

THE RICHARD STOCKTON COLLEGE OF NEW JERSEY COASTAL RESEARCH CENTER



The panorama across the Barnegat Inlet shoreline was entirely water in 1989. All the sand and the early growth of a maritime forest is the direct result of re-aligning the south jetty to Barnegat Inlet. It is now 2,400 feet to Barnegat Light from the shoreline, a distance twice the width of the Wildwood beach and it all is just 20 years old.

New Jersey Beach Profile Network 2010 Annual Report on Shoreline Changes in New Jersey Coastal Reaches One Through Fifteen Raritan Bay to Delaware Bay

Prepared for:

New Jersey Department of Environmental Protection
Division of Construction and Engineering
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June 30, 2011

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EXECUTIVE SUMMARY

The New Jersey Beach Profile Network (NJBPN) project was authorized by the New Jersey Department of Environmental Protection (NJDEP) in 1986. The report is divided into four coastal county segments and provides a summary of beach changes for that county. Major beach restoration or hard structure projects are reviewed for performance and effectiveness. A discussion of issues and pending project work in the county is also included. These observations on beach changes along the New Jersey coastline provide a means to determine both rapid seasonal changes as well as follow long-term trends in shoreline position and beach volume. Major shore protection projects resulting in the addition of millions of cubic yards of new sand have given a performance monitoring aspect to the report. The report includes performance reviews of the 105 profile site locations that extend from the lower Raritan Bay, along the four oceanfront county shorelines and into Delaware Bay along the western shore of Cape May Co.

The photographs, cross sections, trend charts, and text focus on the seasonal and year to year changes observed since the previous report. The report is also found on the website at www.stockton.edu/crc. Past reports are linked to the site so comparisons can be made to the 2009-2010 observations along the New Jersey coastline. These reports show the following:

- The enormous positive impact of beach nourishment over the past 24 years.
- The enhanced shoreline protection benefits of 24 years of dune growth in height and width.
- The importance of the inlet processes and their impact on changes on adjacent beaches.
- The ability to analyze causes of extreme variations at specific sites on the coast.
- The pattern of sand distribution along barrier islands as determined by that island's profiles.
- The beneficial results of the low incidence of serious storm events impacting the NJ coast.
- The ability to gage the impact of Declared Disaster events on the NJ coastline.

The final bullet point is illustrated in this report since the majority of the beach profiles had been surveyed prior to the November 11, 2009 major storm event. The 2009 report showed that little impact in the Fall-to-Fall comparisons had yet occurred. The storm damage appears when one compares the Fall of 2009 to the Fall of 2010 and the negative effect of 9 northeast storms appears in the average sand volume loss rates. The November 11 – 15, 2009 storm, while not extreme in wind velocity, did continue for four days and seven high tide cycles. Storm damage triggered a Presidential Disaster Declaration DR-NJ 1867 for Cape May, Atlantic and Ocean Counties. All dunes received some scarp damage except for the widest beaches and parts of the two NJ State/local beach projects completed in 2009. The worst damage was observed along the beaches just south of each tidal inlet especially in Ocean City, Avalon and Atlantic City. Both beach projects (Upper Township and North Wildwood) also experienced losses exceeding 150,000 cy from the northeast corner at each inlet. Snow storms in December and January continued the process of attrition. Mid-February and mid-March 2010 saw the last two significant storms, each of which also produced Disaster Declarations DR-NJ 1889 (snow removal emergency mostly) and DR-NJ 1897 (continued erosion to already damaged beaches and

dunes). Many coastal communities resorted to trucking in thousands of cubic yards of quarry sand to bolster damaged dunes to preclude breaching in potential future events. The Borough of Avalon hauled 30,000 cubic yards to the dunes between 17th and 21st Streets where 125 feet of landward retreat had occurred. Long Beach Township likewise hauled sand to multiple sites where the dunes had been all but erased leaving properties with wave swash under them at high tide. The dredge returned to Avalon in 2010 and again in 2011 (US Army Corps of Engineers [ACOE] maintenance) as well as a major restoration to the 2009 North Wildwood project. As of June 2011, the dredge is pumping sand onto the northern Absecon Island shoreline as Atlantic City's beach is receiving maintenance. In spite of these storm events, the surveys surrounding Long Branch in Monmouth County have shown that the 2010 fill along the southern shoreline of that City has moved dramatically north by several miles detectable all the way to the Seven Presidents Park site. A new site was established at Lake Tackanassee (Site 272) in Long Branch to better document sand movement to the south. The Pullman Avenue site in Elberon has never demonstrated any significant quantity of material deposited from the northern segment of the Monmouth County fill.

The survey data was analyzed and evaluated to show changes in the four county shorelines and sand volume changes for the 18-month study interval. The three-month seasonal average sand volume changes for each county plus the 18-month summary are shown below.

	S 09 – F 09	F 09 – S 10	S 10 – F 10	S 09 – F 10
	Cu. yds/ft.	Cu. yds/ft.	Cu. yds/ft.	Cu. yds/ft.
Monmouth County	-2.76	-5.76	-2.92	-10.70
Ocean County	5.38	-2.09	3.39	11.48
Atlantic County	-11.52	-0.96	7.06	-5.41
Cape May County	2.59	5.78	15.46	24.24

The values for Cape May County reflect the beach nourishment activity in 2010. The storm damage was actively restored in many places so the Fall 2009 to Spring 2010 survey is positive in Cape May County only. By the Fall 2010 survey the county beaches had averaged a significant gain in sand volume.

The shoreline change values represent the derived difference in horizontal distance to the zero elevation position (NAVD88) from the reference monument on the two profiles being compared. Advances seaward are positive and retreats landward are negative. Each number shown below is the average change for all the sites in each county. Monmouth County clearly suffered the most shoreline retreat with Cape May County posting the most impressive recovery by the Fall of 2010.

	S 09 – F 09	F 09 – S 10	S 10 – F 10	S 09 – F 10
	Feet	Feet	Feet	Feet
Monmouth County	-6.71	-10.36	1.44	-16.58
Ocean County	-10.38	-5.79	19.88	4.29
Atlantic County	-7.32	0.01	7.68	1.57
Cape May County	5.86	0.35	30.90	41.28

ACKNOWLEDGEMENTS

This research was funded by the State of New Jersey Department of Environmental Protection, Division of Construction and Engineering under the Shore Protection legislation authorizing the stable funding of coastal projects (NJ PL 93 Chap 155). This is the final report under contract #4242-11.

INTRODUCTION:

The New Jersey Beach Profile Network (NJBPN) project provides local and regional information on coastal zone changes and is designed to document seasonal and storm-related damage assessments of the New Jersey shoreline. The report includes long-term trends at sites to develop statistically meaningful information for use by State and local coastal zone managers. The database covers 24 years at 105 locations between Raritan Bay (three sites in the lower bay), the Atlantic Ocean coastline, and Delaware Bay (four sites on the western shoreline of Cape May County). Each site has been visited annually in the fall since 1986. Semiannual visits, each spring and fall, began in 1994 following the passage of Public Law 155. The program was expanded to take surveys every spring following the winter northeasters and in the fall following the summer beach accretion. In addition, new sites were established in the gaps of coverage and adjacent tidal inlet shorelines. The information collected consists of photographs of the beach/dune system at each site, a topographic profile of the dune, beach and seafloor to a minimum depth of 14-16 feet, and field notes on significant geologic changes. Also, construction activity is noted and necessary information regarding quantity and duration of such activity is gathered. The field data are used to generate graphical cross section plots, which can be used for comparison across the width of the active coastal zone. The cross section is also used to calculate sand volume and shoreline position changes. The 2010 report is the latest in a series of annual reports prepared for the New Jersey Department of Environmental Protection (NJDEP) that began in 1987. The information is arranged by county and sequential profile site location, and includes the survey cross sections, site photographs, and the description of significant changes. The tables of beach volume and shoreline change data are found after the county site descriptions for Cape May County. A summary of each county's coastal zone activities follows the county profile site location diagram.

THE NEW JERSEY COASTAL ZONE:

The northern coast in Monmouth County is considered a headland beach (carved into older geologic sedimentary units that created a sandy beach backed by a bluff of the older sediments) which erode during serious storm events. The erosion provided new sand supplies and some gravel to the beach system, but the repeated bluff retreat produced by storms quickly became a serious problem following extensive human development during the last third of the 19th Century. Coastal protection structures multiplied and intensified between 1880 and 1950. Centuries of erosion had created two major sand spits, one to the north from Long Branch (Sandy Hook), and the other to the south from Bay Head (Mantoloking to Barnegat Inlet). To the south of Barnegat Inlet, barrier islands compose the remainder of the NJ coastline where individual islands are separated from the mainland by a series of bays and tidal lagoons. These islands provide no local sand supply to the beach and as a result the shoreline moves landward with rising sea level. All areas of the New Jersey coastline continue to strive for equilibrium in response to storms, waves, sea level and tidal currents in spite of all human efforts to establish stability and protect man-made development.

The greatest human influence on growth in the coastal counties was from the establishment of the rail system from the metropolitan centers to the shore. Businessmen in New York City created the New York & Long Branch Railroad in the 1870's following the Camden & Atlantic City Railroad's construction to Atlantic City on Absecon Island in the late 1850's. This growth accelerated during the last 20 years of the 19th Century.

Previously, visitors had been coming to the NJ shore by boat or overland to small “resorts” in Cape May City, Tucker’s Beach and points along the Monmouth County shoreline. Every major conflict and/or financial crisis curtailed the rate of development. World War I halted growth, but after the peace major new hotels were built at all the, then developed sites. The Great Depression followed by World War II eliminated growth until the late 1940’s. Between 1950 and 2000 the rush to the shore was on. Multi-lane highways replaced the railroads to give the public access and the purchase of a second home became the way to vacation at the beach. Today visitors generate \$27.7 billion in tourism revenue; create 350,000 jobs at local businesses, which pay \$5.0 billion in taxes to the NJ treasury making the Jersey shore and its tourism the second largest state industry.

Naturally, defending this investment against storms, tidal currents, and sea level rise has also become a highly advanced industry. Early efforts relied on local products primarily the Eastern White Cedar to create bulkheads, jetties and groins along the coast. Big errors made during the early years were:

- 1) Not reserving the dry beach and dune system as publicly held real estate.
- 2) In many cases plowing large dune systems flat to make more room for development.
- 3) Building on tidal inlet channel margins and failing to recognize the rapid rates of channel migration.

The arrival of the railroad meant that other products could be brought in to hold back the sea. Concrete, stone and steel made their impact as all structures facing the ocean got higher, longer, and tougher. Better roads and trucks brought all these commodities directly to any coastal site in crisis. As a result many segments of the coast have continuous bulkheads, closely spaced groins and all but 3 of the 11 inlets are confined by jetties.

The earliest attempt at sand supplies came in the form of trucking sand from Belmar beaches across the Shark River Inlet and dumping it on the Avon side to effectively “by-pass” the inlet. In 1952 the ACOE conducted a 2.54 million cubic yard beach fill in Ocean City in Cape May County. Beach restoration followed the devastating March 1962 northeast storm as many sources of sand were employed to replace the beaches torn away by the event. Beach nourishment got a boost in the 1970’s as the State passed two multi-million dollar bond issues to finance projects at a variety of places. Congressman William Hughes guided an initial Federal project in Ocean City at the same time the restoration was advancing to construction in Cape May City. These successes generated interest in undertaking the restoration of the entire Monmouth County oceanfront shoreline. Five years, 25 million cubic yards of sand and \$250 million dollars later, the largest beach restoration project ever in Monmouth County was completed by 2000. Additional Federal beach projects were approved and constructed in Surf City, Brigantine, Atlantic City, Ventnor City, Ocean City, Avalon, Stone Harbor, Cape May City and Cape May Point. Federal projects are pending for the Northern Ocean County shoreline (hampered by real estate issues), Ludlam Island and North Wildwood, but lack sufficient funding to go to construction. State and local sponsorship have carried this effort to non-Federal sites. This effort has moved the State of New Jersey to number one in the nation in terms of the percentage of the shoreline under nourishment contracts and in terms of obtaining Federal dollars for beach restoration.

The legacy of having private ownership of the beach has proved to be a thorn in the side of future beach nourishment in areas pending because private ownership frequently extends to the Mean High Tide Line in New Jersey. The original private developers held thousands of feet of coastal property, but with subdivisions to create 50 to 100-foot wide lots for individual homes, the number of properties within a prospective beach restoration project makes obtaining signed easement documents nearly impossible. Owner resistance varies from reluctant to militantly against allowing the project to proceed on their piece of the beach. Experience has shown that a few antagonistic property owners can sabotage a major project in spite of the enormous economic benefit to the municipality as a whole. Litigation takes time and money and the Federal agency (ACOE) insists that real estate problems are the responsibility of the local sponsor of a project. A Court decision has forced the NJDEP to re-evaluate their public access goals especially in sections of the NJ coast primarily devoted to private single family homes at the shoreline. Public funding for shore protection has many public benefits beyond saving expensive private homes at the beach. The health of the NJ beach economy depends on making investments in all of it over time if the State desires to maximize the benefits to, utilization by, and revenue stream this part of the State’s environment provides to its citizens.

STORM EVENTS IN 2009-2010:

The 2009-2010 winter storm season began on September 5-6, 2009 and nine storm events followed with two of the storms causing significant damage to the shoreline. The worst occurred November 11-15, 2009 and lead to a Presidential Disaster Declaration (DR-NJ 1867) by the Federal Emergency Management Agency (FEMA). The effects became worse further south along the coast. Storms continued in February and March 2010 as El Nino effects kept the northern Pacific Ocean in storm mode all winter. A second northeast storm between March 11 and 14, 2010 received a Presidential Disaster Declaration (DR-NJ 1897) on April 2, 2010. After this event, the storms stopped and summer-style recovery and accretion commenced. In September 2010, two hurricanes (Earl and Igor) passed about 500 miles seaward of the NJ coast and provided several days each of long-period, large swell that moved more sand than usual back to the beach. This was a positive response because the beaches had become narrower from the offshore movement of sand during the numerous 2009-2010 storm events. The storm-generated littoral currents moved material south and eroded the beaches on the south side of each tidal inlet. Dunes lost sand with some scarps reaching the crest of the existing dune. Several homes on Long Beach Island were left standing on the wet beach at low tide requiring emergency authorization of funding replacement sand supplies. Quarry sand was hauled to the Borough of Avalon to restore the dune between 17th and 21st Streets. Two large NJ State/local beach projects suffered multi-hundred thousand cubic yard sand losses in The Township of Upper and North Wildwood. Both of these projects were completed in 2009, with the contractor forced off the site prior to finishing the last 40,000 cy of the contract in the City of North Wildwood.

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New Jersey Beach Profile Network

Monmouth County

**Raritan Bay and Sandy Hook
to Manasquan Inlet**

**NJBPN Profile #'s
187 - 256**

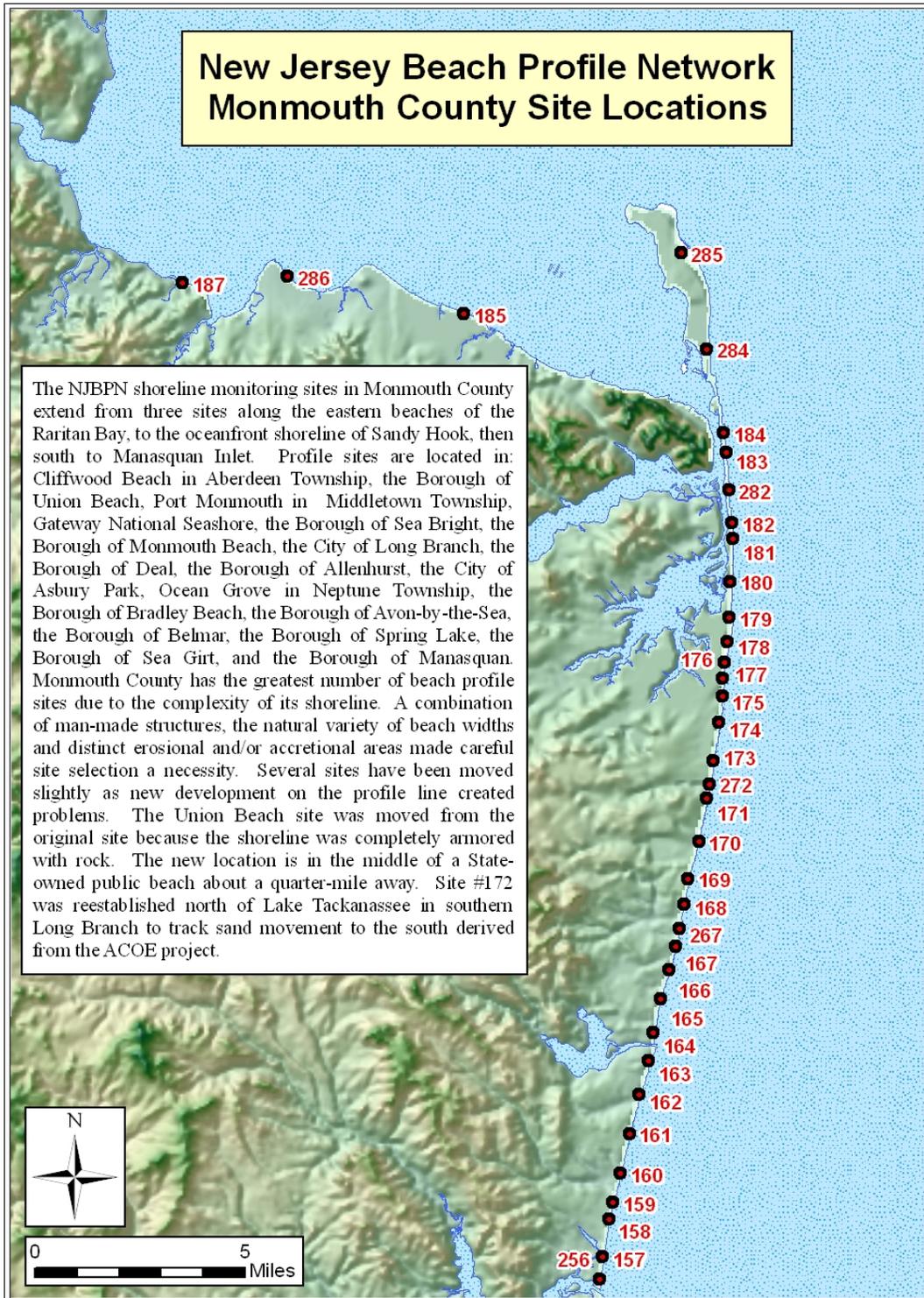


Figure 1. Location map for the 36 NJBPN profiles in Monmouth County, NJ

MONMOUTH COUNTY SPRING 2009 to FALL 2010

Monmouth County contains 36 profile stations, making it the most densely surveyed county. There are three sites along the Raritan Bay shoreline and the complexity of coastal construction along the Atlantic shoreline demanded a greater number of profile stations to cover the variety of coastal shoreline features present in the county. The profile station pages contain two photographs and four survey plots that show changes from Spring 2009 to Fall 2010. This year a site was added to the Monmouth County database and it replaces Site 172 which was lost when a major project was built on the original site in southern Long Branch. The new site is located just north of Lake Tackanasee in Long Branch (Site 272).

Monmouth County received the benefit of the largest, most expensive and most comprehensive beach nourishment project ever in the United States beginning in 1994. Completed by the New York District Army Corps of Engineers (ACOE) for \$210,000,000, this project continued in three phases until the year 2000. In all, 21 miles of the county shoreline were restored with a 100-foot wider berm and a dune system built in all locations where practical (a total of 6.1 million cubic yards of sand). The only gaps in the entire project where no sand was placed on the beaches were in the communities of Loch Arbor, Allenhurst, Deal and Elberon because these communities would not provide the necessary real estate easements from owners. This fact divides the restored shoreline into two filled segments: one from the Sandy Hook National Seashore south to the Long Branch/Elberon boundary; then no fill to the Asbury Park boundary; and the second segment from Asbury Park to the Manasquan Inlet. The National Park Service also piggybacked onto the Federal project operations and placed sand onto the erosional zone within the Sandy Hook Park boundary, thus adding to the length of the fill.

Maintenance fills have been completed following two strong storms in 1998, hot-spot erosion in Monmouth Beach in 1997 and 2002, and in southern Long Branch in March 2009. The southern Long Branch project extended south of West End Avenue and north toward Broadway Avenue. Funds in the amount of \$2,961,000, \$3,305,000 and \$1,316,000 were appropriated for Fiscal Years 2006, 2007 and 2008, respectively. This funding was used to design and construct approximately 2400 linear feet of beach re-nourishment in South Long Branch. Since completion in 2001, the southern segment (Asbury to Manasquan) has not required maintenance.

TREND ANALYSES:

Selected locations were chosen to review trends in shoreline changes. The trend analysis for Site 187 in Aberdeen, one of the three Raritan Bay profile locations, demonstrates the difference in how coastal processes work when fetch is limited. The small size of the waves creates little changes to the offshore bathymetry. Site 181 in Sea Bright shows the changes to the Atlantic shoreline where the Federally-funded beach fill was placed in 1995. All losses were restored in 2002 bringing the net increase in sand volume to just over 200 cy/ft. Since 2002 there have been steady losses of sand (approximately 120 cy/ft) from the placement volume over the past 9 years.

Site 179, Cottage Road, in Monmouth Beach has been an enigma due to persistent, rapid loss of sand deposits. Observations made the past two years may lead to possible reasons. There is a massive stone groin protecting the Monmouth Beach Club property positioned about 500 feet south of this site. In the absence of northeast storms the dominant littoral currents are directed to the north, so the sand moves north away from the groin and the Cottage Road site and is not being replaced by significant material traveling north around the groin. By the Fall 2009 survey the site was devoid of sand, the dune was gone and the beach was wet at low tide, not far from the conditions existing here prior to the beach fill. Following the 2009-2010 winter storm season sand had reappeared as a dry beach fronting the rocks, a minimal, but significant improvement when

compared to the Fall 2009 survey situation. The littoral currents were reversed by the northeasters and were increased in magnitude during the storms. However, the groin protecting the Beach Club served to impound the sand and did not allow sediment to pass further south and the profile site beach accumulated sand during the period of severe weather. If this is the case, this location will be a perpetual “Hot Spot” for erosion.

The southern segment of the ACOE project has weathered the 2009-2010 storm events very well. The beach at Site 167 in Asbury Park gained sand volume in 4 of 10 years which allowed the beach to maintain its appearance and storm resistance for a decade without need for maintenance. At Site 160, Salem Avenue in Spring Lake, sand volume increased for over a decade following the initial sand placement. Then, three years of continuous loss dragged the total volume below that placed by the ACOE. However, the site continues to maintain a healthy profile 13 years after the project was completed.

This trend is true from Asbury Park south to Manasquan, NJ. Loss from the southern Monmouth County fill section that moved to the north has benefited Loch Arbor and the Borough of Allenhurst as sand slowly moved north around the northern Asbury Park groin into the short shoreline cell containing these two municipalities. An extensive groin complex built at the Allenhurst – Deal boundary prevents sand movement into the Borough of Deal. Likewise, 13 years of observations have shown that little sand has moved south into Elberon or Deal from Long Branch (Pullman Ave., Roosevelt Ave., and Darlington Ave. sites). The groins and shoreline armor stone remain the line of storm defense for this shoreline segment. Had the ACOE project been finished through this area, these groins would have retained much of the sand, but issues similar to that seen in Monmouth Beach (Site 179) could be expected around the largest of the rock groins along this shoreline. Though there was a substantial loss of sediment from the beaches of Monmouth County in the 2009-2010 winter storm season, the county remains over 13 million cy of sand above the amounts in the 1993 beaches (Figure 7).

Thus far no significant funding has been appropriated to conduct maintenance beach nourishment projects for Monmouth County. The NY District ACOE pieced together the funding package to maintain the Long Branch segment in 2009. There are planning documents in progress to add sand to the Monmouth Beach erosional hot spot (Site 179), but no time table for construction has been announced. No other beach restoration projects have been authorized by local municipal governments. Sea Girt commenced designing and building a dune system to augment the level of storm protection and prevent sand from blowing into Ocean Avenue. Thus far Belmar has not seen fit to build a dune system along its oceanfront. The Ocean Grove and Bradley Beach dunes have done well with periodic maintenance tailored to reduce excess height development or encroachment into the parcels landward of the dune alignment.

The Raritan Bay shoreline continues to erode slowly at two of the three sites with no impact seen below a depth of 2 feet in the bay due to short-period, low-amplitude waves breaking on the shoreline. Monmouth County parks system is preparing to restore the scrap and rubble-core dune along the park shoreline at Site 185. The New York District ACOE has plans in various states of readiness for Port Monmouth, Leonardo (flooding), Union Beach, Highlands (flooding) and Keyport (flooding) shorelines and associated low-lying areas. These projects have been authorized by the WRDA of 2007, but no appropriations have come from Congress to proceed to construction. These five Raritan Bay projects have the majority of the funds slated for flood abatement and storm surge associated with strong northeast storms.

24-Year Sand Volume Changes at Site 187, Cliffwood Beach, Aberdeen

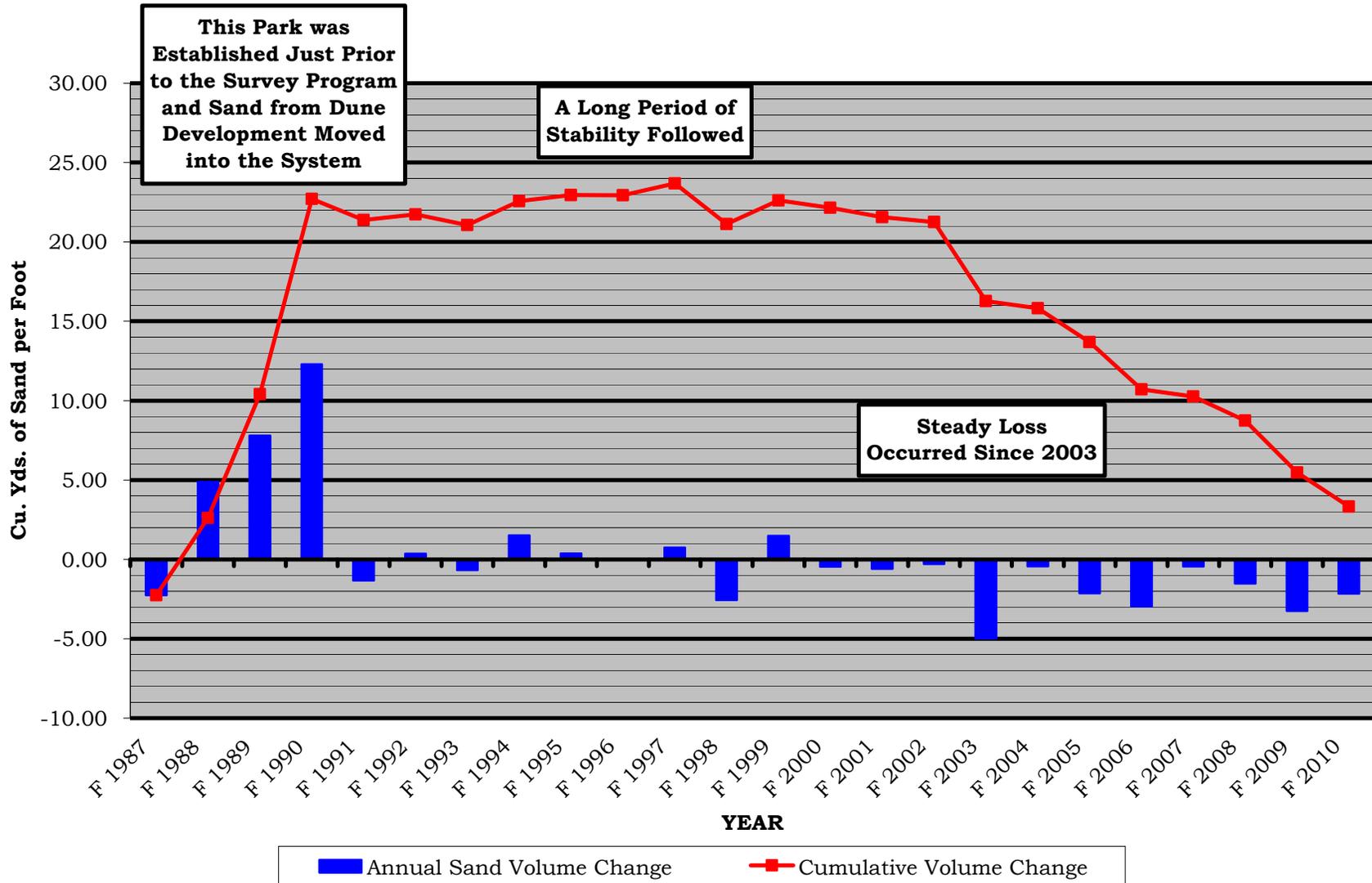


Figure 2. There are three sites along the eastern Raritan Bay shoreline in Monmouth County where Cliffwood Beach is the westernmost of the three. Located in a park created just before the establishment of the NJBPN program, the sand available in the system added to the beach/dune system during the three years following the initial pair of surveys. During the next 12 years the shoreline was stable in spite of northeast storms and other events. In 2003 a slow sand loss commenced that has reduced the sand volume to nearly that present in 1986.

24- Year Sand Volume Changes at Site 181, Municipal Lot, Sea Bright

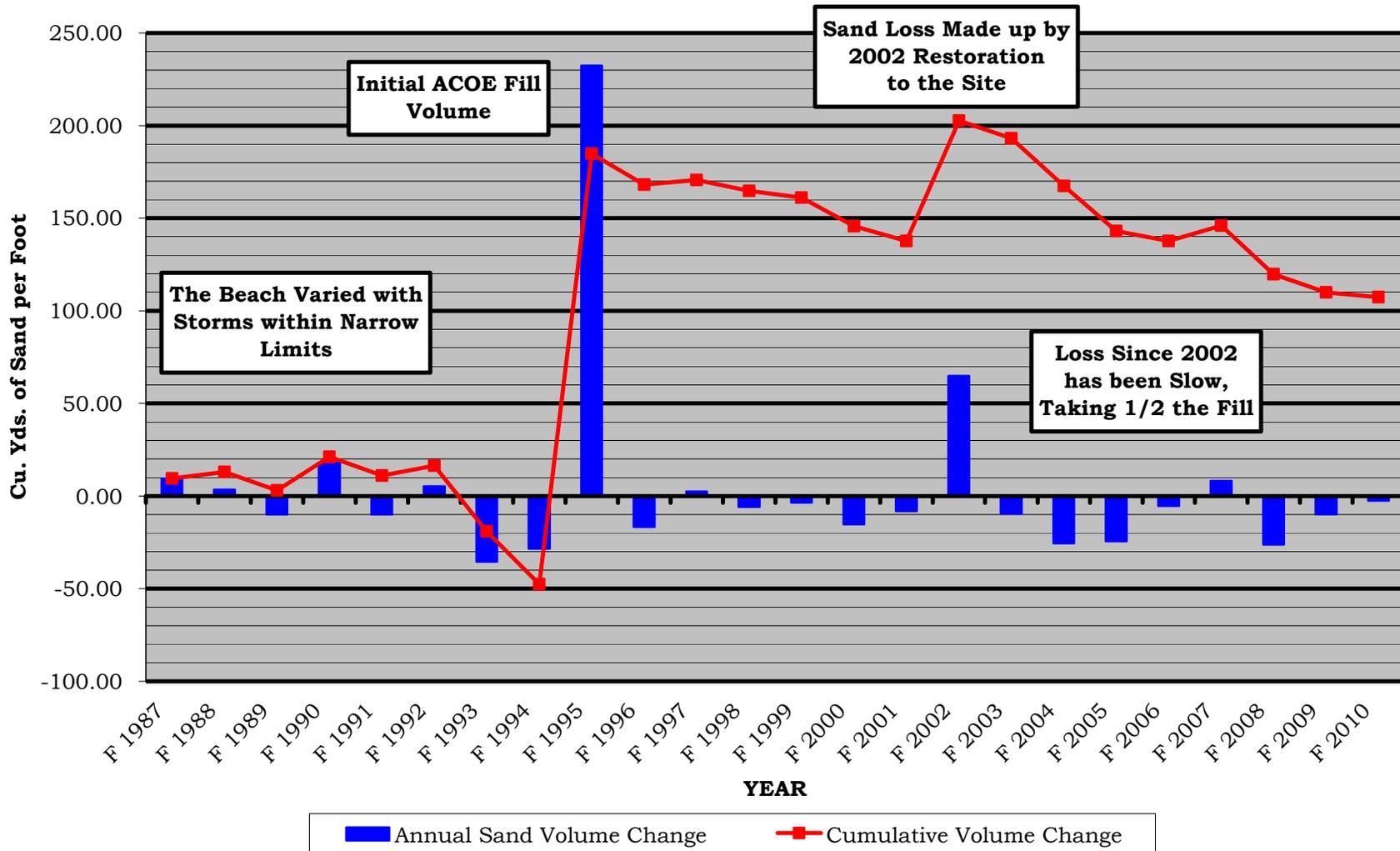


Figure 3. This site was added in order to show the retention rates of the northern Sea Bright beaches for the ACOE project sand deposits. Placed in 1995, the shoreline lost material, but was restored in 2002 to levels exceeding the initial deposit. Seven of the past eight years saw loss rates that have nearly reduced the 200 yds³/ft. to half that amount. Sand lost from Sea Bright ends up in Sandy Hook adding to the National Seashore beach.

24- Year Sand Volume Changes at Site 179, Cottage Road, Monmouth Beach

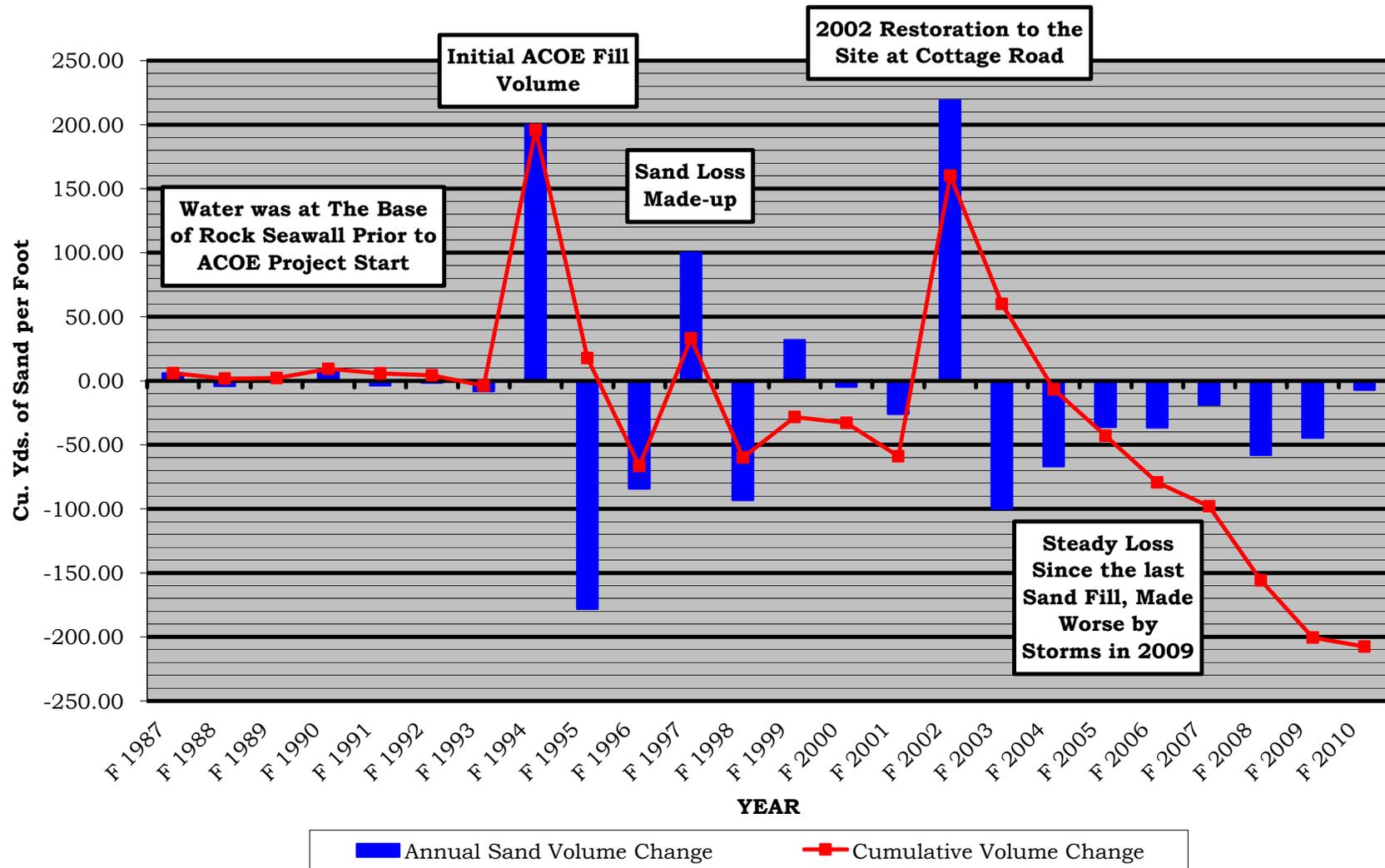


Figure 4. Site #179 at Cottage Road in Monmouth Beach initially had several feet of water at the seaward base of the seawall rocks prior to the ACOE project starting in 1994. A high initial loss rate forced The ACOE to make up the deficit in 1997 followed by maintenance work in 2002. Chronic losses continue because the groins once the sole protection for the Monmouth Beach Club now prevent sand from reaching this site from the south. The smaller 2010 loss is due to NE storms moving sand south to the groin, reversing the trend this year.

24- Year Sand Volume Changes at Site 167, 3rd Avenue, Asbury Park

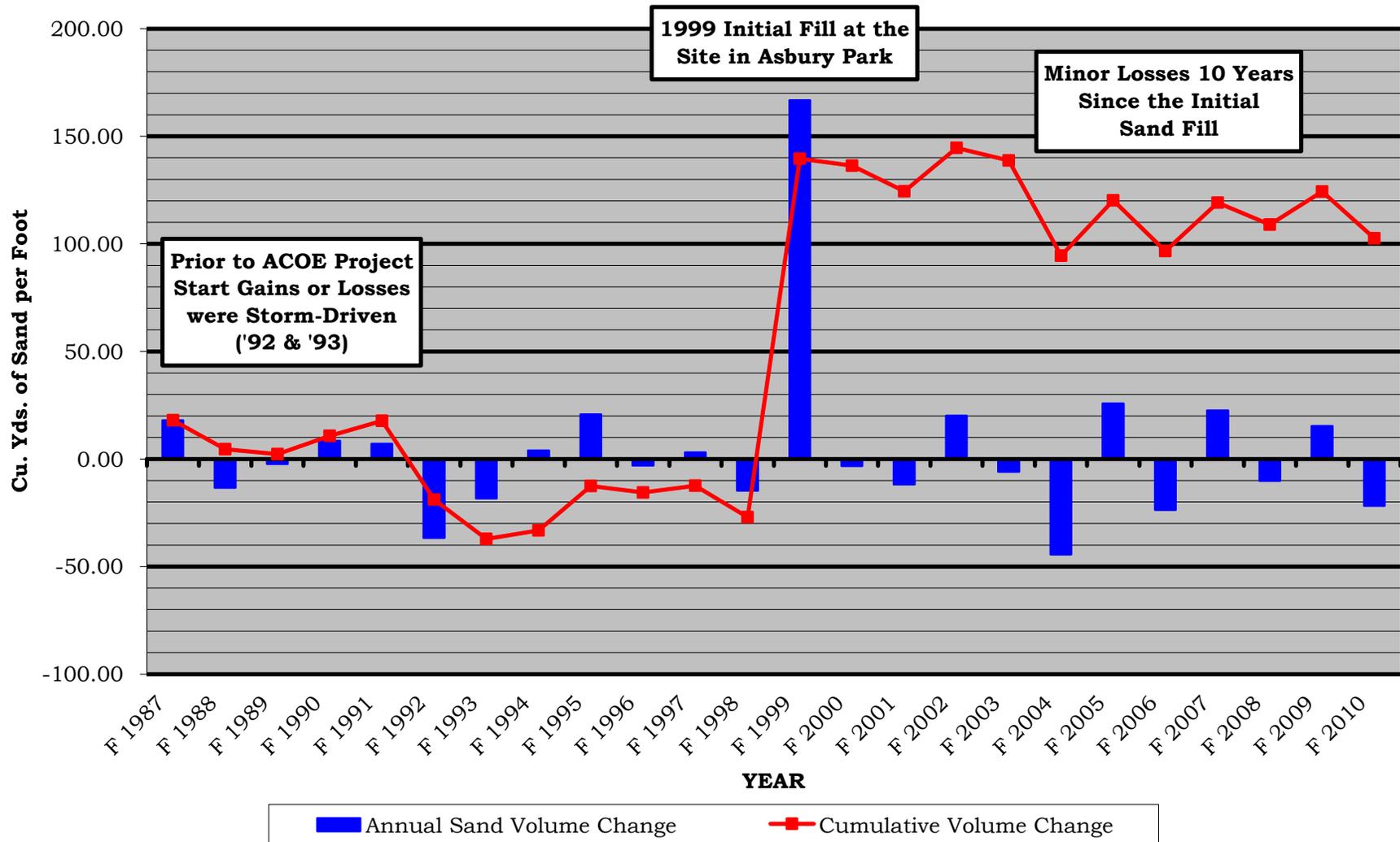


Figure 5. The Third Avenue location in Asbury Park received the Federal beach nourishment in 1999. No additional work has been required since. Four of the eleven years since saw additional natural accretion that helped keep the beach near the ACOE sand placement volume seen in 1999. The fall 2009 survey preceded the majority of the northeast events so those losses are reflected in the decline in 2010.

24- Year Sand Volume Changes at Site 160, Salem Avenue, Spring Lake

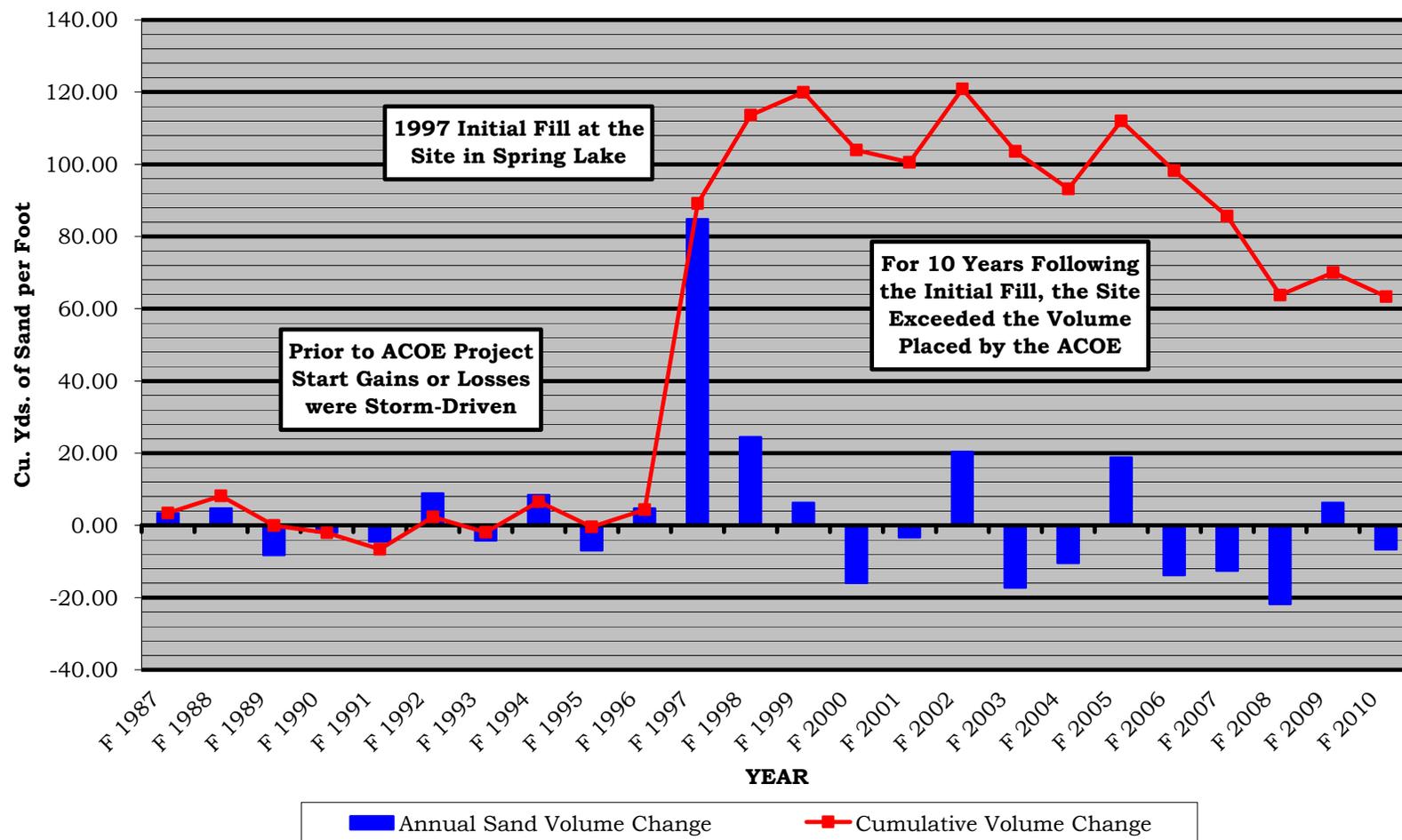


Figure 6. This is another site selected to show the relative stability of the southern fill sector in Monmouth County. The fill volume of 85 yds³/ft. completed in 1997 was followed by 5 of 13 years with sand added to that placed in 1997. For a decade the site maintained an excess volume of sand over that placed by the ACOE. 2008 took the biggest bite out of the sand supply with a partial recovery in 2009. That survey in 2009 preceded most of the northeast storms which are reflected in the decline shown between the fall of 2009 and 2010.

ANNUAL & CUMULATIVE OCEANFRONT SHORELINE SAND VOLUME CHANGES, MONMOUTH COUNTY 1987 to 2010

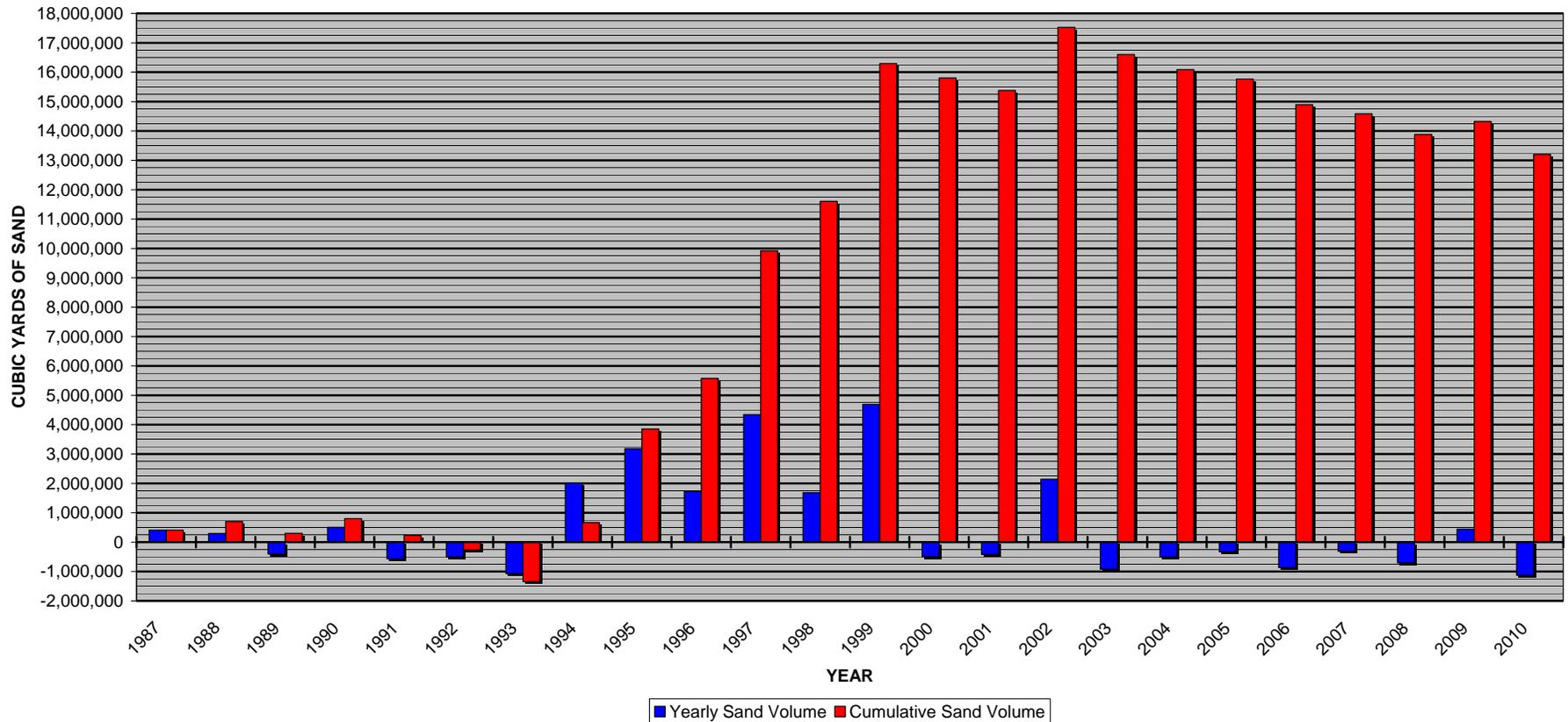


Figure 7. The final bar graph illustrates the trend and each year’s average sand volume change for all 36 of the Monmouth County survey sites. Between 1994 and 1999 the ACOE project was underway along 21 miles of the county shoreline adding 140 yds³/ft. in average cumulative sand volume to the county’s beaches. Storm recovery work in 1997 and maintenance work performed in 2002 added sand to portions of the project, but no new sand was placed until 2009’s work in Long Branch. The El Nino year of 2009 and 2010 shows up as a substantial loss (-1,127,027 cubic yards) in the 2010 comparison because most of the surveys were complete prior to the November 2009 storm. The county remains as the graph shows, over 13,190,000 cubic yards of sand ahead of the 1993 situation. If the peak value of 17,500,000 cubic yards from 2002 represents 100% of the fill volume, then 75.4% of the sand pumped still resides on Monmouth County beaches 16 years after this project started. This graph is only based on those sites receiving sand and does not count the material that flowed north into Sandy Hook National Seashore. The Gunnison Beach site #285 has gained an average of 19.01 yds³/ft. since 1995 or 304.16 yds³/ft. for each foot of shoreline near that site. The 2.5 mile distance between #285 and #284 where the average gain was 5.18 yds³/ft. would have accumulated 2,554,464 cubic yards of sand over the 16 years since the project was completed. The combination of the Sandy Hook gain with the residual sand accounts for 90% of the ACOE fill volume and only includes half the Sandy Hook shoreline.



Figure 8. Aerial view of Gunnison Beach in the Sandy Hook National Seashore. This shoreline has been accretional since the NY District Corps of Engineers completed its beach restoration in Monmouth County in 1999. Sand moves north along the Sandy Hook shoreline adding to the northern spit that curves into New York Harbor. The average sand volume increase between the two profile sites in the park (5.18 yds³/ft.) multiplied by the distance in feet between the two sites provides a total accretional volume of sand nearly equal to the loss volume experienced along the 21 miles of nourishment project shoreline (2,554,464 cubic yards). Views such as this are now available from Bingmaps.com if you select the oblique aerial view. The profile location is indicated by the red arrow. The back portion of the beach is an array of incipient dunes and minor dune ridges due to the extensive width of the berm.

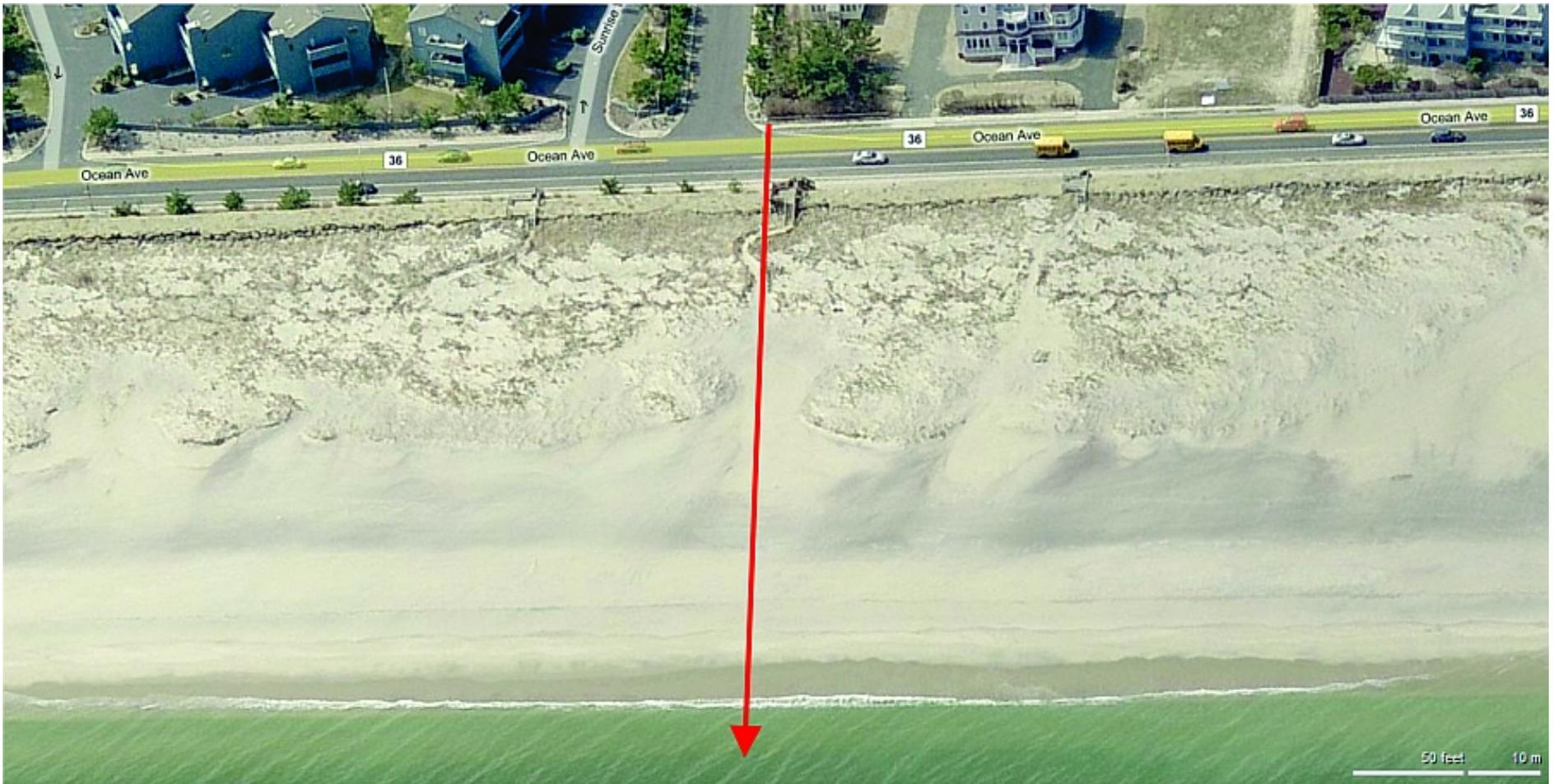


Figure 9. Sunrise Court along NJ Route 36 in Sea Bright, NJ. Prior to the beach restoration, the ocean was at the rock seawall that was defending the highway until 1998. The rocks are still present, but today a substantial beach exists seaward of the wall. The profile line is indicated by the red arrow. No effort was expended in building a dune system, but one developed anyway. The combination of no view from the highway, and a lack of public parking have made this stretch of beach one of the best-kept secrets on the NJ shoreline. During the bathing season the occasional visitor will encounter a few fishermen, several folks walking their dogs, and maybe a serious jogger during any time of day.

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CLIFFWOOD BEACH - SITE 187

Photo taken December 14, 2009. View to the east.



Shoreline retreat exposed an old timber structure on the beach in 2007 and continued in 2008.

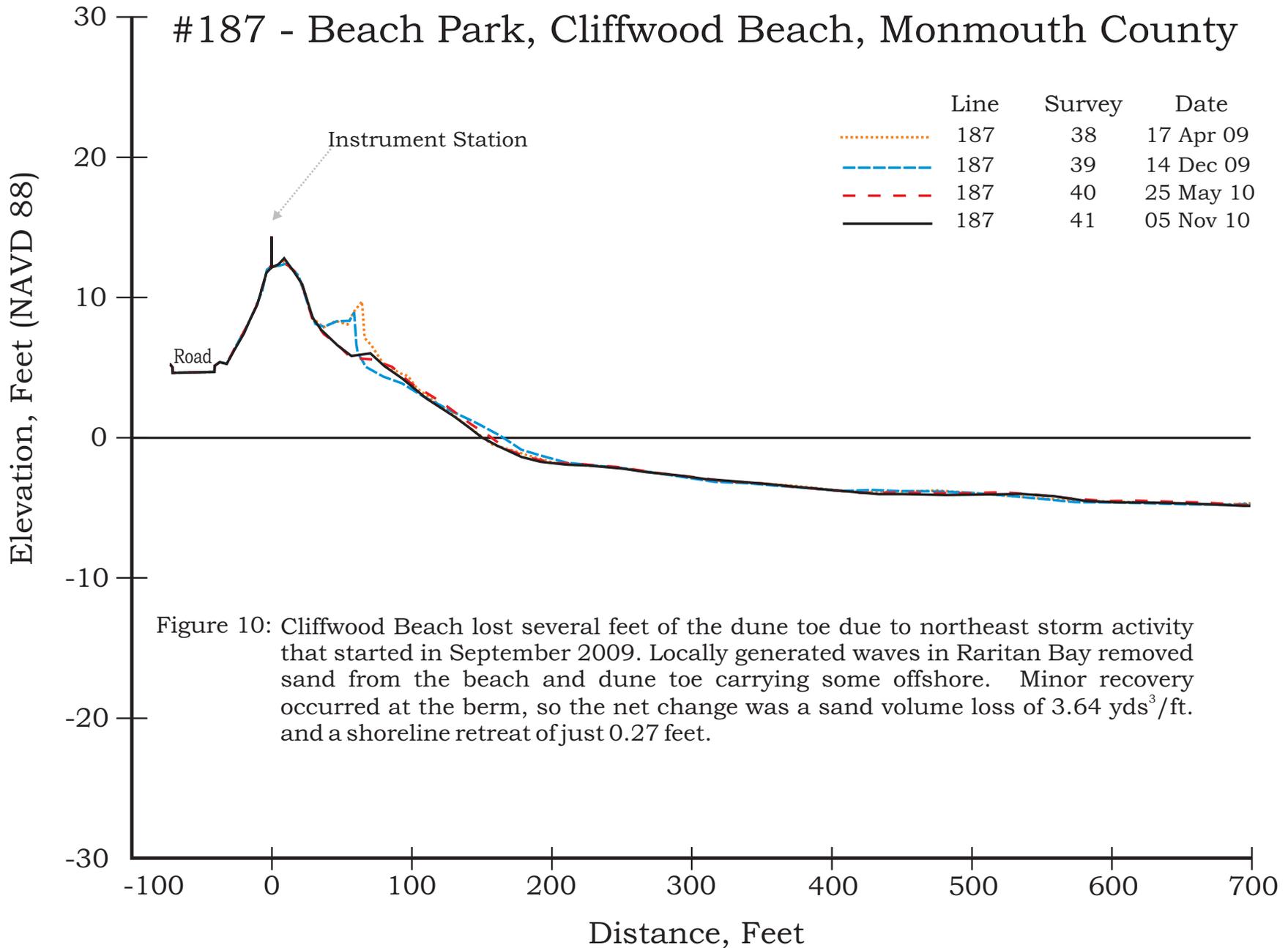
Photo taken November 5, 2010. View to the east.



Comparing the profiles over the year, the profile location lost volume (-2.16 cu yd/ft) and the shoreline moved landward (-14.77 ft). Raritan Bay northeast storm waves cut into the dunes and pushed back the beach.

New Jersey Beach Profile Network

#187 - Beach Park, Cliffwood Beach, Monmouth County



UNION BEACH - SITE 286



Photo taken December 14, 2009. View to the east.

After discussions with the NJDEP, former site 186 was abandoned and a new one was established about a quarter mile to the northwest along the shoreline to a public bathing beach so that more normal shoreline changes could be followed. This new site was established in 2009 and is near the intersection of Beach and Front Streets in Union Beach. The orange fencing on the beach appears to be designed to prevent sand from blowing onto the parking/roadway area during the winter.



Photo taken November 5, 2010. View to the east.

Comparing the profiles over the year, the profile location lost volume (-2.05 cu yd/ft) and the shoreline moved seaward (0.45 ft).

New Jersey Beach Profile Network

#286 - Beach Street, Union Beach, Monmouth County

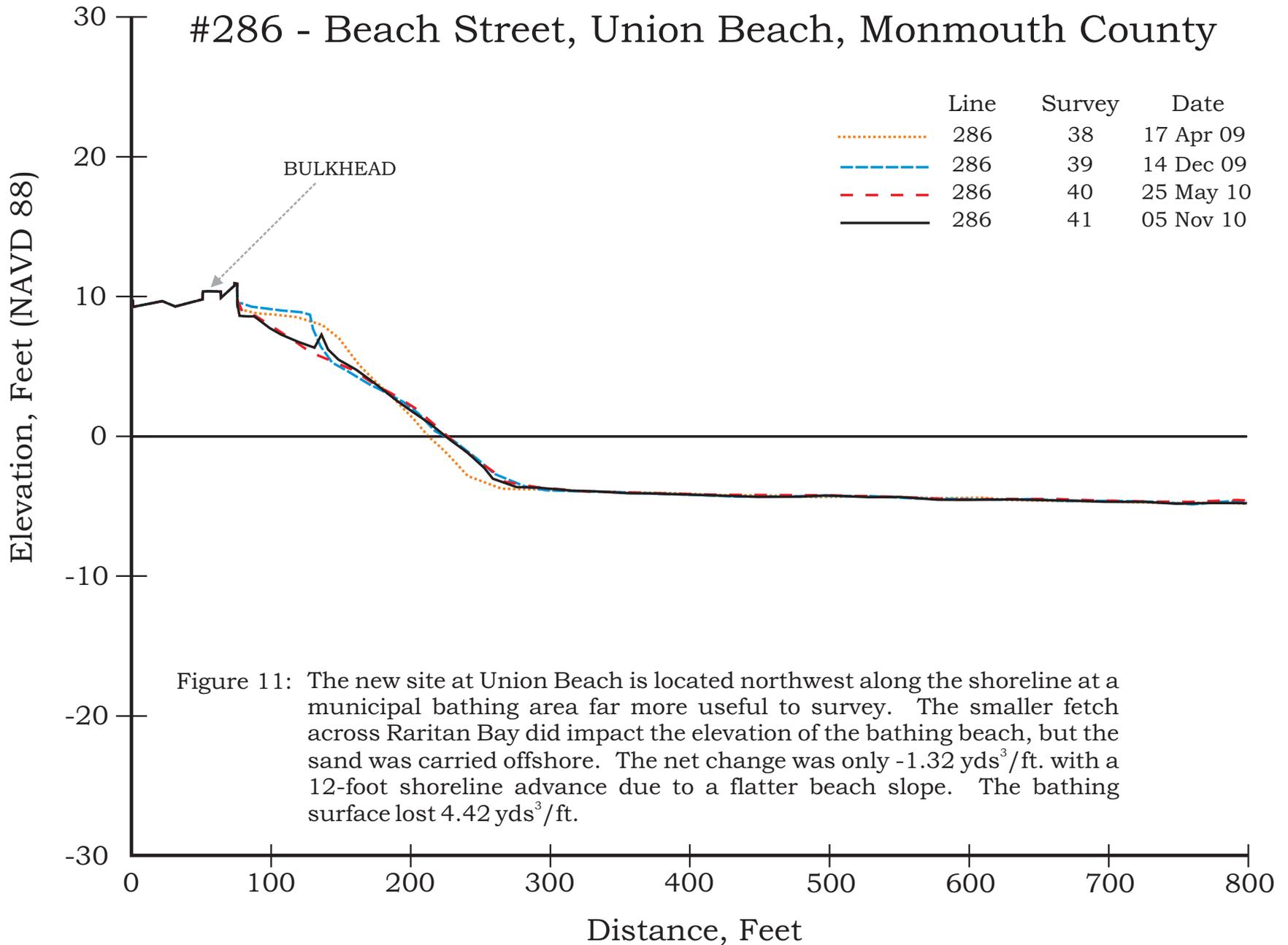


Figure 11: The new site at Union Beach is located northwest along the shoreline at a municipal bathing area far more useful to survey. The smaller fetch across Raritan Bay did impact the elevation of the bathing beach, but the sand was carried offshore. The net change was only $-1.32 \text{ yds}^3/\text{ft}$. with a 12-foot shoreline advance due to a flatter beach slope. The bathing surface lost $4.42 \text{ yds}^3/\text{ft}$.

SPY HOUSE MUSEUM - SITE 185



Photo taken December 14, 2009. View to the west.

Northeast storms cut away at the dune as the beach retreated before the erosion produced by the waves generated on Raritan Bay.

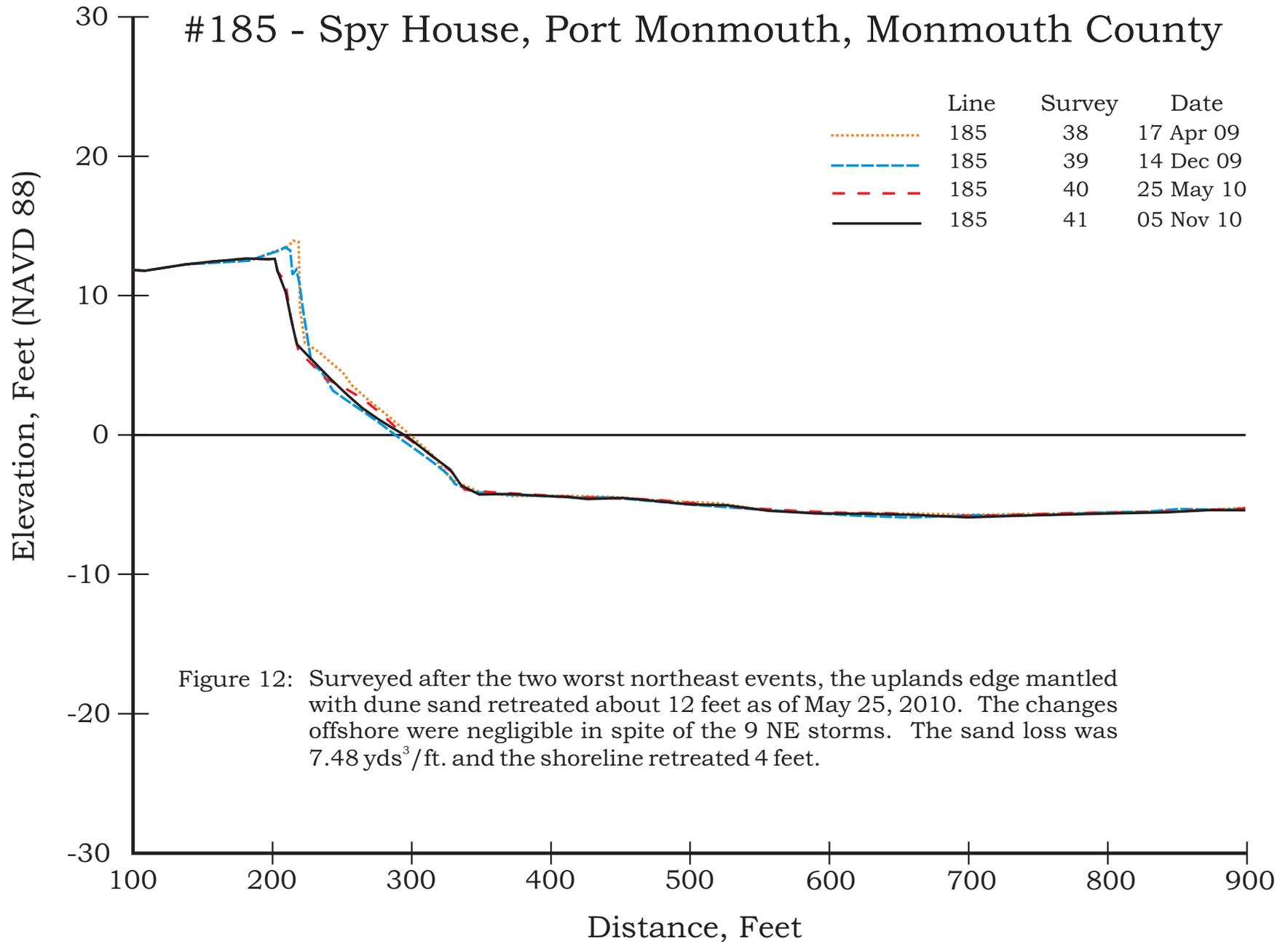


Photo taken November 5, 2010. View to the west.

Comparing the profiles over the year the location lost volume (-2.32 cu yd/ft) and the shoreline moved seaward (6.61 ft).

New Jersey Beach Profile Network

#185 - Spy House, Port Monmouth, Monmouth County



SANDY HOOK NATIONAL SEASHORE - SITE 285



Photo taken November 3, 2009. View to the north/east.

The beach grows relatively continuously since the Federal project provided abundant material to move north to the end of Sandy Hook.

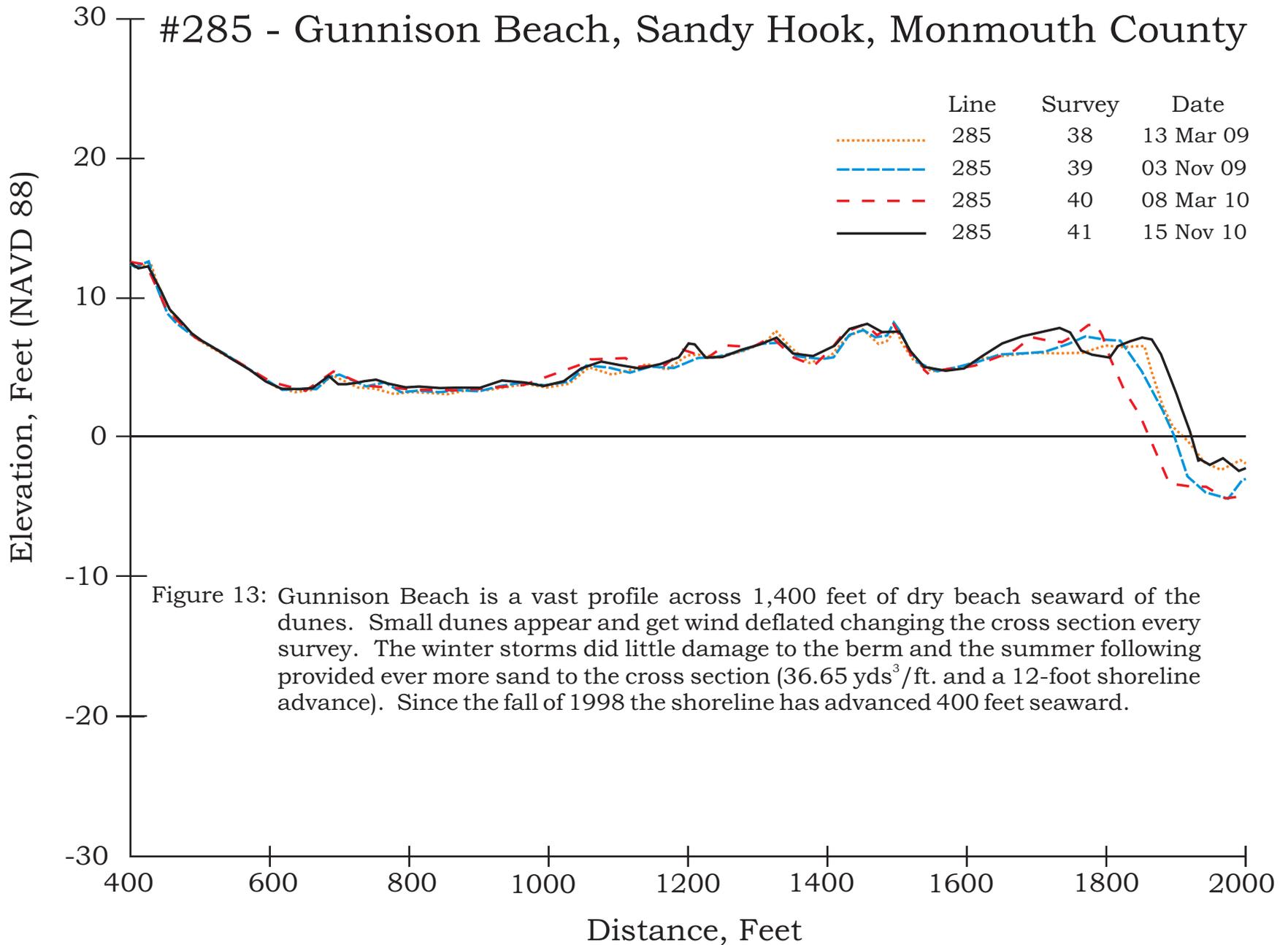


Photo taken November 15, 2010. View to the north/east.

Comparing the profiles over the year, the location gained in volume (32.04 cu yd/ft) and the shoreline moved seaward (24.41 ft).

New Jersey Beach Profile Network

#285 - Gunnison Beach, Sandy Hook, Monmouth County



SANDY HOOK NATIONAL SEASHORE, PARKING LOT E - SITE 284



Photo taken November 3, 2009. View to the south.

This site is sheltered from northeast waves by Long Island.

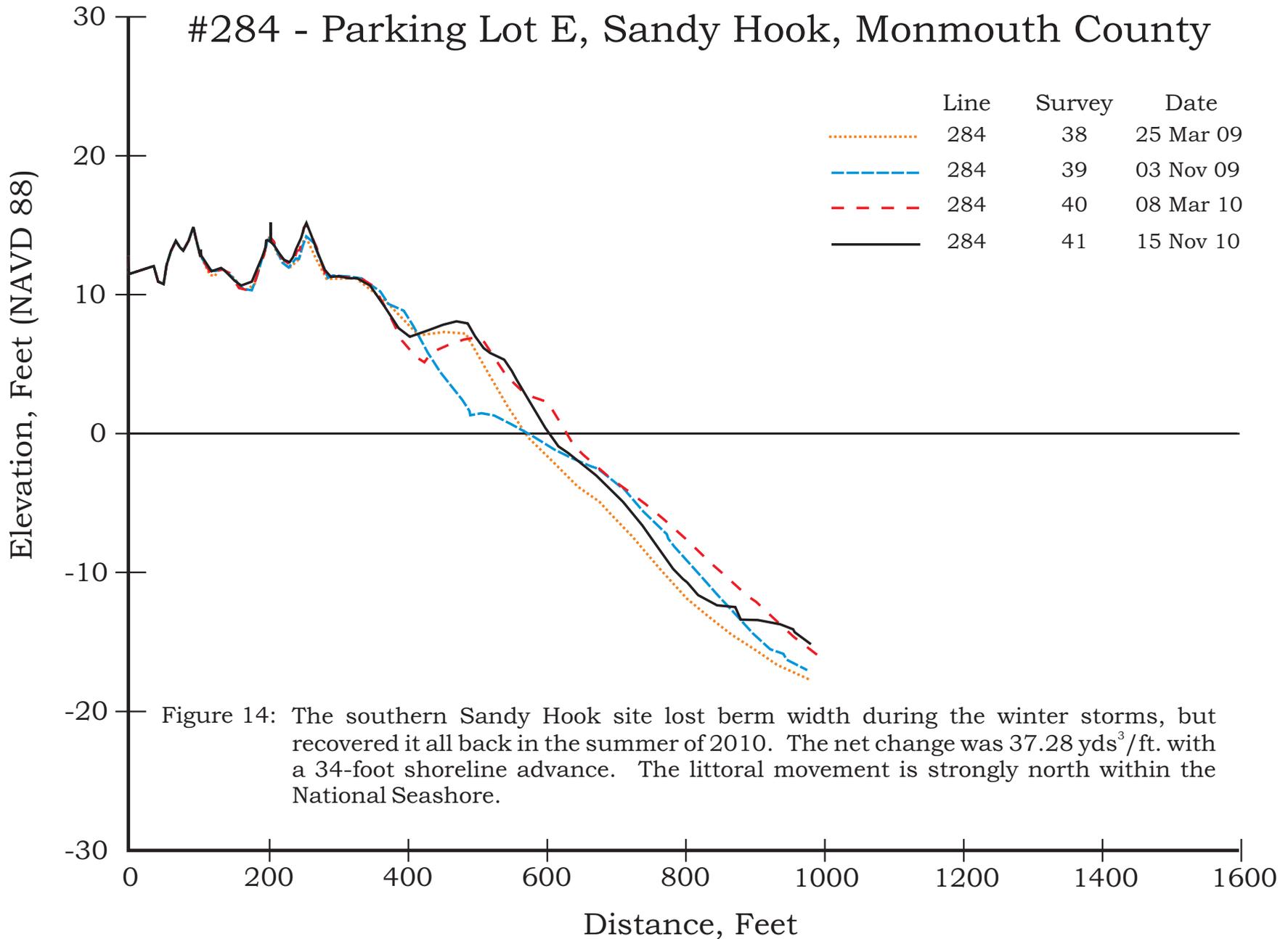


Photo taken . View to the south.

Comparing the profiles over the year, the profile location gained volume (22.52 cu yd/ft) but the shoreline moved seaward (30.56 ft).

New Jersey Beach Profile Network

#284 - Parking Lot E, Sandy Hook, Monmouth County



SANDY HOOK, HIGHLANDS BEACH - SITE 184



Photo taken November 3, 2009. View to the south.

This site is sheltered from northeast waves by Long Island.

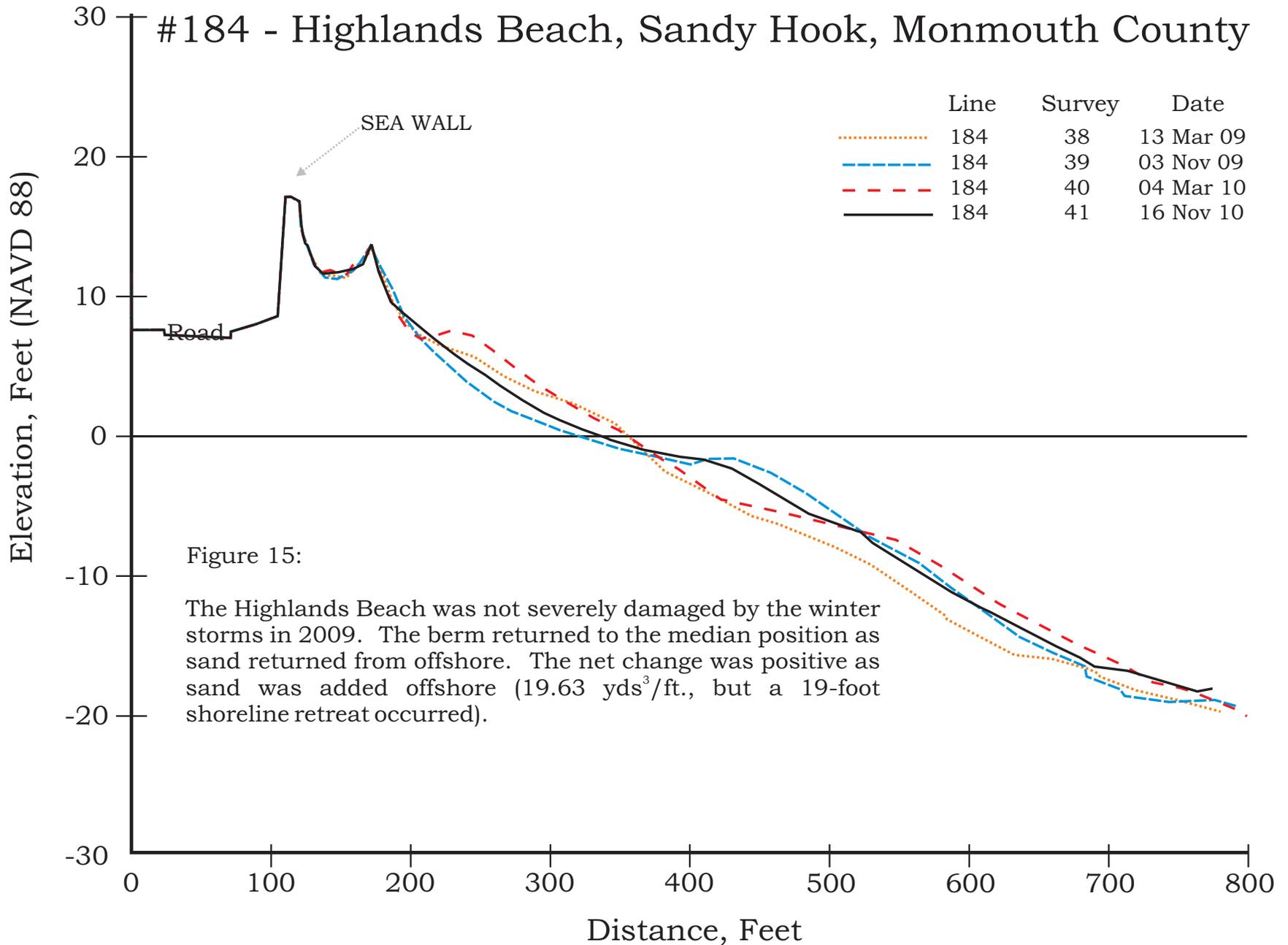


Photo taken November 16, 2010. View to the south.

Comparing the profiles over the year, the profile location gained volume (6.55 cu yd/ft) and the shoreline moved seaward (15.94 ft).

New Jersey Beach Profile Network

#184 - Highlands Beach, Sandy Hook, Monmouth County



VIA RIPA STREET, SEA BRIGHT - SITE 183



Photo taken December 14, 2009. View to the north.

This site has a natural dune that has been growing since 1998. A single line of fence was all that was established following the Federal project. Some loss occurred in the dunes due to the fall 2009 storms.

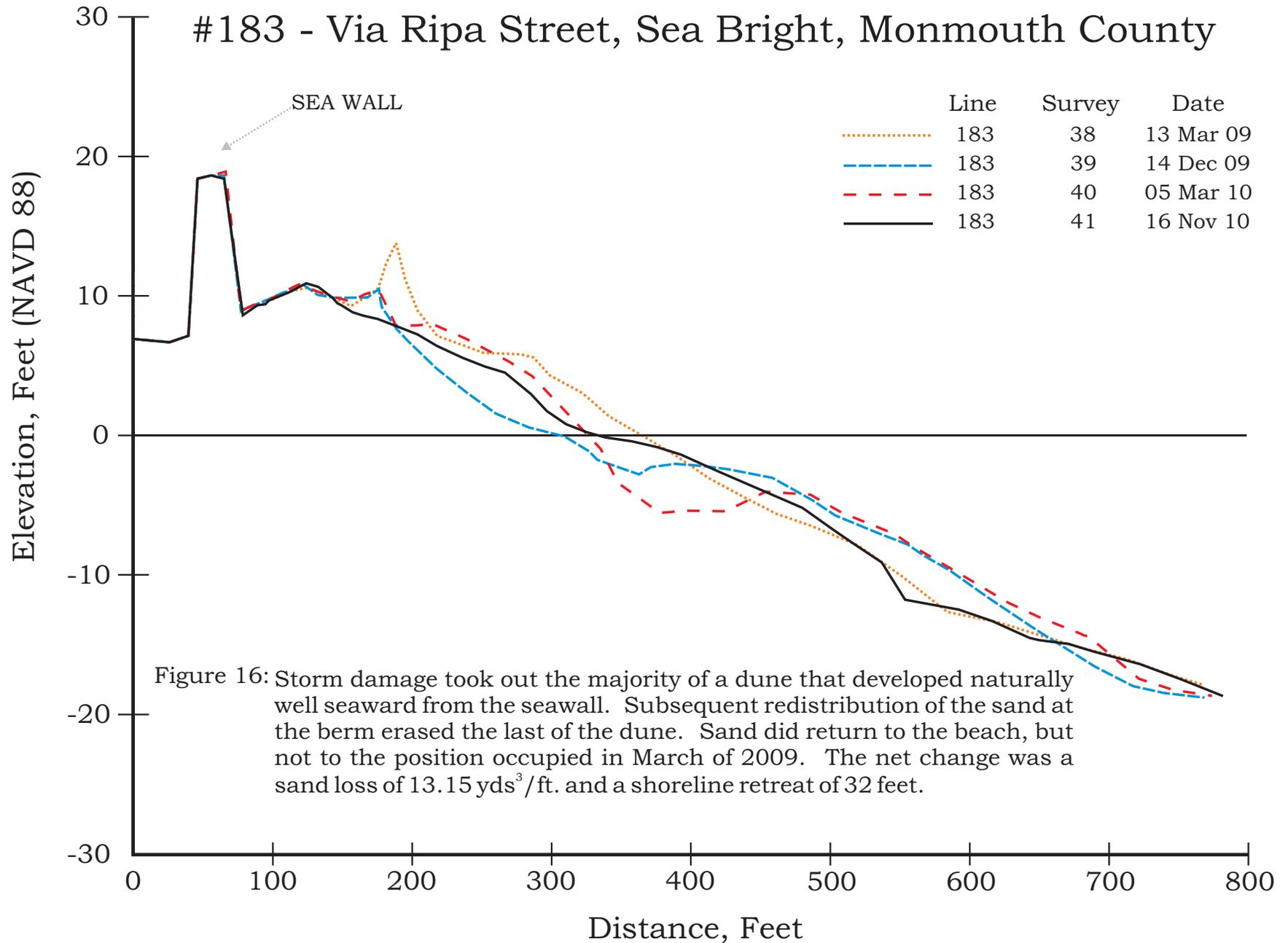


Photo taken November 16, 2010. View to the north.

Comparing the profiles over the year, the profile location gained volume (2.28 cu yd/ft) and the shoreline moved seaward (26.87 ft).

New Jersey Beach Profile Network

#183 - Via Ripa Street, Sea Bright, Monmouth County



SHREWSBURY WAY, SEA BRIGHT - SITE 282



Photo taken December 14, 2009. View to the north.

A sizable bar moved onto the beach in partial recovery following the November 2009 northeast storm.

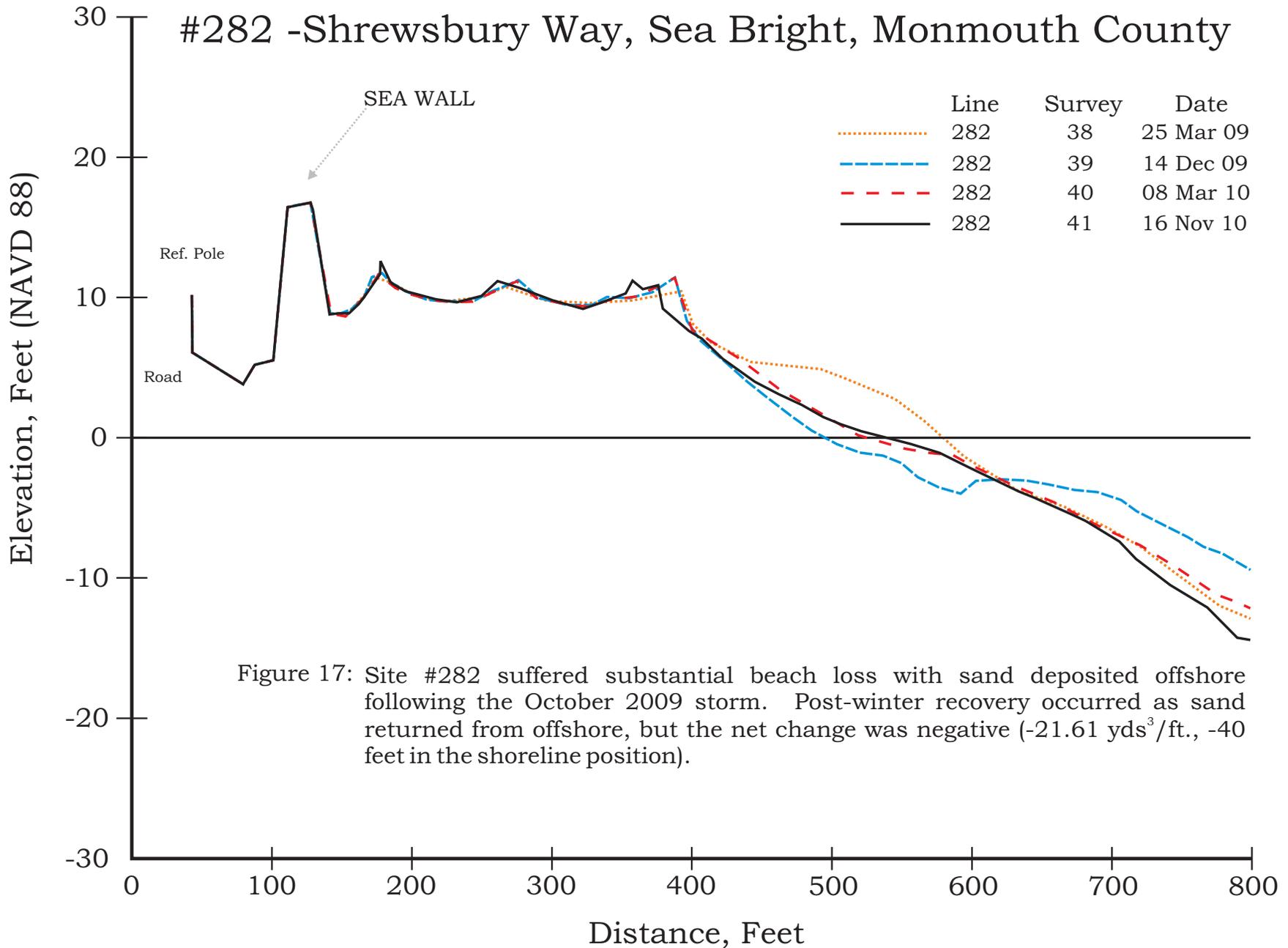


Photo taken November 16, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-19.16 cu yd/ft) and the shoreline moved seaward (44.2 ft). Most of the sand was lost below the 0.0 ft NAVD88 datum.

New Jersey Beach Profile Network

#282 -Shrewsbury Way, Sea Bright, Monmouth County



PUBLIC BEACH, SEA BRIGHT - SITE 182



Photo taken November 5, 2009. View to the south.

This small segment of public shoreline has maintained its general condition since the fill was completed over a decade ago.

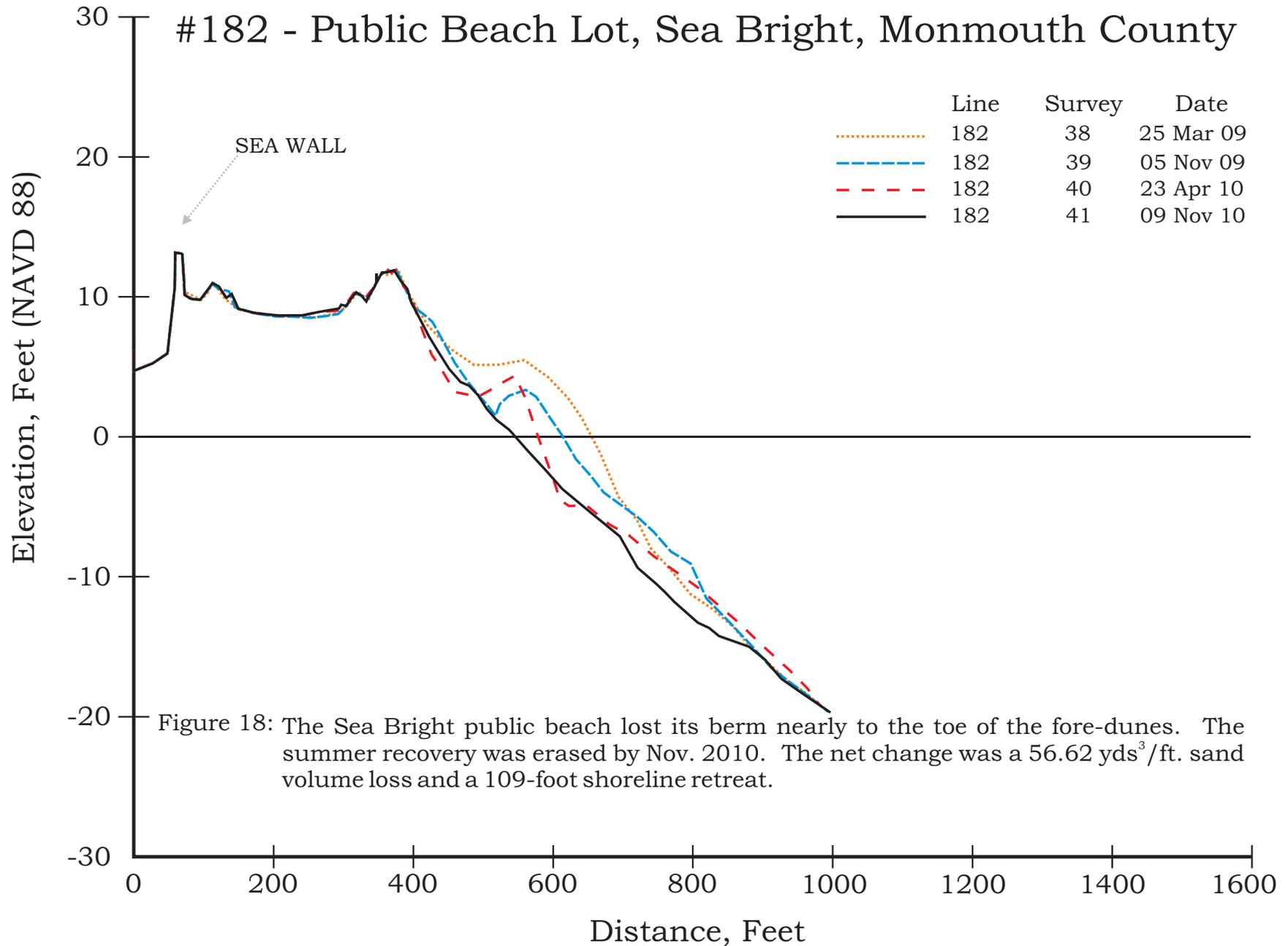


Photo taken November 9, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-41.0 cu yd/ft) and the shoreline moved landward (-68.18 ft).

New Jersey Beach Profile Network

#182 - Public Beach Lot, Sea Bright, Monmouth County



MUNICIPAL BEACH, SEA BRIGHT - SITE 181



Photo taken November 5, 2009. View to the north.

The entrance for bathers cuts through the dune system at this location. The beach has slowly retreated since 1996.

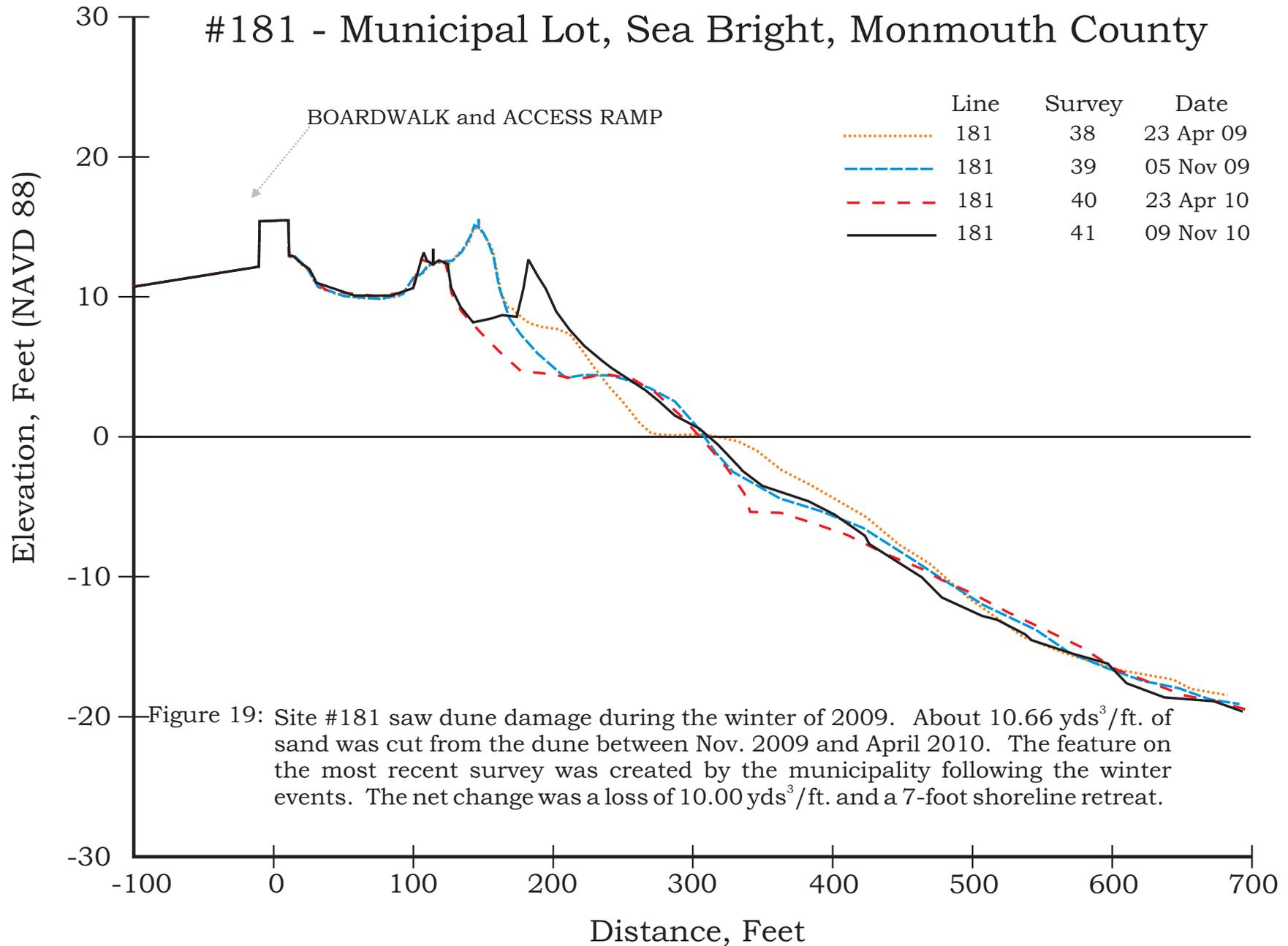


Photo taken November 9, 2010. View to the north.

In 2010, the town pushed sand up from the intertidal area to construct a dune. Comparing the profiles over the year, the profile location lost volume (-2.58 cu yd/ft) and the shoreline moved seaward (3.23 ft). Most of the sand was eroded from the offshore area.

New Jersey Beach Profile Network

#181 - Municipal Lot, Sea Bright, Monmouth County



SUNSET COURT, SEA BRIGHT - SITE 180



Photo taken November 5, 2009. View to the north.

Here, in contrast to Site 179 a short distance away, there is a decent beach and healthy dune system. There is a need for a maintenance fill or modification to the privately-owned structure causing the problem.

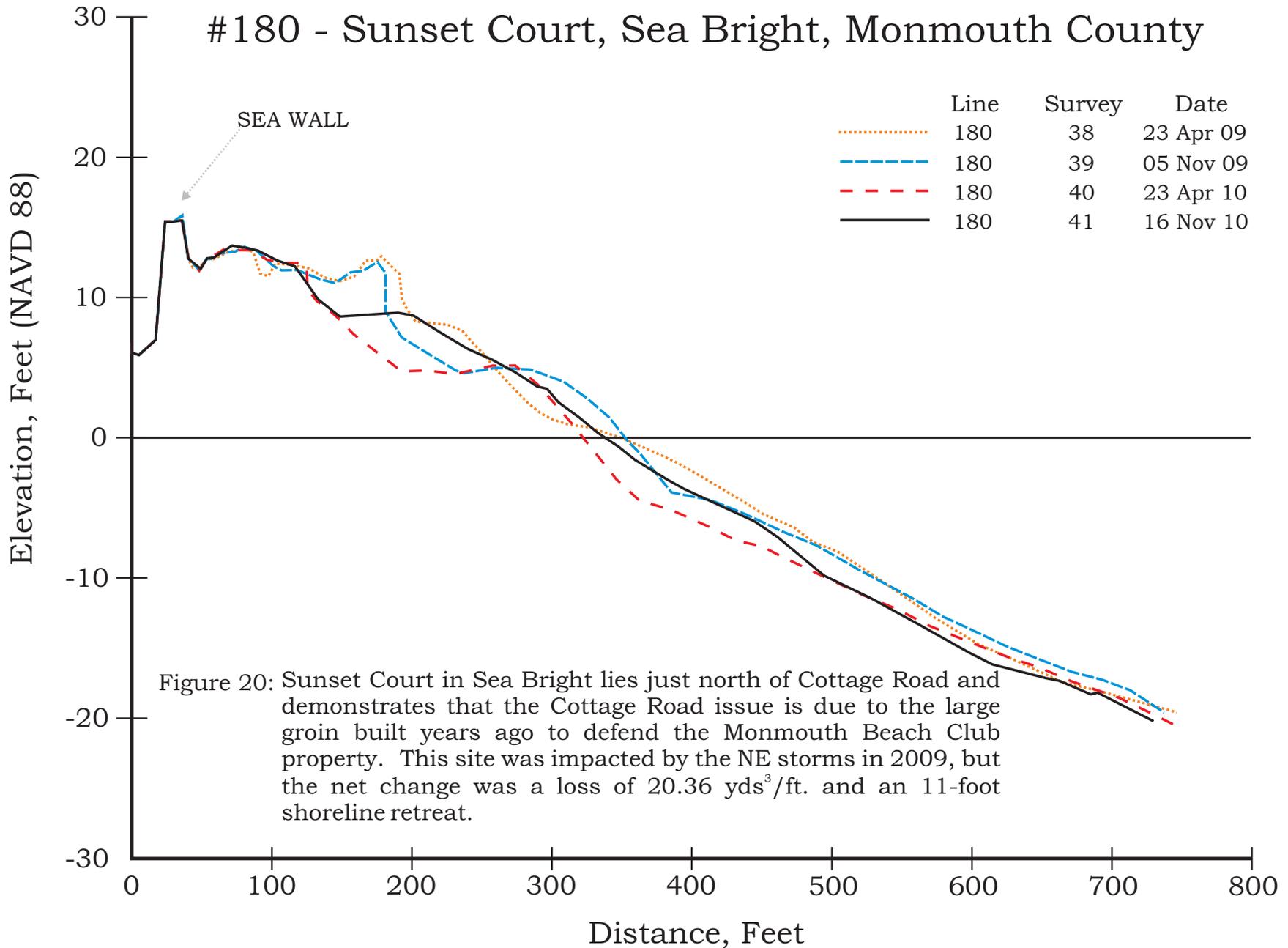


Photo taken November 16, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-18.49 cu yd/ft) and the shoreline moved landward (-14.27 ft).

New Jersey Beach Profile Network

#180 - Sunset Court, Sea Bright, Monmouth County



COTTAGE ROAD, MONMOUTH BEACH - SITE 179



Photo taken November 4, 2009. View to the north.

Cottage Road is the southern source area for sand when littoral currents are moving north toward Sandy Hook. This is because of a massive rock groin built decades ago to protect a private beach club in Monmouth Beach located immediately to the south. Only a meager quantity of sand remains because the heavy reversal in the direction of longshore transport had yet to occur in sufficient magnitude.



Photo taken November 16, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-7.08 cu yd/ft) and the shoreline moved landward (-19.3 ft).

New Jersey Beach Profile Network

#179 - Cottage Road, Monmouth Beach, Monmouth County

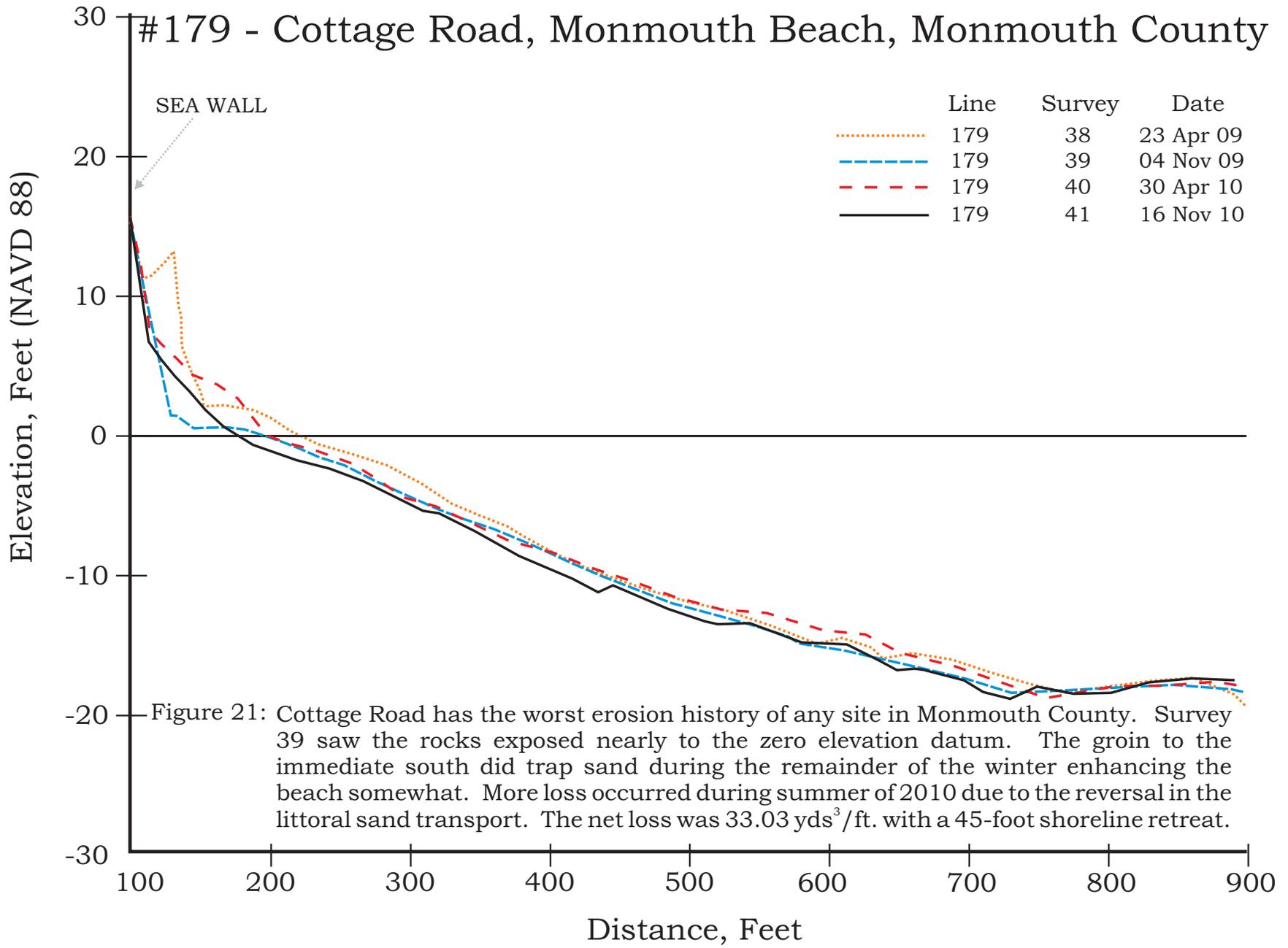


Figure 21: Cottage Road has the worst erosion history of any site in Monmouth County. Survey 39 saw the rocks exposed nearly to the zero elevation datum. The groin to the immediate south did trap sand during the remainder of the winter enhancing the beach somewhat. More loss occurred during summer of 2010 due to the reversal in the littoral sand transport. The net loss was 33.03 yds³/ft. with a 45-foot shoreline retreat.

MONMOUTH BEACH CLUB, MONMOUTH BEACH - SITE 178



Photo taken November 4, 2009. View to the north.

The Monmouth Beach Club shoreline lies south of the big groin complex just south of Cottage Road. Sand transport around the Monmouth Beach Club area has been continuously difficult since the ACOE project was built.

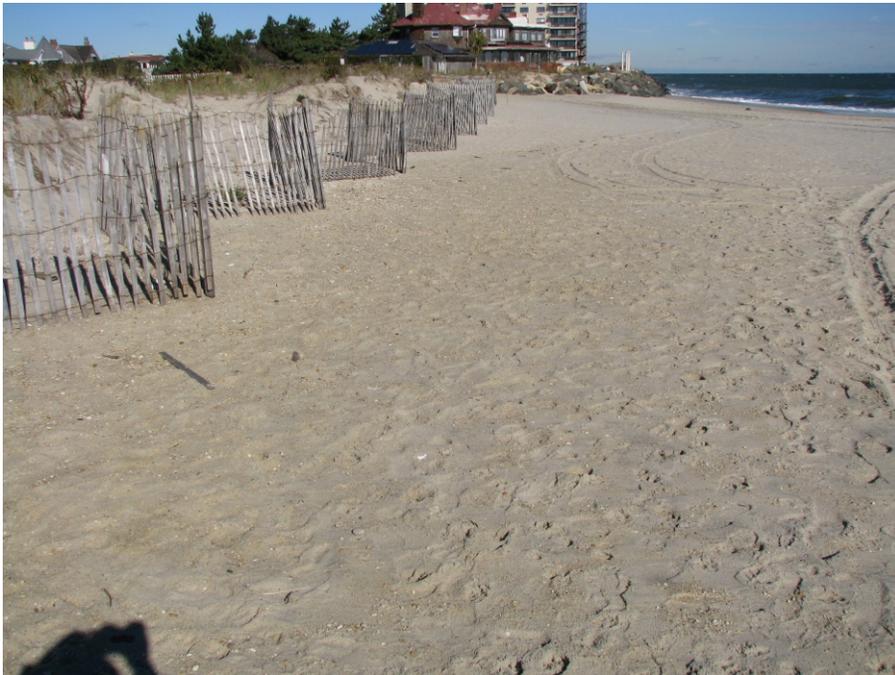
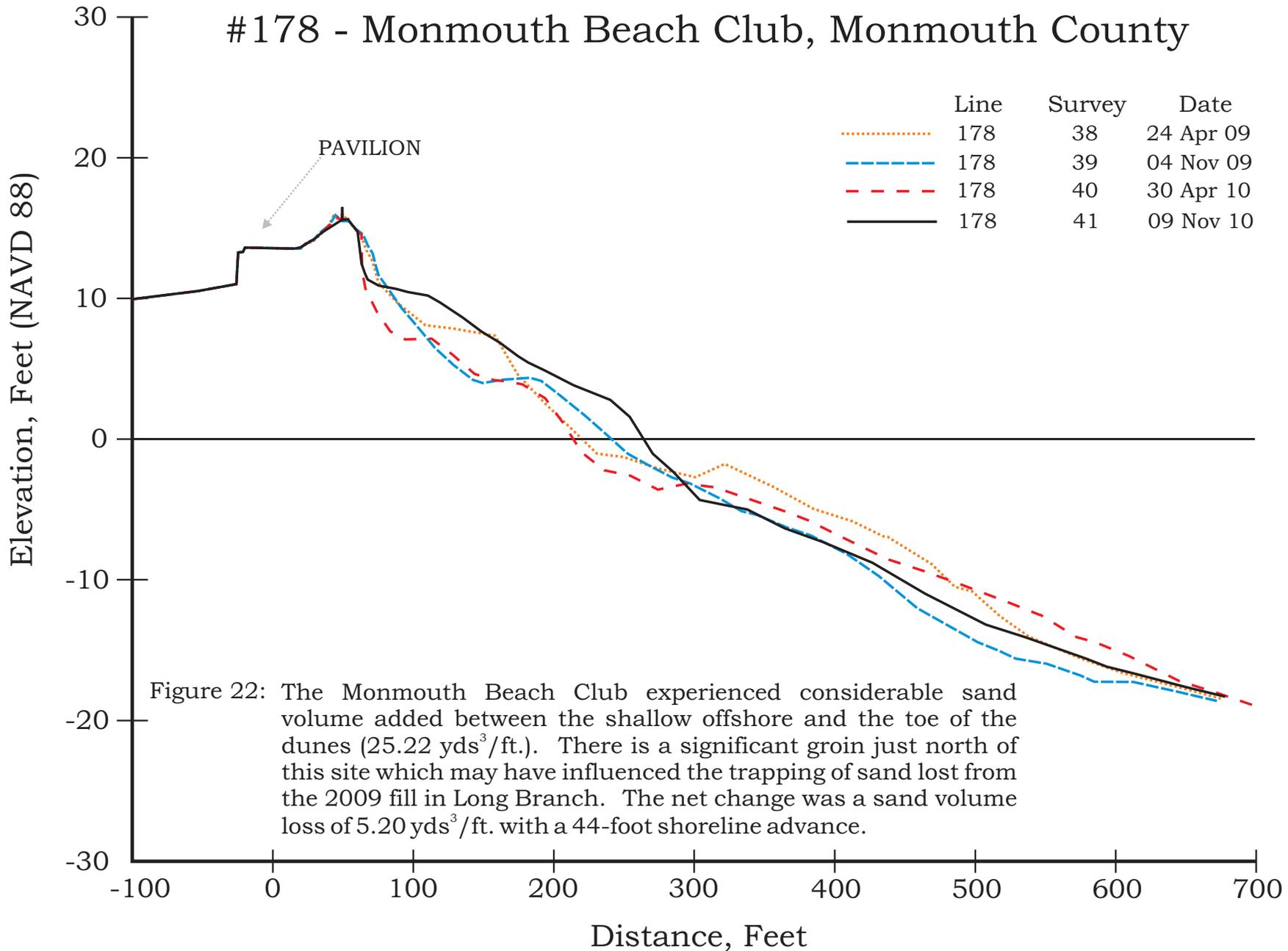


Photo taken November 9, 2010. View to the north.

Comparing the profiles over the year, the profile location gained volume (24.56 cu yd/ft) and the shoreline moved seaward (22.83 ft).

New Jersey Beach Profile Network

#178 - Monmouth Beach Club, Monmouth County



404 OCEAN AVENUE, LONG BRANCH - SITE 177



Photo taken November 4, 2009. View to the south.

The photo shows the dunes prior to the 2009 Veteran's Day storm.

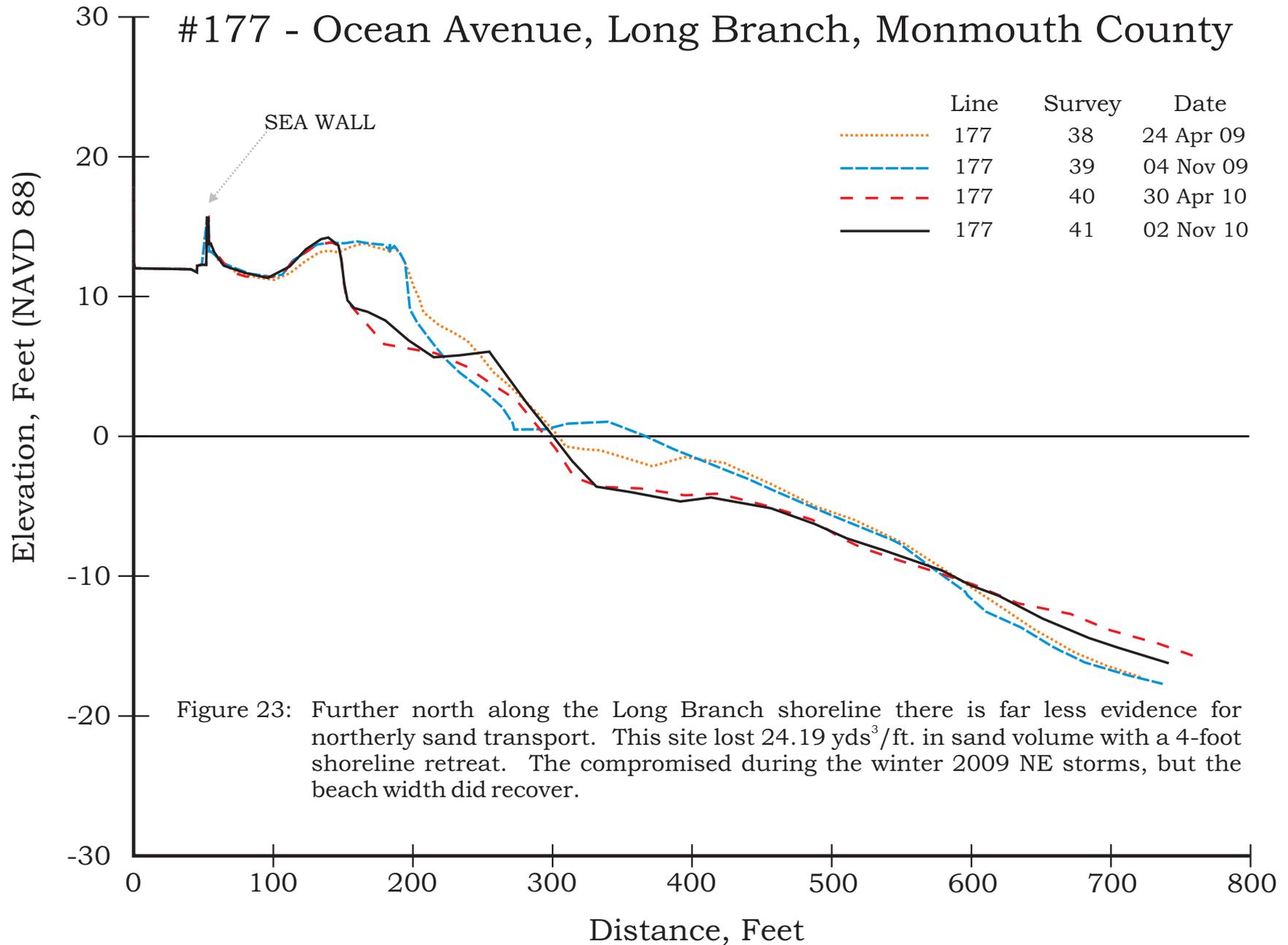


Photo taken November 2, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-18.73 cu yd/ft) and the shoreline moved landward (-66.57 ft).

New Jersey Beach Profile Network

#177 - Ocean Avenue, Long Branch, Monmouth County



SEVEN PRESIDENTS PARK, MONMOUTH BEACH - SITE 176



Photo taken October 22, 2009. View to the south.

At the Seven Presidents Park the beach had a broad flat slope to the water from a narrow segment of flat dry beach.

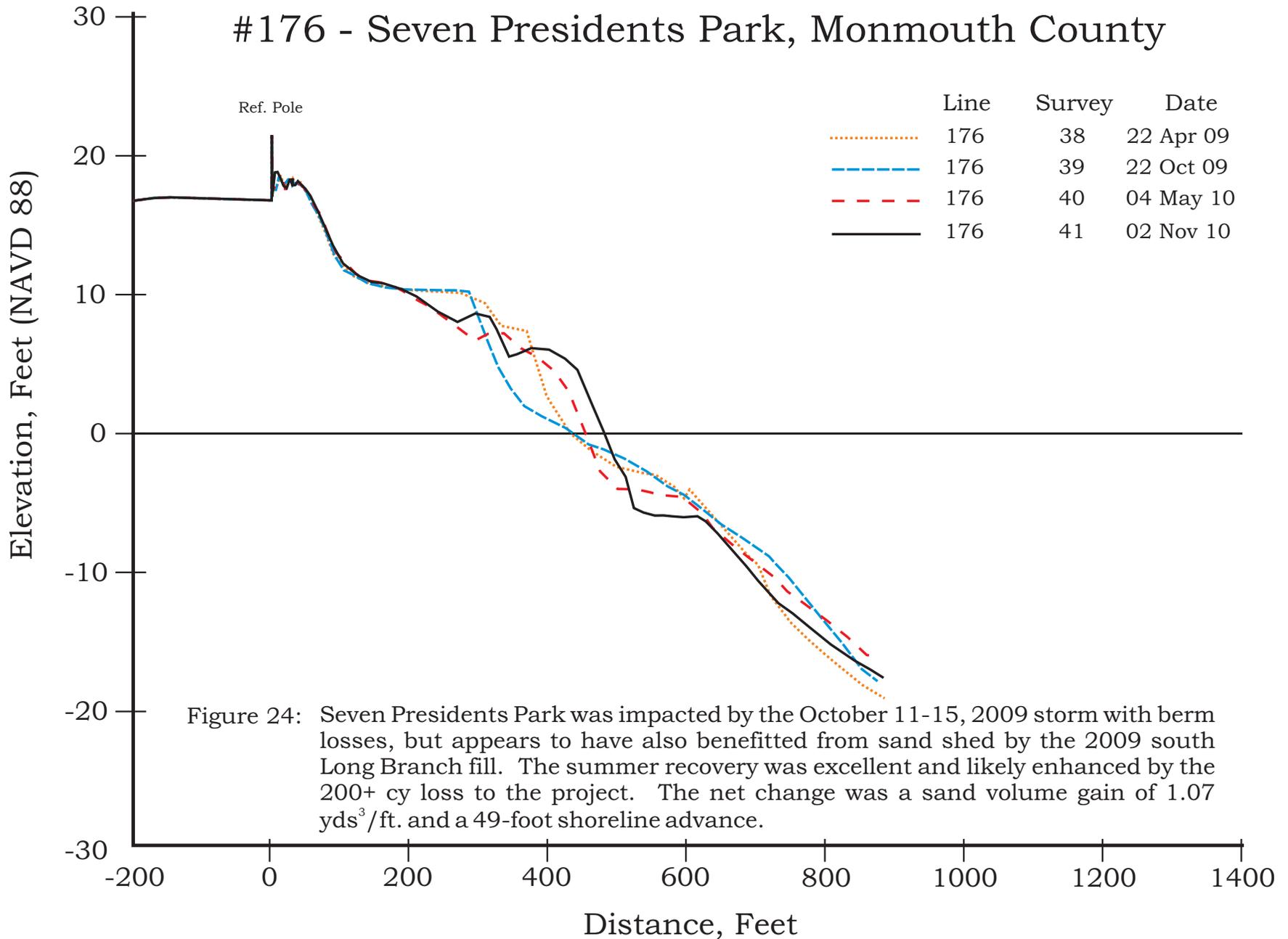


Photo taken November 2, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-1.27 cu yd/ft) and the shoreline moved seaward (44.92 ft). Most of the sand was lost below the 0.0 ft NAVD88 datum.

New Jersey Beach Profile Network

#176 - Seven Presidents Park, Monmouth County



BROADWAY AVENUE, LONG BRANCH - SITE 175



Photo taken October 22, 2009. View to the north.

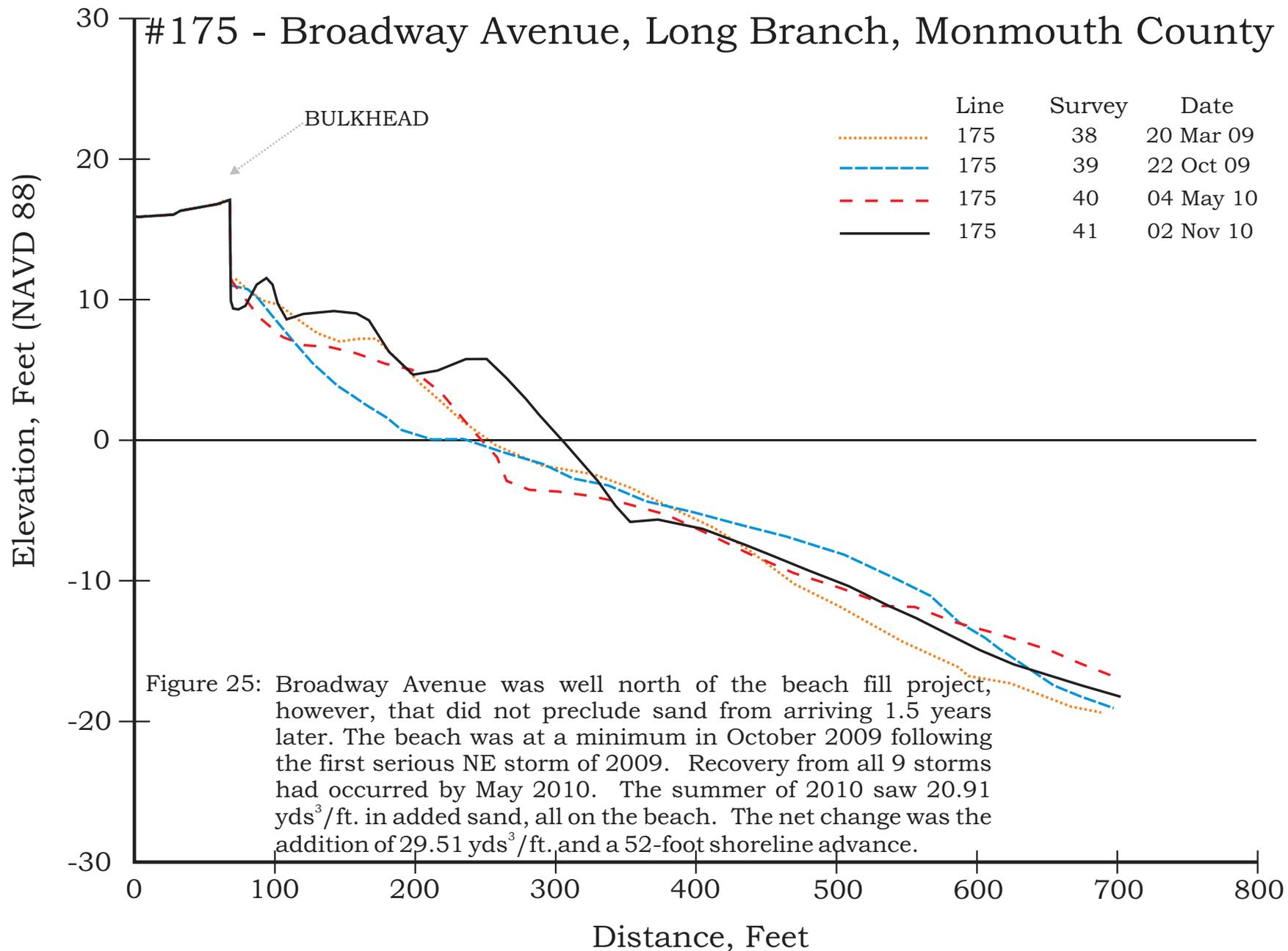
The old rusted steel showing in both photographs is the top of the 70-year old vertical steel bulkhead used to defend the uplands bluff.



Photo taken November 2, 2010. View to the north

Comparing the profiles over the year, the profile location gained volume (20.62 cu yd/ft) and the shoreline moved seaward (67.5 ft). Most of the gain was above the 0.00 ft NAVD88 datum.

New Jersey Beach Profile Network



MORRIS AVENUE, LONG BRANCH - SITE 174



Photo taken October 22, 2009. View to the south.

This central area of the Long Branch municipal beach is defended by both groins and a rock sea wall at the bluff. Sand was placed on the beaches to the south of this site in 2009 by the USACE as maintenance material and this site benefitted from the northward transport of sediment in 2009.

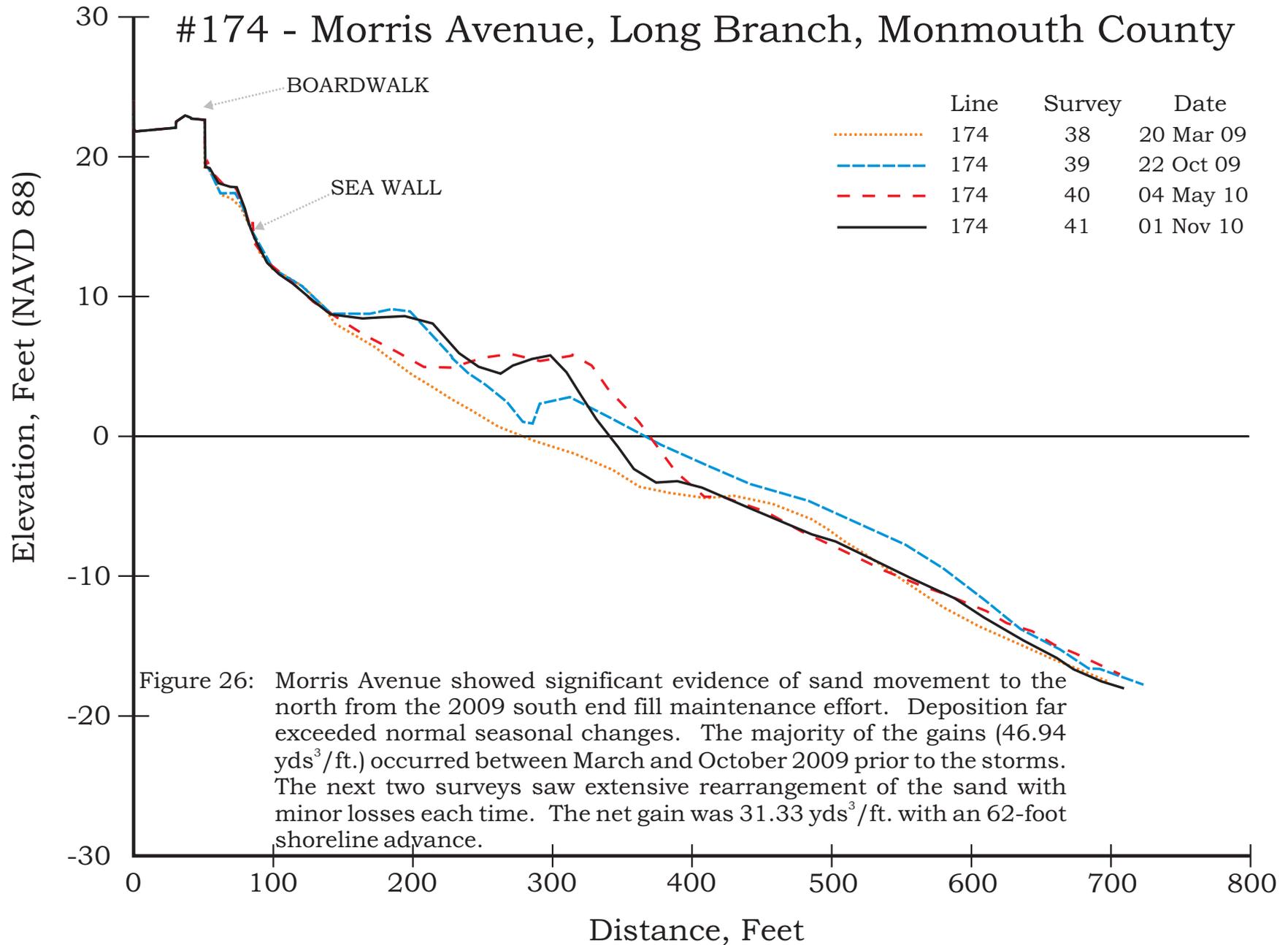


Photo taken November 1, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-15.94 cu yd/ft) and the shoreline moved landward (-25.489 ft). Most of the volume loss occurred below the 0.0 ft NAVD88 datum.

New Jersey Beach Profile Network

#174 - Morris Avenue, Long Branch, Monmouth County



WEST END AVENUE, LONG BRANCH - SITE 173



Photo taken October 14, 2009. View to the south.

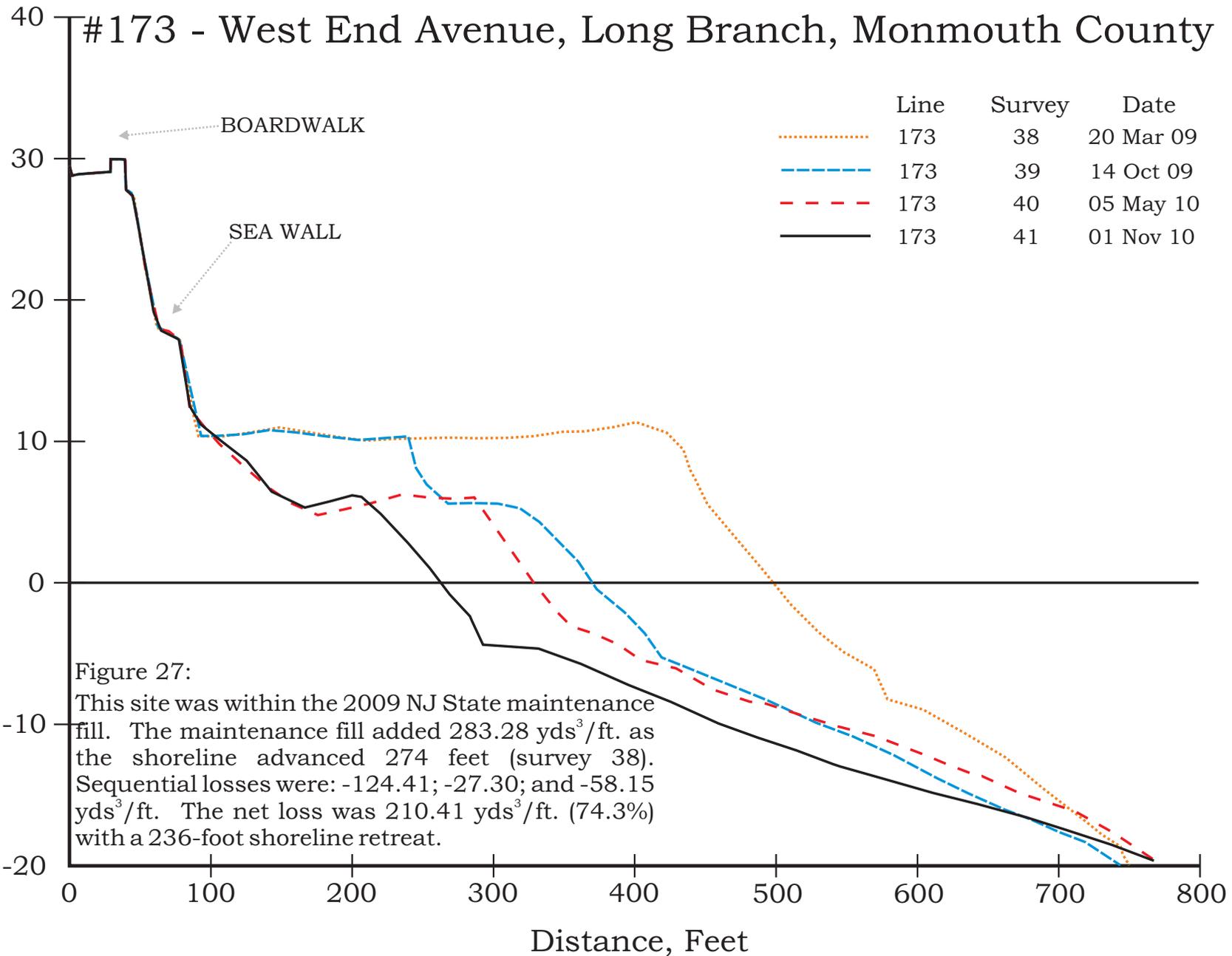
This is the southernmost survey site within the Long Branch to Sandy Hook segment of the Monmouth County beach fill. The deposition stopped just south of here due to real estate issues along privately owned oceanfront tracts in Elberon and Deal into Allenhurst. This view shows the top of the bluff, the rock sea wall and the remaining beach between the groins. The 2009 beach restoration maintenance fill augmented this site substantially by March 2009.



Photo taken November 1, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-85.5 cu yd/ft) and the shoreline moved landward (-107.47 ft). Erosion of the maintenance fill material occurred over the whole profile.

New Jersey Beach Profile Network



805 OCEAN AVE., LONG BRANCH - SITE 272



Photo taken June 2, 2010. View to the south.

This new site was established to replace former site 171 that was lost due to development.

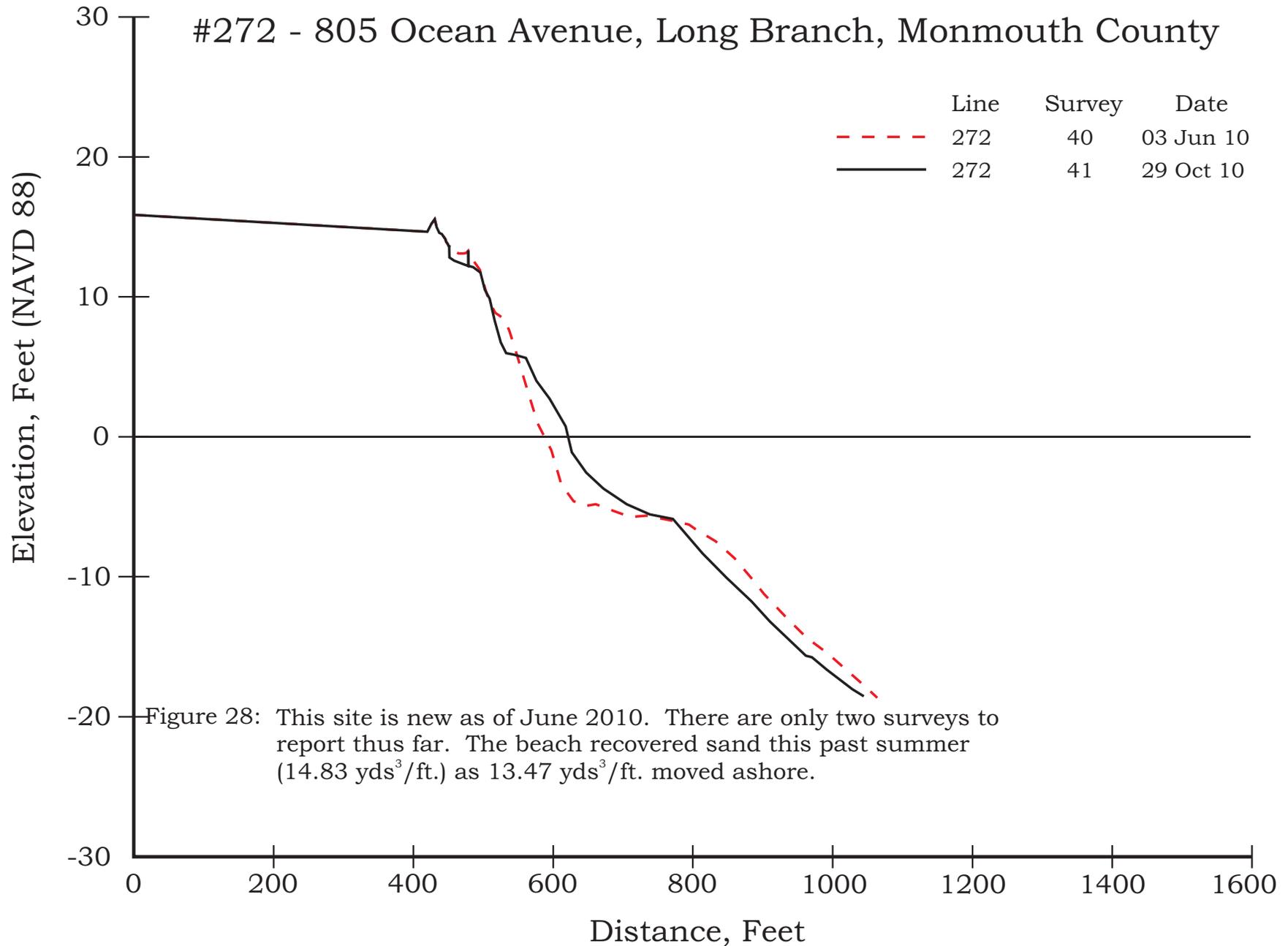


Photo taken October 29, 2010. View to the south.

Comparing the profiles over the summer (four months), the profile location gained volume (14.83 cu yd/ft)

New Jersey Beach Profile Network

#272 - 805 Ocean Avenue, Long Branch, Monmouth County



PULLMAN AVENUE, ELBERON - SITE 171



Photo taken October 14, 2009. View to the north.

Located on the highest elevation (+36 feet) along the Monmouth County bluff, this site lies about a mile south of the southern end of the beach fill in Long Branch. There was no dry beach in 2009, in fact none has existed since the May 2008 survey.

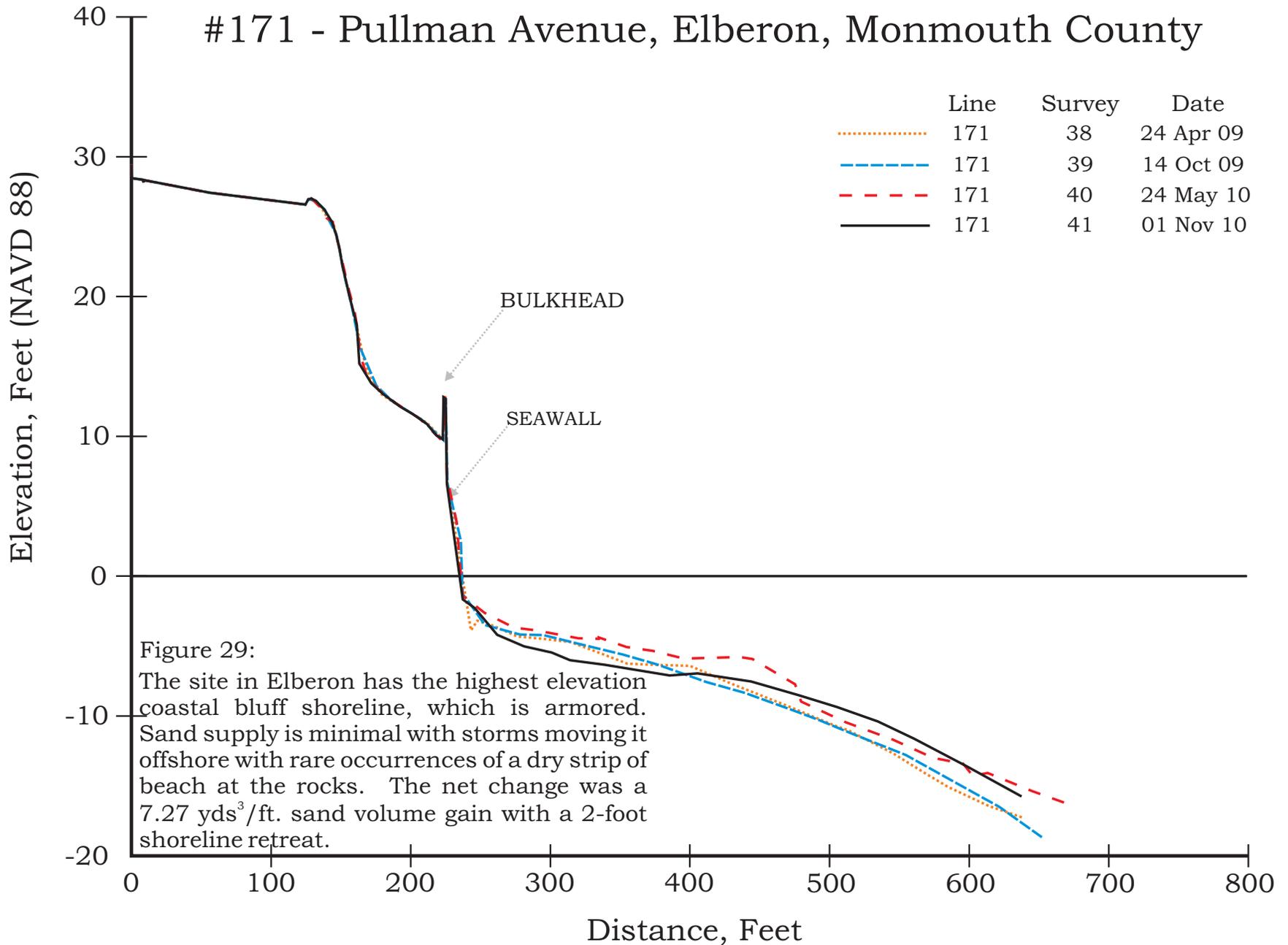


Photo taken November 1, 2010. View to the north (on the bulkhead/revetment).

Comparing the profiles over the year, the profile location gained volume (5.77 cu yd/ft) and the shoreline moved landward (-1.76 ft). Most of the volume loss occurred above the 0.0 ft NAVD88 datum.

New Jersey Beach Profile Network

#171 - Pullman Avenue, Elberon, Monmouth County



ROOSEVELT AVENUE, DEAL - SITE 170



Photo taken October 14, 2009. View to the north.

This view to the north along the rock-armored shoreline of Deal shows a small sand pocket trapped against the northern groin in the cell. Sand shifts north to south within the cell, but little new material can move laterally along the shoreline. Groins every 700 to 1,000 feet make that impossible.

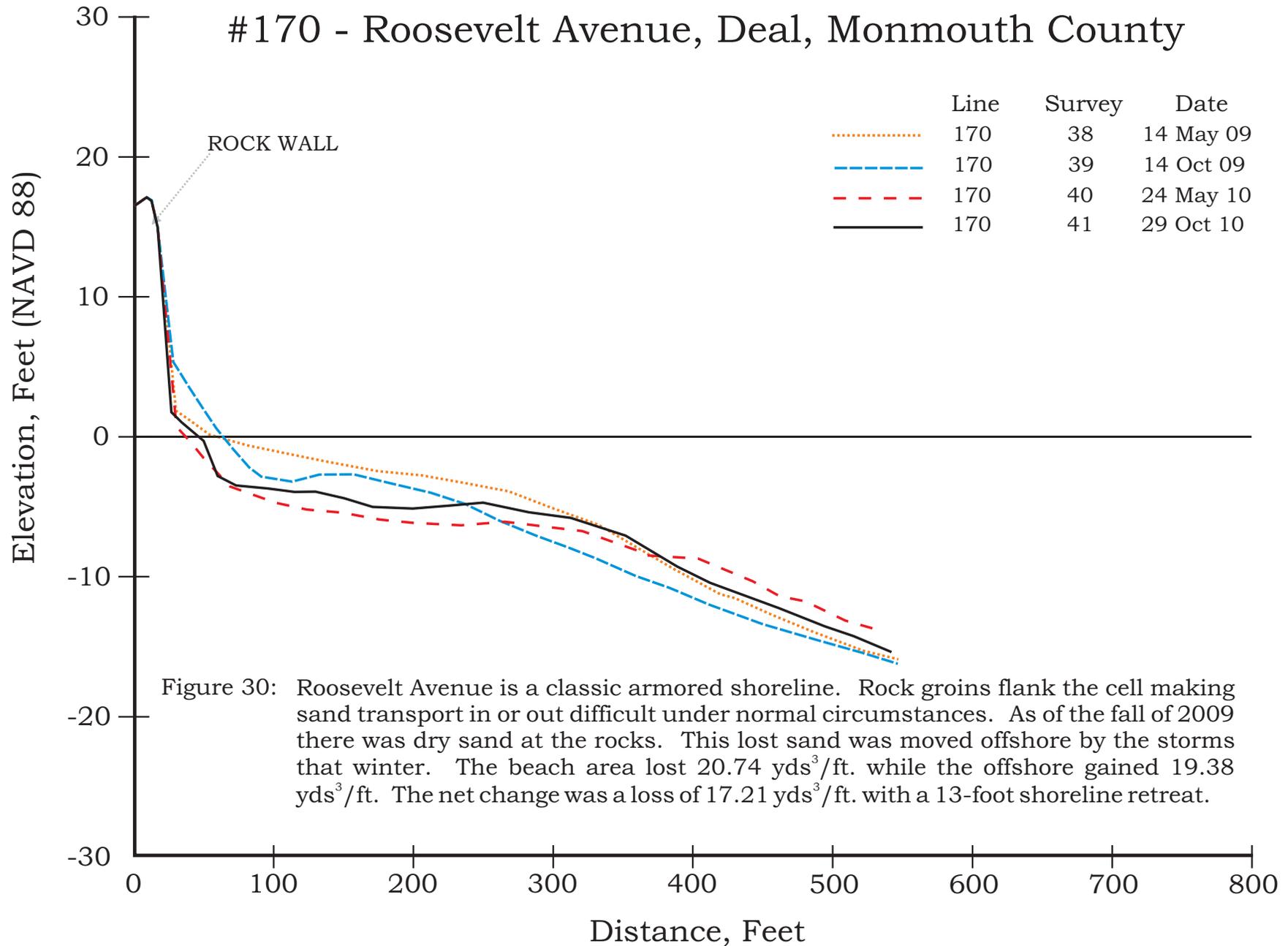


Photo taken October 29, 2010. View to the north.

Comparing the profiles over the year, the profile location gained volume (3.95 cu yd/ft) and the shoreline moved landward (-17.54 ft). The volume loss occurred above the 0.0 ft NAVD88 datum.

New Jersey Beach Profile Network

#170 - Roosevelt Avenue, Deal, Monmouth County



DARLINGTON AVENUE, DEAL - SITE 169



Photo taken October 13, 2009. View to the south.

Darlington Avenue in Deal has the best preserved bluff shoreline anywhere along the Monmouth County coast. The beach berm protects the toe of the bluff. The sand had ramped up the slope and was vegetated. Recently, owners have placed rock along the toe of the bluff to the south of the line at Darlington Avenue.

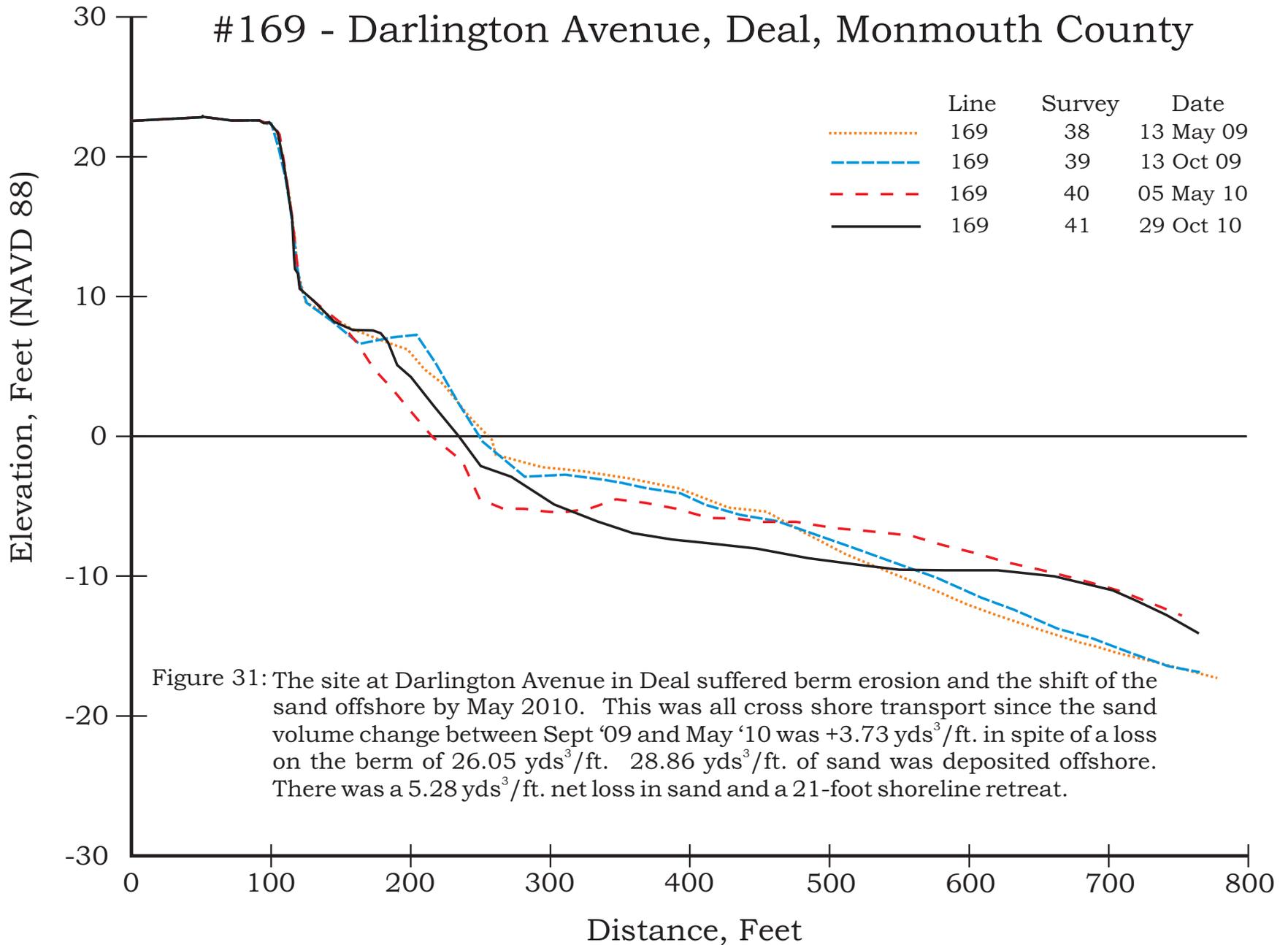


Photo taken October 29, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-8.14 cu yd/ft) and the shoreline moved landward (-14.6 ft).

New Jersey Beach Profile Network

#169 - Darlington Avenue, Deal, Monmouth County



CORLIES AVENUE, ALLENHURST - SITE 168



Photo taken October 13, 2009. View to the south.

The Allenhurst beach is located in front of an old concrete seawall built to protect the easily eroded bluff years ago. It has survived many storms. The beach was wider than it had been in decades due to sand escape from the groin seen to the south that retains the Asbury Park section of the Federal fill. For some reason neither Loch Arbor (a one-block wide oceanfront community) nor Allenhurst chose to participate in the US Army Corps Monmouth County project. However, the tendency for sand to move north along this part of the NJ coastline has provided a boost to both community beaches.

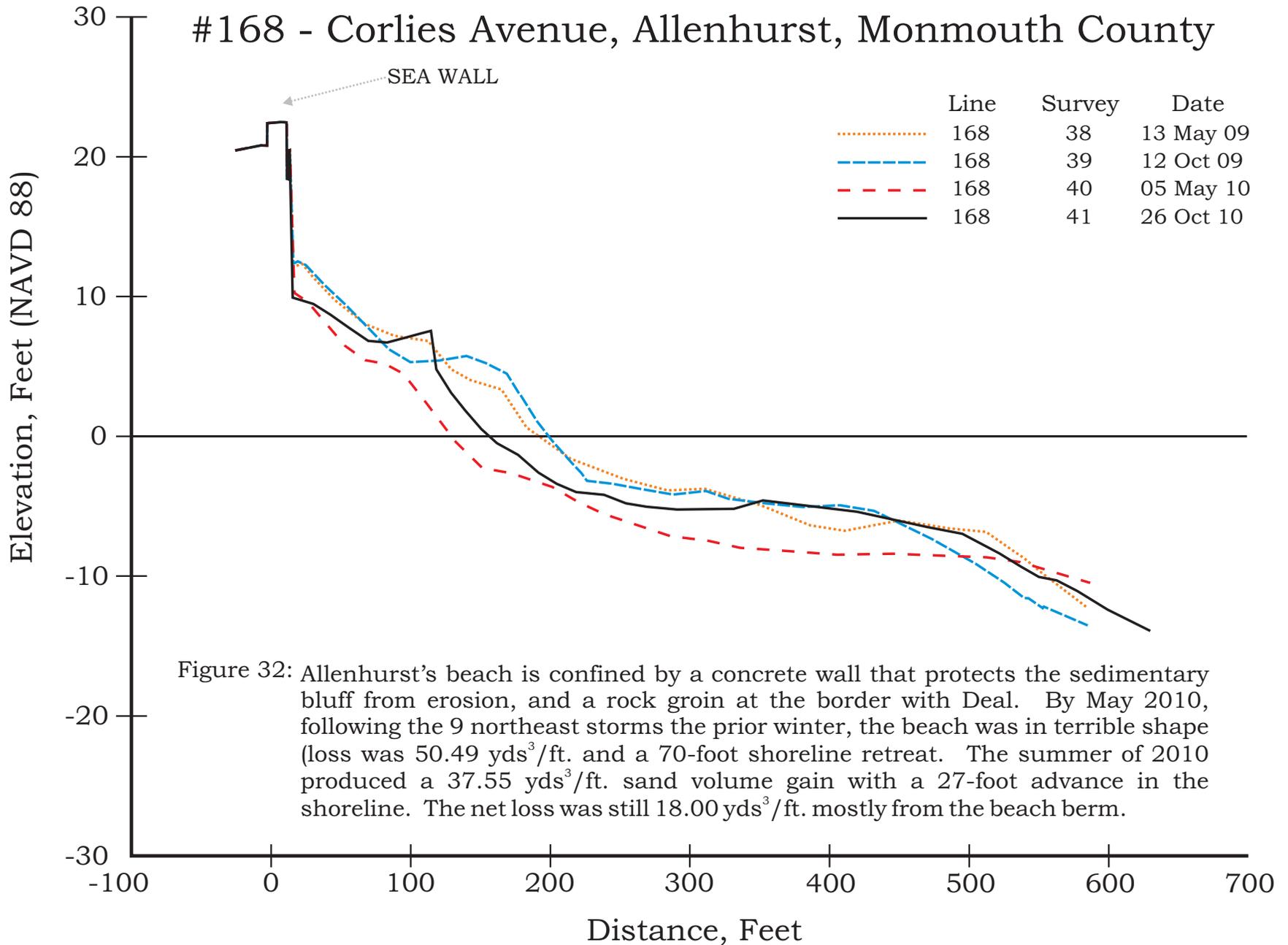


Photo taken October 26, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-12.88 cu yd/ft) and the shoreline moved landward (-42.48 ft).

New Jersey Beach Profile Network

#168 - Corlies Avenue, Allenhurst, Monmouth County



3rd AVENUE, ASBURY PARK - SITE 167



Photo taken October 12, 2009. View to the north.

The middle of the Asbury Park beach is wide and very flat with no dune. The recreational use precludes a natural dune from forming and no municipal work was done to force a dune to grow near the boardwalk.

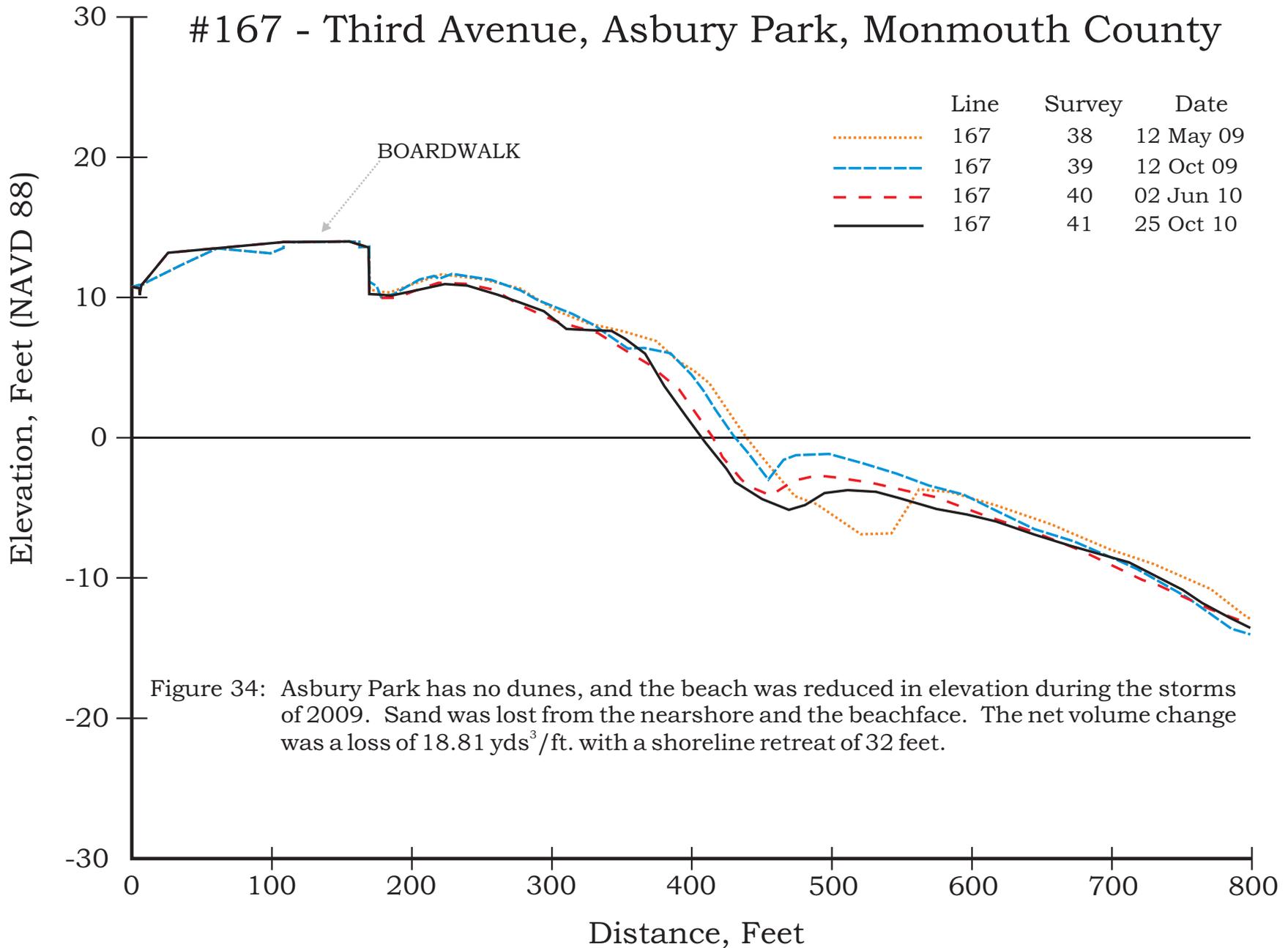


Photo taken October 25, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-21.77 cu yd/ft) and the shoreline moved landward (-23.92 ft).

New Jersey Beach Profile Network

#167 - Third Avenue, Asbury Park, Monmouth County



7th AVENUE, ASBURY PARK - SITE 267



Photo taken October 12, 2009. View to the north.

Located at the northern end of the south segment of the Monmouth County project, this Asbury Park beach has retained most of the initial deposit of sand. No maintenance has been done since completion in 1999. There is a large terminal groin between Asbury Park and Loch Arbor that some sand has moved around in the last decade, but not enough to be any detriment to the Asbury Park beach.

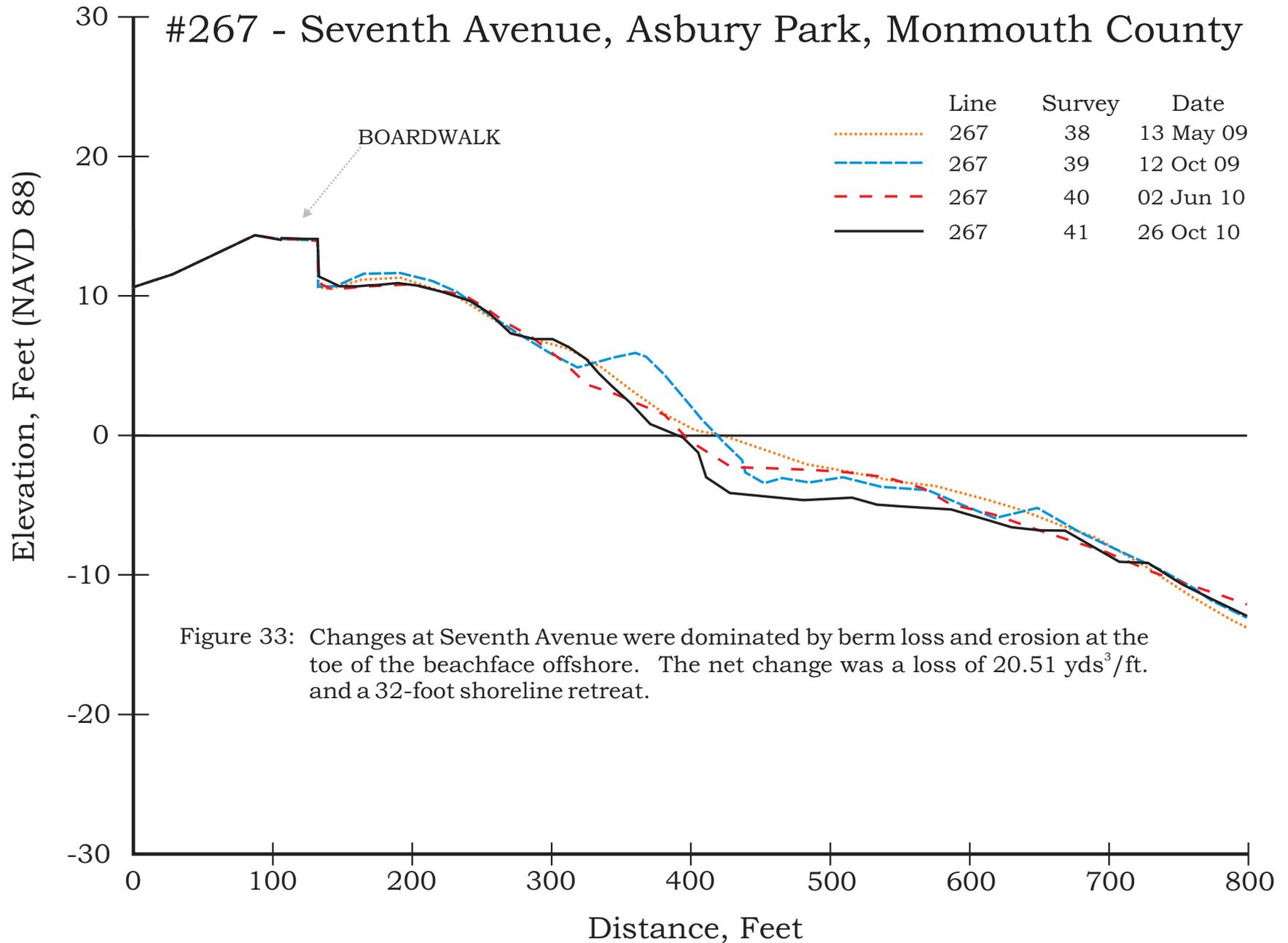


Photo taken October 26, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-22.96 cu yd/ft) and the shoreline moved landward (-28.21 ft).

New Jersey Beach Profile Network

#267 - Seventh Avenue, Asbury Park, Monmouth County



OCEAN PATHWAY, OCEAN GROVE - SITE 166



Photo taken October 9, 2009. View to the north.

Ocean Grove has an equally wide beach as Asbury Park, but took steps to create a dune between the beach and the boardwalk.

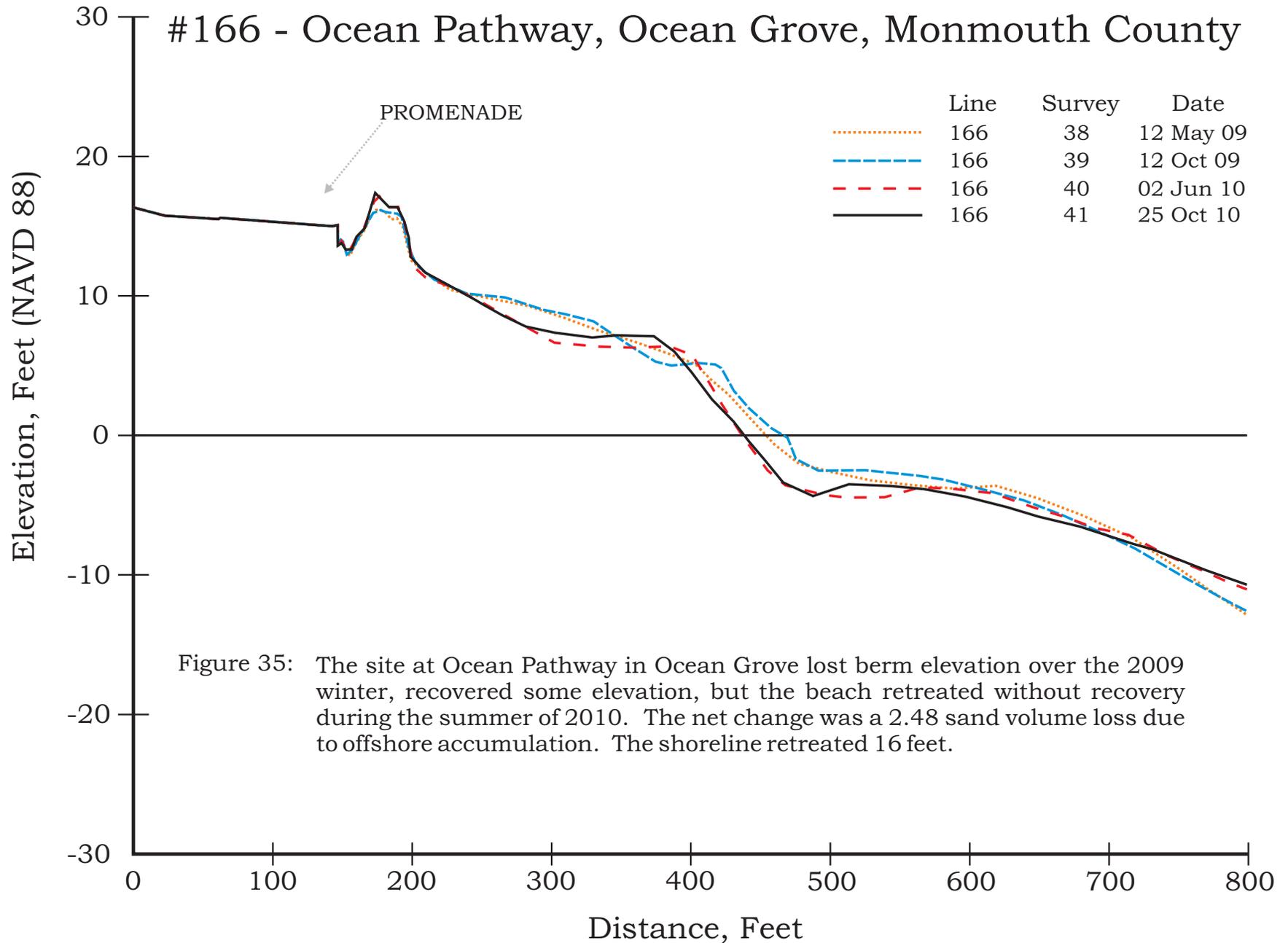


Photo taken October 25, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-6.17cu yd/ft) but the shoreline moved landward (-28.22 ft).

New Jersey Beach Profile Network

#166 - Ocean Pathway, Ocean Grove, Monmouth County



McCABE AVENUE, BRADLEY BEACH - SITE 165



Photo taken October 9, 2009. View to the south.

This location is far different from what it was in 1996 before the beach fill. The first step the community made was to pull the boardwalk back off the beach and replace it with a paver promenade on the top of the bluff between Ocean Avenue and the boardwalk. This provided an additional 40 feet of badly needed beach width. By October 2008, the dune was well developed where the boardwalk once was and the filled beach extended 235 feet further seaward to the berm.

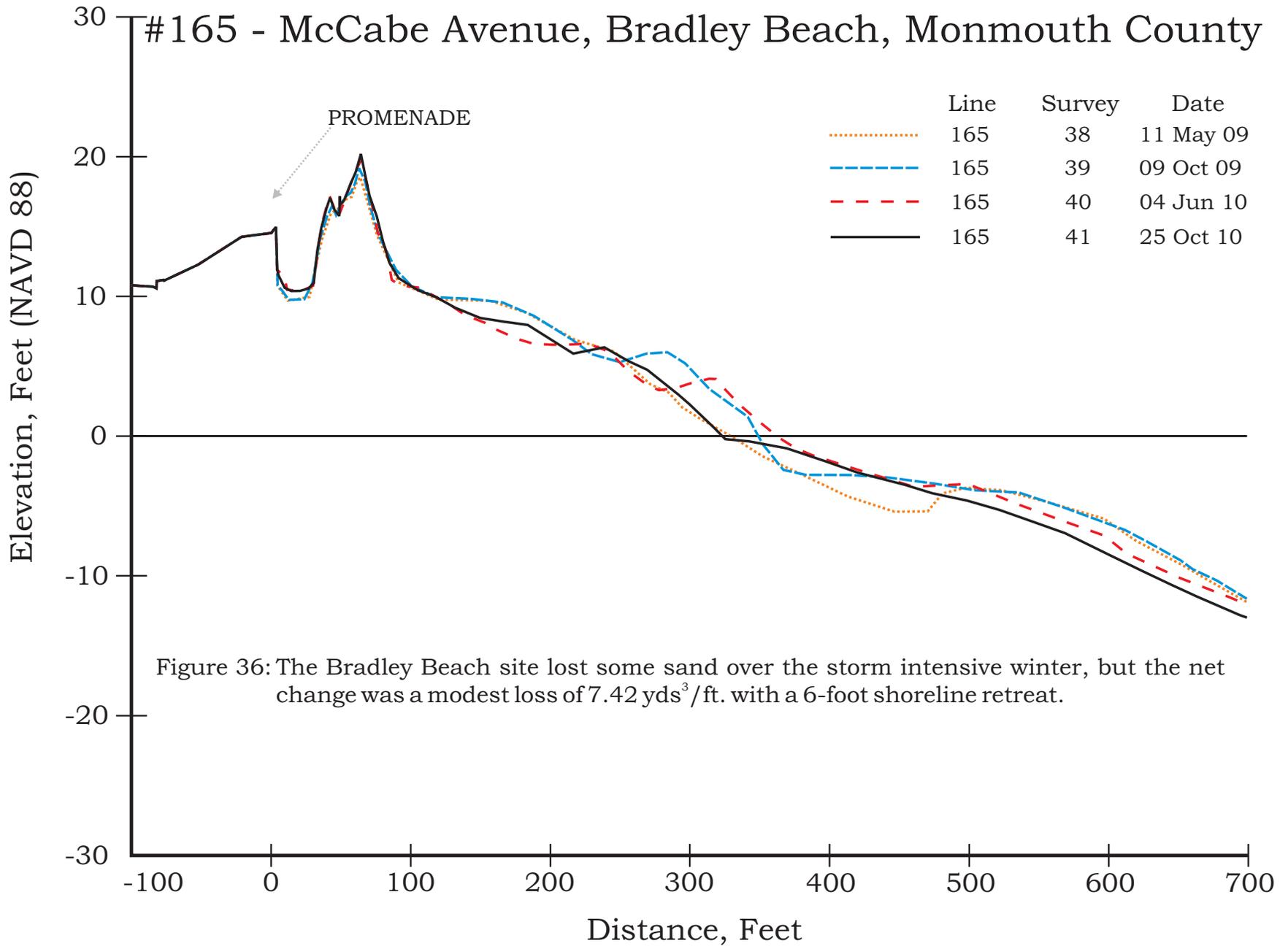


Photo taken October 25, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-23.25 cu yd/ft) and the shoreline moved landward (-25.96 ft).

New Jersey Beach Profile Network

#165 - McCabe Avenue, Bradley Beach, Monmouth County



SYLVANIA AVENUE, AVON BY THE SEA - SITE 164



Photo taken October 9, 2009. View to the south.

This photo shows the beach just north of the Shark River Inlet. This is the most significant barrier to the free movement of sand along this southern Monmouth County fill segment. No dune was built along this community's shoreline so all the fill-widened beach is available for blankets in the summer.

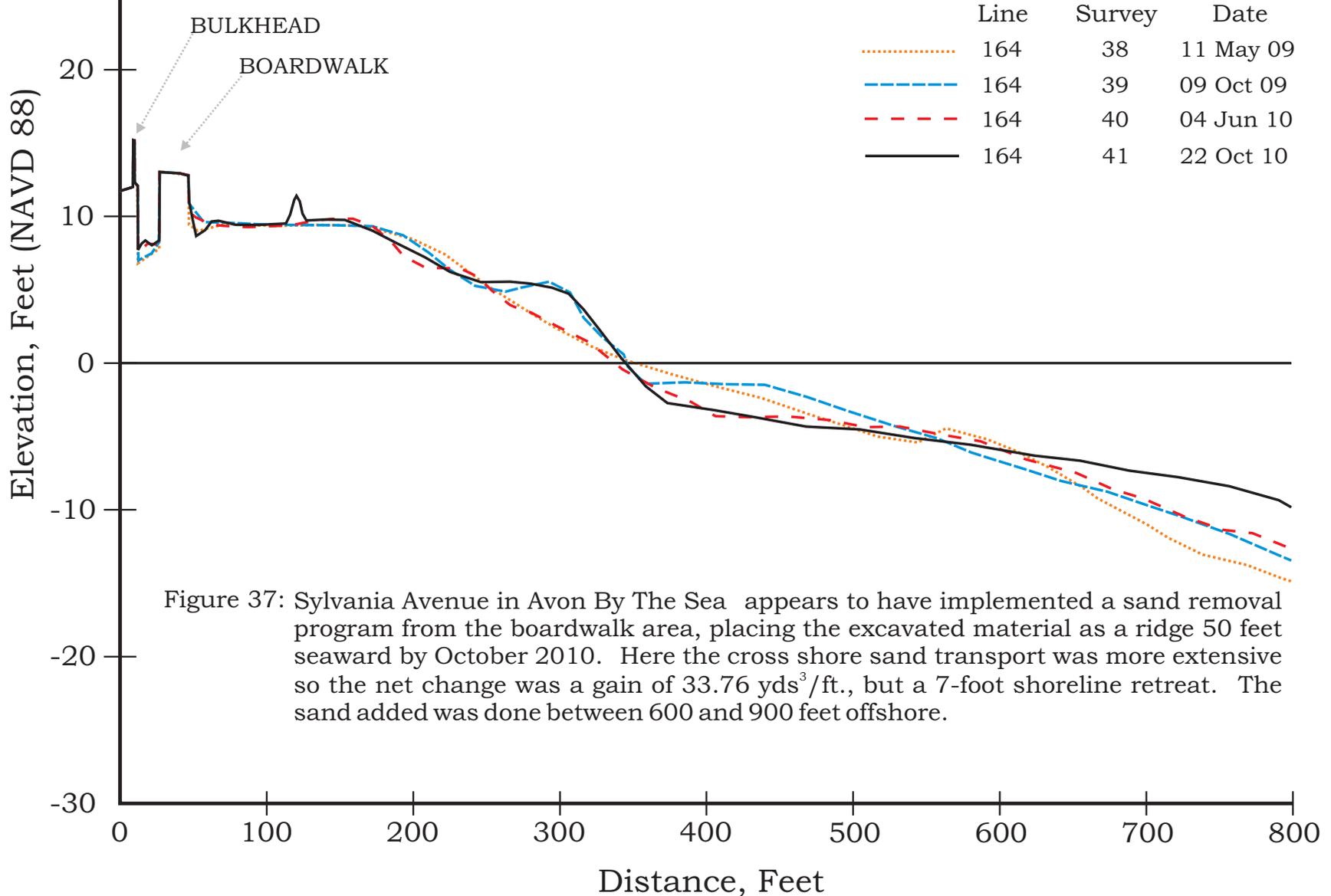


Photo taken October 22, 2010. View to the south.

In the fall/winter of 2009-2010, the town moved sand from the intertidal area to construct a dune and to prevent windblown sand from accumulating on the boardwalk. Comparing the profiles over the year, the profile location gained volume (18.24 cu yd/ft) and the shoreline moved landward (0.68 ft). Most of the volume gain was below the 0.0 ft NAVD88 datum.

New Jersey Beach Profile Network

#164 - Sylvania Avenue, Avon By The Sea, Monmouth County



5th AVENUE, BELMAR - SITE 163



Photo taken October 5, 2009. View to the north.

The northern Belmar beach lies just south of the Shark River Inlet and has historically trapped sand moving north. This photograph illustrates the 350-foot wide, flat beach with a token dune just east of the boardwalk.

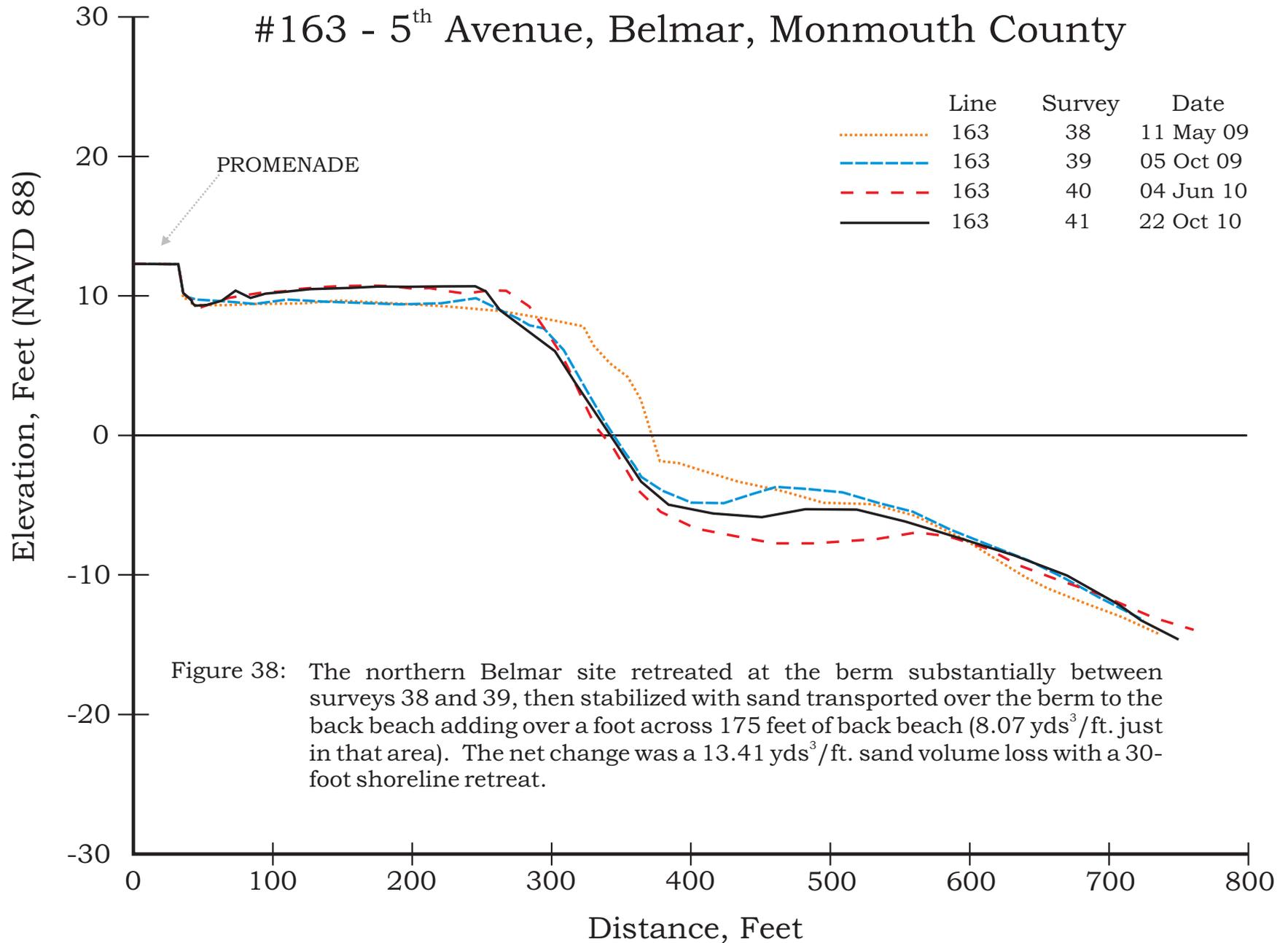


Photo taken October 22, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-4.05cu yd/ft) and the shoreline moved landward (-2.36 ft).

New Jersey Beach Profile Network

#163 - 5th Avenue, Belmar, Monmouth County



18th AVENUE, BELMAR - SITE 162



Photo taken October 5, 2009. View to the north.

In southern Belmar the beach is a little narrower, but the “dune” represents a landscaping endeavor. In 2008 the municipality erected three lines of sand fencing in an effort to reduce sand transport onto Ocean Avenue, the boardwalk and the decorative planting that constitutes the City’s dune system.

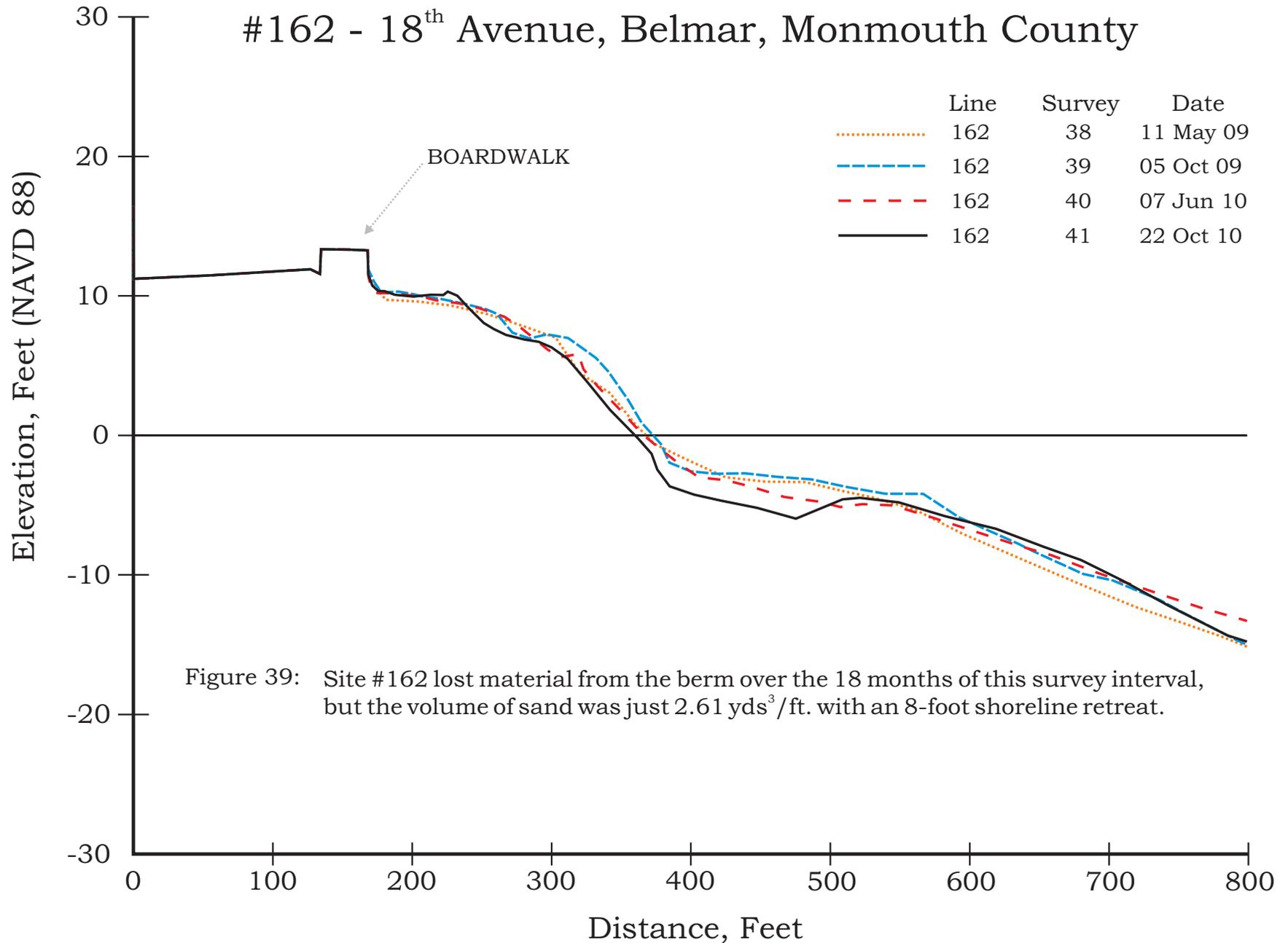


Photo taken October 22, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-16.38 cu yd/ft) and the shoreline moved landward (-13.02 ft). The City placed fencing for the winter season.

New Jersey Beach Profile Network

#162 - 18th Avenue, Belmar, Monmouth County



BRIGHTON AVENUE, SPRING LAKE - SITE 161



Photo taken October 5, 2009. View to the south.

The Spring Lake beach always had a dune located between the boardwalk and Ocean Avenue. This feature has grown larger since the Federal project was completed and a deep trough between the dune and the landward side of the boardwalk filled in with sand.

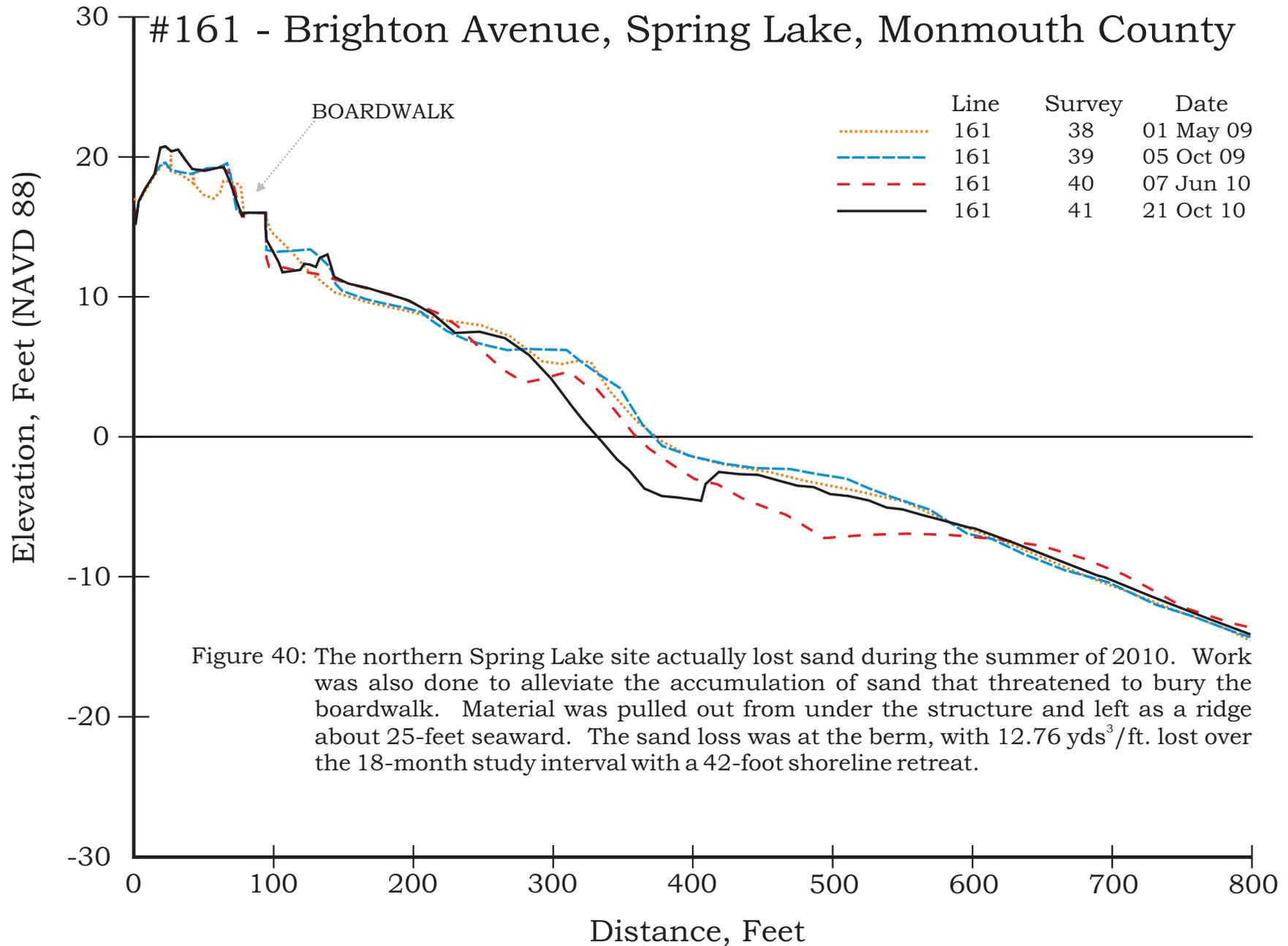


Photo taken October 21, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-16.59 cu yd/ft) and the shoreline moved landward (-40.37 ft).

New Jersey Beach Profile Network

#161 - Brighton Avenue, Spring Lake, Monmouth County



SALEM AVENUE, SPRING LAKE - SITE 160



Photo taken October 2, 2009. View to the south.

The beach restoration project dramatically changed the southern Monmouth County beaches by increasing the width by 200%.

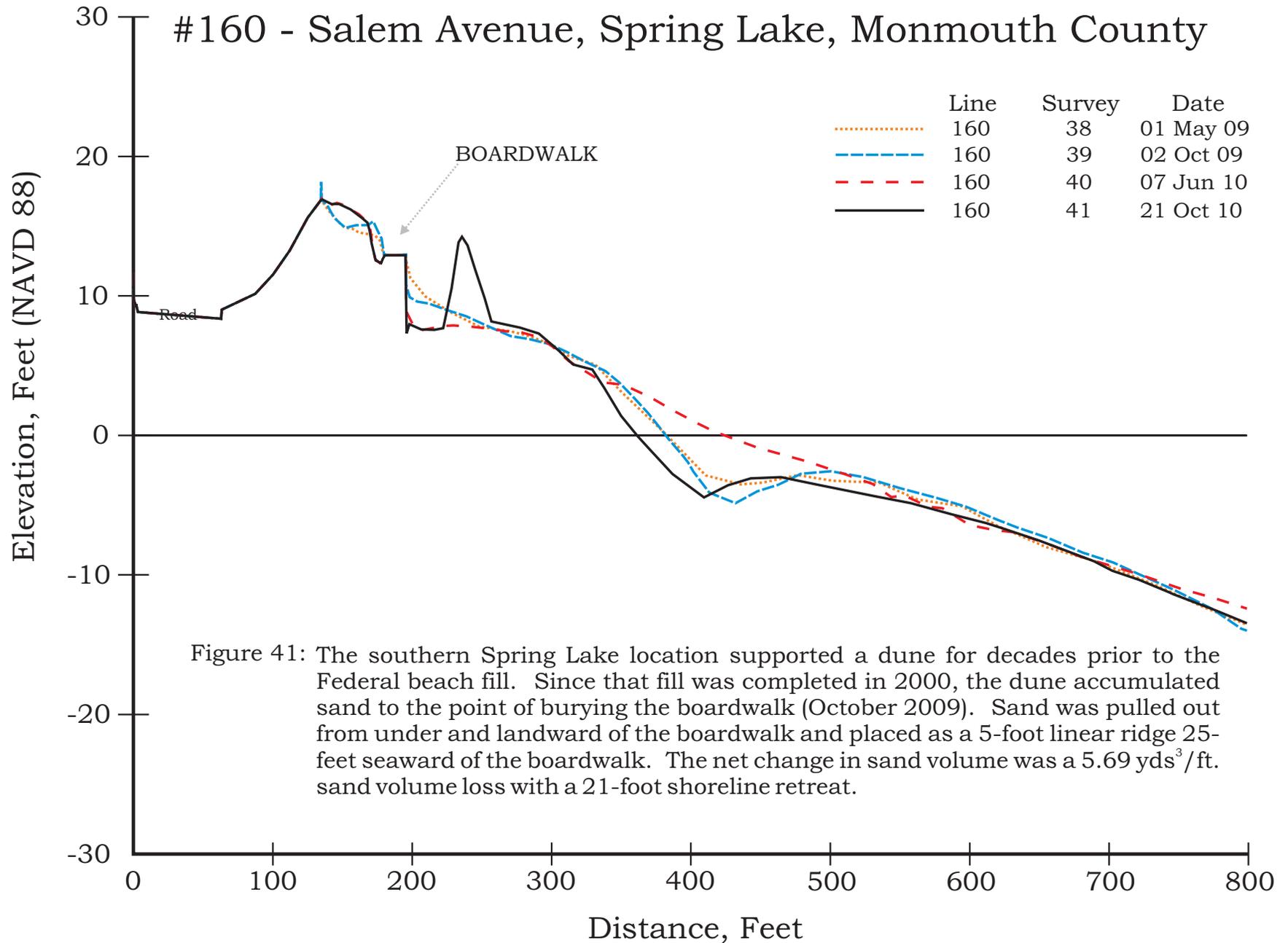


Photo taken October 21, 2010. View to the south.

The Town removed the sandy material from under the boardwalk and placed it on the beach as part of its routine sand management program. Comparing the profiles over the year, the profile location lost volume (-6.7 cu yd/ft) and the shoreline moved landward (-20.67 ft).

New Jersey Beach Profile Network

#160 - Salem Avenue, Spring Lake, Monmouth County



NEW YORK AVENUE, SEA GIRT - SITE 159



Photo taken October 2, 2009. View to the north.

New York Avenue is located in the public recreational section of the Sea Girt shoreline. This view shows the beach and boardwalk.



Photo taken October 21, 2010. View to the north.

The photo shows sand trapped by the sand fencing. Comparing the profiles over the year, the profile location lost volume (-11.62 cu yd/ft) and the shoreline moved landward (-20.52 ft).

New Jersey Beach Profile Network

#159 - New York Avenue, Sea Girt, Monmouth County

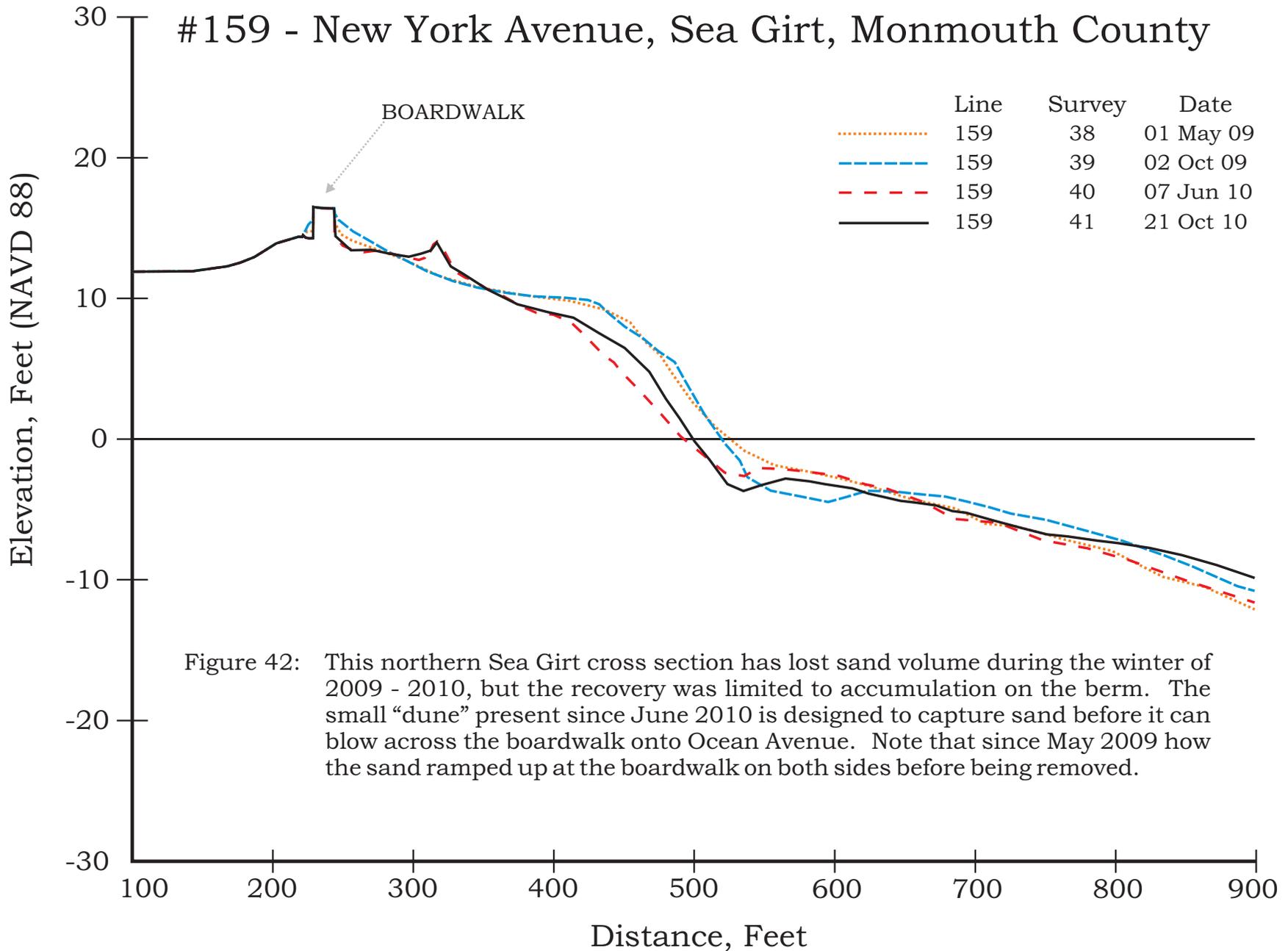


Figure 42: This northern Sea Girt cross section has lost sand volume during the winter of 2009 - 2010, but the recovery was limited to accumulation on the berm. The small “dune” present since June 2010 is designed to capture sand before it can blow across the boardwalk onto Ocean Avenue. Note that since May 2009 how the sand ramped up at the boardwalk on both sides before being removed.

TRENTON AVENUE, SEA GIRT - SITE 158



Photo taken October 1, 2009. View to the south.

The Trenton Avenue site is near the southern boundary of Sea Girt and the NJ State Police training center between Sea Girt and Manasquan. The 1996 Federal beach restoration project has allowed accretion of dunes and the growth of grass seaward of the elevated boardwalk.

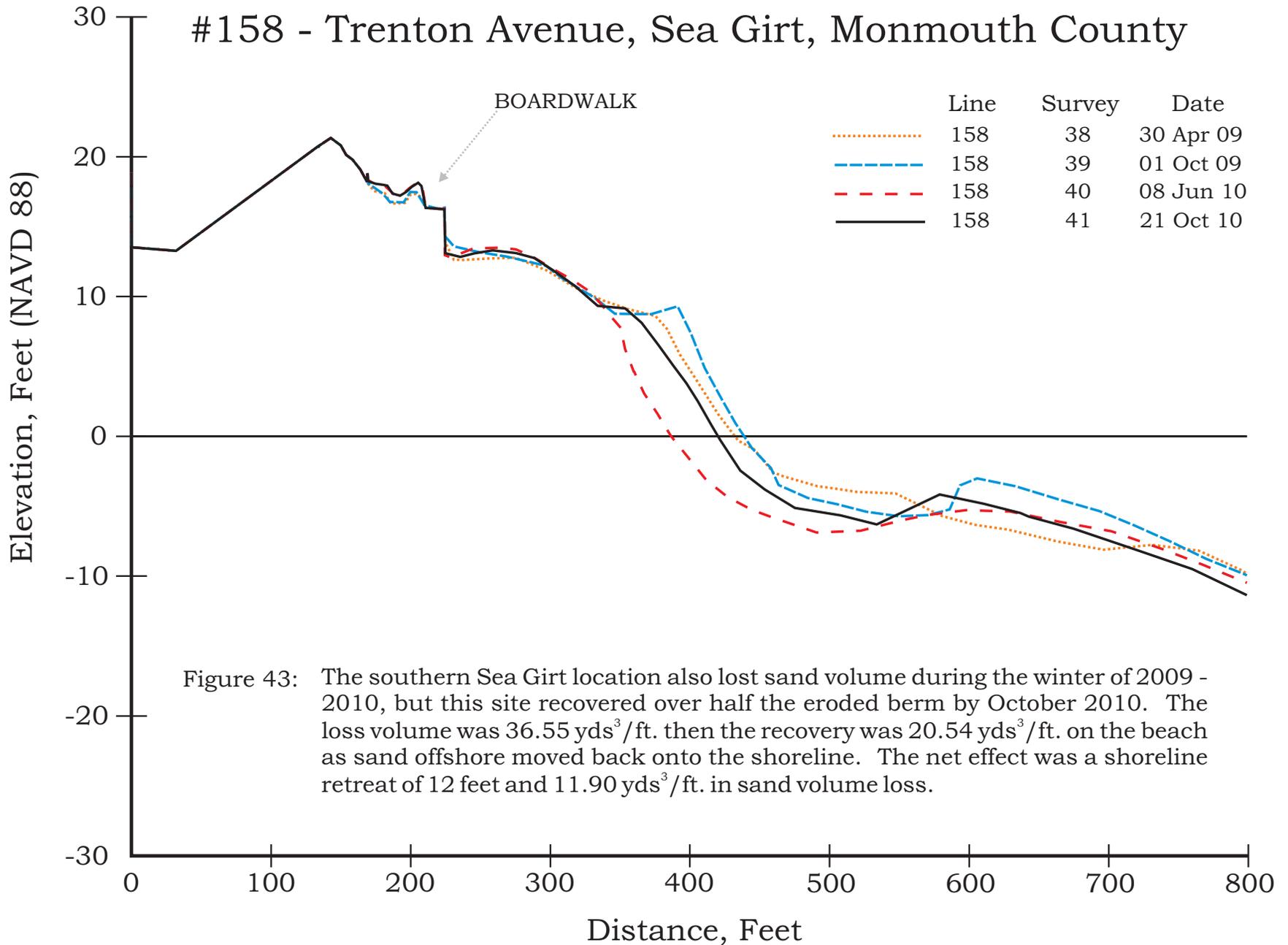


Photo taken October 21, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-30.22 cu yd/ft) and the shoreline moved landward (-18.69 ft).

New Jersey Beach Profile Network

#158 - Trenton Avenue, Sea Girt, Monmouth County



RIDDLE WAY, MANASQUAN - SITE 157



Photo taken October 1, 2009. View to the south.

Located in the middle of the Manasquan shoreline, Riddle Way has a dune that dates from after the December 1992 storm. The community erected straight line sand fence to capture winter sand transport on the beach rather than in the dunes.

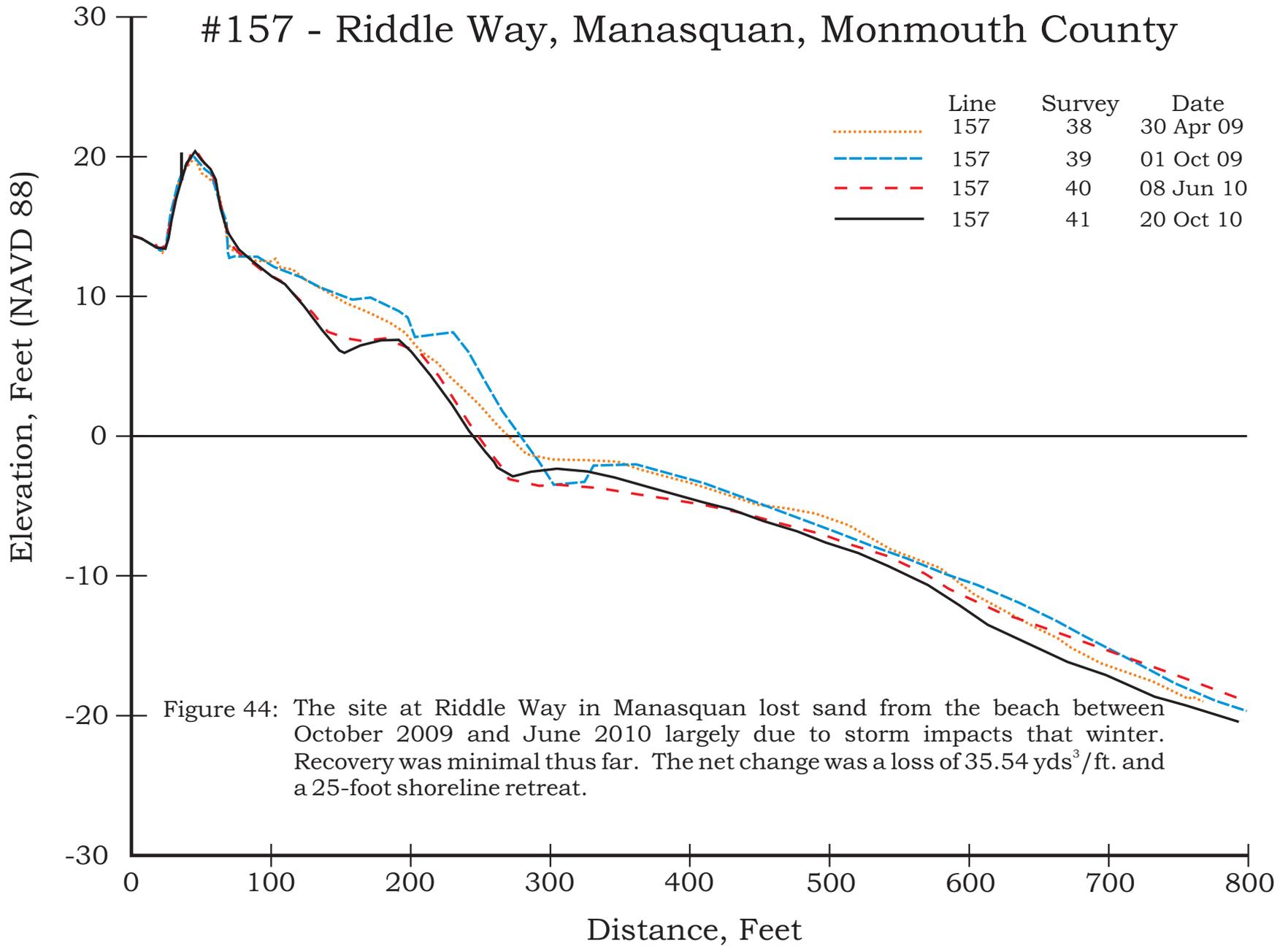


Photo taken October 20, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-47.07 cu yd/ft) and the shoreline moved landward (-34.0 ft).

New Jersey Beach Profile Network

#157 - Riddle Way, Manasquan, Monmouth County



POMPANO AVENUE, MANASQUAN - SITE 256



Photo taken October 1, 2009. View to the north.

This site was established following dramatic changes observed after the 1992 northeast storm. Pompano Avenue is two - three blocks from the north jetty to Manasquan Inlet.



Photo taken October 20, 2010. View to the north.

Comparing the profiles over the year, the profile location gained volume (15.81 cu yd/ft) and the shoreline moved seaward (6.16 ft). The snow fence was designed to trap wind-transported sand.

New Jersey Beach Profile Network

#256 - Pompano Avenue, Manasquan, Monmouth County

