



New Jersey Beach Profile Network

Cape May County

**Great Egg Harbor Inlet
to Stow Creek**

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

CAPE MAY COUNTY SPRING 2008 to FALL 2009

Cape May County contains the highest number of coastal restoration projects of the four coastal counties. 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, Cape May Meadows/Cape May Point. The balance of Peck's Beach (Ocean City) is a NJ State/local project. Reeds Beach is a State project with beach restoration 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 waits for sufficient funding at the moment.

Recent State funding in 2009 set the stage for four municipal projects dubbed the 2009 "Mega-project". The municipalities of Upper Township (Strathmere), Sea Isle City, the City of North Wildwood and the Borough of Stone Harbor cooperated with the State for shore protection. The Strathmere erosion problem was related to dynamic changes in the tidal channel geometry of Corson's Inlet that when combined with even minor northeast storms produce a serious threat to the northernmost development on Ludlam Island. During 2008 the situation spiraled out of control to the point where the property owners were forced to install a 30-foot steel bulkhead along their inlet shoreline and the municipality funded \$1.2 million for a rock revetment at the base of the steel wall. The State included restoration of much of 30 acres of State park open space that vanished from the north end of Ludlam Island along with the impact on Strathmere.

Starting in 1998, inlet dynamics have negatively impacted the City of North Wildwood. Sand from the ocean beach has moved into Hereford inlet as a result of shifts in the tidal channel away from the City of North Wildwood's inlet shoreline. This allowed oceanfront sand to flow into the inlet creating a large sand spit along the inlet revetment. The beach narrowed by 1,054 feet at the 15th Avenue survey site between 1998 and 2005. This brought the City's beachfront infrastructure within easy reach of stronger northeast storms and beach restoration was instituted. The NJ State project is designed to augment the beach between the inlet to Juniper Avenue by widening the beach by 300 feet (base bid) and building a dune with a consistent elevation of 14.75 feet NAVD88. The past three years of surveys have shown that the rate of shoreline retreat has diminished and stabilized at the 15th Avenue site.

Federal funding is expected in 2009 for Ocean City and the maintenance of that project between Seaspray Road in the "Gardens" section of northern Ocean City and 12th Street. This follows work completed in 2008 by the State and Ocean City to replenish severely eroded beaches between the Longport Bridge and 12th Street with 900,825 cubic yards placed on the beach. The State is expected to attempt to fund a "betterment" of the ACOE project by piggybacking onto the Federal effort with a continuation using State and local funding for the beach from 34th south to 56th Street. Avalon and Stone Harbor qualifies for federal maintenance, but no funds are currently available. In 2007 Avalon trucked 86,212 cubic yards of sand for critical access to the northern beach between 10th and 15th Streets. In 2008 the Borough contracted for hydraulic dredging of Townsend's Inlet sand to provide summer access in the same area with 253,287 cubic yards delivered between 9th and 18th Streets. The dredge was forced to return in 2010 for a significant restoration effort between 10th and 22nd Streets in Avalon.

Only Wildwood, Wildwood Crest and the section of Lower Township south of Wildwood Crest have not benefited from either NJ State beach projects or federally-sponsored work. Illustrations below cover annual changes in sand supply observed since 1986 at several locations. Two sites have retained all the emplaced sand or added additional volume as littoral processes moved more sand to the site. There are locations on each project where stability is lacking, (see below) but restoration sand volumes have been far less than the initial nourishment effort. The Delaware Bay shoreline has historically retreated about 2-feet per year as the thin

deposit of sand is forced eastward onto the eroding edge of the salt marsh. Higbee Beach is typical of this process. Work in 2008 helped remedy this problem where dredge material from Bidwell Creek was pumped south along Reeds Beach increasing the shoreline width and providing enough sand for a minimal dune at the top of the beachface. The Western Cape May County shoreline would require relatively minimal sand quantities per linear foot of shoreline, but providing that sand source is difficult. A decade ago plans for deepening the Delaware Bay shipping channel was thought to be an avenue to providing abundant quality sand for these beaches. To date no serious progress has been made to implement this project.

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

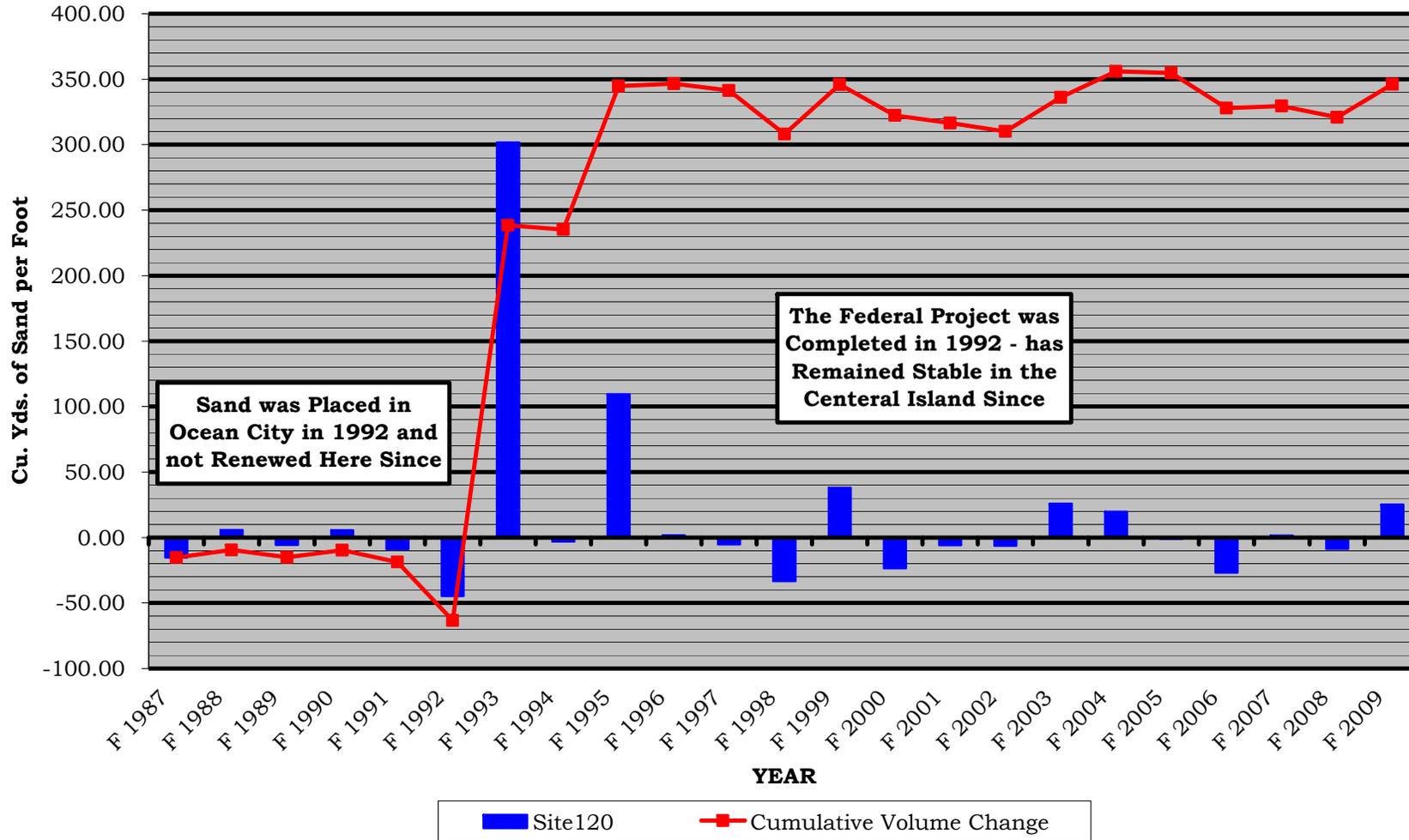


Figure 91. The sediment supply present along this segment of the Ocean City shoreline between 1986 and 1991 was so meager that high tide was landward of the boardwalk. The Halloween Storm of 1991 demolished the boardwalk north of this site for 5 blocks. The initial nourishment occurred in the summer 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.

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

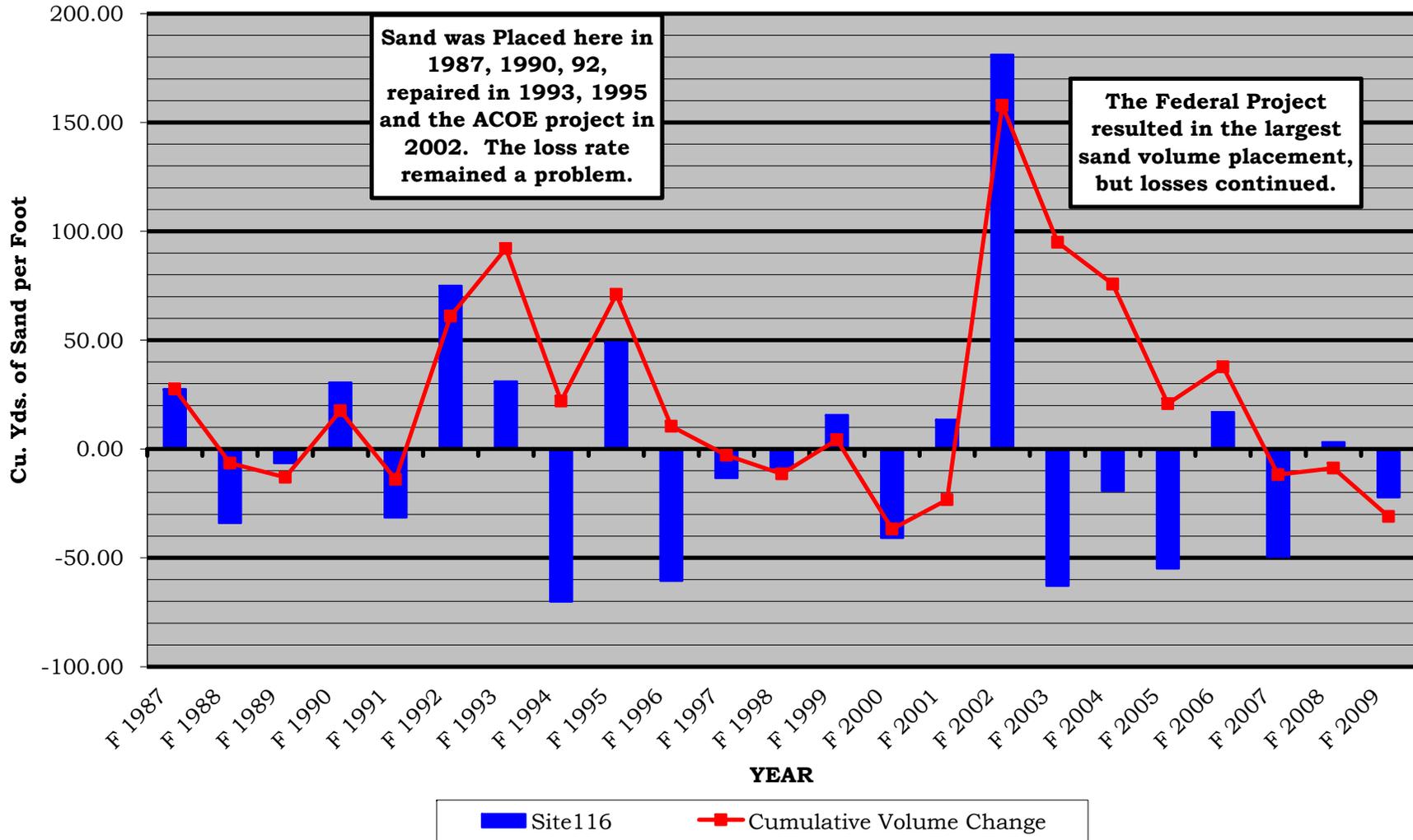


Figure 92. The northern end of Avalon’s beachfront has suffered substantial erosion between 9th and 23rd Streets since 1978. The loss rate appears to be about 35 to 50 cubic yards per foot of shoreline per year. There is little supply of new sand naturally due to an extended inlet jetty at 8th Street. 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 is to be placed in 2010.

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

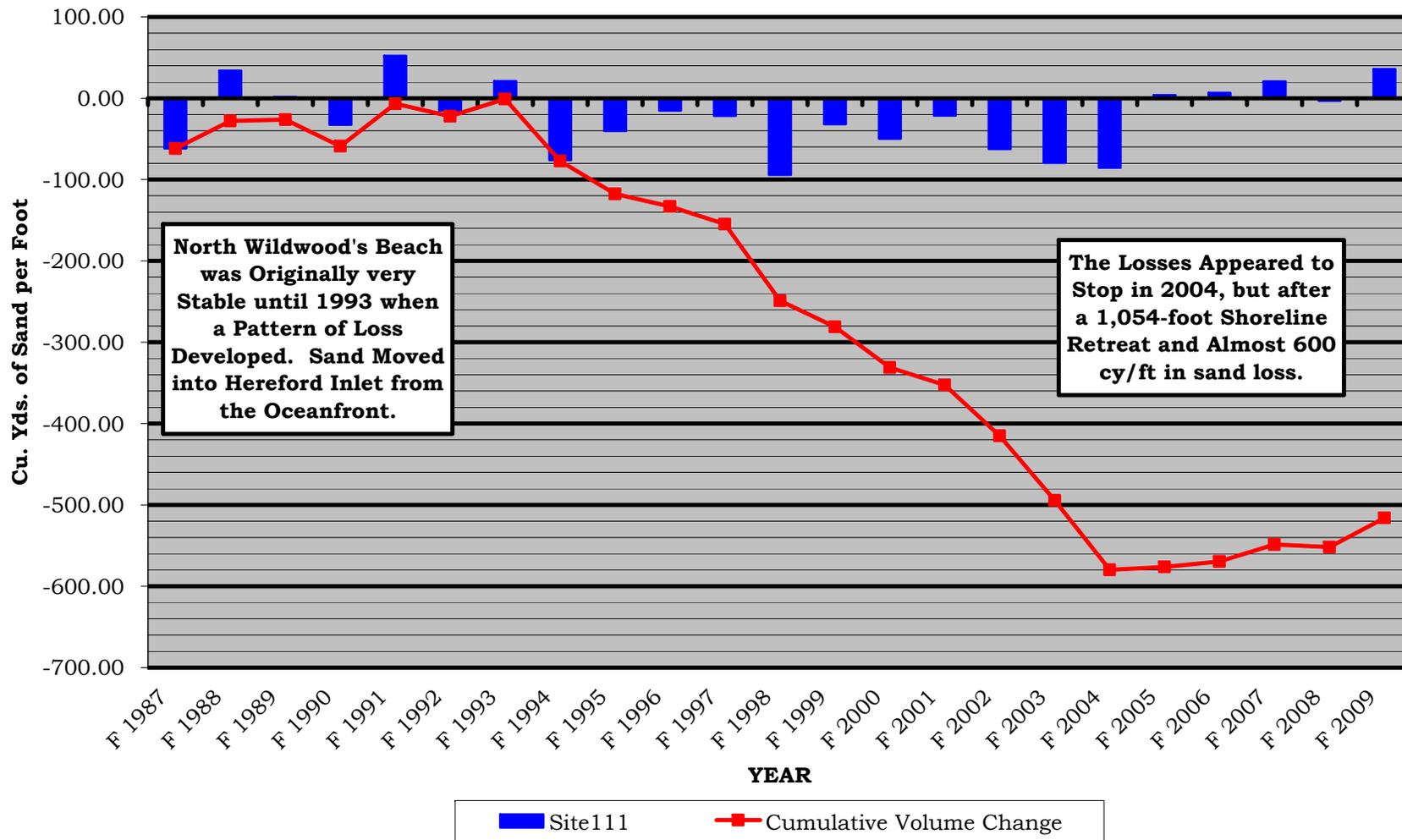


Figure 93. The past 23 years of surveys in North Wildwood debunks the popular notion that all sand in New Jersey goes to the Wildwoods. Changes to the tidal current patterns in Hereford Inlet in 1992-1993 produced another cycle of beach erosion where the lost sand deposited along the No. Wildwood inlet 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.

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

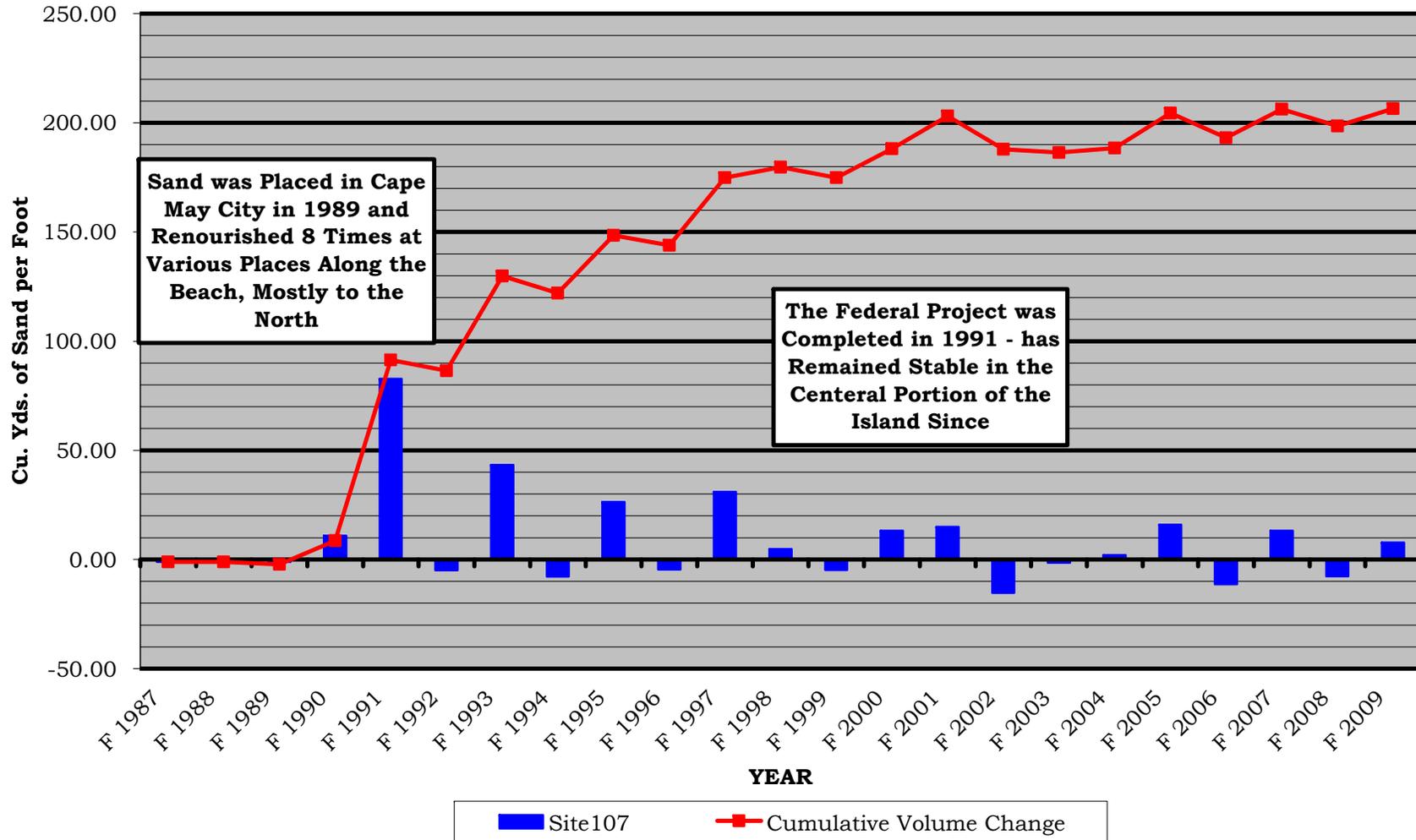


Figure 94. Beach nourishment was started in Cape May City in 1989 as the initial Federal project in New Jersey. Initially this beach was wet to the rock revetment defending Ocean Avenue along Cape May City. Sand pumping provided sand in 1990 and 1991 converting this shoreline from just a view of the 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.

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

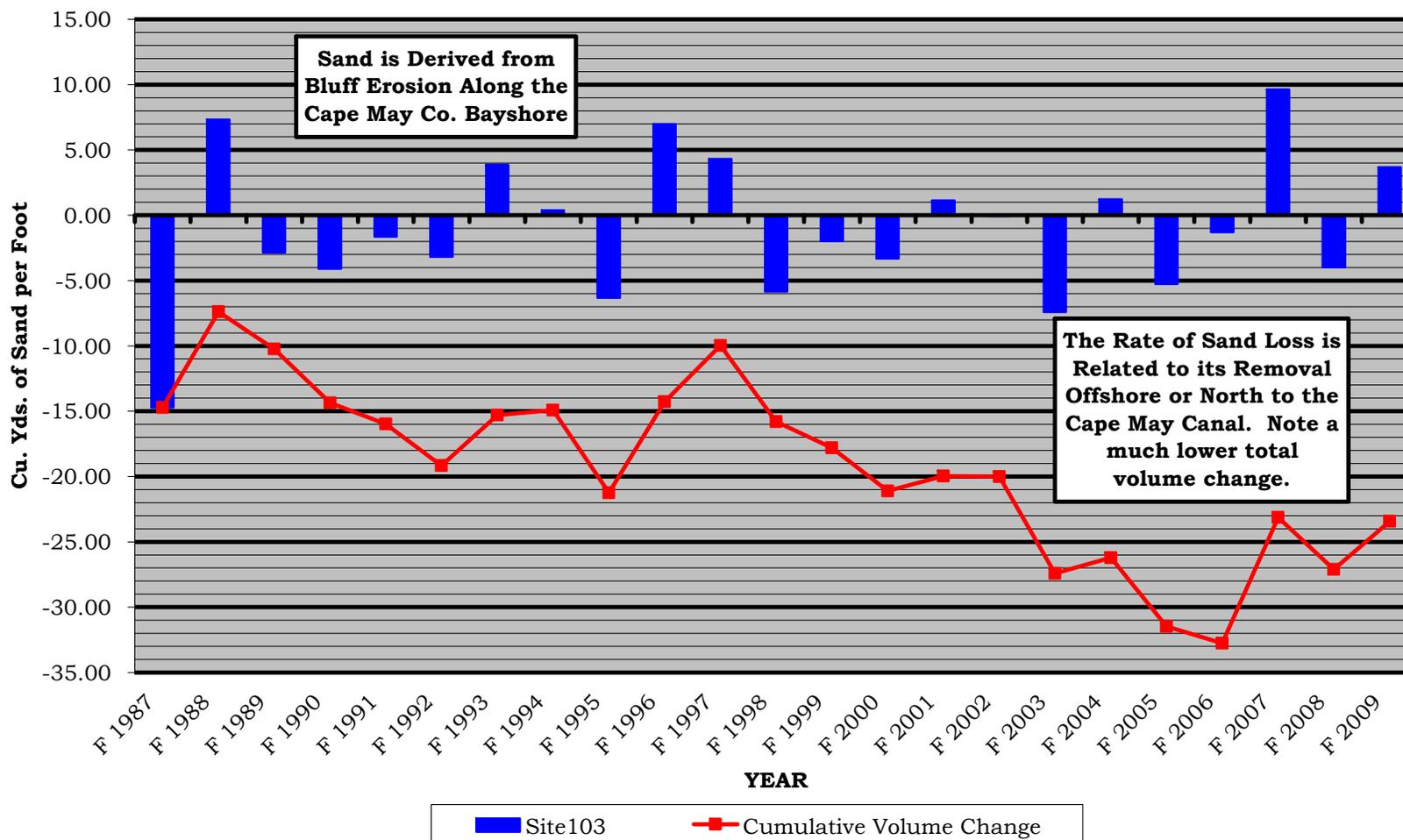


Figure 95. The four sites on Delaware Bay in Cape May County display far smaller changes each year due to the far smaller wave energy available to change things. Higbee Beach is a natural area in the southern part of this western bay shoreline and consists of a sandy vegetated bluff which erodes when 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

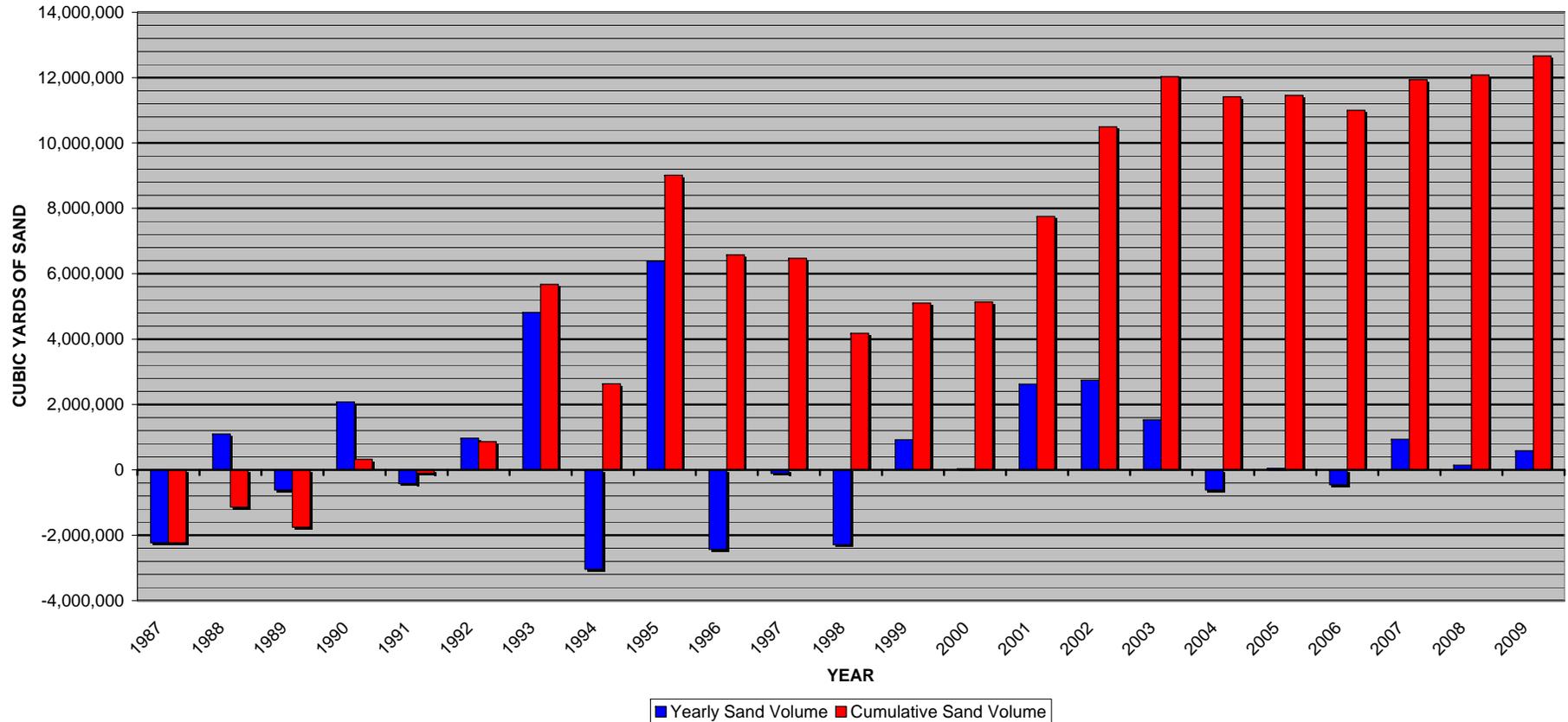


Figure 96. The improvement in the average sand volume present on Cape May County beaches is clearly associated with the many major projects conducted within the County. Starting in 1989 the communities of Ocean City and Cape May City along with Avalon provided large volumes of sand to their municipal 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. These projects have produced over 12 million added cubic yards to the County shoreline’s sand volume.

In summary for Cape May County, Congressional funding for the ACOE to institute or maintain existing projects has been quite limited. 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. They also have money to develop, approve and execute the Project Partnership Agreement with the State of New Jersey. The local issues related to real estate, state permits, and ancillary parts of the project (dune grass, monitoring and fencing) are funded by the State/local partnership.

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. Older installations at two other cells in the community continued to maintain a perched beach as well. These installations show that if the area landward of the line of reef units is closed by groins at each end, the beach sand remains in place longer than if the line of reef units is open at one or both ends. Monitoring was reduced to once per year with the cancellation of experimental 227-type projects by the ACOE. The State undertook the final annual review of this project in October 2008. 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. There also has been a small reversal in an erosion trend seen in the sand volume found at Higbee Beach located between Cape May Point’s final groin and the Cape May Canal jetties.

GARDENS ROAD, OCEAN CITY - SITE 225



Photo taken October 8, 2008. 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 photograph shows a vertical scarp and there is a narrow beach and little tendency to develop a berm.

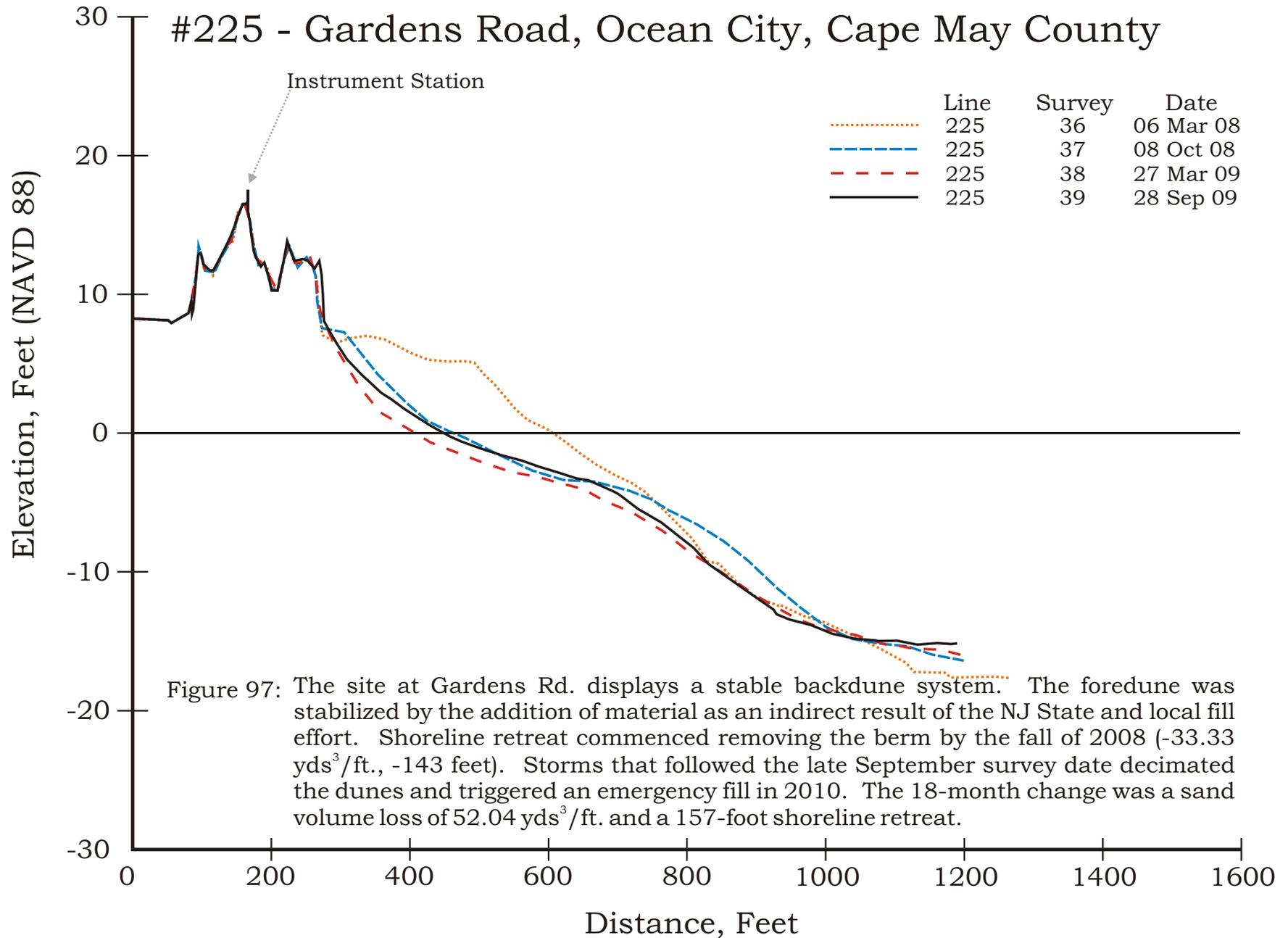


Photo taken September 28, 2009. View to the north.

Comparing the profiles over the eleven month time period, the profile location lost volume (-18.18 cu yd/ft) and the shoreline moved landward (-13.96 ft). This survey preceded the fall 2009 storm erosion that cut deeply into the dune forcing an emergency renourishment completed in 2010.

New Jersey Beach Profile Network

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



6th STREET, OCEAN CITY - SITE 125



Photo taken October 8, 2008. 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 September 28, 2009. View to the south.

Comparing the profiles over the eleven month time period, the profile location lost volume (-73.42 cu yd/ft) and the shoreline moved landward (-96.72 ft). Further losses were recorded during the fall of 2009 requiring yet another emergency fill in 2010.

New Jersey Beach Profile Network

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

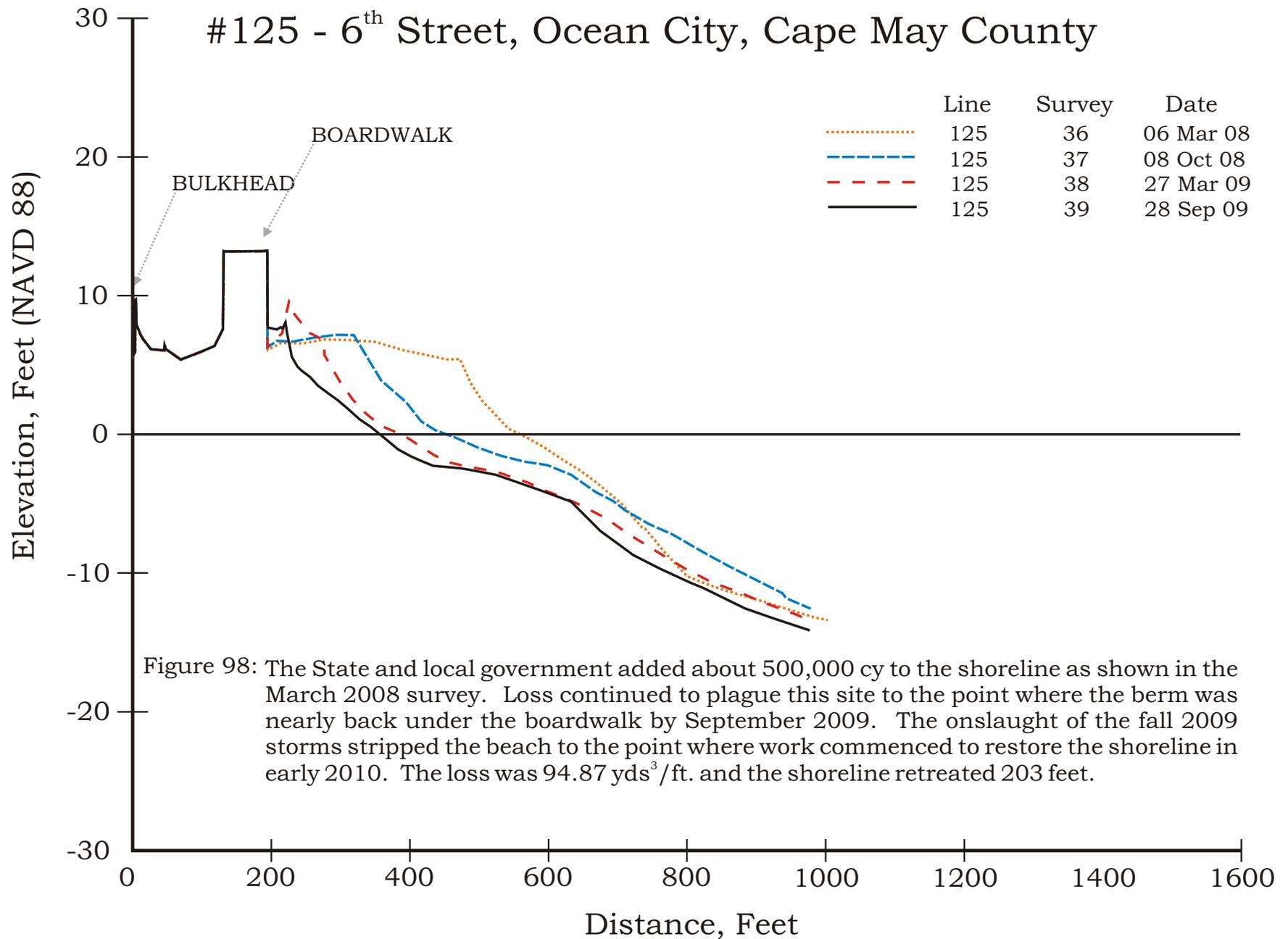


Figure 98: The State and local government added about 500,000 cy to the shoreline as shown in the March 2008 survey. Loss continued to plague this site to the point where the berm was nearly back under the boardwalk by September 2009. The onslaught of the fall 2009 storms stripped the beach to the point where work commenced to restore the shoreline in early 2010. The loss was 94.87 yds³/ft. and the shoreline retreated 203 feet.

20th STREET, OCEAN CITY - SITE 124



Photo taken October 8, 2008. View to the north.

The 20th Street profile is a dramatic example of beach nourishment success. The October 8, 2008 shot was closer to the beach and shows the summer grass growth and the gradational transition to the dry beach. The homes barely show in the distance to the left of the photograph 16 years following the initial nourishment in 1992. Remember that 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.

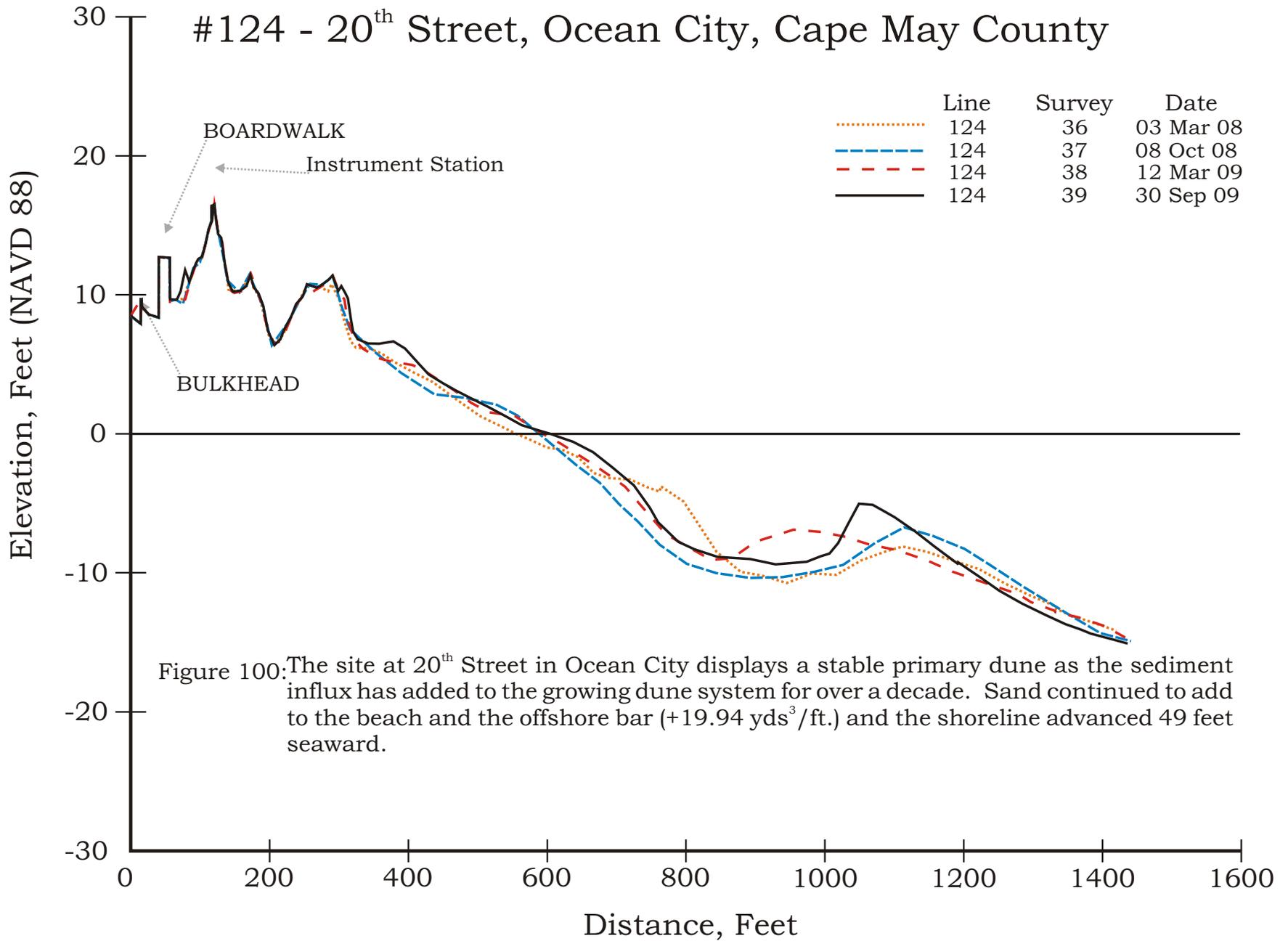


Photo taken September 30, 2009. View to the north.

Comparing the profiles over the eleven month time period, the profile location gained volume (25.23 cu yd/ft) and the shoreline moved seaward (15.56 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 October 10, 2008. 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.

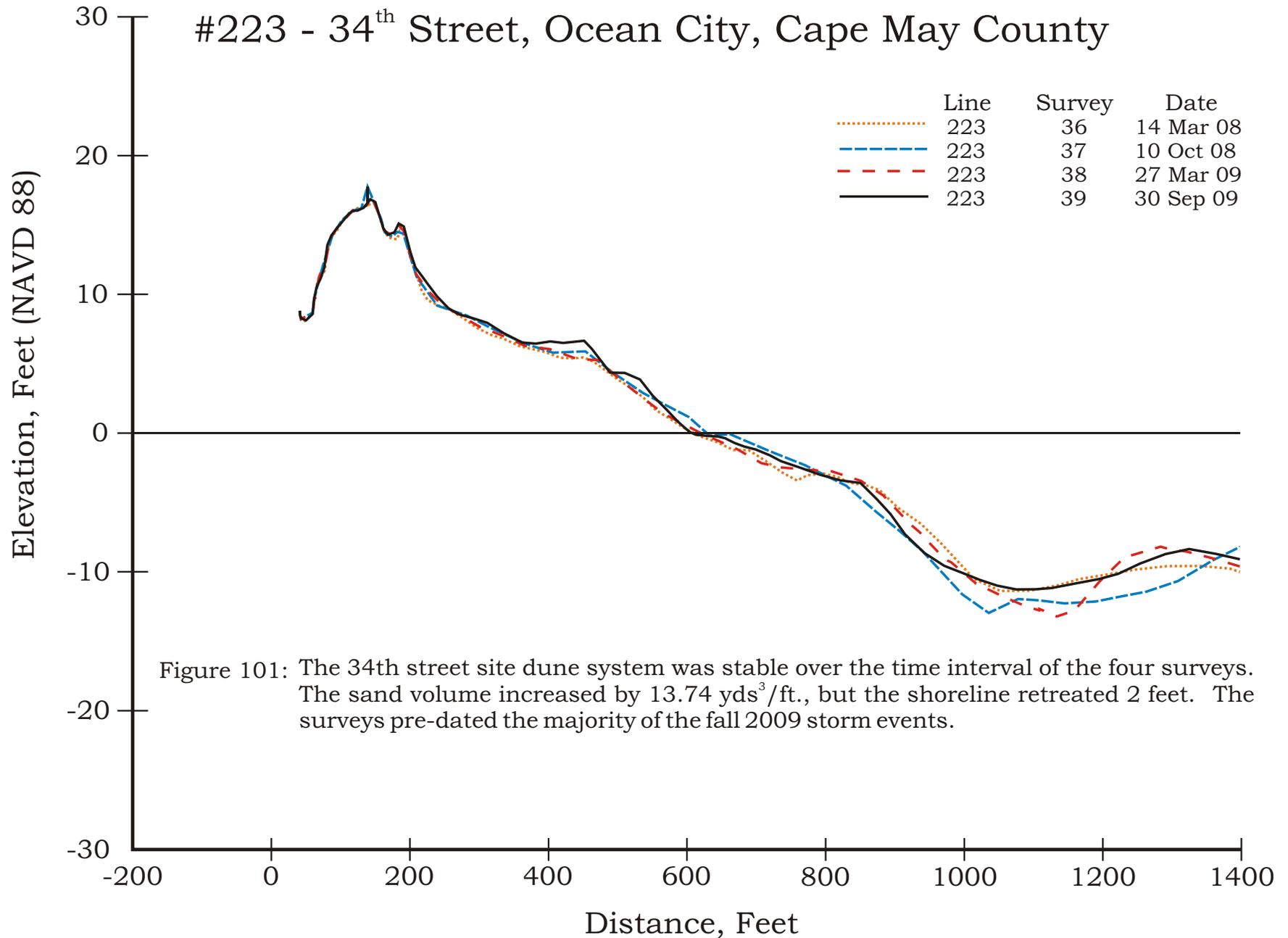


Photo taken September 30, 2009. View to the south.

Comparing the profiles over the eleven month time period, the profile location gained volume (22.10 cu yd/ft) and the shoreline moved landward (-20.9 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network

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



56th STREET, OCEAN CITY - SITE 122



Photo taken October 10, 2008. View to the north.

The southern part of the developed part of Ocean City has a narrower beach, but a substantial dune shown here. 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. By October 10, 2008 grass growth has made the dune look more impressive, but the width and height is substantially the same. The beach is stable if narrow.

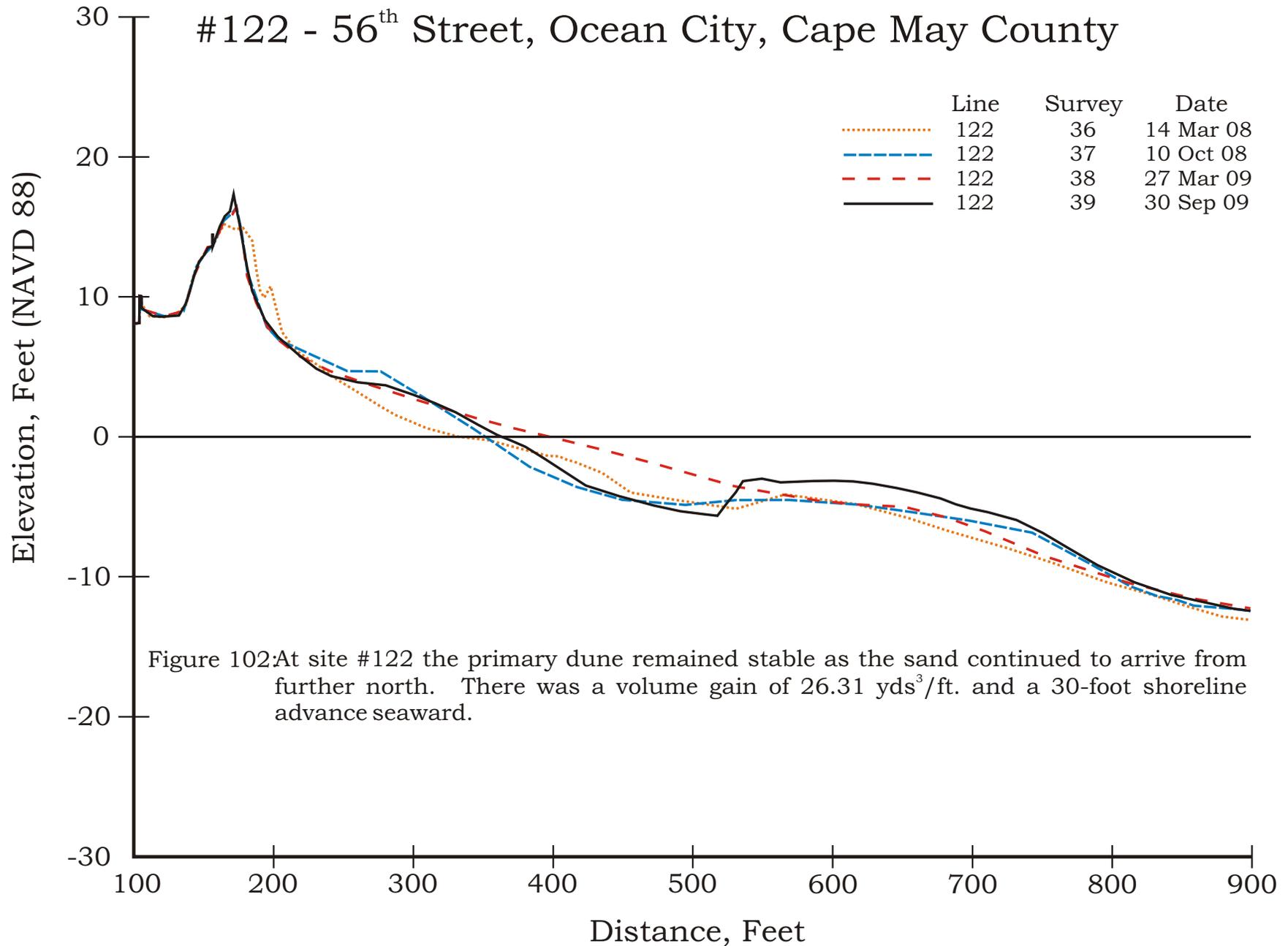


Photo taken September 30, 2009. View to the north.

Comparing the profiles over the eleven month time period, the profile location gained volume (18.08 cu yd/ft) and the shoreline moved seaward (11.73 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network

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



WILLIAMS ROAD, STRATHMERE - SITE 121



Photo taken October 22, 2008. View to the north.

The beach at Williams Road was still wide enough to prevent dune erosion by high tides November 5, 2007. The issues that plagued the local municipality during 2008 were just beginning to appear. North of the groin that just barely shows way down the beach, erosion was carving away at the sand from that point to the inlet. By October 22, 2008 the loss was beginning to affect this site as well. Note that the dune is scarped and the debris is pushed up against the dune toe where it was deposited out on the beach a year earlier. 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.

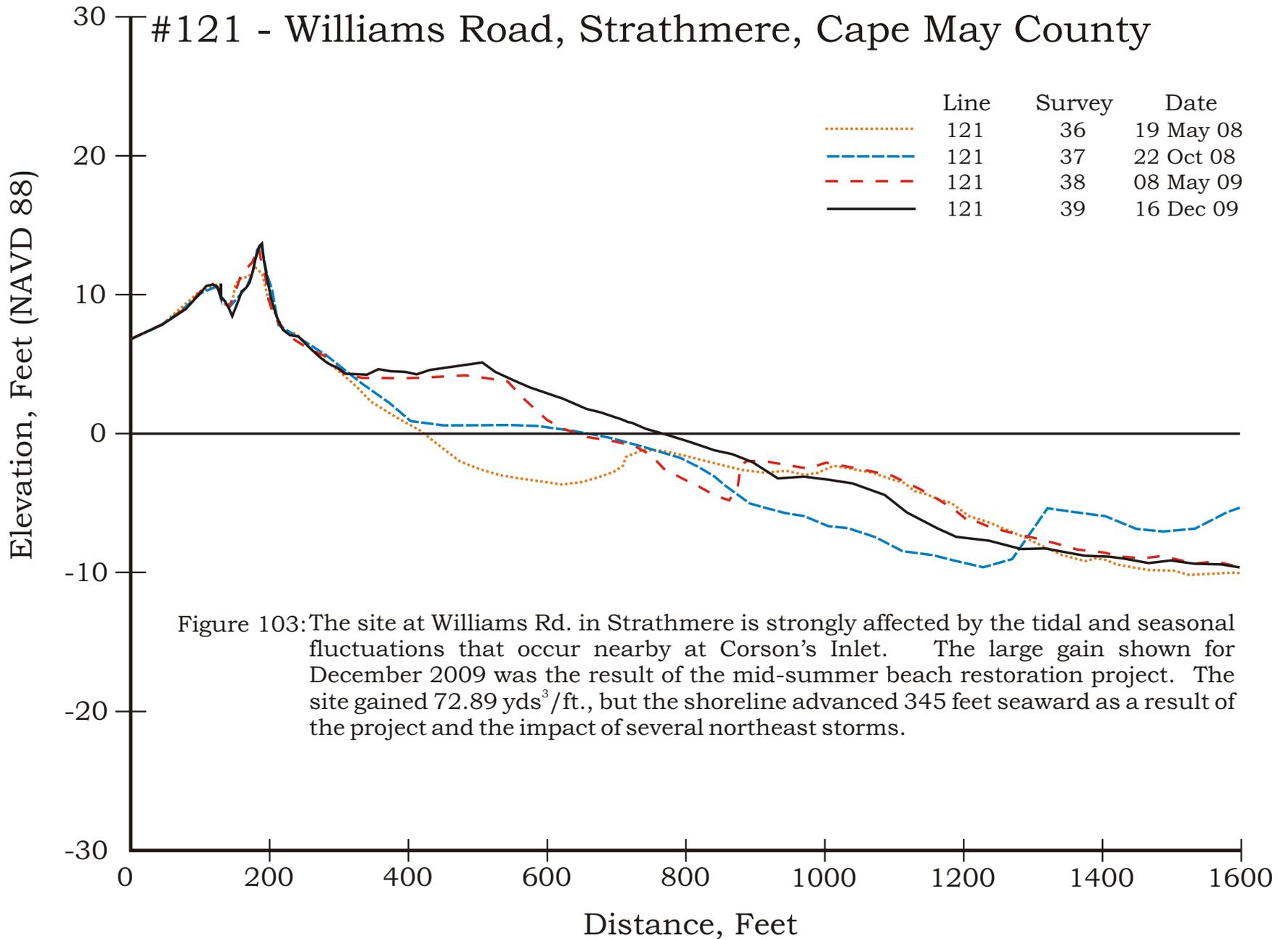


Photo taken December 16, 2009. View to the north.

Comparing the profiles over the fourteen month time period, the profile location gained volume (7.28 cu yd/ft) and the shoreline moved seaward (123.10 ft) due to a beach nourishment project completed in late July 2009.

New Jersey Beach Profile Network

#121 - Williams Road, Strathmere, Cape May County



1st STREET, SEA ISLE CITY - SITE 120



Photo taken October 22, 2008. View to the north.

This central island location has a sand starvation problem that shows in the narrow beach, low, narrow dune where the tide reaches the dune almost every day. There is a 10-foot diameter geo-tube located in the dune that is exposed to the south, but not right at the profile cross section or to the north.

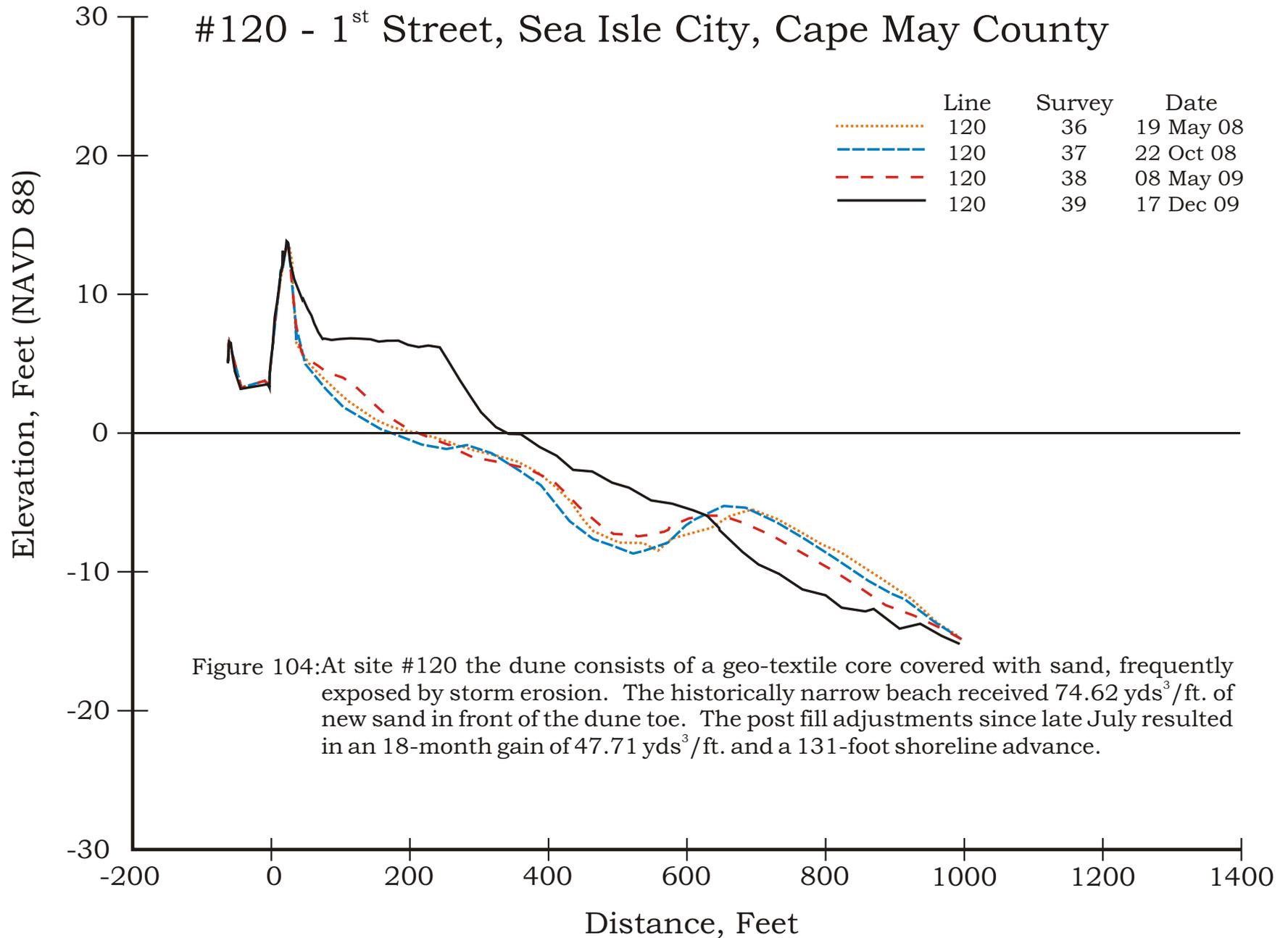


Photo taken December 17, 2009. View to the north.

Comparing the profiles over the fourteen month time period, the profile location gained volume (59.25 cu yd/ft) and the shoreline moved seaward (167.44 ft). The sand volume increase was dominantly due to completing the Strathmere/Sea Isle City beach nourishment project.

New Jersey Beach Profile Network

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



25th STREET, SEA ISLE CITY - SITE 119



Photo taken September 18, 2008. View to the north.

In September 2008, the beach was recovering as the offshore sand bar was welding to the beach. The trough shown is termed a “runnel” and the sand seaward is the “ridge”. This is the climax of summer accretion as the sand in the bar migrates onto the beach.

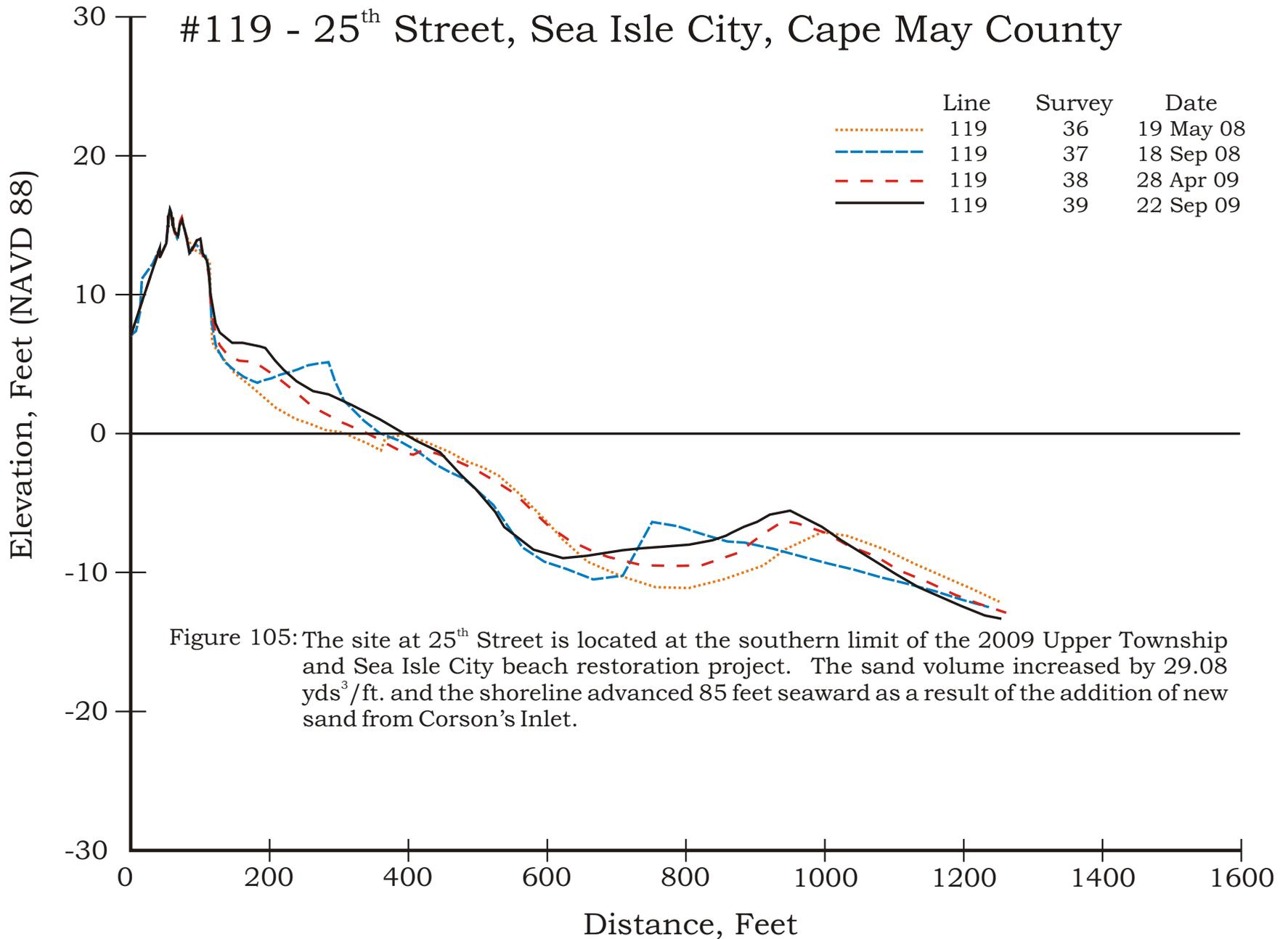


Photo taken September 22, 2009. View to the north.

Comparing the profiles over the one year time period, the profile location gained volume (24.86 cu yd/ft) and the shoreline moved seaward (32.95 ft). This area was subject to the Sea Isle City portion of the Ludlam Island fill project.

New Jersey Beach Profile Network

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



57th STREET, SEA ISLE CITY - SITE 118



Photo taken September 18, 2008. 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.

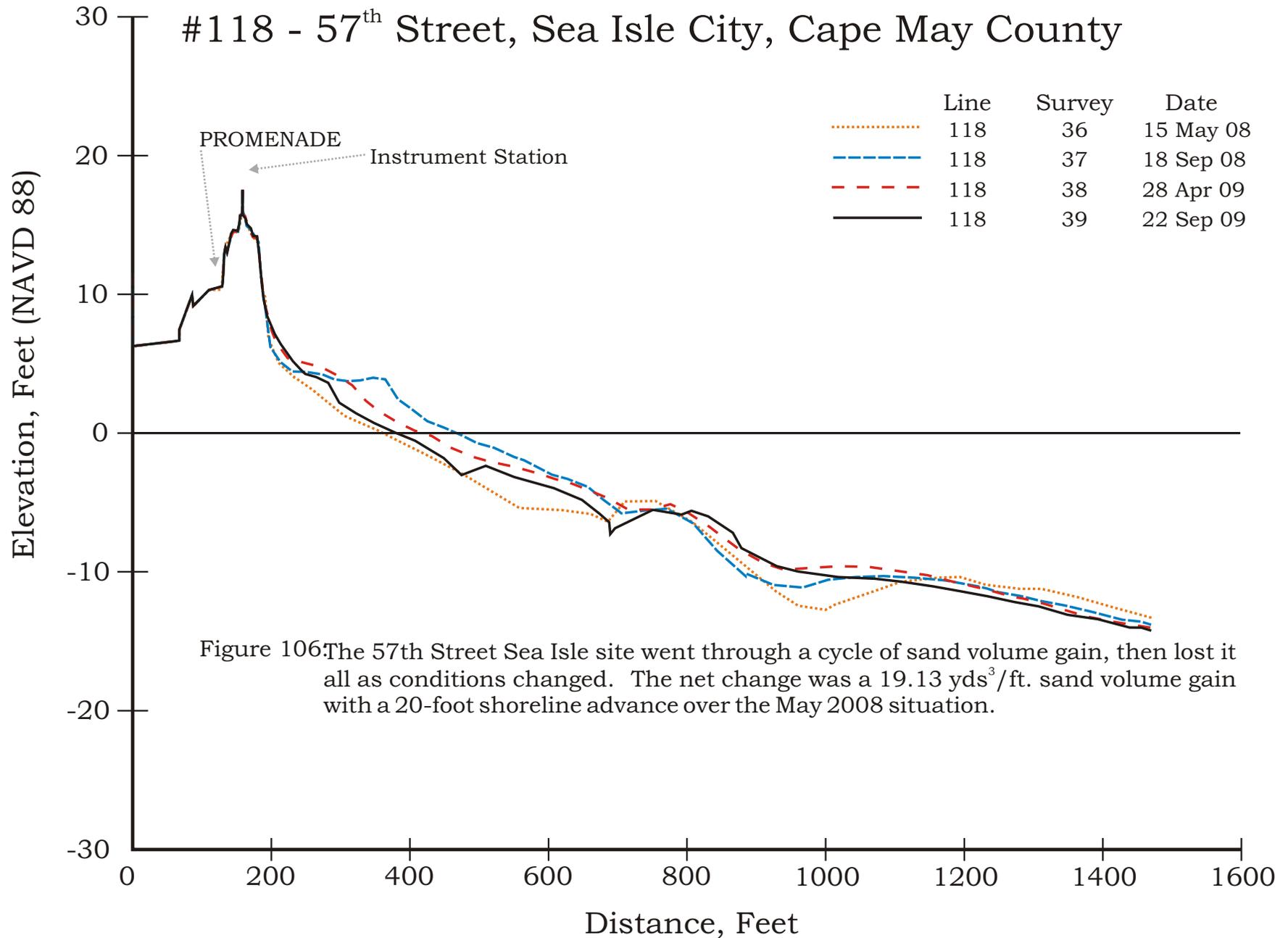


Photo taken September 22, 2009. View to the north.

Comparing the profiles over the one year time period, the profile location gained volume (19.13 cu yd/ft) and the shoreline moved seaward (32.09 ft).

New Jersey Beach Profile Network

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



80th STREET, SEA ISLE CITY - SITE 117



Photo taken September 15, 2008. 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.

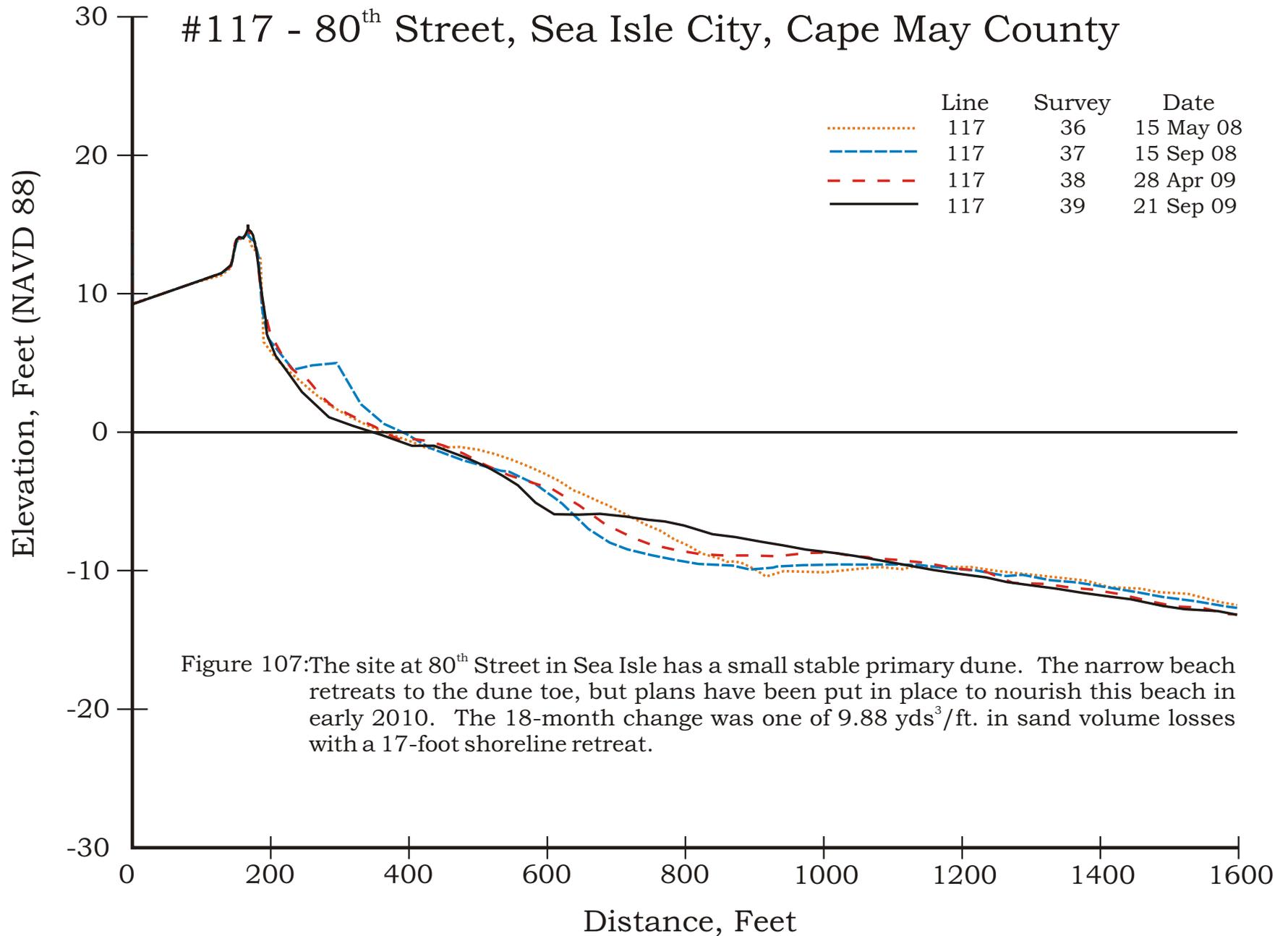


Photo taken September 21, 2009. View to the south.

Comparing the profiles over the one year time period, the profile location gained volume (2.59 cu yd/ft) and the shoreline moved landward (-42.51 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network

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



9th STREET, AVALON - SITE 216



Photo taken December 17, 2008. View to the south.

In June 2007, approximately 80,000 cubic yards of quarry sand was placed on the beach between 10th and 17th Streets. By September 2008, the beach was significantly wider following the hydraulic pumping of 242,637 cubic yards of sand from Townsend's Inlet onto the shoreline between 10th and 18th Streets. This provided a successful summer recreational season.

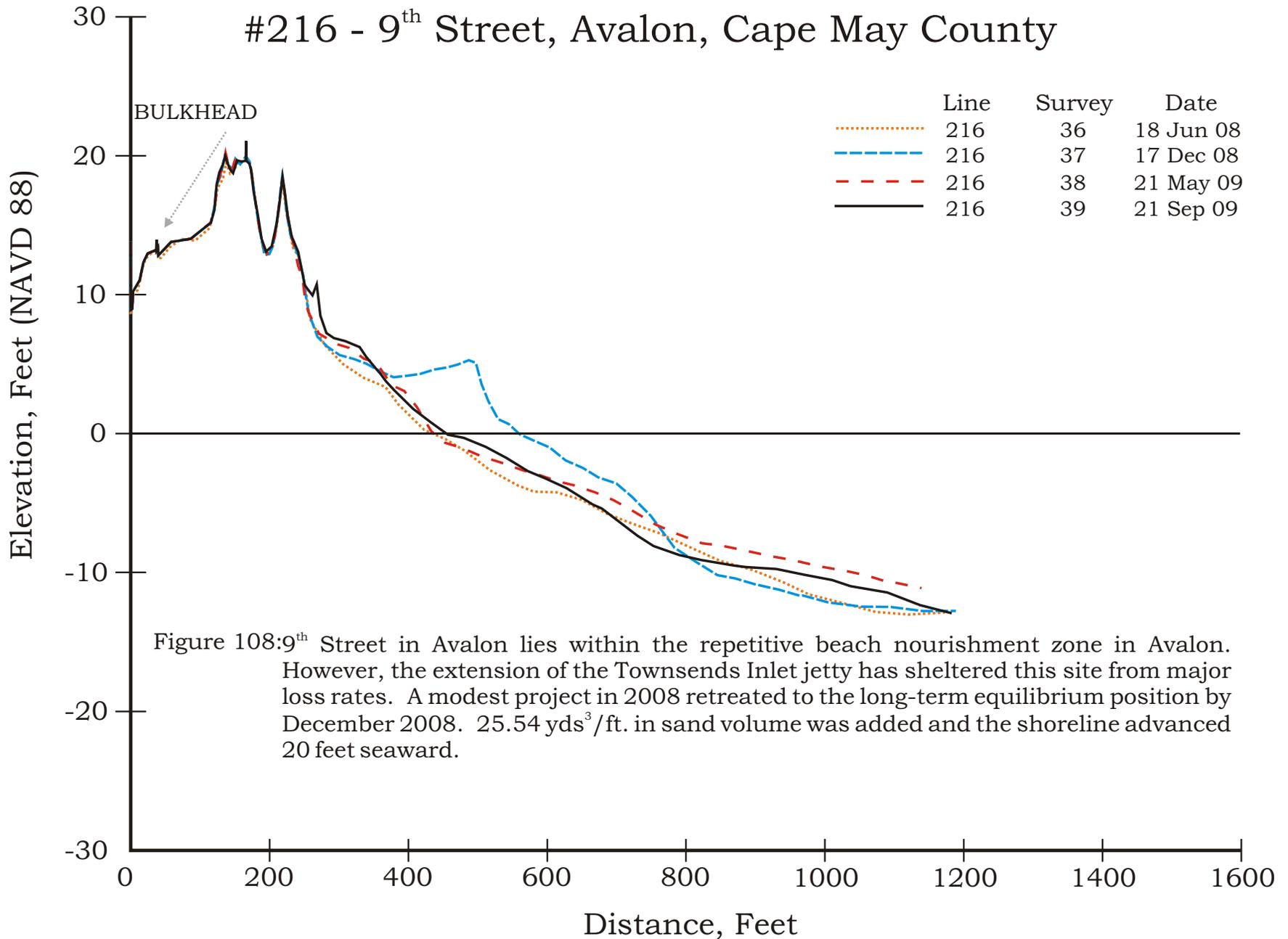


Photo taken September 21, 2009. View to the south.

Comparing the profiles over the nine month time period, the profile location lost volume (-23.22 cu yd/ft) and the shoreline moved landward (-104.65 ft). The fall 2009 storms decimated this beach reducing the width to zero elevation and distance from the rocks that barely are visible in the distance in the top picture.

New Jersey Beach Profile Network

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



23rd STREET, AVALON - SITE 116



Photo taken December 17, 2008. View to the north.

In 2008, the dune toe slope is uniform and has traces of wind transported sand spread across it.

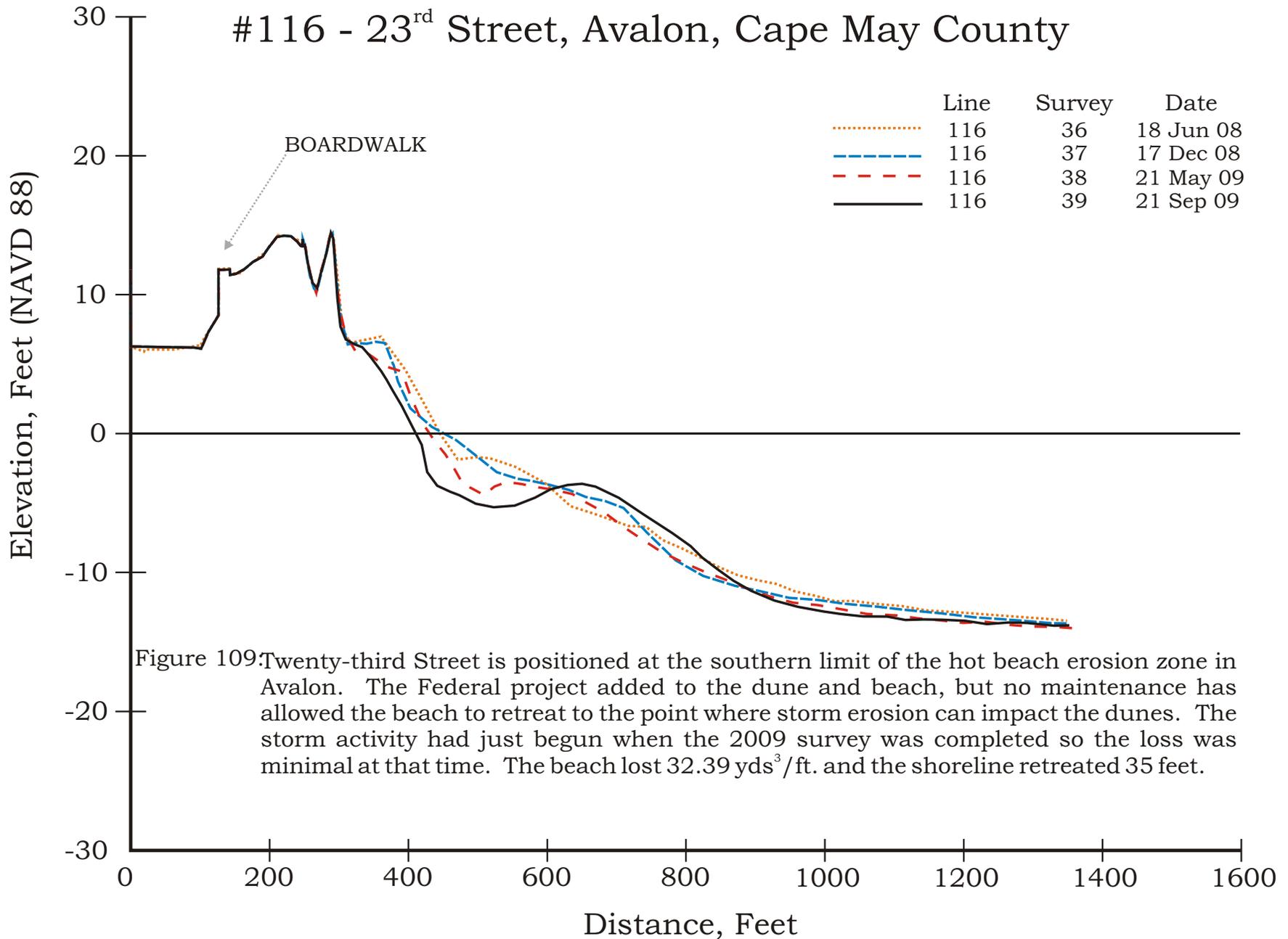


Photo taken September 21, 2009. View to the north.

Comparing the profiles over the nine month time period, the profile location lost volume (-22.2 cu yd/ft) and the shoreline moved landward (-40.51 ft). 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.

New Jersey Beach Profile Network

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



35th STREET, AVALON - SITE 115



Photo taken December 23, 2008. View to the south.

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. By 2008, the grass was a bit more lush and had moved slightly seaward onto the dry sand. The beach and dune system was essentially the same adding modest quantities of material.

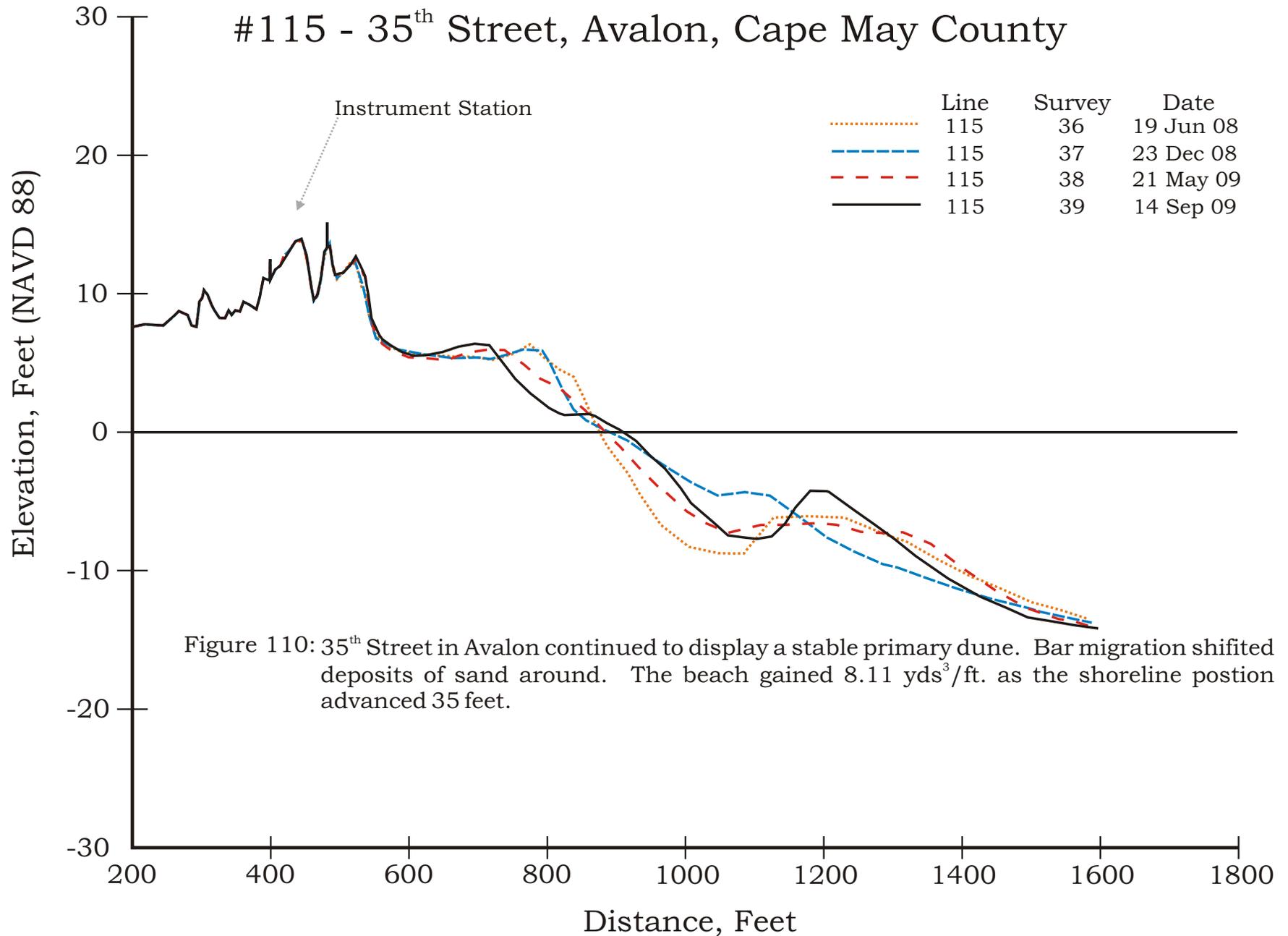


Photo taken September 14, 2009. View to the south.

Comparing the profiles over the nine month time period, the profile location lost volume (-3.1 cu yd/ft) and the shoreline moved seaward (19.26 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network

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



70th STREET, AVALON - SITE 114



Photo taken December 23, 2008. 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.

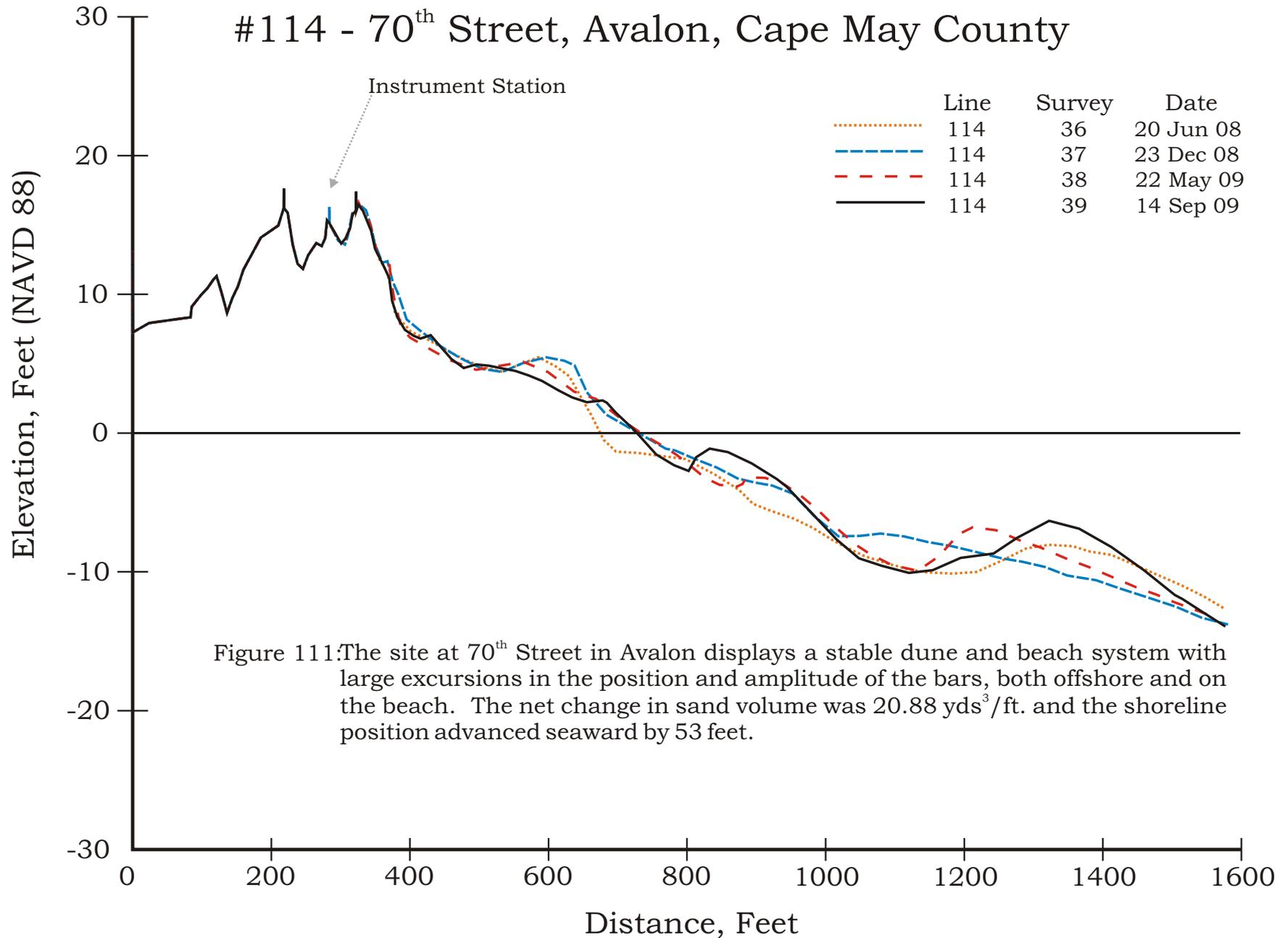


Photo taken September 14, 2009. View to the north.

Comparing the profiles over the ninemonth time period, the profile location gained volume (6.0 cu yd/ft) and the shoreline moved landward (-2.36 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network

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



90th STREET, STONE HARBOR - SITE 113



Photo taken September 30, 2008. 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, but low storm intensity and frequency has prevented any wave damage to the dunes.

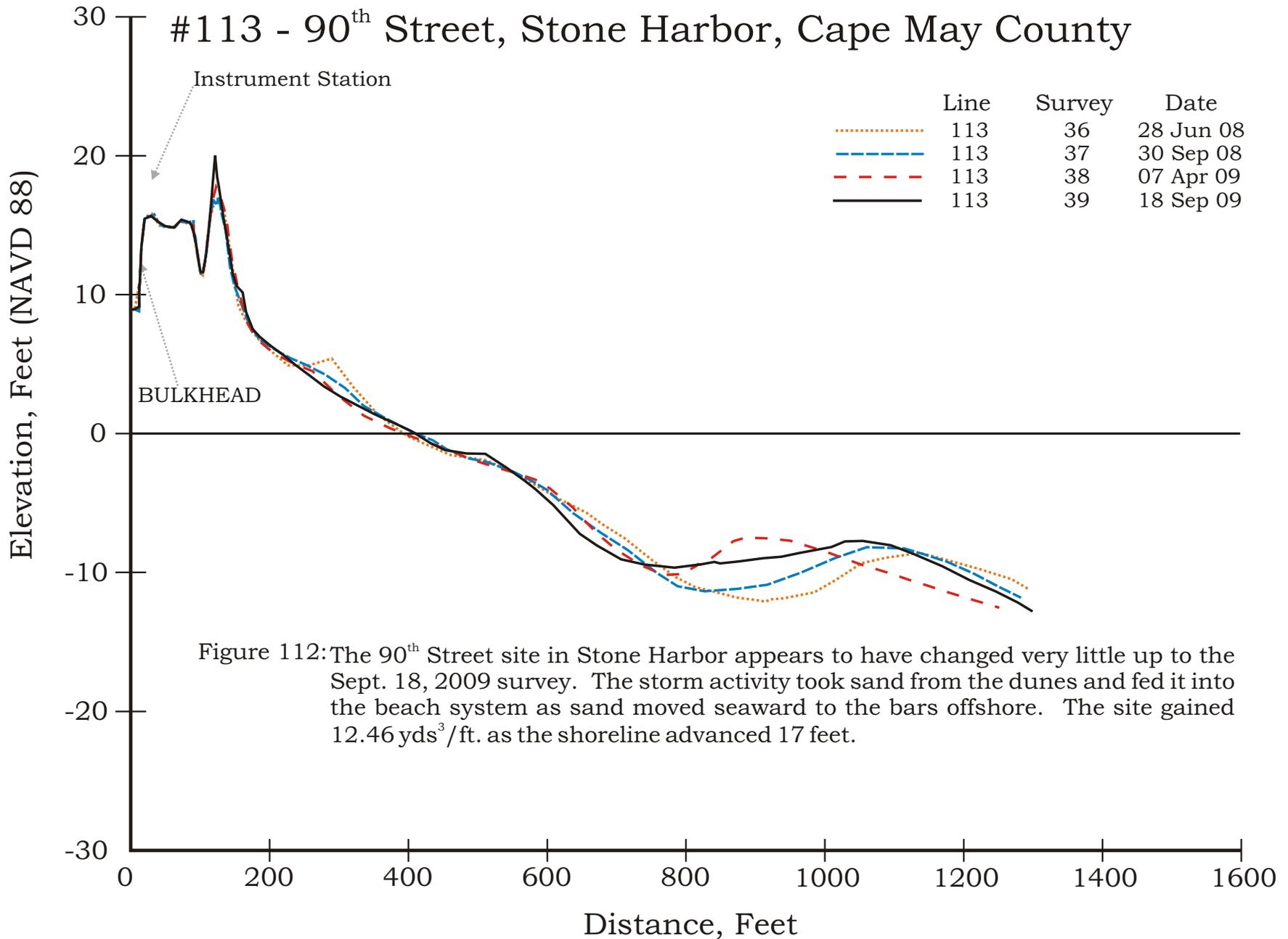


Photo taken September 18, 2009. View to the south.

Comparing the profiles over the one year time period, the profile location gained volume (8.83 cu yd/ft) and the shoreline moved landward (-1.66 ft). The sand volume increase was dominantly found offshore. This survey preceded the fall 2009 storms that did reach the dunes here, but did little real damage.

New Jersey Beach Profile Network

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



SOUTH END, STONE HARBOR - SITE 212



Photo taken September 22, 2008. View to the south.

This beach is entirely composed of nourishment sand since the stone revetment was the principle barrier to wave damage prior to 1998. 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.

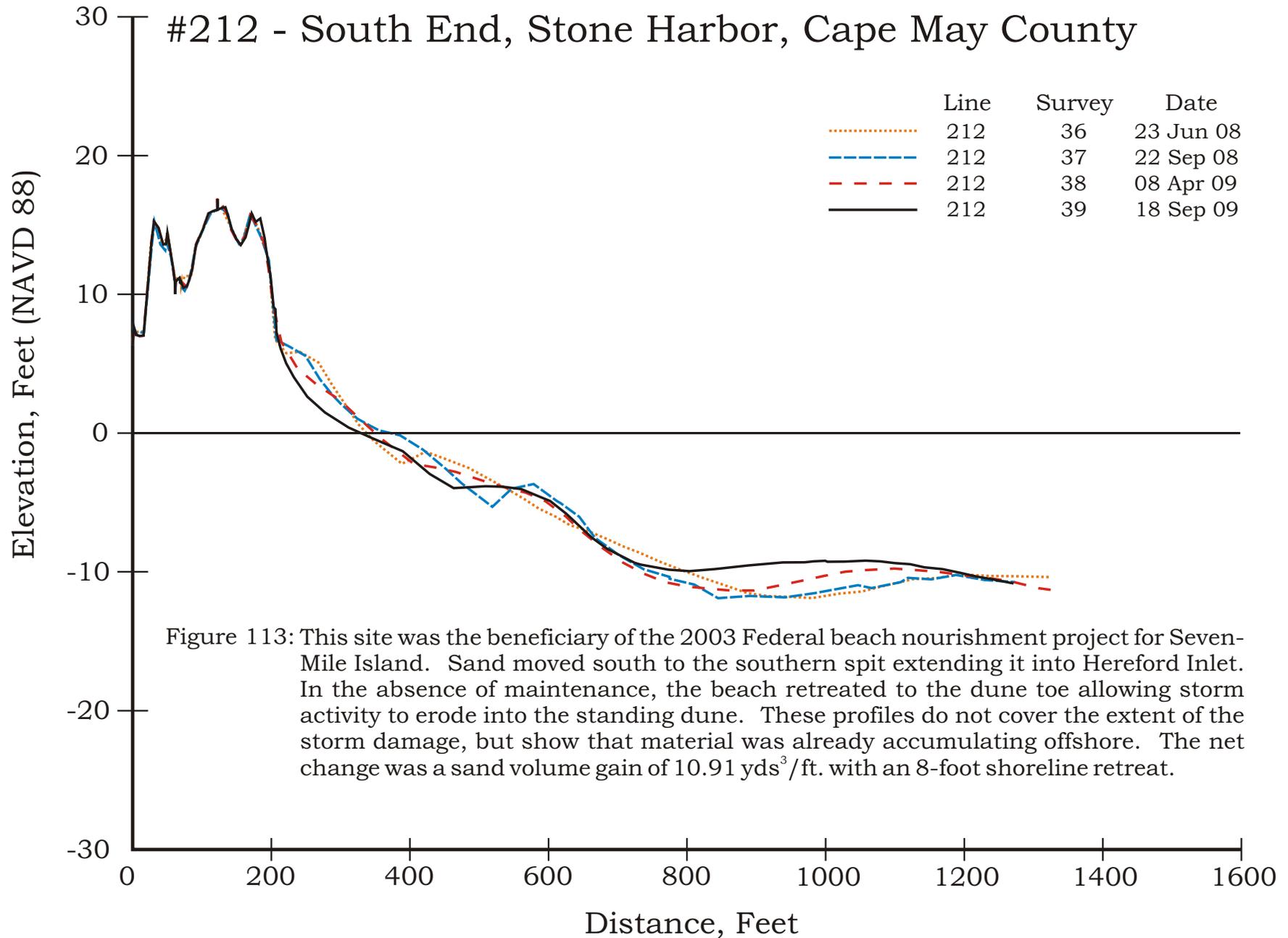


Photo taken September 18, 2009. View to the south.

Comparing the profiles over the one year time period, the profile location gained volume (14.91 cu yd/ft) and the shoreline moved landward (-42.83 ft). The sand volume increase was dominantly found offshore. Storms removed most of the boat tethering poles and cut a substantial scarp in the dunes starting in mid-October.

New Jersey Beach Profile Network

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



15th AVENUE, NORTH WILDWOOD - SITE 111



Photo taken September 30, 2008. 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.

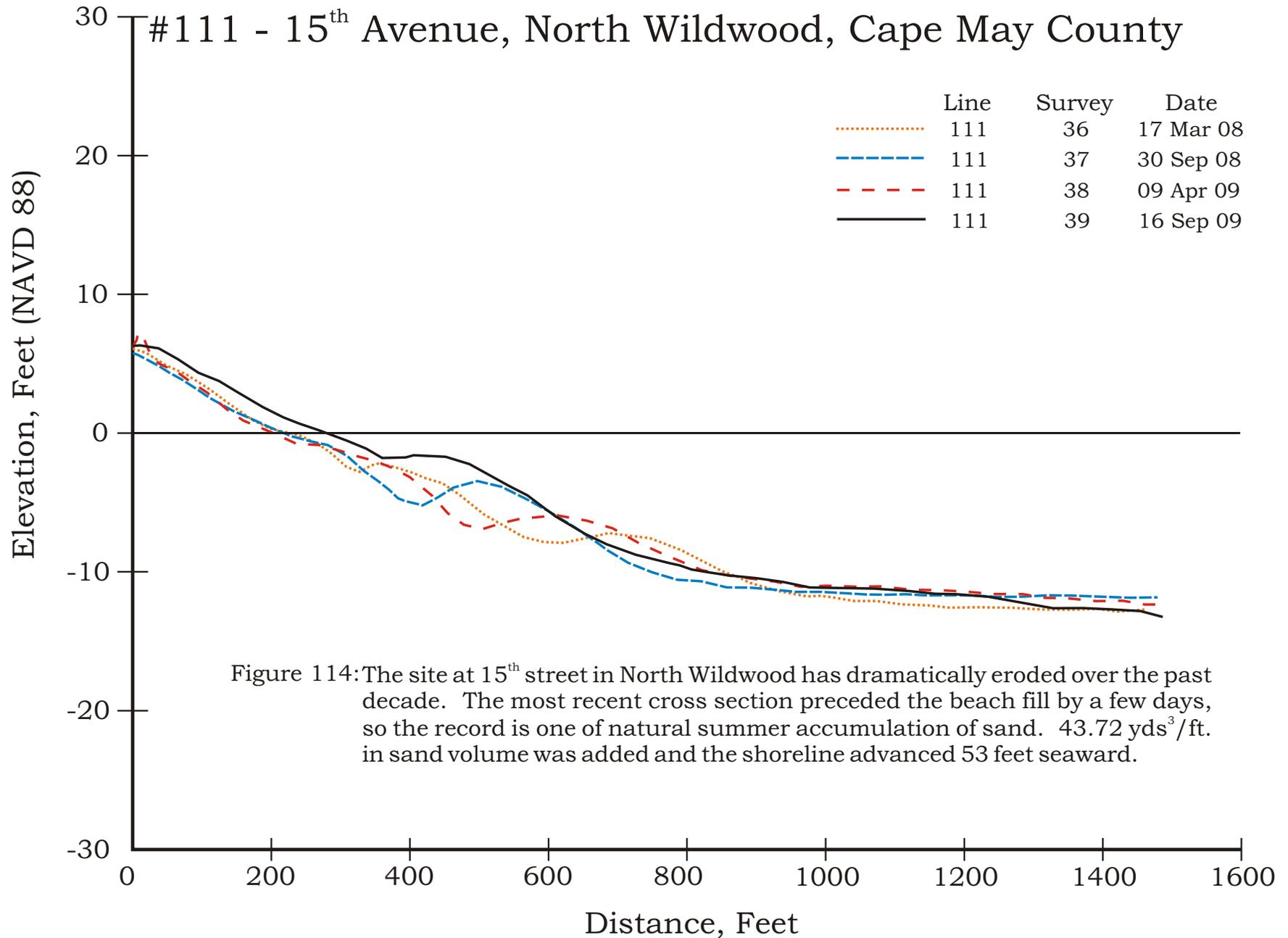


Photo taken September 16, 2009. View to the north.

Comparing the profiles over the one year time period, the profile location gained volume (35.97 cu yd/ft) and the shoreline moved seaward (61.77 ft). 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.

New Jersey Beach Profile Network

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



CRESSE AVENUE, WILDWOOD - SITE 110



Photo taken September 30, 2008. View to the south.

The Cresse Avenue site has grown 500 feet 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.

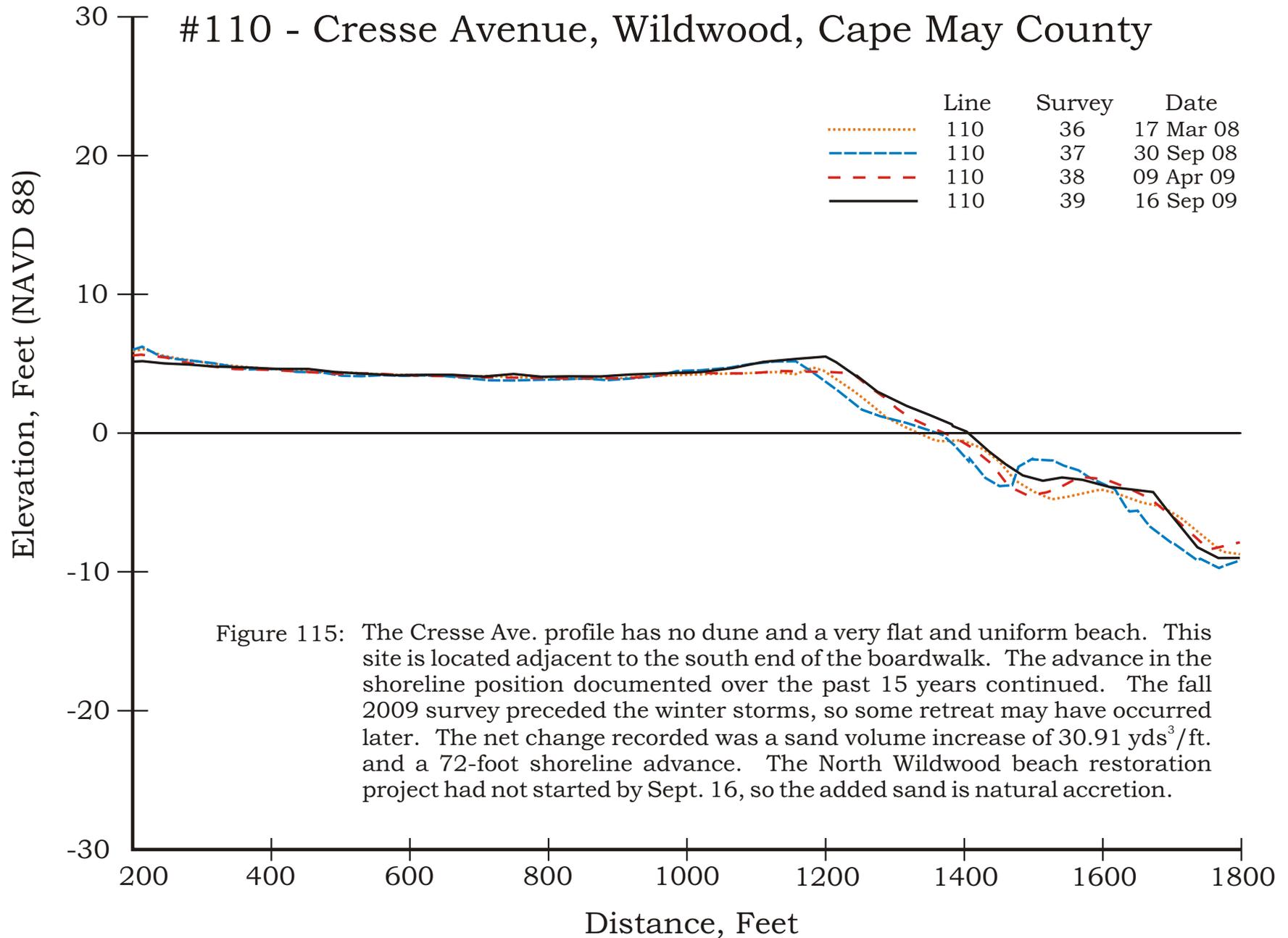


Photo taken September 16, 2009. View to the south.

Comparing the profiles over the one year time period, the profile location gained volume (20.17cu yd/ft) and the shoreline moved seaward (44.85 ft). 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.

New Jersey Beach Profile Network

#110 - Cresse Avenue, Wildwood, Cape May County



RALEIGH AVENUE, LOWER TOWNSHIP - SITE 109



Photo taken October 27, 2008. View to the south.

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

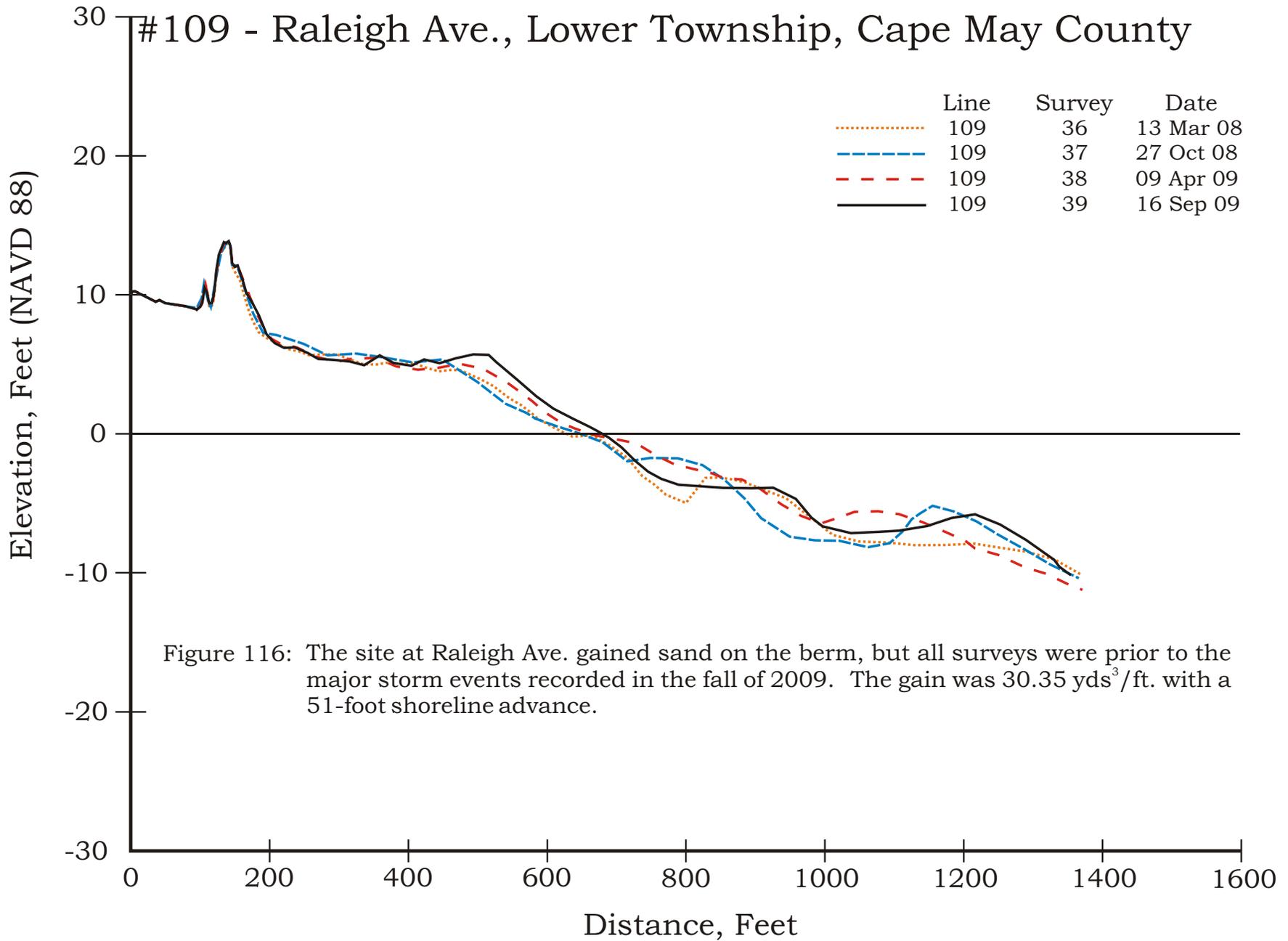


Photo taken September 16, 2009. View to the south.

Comparing the profiles over the eleven month time period, the profile location gained volume (17.47 cu yd/ft) and the shoreline moved seaward (31.27 ft).

New Jersey Beach Profile Network

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



CAPE MAY NATIONAL WILDLIFE REFUGE - SITE 208



Photo taken October 27, 2008. View to the north.

The refuge site was established in 1994 to have a better handle on the changes close to the inlet. This 2008 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.

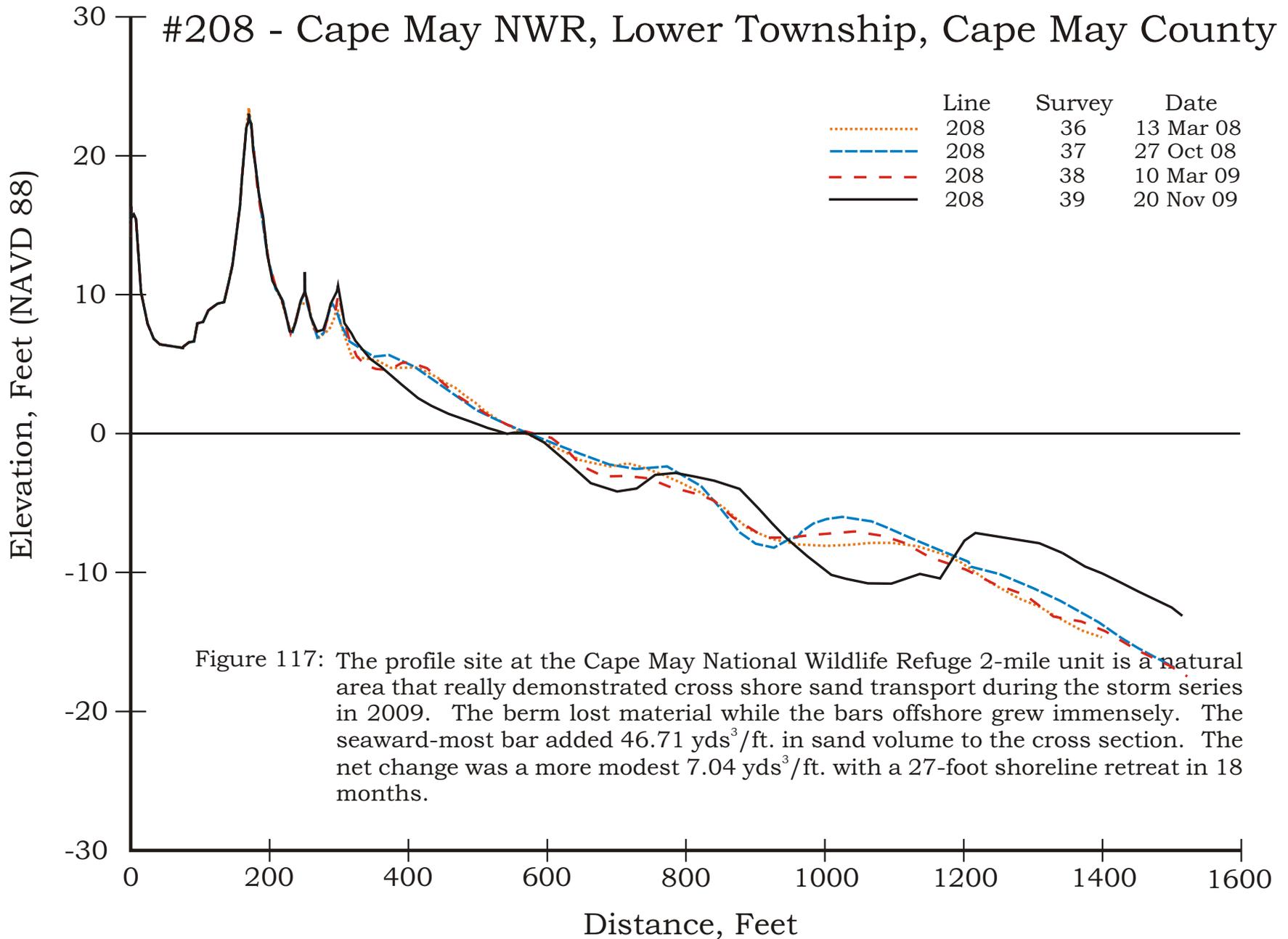


Photo taken November 19, 2009. View to the north.

Comparing the profiles over the thirteen month time period, the profile location gained volume (3.51 cu yd/ft) and the shoreline moved landward (-32.82 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network

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



CAPE MAY BEACH CLUB - SITE 108



Photo taken September 11, 2008. View to the north.

The Beach Club site was renourished in 1989 as the Cape May City project got underway. This September 2008 photograph shows the sand built up on the berm following a period of quiet weather during the winter. The fill project placed sufficient sand to prevent easy wave attack on the local development.

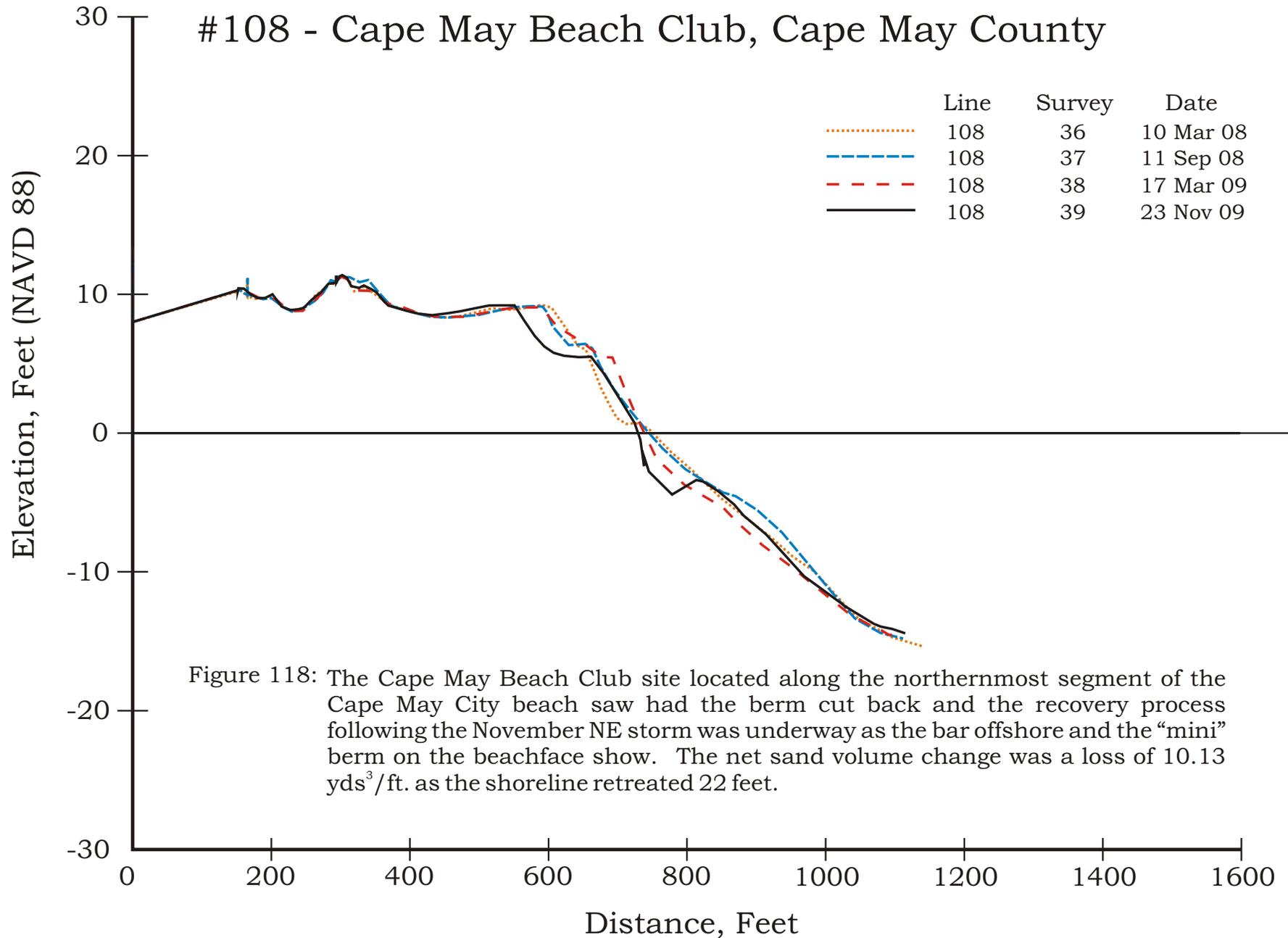


Photo taken November 24, 2009. View to the north.

Comparing the profiles over the fourteen month time period, the profile location lost volume (-16.07 cu yd/ft) and the shoreline moved landward (-15.65 ft).

New Jersey Beach Profile Network

#108 - Cape May Beach Club, Cape May County



BALTIMORE AVENUE, CAPE MAY CITY - SITE 107



Photo taken September 11, 2008. View to the north.

This September 2008 picture shows the tips of the groins exposed, but the beach has remained stable for over 20 years.

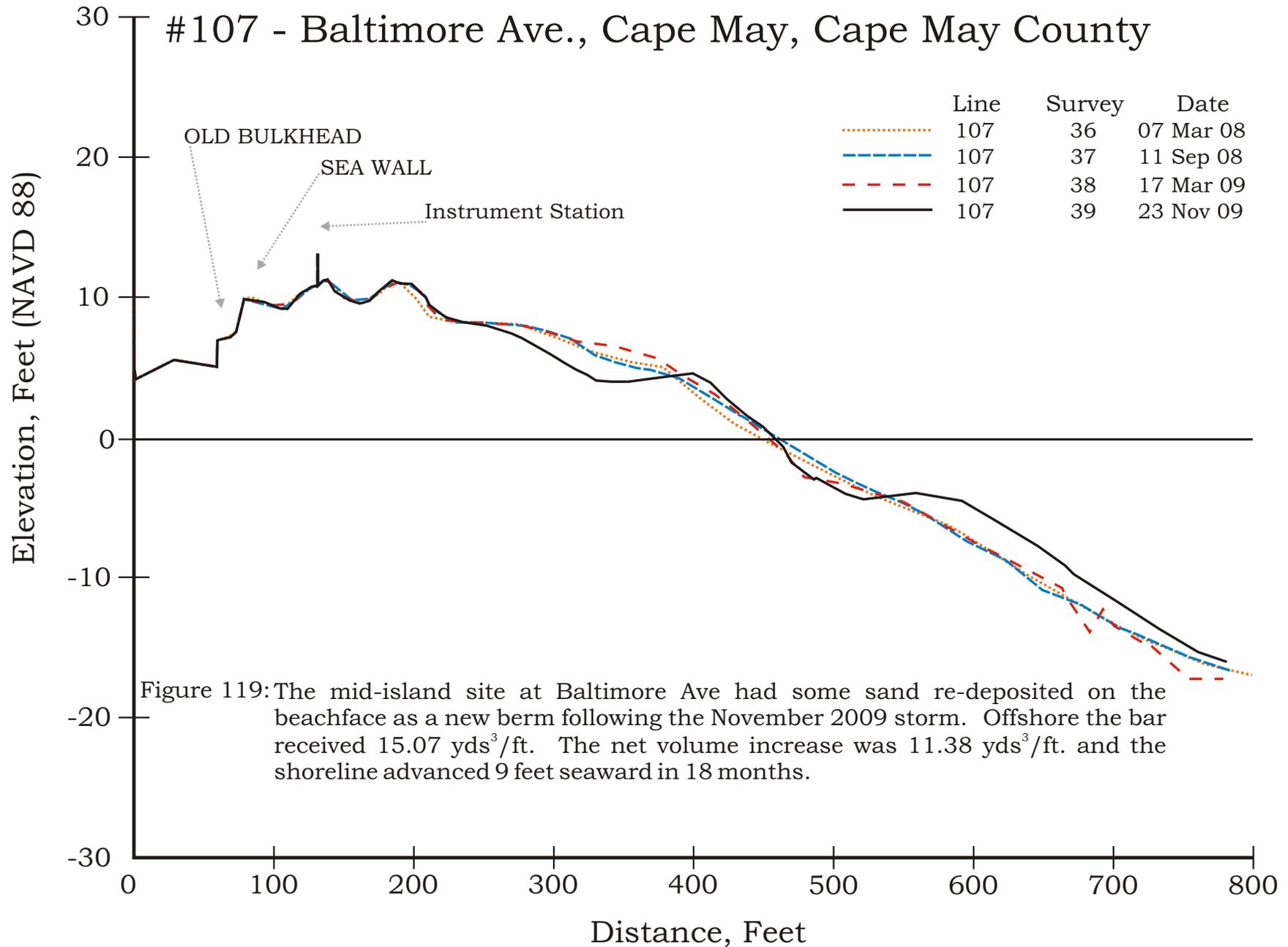


Photo taken November 23, 2009. View to the north.

Comparing the profiles over the fourteen month time period, the profile location gained volume (7.83 cu yd/ft) and the shoreline moved landward (-3.31 ft). The sand volume increase was dominantly found offshore

New Jersey Beach Profile Network

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



BROADWAY AVENUE, CAPE MAY CITY - SITE 206



Photo taken September 10, 2008. View to the north.

This is the main recreational beach area in Cape May City and was restored in 1990. This September 2008 photograph shows the recreational beach as an expanse of dry sand held in place by the terminal groin to the south of this northeast view.

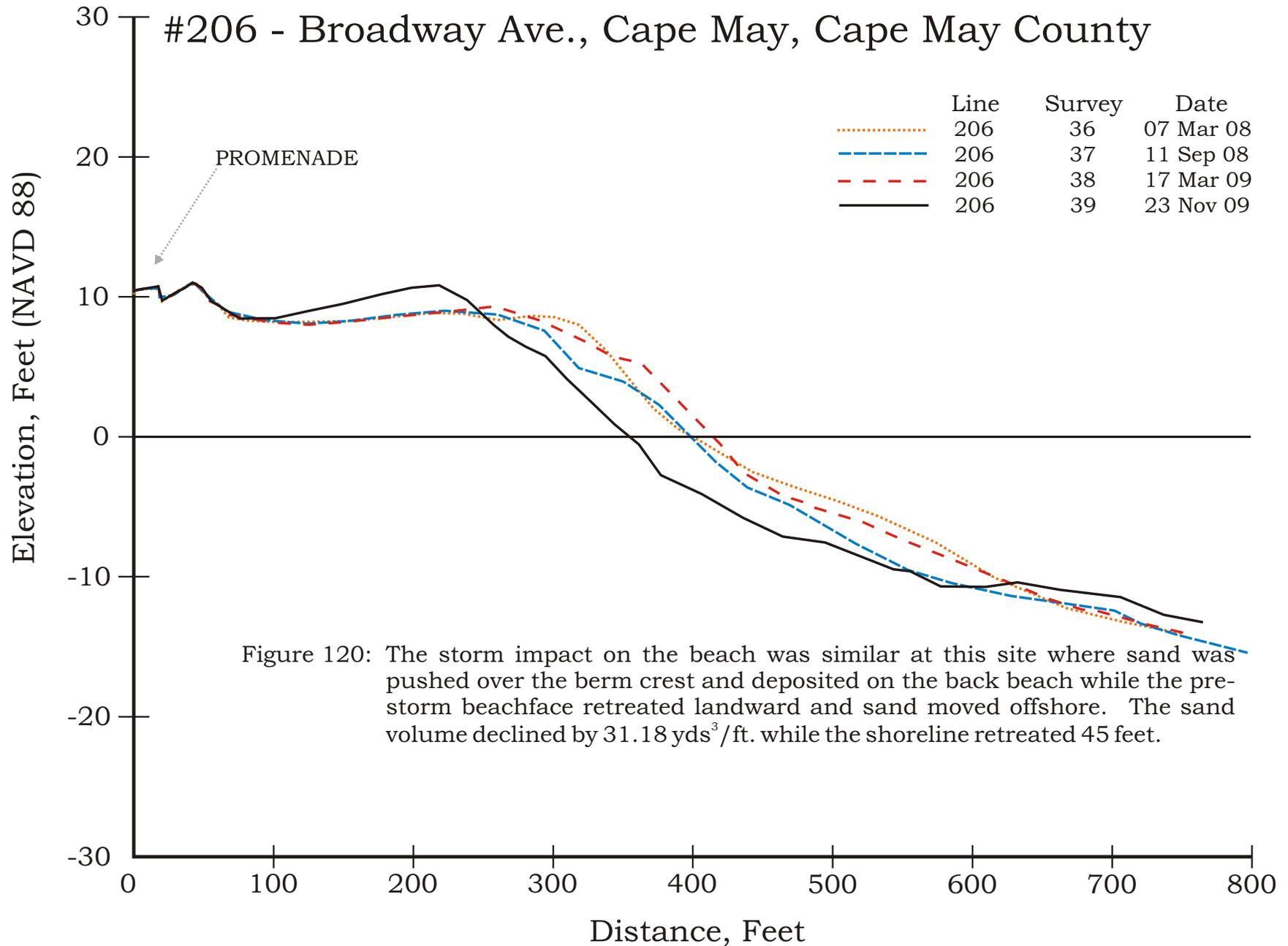


Photo taken November 24, 2009. View to the north.

Comparing the profiles over the fourteen month time period, the profile location lost volume (-12.19 cu yd/ft) and the shoreline moved landward (-43.85 ft).

New Jersey Beach Profile Network

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



NATURE CONSERVANCY, CAPE MAY - SITE 105



Photo taken September 10, 2008. 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 October 10, 2009. View to the north.

Comparing the profiles over the thirteen month time period, the profile location lost volume (-45.03 cu yd/ft) and the shoreline moved landward (-75.33 ft). The sand volume decrease was dominantly found offshore.

New Jersey Beach Profile Network

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

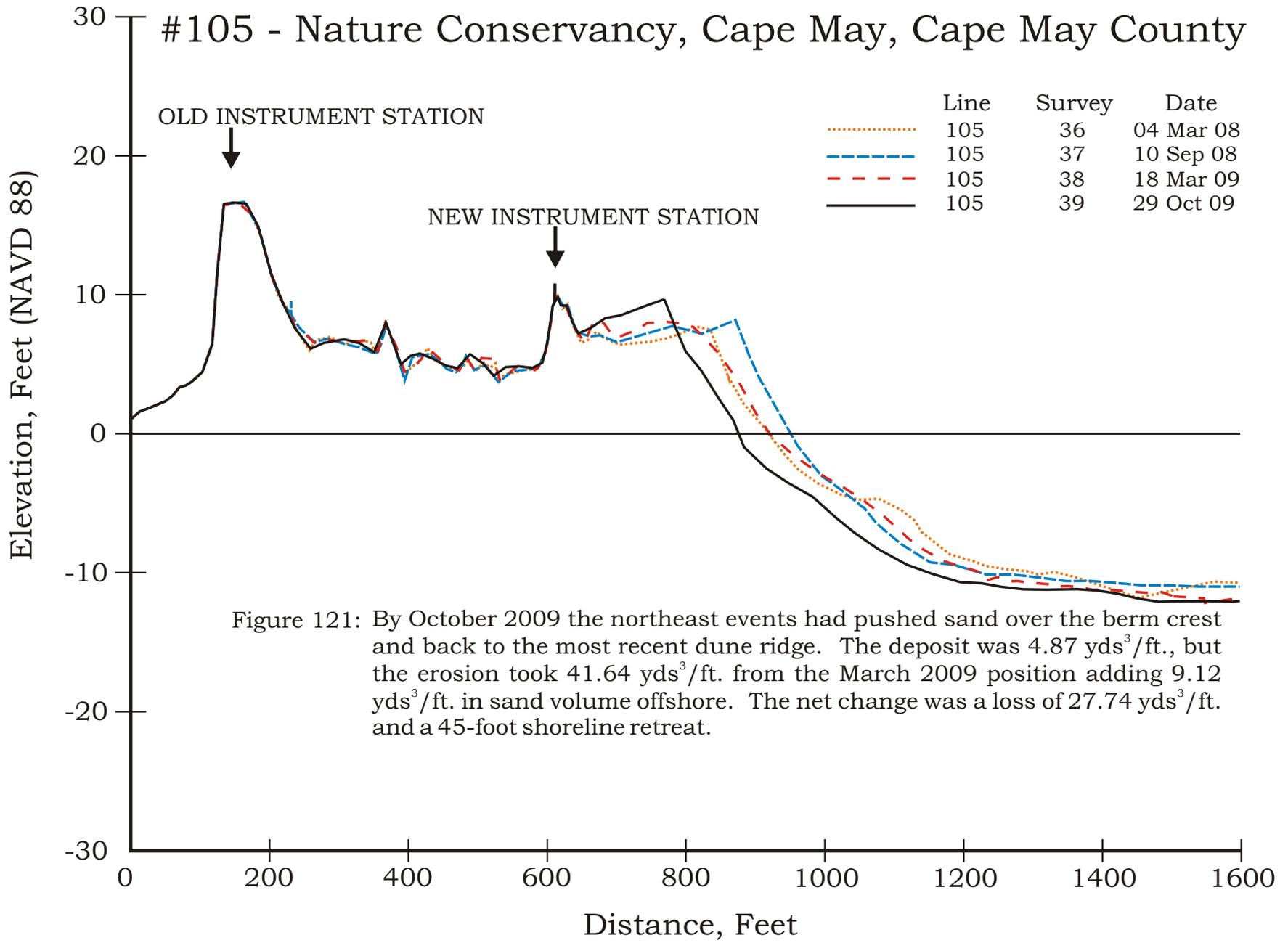


Figure 121: By October 2009 the northeast events had pushed sand over the berm crest and back to the most recent dune ridge. The deposit was 4.87 yds³/ft., but the erosion took 41.64 yds³/ft. from the March 2009 position adding 9.12 yds³/ft. in sand volume offshore. The net change was a loss of 27.74 yds³/ft. and a 45-foot shoreline retreat.

LAKE DRIVE, CAPE MAY POINT - SITE 104



Photo taken September 11, 2008. View to the south/east.

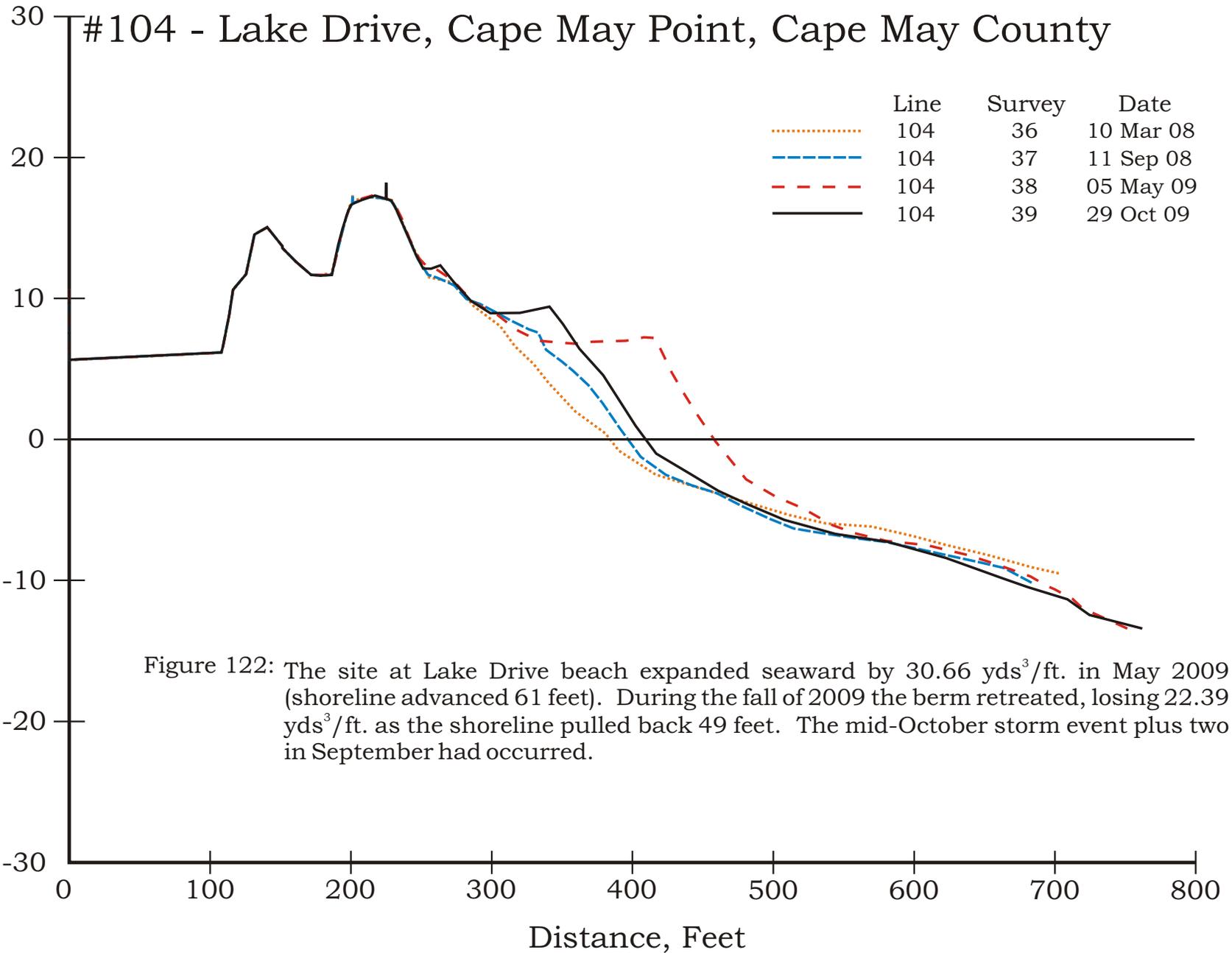
Located at the extreme southern tip of the Cape May County peninsula in the Borough of Cape May Point, this site was nourished in 2005 by the ACOE.



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

Comparing the profiles over the thirteen month time period, the profile location gained volume (8.78 cu yd/ft) and the shoreline moved seaward (12.55 ft). The sand volume increase was dominantly found offshore.

New Jersey Beach Profile Network



HIGBEE BEACH - SITE 103



Photo taken September 19, 2008. 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.

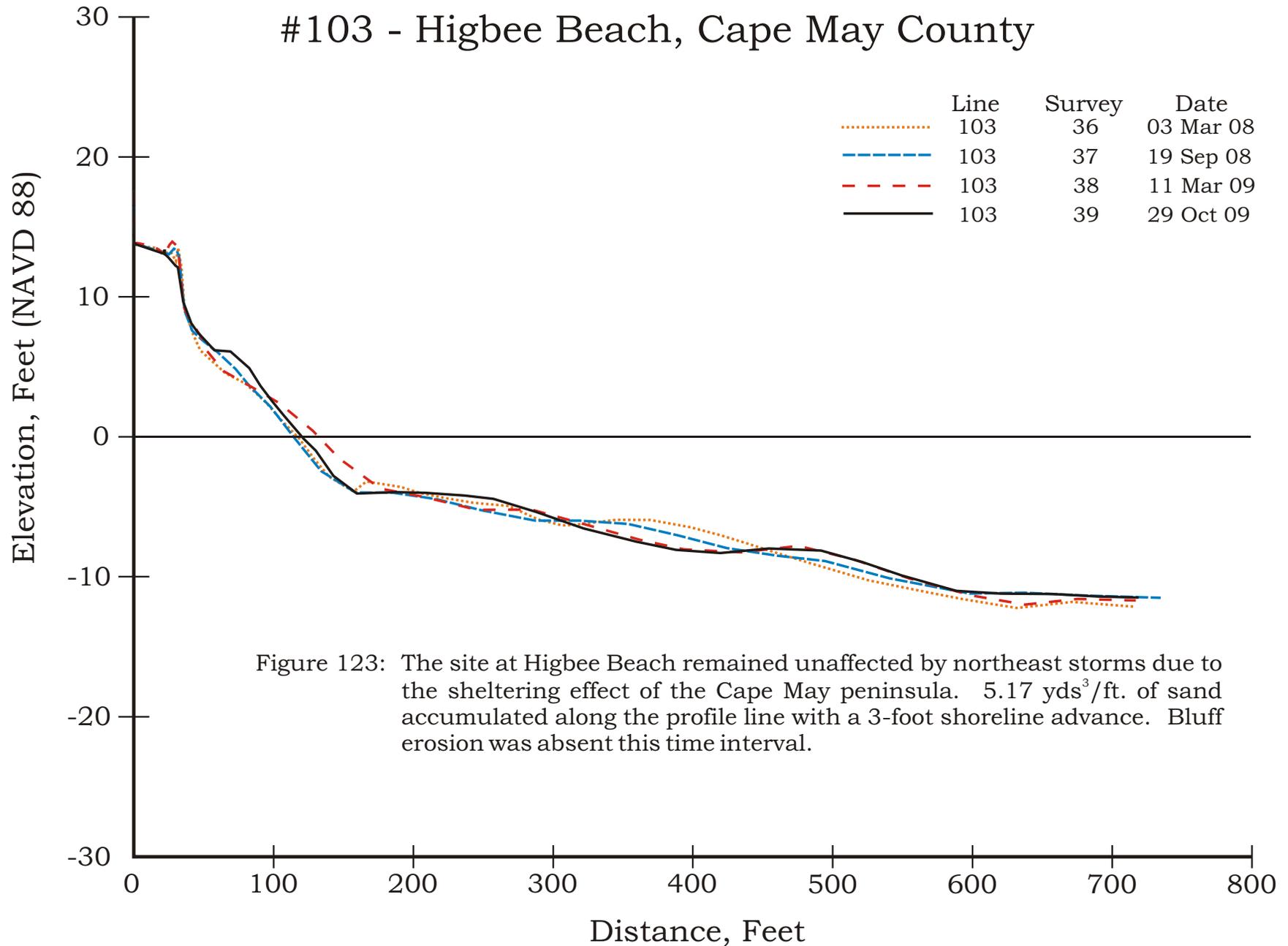


Photo taken October 29, 2009. View to the north.

Comparing the profiles over the thirteen month time period, the profile location gained volume (3.69 cu yd/ft) and the shoreline moved seaward (5.96 ft).

New Jersey Beach Profile Network

#103 - Higbee Beach, Cape May County



WHITTIER AVENUE, NORTH CAPE MAY - SITE 102



Photo taken September 19, 2008. 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.

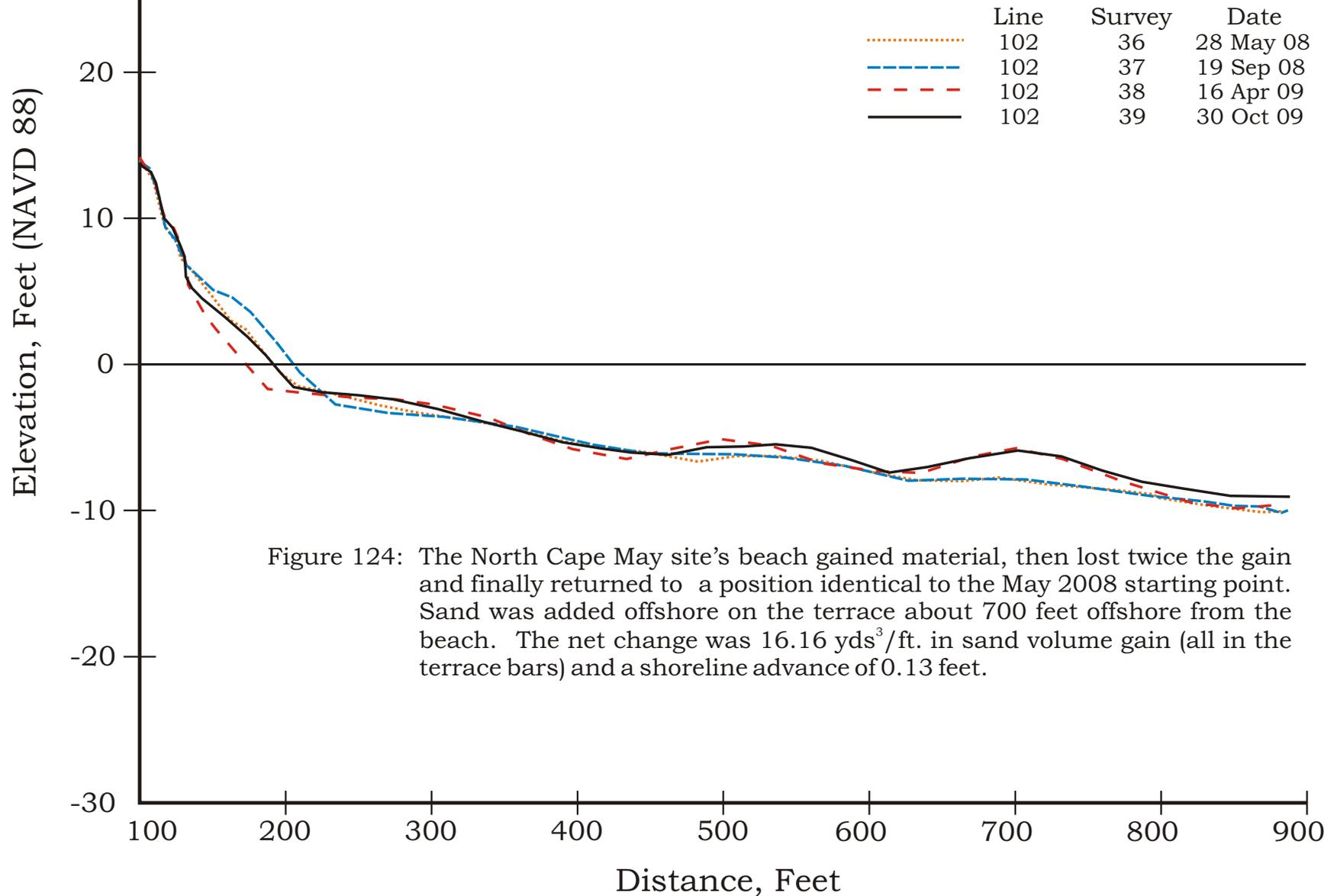


Photo taken October 30, 2009. View to the south.

Comparing the profiles over the thirteen month time period, the profile location gained volume (12.02 cu yd/ft) and the shoreline moved landward (-13.8 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 - SITE 101



Photo taken October 20, 2008. View to the south.

This October 2008 photograph shows some shoreline erosion as the berm present above is now almost a scarp at the toe of the grass.

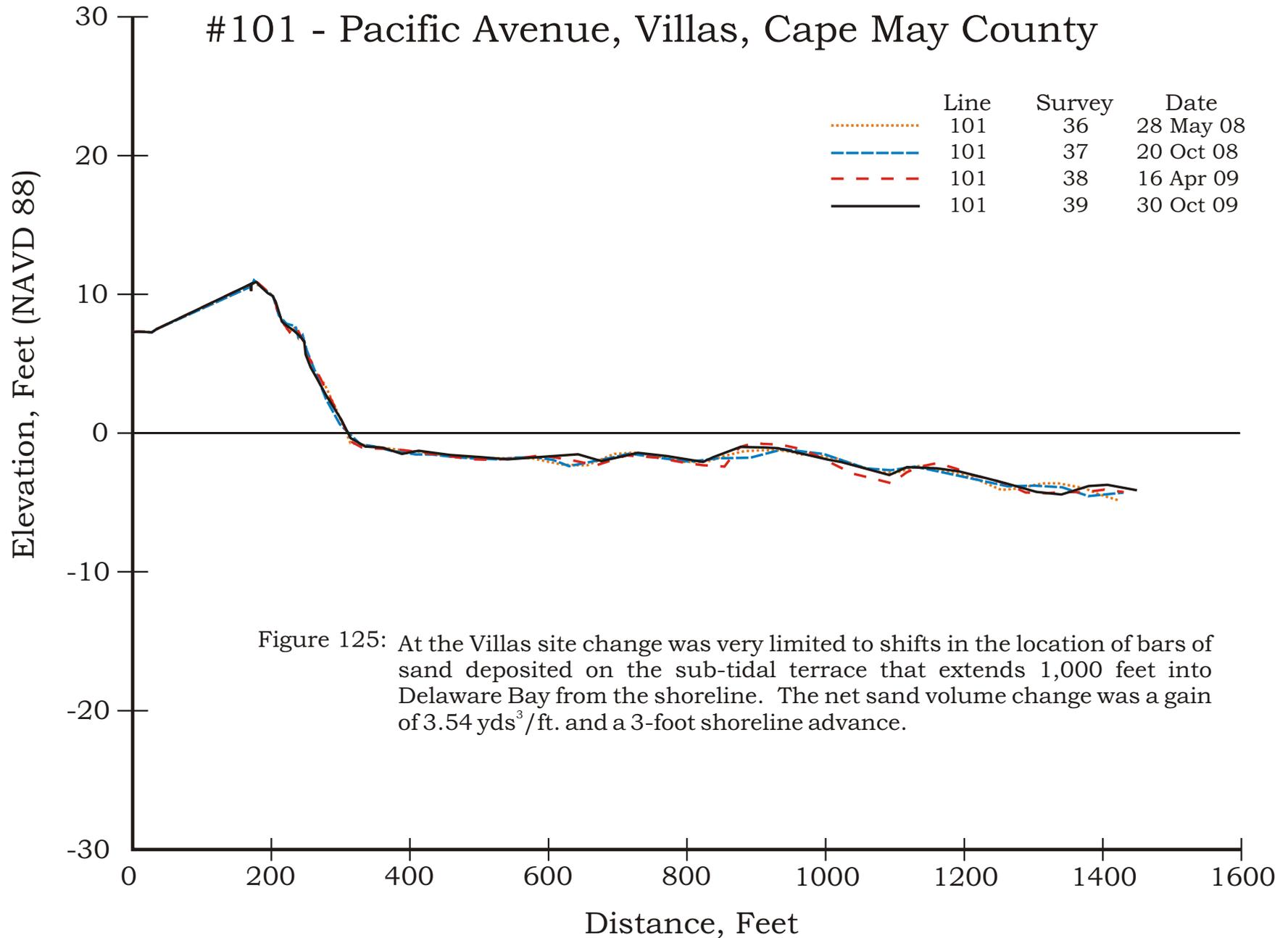


Photo taken October 30, 2009. View to the south.

Comparing the profiles over the fourteen month time period, the profile location gained volume (4.89 cu yd/ft) and the shoreline moved landward (-1.25 ft).

New Jersey Beach Profile Network

#101 - Pacific Avenue, Villas, Cape May County



REEDS BEACH - SITE 100



Photo taken October 20, 2008. 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 November 18, 2009. View to the south.

Comparing the profiles over the thirteen month time period, the profile location lost volume (-5.56 cu yd/ft) and the shoreline moved landward (-14.86 ft).

New Jersey Beach Profile Network

#100 - Reeds Beach, Cape May County

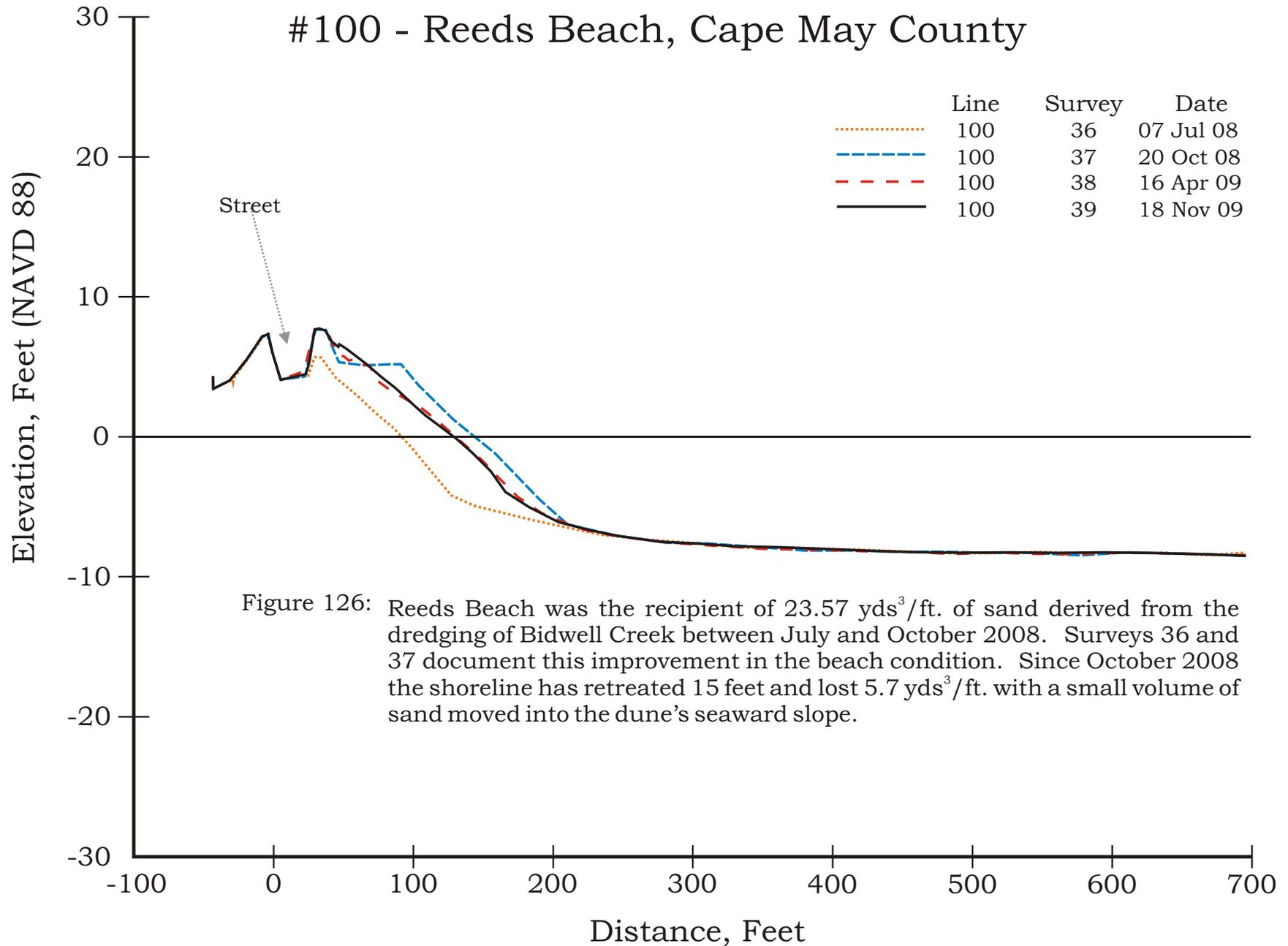


TABLE 1
MONMOUTH COUNTY
ANNUAL BEACH VOLUME CHANGES
SPRING 2008 - SPRING 2009 & FALL 2008 - FALL 2009
Survey

PROFILE SITE LOCATION	36 - 38	37 - 39
	S2008-S2009	F2008 - F2009
	(volume expressed as cubic yards per foot)	
187: Cliffwood Beach Park	-2.75	-3.26
286: Union Beach	Moved	Moved
185: Port Monmouth, Spy House Museum	-1.84	-5.63
285: Gateway National R. A., Gunnison Beach	23.06	0.32
284: Gateway National R. A., Parking Lot E	17.25	13.42
184: Highland Beach, Gateway Entrance	-14.70	16.05
183: Highland Beach, Via Ripa St.	-3.62	-20.39
282: Sea Bright, Shrewsbury Way	0.12	-11.71
182: Sea Bright, North of Route 520	-9.36	-7.24
181: Sea Bright, Municipal Beach	-30.77	-9.83
180: Sea Bright, Sunset Court	-11.40	4.29
179: Monmouth Beach, Cottage Rd.	-47.34	-44.57
178: Monmouth Beach, Beach Club	0.64	-30.75
177: Long Branch, 404 Ocean Ave.	-8.26	-9.21
176: Long Branch, Seven Presidents Park	-27.81	-12.83
175: Long Branch, North Broadway Ave.	-7.59	7.33
174: Long Branch, Morris Ave.	-5.97	52.98
173: Long Branch, West End Ave.	252.85	158.86
172: Long Branch	** NO LONGER ACTIVE **	
171: Elberon, Pullman Ave.	-8.33	-8.67
170: Deal, Roosevelt Ave.	26.33	-6.77
169: Deal, Darlington Ave.	-4.24	-9.68
168: Allenhurst, Corlies Ave.	33.83	14.01
267: Asbury Park, 7th Ave.	12.13	11.94
167: Asbury Park, 3rd Ave.	9.26	15.21
166: Ocean grove, Ocean Pathway	-7.66	-9.16
165: Bradley Beach, McCabe Ave.	-27.43	7.11
164: Avon-By-The-Sea, Sylvania Ave.	-18.28	-6.10
163: Belmar, 5th Ave.	8.92	-0.75
162: Belmar, 18th Ave.	-4.60	1.68
161: Spring Lake, Brighton Ave.	5.98	4.23
160: Spring Lake, Salem Ave.	-1.61	6.28
159: Sea Girt, New York Ave.	-7.55	13.25
158: Sea Girt, Trenton Ave.	6.36	17.76
157: Manasquan, Riddle Way	-6.72	10.81
256: Manasquan, Pompano Ave.	-14.00	-13.74

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

TABLE 2
MONMOUTH COUNTY
ANNUAL SHORELINE CHANGES
SPRING 2008 - SPRING 2009 & FALL 2008 - FALL 2009

Survey

PROFILE SITE LOCATION	36 - 38	37 - 39
	S2008-S2009	F2008 - F2009
	(shoreline change expressed in feet)	
187: Cliffwood Beach Park	-10.3	6.8
286: Union Beach	Moved	Moved
185: Port Monmouth, Spy House Museum	-1.1	-13.5
285: Gateway National R. A., Gunnison Beach	32.1	19.7
284: Gateway National R. A., Parking Lot E	16.5	-27.6
184: Highland Beach, Gateway Entrance	28.6	-36.7
183: Highland Beach, Via Ripa St.	-3.1	-83.2
282: Sea Bright, Shrewsbury Way	-14.1	-118.7
182: Sea Bright, North of Route 520	-6.0	27.1
181: Sea Bright, Municipal Beach	-32.0	6.6
180: Sea Bright, Sunset Court	-14.0	-6.4
179: Monmouth Beach, Cottage Rd.	-14.2	-67.6
178: Monmouth Beach, Beach Club	-45.4	-38.3
177: Long Branch, 404 Ocean Ave.	-31.8	26.6
176: Long Branch, Seven Presidents Park	-58.7	-22.8
175: Long Branch, North Broadway Ave.	-2.8	-48.6
174: Long Branch, Morris Ave.	-6.3	122.9
173: Long Branch, West End Ave.	270.8	146.1
172: Long Branch	** NO LONGER ACTIVE **	
171: Elberon, Pullman Ave.	-8.4	-0.6
170: Deal, Roosevelt Ave.	25.1	24.7
169: Deal, Darlington Ave.	15.9	0.3
168: Allenhurst, Corlies Ave.	36.6	34.4
267: Asbury Park, 7th Ave.	9.0	18.5
167: Asbury Park, 3rd Ave.	0.3	8.1
166: Ocean grove, Ocean Pathway	1.5	7.5
165: Bradley Beach, McCabe Ave.	-22.9	13.1
164: Avon-By-The-Sea, Sylvania Ave.	26.1	-5.5
163: Belmar, 5th Ave.	19.9	-28.9
162: Belmar, 18th Ave.	6.2	-14.7
161: Spring Lake, Brighton Ave.	27.0	7.3
160: Spring Lake, Salem Ave.	9.0	10.7
159: Sea Girt, New York Ave.	3.1	-3.2
158: Sea Girt, Trenton Ave.	6.1	-5.6
157: Manasquan, Riddle Way	-3.7	3.3
256: Manasquan, Pompano Ave.	9.9	-28.3

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	36-37 S08-F08	37-38 F08-S09	38-39 S09-F09	36-39 S08-F09
		(volume expressed as cubic yards per foot of beachfront)			
187: Cliffwood Beach Park		-1.38	-1.57	-1.54	-4.34
286: Union Beach		-1.61	Moved	0.69	Moved
185: Port Monmouth, Spy House Museum		-1.56	-0.43	-5.13	-7.48
285: Gateway National R. A., Gunnison Beach		22.15	0.33	-0.01	22.29
284: Gateway National R. A., Parking Lot E		18.04	-0.74	14.18	31.34
184: Highland Beach, Gateway Entrance		-17.17	2.94	13.27	-1.26
183: Highland Beach, Via Ripa St.		1.44	-4.87	-15.33	-19.15
282: Sea Bright, Shrewsbury Way		9.50	-9.59	-2.11	-2.44
182: Sea Bright, North of Route 520		-17.94	8.26	-15.62	-25.00
181: Sea Bright, Municipal Beach		-28.25	-2.11	-7.75	-37.97
180: Sea Bright, Sunset Court		-17.32	5.86	-1.67	-12.94
179: Monmouth Beach, Cottage Rd.		-28.52	-18.92	-25.44	-72.60
178: Monmouth Beach, Beach Club		1.46	-0.82	-29.93	-29.29
177: Long Branch, 404 Ocean Ave.		-4.15	-4.42	-4.62	-13.27
176: Long Branch, Seven Presidents Park		-12.57	-14.79	2.18	-25.24
175: Long Branch, North Broadway Ave.		-5.73	-1.88	9.14	1.58
174: Long Branch, Morris Ave.		-11.89	5.88	46.94	40.99
173: Long Branch, West End Ave.		-2.47	283.28	-124.41	138.81
172: Long Branch			** NO LONGER ACTIVE **		
171: Elberon, Pullman Ave.		1.59	-10.11	1.71	-7.25
170: Deal, Roosevelt Ave.		11.78	14.43	-21.21	5.28
169: Deal, Darlington Ave.		8.18	-12.54	2.85	-1.39
168: Allenhurst, Corlies Ave.		17.16	19.20	-5.07	28.83
267: Asbury Park, 7th Ave.		2.63	9.38	2.53	14.53
167: Asbury Park, 3rd Ave.		-3.17	12.35	2.94	12.08
166: Ocean grove, Ocean Pathway		4.38	-11.86	1.49	-3.62
165: Bradley Beach, McCabe Ave.		-17.61	-9.88	15.31	-6.81
164: Avon-By-The-Sea, Sylvania Ave.		3.02	-21.22	15.08	-2.94
163: Belmar, 5th Ave.		0.19	8.87	-9.46	0.07
162: Belmar, 18th Ave.		7.64	-12.07	13.76	9.23
161: Spring Lake, Brighton Ave.		5.35	0.54	3.70	9.80
160: Spring Lake, Salem Ave.		-7.85	5.70	0.91	-0.71
159: Sea Girt, New York Ave.		-12.49	6.35	6.92	1.17
158: Sea Girt, Trenton Ave.		7.27	-0.90	18.47	25.25
157: Manasquan, Riddle Way		-7.46	0.77	10.48	3.48
256: Manasquan, Pompano Ave.		-14.01	-0.36	-12.75	-27.68

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	36-37 S08-F08	37-38 F08-S09	38-39 S09-F09	36-39 S08-F09
		(shoreline change expressed in feet)			
187: Cliffwood Beach Park		-2.6	-7.7	14.5	4.2
286: Union Beach		-1.4	Moved	11.9	Moved
185: Port Monmouth, Spy House Museum		1.5	-2.6	-10.9	-12.0
285: Gateway National R. A., Gunnison Beach		0.1	32.0	-12.3	19.8
284: Gateway National R. A., Parking Lot E		47.8	-31.2	3.7	20.2
184: Highland Beach, Gateway Entrance		30.3	-1.7	-35.0	-6.4
183: Highland Beach, Via Ripa St.		21.7	-24.8	-58.4	-61.6
282: Sea Bright, Shrewsbury Way		20.4	-34.4	-84.3	-98.3
182: Sea Bright, North of Route 520		-74.3	68.3	-41.1	-47.1
181: Sea Bright, Municipal Beach		-48.4	16.4	-9.8	-41.8
180: Sea Bright, Sunset Court		-4.6	-9.4	3.0	-11.0
179: Monmouth Beach, Cottage Rd.		28.2	-42.4	-25.2	-39.4
178: Monmouth Beach, Beach Club		14.0	-59.4	21.1	-24.3
177: Long Branch, 404 Ocean Ave.		4.1	-35.9	62.5	30.7
176: Long Branch, Seven Presidents Park		-31.9	-26.8	3.9	-54.8
175: Long Branch, North Broadway Ave.		30.6	-33.4	-15.2	-18.0
174: Long Branch, Morris Ave.		-41.5	35.1	87.8	81.4
173: Long Branch, West End Ave.		-3.5	274.3	-128.2	142.7
172: Long Branch			** NO LONGER ACTIVE **		
171: Elberon, Pullman Ave.		-8.0	-0.4	-0.2	-8.6
170: Deal, Roosevelt Ave.		4.7	20.5	4.2	29.3
169: Deal, Darlington Ave.		9.1	6.9	-6.6	9.3
168: Allenhurst, Corlies Ave.		9.3	27.3	7.1	43.7
267: Asbury Park, 7th Ave.		-13.5	22.5	-3.9	5.1
167: Asbury Park, 3rd Ave.		-15.8	16.1	-8.0	-7.7
166: Ocean grove, Ocean Pathway		6.5	-5.0	12.6	14.0
165: Bradley Beach, McCabe Ave.		-16.4	-6.5	19.6	-3.3
164: Avon-By-The-Sea, Sylvania Ave.		25.7	0.4	-5.9	20.2
163: Belmar, 5th Ave.		21.4	-1.5	-27.4	-7.5
162: Belmar, 18th Ave.		25.9	-19.8	5.1	11.3
161: Spring Lake, Brighton Ave.		18.0	9.0	-1.7	25.2
160: Spring Lake, Salem Ave.		-2.5	11.5	-0.8	8.2
159: Sea Girt, New York Ave.		0.3	2.7	-5.9	-2.9
158: Sea Girt, Trenton Ave.		18.3	-12.2	6.7	12.7
157: Manasquan, Riddle Way		1.8	-5.5	8.7	5.0
256: Manasquan, Pompano Ave.		5.4	4.5	-32.9	-23.0

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

TABLE 5
OCEAN COUNTY
ANNUAL BEACH VOLUME CHANGES
SPRING 2008 - SPRING 2009 & FALL 2008 - FALL 2009

Survey

PROFILE SITE	36 - 38	37 - 39
LOCATION	S2008-S2009	F2008 - F2009
	(volume expressed as cubic yards per foot)	
156: Point Pleasant, Water St.	31.46	4.12
155: Point Pleasant, Maryland Ave.	21.52	17.89
154: Bay Head, Johnson Ave.	13.58	-1.49
153: Mantoloking, 1117 Ocean Ave.	3.67	2.48
152: Brick Townhsip, Public Beach	-9.86	10.66
151: Normandy Beach, 1st Ave	-0.13	-4.14
150: Lavallette, White Ave.	-21.31	-16.17
149: Ortley Beach, 8th Ave.	-16.09	3.60
148: Seaside Park, 4th Ave.	-4.53	-16.73
347: Berkeley Township, 6th Ave.	-3.29	-2.38
247: Island Beach State Park, North	-19.31	13.76
246: Island Beach State Park, Middle	8.68	-24.60
146: Island Beach State Park, South	2.54	15.05
245: Barnegat Light, 10th St.	20.11	8.55
145: Barnegat Light, 26th St.	28.41	-19.57
144: Loveladies, La Baia St.	-6.34	18.47
143: Harvey Cedars, 73rd St.	-8.40	-27.98
142: Harvey Cedars, Tranquility Drive	-11.01	18.98
241: Surf City, 20th St.	-29.12	-41.98
141: Ship Bottom, 8th St.	-1.03	12.04
140: Long BeachTownship, 32nd St.	10.22	-7.05
139: Long Beach Township, 81st St.	-21.86	-4.58
138: Long Beach Township, Old Whaling Rd.	24.29	84.56
137: Beach Haven, Taylor Ave.	14.05	13.42
136: Beach Haven, Dolphin Ave.	10.50	26.01
135: Long Beach Township, Webster Ave.	-7.08	-63.70
234: Long Beach Township, Border w/ Refuge	0.39	13.88

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

TABLE 6
OCEAN COUNTY
ANNUAL SHORELINE CHANGES
SPRING 2008 - SPRING 2009 & FALL 2008 - FALL 2009
Survey

PROFILE SITE LOCATION	36 - 38	37 - 39
	S2008-S2009	F2008 - F2009
	(shoreline change expressed in feet)	
156: Point Pleasant, Water St.	31.5	-15.1
155: Point Pleasant, Maryland Ave.	71.7	14.1
154: Bay Head, Johnson Ave.	-14.6	-17.2
153: Mantoloking, 1117 Ocean Ave.	13.0	-17.1
152: Brick Township, Public Beach	10.3	-33.2
151: Normandy Beach, 1st Ave	44.5	-28.3
150: Lavallette, White Ave.	0.3	-2.3
149: Ortley Beach, 8th Ave.	12.2	9.2
148: Seaside Park, 4th Ave.	11.5	-18.7
347: Berkeley Township, 6th Ave.	-4.2	-20.3
247: Island Beach State Park, North	5.2	-9.1
246: Island Beach State Park, Middle	35.0	-43.9
146: Island Beach State Park, South	5.7	25.3
245: Barnegat Light, 10th St.	48.2	70.2
145: Barnegat Light, 26th St.	50.3	-30.8
144: Loveladies, La Baia St.	-3.5	-2.0
143: Harvey Cedars, 73rd St.	4.7	-27.4
142: Harvey Cedars, Tranquility Drive	-12.8	0.7
241: Surf City, 20th St.	-48.6	-87.5
141: Ship Bottom, 8th St.	27.7	11.3
140: Long Beach Township, 32nd St.	-7.6	15.7
139: Long Beach Township, 81st St.	22.1	-21.9
138: Long Beach Township, Old Whaling Rd.	23.5	61.5
137: Beach Haven, Taylor Ave.	20.5	-7.3
136: Beach Haven, Dolphin Ave.	2.8	22.2
135: Long Beach Township, Webster Ave.	-29.5	-94.0
234: Long Beach Township, Border w/ Refuge	-45.2	-26.7

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	36-37	37-38	38-39	36-39
		S08-F08	F08-S09	S09-F09	S08-F09
		(volume expressed as cubic yards per foot of beachfront)			
156: Point Pleasant, Water St.		33.42	-1.72	5.95	37.59
155: Point Pleasant, Maryland Ave.		14.50	6.52	11.09	32.56
154: Bay Head, Johnson Ave.		14.96	-1.32	-0.11	13.53
153: Mantoloking, 1117 Ocean Ave.		0.22	3.26	-0.72	2.81
152: Brick Townhsip, Public Beach		-7.29	-2.50	13.13	3.53
151: Normandy Beach, 1st Ave		-8.72	8.27	-12.61	-13.13
150: Lavallette, White Ave.		7.32	-28.77	12.76	-8.55
149: Ortley Beach, 8th Ave.		-10.11	-5.32	8.85	-7.02
148: Seaside Park, 4th Ave.		18.34	-22.79	5.94	1.55
347: Berkeley Township, 6th Ave.		-7.88	4.70	-7.04	-10.06
247: Island Beach State Park, North		2.03	-21.16	35.06	15.76
246: Island Beach State Park, Middle		13.68	-6.24	-18.68	-14.59
146: Island Beach State Park, South		18.56	-15.85	31.28	33.59
245: Barnegat Light, 10th St.		38.10	-17.86	25.43	44.05
145: Barnegat Light, 26th St.		12.20	16.37	-36.31	-8.15
144: Loveladies, La Baia St.		-20.33	13.93	4.05	-2.47
143: Harvey Cedars, 73rd St.		10.50	-18.69	-9.52	-17.81
142: Harvey Cedars, Tranquility Drive		-0.51	-10.49	29.57	18.95
241: Surf City, 20th St.		-13.12	-15.89	-25.12	-54.36
141: Ship Bottom, 8th St.		-10.25	9.27	2.87	1.79
140: Long BeachTownship, 32nd St.		4.66	5.63	-12.76	-2.42
139: Long Beach Township, 81 st St.		5.73	-8.38	2.80	6.50
138: Long Beach Township, Old Whaling Rd.		14.02	10.30	74.28	98.63
137: Beach Haven, Taylor Ave.		9.21	5.08	8.50	23.34
136: Beach Haven, Dolphin Ave.		9.12	1.31	24.41	34.82
135: Long Beach Township, Webster Ave.		-4.07	-2.96	-60.61	-67.88
234: Long Beach Township, Border w/ Refuge		24.47	-24.14	38.07	38.52

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	36-37	37-38	38-39	36-39
		S08-F08	F08-S09	S09-F09	S08-F09
			(shoreline change expressed in feet)		
156: Point Pleasant, Water St.		31.9	-0.4	-14.7	16.8
155: Point Pleasant, Maryland Ave.		30.9	40.8	-26.7	45.0
154: Bay Head, Johnson Ave.		18.4	-33.0	15.8	1.2
153: Mantoloking, 1117 Ocean Ave.		2.3	10.7	-27.8	-14.8
152: Brick Township, Public Beach		23.4	-13.1	-20.1	-9.8
151: Normandy Beach, 1st Ave		18.5	26.0	-54.3	-9.7
150: Lavallette, White Ave.		7.7	-7.4	5.1	5.3
149: Ortley Beach, 8th Ave.		7.3	4.9	4.4	16.5
148: Seaside Park, 4th Ave.		26.4	-15.0	-3.7	7.8
347: Berkeley Township, 6th Ave.		2.8	-7.0	-13.3	-17.5
247: Island Beach State Park, North		9.0	-3.8	-5.3	-0.1
246: Island Beach State Park, Middle		5.8	29.2	-73.1	-38.1
146: Island Beach State Park, South		3.4	2.3	23.1	28.7
245: Barnegat Light, 10th St.		51.9	-3.7	73.9	122.1
145: Barnegat Light, 26th St.		1.5	48.7	-79.5	-29.3
144: Loveladies, La Baia St.		-9.8	6.3	-8.3	-11.8
143: Harvey Cedars, 73rd St.		9.6	-5.0	-22.4	-17.8
142: Harvey Cedars, Tranquility Drive		-8.0	-4.7	5.4	-7.3
241: Surf City, 20th St.		-24.3	-24.2	-63.3	-111.8
141: Ship Bottom, 8th St.		-9.3	37.0	-25.7	2.0
140: Long Beach Township, 32nd St.		-36.6	29.0	-13.3	-20.9
139: Long Beach Township, 81st St.		17.3	4.8	-26.7	-4.6
138: Long Beach Township, Old Whaling Rd.		24.0	-0.5	62.1	85.5
137: Beach Haven, Taylor Ave.		20.3	0.2	-7.6	13.0
136: Beach Haven, Dolphin Ave.		1.0	1.8	20.4	23.2
135: Long Beach Township, Webster Ave.		-25.2	-4.3	-89.7	-119.2
234: Long Beach Township, Border w/Refuge		56.1	-101.3	74.6	29.4

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

**TABLE 9
ATLANTIC COUNTY
ANNUAL BEACH VOLUME CHANGES
SPRING 2008 - SPRING 2009 & FALL 2008 - FALL 2009**

PROFILE SITE LOCATION	Survey	
	36 - 38 S2008-S2009	37 - 39 F2008 - F2009
	(volume expressed as cubic yards per foot)	
134: Brigantine, Green Acres	5.07	-6.17
133: Brigantine, 4th Street North	-12.01	-44.54
132: Brigantine, 15th Street South	-17.61	10.24
131: Brigantine, 43rd Street South	27.38	-2.01
130: Atlantic City, North Carolina Ave.	-8.55	-13.91
129: Atlantic City, Raleigh Ave.	-6.03	-22.06
128: Ventnor City, Dorset Ave.	7.06	5.34
127: Margate City, Benson Ave.	30.24	-5.36
126: Longport, 17th St.	11.97	10.44

**TABLE 10
ATLANTIC COUNTY
ANNUAL SHORELINE CHANGES
SPRING 2008 - SPRING 2009 & FALL 2008 - FALL 2009**

PROFILE SITE LOCATION	Survey	
	36 - 38 S2008-S2009	37 - 39 F2008 - F2009
	(shoreline change expressed in feet)	
134: Brigantine, Green Acres	-33.8	-65.5
133: Brigantine, 4th Street North	-56.9	-40.7
132: Brigantine, 15th Street South	-84.8	-9.1
131: Brigantine, 43rd Street South	78.3	41.8
130: Atlantic City, North Carolina Ave.	-17.9	-6.7
129: Atlantic City, Raleigh Ave.	5.7	17.5
128: Ventnor City, Dorset Ave.	44.2	12.9
127: Margate City, Benson Ave.	71.8	13.5
126: Longport, 17th St.	0.6	-28.4

**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	36-37	37-38	38-39	36-39
		S08-F08	F08-S09	S09-F09	S08-F09
		(volume expressed as cubic yards per foot of beachfront)			
134: Brigantine, Green Acres		6.08	-0.67	-5.41	-1.38
133: Brigantine, 4th Street North		-0.72	-11.49	-33.12	-46.07
132: Brigantine, 15th Street South		-31.73	15.04	-4.56	-19.84
131: Brigantine, 43rd Street South		28.85	-1.54	8.70	33.23
130: Atlantic City, North Carolina Ave.		-5.94	-2.65	-11.05	-18.48
129: Atlantic City, Raleigh Ave.		22.44	-26.73	5.71	0.77
128: Ventnor City, Dorset Ave.		-4.28	10.93	-5.90	0.95
127: Margate City, Benson Ave.		10.03	20.07	-28.61	3.56
126: Longport, 17th St.		13.26	-1.28	11.70	23.59

**TABLE 12
ATLANTIC COUNTY
SEASONAL SHORELINE CHANGES**

PROFILE SITE LOCATION	Survey	36-37	37-38	38-39	36-39
		S08-F08	F08-S09	S09-F09	S08-F09
		(shoreline change expressed in feet)			
134: Brigantine, Green Acres		18.2	-52.0	-13.5	-47.3
133: Brigantine, 4th Street North		-36.2	-20.7	-20.0	-76.9
132: Brigantine, 15th Street South		-43.5	-41.3	32.2	-52.7
131: Brigantine, 43rd Street South		33.7	44.6	-2.8	75.5
130: Atlantic City, North Carolina Ave.		-14.2	-3.7	-3.0	-20.9
129: Atlantic City, Raleigh Ave.		3.8	1.9	15.6	21.3
128: Ventnor City, Dorset Ave.		10.8	33.4	-20.5	23.7
127: Margate City, Benson Ave.		23.9	47.8	-34.4	37.4
126: Longport, 17th St.		2.0	-1.5	-26.9	-26.3

**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 2008 - SPRING 2009 & FALL 2008 - FALL 2009

PROFILE SITE LOCATION	Survey	
	36 - 38 S2008-S2009	37 - 39 F2008 - F2009
	(volume expressed as cubic yards per foot)	
225: Ocean City, Gardens Rd.	-69.05	-18.18
125: Ocean City, 6th St.	-68.54	-73.42
124: Ocean City, 20th St.	10.92	25.23
223: Ocean City, 34th St.	1.07	22.10
122: Ocean City, 56th St.	25.95	18.08
121: Strathmere, Williams Rd.	65.84	42.56
120: Sea Isle City, 1st St.	-5.31	59.25
119: Sea Isle City, 25th St.	18.79	24.86
118: Sea Isle City, 57th St.	44.93	-24.67
117: Sea Isle City, 80th St.	-8.88	2.59
216: Avalon, 9th St.	40.34	-23.22
116: Avalon, 23rd St.	-28.97	-22.20
115: Avalon, 35th St.	7.92	-3.10
114: Avalon, 70th St.	14.39	6.00
113: Stone Harbor, 90th St.	6.88	8.83
212: Stone Harbor, 121st St.	-0.16	14.91
112: Stone Harbor, South Pointe	** NO LONGER ACTIVE **	
111: North Wildwood, 15th Ave.	16.07	35.97
110: Wildwood, Cresse Ave.	10.31	20.17
109: Lower Township, Raleigh Ave.	22.93	17.47
208: Lower Township, U.S.C.G. Base	2.12	3.51
108: Cape May, Beach Club	-5.69	-16.07
107: Cape May, Baltimore Ave.	1.66	7.83
206: Cape May, Broadway Ave.	0.46	-12.19
105: Cape May, Nature Conservancy	-7.92	-45.03
104: Cape May Point, Lake Dr.	32.07	8.78
103: Higbee Beach State Park	4.52	3.69
102: North Cape May, Whittier	8.26	12.02
101: Villas, Pacific Ave.	-1.21	4.89
100: Reeds Beach, Beach Ave.	16.78	-5.56

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 2008 - SPRING 2009 & FALL 2008 - FALL 2009

Survey

PROFILE SITE LOCATION	36 - 38	37 - 39
	S2008-S2009	F2008 - F2009
	(shoreline change expressed in feet)	
225: Ocean City, Gardens Rd.	-198.7	-14.0
125: Ocean City, 6th St.	-173.5	-96.7
124: Ocean City, 20th St.	38.1	15.6
223: Ocean City, 34th St.	10.5	-20.9
122: Ocean City, 56th St.	64.5	11.7
121: Strathmere, Williams Rd.	221.5	107.7
120: Sea Isle City, 1st St.	2.1	167.4
119: Sea Isle City, 25th St.	32.1	33.0
118: Sea Isle City, 57th St.	57.3	-87.1
117: Sea Isle City, 80th St.	-0.6	-42.5
216: Avalon, 9th St.	1.9	-104.7
116: Avalon, 23rd St.	-15.0	-40.5
115: Avalon, 35th St.	8.1	19.3
114: Avalon, 70th St.	59.1	-2.4
113: Stone Harbor, 90th St.	-0.5	-1.7
212: Stone Harbor, 121st St.	13.0	-42.8
112: Stone Harbor, South Pointe	** NO LONGER ACTIVE **	
111: North Wildwood, 15th Ave.	-24.6	61.8
110: Wildwood, Cresse Ave.	37.0	44.9
109: Lower Township, Raleigh Ave.	33.4	31.3
208: Lower Township, U.S.C.G. Base	12.8	-32.8
108: Cape May, Beach Club	-12.5	-15.7
107: Cape May, Baltimore Ave.	5.0	-3.3
206: Cape May, Broadway Ave.	14.8	-43.9
105: Cape May, Nature Conservancy	1.6	-75.3
104: Cape May Point, Lake Dr.	74.0	12.6
103: Higbee Beach State Park	15.1	6.0
102: North Cape May, Whhittier	-18.6	-13.8
101: Villas, Pacific Ave.	1.1	-1.3
100: Reeds Beach, Beach Ave.	38.8	-14.9

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	36-37	37-38	38-39	36-39
		S08-F08	F08-S09	S09-F09	S08-F09
		(volume expressed as cubic yards per foot of beachfront)			
225: Ocean City, Gardens Rd.		-33.33	-36.24	18.14	-52.04
125: Ocean City, 6th St.		-21.56	-47.00	-26.12	-94.87
124: Ocean City, 20th St.		-5.70	17.11	8.40	19.94
223: Ocean City, 34th St.		-7.35	8.19	12.48	13.74
122: Ocean City, 56th St.		10.73	15.27	2.05	26.31
121: Strathmere, Williams Rd.		31.34	34.56	7.28	72.89
120: Sea Isle City, 1st St.		-11.56	6.30	52.96	47.71
119: Sea Isle City, 25th St.		5.04	14.16	10.24	29.08
118: Sea Isle City, 57th St.		43.80	1.22	-25.89	19.13
117: Sea Isle City, 80th St.		-12.40	3.34	-1.19	-9.88
216: Avalon, 9th St.		48.81	-8.30	-15.23	25.54
116: Avalon, 23rd St.		-10.23	-18.67	-3.53	-32.39
115: Avalon, 35th St.		11.22	-3.25	0.04	8.11
114: Avalon, 70th St.		14.85	-1.31	7.39	20.88
113: Stone Harbor, 90th St.		4.19	1.75	7.77	12.46
212: Stone Harbor, 121st St.		-4.01	5.03	9.95	10.91
112: Stone Harbor, South Pointe		** NO LONGER ACTIVE **			
111: North Wildwood, 15th Ave.		7.15	8.56	27.08	43.72
110: Wildwood, Cresse Ave.		10.19	1.13	20.79	30.91
109: Lower Township, Raleigh Ave.		12.60	10.60	6.55	30.35
208: Lower Township, U.S.C.G. Base		19.15	-17.93	23.28	7.04
108: Cape May, Beach Club		5.80	-11.24	-4.78	-10.13
107: Cape May, Baltimore Ave.		3.18	-1.48	9.36	11.38
206: Cape May, Broadway Ave.		-18.20	18.87	-31.35	-31.18
105: Cape May, Nature Conservancy		8.04	-17.56	-27.74	-42.45
104: Cape May Point, Lake Dr.		2.28	30.66	-22.39	9.91
103: Higbee Beach State Park		1.51	3.10	0.43	5.17
102: North Cape May, Whittier Ave.		4.36	3.80	8.04	16.16
101: Villas, Pacific Ave.		-1.06	-0.01	4.56	3.54
100: Reeds Beach, Beach Ave.		22.99	-6.27	0.57	17.53

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

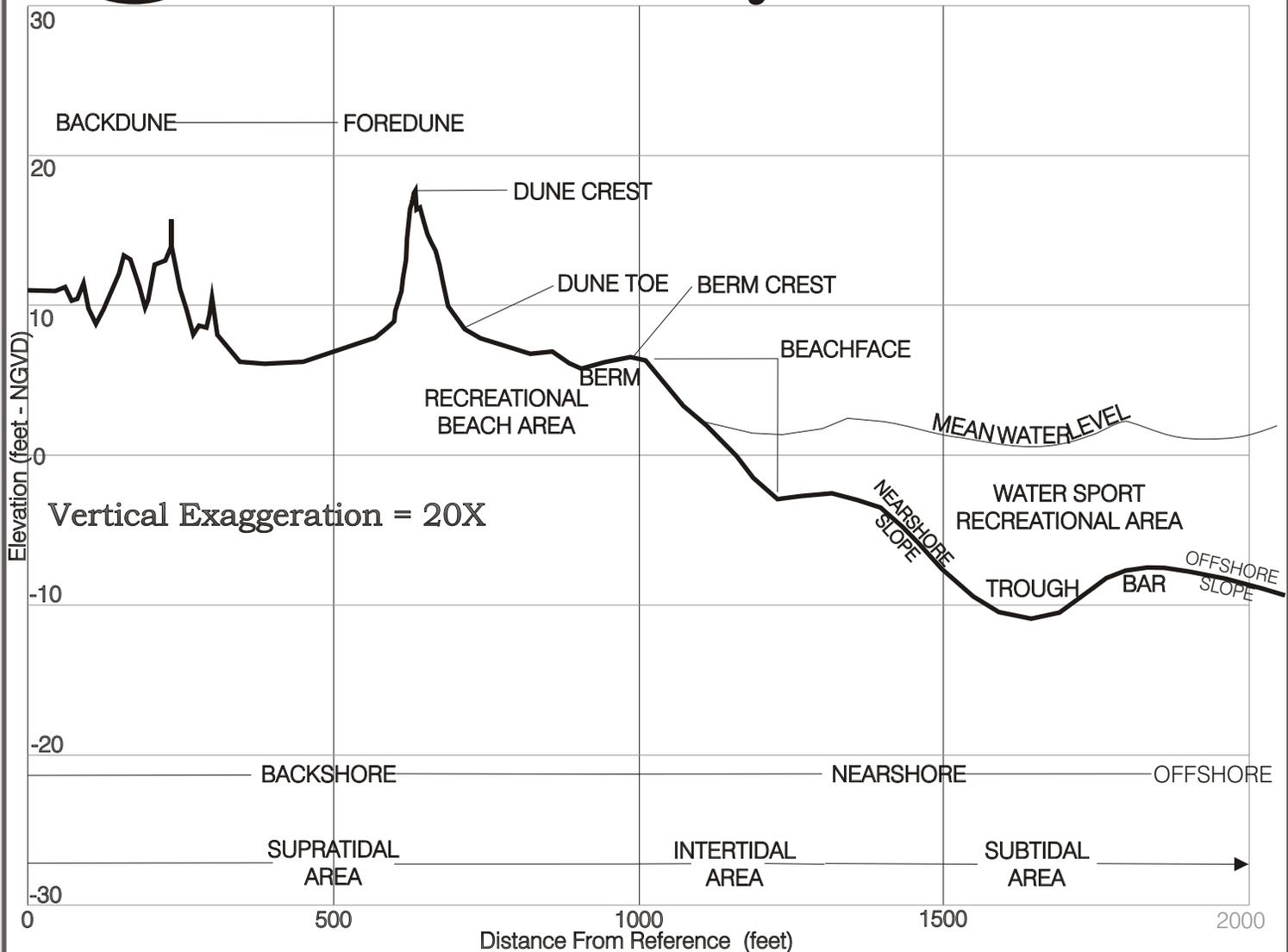
TABLE 16
CAPE MAY COUNTY
SEASONAL SHORELINE CHANGES

PROFILE SITE LOCATION	Survey	36-37	37-38	38-39	36-39
		S08-F08	F08-S09	S09-F09	S08-F09
			(shoreline change expressed in feet)		
225: Ocean City, Gardens Rd.		-143.3	-55.5	41.5	-157.2
125: Ocean City, 6th St.		-106.4	-67.1	-29.7	-203.1
124: Ocean City, 20th St.		33.3	4.8	10.7	48.8
223: Ocean City, 34th St.		18.7	-8.2	-12.7	-2.2
122: Ocean City, 56th St.		18.4	46.1	-34.4	30.1
121: Strathmere, Williams Rd.		236.8	-15.4	123.1	344.6
120: Sea Isle City, 1st St.		-36.7	38.8	128.7	130.8
119: Sea Isle City, 25th St..		51.6	-19.5	52.5	84.5
118: Sea Isle City, 57th St..		106.7	-49.4	-37.7	19.6
117: Sea Isle City, 80th St..		25.2	-25.7	-16.8	-17.3
216: Avalon, 9th St.		124.6	-122.7	18.0	20.0
116: Avalon, 23rd St.		5.8	-20.8	-19.7	-34.7
115: Avalon, 35th St.		14.8	-6.7	26.0	34.1
114: Avalon, 70th St.		55.5	3.6	-6.0	53.1
113: Stone Harbor, 90th St.		18.4	-18.9	17.2	16.7
212: Stone Harbor, 121st St.		34.8	-21.9	-20.9	-8.0
112: Stone Harbor, South Pointe			** NO LONGER ACTIVE **		
111: North Wildwood, 15th Ave.		-9.2	-15.3	77.1	52.5
110: Wildwood, Cresse Ave.		27.0	10.1	34.8	71.8
109: Lower Township, Raleigh Ave.		20.1	13.4	17.9	51.3
208: Lower Township, U.S.C.G. Base		5.9	6.9	-39.7	-26.9
108: Cape May, Beach Club		-5.9	-6.6	-9.1	-21.5
107: Cape May, Baltimore Ave.		12.7	-7.7	4.4	9.4
206: Cape May, Broadway Ave.		-1.2	15.9	-59.8	-45.0
105: Cape May, Nature Conservancy		32.1	-30.5	-44.8	-43.2
104: Cape May Point, Lake Dr.		12.7	61.3	-48.7	25.3
103: Higbee Beach State Park		-2.8	17.9	-11.9	3.2
102: North Cape May, Whittier Ave.		13.9	-32.5	18.7	0.1
101: Villas, Pacific Ave.		3.9	-2.8	1.5	2.6
100: Reeds Beach, Beach Ave.		52.3	-13.5	-1.4	37.4

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



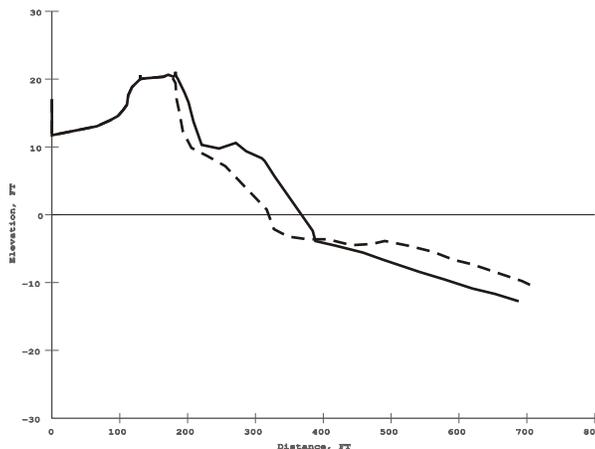
Typical Beach Profiles in New Jersey



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.

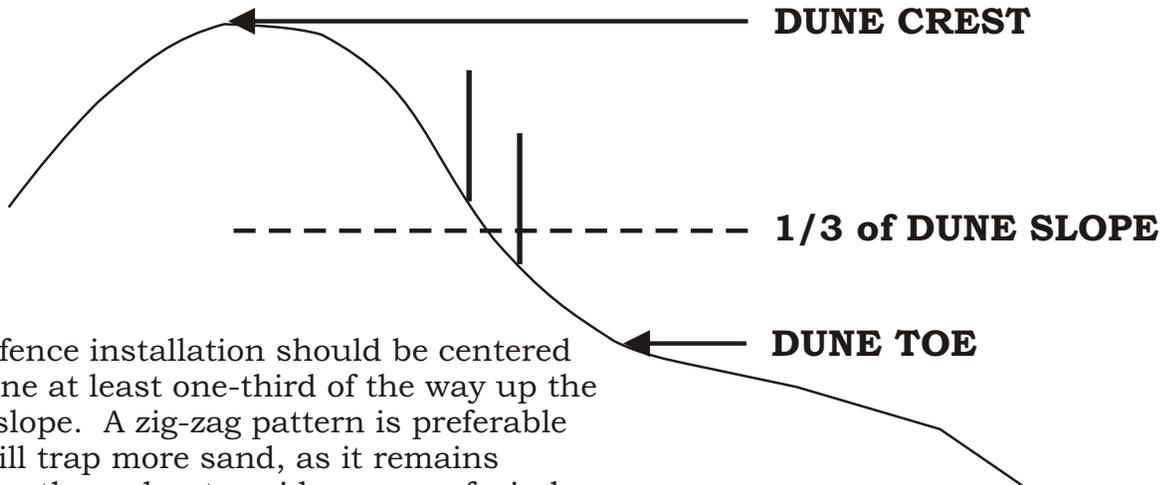
Updrift - In the direction opposite of the dominant movement of littoral materials.

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.



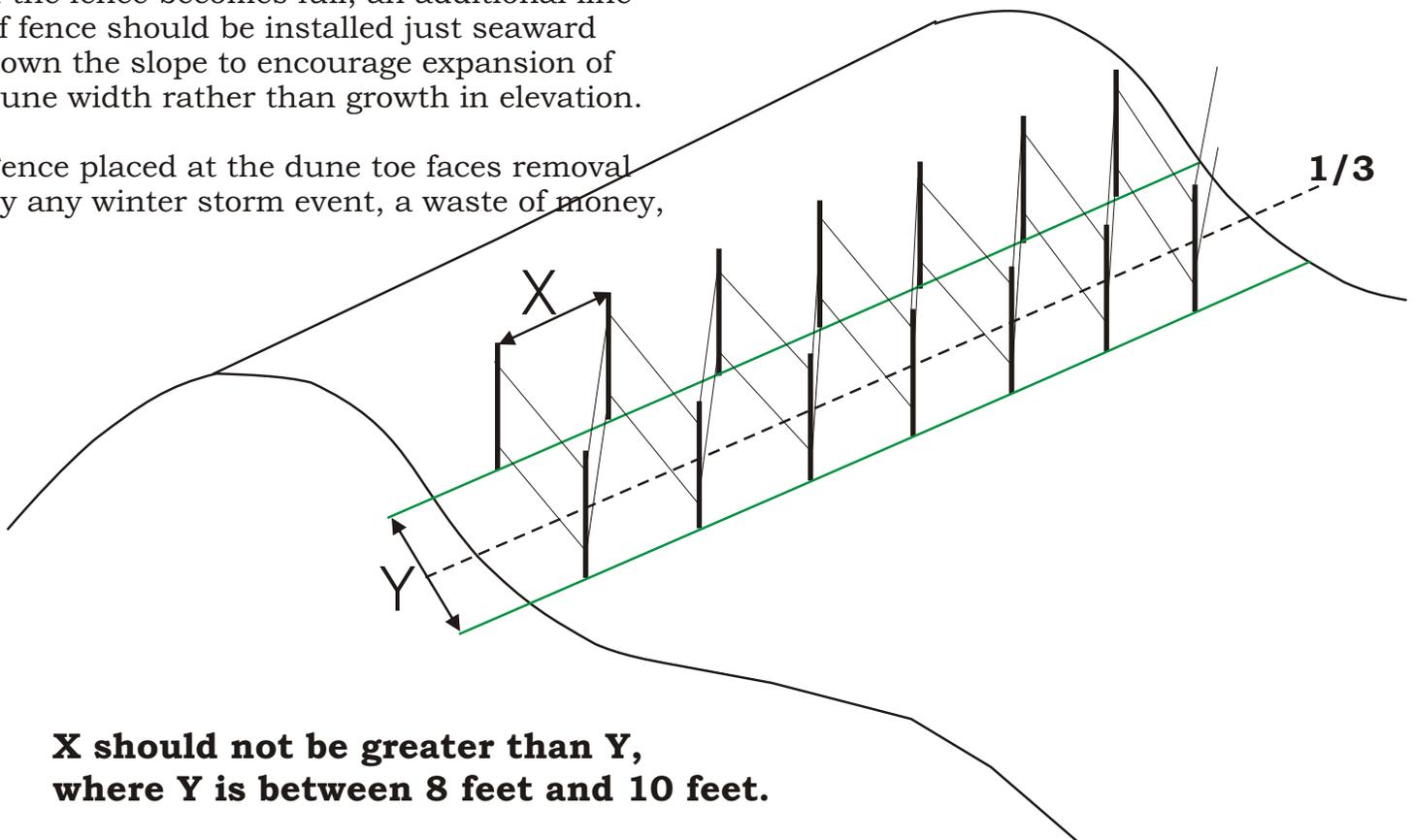
Optimal Dune Fence Placement (Initial Fence Placement)



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.

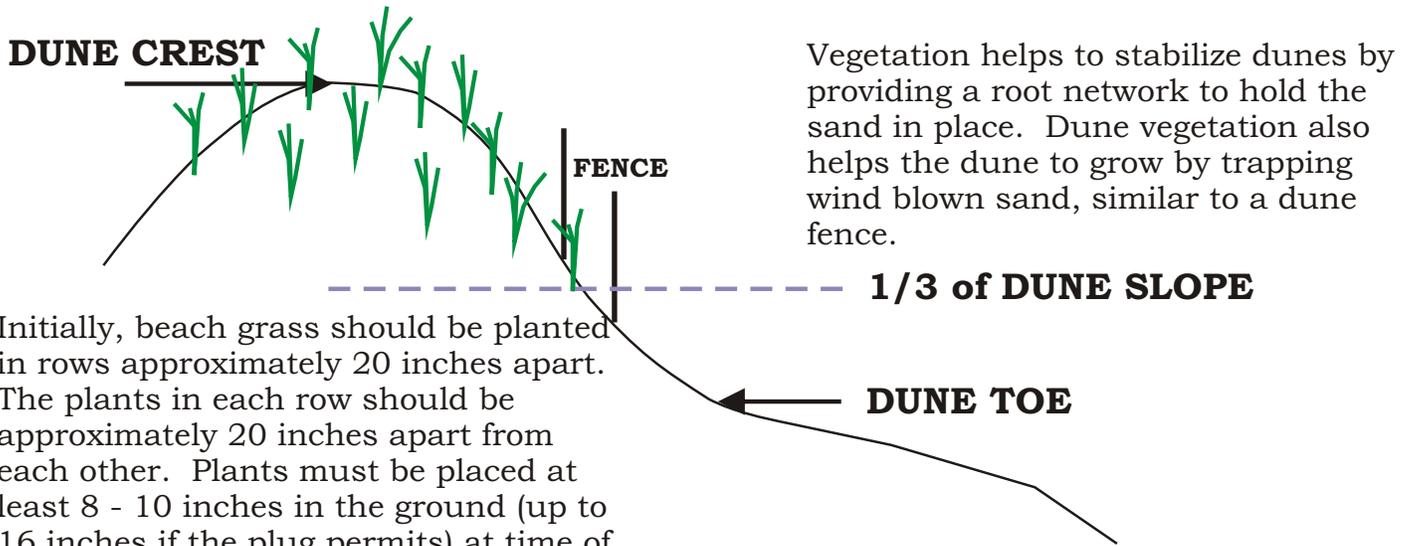
Fence placed at the dune toe faces removal by any winter storm event, a waste of money,



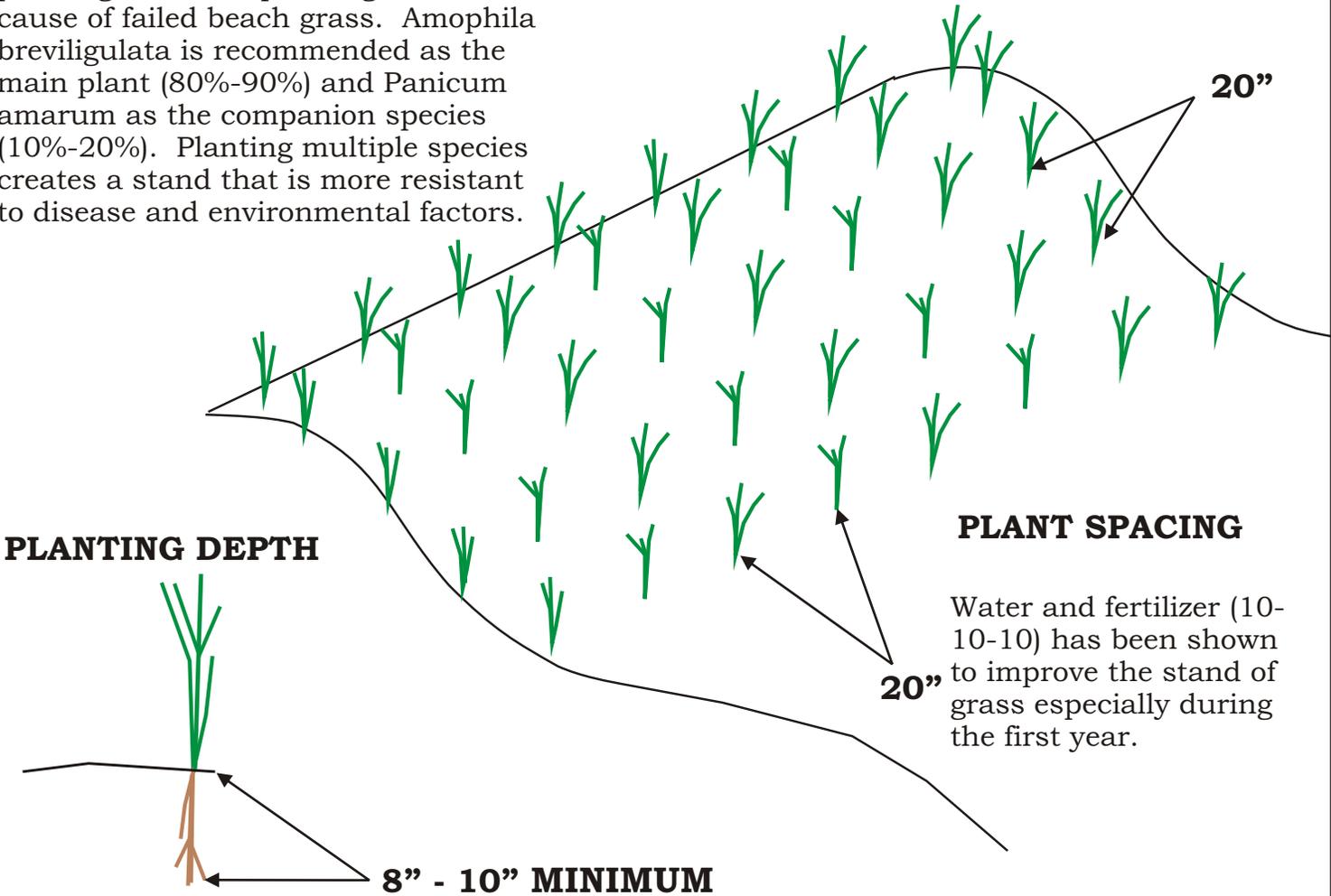
**X should not be greater than Y,
where Y is between 8 feet and 10 feet.**



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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