD) though the history suggests retreat of the dune feature.



**Photo 6. View looking north from Yamato Rock. Note the narrow beach width, steep profile and scarping of the berm and dune.**



**Photo 7. View of a scarped dune and beach erosion. Note that there is an approximate paint line on the staircase, which generally indicates a previous beach elevation and shows erosion of the beach. The missing handrail suggests recent damage from Hurricane Sandy.**



**Photo 8. Deflation of the dune underneath the deck at 4513 S Ocean Blvd, likely as a result of Hurricane Sandy.**

South of Yamato Rock, the beach is stable and healthy and the three properties (4713, 4715 and 4801 S Ocean Blvd) have a 50-foot wide vegetated dune and 100-foot beach in front of the structures (Photo 9). The dune crests at approximately +20 feet, NAVD (FDEP profile R-204). This section of beach has benefited from the North Boca Raton Beach nourishment projects constructed in 1988, 1998, and 2011.



**Photo 9. View looking south from Yamato Rock.**

## **5 PROBLEM IDENTIFICATION AND ALTERNATIVES**

The review of historic and existing conditions suggests that the Town's beaches are performing very well overall. They have benefited from the beach nourishment projects constructed in Delray Beach and the natural north to south transport of sand. This natural movement of sand has widened the beaches at the north end of Town and resulted in a relatively stable beach in the center of Town. The beaches at the southern end of the Town are narrow and stable to erosional. Some condominiums at the south end of Town could benefit from a wider beach for recreational purposes while other properties will continue to experience damage during lower frequency storm events.

The primary issue along the Town's beaches is shoreline recession and dune impacts during a large storm event. The analysis shows that significant shoreline recession and dune erosion occur and the recovery can be slow. Many residents reconstruct their dunes using upland sand, which requires permitting unless a State of Emergency is declared.

The following options are available:

### **5.1 No Action by the Town of Highland Beach**

The Town's beaches are performing relatively well and no infrastructure is under imminent threat. Upland property owners have reconstructed their dunes following storm events and this practice should be encouraged.

Reconstruction of the dunes using sand from upland borrow sources requires an FDEP field permit. For quantities less than 200 cubic yards, the property owner can apply for and be issued a permit by the FDEP's field representative. Permits for volumes in excess of 200 cubic yards are issued by FDEP staff in Tallahassee. The basic permit requirements are for the sand to be beach compatible. Given that this action is typically performed on a small scale (up to a dozen truck loads per owner), there is limited impact on the Town's infrastructure or traffic patterns.

Following significant storm events, such as Hurricane Sandy, the FDEP may issue an Emergency Order. A typical Emergency Order allows the Town to issue permits to individual property owners in lieu of an FDEP permit and allows:

- Activities to secure structures for safety purposes.
- Temporary armoring that must be removed within 60 days of installation
- Repair or replacement of minor ancillary structures (such as stairs, landings and HVAC platforms) and service utilities necessary for occupancy of a habitable structure.
- Repair of foundations for buildings that have not been substantially damaged.
- Replacement or repair of caps and anchoring systems for seawalls or bulkheads.
- Restoration of a damaged dune system using beach compatible sand.

A copy of the Emergency Order issued after Hurricane Sandy is included in Appendix B for your reference and better details work the Town may approve.

The Town's Comprehensive Plan was reviewed and is sufficient to ensure that any new building follows Florida's building statutes.

The No Action alternative will leave residents and the Town having to respond to any future large hurricane events in a manner similar to the response following Hurricane Sandy. The No Action alternative does not address recreational and storm damage reduction issues identified within the Town, though these are mostly located in the southern end. It is recommended that the Town residents consider a more pro-active position with respect to their beach program.

### **5.2 Dune Restoration and Enhancement**

A Town wide dune restoration and enhancement project could be developed. A template would be developed for various sections of the Town that would meet the needs of the upland property owners from a recreation and storm damage reduction perspective.

It is possible that a proposed dune section would be completely encompassed by the current beach profile such that the project would not need to be constructed at a given location at this time. However, in the case of a storm event, the Town would hold a permit to reconstruct the dunes in the impacted area regardless of whether an Emergency Order was issued.

There are several advantages to this approach:

- Once engineered and constructed, the Town could apply for FEMA reimbursement to rebuild the dunes if the project was impacted by a large storm event and the County was included in a Federal Emergency Declaration.
- This project would be constructed via truck haul allowing small quantities to be placed in discrete locations.
- The Town could budget and address small sections of the Town each year rather than having a large capital outlay.
- The upland property owner could construct the dune using private funds avoiding construction costs for the Town. The upland property owner would benefit from the Town having performed the legwork to obtain a standing permit.
- A truck haul project has relatively low mobilization costs allowing most of the cost to be spent on sand.
- By limiting sand placement above mean high water, the effort to obtain a permit is reduced.
- There are no impacts to the riparian rights of the upland property owners. Upland property owners currently own the land to the mean high water and they would retain this right.

The disadvantages to this approach include:

- Sand would only be placed above mean high water limiting the volume of sand that could be placed and hence the storm damage reduction benefit.
- There would be no seaward shift of the shoreline and thus no increase in recreational space along the beach.
- The cost of upland sand placement has a high per cubic yard cost.
- The Town has limited beach access points to construct this type of project.
- This could take a significant level of coordination on the part of the Town to develop, administer and maintain the permit.

The City of Delray Beach just constructed a similar project for areas outside of their main beach restoration area. The mobilization cost was \$75,000 while the unit cost was \$54.50/cubic yard.

The minimum dune size that would be recommended for the Town of Highland Beach would be 6 cubic yards/foot. This would maximize the Town's eligibility for FEMA reimbursement. This equates to a fill volume of approximately 90,000 cubic yards. The approximate cost of this project would be \$4.6M.

### 5.3 Beach Nourishment Project

A beach nourishment project would likely involve advancing the shoreline seaward by approximately 50 feet as this is the design profile applied for the Delray Beach and North Boca Raton projects. This would provide greater storm damage reduction and recreational benefits.

Delray Beach and North Boca Raton have wider beaches than this to account for background erosion rates but the Town of Highland Beach has a relatively stable beach and would not require this additional fill. The design berm elevation of the Delray Beach and North Boca Raton beach nourishment projects is at +7.5 feet, NAVD and a similar berm crest elevation is proposed for the Town of Highland Beach (Figure 7). The approximate fill volume required to construct this template throughout the entire 2.84 miles of the Town is approximately 1.0M cubic yards.

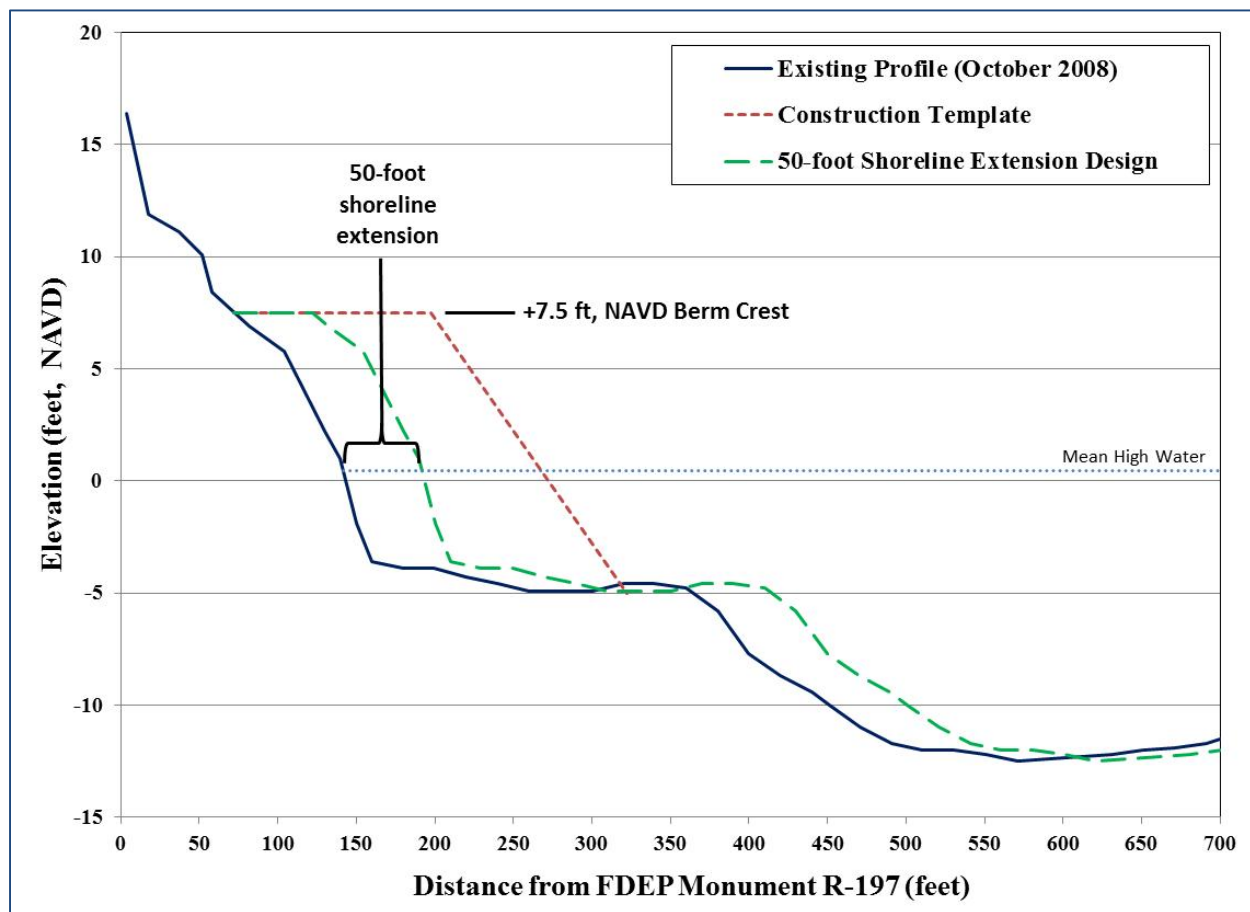


Figure 7. Typical Cross-Section of the Proposed Beach Nourishment Project

The beach would be built wider than the 50-foot design width for constructability purposes. The construction template might shift the shoreline up to 150 feet offshore, but the profile would then reshape to a more natural condition and the shoreline would stabilize approximately 50 feet seaward of the pre-construction shoreline. This might take up to a year though a large storm would speed the “equilibration” process.

The cost to construct this project in 2014 would be approximately \$9.5M. This includes a mobilization cost of \$4.0M and a unit cost of \$5.50 per cubic yard. It would be possible to reduce this cost by sharing in the mobilization cost with either Boca Raton or Delray Beach when they construct their next project. Given that Delray Beach is about to construct their next project and Boca Raton just finished North Boca Raton, it could be several years until the timing is conducive for this partnering. A 5 year delay in the project could increase costs to \$14M given the rate of dredge cost inflation over the last 10 years. Splitting the mobilization cost with Boca Raton or Delray Beach could reduce the project cost to \$12M. The permit for initial construction of such a project is good for 5 years, providing time to coordinate with your neighbors.

Some of the advantages of a full beach nourishment project include:

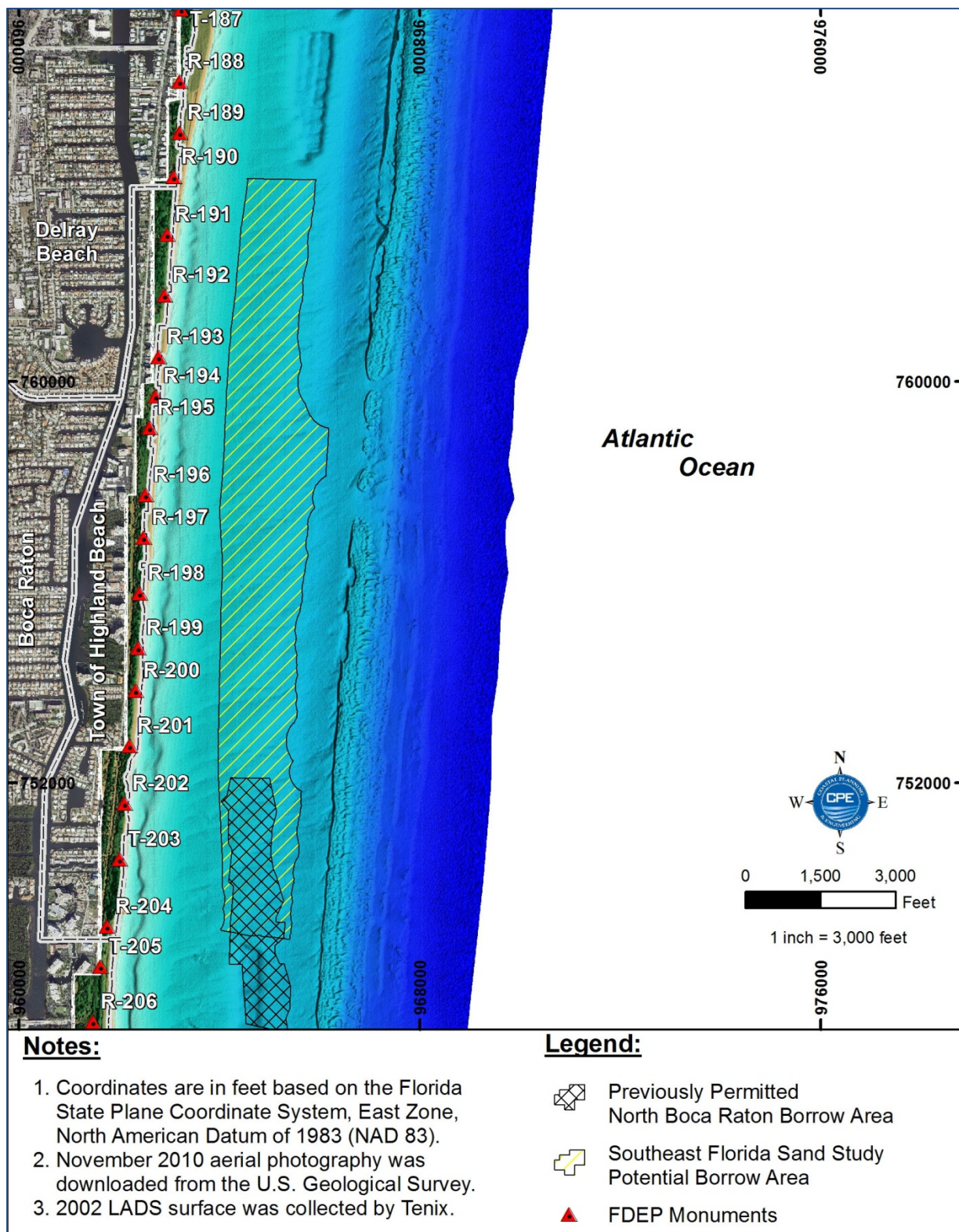
- The project would provide significant storm damage reduction benefits.
- The project would provide additional recreational benefits.
- The Town could apply for FEMA reimbursement to rebuild a portion of the project (up to 6 cubic yards/foot) if the project was impacted by a large storm event and Palm Beach County was included in a Federal Emergency Declaration.
- The unit cost for this type of fill is much lower than a truck haul project.

The disadvantages of a beach nourishment project:

- A nourished beach becomes State land seaward of the pre-construction mean high water line. An Erosion Control Line (ECL) is established as part of the permitting process, which is the mean high water line prior to construction of the project. This becomes the seaward property line of the upland property owner. While there are restrictions on construction and use of the beach on the new portion of the beach, some upland property owners may object to the “loss” of riparian rights all the way to the mean high water line.
- There is a high capital outlay for initial construction of the project.

The persistent hard bottom at the south end of Town may present some permitting challenges. While the acreage impacted is low (approximately 1.2 acres) the permitting agencies may require avoidance of some of this rock (specifically Yamato Rock) or mitigation in the form of an offshore artificial reef.

CPE has performed considerable offshore sand search investigations for the cities of Boca Raton and Delray Beach and is confident that sufficient sand resources are available directly offshore of the Town of Highland Beach. The USACE (2012) has collected data further north and directly offshore of the Town of Highland Beach. The data confirmed that the same sand feature dredged to construct the North Boca Raton Project extends further into the Town of Highland Beach though a detailed investigation of this potential source still needs to be performed. Potential sand resources and their proximity to the Town are shown in Figure 8.



**Figure 8. Offshore Borrow Areas and Potential Sand Resources**

This is the recommended alternative. It ensures that sufficient storm damage protection and recreational areas are available throughout the Town.

## 5.4 Coastal Structures

Coastal structures are appealing because it is assumed that they prevent sand from washing away. In reality, coastal structures simply redistribute sand within a littoral cell. For example, building a groin will hold additional sand on the north side of the groin but that sand will be deprived from the south side of the groin causing an erosional area. There is no additional sand introduced to the system as is the case with a beach nourishment project. Strategic use of coastal structures is possible in areas that have alternating areas of erosion and accretion. The concept is to reduce the erosion in one area by reducing accretion in another. Various coastal structures were evaluated within the Town of Highland Beach based on this concept.

### 5.4.1 Groins

Groins are shore perpendicular structures that work by intercepting sand flowing along the shoreline. They generally result in a saw-toothed pattern in the shoreline with sand building up on the north side of the groin (in the case of Town of Highland Beach) and a corresponding recession in the shoreline on the south side of the groin (Photo 10). The groins are designed such that the downdrift shoreline location meets the design goals. They are often constructed in conjunction with a beach nourishment project to avoid initial erosion and shoreline retreat (ie pre-fill the groin field).

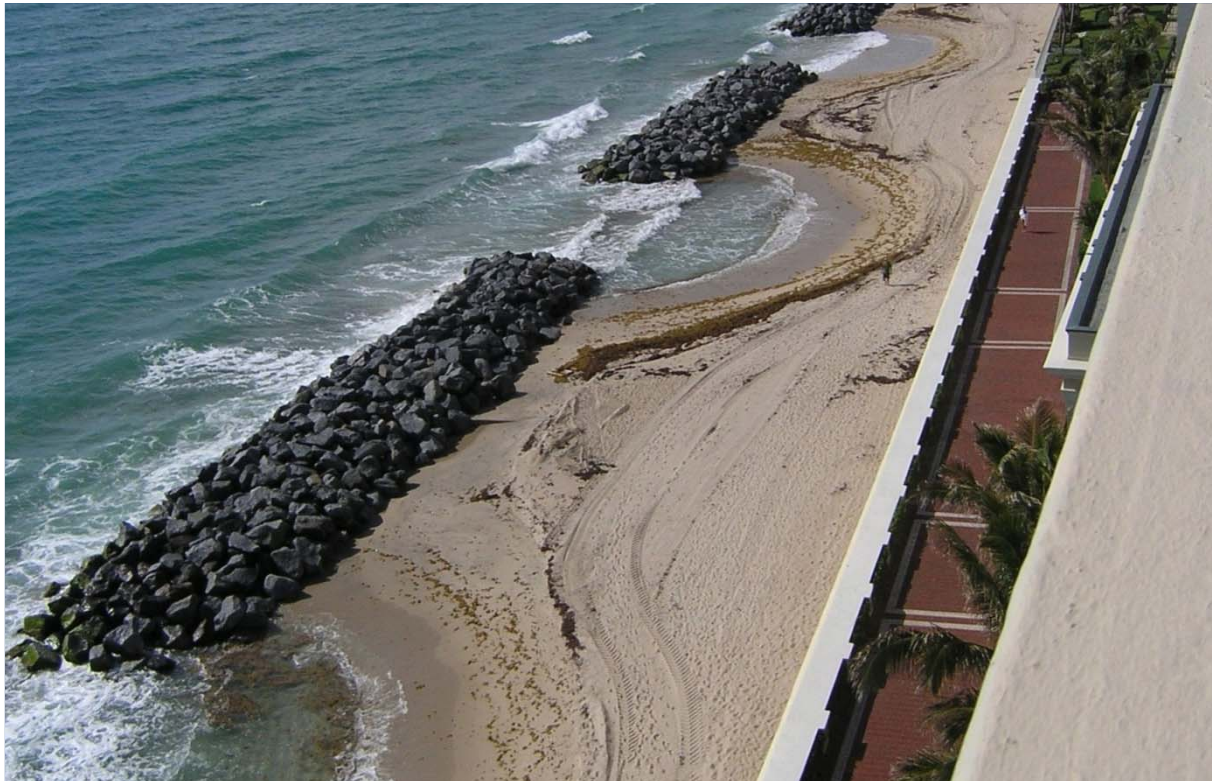


**Photo 10. Permeable adjustable groin in Longboat Key. Note the shoreline offset on the left (south) side of the groin compared to the right (north) side of the groin.**

In Highland Beach, the shoreline is uniform and there are no areas that are well suited to construction of a single groin or a groin field (multiple groins). The cost of groins can be quite high. The cost of a single groin constructed in Boca Raton in 2005 was \$815,360.

#### 5.4.2 Emergent Offshore Breakwaters

Breakwaters are shore perpendicular structures. They provide protection to the shoreline by waves breaking directly against the structure and providing shelter to the shoreline in its lee. Wave energy is dissipated in the gap due to diffraction of the wave energy. Again, the breakwaters will hold sand behind them at the expense of the sand adjacent to the breakwater. The shoreline then has a cusped shape as shown in Photo 11.



**Photo 11. Breakwaters at the Breakers Hotel, Town of Palm Beach. Note the crenulate shape of the shoreline.**

CPE recently permitted and oversaw rehabilitation of the breakwater field at the Breakers Hotel, in the Town of Palm Beach. The permitting effort was quite intensive even though this was a rehabilitation project. A breakwater field permit application at Singer Island was recently withdrawn because of environmental objections. Given that shoreline along the Town of Highland Beach is relatively stable, a breakwater field is not a recommended option due to aesthetics and permitting difficulties.

The cost of a single 150-foot long breakwater is estimated at \$500,000, excluding mobilization.

#### 5.4.3 Submerged Offshore Breakwater

A submerged breakwater has a crest below mean low water while an emergent breakwater typically has a breakwater crest a few feet above mean high water.

The benefit of a submerged structure is that there are fewer concerns with negative impacts to sea turtle nesting. Also, because the structure is submerged it does not have the same aesthetic concerns as an emergent structure. It is not clear whether a submerged breakwater would be viewed as compensatory mitigation for hard bottom coverage by the permitting agencies.

The drawback of a submerged structure is that it is not nearly as effective as an emergent structure. They have to be much wider than an emergent breakwater to be effective and are similar in cost, if not more expensive. They can be hazardous to boats and will have to be marked with navigation warning signs. Lastly, they have the potential to initiate rip currents between submerged structures because waves break over the structure but the return flow is restricted by the structure. This flow will then be funneled towards a gap between the structures resulting in a recurrent rip current. For longer, continuous submerged structures, an alongshore current can be created due to wave setup across the structure resulting in an erosional stress on the shoreline.

#### 5.4.4 Patented Technologies

There are several “patented technologies” that claim to prevent shoreline erosion and build beaches. These are often marketed as having no downdrift impacts or negative environmental benefits. We caution considering the installation these “technologies”. The FDEP regularly reviews these claims, requiring a permitting process and peer review of any field tests. We recommend asking for the FDEP’s opinion if approached.

#### 5.4.5 Coastal Structures Summary

Coastal structures are not recommended for implementation by the Town given the stable to accretional nature of the shoreline, uniform longshore transport rate, and no definable erosion hot spots. The cost of the structures will exceed the benefit.

Individual property owners may want to consider structures in front of their property in order to expand the dry beach width. We recommend that the Town advise the property owner to investigate this possibility at the property owner’s cost. The Town will be required to provide a finding of consistency with the Town’s Coastal Management Plan as part of the owner’s application process. The individual property owner should submit the engineering design basis to the Town for review prior to the Town providing such a letter. This (CPE’s) report should not be viewed as a definitive negative response for such applications. As stated previously, strategic use of structures can be beneficial but must be carefully designed and monitored. There is no Town benefit for the installation of coastal structures at this time.

## **6 FUNDING MECHANISMS**

Obviously the cost of a beach nourishment project is significant. Such a large cost may not be viable within the Town's Capital Improvement budget. This section discusses other possible funding sources and mechanisms.

### **6.1 Federal Funding**

Some of the beach nourishment projects around the State of Florida are cost shared by the Federal Government through the U.S. Army Corps of Engineers (USACE). North Boca Raton and Delray Beach are two examples of projects with Federal funding programs. This is a complicated process and requires several years to develop documents to support this funding. There are numerous projects in line for this funding and an application by the Town would be at the bottom of the list. It is highly unlikely that the Town would successfully obtain Federal funding given the current economic conditions. Furthermore, several towns have not been reimbursed for approved and constructed projects. Reimbursement of the costs used to be obtained through Congressional budget line items ("earmarks") but with the ban on these, reimbursement is based on USACE "Construction General" funds and how the USACE disburses these funds. The USACE does not have sufficient funds to reimburse all eligible projects and thus some towns do not receive the reimbursement funds.

Even if the Town was successful in applying for Federal funding, the funding is capped at a maximum of 65% of project costs. This is then decreased based on the percentage of the beach that is more than ¼ mile from a public beach access. Given that there is currently no public beach access within the Town, Federal funding would not be available. If the County were to construct the park at the south end of Town and have sufficient parking on the west side of A-1-A, Federal funding would still be limited to less than 10% of construction cost because of the limited distance that this access would cover.

### **6.2 State Funding**

The State of Florida recognizes the benefit of beaches for storm damage protection and supporting the tourism industry. The Beach Management Funding Assistance Program (FS, 62B-36 and included in Appendix C) is funded based on Ad Valorem taxes and administered through the FDEP. The funding for the program is used to support the Department and provide construction funds to eligible projects. The State will cost share up to 50% of the non-Federal cost but there are thresholds for funding that may be difficult for the Town to meet.

First, the State will only fund beaches that are deemed to be "critically eroded". The Town of Highland Beach is not currently deemed to be a critically eroded shoreline. Given the Town's history of shoreline advance since 1975, as documented in Section 3.2 of this report, convincing the FDEP that the shoreline is critically eroded will be an intensive effort.

Second, the State has a beach access requirement for receiving State funds. A "primary beach access", defined as a beach access with at least 100 public parking places and public restrooms, will allow for funding of a beach project up to ½ mile from the access. A "secondary beach access", defined as an access that may have public amenities but does not qualify as primary

access, will provide for funding based on the number of available public parking places. Given that there are currently no public beach access points within the Town, State funding is not a potential funding source at this time. Construction of the County Park would open the potential for State funding but depending on the type and size of the park, funding would still be limited to the portion of the project within ½ mile of the park.

Third, the State typically only has sufficient funds for 10% of the projects for which funds are requested each year. A cursory evaluation suggests that the Town of Highland Beach would rank low on the list based on the funding eligibility requirements compared to other applicants. A full description of the ranking criteria is included in Appendix C but in summary, the criteria are:

- Severity of erosion (based on average erosion rate).
- Threat to upland structures (percent of developed properties seaward of the projected 25-year interval return storm)
- Recreational and economic benefits (percent property zoned as commercial or recreational).
- Availability of federal funds.
- Local sponsor financial and administrative commitment.
- Previous state commitment.
- Project performance (expected life of the project).
- Mitigation of inlet effects.
- Innovative technologies.
- Enhance nesting sea turtle refuges.
- Regionalization (projects where two or more local government entities couple their projects to reduce costs).
- Significance (length of project).

In summary, it is unlikely that the Town will be successful in securing State funding.

### **6.3 County Funding**

Palm Beach County funds their beach program using a portion of the funds collected through the Tourist Development Tax (or “Bed Tax”). This is a 5% tax on any short term rental. The County follows the same criteria that the State uses to allocate funds between projects. Again, the lack of current public beach access will thwart any Town request for County funding assistance. If the County Park were to be constructed, funding might still be limited as they use the State’s ranking criteria.

### **6.4 Local Funding Mechanisms**

Given the low probability of receiving Federal, State or County funding, the Town will likely to have to fund any beach initiatives by Town residents. There are two primary factors to be considered. First, a mechanism is necessary to assess and disburse funds collected from the property owners. Second, a cost apportionment plan is necessary to prorate the total cost among individual property owners. Table 9 shows several alternatives that the Town could use to raise

funds locally for a beach program. Mechanisms employed by other municipalities are discussed briefly in the following section.

#### 6.4.1 Ad Valorem Tax

The Town could petition the Board of County Commissioners to levy a separate Ad Valorem tax or increase the millage rate on existing general revenues to pay for the project. A separate tax on individual properties is proportional to the benefits, which is determined from an economic analysis. The general revenue approach would have all property owners pay for the project in proportion to the assessed value of their property. The County would collect the tax and then turn this over to the Town to administer.

Voter approval would be needed at a referendum for the Town to issue a bond to pay the costs of the project. Ad Valorem taxes would be pledged as security for the bond.

#### 6.4.2 Erosion Prevention District

The State Legislature may create a separate beach and shore preservation district. The District would be self-governed by a Board of Directors who are resident in the District. In Longboat Key, taxing is setup such that those properties located west (seaward) of Gulf of Mexico Drive pay 80% of the required funding while those on the east side pay 20%. A similar mechanism could be considered by the Town with those located east of S Ocean Blvd paying a larger percentage because they have greater benefit due to having ocean front property.

#### 6.4.3 Special Assessments

Florida municipalities can levy special assessments under FS 166, unless there is a restriction in the Town charter. The Town attorney would need to review this option. A special assessment can be apportioned among property owners in relation to the benefit, similar to the discussion within the Erosion Prevention District.

#### 6.4.4 Municipal Services Benefit Unit (MSBU)

MSBU's are authorized by FS 125. A petition by the majority of property owners to the Board of County Commissioners is required in order to pass an ordinance establishing the MSBU. Public hearings are held to levy the assessment. MSBU's do not require a vote by referendum and involve only property owners. This is beneficial because property owners may visit seasonally and have their voter registration in another State. An MSBU will allow them to be included in the process. Once established, the MSBU has taxing and assessing authority, and bonding and borrowing capability, using assessed property values as security.

**Table 9. Alternative Local Funding Mechanisms (from Stevens & Assoc, 1986)**

	<b>ALTERNATIVE</b>	<b>DESCRIPTION</b>	<b>HOW ESTABLISHED</b>	<b>PROS</b>	<b>CONS</b>
1.	Ad Valorem Tax	Uniform Property Tax	Budgetary Process	Existing authority	No continuous source; competition w/others; Poor Management
2.	Bonding	Selling bonds to create revenue - bond retired by Ad Valorem Tax	Referendum	New revenue covers large initial costs	Non- continuous source; time delays; confined to specific projects; poor tool for management and planning
3.	Independent Special Taxing Districts	Independent Gov't established by Legislature to collect property tax for special purpose	By act of Legislature	Continuous source of funds	New government added -not favored by Legislature; voter dependent
4.	Dependent Special Taxing District	Ad Valorem tax collected and administered by the County for a special purpose	By act of Legislature	Ability to fund projects	Limited by total County capital of 10 mils subject to political climate
5.	Municipal Service Taxing Unit (MSTU)	Property tax of a specific area for service	By petition of property owners; local authority under FS 125	Existing authorization; not project limited	Taxes only in improved area, adjacent property owners
6.	Municipal Service Benefit Unit (MSBU)	Special assessments of benefitted properties	Petitions of majority of property owners	Existing authority; no competition with others	Project limited; difficult to establish
7.	Erosion Prevention Districts (FS 161)	A dependent taxing district collecting property taxes	Established by ordinance of the County under FS161	Existing authorization; benefit zones can be taxed differently	Included in total County millage cap; politically affected
8.	Private Funding	Donations	By mutual agreement	Addresses needs of private property	Not practical for countywide funding
9.	Parking Meters and Park Feed	User Fees	Locally initiated	User benefits = pay	Private benefit is not assessed; limited funding
10.	Beach Management Districts (Regional)	Larger government spanning a number of Counties with property taxing authority	State Legislature	Stable funding source; larger tax base; not politically motivated	Funds may be disproportionately used

## **7 SUMMARY AND RECOMMENDATIONS**

The beach in the Town of Highland Beach has benefited from the beach nourishment projects in Delray Beach and to a lesser extent Boca Raton. The shoreline has advanced an average of over 1 foot/year since 1975. The beach at the north end of the Town has advanced the most while the beach at the south end of Town has receded. Overall the beach is in good condition and does not have an immediate need for a renourishment project.

However, many of the upland properties sustained damage during Hurricane Sandy and an analysis of the beach response in the 2004 hurricane season shows that the Town is susceptible to damage during a large storm event or an active hurricane season. While the shoreline will recover from these events, upland property owners will have to independently address damage to the dune system because the dunes will not recover naturally in a short period of time.

It is recommended that the residents prepare for a nourishment project so that a pro-active response is available if there is an active hurricane season. Beach nourishment projects can take several years to design and permit so this process should be initiated as soon as practical.

An initial estimate of the construction cost of a beach nourishment project is \$9M, assuming construction in the winter of 2015. The cost of delaying construction until 2020 could increase the cost to \$14M. Cost savings could be realized by coordinating construction with either Delray Beach or Boca Raton, which could save some of the dredge mobilization costs. There should be sufficient sand resources directly offshore to support multiple beach nourishment projects.

A beach nourishment project requires a significant cost outlay. The Town and/or residents would need to determine whether the local government or a separate entity would undertake the permitting and construction effort. Should the local government be involved in the funding, the Town may not be able to cover the cost within their regular Capital Improvement budget. If so, the Town may wish to consider several funding mechanisms for the project including Ad Valorem taxes, creating an Erosion Prevention District or creating a Municipal Services Benefit Unit.

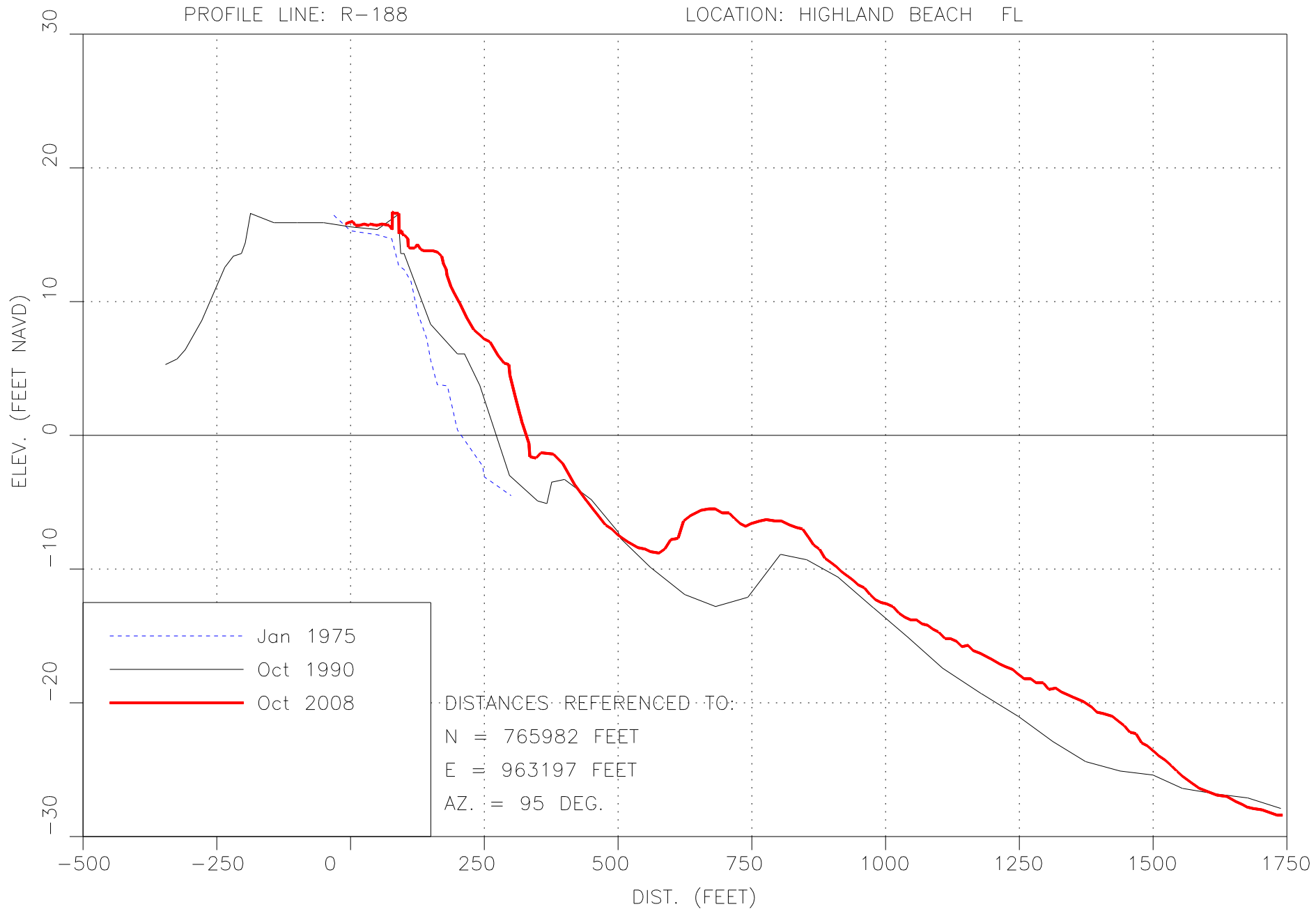
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**APPENDIX A**  
**BEACH PROFILE CROSS-SECTIONS**

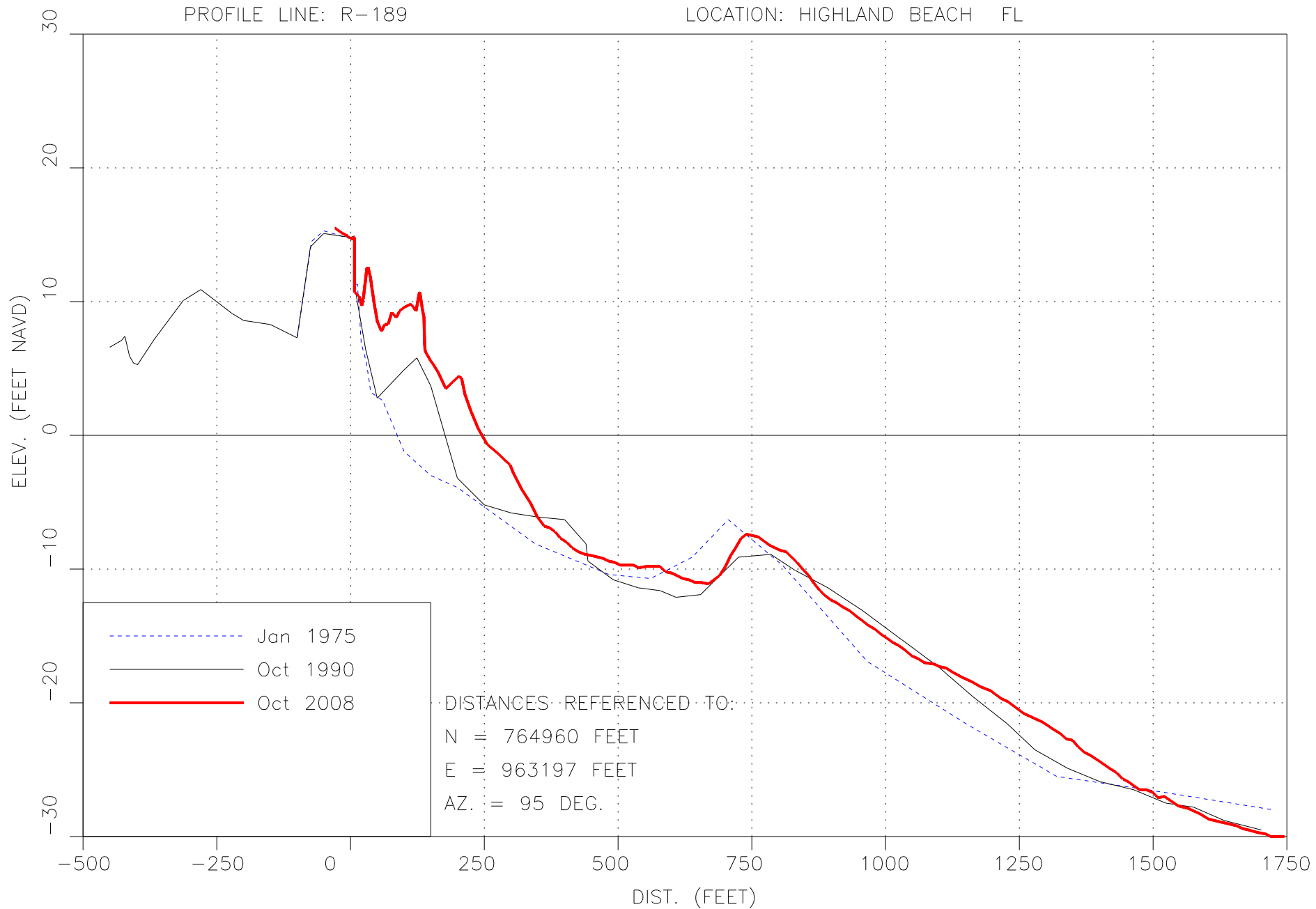
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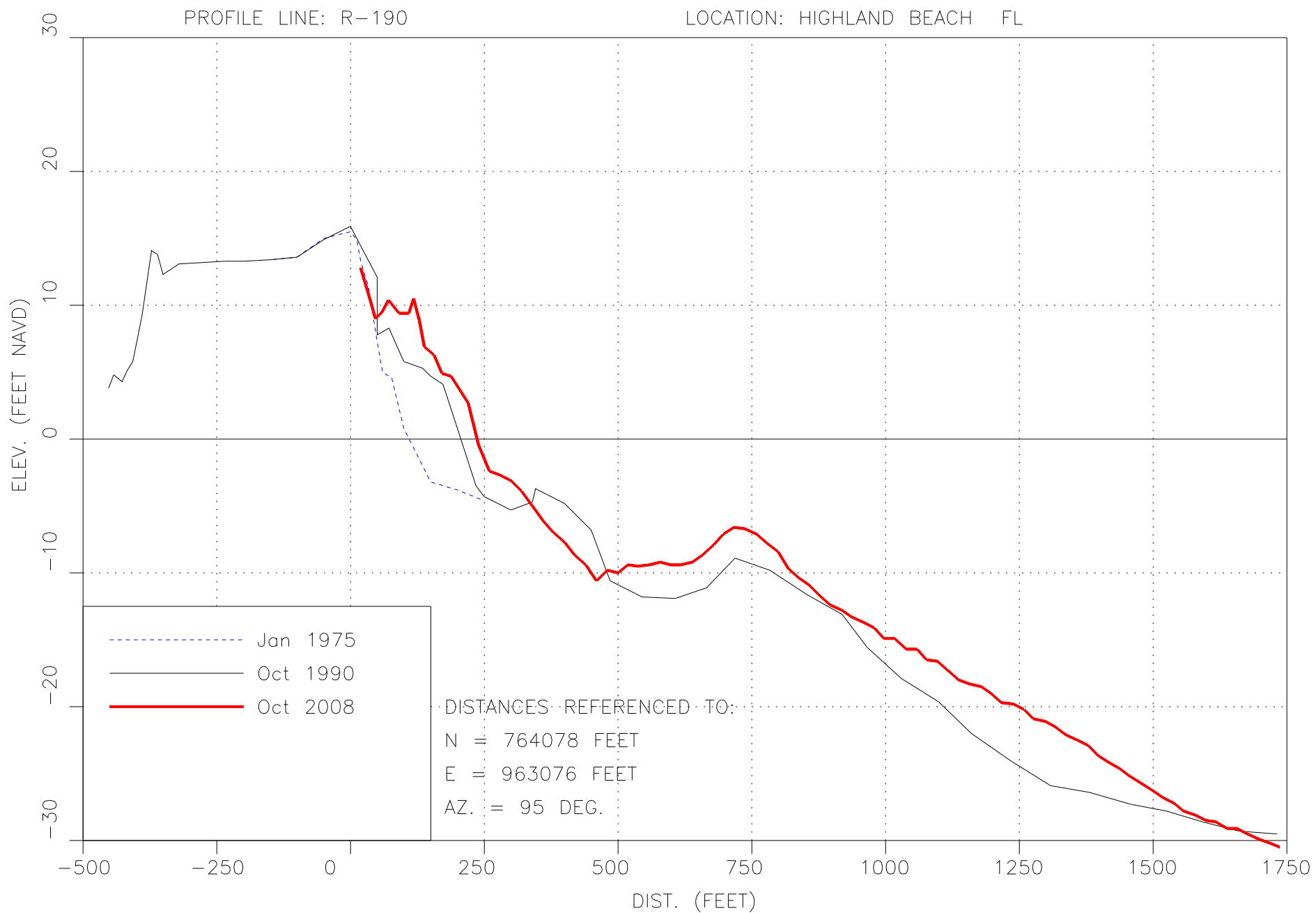
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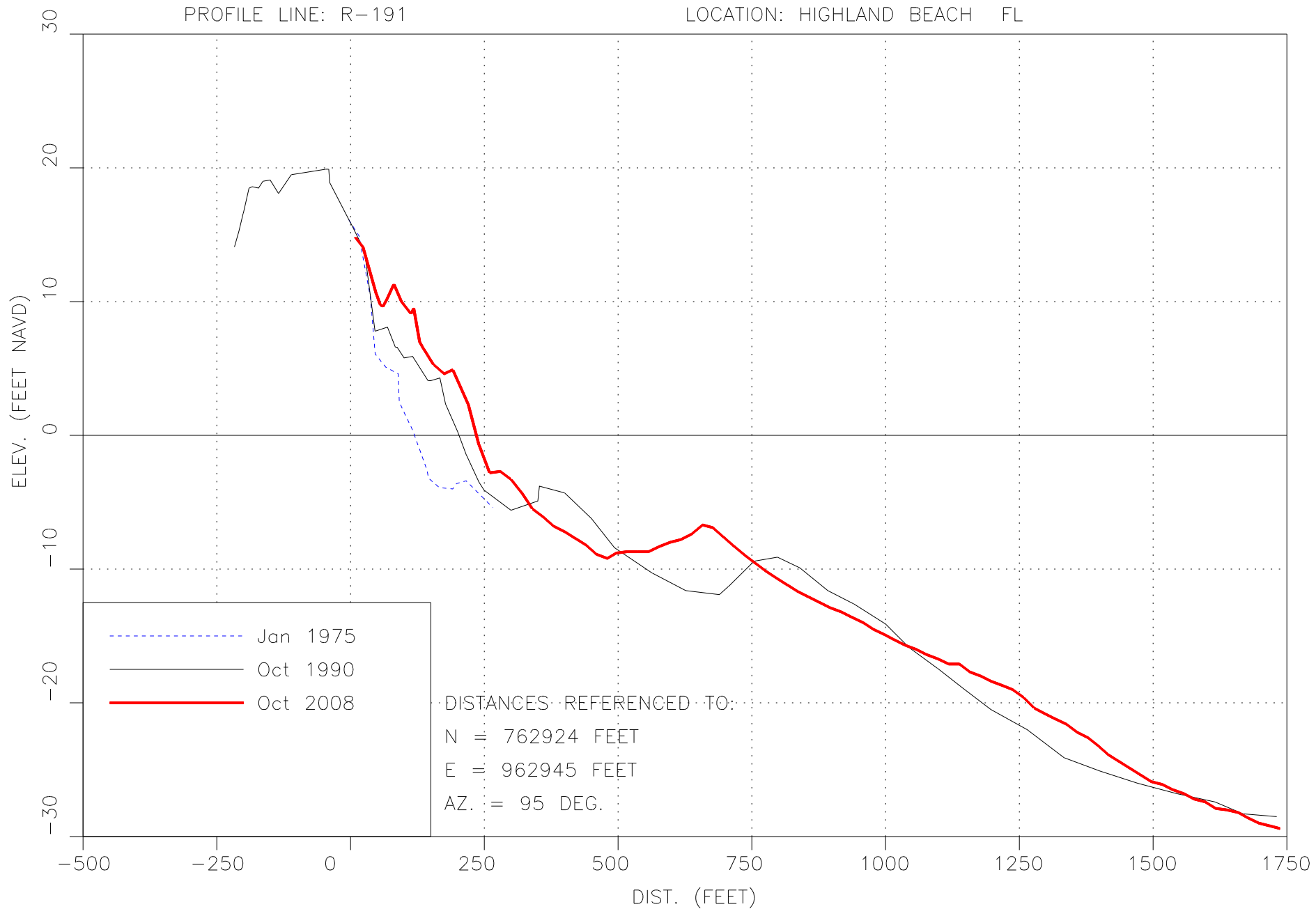
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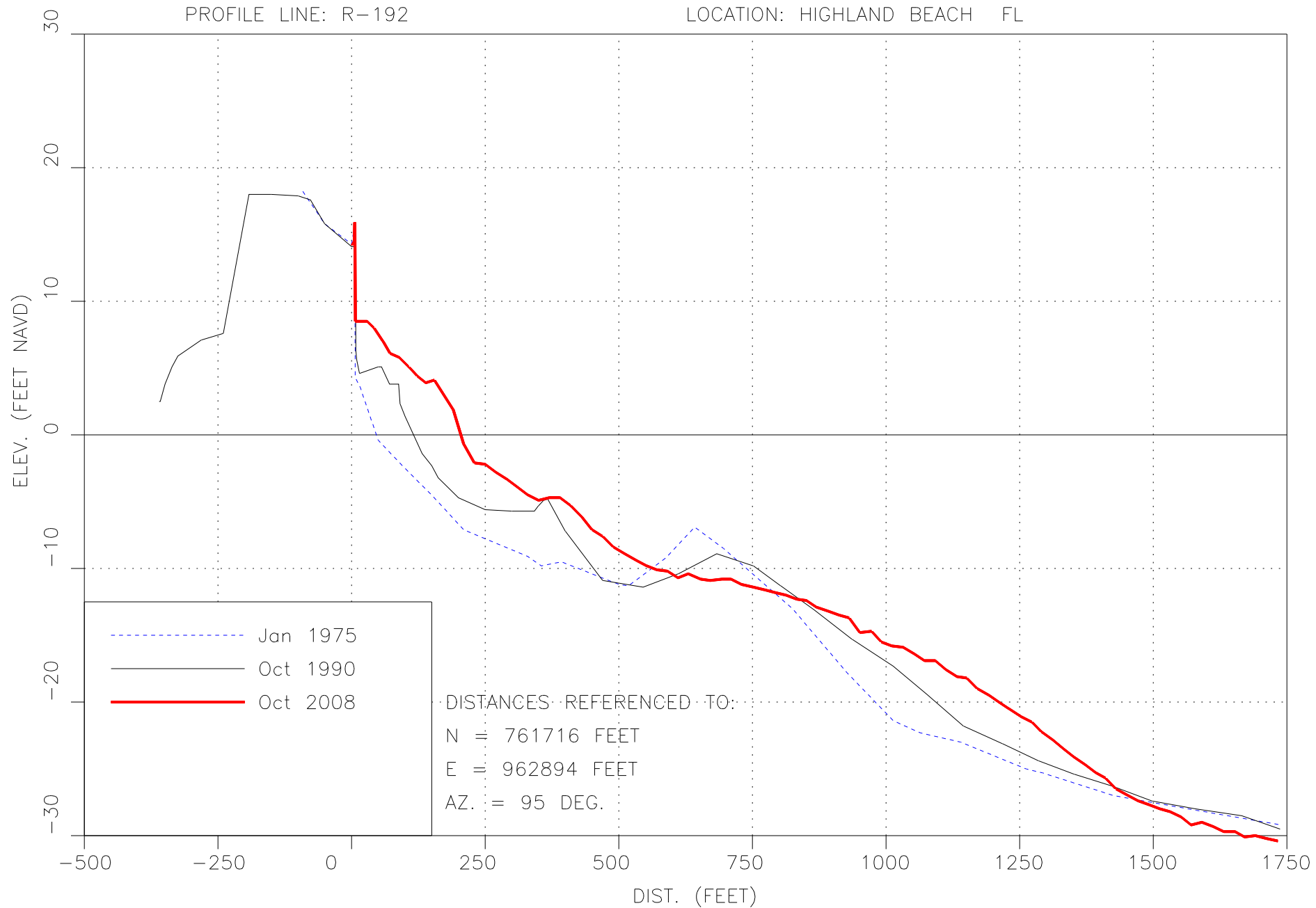
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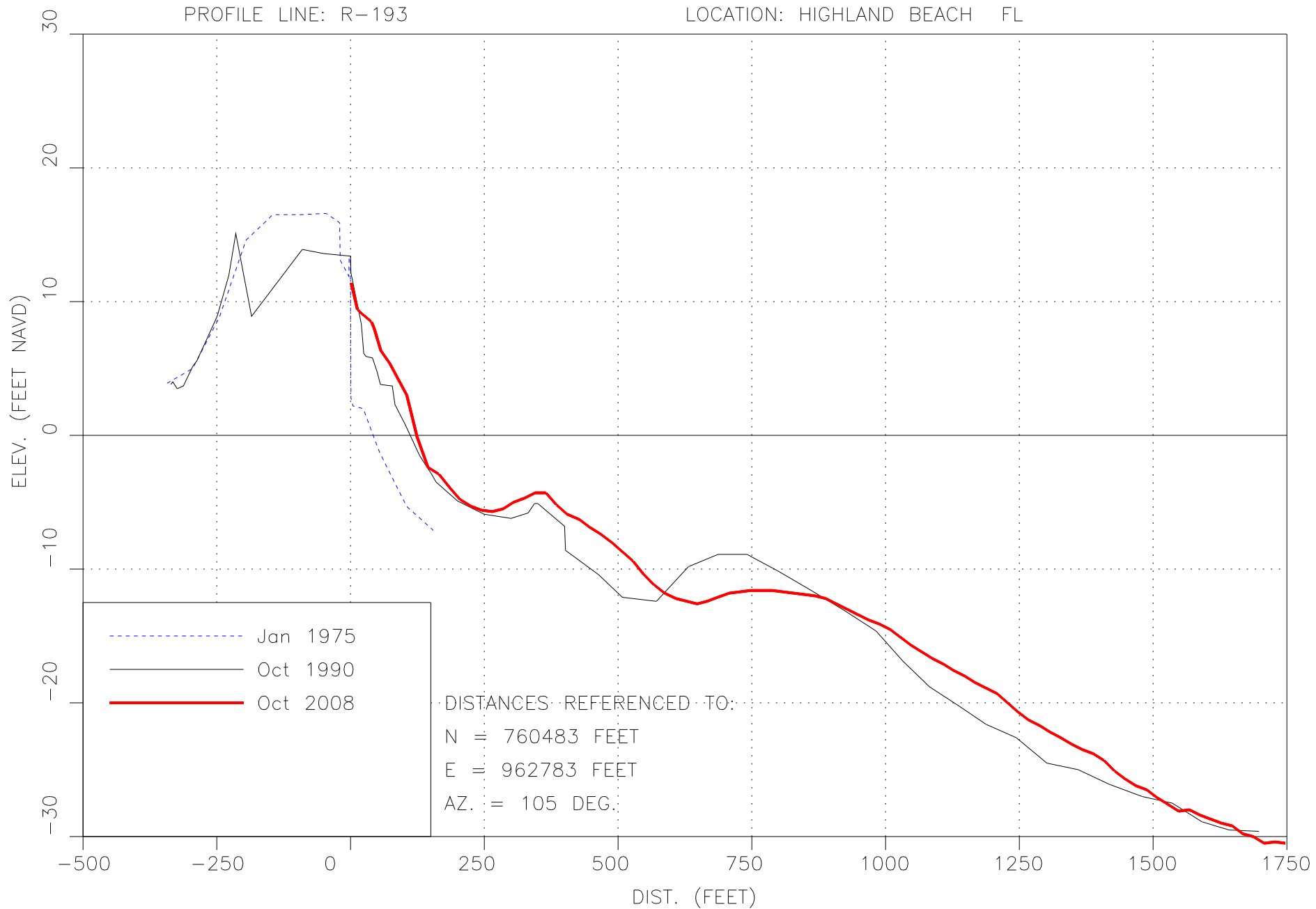
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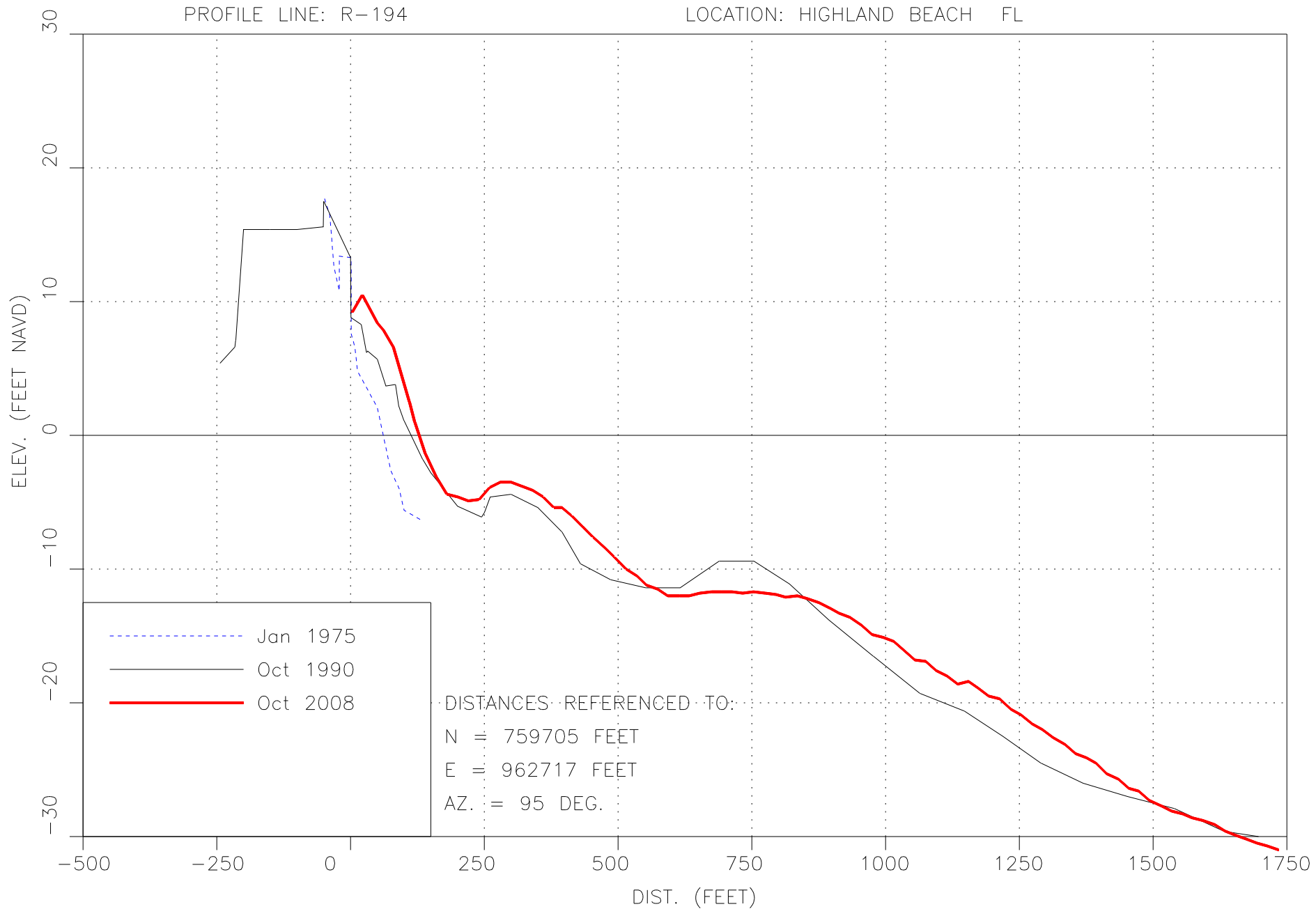
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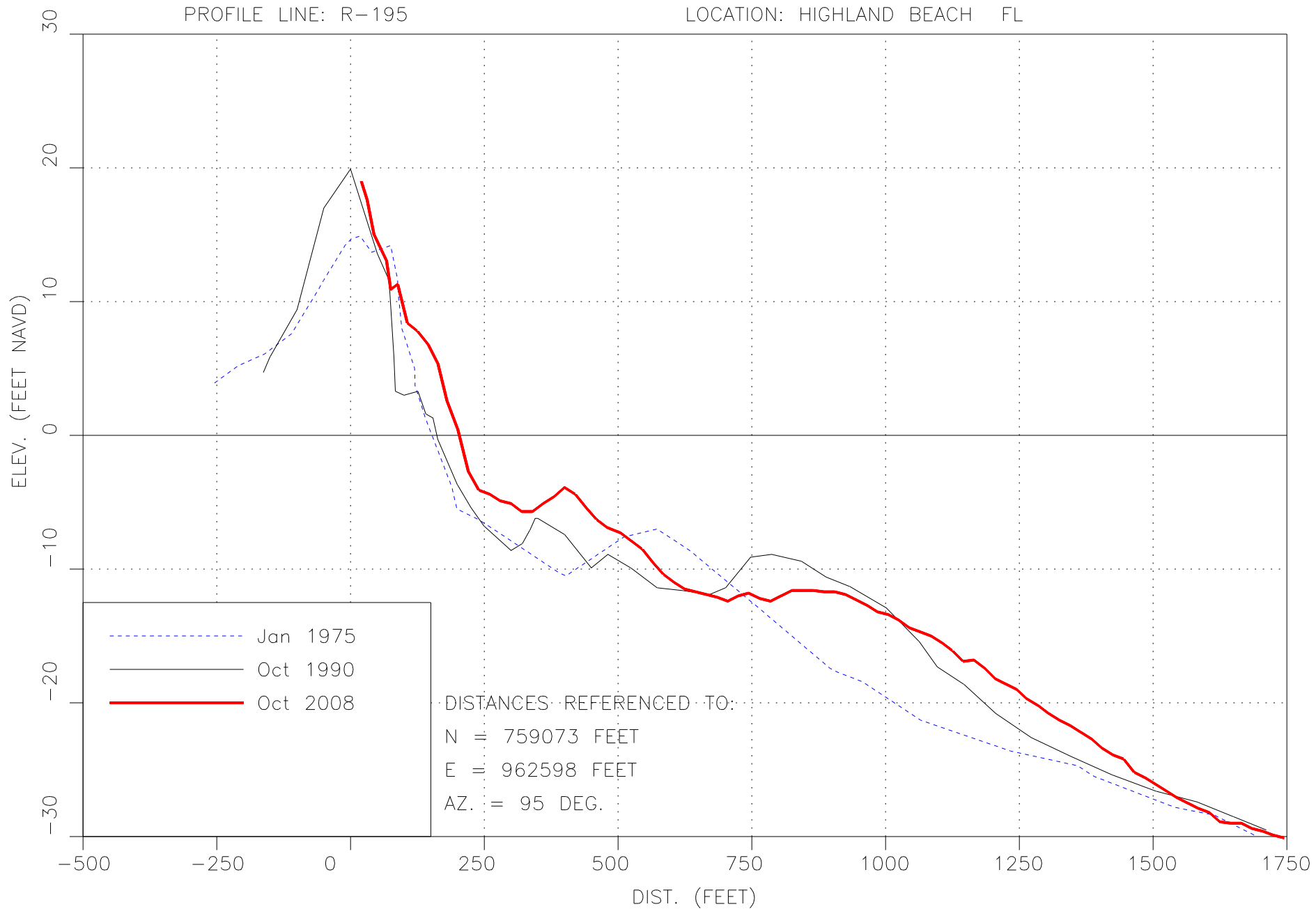
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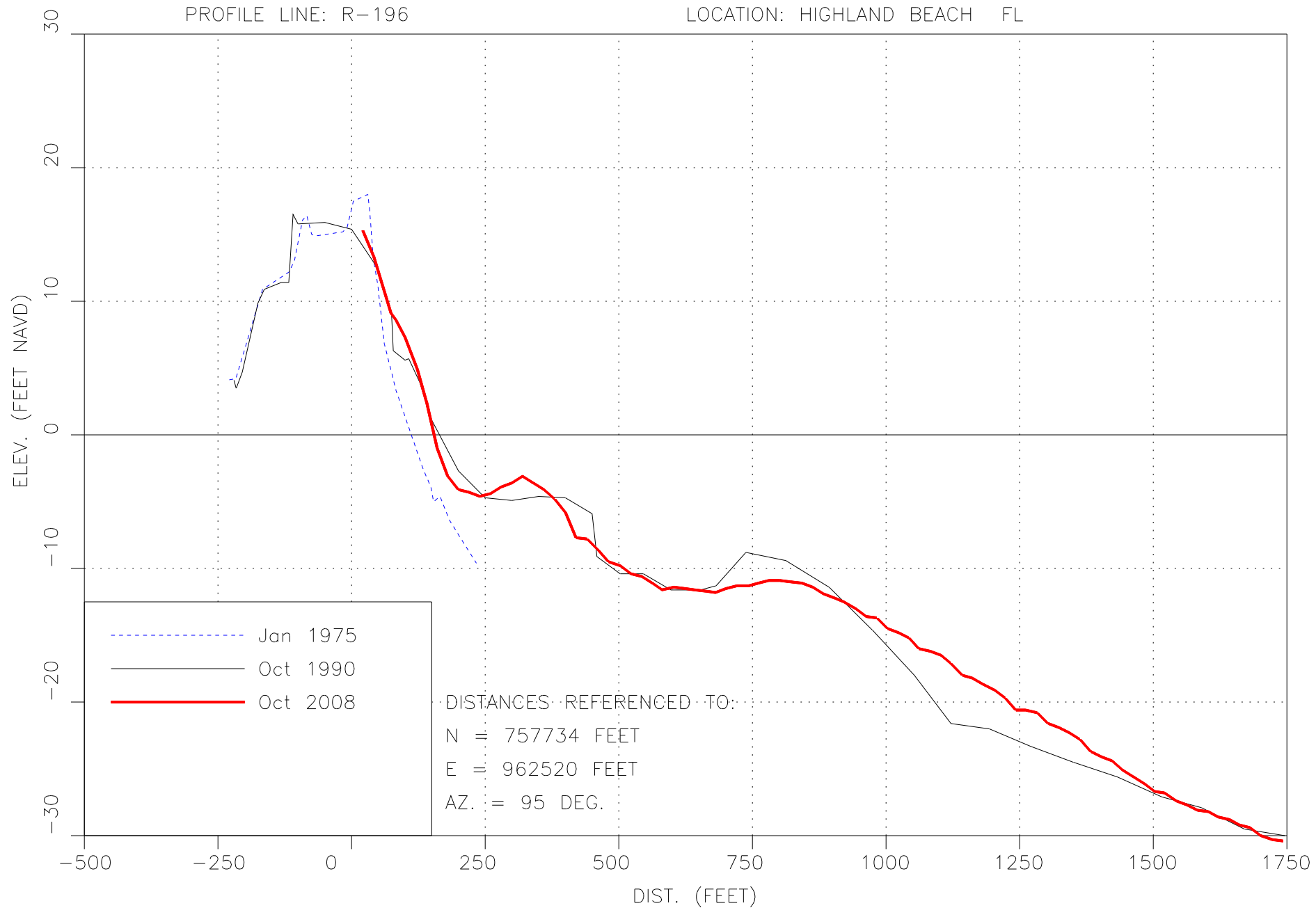
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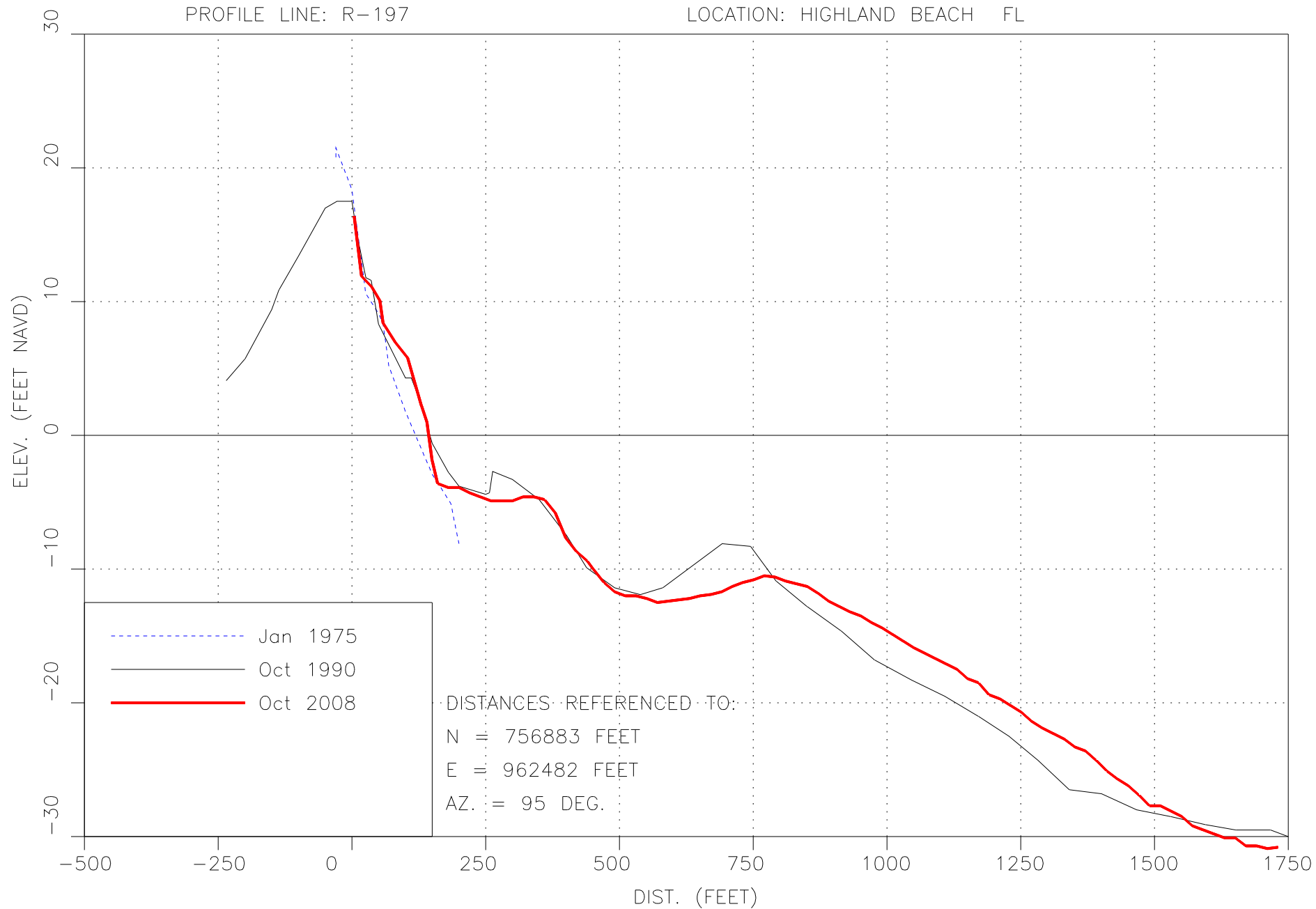
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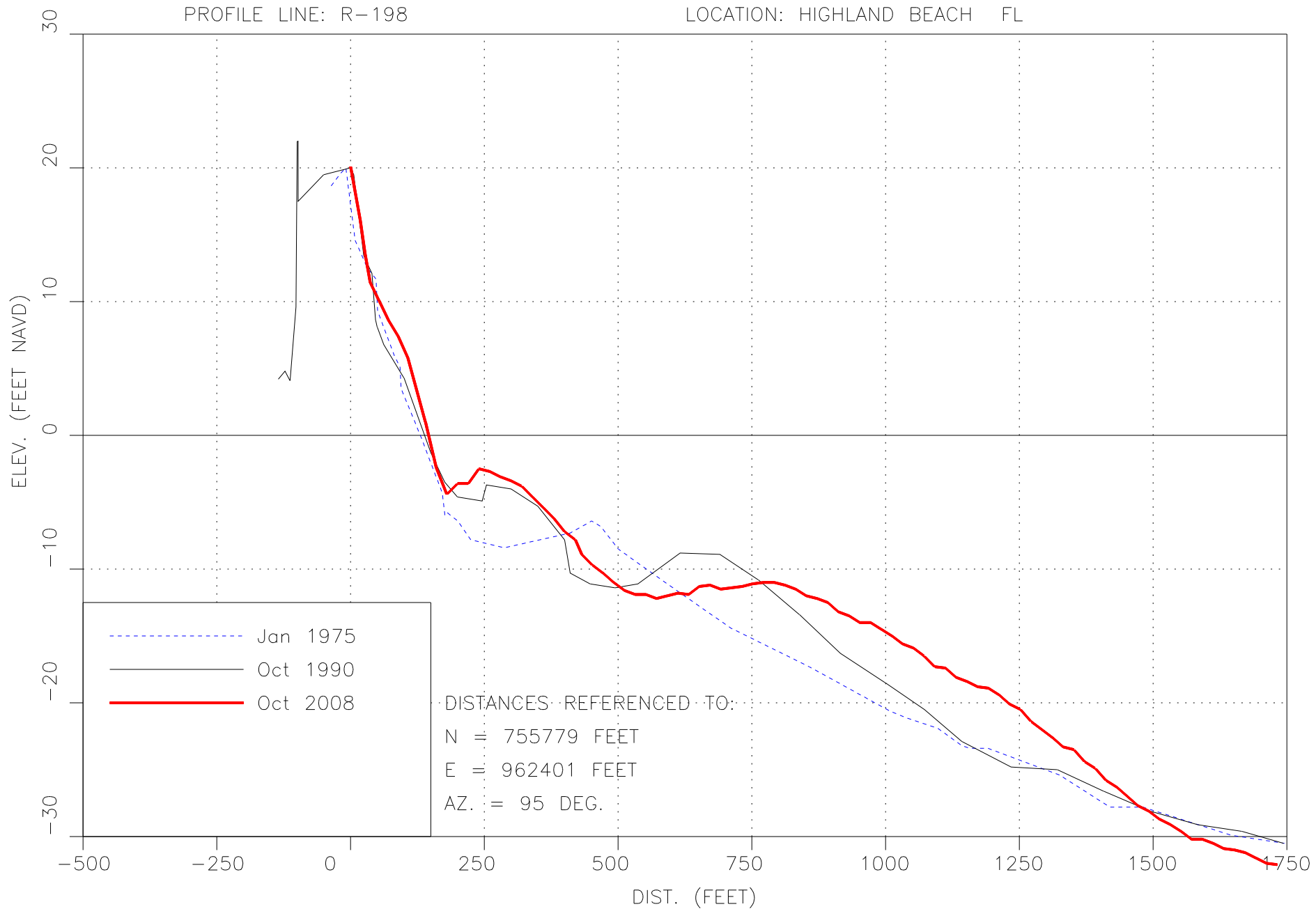
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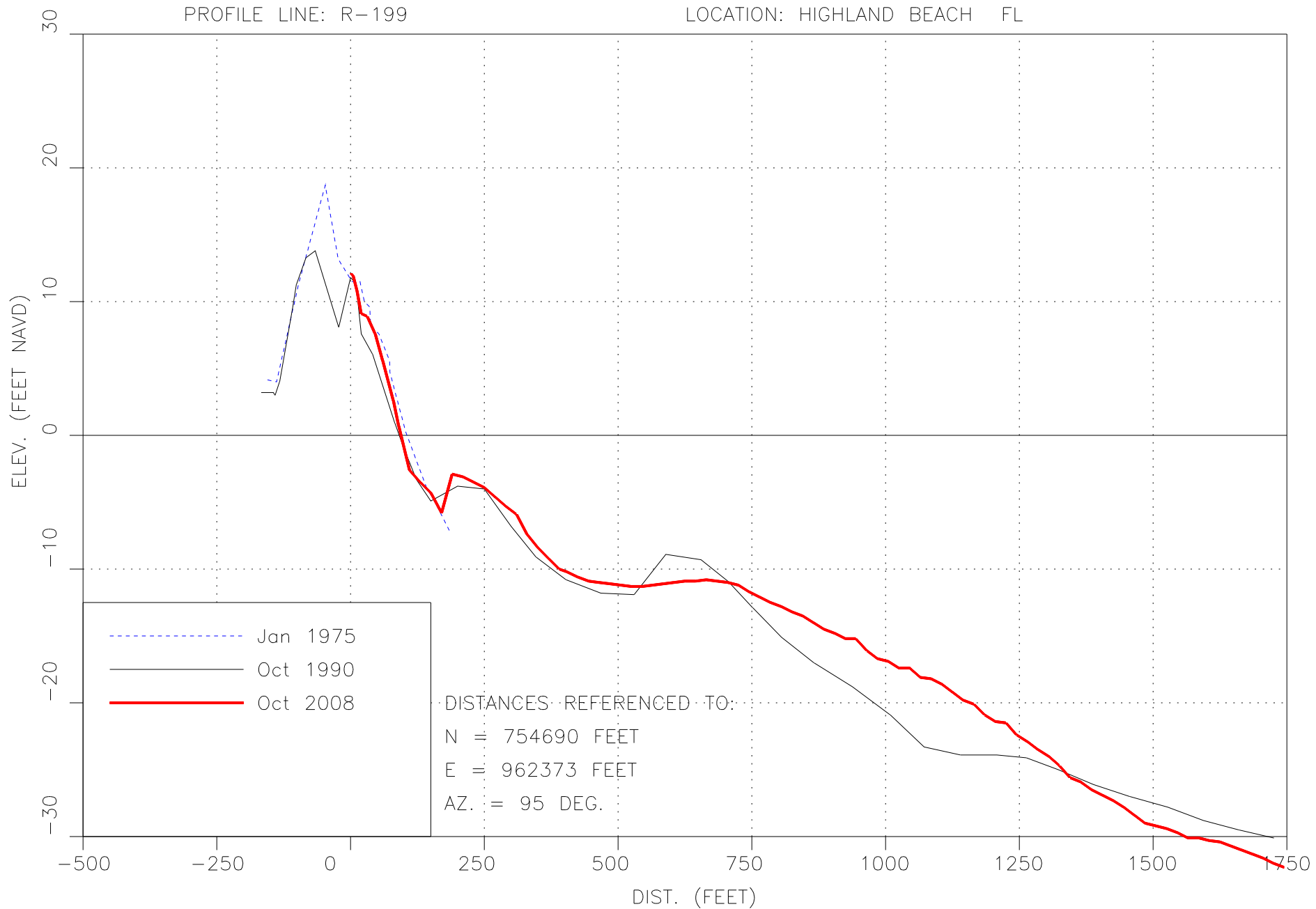
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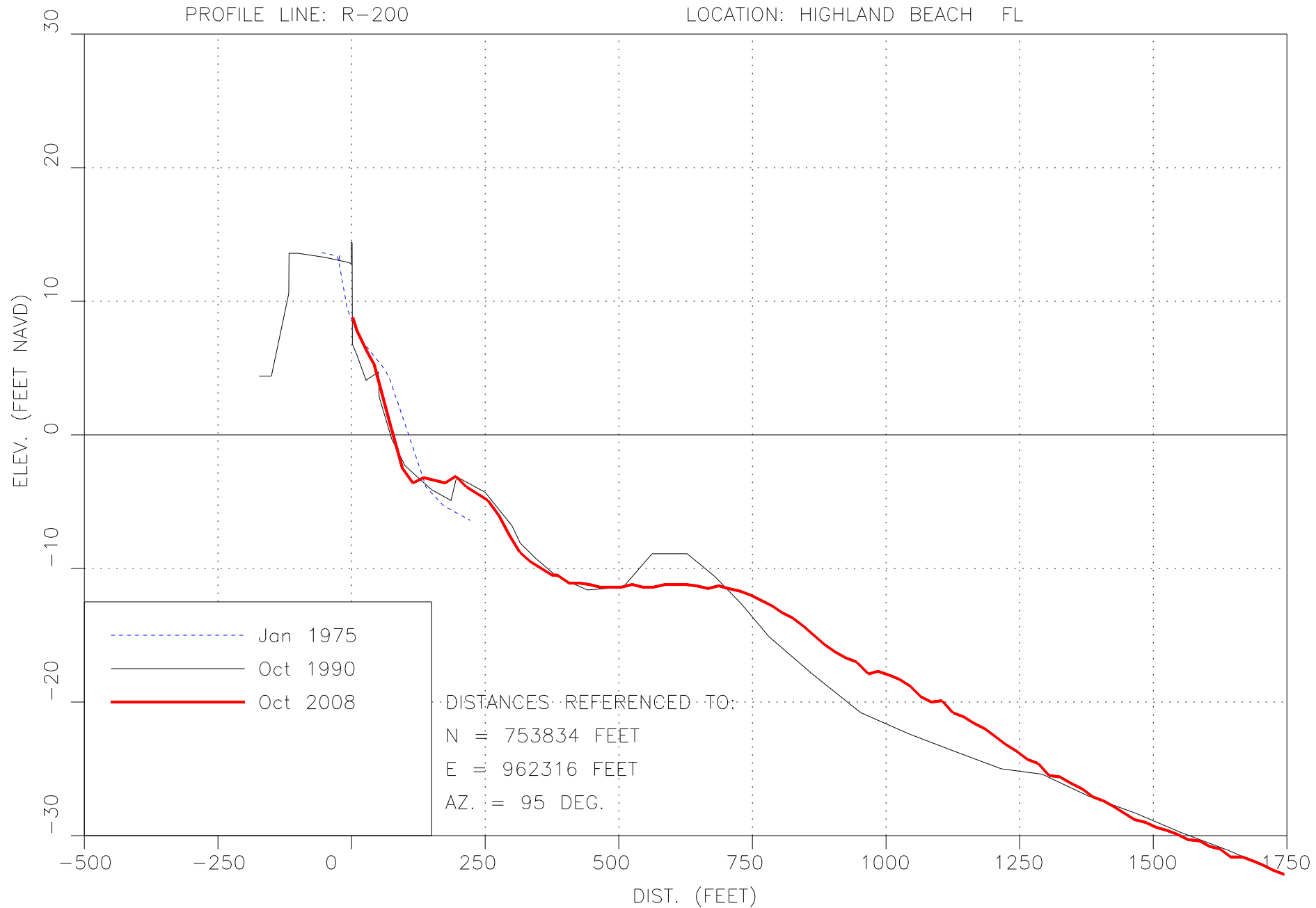
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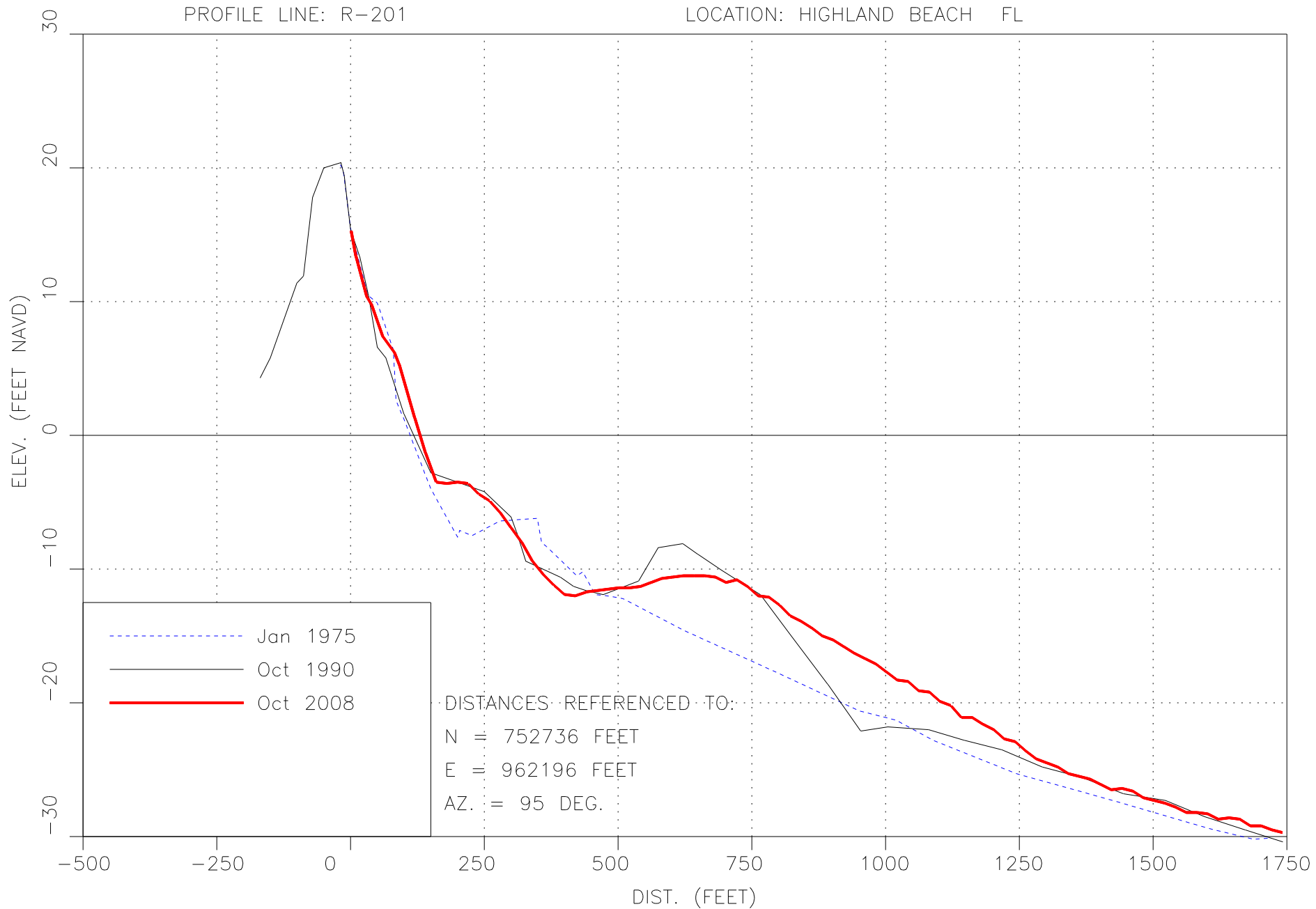
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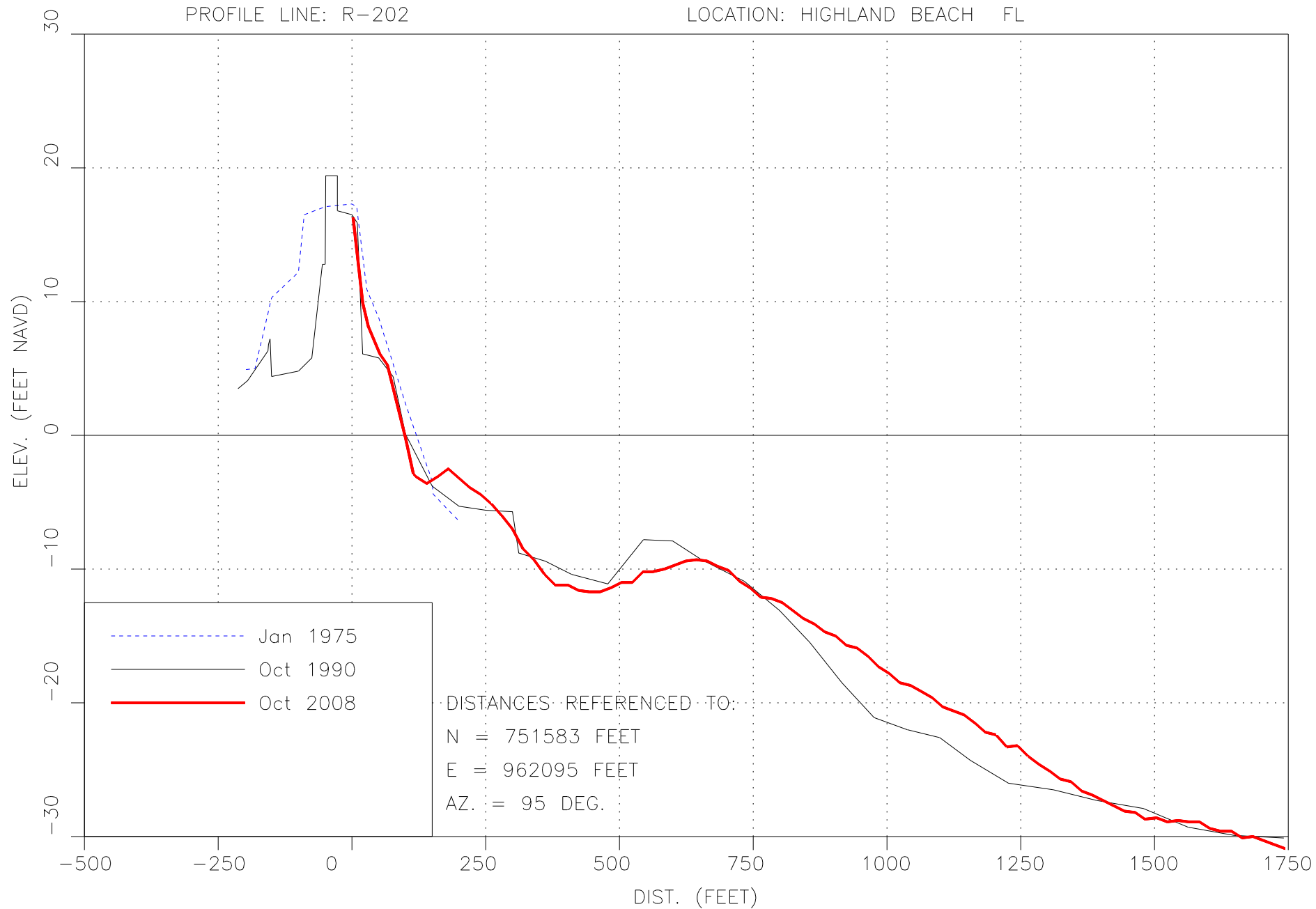
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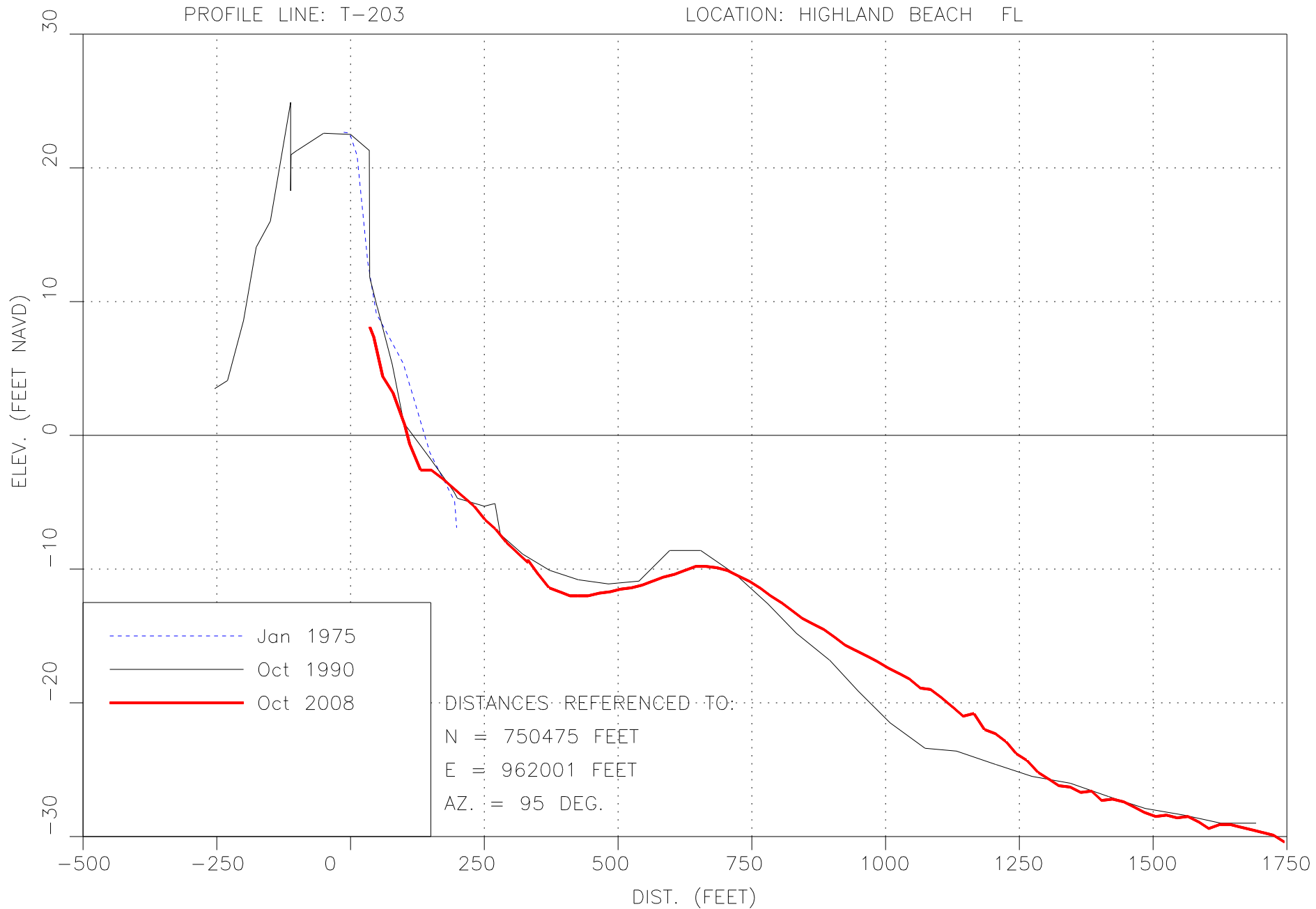
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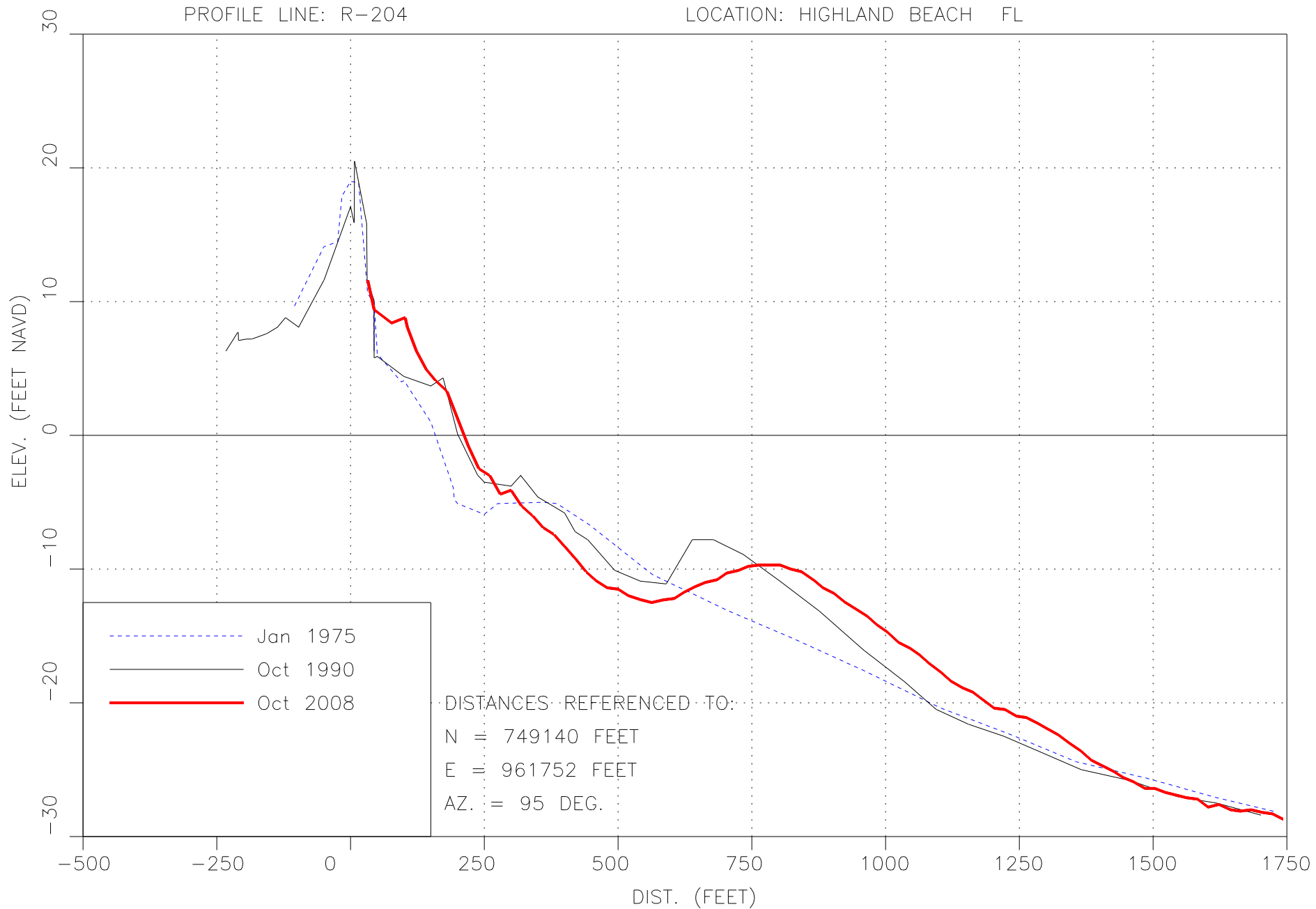
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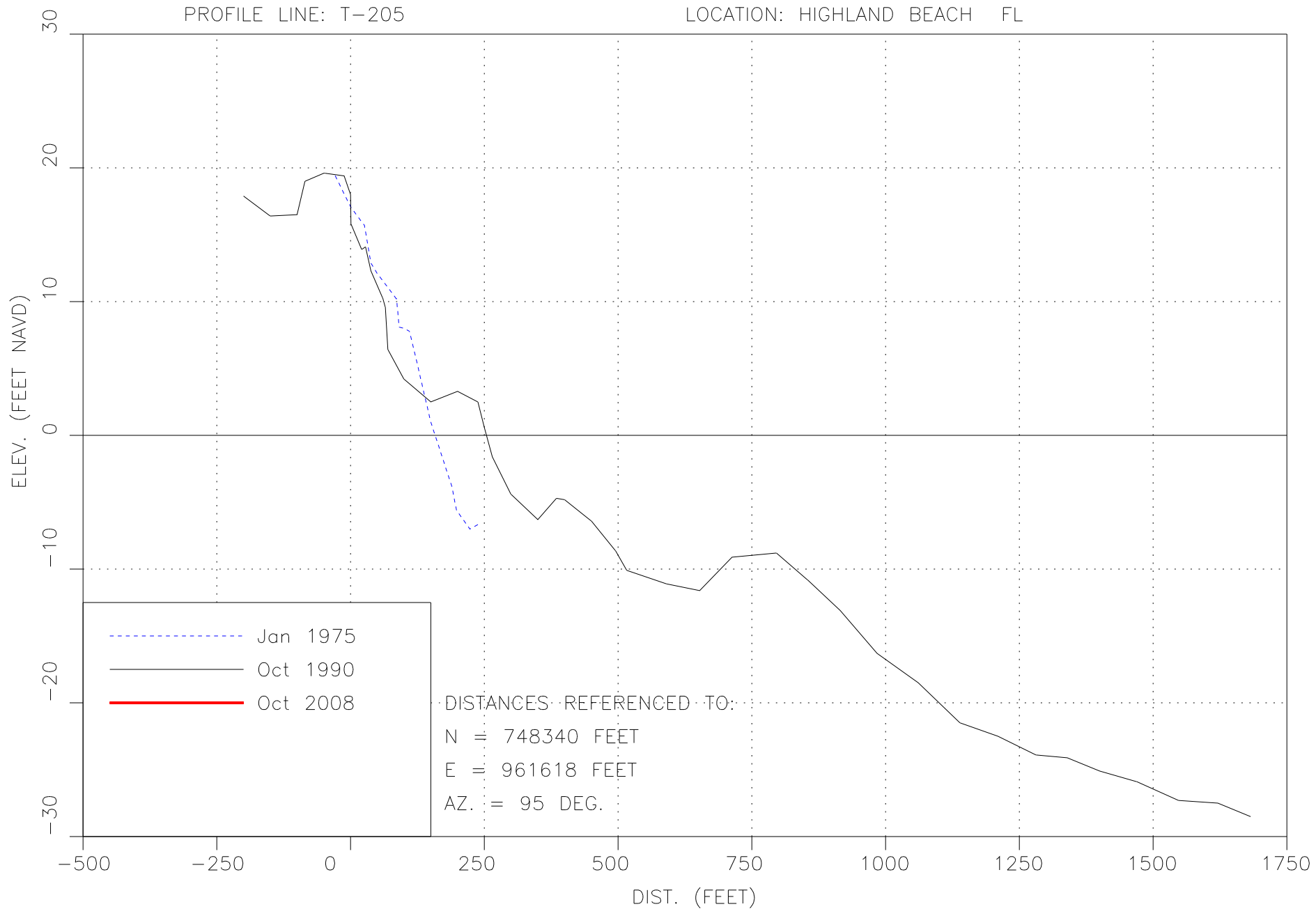
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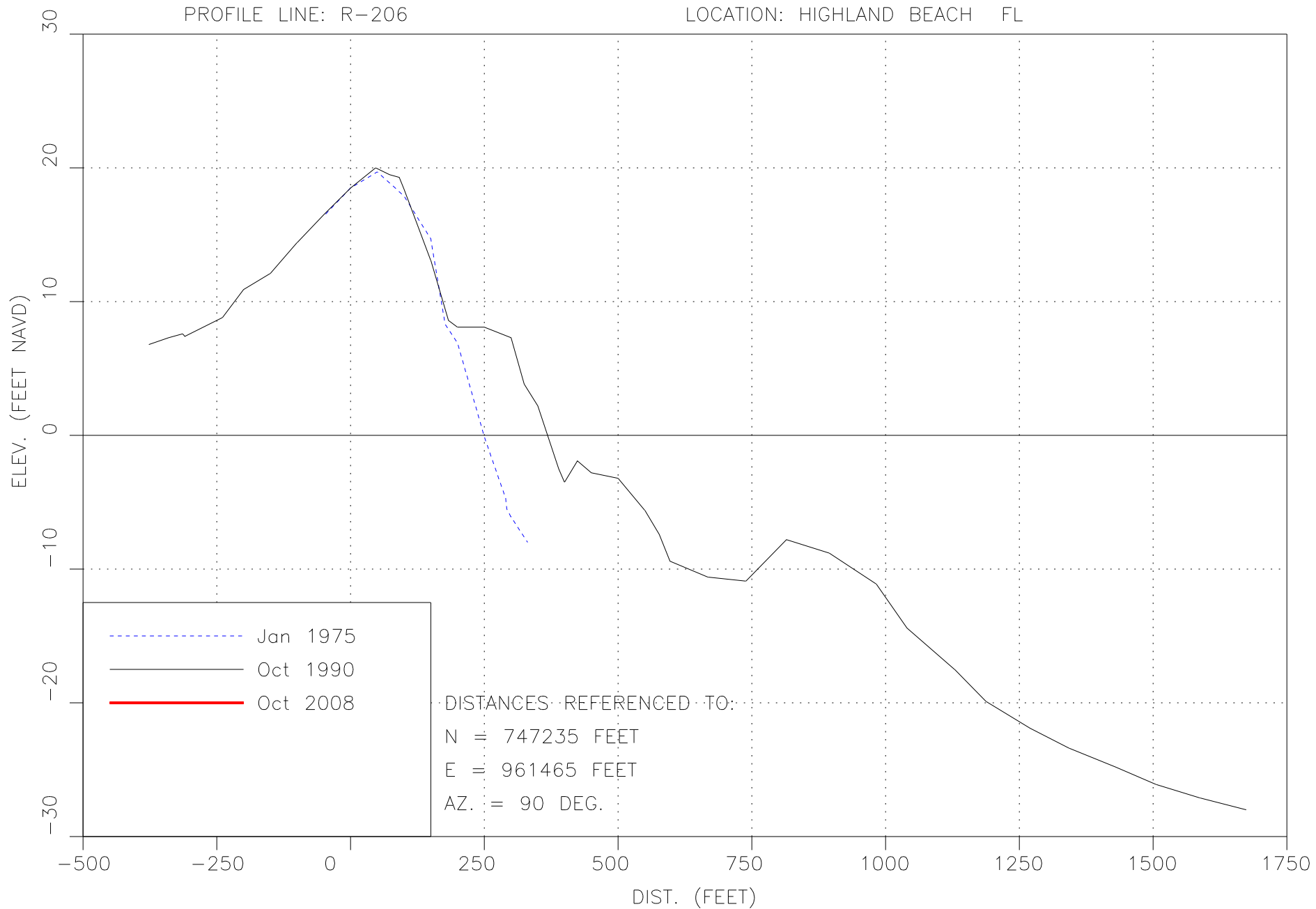
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LOCATION: HIGHLAND BEACH FL



PROFILE LINE: R-206

LOCATION: HIGHLAND BEACH FL



**APPENDIX B**  
**STATE OF FLORIDA FINAL EMERGENCY ORDER FOR**  
**HURRICANE SANDY REPAIRS**

**STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**In re:**

**EMERGENCY AUTHORIZATION FOR  
REPAIRS, REPLACEMENT,  
RESTORATION AND CERTAIN  
OTHER MEASURES MADE NECESSARY  
BY HURRICANE SANDY**

**OGC NO. 12-1641**

**EMERGENCY FINAL ORDER**

Under Section 120.569(2)(n), Florida Statutes, and upon consideration of the following findings of fact, the State of Florida Department of Environmental Protection (Department) enters this Emergency Final Order (Order), including Findings of Fact and Conclusions of Law, in response to the imminent or immediate danger to the public health, safety, and welfare of the citizens of the State of Florida resulting from the damage wrought by Hurricane Sandy (hereinafter "the Hurricane").

**FINDINGS OF FACT**

1. On the 26th day of October, 2012, the Hurricane affected Florida with reported maximum sustained winds of 49 miles per hour, tides 6 feet above normal and high surf conditions. The Hurricane caused coastal damage within the following counties: Brevard, Broward, Flagler, Indian River, Martin, Miami-Dade, Palm Beach, St. Johns, St. Lucie and Volusia which shall constitute the specific area covered by this Order. This area shall herein be referred to as the "Emergency Area."

2. The Department finds that the Hurricane has created a state of emergency threatening the public health, safety, welfare, and property throughout the coast line of the Emergency Area. As a result of the emergency, immediate action by Florida's citizens and government is necessary to repair, replace, and restore structures damaged by the Hurricane.

3. The Department finds that an emergency authorization is required to address the need for immediate action because the normal procedures for obtaining the necessary authorizations would not result in sufficiently timely action to address the emergency.

4. The Department finds that immediate, strict compliance with the provisions of the rules or orders noted within this Order would prevent, hinder, or delay necessary action in coping with the emergency, and that the actions authorized under this order are narrowly tailored to address the immediate need for action and are procedurally fair under the circumstances.

### **CONCLUSIONS OF LAW**

1. Based on the findings recited above, it is hereby concluded that the emergency caused by the Hurricane continues to pose an immediate danger to the public health, safety, or welfare and requires an immediate order of the Department.

2. Under Section 120.569(2)(n), Florida Statutes, the Secretary of the Department is authorized to issue this Order.

3. Suspension of rules as noted within this Order is required so as not to prevent, hinder, or delay necessary action in coping with the emergency.

### ***THEREFORE, IT IS ORDERED:***

#### **1. Coastal Construction Control Line Activities**

This section applies to activities conducted within the Emergency Area seaward of the Coastal Construction Control Lines (CCCLs) as established by Chapter 62B-26, Florida Administrative Code. Emergency Permits may be issued by the Department pursuant to Rule 62B-33.014, Florida Administrative Code. A list of activities seaward of the CCCL that are exempt from CCCL permitting requirements is contained in Rule 62B-33.004, Florida Administrative Code, and Section 161.053(11), Florida Statutes. The Department has developed

a Public Information Handout to provide property owners with a concise explanation of activities that are authorized seaward of the CCCL in this Order. To obtain a copy please visit the “hot topics” section of the Department’s website at [www.dep.state.fl.us/beaches](http://www.dep.state.fl.us/beaches). You may also contact the Department directly by mail at 3900 Commonwealth Boulevard, Mail Station #300, Tallahassee, Florida 32399-3000 or by phone at 850/488-7708 or 850/922-7881.

This Order does not authorize the construction of permanent structures that did not exist prior to the emergency, nor does it authorize beach scraping performed by itself or in association with any other activities. In addition, activities that extend onto state owned lands of Florida seaward of the mean high-water line that would typically require a permit pursuant to Sections 161.041 and/or 161.055, Florida Statutes, (i.e., regulated under a Joint Coastal Permit (JCP) are not authorized under this Subsection. JCP activities are addressed separately in Section 2. of this Order.

**a. Activities Undertaken by Local Governments, the Department’s Division of Recreation and Parks, and Utility Companies**

The following activities may be undertaken by local governments, the Department’s Division of Recreation and Parks, and utility companies to protect, repair, or replace structures and property without notice to the Department or a water management district, subject to the limitations below. Work performed under subsection 1.a. must be complete by December 28, 2013.

(1) Removal of Hurricane-generated debris. Prior to removing the debris and to the greatest extent possible, beach compatible sand should be separated from the debris and kept on site. To prevent debris from becoming buried, all Hurricane-generated debris shall be removed prior to conducting any fill activities.

(2) The repair of the following public facilities: utilities, roads and beach access ramps.

(3) Return of sand to the beach and dune system that has been deposited upland by the Hurricane, and restoration of a damaged dune system using beach compatible sand from an upland source. The fill material shall not cover any Hurricane-generated debris or construction debris. All fill material shall be sand that is similar to the pre-Hurricane beach sand in both coloration and grain size and be free of debris, rocks, clay or other foreign matter. No sand may be obtained from the beach or below the mean high water line seaward of the CCCL without specific written authorization from the Department.

**b. Activities Requiring Local Authorization**

Local governments are authorized to issue permits in lieu of Department permits to private and public property owners for the activities listed below. Local governments shall notify the Department in writing within three (3) working days of permits issued under this section. Work authorized by the local government must be complete within 90 days of the expiration of this Order.

(1) Temporary or remedial activities that are necessary to secure structures in order to remove safety hazards and prevent further damage or collapse of foundations.

(2) Temporary wooden retaining walls, cantilever sheetpile walls (without concrete caps, tiebacks, or other reinforcement), sandbags less than 100 lbs./filled bag, or similar structures. Temporary armoring must be removed within 60 days of installation or the individual must seek authorization from the Department to keep the temporary armoring in place.

**Pursuant to Section 161.085(3), Florida Statutes, this Order does not authorize local governments to permit geotextile containers as the core of a reconstructed dune for the purposes of temporary armoring.**

(3) Repair or replacement of minor ancillary structures (such as stairs, landings, and HVAC platforms) and services utilities that are associated with the existing habitable structure and are necessary for occupancy of the habitable structure.

The repair of minor ancillary structures or service utilities shall not exceed the size of the original structure or service utility damaged or destroyed by the Hurricane. Repair of surviving beach/dune walkovers is authorized provided the structure is substantially intact and the repair allows for adjustments to be made to the seaward terminus of the walkover if necessary to accommodate changes in the shoreline topography and native salt-resistant vegetation patterns resulting from the post-Hurricane recovery of the beach and dune system.

(4) Permanent repair of foundations for buildings that have not been substantially damaged.

(5) The replacement or repair of caps and anchoring systems (or tiebacks), for seawalls or bulkheads.

(6) Restoration of a damaged dune system using beach compatible sand from an upland source.

All fill material shall be sand that is similar to the pre-Hurricane beach sand in both coloration and grain size and be free of debris, rocks, clay or other foreign matter. No sand may be obtained from the beach or below mean high water seaward of the CCCL without specific written authorization from the Department.

(7) Return of sand to the beach dune system which has been deposited upland by the Hurricane.

The recovered fill material shall be free of debris and not cover any Hurricane-generated debris or construction debris.

## **2. Joint Coastal Permit (JCP) Activities**

This Subsection applies to certain activities along the natural sandy beaches of the Atlantic Ocean that extend onto sovereignty lands of Florida, seaward of the mean high-water line (MHWL) and are likely to have a material physical effect on the coastal system or natural beach and inlet processes, i.e., activities that are regulated under a JCP, pursuant to Section 161.041 and/or 161.055, Florida Statutes.

a. In lieu of a normal JCP for activities summarized above, federal, state or local governments may apply to the Department for emergency authorizations to alleviate hazardous conditions resulting from the Hurricane that pose an immediate danger to life or limb, including sudden and unpredictable hazards to navigation. Applications for emergency authorizations shall meet the following criteria:

(1) The application must be received by the Department within the effective date of issuance of the Department's Order.

(2) The hazardous conditions are a result of the Hurricane identified in the Department's Order and did not exist prior to the Hurricane.

(3) The proposed measures are limited to the minimum amount necessary to alleviate the hazardous conditions by temporarily stabilizing the structure or clearing the channel, until a JCP can be processed to address the long-term repair;

(4) Fill material shall not extend seaward of the MHWL that existed immediately before the Hurricane;

(5) Navigational dredging shall not exceed channel depths that existed immediately before the Hurricane;

(6) Reconstruction of non-water-dependent structures on sovereign submerged lands unless authorized by Subsection 18-21.00405(6), Florida Administrative Code, is prohibited;

(7) Fill may only be placed seaward of the MHWL to temporarily stabilize an upland structure, if that structure is in danger of imminent collapse and that structure was located behind the primary dune line prior to the Hurricane;

(8) The placement of fill may only extend the MHWL seaward of the current (post-Hurricane) location if the applicant provides proof that the riparian owner(s) has obtained a disclaimer under Rule 18-21.019, Florida Administrative Code (from the Department's Division of State Lands) for the proposed project site or documentation from the Department that a valid erosion control line has been established at the fill site.

(9) Any fill material placed on the beach shall meet the criteria for beach-quality sand in Paragraph 62B-41.007(2)(j), Florida Administrative Code;

(10) The proposed measures shall not cause water quality violations outside of the mixing zone, established pursuant to Rule 62-4.244, Florida Administrative Code; and

(11) The proposed measures shall not adversely affect hardbottom communities, seagrass communities or functional marine turtle nesting habitat, and shall not contribute to erosion of adjacent properties.

b. Emergency authorizations shall expire 90 days after issuance.

c. Application fees and noticing requirements shall be waived for projects that are eligible for an emergency JCP authorization.

d. Activities not covered by section 2. of this Order may require a permit from the Department under Section 161.041 or 161.055, Florida Statutes and Chapter 62B-49, Florida Administrative Code. For more information, please contact the Department by mail at 3900 Commonwealth Boulevard, Mail Station #300, Tallahassee, Florida 32399-3000 or by phone at 850/487-4475. If the activities are associated with the repair of damage from the Hurricane identified in the Department's Order, and the applicant can demonstrate that expeditious processing of the JCP application is necessary to meet State or federal recovery efforts, including funding deadlines, the Department may deviate from the standard procedures as follows:

- (1) Processing fees may be waived; and
- (2) The requirement to publish a Notice of Receipt of Application and a Notice of Intended Agency Action pursuant to Rule 62B-49.005(8), Florida Administrative Code, may be waived, along with the associated 14-day waiting period.

### **3. General Conditions**

a. All activities conducted under sections 1. and 2. of this Order shall be performed using appropriate best management practices in accordance with the guidelines and specifications in Chapter 6 of the Florida Land Development Manual: A Guide to Sound Land and Water Management (Florida Department of Environmental Regulation 1988). For activities conducted in or discharging to wetlands or other surface waters, best management practices include properly installed and maintained erosion and turbidity control devices to prevent erosion and shoaling, to control turbidity, and to prevent violations of state water quality standards and to protect the functions provided by wetlands and other surface waters to fish, wildlife, and listed species.

b. The authorizations in sections 1. and 2. of this Order shall not apply to structures and associated activities that were not legally existing or otherwise properly authorized by all applicable agencies before the passage of the Hurricane.

c. Applicable environmental resource, surface water management, dredge and fill, coastal construction control line, or joint coastal permits shall be required following provisions of statute and rule for other activities not authorized in this Order that do not otherwise qualify as an exempt activity under statute or rule.

d. The nature, timing, and sequence of construction authorized under this Order shall be conducted in such a manner as to provide protection to, and so as to not disturb, native salt-resistant vegetation and listed species and their habitat, including threatened or endangered sea turtles, endangered manatees, endangered beach mice, endangered plant communities, and migratory shorebirds. If activities conducted under sections 1. or 2. of this Order occur during the marine turtle nesting season (March 1 through October 31 in Brevard, Indian River, St. Lucie, Martin, Palm Beach and Broward County, May 1 through October 31 in all other coastal counties within the state), such activities must be coordinated with the Florida Fish and Wildlife Conservation Commission's Imperiled Species Management Section to ensure that all activities comply with state and federal requirements for the protection of sea turtles, their nests, hatchlings, and nesting habitat.

e. Nothing in this order authorizes the taking, attempted taking, pursuing, harassing, capturing or killing of any species (or the nests or eggs of any species) listed under Rule 68A-27, Florida Administrative Code or under the Federal Endangered Species Act.

f. Persons are advised that all structures that are rebuilt should be rebuilt in accordance with all applicable local, state, and federal building standards and requirements of the Federal Emergency Management Act.

g. It is recommended that, where possible, owners of property should maintain documentation (such as photos) of the condition of the structures or lands as they existed prior to initiating any activities authorized under this Order, and should provide such documentation to the Department if requested to do so.

#### **4. Authorization to Use State Owned Submerged Lands**

The Department has been delegated by the Board of Trustees of the Internal Improvement Trust Fund the authority to grant the following authorizations to use state owned submerged lands, that is, lands lying waterward of the line of mean high water, erosion control line or ordinary high water line, in association with the structure or activity subject to repair, restoration, removal, or replacement authorized in this section.

a. Except as provided in paragraphs 4.b., c., and d. of this Order, activities authorized under this Order involving the repair, replacement, or restoration of the activities and structures, and the removal of debris located on submerged lands owned by the state that do not qualify for consent by rule under Rule 18-21.005(1)(b), Florida Administrative Code are hereby granted a Letter of Consent under Rule 18-21.005(1)(c), Florida Administrative Code, provided:

(1) Such repair, restoration, or replacement or removal is conducted in accordance with the terms, conditions, and limitations of this Order;

(2) The structure or activity subject to repair, restoration, or replacement was authorized by the Board of Trustees of the Internal Improvement Trust Fund prior to the Hurricane, or was otherwise legally existing immediately prior to the Hurricane;

(3) The activities are conducted solely to repair, restore, or replace structures or land that was damaged by the Hurricane, or to remove debris resulting solely from the Hurricane; and

(4) The structures and activities are repaired, restored, or replaced in the same location and configuration as was authorized by the Board of Trustees of the Internal Improvement Trust Fund or which otherwise legally existed immediately prior to the Hurricane.

(5) All the terms and conditions of Rule 18-21.005(1)(b) or 18-21.005(1)(c), Florida Administrative Code, as applicable, are met (including certain restrictions for activities performed within aquatic preserves), and provided that activities that require an easement under Rule 18-21.005(1)(e), Florida Administrative Code must obtain the applicable state owned submerged lands easement under Chapter 18-21, Florida Administrative Code within one year of expiration of this Order. This Order does not limit the provisions of those statutory and rule provisions.

b. Non-water dependent structures, grandfathered pursuant to Rule 18-21.00405, Florida Administrative Code, are not authorized to be repaired, restored, or replaced when more than 50% of the structure or activity is lost (based on the cost to repair, restore, or replace the structure or activity);

c. Water-dependent structures that were legally existing immediately before the Hurricane but not in conformance with the current criteria of Chapters 18-18, 18-20 or 18-21, Florida Administrative Code, as applicable, may be repaired, restored, or replaced to the footprint that existed immediately before the Hurricane, but shall, to the greatest extent practicable, be repaired, restored, or replaced to meet the current criteria of Chapters 18-18, 18-20 and 18-21, Florida Administrative Code, as applicable, with respect to design features such as the elevation of decking surfaces and the spacing of deck planking.

d. This Order does not authorize the reconstruction or repair of unauthorized structures that failed to qualify for the grandfather provisions of former Rule 18-21.0405, Florida Administrative Code.

## **5. GENERAL PROVISIONS**

### **A. General Limitations**

The Department issues this Order solely to address the emergency created by the Hurricane. This Order shall not be construed to authorize any activity within the jurisdiction of the Department except in accordance with the express terms of this Order. Under no circumstances shall anything contained in this Order be construed to authorize the repair, replacement, or reconstruction of any type of unauthorized or illegal structure, habitable or otherwise. This Order does not convey any property rights or any rights or privileges other than those specified in this Order.

### **B. Suspension of Rules**

Within the Emergency Area, the requirements and effects of rules which conflict with the provisions of this Order are suspended to the extent necessary to implement this Order.

To the extent that any requirement to obtain a permit, lease, consent of use, or other authorization is waived by this Order, it should also be construed that the procedural requirements for obtaining such permit, lease, consent of use or other authorization, including requirements for fees and publication of notices, are suspended for the duration of this order.

### **C. Other Authorizations Required**

This Order only provides relief from the specific regulatory and proprietary requirements addressed herein for the duration of the Order, and does not provide relief from the requirements of other federal, state, water management districts, and local agencies. This Order therefore does not negate the need for the property owner to obtain any other required permits or authorizations, nor

from the need to comply with all the requirements of those agencies. This Order does not provide relief from any of the requirements of Chapter 471, Florida Statutes, regarding professional engineering.

Activities subject to Federal consistency review that are emergency actions necessary for the repair of immediate, demonstrable threats to public health or safety are consistent with the Florida Coastal Management Program if conducted in strict conformance with this Order.

**D. Expiration Date**

This Order shall take effect immediately upon execution by the Secretary of the Department, and shall expire on December 28, 2012, unless modified or extended by further order.

**E. Violation of Conditions of Emergency Final Order**

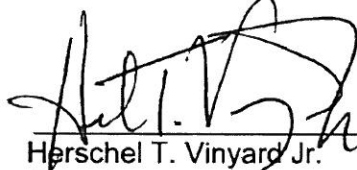
Failure to comply with any condition set forth in this Order shall constitute a violation of a Department Final Order under Chapters 161, 253, 258, 373, and 403, Florida Statutes, and enforcement proceedings may be brought in any appropriate administrative or judicial forum.

**NOTICE OF RIGHTS**

Pursuant to Section 120.569(2)(n), Florida Statutes, any party adversely affected by this Order has the right to seek an injunction of this Order in circuit court or judicial review of it under Section 120.68, Florida Statutes. Judicial review must be sought by filing a notice of appeal under Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within thirty days after this Order is filed with the Clerk of the Department.

**DONE AND ORDERED** on this 31<sup>st</sup> day of October, 2012, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION

  
\_\_\_\_\_  
Herschel T. Vinyard Jr.  
Secretary

3900 Commonwealth Blvd  
Tallahassee, FL 32399-3000

FILED on this date, pursuant to  
§120.52, Florida Statutes, with the  
designated Department Clerk,  
receipt of which is hereby acknowledged.

  
\_\_\_\_\_  
CLERK

DATE : 10/31/12

**APPENDIX C**  
**STATE OF FLORIDA BEACH MANAGEMENT FUNDING**  
**ASSISTANCE PROGRAM**

# Beach Erosion Control Program

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Local Government Funding Assistance Program: -  
Ranking Criteria for -  
Beach and Inlet Management Projects -

7/17/2012

A discussion of statutory and rule authority for ranking criteria and practical methods used by Bureau staff for the award of ranking points to beach and inlet management projects for determining priority listing in the annual Local Government Funding Request submitted to the Governor and Legislature.

## **Beach Erosion Control Program Mission**

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Recognizing the importance of the state's beaches, the Florida Legislature in 1986 adopted a posture of protecting and restoring the state's beaches through a comprehensive beach management planning program. Under the program, the Department of Environmental Protection's Bureau of Beaches and Coastal Systems (Bureau) evaluates beach erosion problems statewide seeking viable solutions for the preservation of valuable infrastructure, upland development and critical habitat. The primary vehicle for implementing the beach management planning recommendations is the Florida Beach Erosion Control Program (Program), which was established for the purpose of working in concert with local, state and federal governmental entities to achieve the protection, preservation and restoration of the coastal sandy beach resources of the state. Under the program, financial assistance in an amount up to 75 percent of project costs is available to Florida's county and municipal governments, community development districts, or special taxing districts for shore protection and preservation activities located on the Gulf of Mexico, Atlantic Ocean, or Straits of Florida.

Eligible activities include beach restoration and nourishment activities, project design and engineering studies, environmental studies and monitoring, inlet management planning, inlet management activities to reduce adjacent beach erosion, dune restoration and protection activities, and other beach erosion prevention related activities consistent with the adopted Strategic Beach Management Plan. The program is authorized by Section 161.101, Florida Statutes. Since its inception in 1964, the Program has been a primary source of funding to local governments for beach erosion control and preservation activities.

This document is designed to be used by local sponsors when preparing annual funding requests. The document describes each ranking criteria used to establish annual priority order for beach erosion control projects. Statutory authority, rule administration, and the methodology used for assigning points are listed for each criterion as they appear in the rule. Where appropriate, techniques for improving the award of points are discussed or listed.

Statutory authority is provided in Chapter 161, Florida Statutes. Administrative policy is provided in Chapter 62B-36, Florida Administrative Code.

## **Funding Assistance Program Eligibility**

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In order to be eligible for the Funding Assistance Program, projects must be sponsored by a local government and comply with the following criteria:

- Project areas must be on a sandy shoreline in Florida fronting the Atlantic Ocean, Gulf of Mexico, or the Straits of Florida.
- Projects must address shoreline designated as ‘critically eroded’ in the Department’s most recent Critical Erosion Report.
- Beach management projects shall be accessible to the general public and access shall be maintained for the life of the project. Inlet management projects generally do not have to provide public access.
- Projects must be consistent with the Strategic Beach Management Plan and be included in the Statewide Long Range Budget Plan.
- Projects shall be conducted in a manner that encourages cost-savings, fosters regional coordination of projects, optimizes management of sediments and project performance, protects the environment, mitigates impacts caused by modified inlets and provides long-term solutions.
- Appropriate feasibility studies or analysis shall be required before design or construction of new projects. Analysis must determine that the project avoids or minimizes adverse impacts and is cost effective.
- Beach management projects authorized by Congress for federal financial participation are eligible. Local governmental entities shall pursue federal appropriations to the maximum extent possible in order to proportionally reduce state and local project costs.
- Local sponsors must submit an Annual Funding Request and Local Long Range Budget Plan for projects expected to be initiated or continued in the fiscal year upon notification by the Department.

## **Policy**

Rule- 62B-36.003

## Overview of Ranking Criteria

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### **Intent**

<b>Total Points:</b>
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<b>103 Points</b>
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Statute- 161.101(14): The intent of the Legislature in preserving and protecting Florida's sandy beaches pursuant to this act is to direct beach erosion control appropriations to the state's most severely eroded beaches, and to prevent further adverse impact caused by improved, modified, or altered inlets, coastal armoring, or existing upland development. In establishing annual project funding priorities, the department shall seek formal input from local coastal governments, beach and general government interest groups, and university experts. Criteria to be considered by the department in determining annual funding priorities shall include: ...

### **Rule**

Rule- 62B-36.006(1): Eligible projects requesting funding for the upcoming fiscal year will be ranked in priority for the Department's legislative budget request. Projects previously ranked for a construction phase will retain their project score through the monitoring phase. Eligible projects will be assigned a total point score by the Department based on the following criteria: ...

### **Specific Authority**

161.101, 161.161 FS. Law Implemented 161.088, 161.091, 161.101, 161.161 FS. History—New 6-10-83, Formerly 16B-36.06, 16B-36.006, Amended 12-25-03.

## Severity of Erosion

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### **Intent**

Statute- 161.101(14) (a) The severity of erosion conditions, the threat to existing upland development, and recreational and/or economic benefits.

### **Rule**

Rule- 62B-36.006(1) (a) Severity of erosion. The severity of erosion score is determined by the average rate of erosion for the project area over 30 years based upon the Department's long term data base for the project length at 2 points per foot of erosion, rounded to the nearest whole foot, for a maximum total of 10 points.

### **Method of Calculation**

The historical Mean High Water (MHW) data files contained in the Bureau's Historic Shoreline Database shall be used to calculate the average rate of erosion for a 30-year period after 1972 and prior to any beach fill placement in the project area. Linear least square fit to the data is used to determine the erosion/accretion trend.

Historical data is available at:

<ftp://ftp.dep.state.fl.us/pub/water/beaches/HSSD/MHWfiles>

<b>Maximum Credit:</b>
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<b>10 Points</b>
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## Threat to Upland Structures

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### Intent

Statute- 161.101(14) (a) The severity of erosion conditions, the threat to existing upland development, and recreational and/or economic benefits.

<b>Maximum Credit:</b>
----------------------------

<b>10 Points</b>
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### Rule

Rule- 62B-36.006(1) (b) Threat to upland structures. The percent of developed property containing structures within the project boundaries at or seaward of the projected 25-year return interval storm event erosion limit times ten, rounded to the nearest whole number, for a maximum total of 10 points.

### Method of Calculation

The threat to upland structures is determined by the application of the Dean CCCLr or the SBEACH Storm Erosion Model using a 25-year return interval storm tide hydrograph on the most recent beach-offshore profile data at each R-monument in the project area. The Department may use the results of an erosion model submitted in the feasibility study if the study recommends strategies for beach erosion control activities that are accepted by the Department for adoption into the Strategic Beach Management Plan. It should be noted that properties that have existing armoring will be deemed non-threatened.

Points are only awarded to new projects for shorelines that have not been restored. Once the restoration is completed, the upland structures should no longer be threatened.

## **Recreational and Economic Benefits**

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<b>Maximum Credit:</b>
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<b>10 Points</b>
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### **Intent**

Statute- 161.101(14) (a) The severity of erosion conditions, the threat to existing upland development, and recreational and/or economic benefits.

### **Rule**

Rule- 62B-36.006(1) (c) Recreational and economic benefits. The percentage of linear footage of property within the project boundaries zoned commercial or recreational, or the equivalent, in the current local government land use map times ten, rounded to the nearest whole number, for a maximum total of 10 points.

### **Method of Calculation**

Shoreline length within the project boundaries zoned “commercial” or “recreational” is calculated using GIS-based mapping tools. The commercial/recreational shoreline is then calculated as a percentage of the total project length. Designation must be derived from local zoning maps. Undesignated parcels are typically assigned the designation of the adjacent parcels. Resort condominiums are typically designated high-density residential, and are not included in the commercial/recreational calculation in this category.

### **Potential Technologies and Strategies**

Rezoning of properties within the project boundaries to commercial or recreational zoning will increase points in this category.

## **Congressional Authorization of Project**

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### **Intent**

<b>Maximum Credit:</b>
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<b>5 Points</b>
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Statute- 161.101(14) (b) The availability of federal matching dollars.

### **Rule**

Rule- 62B-36.006(1) (d) Availability of federal funds. Projects with Congressional authorization for the project phase shall receive 5 points.

### **Method of Calculation**

Projects that have been authorized by U.S. Congress for a U.S. Army Corps of Engineers project for the project phase receive 5 points. Award of points in this category recognizes projects that have made an effort to acquire federal support for the project by initiating or completing a federal feasibility study. This feasibility study indicates the efforts of the local sponsor to acquire future federal funding.

Projects pursuing funding for subsequent phases of the project will require federal authorization for each specific phase, prior to being awarded points for those subsequent phases.

### **Potential Technologies and Strategies**

Projects which have not previously sought federal authorization can acquire points in this category by pursuing authorization with the U.S. Army Corps of Engineers to conduct a federal feasibility study.

## Availability of Federal Matching Funds

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### **Intent**

<b>Maximum Credit:</b>
<b>5 Points</b>

Statute- 161.101(14) (b) The availability of federal matching dollars.

### **Rule**

Rule- 62B-36.006(1) (d) Availability of federal funds. ... Projects with a current Project Cooperation Agreement executed for the project phase or with available federal funds shall receive 5 points.

### **Method of Calculation**

Points are awarded in this category when federal matching dollars are secured through a current Project Cooperation Agreement (PCA) or Project Partnership Agreement (PPA) for the proposed phase. If the PPA/PCA indicates that scheduled activities have been approved but funds have not yet been appropriated, no points are awarded since the statutory intent was to leverage matching federal dollars.

### **Potential Technologies and Strategies**

Projects can maximize points in this category if federal funds from the U.S. Army Corps of Engineers are secured prior to requesting state funds.

## **Dedicated Long Term Funding Source**

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<b>Maximum Credit:</b>
<b>3 Points</b>

### **Intent**

Statute- 161.101(14) (c) The extent of local government sponsor financial and administrative commitment to the project, including a long-term financial plan with a designated funding source or sources for initial construction and periodic maintenance.

### **Rule**

Rule- 62B-36.006(1) (e) Local sponsor financial and administrative commitment. Local governments who have a long term funding source dedicated to the restoration and management of the beach project shall receive 3 points;

### **Method of Calculation**

Long term designated funding sources that are established by referendum or a specific taxing district receives 3 points. Examples of these include Municipal Service Benefit Units, Municipal Service Taxing Unit, Tourist Development Council taxes (bed taxes), dedicated portion of local sales tax, inlet district taxes, etc. Voter referendum indicates community-wide support for the project and long term funding source to maintain the project. Line items in annual capital improvements budgets do not qualify due to the susceptibility to change based on annually fluctuating priorities.

### **Potential Technologies and Strategies**

Development of a local designated long term funding source is eligible for cost-sharing under the Feasibility funding category. A scope of work to develop options, determine a chosen alternative, and implement the funding source is recommended. Bureau staff can assist with all phases of development.

## **Dedicated Administrative Staff**

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### **Intent**

Statute- 161.101(14) (c) The extent of local government sponsor financial and administrative commitment to the project, including a long-term financial plan with a designated funding source or sources for initial construction and periodic maintenance.

### **Rule**

(e) Local sponsor financial and administrative commitment.....those with staff dedicated for administrative support shall receive 1 point;

### **Method of Calculation**

The point is awarded to a local sponsor with at least one full-time staff member dedicated to the beach erosion control program.

### **Potential Technologies and Strategies**

The acquisition of a full-time coastal coordinator within the local sponsor's staff will achieve the award of one point in this category.

<b>Maximum Credit:</b>
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<b>1 Points</b>
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## Quarterly Reporting Requirements

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### **Intent**

<b>Maximum Credit:</b>
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<b>1 Points</b>
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Statute- 161.101(14) (c) The extent of local government sponsor financial and administrative commitment to the project, including a long-term financial plan with a designated funding source or sources for initial construction and periodic maintenance.

### **Rule**

(e) Local sponsor financial and administrative commitment.....those with 75% or better compliance record for submitting quarterly reports and billings correctly and on time over the previous year shall receive 1 point.

### **Method of Calculation**

Quarterly reports are due 30 days following the end of the fiscal quarter, even if no work has been completed and no billings are submitted. This is a contract requirement.

### **Potential Technologies and Strategies**

Timely submission of quarterly reports will not only provide a ranking point in this category, but it will also provide the Department with current project status updates and help to maintain contract compliance. Local sponsors without a current contract may voluntarily submit quarterly reports and receive award of this point.

## **Previous State Financial Commitment**

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### **Intent**

Statute- 161.101(14) (d) Previous state commitment and involvement in the project.

### **Rule**

Rule- 62B-36.006(1) (f) Previous state commitment. Projects where the Department has previously cost shared feasibility or design phase shall receive 1 point;

### **Method of Calculation**

One point is awarded if the Department has previously executed a cost sharing agreement using program funds for a feasibility or design study.

### **Potential Technologies and Strategies**

The point is awarded to local sponsors to acknowledge ongoing efforts to maintain previously-established projects. A project is eligible to receive this ranking point once the local sponsor enters into a cost-sharing agreement with the Department for a particular project.

<b>Maximum Credit:</b>
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<b>1 Points</b>
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## **Enhanced Longevity of an Existing Project**

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### **Intent**

Statute- 161.101(14) (d) Previous state commitment and involvement in the project.

### **Rule**

Rule- 62B-36.006(1) (f) Previous state commitment .....projects to enhance, or increase the longevity of a previously constructed project shall receive 4 points;

### **Method of Calculation**

Points can be awarded in this category for projects that propose an alternative design to increase the nourishment interval through a structural alternative, alternative beach fill design or geotechnical improvement to the project.

### **Potential Technologies and Strategies**

For beach projects, points have been awarded in the past for the construction of an erosion control structure designed to extend the life of a beach nourishment project, redesign of an existing structure, or berm design alternatives that improve project performance.

For inlet projects, points have been awarded in the past for projects that increase inlet sediment bypassing, such as construction or expansion of sediment impoundment basins, improvements to jetty design, or the acquisition and operation of a floating or fixed sediment transfer plant.

<b>Maximum Credit:</b>
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<b>4 Points</b>
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## **Nourish a Previously Restored Shoreline**

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### **Intent**

Statute- 161.101(14) (d) Previous state commitment and involvement in the project.

### **Rule**

Rule- 62B-36.006(1) (f) Previous state commitment .....and projects that will nourish a previously restored shoreline shall receive 5 points,

### **Method of Calculation**

Points are rewarded for nourishment projects in an effort to provide continued state support for established projects.

### **Potential Technologies and Strategies**

Any previously constructed project will qualify for these points. For new projects, points can be awarded once the project has been constructed.

<b>Maximum Credit:</b>
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<b>5 Points</b>
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## Project Performance

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### **Intent**

Statute- 161.101(14) (e) The anticipated physical performance of the proposed project, including the frequency of periodic planned nourishment.

### **Rule**

Rule- 62B-36.006(1) (g) Project performance. Performance points shall be based upon the expected life of a project, as documented in a feasibility study or on the actual nourishment interval. Projects shall receive 1 point for every year of the expected life or actual life with a maximum total of 10 points.

### **Method of Calculation**

Project performance is most often judged by the length of the nourishment interval, which would initially be established by the feasibility study. Once a project has been restored and subsequently nourished, an actual performance interval can be established. An interim beach nourishment event to restore a project eroded by a major storm event will not be used in calculating the nourishment interval.

<b>Maximum Credit:</b>
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<b>10 Points</b>
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## **Mitigating Inlet Effects**

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### **Intent**

Statute- 161.101(14) (f) The extent to which the proposed project mitigates the adverse impact of improved, modified, or altered inlets on adjacent beaches.

### **Rule**

Rule- 62B-36.006(1) (h) Mitigation of inlet effects. Projects that implement strategies in the Strategic Beach Management Plan for sediment bypassing or supplemental nourishment to adjacent beaches shall receive points based upon the percentage of the target bypass volume to be achieved times 10 for a maximum total of 10 points.

### **Method of Calculation**

For inlet projects, points are awarded based on the percentage of the bypass target achieved on an annually averaged basis. Calculations are made using the annual average of bypass material placed on the adjacent eroding shorelines divided by the annual bypass objective indicated in the Department-adopted Inlet Management Plan (IMP) or the Strategic Beach Management Plan (SBMP).

For beach projects, this criterion has not been used since the legislative changes to Chapter 161.143 were passed in 2008. The decision was anticipated to be an interim measure used until new inlet ranking criteria could be adopted by rule. However, points will be awarded to beach projects for the FY2013/14 funding cycle. Beach projects eligible for these points must be located within the area of inlet influence.

### **Potential Technologies and Strategies**

Inlet bypassing efficiency can be improved by establishing a regular bypassing program for the inlet and constructing inlet management features, such as sediment impoundment basins, to increase the availability of sand within the system. Regular updates of the Inlet Management Plan can help the local sponsor and the Department to develop new strategies for mitigating an inlet's erosive effects.

<b>Maximum Credit:</b>
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<b>10 Points</b>
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## **Innovative Technologies**

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### **Intent**

Statute- 161.101(14) (g) Innovative, cost-effective, and environmentally sensitive applications to reduce erosion.

<b>Maximum Credit:</b>
<b>3 Points</b>

### **Rule**

Rule- 62B-36.006(1) (i) Innovative technologies. Projects to address erosion that are economically competitive and environmentally sensitive and designed to demonstrate an innovative application of existing technologies shall receive 3 points;

### **Method of Calculation**

Projects involving innovative erosion control structures, construction techniques or environmental protection elements based on current technologies receive 3 points. Review of this criterion is conducted jointly by the Bureau's permitting, engineering and project management staff.

### **Potential Technologies and Strategies**

Potential technologies include designs that potentially:

- Improve project performance by increasing nourishment interval
- Reduce costs over conventional beach erosion control activities
- Minimize adverse impacts to environmental resources, especially endangered or threatened species.
- Increase the ability to filter or screen sediments during the dredging process to produce larger quantities of beach compatible material
- Implement new methods for mitigating localized areas of accelerated erosion (hot spots).

## Technologies New to Florida

---

### **Intent**

Statute- 161.101(14) (g) Innovative, cost-effective, and environmentally sensitive applications to reduce erosion.

<b>Maximum Credit:</b>
<b>5 Points</b>

### **Rule**

Rule- 62B-36.006(1) (i) Innovative technologies .....projects that demonstrate technologies previously untried in the state shall receive 5 points for a maximum total of 5 points.

### **Method of Calculation**

Projects that would use dredging techniques, separation technologies, methods of protection of environmental resources or quality control, etc. not previously tried in Florida would receive 5 points. Review of this criterion is conducted jointly by the Bureau's permitting, engineering and project management staff.

### **Potential Technologies and Strategies**

Projects that could potentially qualify for points include those employing techniques previously not permitted in Florida, including:

- More efficient dredging vessels
- Deep water systems
- Separation technology, such as the hydrocyclone to utilize marginal material.

## Enhancing Nesting Sea Turtle Nesting Refuges

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### **Intent**

Statute- 161.101(14) (h) Projects that provide enhanced habitat within or adjacent to designated refuges of nesting sea turtles.

### **Rule**

Rule- 62B-36.006(1) (j) Enhance nesting sea turtle refuges. Projects that are adjacent or within designated nesting sea turtle refuges shall receive 5 points.

### **Method of Calculation**

Archie Carr National Wildlife Refuge is the only designated sea turtle refuge in the state and therefore only projects within or immediately adjacent to that particular refuge receive points.

<b>Maximum Credit:</b>
<b>5 Points</b>

## **Regionalization**

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### **Intent**

<b>Maximum Credit:</b>
<b>5 Points</b>

Statute- 161.101(14) (i) The extent to which local or regional sponsors of beach erosion control projects agree to coordinate the planning, design, and construction of their projects to take advantage of identifiable cost savings.

### **Rule**

Rule- 62B-36.006(1) (k) Regionalization. Projects where two or more local governmental entities couple their projects for contracting to reduce costs shall receive 5 points.

### **Method of Calculation**

Points can be awarded in this category for two or more projects proposed by two or more local sponsors that are entering the same phase and can demonstrate significant anticipated cost savings through joint contracting. Projects must be able to demonstrate cost savings by bidding the projects separately and jointly. Points cannot be awarded until the Department is provided with an executed interlocal agreement between the local sponsors.

### **Potential Technologies and Strategies**

Local sponsors can work with regional neighbors to coordinate construction schedules to reduce mobilization/demobilization costs, volume production costs, and observation/monitoring costs.

## **Project Significance**

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### **Intent**

Statute- 161.101(14) (j) The degree to which the project addresses the state's most significant beach erosion problems.

### **Rule**

Rule- 62B-36.006(1) (l) Significance. Projects shall receive points based upon the project length at one point a mile, rounded to the nearest whole number, for a total maximum of 10 points.

### **Method of Calculation**

Points are awarded based on project length with the assumption that a longer contiguous project will protect more upland structures and habitat and will have a longer project performance, i.e. longer nourishment interval.

### **Potential Technologies and Strategies**

Local sponsors with multiple project segments can combine those segments to produce a longer length, if the construction phase for all segments is scheduled concurrently. Concurrent scheduling of projects can also decrease overall projects costs by reducing mobilization/demobilization costs.

<b>Maximum Credit:</b>
<b>10 Points</b>

## **Readiness to Proceed**

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### **Intent**

Statute- 161(14) following (j) In the event that more than one project qualifies equally under the provisions of this subsection, the department shall assign funding priority to those projects that are ready to proceed.

### **Rule**

Rule- 62B-36.006(1) (m) In the event that more than one project receives the same number of points, the Department shall assign funding priority to that project most ready to initiate construction.

### **Method of Calculation**

Points are awarded in this category when all other ranking assessments have been completed in order to rectify any project ties in the ranking list. Readiness to Proceed is determined by Bureau staff based on the status of the permit, local funding source, federal funding if applicable, construction easements, and construction schedule for each project.

### **Potential Technologies and Strategies**

In order to improve standing in this category, local sponsors can attempt to have permits, easements, funding and schedules completed prior to requesting funding.

**CHAPTER 62B-36**  
**BEACH MANAGEMENT FUNDING ASSISTANCE PROGRAM**

62B-36.001	Purpose
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**62B-36.001 Purpose.**

The Beach Management Program works in concert with eligible governmental entities to achieve protection, preservation and restoration of the sandy beaches fronting the Atlantic Ocean, the Gulf of Mexico and the Straits of Florida. The Department may enter into a cost sharing agreement with eligible governmental entities for the implementation of beach management projects. This rule establishes funding request procedures, project ranking, cost sharing procedures and project agreement requirements pursuant to Sections 161.088, 161.091, 161.101 and 161.161, F.S.

*Specific Authority 161.101, 161.161 FS. Law Implemented 161.088, 161.091, 161.101, 161.161 FS. History--New 6-10-83, Formerly 16B-36.01, 16B-36.001, Amended 12-25-03.*

**62B-36.002 Definitions.**

(1) "Annual Funding Request and Local Long Range Budget Plan" is the document submitted by the eligible governmental entity which includes a detailed description for the next fiscal year's funding request and a schedule for the disbursement of funds to be requested for beach management projects or related activities over a given period of time.

(2) "Beach Management" is protecting, maintaining, preserving, or enhancing Florida's beaches including but not limited to, restoring or nourishing beach and dune systems, dune protection and restoration activities, restoration of natural shoreline processes, inlet management activities to facilitate sand bypassing, construction of erosion control structures, supporting engineering and environmental studies, project monitoring, mitigation, and removal of derelict structures and obstacles to natural shoreline processes.

(3) "Contractual Services" are the provision of engineering, professional, or scientific services for eligible activities as otherwise described in this chapter. Such activities may be performed by a private company or individual, or, if approved by the Department, pursuant to subsection 62B-36.007(4), F.A.C., an eligible governmental entity.

(4) "Critically Eroded Shoreline" is a segment of shoreline where natural processes or human activities have caused, or contributed to, erosion and recession of the beach and dune system to such a degree that upland development, recreational interests, wildlife habitat or important cultural resources are threatened or lost. Critically eroded shoreline may also include adjacent segments or gaps between identified critical erosion areas which, although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects.

(5) "Department" is the Department of Environmental Protection.

(6) "Eligible Governmental Entity" is any state, county, municipality, township, special district, or any other public agency having authority and responsibility for preserving and protecting the beach and dune system.

(7) "Inlet" is a short narrow waterway including all related flood and ebb tidal shoals and the inlet shorelines, connecting a bay, lagoon, or similar body of water with the Gulf of Mexico, the Straits of Florida, or the Atlantic Ocean. Improved, altered or modified inlets are those where stabilizing rigid coastal structures have been constructed, or where inlet related structures or features such as channels have been constructed or are actively maintained and the channel depth is greater than the inlet system would support in a natural state.

(8) "Project Agreement" is a contract executed between the Department and the eligible governmental entity that explicitly defines the terms and conditions under which the project shall be conducted.

(9) "Project Boundary" means the shoreline of the beach management project and the first row of development immediately landward of the beach vegetation line or beach erosion control line, whichever is further landward.

(10) "Project Phase" is a logical step required in developing and implementing a project. A typical project will normally include

the following phases:

(a) “Feasibility” – is the characterization of the erosion problem and constraints on remediation alternatives, development and analysis of alternatives to address the problem, and selection of the cost-effective, environmentally sound alternative that avoids or minimizes adverse impacts.

(b) “Design and Permitting” – is the development of plans, specifications, permit applications and final costs for the project.

(c) “Construction” – is the execution of the selected project.

(d) “Monitoring” – is the collection of project performance, biological and environmental data.

(11) “Public Beach Access” is an entry zone adjacent to a sandy beach under public ownership or control which is specifically used for providing access to the beach for the general public. The access must be signed, maintained and clearly visible from the adjacent roadway. The types of public beach access sites are:

(a) “Primary Beach Access” is a site with at least 100 public parking spaces and public restrooms.

(b) “Secondary Beach Access” is a site that may have parking and amenities, but does not qualify as a primary beach access.

(12) “Public Lodging Establishment” is any public lodging establishment currently licensed by the Department of Business and Professional Regulation in the classification of “hotel”, “motel” and “resort condominium” with six or more units and fronting directly on the sandy beach.

(13) “Statewide Long Range Budget Plan” is the planning document used by the Department to schedule the disbursement of funds over a given period of time. It is developed in coordination with eligible governmental entities based on the Strategic Beach Management Plan and Local Long Range Budget Plans.

(14) “Strategic Beach Management Plan” is the Department’s adopted plan for management of the critically eroded shoreline of the state and the related coastal system.

*Specific Authority 161.101, 161.161 FS. Law Implemented 161.088, 161.091, 161.101, 161.161 FS. History—New 6-10-83, Formerly 16B-36.02, 16B-36.002, Amended 12-25-03.*

### **62B-36.003 Policy.**

(1) The Beach Management Program is established to develop and execute a comprehensive, long range, statewide beach management plan for erosion control, beach preservation, restoration, nourishment and storm protection for the critically eroded shoreline of the State of Florida. This comprehensive program includes the Strategic Beach Management Plan, the Critical Erosion Report, shoreline change reports, inlet management studies, state and federal feasibility and design studies, the Statewide Long Range Budget Plan, and other reports as the Department may find necessary for a multiyear maintenance and repair strategy. The comprehensive program is implemented through projects consistent with the Strategic Beach Management Plan and included in the Statewide Long Range Budget Plan.

(2) The Department shall annually review available information and revise the designations of critically eroded shoreline in the Critical Erosion Report. Eligible governmental entities shall be notified of any proposed changes and be given an opportunity to submit additional information to justify or refute proposed revisions.

(3) Beach management projects funded by the Department shall be conducted in a manner that encourages cost-savings, fosters regional coordination of projects, optimizes management of sediments and project performance, protects the environment, and provides long-term solutions. Appropriate feasibility studies or analysis shall be required before design or construction of new projects.

(4) Beach and dune restoration and nourishment projects funded by the Department shall be accessible to the general public and access shall be maintained for the life of the project. Inlet sediment bypassing and the initial restoration of adjacent shorelines impacted by improved, modified or altered inlets, do not have to provide for public access, except for when an Erosion Control Line has been established. Shoreline segments shall be evaluated for public access as set forth in subsection 62B-36.007(1), F.A.C.

(5) Beach management projects will be evaluated on a case by case basis and may be cost shared, pursuant to Rules 62B-36.006 and 62B-36.007, F.A.C., when determined to avoid or minimize adverse impacts and be cost effective as demonstrated by feasibility and design studies.

(6) Activities primarily related to navigation or other infrastructure improvements at inlets are, generally, not eligible for cost sharing. However, components of projects which mitigate critically eroded shoreline caused by alterations, modifications or improvements to inlets, implement components of the Strategic Beach Management Plan, and which do not increase impacts, are

eligible for cost sharing of up to 50% of the non-federal share for those components which:

(a) Are designed to minimize the erosive effects to the downdrift shoreline caused by the inlet by improving or facilitating the efficiency of sand bypassing, such as the construction of sand bypassing facilities, sand traps and jetty alterations; or

(b) Cost effectively place beach quality sand on the adjacent eroded beaches, such as the incremental cost of placing sand on the beach rather than in an offshore disposal area. The Department will cost share only in the incremental cost of placement of the material, not mobilization and demobilization of equipment, design studies, or any other activity normal to the operation and maintenance of the inlet.

(7) Eligible governmental entities are encouraged to consider existing inlet navigation maintenance activities as potential sources of sand when developing beach restoration or nourishment projects.

(8) Beach management projects authorized by Congress for federal financial participation shall be cost shared up to 50% of the non-federal share. Eligible governmental entities shall pursue federal appropriations to the maximum extent possible in order to proportionally reduce state and local project costs. The Department will not cost share on the federal portion of an authorized project unless an immediate threat to upland properties and financial loss is demonstrated.

(9) Upon notification from the Department of the 60-day submittal period, eligible governmental entities shall submit an updated Annual Funding Request and Local Long Range Budget Plan. Annual funding shall only be requested for projects expected to be initiated or continued in that fiscal year.

(10) The Department shall annually review and rank all projects requested by eligible governmental entities for the next fiscal year, and maintain a current project listing in priority order. As part of the review, the Department shall seek formal input from local coastal governments, beach and general government interest groups, and university experts. The project listing shall also identify unranked projects and funds needed for statewide and regional management activities, state sponsored or co-sponsored demonstration projects, new feasibility and design studies, and a consolidated category for project monitoring required by permit. In determining the final project ranking, the Department shall consider likely available funding and include a primary and alternate list of all projects. The primary list shall include those projects where legislatively appropriated funding is anticipated to be adequate to fund the projects. The alternate list includes those projects where funding is not anticipated to be available. Funding that may become available due to savings or scheduling changes shall be made available in the fourth quarter of the fiscal year to projects in the following order:

(a) Projects on the primary list that require additional funds to complete the project phase.

(b) Previously funded projects that require additional funds to complete the project phase.

(c) Projects on the alternate list in priority order.

(d) Emergency situations as determined by the Department.

(11) The Department, in consultation with the eligible governmental entity, has the discretion, pursuant to Section 161.101(20), F.S., to revise funding for projects identified on the primary or alternate list if it is determined by the Department that the project is not ready to be initiated during the fiscal year. If the Department revises funding for a primary list project, at the request of the eligible governmental entity, the project shall be included on the subsequent year's primary list, regardless of prioritization pursuant to Rule 62B-36.006, F.A.C.

(12) Eligible governmental entities may design and construct beach management projects prior to the receipt of funding from the state and may subsequently apply for reimbursement from the Department pursuant to the procedure in subsection 62B-36.009(3), F.A.C.

*Specific Authority 161.101, 161.161 FS. Law Implemented 161.088, 161.091, 161.101, 161.161 FS. History—New 6-10-83, Formerly 16B-36.03, Amended 4-27-86, Formerly 16B-36.003, Amended 12-25-03.*

### **62B-36.005 Annual Funding Requests.**

(1) Annual funding requests for cost sharing of projects shall be submitted by the eligible governmental entity to the Department. Projects previously submitted, but not funded, and projects with cost overruns should be included. Eligible governmental entities who have received funding for projects in past fiscal years and who anticipate requesting funding in subsequent years shall update the Local Long Range Budget Plan as to costs and scheduling. The Local Long Range Budget Plan shall be consistent with the Strategic Beach Management Plan and have a 10-year minimum time frame. The submittal shall be in electronic format and include:

(a) A detailed project description, including project boundaries by Department range monuments, methods used in conducting the project, and data or analysis to apply the ranking criteria required by Rule 62B-36.006, F.A.C.

(b) A map of the project area depicting the public beach access, the public parking within one quarter mile of each beach access, public restroom facilities, the public lodging establishments, and comprehensive plan designations of commercial and recreational facilities within the project boundary.

(c) Current license documentation on public lodging establishments within the project boundaries, including the number of units available, if used to document public access.

(d) A current or updated resolution from the eligible governmental entity which includes statements of their support of the project, willingness to serve as the local sponsor, and a statement of the extent of their ability and willingness to provide the necessary local funding share to implement the project.

(e) A schedule of activities by project phase.

(f) The annual project cost estimates that indicate cost sharing by the eligible governmental entity, with sufficient supporting detail depicting costs of project phases.

(2) The Department shall evaluate projects submitted to determine eligibility, project ranking and priority, and the extent of cost sharing. Upon completion of the evaluation process, all eligible projects will be incorporated into the Department's Statewide Long Range Budget Plan, which will be submitted to the Legislature along with the Department's legislative budget request prioritizing projects according to the criteria in Rule 62B-36.006, F.A.C.

(3) Funding requests shall be evaluated and ranked on the basis of information provided by the eligible governmental entity, except where such data is superseded by better quality information obtained by the Department. Failure to provide all required information and documentation relating to eligibility and ranking criteria will result in the request being declared ineligible or receiving reduced ranking points. Failure to provide accurate information will lead to termination of the project's eligibility for the requested fiscal year.

*Specific Authority 161.101, 161.161 FS. Law Implemented 161.088, 161.091, 161.101, 161.161 FS. History--New 6-10-83, Formerly 16B-36.05, Amended 4-27-86, Formerly 16B-36.005, Amended 12-25-03.*

### **62B-36.006 Project Ranking Procedure.**

(1) Eligible projects requesting funding for the upcoming fiscal year will be ranked in priority for the Department's legislative budget request. Projects previously ranked for a construction phase will retain their project score through the monitoring phase. Eligible projects will be assigned a total point score by the Department based on the following criteria:

(a) Severity of erosion. The severity of erosion score is determined by the average rate of erosion for the project area over 30 years based upon the Department's long term data base for the project length at 2 points per foot of erosion, rounded to the nearest whole foot, for a maximum total of 10 points.

(b) Threat to upland structures. The percent of developed property containing structures within the project boundaries at or seaward of the projected 25-year return interval storm event erosion limit times ten, rounded to the nearest whole number, for a maximum total of 10 points.

(c) Recreational and economic benefits. The percentage of linear footage of property within the project boundaries zoned commercial or recreational, or the equivalent, in the current local government land use map times ten, rounded to the nearest whole number, for a maximum total of 10 points.

(d) Availability of federal funds. Projects with Congressional authorization for the project phase shall receive 5 points. Projects with a current Project Cooperation Agreement executed for the project phase or with available federal funds shall receive 5 points. Maximum total for availability of federal funds is 10 points.

(e) Local sponsor financial and administrative commitment. Local governments who have a long term funding source dedicated to the restoration and management of the beach project shall receive 3 points; those with staff dedicated for administrative support shall receive 1 point; those with 75% or better compliance record for submitting quarterly reports and billings correctly and on time over the previous year shall receive 1 point for a maximum total of 5 points.

(f) Previous state commitment. Projects where the Department has previously cost shared a feasibility or design phase shall receive 1 point; projects to enhance, or increase the longevity of a previously constructed project shall receive 4 points; and projects that will nourish a previously restored shoreline shall receive 5 points, for a maximum total of 10 points.

(g) Project performance. Performance points shall be based upon the expected life of a project, as documented in a feasibility study or on the actual nourishment interval. Projects shall receive 1 point for every year of the expected life or actual life with a maximum total of 10 points.

(h) Mitigation of inlet effects. Projects that implement strategies in the Strategic Beach Management Plan for sediment bypassing or supplemental nourishment to adjacent beaches shall receive points based upon the percentage of the target bypass volume to be achieved times 10 for a maximum total of 10 points.

(i) Innovative technologies. Projects to address erosion that are economically competitive and environmentally sensitive and designed to demonstrate an innovative application of existing technologies shall receive 3 points; projects that demonstrate technologies previously untried in the state shall receive 5 points for a maximum total of 5 points.

(j) Enhance nesting sea turtle refuges. Projects that are adjacent or within designated nesting sea turtle refuges shall receive 5 points.

(k) Regionalization. Projects where two or more local governmental entities couple their projects for contracting to reduce costs shall receive 5 points.

(l) Significance. Projects shall receive points based upon the project length at one point a mile, rounded to the nearest whole number, for a total maximum of 10 points.

(m) In the event that more than one project receives the same number of points, the Department shall assign funding priority to that project most ready to initiate construction.

*Specific Authority 161.101, 161.161 FS. Law Implemented 161.088, 161.091, 161.101, 161.161 FS. History--New 6-10-83, Formerly 16B-36.06, 16B-36.006, Amended 12-25-03.*

#### **62B-36.007 Project Cost Sharing.**

(1) Until the unmet demand for repairing Florida's beaches is satisfied, the Department intends to cost share equally the costs with local governmental entities, except where actual cost savings from regional coordination can be demonstrated pursuant to subsection 62B-36.007(2), F.A.C. The Department will cost share up to 50% of the non-federal share of projects subject to adjustment for the level of public accessibility calculated using the following criteria:

(a) Primary beach access sites shall be granted eligibility for one-half mile in each shore-parallel direction from the access site plus the shoreline length of the access site.

(b) Public lodging establishments shall be granted eligibility based upon the percentage of units available to the public, rounded to the nearest 10%, times the property's beachfront footage.

(c) Secondary beach access sites shall be granted eligibility for the shoreline length of the access site. Additional eligibility shall be granted for up to one-quarter mile in each shore parallel direction at a rate of 52.8 linear feet per parking space, provided:

1. Parking is located within one-quarter mile of the secondary beach access site; and

2. Parking is clearly signed or otherwise clearly designated as parking for the general public on an equal basis.

(d) Eligible shoreline lengths cannot overlap.

(e) The sum of the eligible shoreline lengths, as defined above, is divided by the total project length to determine the percentage of the total project that is eligible for cost sharing.

(2) Cost savings, which occur due to the planned geographic coordination or sequencing of two or more projects between eligible governmental entities, may qualify for additional reimbursement. Geographic sequencing means combining two projects together for the purpose of construction contracting. In order to determine the increase in the state's cost share the projects shall be bid jointly and separately to demonstrate the cost savings of combining the projects. The cost share shall be adjusted not to exceed the state's maximum cost share amount of 75 percent of the eligible costs.

(3) All costs of environmental and performance monitoring required by the Department's permit with the governmental entity or a permit issued to the US Army Corps of Engineers, are eligible for cost sharing.

(4) The Department will cost share for private contractual services necessary to conduct the project. Services may be contracted to a governmental entity if the Department is shown evidence that the entity's proposal is cost effective, of sufficient professional quality, and otherwise in the general public interest. In determining whether contractual services are cost effective, the Department shall consider cost estimates provided by the governmental entity from fully qualified private companies or individuals. Specific contractual services performed by or for local governments shall be subject to specific accountability measures and audit requirements and be consistent with the principles of Chapter 287, F.S., for competitive bidding and opportunity.

*Specific Authority 161.101, 161.161 FS. Law Implemented 161.088, 161.091, 161.101, 161.161 FS. History—New 6-10-83, Formerly 16B-36.07, Amended 4-27-86, Formerly 16B-36.007, Amended 12-25-03.*

#### **62B-36.009 Project Agreements.**

(1) The Department and the eligible governmental entity will execute a project agreement when funds are available and the project is ready to proceed. The project agreement shall include the following:

(a) The estimated costs for each eligible project item, including the amount of the local sponsor's share, the Department's share, and when applicable, the federal share;

(b) A scope of work and estimated date of completion for each eligible project item; and

(c) A periodic reporting and billing schedule.

(2) The Department's annual financial obligation under the agreement shall be contingent upon a legislative appropriation and continued availability of funds. Funds not expended in a timely manner are subject to reversion to the General Revenue Fund.

(3) Eligible governmental entities may design and construct beach management projects which are consistent with this rule and Chapter 161, F.S., prior to the receipt of funding from the state pursuant to Sections 161.101 and 161.161, F.S., and may subsequently apply for reimbursement from the state within three years pursuant to Section 161.101, F.S., provided that:

(a) The eligible governmental entity and the Department have entered into a project agreement, which approves the project and establishes the basis for reimbursement before the project phase commences. No reimbursement shall be granted for work accomplished prior to the date of the agreement unless specifically set forth in the agreement;

(b) The project has been subject to review by the Department in the design and construction phases and the project has been found to be consistent with the intent of Chapter 161, F.S., for project eligibility and cost effectiveness;

(c) Reimbursement shall be limited to eligible project costs as specified in the written agreement referenced in paragraph (a) above and this rule;

(d) The project has been prioritized as required in Section 161.101(9), F.S., and is subject to legislative appropriation; and

(e) Complete documentation of all costs are provided to the Department, pursuant to the requirements of the State's Auditor General.

*Specific Authority 161.101, 161.161 FS. Law Implemented 161.088, 161.091, 161.101, 161.161 FS. History—New 6-10-83, Formerly 16B-36.09, 16B-36.009, Amended 12-25-03.*