New Jersey Beach Profile Network

Ocean County

Manasquan Inlet to Little Egg Inlet

NJBPN Profile #'s 156 - 234

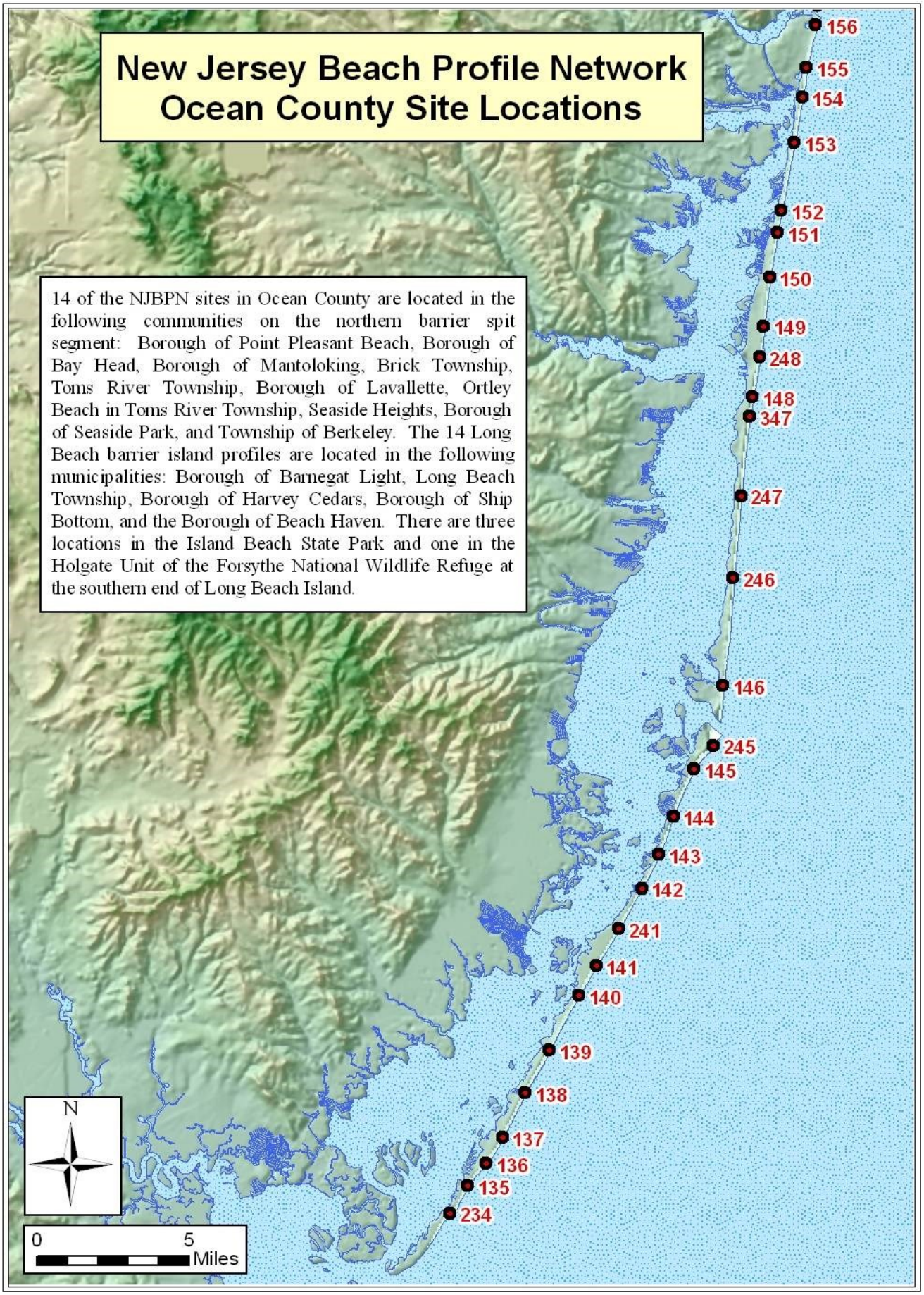


Figure 38. Locations of the 28 NJBPN profile stations in Ocean County, NJ.

Individual Site Descriptions:

Beaches in Northern Ocean County continued to recover slowly as sand transported offshore continued to return to the shoreline. Modest efforts in adding material continued in Mantoloking to Ortley Beach using ad hoc sources and continued recovery of overwash deposition. The winter storms from early October 2015 through northeast storm Jonas on January 23, 2016 demonstrated that wave erosion was more than likely to breach the existing dune/beach barrier because the 3-mile steel bulkhead installed in 2015 was reached at almost its entire length. Maximum elevations of scour reached 22 feet of vertical steel exposed in Mantoloking with averages in the 12 to 15 feet common. Municipal officials prudently closed all public access to the beach due to the risk of falling down the residual dune slope to the top of the wall and then the vertical drop to the wet beach or water. A dedicated effort using sand returning from offshore has managed to re-cover the exposed steel with sand and with continued grooming, create a suitable recreational beach for the coming season.

The steel bulkhead without future large-scale beach nourishment will continue to be a major winter problem with no public access to the beach and a far greater potential for beach injuries than ever emerged from all prior beach nourishment activities. Any moderate northeast storm will expose the vertical surface, plus accelerate southerly longshore transport of the eroded sand in the extreme wave turbulence zone, generated between reflected and incoming storm waves within the 500-foot wide surf zone seaward of the wall.

The US Army Corps of Engineers had completed three segments of its Long Beach Island project prior to Sandy. These included Surf City in 2007, Harvey Cedars in 2009 and Brant Beach in 2012. The berm width at 8.5 feet elevation (NAVD88 datum) was set at 100 feet accompanied by a dune with a crest elevation of 22 feet and a 25-foot width. There are 1:5 slopes landward and seaward to the existing beach and landward surfaces. The 22-foot elevation was designed to be high enough to prevent the 1% annual chance storm (100 year event) wave from over-topping the feature. The design worked as planned in all cases where the project had been completed. Comparable natural dunes with at least a 50-foot wide dry beach also prevented overwash especially in Barnegat Light Borough on the north end of Long Beach Island.

Work continues to complete the LBI project as designed by the USACE. The passage of PL 113-2 by Congress in January 2013 provided the USACE with the authorization to complete all authorized, but yet unconstructed shore protection projects in New Jersey at 100% initial federal cost. The State is in the process of dealing in court with involuntary project easement access from oceanfront owners on both Long Beach Island and in Northern Ocean County.

Point Pleasant Beach, Water Street and Maryland Avenue; #156 and #155;

The restoration is relatively complete in terms of beach width from the Manasquan jetty south along the boardwalk, then south of the boardwalk the dunes have been largely restored. All recovery is due to natural migration of Sandy-generated deposits back toward the beach. Minimal additional sand added during 2014 or 2015. Point Pleasant's northern site lost just over 30 cubic yards per foot of shoreline in 2015.

Bay Head, Johnson Avenue; #154;

The beach was restored by hauling as much overwash sand as possible back to restore the dunes. In addition the rock revetment installed after the 1962 NE storm was extended south into Mantoloking between Carrigan and Chafey Place at individual property owner expense. No beach sand was pumped in beyond that hauled back from overwash deposits or moved back onto the shoreline naturally. The site lost some beach width, and lost minor sand volume in 2015.

Mantoloking, 1117 Ocean Avenue; #153;

Route 35 work was nearly complete restoring all types of utility work lost during Sandy. The NJ Dept. of Transportation (NJDOT) was the main sponsor of a steel vertical bulkhead constructed between the end of the rock revetment from Bay Head along the entire Mantoloking oceanfront, ending south in Brick Township. Completed at top elevation of 16.0 feet NAVD 88, this wall was initially buried in recovery sand making up a "dune" containing the wall as a core. This was promoted as a final line of defense for protecting NJ State highway 35. The new structure survived its first winter, but even minor storms such as the December 9, 2014 event exposed the wall for hundreds of feet as a vertical steel surface up to 10 feet high above the beach because wave action reached the structure and enhanced the erosion.

Northeast storm Jonas, January 23, 2016 exposed 85% of the wall's length leaving between 6 and 22 feet of vertical surface exposed above either a wet beach at low tide or a sand surface below the elevation of low tide. Wave energy was reflected from the wall and intercepted the next incoming wave with explosive force captured on video that can be viewed at https://www.youtube.com/watch?v=qchgBrI9WAA&noredirect=1 . However, the Mantoloking profile remained relatively constant changing little throughout the interval, largely due to massive efforts to recover sand from offshore to re-cover the wall as soon as it was accessible and constantly searching for sand volumes from anywhere available to add to the beach.

Brick Township, Public Beach #3, #152;

The steel wall extends south past this site as well, and was exposed after Jonas, but at 4 to 6 foot relief instead of the extreme values seen in Mantoloking. It has been re-buried in returning beach sand. The fact that both sites 152 and 151 saw over and average of 20 cubic yards of added sand this year may be related to deposition near or beyond the south end of the steel wall caused by wave turbulence at the wall. This will be followed carefully.

Toms River Township (Normandy Beach, Ortley Beach), 1st Avenue and 8th Avenue; #151 and #149;

Overwash, dune loss and extensive structural damage occurred along this segment of Northern Ocean County. Ortley Beach was particularly hard hit. No tidal inlet breach occurred, but overwash took many homes as well as the dune and beach. Sand was hauled back to generate a dune and sand migrated back to the shoreline from Sandy-generated deposits offshore. Both sites gained double digits in sand volume in 18 months, but direct relationship to the steel wall and differential erosion/deposition due to wave interaction is a work in progress.

Lavallette; White Avenue; #150;

Sand volume loss and shoreline retreat hit this location harder than most for reasons not terribly clear.

Seaside Heights; Franklin Avenue; #248;

Infrastructure repairs and replacement is well underway, but the site did not gain sand or see shoreline advances seaward (-19.96 yds^3/ft. and -17 feet).

Seaside Park; 4th Avenue; #148;

Seaside Park is still working to finalize the post-Sandy restoration of private and public infrastructure, with no significant changes recorded at the beach. There may be a sand accumulation mode that resembles a pod of material moving slowly along the shoreline with zones of accretion at the apex of the body of sand and zones of depletion where the pod ends along as much as a 1,500 foot pod length.

Midway Beach (Berkeley Township); 6th Avenue; #347

The private dune here was wide and high enough to be an island of low damage in an otherwise devastated region. Sand accumulated at the site at the highest rate for any Northern Ocean County profile (+46.73 yds^3/ft.) and with a 19-foot shoreline advance.

Island Beach State Park; Sites #247, #246, and #146;

Two of three sites gained sand, but the loser was the southernmost location, which is unusual in that normal littoral transport is from north to south. However, the northern two sites saw shoreline retreat while the southern site advanced 6 feet.

Barnegat Light Borough; 10th Street and 26th Street; #245 and #145;

Natural recovery was essentially complete by 2013 in Barnegat Light Borough, since there had been little damage due to the southern orientation of the shoreline and the huge sand volume added since the jetty realignment in 1990. The 10th Street location lost sand volume while the 26th Street site gained substantially (-29.06 yds^3/ft. versus +33.09 yds^3/ft.). The shoreline change followed the pattern (-11 feet versus +95 feet).

Long Beach Township (Loveladies); La Baia Street; #144;

Loveladies recovered some beach material from offshore and restored dunes using sand hauled back to the beach. 2015 saw minimal further enhancement.

Harvey Cedars; 73rd Street and Tranquility Drive; #143 and #142;

The USACE returned to place sand on the beach to restore the project to design specifications. During 2014 there was minor sand loss (-24.67 yds^3/ft. and 22.18 yds^3/ft.). Winter shoreline retreat was pretty extensive (-123 and -103 feet respectively). During 2015, the two sites saw -8.16 yds^3/ft. and +1.61 yds^3/ft. in sand volume changes with shoreline movements of +22 and+19 feet.

Surf City; 20th Street; #241;

Surf City was the location of the initial Army Corps project effort in 2007. The project was restored to design specifications during 2013. During 2014, both the change in sand volume declined at this site and the shoreline position retreated due to impacts largely confined to the period between the fall 2013 survey and the spring 2014 review. The 2015 changes were minimal in sand volume (-2.36 yds^3/ft.), but saw a 40-foot shoreline advance.

Ship Bottom; 8th Street; #141;

Recovery was limited to landward migration of offshore deposits created from beach and dune sand eroded in Sandy. The 2015 recovery continued from 2014 as an additional 7.20 yds^3/ft. in sand volume was added producing a sizable 48-foot shoreline advance seaward.

Long Beach Township (Brant Beach, 32nd St; #140; Beach Haven Crest, 81st St; #139; Spray Beach) Old Whaling Rd; #138;

Brant Beach was the most recent segment of LBI to receive the Army Corps beach replenishment project completed in early 2012. The USACE restored this segment to design specifications adding 135.50 yds^3/ft.

Work continued in early 2015 as site 140 gained 44.05 yds^3/ft. naturally, but sites 139 and 138 gained 206.48 yds^3/ft. and 128.00 yds^3/ft. respectively. The shoreline response was predictable with the three sites advancing 67, 289 and 186 feet due to beach nourishment work.

Beach Haven; Taylor Ave; #137 and Dolphin Ave; #136;

Both survey sites in Beach Haven suffered dune failure during Hurricane Sandy. Sand was hauled back to the beach to provide dune protection. The USACE contractor is working south toward Beach Haven through Holgate in future beach nourishment under the authorized LBI project. During 2015 the northern site gained 41.07 yds^3/ft. as sand moved south into the location while the southern location gained 7.66 yds^3/ft.

Long Beach Township (Holgate); Webster Ave; #135;

This location is also on the agenda for the USACE to extend the Brant Beach project south to the terminal groin in Holgate. During 2015 the site gained 27.81 yds^3/ft. with an advance in the shoreline position of 43 feet.

Forsythe Wildlife Refuge site; Located at the northern boundary; #234;

During Sandy, total overwash occurred all along the refuge that spread clean sand across the vegetation and into Barnegat Bay. Dune recovery will be slow allowing the shorebirds to have a wide open habitat for some time. No tidal inlet breach occurred, so Long Beach Island retains its pre-Sandy dimensions. The site actually gained sand volume during the winter of 2013 to 2014 (30.95 yds^3/ft.), but lost 25.93 yds^3/ft. during the following summer. Shoreline position retreat was substantial at 117 feet over the entire year split 69 in the winter and 48 the following summer of 2014. Conditions produced beach sand accumulation in 2015 adding 49.38 yds^3/ft. to the cross section accompanied with a 152-foot shoreline advance. This advance erases the prior year's retreat.

NJBPN 156 – Water Street, Point Pleasant

The Water Street site is located toward the south end of the Point Pleasant Beach boardwalk. The photo on the left (taken September 29, 2014) shows the backshore as a result of local efforts in maintaining the dry beach. The photo on the right (taken December 14, 2015) shows a similar backshore to 2014 though shoreline retreat (-42.3 ft.) was recorded between the two surveys.

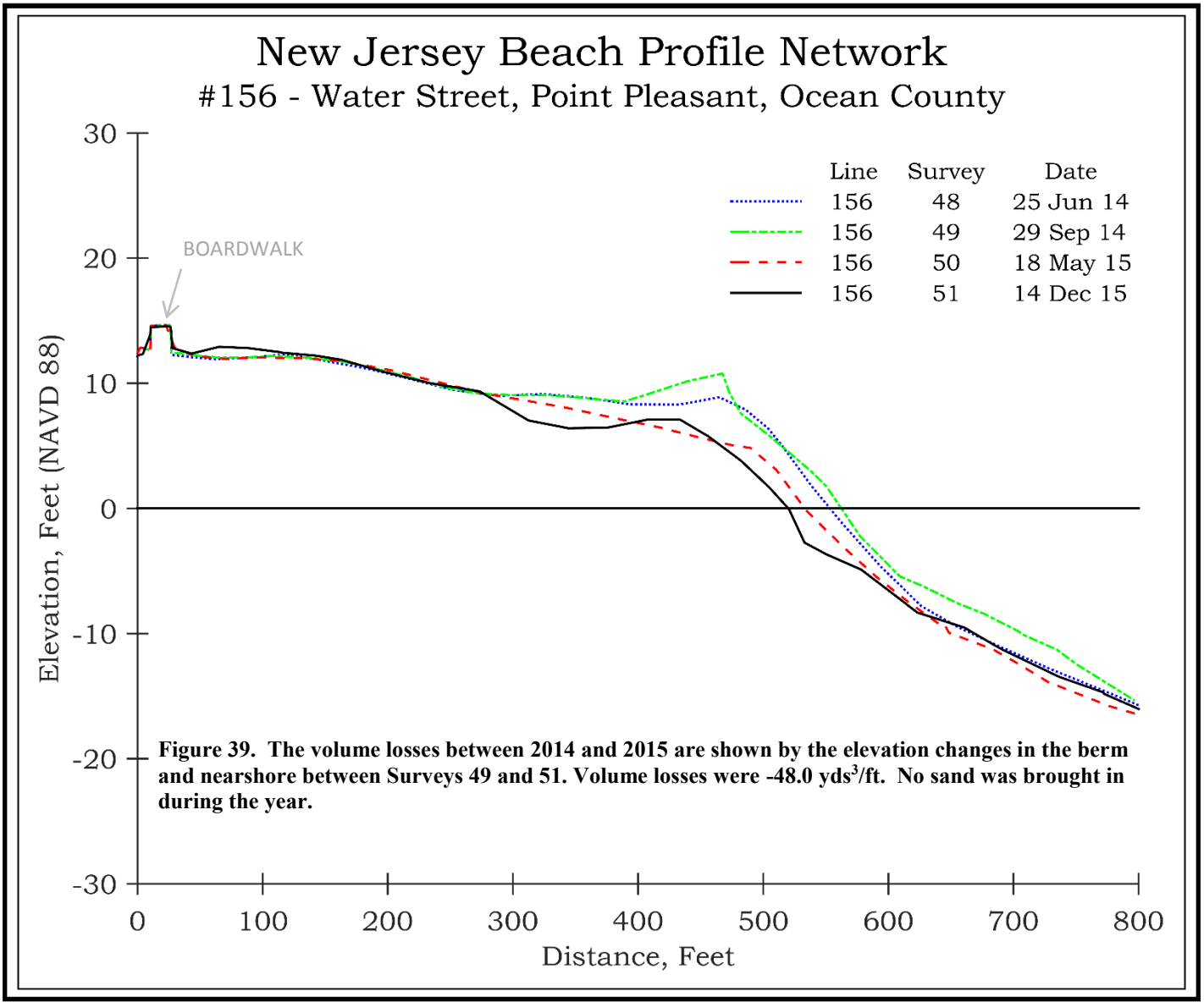


Figure 39. The volume losses between 2014 and 2015 are shown by the elevation changes in the berm and nearshore between Surveys 49 and 51. Volume losses were -48.0 yds^3/ft. No sand was brought in during the year.

NJBPN 155 – Maryland Avenue, Point Pleasant

The Maryland Avenue profile is located south of Manasquan Inlet. The photos (left taken September 29, 2014 and right taken December 14, 2015) show a maintained beach. Installation of sand fencing seaward of existing fence is a local effort to capture wind-blown sand. Volume changes across the profile were minimal (0.72 yd^3/ft.) between fall 2014 and fall 2015.

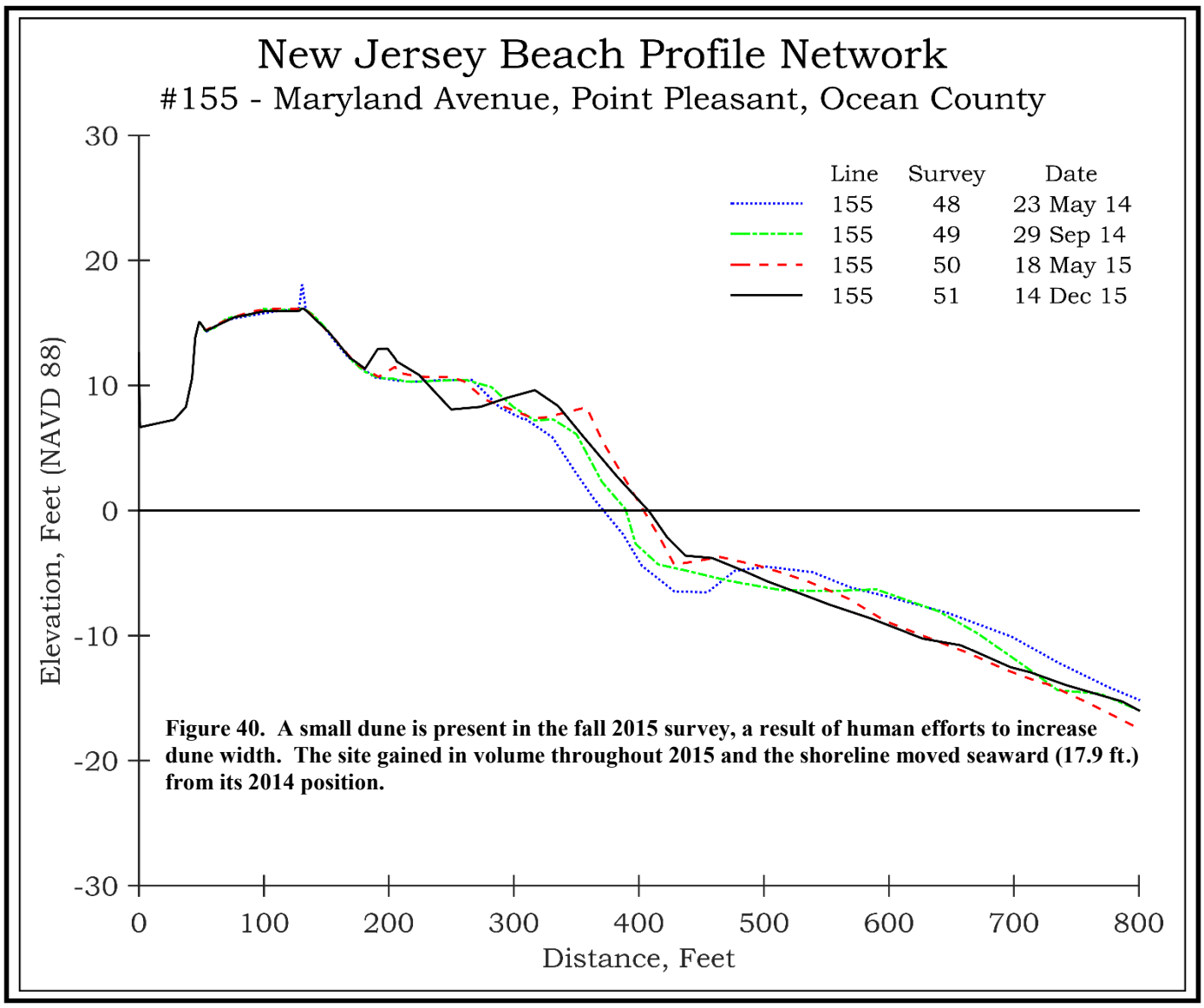


Figure 40. A small dune is present in the fall 2015 survey, a result of human efforts to increase dune width. The site gained in volume throughout 2015 and the shoreline moved seaward (17.9 ft.) from its 2014 position.

NJBPN 154 – Johnson Avenue, Bay Head

Both photos (left taken September 29, 2014 and right taken December 14, 2015) show the condition of the berm at the Bay Head location. While the berm appears wider in the photos, the profile lost volume (-20.31 yd^3/ft.) during this time period, predominantly below the 0.0 ft. datum.

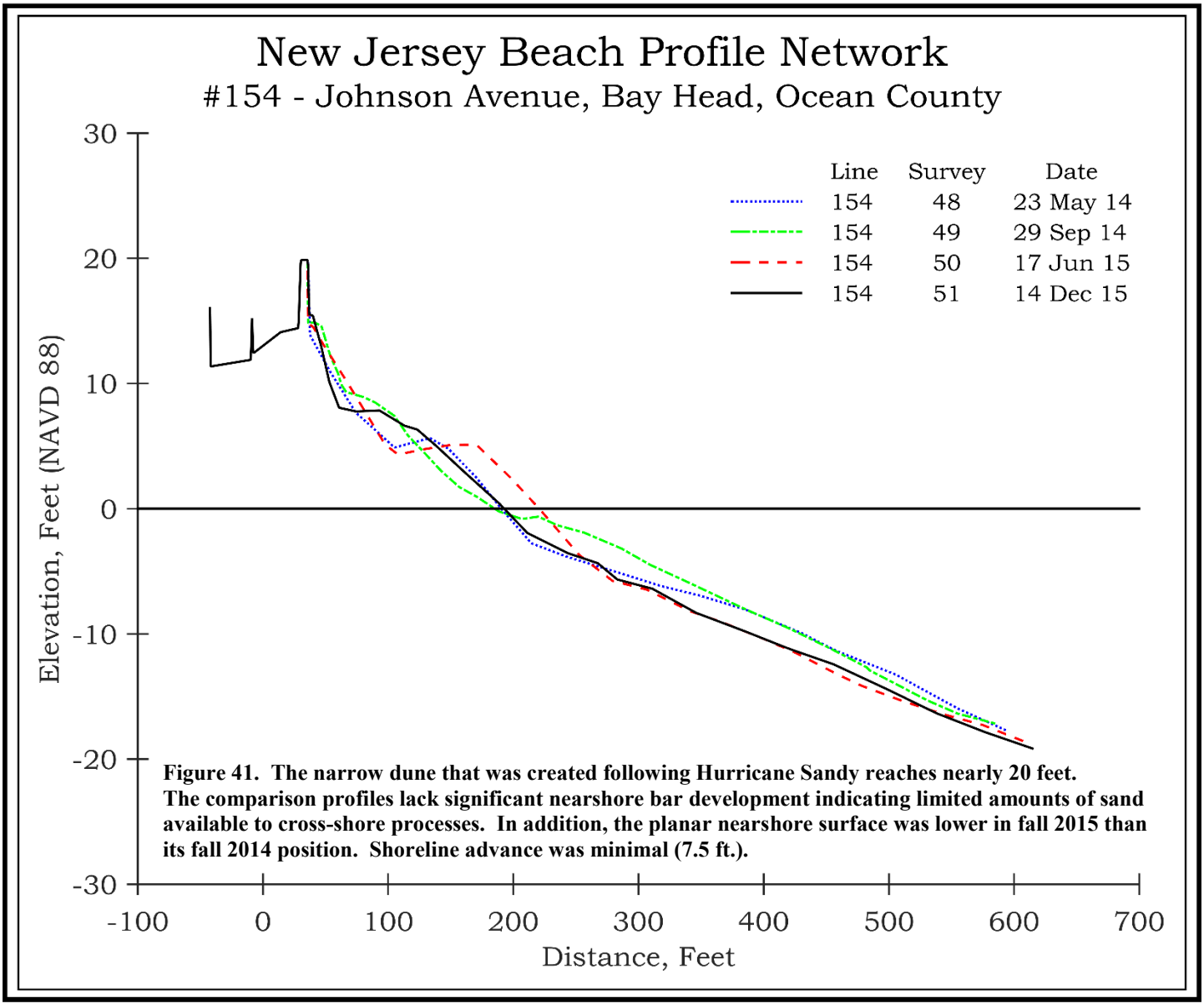


Figure 41. The narrow dune that was created following Hurricane Sandy reaches nearly 20 feet. The comparison profiles lack significant nearshore bar development indicating limited amounts of sand available to cross-shore processes. In addition, the planar nearshore surface was lower in fall 2015 than its fall 2014 position. Shoreline advance was minimal (7.5 ft.).

NJBPN 153 – 1117 Ocean Avenue, Mantoloking

The profile at this Mantoloking location is constantly manipulated by human efforts to protect the steel bulkhead that was installed to protect Route 35 from storm surge. The photos (left taken September 23, 2014 and right taken December 14, 2015) show the narrow dry beach that is less than 100 ft. in width and sand scraped from the berm to protect the steel bulkhead which was exposed following the October 2-5, 2015 northeast storm.

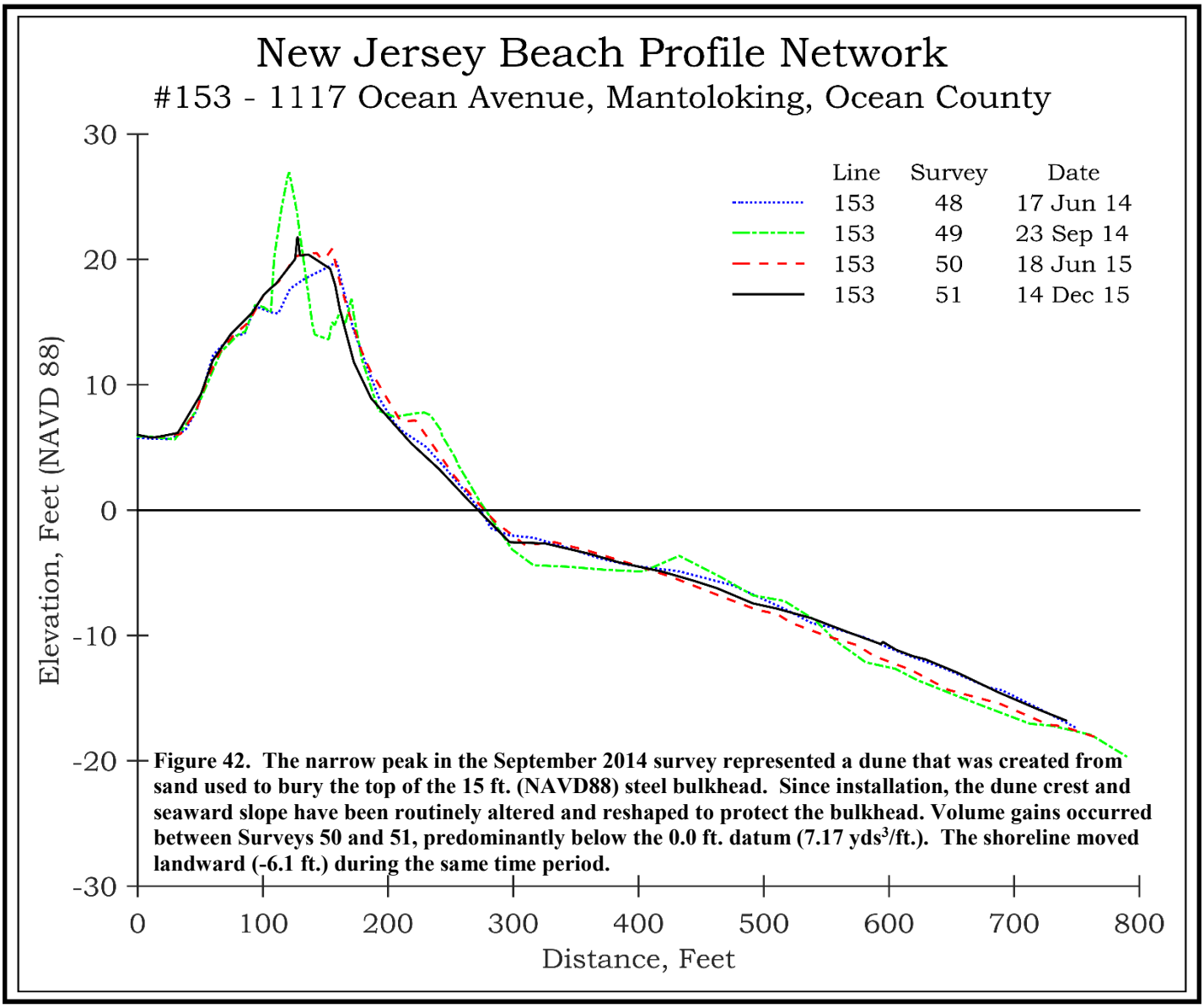


Figure 42. The narrow peak in the September 2014 survey represented a dune that was created from sand used to bury the top of the 15 ft. (NAVD88) steel bulkhead. Since installation, the dune crest and seaward slope have been routinely altered and reshaped to protect the bulkhead. Volume gains occurred between Surveys 50 and 51, predominantly below the 0.0 ft. datum (7.17 yds^3/ft.). The shoreline moved landward (-6.1 ft.) during the same time period.

NJBPN 152 – Public Beach #3, Brick Township

On the left (taken September 30, 2014) shows the installation of the southern section of the steel bulkhead. The right photo (December 14, 2015) is the view from the top of the new dune that covers the bulkhead. Sand was brought in from a non-beach source for the construction.

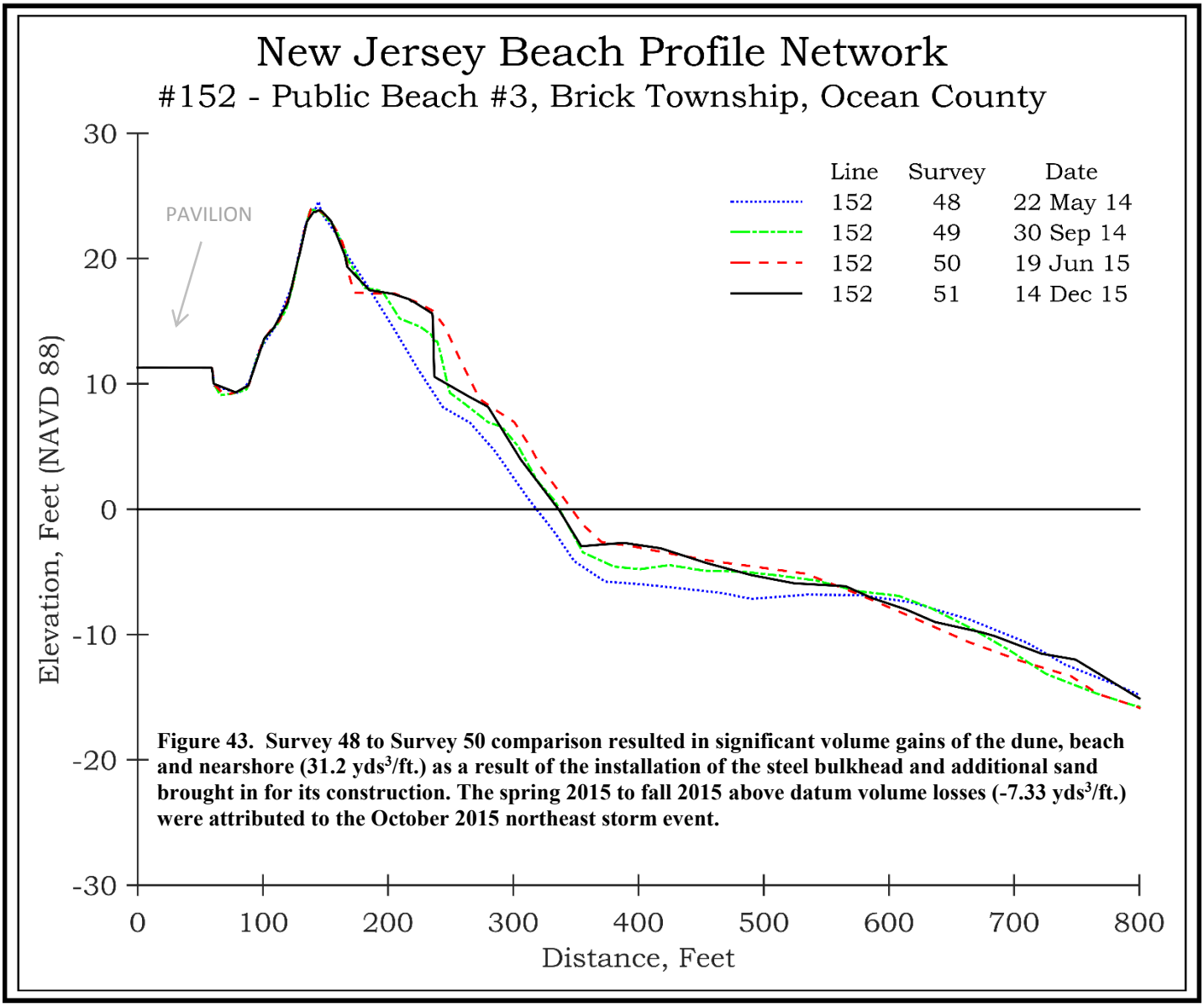


Figure 43. Survey 48 to Survey 50 comparison resulted in significant volume gains of the dune, beach and nearshore (31.2 yds^3/ft.) as a result of the installation of the steel bulkhead and additional sand brought in for its construction. The spring 2015 to fall 2015 above datum volume losses (-7.33 yds^3/ft.) were attributed to the October 2015 northeast storm event.

NJBPN 151 – 1st Avenue, Normandy Beach

On the left (September 30, 2014), the view is from the top of the dune that was created in 2014. On the right, (December 11, 2015) the scarped dune is protected by a narrow 50 ft. berm. The dune crest elevation was 18.39 ft. NAVD 88 but its width was expanded landward to add additional protection to the shorefront structures.

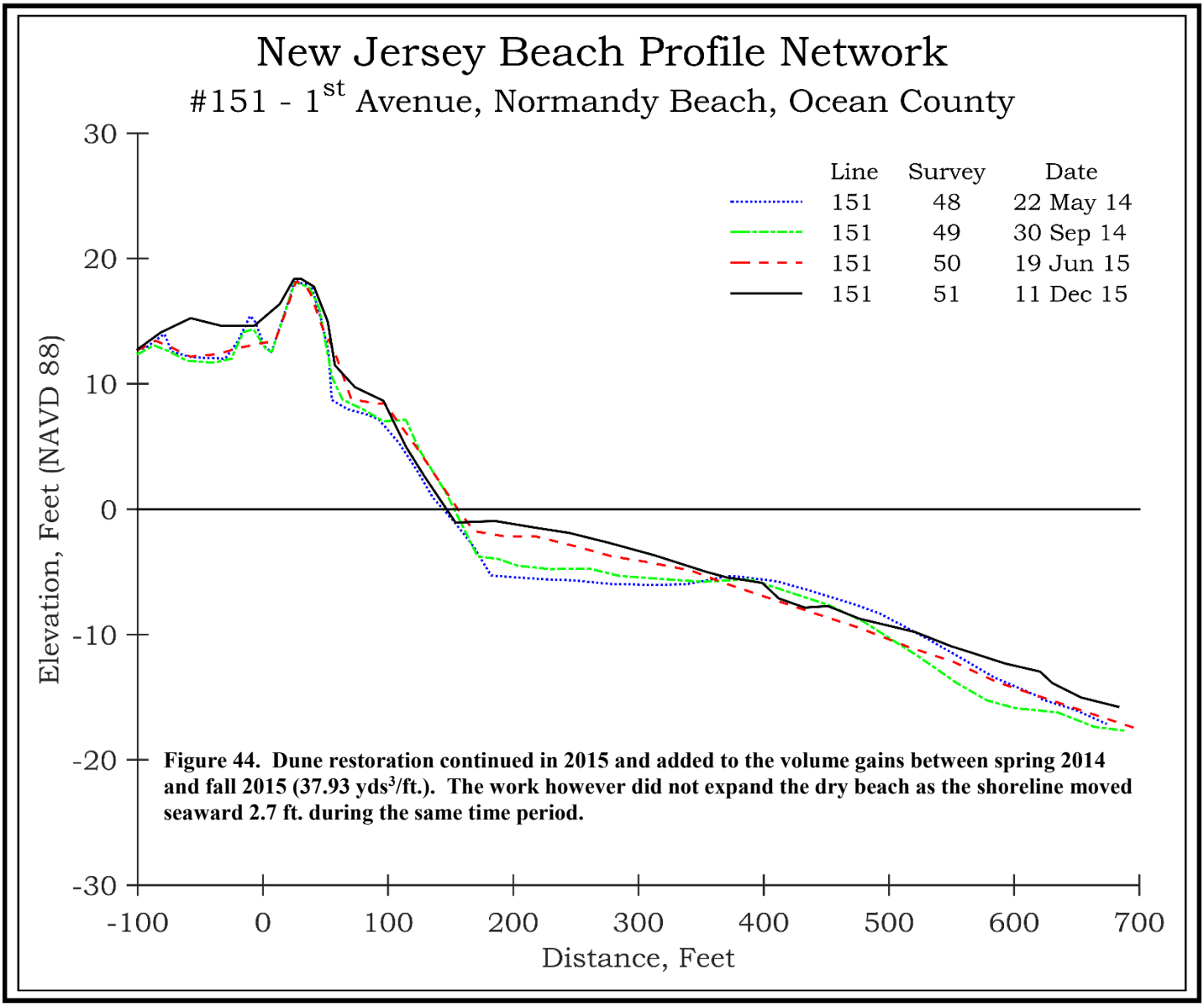


Figure 44. Dune restoration continued in 2015 and added to the volume gains between spring 2014 and fall 2015 (37.93 yds^3/ft.). The work however did not expand the dry beach as the shoreline moved seaward 2.7 ft. during the same time period.

NJBPN 150 – White Avenue, Lavallette

At the Lavallete site, the photos (left taken September 30, 2014) and right (taken December 11, 2015) show the condition of the dune that was created by pushing sand against the boardwalk following Hurricane Sandy. Some sand accumulated at the seaward base of the dune after the June 2015 survey.

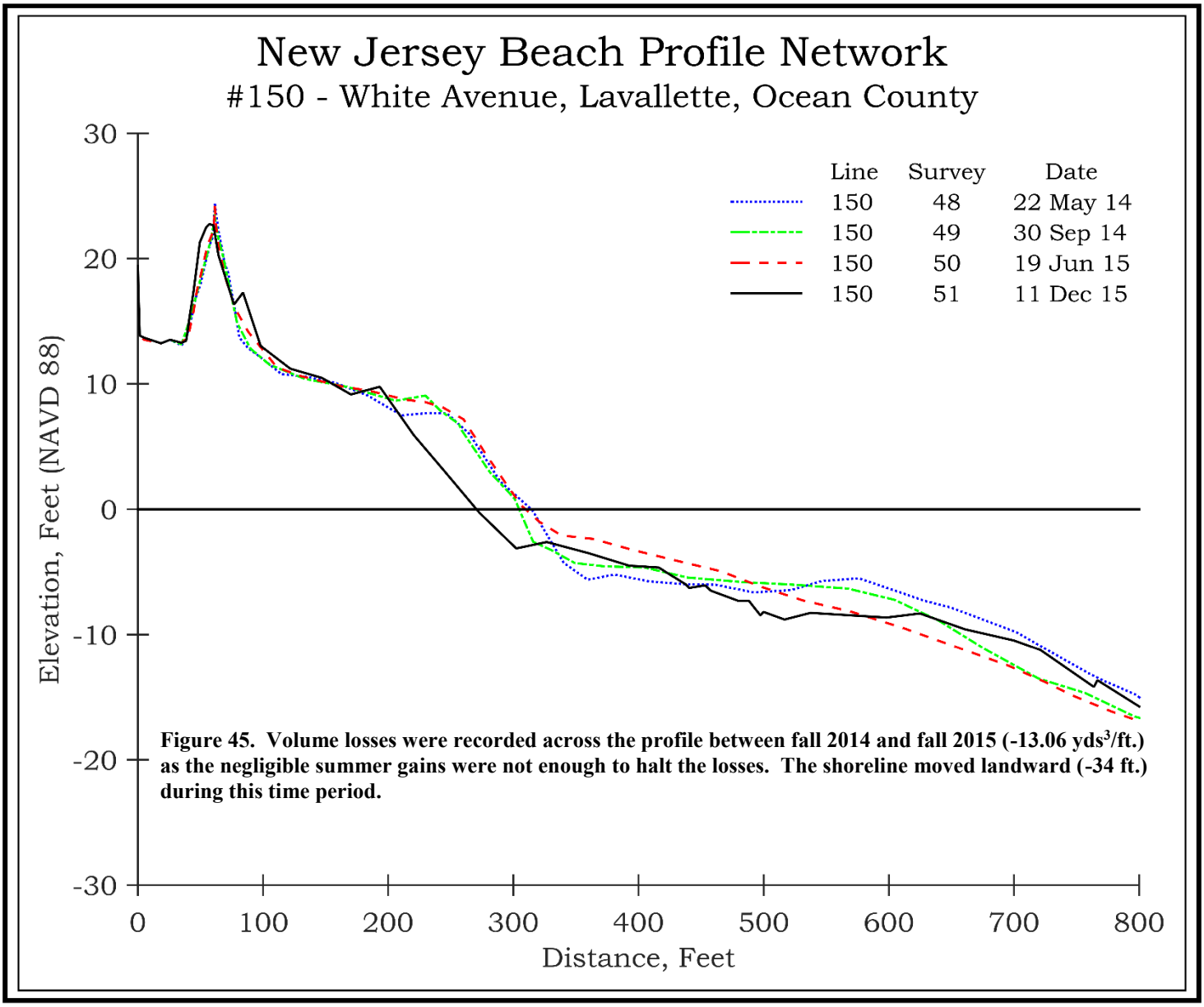
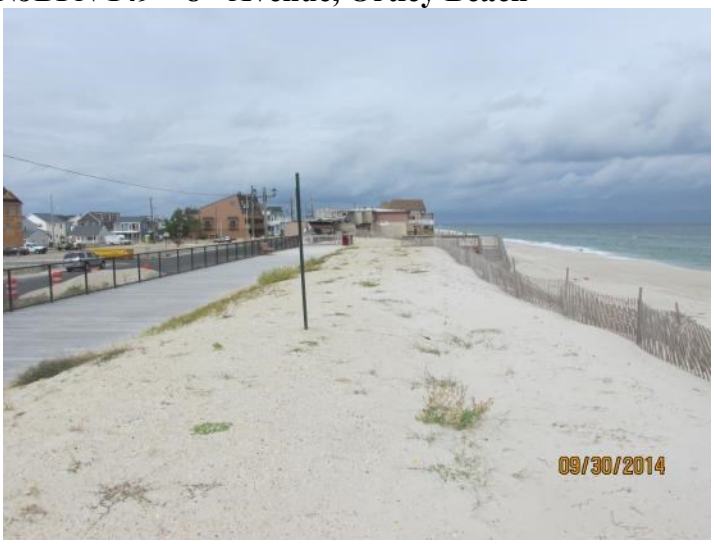


Figure 45. Volume losses were recorded across the profile between fall 2014 and fall 2015 (-13.06 yds^3/ft.) as the negligible summer gains were not enough to halt the losses. The shoreline moved landward (-34 ft.) during this time period.

NJBPN 149 – 8th Avenue, Ortley Beach



By November 2013 the restored boardwalk was moved landward of its original position (about 25 feet) and a new dune was created using recovered sand but was not planted with vegetation by the 2014 survey (September 30, 2014) but completed by the December 11, 2015 (on right) .

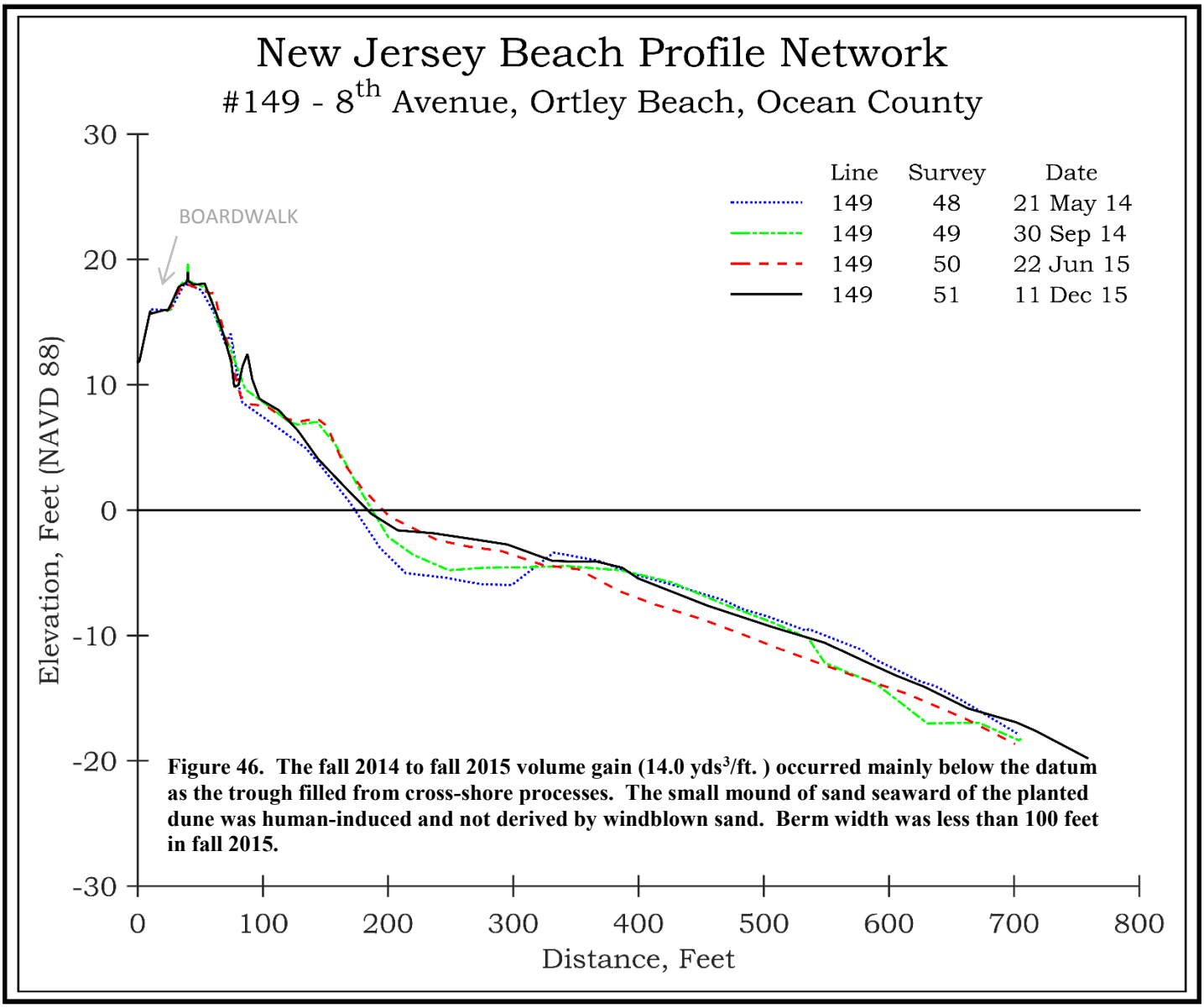


Figure 46. The fall 2014 to fall 2015 volume gain (14.0 yds^3/ft.) occurred mainly below the datum as the trough filled from cross-shore processes. The small mound of sand seaward of the planted dune was human-induced and not derived by windblown sand. Berm width was less than 100 feet in fall 2015.

NJBPN 248 – Franklin Avenue, Seaside Heights

The two annual photos at the Franklin Avenue site show a nearly identical backshore elevation (left taken November 14, 2014 and right photo taken December 12, 2015). However, the 2015 photo does not show the deep runnel feature that is apparent in the profile cross section below.

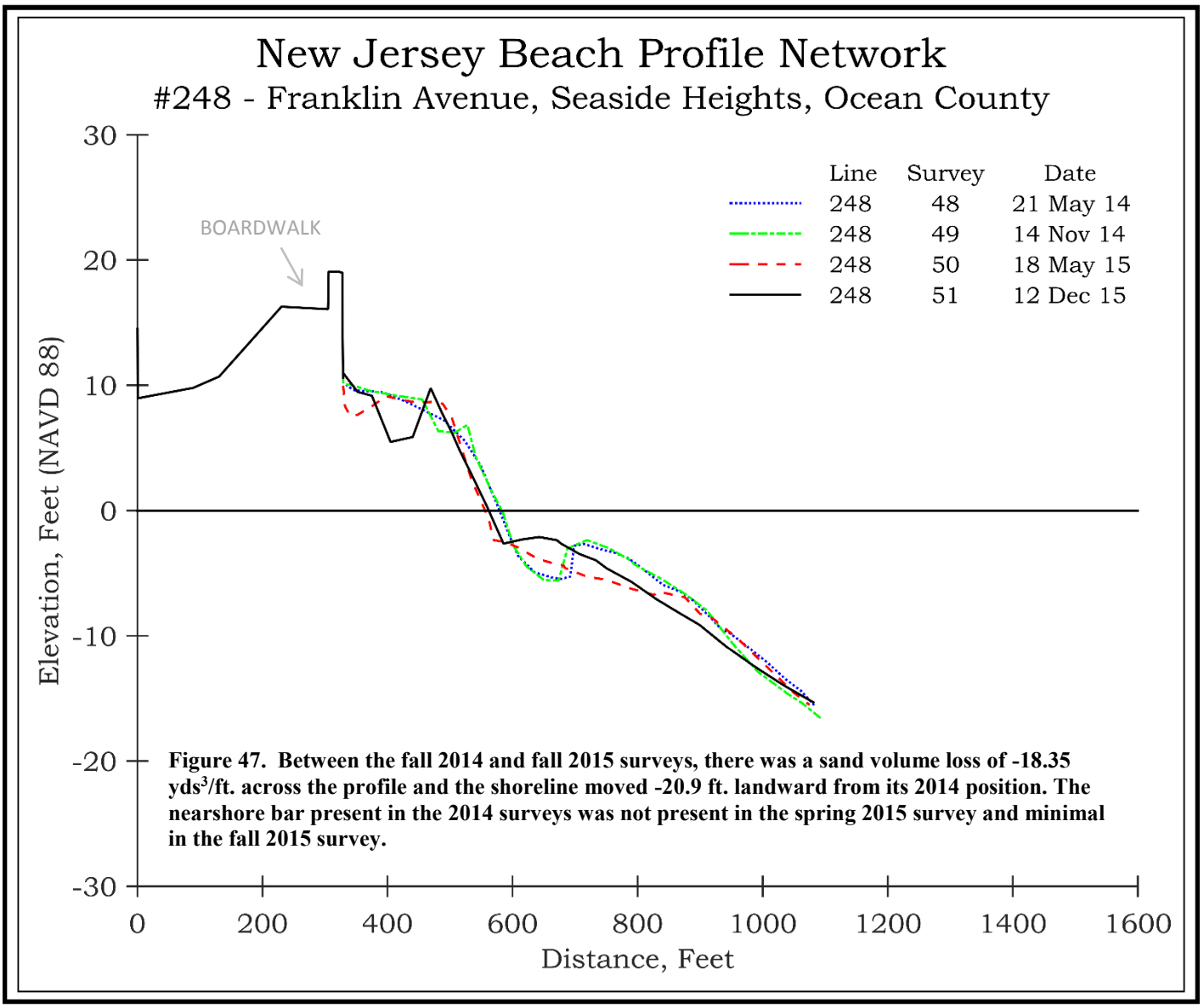


Figure 47. Between the fall 2014 and fall 2015 surveys, there was a sand volume loss of -18.35 yds^3/ft. across the profile and the shoreline moved -20.9 ft. landward from its 2014 position. The nearshore bar present in the 2014 surveys was not present in the spring 2015 survey and minimal in the fall 2015 survey.

NJBPN 148 – 4th Avenue, Seaside Park

The photo on the left (taken November 14, 2014) shows the beach has remained constant from its 2013 state with some minor growth in the dune. The right photo (taken December 7, 2015) shows sand accumulating on the landward side of the seaward-most dune fence.

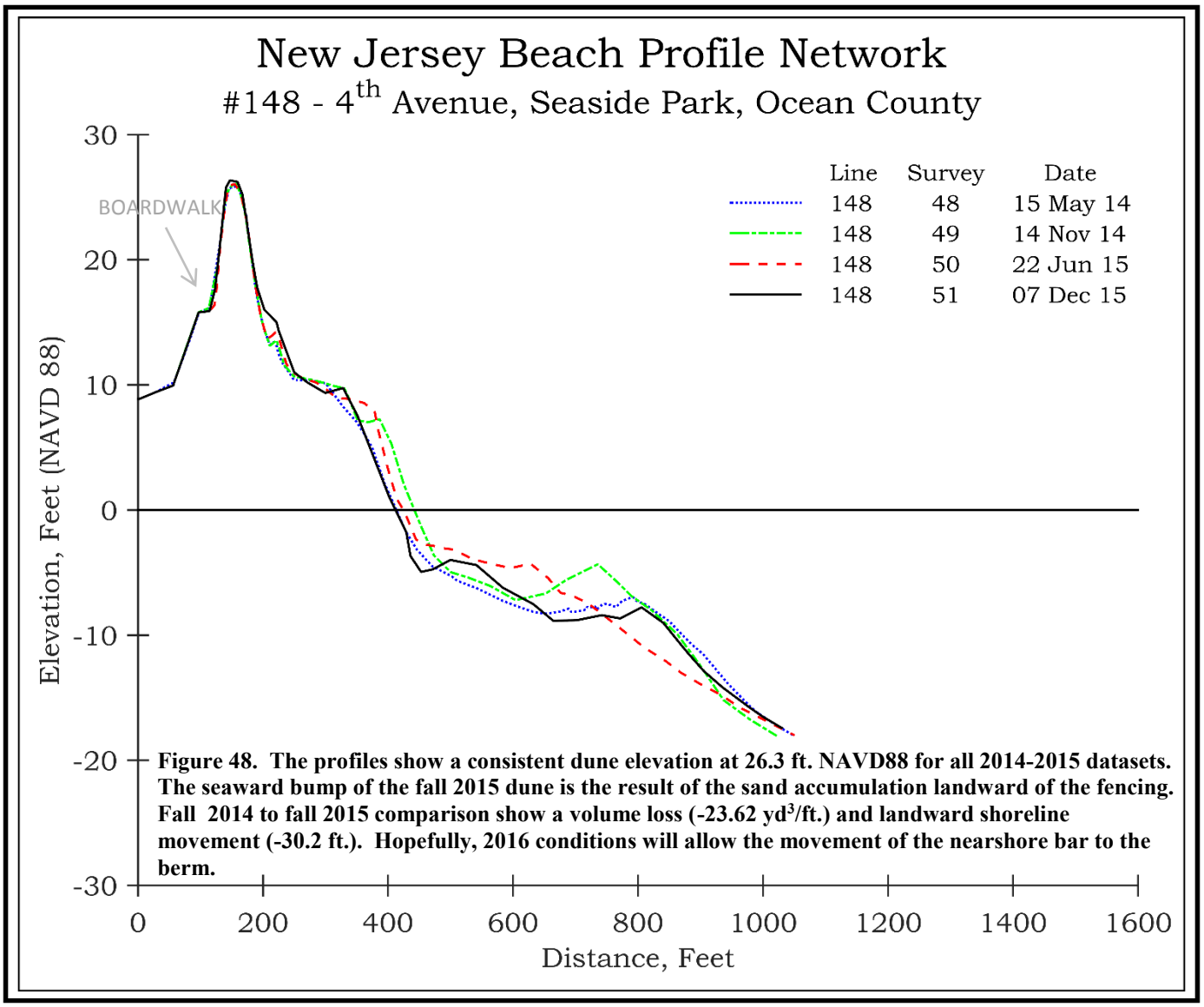
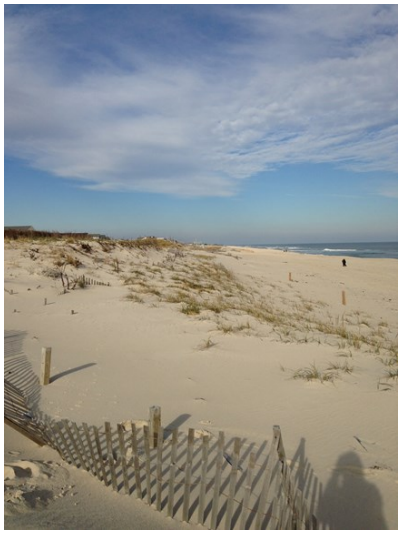


Figure 48. The profiles show a consistent dune elevation at 26.3 ft. NAVD88 for all 2014-2015 datasets. The seaward bump of the fall 2015 dune is the result of the sand accumulation landward of the fencing. Fall 2014 to fall 2015 comparison show a volume loss (-23.62 yd^3/ft.) and landward shoreline movement (-30.2 ft.). Hopefully, 2016 conditions will allow the movement of the nearshore bar to the berm.

NJBPN 347 (originally 147) – 6th Lane, Midway Beach



At the 6th Lane location, both photos (left taken November 14, 2014 and right taken December 7, 2015) show the characteristics of the foredune. Expansion of this feature continued into 2015. The shoreline position moved landward (-4.35 ft.) during this time period. The dry beach remained at nearly 200 feet wide for both surveys.

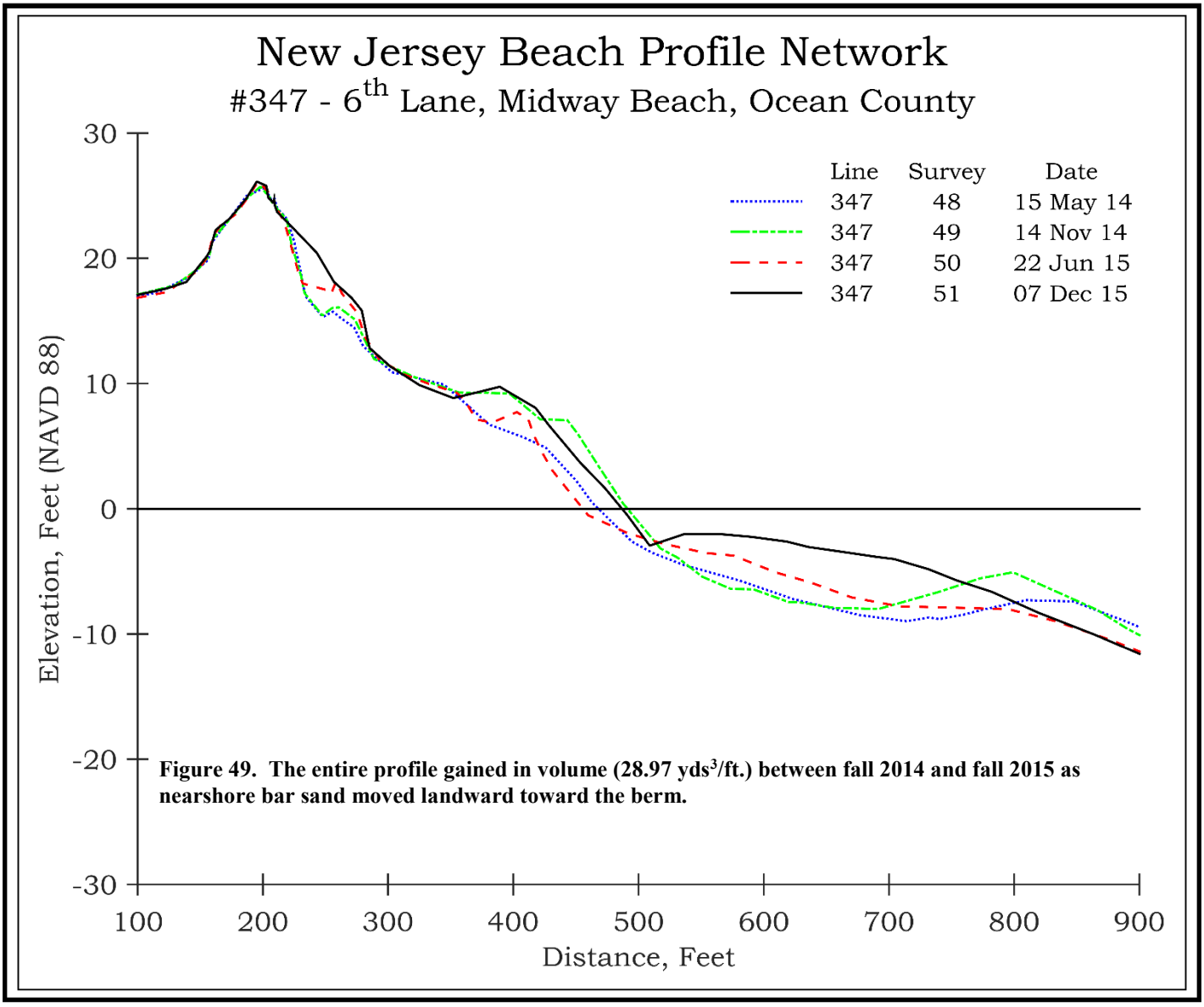


Figure 49. The entire profile gained in volume (28.97 yds^3/ft.) between fall 2014 and fall 2015 as nearshore bar sand moved landward toward the berm.

NJBPN 247 – North End, Island Beach State Park

The left photo (taken November 20, 2014) shows the scarp in the dune system that was generated during Hurricane Sandy. By 2015 (right photo taken December 7, 2015) a modest natural accumulation of sand on the seaward slope was found along sporadic sections of the dune scarp.

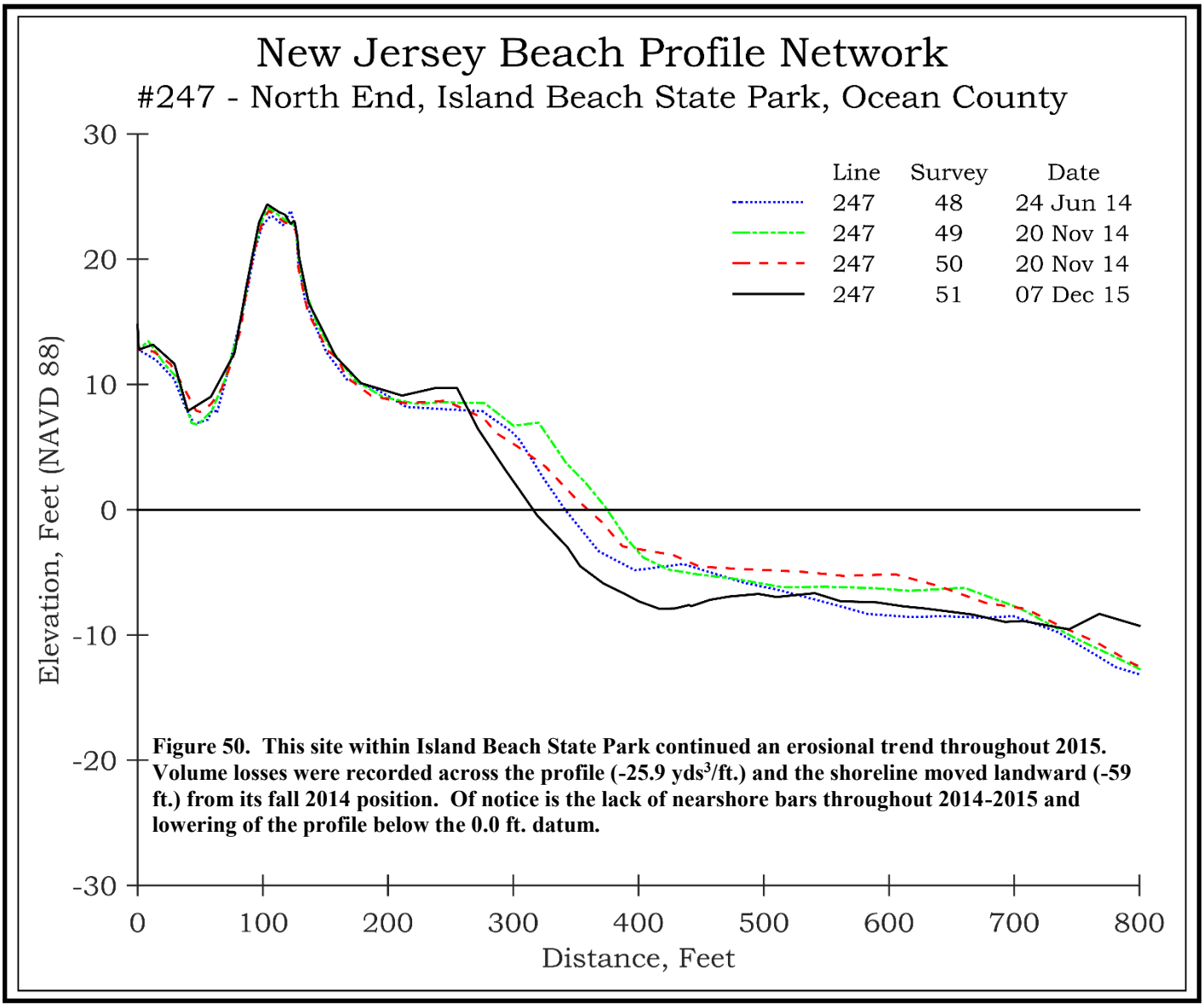


Figure 50. This site within Island Beach State Park continued an erosional trend throughout 2015. Volume losses were recorded across the profile (-25.9 yds^3/ft.) and the shoreline moved landward (-59 ft.) from its fall 2014 position. Of notice is the lack of nearshore bars throughout 2014-2015 and lowering of the profile below the 0.0 ft. datum.

NJBPN 246 – Parking Lot A7, Island Beach State Park

The photos (left November 20, 2014 and right December 7, 2015) that were taken at this Island Beach State Park location show the condition of the dune via sand fencing and natural recovery. The dunes here are lower than at the other two sites within the park, but the dune field is nearly 200 feet wide.

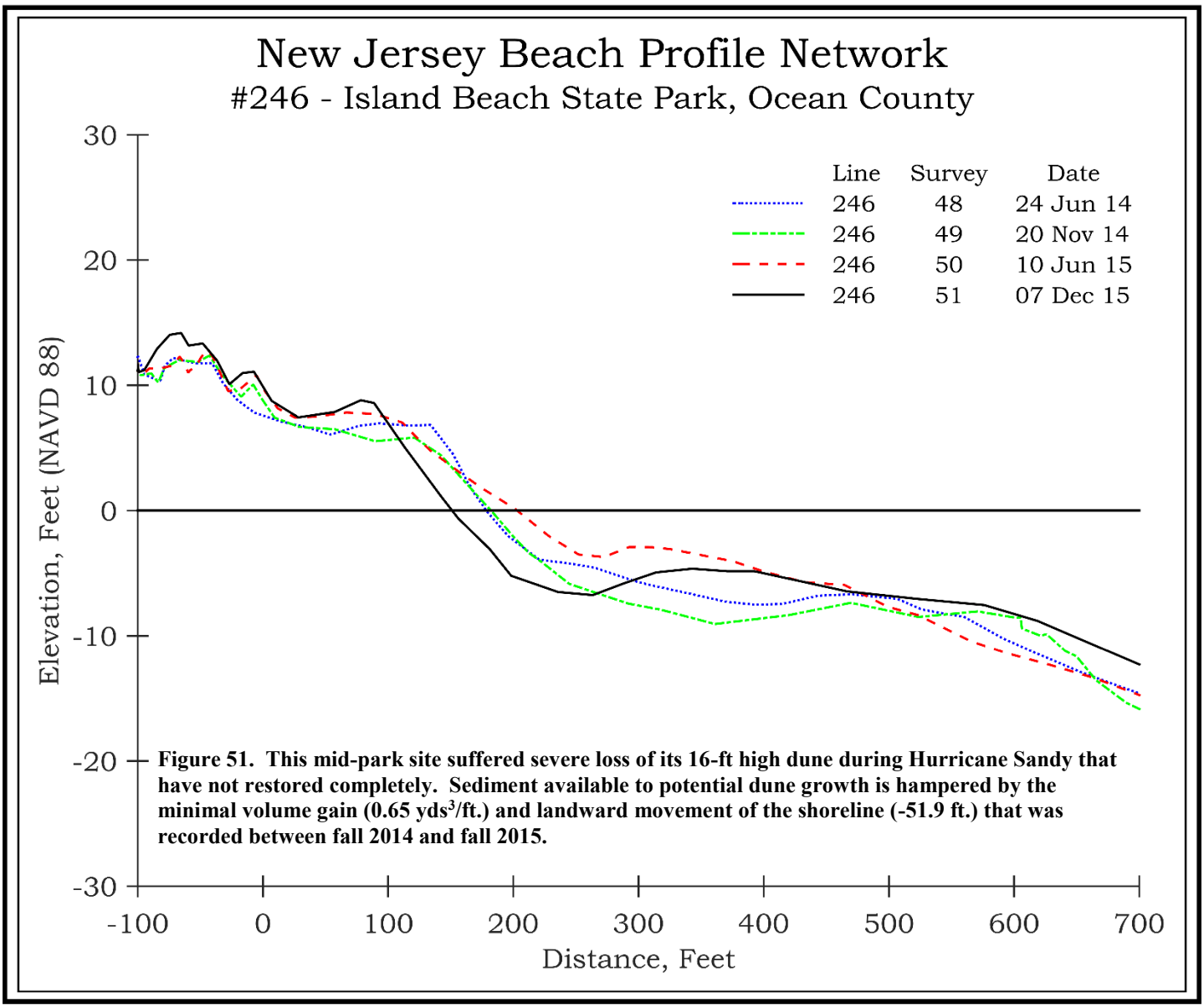


Figure 51. This mid-park site suffered severe loss of its 16-ft high dune during Hurricane Sandy that have not restored completely. Sediment available to potential dune growth is hampered by the minimal volume gain (0.65 yds^3/ft.) and landward movement of the shoreline (-51.9 ft.) that was recorded between fall 2014 and fall 2015.

NJBPN 146 – South End, Island Beach State Park

This site within the state protected area is less than a mile from the north Barnegat Inlet jetty. Both photos (left taken November 20, 2014 and right taken December 7, 2015) show the scarped dune and a wide dry beach. Here, as in the other Island Beach State Park locations, natural recovery of the dune has not restored the dune field to pre-Hurricane Sandy conditions.

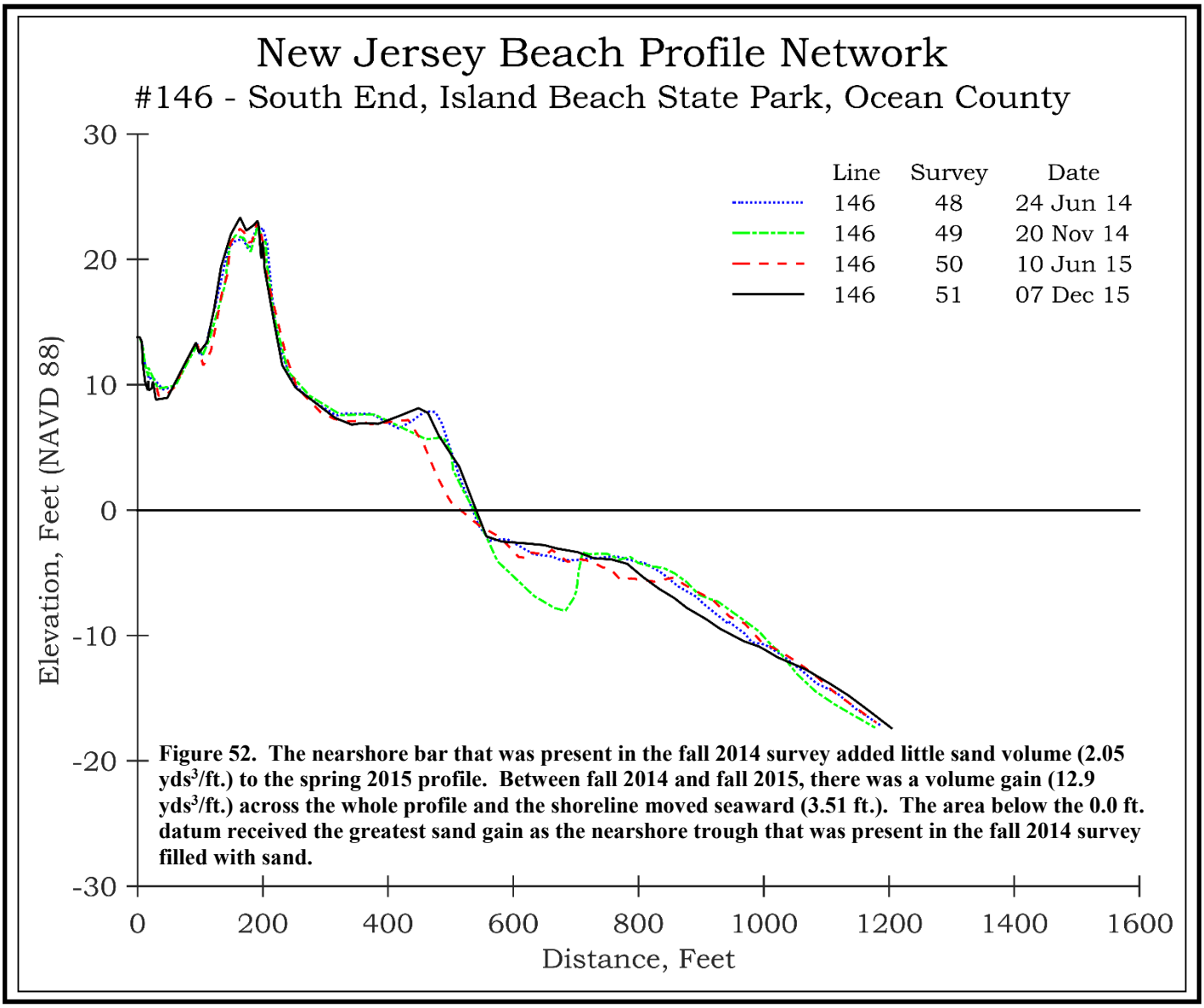


Figure 52. The nearshore bar that was present in the fall 2014 survey added little sand volume (2.05 yds^3/ft.) to the spring 2015 profile. Between fall 2014 and fall 2015, there was a volume gain (12.9 yds^3/ft.) across the whole profile and the shoreline moved seaward (3.51 ft.). The area below the 0.0 ft. datum received the greatest sand gain as the nearshore trough that was present in the fall 2014 survey filled with sand.

NJBPN 245 – 10th Street, Barnegat Light

This site is located approximately 1500 feet south of the Barnegat Inlet south jetty and was established to monitor the changes at the inlet. Both photos (left taken November 12, 2014 and right taken September 2, 2015) show healthy dune vegetation nearly three years after Hurricane Sandy.

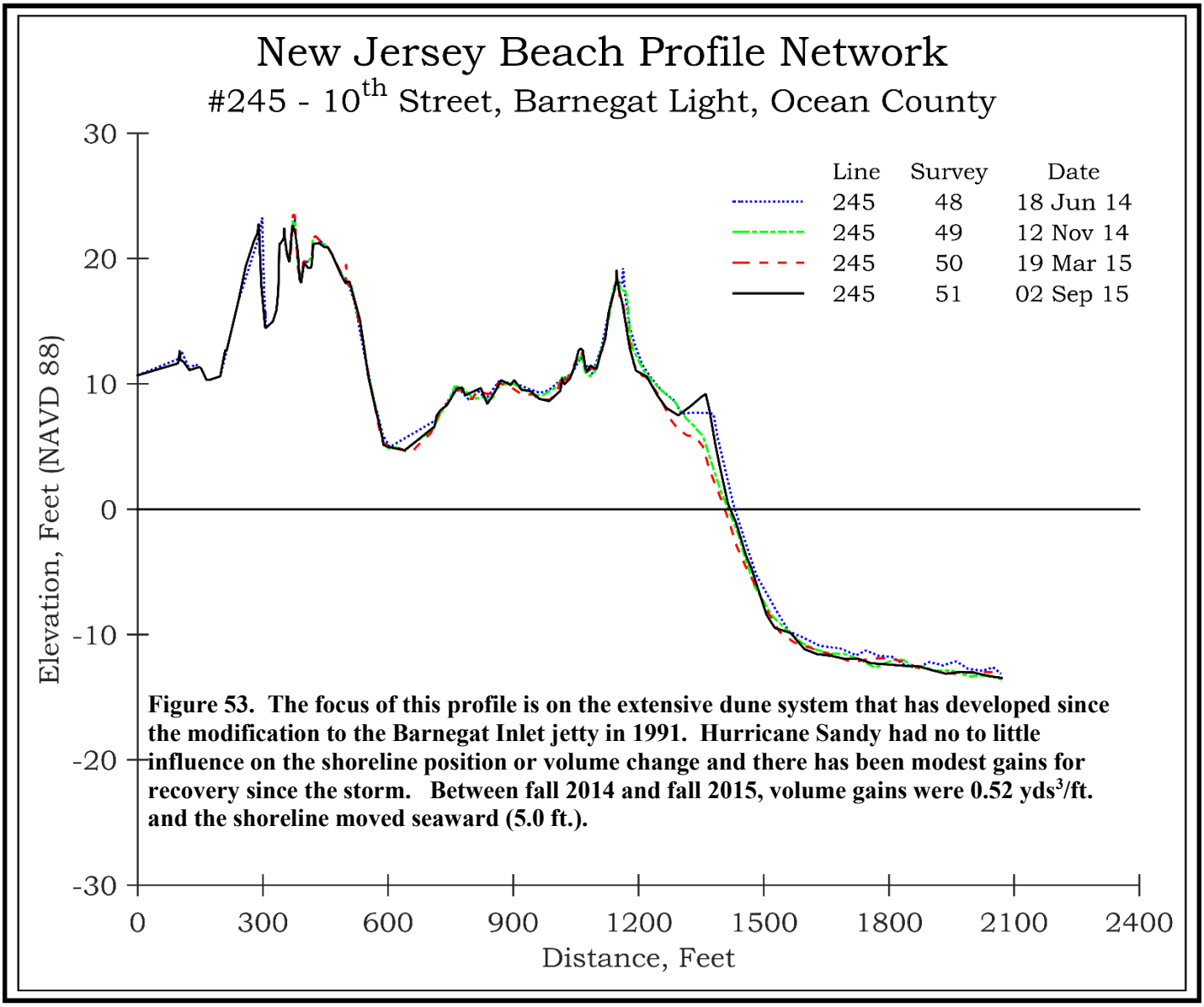


Figure 53. The focus of this profile is on the extensive dune system that has developed since the modification to the Barnegat Inlet jetty in 1991. Hurricane Sandy had no to little influence on the shoreline position or volume change and there has been modest gains for recovery since the storm. Between fall 2014 and fall 2015, volume gains were 0.52 yds^3/ft. and the shoreline moved seaward (5.0 ft.).

NJBPN 145 – 26th Street, Barnegat Light

The profile at 26th Street consists of a wide, high dune system that is sparsely vegetated but stable (left photo taken November 12, 2014 and right photo taken September 2, 2015). The stability is attributed to the profile's position with respect to the Barnegat Inlet south jetty which traps the northward-driven littoral drift.

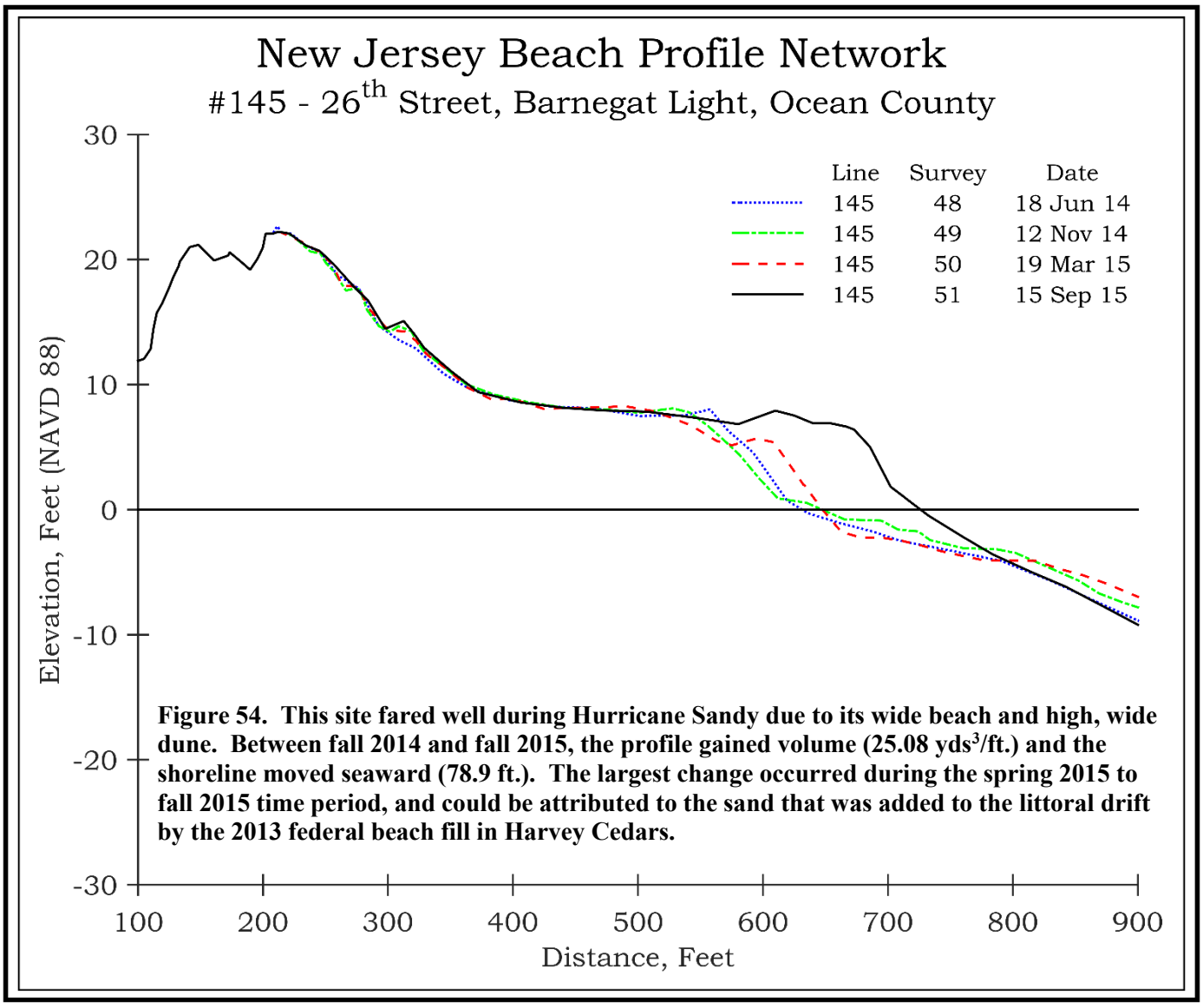


Figure 54. This site fared well during Hurricane Sandy due to its wide beach and high, wide dune. Between fall 2014 and fall 2015, the profile gained volume (25.08 yds^3/ft.) and the shoreline moved seaward (78.9 ft.). The largest change occurred during the spring 2015 to fall 2015 time period, and could be attributed to the sand that was added to the littoral drift by the 2013 federal beach fill in Harvey Cedars.

NJBPN 144 – La Baia Street, Loveladies

The La Baia Street site is not included in the federal beach fill but has had modest gains in volume and shoreline position throughout 2014 and 2015. Both photos (left taken November 12, 2014 and right taken September 15, 2015) show a 100+ ft wide berm. An enhanced dune would provide greater storm protection to shorefront properties.

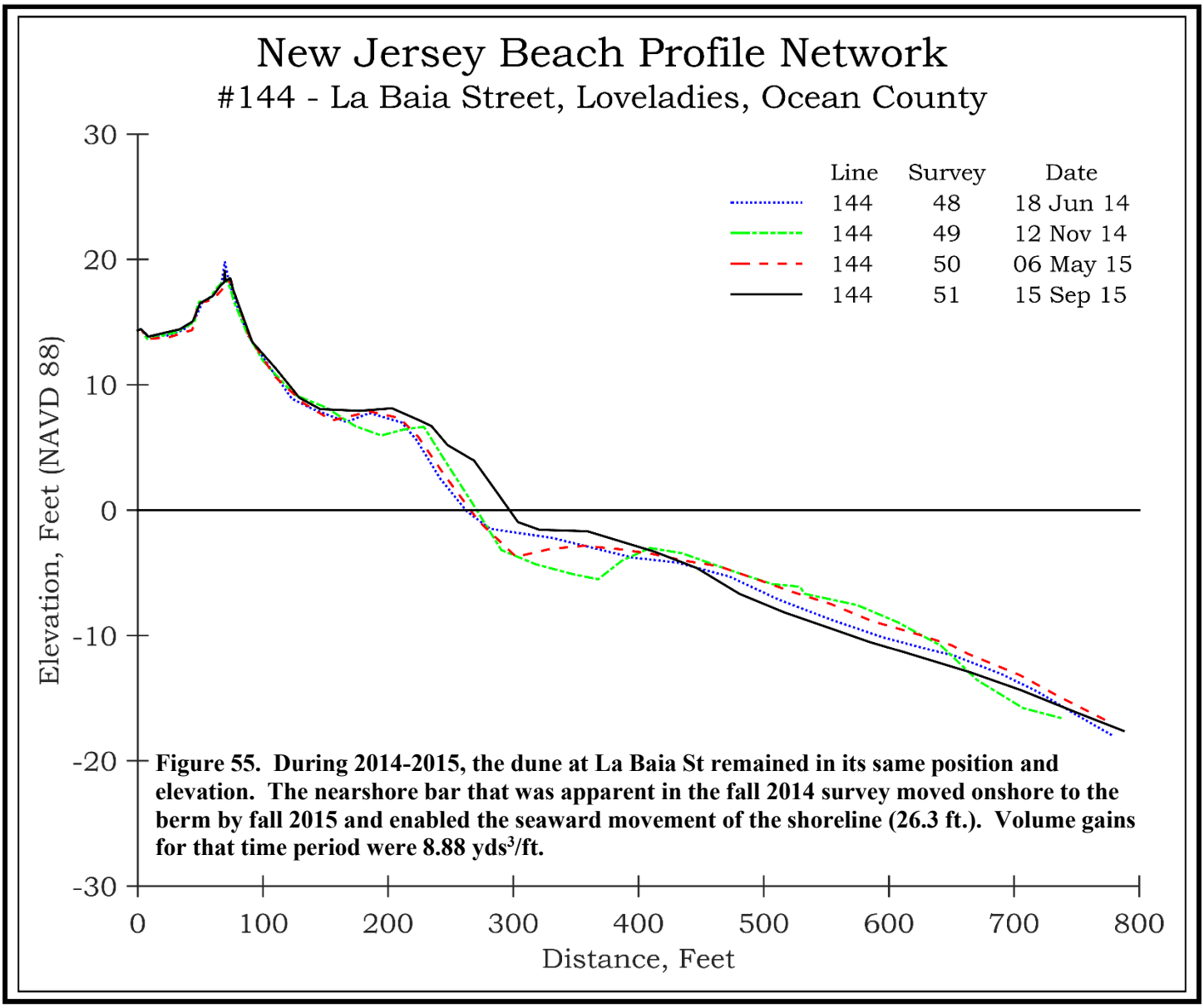


Figure 55. During 2014-2015, the dune at La Baia St remained in its same position and elevation. The nearshore bar that was apparent in the fall 2014 survey moved onshore to the berm by fall 2015 and enabled the seaward movement of the shoreline (26.3 ft.). Volume gains for that time period were 8.88 yds^3/ft.

NJBPN 143 – 73rd Street, Harvey Cedars

The photos (left taken November 13, 2014 and right taken September 15, 2015) show the dune condition at 73rd Street. This site received sand from the 2013 USACE emergency beach nourishment project for sections of Long Beach Island.

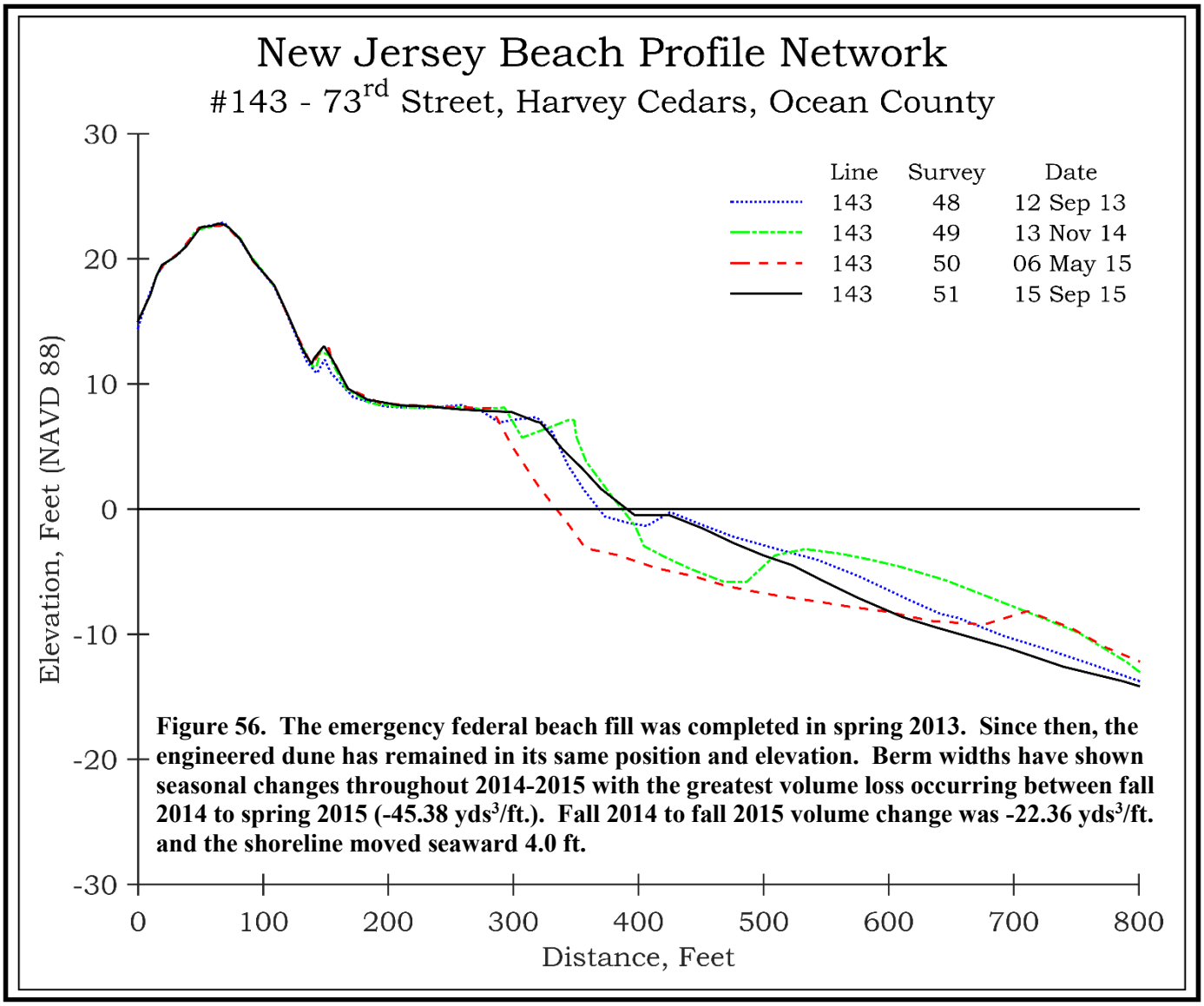


Figure 56. The emergency federal beach fill was completed in spring 2013. Since then, the engineered dune has remained in its same position and elevation. Berm widths have shown seasonal changes throughout 2014-2015 with the greatest volume loss occurring between fall 2014 to spring 2015 (-45.38 yds^3/ft.). Fall 2014 to fall 2015 volume change was -22.36 yds^3/ft. and the shoreline moved seaward 4.0 ft.

NJBPN 142 – Tranquility Drive, Harvey Cedars

The photos (left taken November 13, 2014 and right taken September 16, 2015) show the nearly unchanged condition of the engineered dune at Tranquility Drive. This site was included in the emergency federal beach nourishment project that was completed in spring 2013.

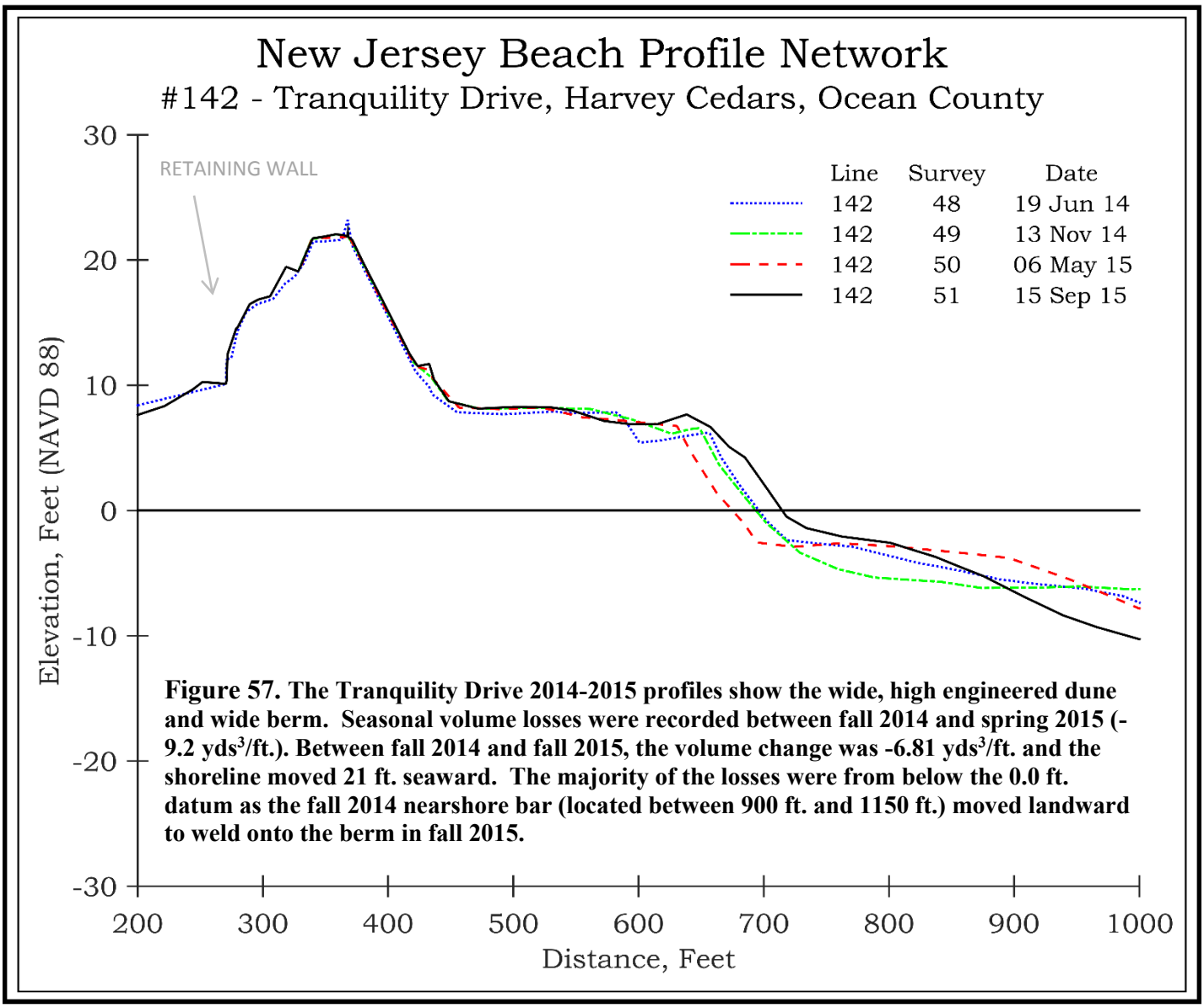


Figure 57. The Tranquility Drive 2014-2015 profiles show the wide, high engineered dune and wide berm. Seasonal volume losses were recorded between fall 2014 and spring 2015 (-9.2 yds^3/ft.). Between fall 2014 and fall 2015, the volume change was -6.81 yds^3/ft. and the shoreline moved 21 ft. seaward. The majority of the losses were from below the 0.0 ft. datum as the fall 2014 nearshore bar (located between 900 ft. and 1150 ft.) moved landward to weld onto the berm in fall 2015.

NJBPN 241 – 20th Street – Surf City

The photographs above were taken on November 13, 2014 (left) and September 15, 2015 (right). Both images show the view of 20th Street access path over the engineered dune with the view to the southeast. This site was restored to design conditions in September 2013 through the emergency federal beach fill efforts.

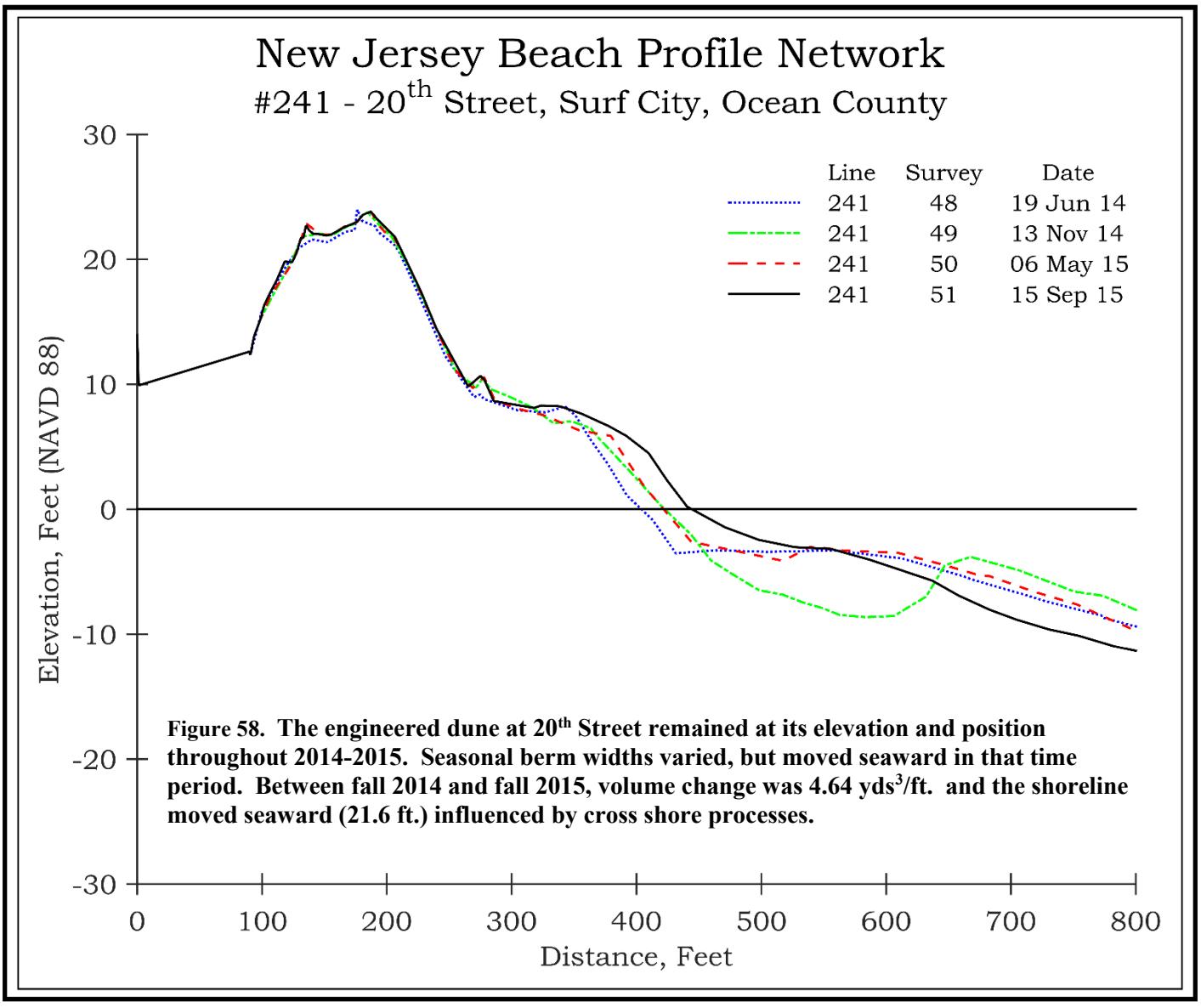


Figure 58. The engineered dune at 20th Street remained at its elevation and position throughout 2014-2015. Seasonal berm widths varied, but moved seaward in that time period. Between fall 2014 and fall 2015, volume change was 4.64 yds^3/ft. and the shoreline moved seaward (21.6 ft.) influenced by cross shore processes.

NJBPN 141 – 8th Street, Ship Bottom

The photos of the 8th Street location (left taken October 15, 2014 and right taken December 15, 2015) show the seaward base of the dune before and after the federal beach fill which was completed in spring 2015.

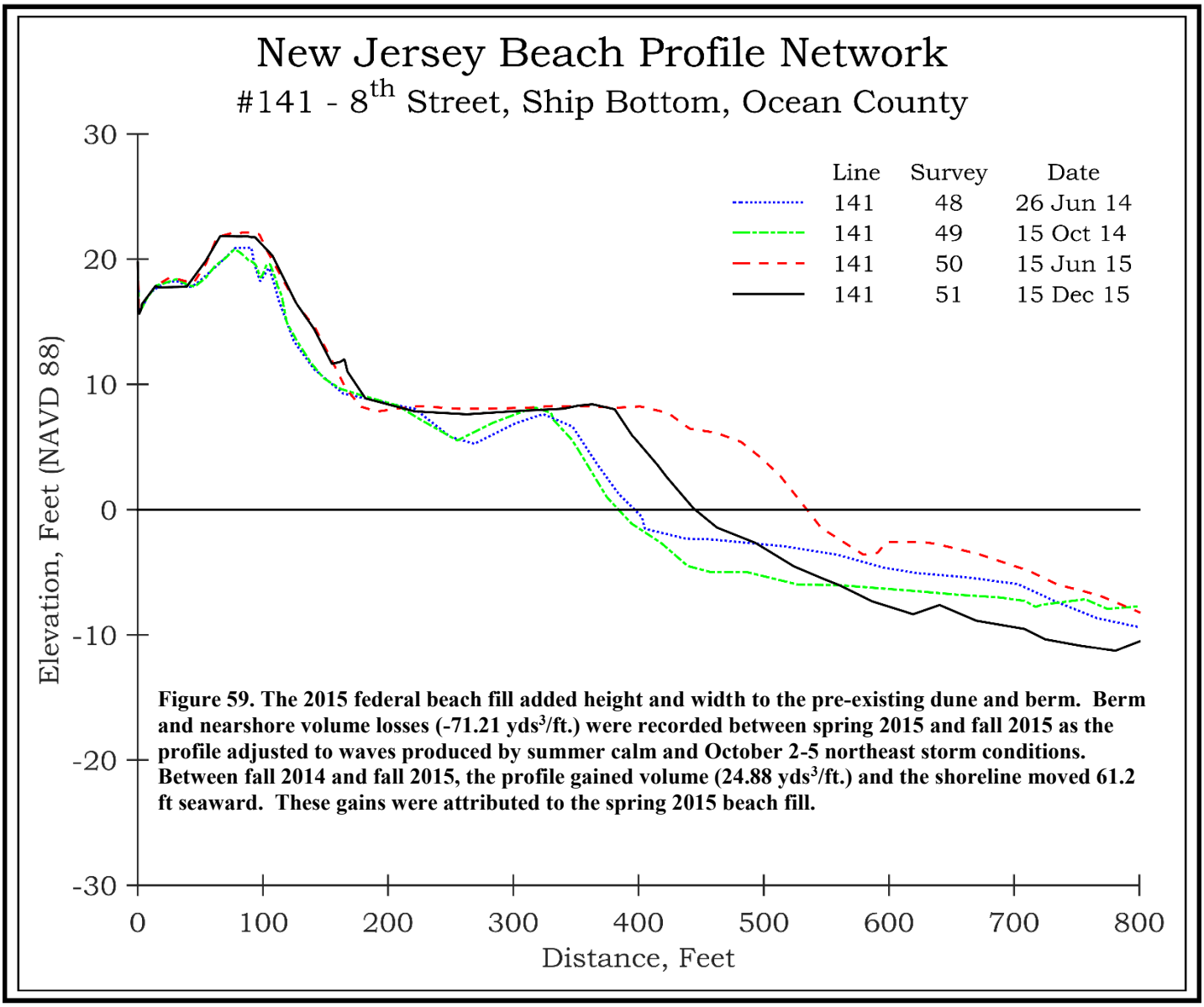


Figure 59. The 2015 federal beach fill added height and width to the pre-existing dune and berm. Berm and nearshore volume losses (-71.21 yds^3/ft.) were recorded between spring 2015 and fall 2015 as the profile adjusted to waves produced by summer calm and October 2-5 northeast storm conditions. Between fall 2014 and fall 2015, the profile gained volume (24.88 yds^3/ft.) and the shoreline moved 61.2 ft seaward. These gains were attributed to the spring 2015 beach fill.

NJBPN 140 – 32nd Street, Long Beach Township

The 32nd Street location was the recipient of emergency federal beach fill in summer 2015 to restore the damages incurred from Hurricane Sandy. The photos (left taken October 17, 2014 and right taken September 2, 2015) show the condition of the engineered dune which remained in its position and elevation during 2014-2015.

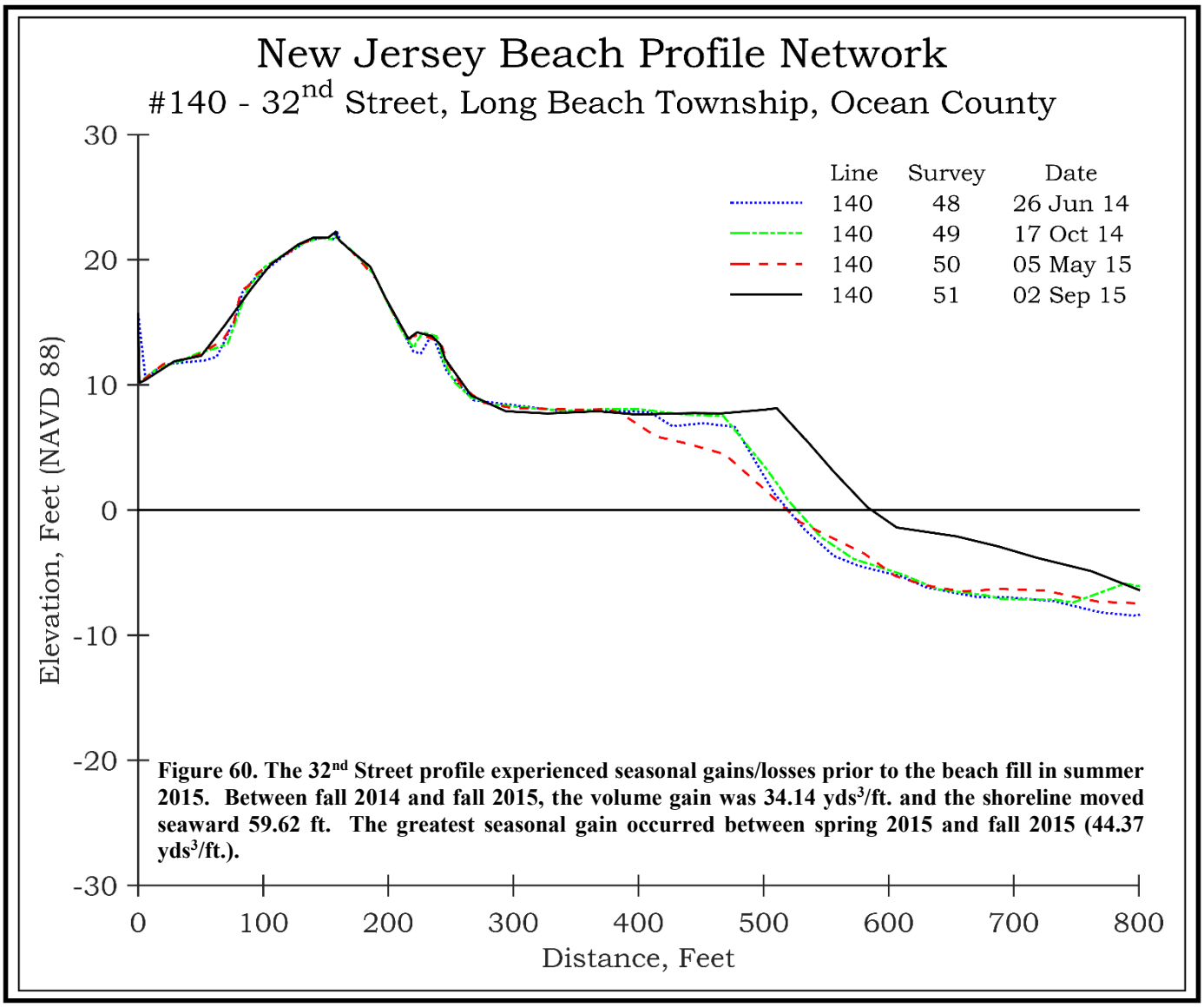


Figure 60. The 32nd Street profile experienced seasonal gains/losses prior to the beach fill in summer 2015. Between fall 2014 and fall 2015, the volume gain was 34.14 yds^3/ft. and the shoreline moved seaward 59.62 ft. The greatest seasonal gain occurred between spring 2015 and fall 2015 (44.37 yds^3/ft.).

NJBPN 139 – 81st Street, Long Beach Township

The 81st Street location was the recipient of its first federal beach fill in summer 2015. The photos (left taken October 17, 2014 and right taken December 15, 2015) show the dune conditions before and after the nourishment project. Both views were taken from the dune crest.

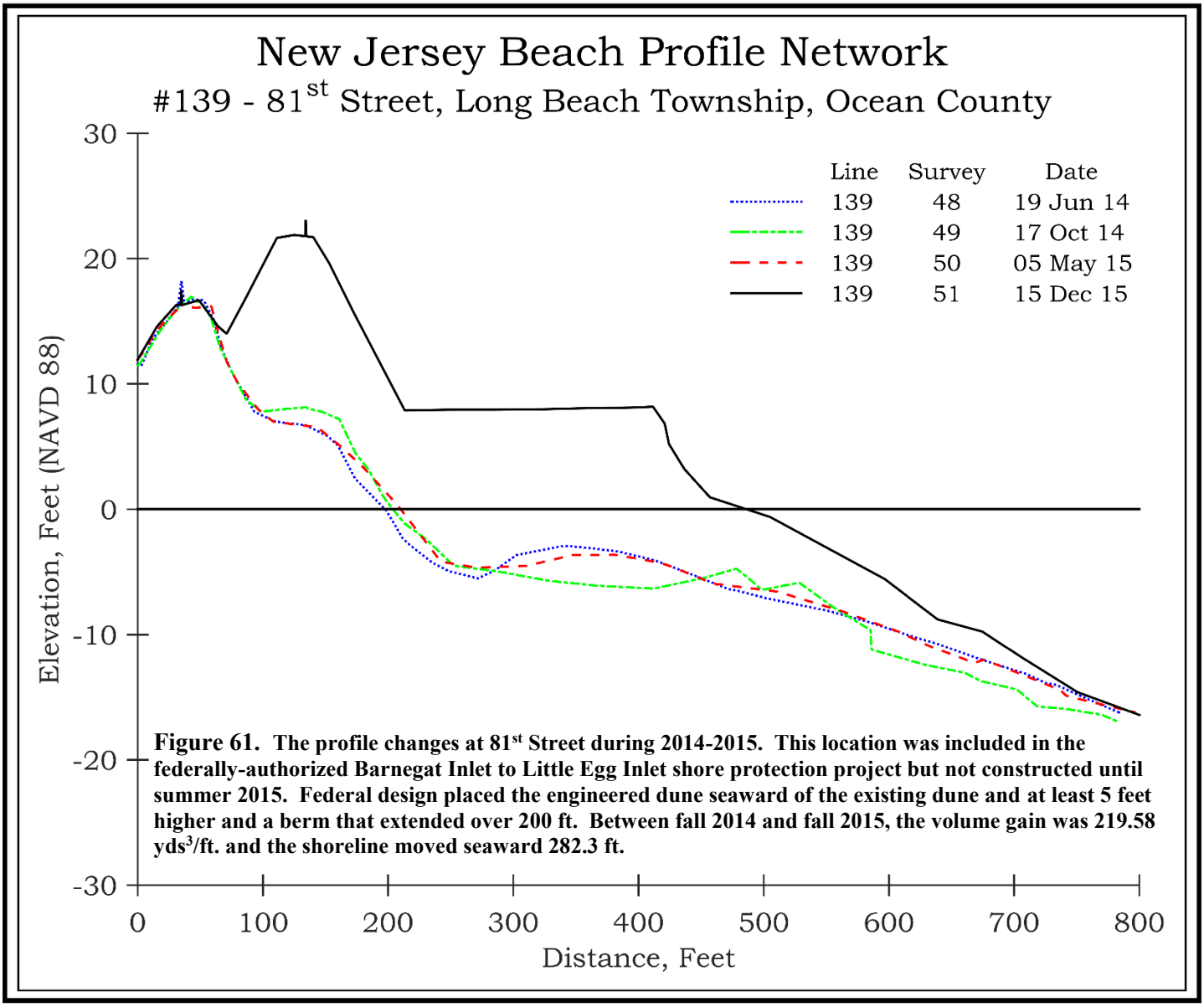


Figure 61. The profile changes at 81st Street during 2014-2015. This location was included in the federally-authorized Barnegat Inlet to Little Egg Inlet shore protection project but not constructed until summer 2015. Federal design placed the engineered dune seaward of the existing dune and at least 5 feet higher and a berm that extended over 200 ft. Between fall 2014 and fall 2015, the volume gain was 219.58 yds^3/ft. and the shoreline moved seaward 282.3 ft.

NJBPN 138 – Old Whaling Road (124th Street), Long Beach Township

The 124th Street location was included in the emergency federal beach fill in 2015. The photos (left taken October 17, 2014 before the fill and right taken December 15, 2015 after project completion) show the view from the dune crest. The pre-project dune height was greater than 20 ft NAVD88 and was an important component in limiting the effects of Hurricane Sandy on shorefront properties.

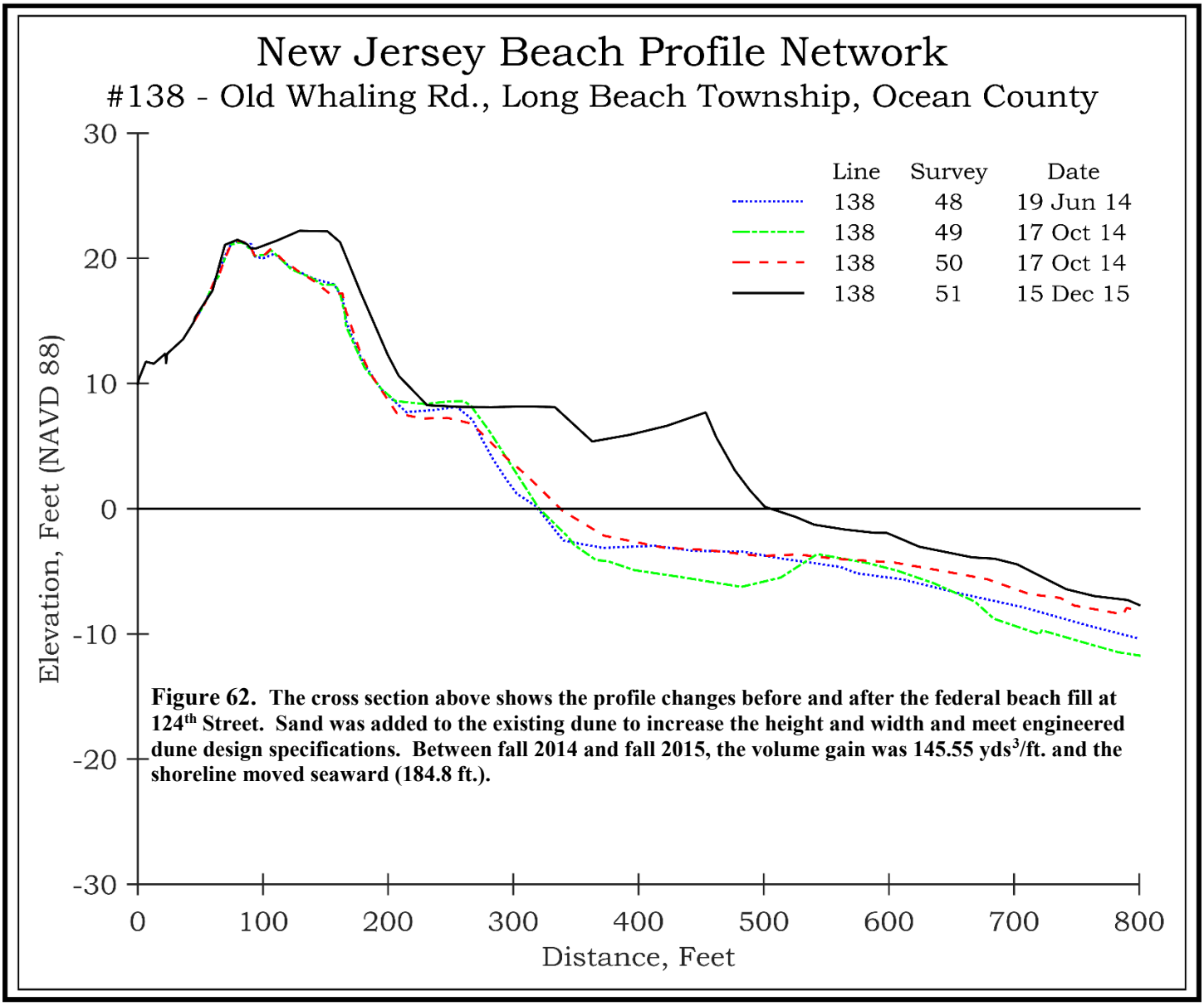


Figure 62. The cross section above shows the profile changes before and after the federal beach fill at 124th Street. Sand was added to the existing dune to increase the height and width and meet engineered dune design specifications. Between fall 2014 and fall 2015, the volume gain was 145.55 yds^3/ft. and the shoreline moved seaward (184.8 ft.).

NJBPN 137 – Taylor Avenue, Beach Haven

The photos from the Taylor Avenue location were taken from the dune crest (left taken October 31, 2014 and right taken December 15, 2015). This site is scheduled for federal beach nourishment, but the project had not reached here by the fall 2015 survey. During Hurricane Sandy, this site lost a substantial amount of the dune. Post-storm efforts restored the dune using recovered overwashed sands.

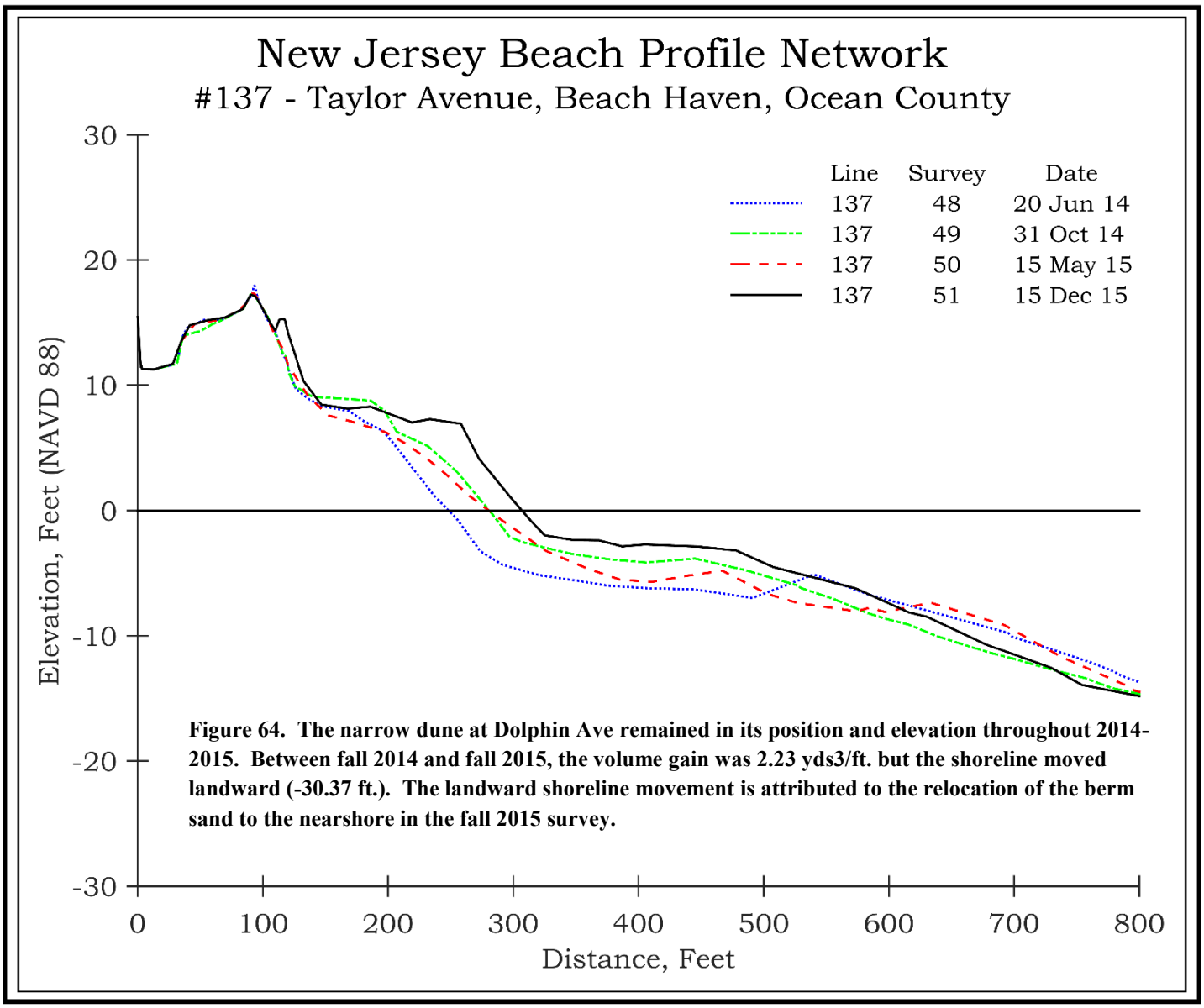
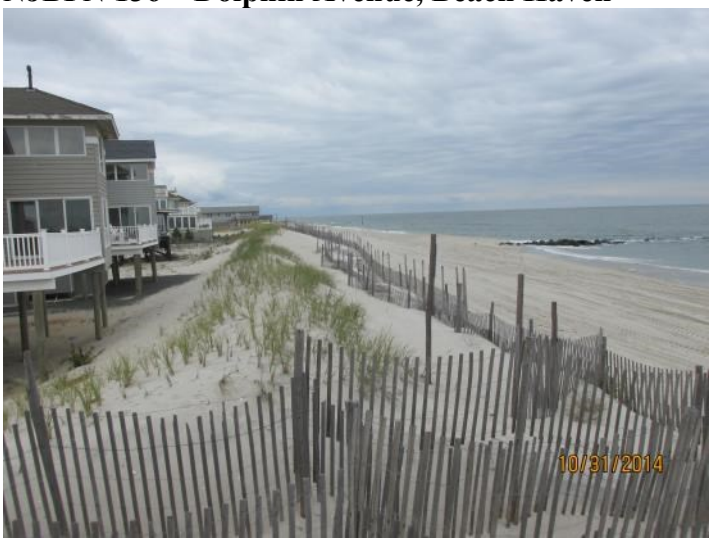


Figure 64. The narrow dune at Dolphin Ave remained in its position and elevation throughout 2014-2015. Between fall 2014 and fall 2015, the volume gain was 2.23 yds3/ft. but the shoreline moved landward (-30.37 ft.). The landward shoreline movement is attributed to the relocation of the berm sand to the nearshore in the fall 2015 survey.

NJBPN 136 – Dolphin Avenue, Beach Haven



The Dolphin Avenue dune was completely eroded away during Hurricane Sandy. The photos (left taken October 31, 2014 and right photo taken December 15, 2015). Both images show the condition of the dune from the dune crest. The lost dune was replaced by a smaller feature using sand hauled back to the beach from inland deposits.

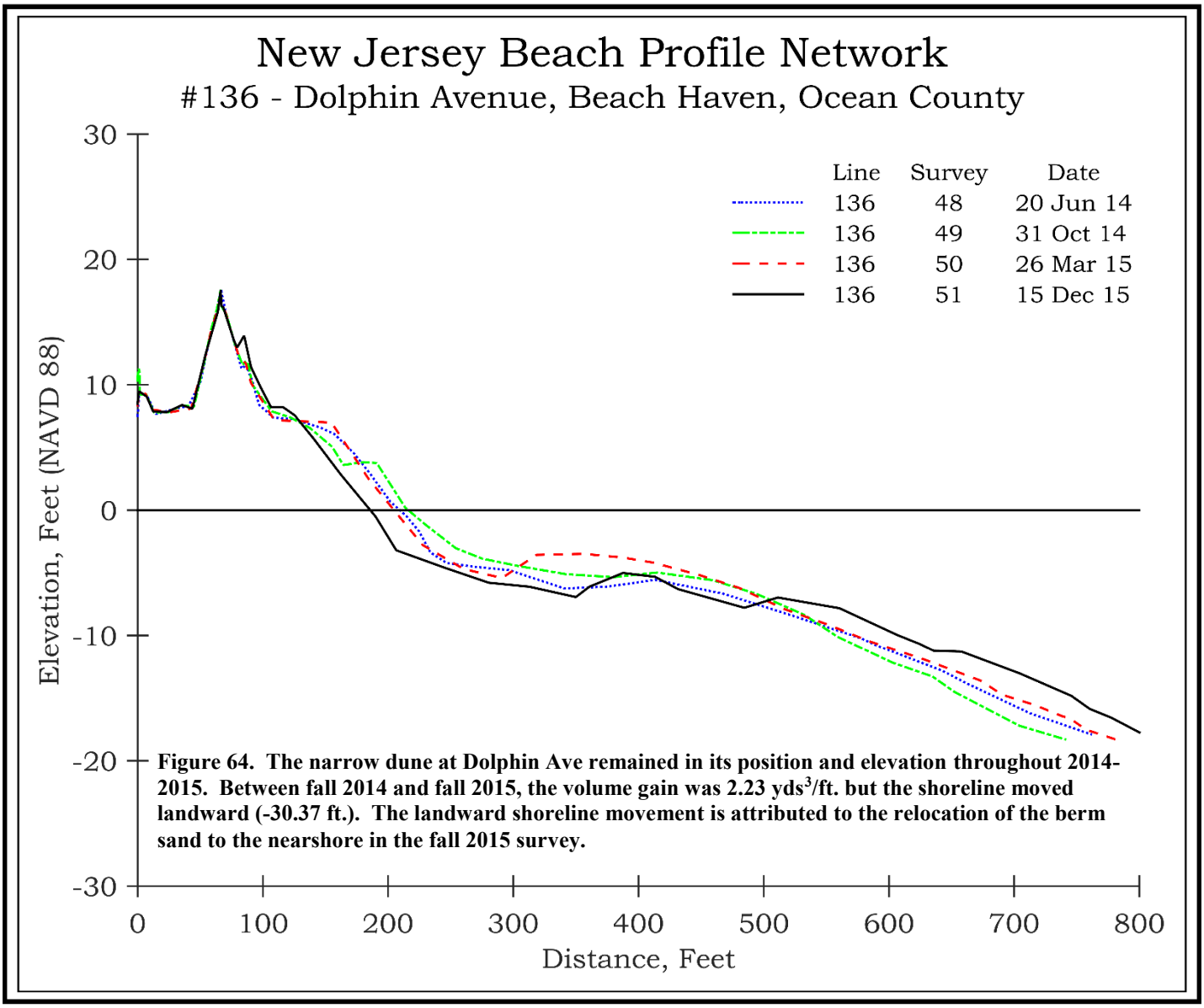
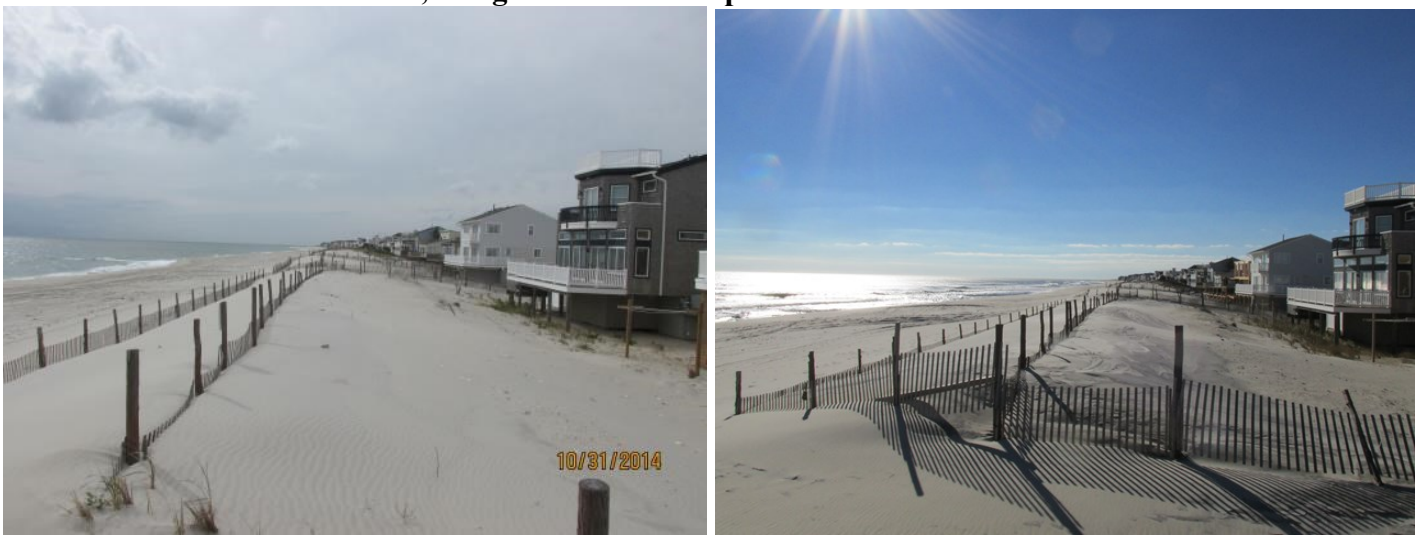


Figure 64. The narrow dune at Dolphin Ave remained in its position and elevation throughout 2014-2015. Between fall 2014 and fall 2015, the volume gain was 2.23 yds^3/ft. but the shoreline moved landward (-30.37 ft.). The landward shoreline movement is attributed to the relocation of the berm sand to the nearshore in the fall 2015 survey.

NJBPN 135 – Webster Avenue, Long Beach Township



The Webster Avenue photos were taken from the crest of the restored dune (left taken October 31, 2014 and right taken December 15, 2015). The dune was restored to its original position and elevation in 2013 and has remained consistent throughout 2014-2015.

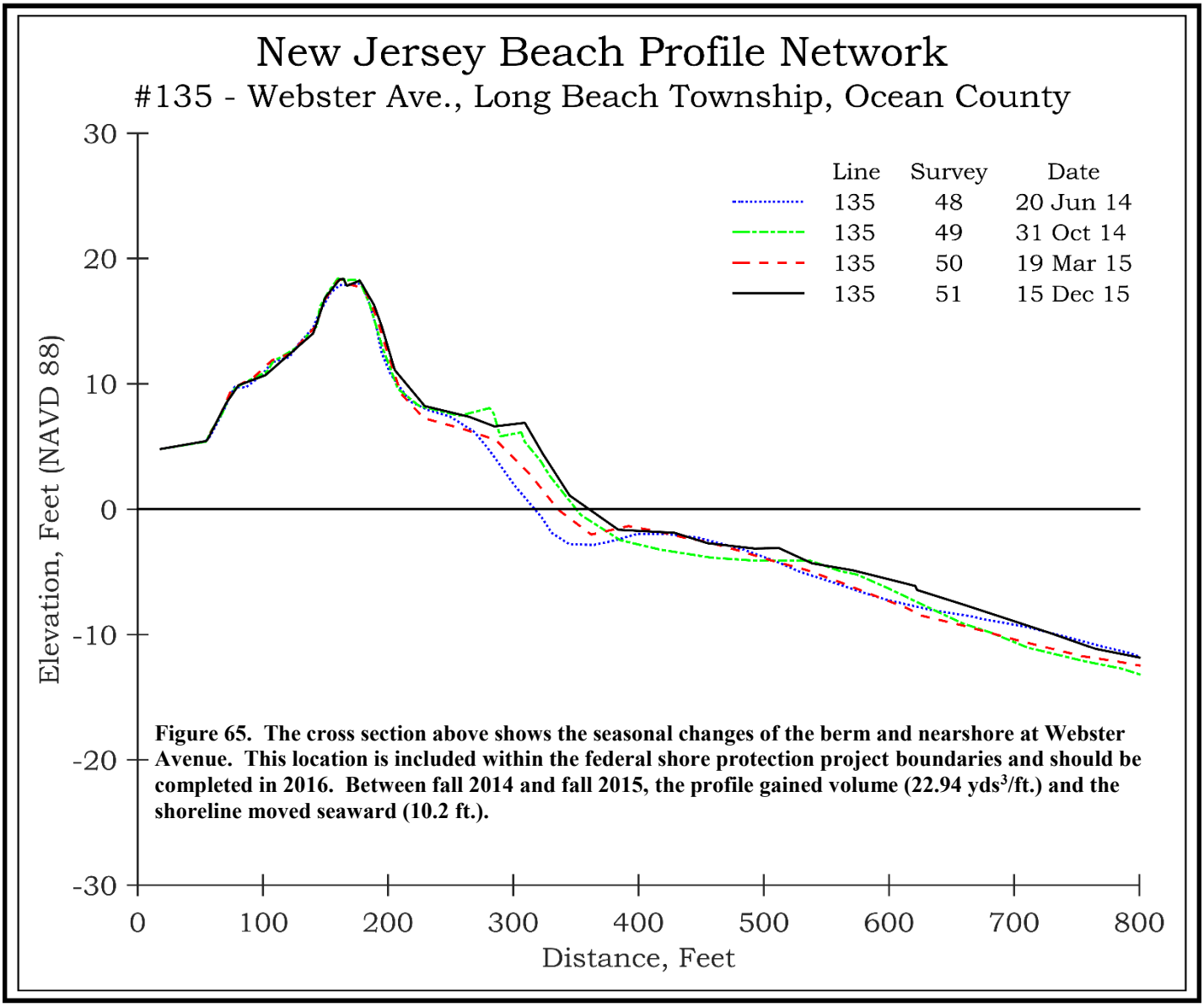
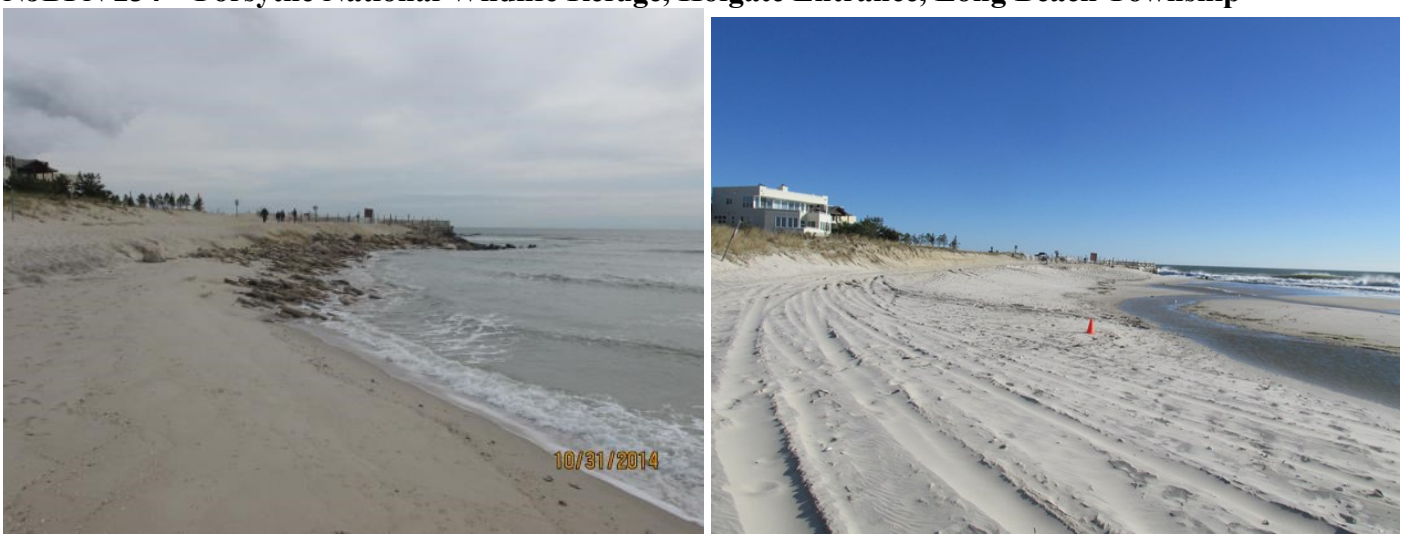


Figure 65. The cross section above shows the seasonal changes of the berm and nearshore at Webster Avenue. This location is included within the federal shore protection project boundaries and should be completed in 2016. Between fall 2014 and fall 2015, the profile gained volume (22.94 yds^3/ft.) and the shoreline moved seaward (10.2 ft.).

NJBPN 234 – Forsythe National Wildlife Refuge, Holgate Entrance, Long Beach Township



The Holgate Unit photos (left taken October 31, 2014 and right taken December 15, 2015) show the changing conditions of the berm and surf zone. This site is immediately south of the Long Beach Island terminal groin which influences the amount of sand that is available to this downdrift beach. The profile was completely overwashed during Hurricane Sandy.

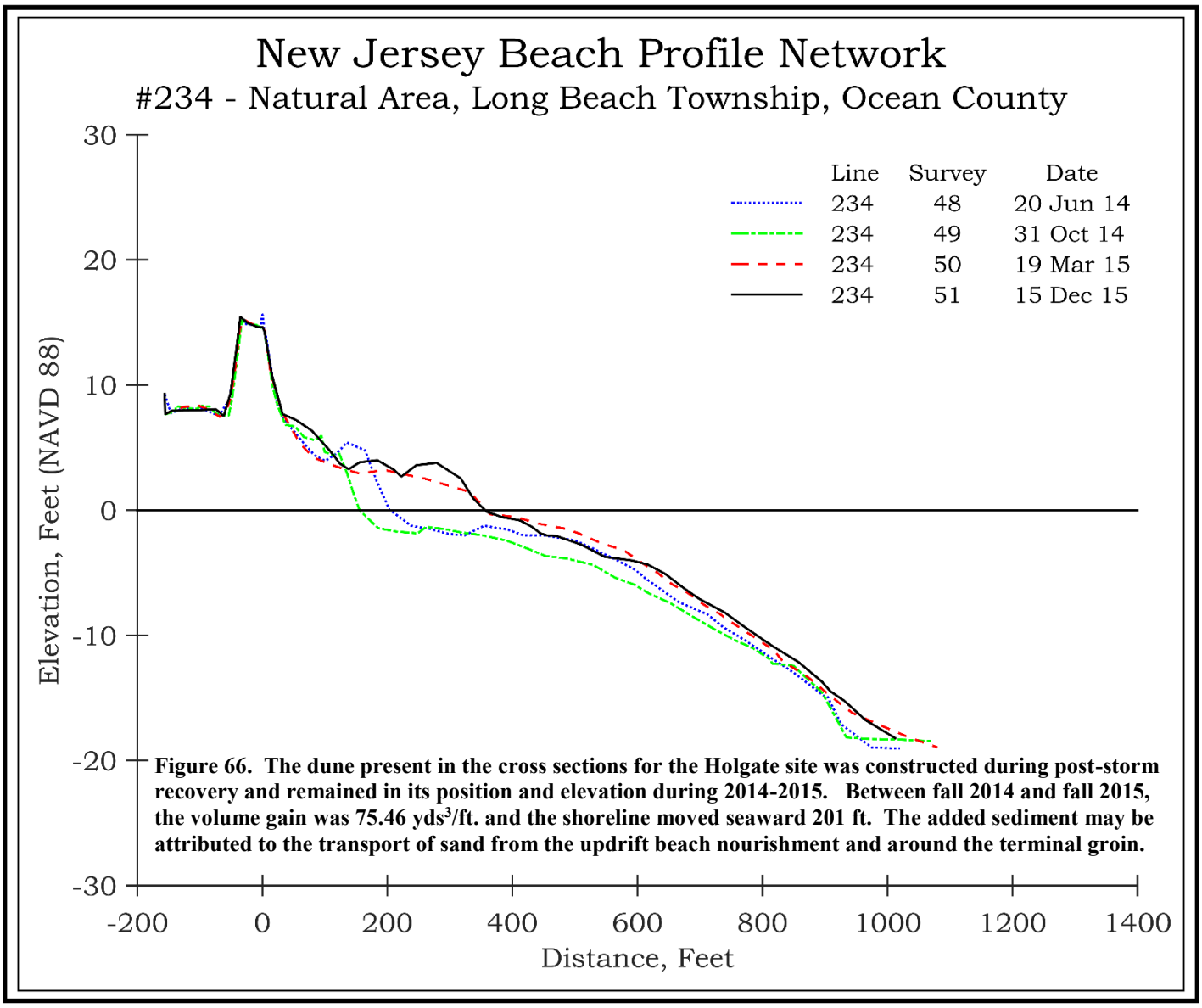


Figure 66. The dune present in the cross sections for the Holgate site was constructed during post-storm recovery and remained in its position and elevation during 2014-2015. Between fall 2014 and fall 2015, the volume gain was 75.46 yds^3/ft. and the shoreline moved seaward 201 ft. The added sediment may be attributed to the transport of sand from the updrift beach nourishment and around the terminal groin.

Summary & Conclusions

The beach conditions have continued to perform differently in Ocean County than those seen in Monmouth County where the New York District Corps of Engineers brought 21 miles of that County's shoreline back to design conditions. The differential continued into 2015 emphasized where the USACE continued working on the LBI segment of the shore protection project, but no work was attempted in Northern Ocean County. The right two columns show percentage of beach/dune loss recovered to elevation zero (NAVD88) and the change in shoreline position (the elevation zero point on each cross section). The percentages come from the observed beach volume lost during Sandy (column 2) together with the shoreline retreat (column 3). The survey prior to Hurricane Sandy was used as the baseline for columns 4, 5 and 6. The USACE project locations completed by December 2015 are highlighted in orange.

Table 1 – Ocean County Sand Volumes & Shoreline Changes 3 Years Following Sandy

LOCATION	Beach Loss	Shoreline	Beach Volume	Beach Volume	Beach Volume	2015 Shoreline	Beach	Shoreline
Comparisons with pre-Sandy	During Sandy	Storm Retreat	by Fall 2013	by Fall 2014	by Fall 2015	Relative to pre-S	Recovery	Recovery
Beach & Shoreline Data	cu yds/ft.	feet	cu yds/ft.	cu yds/ft.	cu yds/ft.	feet	Percent	Percent
Water Street, Pt. Pleasant	-109.55	-130	-66.92	-32.22	-80.24	-99	27%	24%
Maryland Avenue, Pt. P.	-30.35	-54	-10.73	-30.82	-30.10	-5	1%	91%
Johnson Avenue, Bay Head	-60.00	-86	-25.83	-33.32	-53.64	-54	11%	37%
1117 Ocean Avenue, Mant.	-94.03	-92	-9.30	-10.02	-2.85	-39	97%	58%
Public Beach #3, Brick Twp.	-50.95	-66	-13.95	-4.42	5.44	-48	111%	27%
1st Avenue, Normandy	-74.33	-58	-38.98	-17.65	26.40	-28	136%	52%
White Avenue, Lavallette	-45.49	-92	-16.66	-38.15	-51.21	-106	-13%	-15%
8th Avenue, Ortley Beach	-30.62	-63	-44.52	-14.50	-0.50	-65	98%	-3%
Franklin Avenue, Seaside Hgt	-32.32	-69	-15.28	-12.08	-30.43	-49	6%	29%
4th Avenue, Seaside Park	-28.74	-26	-18.14	-15.47	-39.09	-28	-36%	-8%
6th Lane, Midway	-21.01	-6	-7.77	-10.67	18.31	15	187%	350%
IBSP North Site	-39.45	-26	-64.41	-27.78	-53.71	-112	-36%	-331%
IBSP Mid Site	-72.21	-83	-58.13	-31.66	4.89	-81	107%	2%
IBSP South Site	-73.38	-180	-28.78	-49.05	-36.15	-81	51%	55%
10th Street, Barnegat Light	-33.18	-21	-27.74	-21.41	-20.89	-51	37%	-143%
26th Street, Barnegat Light	-46.01	-87	-18.55	-8.33	16.75	71	136%	182%
La Baia Street, Loveladies	-52.83	-117	-33.46	-26.62	-17.74	-67	66%	43%
73rd Street, HC	-61.38	-119	46.52	-2.90	-25.26	-17	59%	86%
Tranquility Drive, HC	-14.52	-35	72.26	15.69	8.88	73	161%	309%
20th Street, Surf City	-32.46	-44	23.40	-7.59	-2.95	20	91%	145%
8th Street, Ship Bottom	-55.46	-78	12.25	0.52	25.40	98	146%	226%
32nd Street, LBTwp	-109.19	-164	44.94	9.24	40.38	21	137%	113%
81st Street, LBTwp	-50.84	-27	-40.36	12.76	232.34	308	557%	1241%
Old Whaling Road, LBTwp	8.05	19	4.96	13.63	159.18	189	1877%	895%
Taylor Avenue, Beach Haven	14.17	36	31.99	2.55	30.46	53	115%	47%
Dolphin Avenue, Beach Haven	-49.75	-44	-4.82	-19.38	-17.15	-34	66%	23%
Webster Avenue, Holgate	-40.26	-93	-13.56	-7.54	15.40	-29	138%	69%
Forsythe Refuge	119.23	128	123.90	13.09	88.55	229	-26%	79%
Average Volume Changes	**-41.67**	**-59.89**	**-7.06**	**-12.65**	**-9.62**	**-24.29**	**1.54**	**1.31**
(without ACOE work)			**83.1%**	**69.7%**	**76.9%**	**59.5%**	**103.7%**	**102.2%**
New ACOE Work Complete				**Recovery including ACOE work**			**153.8%**	**131.5%**
				Northern Ocean County Recovery			**53.2%**	**26.3%**
				Long Beach Island Recovery			**254.4%**	**236.6%**

Tracking the changing beach volume percentages across from 2013 to 2015, the northern Ocean County sites changed erratically between steady gains (Brick Twp. public beach #3 or IBSP middle site), to variable changes (1117 Ocean Avenue Mantoloking) to steady loss since Sandy (Johnson Ave., Bay Head). Long Beach Island changes augmented by the USACE project saw positive sand volume changes at every site with eight locations of 14 with over 100% recovery in sand volume and a shoreline position 100% further seaward than it was pre-Sandy. The bottom line is seen best on the table's bottom three lines where the LBI recovery averages over 200% while the Northern County shoreline lags at 53% of sand volume and 26% of the shoreline position.