



New Jersey Beach Profile Network

Cape May County

**Great Egg Harbor Inlet
to Stow Creek**

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

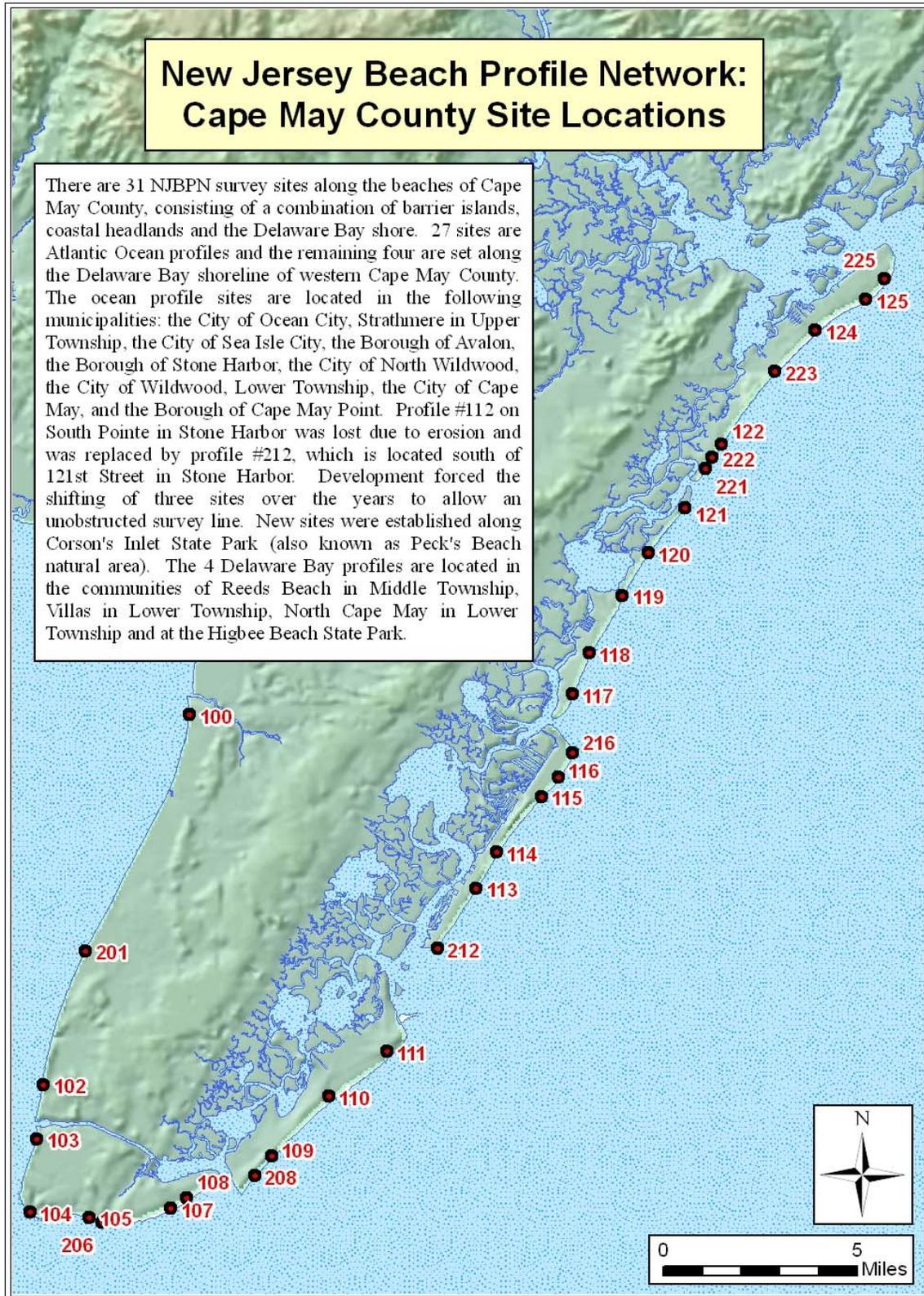


Figure 95. Locations for the 31 NJBPN profile sites in Cape May County, NJ

CAPE MAY COUNTY SPRING 2009 to FALL 2010

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 has recently concluded State-aid agreements for beach nourishment 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 are still being addressed with restoration projects. There were three Disaster Reports triggered by storms as the worst of the events hit the coastline. Between early September 2009 and December 26, 2010 there were 9 recorded northeast events three of which produced US Presidential disaster declarations. The first was a 4-day northeaster occurring between November 11 and 14, 2009 (declared December 22, 2009). This followed two minor events that served to lower the beach berm in preparation for the larger event in November. The second northeaster occurred March 11 to 13, 2010 and was declared a disaster for New Jersey shoreline communities on April 2, 2010. There were five other minor events between the November and March storms. While the summer of 2010 was very beneficial for shoreline recovery, the final event was a massive snow storm on December 26, 2010 which did not severely impact the beaches in spite of adding excessive snow removal expenses.

Two new sites were established in Cape May County to augment 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 222 is located approximately 1,000 ft south of the fishing pier between 58th and 59th Streets in Ocean City. Site 221 is located approximately one-third mile closer to Corson's Inlet.

The fall 2010 hurricane season saw two storms Igor and Earl, pass over 500 miles east of NJ, but the radiating storm swell acted to generate strong cross shore sand movement aiding the beach recovery between late August and mid-September.

Storm recovery was undertaken in North Wildwood in 2010 with the goal of distributing the sand in areas where it would have a longer residence time. The majority of the restoration sand was pumped south of 3rd Avenue leaving the northern section of the shoreline with the hard structures as the final line of defense. The recovery at the Upper Township municipal shoreline was delayed until late in 2011 by deliberations between the State, the Township and FEMA regarding a process whereby all three Disaster documents were rolled up into one for DR-NJ 1954 from December 26, 2010. Approximately 435,000 cubic yards of sand will be needed to restore that shoreline and the NJ State Park at Corson's Inlet. Restoration will be conducted at the same time in Sea Isle City.

The Borough of Avalon completed a 650,000 cy restoration of the beach between 10th and 28th Streets using Townsend's Inlet sand in 2010, and in 2011 the federal government placed an additional 450,000 cy. Sand was pumped onto the Ocean City beaches in 2010. In early 2011 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 late glacial geologic history of the Delaware Bay implies a vast storage of sand transported from the ice front as it advanced and withdrew 25,000 to 14,500 years ago. No systematic stratigraphic search has ever been conducted to determine the location or thickness of these Delaware River terrace deposits when river flow was many times what it is today. These deposits should be investigated for future sand sources.

TREND ANALYSES AND SUMMARY:

Selected locations were chosen to review trends in shoreline changes for Cape May County. The trend analysis for Site 124 at 20th Street in Ocean City shows stable beach due in part to the Federal beach fill project that was completed in 1992. Site 116 in northern Avalon has suffered erosion and several beach fill projects have been placed in the area. The site had a modest gain in 2010 due to sand placement. In North Wildwood (Site 111) the coastal processes surrounding Hereford Inlet have a direct effect on the stability of this beach and the erosion trend continued from about 1994. This site received some sand in late 2009 and 2010. At Site 107 in Cape May City, the beach has remained relatively stable since the completion of a federal beach fill in 1991. Along Delaware Bay wave energy is smaller than on the open ocean coast. At Site 103, Higbee Beach in Lower Township, sand sources to feed the beach are limited and the site experiences an overall erosion trend. The addition of several million cy of sand to the Cape May County beaches have provided an overall gain in sand volume.

The ACOE 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 either FY 08, FY 09, or FY 10, which ends September 30, 2010. “Stimulus money” can not 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 table and chart above indicate, 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 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.

24-Year Sand Volume Changes at Site 124, 20th St., Ocean City

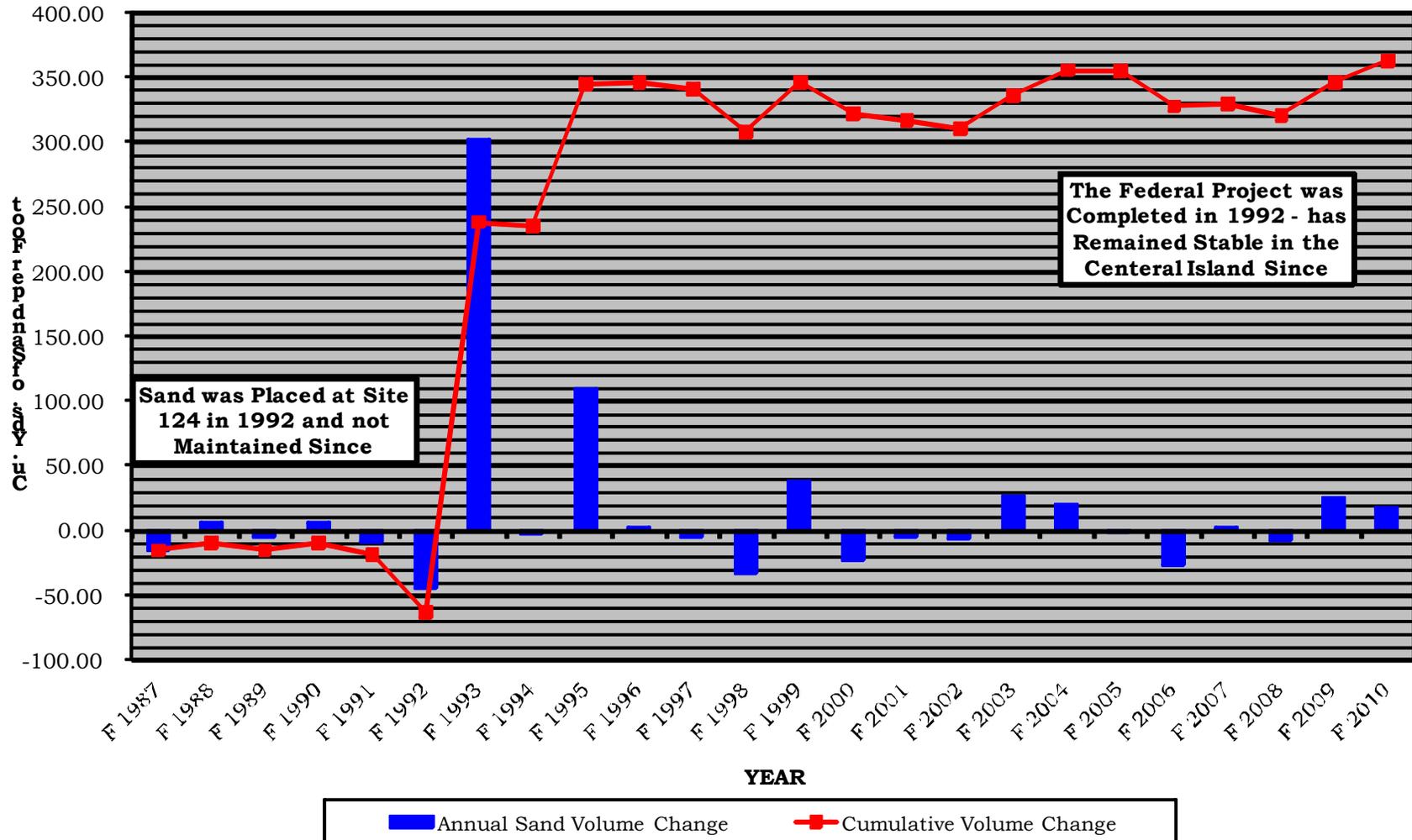


Figure 96. The sediment supply present along this segment of the Ocean City shoreline between 1986 and 1991 was so meager that high tide was landward of the boardwalk. The Halloween Storm of 1991 demolished the boardwalk north of this site for 5 blocks. The initial nourishment occurred in the summer of 1992 and that following December a more serious storm did zero damage to the municipal oceanfront infrastructure. Sand continued to arrive following the initial year of the project because new sand has been added 9 times at the northern erosional “hot-spot” at 6th Street. Today this site supports a massive dune system and is very stable.

24- Year Sand Volume Changes at Site 116, 23rd St., Avalon

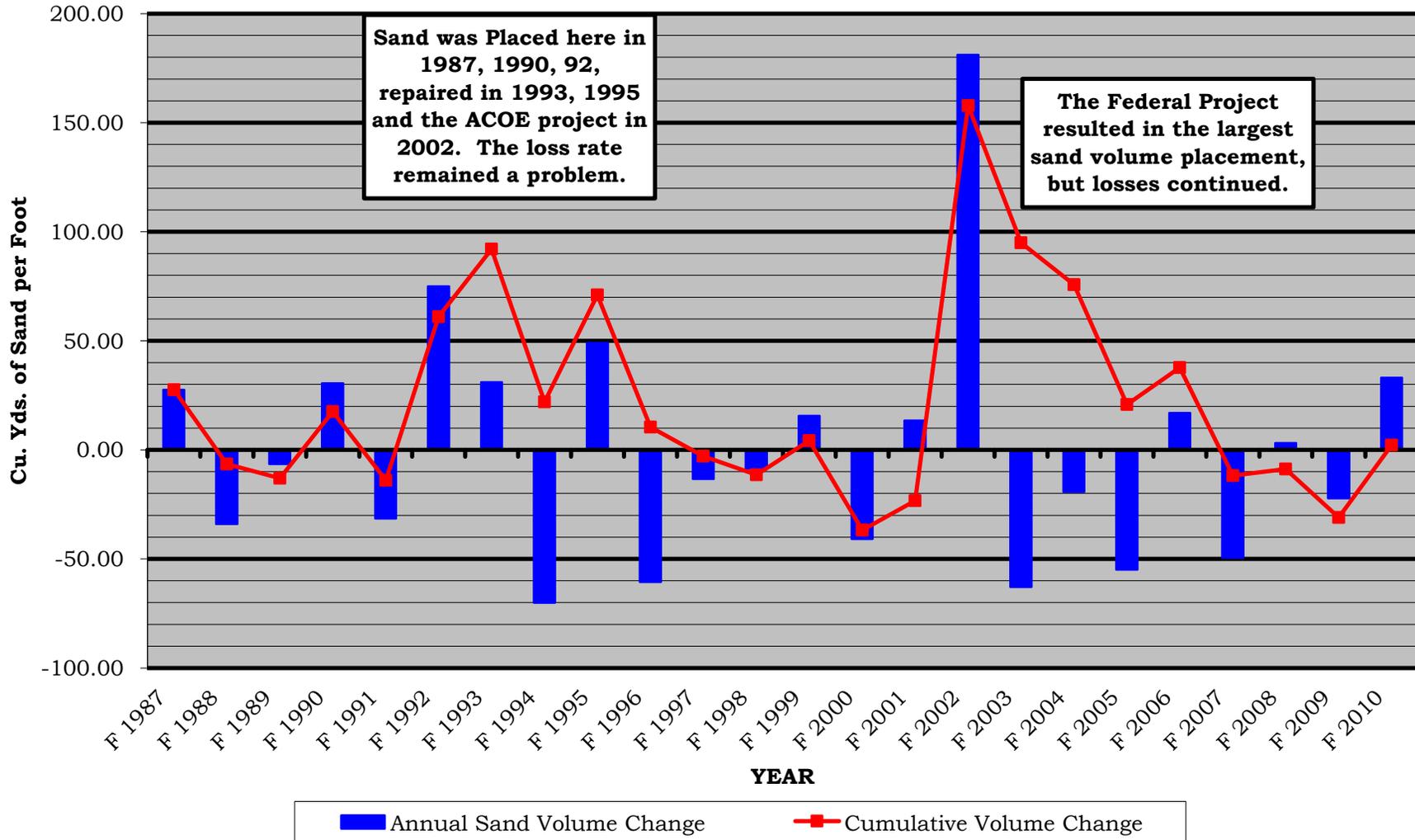


Figure 97. The northern end of Avalon’s beachfront has suffered erosion between 9th and 23rd Streets since 1978. The loss rate appears to be 35 to 50 cubic yards/foot of shoreline per year. There is little supply of new sand naturally due to an extended inlet jetty at 8th Street. Work is on-going to develop a mitigating solution to this loss rate. Top on the list is to institute transferring sand back to the site from the south where monitoring history says it is being deposited. Sand was placed in 2010 and again in 2011 by the ACOE.

24-Year Sand Volume Changes at Site 111, 15th Avenue, North Wildwood

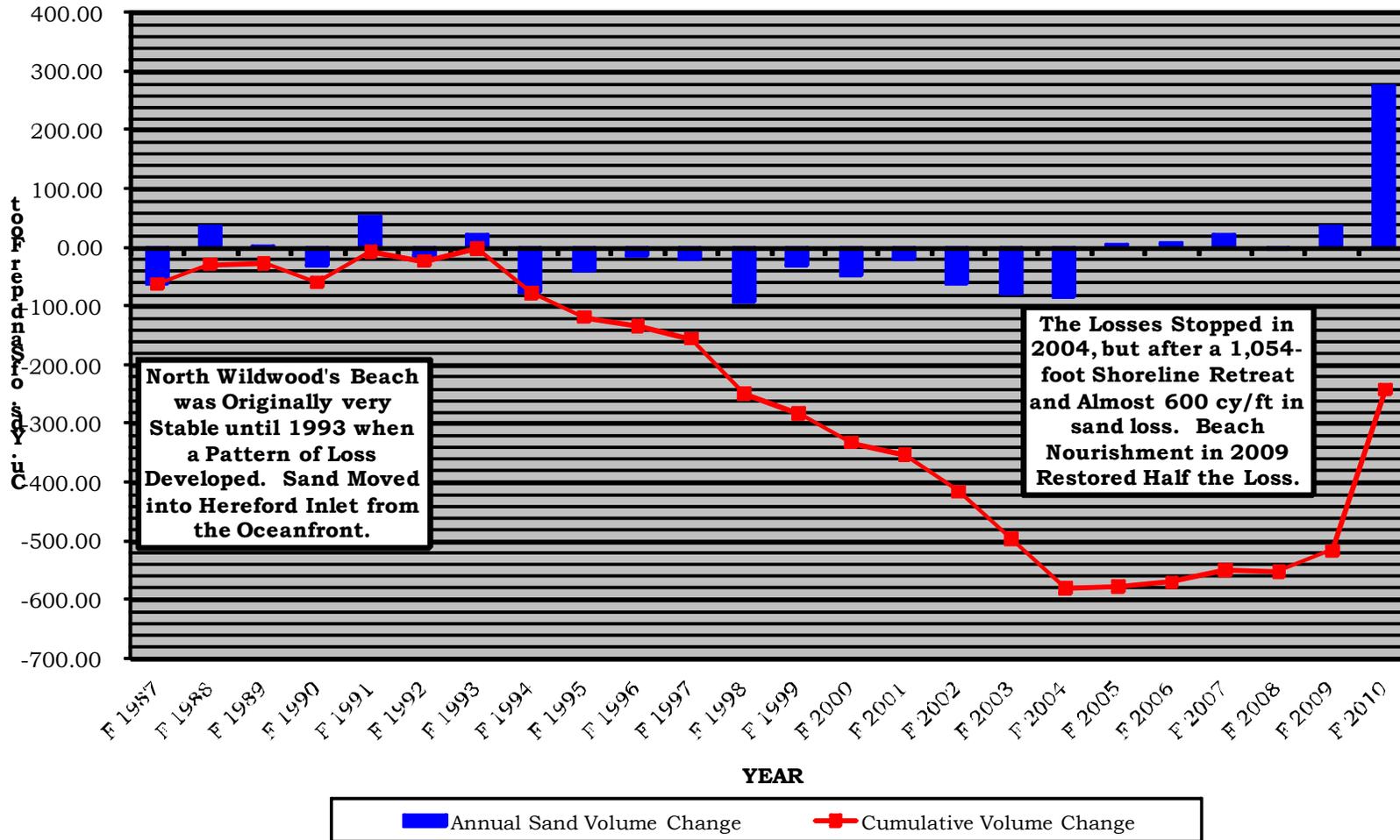


Figure 98. The past 24 years of surveys in North Wildwood debunks the popular notion that all sand in New Jersey goes to the Wildwoods. Changes to the tidal current patterns in Hereford Inlet in 1992-1993 produced another cycle of beach erosion where the lost sand deposited along the No. Wildwood inlet shoreline and moved south into the City of Wildwood. The loss rate was pretty steady for 11 years until 2004. City officials commenced planning a major (1,400,000 cy) beach nourishment project finally started in the fall of 2009 (after the F-2009 survey was done). Storms damaged the project prior to finishing with restoration completed in 2010 as the rebound in the cumulative trend curve shows.

24-Year Sand Volume Changes at Site 107, Baltimore Ave. Cape May City

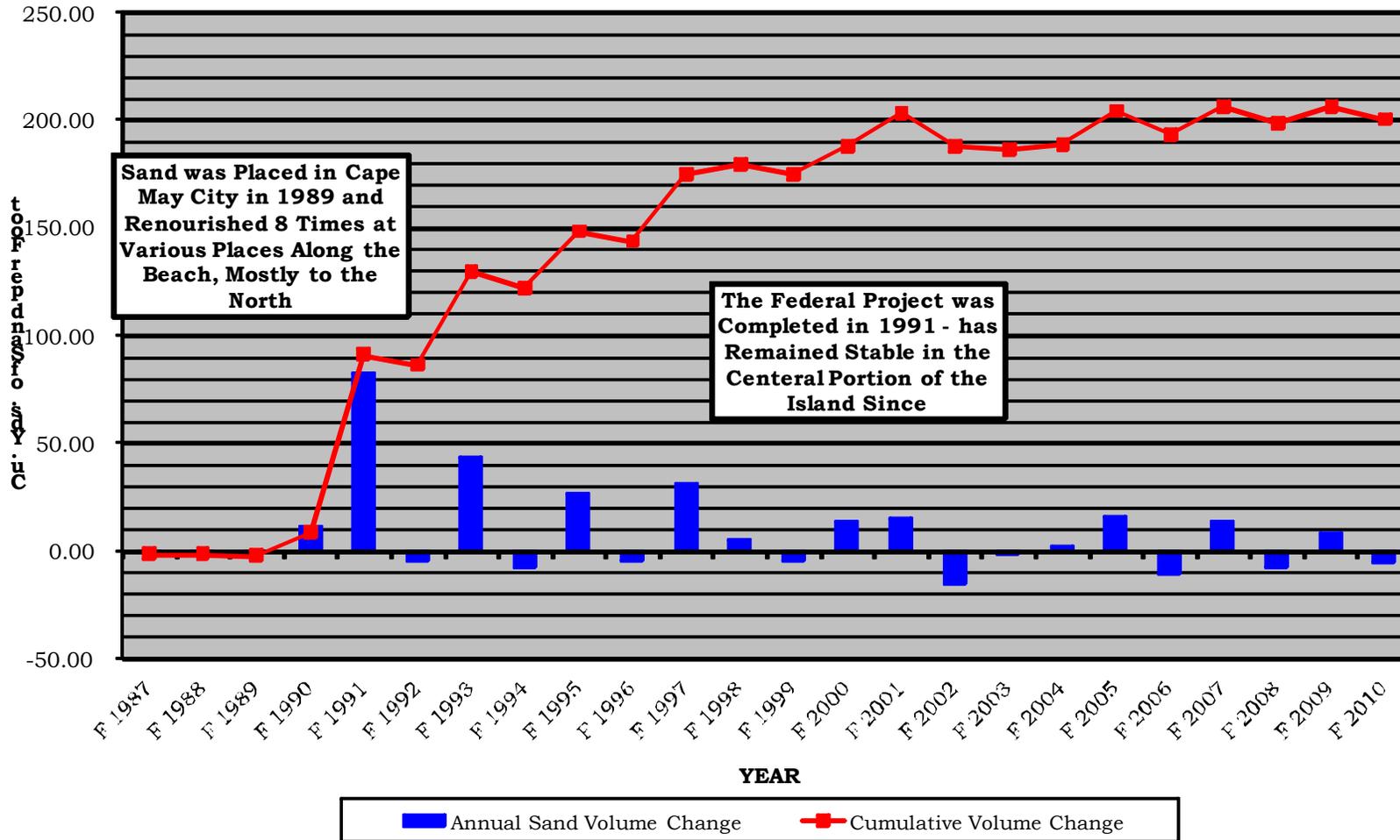


Figure 99. Beach nourishment was started in Cape May City in 1989 as the initial Federal project in New Jersey. This beach was wet to the rock revetment defending Ocean Avenue along Cape May City. Sand pumping provided sand in 1990 and 1991 converting this shoreline from just a view of the sea from the rocks to a truly great recreational beach. There have been 8 maintenance efforts since 1989, each one contributing something to the total volume present here. With about 200 yds³/ft. in additional sand volume, the Baltimore Avenue beach is a model for stability at this point in this project.

24-Year Sand Volume Changes at Site 103, Higbee Beach, Lower Township

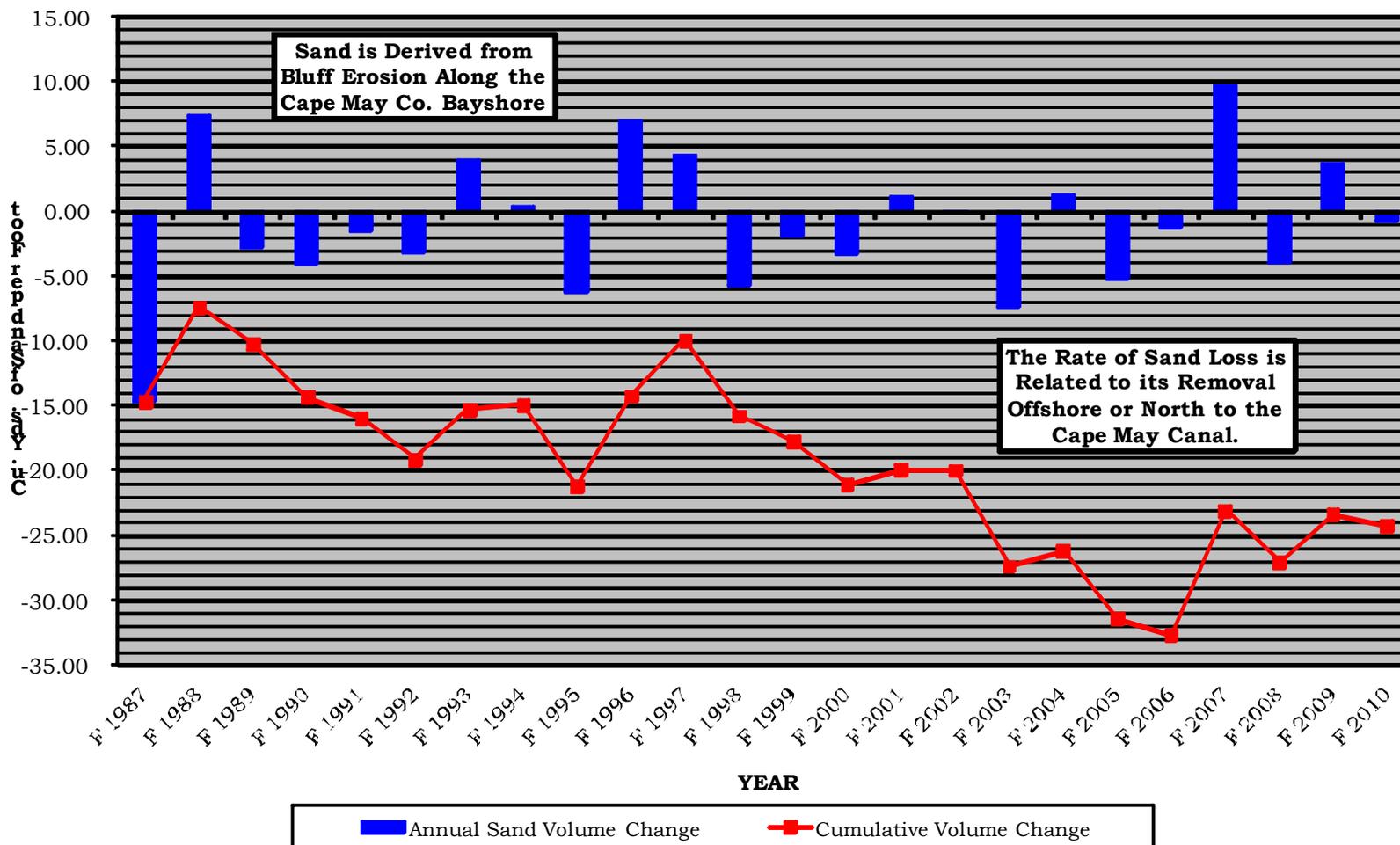


Figure 100. The four sites on Delaware Bay in Cape May County display smaller changes each year due to the far smaller wave energy available to change things. Higbee Beach is a natural area in the southern part of this western bay shoreline and consists of a sandy vegetated bluff which erodes when storms raise the tide or strong northwest winds at high tide raise big waves on Delaware Bay. The derived sand becomes part of the beach and travels north to the jetties confining the Cape May Canal or moves offshore onto the Delaware Bay floor as a thin layer spread over a several hundred-foot range seaward of the low tide line. It took 21 years to double the initial year's recorded sand loss volume. The trend reversal since 2006 may be due to the Cape May Point project sand arriving.

ANNUAL & CUMULATIVE OCEANFRONT SHORELINE SAND VOLUME CHANGES, CAPE MAY COUNTY 1987 to 2009

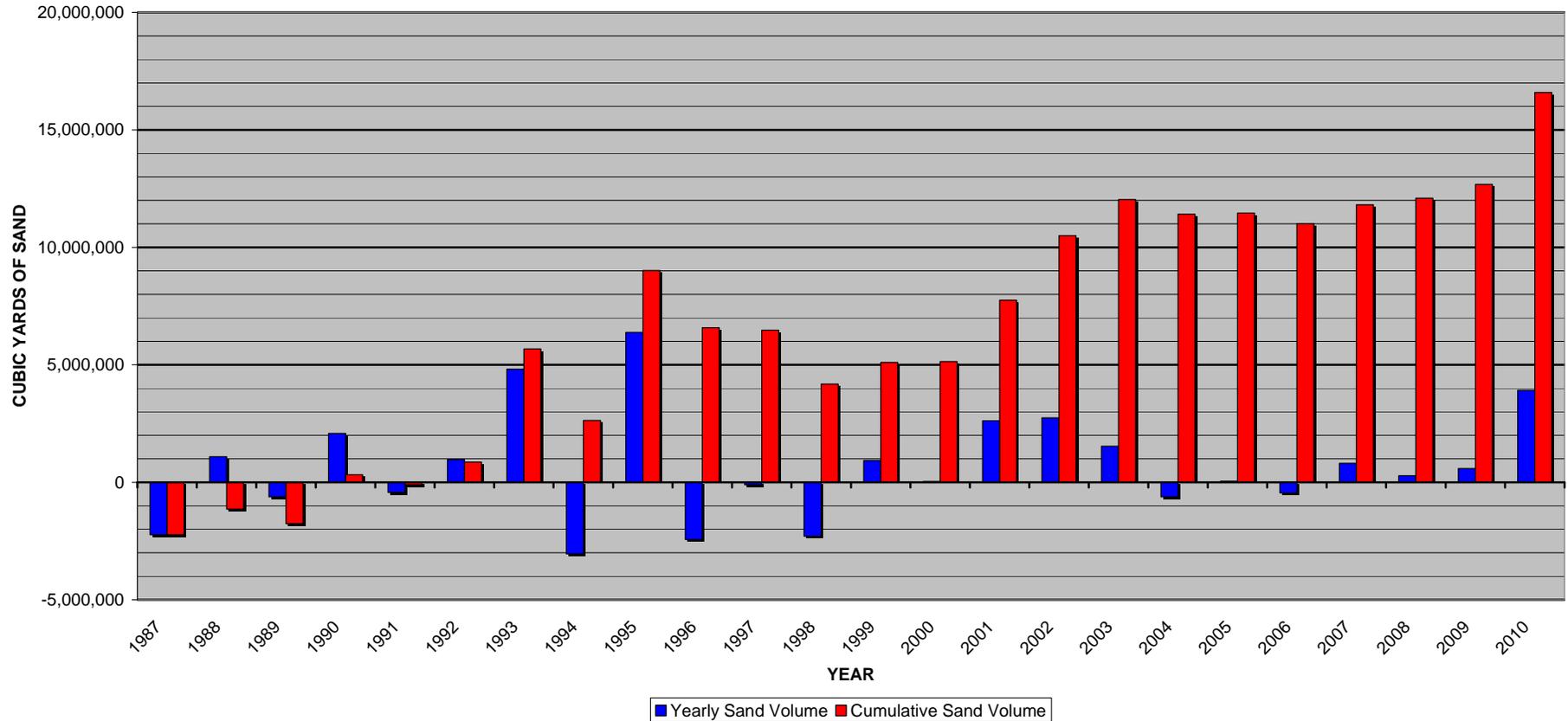


Figure 101. The improvement in the average sand volume present on Cape May County beaches is clearly associated with the many major projects conducted within the County. Starting in 1989 the communities of Ocean City and Cape May City along with Avalon provided large volumes of sand to their municipal beaches. The ACOE is involved in Ocean City, Avalon, Stone Harbor, Cape May City and Cape May Point with the State placing sand in Strathmere (2001 and 2009) and in Sea Isle City and North Wildwood in 2009. Major work in 2009 and 2010 added over 6.4 million cubic yards of sand to the County shoreline. Not since 1995 following the two early 90’s storms has this much sand been added. Between the State and Federal projects these projects have produced over 16.5 million added cubic yards to the County shoreline’s sand volume.

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GARDENS ROAD, OCEAN CITY - SITE 225



Photo taken September 28, 2009. View to the north.

The Gardens Road site has suffered erosion beginning in 2005 as the sand supply from the northern end of the oceanfront beach receiving beach nourishment periodically declined with time. The last effort was the 4th renourishment done by the ACOE by February 2004 (1.6 million cubic yards). Funding has been absent to continue until the NJ State completed a project in late 2008. This survey preceded the fall 2009 storm erosion that cut deeply into the dune forcing an emergency renourishment completed in 2010.

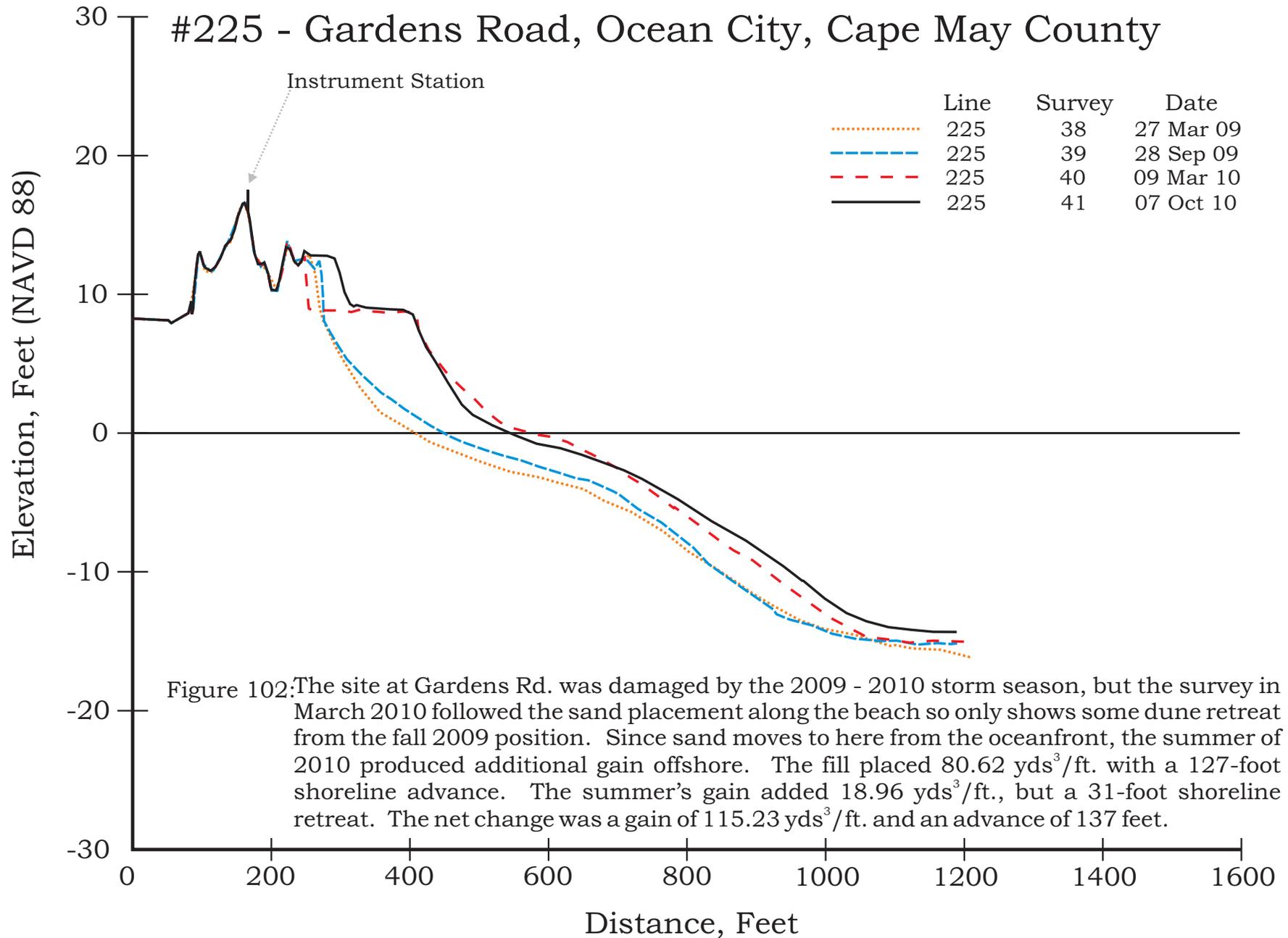


Photo taken October 7, 2010

The fill placed 80.62 yds³/ft. with a 127-foot shoreline advance. The summer's gain added 18.96 yds³/ft., though there was a 31-foot shoreline retreat. The net change was a gain of 115.23 yds³/ft. and an advance of 137 feet

New Jersey Beach Profile Network

#225 - Gardens Road, Ocean City, Cape May County



6th STREET, OCEAN CITY - SITE 125



Photo taken September 28, 2009. View to the south..

In 2008, the beach was wider than in previous years due to a project financed by the State of NJ and the local municipality. This was necessary as a result of a lack of Federal funding for the Corps District to continue its maintenance program in Ocean City. This photograph shows the new beach and snow fencing erected to begin the process of rebuilding the dunes in the gap where erosion took all the material.

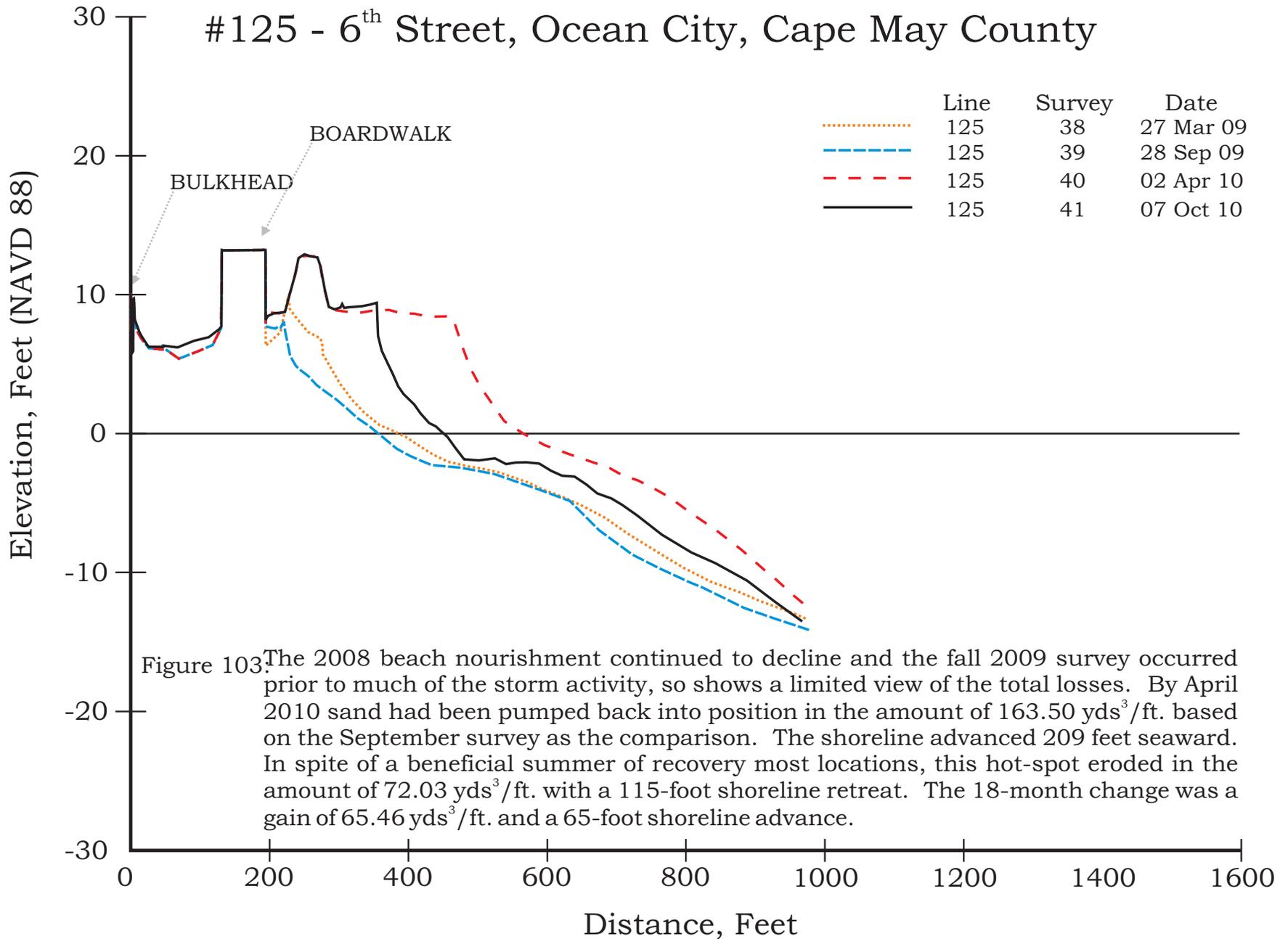


Photo taken October 7, 2010. View to the south.

In April, 2010 163.50 yds³/ft was placed on the shoreline and it advanced 209 feet seaward. In spite of a beneficial summer of recovery most locations, this hot-spot eroded in the amount of 72.03 yds³/ft. with a 115-foot shoreline retreat.

New Jersey Beach Profile Network

#125 - 6th Street, Ocean City, Cape May County



20th STREET, OCEAN CITY - SITE 124



Photo taken September 30, 2009. View to the north.

The 20th Street profile is a dramatic example of beach nourishment success that was completed in 1992. This photo shows the summer dune grass growth and the gradational transition to the dry beach. In 1989, these houses were essentially at the normal high tide line protected only by a wooden bulkhead with a top elevation of 11 feet.

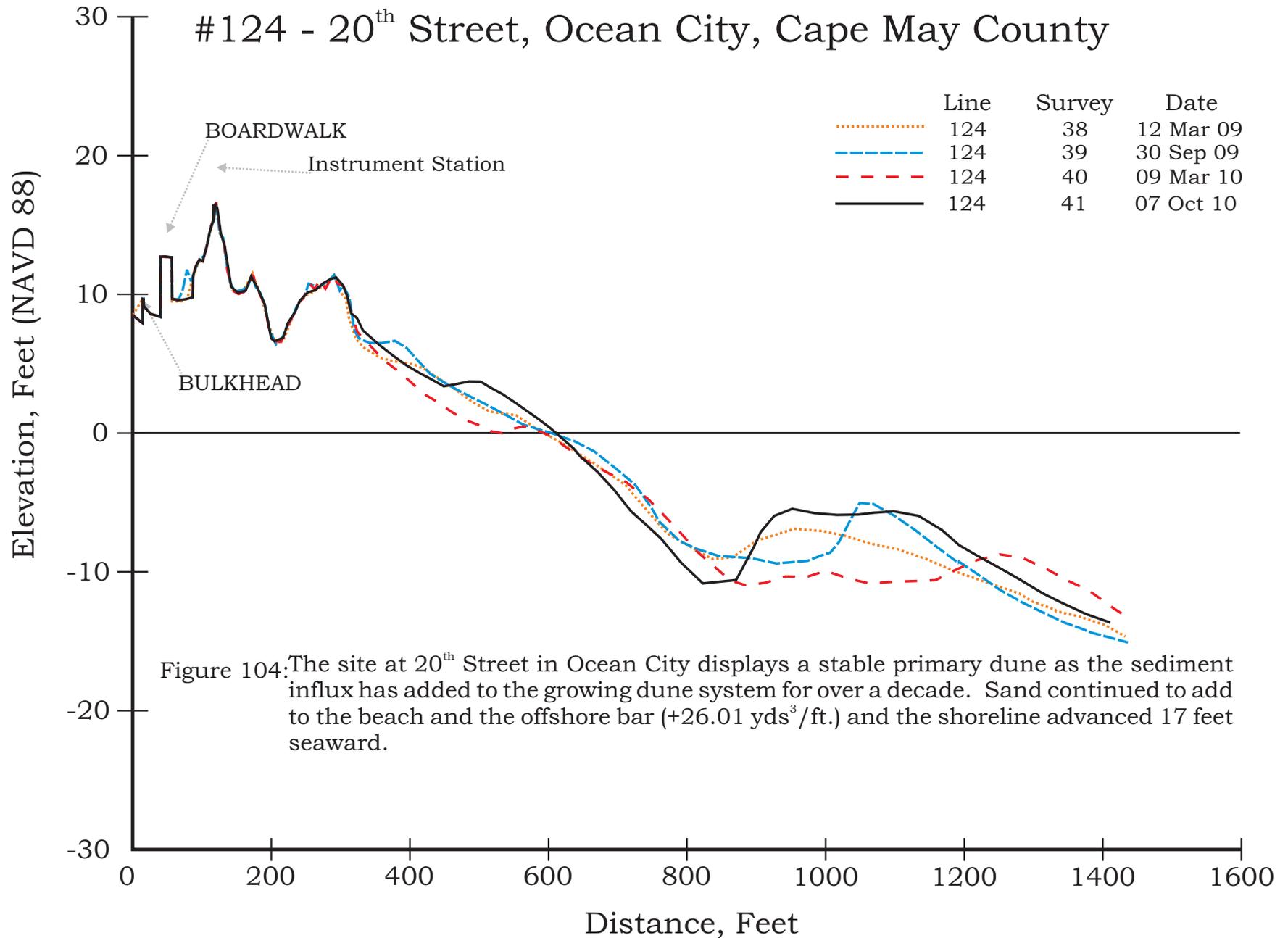


Photo taken October 7, 2010. View to the north.

Comparing the profiles over the year, the profile location gained volume (26.01 cu yd/ft) and the shoreline moved seaward (6.65 ft). The sand volume increase was found throughout the profile.

New Jersey Beach Profile Network

#124 - 20th Street, Ocean City, Cape May County



34th STREET, OCEAN CITY - SITE 223



Photo taken September 30, 2009. View to the south.

The Federal portion of the Ocean City beach restoration that was completed prior to 1995 ends at this location (34th Street). A State-local project was completed for the area to the south to 59th Street.

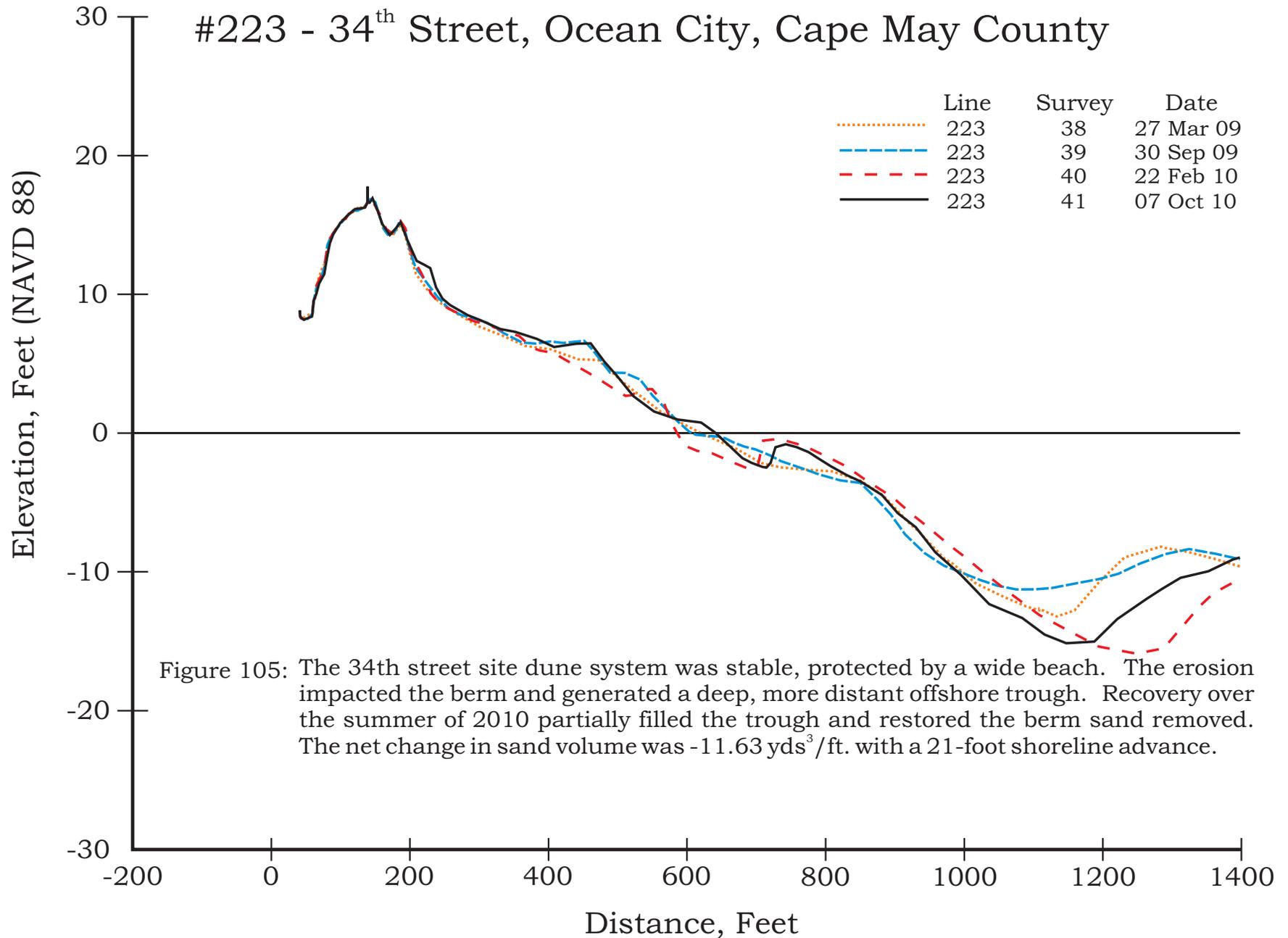


Photo taken October 7, 2010. View to the southeast.

Comparing the profiles over the year, the profile location lost volume (-25.72 cu yd/ft) and the shoreline moved seaward (33.92 ft). Most of the sand volume loss was from below 0 NAVD.

New Jersey Beach Profile Network

#223 - 34th Street, Ocean City, Cape May County



56th STREET, OCEAN CITY - SITE 122



Photo taken September 30, 2009. View to the north.

The southern part of the developed part of Ocean City has a narrower beach, but a substantial dune. The slow erosion has reduced the initial 1995 beach width to the point where restoration is presently working through the permitting process. The State will maintain this section of the beach for the first time since 1995.

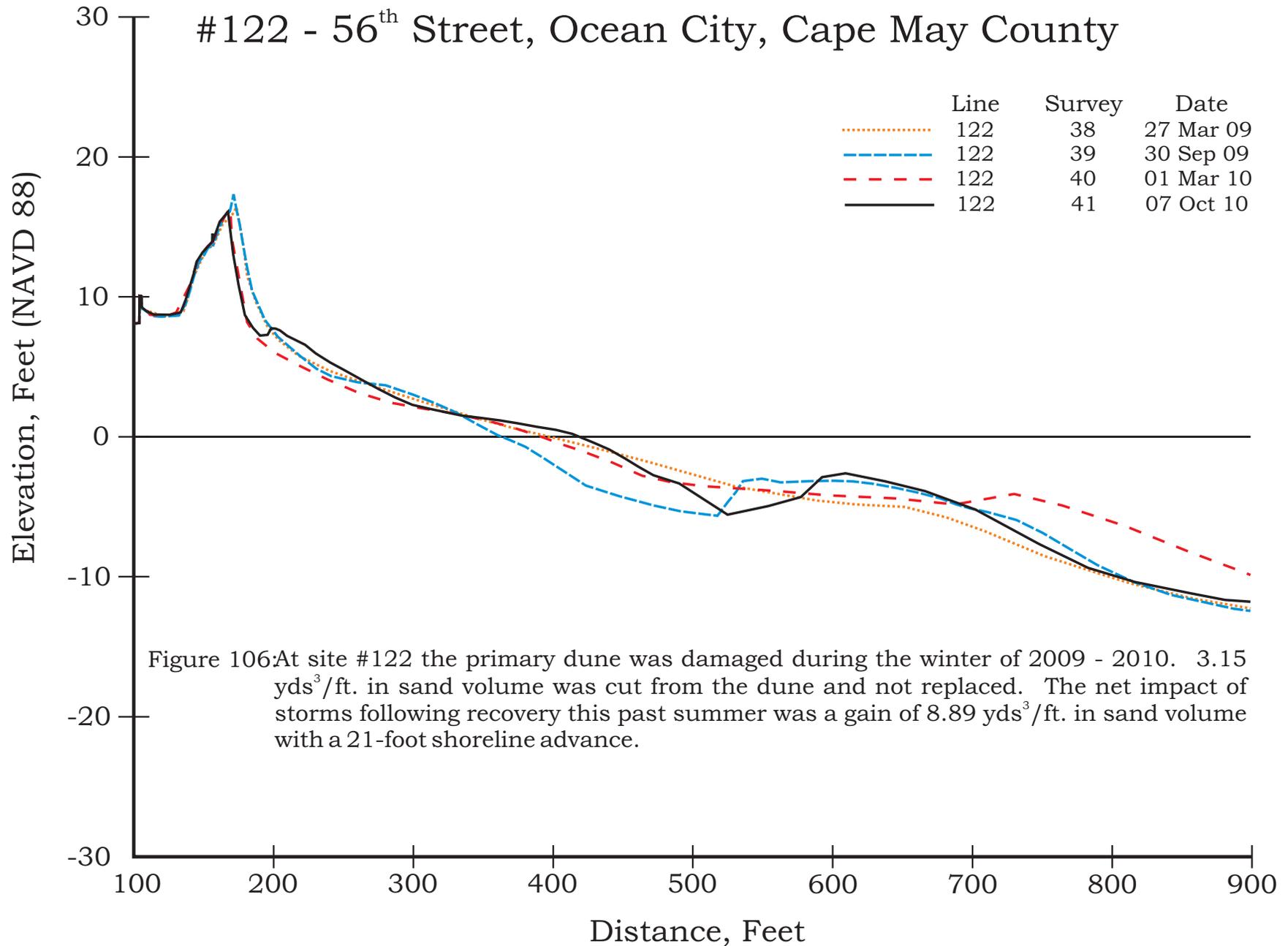


Photo taken October 7, 2010. View to the north.

The primary dune was damaged during the 2009-2010 storm season. Comparing the profiles over the year, the profile location gained volume (8.89 cu yd/ft) and the shoreline moved seaward (21.09 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network

#122 - 56th Street, Ocean City, Cape May County



59th STREET, OCEAN CITY - SITE 222



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

This new site was established because there was a lack of profile data for this section of the island.

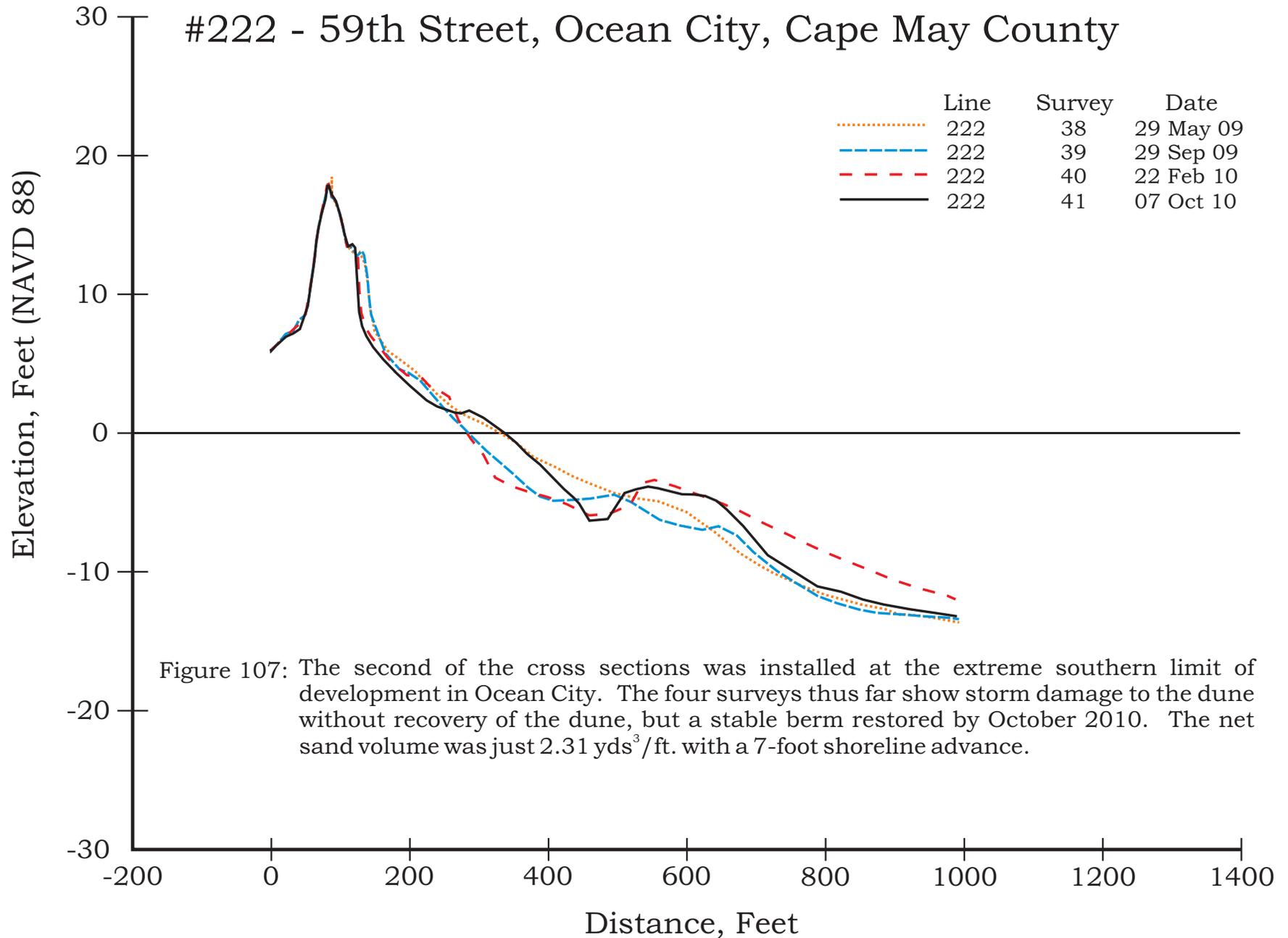


Photo taken October 7, 2010. View to the north

Comparing the profiles over the nine month time period, the profile location lost volume (-14.63 cu yd/ft) and the shoreline moved seaward (54.78 ft).

New Jersey Beach Profile Network

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



CORSON'S INLET PARK, OCEAN CITY - SITE 221



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

This is a new site that was established to monitor changes near Corson's Inlet.

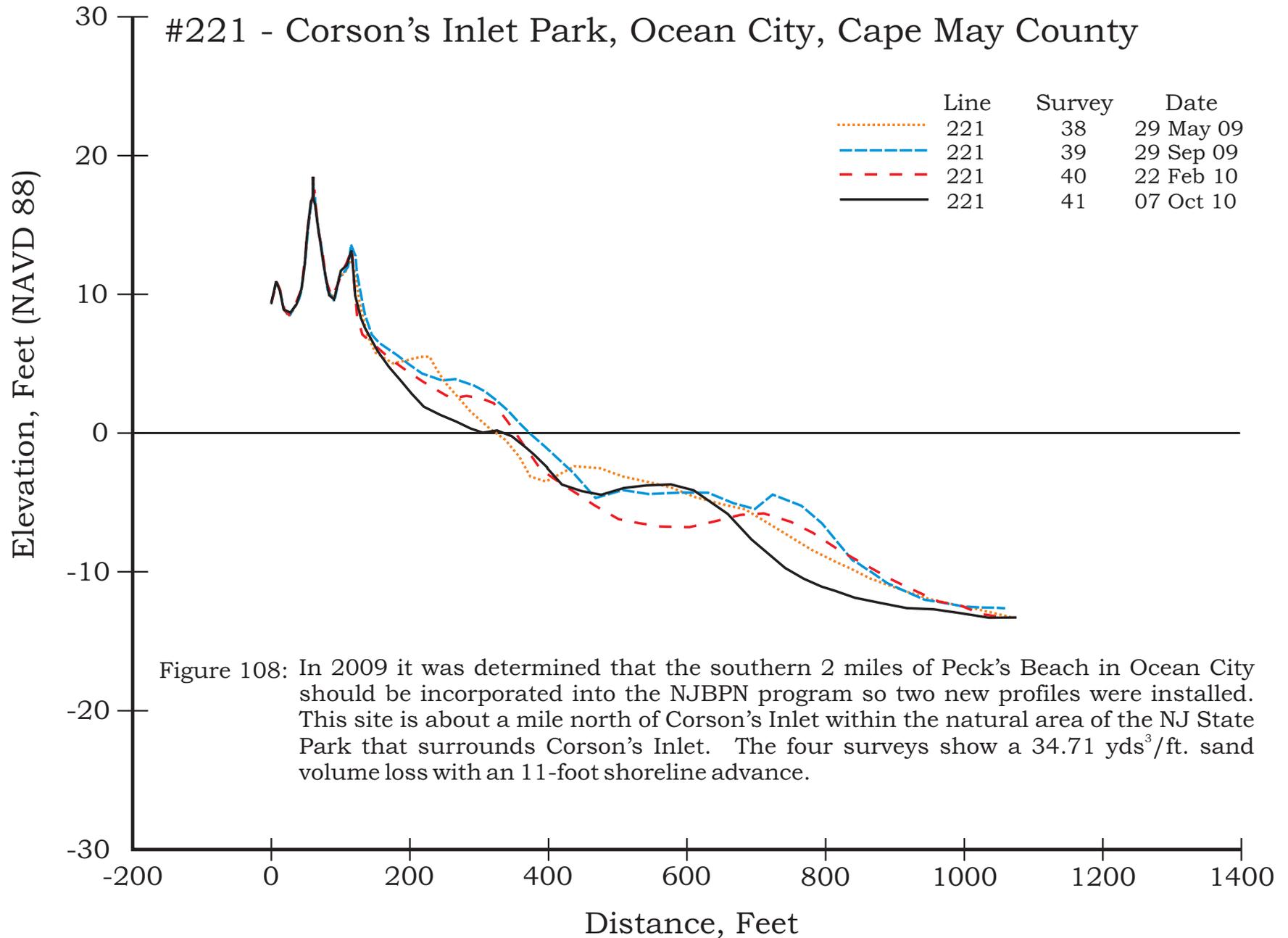


Photo taken October 7, 2010. View to the north.

Comparing the profiles over the nine month time period, the profile location lost volume (-21.45 cu yd/ft) and the shoreline moved landward (-16.9 ft). Sand volume loss occurred across the entire profile.

New Jersey Beach Profile Network

#221 - Corson's Inlet Park, Ocean City, Cape May County



WILLIAMS ROAD, STRATHMERE - SITE 121



Photo taken December 16, 2009. View to the north.

The beach at Williams Road was still wide enough to prevent dune erosion by the 2009 fall storms. Normal high tide is still coming short of the dune toe, but any sort of tide elevation enhancement allows the waves to reach the dune.

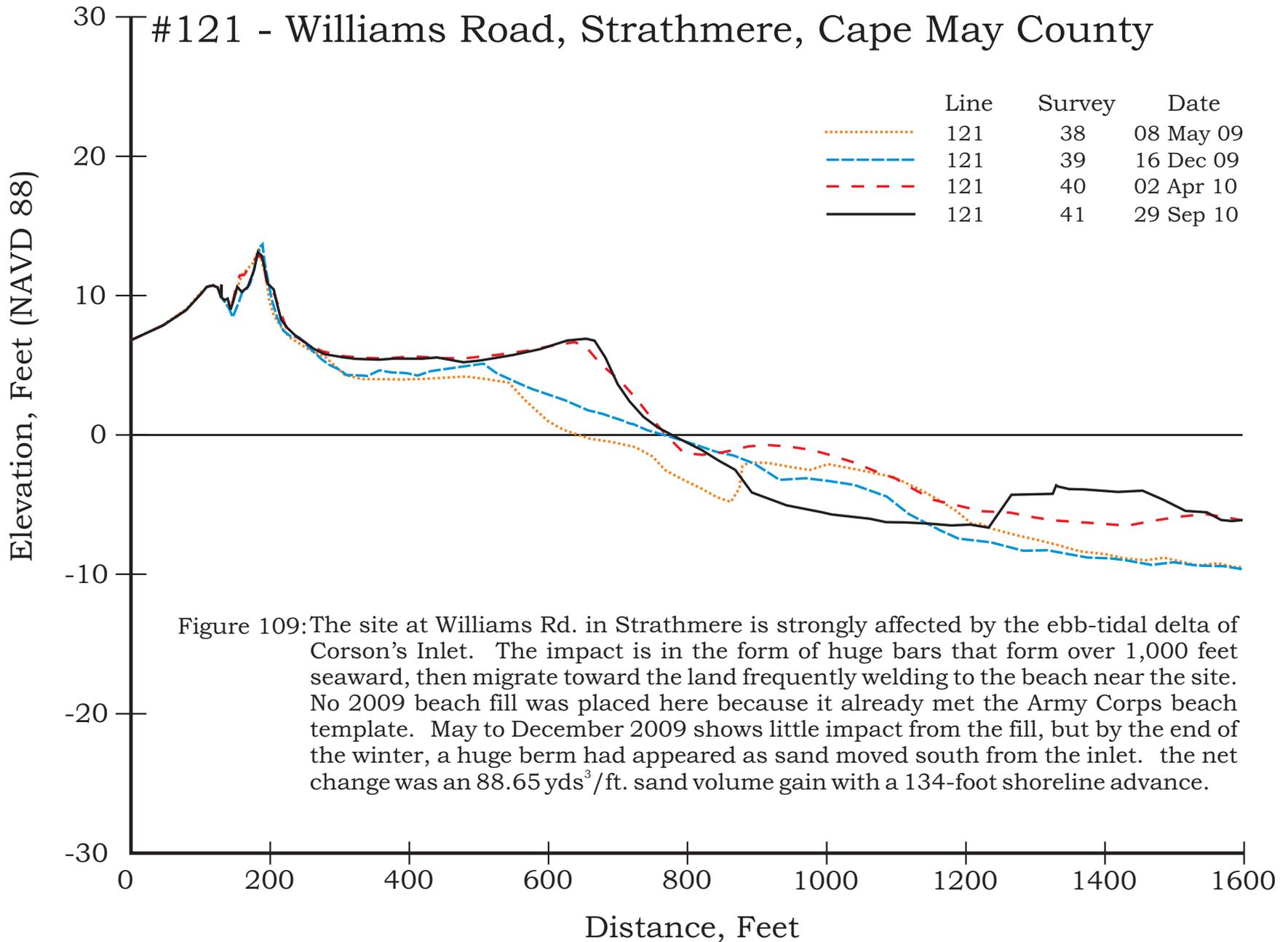


Photo taken September 29, 2010. View to the north.

This profile is strongly affected by the Corson's Inlet ebb-tidal delta that migrate and weld onto the beach. Comparing the profiles over the nine month time period, the profile location gained volume (81.31 cu yd/ft) and the shoreline moved seaward (11.24 ft).

New Jersey Beach Profile Network

#121 - Williams Road, Strathmere, Cape May County



1st STREET, SEA ISLE CITY - SITE 120



Photo taken December 17, 2009. View to the south.

This central island location has a sand starvation problem that shows in the narrow beach and the low, narrow dune where the tide reaches the dune almost every day. There is a 10-foot diameter geotextile tube that is used for the core of the dune.

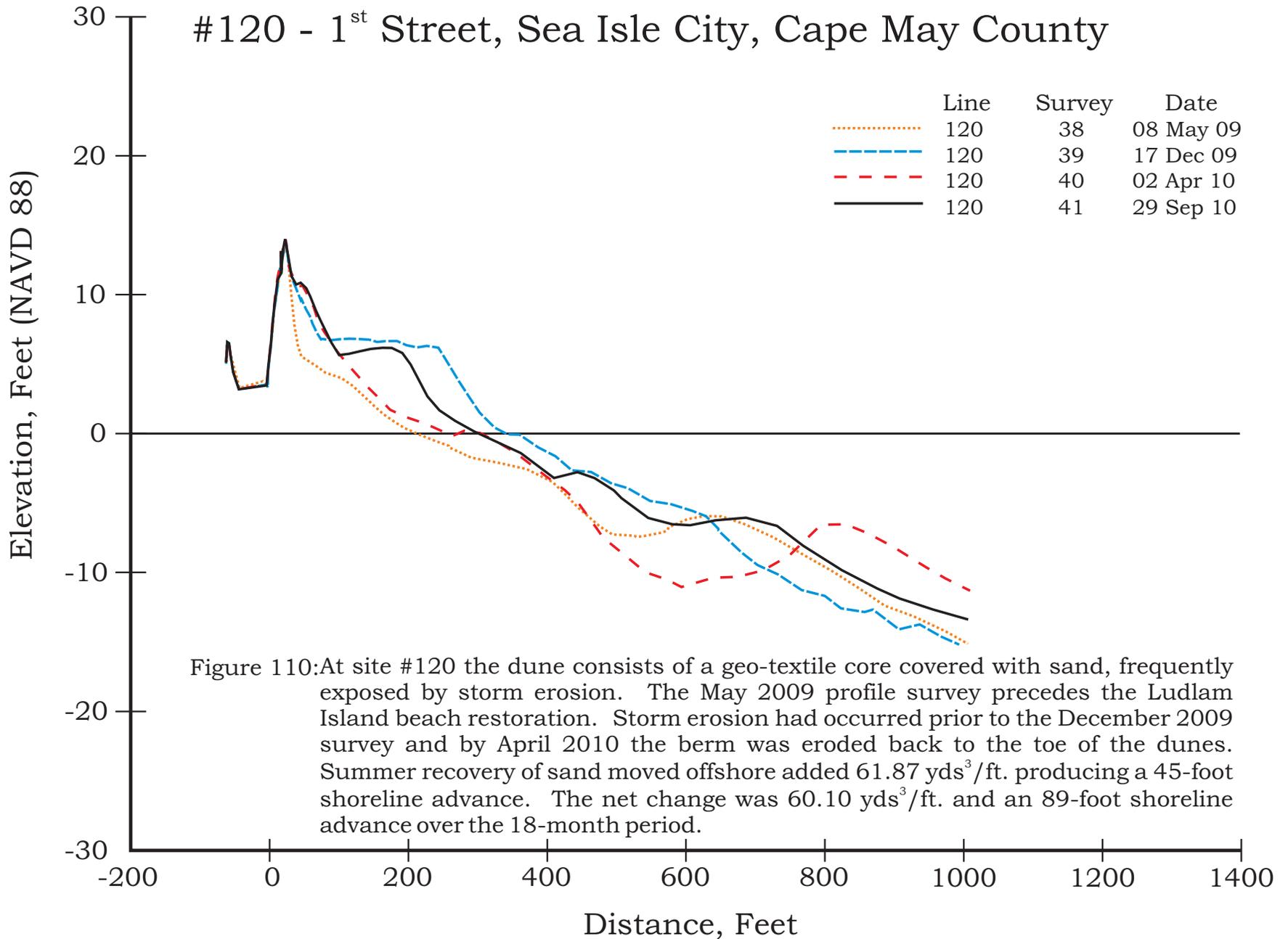


Photo taken September 29, 2010. View to the south.

Comparing the profiles over the nine month time period, the profile location gained volume (6.23 cu yd/ft) and the shoreline moved landward (-39.33 ft). The sand volume increase occurred below the 0 NAVD datum.

New Jersey Beach Profile Network

#120 - 1st Street, Sea Isle City, Cape May County



25th STREET, SEA ISLE CITY - SITE 119



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

This area shows the southern portion of the Sea Isle City/Ludlam Island beach fill project which was completed in September 2009.

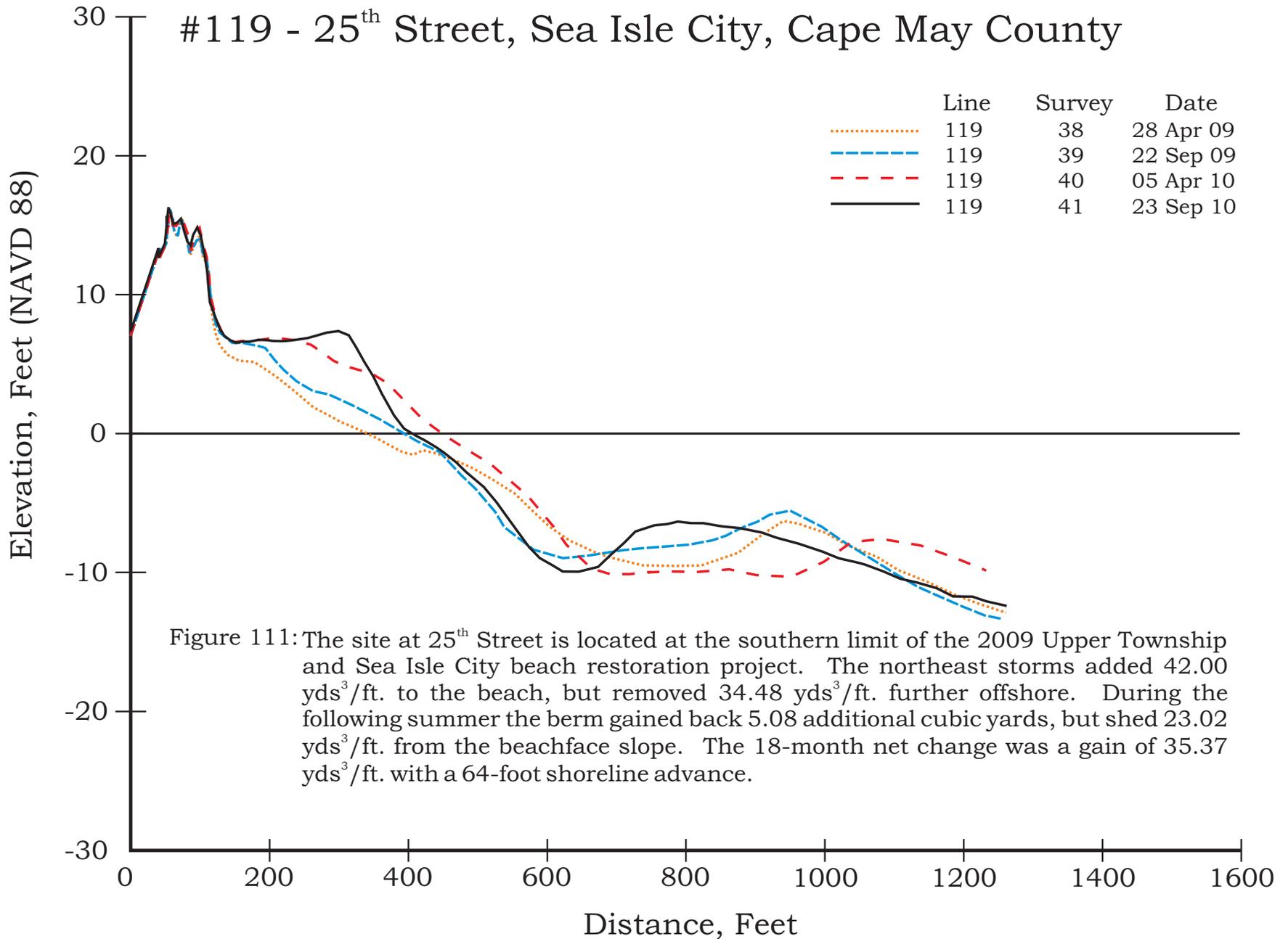


Photo taken September 23, 2010 . View to the north.

Comparing the profiles over the one year time period, the profile location gained volume (25.04 cu yd/ft) and the shoreline moved seaward (11.89 ft).

New Jersey Beach Profile Network

#119 - 25th Street, Sea Isle City, Cape May County



57th STREET, SEA ISLE CITY - SITE 118



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

The heavy-use section of the Sea Isle City beach remains reasonably stable with a dune between the promenade and the beach.



Photo taken September 23, 2010 . View to the north.

Comparing the profiles over the one year time period, the profile location gained volume (25.04 cu yd/ft) and the shoreline moved seaward (11.89 ft).

New Jersey Beach Profile Network

#118 - 57th Street, Sea Isle City, Cape May County

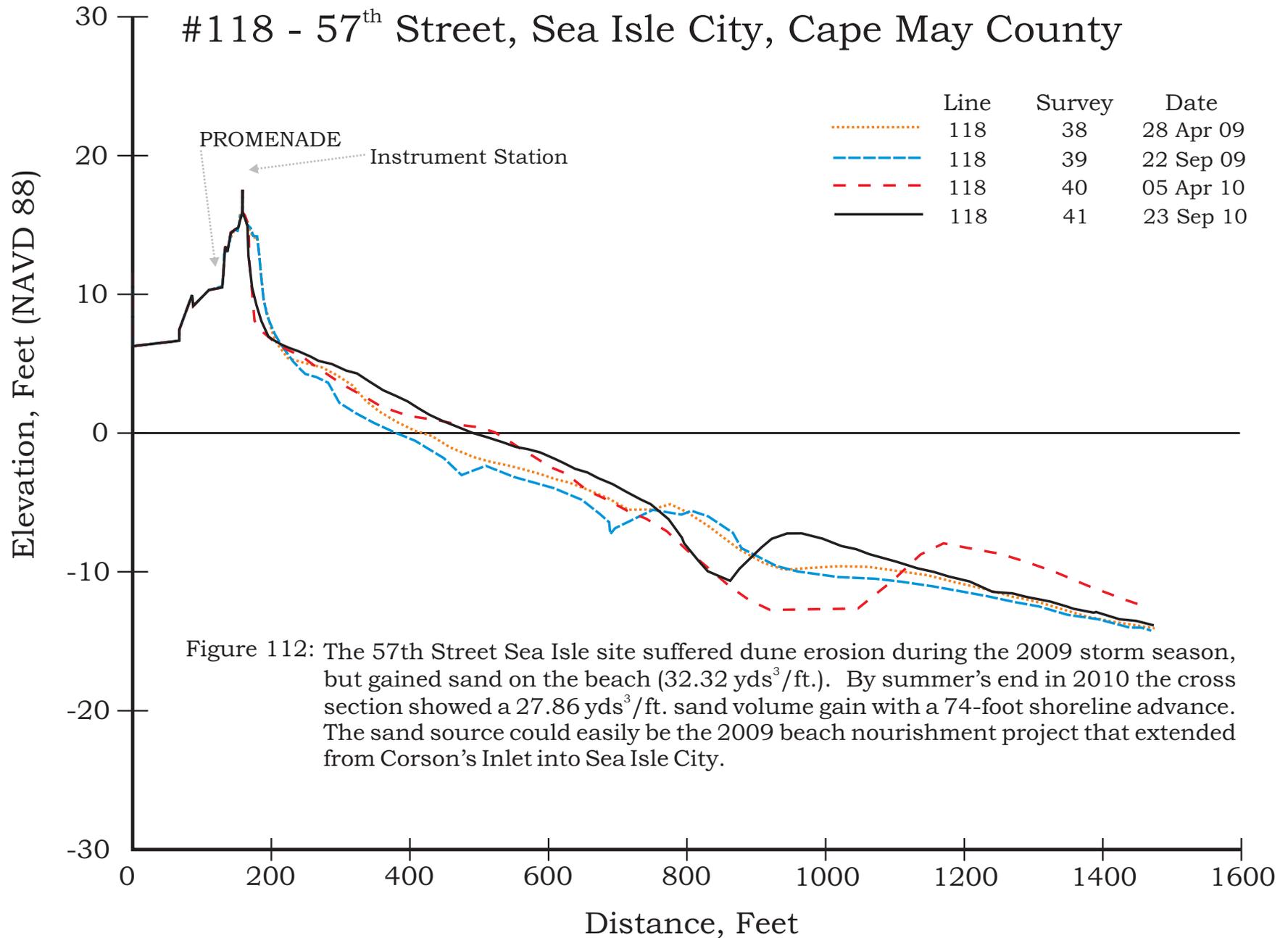


Figure 112: The 57th Street Sea Isle site suffered dune erosion during the 2009 storm season, but gained sand on the beach (32.32 yds³/ft.). By summer's end in 2010 the cross section showed a 27.86 yds³/ft. sand volume gain with a 74-foot shoreline advance. The sand source could easily be the 2009 beach nourishment project that extended from Corson's Inlet into Sea Isle City.

80th STREET, SEA ISLE CITY - SITE 117



Photo taken September 21, 2009. View to the south.

The southern segment of Sea Isle City was impacted by the May 2008 northeast storm. The storm was relatively minor, but reached the dune toe in many places with narrow beaches.

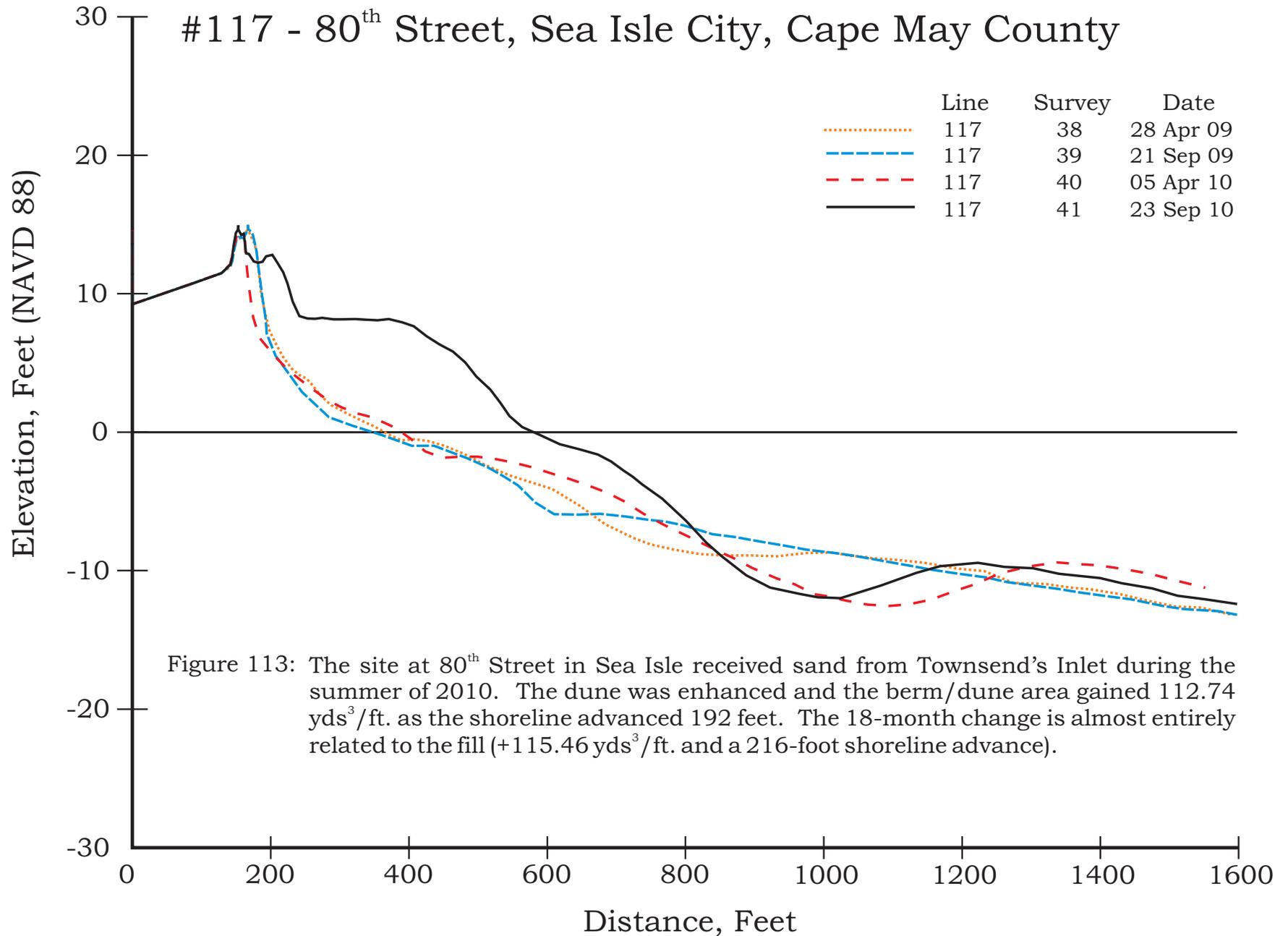


Photo taken September 23, 2010 . View to the south.

Comparing the profiles over the one year time period, the profile location gained volume (116.14 cu yd/ft) and the shoreline moved seaward (232.9 ft). The sand volume increase was throughout the profile.

New Jersey Beach Profile Network

#117 - 80th Street, Sea Isle City, Cape May County



9th STREET, AVALON - SITE 216



Photo taken September 21, 2009. View to the south.

The fall 2009 storms decimated this beach reducing the width to zero elevation and distance from the rocks that barely are visible in the photo.

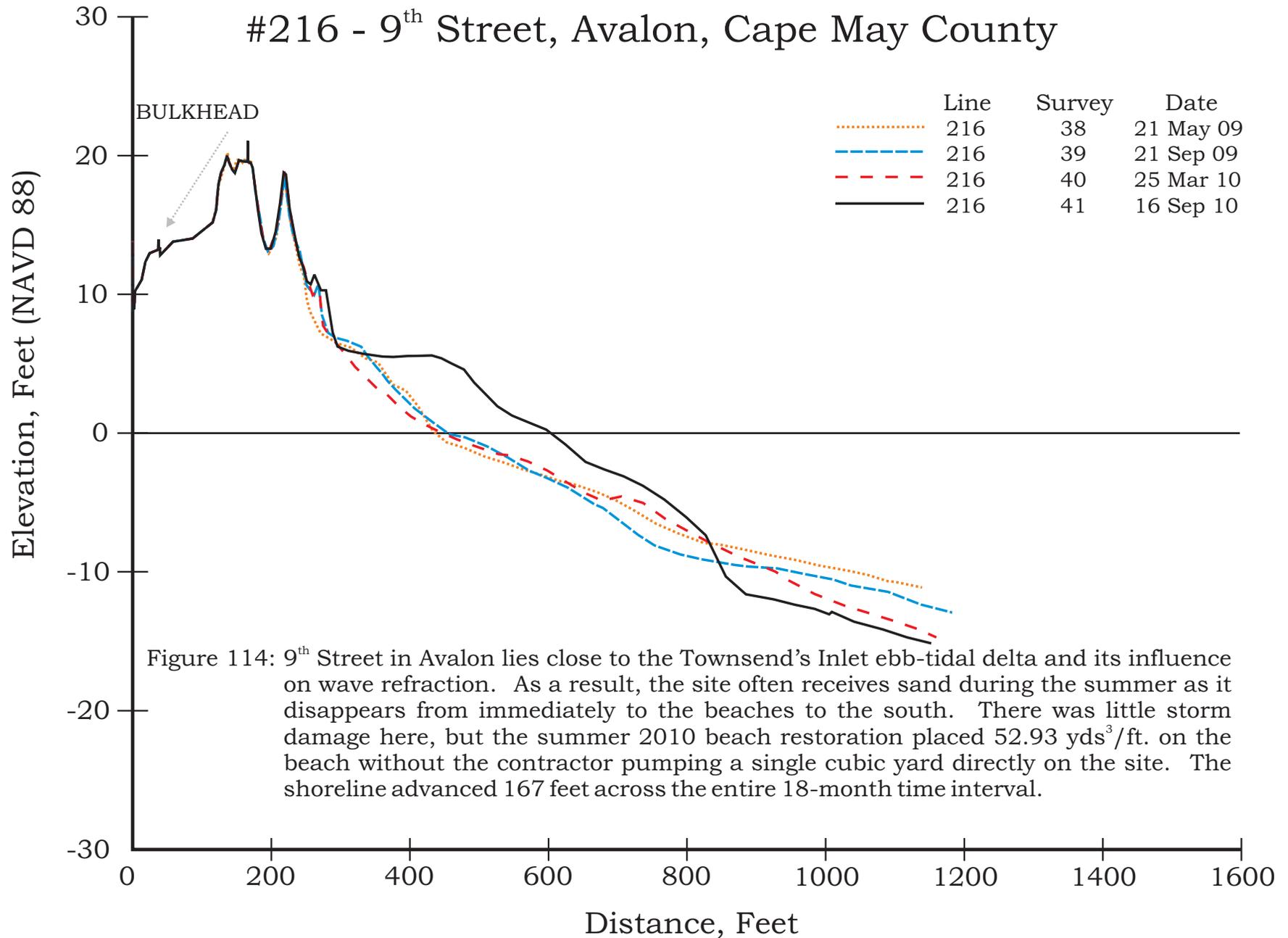


Photo taken November 23, 2010. View to the south.

Comparing the profiles over the nine month time period, the profile location gained volume (36.07 cu yd/ft) and the shoreline moved seaward (148.54 ft).

New Jersey Beach Profile Network

#216 - 9th Street, Avalon, Cape May County



23rd STREET, AVALON - SITE 116



Photo taken September 21, 2009. View to the north.

Between 2008 and 2009, this profile lost sand volume. Further erosion pushed the dune landward to the point where emergency work was instituted by hauling in 30,000 cy of quarry sand first followed by a 643,000 cy beach nourishment project in the late spring of 2010.

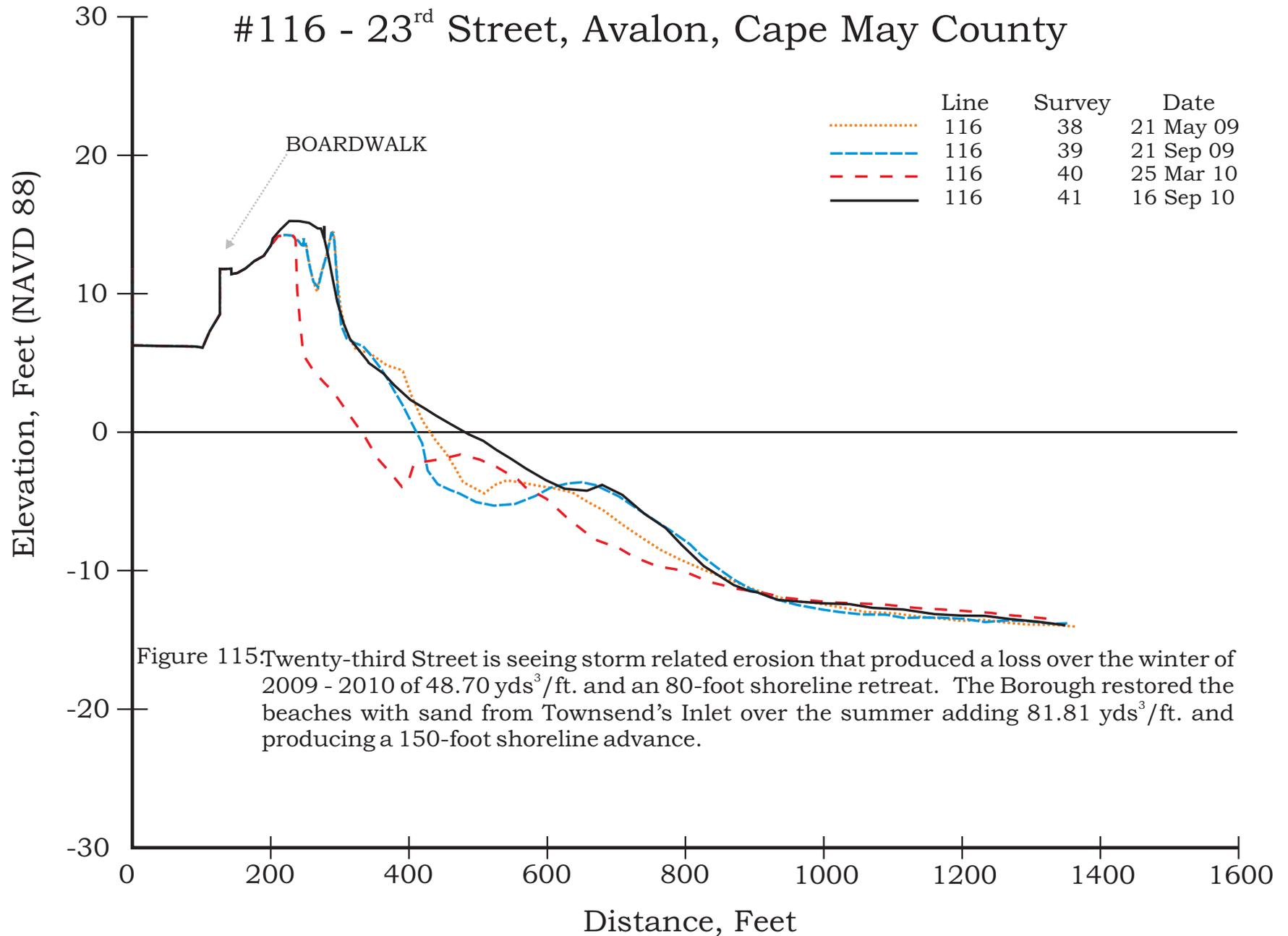


Photo taken November 24, 2010. View to the north.

The Borough restored the beaches with sand from Townsend's Inlet during the summer of 2010. Comparing the profiles over the year time period, the profile location gained volume (33.1 cu yd/ft) and the shoreline moved seaward (70.18ft). Most of the sediment gain was found below the 0 NAVD datum.

New Jersey Beach Profile Network

#116 - 23rd Street, Avalon, Cape May County



35th STREET, AVALON - SITE 115



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

South of 28th Street the Avalon beach becomes wide and the dune system grows to be the largest anywhere along the NJ shoreline. With elevations reaching 55 feet and a width between the dune toe and the development exceeding 1,000 feet there is no better protection along the coast.

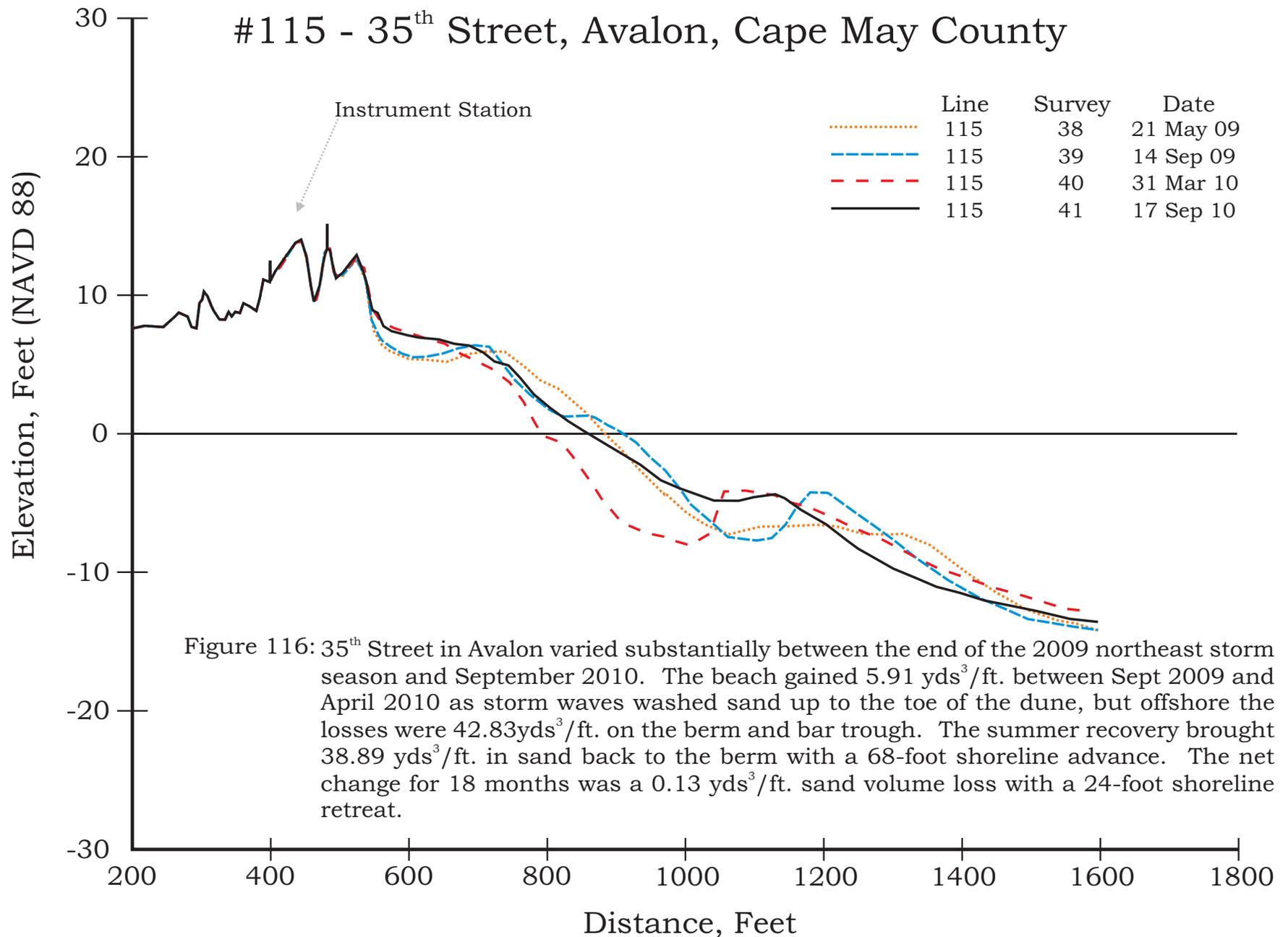


Photo taken November 24, 2010. View to the north.

Comparing the profiles over the year, the profile location volume was stable (-0.18 cu yd/ft) and the shoreline moved landward (-50.27 ft). The sand volume increase was dominantly found above the 0 NAVD datum.

New Jersey Beach Profile Network

#115 - 35th Street, Avalon, Cape May County



70th STREET, AVALON - SITE 114



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

The beach in southern Avalon has a significant dune and a wide beach in spite of development east of Dune Drive.

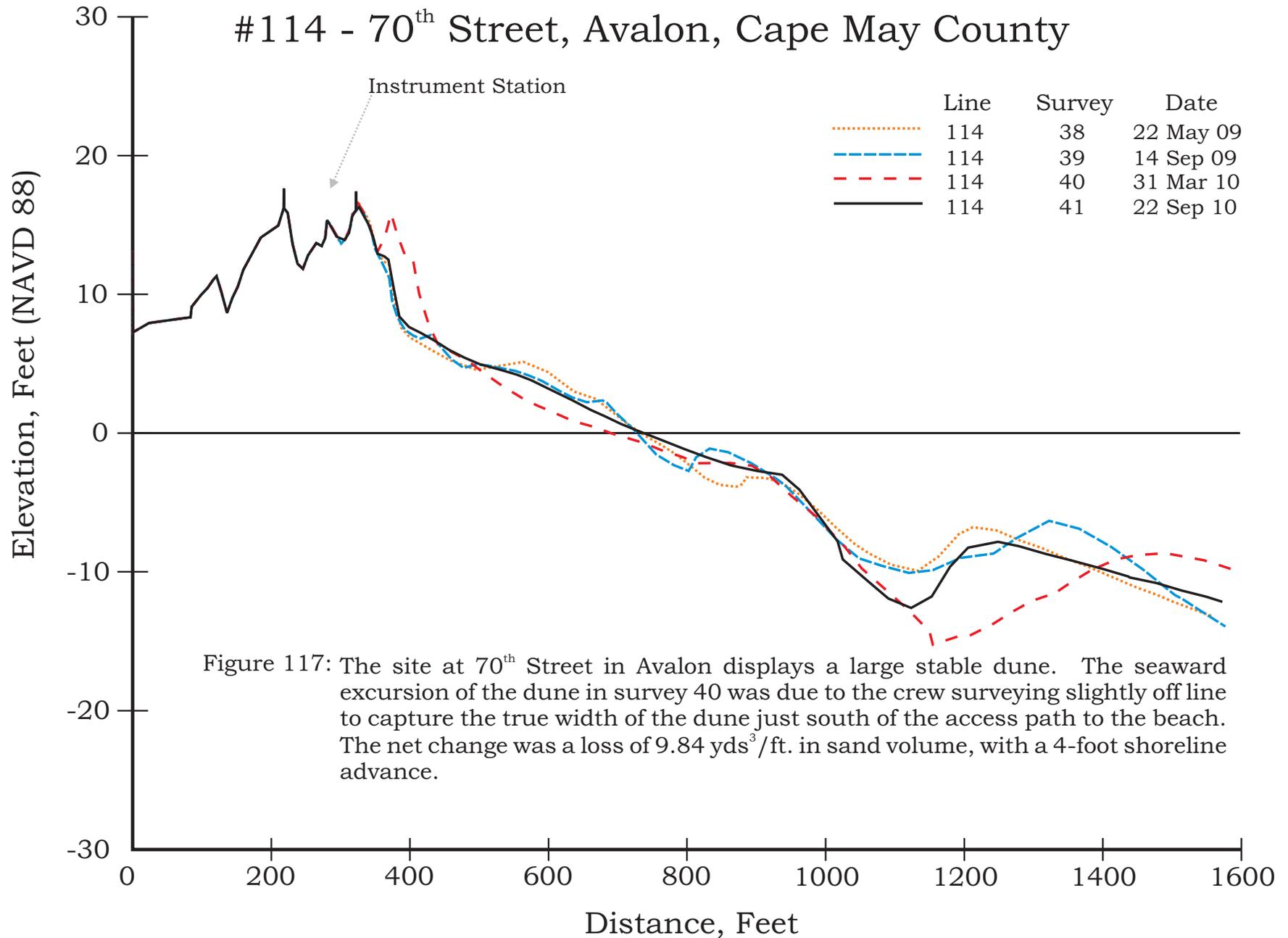


Photo taken November 24, 2010. View to the north.

Comparing the profiles over the year, the profile location lost volume (-16.16 cu yd/ft) and the shoreline moved seaward (9.99 ft).

New Jersey Beach Profile Network

#114 - 70th Street, Avalon, Cape May County



90th STREET, STONE HARBOR - SITE 113



Photo taken September 18, 2009. View to the south.

Stone Harbor conducted a beach restoration in 1998 and participated in a Federally-sponsored project in 2003. Both projects resulted in dramatic increases in the sand volume present in the dunes. By September 2008, the beach had narrowed somewhat. This survey preceded the fall 2009 storms that did reach the dunes here, but did little real damage.

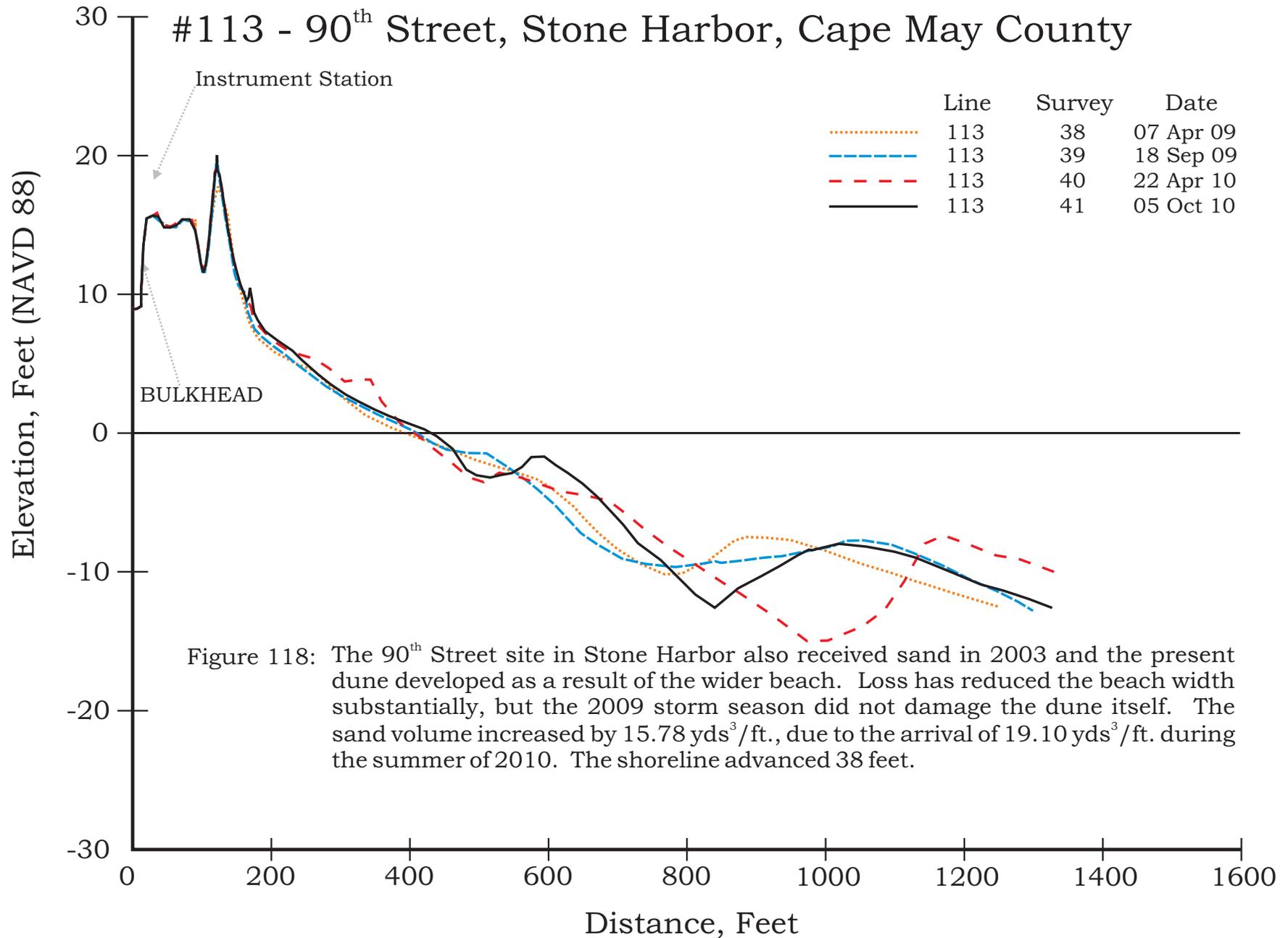


Photo taken October 5, 2010 . View to the south.

Comparing the profiles over the one year time period, the profile location gained volume (8.75 cu yd/ft) and the shoreline moved seaward (20.47 ft). The sand volume increase was throughout the profile.

New Jersey Beach Profile Network

#113 - 90th Street, Stone Harbor, Cape May County



SOUTH END, STONE HARBOR - SITE 212



Photo taken September 18, 2009. View to the south.

By September 2008, the beach width continued to decline bringing the dune toe within easy reach of potential storm waves. The primary use of the beach is storage of the small sail craft used in the surf and just offshore during the summer. Storms removed most of the boat tethering poles and cut a substantial scarp in the dunes starting in mid-October, 2009.

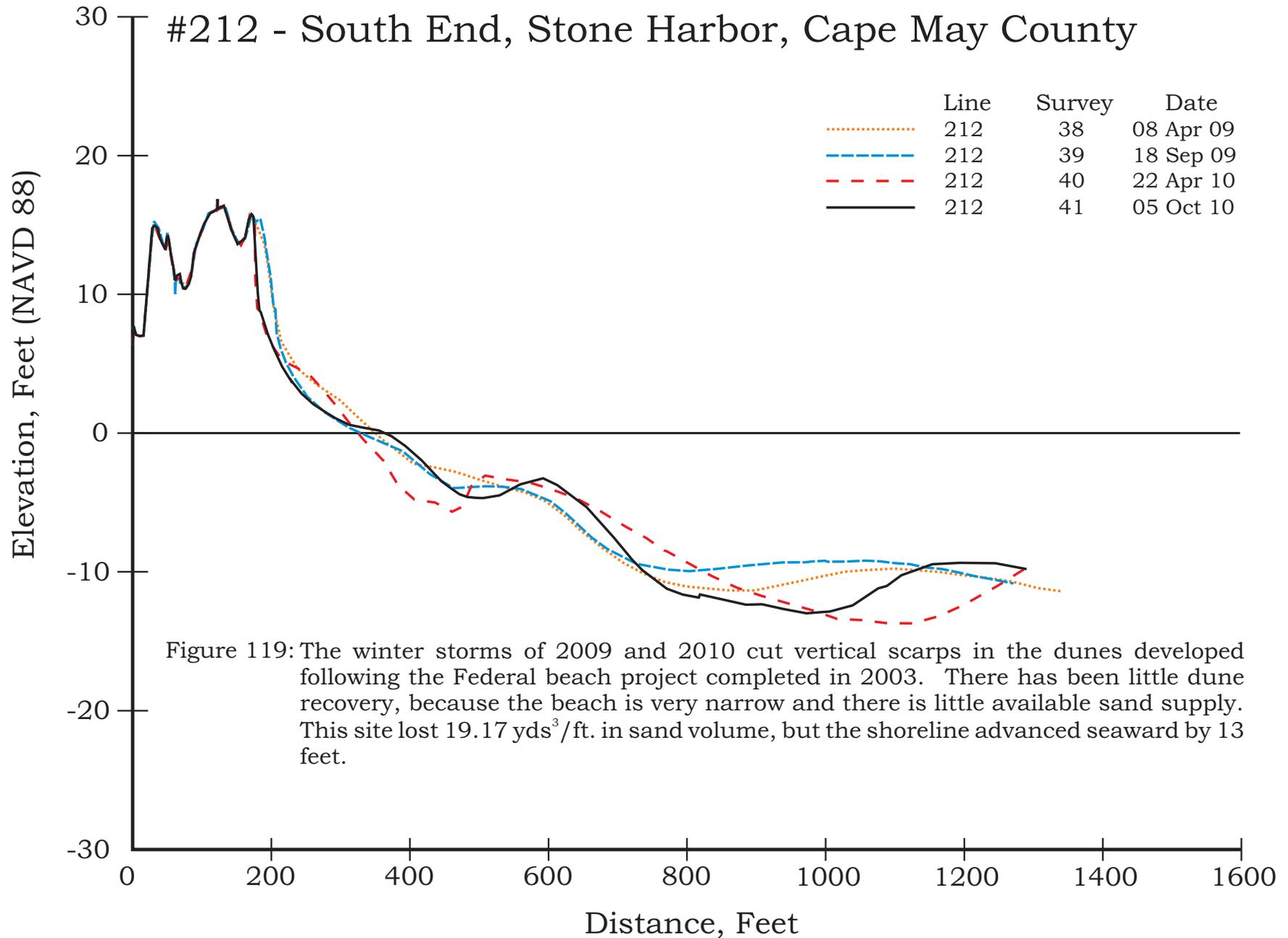


Photo taken October 5, 2010. View to the south.

Comparing the profiles over the one year time period, the profile location lost volume (-29.76 cu yd/ft) and the shoreline moved seaward (34.27 ft). The sand volume loss was over the entire profile.

New Jersey Beach Profile Network

#212 - South End, Stone Harbor, Cape May County



15th AVENUE, NORTH WILDWOOD - SITE 111



Photo taken September 16, 2009. View to the north.

This photo location is far landward of the shoreline in 1998. Erosion had caused significant shoreline retreat over the last decade, accelerated by inlet dynamics in nearby Hereford Inlet that redirected the main tidal channel flow away from the NW. The fall 2009 saw a massive beach restoration effort that was halted by the November 2009 northeaster. Work resumed in June to both complete and restore the damage done during the winter storms.

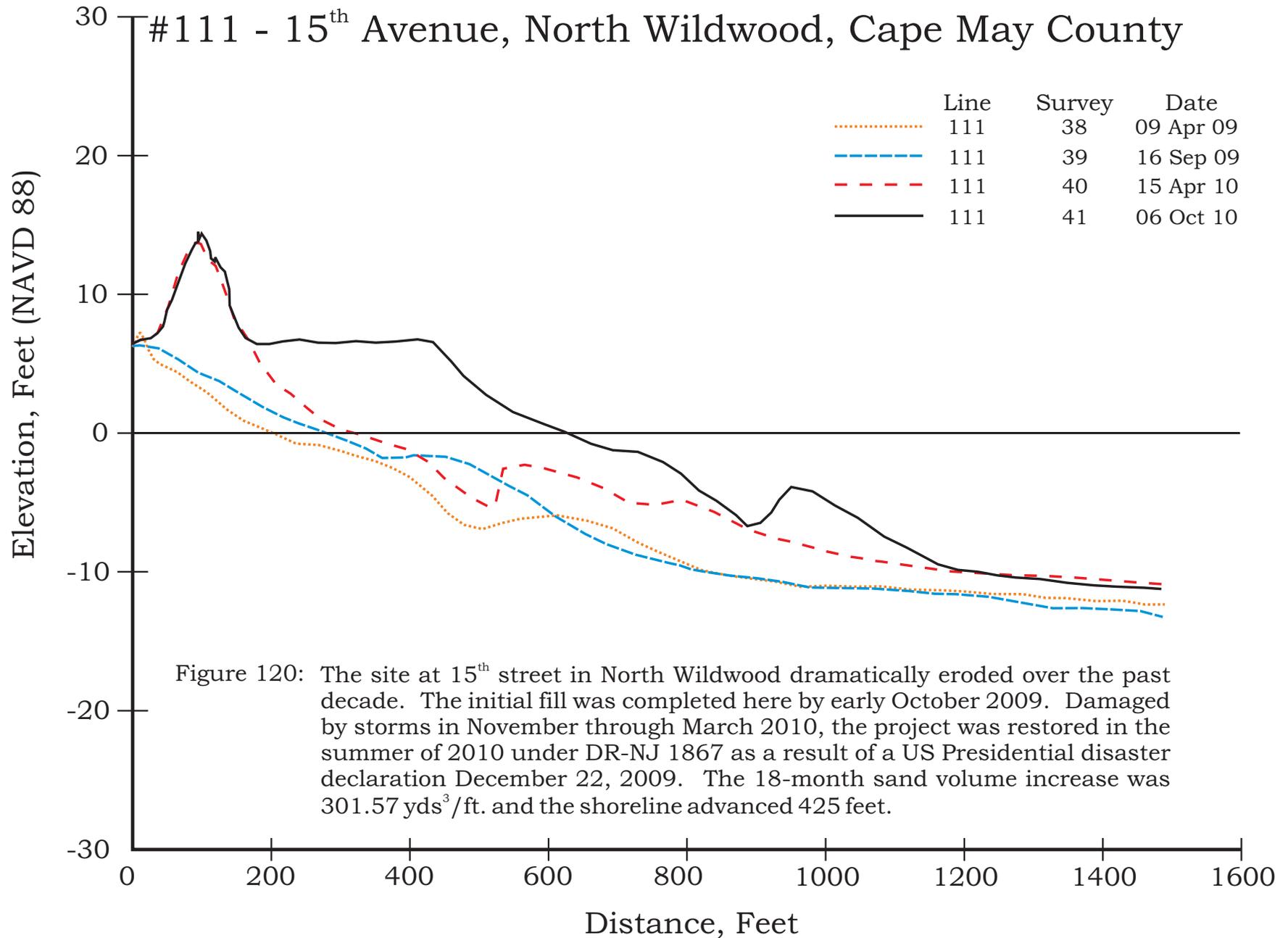


Photo taken October 6, 2010. View to the north.

Damaged by storms in November through March 2010, the beach was restored in the summer of 2010 under DR-NJ 1867 as a result of a US Presidential disaster declaration December 22, 2009. Comparing the profiles over the one year time period, the profile location gained volume (274.43 cu yd/ft) and the shoreline moved seaward (348.34 ft).

New Jersey Beach Profile Network

#111 - 15th Avenue, North Wildwood, Cape May County



CRESSE AVENUE, WILDWOOD - SITE 110



Photo taken September 16, 2009. View to the south.

The Cresse Avenue site has grown wider over the same period that the North Wildwood beach eroded. This photo shows the wide, wind-swept dry beach between the boardwalk and the shoreline. Approximately half the sand removed from the North Wildwood beaches was deposited along the Wildwood shoreline and the other half went into Hereford Inlet along the North Wildwood side of the tidal channel. This process started in 1998 and seems to have abated in 2006.

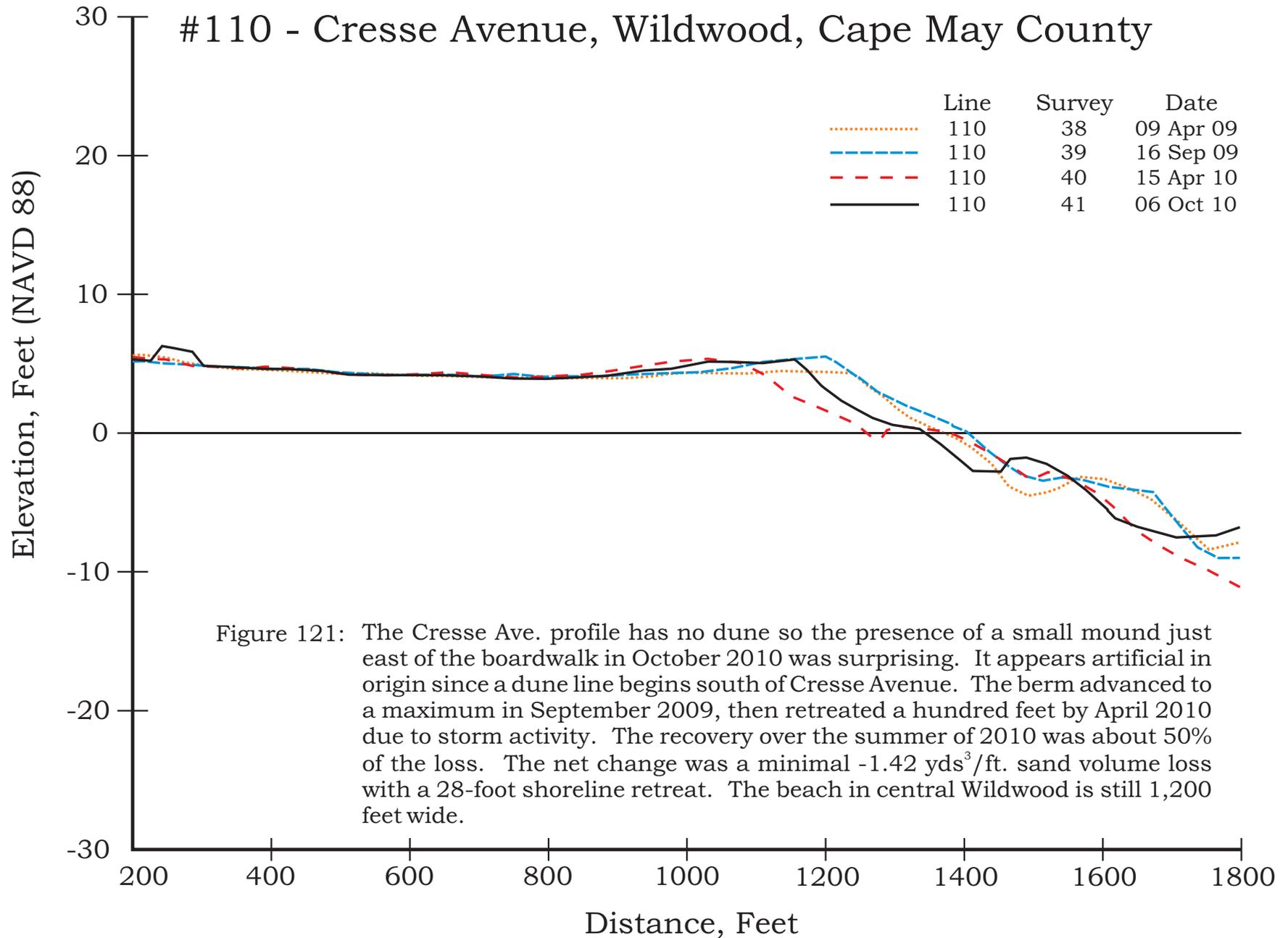


Photo taken October 6, 2010 . View to the south.

Comparing the profiles over the one year time period, the profile location lost volume (-23.07 cu yd/ft) and the shoreline moved landward (-62.34 ft).

New Jersey Beach Profile Network

#110 - Cresse Avenue, Wildwood, Cape May County



RALEIGH AVENUE, LOWER TOWNSHIP - SITE 109



Photo taken September 16, 2009. View to the south.

Wide beaches and sizable dunes mark the southern part of this shoreline.

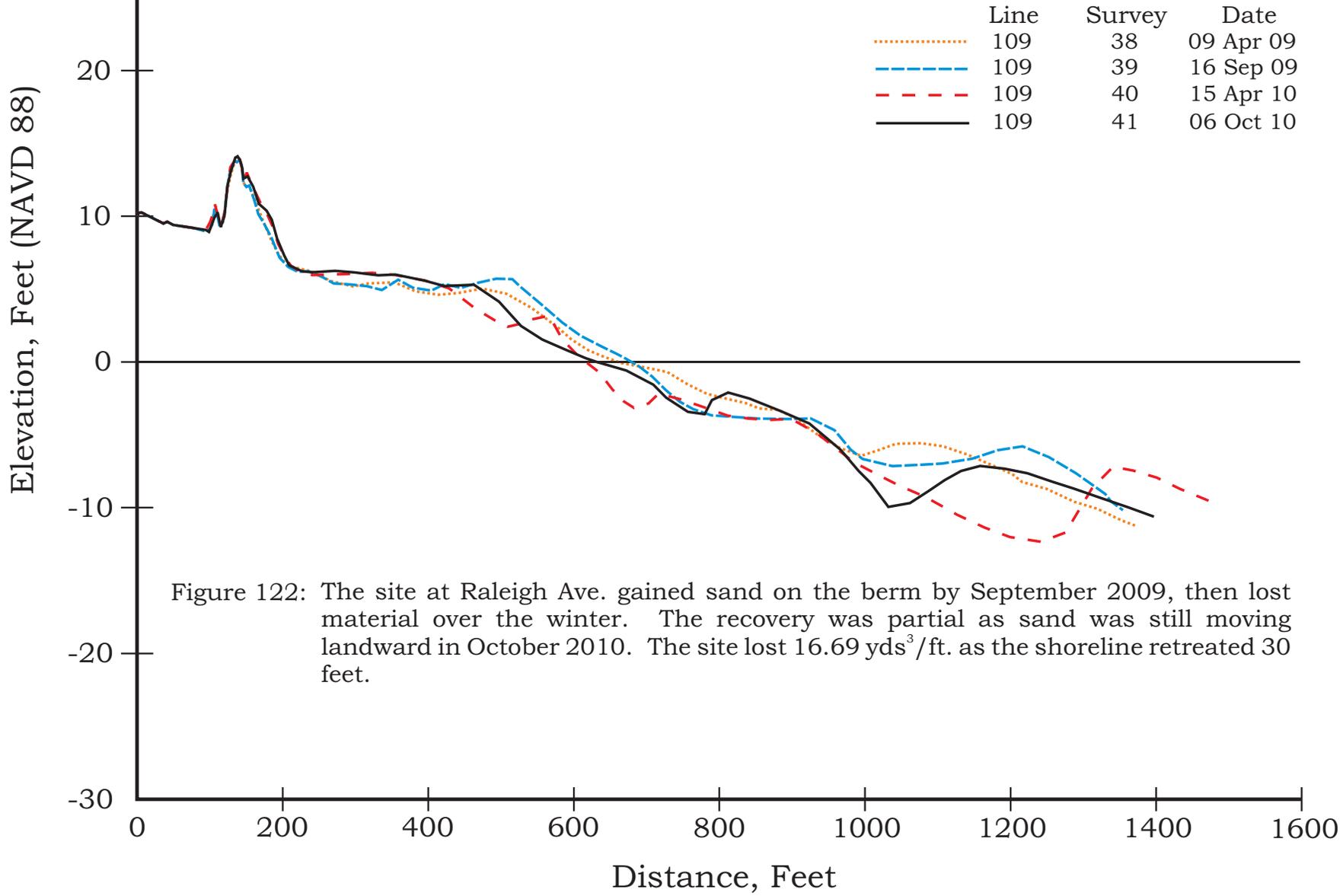


Photo taken October 6, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-24.04 cu yd/ft) and the shoreline moved landward (-47.43 ft).

New Jersey Beach Profile Network

#109 - Raleigh Ave., Lower Township, Cape May County



CAPE MAY NATIONAL WILDLIFE REFUGE - SITE 208



Photo taken November 19, 2009. View to the north.

The refuge site was established in 1994 to have a better handle on the changes close to the inlet. This 2009 view shows the gradual transition between the primary dune and the dry beach. The sand volume gets trapped behind the Cold Springs Inlet jetty and creates a wide beach.

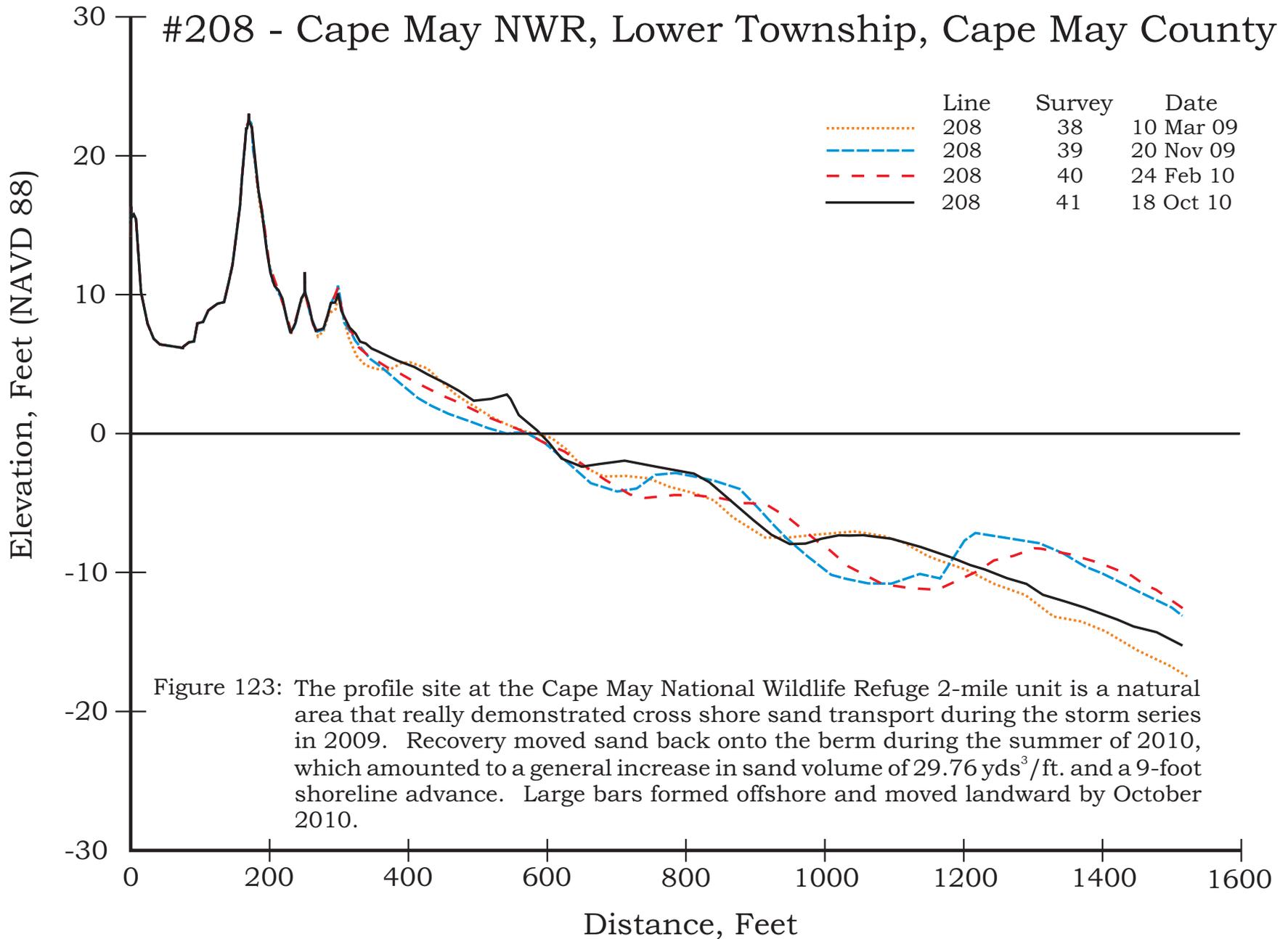


Photo taken October 18, 2010. View to the north.

Comparing the profiles over the eleven month time period, the profile location gained volume (6.65 cu yd/ft) and the shoreline moved seaward (48.33 ft). The sand volume increase was dominantly found onshore.

New Jersey Beach Profile Network

#208 - Cape May NWR, Lower Township, Cape May County



CAPE MAY BEACH CLUB - SITE 108



Photo taken November 24, 2009. View to the north.

The Beach Club site was renourished in 1989 as the Cape May City project got underway. This photo shows the conditions of the beach approximately one week following the 2009 Veteran's Day nor'easter.

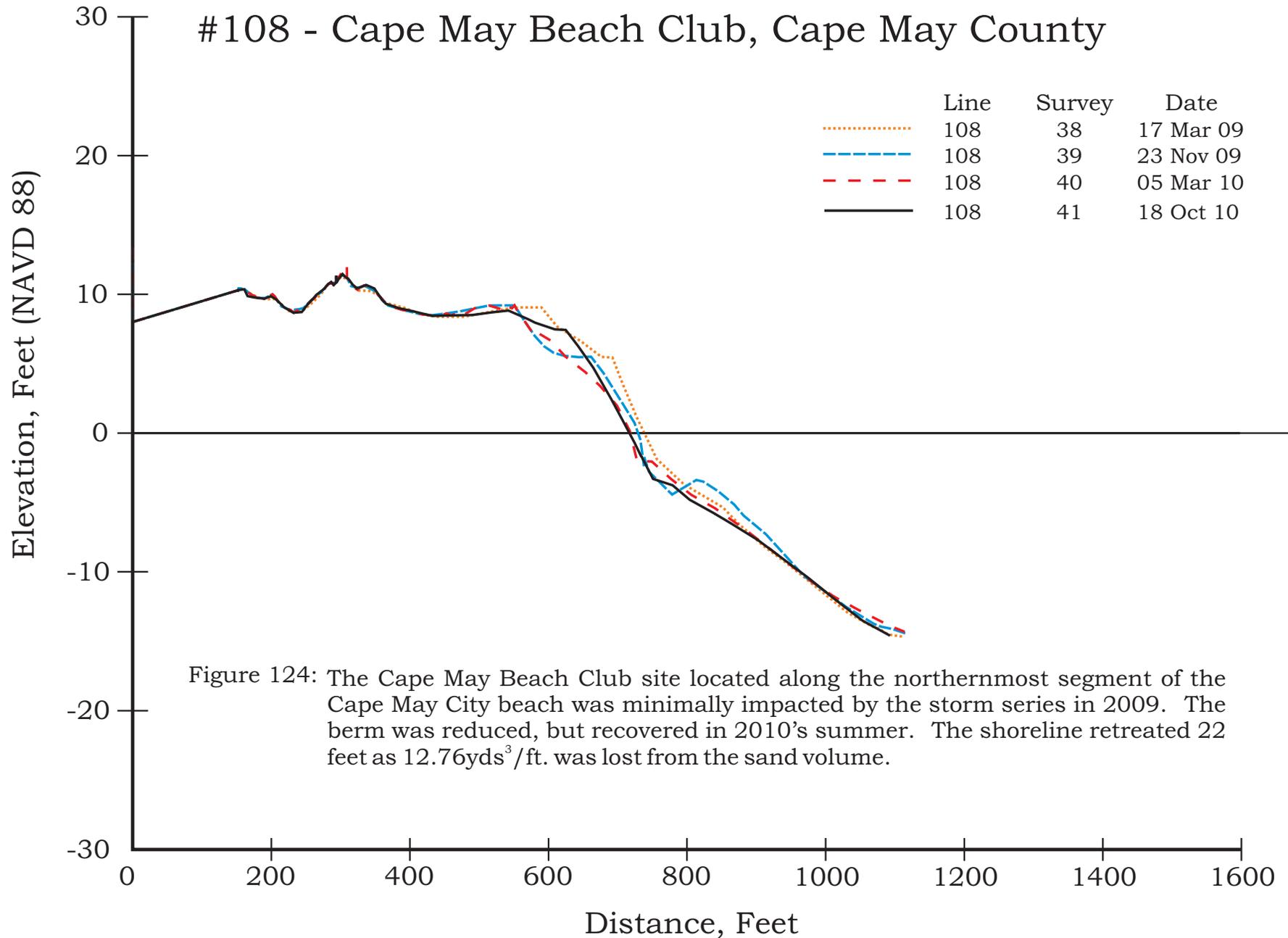


Photo taken October 18, 2010 . View to the north.

For the second year, this profile location lost volume (-7.92 cu yd/ft) and the shoreline moved landward (-12.5 ft).

New Jersey Beach Profile Network

#108 - Cape May Beach Club, Cape May County



BALTIMORE AVENUE, CAPE MAY CITY - SITE 107



Photo taken November 23, 2009. View to the north.

This beach has remained relatively stable for over 20 years.

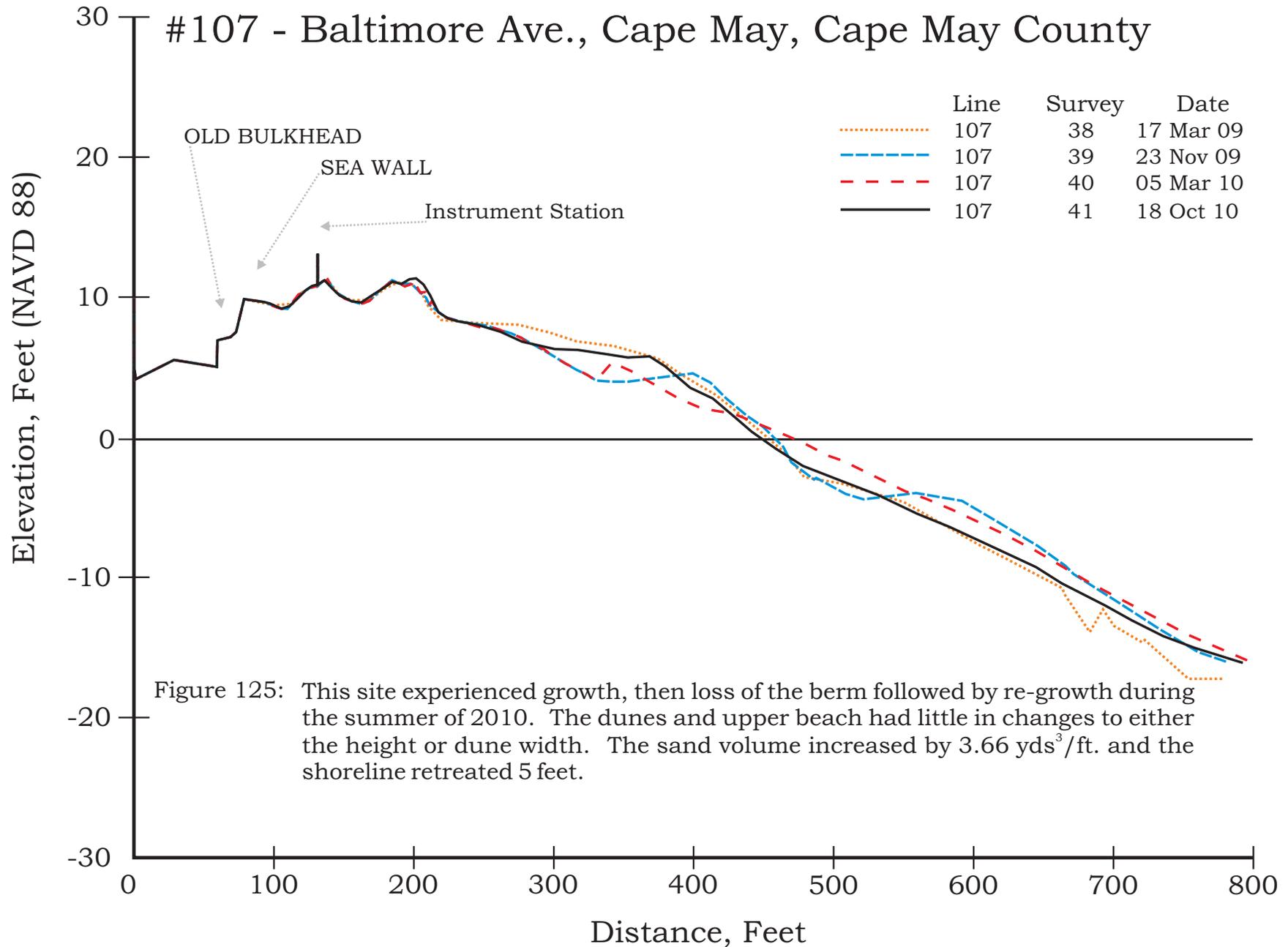


Photo taken October 18, 2010 . View to the north.

Comparing the profiles over the eleven month time period, the profile location lost volume (-5.77 cu yd/ft) and the shoreline moved landward (-9.34 ft).

New Jersey Beach Profile Network

#107 - Baltimore Ave., Cape May, Cape May County



BROADWAY AVENUE, CAPE MAY CITY - SITE 206

Photo taken November 24, 2009. View to the north.

This is the main recreational beach area in Cape May City and was restored in 1990. This photograph shows the recreational beach held in place by the terminal groin.



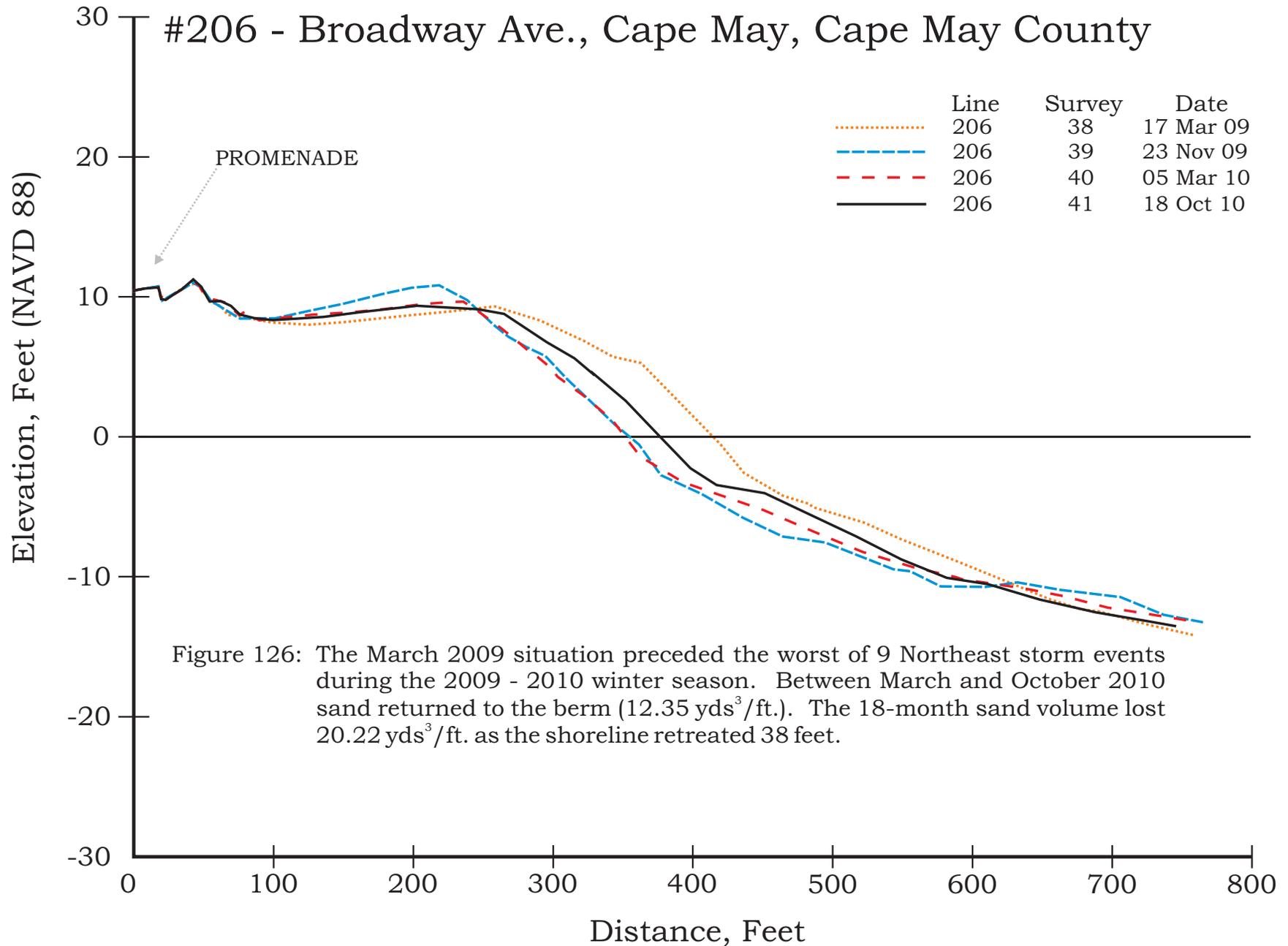
Photo taken October 18, 2010 . View to the north.

Comparing the profiles over the eleven month time period, the profile location gained volume (11.57 cu yd/ft) and the shoreline moved seaward (21.85 ft).



New Jersey Beach Profile Network

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



NATURE CONSERVANCY, CAPE MAY - SITE 105



Photo taken October 10, 2009. View to the north.

Sand shed from Cape May City is deposited along this beach segment. The Cape May City terminal groin located at Third Avenue shows in the distance along the curve of the shoreline.



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

Comparing the profiles over the year, the profile location lost volume (-36.91 cu yd/ft) and the shoreline moved landward (-56.02 ft).

New Jersey Beach Profile Network

#105 - Nature Conservancy, Cape May, Cape May County

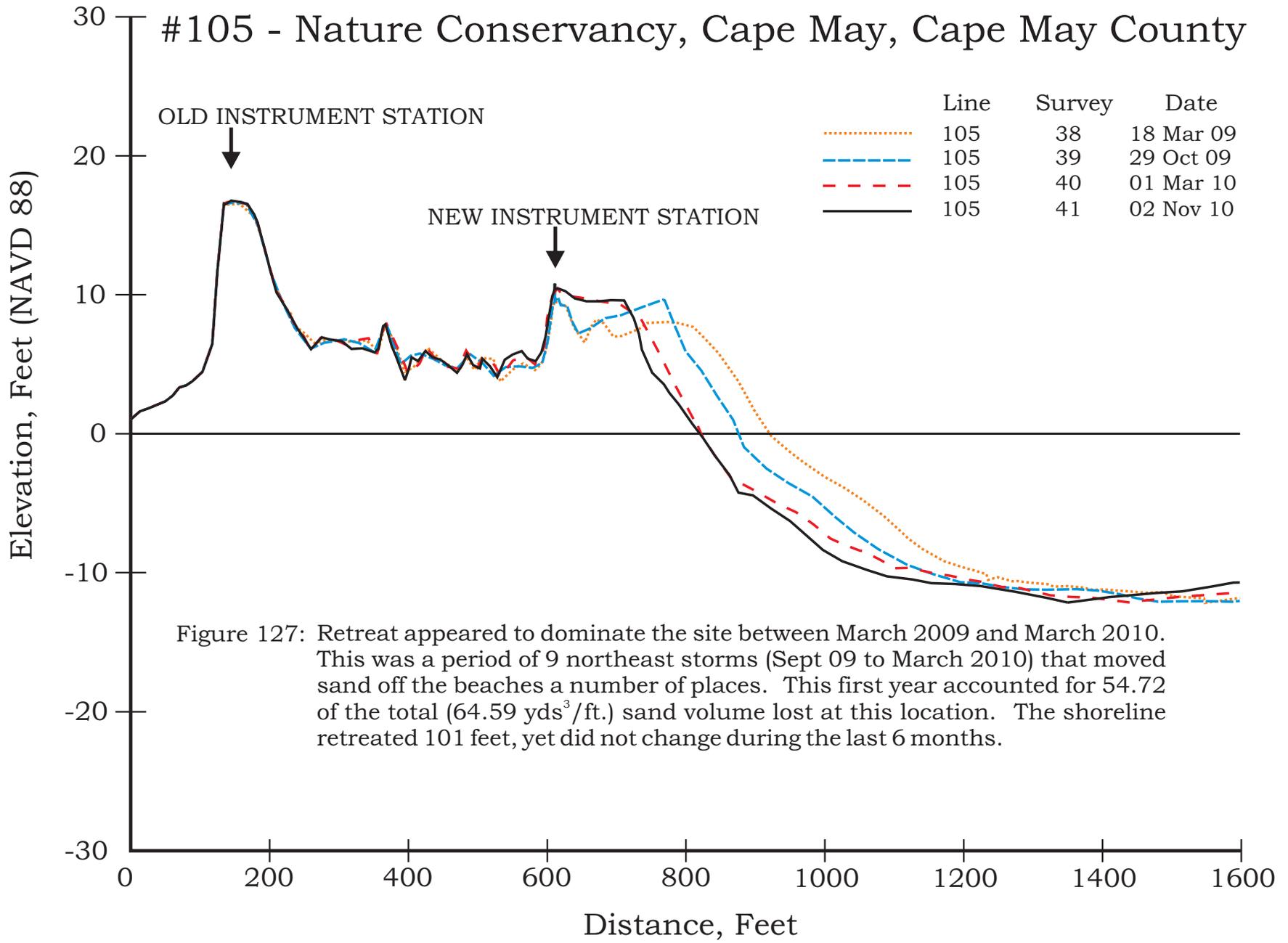


Figure 127: Retreat appeared to dominate the site between March 2009 and March 2010. This was a period of 9 northeast storms (Sept 09 to March 2010) that moved sand off the beaches a number of places. This first year accounted for 54.72 of the total (64.59 yds³/ft.) sand volume lost at this location. The shoreline retreated 101 feet, yet did not change during the last 6 months.

LAKE DRIVE, CAPE MAY POINT - SITE 104



Photo taken October 29, 2009. View to the south/west.

Located at the extreme southern tip of the Cape May County peninsula in the Borough of Cape May Point, this site was nourished in 2005 by the ACOE.

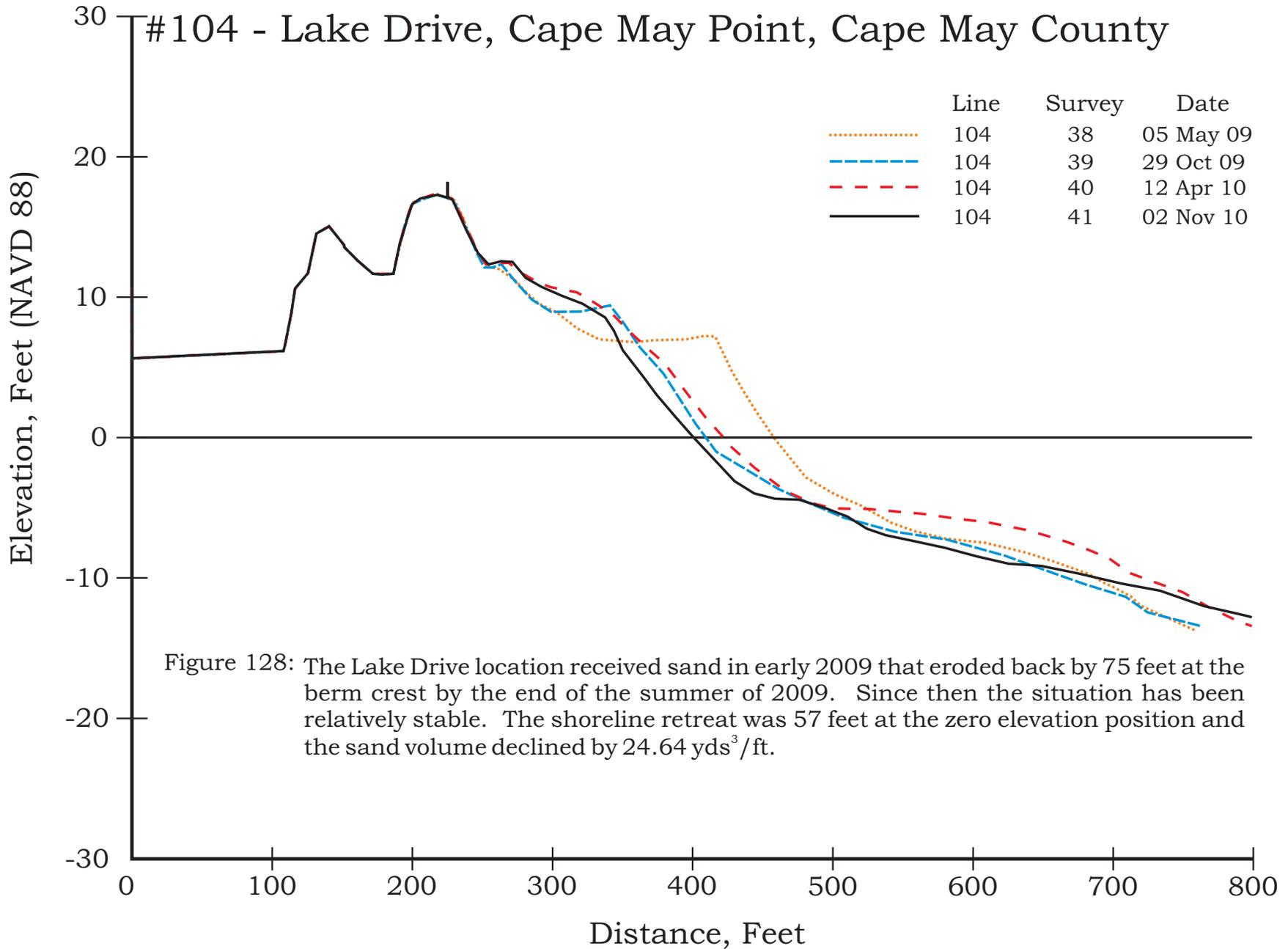


Photo taken November 2, 2010 . View to the south/west

Comparing the profiles over the year, the profile location lost volume (-2.0 cu yd/ft) and the shoreline moved landward (-8.58 ft).

New Jersey Beach Profile Network

#104 - Lake Drive, Cape May Point, Cape May County



HIGBEE BEACH - SITE 103



Photo taken October 29, 2009. View to the north.

This is a natural area without any development. The changes to the shoreline are driven by southwest winds and the strong northwest winds that follow winter northeast events. The view is to the northwest along the berm toward the Cape May Ferry terminal at the Cape May Canal entrance into Delaware Bay.

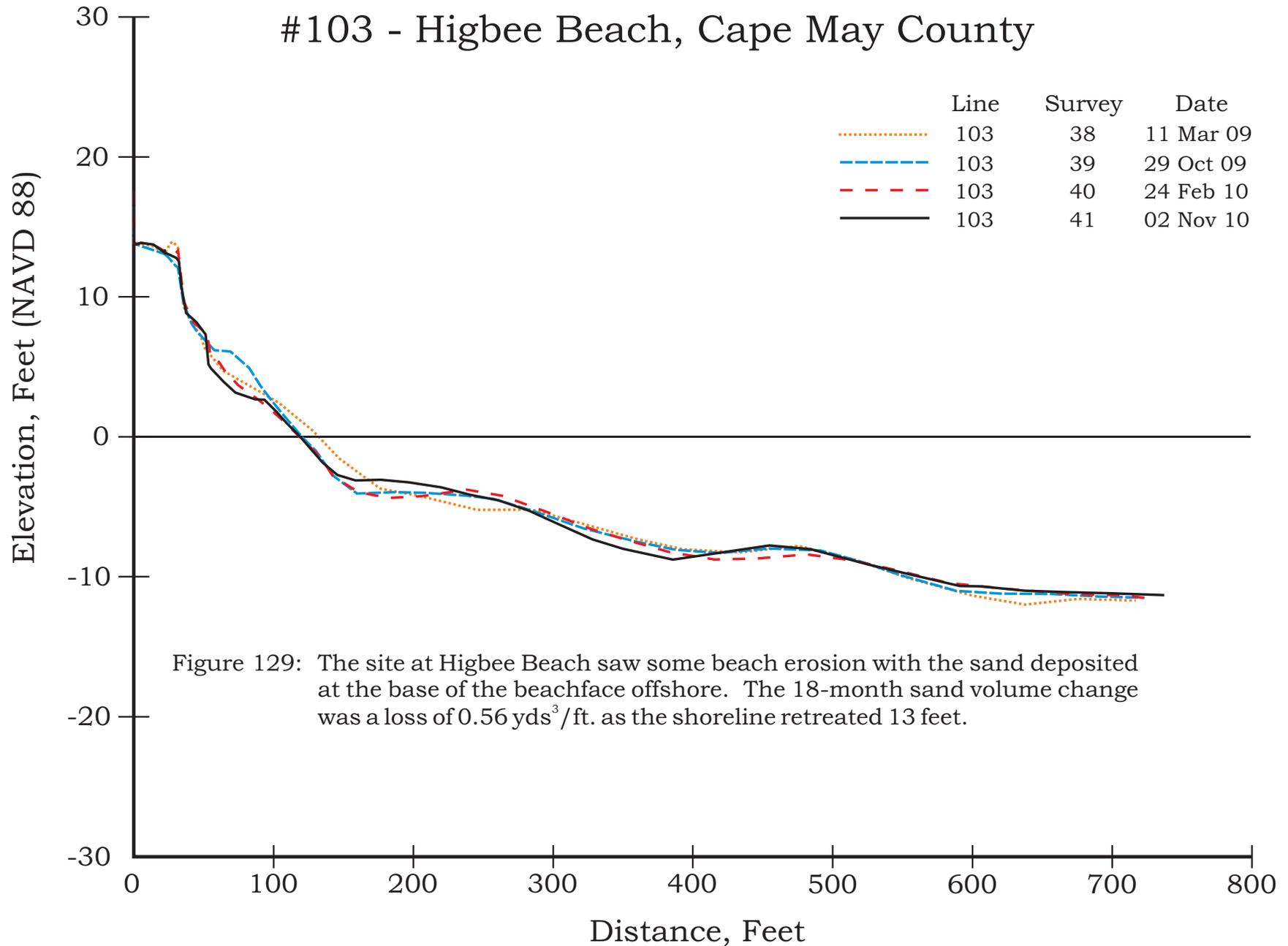


Photo taken November 2, 2010 . View to the north.

Comparing the profiles over the thirteen month time period, the profile location lost volume (-0.88 cu yd/ft) and the shoreline moved landward (-1.21 ft).

New Jersey Beach Profile Network

#103 - Higbee Beach, Cape May County



WHITTIER AVENUE, NORTH CAPE MAY - SITE 102



Photo taken October 30, 2009. View to the south.

The final three sites are within Delaware Bay and are only influenced by westerly winds. This picture shows the dry beach with a line of debris from a higher-than-normal tide. Some debris is as far up the beach slope as the grass line.

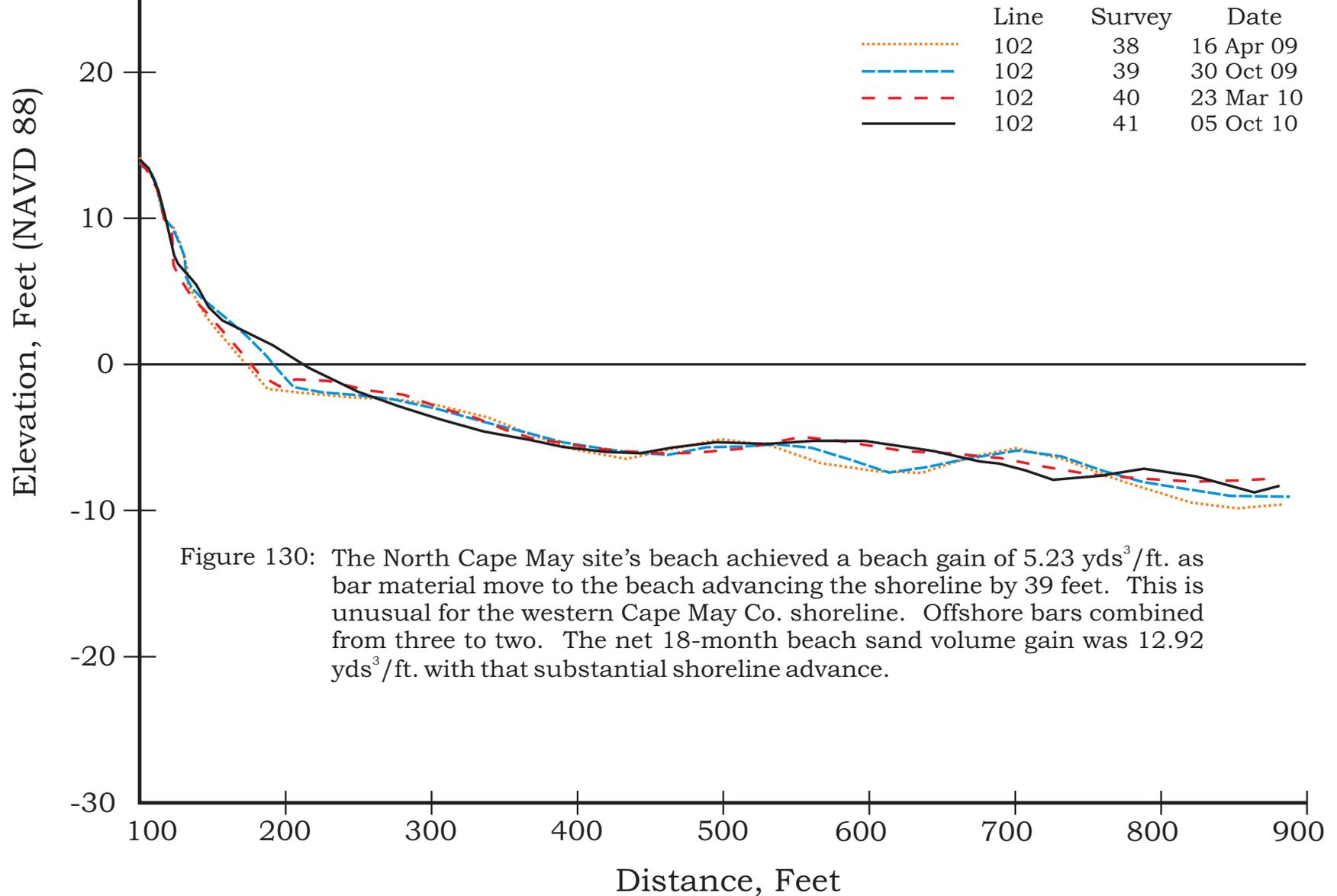


Photo taken October 5, 2010. View to the south.

Comparing the profiles over the year, the profile location gained volume (4.98 cu yd/ft) and the shoreline moved seaward (20.18 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network

#102 - Whittier Ave, North Cape May, Cape May County



PACIFIC AVENUE, VILLAS - formerly SITE 101, now 201



Photo taken October 30, 2009. View to the south.

This October 2009 photograph shows some shoreline erosion as the berm present above is now almost a scarp at the toe of the grass.

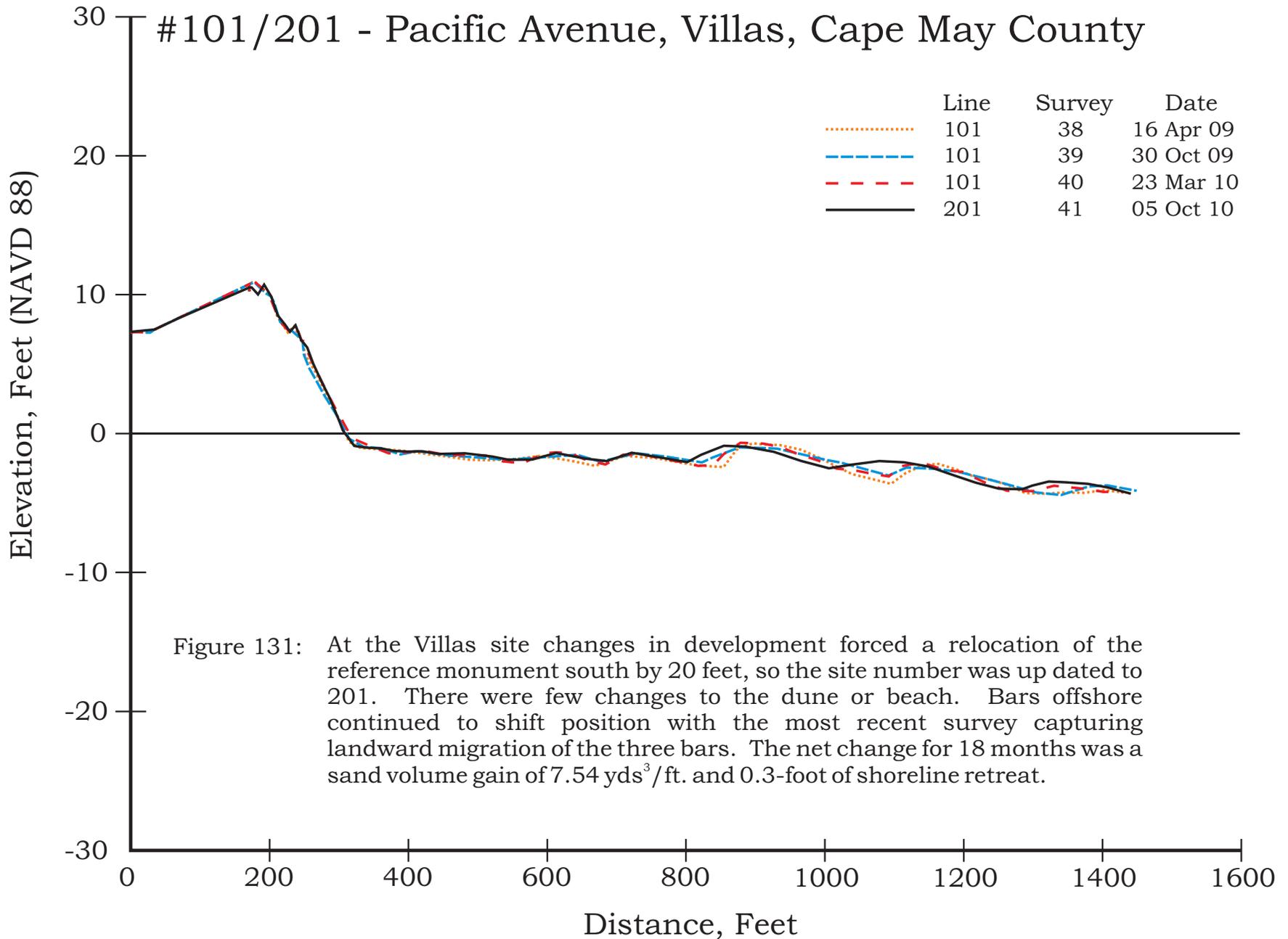


Photo taken October 5, 2010. View to the south.

This profile location was moved approximately 100 ft south because of the difficulty in accessing the site. Therefore, no profile volumes nor shoreline position was calculated for the one year period.

New Jersey Beach Profile Network

#101/201 - Pacific Avenue, Villas, Cape May County



REEDS BEACH - SITE 100



Photo taken November 18, 2009. View to the south.

The Reeds Beach location has been erosional over the past 20 years, but not to the point of property loss. The new fence was placed along a restored dune built from sand dredged from nearby Bidwell Creek navigation project. The dredge material was originally derived from this shoreline, so the best use was to put it back on the beach.



Photo taken October 5, 2010. View to the south.

Comparing the profiles over the year, the profile location lost volume (-1.06 cu yd/ft) and the shoreline moved landward (-3.95 ft).

New Jersey Beach Profile Network

#100 - Reeds Beach, Cape May County

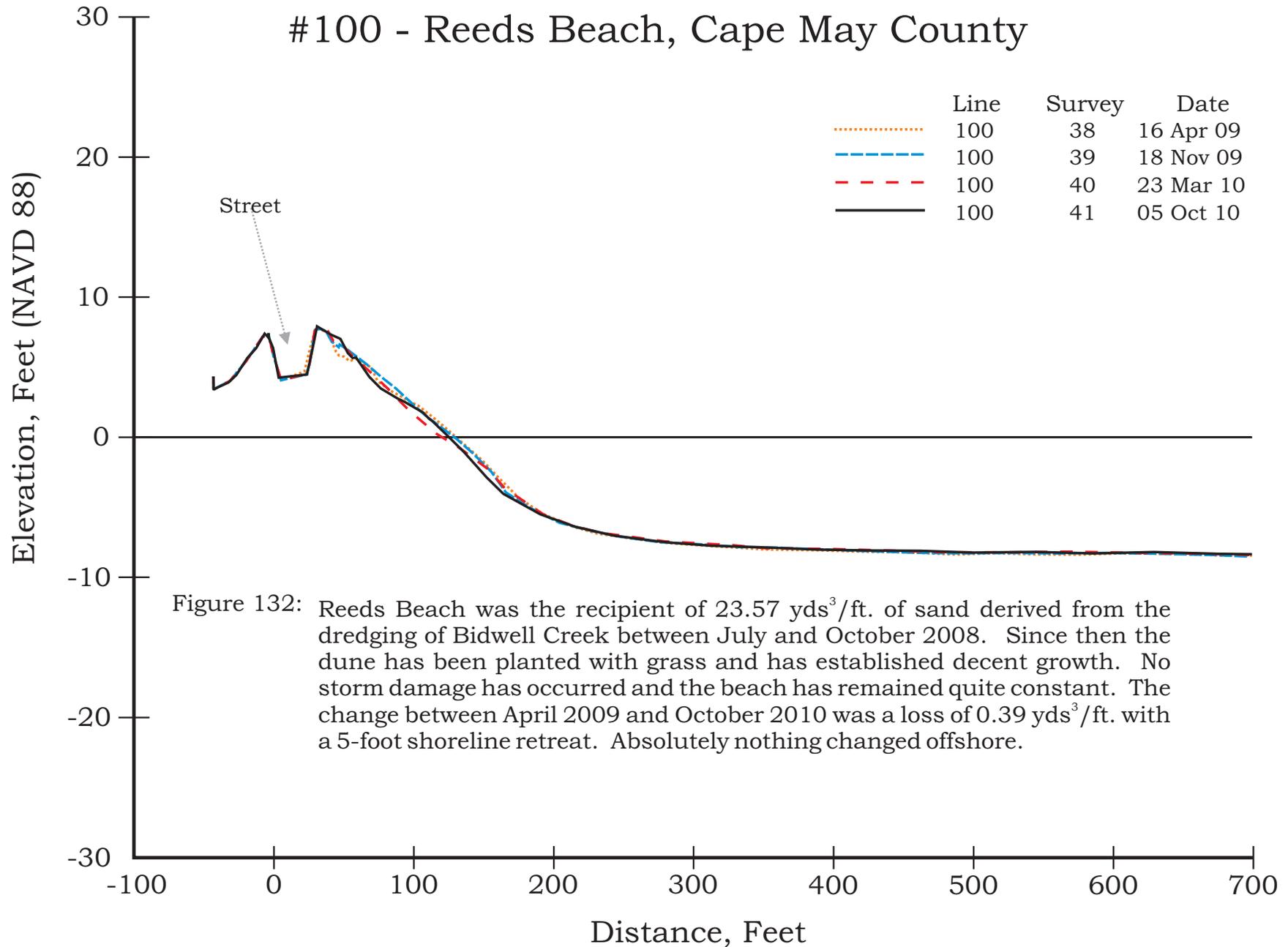


TABLE 1
MONMOUTH COUNTY
ANNUAL BEACH VOLUME CHANGES
SPRING 2009 - SPRING 2010 & FALL 2009 - FALL 2010
Survey

PROFILE SITE LOCATION	38 - 40	39 - 41
	S2009-S2010	F2009 - F2010
	(volume expressed as cubic yards per foot)	
187: Cliffwood Beach Park	-1.44	-2.16
286: Union Beach	1.22	-2.05
185: Port Monmouth, Spy House Museum	-3.02	-2.32
285: Gateway National R. A., Gunnison Beach	17.98	32.04
284: Gateway National R. A., Parking Lot E	52.37	22.52
184: Highland Beach, Gateway Entrance	28.08	6.55
183: Highland Beach, Via Ripa St.	-3.28	2.28
282: Sea Bright, Shrewsbury Way	-10.81	-19.16
182: Sea Bright, North of Route 520	-33.88	-41.00
181: Sea Bright, Municipal Beach	-21.92	-2.58
180: Sea Bright, Sunset Court	-38.63	-18.49
179: Monmouth Beach, Cottage Rd.	-7.50	-7.08
178: Monmouth Beach, Beach Club	-13.30	24.56
177: Long Branch, 404 Ocean Ave.	-25.85	-18.73
176: Long Branch, Seven Presidents Park	2.92	-1.27
175: Long Branch, North Broadway Ave.	8.24	20.62
174: Long Branch, Morris Ave.	36.28	-15.94
173: Long Branch, West End Ave.	-152.24	-85.50
272: Long Branch 805 Ocean Ave.	no data	no data
171: Elberon, Pullman Ave.	17.03	5.77
170: Deal, Roosevelt Ave.	-22.42	3.95
169: Deal, Darlington Ave.	6.61	-8.14
168: Allenhurst, Corlies Ave.	-55.61	-12.88
267: Asbury Park, 7th Ave.	-3.06	-22.96
167: Asbury Park, 3rd Ave.	-9.99	-21.77
166: Ocean grove, Ocean Pathway	0.61	-6.17
165: Bradley Beach, McCabe Ave.	8.60	-23.25
164: Avon-By-The-Sea, Sylvania Ave.	10.96	18.24
163: Belmar, 5th Ave.	-25.52	-4.05
162: Belmar, 18th Ave.	6.65	-16.38
161: Spring Lake, Brighton Ave.	-15.86	-16.59
160: Spring Lake, Salem Ave.	13.69	-6.70
159: Sea Girt, New York Ave.	-15.69	-11.62
158: Sea Girt, Trenton Ave.	-18.89	-30.22
157: Manasquan, Riddle Way	-23.91	-47.07
256: Manasquan, Pompano Ave.	-6.22	15.81

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

TABLE 2
MONMOUTH COUNTY
ANNUAL SHORELINE CHANGES
SPRING 2009 - SPRING 2010 & FALL 2009 - FALL 2010
Survey

PROFILE SITE LOCATION	38 - 40	39 - 41
	S2009-S2010	F2009 - F2010
	(shoreline change expressed in feet)	
187: Cliffwood Beach Park	6.1	-1.6
286: Union Beach	13.9	0.5
185: Port Monmouth, Spy House Museum	-5.0	6.6
285: Gateway National R. A., Gunnison Beach	-48.6	24.4
284: Gateway National R. A., Parking Lot E	59.4	30.6
184: Highland Beach, Gateway Entrance	-0.5	15.9
183: Highland Beach, Via Ripa St.	-38.8	26.9
282: Sea Bright, Shrewsbury Way	-54.4	44.2
182: Sea Bright, North of Route 520	-76.7	-68.2
181: Sea Bright, Municipal Beach	-13.0	3.2
180: Sea Bright, Sunset Court	-27.1	-14.3
179: Monmouth Beach, Cottage Rd.	-23.0	-19.3
178: Monmouth Beach, Beach Club	-6.3	22.8
177: Long Branch, 404 Ocean Ave.	-9.4	-66.6
176: Long Branch, Seven Presidents Park	21.7	44.9
175: Long Branch, North Broadway Ave.	-5.1	67.5
174: Long Branch, Morris Ave.	90.9	-25.5
173: Long Branch, West End Ave.	-169.7	-107.5
272: Long Branch 805 Ocean Ave.	no data	no data
171: Elberon, Pullman Ave.	-1.0	-1.8
170: Deal, Roosevelt Ave.	-22.6	-17.5
169: Deal, Darlington Ave.	-40.6	-14.6
168: Allenhurst, Corlies Ave.	-62.8	-42.5
267: Asbury Park, 7th Ave.	-27.6	-28.2
167: Asbury Park, 3rd Ave.	-23.9	-23.9
166: Ocean grove, Ocean Pathway	-17.2	-28.2
165: Bradley Beach, McCabe Ave.	33.1	-26.0
164: Avon-By-The-Sea, Sylvania Ave.	-14.1	-0.7
163: Belmar, 5th Ave.	-35.2	-2.4
162: Belmar, 18th Ave.	-1.5	-13.0
161: Spring Lake, Brighton Ave.	-14.1	-40.4
160: Spring Lake, Salem Ave.	41.4	-20.7
159: Sea Girt, New York Ave.	-32.9	-20.5
158: Sea Girt, Trenton Ave.	-45.7	-18.7
157: Manasquan, Riddle Way	-21.6	-34.0
256: Manasquan, Pompano Ave.	-42.9	6.2

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

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

PROFILE SITE LOCATION	Survey	38-39 S09-F09	39-40 F09-S10	40-41 S10-F10	38-41 S09-F10
		(volume expressed as cubic yards per foot of beachfront)			
187: Cliffwood Beach Park		-1.54	0.24	-2.42	-3.64
286: Union Beach		0.69	0.38	-2.26	-1.32
185: Port Monmouth, Spy House Museum		-5.13	1.86	-4.32	-7.48
285: Gateway National R. A., Gunnison Beach		-0.01	5.93	13.93	36.65
284: Gateway National R. A., Parking Lot E		14.18	37.91	-15.16	37.28
184: Highland Beach, Gateway Entrance		13.27	14.81	-8.42	19.63
183: Highland Beach, Via Ripa St.		-15.33	11.92	-9.73	-13.15
282: Sea Bright, Shrewsbury Way		-2.11	-9.13	-10.69	-21.61
182: Sea Bright, North of Route 520		-15.62	-18.52	-22.42	-56.62
181: Sea Bright, Municipal Beach		-7.75	-14.41	11.98	-10.00
180: Sea Bright, Sunset Court		-1.67	-36.57	17.99	-20.36
179: Monmouth Beach, Cottage Rd.		-25.44	17.76	-24.47	-33.03
178: Monmouth Beach, Beach Club		-29.93	16.64	7.98	-5.20
177: Long Branch, 404 Ocean Ave.		-4.62	-19.85	1.05	-24.19
176: Long Branch, Seven Presidents Park		2.18	0.40	-1.66	1.07
175: Long Branch, North Broadway Ave.		9.14	-0.34	20.91	29.51
174: Long Branch, Morris Ave.		46.94	-10.52	-5.27	31.33
173: Long Branch, West End Ave.		-124.41	-27.30	-58.15	-210.41
272: Long Branch 805 Ocean Ave.		no data	no data	-1.40	no data
171: Elberon, Pullman Ave.		1.71	17.16	-9.82	7.27
170: Deal, Roosevelt Ave.		-21.21	-1.36	5.00	-17.21
169: Deal, Darlington Ave.		2.85	3.73	-13.25	-5.28
168: Allenhurst, Corlies Ave.		-5.07	-50.49	37.55	-18.00
267: Asbury Park, 7th Ave.		2.53	-4.91	-18.81	-20.51
167: Asbury Park, 3rd Ave.		2.94	-12.81	-9.22	-18.81
166: Ocean grove, Ocean Pathway		1.49	-4.61	-3.16	-2.48
165: Bradley Beach, McCabe Ave.		15.31	-8.29	-16.04	-7.42
164: Avon-By-The-Sea, Sylvania Ave.		15.08	-5.06	23.27	33.76
163: Belmar, 5th Ave.		-9.46	-16.47	11.72	-13.41
162: Belmar, 18th Ave.		13.76	-7.11	-9.40	-2.61
161: Spring Lake, Brighton Ave.		3.70	-19.35	2.92	-12.76
160: Spring Lake, Salem Ave.		0.91	12.72	-19.41	-5.69
159: Sea Girt, New York Ave.		6.92	-22.57	10.94	-3.48
158: Sea Girt, Trenton Ave.		18.47	-36.55	6.24	-11.90
157: Manasquan, Riddle Way		10.48	-33.58	-13.34	-35.54
256: Manasquan, Pompano Ave.		-12.75	10.91	2.30	0.54

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

**TABLE 4
MONMOUTH COUNTY
SEASONAL SHORELINE CHANGES**

PROFILE SITE LOCATION	Survey	38-39 S09-F09	39-40 F09-S10	40-41 S10-F10	38-41 S09-F10
		(shoreline change expressed in feet)			
187: Cliffwood Beach Park		14.5	-8.4	-6.4	-0.3
286: Union Beach		11.9	2.00	-1.6	12.39
185: Port Monmouth, Spy House Museum		-10.9	5.9	0.7	-4.3
285: Gateway National R. A., Gunnison Beach		-12.3	-36.3	60.7	12.1
284: Gateway National R. A., Parking Lot E		3.7	55.8	-25.2	34.2
184: Highland Beach, Gateway Entrance		-35.0	34.6	-18.6	-19.1
183: Highland Beach, Via Ripa St.		-58.4	19.7	7.2	-31.6
282: Sea Bright, Shrewsbury Way		-84.3	29.9	14.3	-40.1
182: Sea Bright, North of Route 520		-41.1	-35.6	-32.6	-109.3
181: Sea Bright, Municipal Beach		-9.8	-3.2	6.5	-6.6
180: Sea Bright, Sunset Court		3.0	-30.1	15.8	-11.3
179: Monmouth Beach, Cottage Rd.		-25.2	2.2	-21.5	-44.5
178: Monmouth Beach, Beach Club		21.1	-27.3	50.2	43.9
177: Long Branch, 404 Ocean Ave.		62.5	-71.9	5.3	-4.1
176: Long Branch, Seven Presidents Park		3.9	17.8	27.2	48.8
175: Long Branch, North Broadway Ave.		-15.2	10.1	57.4	52.3
174: Long Branch, Morris Ave.		87.8	3.1	-28.6	62.3
173: Long Branch, West End Ave.		-128.2	-41.6	-65.9	-235.6
272: Long Branch 805 Ocean Ave.		no data	no data	34.0	no data
171: Elberon, Pullman Ave.		-0.2	-0.7	-1.0	-2.0
170: Deal, Roosevelt Ave.		4.2	-26.8	9.3	-13.4
169: Deal, Darlington Ave.		-6.6	-34.0	19.4	-21.2
168: Allenhurst, Corlies Ave.		7.1	-69.8	27.4	-35.4
267: Asbury Park, 7th Ave.		-3.9	-23.7	-4.5	-32.1
167: Asbury Park, 3rd Ave.		-8.0	-15.9	-8.1	-31.9
166: Ocean grove, Ocean Pathway		12.6	-29.7	1.5	-15.7
165: Bradley Beach, McCabe Ave.		19.6	13.5	-39.5	-6.4
164: Avon-By-The-Sea, Sylvania Ave.		-5.9	-8.2	7.5	-6.6
163: Belmar, 5th Ave.		-27.4	-7.8	5.5	-29.8
162: Belmar, 18th Ave.		5.1	-6.6	-6.4	-7.9
161: Spring Lake, Brighton Ave.		-1.7	-12.4	-28.0	-42.1
160: Spring Lake, Salem Ave.		-0.8	42.2	-62.9	-21.5
159: Sea Girt, New York Ave.		-5.9	-27.0	6.5	-26.5
158: Sea Girt, Trenton Ave.		6.7	-52.3	33.7	-12.0
157: Manasquan, Riddle Way		8.7	-30.3	-3.7	-25.3
256: Manasquan, Pompano Ave.		-32.9	-10.1	16.2	-26.7

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

TABLE 5
OCEAN COUNTY
ANNUAL BEACH VOLUME CHANGES
SPRING 2009 - SPRING 2010 & FALL 2009 - FALL 2010
Survey

PROFILE SITE LOCATION	38 - 40	39 - 41
	S2009-S2010	F2009 - F2010
	(volume expressed as cubic yards per foot)	
156: Point Pleasant, Water St.	-77.14	-40.14
155: Point Pleasant, Maryland Ave.	13.64	-14.39
154: Bay Head, Johnson Ave.	-10.21	4.69
153: Mantoloking, 1117 Ocean Ave.	0.66	4.26
152: Brick Townhsip, Public Beach	-2.67	-16.90
151: Normandy Beach, 1st Ave	-12.60	-6.16
150: Lavallette, White Ave.	12.16	-4.25
149: Ortlely Beach, 8th Ave.	8.59	-0.77
248: Seaside, Franklin Ave.	no data	-4.08
148: Seaside Park, 4th Ave.	-12.08	0.05
347: Berkeley Township, 6th Ave.	11.27	-11.27
247: Island Beach State Park, North	-19.05	-36.98
246: Island Beach State Park, Middle	-42.17	3.63
146: Island Beach State Park, South	25.73	-34.74
245: Barnegat Light, 10th St.	-20.76	-76.26
145: Barnegat Light, 26th St.	-23.04	24.78
144: Loveladies, La Baia St.	-16.54	28.59
143: Harvey Cedars, 73rd St.	193.27	250.71
142: Harvey Cedars, Tranquility Drive	54.78	160.19
241: Surf City, 20th St.	-47.85	-3.38
141: Ship Bottom, 8th St.	-19.47	-16.43
140: Long BeachTownship, 32nd St.	21.85	17.78
139: Long Beach Township, 81st St.	-2.58	-8.86
138: Long Beach Township, Old Whaling Rd.	64.22	-40.27
137: Beach Haven, Taylor Ave.	22.80	6.89
136: Beach Haven, Dolphin Ave.	23.56	-15.83
135: Long Beach Township, Webster Ave.	-18.76	45.81
234: Long Beach Township, Border w/ Refuge	48.66	-54.94

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

TABLE 6
OCEAN COUNTY
ANNUAL SHORELINE CHANGES
SPRING 2009 - SPRING 2010 & FALL 2009 - FALL 2010
Survey

PROFILE SITE LOCATION	38 - 40	39 - 41
	S2009-S2010	F2009 - F2010
	(shoreline change expressed in feet)	
156: Point Pleasant, Water St.	-107.2	-30.1
155: Point Pleasant, Maryland Ave.	12.1	24.8
154: Bay Head, Johnson Ave.	-3.6	8.3
153: Mantoloking, 1117 Ocean Ave.	-38.6	-13.7
152: Brick Township, Public Beach	-23.2	-0.5
151: Normandy Beach, 1st Ave	-45.4	4.0
150: Lavallette, White Ave.	-26.4	-19.4
149: Ortley Beach, 8th Ave.	-26.1	-22.0
248: Seaside, Franklin Ave.	no data	-6.0
148: Seaside Park, 4th Ave.	-55.1	-18.7
347: Berkeley Township, 6th Ave.	-11.3	-5.1
247: Island Beach State Park, North	-50.3	7.6
246: Island Beach State Park, Middle	-125.8	32.6
146: Island Beach State Park, South	17.0	-40.6
245: Barnegat Light, 10th St.	20.2	-76.1
145: Barnegat Light, 26th St.	-60.2	49.1
144: Loveladies, La Baia St.	-29.0	43.0
143: Harvey Cedars, 73rd St.	270.3	292.2
142: Harvey Cedars, Tranquility Drive	37.6	157.3
241: Surf City, 20th St.	-73.6	24.1
141: Ship Bottom, 8th St.	-47.5	-14.7
140: Long Beach Township, 32nd St.	-7.0	-0.6
139: Long Beach Township, 81st St.	-63.6	7.2
138: Long Beach Township, Old Whaling Rd.	47.0	-24.5
137: Beach Haven, Taylor Ave.	-0.1	21.1
136: Beach Haven, Dolphin Ave.	16.2	1.4
135: Long Beach Township, Webster Ave.	-21.7	87.8
234: Long Beach Township, Border w/ Refuge	-24.6	-93.8

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

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

PROFILE SITE LOCATION	Survey	38-39	39-40	40-41	38-41
		S09-F09	F09-S10	S10-F10	S09-F10
		(volume expressed as cubic yards per foot of beachfront)			
156: Point Pleasant, Water St.		5.95	-83.24	43.03	-33.57
155: Point Pleasant, Maryland Ave.		11.09	2.20	-17.92	-3.43
154: Bay Head, Johnson Ave.		-0.11	-9.76	14.51	4.66
153: Mantoloking, 1117 Ocean Ave.		-0.72	1.79	2.06	3.51
152: Brick Township, Public Beach		13.13	-15.85	-0.89	-3.94
151: Normandy Beach, 1st Ave		-12.61	0.53	-5.84	-19.05
150: Lavallette, White Ave.		12.76	0.08	-4.41	8.51
149: Ortley Beach, 8th Ave.		8.85	-0.32	3.47	8.71
248: Seaside, Franklin Ave.		no data	-13.51	-17.75	no data
148: Seaside Park, 4th Ave.		5.94	-18.03	-18.42	6.03
347: Berkeley Township, 6th Ave.		-7.04	-18.41	-29.60	-18.13
247: Island Beach State Park, North		35.06	-54.06	16.56	-2.44
246: Island Beach State Park, Middle		-18.68	-24.96	27.89	-12.80
146: Island Beach State Park, South		31.28	-5.43	-29.30	-3.55
245: Barnegat Light, 10th St.		25.43	-46.27	-29.72	-50.29
145: Barnegat Light, 26th St.		-36.31	13.46	11.59	-13.20
144: Loveladies, La Baia St.		4.05	-20.49	48.86	33.13
143: Harvey Cedars, 73rd St.		-9.52	202.13	49.77	242.44
142: Harvey Cedars, Tranquility Drive		29.57	25.04	134.73	188.94
241: Surf City, 20th St.		-25.12	-21.73	18.90	-29.11
141: Ship Bottom, 8th St.		2.87	-22.81	6.26	-12.21
140: Long Beach Township, 32nd St.		-12.76	13.75	-15.16	4.39
139: Long Beach Township, 81st St.		2.80	-13.07	-1.70	-4.16
138: Long Beach Township, Old Whaling Rd.		74.28	-10.96	-29.41	32.91
137: Beach Haven, Taylor Ave.		8.50	12.74	-7.35	15.65
136: Beach Haven, Dolphin Ave.		24.41	-2.74	-13.87	10.22
135: Long Beach Township, Webster Ave.		-60.61	41.94	3.62	-14.96
234: Long Beach Township, Border w/ Refuge		38.07	9.60	-64.87	-16.77

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

**TABLE 8
OCEAN COUNTY
SEASONAL SHORELINE CHANGES**

PROFILE SITE LOCATION	Survey	38-39 S09-F09	39-40 F09-S10	40-41 S10-F10	38-41 S09-F10
		(shoreline change expressed in feet)			
156: Point Pleasant, Water St.		-14.7	-92.5	62.5	-44.8
155: Point Pleasant, Maryland Ave.		-26.7	38.8	-14.0	-1.9
154: Bay Head, Johnson Ave.		15.8	-19.4	27.7	24.0
153: Mantoloking, 1117 Ocean Ave.		-27.8	-10.8	-3.0	-41.5
152: Brick Township, Public Beach		-20.1	-3.1	2.6	-20.6
151: Normandy Beach, 1st Ave		-54.3	8.8	-4.9	-50.3
150: Lavallette, White Ave.		5.1	-31.5	12.1	-14.3
149: Ortley Beach, 8th Ave.		4.4	-30.5	8.4	-17.7
248: Seaside, Franklin Ave.		no data	-32.4	26.4	no data
148: Seaside Park, 4th Ave.		-3.7	-51.7	33.0	-22.4
347: Berkeley Township, 6th Ave.		-13.3	2.1	-7.2	-18.5
247: Island Beach State Park, North		-5.3	-45.1	52.6	-2.3
246: Island Beach State Park, Middle		-73.1	-52.6	85.2	-40.6
146: Island Beach State Park, South		23.1	-6.1	-34.6	-17.6
245: Barnegat Light, 10th St.		73.9	-53.7	-22.4	-2.2
145: Barnegat Light, 26th St.		-79.5	19.3	29.9	-30.4
144: Loveladies, La Baia St.		-8.3	-20.7	63.8	34.8
143: Harvey Cedars, 73rd St.		-22.4	292.7	-0.5	269.8
142: Harvey Cedars, Tranquility Drive		5.4	32.2	125.2	162.8
241: Surf City, 20th St.		-63.3	-10.4	34.5	-39.1
141: Ship Bottom, 8th St.		-25.7	-21.8	7.2	-25.7
140: Long Beach Township, 32nd St.		-13.3	6.3	-6.9	-13.9
139: Long Beach Township, 81st St.		-26.7	-37.0	44.2	-19.4
138: Long Beach Township, Old Whaling Rd.		62.1	-15.1	-9.4	37.6
137: Beach Haven, Taylor Ave.		-7.6	7.5	13.6	13.6
136: Beach Haven, Dolphin Ave.		20.4	-4.3	5.6	21.8
135: Long Beach Township, Webster Ave.		-89.7	68.0	19.8	-1.9
234: Long Beach Township, Border w/Refuge		74.6	-99.2	5.4	-19.2

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

TABLE 9
ATLANTIC COUNTY
ANNUAL BEACH VOLUME CHANGES
SPRING 2009 - SPRING 2010 & FALL 2009 - FALL 2010

Survey

PROFILE SITE LOCATION	38 - 40	39 - 41
	S2009-S2010	F2009 - F2010
	(volume expressed as cubic yards per foot)	
134: Brigantine, Green Acres	-31.71	-3.75
133: Brigantine, 4th Street North	-50.13	-10.51
132: Brigantine, 15th Street South	-26.61	10.42
131: Brigantine, 43rd Street South	15.55	42.79
230: Atlantic City, Rhode Island Ave.	not data	no data
130: Atlantic City, North Carolina Ave.	-7.14	-25.76
129: Atlantic City, Raleigh Ave.	-22.34	-6.96
128: Ventnor City, Dorset Ave.	-28.33	-15.81
127: Margate City, Benson Ave.	8.92	34.91
126: Longport, 17th St.	13.74	-5.36

TABLE 10
ATLANTIC COUNTY
ANNUAL SHORELINE CHANGES
SPRING 2009 - SPRING 2010 & FALL 2009 - FALL 2010

Survey

PROFILE SITE LOCATION	38 - 40	39 - 41
	S2009-S2010	F2009 - F2010
	(shoreline change expressed in feet)	
134: Brigantine, Green Acres	-44.4	48.6
133: Brigantine, 4th Street North	-41.6	6.3
132: Brigantine, 15th Street South	22.3	-41.3
131: Brigantine, 43rd Street South	65.4	38.8
230: Atlantic City, Rhode Island Ave.	no data	no data
130: Atlantic City, North Carolina Ave.	-3.6	-27.4
129: Atlantic City, Raleigh Ave.	-21.7	-20.8
128: Ventnor City, Dorset Ave.	-66.5	-3.4
127: Margate City, Benson Ave.	12.1	32.5
126: Longport, 17th St.	4.8	55.7

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 LOCATION	Survey	38-39	39-40	40-41	38-41
		S09-F09	F09-S10	S10-F10	S09-F10
		(volume expressed as cubic yards per foot of beachfront)			
134: Brigantine, Green Acres		-5.41	-26.40	22.61	-9.47
133: Brigantine, 4th Street North		-33.12	-16.93	6.19	-43.83
132: Brigantine, 15th Street South		-4.56	-21.48	32.49	5.79
131: Brigantine, 43rd Street South		8.70	6.46	37.76	54.07
230: Atlantic City, Rhode Island Ave.		no data	no data	-9.18	no data
130: Atlantic City, North Carolina Ave.		-11.05	4.72	-34.46	-41.26
129: Atlantic City, Raleigh Ave.		5.71	-28.09	23.11	1.08
128: Ventnor City, Dorset Ave.		-5.90	-22.71	6.55	-21.84
127: Margate City, Benson Ave.		-28.61	35.52	-0.72	8.01
126: Longport, 17th St.		11.70	2.09	-7.49	6.34

**TABLE 12
ATLANTIC COUNTY
SEASONAL SHORELINE CHANGES**

PROFILE SITE LOCATION	Survey	38-39	39-40	40-41	38-41
		S09-F09	F09-S10	S10-F10	S09-F10
		(shoreline change expressed in feet)			
134: Brigantine, Green Acres		-13.5	-30.9	79.5	35.1
133: Brigantine, 4th Street North		-20.0	-21.7	27.9	-13.7
132: Brigantine, 15th Street South		32.2	-9.9	-31.5	-9.1
131: Brigantine, 43rd Street South		-2.8	68.2	-29.4	35.9
230: Atlantic City, Rhode Island Ave.		no data	no data	-12.1	no data
130: Atlantic City, North Carolina Ave.		-3.0	-0.6	-26.9	-30.4
129: Atlantic City, Raleigh Ave.		15.6	-37.3	16.4	-5.2
128: Ventnor City, Dorset Ave.		-20.5	-46.0	42.7	-23.8
127: Margate City, Benson Ave.		-34.4	46.4	-13.9	-1.9
126: Longport, 17th St.		-26.9	31.7	24.1	28.9

**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 2009 - SPRING 2010 & FALL 2009 - FALL 2010
Survey

PROFILE SITE LOCATION	38 - 40	39 - 41
	S2009-S2010	F2009 - F2010
	(volume expressed as cubic yards per foot)	
225: Ocean City, Gardens Rd.	96.87	97.15
125: Ocean City, 6th St.	137.65	91.43
124: Ocean City, 20th St.	-20.23	16.86
223: Ocean City, 34th St.	-31.81	-25.72
122: Ocean City, 56th St.	25.96	6.61
222: Ocean City, 59th St.	16.75	21.41
221: Corson's Inlet Park, Ocean City	-13.19	-55.16
121: Strathmere, Williams Rd.	115.75	81.31
120: Sea Isle City, 1st St.	23.33	6.23
119: Sea Isle City, 25th St.	33.96	25.04
118: Sea Isle City, 57th St.	2.34	53.69
117: Sea Isle City, 80th St.	-1.80	116.14
216: Avalon, 9th St.	-17.70	36.07
116: Avalon, 23rd St.	-52.26	33.10
115: Avalon, 35th St.	-21.12	-0.18
114: Avalon, 70th St.	-39.41	-16.16
113: Stone Harbor, 90th St.	-10.44	8.75
212: Stone Harbor, 121st St.	-32.41	-29.76
112: Stone Harbor, South Pointe	** NO LONGER ACTIVE **	
111: North Wildwood, 15th Ave.	159.40	274.43
110: Wildwood, Cresse Ave.	-29.05	-23.07
109: Lower Township, Raleigh Ave.	-47.94	-24.04
208: Lower Township, U.S.C.G. Base	26.18	6.65
108: Cape May, Beach Club	-11.72	-7.92
107: Cape May, Baltimore Ave.	12.53	-5.77
206: Cape May, Broadway Ave.	-32.13	11.57
105: Cape May, Nature Conservancy	-54.72	-36.91
104: Cape May Point, Lake Dr.	2.37	-2.00
103: Higbee Beach State Park	-1.11	-0.88
102: North Cape May, Whittier	10.71	4.98
101: Villas, Pacific Ave.	5.18	2.79
100: Reeds Beach, Beach Ave.	0.36	-1.06

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 2009 - SPRING 2010 & FALL 2009 - FALL 2010

Survey

PROFILE SITE LOCATION	38 - 40	39 - 41
	S2009-S2010	F2009 - F2010
	(shoreline change expressed in feet)	
225: Ocean City, Gardens Rd.	168.6	95.7
125: Ocean City, 6th St.	179.6	94.3
124: Ocean City, 20th St.	-0.7	6.7
223: Ocean City, 34th St.	-34.5	33.9
122: Ocean City, 56th St.	-6.1	55.4
222: Ocean City, 59th St.	-48.0	52.4
221: Corson's Inlet Park, Ocean City	28.2	-37.2
121: Strathmere, Williams Rd.	125.8	11.2
120: Sea Isle City, 1st St.	43.9	-39.3
119: Sea Isle City, 25th St.	107.5	11.9
118: Sea Isle City, 57th St.	106.4	111.4
117: Sea Isle City, 80th St.	24.2	232.9
216: Avalon, 9th St.	10.7	148.5
116: Avalon, 23rd St.	-99.2	70.2
115: Avalon, 35th St.	-92.6	-50.3
114: Avalon, 70th St.	-43.9	10.0
113: Stone Harbor, 90th St.	13.6	20.5
212: Stone Harbor, 121st St.	-25.2	34.3
112: Stone Harbor, South Pointe	** NO LONGER ACTIVE **	
111: North Wildwood, 15th Ave.	117.0	348.3
110: Wildwood, Cresse Ave.	-112.0	-62.3
109: Lower Township, Raleigh Ave.	-45.2	-47.4
208: Lower Township, U.S.C.G. Base	-10.5	48.3
108: Cape May, Beach Club	-20.2	-12.5
107: Cape May, Baltimore Ave.	18.1	-9.3
206: Cape May, Broadway Ave.	-63.1	21.9
105: Cape May, Nature Conservancy	-98.9	-56.0
104: Cape May Point, Lake Dr.	-36.0	-8.6
103: Higbee Beach State Park	-13.5	-1.2
102: North Cape May, Whhittier	3.5	20.2
101: Villas, Pacific Ave.	5.7	-1.9
100: Reeds Beach, Beach Ave.	-10.4	-4.0

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 LOCATION	Survey	38-39	39-40	40-41	38-41
		S09-F09	F09-S10	S10-F10	S09-F10
		(volume expressed as cubic yards per foot of beachfront)			
225: Ocean City, Gardens Rd.		18.14	78.46	18.96	115.23
125: Ocean City, 6th St.		-26.12	163.50	-72.03	65.46
124: Ocean City, 20th St.		8.40	-28.66	46.88	26.01
223: Ocean City, 34th St.		12.48	-44.32	18.60	-11.63
122: Ocean City, 56th St.		2.05	23.24	-17.15	8.89
222: Ocean City, 59th St.		-19.22	35.98	-14.63	2.31
221: Corson's Inlet Park, Ocean City		20.36	-33.36	-21.45	-34.71
121: Strathmere, Williams Rd.		7.28	108.43	-26.07	88.65
120: Sea Isle City, 1st St.		52.96	-31.42	36.83	60.10
119: Sea Isle City, 25th St.		10.24	26.21	-2.13	35.37
118: Sea Isle City, 57th St.		-25.89	28.02	25.40	27.86
117: Sea Isle City, 80th St.		-1.19	-0.94	115.03	115.46
216: Avalon, 9th St.		-15.23	-3.84	39.48	22.12
116: Avalon, 23rd St.		-3.53	-48.70	81.81	29.50
115: Avalon, 35th St.		0.04	-21.26	20.52	-0.13
114: Avalon, 70th St.		7.39	-43.78	28.11	-9.84
113: Stone Harbor, 90th St.		7.77	-12.86	19.10	15.78
212: Stone Harbor, 121st St.		9.95	-42.73	13.20	-19.17
112: Stone Harbor, South Pointe		** NO LONGER ACTIVE **			
111: North Wildwood, 15th Ave.		27.08	132.16	142.50	301.57
110: Wildwood, Cresse Ave.		20.79	-44.95	21.62	-1.42
109: Lower Township, Raleigh Ave.		6.55	-56.61	28.65	-16.69
208: Lower Township, U.S.C.G. Base		23.28	1.84	4.63	29.76
108: Cape May, Beach Club		-4.78	-6.84	-0.57	-12.76
107: Cape May, Baltimore Ave.		9.36	3.43	-9.27	3.66
206: Cape May, Broadway Ave.		-31.35	-0.85	12.35	-20.22
105: Cape May, Nature Conservancy		-27.74	-27.30	-9.49	-64.59
104: Cape May Point, Lake Dr.		-22.39	25.10	-26.31	-24.64
103: Higbee Beach State Park		0.43	-1.59	0.66	-0.56
102: North Cape May, Whittier Ave.		8.04	2.71	2.28	12.92
101: Villas, Pacific Ave.		4.56	0.33	2.53	7.54
100: Reeds Beach, Beach Ave.		0.57	-0.34	-0.80	-0.39

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

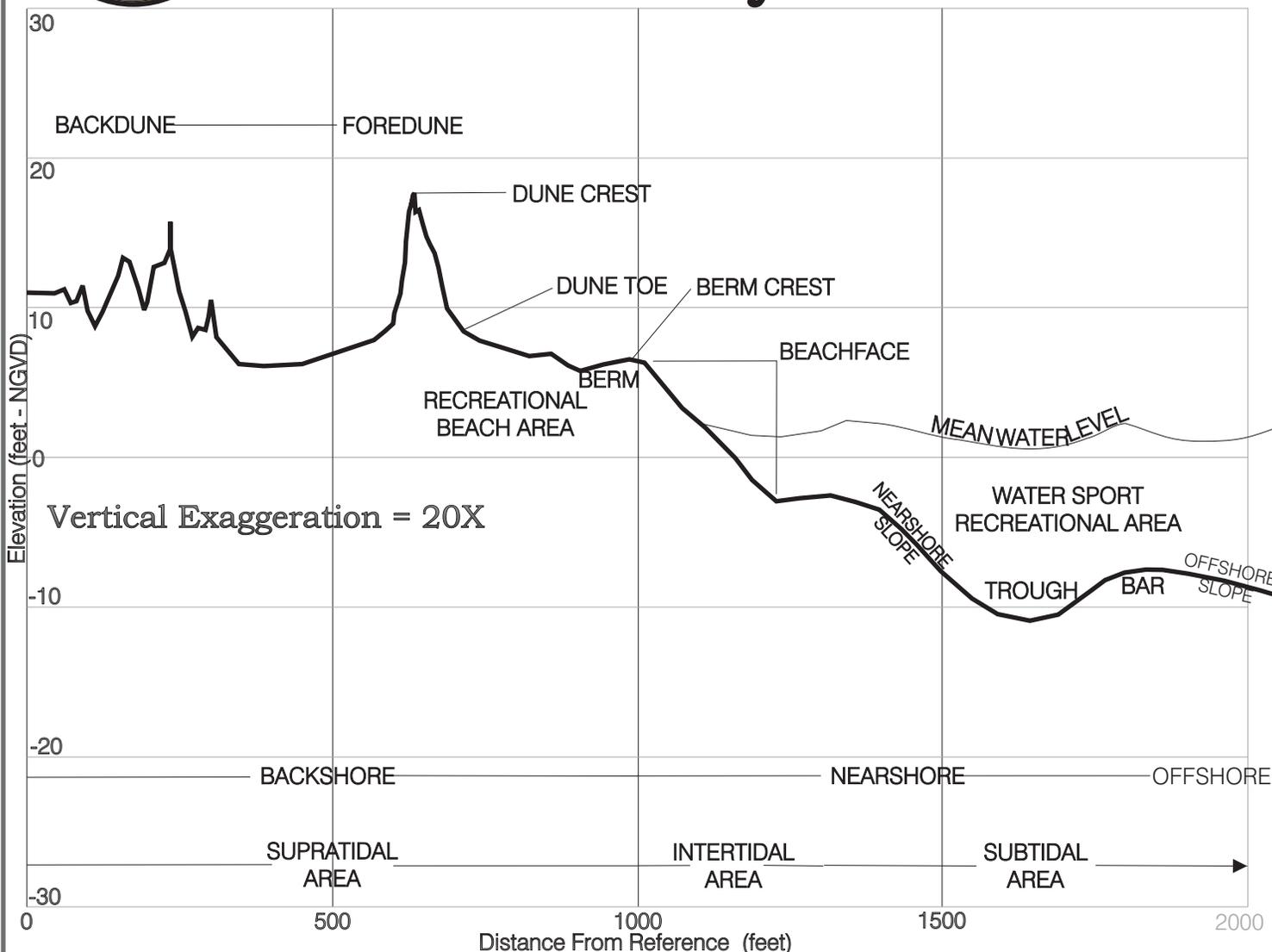
**TABLE 16
CAPE MAY COUNTY
SEASONAL SHORELINE CHANGES**

PROFILE SITE LOCATION	Survey	38-39	39-40	40-41	38-41
		S09-F09	F09-S10	S10-F10	S09-F10
(shoreline change expressed in feet)					
225: Ocean City, Gardens Rd.		41.5	127.0	-31.4	137.2
125: Ocean City, 6th St.		-29.7	209.2	-114.9	64.7
124: Ocean City, 20th St.		10.7	-11.5	18.1	17.4
223: Ocean City, 34th St.		-12.7	-21.7	55.7	21.2
122: Ocean City, 56th St.		-34.4	28.2	27.2	21.1
222: Ocean City, 59th St.		-45.7	-2.4	54.8	6.8
221: Corson's Inlet Park, Ocean City		48.4	-20.3	-16.9	11.3
121: Strathmere, Williams Rd.		123.1	2.7	8.6	134.3
120: Sea Isle City, 1st St.		128.7	-84.8	-45.4	89.3
119: Sea Isle City, 25th St..		52.5	55.1	-43.2	64.3
118: Sea Isle City, 57th St..		-37.7	144.1	-32.7	73.7
117: Sea Isle City, 80th St..		-16.8	41.0	191.9	216.1
216: Avalon, 9th St.		18.0	-7.4	155.9	166.6
116: Avalon, 23rd St.		-19.7	-79.5	149.7	50.5
115: Avalon, 35th St.		26.0	-118.6	68.3	-24.3
114: Avalon, 70th St.		-6.0	-37.9	47.9	4.0
113: Stone Harbor, 90th St.		17.2	-3.6	24.1	37.7
212: Stone Harbor, 121st St.		-20.9	-4.3	38.6	13.3
112: Stone Harbor, South Pointe		** NO LONGER ACTIVE **			
111: North Wildwood, 15th Ave.		77.1	39.9	308.4	425.4
110: Wildwood, Cresse Ave.		34.8	-146.8	84.5	-27.6
109: Lower Township, Raleigh Ave.		17.9	-63.1	15.7	-29.5
208: Lower Township, U.S.C.G. Base		-39.7	29.2	-19.2	8.7
108: Cape May, Beach Club		-9.1	-11.1	-1.4	-21.6
107: Cape May, Baltimore Ave.		4.4	13.7	-23.0	-4.9
206: Cape May, Broadway Ave.		-59.8	-3.3	25.1	-38.0
105: Cape May, Nature Conservancy		-44.8	-54.1	-2.0	-100.8
104: Cape May Point, Lake Dr.		-48.7	12.7	-21.3	-57.3
103: Higbee Beach State Park		-11.9	-1.7	0.4	-13.1
102: North Cape May, Whittier Ave.		18.7	-15.3	35.5	38.9
101: Villas, Pacific Ave.		1.5	4.2	-6.1	-0.3
100: Reeds Beach, Beach Ave.		-1.4	-9.0	5.0	-5.3

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



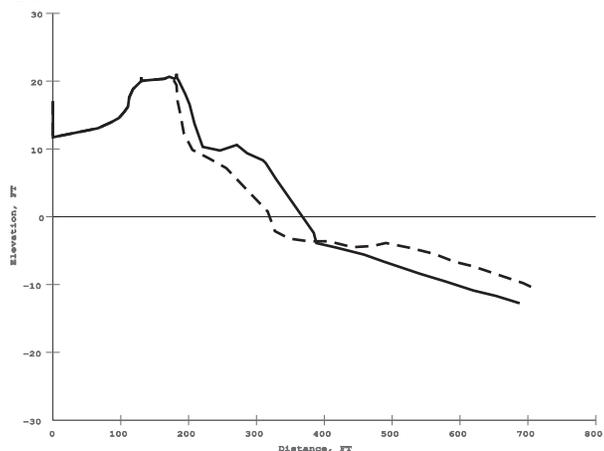
Typical Beach Profiles in New Jersey



Above is a typical beach profile with major features and zones labeled. No beach will show every aspect of this diagram at all times, but it illustrates all important features that appear on the New Jersey shoreline..

Seasonal Variations

The pair of profiles to the left show some of the typical seasonal beach profile changes. The dashed line profile is the result of a winter season, where ocean conditions moved material offshore. The solid line profile is the result of a summer season, where ocean conditions moved sand onshore. The summer profile has a well developed berm and wider beach and dune, while the winter profile has this beach material present in the offshore region of the profile.





Coastal Research Center Glossary of Coastal Terms



Accretion - The addition of material by natural processes.

Aeolian Accretion - The accretion that results from wind driven processes.

Backshore - The area of the beach profile landward of the berm and seaward of upland dunes or bluffs.

Beachface - Also known as foreshore. The area of the beach exposed to regular wave action.

Berm - The nearly horizontal portion of the beach formed at the high water line as waves deposit material. A beach may have no berm or multiple berms.

Bulkhead - A structure that is built to retain or prevent the slumping of land at the influence of water and wave action. Bulkheads are typically made of wood, steel, or aluminum.

Cross-shore Transport - The transfer of sand perpendicular to the shoreline, or along the profile. A bar migrating onto the beach is an example of cross-shore transport.

Current - The flow of water.

Downdrift - The dominant direction of movement of littoral materials.

Datum - A reference level from which elevations are measured.

Dry Beach - The area of beach between the water and dune toe that is commonly used for recreating. Also referred to as recreational beach.

Dune - Unconsolidated hills or mounds of sand. Dunes are the result of aeolian processes and may have vegetation ranging from sparse to dense. Vegetation greatly stabilizes a dune.

Eddy - A circular current running contrary to the main current.

Erosion - The removal of material by natural processes.

Foredune - The most seaward of the dune ridge along the profile.

Geotube - A geotextile fabric tube filled with sand, typically used to retain material or to dissipate wave energy.

Groin - A shore-perpendicular erosion control structure, usually made of wood or rock. This structure acts to slow the process of littoral transport.

Hurricane - A tropical cyclone in the Northern Hemisphere, with sustained winds over 74 mph.

Jetty - A shore-perpendicular erosion control structure similar to a groin, however it is used to control the movement of an inlet or channel.

Littoral Current - Current that moves parallel to shore, that results from the approach of waves not being perpendicular to the shoreline.

Littoral Drift - Also known as longshore transport. Movement of material in the longshore direction, resulting from the littoral currents.



Coastal Research Center Glossary of Coastal Terms



Longshore Transport - Also known as littoral drift. Movement of material in the longshore direction, resulting from the littoral currents.

NGVD - (the datum of 1929) A common elevation reference developed from a specific model of the Earth's surface.

Onshore - In the direction of the shoreline; landward.

Offshore - In the direction opposite of the shoreline; seaward.
The region of the beach profile seaward of the first bar.

Neap Tide - A tide having significantly reduced variations from mean tide levels. Neap tides occur near quarter moon stages.

Nearshore - Region of beach profile extending from the berm seaward through the offshore.

Northeaster - Dominant type of coastal winter storm event experienced in New Jersey, with winds from the northeast that exceed 30 mph.

Revetment - Cover of stone placed on or along a shoreline to protect a slope or shore structure.

Ridge - A low elevation, near shore parallel continuous mound of sand, pushed onshore by wave action.

Riprap - Line of rocks placed randomly along a slope or structure for protection.

Runnel - A continuous area of lower elevation than, but parallel to and adjacent to, a ridge(s).

Scarp - A near vertical feature created through the erosion of material from the lower portion of a slope or bluff.

Scour - Underwater removal of material through currents and wave action.

Seawall - Structure that separates the land and water.

Shoreline - The narrow area of land in contact with the water. When referring to a profile plot, the point where the profile crosses the line representing the datum.

Spring Tide - Tide with the most extreme variations from mean tide levels. Spring tides occur at new or full moon stages.

Swale - A long, narrow, generally shallow depression between ridges.

Swash - The area of beachface exposed to breaking wave energy as waves come ashore.

Storm Surge - The abnormal rise in local sea level that accompanies a hurricane or other major storm event.

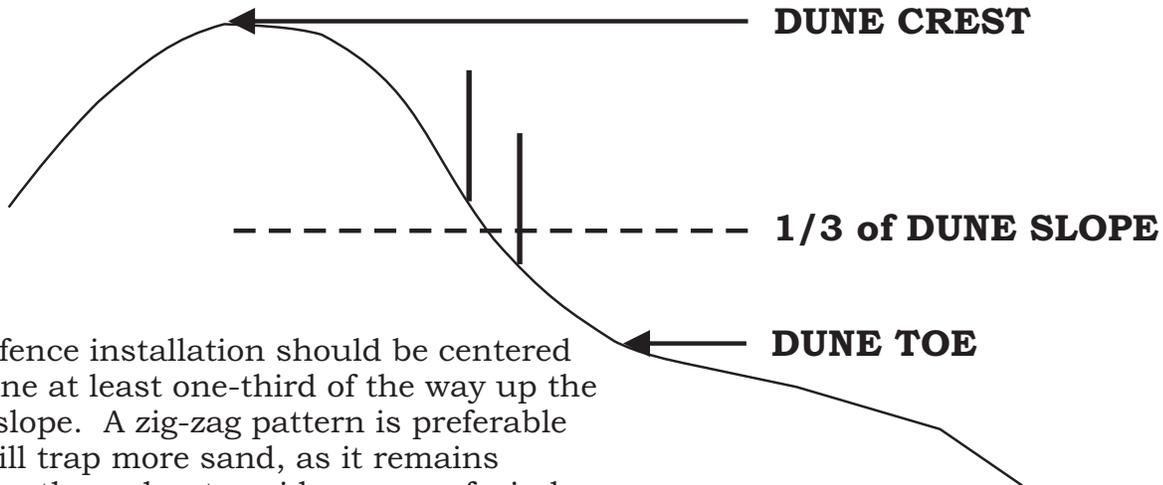
Updrift - In the direction opposite of the dominant movement of littoral materials.

Wrack - Debris deposited on the beach by wave action.

References: A.G.I., U.S.A.C.O.E., N.O.A.A., F.E.M.A., N.J.D.E.P.



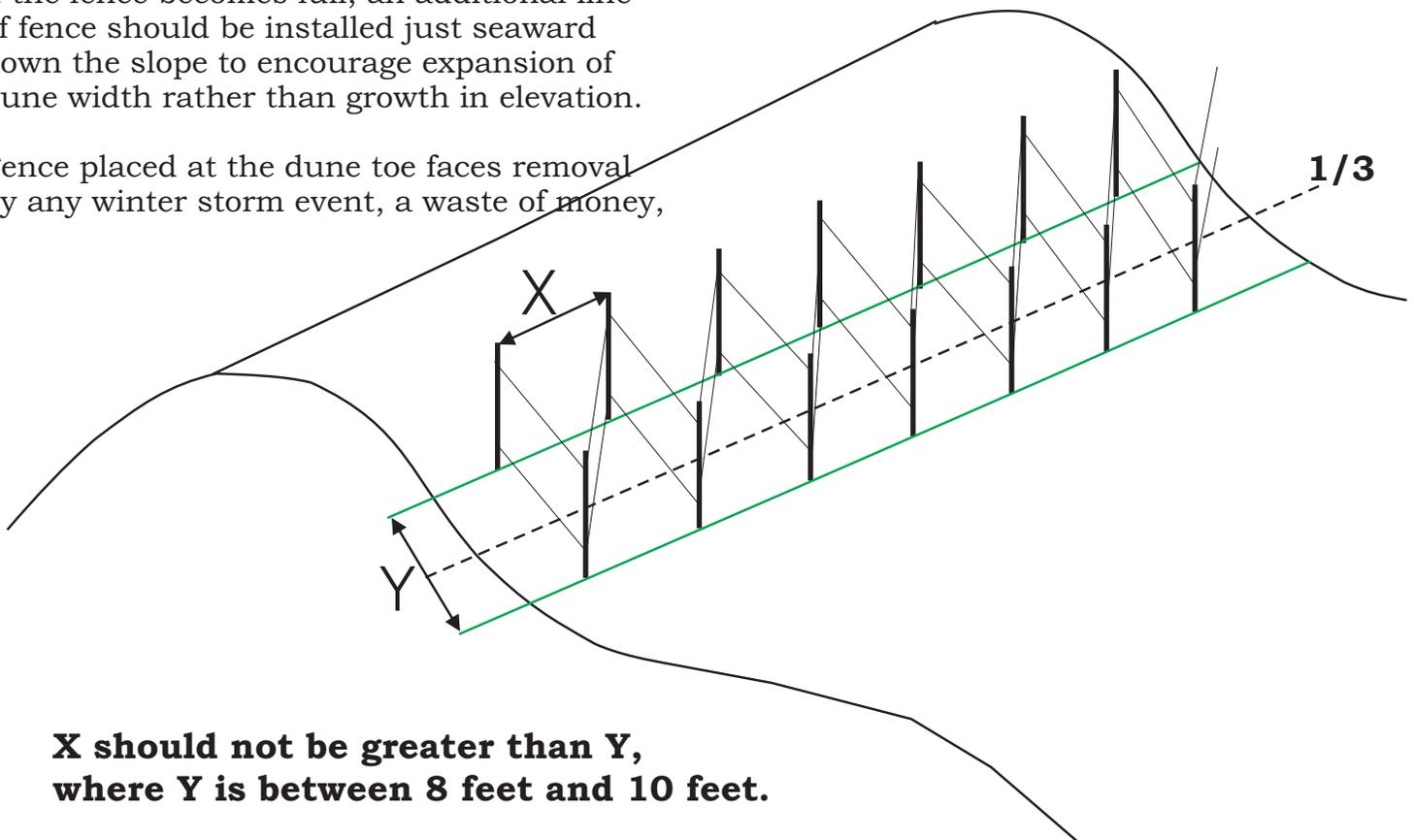
Optimal Dune Fence Placement (Initial Fence Placement)



Dune fence installation should be centered on a line at least one-third of the way up the dune slope. A zig-zag pattern is preferable and will trap more sand, as it remains effective throughout a wider range of wind directions. The zig-zag pattern should be implemented as shown below.

If the fence becomes full, an additional line of fence should be installed just seaward down the slope to encourage expansion of dune width rather than growth in elevation.

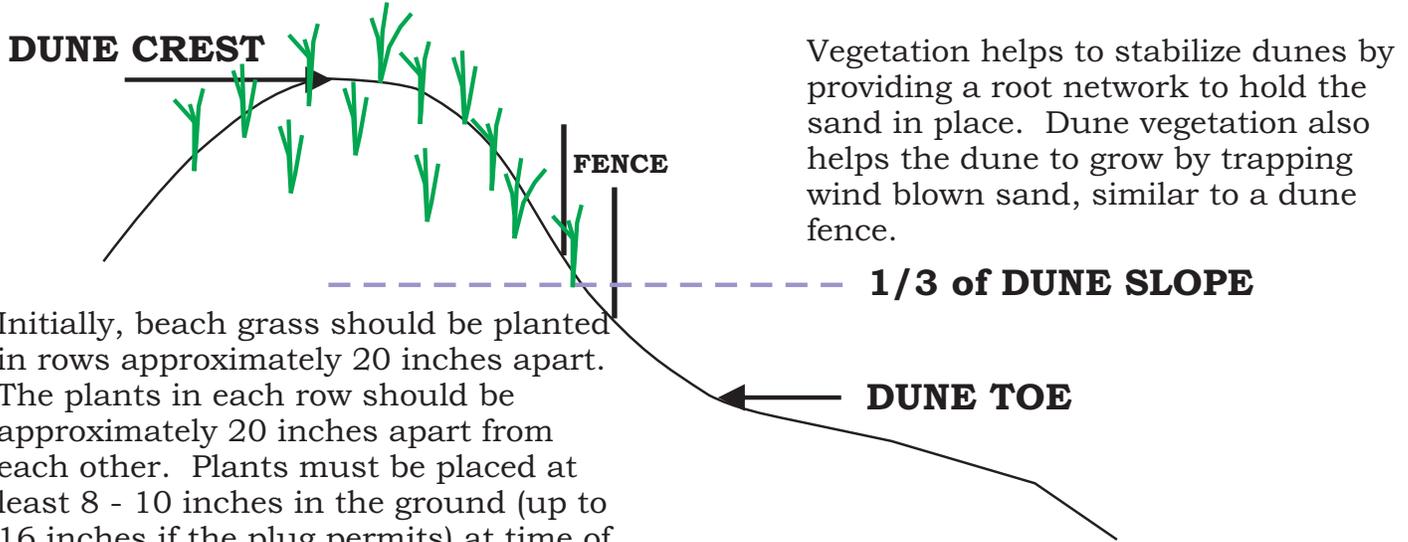
Fence placed at the dune toe faces removal by any winter storm event, a waste of money,



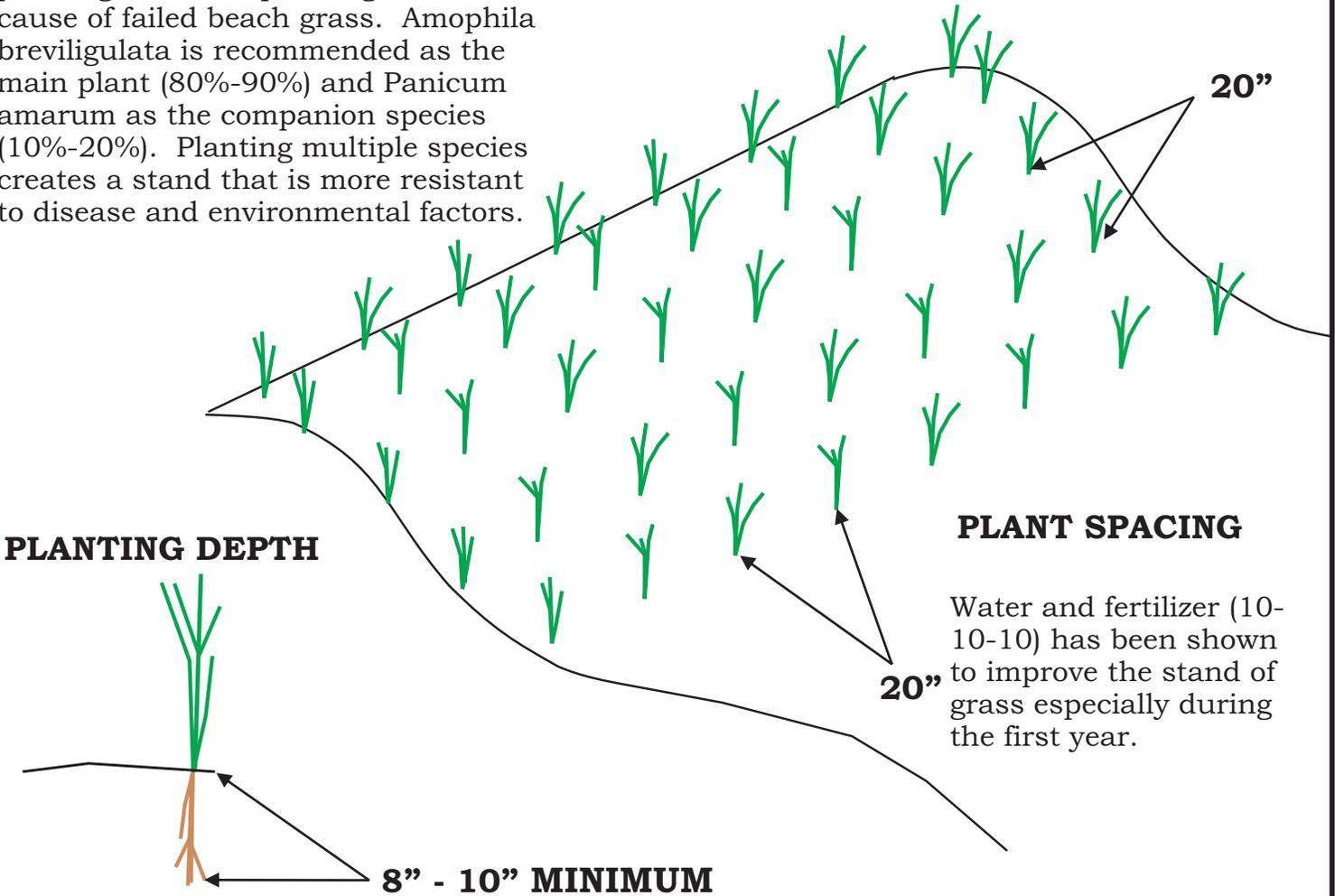
**X should not be greater than Y,
where Y is between 8 feet and 10 feet.**



Optimal Beach Grass Planting (Initial Planting)



Initially, beach grass should be planted in rows approximately 20 inches apart. The plants in each row should be approximately 20 inches apart from each other. Plants must be placed at least 8 - 10 inches in the ground (up to 16 inches if the plug permits) at time of planting. Shallow planting is the #1 cause of failed beach grass. *Amophila breviligulata* is recommended as the main plant (80%-90%) and *Panicum amarum* as the companion species (10%-20%). Planting multiple species creates a stand that is more resistant to disease and environmental factors.



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