

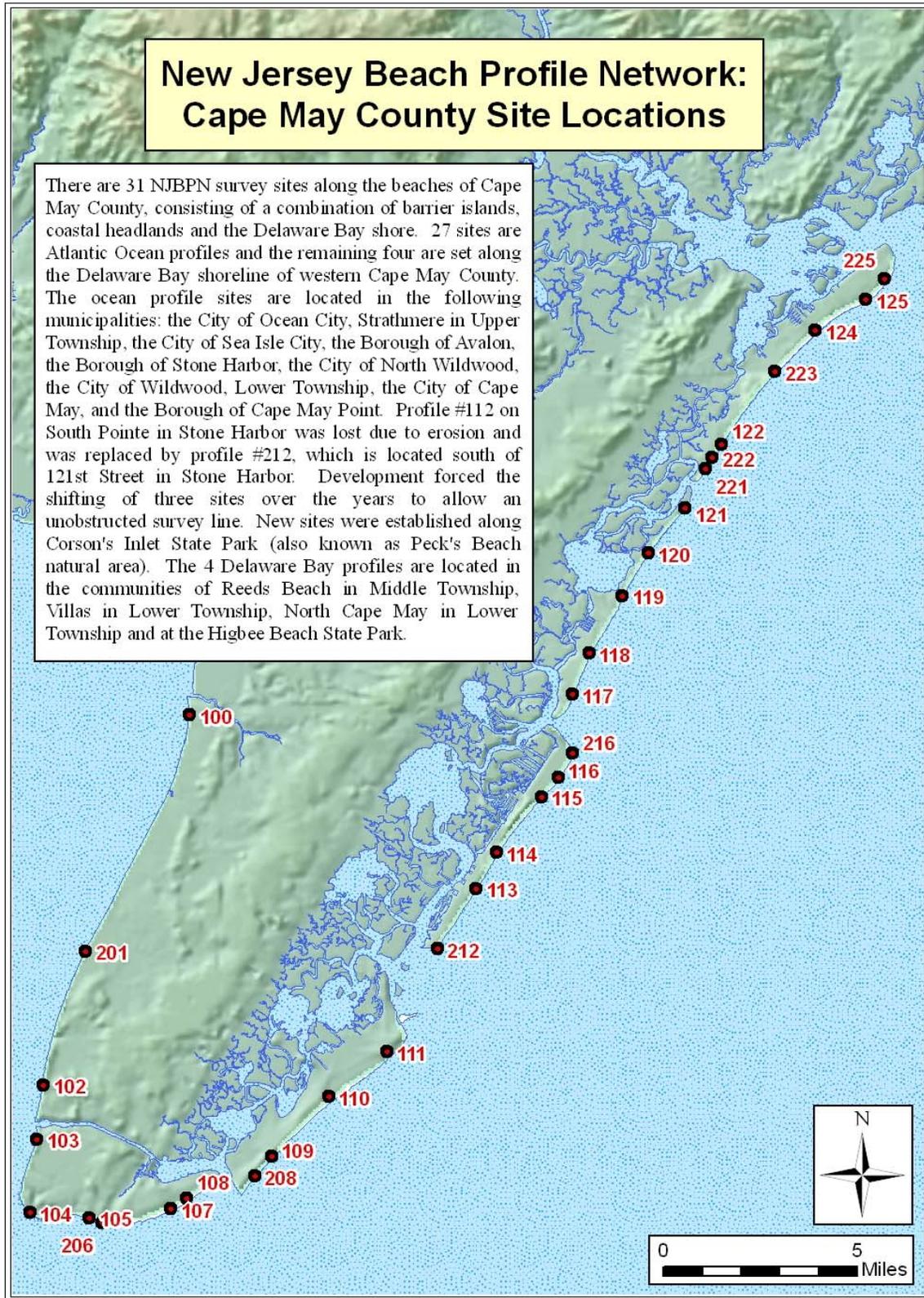


## **New Jersey Beach Profile Network**

# **Cape May County**

**Great Egg Harbor Inlet  
to Stow Creek**

**NJBPN Profile #'s  
225 - 100**



**Figure 303. Locations for the 31 NJBPN profile sites in Cape May County, NJ**

## CAPE MAY COUNTY -- SUMMARY

Hurricane Irene was the first hurricane to cross the NJ coastline since 1903 (not counting Hurricane Gloria in 1985 that passed from west to east). A post-storm re-evaluation of the wind field showed that Irene's maximum sustained winds had just dropped below 75 MPH as she crossed the shoreline, making her a Tropical Storm at the point of coastal transit. While the storm impacts were less than everyone anticipated, evacuation efforts were instituted for all of Cape May County residents with 90% compliance. Beach damage was evident, but confined to the summer berm and dry beach and some dune toe loss, but no breaches or overwash occurred.

Hurricane Irene had some impact on Cape May County beaches, but not nearly as severe as the winter northeast storms of 2009 and 2010. A storm in November 2009 started a series of events leading to three Federal disaster declarations, where two major NJ State and locally sponsored beach restoration projects became eligible for Category "G" disaster assistance funding. In fact the 2009 project in the City of North Wildwood was not quite finished when the November 2009 storm occurred. The other site was the Strathmere and Sea Isle City shoreline on Ludlam Island. Several blocks in the Borough of Avalon also qualified for damage relief for dune loss. FEMA funds are not allowed for any of the federally authorized shore protection projects, so Ocean City, most of Avalon and Stone Harbor, and Cape May City were not eligible for FEMA disaster relief funds.

The US Army Corps found funds from several Coastal Recovery sources to return to their projects in Ocean City, Avalon, Stone Harbor, and Cape May City to add sand between 2009 and 2012. The Corps also completed a reconstruction of the Avalon Townsend's Inlet seawall in the past 5 years. The State provided assistance for the Hereford Inlet seawall in the City of North Wildwood.

Many of the beach changes in the past 18 months were positive in Cape May County with the average profile sand volume change amounting to 15.37 yds<sup>3</sup>/ft. and a shoreline average change of a 34.5-foot advance seaward for the zero elevation position. These changes result from the placement of sand in Ocean City (ACOE maintenance), Upper Township & Sea Isle City (NJ State/local maintenance with FEMA reimbursement), Avalon (sand back-passing), Stone Harbor (ACOE emergency maintenance), North Wildwood (FEMA reimbursed restoration from Hurricane Irene damage as back-passing) and in Cape May City as emergency ACOE maintenance. This nearly county-wide work effort shows in the averages for the entire shoreline.

Beach nourishment derived from inlet shoals, truck-haul from quarries or offshore borrow sites has resulted in Cape May County having the most highly modified coastline along the New Jersey coast. There are five coastal projects involving Federal cooperation with the State of New Jersey and the local municipality. These are Ocean City (northern two thirds of the island), Avalon, Stone Harbor, Cape May City, and Cape May Meadows/Cape May Point. The balance of Peck's Beach (Ocean City) is a NJ State/local project. The State also concluded beach nourishments in the City of North Wildwood, the Township of Upper, and Sea Isle City in 2009. Reeds Beach on Delaware Bay was a State project creating beach restoration as a side benefit from a navigation improvement at Bidwell Creek. The Federal Cape May western shoreline project (29,000 feet Villas & Vicinity) is an ecological restoration project primarily to benefit migratory shorebirds and horseshoe crab egg-laying with a one-time beach restoration. This project continues to wait for sufficient funding.

Storm damages inflicted on the Cape May County shoreline between October 2009 and March of 2010 were addressed with restoration projects in North Wildwood, Avalon, Sea Isle City and Upper Township (Strathmere). Hurricane Irene impacts were remedied with two novel efforts at back-passing surplus sand from zones where accretion dominates the processes in the Borough of Avalon and the City of North Wildwood. Avalon acquired permits to move 63,000 cubic yards of sand from two segments of the island between 70<sup>th</sup> and 31<sup>st</sup> Streets with a substantial exclusion zone between two sites where permits allowed excavation. The

exclusion zone was required by the US Fish & Wildlife service to preclude any impact on nesting or foraging by piping plovers, an endangered species both State and Federally. The City of North Wildwood cooperated with the Borough of Wildwood Crest (by agreement with the City of Wildwood) to excavate up to 96,000 cubic yards of sand from the berm along the Borough oceanfront and truck this surplus north through Wildwood and deposit it within a footprint where Hurricane Irene-generated erosion had produced that quantity of documented loss. Ninety-three thousand (93,000) cubic yards of sand were moved by mid-May 2012 and graded into a dune toe deposit and a wider recreational beach between 3<sup>rd</sup> and 7<sup>th</sup> Avenues. The North Wildwood project required permits from the Army Corps plus modifications to State permits held by the two municipalities allowing beach nourishment and surplus sand removal to the dunes. The permit modifications revolved around an alternative sand source and means of placement (trucks) in North Wildwood and an alternative disposal site in the case of Wildwood Crest (moving it to North Wildwood instead of into the dune system in Wildwood Crest).

Two new survey sites were established in Cape May County to improve the oceanfront coverage. They were placed in the Peck's Beach natural area, known as Corson's Inlet State Park to follow changes to the southern mile of the barrier island shore. (Site #'s 222 and 221 were located south of the fishing pier (#222) and closer to Corson's Inlet (#221)). These sites have not been included in the long-term trend analysis since only two years of record exist thus far.

Other notable municipal projects include the efforts by the Borough of Avalon which completed a 650,000 cubic yard restoration of the beach between 10<sup>th</sup> and 28<sup>th</sup> Streets using Townsend's Inlet sand. Sand was pumped onto the Ocean City beaches in 2009. In early 2011 450,000 cubic yards of sand was distributed among the City of Cape May (120,000 cy), Cape May Meadows (165,000 cy), and 50,000 cy for two beach cells in the Borough of Cape May Point. This laundry list of projects makes this county the most varied and diverse in the State in terms of beach restoration and maintenance. Most of the sediment supply comes from four of the five tidal inlets in Cape May Co., with the offshore supplying Cape May City and Cape May Point.

The US Army Corps of Engineers returned to Cape May County twice during 2010 and provided maintenance beach sand on the shorelines of Cape May City (120,000 cu. yds.), Cape May Meadows (165,000 cu. yds.) and Cape May Point (55,000 cu yds.). Ocean City received 1.4 million cubic yards of additional sand by March 2010. The passage of a new Water Resources Development Act in 2007 included authorization for the continuation of existing projects and the implementation of two new ocean beach projects in Cape May County, but Congress did not appropriate the money to fund the work in FY 08, FY 09, or FY 10, which ended September 30, 2010. "Stimulus money" cannot be spent in FY 10 for beach restoration work without special Congressional budgetary "Add-ons" for such work. The ACOE has funding to continue monitoring of existing projects and to up-date studies (Limited Re-evaluation Report) of designs, costs and benefits for proposed projects. In 2011 the Corps added 625,000 cubic yards of sand to the Avalon and Stone Harbor project. As the chart below indicates, this effort since 1989 has produced a net gain of over 16.5 million cubic yards of sand along the Cape May County shoreline.

The success of using large-capacity, off-road trucks to haul sand from zones of documented surplus to more erosional sections of the coast has made this a new idea worthy of regional application. The mobilization for the job is less than a tenth of that for an ocean dredge and distribution pipeline. The sand hauling cost is equal to or less than the pumping rate from recent dredge projects (\$8.50/cubic yard). The borrow area impacts to the sea bed are eliminated. The issues appear to revolve around apprehension on the part of reviewers concerned with possible impacts to endangered species using the dry beach for nesting and the swash zone for foraging. The Borough of Avalon was required to repetitively sample the sand prior to and subsequent to the 2012 back-passing effort across the two borrow sites and the exclusion zone to see if any detriment came to the prey the endangered species feed on. The project received questions of concern from a small number of beachfront home owners worried about impacts to the quality of the resulting beach and the impact of taking sand from in

front of their property would have on potential storm damage. Work was included in both the biological review and beach recovery surveys to address both of these issues for future use of this “sand recycling” methodology.

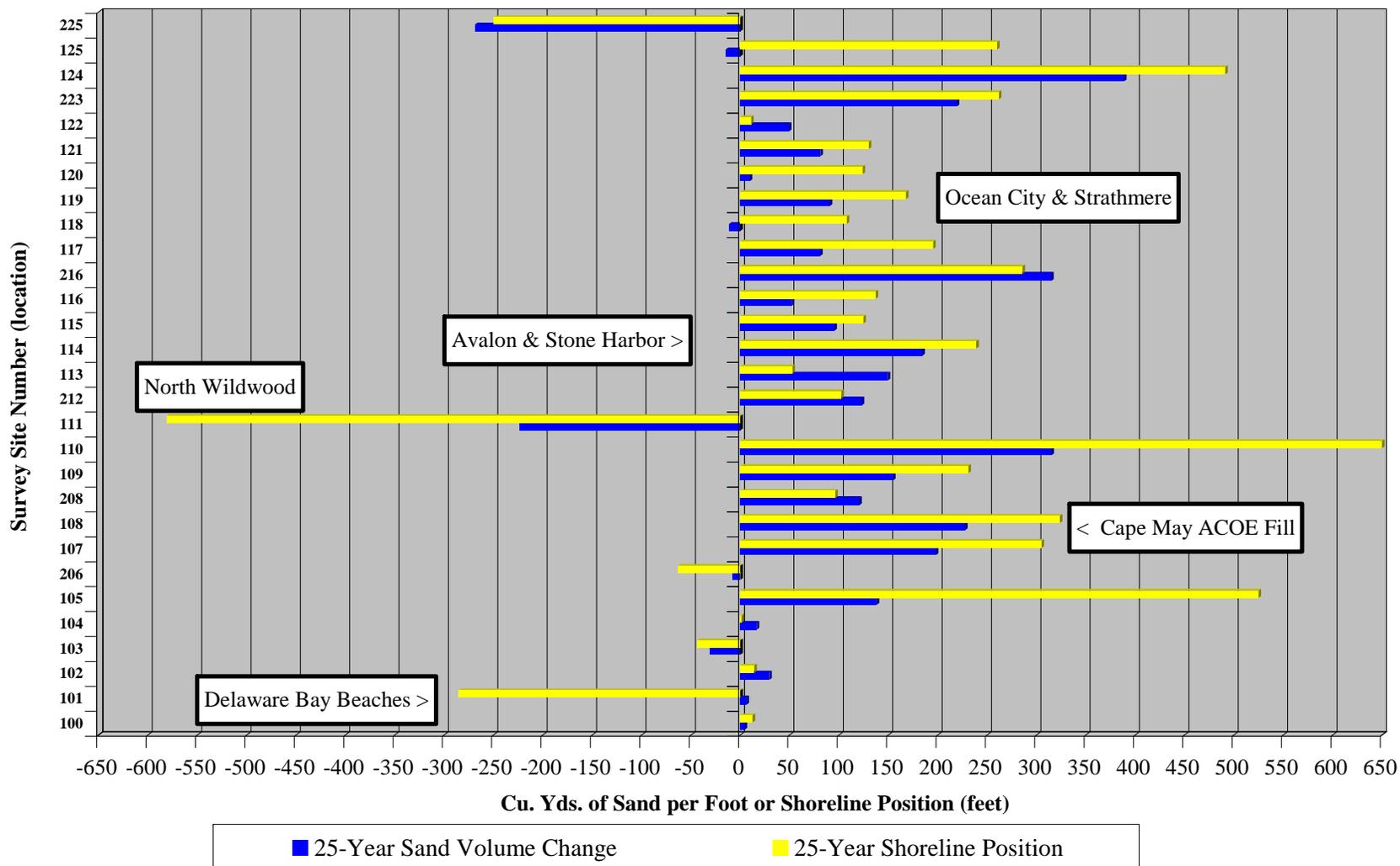
The 25-year assessment for Cape May County finds that the multiple episodes and variety of beach restoration projects has had a significant improvement on the quality, shore protection value and recreational use of the county beaches. The commercial boardwalk segment of Ocean City has undergone a major economic renaissance since 1992 with vast improvements to shore protection extending all the way to 56<sup>th</sup> Street. The profile site at 20<sup>th</sup> Street has seen the high tide line shifted from landward of the boardwalk in 1991 to over 600 feet seaward (450 feet to the toe of the dune vegetation) over the past 21 years.

The community of Strathmere was saved from serious structural loss in 2009 with the NJ State and local project and an extremely narrow and vulnerable shoreline section (Whale Beach) was reinforced with a much wider beach and dune system. Sea Isle City received sand from Corson’s Inlet in 2009 and as a restoration effort in 2011.

The Borough of Avalon continues a 25-year history of beach management employing multiple innovative concepts since the 1993 installation of a beach-saver reef system and inlet geo-textile submerged breakwaters. Cape May City is another example where the Federal project restored a shoreline to far greater economic stability and prosperity than existed in 1989. The Baltimore Avenue beach consisted of water at the seawall at low tide with no usable beach at all. Today there is a 350-foot wide beach and dune system the length of the City oceanfront. North Wildwood, with a 1,000-foot wide dry beach in 1994 found that erosion has many sources and forms, applied for and received NJ State assistance from the Shore Protection Act funds and restored approximately half the sand lost to the communities to the south and into Hereford Inlet. Very recent studies of Hereford Inlet indicate that significant changes to the main tidal channels cutting through the ebb-tidal delta system could have profound impacts on the adjacent island shoreline associated with inlet processes. The traditional main ebb channel has competition from a new channel that exists between Stone Harbor’s South Point and a highly variable sand island locally called Champaign Island. If the new channel becomes dominant, the North Wildwood inlet shoreline and northern oceanfront beach will experience major sand accumulation in the next 18 months.

The Cape May Point 227 experimental reef project continued to have a positive impact on the shorelines of those cells where the concrete structures were placed between groins defining the two cells. Work for the Borough of Cape May Point has verified the sand retention properties of these structures in that type of installation. Sand has also migrated westward to the two groin cells not involved in either breakwater installation or direct sand placement. This has been very beneficial for the Borough.

### Cape May County, Beach Volume & Shoreline Position Changes Over 25 Years



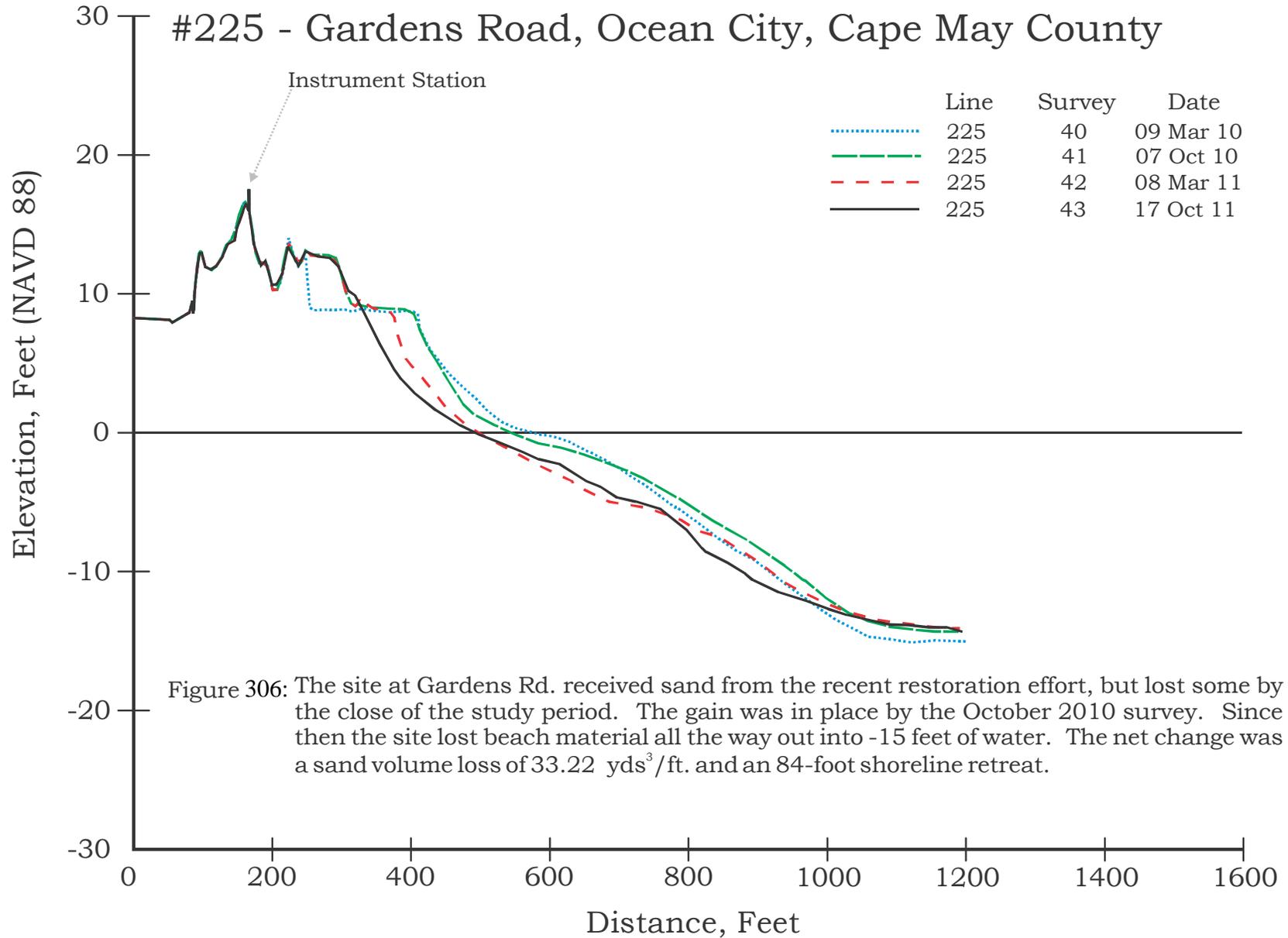
**Figure 304. Summary of 25 years of beach research in Cape May County. The sites located on the north end of each barrier island have an erosional tendency (especially #111 in North Wildwood). Multiple beach nourishment projects have given Cape May County a strong positive change value in both sand volume and shoreline position. The 5 Delaware Bay cross sections have much smaller magnitude change rates.**

Site 225, Gardens Road, Ocean City, NJ – March 8, 2011



Figure 305. View of the seaward dune crest looking north along the Ocean City Beach.

# New Jersey Beach Profile Network



## GARDENS ROAD, OCEAN CITY– SITE 225

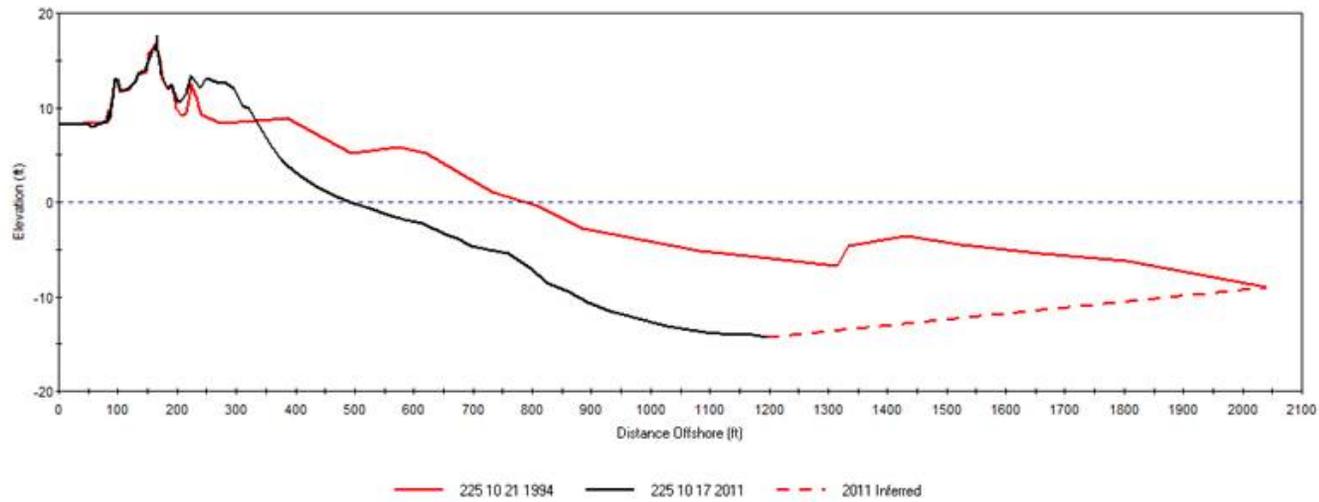
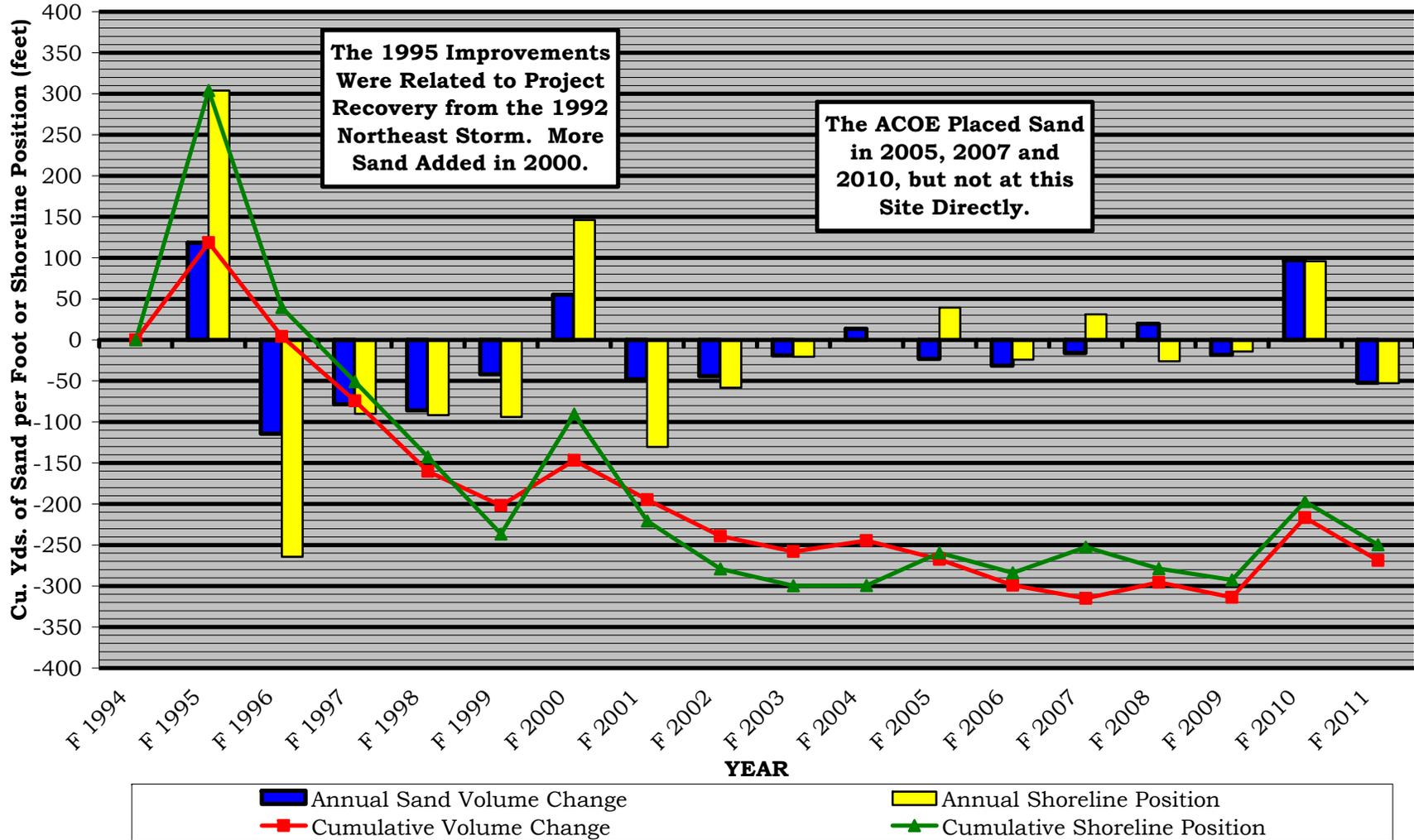


Figure 307: This site was established in 1994 to monitor shoreline changes near Great Egg Inlet. A Federal beach nourishment project was completed in 1995. The high volatility of the site has eroded the shoreline almost 300 feet since 1994. Photo on left taken May 9, 1995. View to the south. Photo on right taken October 17, 2011. View to the south.



**17-Year Coastal Changes at Site 225, Gardens Road, Ocean City, Cape May Co.**



**Figure 308.** The Gardens Road site was added in 1994 to include sites near active inlets due to high volatility in shoreline position and sand volume change. This site responds with rapid accretion following sand placement along the oceanfront, but the sand volume only lasts until the excess material moving north is exhausted whereupon erosion resumes.

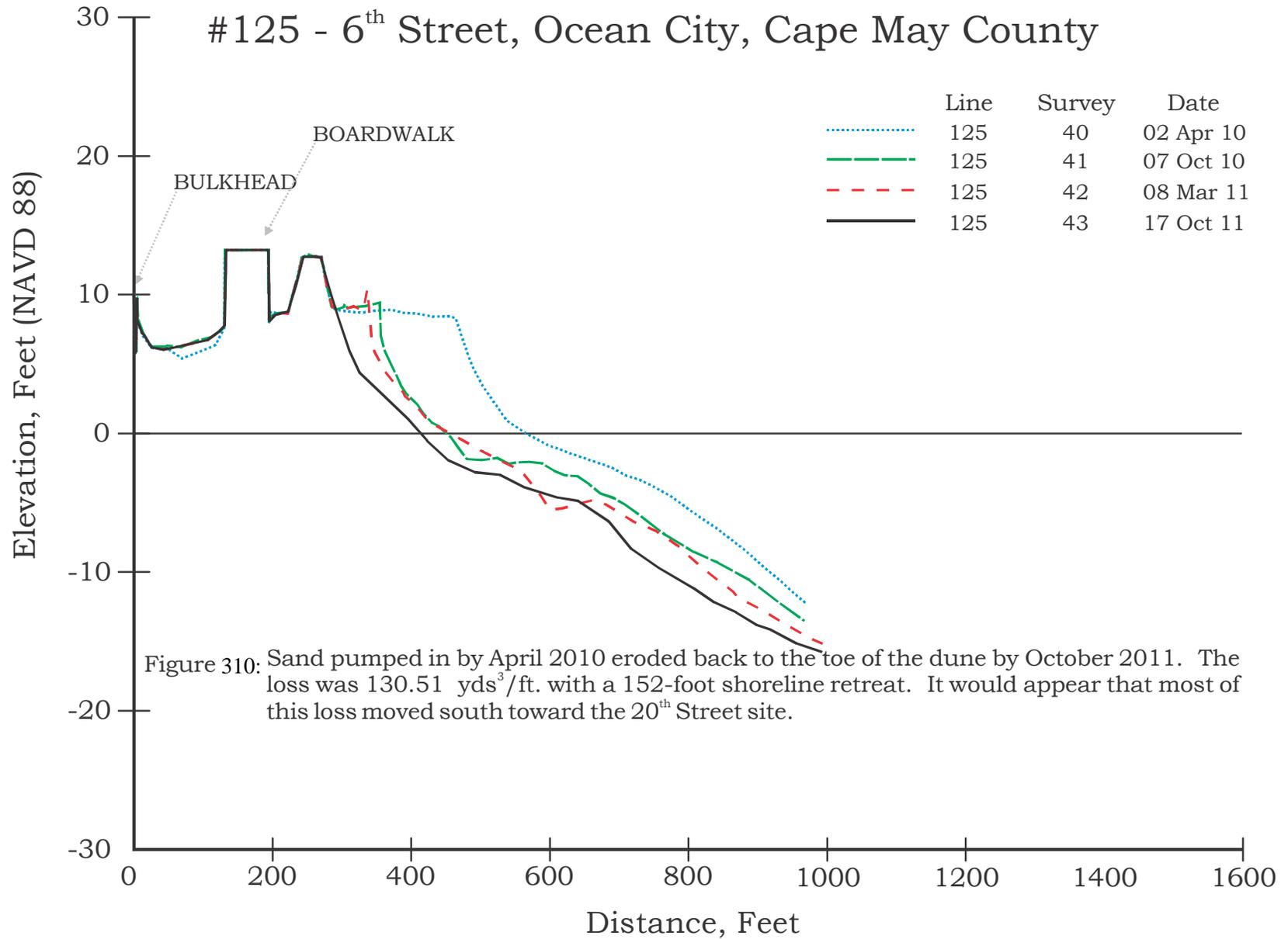
Site 125, 6<sup>th</sup> Street, Ocean City, NJ – March 8, 2011



Figure 309. View of the dune crest and beach looking south along the ocean City beach.

# New Jersey Beach Profile Network

#125 - 6<sup>th</sup> Street, Ocean City, Cape May County



## 6<sup>th</sup> STREET, OCEAN CITY– SITE 125

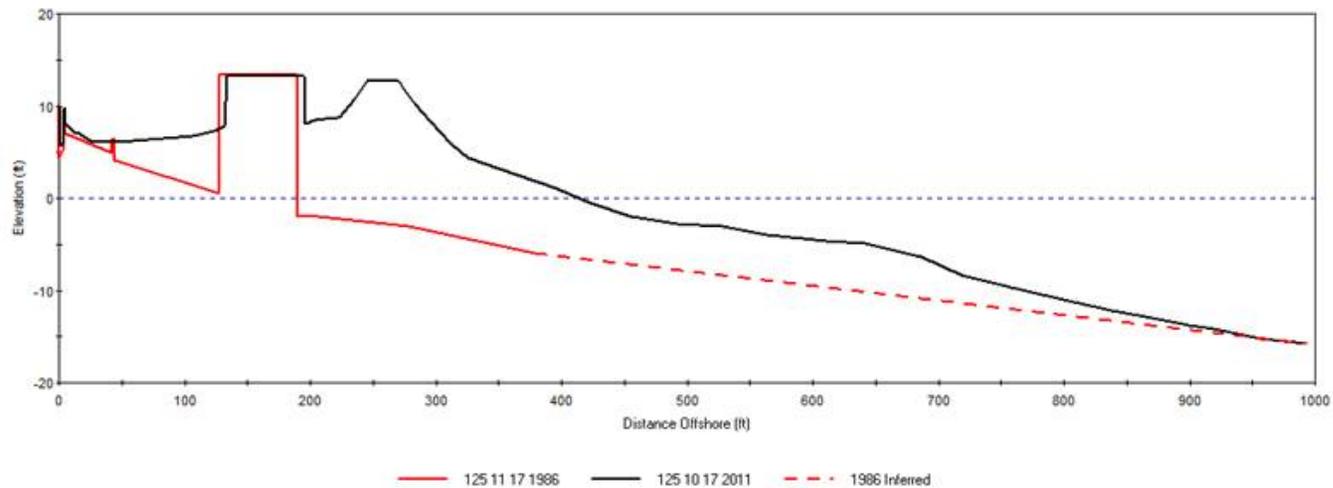


Figure 311: The naturally erosional shoreline at 6<sup>th</sup> Street initially received material in 1991 by the ACOE. Six additional maintenance fills have taken place since then, stabilizing the area. For the 25 years of study the cumulative sand volume gains amounted to 92.79 yds<sup>3</sup>/ft. Photo on left taken October 1, 1991. View to the east. Photo on right taken October 17, 2011. View to the north.



## 25-Year Coastal Changes at Site 125, 6<sup>th</sup> Street, Ocean City, Cape May Co.

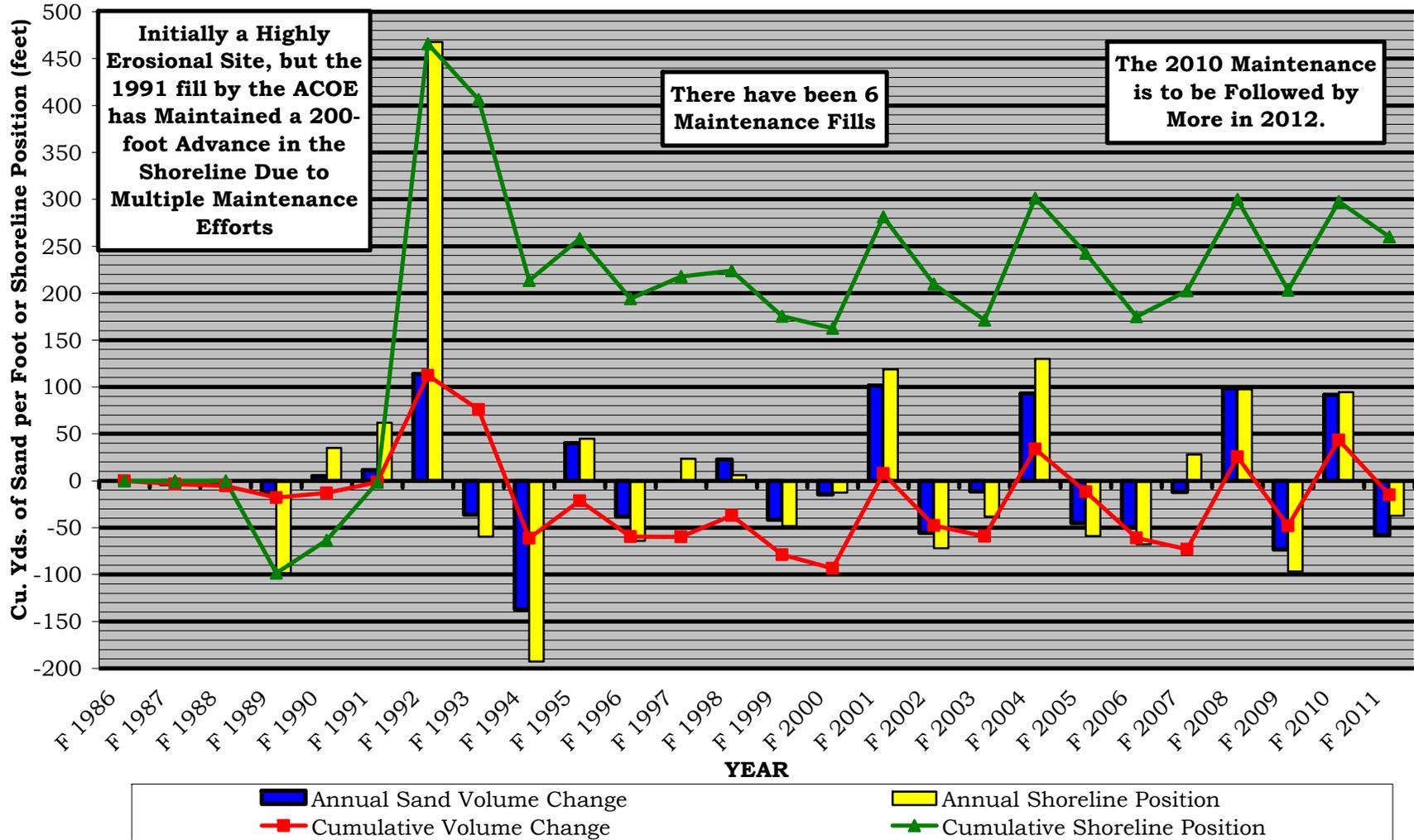


Figure 312. Sixth Street is typical of the very erosional northernmost oceanfront Ocean City shoreline. Repetitive sand placements going back to 1952 when 2.35 million cubic yards were initially placed here by the ACOE, followed by 15 years of local work by the City using their dredge, and a NJ State/local project in 1984, moving into the 1992 initial Federal work now in its 8<sup>th</sup> maintenance cycle. The sand volume remains near the 1986 value, kept constant by the repetitive beach fills. The shoreline position is 250 feet seaward of the 1986 location due to sand having moved seaward along this shoreline.

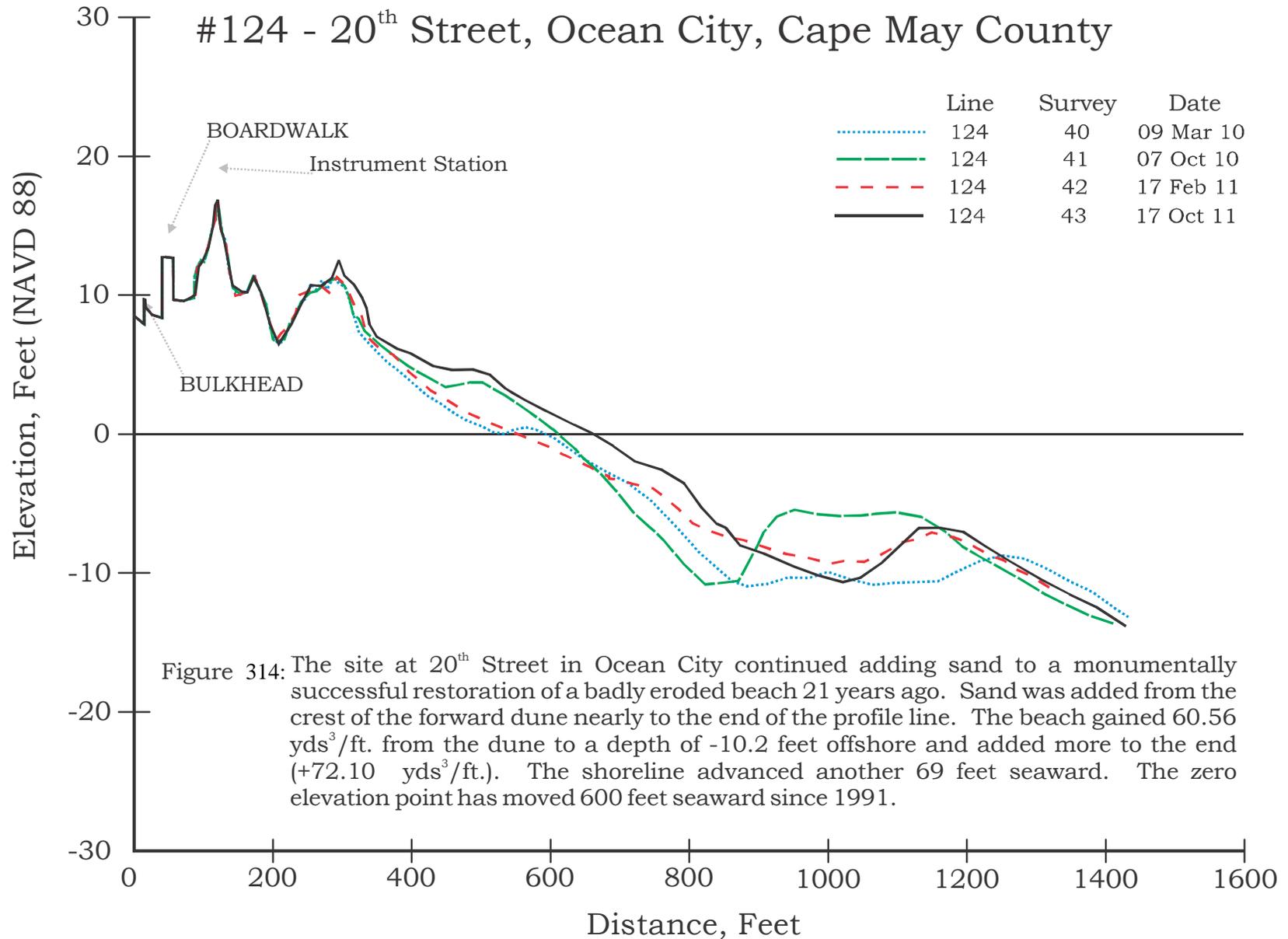
Site 124, 20<sup>th</sup> Street, Ocean City, NJ – February 17, 2011



Figure 313. View of the seaward dune toe and beach looking north.

# New Jersey Beach Profile Network

#124 - 20<sup>th</sup> Street, Ocean City, Cape May County



## 20<sup>th</sup> STREET, OCEAN CITY – SITE 124

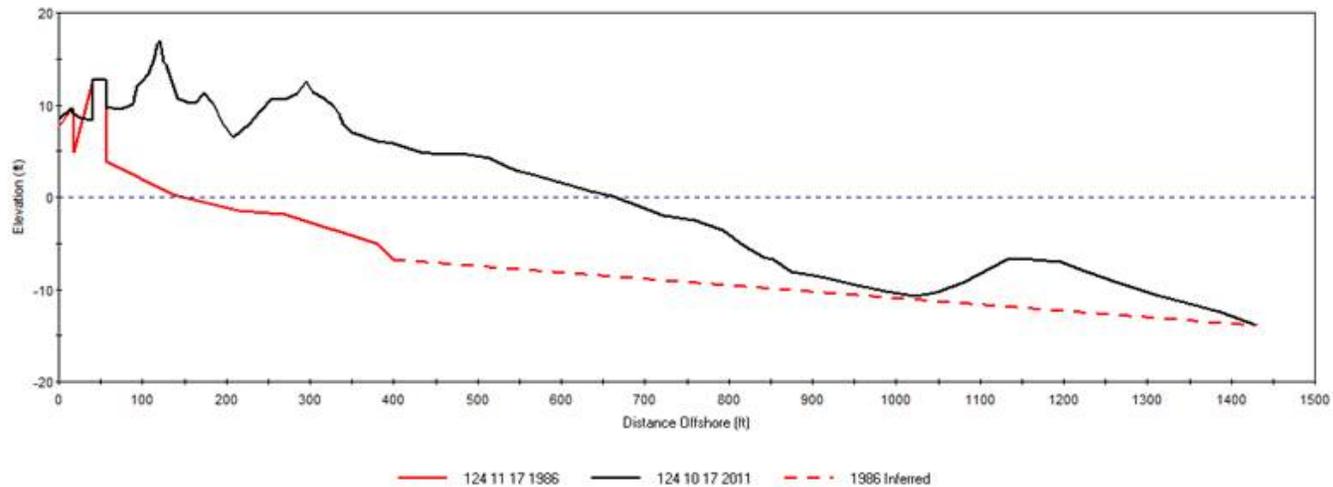
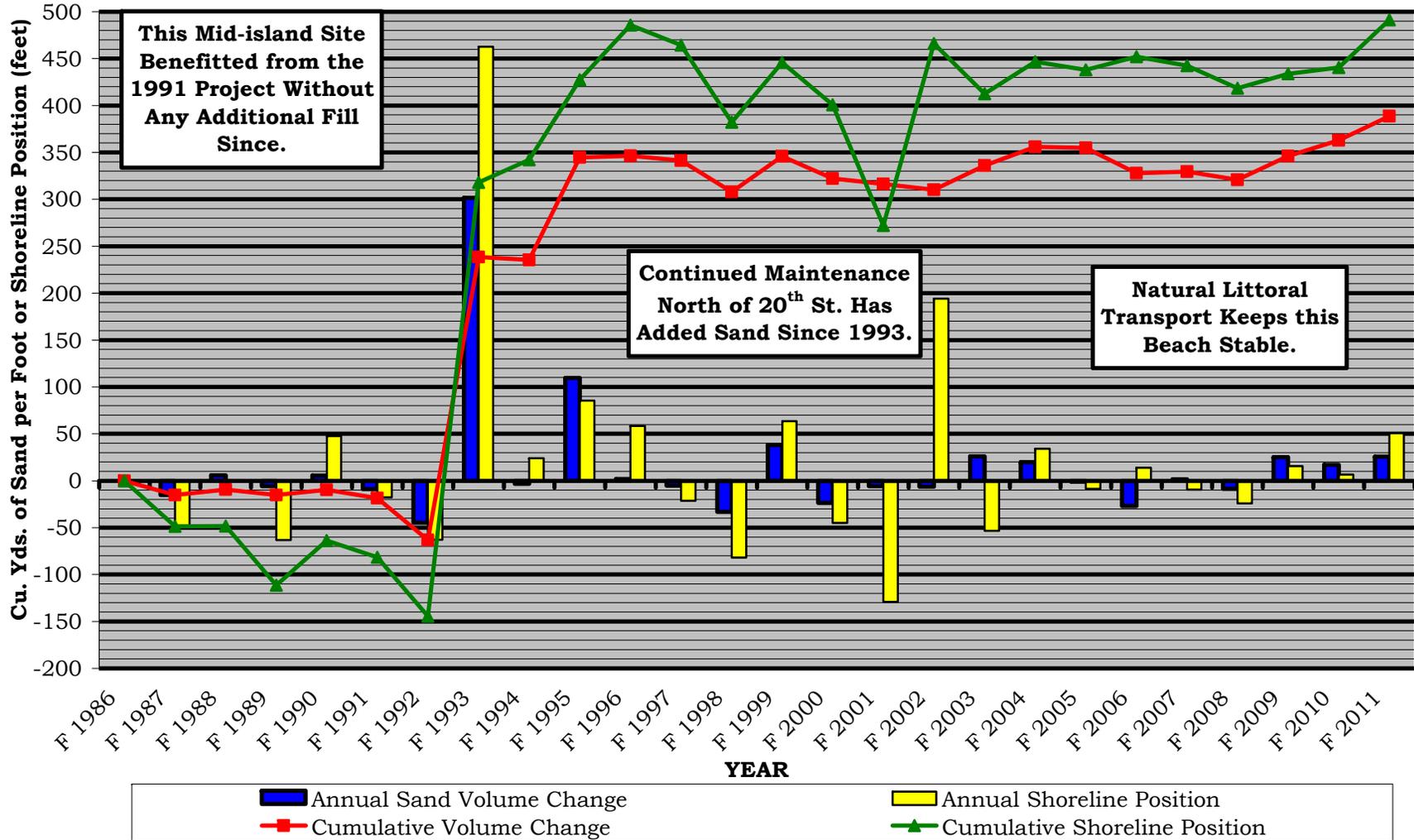


Figure 315: The initial beach replenishment project in 1991 added material to the retreating beach and dune. Since then, no additional sand has been directly placed here, but the profile configuration has remained stable from natural littoral transport of material from the north. Significant sand volume increases (142.15 yds<sup>3</sup>/ft) and shoreline advance (512 feet) have occurred over the 25 years of study. Photo on left taken in 1991. View to the north. Photo on right taken October 17, 2011. View to the north.



## 25-Year Coastal Changes at Site 124, 20<sup>th</sup> Street Ocean City, Cape May Co.



**Figure 316.** An entirely different situation exists at 20<sup>th</sup> Street in Ocean City. Here the shoreline moved 150 feet landward by the 1992 survey putting water under the boardwalk at low tide. The initial fill in the late fall of 1992 has never been duplicated or maintained. The next 18 years has seen an additional 100 cubic yards of sand per foot of shoreline add to this beach derived from further north. 20<sup>th</sup> Street is one of the NJ model sites for successful beach restoration.

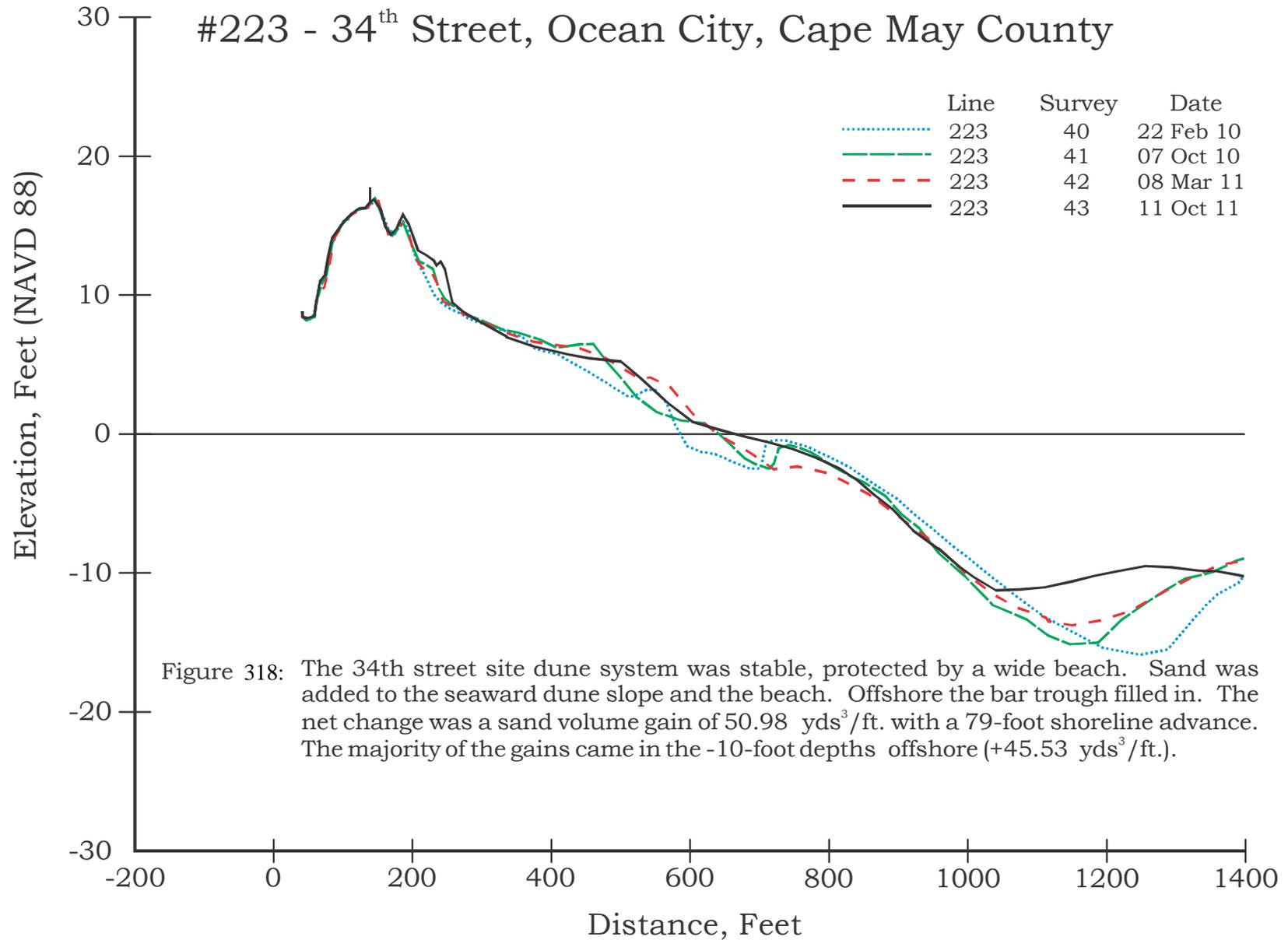
Site 223, 34<sup>th</sup> Street, Ocean City, NJ – March 8, 2011



Figure 317. View looking north along the dune crest at 34<sup>th</sup> Street in early spring 2011.

# New Jersey Beach Profile Network

#223 - 34<sup>th</sup> Street, Ocean City, Cape May County



### 34<sup>th</sup> STREET, OCEAN CITY – SITE 223

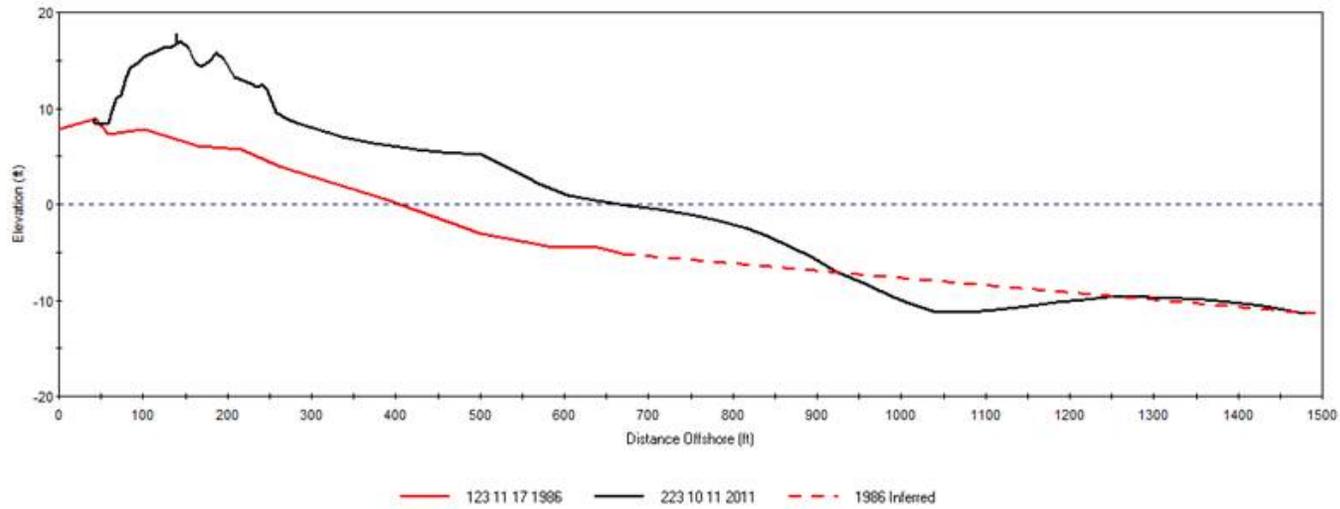
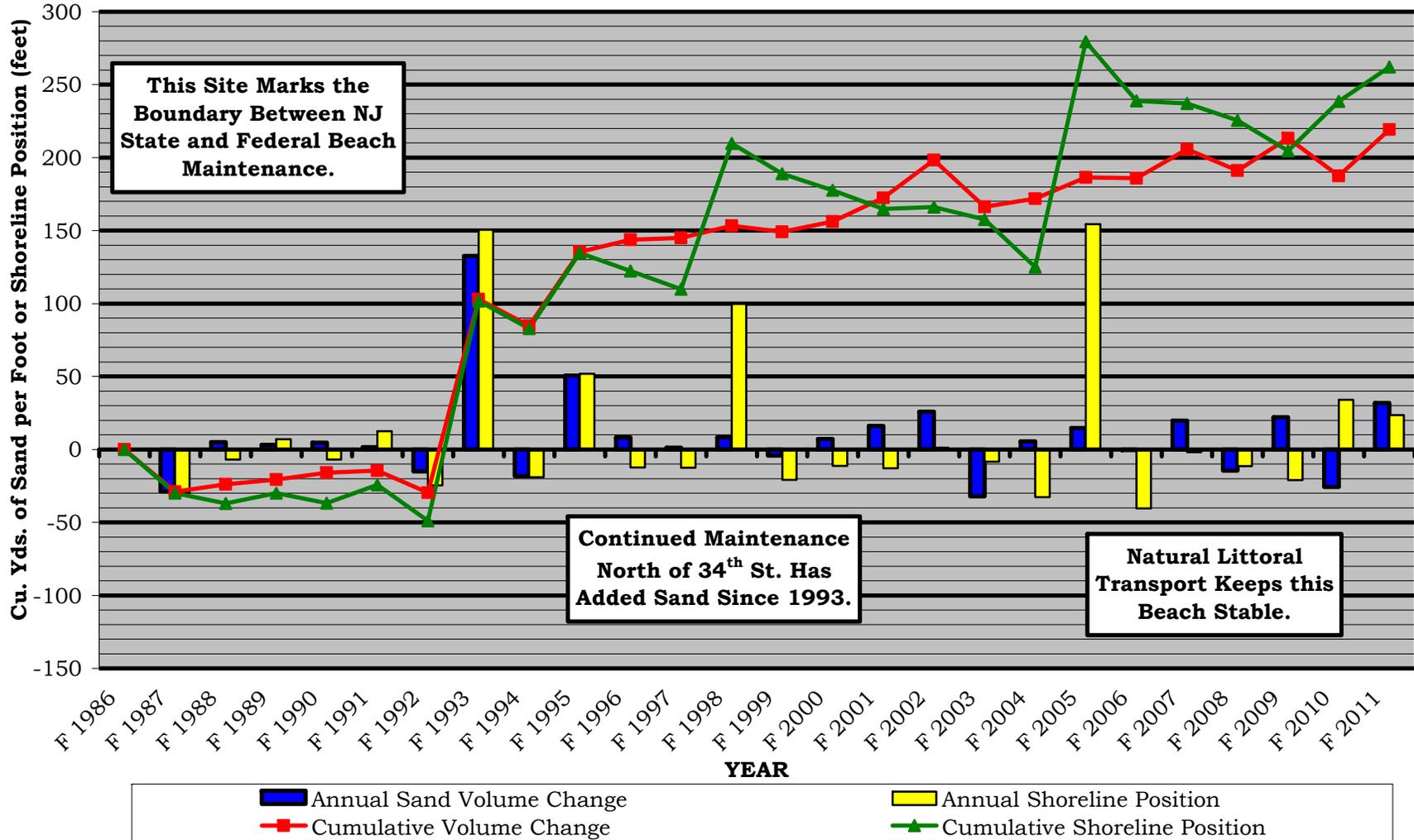


Figure 319: The location of the profile was moved 40 feet to the south to allow measurements of the dune growth and has altered the configuration of the profile. Currently the dune is represented in the October 2011 profile. Photo on left taken May 11, 1995 of former Site 123. View to the northeast. Photo on right taken October 11, 2011. View to the north.



**25-Year Coastal Changes at Site 223, 34<sup>th</sup> Street Ocean City, Cape May Co.**



**Figure 320.** The middle of Peck’s Beach has also responded well to the initial beach restoration in 1992. Maintenance has occurred here, but the residence time appears to be fairly long. The current shoreline and sand volume data are above that initially placed at this site.

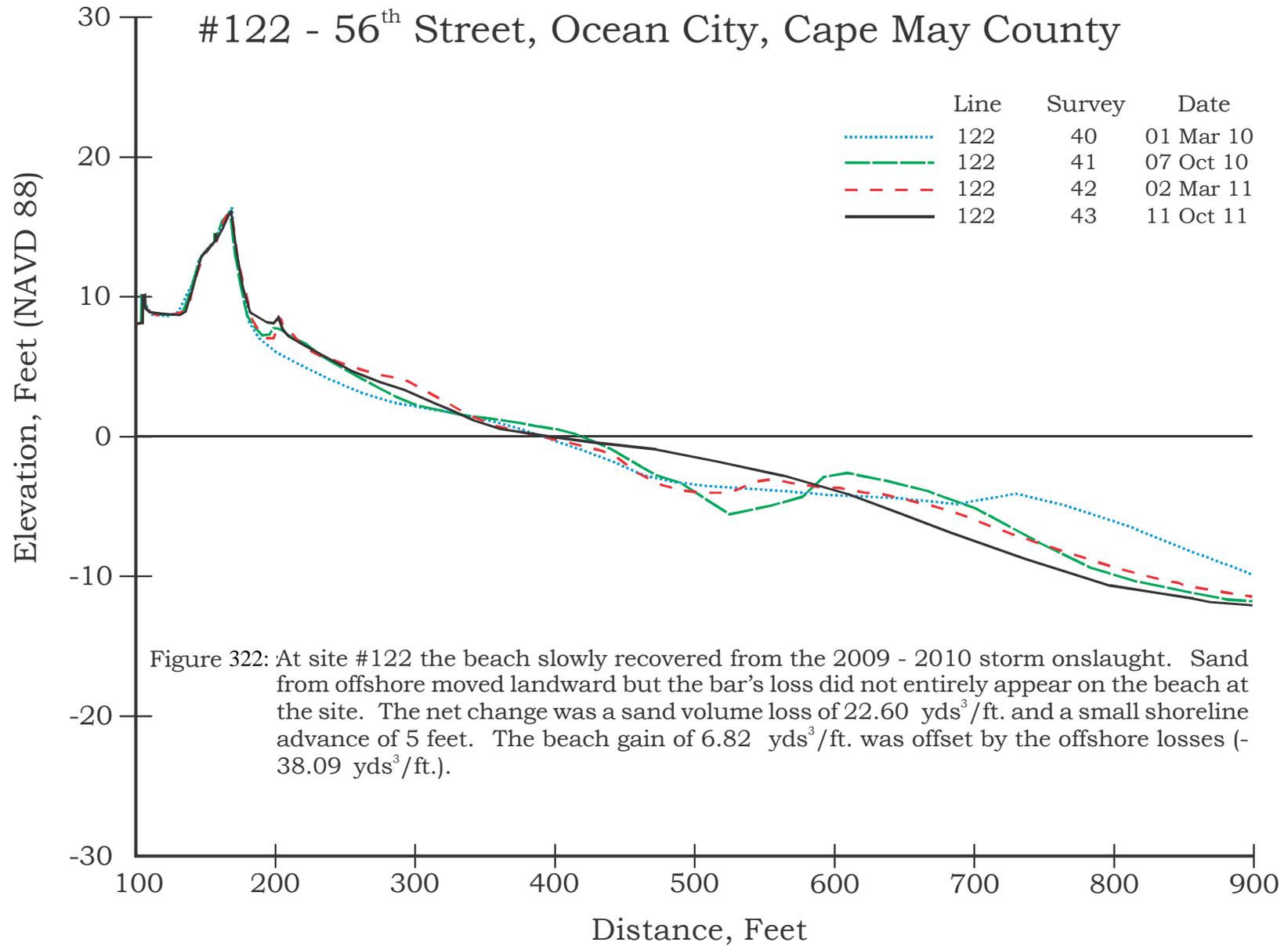
Site 122, 56<sup>th</sup> Street, Ocean City, NJ – March 2, 2011



Figure 321. View along the seaward foredune toe looking south.

# New Jersey Beach Profile Network

#122 - 56<sup>th</sup> Street, Ocean City, Cape May County



## 56<sup>th</sup> STREET, OCEAN CITY – SITE 122

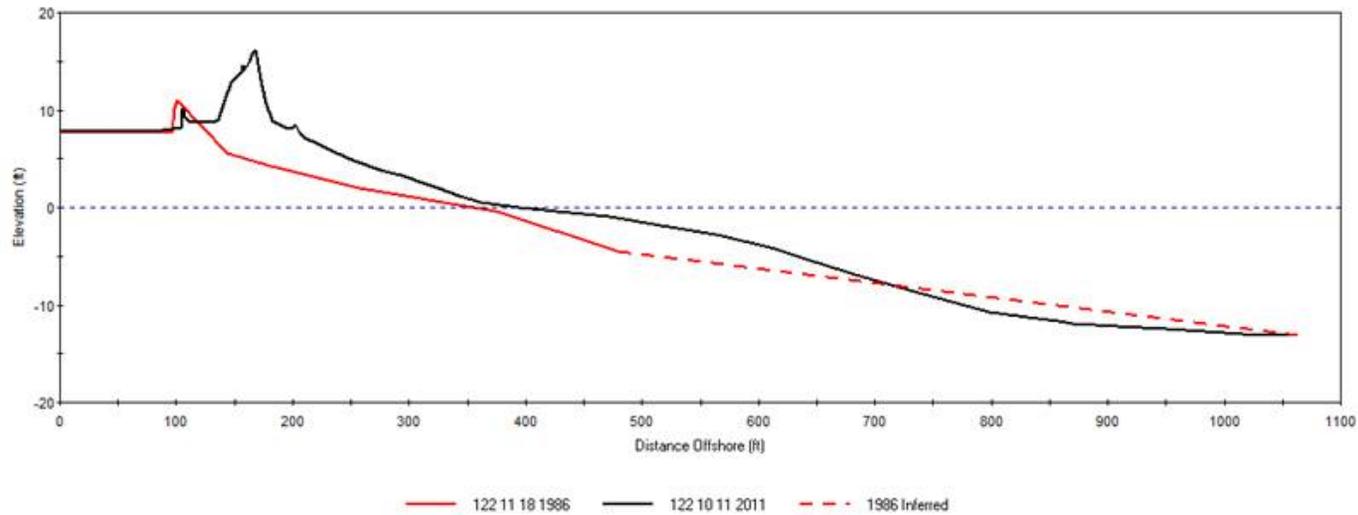


Figure 323: Replenishment work was done here in 1995, 2001 and 2010 maintaining a positive position of the primary dune, shoreline and the sand volume. A 37.84 yds<sup>3</sup>/ft sand volume gain has been recorded since 1986 along with a shoreline advance of 41 feet. Photo on left taken May 11, 1995. View to the south. Photo on right taken October 11, 2011. View to the south.



25-Year Coastal Changes at Site 122, 56<sup>th</sup> Street Ocean City, Cape May Co.

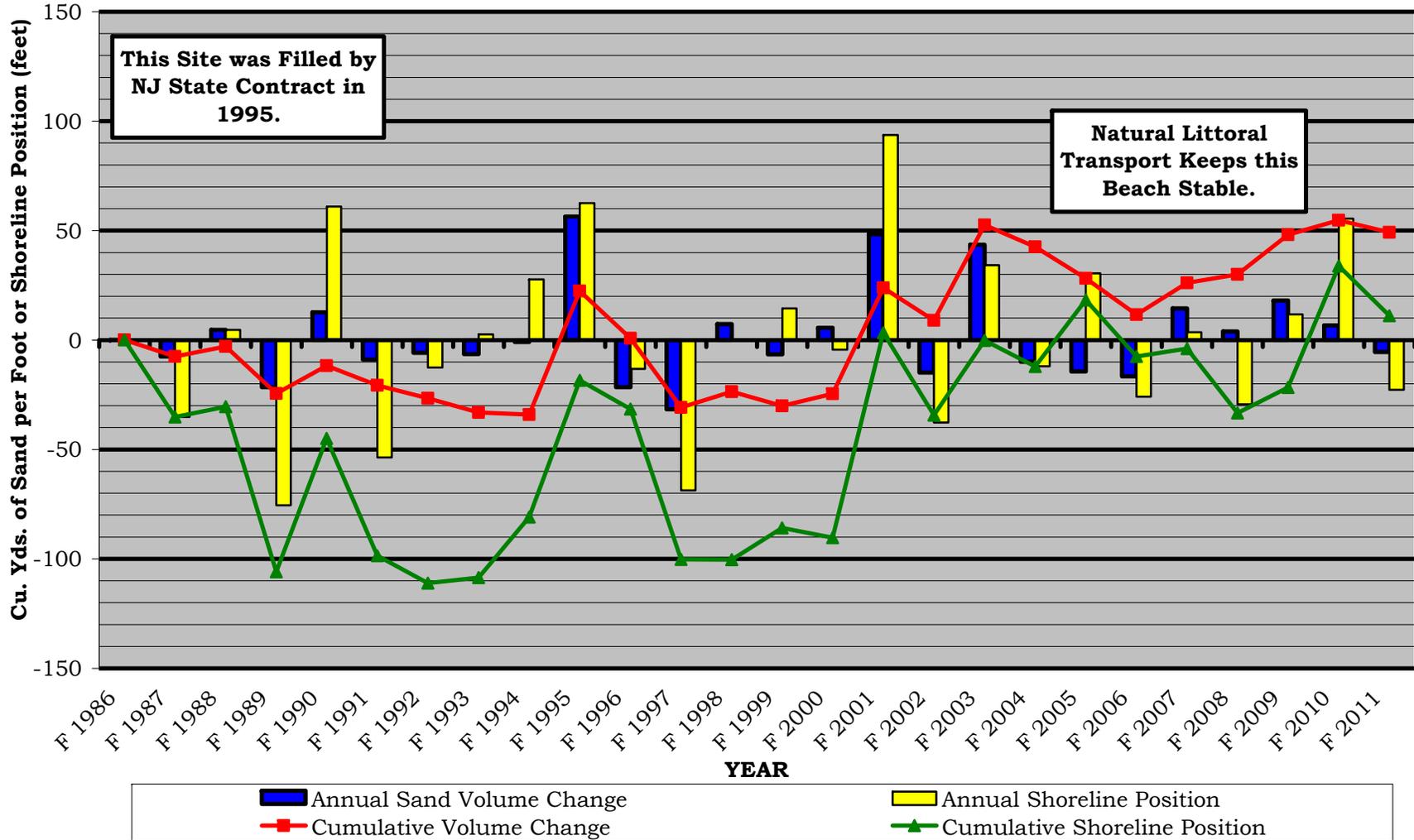


Figure 324. This southern site in the developed section of the island has been the responsibility of the State and local sponsors. Work was completed here in 1995, 2001 and 2010 maintaining a positive position of both the shoreline and the sand volume vs. the 1986 situation. In 2010, two new profile sites were added in the NJ State Park making up the southern 1.5 miles of Peck's Beach Island. No trend analysis is yet relevant and worth presenting.

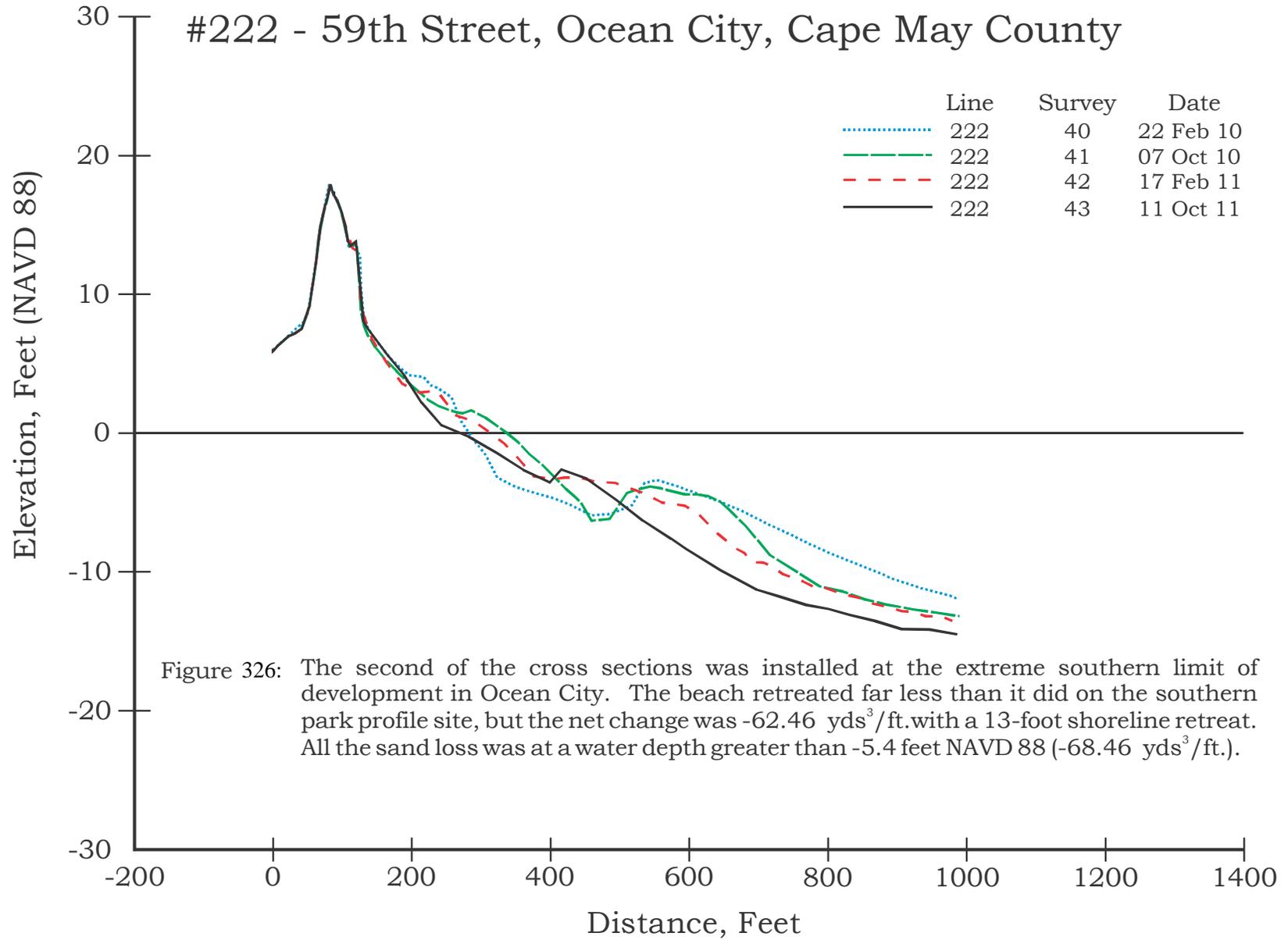
Site 222, 59<sup>th</sup> Street, Ocean City, NJ – February 17, 2011



Figure 325. View to the north of the lower berm and beach along the State Park that occupies the southern segment of the Ocean City Beach.

# New Jersey Beach Profile Network

#222 - 59th Street, Ocean City, Cape May County



## 59<sup>th</sup> STREET, OCEAN CITY – SITE 222

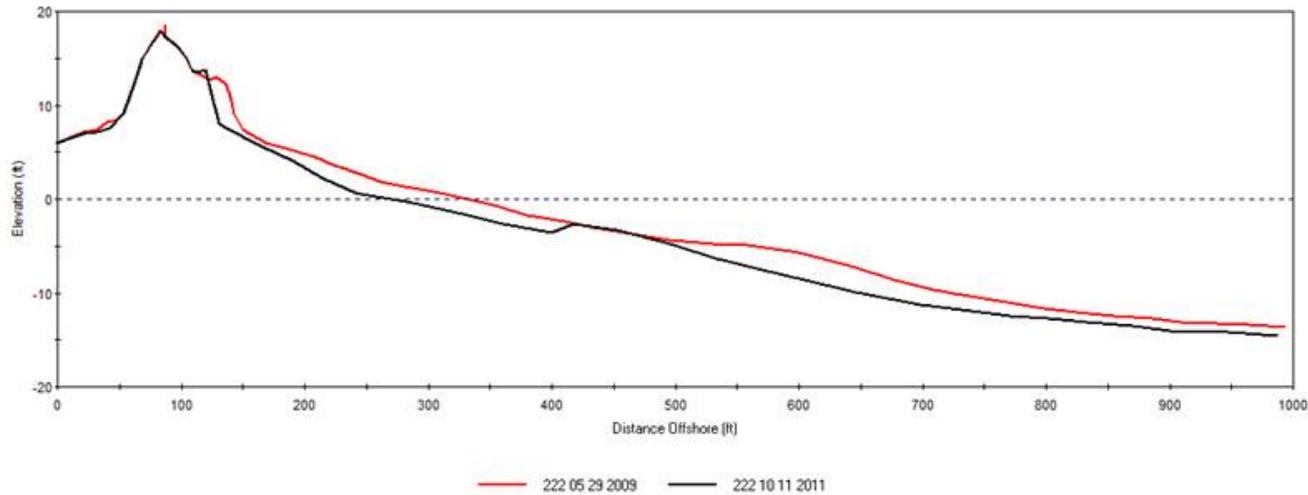


Figure 327: This site was established due to increased need of profile data for this section of the island. Offshore, nearshore, and recreational beach losses culminated in a 61 foot shoreline retreat since 2009. Photo on left taken February 22, 2010. View to the south. Photo on right taken October 11, 2011. View to the south.



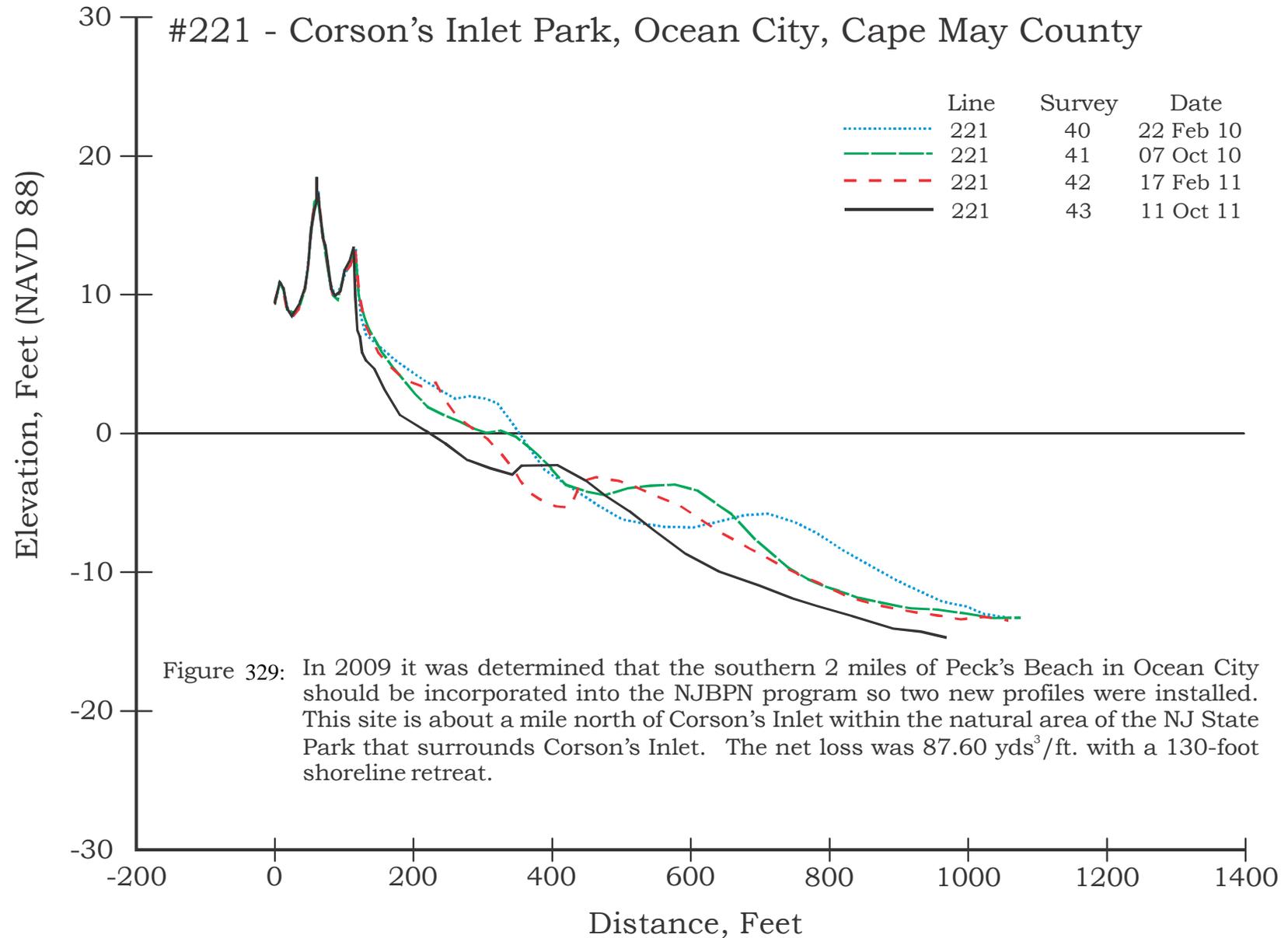
The 25-year trend analysis was not completed because this site was established in 2009.

**Site 221, Corson's Inlet Park, Ocean City, NJ – February 17, 2011**



**Figure 328. View to the north along the seaward dune slope at the south end of Ocean City beach that is part of the NJ State Park system.**

# New Jersey Beach Profile Network



## CORSON'S INLET PARK, OCEAN CITY – SITE 221

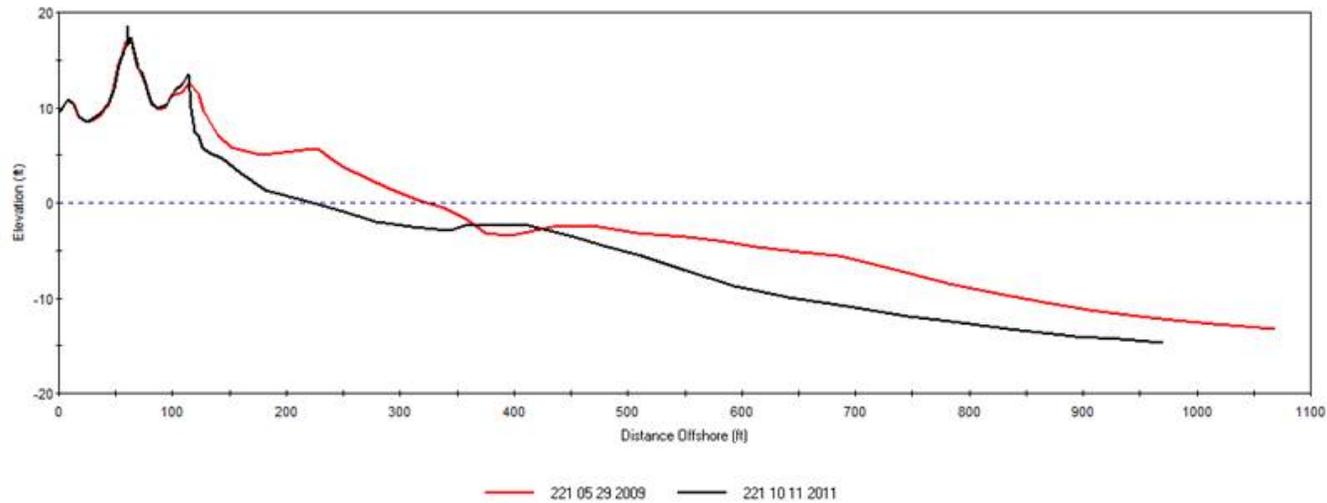


Figure 330: This site was established to monitor changes near Corson's Inlet. Losses offshore as well as at the beachface have retreated the shoreline over 100 feet since 2009.  
Photo on the left taken October 7, 2010. View to the north.  
Photo on the right taken October 11, 2011. View to the north.



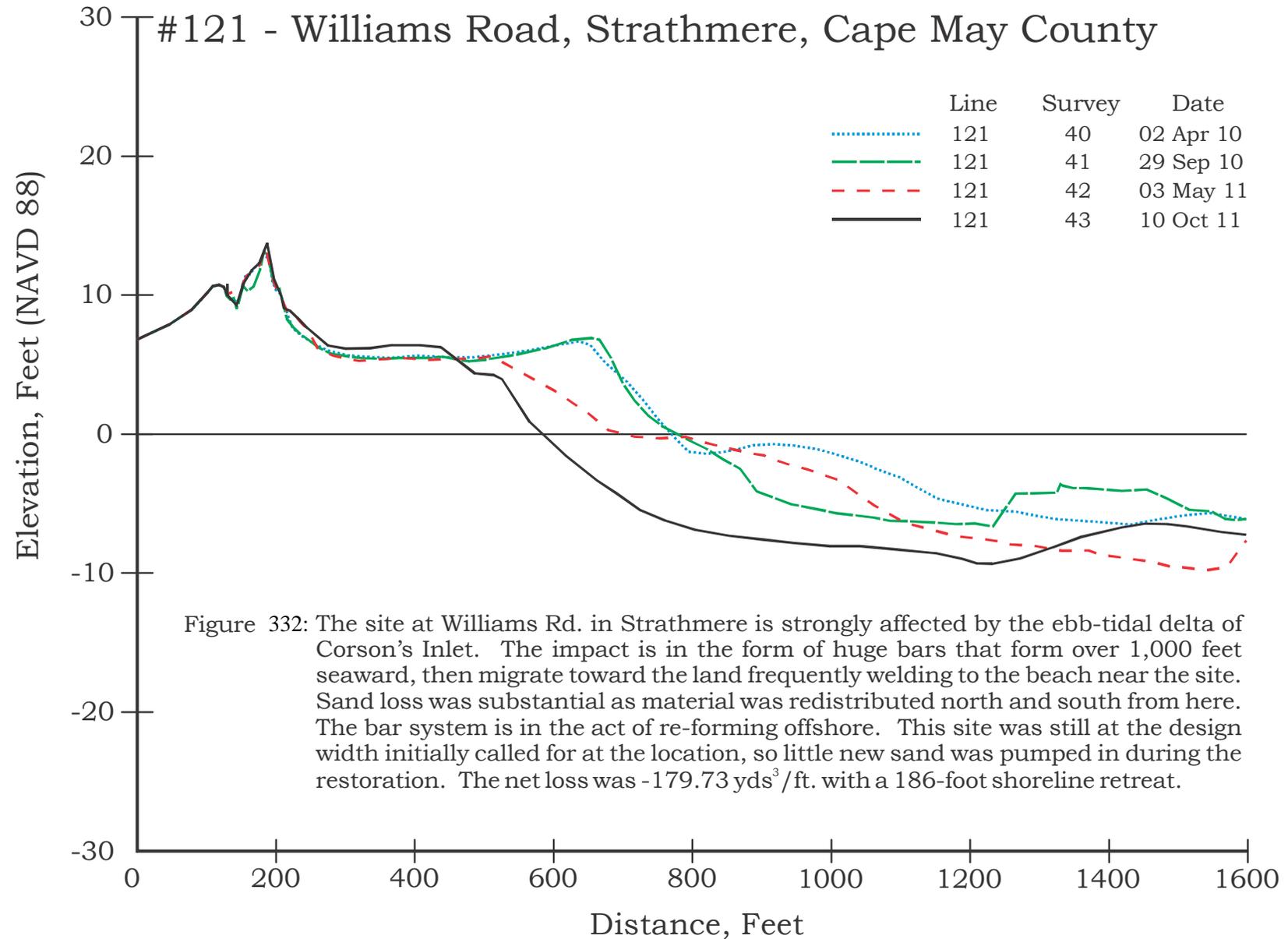
The 25-year trend analysis was not completed because this site was established in 2009.

**Site 121, Williams Road, Strathmere, NJ – May 3, 2011**



**Figure 331. North view of the northern portions of the Strathmere beaches along the seaward dune slope.**

# New Jersey Beach Profile Network



## WILLIAMS ROAD, STRATHMERE – SITE 121

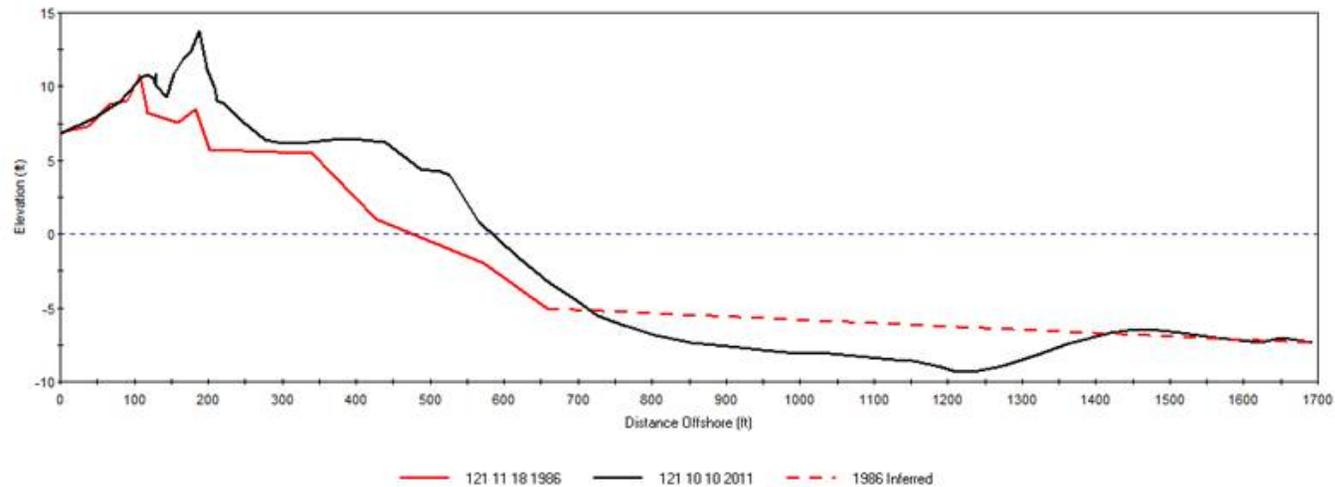
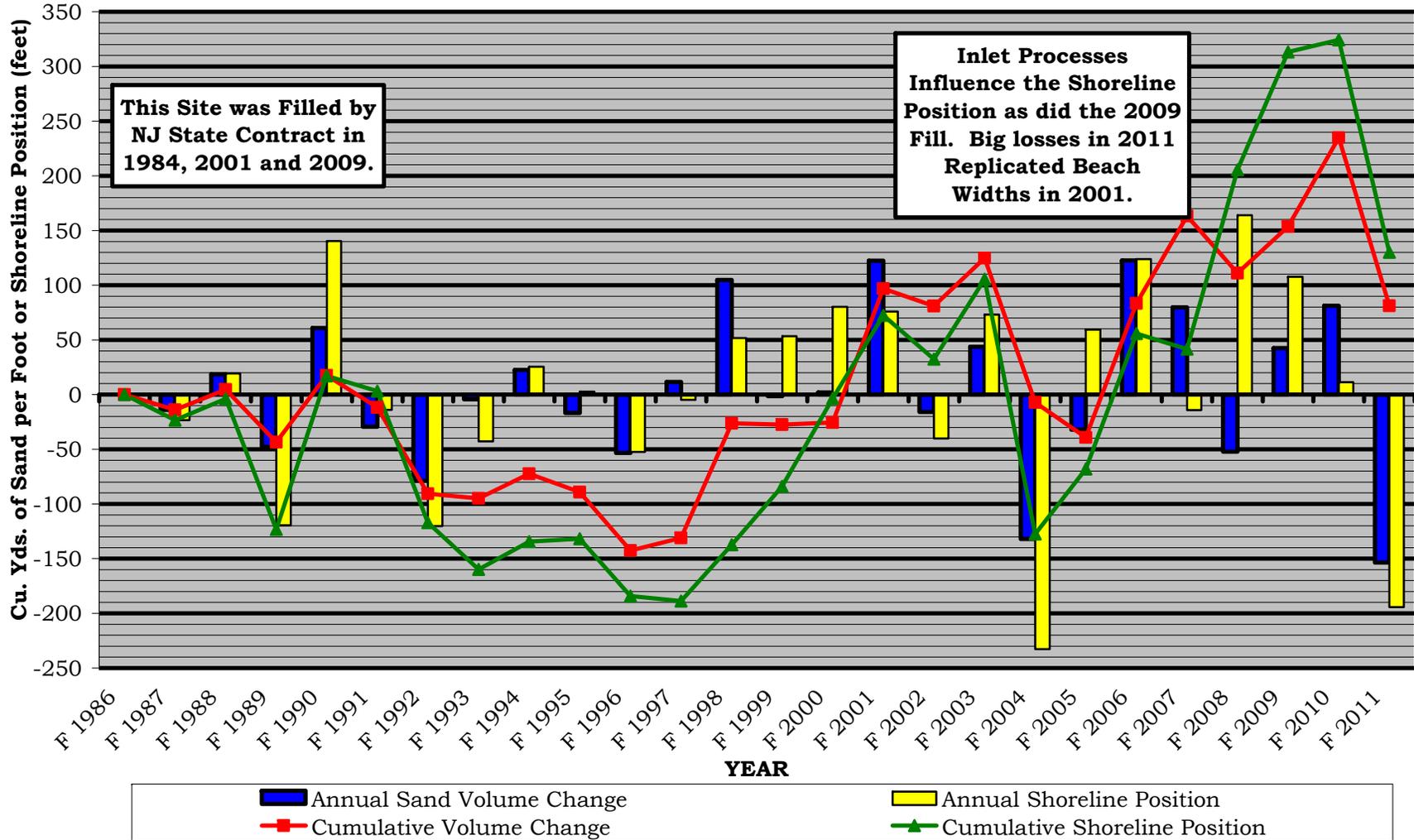


Figure 333: There have been three State/locally sponsored projects in Strathmere (1984, 2001, and 2009) that have enabled dune and beach growth for the 25 year period. Overall cumulative sand volume gains of 61.49 yds<sup>3</sup>/ft and a shoreline advance of 109 feet were recorded. Photo on left taken in 1988. View to the north. Photo on right taken October 10, 2011. View to the north.



**25-Year Coastal Changes at Site 121, Williams Road, Strathmere, Cape May Co.**



**Figure 334.** Very large magnitude changes occur at the northern shoreline of Ludlam Island. There have been three State/locally sponsored projects in Strathmere (1984, 2001, and 2009 plus repair in 2012). A shoreline position variation of 500 feet is due to enormous sand volumes within the Corson's Inlet ebb-tidal shoals which periodically migrate onto the beach. The spikes in 2001 and 2009 were fill related, but the loss in 2011 was due to sand transfer toward the inlet.

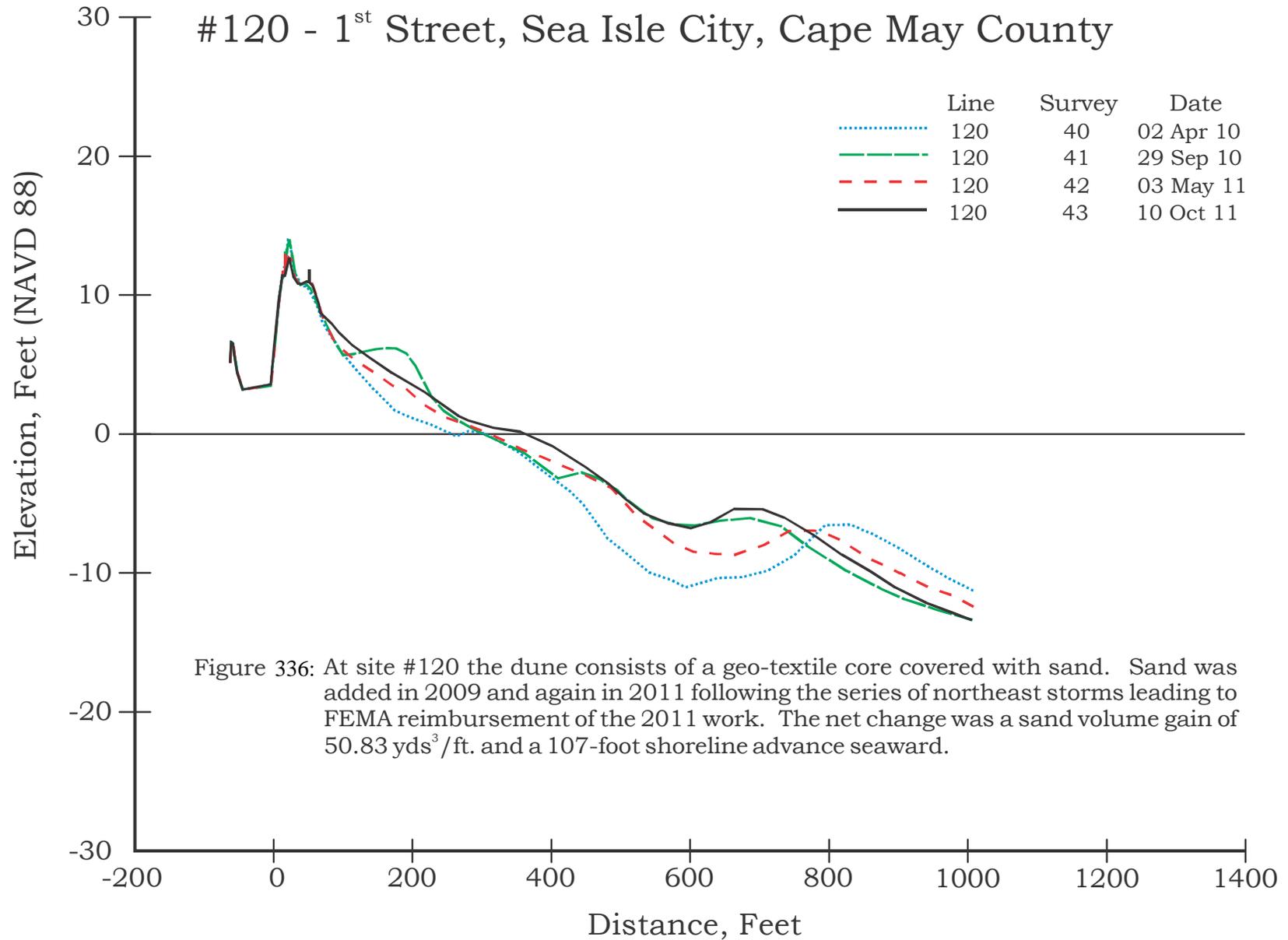
Site 120, 1<sup>st</sup> Street, Sea Isle City, NJ – May 3, 2011



Figure 335. View to the south along the dune crest along Sea Isle City beach.

# New Jersey Beach Profile Network

#120 - 1<sup>st</sup> Street, Sea Isle City, Cape May County



## 1<sup>st</sup> STREET, SEA ISLE CITY – SITE 120

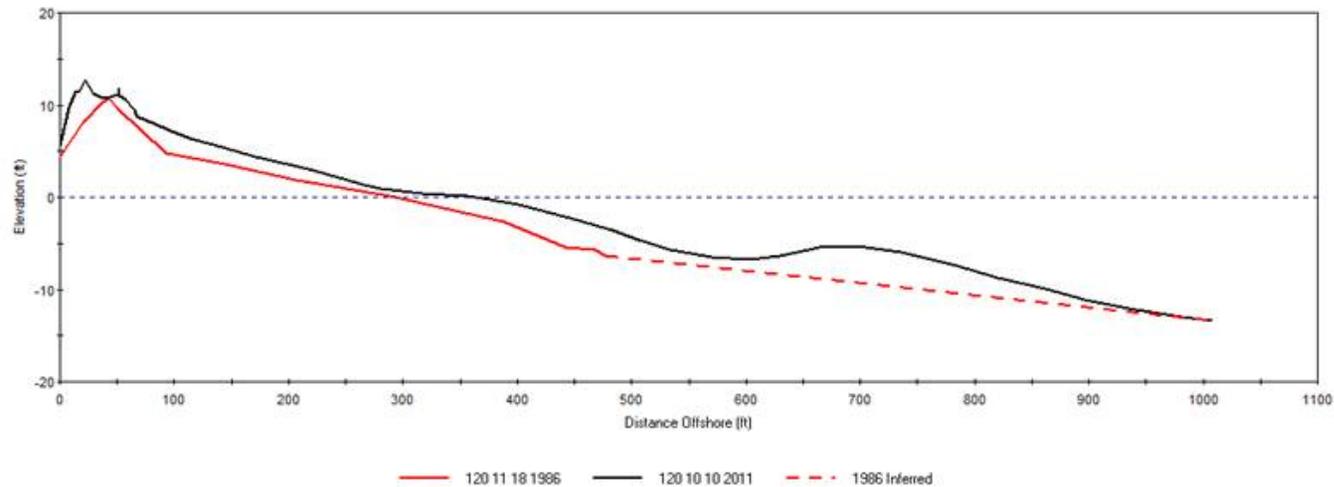


Figure 337: Historically, this site is known for its low elevation and narrow beach. The gradual decline in sand volume is evidence for a limited supply reflecting this low, narrow part of the barrier system. However, the 2009 replenishment sand has added 70 feet of shoreline as well as 32.95 yds<sup>3</sup>/ft of sand.

Photo on left taken October 4, 1991. View to the north.

Photo on right taken October 10, 2011. View to the north.



### 25-Year Coastal Changes at Site 120, 1<sup>st</sup> Street Sea Isle City, Cape May Co.

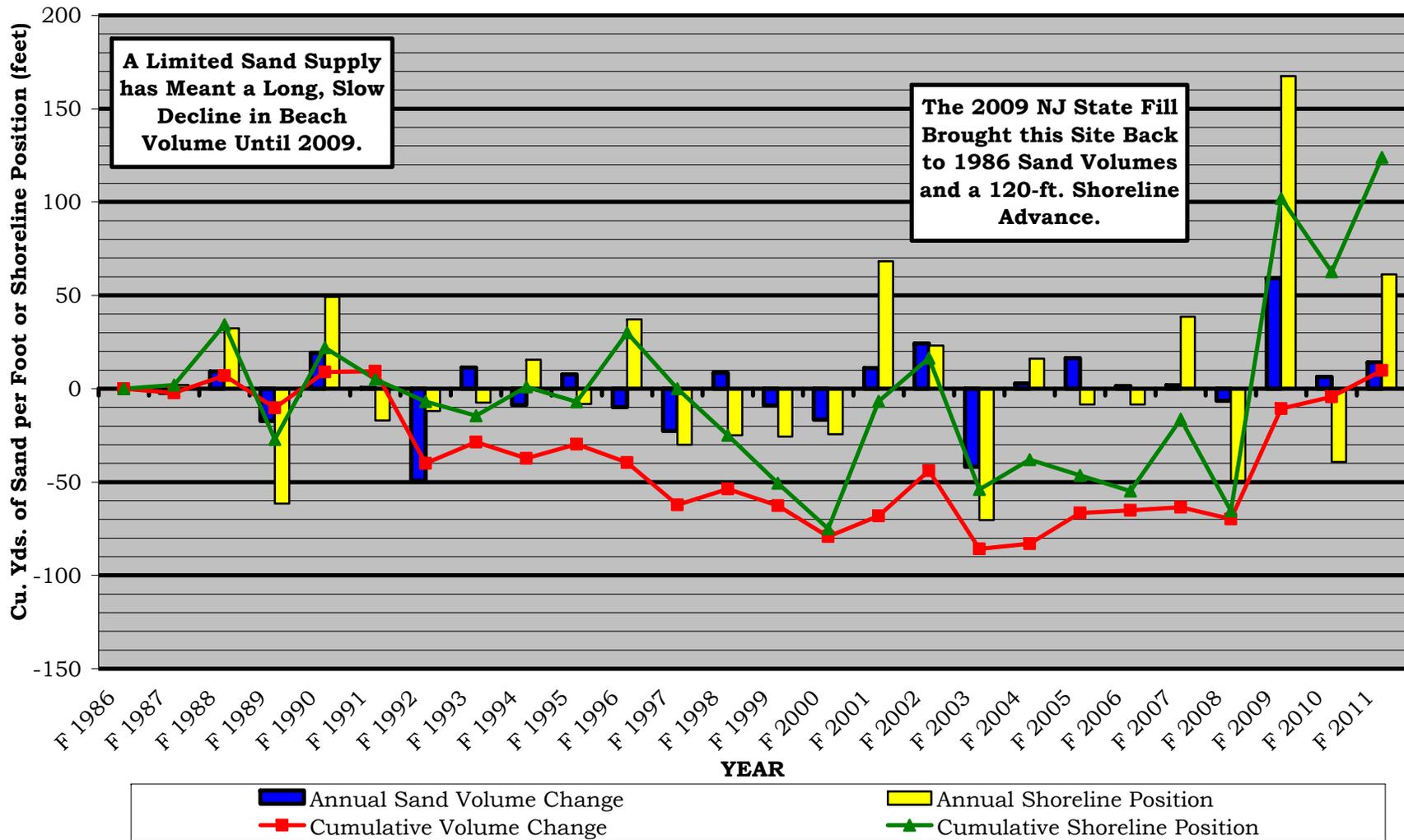


Figure 338. This site is located in the middle of Whale Beach, part of Ludlam Island known for its low elevation, narrow beach and minimal width. The gradual decline in sand volume is evidence for a limited supply reflecting this low, narrow part of the barrier system. The 2009 beach restoration plus the 2011 restoration of the storm losses in 2009 & 2010 have replaced the lost material seen following the 2008 survey.

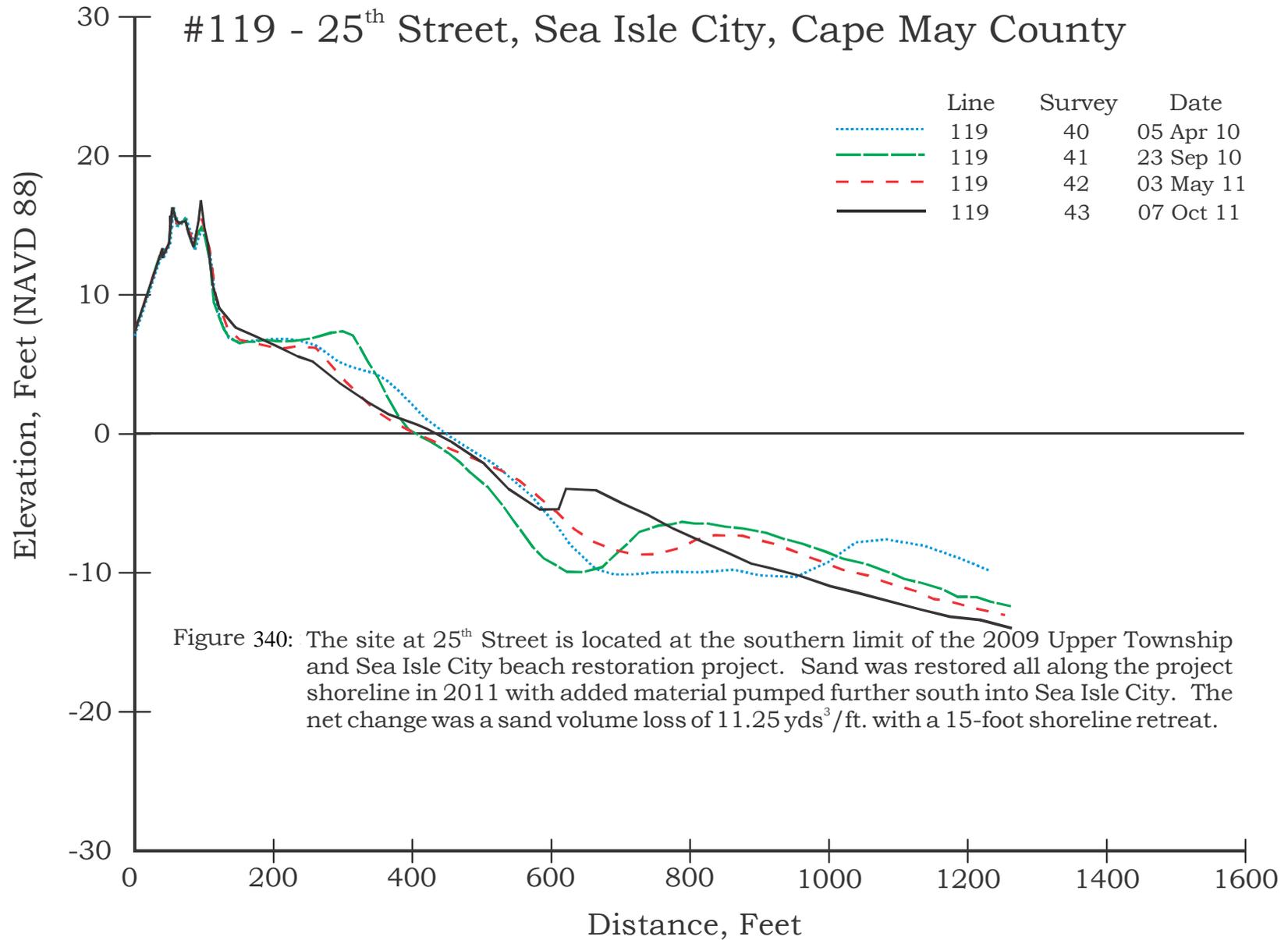
Site 119, 25<sup>th</sup> Street, Sea Isle City, NJ – May 3, 2011



Figure 339. South view of the dune and beach taken in early spring 2011.

# New Jersey Beach Profile Network

#119 - 25<sup>th</sup> Street, Sea Isle City, Cape May County



## 25<sup>th</sup> STREET, SEA ISLE CITY- SITE 119

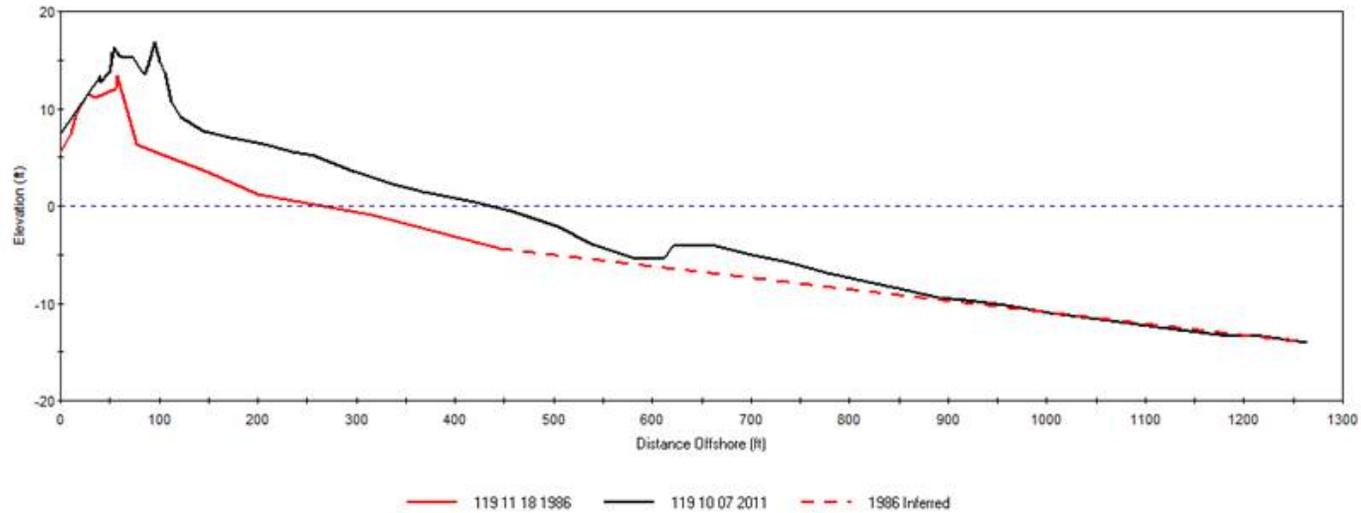


Figure 341: The replenishment project in 2009 has elevated the recreational beach and dune, adding 71.92 yds<sup>3</sup>/ft of sand along the profile. The shoreline also advanced 170 feet since 1986.  
Photo on left taken October 4, 1991. View to the north.  
Photo on right taken October 10, 2011. View to the north.



25-Year Coastal Changes at Site 119, 25<sup>th</sup> Street Sea Isle City, Cape May Co.

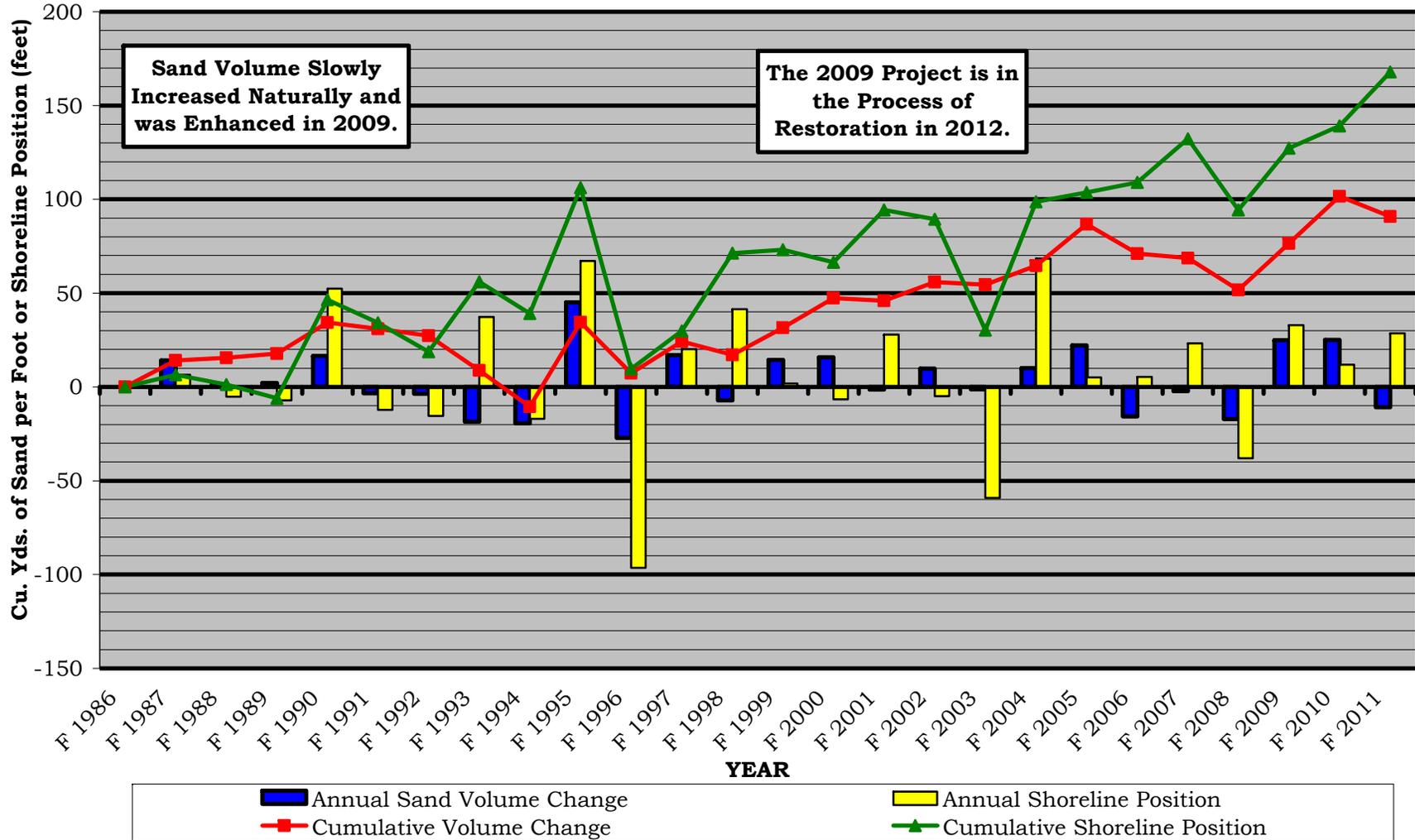


Figure 342. Sand was initially added here in 2009 with repair fill underway in starting late in 2011, so the net change at this site was a slow increase in sand volume with an advance seaward for the shoreline position.

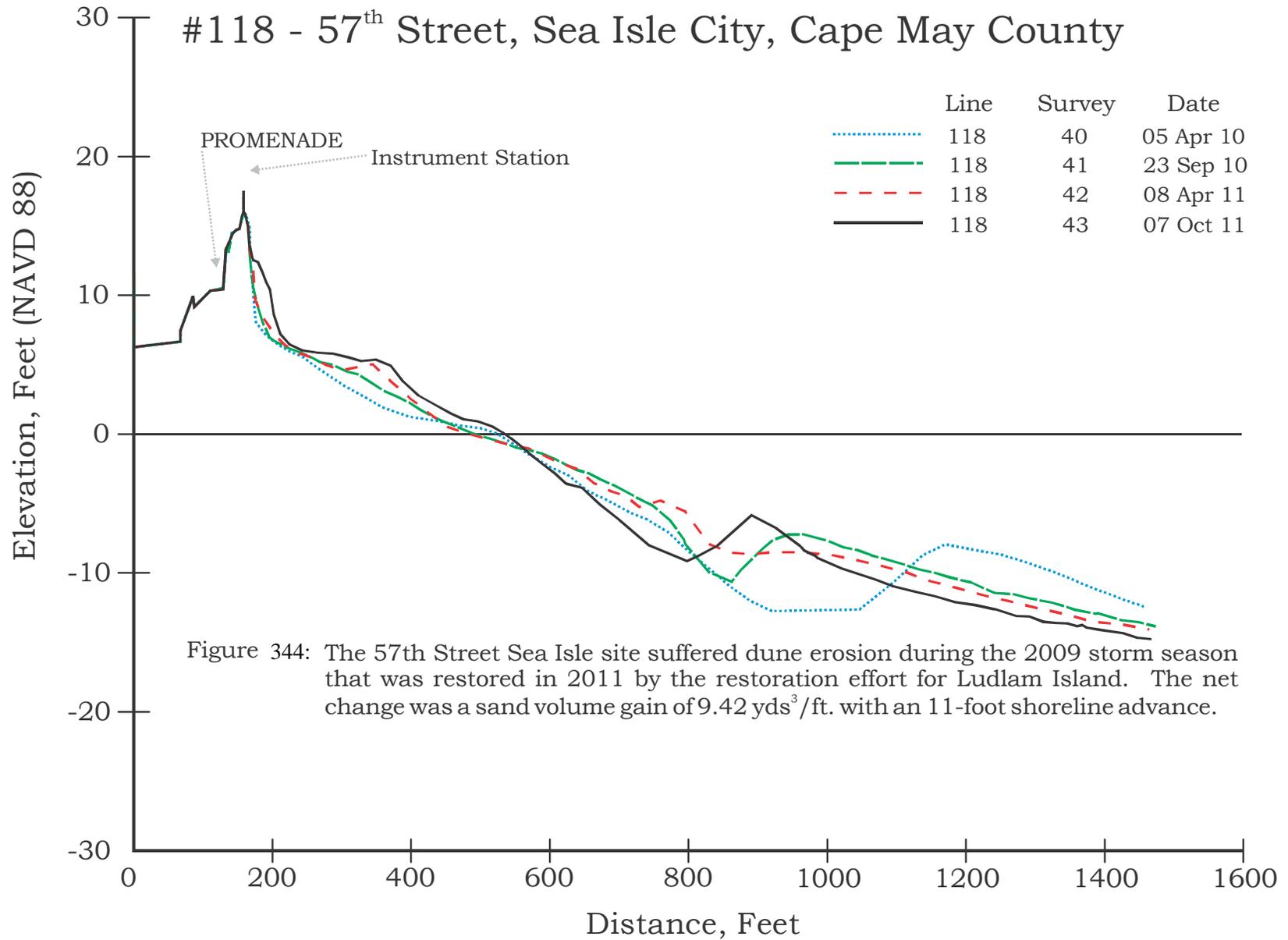
Site 118, 57<sup>th</sup> Street, Sea Isle City, NJ – April 8, 2011



Figure 343. View to the north adjacent to the beach access.

# New Jersey Beach Profile Network

#118 - 57<sup>th</sup> Street, Sea Isle City, Cape May County



### 57<sup>th</sup> STREET, SEA ISLE CITY – SITE 118

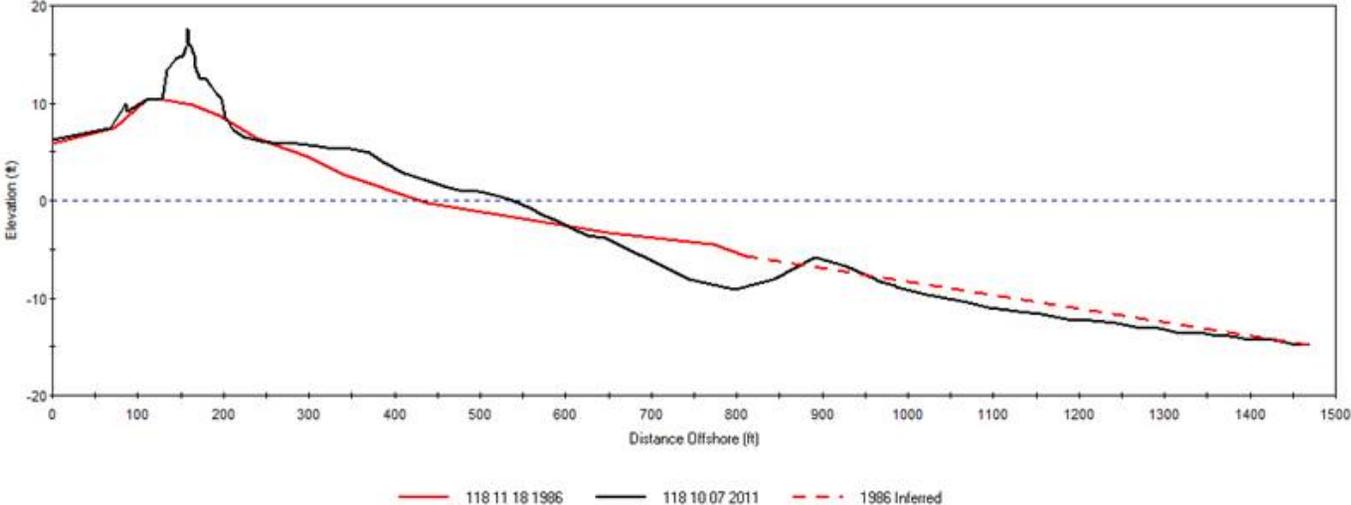
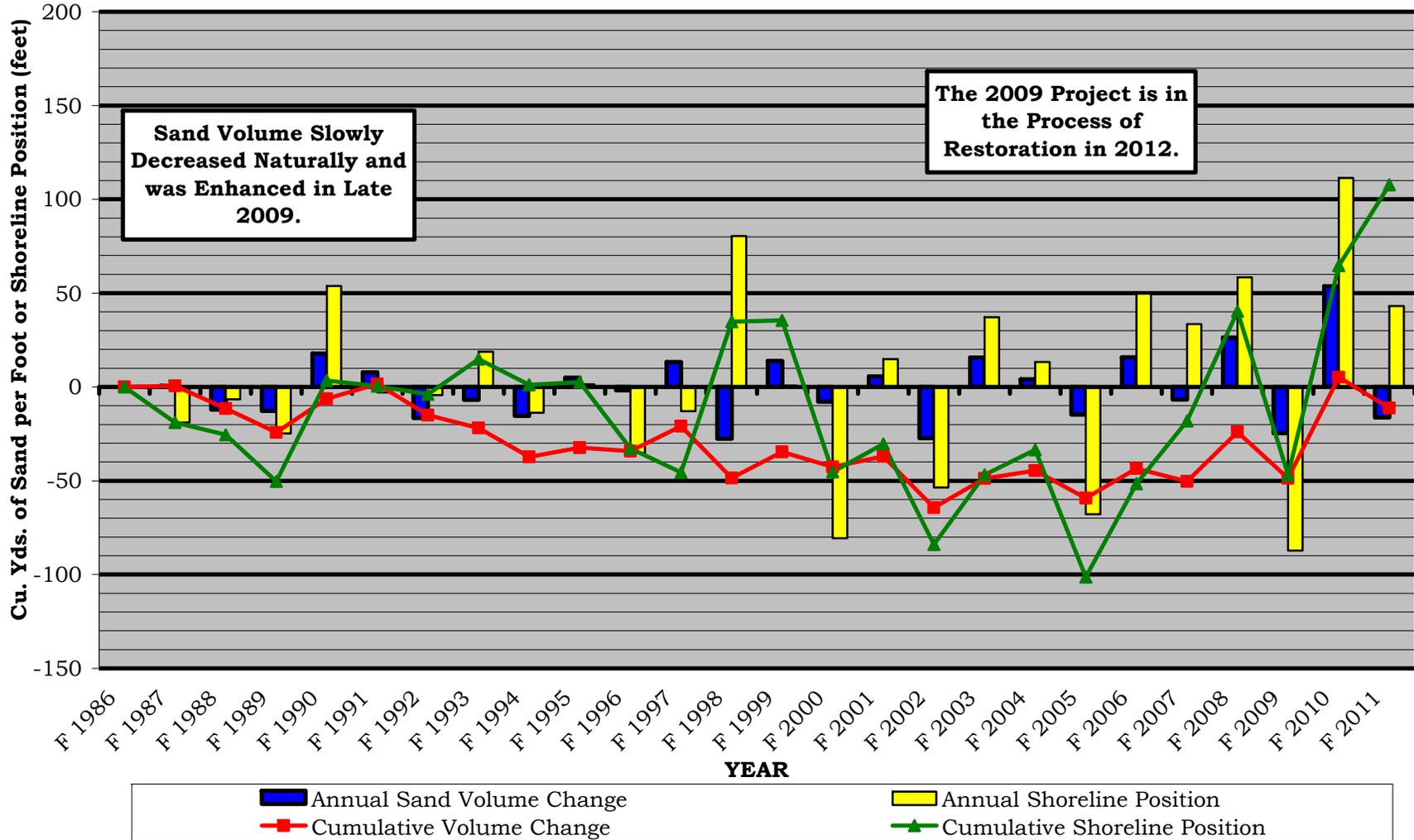


Figure 345: Sand placement in late 2009 advanced the shoreline 106 feet virtually restoring the original 1986 profile configuration. The dune growth since 1986 is also documented in the profile above. Photo on left taken October 19, 1995. View to the south. Photo on right taken October 7, 2011. View to the south.



**25-Year Coastal Changes at Site 118, 57<sup>th</sup> Street Sea Isle City, Cape May Co.**



**Figure 346.** The mid-community beaches of Sea Isle City have been in slow decline for years. Sand was placed here in 2009 and the City funded additional material during the storm repair project that concluded in 2012. The 50 yds<sup>3</sup>/ft. loss in sand volume was restored to the 1986 conditions, with a bonus of a 100-foot shoreline advance.

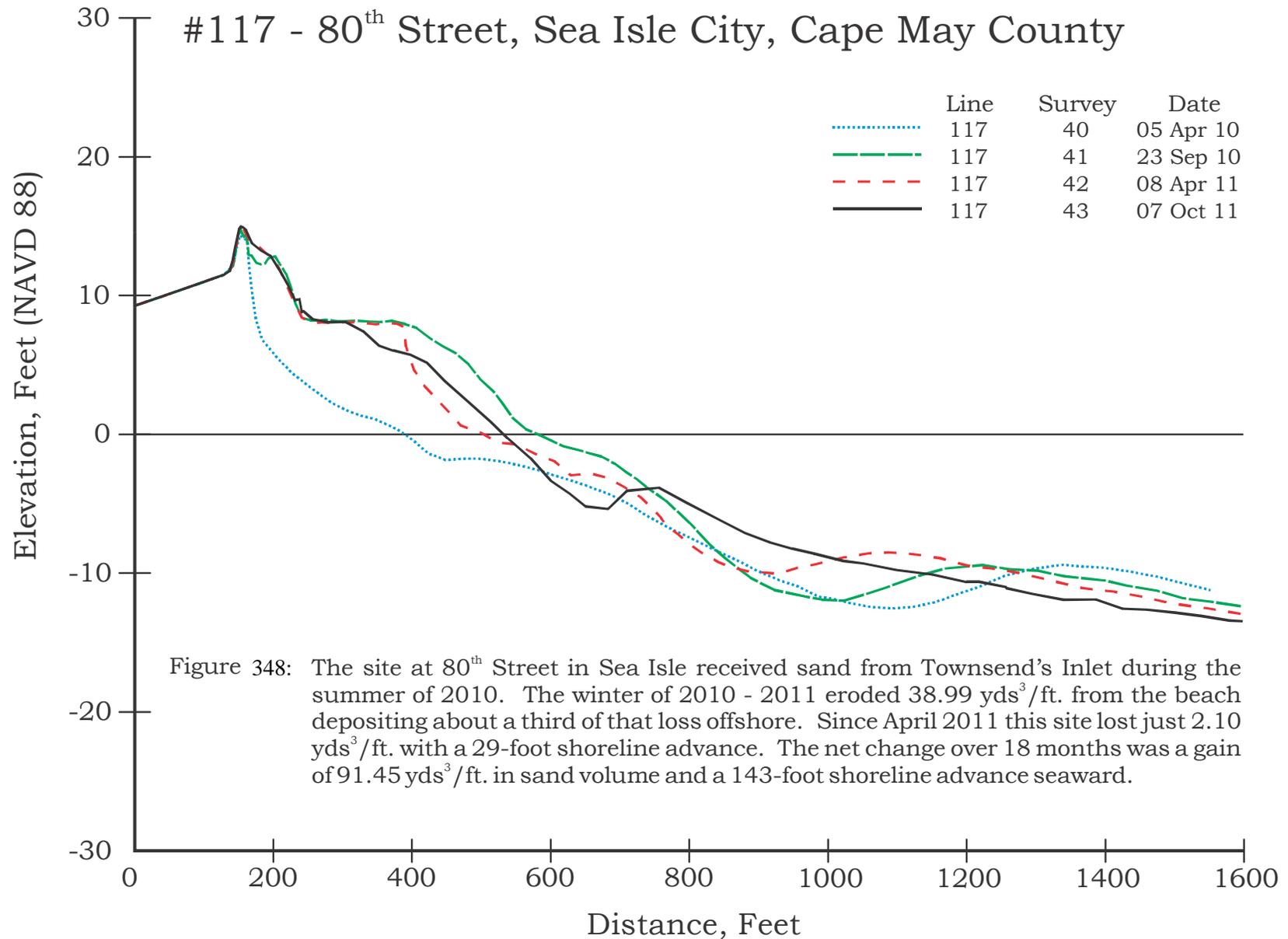
Site 117, 80<sup>th</sup> Street, Sea Isle City, NJ – April 8, 2011



Figure 347. View to the south of the dune grass plugs at the southern end of Sea Isle City.

# New Jersey Beach Profile Network

#117 - 80<sup>th</sup> Street, Sea Isle City, Cape May County



## 80<sup>th</sup> STREET, SEA ISLE CITY – SITE 117

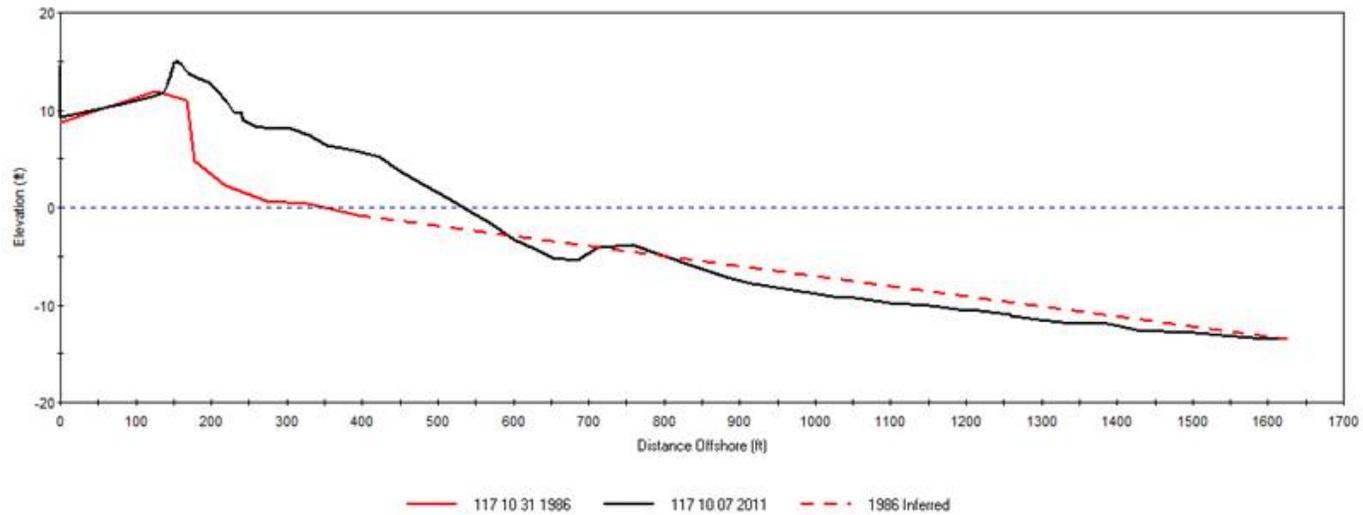


Figure 349: Sea Isle City received the latest beach replenishment sand in late 2009 significantly increasing the recreational beach elevation. Over the 25 year period the shoreline advanced 184 feet. Photo on left taken October 5, 1994. View to the north. Photo on right taken October 7, 2011. View to the north.



## 25-Year Coastal Changes at Site 117, 80<sup>th</sup> Street Sea Isle City, Cape May Co.

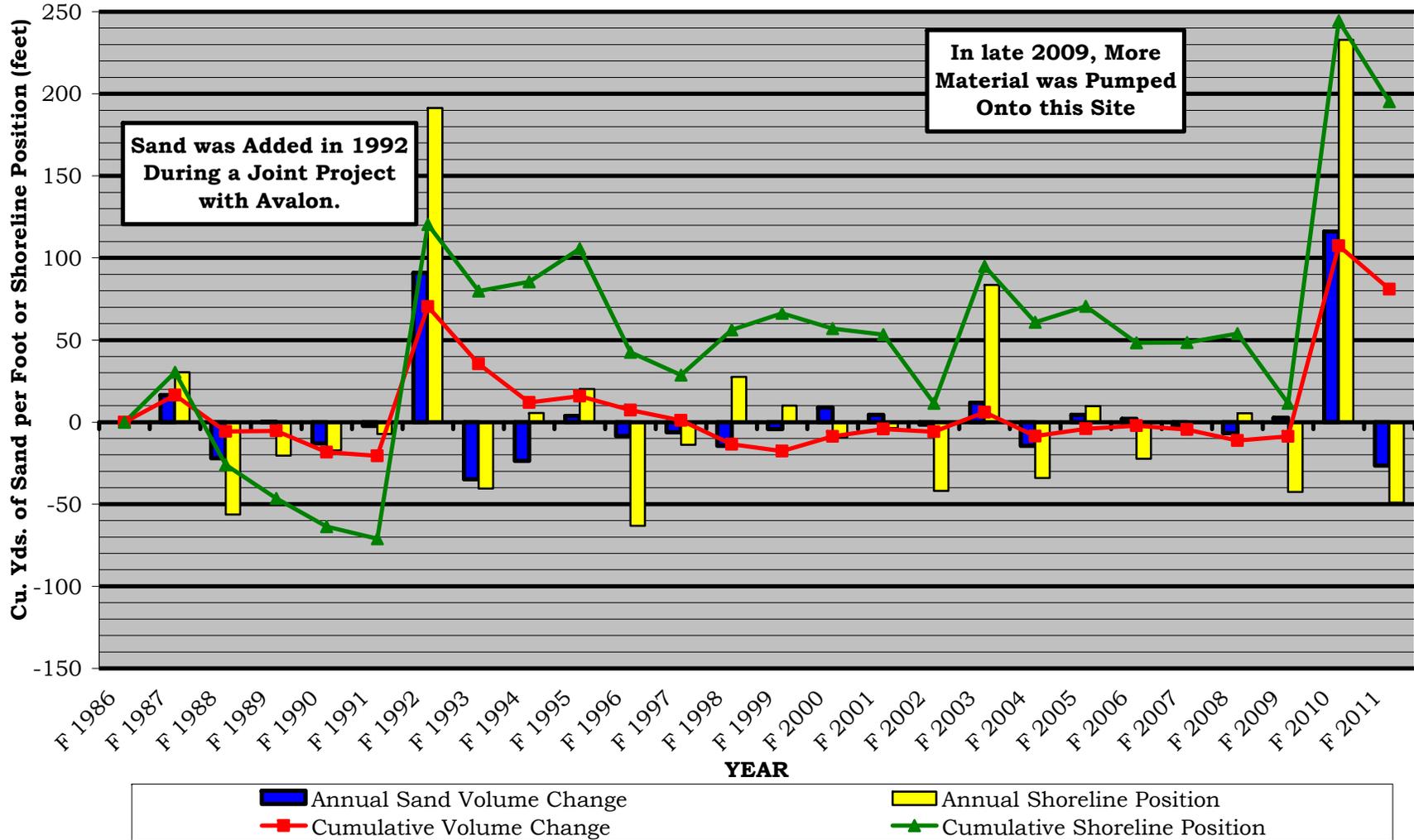


Figure 350. This site is 13 blocks from Townsend’s Inlet. The City had a series of timber and rock groins built successively further south toward the terminal structure at 93<sup>rd</sup> Street with acts as a low profile jetty to the inlet channel over many years of time. In addition sand has been pumped here since 1978. It and a 1982 project preceded this undertaking, but the impact of a 1992 and the 2009 project show dramatically. The site is currently ahead of 1986 beach conditions.

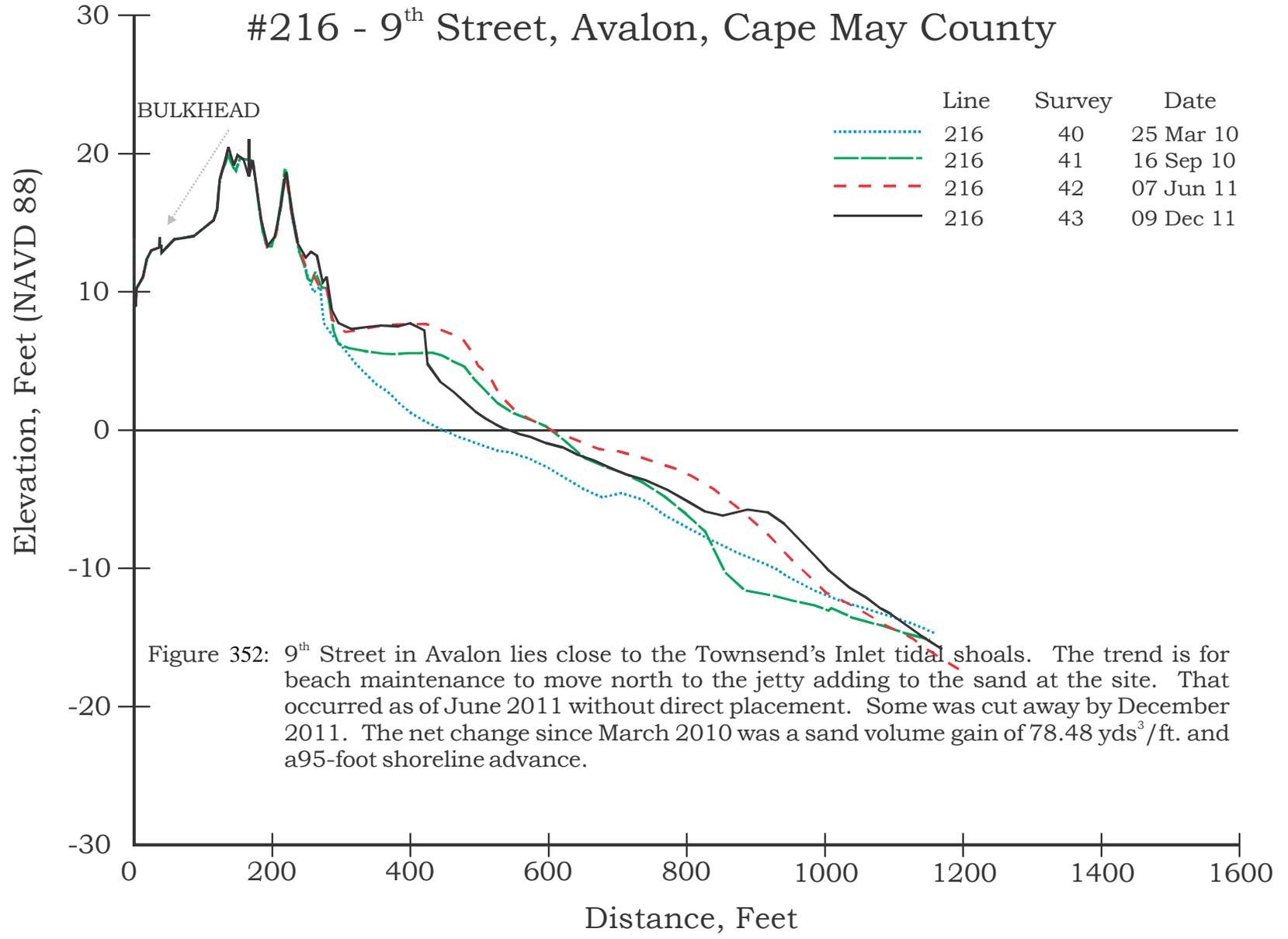
Site 216, 9<sup>th</sup> Street, Avalon, NJ – December 9, 2011



Figure 351. View to the northeast of the northern beaches in Avalon adjacent to the Townsend's Inlet jetty.

# New Jersey Beach Profile Network

## #216 - 9<sup>th</sup> Street, Avalon, Cape May County



## 9<sup>th</sup> STREET AVALON – SITE 216

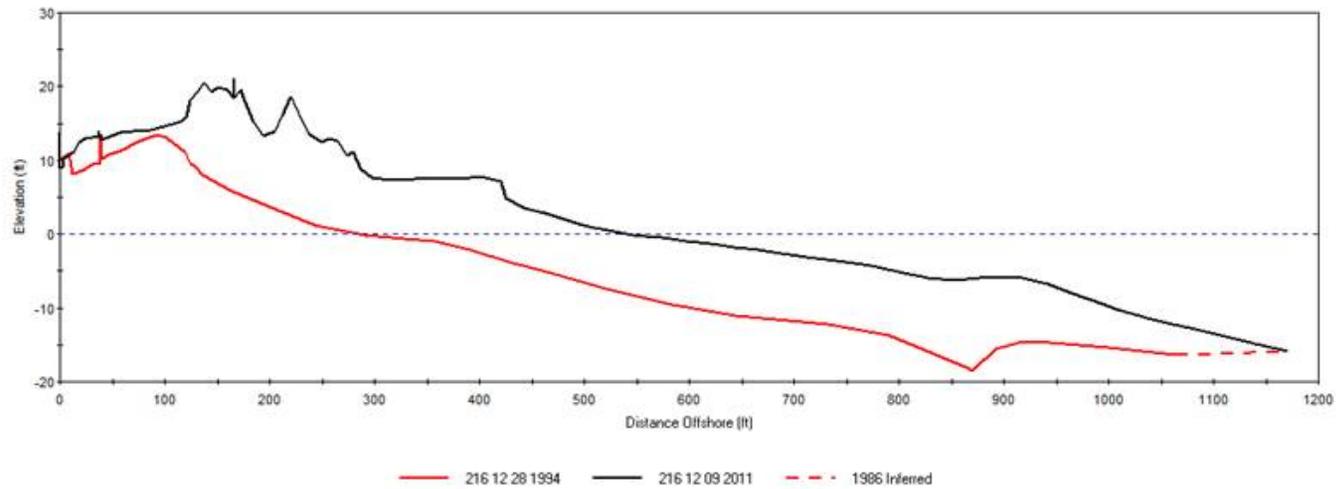


Figure 353: Beach replenishment projects have dominated the area at 9<sup>th</sup> Street. The sand added and the extension of the jetty immediately to the north of the profile has culminated in a shoreline advance of 254 feet and sand volume gains amounting to 325.52 yds<sup>3</sup>/ft. Photo on left taken in 1996. View to the north. Photo on right taken December 9, 2011. View to the northeast.



### 17-Year Coastal Changes at Site 216, 9<sup>th</sup> Street, Avalon, Cape May Co.

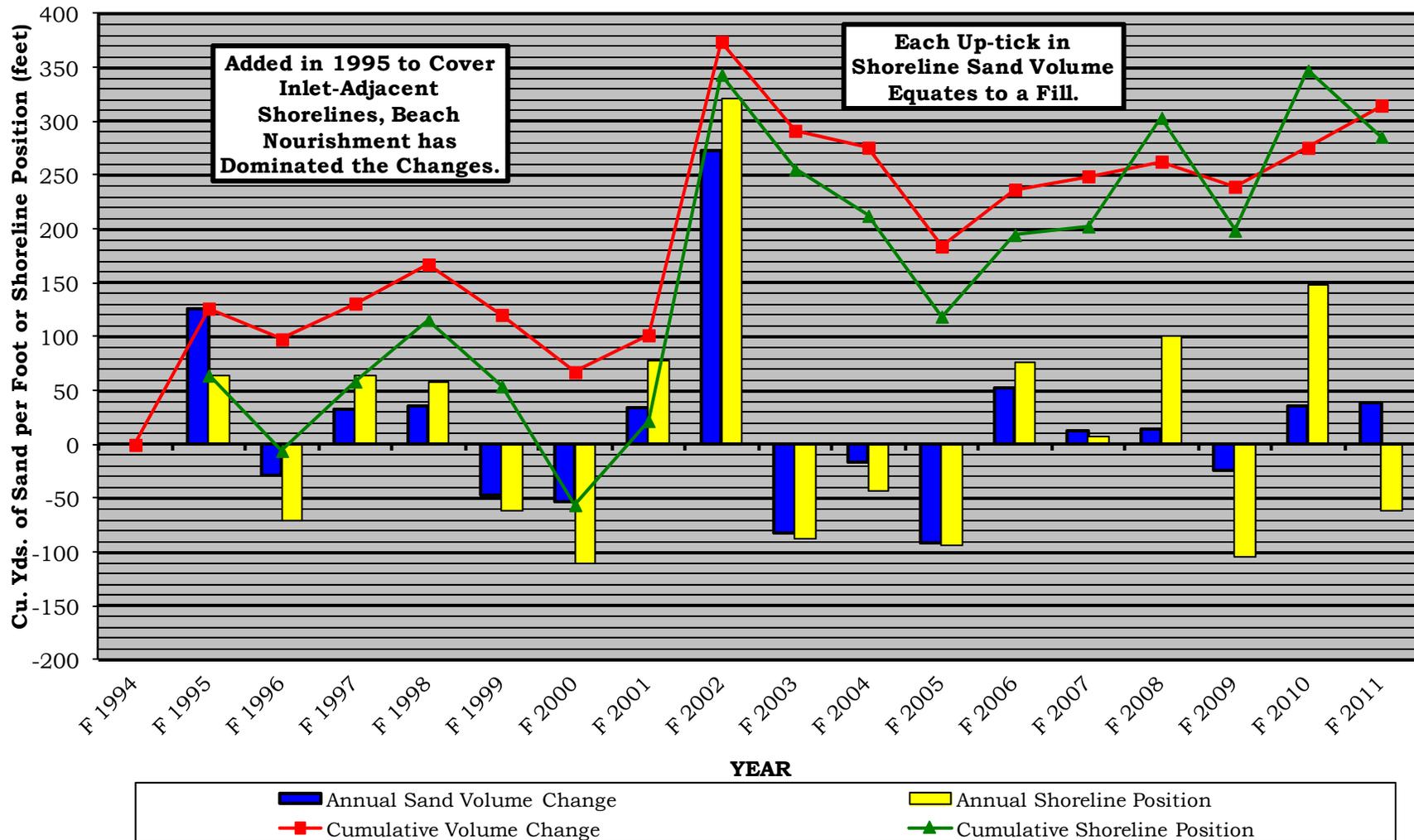


Figure 354. This is another of the inlet-associated cross sections added in 1994. Townsend’s Inlet has had a significant impact on the stability of Avalon’s northern shoreline. The initial beach project happened in 1987 with subsequent additions almost every two years. The Federally-sponsored work commenced in 2003 as the big spike shows. The municipality augmented the Federal beach work multiple times with a variety of sand supplies (back-passing, quarry sand and direct inlet dredging).

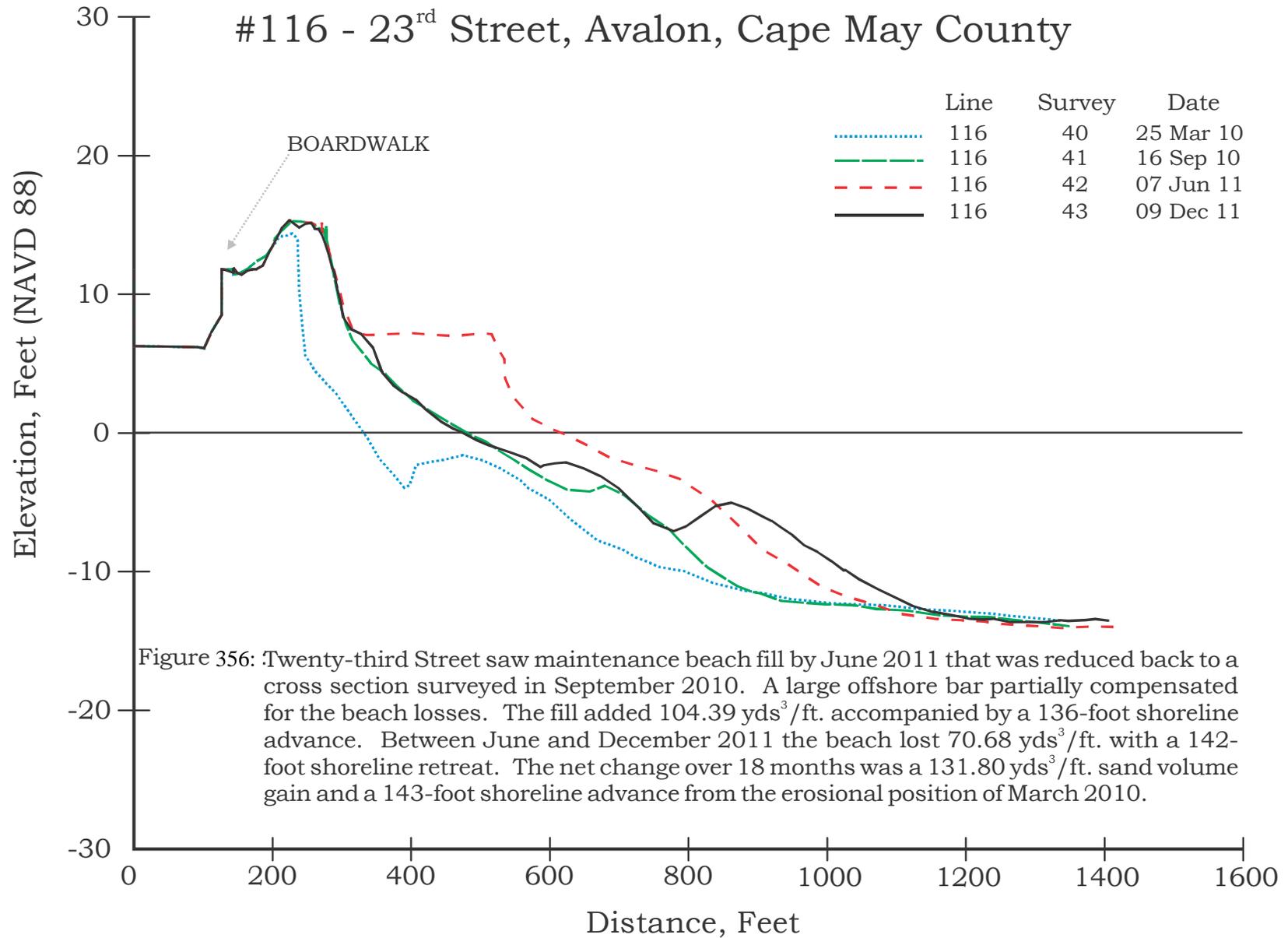
Site 116, 23<sup>rd</sup> Street, Avalon, NJ – December 9, 2011



Figure 355. View to the north of the dune and recreational beach following the beach replenishment project.

# New Jersey Beach Profile Network

#116 - 23<sup>rd</sup> Street, Avalon, Cape May County



## 23<sup>rd</sup> STREET, AVALON – SITE 116

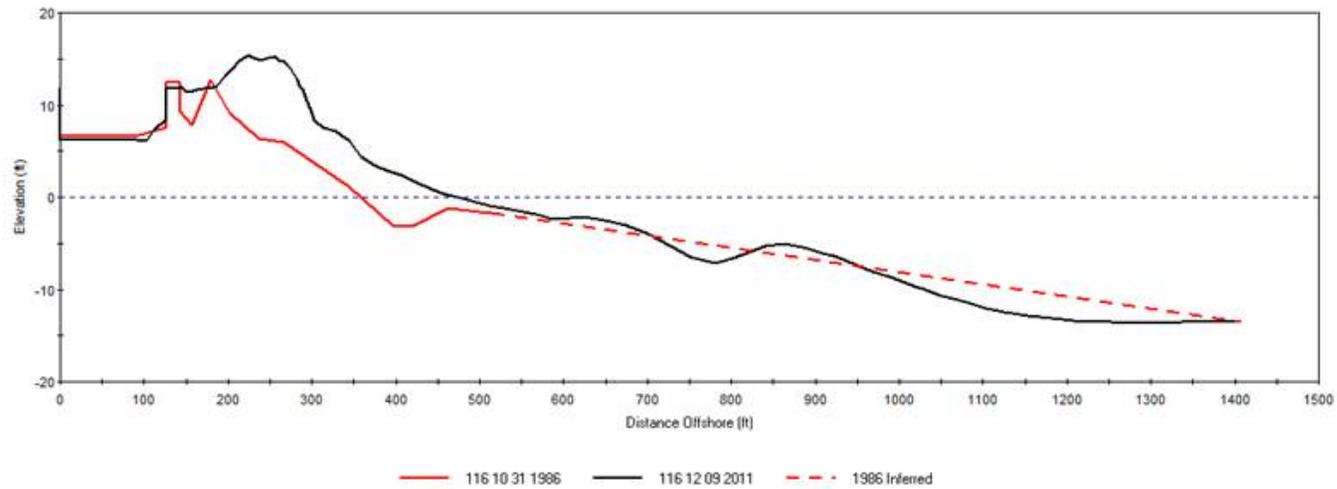
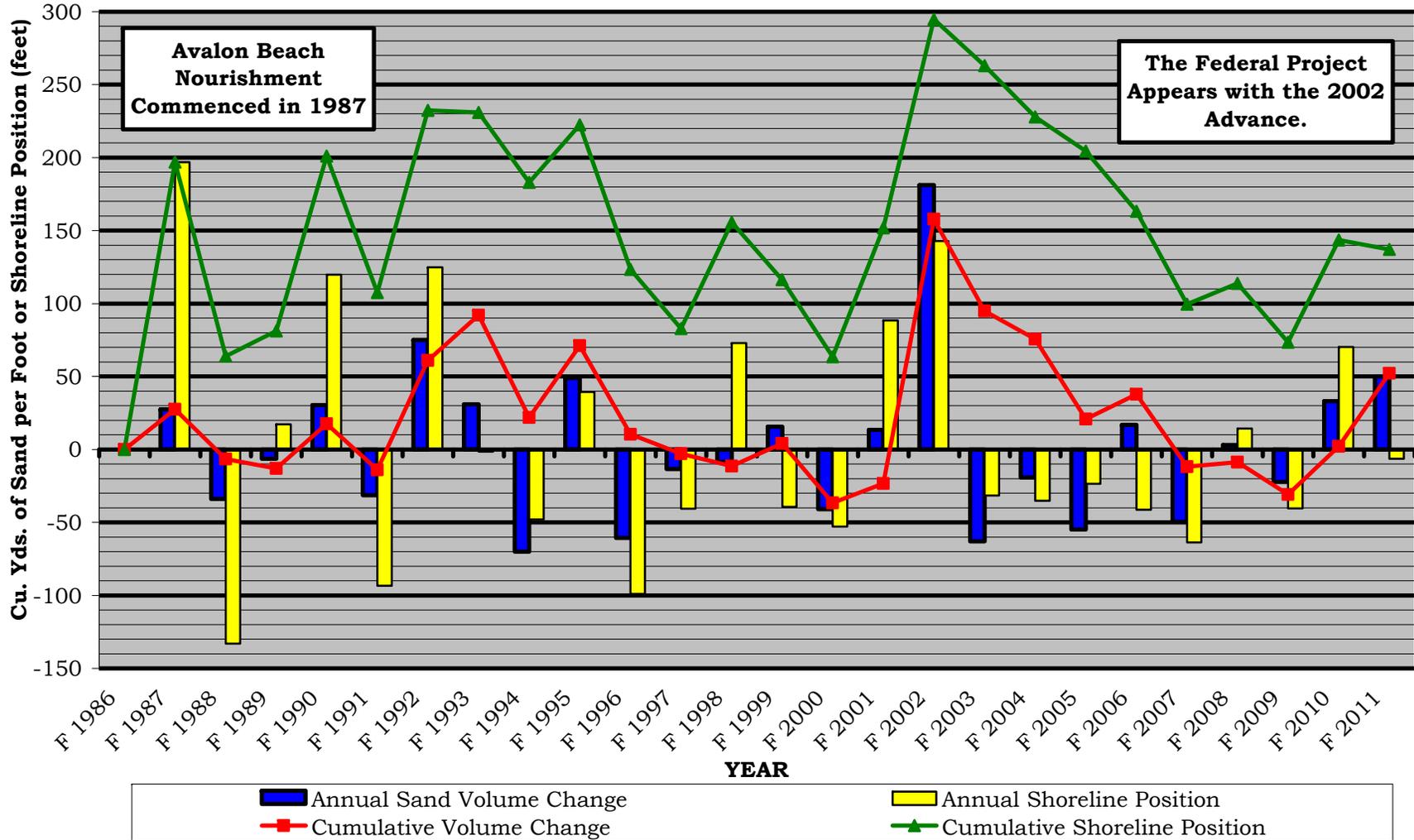


Figure 357: The site at 23<sup>rd</sup> Street has received direct sand placement from numerous beach replenishment projects going back as far as 1987. Currently the dune is shown to have increased in the last 25 years in both elevation and width along with a shoreline advance of 117 feet. Photo on the left taken October 8, 1991. View to the north. Photo on the right taken December 9, 2011. View to the north.



**25-Year Coastal Changes at Site 116, 23<sup>rd</sup> Street Avalon, Cape May Co.**



**Figure 358.** Positioned in the middle of the Avalon beach restoration zone, this site shows the complete history of sand placement since 1987. Not every project saw sand placed directly on this beach, but sand moved to the site readily. The big events were the initial 1987 work and the 2002 Federal initial construction. Decline is evident following 2002 until the Borough intervened in 2010.

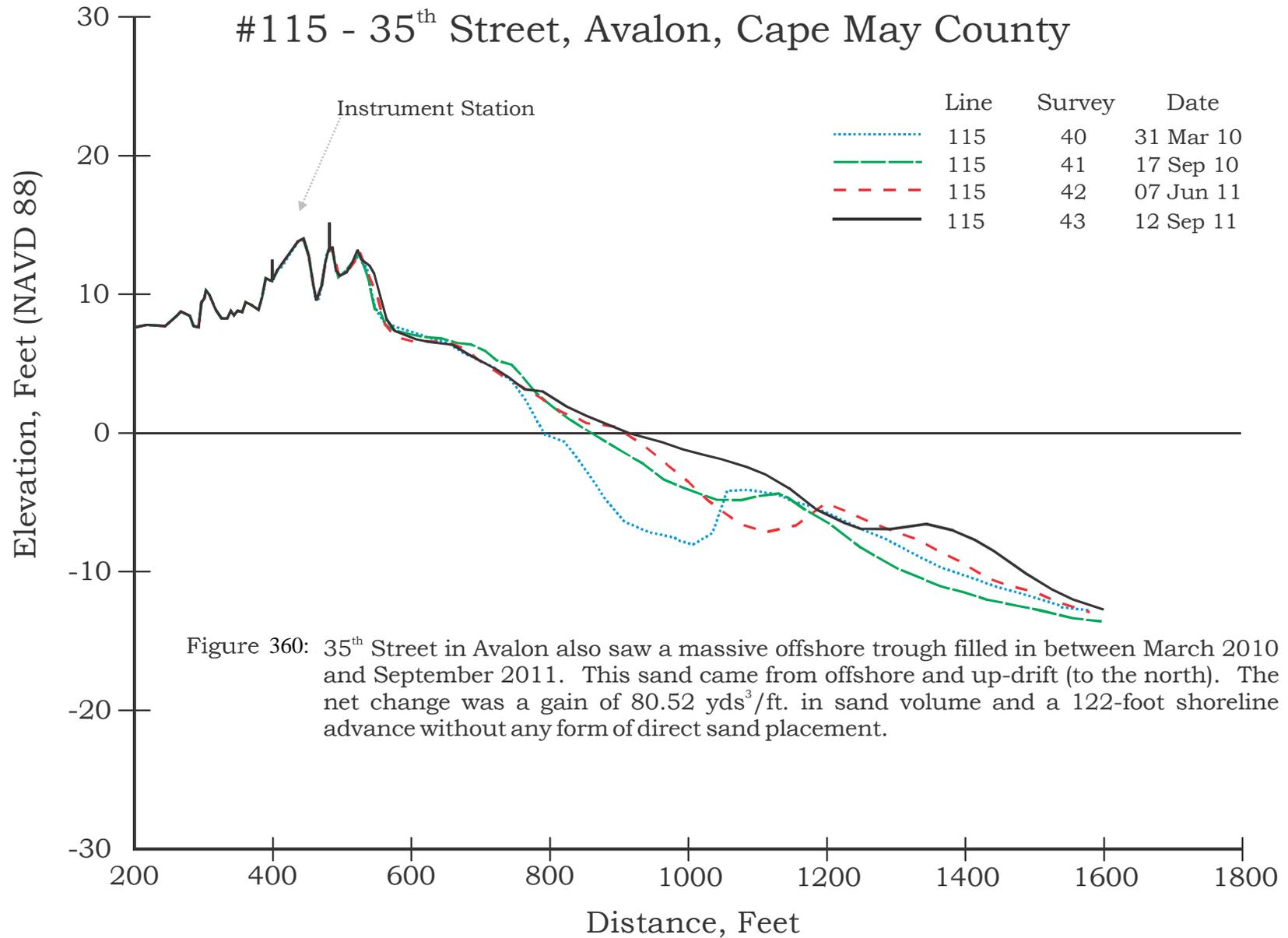
Site 115, 35<sup>th</sup> Street, Avalon, NJ – December 12, 2011



Figure 359. View of the mid-beach looking north in Avalon, NJ.

# New Jersey Beach Profile Network

#115 - 35<sup>th</sup> Street, Avalon, Cape May County



### 35<sup>th</sup> STREET, AVALON – SITE 115

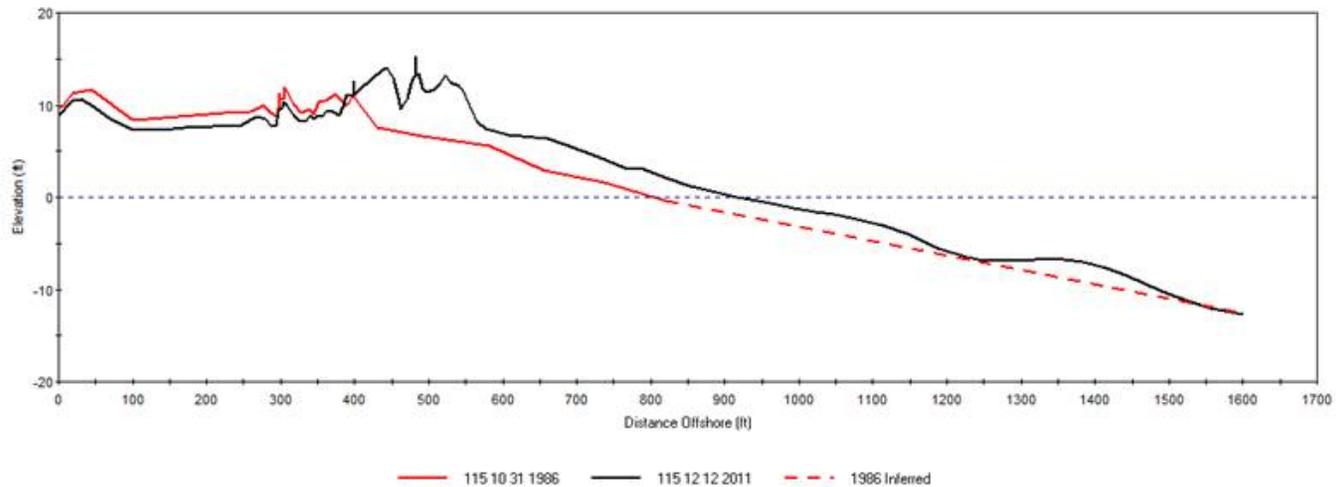


Figure 361: Cumulative sand volume gains over the 25 years of study amounted to 36.92 yds<sup>3</sup>/ft, concentrated in the primary dune growth, recreational beach, and nearshore regions. The transport of sand from the northern beachfill projects over the years has supplied ample material for stability along the profile.  
Photo on left taken October 8, 1991. View to the northeast.  
Photo on right taken December 9, 2011. View to the northeast.



### 25-Year Coastal Changes at Site 115, 35<sup>th</sup> Street Avalon, Cape May Co.

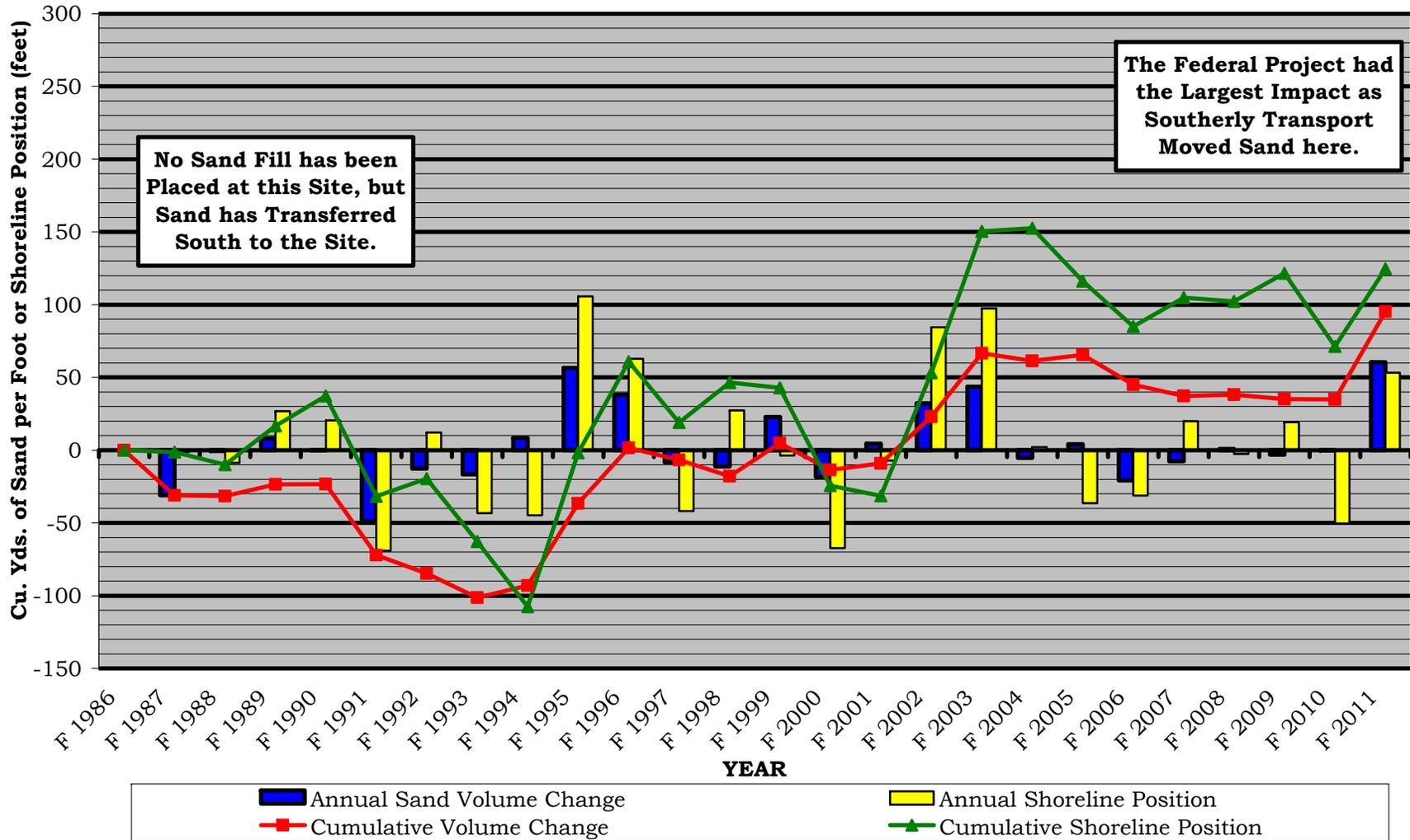


Figure 362. This site lies south of all beach nourishment work in Avalon. Sand moved to the site in quantity in 1995 and 1996 with another pulse in 2011. Derived from the project shoreline, the site has been in positive territory since 2003.

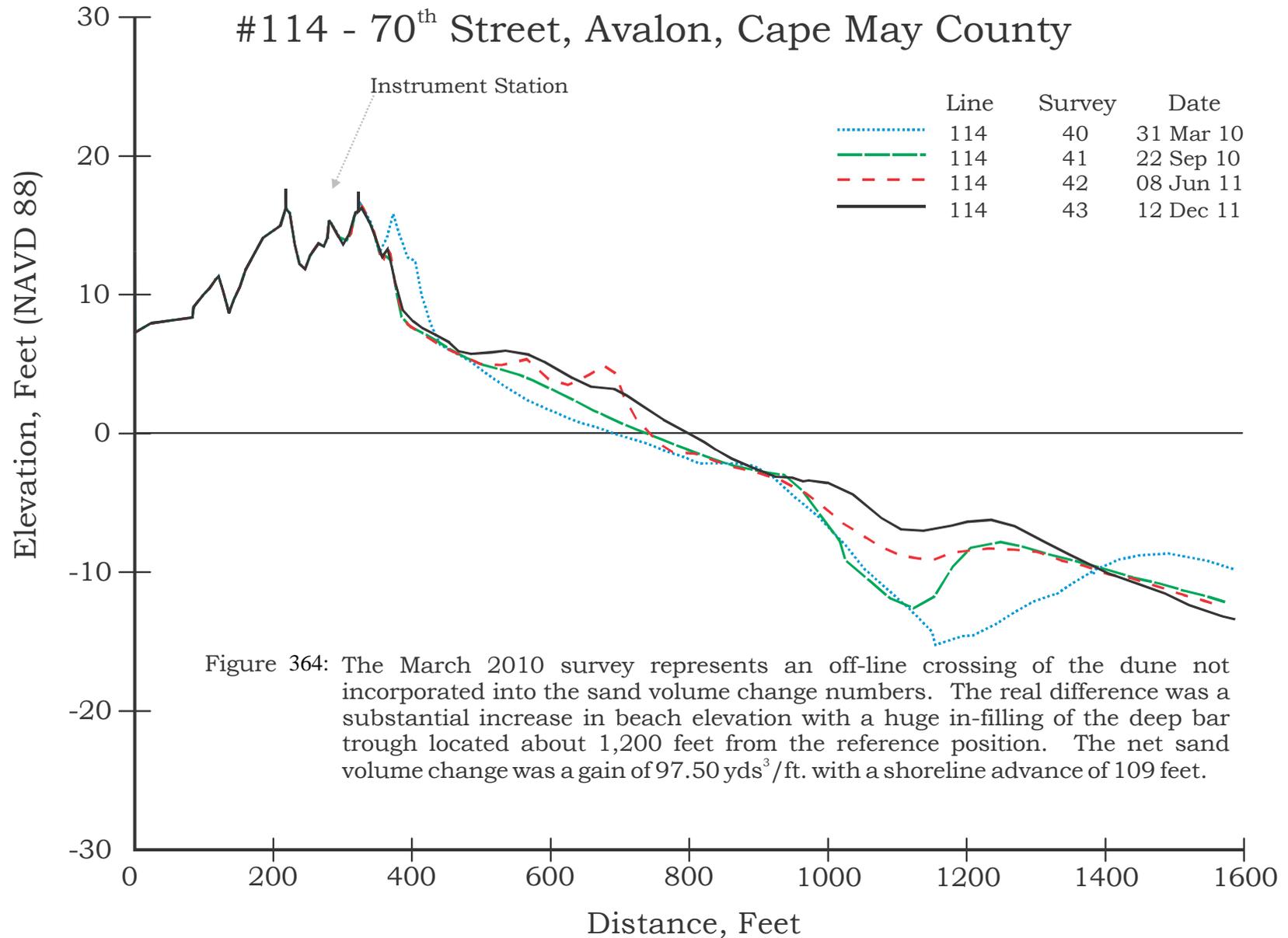
Site 114, 70<sup>th</sup> Street, Avalon, NJ – December 12, 2011



Figure 363. View of Avalon's southern beach along the dune toe looking north.

# New Jersey Beach Profile Network

#114 - 70<sup>th</sup> Street, Avalon, Cape May County



## 70<sup>th</sup> STREET, AVALON – SITE 114

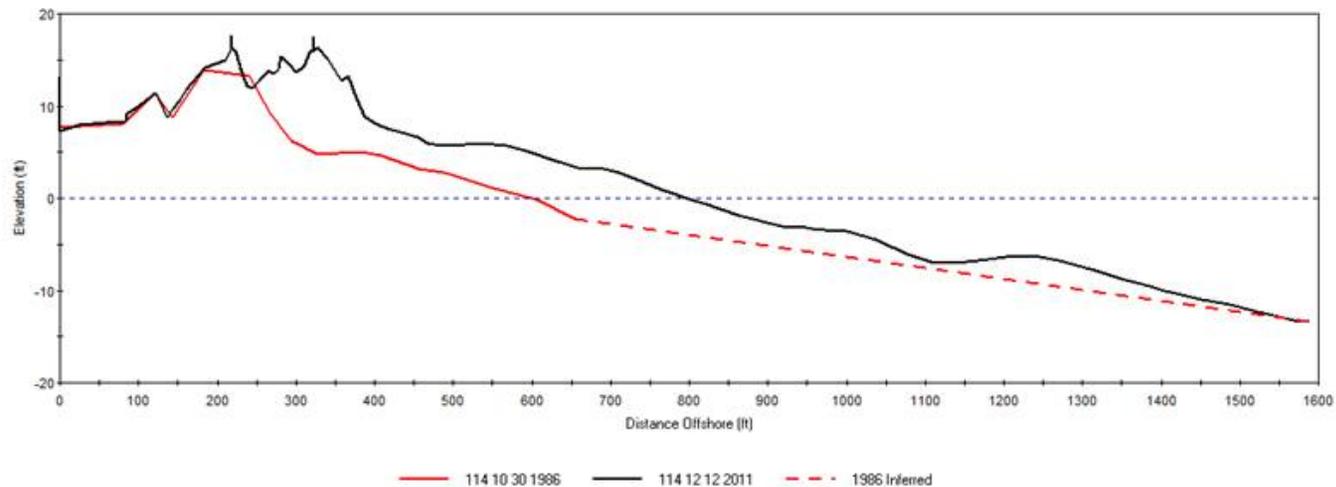


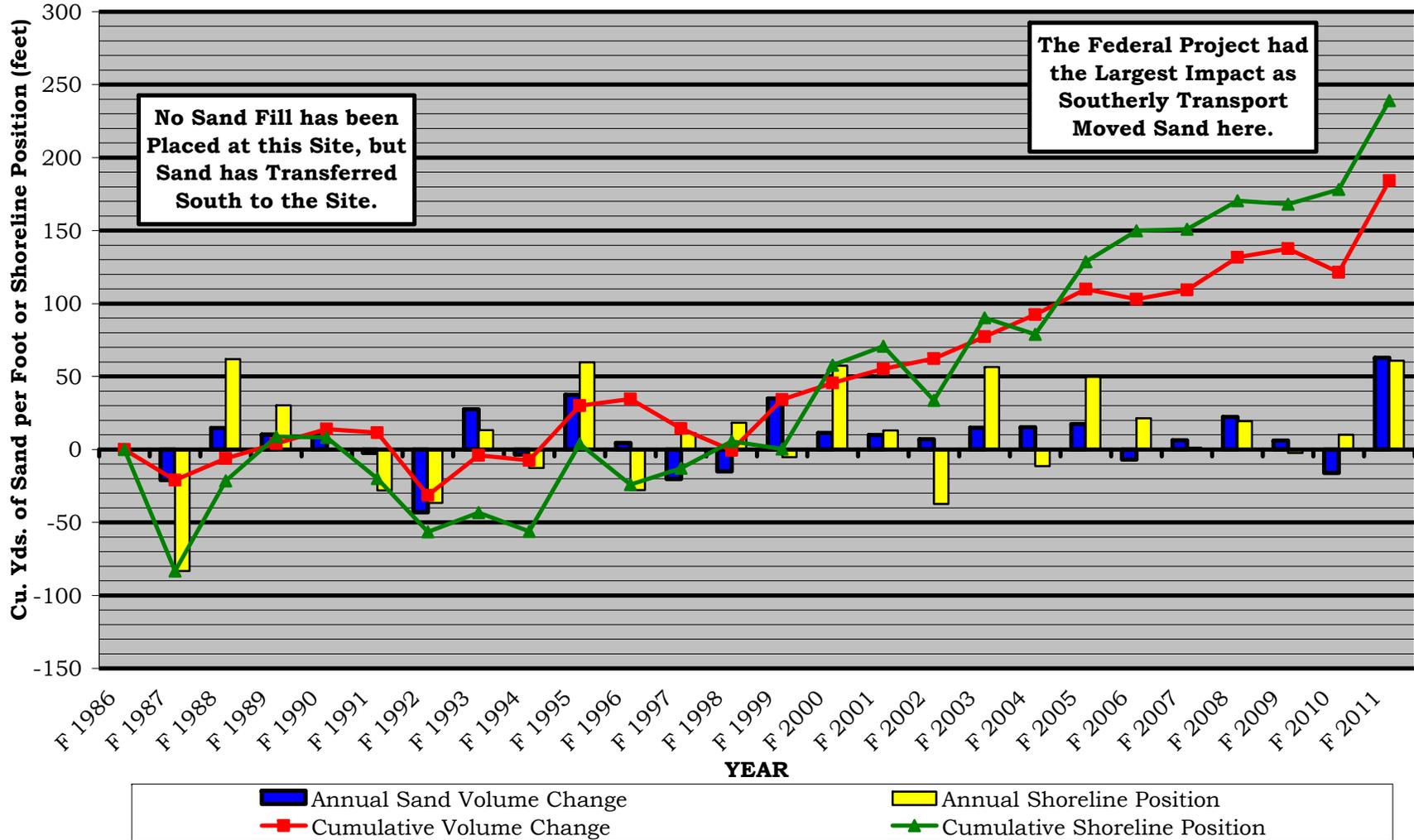
Figure 365: The creation of a seaward dune ridge is depicted in the cross section above. This site marked the tapered end of the beach replenishment projects. Considerable beach elevation increases continued to the offshore portions as well since 1986. The shoreline advanced nearly 200 feet over this time period.

Photo on left taken December 29, 1994. View to the north.

Photo on right taken December 12, 2011. View to the north.



**25-Year Coastal Changes at Site 114, 70<sup>th</sup> Street Avalon, Cape May Co.**



**Figure 366.** Sand has moved toward the center of Seven-Mile-Island since monitoring began, accelerating as the sand nourishment projects accumulated. A steady increase in sand volume and a shoreline advance seaward commenced in 1998 and have seldom reversed in even a minor instance. The dunes and back beach have all benefited greatly.

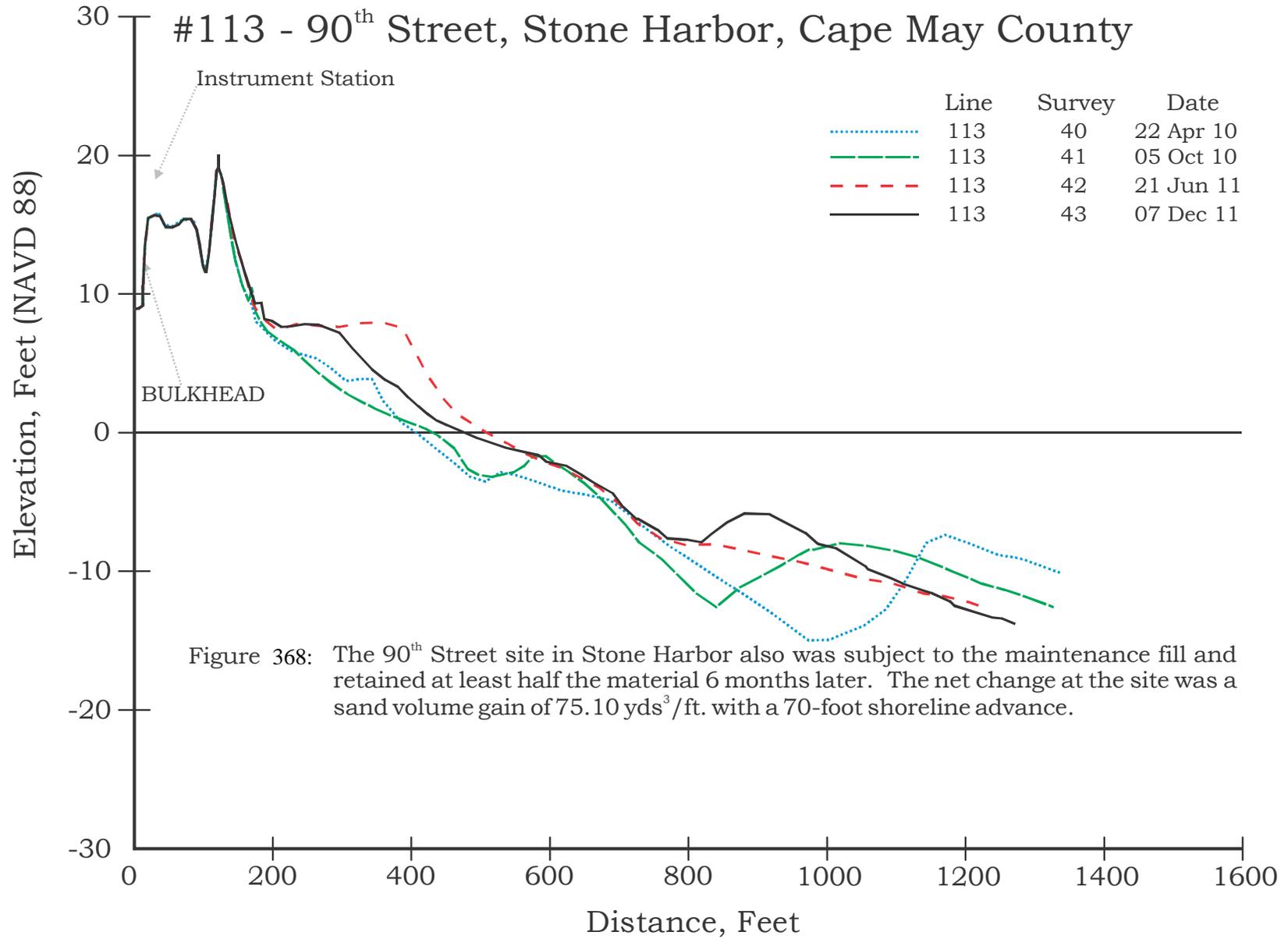
Site 113, 90<sup>th</sup> Street, Stone Harbor, NJ – December 7, 2011



Figure 367. View of the dune and recreational beach looking north.

# New Jersey Beach Profile Network

#113 - 90<sup>th</sup> Street, Stone Harbor, Cape May County



## 90<sup>th</sup> STREET, STONE HARBOR – SITE 113

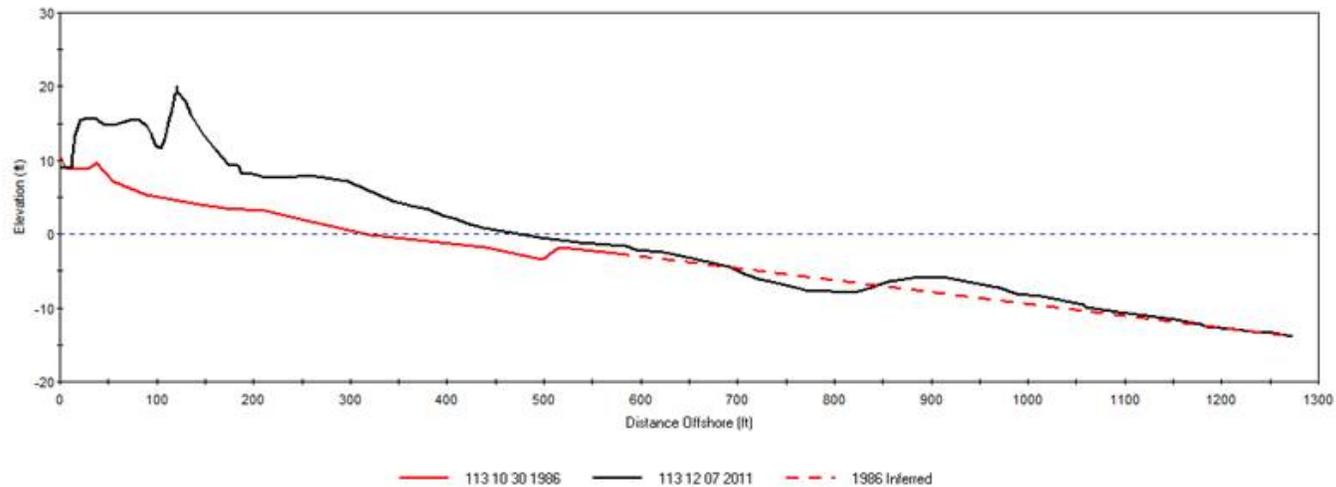


Figure 369: Cumulative sand volume gains amounted to 110.13 yds<sup>3</sup>/ft and the shoreline advanced 159 feet over the course of 25 years at 90<sup>th</sup> Street in Stone harbor. Considerable dune and beach growth are shown due to various beach replenishment cycles conducted over the last 15 years.

Photo on left taken November 4, 1991. View to the north.

Photo on right taken December 7, 2011. View to the north.



## 25-Year Coastal Changes at Site 113, 90<sup>th</sup> Street, Stone Harbor, Cape May Co.

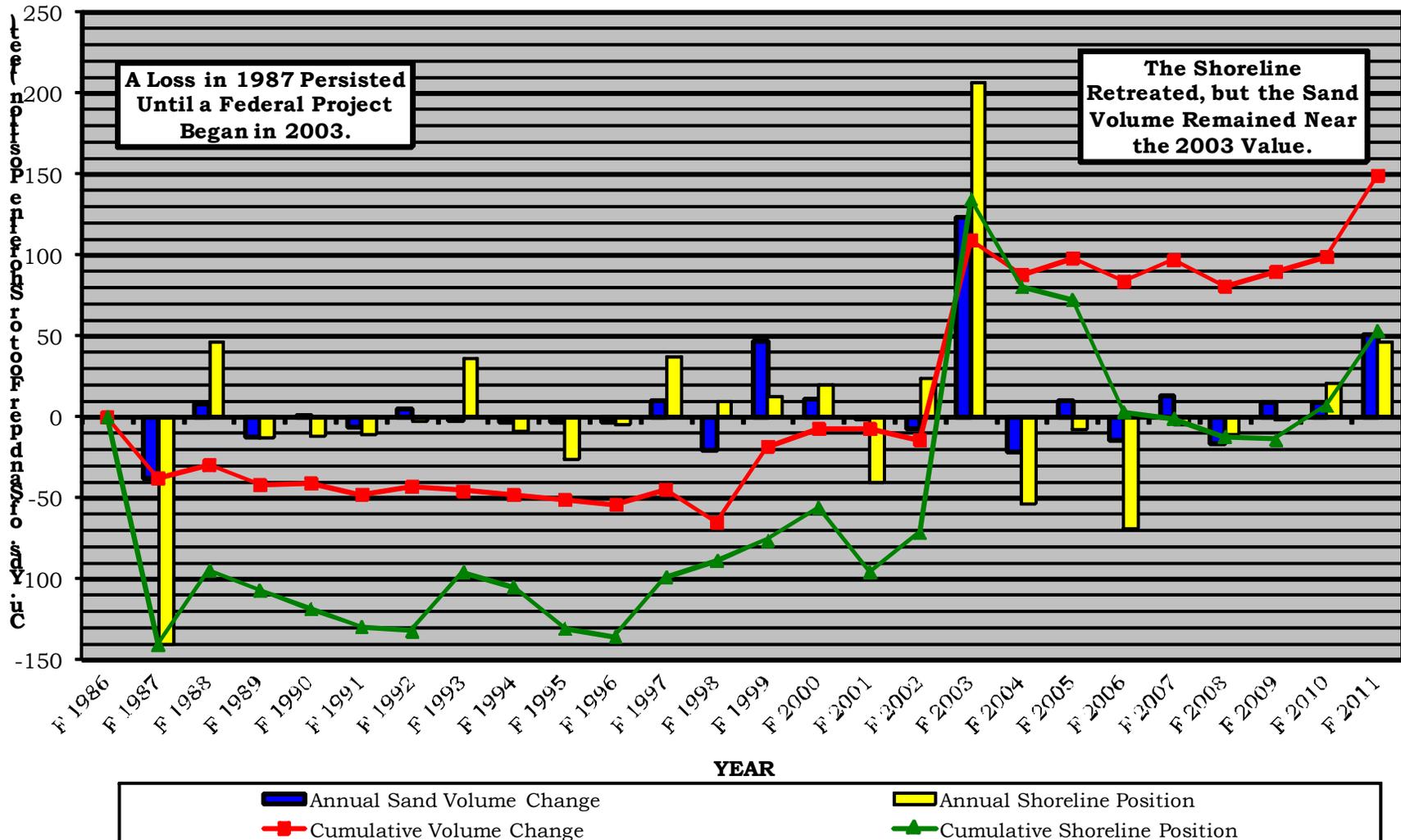


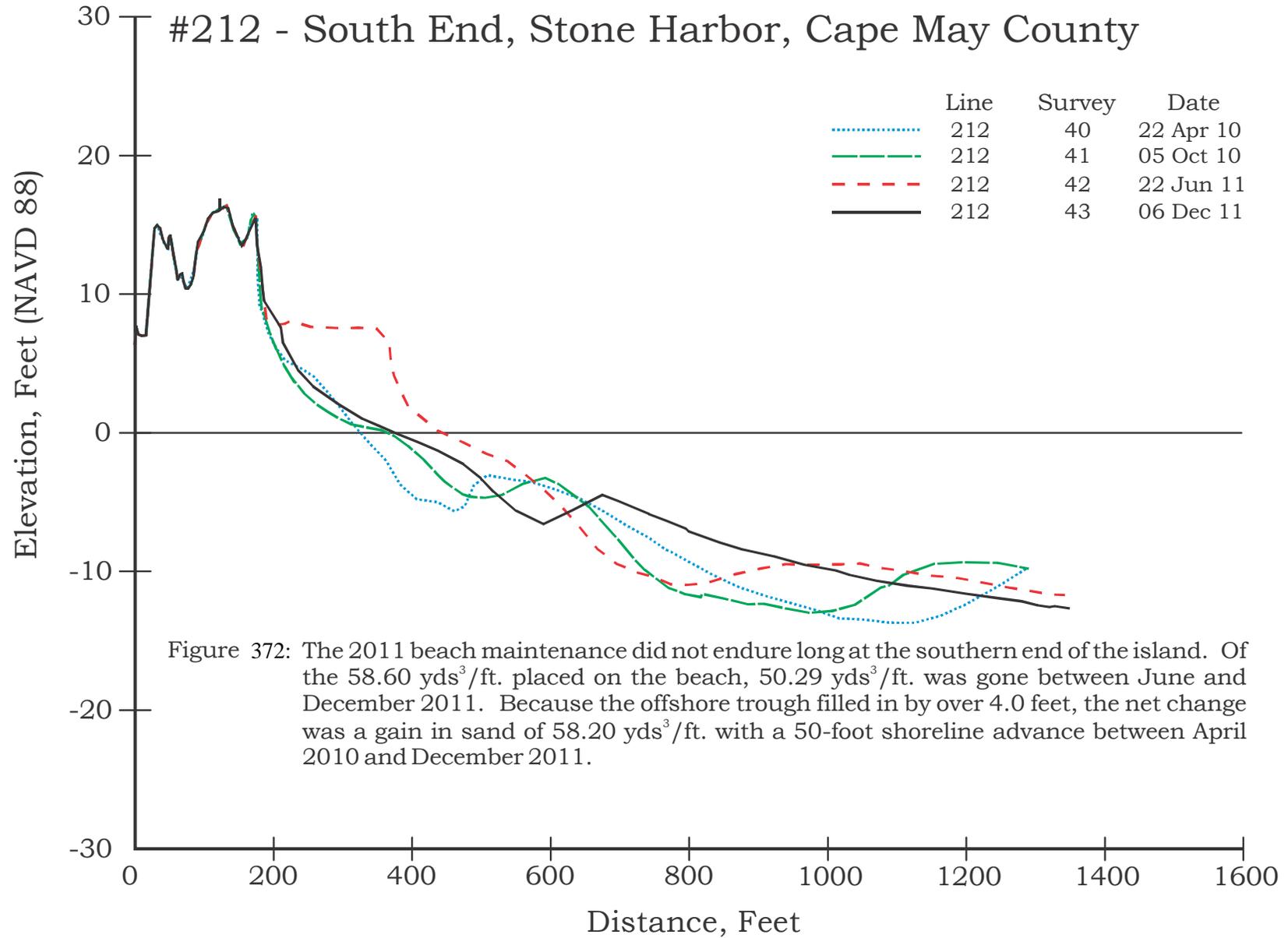
Figure 370. Stone Harbor also participated in the Federal Seven-Mile-Island Shore Protection project that went from late 2002 through into 2004. The shoreline retreated significantly, but the sand volume remained quite positive because much of it was deposited above the berm and into the dunes. The NJ State project supplied sand in 2010 and 2011

**Site 212, South End, Stone Harbor, NJ – December 6, 2011**



**Figure 371. View looking to the south of the beaches at the south end of Stone Harbor.**

# New Jersey Beach Profile Network



## SOUTH END, STONE HARBOR – SITE 212

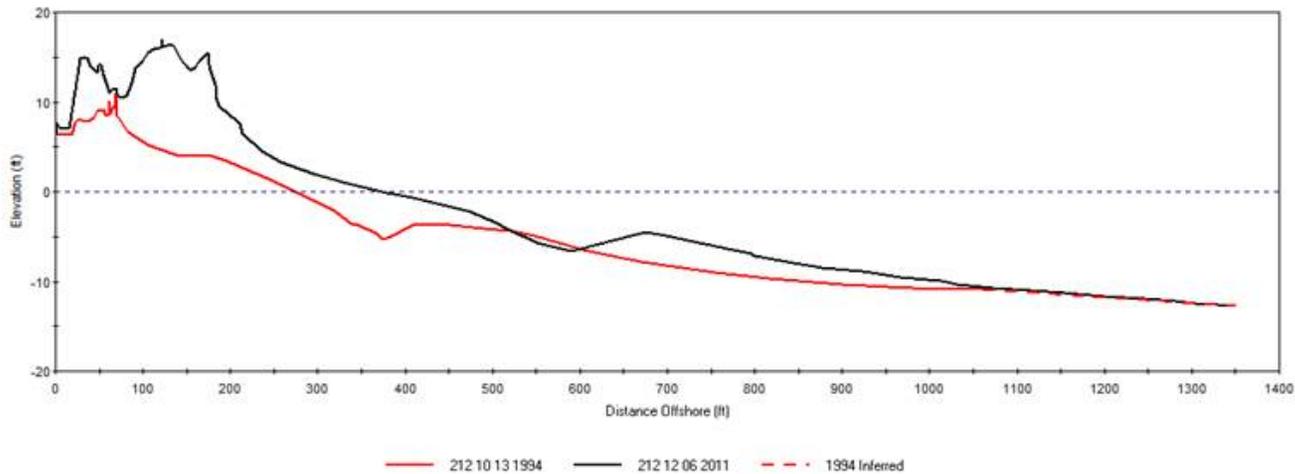


Figure 373: Numerous beach replenishment projects (largest in 2003) over the last decade has provided this profile site in Stone Harbor with significant primary and backdune growth. Currently, there exists an offshore bar that should build onto the existing beachface in the near future. Cumulative sand volume gains for the study period amounted to 118.26 yds<sup>3</sup>/ft. Photo on left taken October 13, 1994. View to the south. Photo on right taken December 6, 2011. View to the south.



**17-Year Coastal Changes at Site 212, South End, Stone Harbor, Cape May Co.**

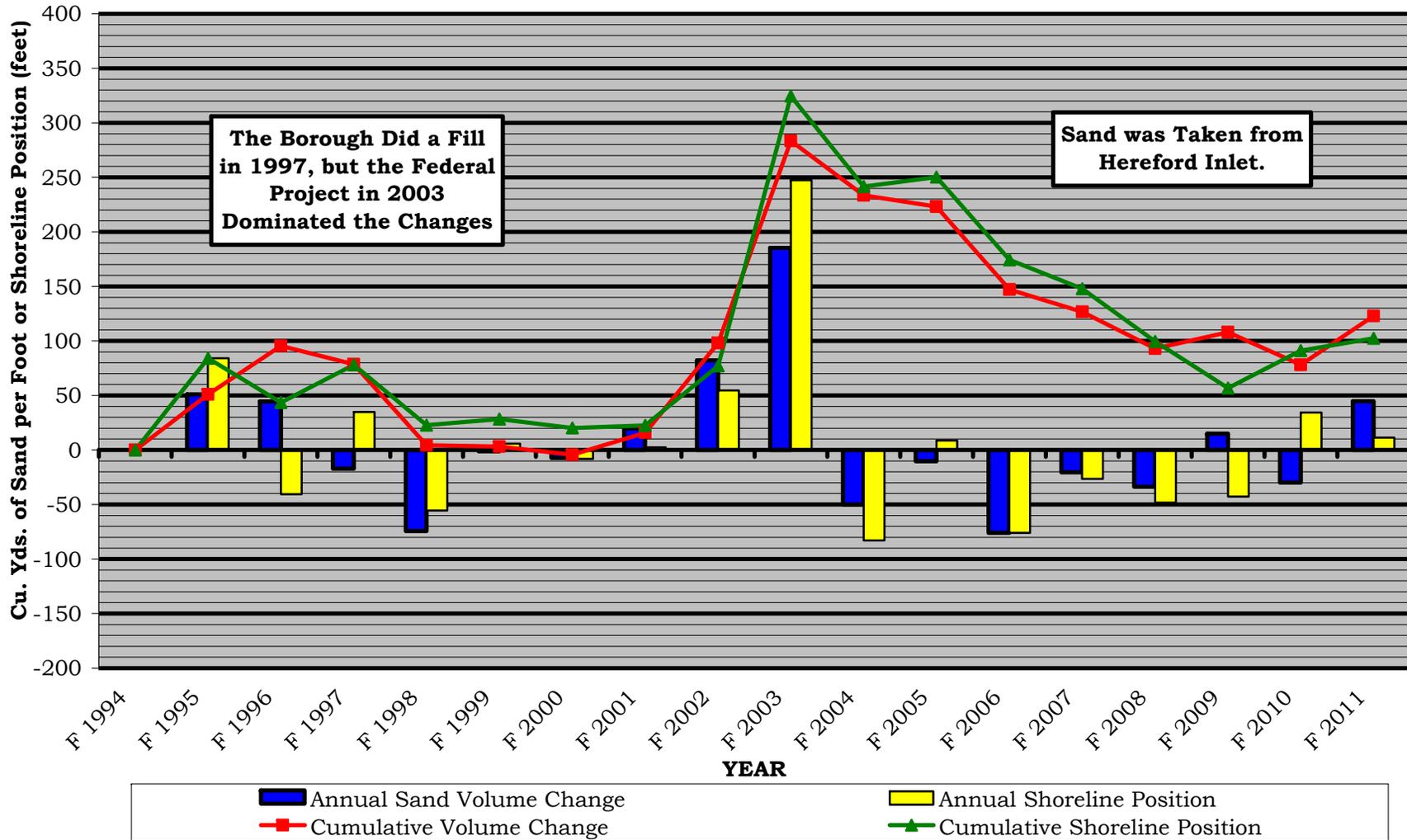


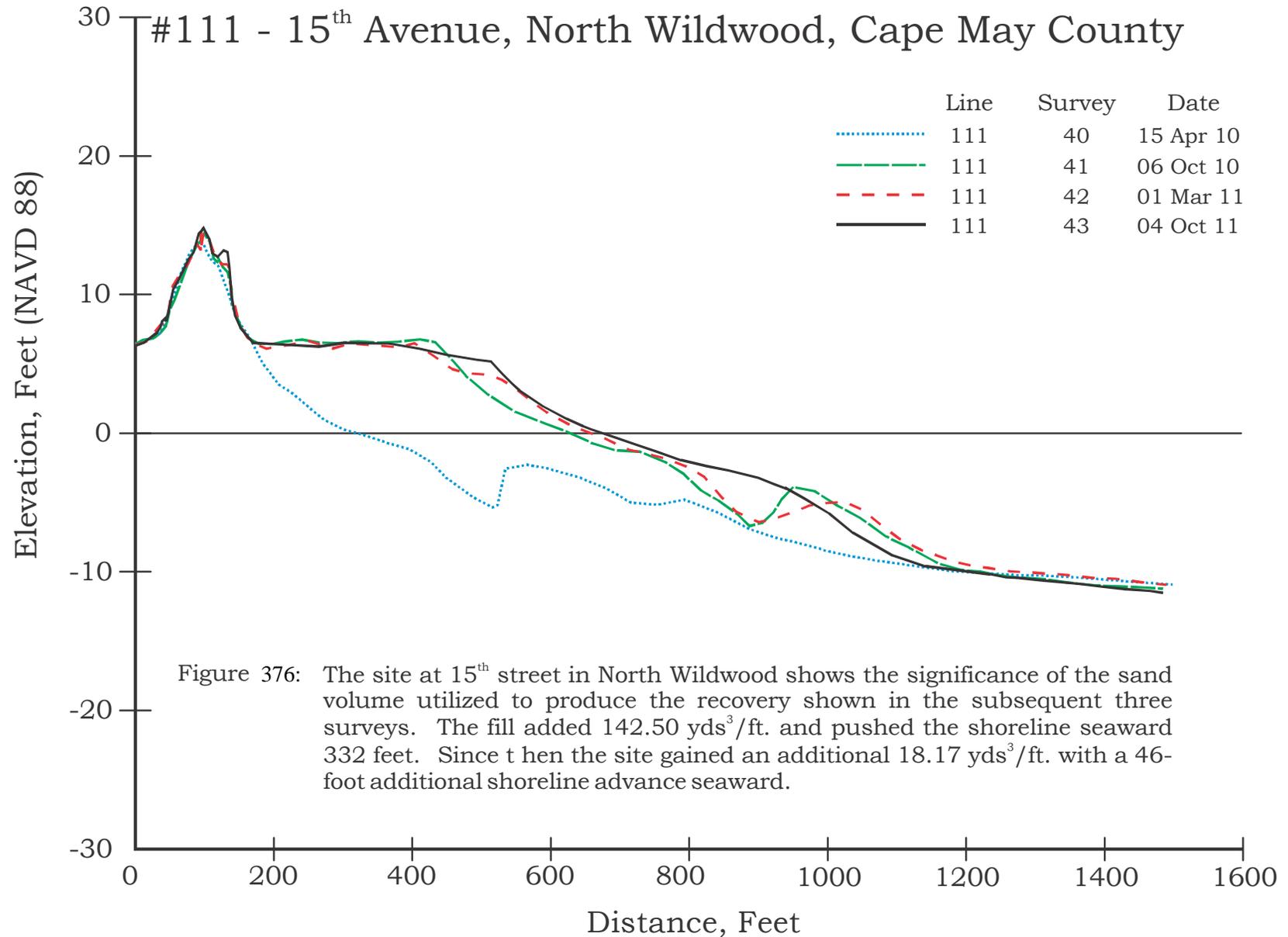
Figure 374. This is another of the inlet-associated cross sections added in 1994. However, this replaces a survey site initially established on the natural southern spit extending into Hereford Inlet. This spit disintegrated in 1990 leaving the entire spit as intertidal and shallow sub-tidal shoals. This location is at the southern end of the developed shoreline and in spite of the total recovery of the uninhabited southern spit, responds to beach work with erosion between efforts. The Federal project produced major changes that decayed over time. Recent recovery occurred in 2010 and 2011.

Site 111, 15<sup>th</sup> Ave., North Wildwood, NJ – March 1, 2011



Figure 375. Northeast view along the seaward dune slope in North Wildwood, NJ.

# New Jersey Beach Profile Network



## 15<sup>th</sup> AVENUE, NORTH WILDWOOD – SITE 111

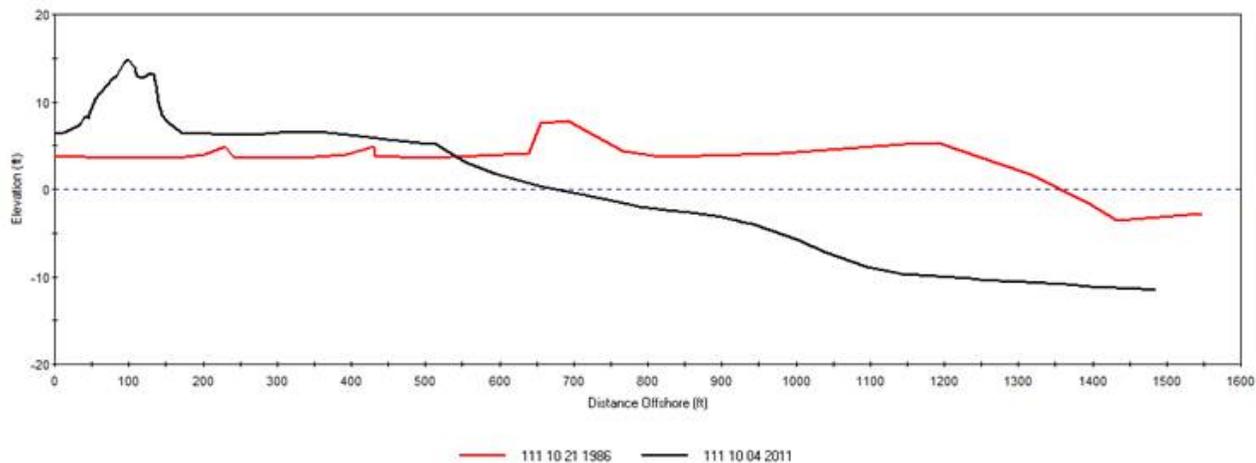


Figure 377: Erosional processes have been at work on the beachface as depicted in the profile above. Shoreline retreat of 681 feet has been recorded since 1986 as well as volume losses totaling -249.84 yds<sup>3</sup>/ft. The dune at this site has grown in width and elevation over the years and currently remains in tact.

Photo on left taken November 4, 1991. View to the south.

Photo on right taken October 4, 2011. View to the south.



### 25-Year Coastal Changes at Site 111, 15<sup>th</sup> Avenue, North Wildwood, Cape May Co.

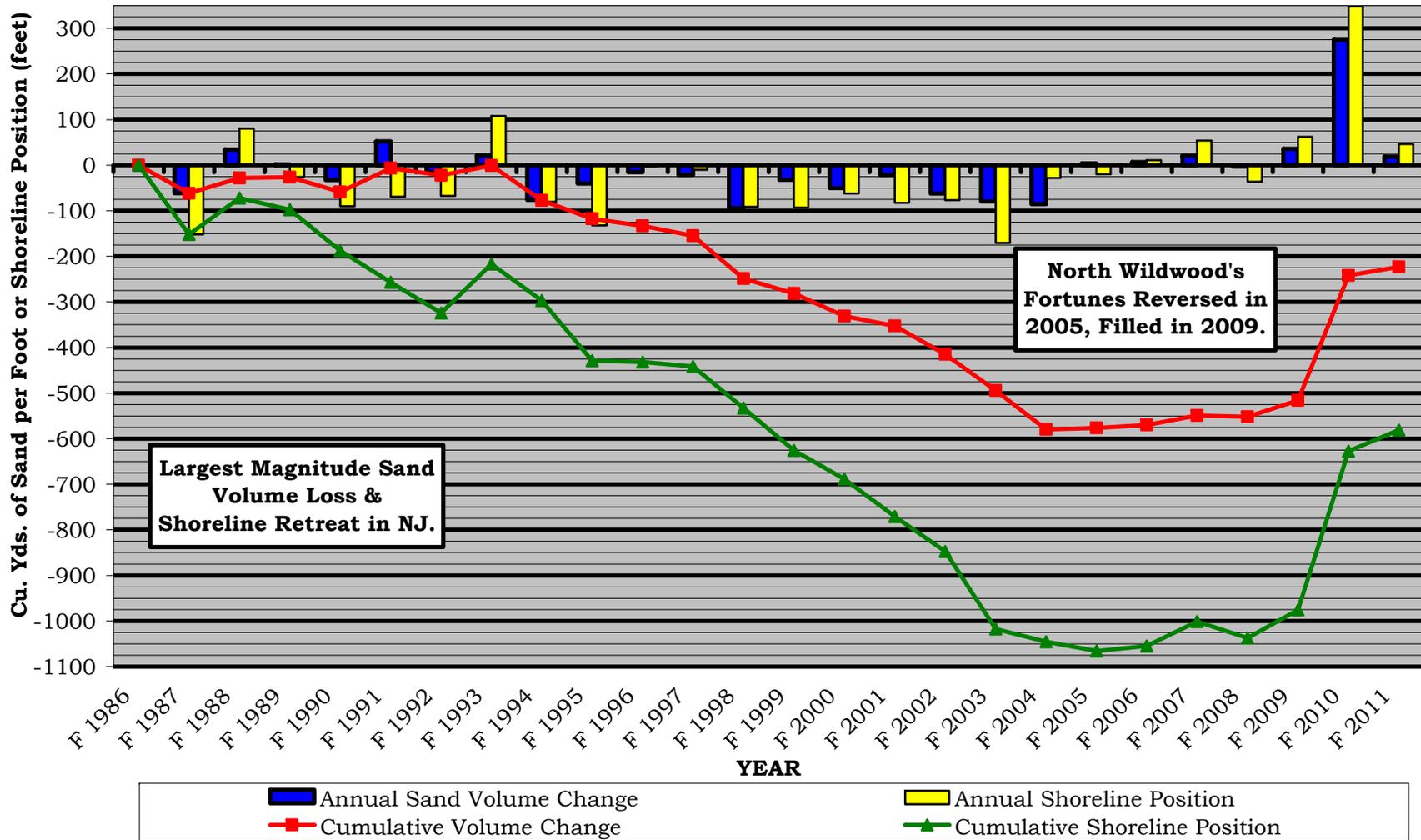


Figure 378. Long thought to be a zone of never-ending sand accretion, North Wildwood's beach retreated over 1,000 feet between 1993 and 2003. Stability at the eroded site continued for 5 years until a 2009 State/local project brought conditions partially back to those present in 1986. The sand volume shed both to the south and into Hereford Inlet as a spit attached to North Wildwood exceeds any beach nourishment amount by 200 yds<sup>3</sup>/ft.

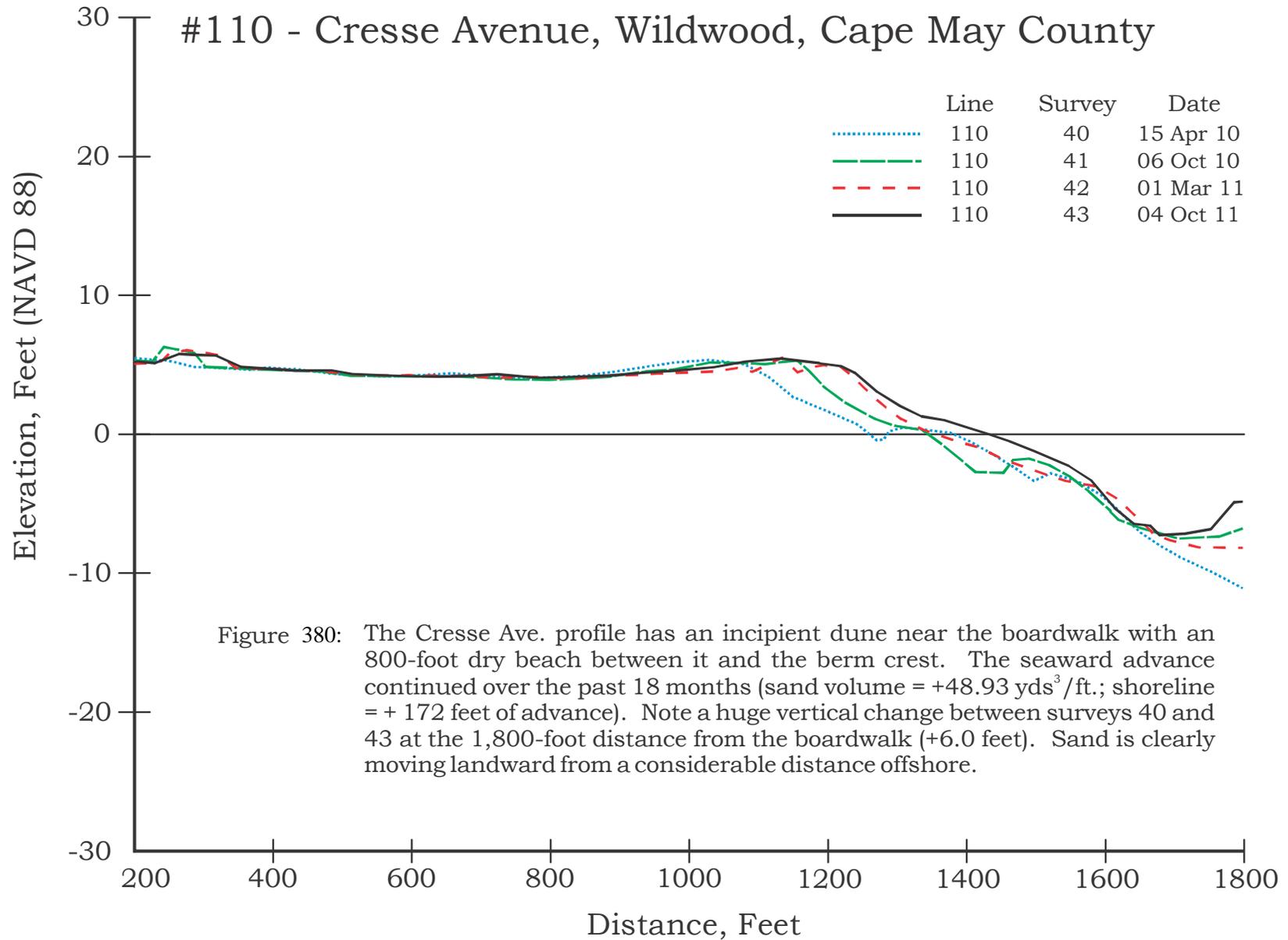
Site 110, Cresse Ave., Wildwood, NJ – March 1, 2011



Figure 379. North view of the recreational beach at Cresse Ave.

# New Jersey Beach Profile Network

#110 - Cresse Avenue, Wildwood, Cape May County



## CRESSE AVENUE, WILDWOOD – SITE 110

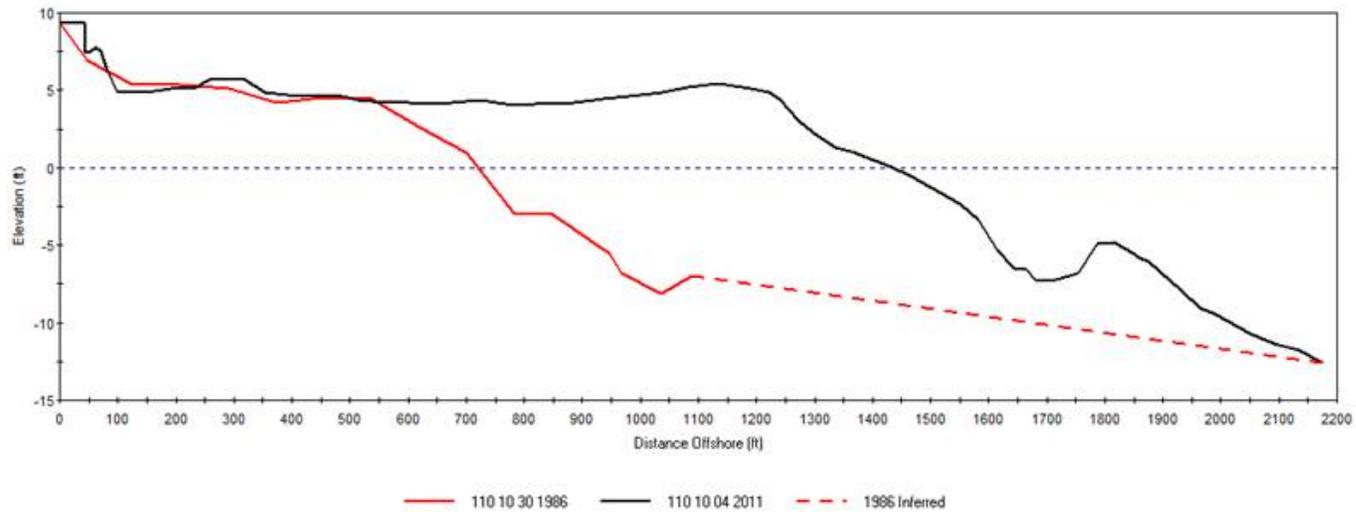
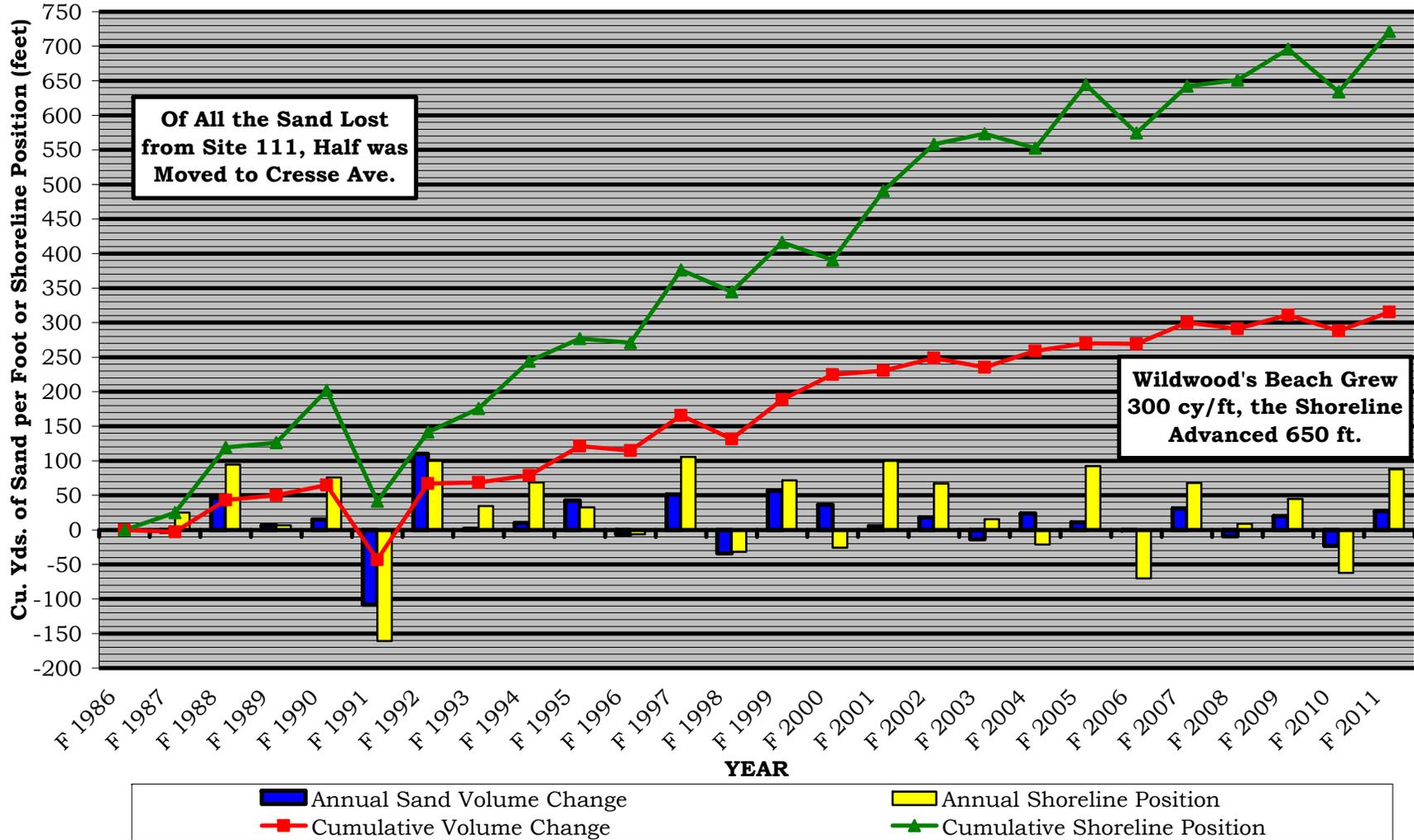


Figure 381: Cresse Avenue above displays tremendous recreational beach growth (shoreline advance of 711 feet) as material from the north has been transported on site. For the study period, cumulative volume gains of 141.54 yds<sup>3</sup>/ft were recorded. Photo on left taken November 4, 1991. View to the east. Photo on right taken October 4, 2011. View to the east.



**25-Year Coastal Changes at Site 110, Cresse Avenue, Wildwood, Cape May Co.**



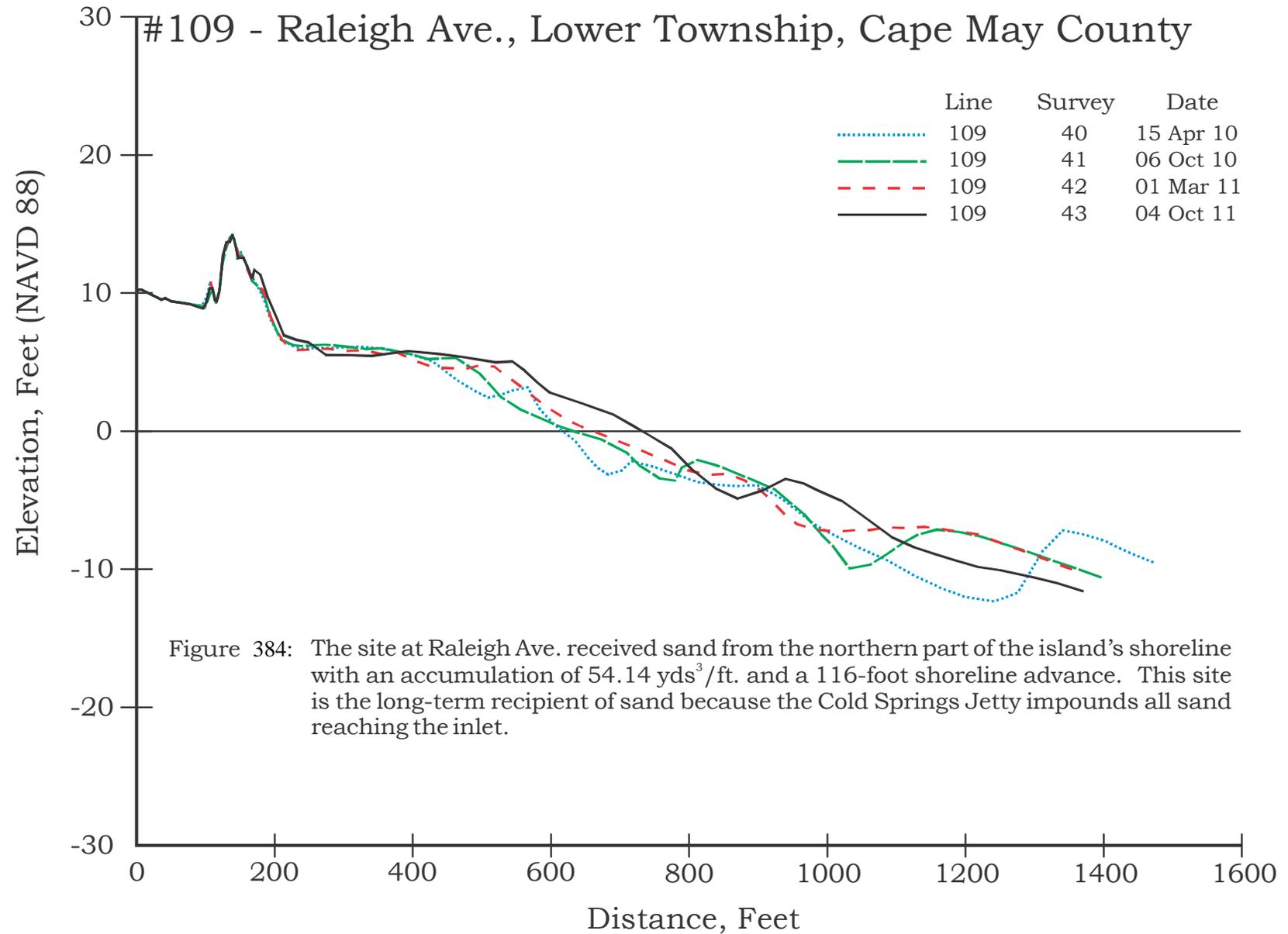
**Figure 382.** The loss documented in North Wildwood is largely to blame for the tremendous accretion seen in the City of Wildwood. Sand steadily moved into this region with one year's exception (1991) and has built up the shoreline by over 650 feet seaward with over 300 yds<sup>3</sup>/ft. in sand volume added.

**Site 109, Raleigh Ave., Lower Twp., NJ – March 1, 2011**



**Figure 383. View of the mid-berm beach looking northeast.**

# New Jersey Beach Profile Network



## RALEIGH AVENUE, LOWER TOWNSHIP – SITE 109

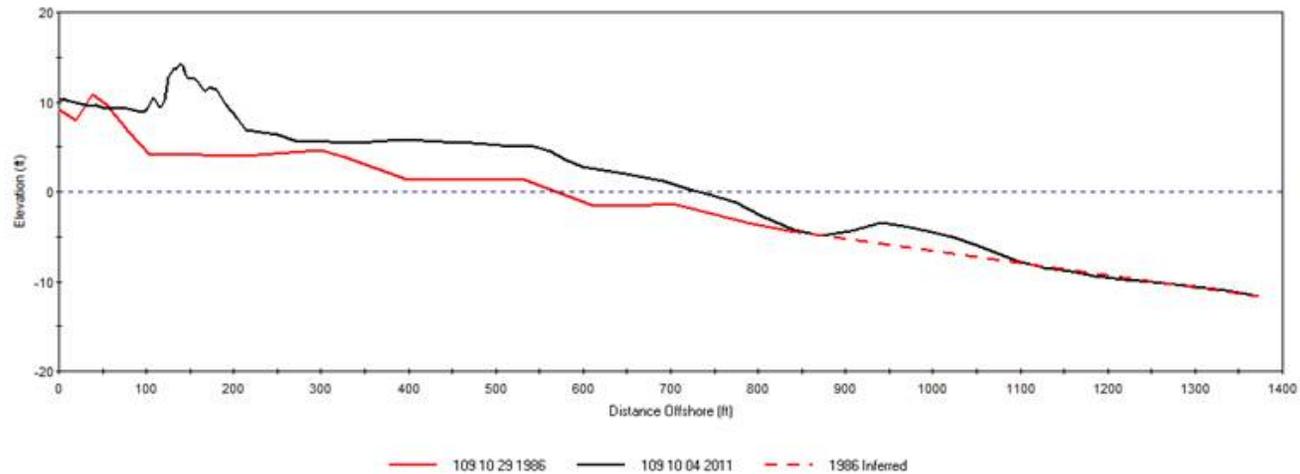
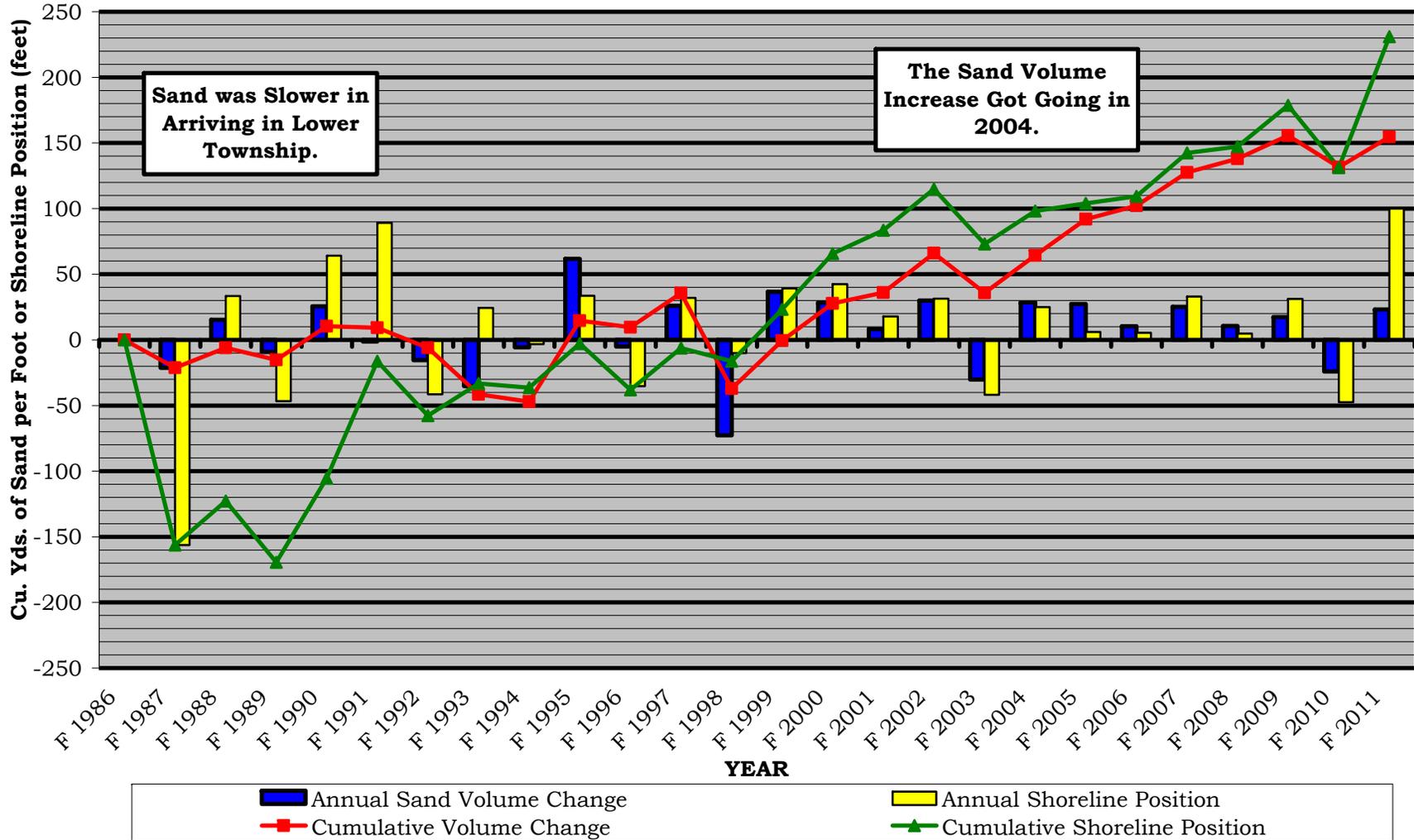


Figure 385: The profile at Raleigh Avenue has not received material directly from renourishment projects. However, sand from the Wildwood region, coupled with dune fence placement has contributed to significant dune and beach growth. The shoreline advanced 164 feet since 1986 and volume gains amounted to 99.97 yds<sup>3</sup>/ft. Photo on left taken November 4, 1991. View to the east. Photo on right taken October 4, 2011. View to the east.



**25-Year Coastal Changes at Site 109, Raleigh Avenue, Lower Township, Cape May Co.**



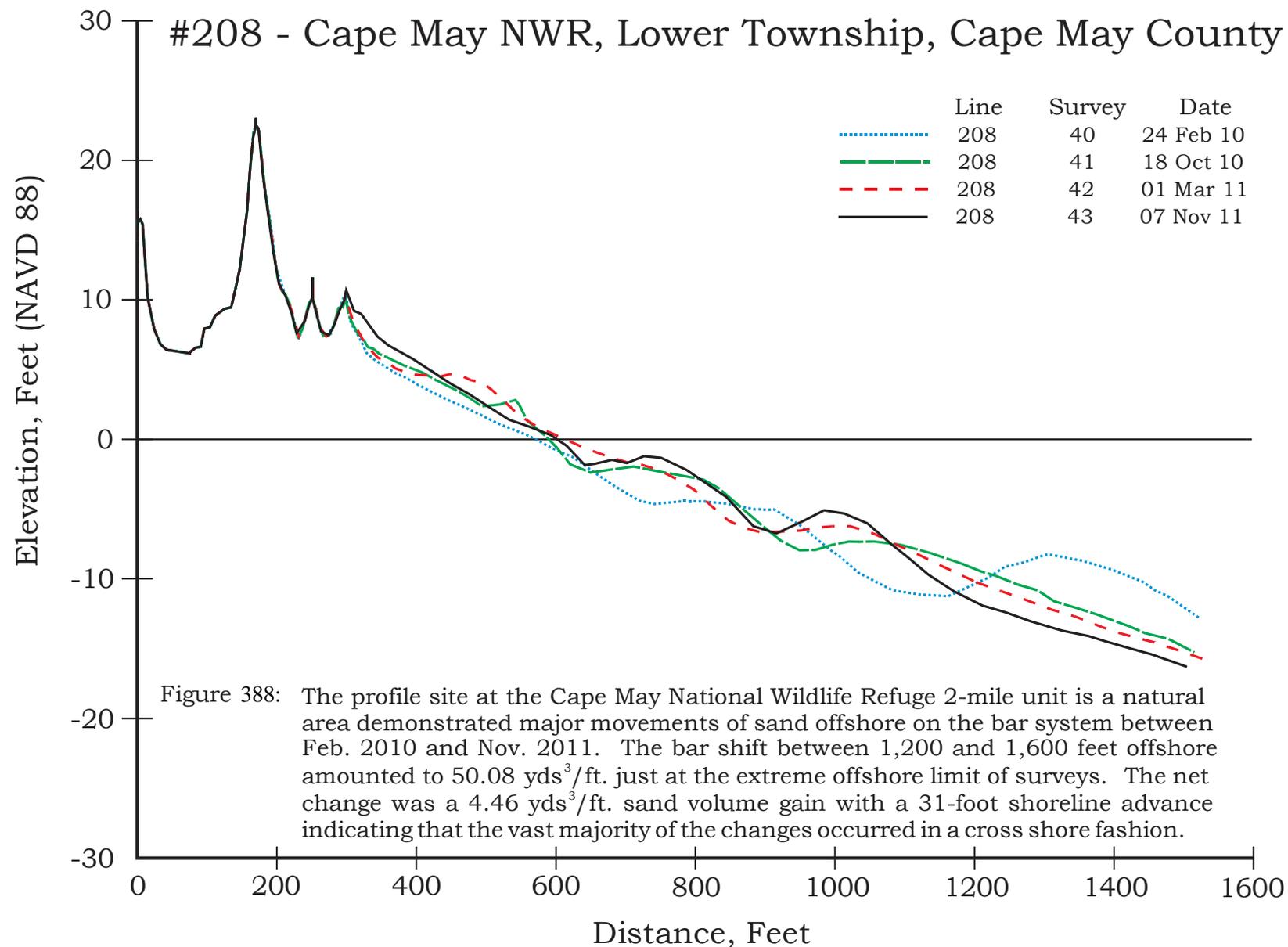
**Figure 386. Raleigh Avenue in Lower Township has accumulated significant sand volume with a 200-plus foot shoreline advance since 1998. This material is all part of the huge erosional problem afflicting North Wildwood since the 1990's. Here the Cold Springs Inlet jetty traps sand and has further widened the beach over the past 100 years.**

**Site 208, Cape May National Wildlife Refuge, Lower Twp., NJ – March 1, 2011**



**Figure 387. View of the unmaintained beach at the wildlife refuge looking northeast.**

# New Jersey Beach Profile Network



## CAPE MAY NATIONAL WILDLIFE REFUGE – SITE 208

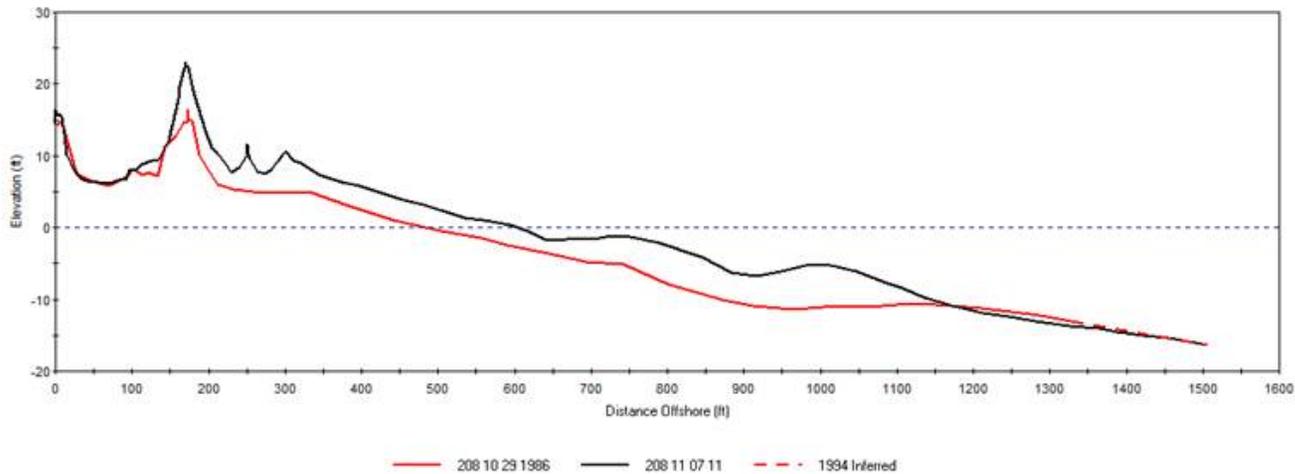
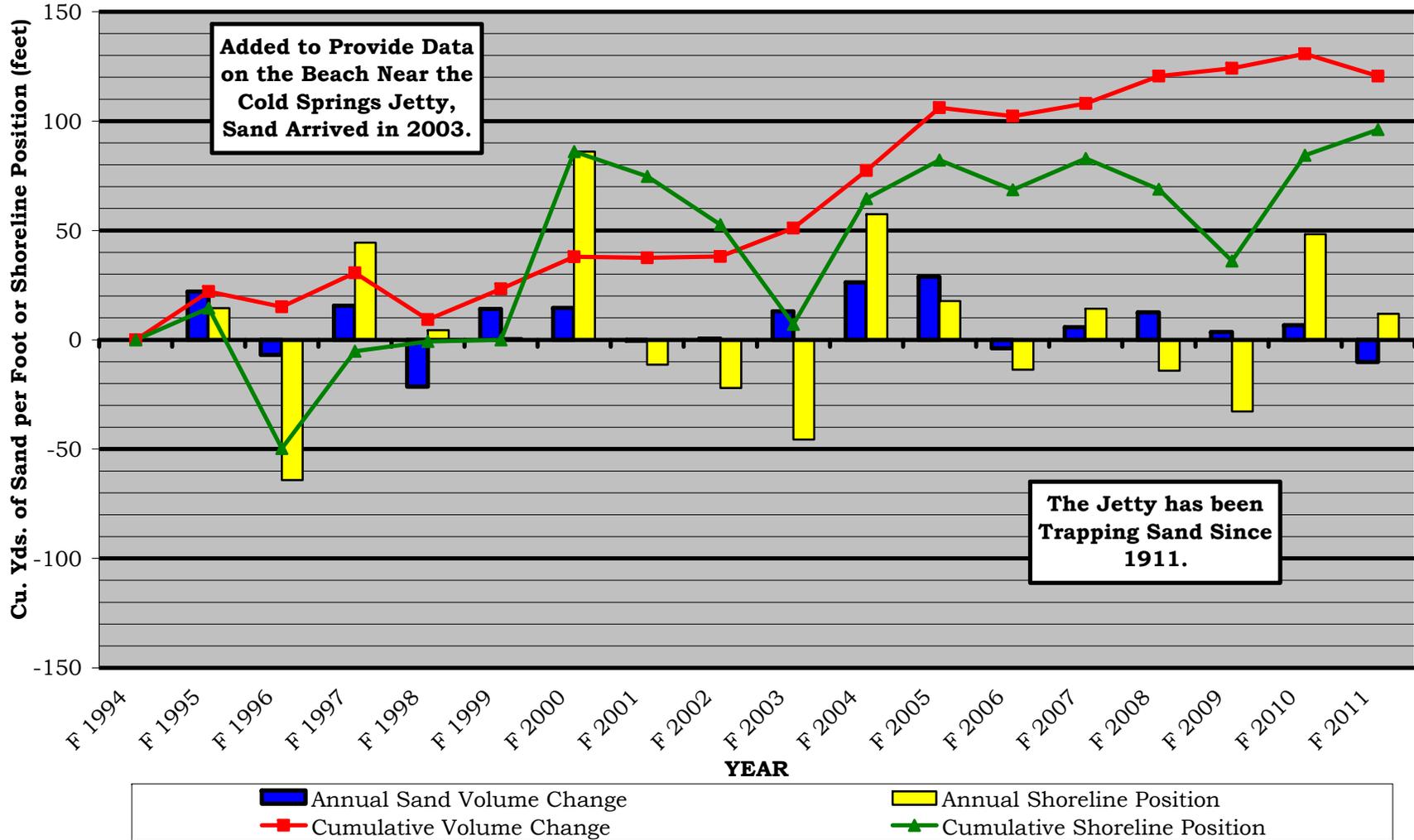


Figure 389: The profile above shows the primary dune elevation has increased over 7 feet as well as widened significantly since 1986. Cumulative volume gains of 137.79 yds<sup>3</sup>/ft were recorded as the beachface and nearshore portions of this profile were also enhanced. Photo on left taken October 13, 1994. View to the east. Photo on right taken November 7, 2011. View to the southeast.



**17-Year Coastal Changes at Site 208, Cape May National Wildlife Refuge, Lower Township, Cape May Co.**



**Figure 390.** Added in 1994 to cover the natural area, then under US Coast Guard authority, sand has steadily added to the beach in spite of large excursions in the shoreline position. Cold Springs Inlet jetties were built by the US Navy contract between 1908 and 1911 to extraordinary lengths and have been trapping sand for a century enhancing the Wildwood shoreline by keeping it confined up-drift of the north jetty.

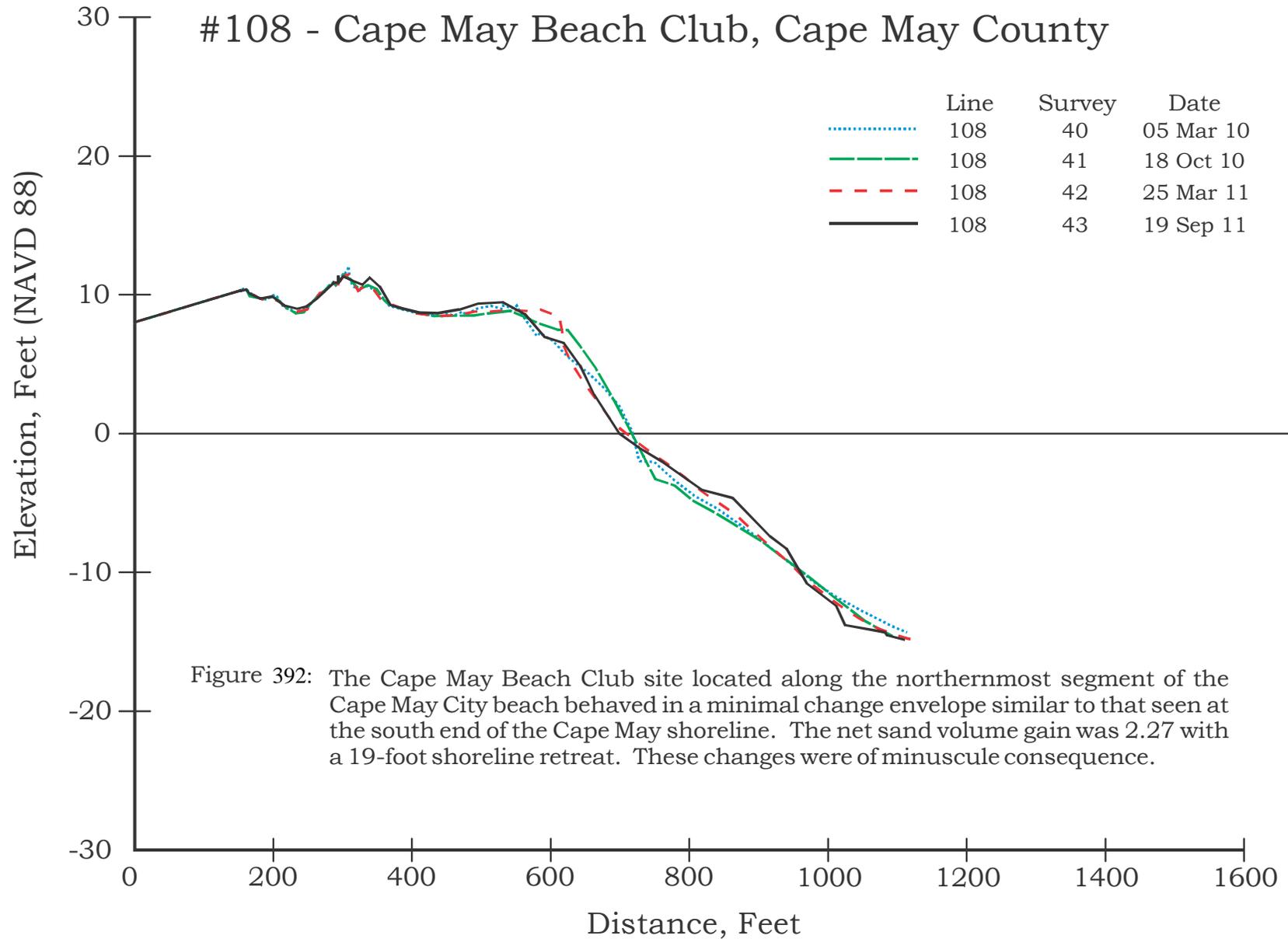
**Site 108, Cape May Beach Club, Cape May City, NJ – March 25, 2011**



**Figure 391. Western view of the berm along the beach club.**

# New Jersey Beach Profile Network

## #108 - Cape May Beach Club, Cape May County



## CAPE MAY BEACH CLUB – SITE 108

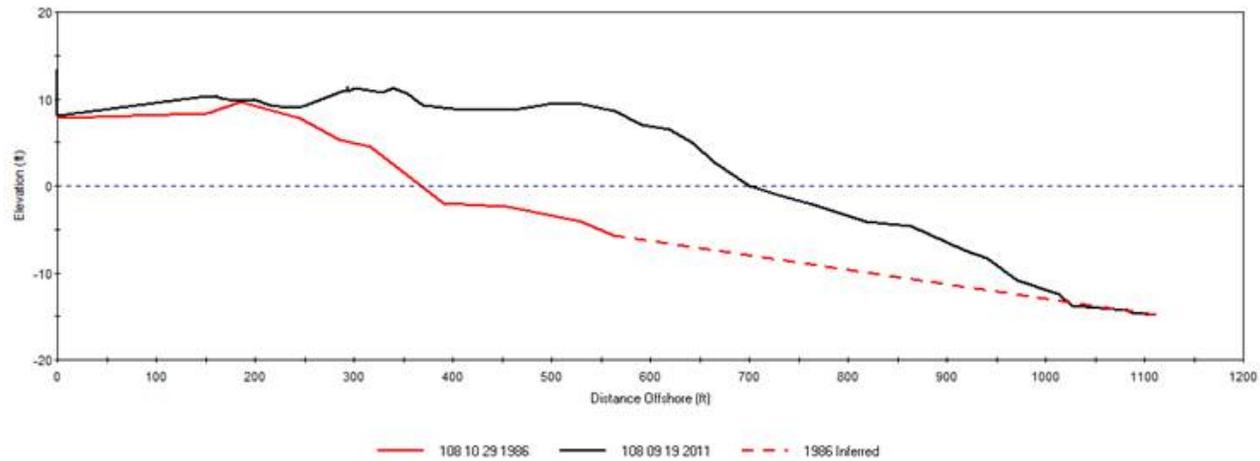


Figure 393: The profile above displays elevation and position increases in the backdune, recreational beach, beachface, nearshore, and offshore. This profile site also received material from many beachfill projects over the years, advancing the shoreline 332 feet, and recording 121.43 yds<sup>3</sup>/ft of sand gain.  
Photo taken November 5, 1991. View to the southeast.  
Photo taken September 19, 2011. View to the east.



### 25-Year Coastal Changes at Site 108, Cape May Beach Club, Cape May City, Cape May Co.

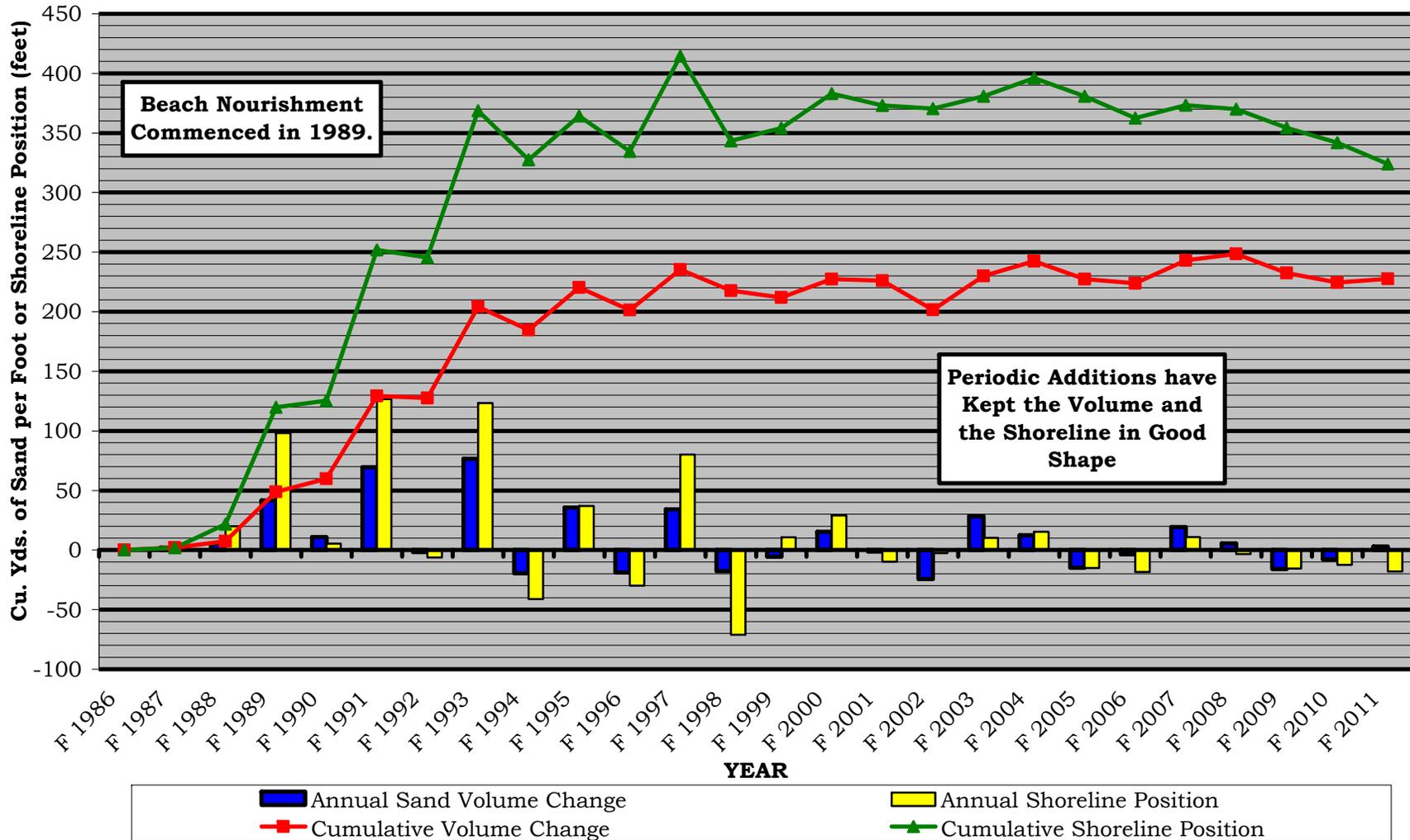


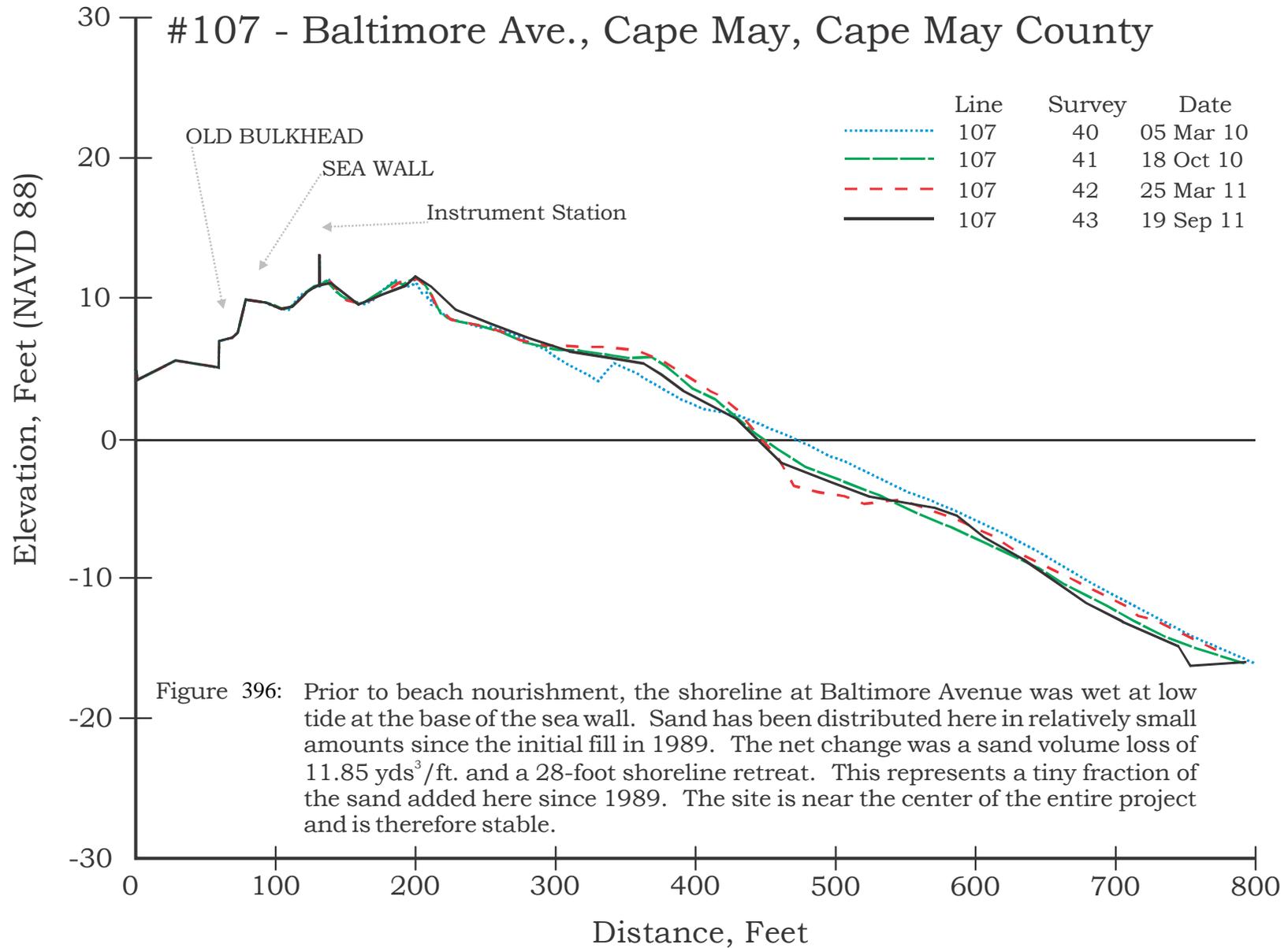
Figure 394. Since the beach north of this site, back to the Cold Springs Inlet jetties is under military control, access to a site closer to the inlet was not allowed. Work was underway in 1986 to solve a long-term, serious erosion problem attributed to the jetty construction and restoration began in 1989. The worst erosion had been within the US Coast Guard site, but this location had seen loss prior to the NJBPN program. The site is maintained in dynamic equilibrium with periodic maintenance nourishments as the last 16 years of record demonstrate.

**Site 107, Baltimore Ave., Cape May City, NJ – March 25, 2011**



**Figure 395. View of the recreational beach looking east along Cape May City beach.**

# New Jersey Beach Profile Network



## BALTIMORE AVENUE, CAPE MAY CITY – SITE 107

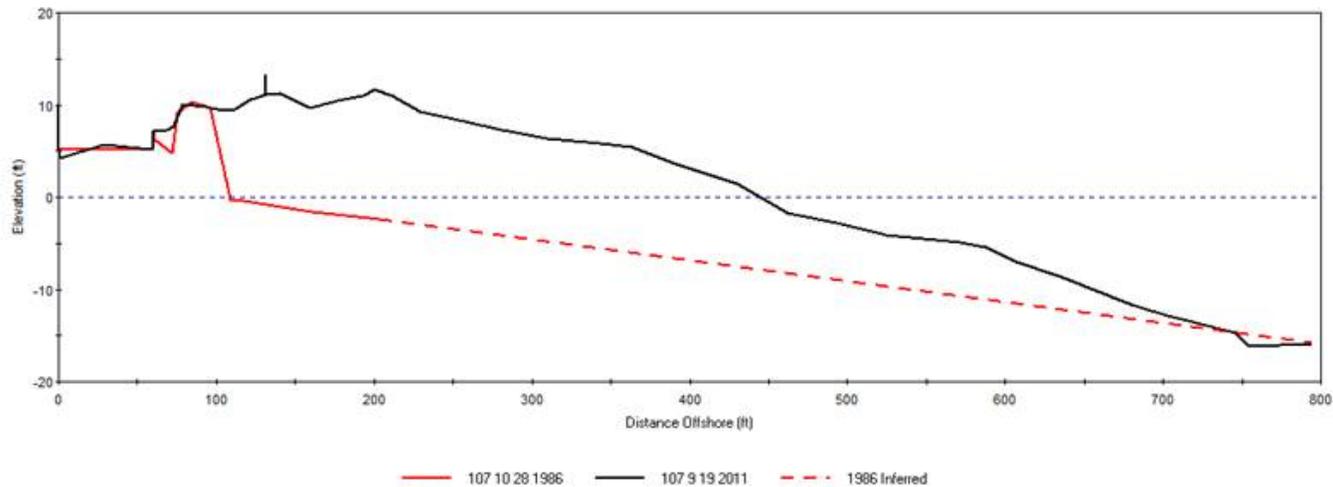
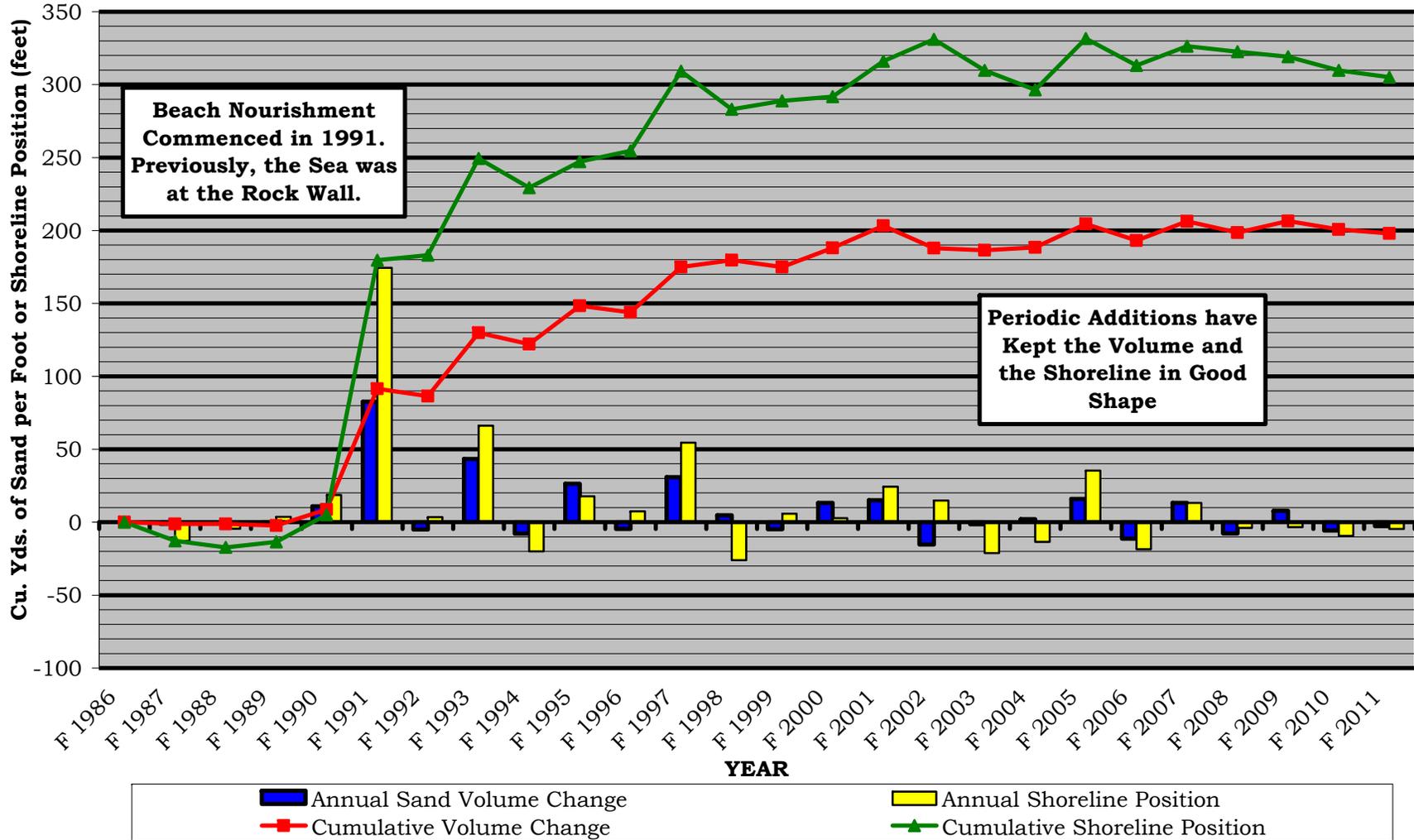


Figure 397: The site of multiple beach replenishment projects over the last two decades, site 107 above shows significant position and elevation increases throughout virtually the entire profile. Over the 25 years of study, the shoreline advanced 37 feet and cumulative volume gains of 45.14 yds<sup>3</sup>/ft were recorded.  
Photo on left taken October 4, 1990. View to the south.  
Photo on right taken September 19, 2011. View to the south.



**25-Year Coastal Changes at Site 107, Baltimore Avenue, Cape May City, Cape May Co.**



**Figure 398. Baltimore Avenue had no beach in 1986. The rock revetment was the only protection for the coast. Beach restoration arrived in 1990 and 1991, with minimal maintenance required here over the next 20 years. Most new sand was placed either to the northeast or down-drift to the southwest.**

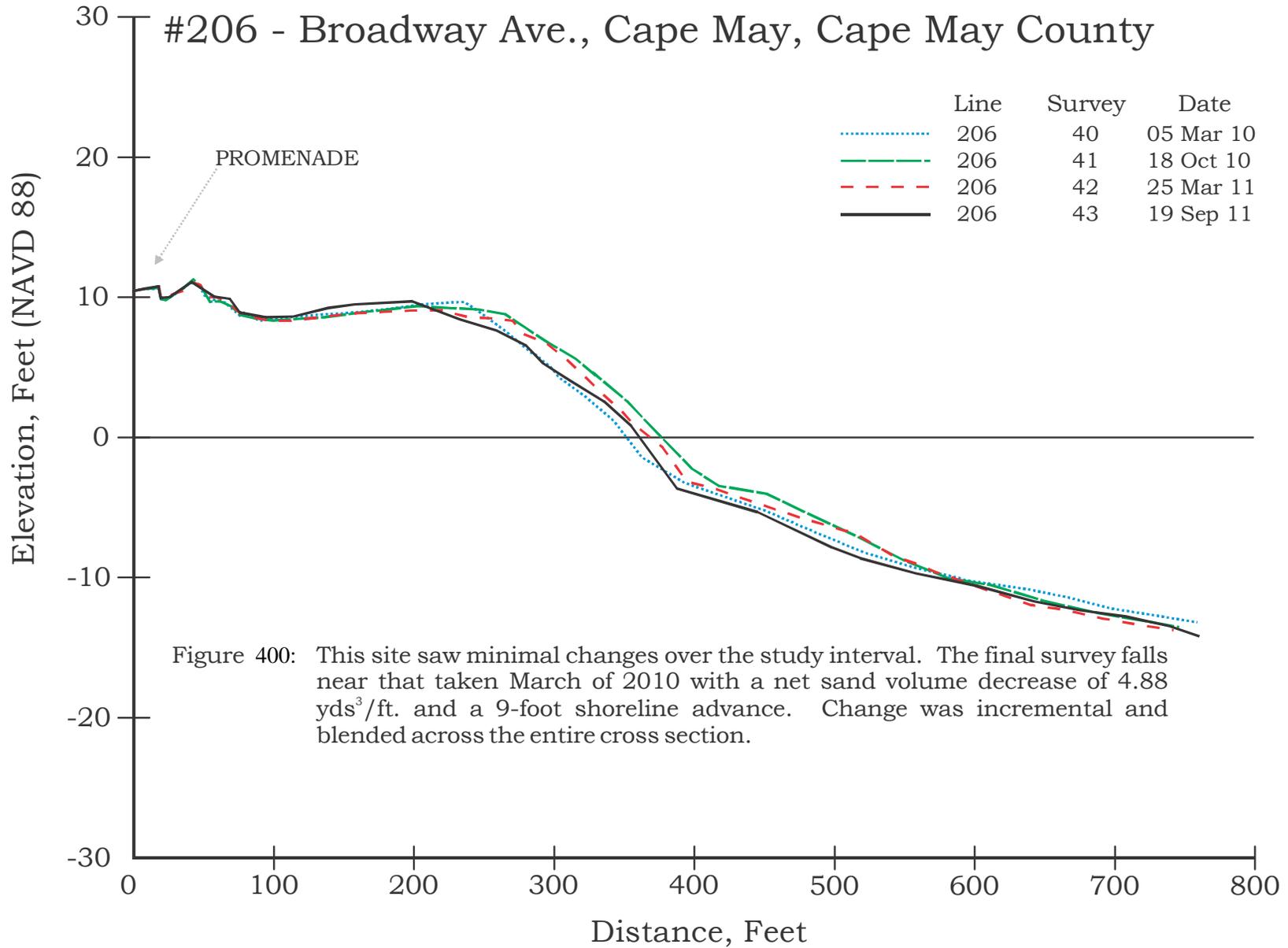
Site 206, Broadway Ave., Cape May City, NJ – March 25, 2011



Figure 399. View of the recreational beach looking east along the Cape May City beach.

# New Jersey Beach Profile Network

#206 - Broadway Ave., Cape May, Cape May County



## BROADWAY AVENUE, CAPE MAY CITY – SITE 206

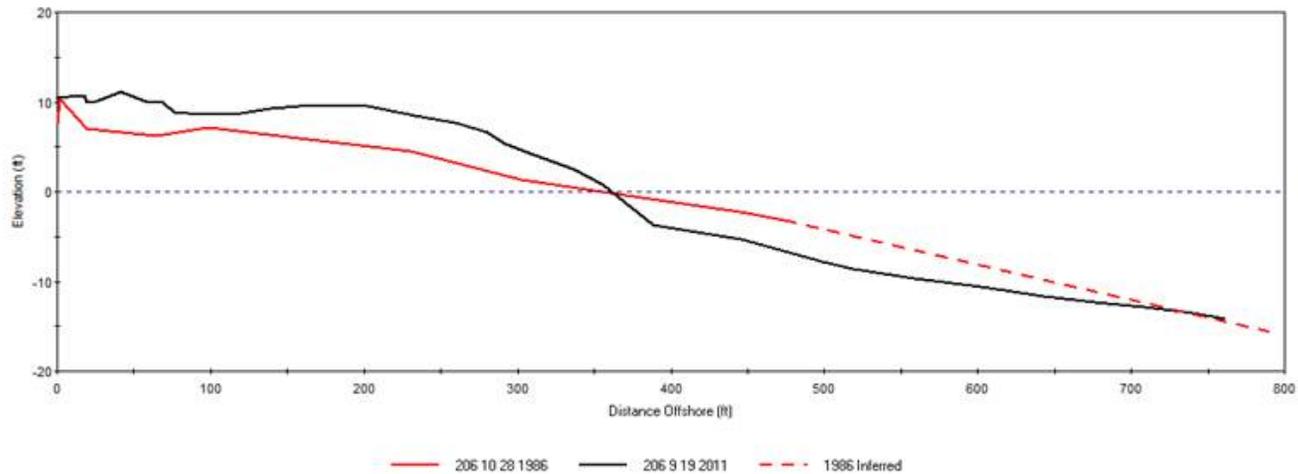
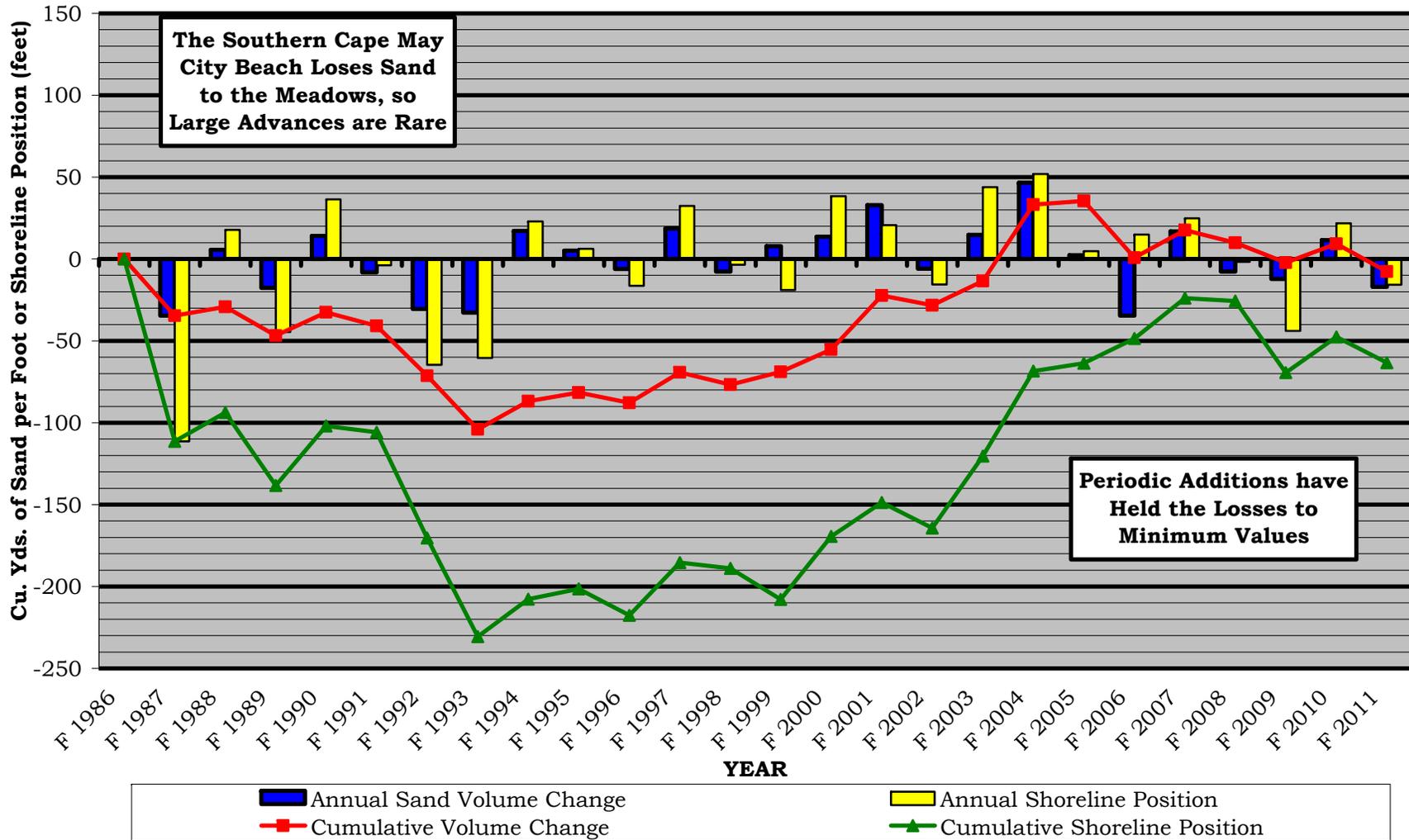


Figure 401: . The profile above displays a shifting of offshore material onto the beachface and recreational beach. This site is the benefactor of multiple beach replenishment projects that began in the early 1990's. A gain of 31.77 yds<sup>3</sup>/ft of sand was recorded for the time period. Photo on left. View to the east.  
Photo on right taken September 19, 2011. View to the west.



### 25-Year Coastal Changes at Site 206, Broadway Avenue, Cape May City, Cape May Co.



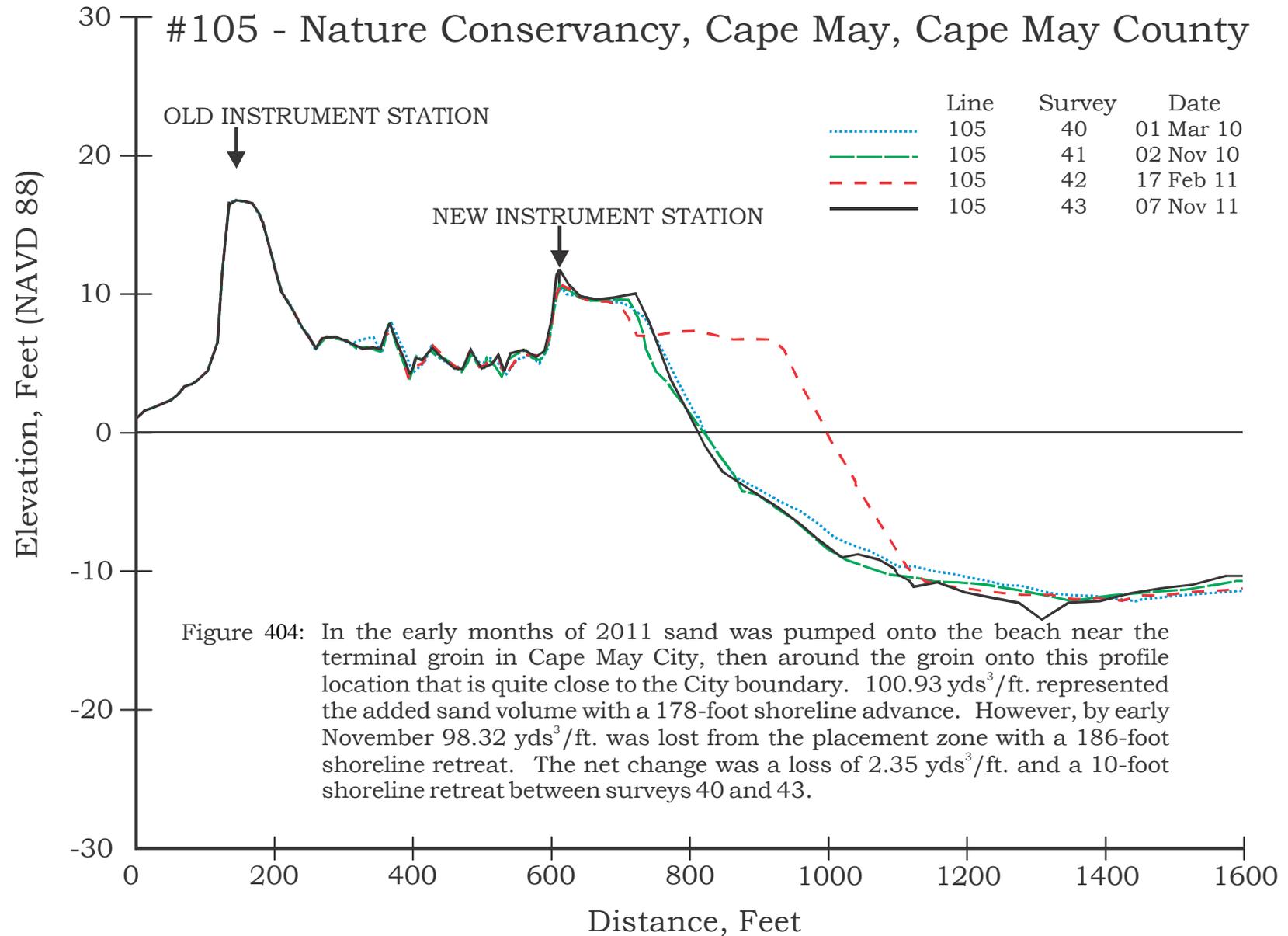
**Figure 402.** Broadway Avenue lies in the zone where sand moves rapidly into the natural area beyond the final rock groin. In spite of periodic maintenance, the site shows a net negative shoreline position and a sand volume nearly the same as present in 1986. Beach nourishment has saved this busy resort area from serious erosion problems.

Site 105, Nature Conservancy, Cape May, NJ – February 17, 2011



Figure 403. View of the mid-berm beach looking east.

# New Jersey Beach Profile Network



## NATURE CONSERVANCY, CAPE MAY – SITE 105

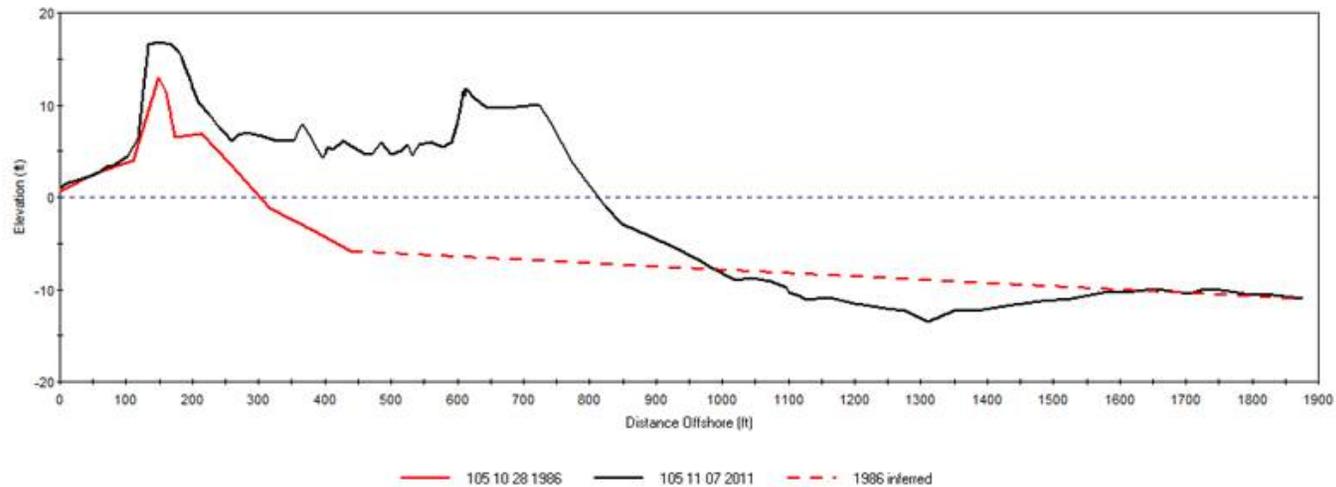
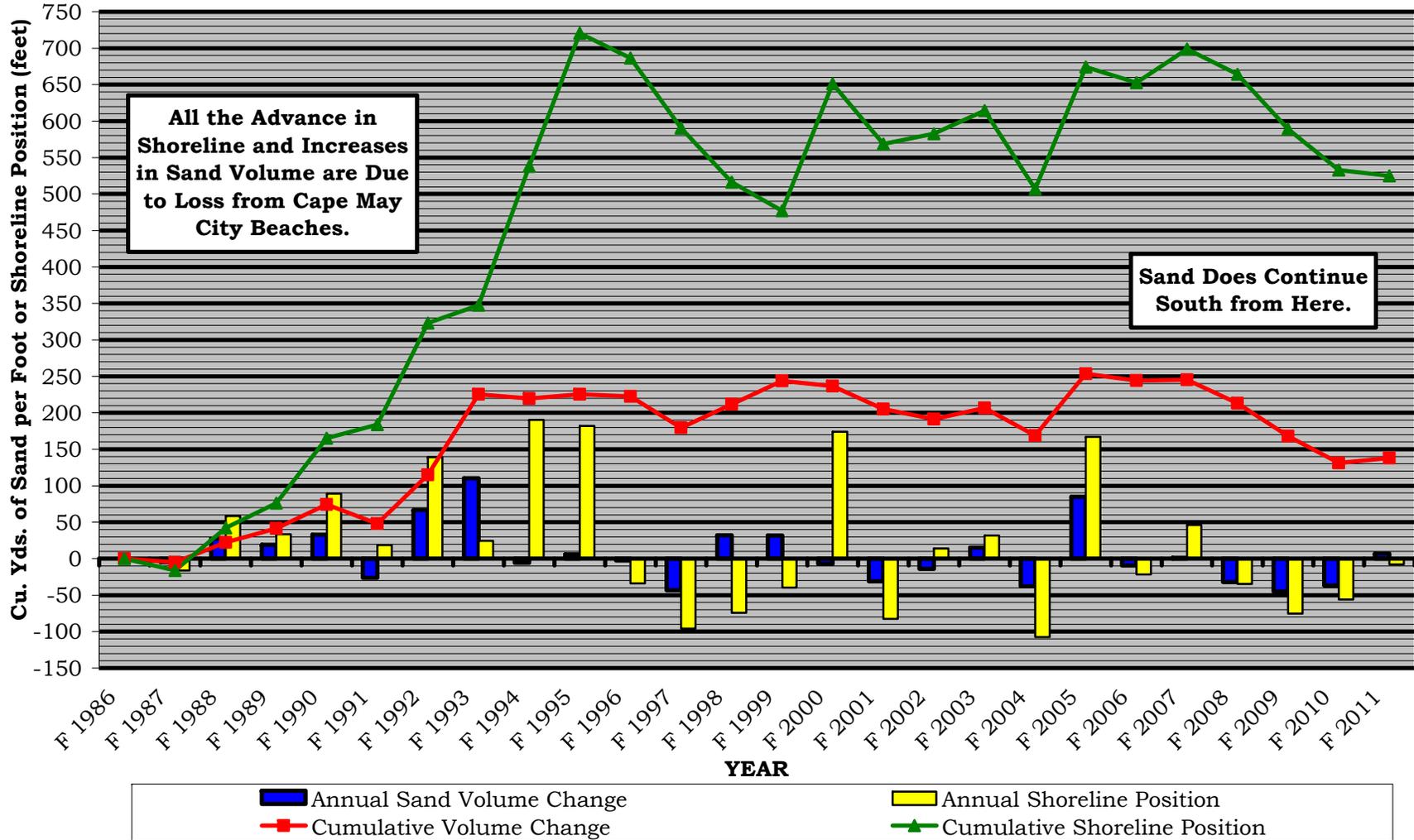


Figure 405: The profile above clearly displays the significant dune growth, in both position and elevation, that has occurred at the nature conservancy. Littoral currents are responsible for transporting material supplied by multiple beachfill events in the area. The shoreline advanced 512 feet and sand volume gains amounted to 81.24 yds<sup>3</sup>/ft over the 25 years of study. Photo on left. View to the west. Photo on right taken November 7, 2011. View to the west.



## 25-Year Coastal Changes at Site 105, Nature Conservancy, Cape May Co.



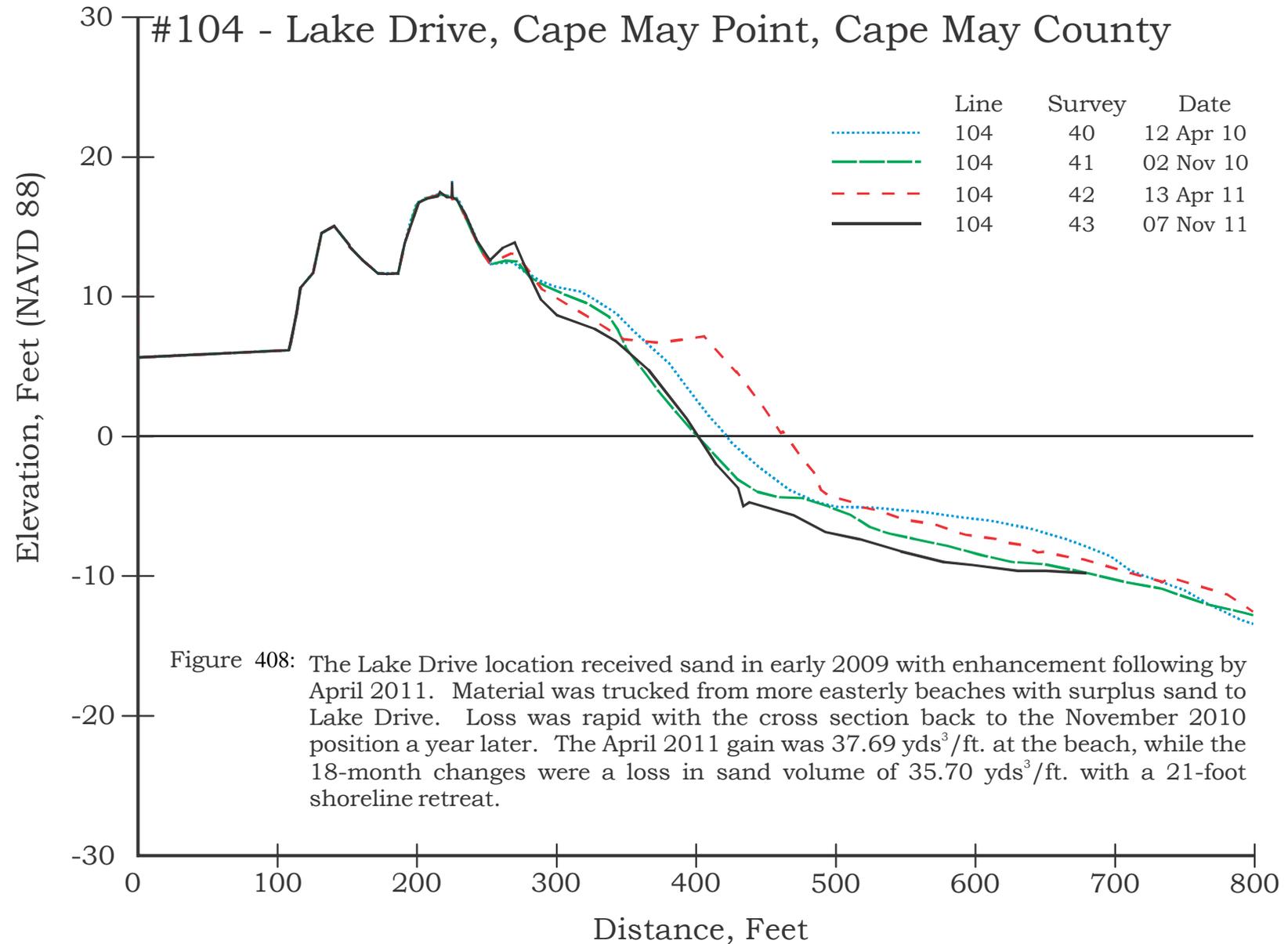
**Figure 406.** This natural shoreline was selected as an environmental restoration site by the ACOE, but the vast majority of the sand deposited since 1989 came from shedding of material from Cape May City beaches. The shoreline advanced as much as 725 feet seaward and remains over 500 feet seaward of the 1986 position. The ACOE restoration took place in 2005 with direct placement along this beach into Cape May Point.

**Site 104, Lake Drive, Cape May Point, NJ – April 13, 2011**



**Figure 407. View of the seaward dune toe looking east along Cape May Point beach.**

# New Jersey Beach Profile Network



## LAKE DRIVE, CAPE MAY POINT – SITE 104

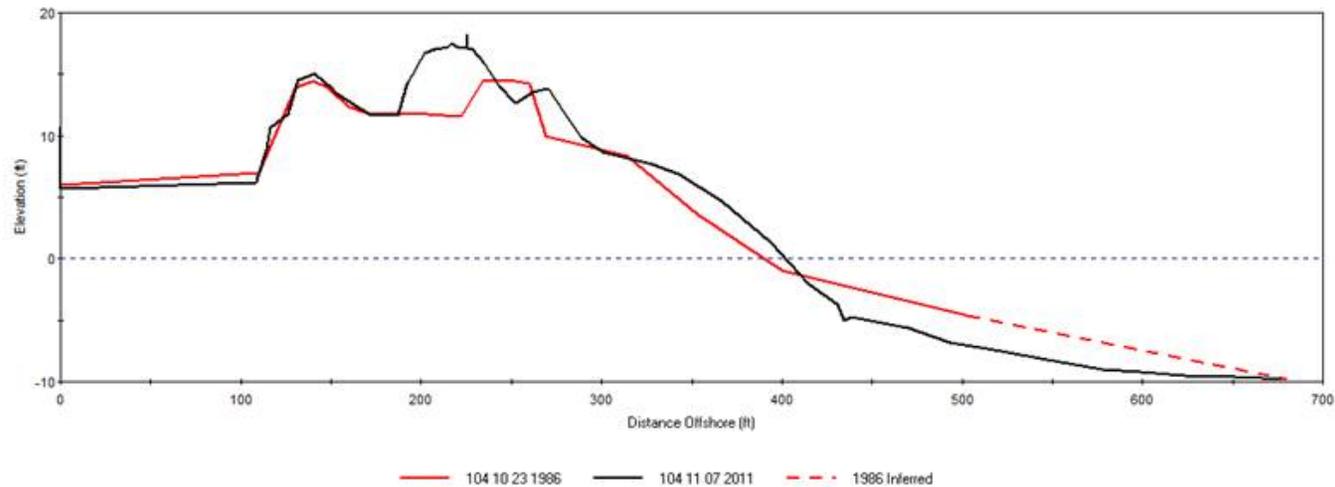


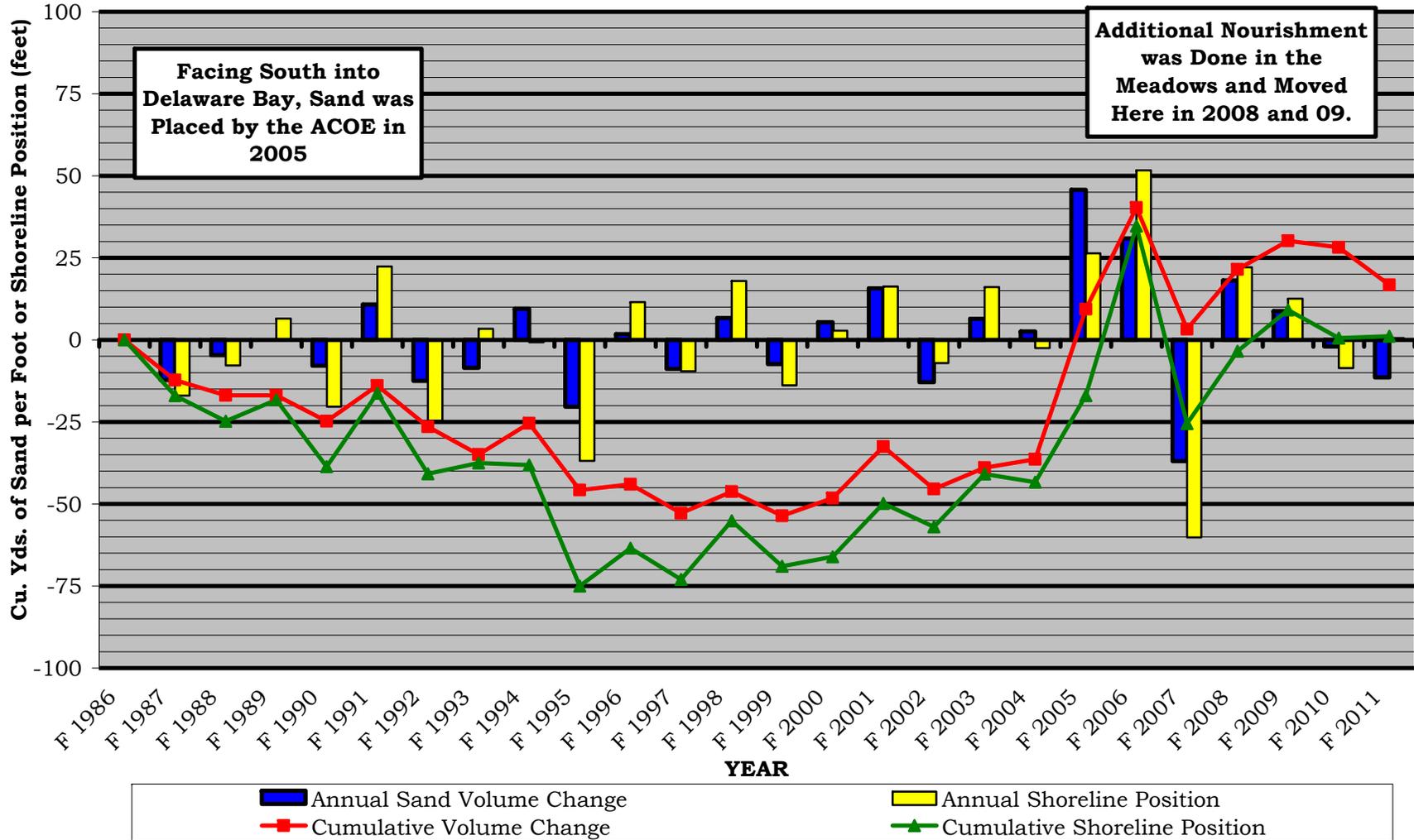
Figure 409: The Lake Drive profile above clearly shows the dune reconfiguration that took place in 2005. Material from adjacent cells has been moved here by mechanical devices since the projects completion, increasing the berm elevation and width, as well as supplying material for the significant fore dune growth.

Photo on left taken November 6, 1991. View to the west.

Photo on right taken November 7, 2011. View to the west.



**25-Year Coastal Changes at Site 104, Lake Drive, Cape May Point, Cape May Co.**



**Figure 410.** This profile site is as far south as one can go in New Jersey. The long-term situation was negative in spite of measures taken to stabilize the shoreline with offshore breakwater units. The change came in 2005 with the ACOE project that was extended into the Borough including the Nature Conservancy and NJ State Park for the lighthouse. The late bump in sand volume comes from movement into Cape May Point from additional work that was completed in the natural area.

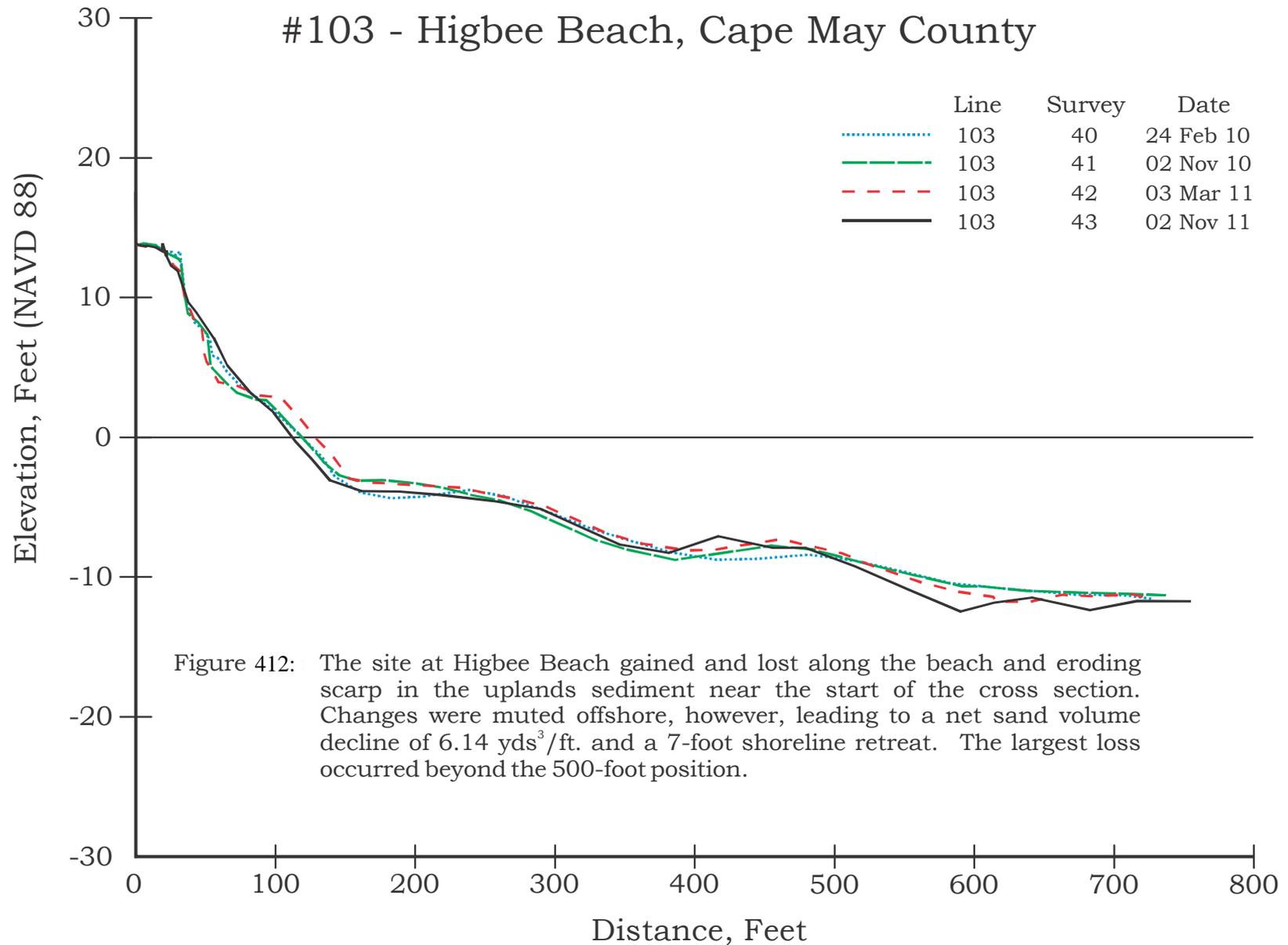
**Site 103, Higbee Beach, Cape May County, NJ – February 17, 2011**



**Figure 411. Southern view of the bayward dune slope and beach.**

# New Jersey Beach Profile Network

## #103 - Higbee Beach, Cape May County



## HIGBEE BEACH – SITE 103

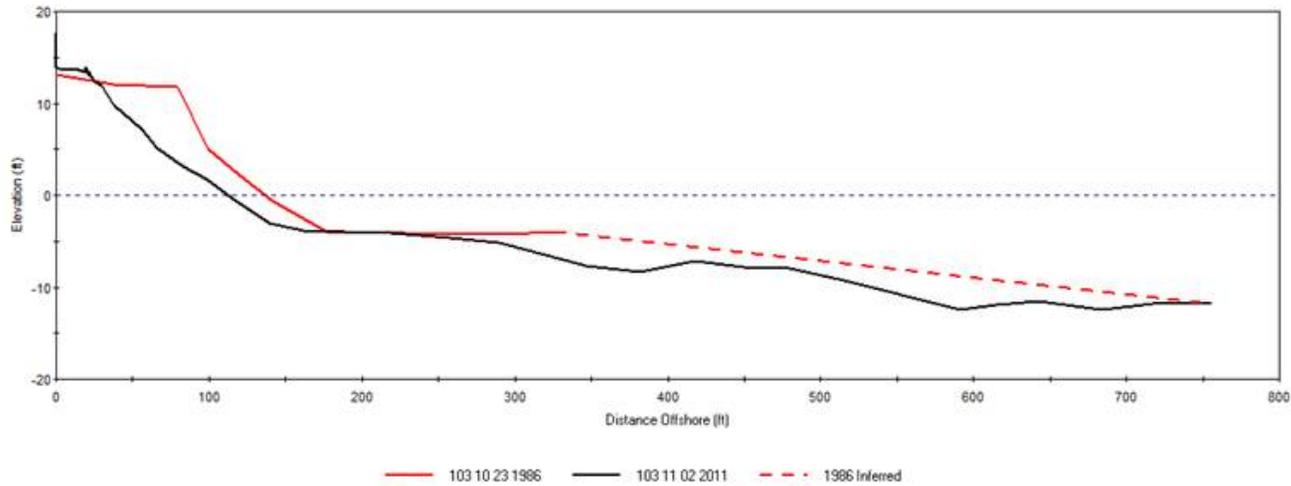
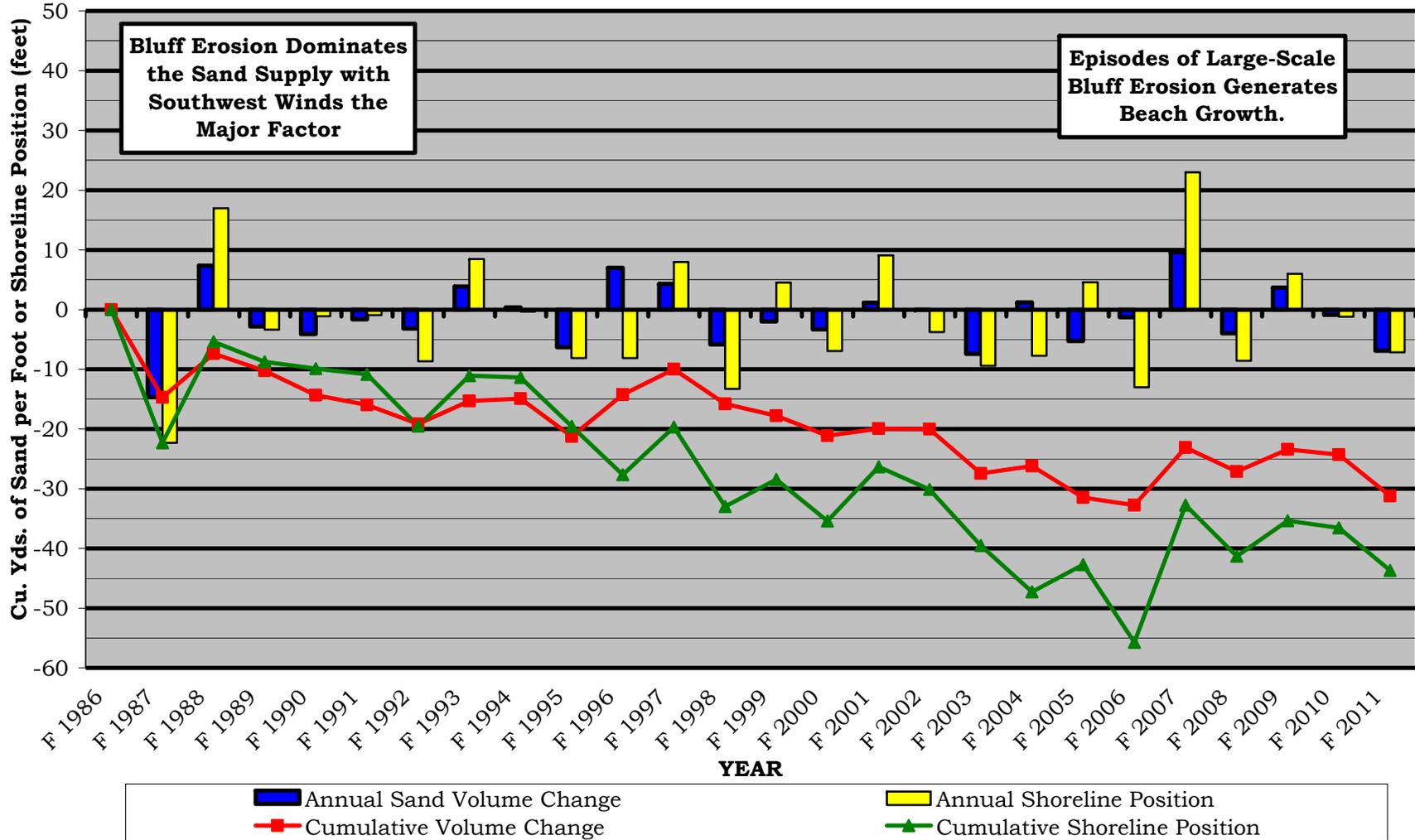


Figure 413: The profile above shows the site at Higbee Beach has undergone continual erosion in the dune, beachface, nearshore, and bay floor regions of the profile. For the study period the shoreline has retreated 25 feet and cumulative losses totaled 22.28 yds<sup>3</sup>/ft of sand. Photo on the left. View to the north. Photo on right taken November 2, 2011. View to the north.



**25-Year Coastal Changes at Site 103, Higbee Beach, Cape May Co.**



**Figure 414.** Higbee Beach is a bluff coast in lower Delaware Bay. The profile begins on the bluff and descends to the beach and bay floor. The sand volume losses are from the erosion of the bluff, not the beach or bay. Sand from the bluff feeds the beach so that the profile slowly retreats landward at the same shape and elevation.

**Site 102, Whittier Ave., North Cape May, NJ – March 3, 2011**



**Figure 415. Southern view of the recreational beach along the North Cape May beach.**

# New Jersey Beach Profile Network

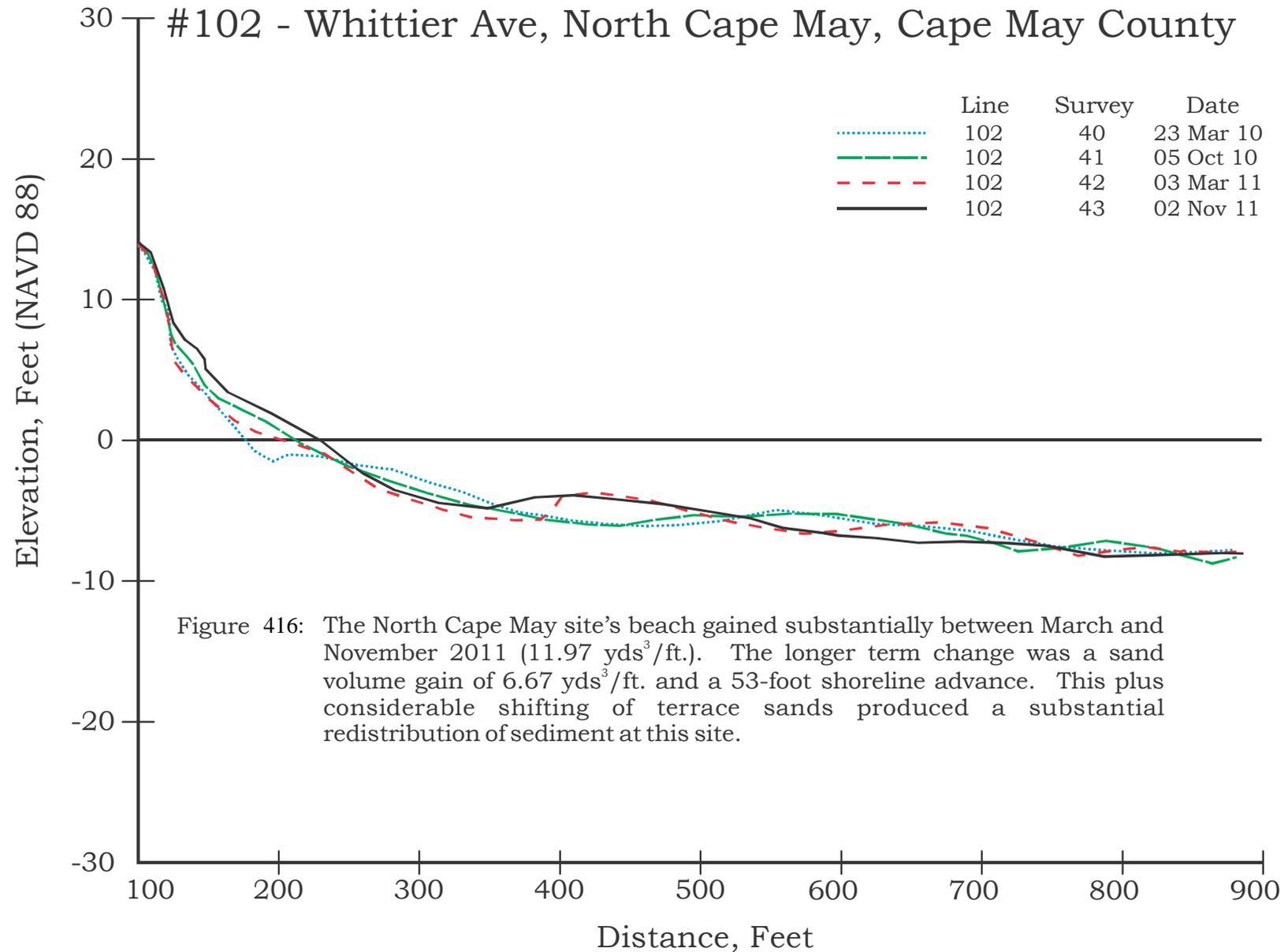


Figure 416: The North Cape May site's beach gained substantially between March and November 2011 (11.97 yds<sup>3</sup>/ft.). The longer term change was a sand volume gain of 6.67 yds<sup>3</sup>/ft. and a 53-foot shoreline advance. This plus considerable shifting of terrace sands produced a substantial redistribution of sediment at this site.

## WHITTIER AVENUE, NORTH CAPE MAY – SITE 102

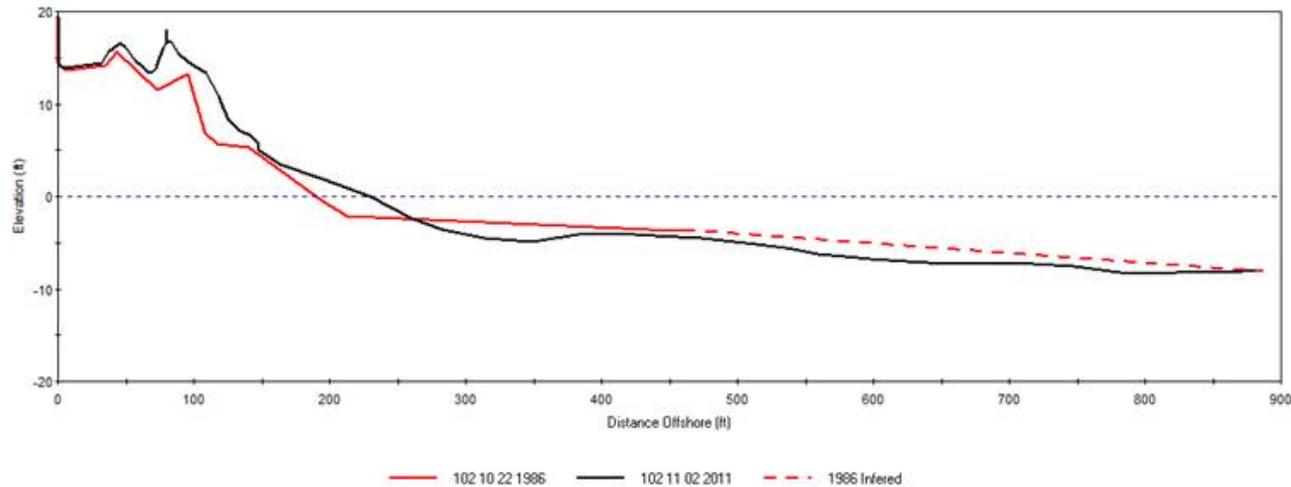
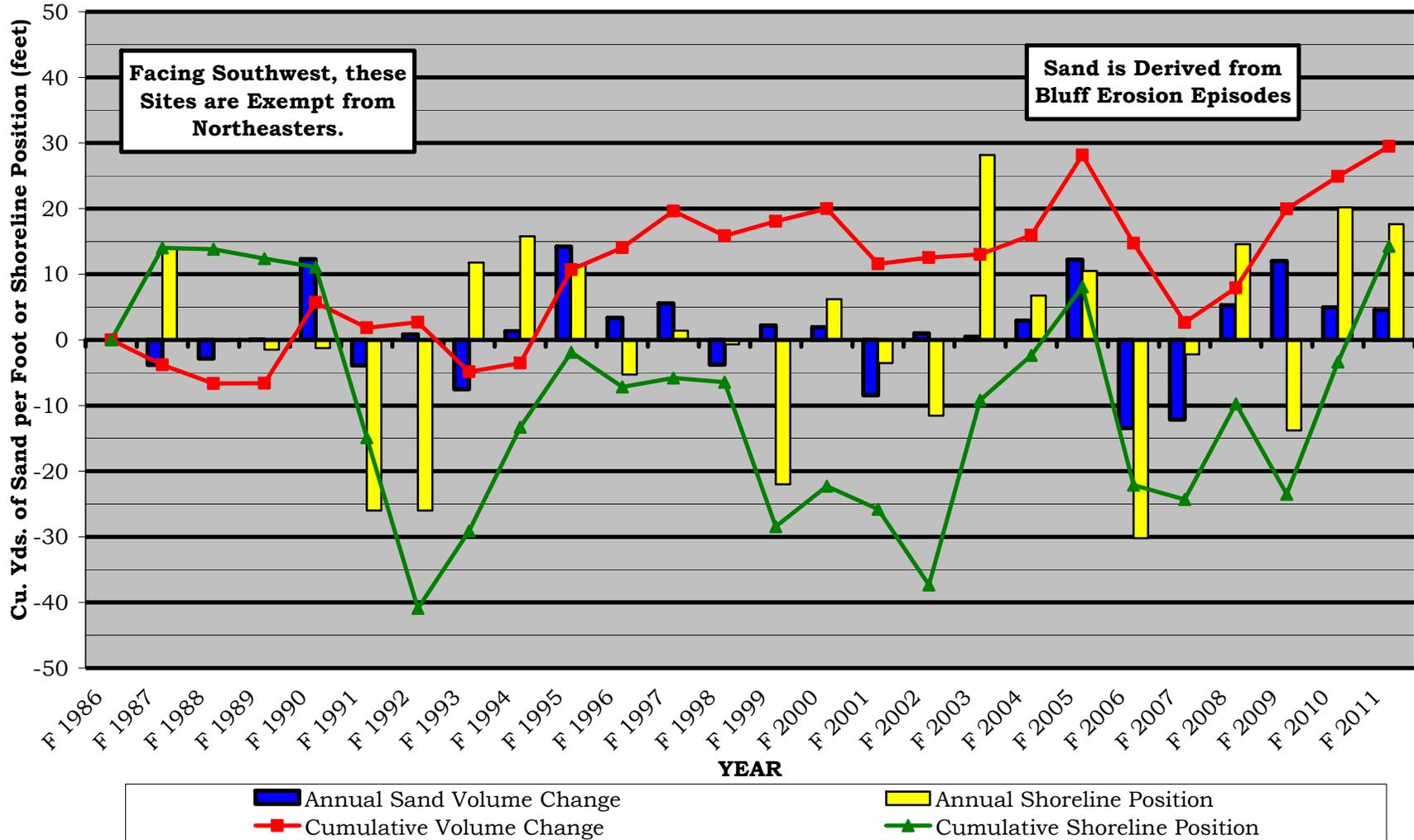


Figure 417: The profile above displayed a modest dune width and elevation increase over the 25 year study. The bay floor elevation portion of the profile decreased marginally by 2011. During this time, the shoreline also advanced 41 feet and added 10.35 yds<sup>3</sup>/ft of material. Photo on left taken November 8, 1991. View to the south. Photo on right taken November 2, 2011. View to the south.



**25-Year Coastal Changes at Site 102, Whittier Avenue North Cape May, Cape May Co.**



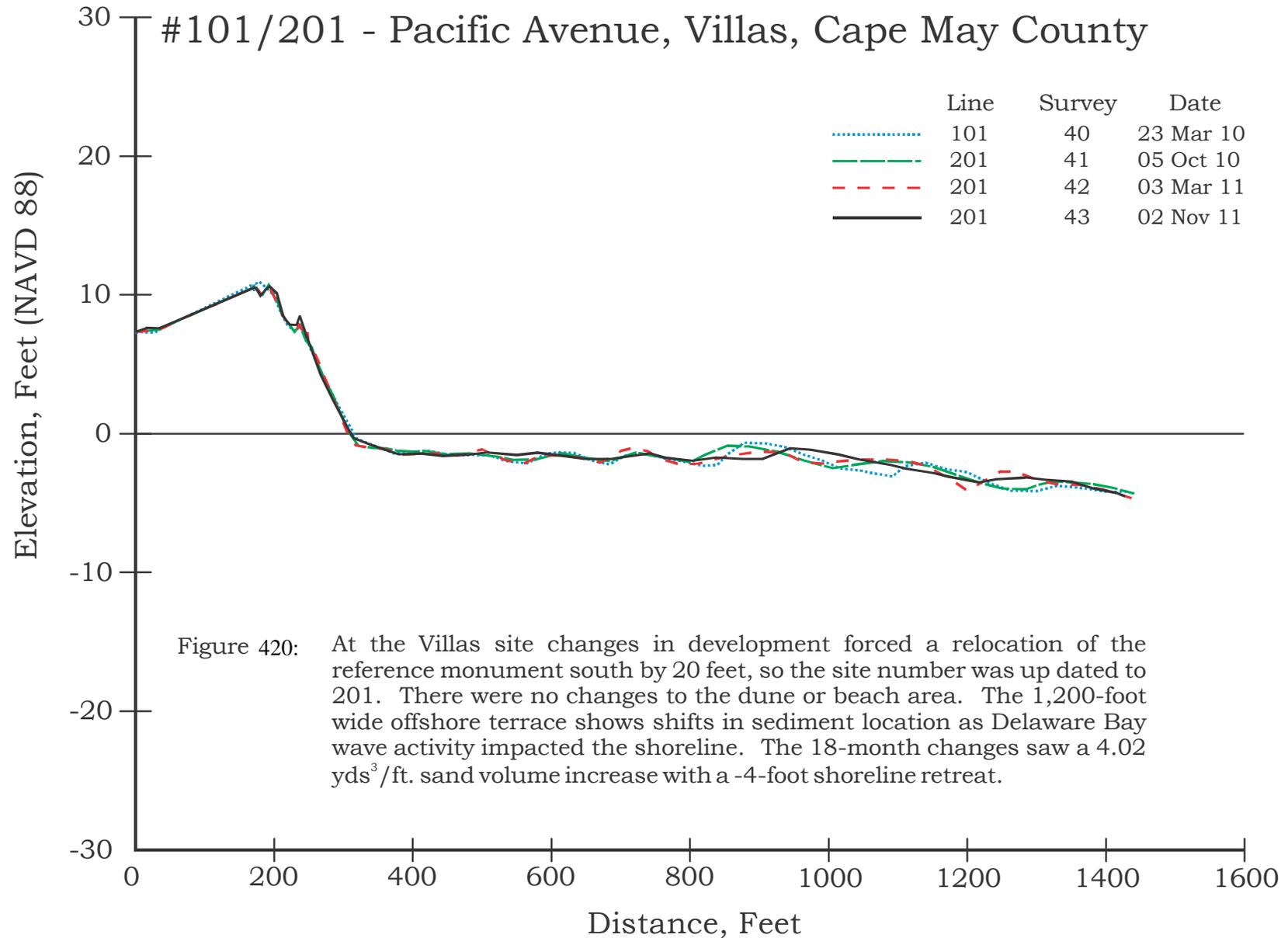
**Figure 418.** The magnitude of change drops in Delaware Bay compared to the oceanfront coast, but retreat and advance appear to occur with some frequency. The driver here is northwest winds following front passage usually in the winter months. The beach is a big dune deposited on and over a low mainland bluff cut into the Cape May Formation along the southwest Cape May County shoreline. There is a wide, very shallow platform seaward of the beach that represents the erosion taking place over centuries of time. This platform lies just below the zero elevation datum, so the shoreline variations are from shifts in the beach itself.

Site 201, Pacific Ave., Villas, NJ – November 2, 2011



Figure 419. View to the south of the mid-berm beach along the Villas, NJ.

# New Jersey Beach Profile Network



## PACIFIC AVENUE, VILLAS – formerly SITE 101, now SITE 201

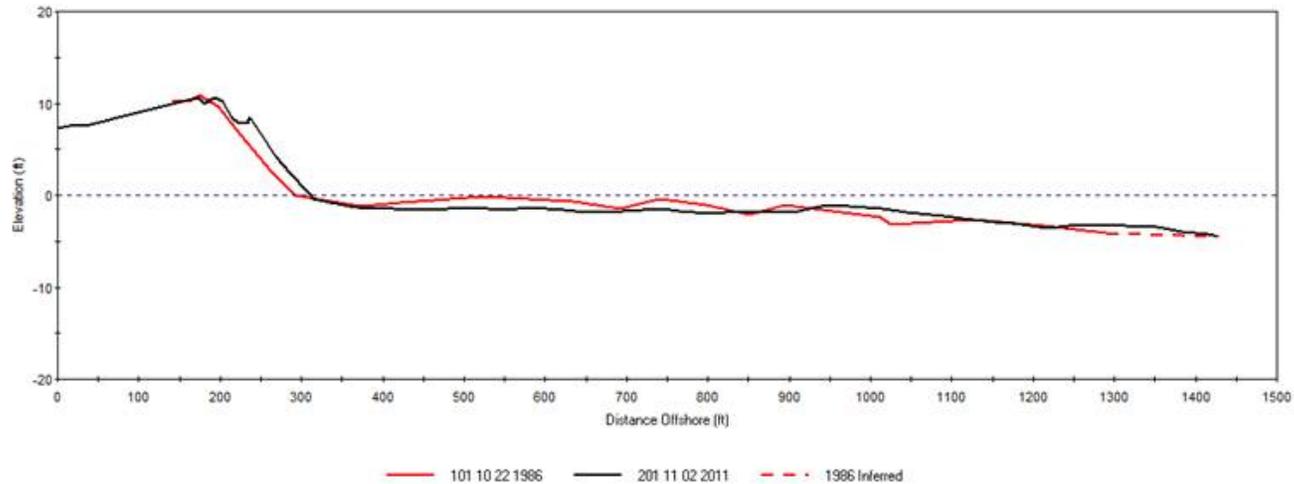
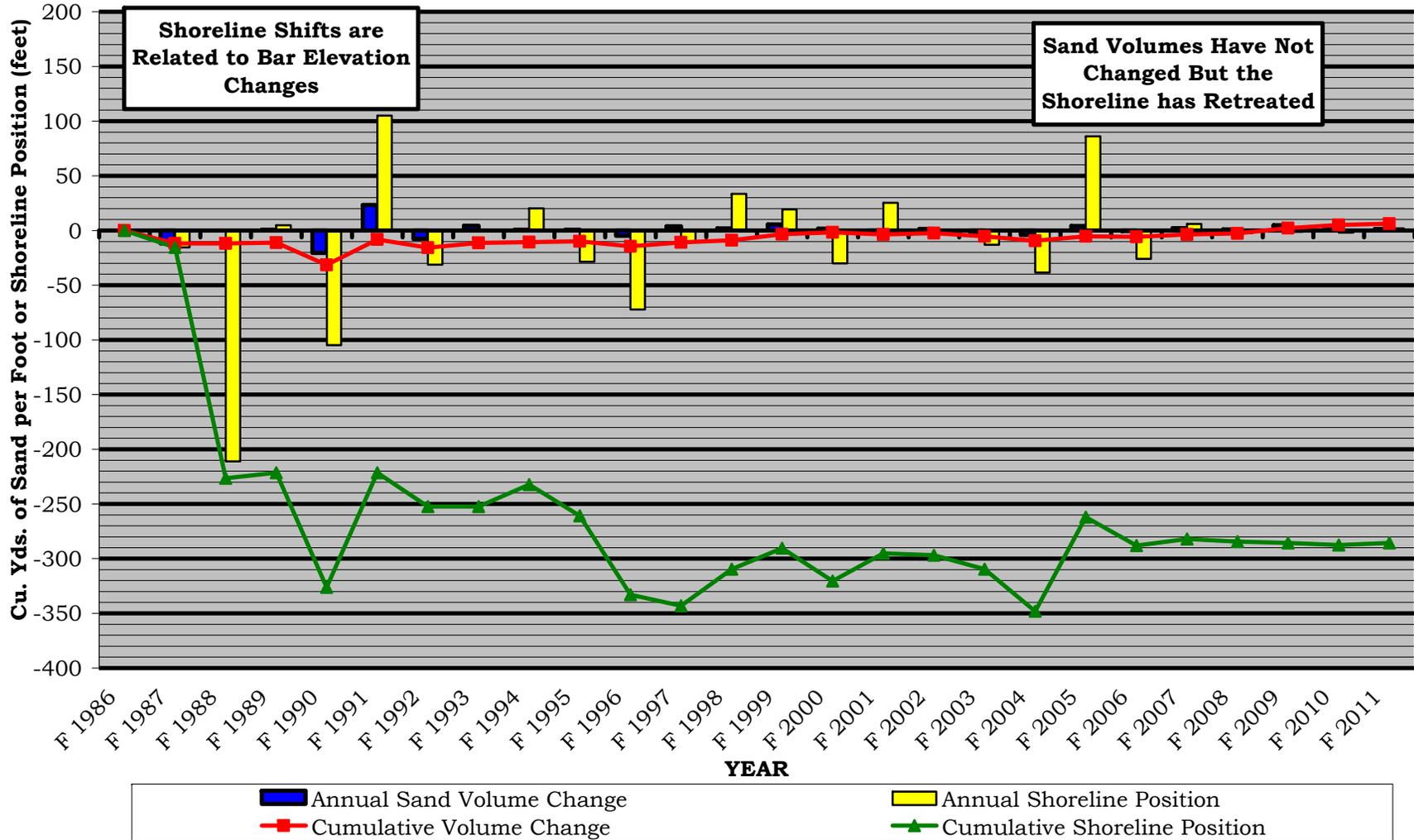


Figure 421: The profile above shows a relatively stable offshore region with sand accretion observed on the seaward dune slope and beach face since 1986. The shoreline advanced 24 feet for the study period. This profile location was moved 100 feet to the south in 2011 due to the continued difficulty in accessing the site.  
Photo on left taken November 8, 1991. View to the south.  
Photo on right taken November 2, 2011. View to the south.



**25-Year Coastal Changes at Site 101, Pacific Avenue Villas, Cape May Co.**



**Figure 422.** Further north along the Delaware Bay shoreline, the beach becomes lower and consists of sand deposited on older marsh deposits covering the Cape May Formation. The sand volume changed very little here, but shoreline retreat spiked in 1988, then remained modestly negative from there.

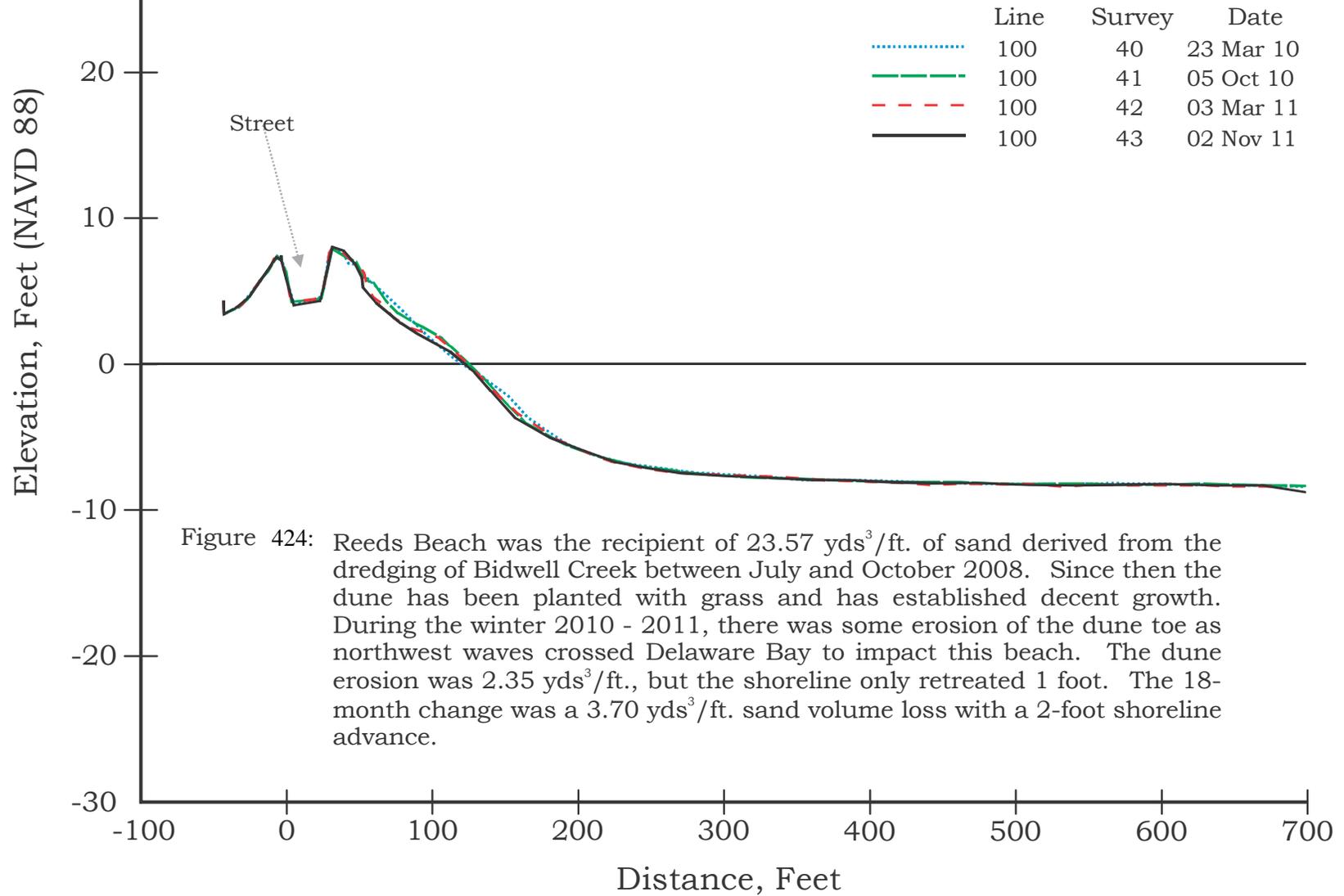
**Site 100, Reeds Beach, Cape May County, NJ – March 3, 2011**



**Figure 423. View of the bayward dune crest looking north.**

# New Jersey Beach Profile Network

## #100 - Reeds Beach, Cape May County



### REEDS BEACH – SITE 100

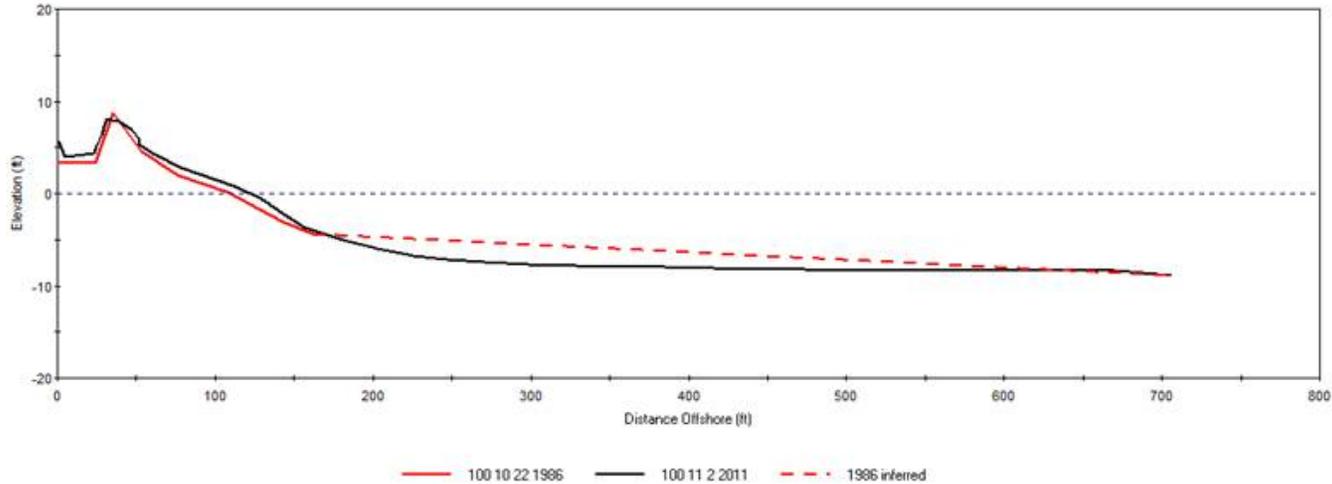


Figure 425: The profile above displays the landward migration of bayfloor materials onto the beach face, dune, and back dune portions of the profile over the 25 year study. Overall volume gains of 5.58 yds<sup>3</sup>/ft and a 12 foot shoreline advancement were recorded. Photo on left taken November 8, 1991. View to the south. Photo on right taken November 2, 2011. View to the south.



### 25-Year Coastal Changes at Site 100, Reeds Beach, Cape May Co.

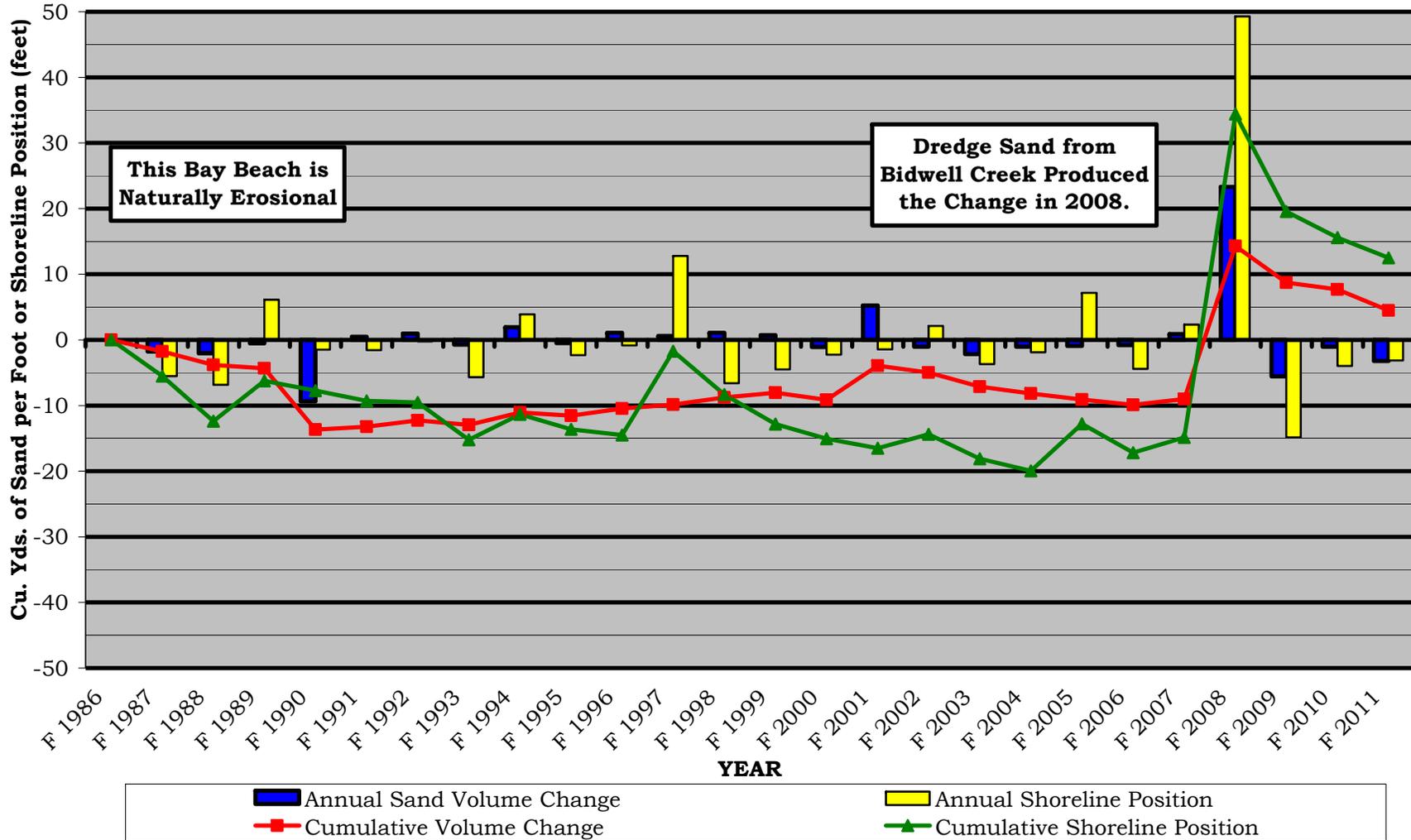


Figure 426. Reeds Beach is the final site in Delaware Bay situated along the marsh coast on a thin sand beach that disappears at Bidwell’s Creek, just north of this site. The State of NJ put sand on this shoreline during a navigation dredging operation in Bidwell’s’ Creek in 2008. The past three years has seen progressive decline in that volume added. The site is about 15 yds<sup>3</sup>/ft. ahead of the 2007 situation. This is quite a significant sand volume at this part of the bay coastline. There is no coastal development on the other side of Bidwell’s Creek along the Delaware Bay shoreline in Cape May County.

**TABLE 1**  
**MONMOUTH COUNTY**  
**ANNUAL BEACH VOLUME CHANGES**  
**SPRING 2010 - SPRING 2011 & FALL 2010 - FALL 2011**

Survey

| <b>PROFILE SITE</b>                         | 40 - 42                                    | 41 - 43              |
|---|--|----------------------|
| <b>LOCATION</b>                             | <b>S2010-S2011</b>                         | <b>F2010 - F2011</b> |
|   | (volume expressed as cubic yards per foot) |                      |
| 187: Cliffwood Beach Park                   | -3.22                                      | -4.82                |
| 286: Union Beach                            | -2.11                                      | 3.10                 |
| 185: Port Monmouth, Spy House Museum        | -4.66                                      | -6.87                |
| 285: Gateway National R. A., Gunnison Beach | 30.63                                      | -4.99                |
| 284: Gateway National R. A., Parking Lot E  | -23.70                                     | -53.67               |
| 184: Highland Beach, Gateway Entrance       | -15.27                                     | -8.21                |
| 183: Highland Beach, Via Ripa St.           | -12.67                                     | -5.06                |
| 282: Sea Bright, Shrewsbury Way             | -12.10                                     | -18.33               |
| 182: Sea Bright, North of Route 520         | -36.54                                     | -15.81               |
| 181: Sea Bright, Municipal Beach            | 13.19                                      | 5.49                 |
| 180: Sea Bright, Sunset Court               | 4.02                                       | -19.17               |
| 179: Monmouth Beach, Cottage Rd.            | -21.98                                     | 16.14                |
| 178: Monmouth Beach, Beach Club             | -10.31                                     | -2.60                |
| 177: Long Branch, 404 Ocean Ave.            | 2.23                                       | 10.16                |
| 176: Long Branch, Seven Presidents Park     | 13.19                                      | 17.48                |
| 175: Long Branch, North Broadway Ave.       | 6.79                                       | -10.32               |
| 174: Long Branch, Morris Ave.               | -1.02                                      | 4.05                 |
| 173: Long Branch, West End Ave.             | -54.40                                     | -31.62               |
| 272: Long Branch 805 Ocean Ave.             | 13.63                                      | 13.14                |
| 171: Elberon, Pullman Ave.                  | -5.45                                      | -17.19               |
| 170: Deal, Roosevelt Ave.                   | 9.70                                       | -16.67               |
| 169: Deal, Darlington Ave.                  | -3.28                                      | 16.38                |
| 168: Allenhurst, Corlies Ave.               | 20.75                                      | 28.98                |
| 267: Asbury Park, 7th Ave.                  | -25.52                                     | 24.81                |
| 167: Asbury Park, 3rd Ave.                  | 7.94                                       | 32.21                |
| 166: Ocean grove, Ocean Pathway             | 10.83                                      | 10.89                |
| 165: Bradley Beach, McCabe Ave.             | -8.49                                      | 20.23                |
| 164: Avon-By-The-Sea, Sylvania Ave.         | 19.50                                      | -21.14               |
| 163: Belmar, 5th Ave.                       | 35.04                                      | 34.70                |
| 162: Belmar, 18th Ave.                      | 13.36                                      | 8.56                 |
| 161: Spring Lake, Brighton Ave.             | 6.01                                       | -24.09               |
| 160: Spring Lake, Salem Ave.                | -15.17                                     | 11.85                |
| 159: Sea Girt, New York Ave.                | 7.46                                       | 14.61                |
| 158: Sea Girt, Trenton Ave.                 | 15.49                                      | 33.25                |
| 157: Manasquan, Riddle Way                  | -0.66                                      | 22.47                |
| 256: Manasquan, Pompano Ave.                | 1.44                                       | -20.13               |

**Table 1. Beach volume changes for Monmouth County, spring and fall year-to-year comparisons.**

**TABLE 2**  
**MONMOUTH COUNTY**  
**ANNUAL SHORELINE CHANGES**  
**SPRING 2010 - SPRING 2011 & FALL 2010 - FALL 2011**

Survey

| PROFILE SITE<br>LOCATION                    | 40 - 42<br>S2010-S2011               | 41 - 43<br>F2010 - F2011 |
|---|--------------------------------------|--------------------------|
|   | (shoreline change expressed in feet) |                          |
| 187: Cliffwood Beach Park                   | -10.0                                | -11.1                    |
| 286: Union Beach                            | -5.0                                 | -5.1                     |
| 185: Port Monmouth, Spy House Museum        | -0.9                                 | -3.4                     |
| 285: Gateway National R. A., Gunnison Beach | 164.0                                | -23.9                    |
| 284: Gateway National R. A., Parking Lot E  | -14.5                                | -59.4                    |
| 184: Highland Beach, Gateway Entrance       | 4.0                                  | 43.0                     |
| 183: Highland Beach, Via Ripa St.           | 29.3                                 | 37.5                     |
| 282: Sea Bright, Shrewsbury Way             | 36.8                                 | 5.3                      |
| 182: Sea Bright, North of Route 520         | -52.5                                | 6.1                      |
| 181: Sea Bright, Municipal Beach            | -1.6                                 | 13.9                     |
| 180: Sea Bright, Sunset Court               | -9.0                                 | -2.6                     |
| 179: Monmouth Beach, Cottage Rd.            | -11.1                                | 8.5                      |
| 178: Monmouth Beach, Beach Club             | 6.9                                  | -21.3                    |
| 177: Long Branch, 404 Ocean Ave.            | 7.4                                  | 66.3                     |
| 176: Long Branch, Seven Presidents Park     | 20.0                                 | 37.0                     |
| 175: Long Branch, North Broadway Ave.       | 50.3                                 | 6.8                      |
| 174: Long Branch, Morris Ave.               | -11.5                                | 4.3                      |
| 173: Long Branch, West End Ave.             | -78.3                                | -32.0                    |
| 272: Long Branch 805 Ocean Ave.             | 29.96                                | 15.4                     |
| 171: Elberon, Pullman Ave.                  | -2.0                                 | 2.1                      |
| 170: Deal, Roosevelt Ave.                   | -6.7                                 | -3.9                     |
| 169: Deal, Darlington Ave.                  | 23.0                                 | 22.8                     |
| 168: Allenhurst, Corlies Ave.               | 45.7                                 | 62.4                     |
| 267: Asbury Park, 7th Ave.                  | -19.8                                | 27.9                     |
| 167: Asbury Park, 3rd Ave.                  | -14.3                                | 55.0                     |
| 166: Ocean grove, Ocean Pathway             | 5.0                                  | 11.6                     |
| 165: Bradley Beach, McCabe Ave.             | -22.2                                | 12.3                     |
| 164: Avon-By-The-Sea, Sylvania Ave.         | 7.9                                  | -14.1                    |
| 163: Belmar, 5th Ave.                       | 20.8                                 | 31.9                     |
| 162: Belmar, 18th Ave.                      | 2.7                                  | 2.1                      |
| 161: Spring Lake, Brighton Ave.             | -19.0                                | 1.3                      |
| 160: Spring Lake, Salem Ave.                | -52.7                                | 18.6                     |
| 159: Sea Girt, New York Ave.                | 17.5                                 | 44.5                     |
| 158: Sea Girt, Trenton Ave.                 | 23.7                                 | 42.4                     |
| 157: Manasquan, Riddle Way                  | -4.5                                 | 35.0                     |
| 256: Manasquan, Pompano Ave.                | 18.8                                 | -8.9                     |

**Table 2. Shoreline changes for Monmouth County, spring and fall year-to-year comparisons.**

**TABLE 3  
MONMOUTH COUNTY  
SEASONAL BEACH VOLUME CHANGES**

| <b>PROFILE SITE<br/>LOCATION</b>            | Survey | 40-41<br><b>S10-F10</b>                                  | 41-42<br><b>F10-S11</b> | 42-43<br><b>S11-F11</b> | 40-43<br><b>S10-F11</b> |
|---|--------|--|-------------------------|-------------------------|-------------------------|
|   |        | (volume expressed as cubic yards per foot of beachfront) |                         |                         |                         |
| 187: Cliffwood Beach Park                   |        | -2.42  | -1.04                   | -3.84                   | -7.07                   |
| 286: Union Beach                            |        | -2.26  | 0.23                    | 2.85                    | 0.76                    |
| 185: Port Monmouth, Spy House Museum        |        | -4.32  | -0.29                   | -6.66                   | -10.81                  |
| 285: Gateway National R. A., Gunnison Beach |        | 13.93  | 16.28                   | -21.19                  | 10.20                   |
| 284: Gateway National R. A., Parking Lot E  |        | -15.16   | -8.49                   | -45.11                  | -68.95                  |
| 184: Highland Beach, Gateway Entrance       |        | -8.42  | -7.17                   | -1.38                   | -16.68                  |
| 183: Highland Beach, Via Ripa St.           |        | -9.73  | -2.87                   | -2.07                   | -14.73                  |
| 282: Sea Bright, Shrewsbury Way             |        | -10.69   | -1.57                   | -16.58                  | -29.25                  |
| 182: Sea Bright, North of Route 520         |        | -22.42   | -13.99                  | -3.29                   | -36.85                  |
| 181: Sea Bright, Municipal Beach            |        | 11.98  | 1.25                    | 6.08                    | 18.51                   |
| 180: Sea Bright, Sunset Court               |        | 17.99  | -14.19                  | -5.37                   | -0.63                   |
| 179: Monmouth Beach, Cottage Rd.            |        | -24.47   | 3.07                    | 12.52                   | -8.82                   |
| 178: Monmouth Beach, Beach Club             |        | 7.98   | -18.45                  | 15.08                   | 5.85                    |
| 177: Long Branch, 404 Ocean Ave.            |        | 1.05   | 0.87                    | 8.78                    | 12.53                   |
| 176: Long Branch, Seven Presidents Park     |        | -1.66  | 14.58                   | 3.27                    | 15.72                   |
| 175: Long Branch, North Broadway Ave.       |        | 20.91  | -14.61                  | 1.68                    | 14.94                   |
| 174: Long Branch, Morris Ave.               |        | -5.27  | 4.30                    | -0.03                   | -1.45                   |
| 173: Long Branch, West End Ave.             |        | -58.15   | 2.74                    | -34.21                  | -88.76                  |
| 272: Long Branch 805 Ocean Ave.             |        | -1.29  | 15.80                   | -2.47                   | 11.82                   |
| 171: Elberon, Pullman Ave.                  |        | -9.82  | 4.24                    | -21.22                  | -27.42                  |
| 170: Deal, Roosevelt Ave.                   |        | 5.00   | 4.80                    | -21.56                  | -11.88                  |
| 169: Deal, Darlington Ave.                  |        | -13.25   | 9.67                    | 6.84                    | 3.45                    |
| 168: Allenhurst, Corlies Ave.               |        | 37.55  | -12.02                  | 40.74                   | 63.09                   |
| 267: Asbury Park, 7th Ave.                  |        | -18.81   | -7.48                   | 32.29                   | 6.77                    |
| 167: Asbury Park, 3rd Ave.                  |        | -9.22  | 16.92                   | 15.40                   | 23.42                   |
| 166: Ocean grove, Ocean Pathway             |        | -3.16  | 14.65                   | -3.79                   | 7.19                    |
| 165: Bradley Beach, McCabe Ave.             |        | -16.04   | 7.27                    | 12.58                   | 5.71                    |
| 164: Avon-By-The-Sea, Sylvania Ave.         |        | 23.27  | -3.67                   | -17.45                  | 2.18                    |
| 163: Belmar, 5th Ave.                       |        | 11.72  | 22.67                   | 10.51                   | 46.28                   |
| 162: Belmar, 18th Ave.                      |        | -9.40  | 22.75                   | -13.74                  | -0.52                   |
| 161: Spring Lake, Brighton Ave.             |        | 2.92   | 2.84                    | -26.82                  | -20.66                  |
| 160: Spring Lake, Salem Ave.                |        | -19.41   | 4.02                    | 11.95                   | -6.12                   |
| 159: Sea Girt, New York Ave.                |        | 10.94  | -3.60                   | 17.81                   | 25.17                   |
| 158: Sea Girt, Trenton Ave.                 |        | 6.24   | 9.26                    | 23.81                   | 39.55                   |
| 157: Manasquan, Riddle Way                  |        | -13.34   | 10.65                   | 11.64                   | 9.70                    |
| 256: Manasquan, Pompano Ave.                |        | 2.30   | -5.48                   | -10.94                  | -16.88                  |

**Table 3. Seasonal beach volume changes and the 18-month volume comparison for Monmouth County.**

**TABLE 4  
MONMOUTH COUNTY  
SEASONAL SHORELINE CHANGES**

| PROFILE SITE<br>LOCATION                    | Survey | 40-41   | 41-42                                | 42-43   | 40-43   |
|---|--------|---------|--------------------------------------|---------|---------|
|   |        | S10-F10 | F10-S11                              | S11-F11 | S10-F11 |
|   |        |         | (shoreline change expressed in feet) |         |         |
| 187: Cliffwood Beach Park                   |        | -6.4    | -3.7                                 | -7.4    | -17.4   |
| 286: Union Beach                            |        | -1.6    | -3.48                                | -1.6    | -6.66   |
| 185: Port Monmouth, Spy House Museum        |        | 0.7     | -1.5                                 | -1.9    | -2.7    |
| 285: Gateway National R. A., Gunnison Beach |        | 60.7    | 103.3                                | -127.2  | 36.8    |
| 284: Gateway National R. A., Parking Lot E  |        | -25.2   | 10.7                                 | -70.1   | -84.6   |
| 184: Highland Beach, Gateway Entrance       |        | -18.6   | 22.6                                 | 20.4    | 24.4    |
| 183: Highland Beach, Via Ripa St.           |        | 7.2     | 22.1                                 | 15.4    | 44.7    |
| 282: Sea Bright, Shrewsbury Way             |        | 14.3    | 22.5                                 | -17.2   | 19.6    |
| 182: Sea Bright, North of Route 520         |        | -32.6   | -19.9                                | 26.0    | -26.5   |
| 181: Sea Bright, Municipal Beach            |        | 6.5     | -8.1                                 | 22.0    | 20.3    |
| 180: Sea Bright, Sunset Court               |        | 15.8    | -24.8                                | 22.1    | 13.2    |
| 179: Monmouth Beach, Cottage Rd.            |        | -21.5   | 10.4                                 | -1.9    | -13.0   |
| 178: Monmouth Beach, Beach Club             |        | 50.2    | -43.3                                | 22.0    | 28.8    |
| 177: Long Branch, 404 Ocean Ave.            |        | 5.3     | 2.1                                  | 64.3    | 71.7    |
| 176: Long Branch, Seven Presidents Park     |        | 27.2    | -7.2                                 | 44.1    | 64.1    |
| 175: Long Branch, North Broadway Ave.       |        | 57.4    | -7.1                                 | 13.9    | 64.2    |
| 174: Long Branch, Morris Ave.               |        | -28.6   | 17.1                                 | -12.8   | -24.3   |
| 173: Long Branch, West End Ave.             |        | -65.9   | -12.4                                | -19.7   | -97.9   |
| 272: Long Branch 805 Ocean Ave.             |        | 33.99   | -4.03                                | 19.5    | 49.4    |
| 171: Elberon, Pullman Ave.                  |        | -1.0    | -1.0                                 | 3.1     | 1.1     |
| 170: Deal, Roosevelt Ave.                   |        | 9.3     | -16.0                                | 12.1    | 5.4     |
| 169: Deal, Darlington Ave.                  |        | 19.4    | 3.6                                  | 19.3    | 42.3    |
| 168: Allenhurst, Corlies Ave.               |        | 27.4    | 18.3                                 | 44.1    | 89.7    |
| 267: Asbury Park, 7th Ave.                  |        | -4.5    | -15.2                                | 43.2    | 23.4    |
| 167: Asbury Park, 3rd Ave.                  |        | -8.1    | -6.2                                 | 61.1    | 46.9    |
| 166: Ocean grove, Ocean Pathway             |        | 1.5     | 3.4                                  | 8.2     | 13.1    |
| 165: Bradley Beach, McCabe Ave.             |        | -39.5   | 17.3                                 | -5.0    | -27.2   |
| 164: Avon-By-The-Sea, Sylvania Ave.         |        | 7.5     | 0.3                                  | -14.4   | -6.5    |
| 163: Belmar, 5th Ave.                       |        | 5.5     | 15.4                                 | 16.5    | 37.3    |
| 162: Belmar, 18th Ave.                      |        | -6.4    | 9.1                                  | -7.1    | -4.4    |
| 161: Spring Lake, Brighton Ave.             |        | -28.0   | 9.0                                  | -7.7    | -26.7   |
| 160: Spring Lake, Salem Ave.                |        | -62.9   | 10.2                                 | 8.4     | -44.3   |
| 159: Sea Girt, New York Ave.                |        | 6.5     | 11.0                                 | 33.5    | 51.0    |
| 158: Sea Girt, Trenton Ave.                 |        | 33.7    | -10.0                                | 52.4    | 76.0    |
| 157: Manasquan, Riddle Way                  |        | -3.7    | -0.8                                 | 35.8    | 31.3    |
| 256: Manasquan, Pompano Ave.                |        | 16.2    | 2.6                                  | -11.5   | 7.3     |

**Table 4. Seasonal shoreline changes and for the 18-month interval for Monmouth County.**

**TABLE 5**  
**OCEAN COUNTY**  
**ANNUAL BEACH VOLUME CHANGES**  
**SPRING 2010 - SPRING 2011 & FALL 2010 - FALL 2011**

Survey

| PROFILE SITE<br>LOCATION                   | 40 - 42                                    | 41 - 43       |
|--|--|---------------|
|  | S2010-S2011                                | F2010 - F2011 |
|  | (volume expressed as cubic yards per foot) |               |
| 156: Point Pleasant, Water St.             | 68.46                                      | 80.11         |
| 155: Point Pleasant, Maryland Ave.         | -15.36                                     | -0.95         |
| 154: Bay Head, Johnson Ave.                | -1.28                                      | 0.80          |
| 153: Mantoloking, 1117 Ocean Ave.          | -6.92                                      | -7.85         |
| 152: Brick Townhsip, Public Beach          | 5.57                                       | 18.72         |
| 151: Normandy Beach, 1st Ave               | -14.32                                     | 7.11          |
| 150: Lavallette, White Ave.                | 1.68                                       | 9.04          |
| 149: Ortlely Beach, 8th Ave.               | -4.18                                      | -0.97         |
| 248: Seaside, Franklin Ave.                | 5.57                                       | 23.25         |
| 148: Seaside Park, 4th Ave.                | 31.52                                      | 2.05          |
| 347: Berkeley Township, 6th Ave.           | -11.05                                     | 12.01         |
| 247: Island Beach State Park, North        | 12.33                                      | -7.14         |
| 246: Island Beach State Park, Middle       | 4.90                                       | -11.89        |
| 146: Island Beach State Park, South        | -24.90                                     | 1.85          |
| 245: Barnegat Light, 10th St.              | -36.25                                     | 35.37         |
| 145: Barnegat Light, 26th St.              | 37.03                                      | 39.01         |
| 144: Loveladies, La Baia St.               | 41.49                                      | 19.10         |
| 143: Harvey Cedars, 73rd St.               | 24.29                                      | -53.02        |
| 142: Harvey Cedars, Tranquility Drive      | 131.05                                     | -18.38        |
| 241: Surf City, 20th St.                   | 2.72                                       | 26.81         |
| 141: Ship Bottom, 8th St.                  | -8.37                                      | 15.66         |
| 140: Long BeachTownship, 32nd St.          | 11.87                                      | -13.73        |
| 139: Long Beach Township, 81st St.         | -5.06                                      | 5.96          |
| 138: Long Beach Township, Old Whaling Rd.  | -41.94                                     | -10.51        |
| 137: Beach Haven, Taylor Ave.              | -11.35                                     | -26.37        |
| 136: Beach Haven, Dolphin Ave.             | -14.37                                     | -18.12        |
| 135: Long Beach Township, Webster Ave.     | 2.34                                       | 11.33         |
| 234: Long Beach Township, Border w/ Refuge | -41.40                                     | -46.72        |

**Table 5. Beach volume changes for Ocean County, spring and fall year-to-year comparisons.**

**TABLE 6**  
**OCEAN COUNTY**  
**ANNUAL SHORELINE CHANGES**  
**SPRING 2010 - SPRING 2011 & FALL 2010 - FALL 2011**

Survey

| <b>PROFILE SITE</b>                        | 40 - 42                              | 41 - 43              |
|--|--------------------------------------|----------------------|
| <b>LOCATION</b>                            | <b>S2010-S2011</b>                   | <b>F2010 - F2011</b> |
|  | (shoreline change expressed in feet) |                      |
| 156: Point Pleasant, Water St.             | 94.8                                 | 88.2                 |
| 155: Point Pleasant, Maryland Ave.         | -52.7                                | 18.8                 |
| 154: Bay Head, Johnson Ave.                | -52.3                                | -0.2                 |
| 153: Mantoloking, 1117 Ocean Ave.          | 13.6                                 | 43.3                 |
| 152: Brick Township, Public Beach          | 9.9                                  | 27.3                 |
| 151: Normandy Beach, 1st Ave               | -18.4                                | 26.6                 |
| 150: Lavallette, White Ave.                | 24.6                                 | 35.8                 |
| 149: Ortley Beach, 8th Ave.                | 2.1                                  | 75.5                 |
| 248: Seaside, Franklin Ave.                | 49.1                                 | 46.7                 |
| 148: Seaside Park, 4th Ave.                | 46.1                                 | 15.0                 |
| 347: Berkeley Township, 6th Ave.           | -12.2                                | 24.1                 |
| 247: Island Beach State Park, North        | 53.2                                 | 8.5                  |
| 246: Island Beach State Park, Middle       | 67.9                                 | 4.6                  |
| 146: Island Beach State Park, South        | -42.6                                | 34.1                 |
| 245: Barnegat Light, 10th St.              | -45.0                                | 40.5                 |
| 145: Barnegat Light, 26th St.              | 66.5                                 | 55.1                 |
| 144: Loveladies, La Baia St.               | 68.3                                 | 26.9                 |
| 143: Harvey Cedars, 73rd St.               | -34.5                                | -46.7                |
| 142: Harvey Cedars, Tranquility Drive      | 133.7                                | 22.1                 |
| 241: Surf City, 20th St.                   | 18.6                                 | 43.1                 |
| 141: Ship Bottom, 8th St.                  | -15.2                                | 31.4                 |
| 140: Long Beach Township, 32nd St.         | 54.4                                 | 1.6                  |
| 139: Long Beach Township, 81st St.         | 43.4                                 | 4.4                  |
| 138: Long Beach Township, Old Whaling Rd.  | -10.5                                | -15.6                |
| 137: Beach Haven, Taylor Ave.              | 32.1                                 | -14.8                |
| 136: Beach Haven, Dolphin Ave.             | 23.9                                 | -9.2                 |
| 135: Long Beach Township, Webster Ave.     | 44.4                                 | 25.9                 |
| 234: Long Beach Township, Border w/ Refuge | 56.2                                 | -69.8                |

**Table 6. Shoreline changes for Ocean County, spring and fall year-to-year comparisons.**

**TABLE 7  
OCEAN COUNTY  
SEASONAL BEACH VOLUME CHANGES**

| PROFILE SITE<br>LOCATION                   | Survey | 40-41  | 41-42          | 42-43          | 40-43          |
|--|--------|--|----------------|----------------|----------------|
|  |        | <b>S10-F10</b>   | <b>F10-S11</b> | <b>S11-F11</b> | <b>S10-F11</b> |
|  |        | (volume expressed as cubic yards per foot of beachfront) |                |                |                |
| 156: Point Pleasant, Water St.             |        | 43.03  | 26.61          | 54.32          | 120.80         |
| 155: Point Pleasant, Maryland Ave.         |        | -17.92   | 2.83           | -3.79          | -19.50         |
| 154: Bay Head, Johnson Ave.                |        | 14.51  | -16.29         | 17.30          | 15.45          |
| 153: Mantoloking, 1117 Ocean Ave.          |        | 2.06   | -9.50          | 1.64           | -5.42          |
| 152: Brick Townhsip, Public Beach          |        | -0.89  | 6.78           | 11.78          | 17.42          |
| 151: Normandy Beach, 1st Ave               |        | -5.84  | -6.90          | 13.89          | 0.07           |
| 150: Lavallette, White Ave.                |        | -4.41  | 6.17           | -2.62          | 4.74           |
| 149: Ortley Beach, 8th Ave.                |        | 3.47   | -4.90          | 0.48           | 4.80           |
| 248: Seaside, Franklin Ave.                |        | -17.75   | 23.14          | 0.37           | 5.82           |
| 148: Seaside Park, 4th Ave.                |        | 18.42  | 13.73          | -11.89         | 21.13          |
| 347: Berkeley Township, 6th Ave.           |        | -29.60   | 18.48          | -0.83          | -15.55         |
| 247: Island Beach State Park, North        |        | 16.56  | -3.91          | -3.16          | 8.50           |
| 246: Island Beach State Park, Middle       |        | 27.89  | -24.41         | 15.84          | 17.15          |
| 146: Island Beach State Park, South        |        | -29.26   | 4.23           | -2.48          |                |
| 245: Barnegat Light, 10th St.              |        | -29.72   | -6.23          | 41.60          | 5.05           |
| 145: Barnegat Light, 26th St.              |        | 11.59  | 23.26          | 15.54          | 52.77          |
| 144: Loveladies, La Baia St.               |        | 48.86  | -2.48          | 21.71          | 68.01          |
| 143: Harvey Cedars, 73rd St.               |        | 49.77  | -27.81         | -28.08         | 3.37           |
| 142: Harvey Cedars, Tranquility Drive      |        | 134.73   | -5.74          | -13.79         | 117.33         |
| 241: Surf City, 20th St.                   |        | 18.90  | -16.13         | 43.01          | 45.61          |
| 141: Ship Bottom, 8th St.                  |        | 6.26   | -14.67         | 30.21          | 22.40          |
| 140: Long BeachTownship, 32nd St.          |        | -15.16   | 27.36          | -41.20         | -28.37         |
| 139: Long Beach Township, 81st St.         |        | -1.70  | -3.52          | 9.10           | 5.54           |
| 138: Long Beach Township, Old Whaling Rd.  |        | -29.41   | -11.39         | 0.91           | -40.99         |
| 137: Beach Haven, Taylor Ave.              |        | -7.35  | -4.03          | -22.60         | -33.67         |
| 136: Beach Haven, Dolphin Ave.             |        | -13.87   | -0.88          | -17.18         | -31.37         |
| 135: Long Beach Township, Webster Ave.     |        | 3.62   | -1.53          | 12.67          | 14.83          |
| 234: Long Beach Township, Border w/ Refuge |        | -64.87   | 23.78          | -71.51         | -112.38        |

**Table 7. Seasonal beach volume changes and the 18-month volume comparison for Ocean County.**

**TABLE 8  
OCEAN COUNTY  
SEASONAL SHORELINE CHANGES**

| PROFILE SITE<br>LOCATION                  | Survey | 40-41          | 41-42                                | 42-43          | 40-43          |
|---|--------|----------------|--------------------------------------|----------------|----------------|
|   |        | <b>S10-F10</b> | <b>F10-S11</b>                       | <b>S11-F11</b> | <b>S10-F11</b> |
|   |        |                | (shoreline change expressed in feet) |                |                |
| 156: Point Pleasant, Water St.            |        | 62.5           | 32.3                                 | 55.9           | 150.7          |
| 155: Point Pleasant, Maryland Ave.        |        | -14.0          | -38.7                                | 57.5           | 4.8            |
| 154: Bay Head, Johnson Ave.               |        | 27.7           | -80.0                                | 79.8           | 27.5           |
| 153: Mantoloking, 1117 Ocean Ave.         |        | -3.0           | 16.6                                 | 26.7           | 40.3           |
| 152: Brick Township, Public Beach         |        | 2.6            | 7.3                                  | 20.0           | 29.9           |
| 151: Normandy Beach, 1st Ave              |        | -4.9           | -13.5                                | 40.1           | 21.8           |
| 150: Lavallette, White Ave.               |        | 12.1           | 12.4                                 | 23.3           | 47.9           |
| 149: Ortley Beach, 8th Ave.               |        | 8.4            | -6.4                                 | 81.9           | 84.0           |
| 248: Seaside, Franklin Ave.               |        | 26.4           | 22.7                                 | 23.9           | 73.1           |
| 148: Seaside Park, 4th Ave.               |        | 33.0           | 13.1                                 | 1.9            | 48.0           |
| 347: Berkeley Township, 6th Ave.          |        | -7.2           | -5.0                                 | 29.1           | 16.9           |
| 247: Island Beach State Park, North       |        | 52.6           | 0.5                                  | 8.0            | 61.2           |
| 246: Island Beach State Park, Middle      |        | 85.2           | -17.3                                | 21.9           | 89.8           |
| 146: Island Beach State Park, South       |        | -34.6          | -8.1                                 | 42.2           | -0.5           |
| 245: Barnegat Light, 10th St.             |        | -22.4          | -22.5                                | 63.0           | 18.1           |
| 145: Barnegat Light, 26th St.             |        | 29.9           | 36.7                                 | 18.5           | 85.0           |
| 144: Loveladies, La Baia St.              |        | 63.8           | 4.5                                  | 22.4           | 90.7           |
| 143: Harvey Cedars, 73rd St.              |        | -0.5           | -34.0                                | -12.7          | -47.2          |
| 142: Harvey Cedars, Tranquility Drive     |        | 125.2          | 8.5                                  | 13.6           | 147.2          |
| 241: Surf City, 20th St.                  |        | 34.5           | -15.9                                | 59.0           | 77.6           |
| 141: Ship Bottom, 8th St.                 |        | 7.2            | -22.4                                | 53.7           | 38.5           |
| 140: Long BeachTownship, 32nd St.         |        | -6.9           | 61.2                                 | -59.7          | -5.3           |
| 139: Long Beach Township, 81st St.        |        | 44.2           | -0.8                                 | 5.1            | 48.5           |
| 138: Long Beach Township, Old Whaling Rd. |        | -9.4           | -1.1                                 | -14.5          | -25.0          |
| 137: Beach Haven, Taylor Ave.             |        | 13.6           | 18.5                                 | -33.3          | -1.2           |
| 136: Beach Haven, Dolphin Ave.            |        | 5.6            | 18.3                                 | -27.4          | -3.5           |
| 135: Long Beach Township, Webster Ave.    |        | 19.8           | 24.7                                 | 1.2            | 45.6           |
| 234: Long Beach Township, Border w/Refuge |        | 5.4            | 50.8                                 | -120.6         | -64.4          |

**Table 8. Seasonal shoreline changes and for the 18-month interval for Ocean County.**

**TABLE 9  
ATLANTIC COUNTY  
ANNUAL BEACH VOLUME CHANGES  
SPRING 2010 - SPRING 2011 & FALL 2010 - FALL 2011**

| PROFILE SITE<br>LOCATION                | Survey                                     |                          |
|---|--|--------------------------|
|   | 40 - 42<br>S2010-S2011                     | 41 - 43<br>F2010 - F2011 |
|   | (volume expressed as cubic yards per foot) |                          |
| 134: Brigantine, Green Acres            | 20.82                                      | 23.79                    |
| 133: Brigantine, 4th Street North       | 17.85                                      | 13.86                    |
| 132: Brigantine, 15th Street South      | 33.58                                      | -6.54                    |
| 131: Brigantine, 43rd Street South      | 51.32                                      | 52.80                    |
| 230: Atlantic City, Rhode Island Ave.   | -3.16                                      | 146.69                   |
| 130: Atlantic City, North Carolina Ave. | -38.21                                     | 113.07                   |
| 129: Atlantic City, Raleigh Ave.        | 14.72                                      | -8.94                    |
| 128: Ventnor City, Dorset Ave.          | 27.47                                      | 24.77                    |
| 127: Margate City, Benson Ave.          | -25.22                                     | -19.12                   |
| 126: Longport, 17th St.                 | -4.42                                      | 17.88                    |

**TABLE 10  
ATLANTIC COUNTY  
ANNUAL SHORELINE CHANGES  
SPRING 2010 - SPRING 2011 & FALL 2010 - FALL 2011**

| PROFILE SITE<br>LOCATION                | Survey                               |                          |
|---|--------------------------------------|--------------------------|
|   | 40 - 42<br>S2010-S2011               | 41 - 43<br>F2010 - F2011 |
|   | (shoreline change expressed in feet) |                          |
| 134: Brigantine, Green Acres            | 32.7                                 | -17.0                    |
| 133: Brigantine, 4th Street North       | 24.0                                 | -12.3                    |
| 132: Brigantine, 15th Street South      | 43.8                                 | 44.3                     |
| 131: Brigantine, 43rd Street South      | 73.1                                 | 59.4                     |
| 230: Atlantic City, Rhode Island Ave.   | -11.3                                | 50.2                     |
| 130: Atlantic City, North Carolina Ave. | -35.0                                | 123.7                    |
| 129: Atlantic City, Raleigh Ave.        | 38.7                                 | 24.9                     |
| 128: Ventnor City, Dorset Ave.          | 71.7                                 | 44.0                     |
| 127: Margate City, Benson Ave.          | -67.4                                | -22.0                    |
| 126: Longport, 17th St.                 | 39.2                                 | 10.6                     |

**Table 9. Beach volume changes for Atlantic County, spring and fall year-to-year comparisons.  
Table 10. Shoreline changes for Atlantic County, spring and fall year-to-year comparisons.**

**TABLE 11  
ATLANTIC COUNTY  
SEASONAL BEACH VOLUME CHANGES**

| PROFILE SITE<br>LOCATION                | Survey | 40-41  | 41-42   | 42-43   | 40-43   |
|---|--------|--|---------|---------|---------|
|   |        | S10-F10  | F10-S11 | S11-F11 | S10-F11 |
|   |        | (volume expressed as cubic yards per foot of beachfront) |         |         |         |
|   |        |  |         |         |         |
| 134: Brigantine, Green Acres            |        | 22.61  | -1.68   | 25.60   | 46.23   |
| 133: Brigantine, 4th Street North       |        | 6.19   | 11.54   | 1.68    | 19.77   |
| 132: Brigantine, 15th Street South      |        | 32.49  | 2.93    | -9.38   | 25.66   |
| 131: Brigantine, 43rd Street South      |        | 37.76  | 13.51   | 39.27   | 90.59   |
| 230: Atlantic City, Rhode Island Ave.   |        | -9.15  | 5.84    | 140.75  | 136.29  |
| 130: Atlantic City, North Carolina Ave. |        | -34.46   | -4.68   | 116.20  | 78.46   |
| 129: Atlantic City, Raleigh Ave.        |        | 23.11  | -8.11   | -0.70   | 14.21   |
| 128: Ventnor City, Dorset Ave.          |        | 6.55   | 21.07   | 3.58    | 30.09   |
| 127: Margate City, Benson Ave.          |        | -0.72  | -24.50  | 5.52    | -19.82  |
| 126: Longport, 17th St.                 |        | -7.49  | 2.23    | 15.61   | 10.21   |

**TABLE 12  
ATLANTIC COUNTY  
SEASONAL SHORELINE CHANGES**

| PROFILE SITE<br>LOCATION                | Survey | 40-41                                | 41-42   | 42-43   | 40-43   |
|---|--------|--------------------------------------|---------|---------|---------|
|   |        | S10-F10                              | F10-S11 | S11-F11 | S10-F11 |
|   |        | (shoreline change expressed in feet) |         |         |         |
|   |        |                                      |         |         |         |
| 134: Brigantine, Green Acres            |        | 79.5                                 | -46.8   | 29.8    | 62.5    |
| 133: Brigantine, 4th Street North       |        | 27.9                                 | -3.9    | -8.4    | 15.6    |
| 132: Brigantine, 15th Street South      |        | -31.5                                | 75.3    | -31.0   | 12.8    |
| 131: Brigantine, 43rd Street South      |        | -29.4                                | 102.5   | -43.2   | 30.0    |
| 230: Atlantic City, Rhode Island Ave.   |        | -12.1                                | 0.7     | 49.5    | 38.1    |
| 130: Atlantic City, North Carolina Ave. |        | -26.9                                | -8.1    | 131.9   | 96.9    |
| 129: Atlantic City, Raleigh Ave.        |        | 16.4                                 | 22.3    | 2.6     | 41.3    |
| 128: Ventnor City, Dorset Ave.          |        | 42.7                                 | 29.1    | 14.9    | 86.6    |
| 127: Margate City, Benson Ave.          |        | -13.9                                | -53.4   | 31.5    | -35.9   |
| 126: Longport, 17th St.                 |        | 24.1                                 | 15.2    | -4.5    | 34.7    |

**Table 11. Seasonal beach volume changes and the 18-month volume comparison for Atlantic County.  
Table 12. Seasonal shoreline changes and for the 18-month interval for Atlantic County.**

**TABLE 13**  
**CAPE MAY COUNTY**  
**ANNUAL BEACH VOLUME CHANGES**  
**SPRING 2010 - SPRING 2011 & FALL 2010 - FALL 2011**

| PROFILE SITE<br>LOCATION             | Survey                                     |                                 |
|--------------------------------------|--|---------------------------------|
|                                      | 40 - 42<br><b>S2010-S2011</b>              | 41 - 43<br><b>F2010 - F2011</b> |
|                                      | (volume expressed as cubic yards per foot) |                                 |
| 225: Ocean City, Gardens Rd.         | -19.58                                     | -52.18                          |
| 125: Ocean City, 6th St.             | -93.04                                     | -58.27                          |
| 124: Ocean City, 20th St.            | 33.98                                      | 25.69                           |
| 223: Ocean City, 34th St.            | 24.57                                      | 31.78                           |
| 122: Ocean City, 56th St.            | -15.12                                     | -5.44                           |
| 222: Ocean City, 59th St.            | -23.78                                     | -48.13                          |
| 221: Corson's Inlet Park, Ocean City | -39.02                                     | -67.36                          |
| 121: Strathmere, Williams Rd.        | -90.56                                     | -153.68                         |
| 120: Sea Isle City, 1st St.          | 31.18                                      | 14.12                           |
| 119: Sea Isle City, 25th St.         | -9.09                                      | -10.80                          |
| 118: Sea Isle City, 57th St.         | 22.32                                      | -16.29                          |
| 117: Sea Isle City, 80th St.         | 92.45                                      | -26.48                          |
| 216: Avalon, 9th St.                 | 96.05                                      | 39.23                           |
| 116: Avalon, 23rd St.                | 183.12                                     | 50.08                           |
| 115: Avalon, 35th St.                | 40.27                                      | 60.50                           |
| 114: Avalon, 70th St.                | 54.91                                      | 62.92                           |
| 113: Stone Harbor, 90th St.          | 81.94                                      | 50.73                           |
| 212: Stone Harbor, 121st St.         | 82.65                                      | 44.76                           |
| 112: Stone Harbor, South Pointe      | ** NO LONGER ACTIVE **                     |                                 |
| 111: North Wildwood, 15th Ave.       | 155.69                                     | 18.17                           |
| 110: Wildwood, Cresse Ave.           | 28.04                                      | 27.12                           |
| 109: Lower Township, Raleigh Ave.    | 44.45                                      | 23.18                           |
| 208: Lower Township, U.S.C.G. Base   | 1.58                                       | -10.15                          |
| 108: Cape May, Beach Club            | -0.19                                      | 3.05                            |
| 107: Cape May, Baltimore Ave.        | -5.08                                      | -2.60                           |
| 206: Cape May, Broadway Ave.         | 3.88                                       | -16.91                          |
| 105: Cape May, Nature Conservancy    | 84.34                                      | 7.01                            |
| 104: Cape May Point, Lake Dr.        | 10.18                                      | -11.49                          |
| 103: Higbee Beach State Park         | 4.88                                       | -6.91                           |
| 102: North Cape May, Whittier        | 0.05                                       | 4.57                            |
| 101: Villas, Pacific Ave.            | 1.36                                       | 1.34                            |
| 100: Reeds Beach, Beach Ave.         | -2.28                                      | -3.19                           |

**Table 13. Beach volume changes for Cape May County, spring and fall year-to-year comparisons.**

**TABLE 14**  
**CAPE MAY COUNTY**  
**ANNUAL SHORELINE CHANGES**  
**SPRING 2010 - SPRING 2011 & FALL 2010 - FALL 2011**

Survey

| PROFILE SITE<br>LOCATION             | 40 - 42                              | 41 - 43       |
|--------------------------------------|--------------------------------------|---------------|
|                                      | S2010-S2011                          | F2010 - F2011 |
|                                      | (shoreline change expressed in feet) |               |
| 225: Ocean City, Gardens Rd.         | -78.9                                | -52.8         |
| 125: Ocean City, 6th St.             | -110.1                               | -37.4         |
| 124: Ocean City, 20th St.            | -40.8                                | 50.7          |
| 223: Ocean City, 34th St.            | 54.3                                 | 23.5          |
| 122: Ocean City, 56th St.            | -1.3                                 | -22.7         |
| 222: Ocean City, 59th St.            | 31.4                                 | -67.8         |
| 221: Corson's Inlet Park, Ocean City | -57.5                                | -112.7        |
| 121: Strathmere, Williams Rd.        | -68.4                                | -194.3        |
| 120: Sea Isle City, 1st St.          | 53.9                                 | 61.3          |
| 119: Sea Isle City, 25th St.         | -43.5                                | 28.6          |
| 118: Sea Isle City, 57th St.         | -41.5                                | 43.2          |
| 117: Sea Isle City, 80th St.         | 114.3                                | -49.1         |
| 216: Avalon, 9th St.                 | 157.0                                | -61.4         |
| 116: Avalon, 23rd St.                | 285.6                                | -6.4          |
| 115: Avalon, 35th St.                | 116.3                                | 53.4          |
| 114: Avalon, 70th St.                | 53.2                                 | 60.9          |
| 113: Stone Harbor, 90th St.          | 102.5                                | 46.2          |
| 212: Stone Harbor, 121st St.         | 118.2                                | 11.3          |
| 112: Stone Harbor, South Pointe      | ** NO LONGER ACTIVE **               |               |
| 111: North Wildwood, 15th Ave.       | 338.6                                | 46.2          |
| 110: Wildwood, Cresse Ave.           | 95.9                                 | 87.7          |
| 109: Lower Township, Raleigh Ave.    | 44.3                                 | 99.9          |
| 208: Lower Township, U.S.C.G. Base   | 43.3                                 | 11.9          |
| 108: Cape May, Beach Club            | -9.3                                 | -17.9         |
| 107: Cape May, Baltimore Ave.        | -24.9                                | -4.7          |
| 206: Cape May, Broadway Ave.         | 16.8                                 | -15.7         |
| 105: Cape May, Nature Conservancy    | 176.0                                | -8.0          |
| 104: Cape May Point, Lake Dr.        | 42.5                                 | 0.6           |
| 103: Higbee Beach State Park         | 9.8                                  | -7.1          |
| 102: North Cape May, Whhittier       | 26.2                                 | 17.6          |
| 101: Villas, Pacific Ave.            | -8.9                                 | 1.8           |
| 100: Reeds Beach, Beach Ave.         | 4.0                                  | -3.1          |

**Table 14. Shoreline changes for Cape May County, spring and fall year-to-year comparisons.**

**TABLE 15  
CAPE MAY COUNTY  
SEASONAL BEACH VOLUME CHANGES**

| PROFILE SITE<br>LOCATION             | Survey | 40-41  | 41-42   | 42-43   | 40-43   |
|--------------------------------------|--------|--|---------|---------|---------|
|                                      |        | S10-F10  | F10-S11 | S11-F11 | S10-F11 |
|                                      |        | (volume expressed as cubic yards per foot of beachfront) |         |         |         |
| 225: Ocean City, Gardens Rd.         |        | 18.96  | -38.58  | -13.77  | -33.22  |
| 125: Ocean City, 6th St.             |        | -72.03   | -21.04  | -37.82  | -130.51 |
| 124: Ocean City, 20th St.            |        | 46.88  | -13.22  | 39.11   | 72.10   |
| 223: Ocean City, 34th St.            |        | 18.60  | 5.88    | 26.18   | 50.98   |
| 122: Ocean City, 56th St.            |        | -17.15   | 1.96    | -7.47   | -22.60  |
| 222: Ocean City, 59th St.            |        | -14.63   | -9.79   | -37.99  | -62.46  |
| 221: Corson's Inlet Park, Ocean City |        | -21.45   | -17.53  | -50.72  | -87.60  |
| 121: Strathmere, Williams Rd.        |        | -26.07   | -64.64  | -89.17  | -179.73 |
| 120: Sea Isle City, 1st St.          |        | 36.83  | -5.49   | 19.58   | 50.83   |
| 119: Sea Isle City, 25th St.         |        | -2.13  | -7.58   | -2.72   | -11.25  |
| 118: Sea Isle City, 57th St.         |        | 25.40  | -3.00   | -13.12  | 9.42    |
| 117: Sea Isle City, 80th St.         |        | 115.03   | -24.29  | -2.40   | 91.45   |
| 216: Avalon, 9th St.                 |        | 39.48  | 56.96   | -17.23  | 78.48   |
| 116: Avalon, 23rd St.                |        | 81.81  | 101.28  | -50.08  | 131.80  |
| 115: Avalon, 35th St.                |        | 20.52  | 19.56   | 40.38   | 80.52   |
| 114: Avalon, 70th St.                |        | 28.11  | 26.24   | 36.91   | 97.50   |
| 113: Stone Harbor, 90th St.          |        | 19.10  | 53.93   | -0.01   | 75.10   |
| 212: Stone Harbor, 121st St.         |        | 13.20  | 69.32   | -26.31  | 58.20   |
| 112: Stone Harbor, South Pointe      |        | ** NO LONGER ACTIVE **                                   |         |         |         |
| 111: North Wildwood, 15th Ave.       |        | 142.50   | 13.28   | 4.94    | 160.54  |
| 110: Wildwood, Cresse Ave.           |        | 21.62  | 6.77    | 20.34   | 48.93   |
| 109: Lower Township, Raleigh Ave.    |        | 28.65  | 12.68   | 10.82   | 54.14   |
| 208: Lower Township, U.S.C.G. Base   |        | 4.63   | -1.91   | -8.20   | -4.46   |
| 108: Cape May, Beach Club            |        | -0.57  | 0.88    | 2.30    | 2.27    |
| 107: Cape May, Baltimore Ave.        |        | -9.27  | 3.89    | -6.47   | -11.85  |
| 206: Cape May, Broadway Ave.         |        | 12.35  | -8.55   | -8.29   | -4.88   |
| 105: Cape May, Nature Conservancy    |        | -9.49  | 94.04   | -87.46  | -2.35   |
| 104: Cape May Point, Lake Dr.        |        | -26.31   | 36.53   | -44.26  | -35.70  |
| 103: Higbee Beach State Park         |        | 0.66   | 4.19    | -11.06  | -6.14   |
| 102: North Cape May, Whittier Ave.   |        | 2.28   | -2.19   | 6.63    | 6.67    |
| 101: Villas, Pacific Ave.            |        | 2.53   | -1.25   | 2.66    | 4.02    |
| 100: Reeds Beach, Beach Ave.         |        | -0.80  | -1.42   | -1.53   | -3.70   |

**Table 15. Seasonal beach volume changes and the 18-month volume comparison for Cape May County.**

**TABLE 16  
CAPE MAY COUNTY  
SEASONAL SHORELINE CHANGES**

| PROFILE SITE<br>LOCATION             | Survey | 40-41                                | 41-42   | 42-43   | 40-43   |
|--------------------------------------|--------|--------------------------------------|---------|---------|---------|
|                                      |        | S10-F10                              | F10-S11 | S11-F11 | S10-F11 |
|                                      |        | (shoreline change expressed in feet) |         |         |         |
| 225: Ocean City, Gardens Rd.         |        | -31.4                                | -47.5   | -5.2    | -84.1   |
| 125: Ocean City, 6th St.             |        | -114.9                               | 4.9     | -42.2   | -152.3  |
| 124: Ocean City, 20th St.            |        | 18.1                                 | -59.0   | 109.6   | 68.8    |
| 223: Ocean City, 34th St.            |        | 55.7                                 | -1.4    | 24.9    | 79.2    |
| 122: Ocean City, 56th St.            |        | 27.2                                 | -28.6   | 5.8     | 4.5     |
| 222: Ocean City, 59th St.            |        | 54.8                                 | -23.4   | -44.4   | -13.0   |
| 221: Corson's Inlet Park, Ocean City |        | -16.9                                | -40.6   | -72.2   | -129.6  |
| 121: Strathmere, Williams Rd.        |        | 8.6                                  | -77.0   | -117.3  | -185.7  |
| 120: Sea Isle City, 1st St.          |        | 45.4                                 | 8.4     | 52.9    | 106.7   |
| 119: Sea Isle City, 25th St..        |        | -43.2                                | -0.3    | 28.9    | -14.6   |
| 118: Sea Isle City, 57th St..        |        | -32.7                                | -8.8    | 52.0    | 10.5    |
| 117: Sea Isle City, 80th St..        |        | 191.9                                | -77.6   | 28.6    | 142.8   |
| 216: Avalon, 9th St.                 |        | 155.9                                | 1.1     | -62.5   | 94.5    |
| 116: Avalon, 23rd St.                |        | 149.7                                | 135.9   | -142.3  | 143.3   |
| 115: Avalon, 35th St.                |        | 68.3                                 | 48.0    | 5.4     | 121.7   |
| 114: Avalon, 70th St.                |        | 47.9                                 | 5.3     | 55.7    | 108.8   |
| 113: Stone Harbor, 90th St.          |        | 24.1                                 | 78.4    | -32.2   | 70.3    |
| 212: Stone Harbor, 121st St.         |        | 38.6                                 | 79.7    | -68.3   | 49.9    |
| 112: Stone Harbor, South Pointe      |        | ** NO LONGER ACTIVE **               |         |         |         |
| 111: North Wildwood, 15th Ave.       |        | 308.4                                | 30.1    | 16.1    | 354.7   |
| 110: Wildwood, Cresse Ave.           |        | 84.5                                 | 11.4    | 76.3    | 172.2   |
| 109: Lower Township, Raleigh Ave.    |        | 15.7                                 | 28.6    | 71.2    | 115.5   |
| 208: Lower Township, U.S.C.G. Base   |        | 19.2                                 | 24.1    | -12.2   | 31.0    |
| 108: Cape May, Beach Club            |        | -1.4                                 | -8.0    | -9.9    | -19.3   |
| 107: Cape May, Baltimore Ave.        |        | -23.0                                | -1.8    | -2.9    | -27.7   |
| 206: Cape May, Broadway Ave.         |        | 25.1                                 | -8.3    | -7.4    | 9.4     |
| 105: Cape May, Nature Conservancy    |        | -2.0                                 | 177.9   | -186.0  | -10.0   |
| 104: Cape May Point, Lake Dr.        |        | -21.3                                | 63.8    | -63.2   | -20.8   |
| 103: Higbee Beach State Park         |        | 0.4                                  | 9.4     | -16.5   | -6.7    |
| 102: North Cape May, Whittier Ave.   |        | 35.5                                 | -9.3    | 26.9    | 53.1    |
| 101: Villas, Pacific Ave.            |        | -6.1                                 | -2.8    | 4.7     | -4.2    |
| 100: Reeds Beach, Beach Ave.         |        | 5.0                                  | -1.0    | -2.1    | 1.9     |

**Table 16. Seasonal shoreline changes and for the 18-month interval for Cape May County.**