2017 ANNUAL REPORT ON
THE CONDITION OF THE MUNICIPAL BEACHES FOR
THE BOROUGH OF STONE HARBOR, CAPE MAY COUNTY, NEW JERSEY

Aerial photograph taken February 1, 2017 showing staging of equipment used for the 2nd Periodic Nourishment Cycle in the Borough's southern section (courtesy Ted Kingston).

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Introduction:

This annual report presents the status of the beaches and dunes within the Borough of Stone Harbor from October 2016 to October 2017. During this time, the Borough's beaches between 105th and 123rd Streets received maintenance sands in the 2nd Periodic Nourishment Cycle that commenced in February 2017 using Hereford Inlet as the borrow source. By March 7, the total amount placed in the southerly section was 394,000 cubic yards (CY) (http://stoneharbornj.org/stone-harboravalon-beach-replenishment-project-update/). In May, repairs commenced in Stone Harbor's north end beaches (80th Street to 105th Street) using Flood Control Coastal Emergency Act (FCCE) funding. A borrow site within Townsends Inlet was the sand source for approximately 320,000 CY that was placed on the Borough's north end beaches (80th to 105th Streets). The north end project was completed a few days prior to the Stockton University Coastal Research Center (CRC) June survey. Adding these two sand volume totals, the Borough oceanfront received 714,000 cubic yards of additional sand.

This report presents annual volume and shoreline changes between Surveys #48 and #50 (Table 1) and semi-annual changes (Surveys #49 to #50) presented in Table 2.

2017 Weather Events;

The 2016-2017 fall/winter was generally quiet with the exception of a northeast storm that occurred January 23, 2017, the one-year anniversary of destructive northeast storm Jonas (2016). The January 2017 storm was less severe than the Jonas northeaster and minor flooding was reported. Coastal flood events occurred in March and May from low-pressure systems. In September (18-19), coastal flooding and high waves were associated with the offshore passage of Hurricane Jose.

Beach Monitoring Program Methodology

The CRC established the Borough's beach monitoring program in June of 1996 to address the shoreline changes along the 13,077 feet of municipal oceanfront beaches. Eight permanent beach profile-monitoring sites were established to gather data initially on a quarterly basis, but shifted to a semi-annual survey in 2007. Each profile starts at a fixed reference position behind the dunes, crosses the dunes, beach and extends over 600 feet into the water, ending at a depth of 12-16 feet. Each of the groin compartments or cells along the Borough beachfront contains one profile line. Work continues on the semi-annual monitoring schedule.

The following is a list of the profile locations:

♦ **SH-82**	82nd Street	Border with Avalon – 84th St. groin
♦ **SH-90**	90th Street	84th St. groin – 92nd St. groin
♦ **SH-95**	95th Street	92nd St. groin – 98th St. groin
♦ **SH-103**	103rd Street	98th St. groin – 106th St. groin
♦ **SH-108**	108th Street	106th St. groin – 111th St. groin
♦ **SH-112**	112th Street (paper street)	111th St. groin – 114th St. groin
♦ **SH-116**	116th Street	114th St. groin – 122nd St. groin
♦ **SH-123**	123rd Street (paper street)	122nd St. groin – terminal groin

Surveys Completed

The CRC completed three surveys between October 2016 and October 2017:

- **Survey 48** represents a full dune, beach and nearshore survey at all sites for fall 2016 (October).
- **Survey 49** represents a full dune, beach and nearshore survey at all sites for spring 2017 (profile sites 82, 90, 95, and 103 completed in June, and profiles sites 108, 112, 116, and 123 completed in March).
- **Survey 50** represents a full dune, beach and nearshore survey at all sites for fall 2017 (October).

Stone Harbor Engineered Beach Performance

Since completion of the Federal/State/Municipal beach nourishment project within the Borough of Stone Harbor in 2003, the engineered beach sustained several significant storm events but maintained its storm protection value to the community during Hurricanes Irene and Sandy by preventing major flooding by storm waves and dune breaches. After Sandy, the beaches received sand courtesy of Public Law 113-2 that authorized emergency repairs to the Borough's beaches at no cost to the state or Borough (2013), and through a periodic nourishment cycle (2017) which was cost-shared.

Tables 1 and 2 provide shoreline and volume change information for each of the ocean beach profile locations within the Borough of Stone Harbor. Shoreline changes were calculated by comparing the zero datum positions for the 2016-2017 monitoring period. Sand volume changes across the length of the survey line were determined for each individual profile site by computing the cut and fill cell changes in the profile with the previous survey or, were calculated from the annual surveys. These values are expressed in cubic yards of sand per linear foot of beachfront ($yds^3/ft.$). The total beach volume change is calculated using this value. The distance (cell width) between groins along the beachfront of Stone Harbor was measured between the centerlines of adjacent groins. Each cell's net sand volume change is determined by multiplying each cross section volume change by its corresponding groin cell width.

Table 1 represents the annual changes in shoreline position and across profile volume changes (from Fall 2016 [Survey 48] to Fall 2017 [Survey 50]).

Table 1
Stone Harbor
Fall 2016 (#48) to Fall 2017 (#50)
Annual Shoreline and Profile Sand Volume Changes

Profile Number	Shoreline Change (feet)	Volume Change (yds^3/ft)	Cell Distance (feet)	Cell Volume Change (yds^3)
SH-82	41	46.80	1,381	64,634
SH-90	80	74.13	2,240	166,040
SH-95	47	44.69	1,680	75,084
SH-103	126	88.57	2,208	195,558
SH-108	93	74.43	1,433	106,657
SH-112	71	41.98	804	33,754
SH-116	100	68.43	2,273	155,546
SH-123	13	28.52	1,058	30,175
		Total Volume Change =		**827,448**

Since the completion of the emergency fill in 2013 that added 674,224 CY of sand, the annual sand volume losses from the Borough's ocean beaches and nearshore were: -188,886 CY (2013-2014), -305,672 CY (2014-

2015), and -292,889 CY (2015-2016), totaling -787,447 CY. This volume resulted in a loss of 116.8% of the pay volume placed on the beaches in 2013.

Table 1 shows that all beaches within the Borough gained in volume and the shoreline moved seaward between October 2016 and October 2017. The gains were attributed to the separate beach fill activities that occurred in February-March 2017 in the southern section (105th Street to 123rd Street) and in May-June 2017 in the north end (80th Street to 105th Street). Approximately 714,000 CY of sand were placed on the Borough's beaches.

Table 2 provides the changes that occurred between June and October 2017. Even though some sites lost sand volume (SH-103 & SH-108), there was an overall gain of 59,267 cubic yards within the Borough's oceanfront.

Table 2
Stone Harbor Semi-Annual Survey
Spring 2017 (#49) to Fall 2017 (#50)
Shoreline and Total Sand Volume Changes

Profile Number	Shoreline Change (feet)	Volume Change (yds^3/ft)	Cell Distance (feet)	Cell Volume Change (yds^3)
SH-82	-59	3.70	1,381	5,107
SH-90	-21	28.55	2,240	63,941
SH-95	-52	15.58	1,680	26,168
SH-103	-64	-30.16	2,208	-66,587
SH-108	-66	-49.08	1,433	-70,337
SH-112	29	5.15	804	4,137
SH-116	76	43.10	2,273	97,962
SH-123	17	-1.06	1,058	-1,124
		Total Volume Change =		**59,267**

The semi-annual comparison (Table 2) shows that the shoreline retreated at the northern and central profile locations, though volume losses were recorded at only the central locations (103rd Street and 108th Street). Spring to Fall landward shoreline movement has been a typical occurrence since 2014 and may be related to beach fill equilibration as the summer waves move sand landward and generate a steeper beachface, making the shoreline appear to migrate landward. The largest portion of the volume losses recorded at 103rd Street and 108th Street were from the berm (above 0.0 ft. NAVD). After the beach nourishment activities, both profile locations displayed the widest beaches within the Borough (approximately 250 ft.). The beach sands from these locations between June and October were either moved downdrift or captured in a nearshore bar beyond the CRC's measured profile. The October surveys were completed approximately two weeks after the offshore passage of Hurricane Jose. The larger wave set accompanying the hurricane likely adjusted the profile shape. The net change to the Borough's beaches was 59,267 CY, which spread across 13,077 feet of oceanfront beach is only 4.53 yds^3/ft. added to each foot of the oceanfront. The summer accretion is always beneficial.

Individual Site Descriptions:

This section describes the changes documented at each of the beach profile locations from October 2016 to October 2017. All of the sites are located within the Federal shore protection project limits that received sand during the February-March (105th to 123rd Streets) or May-June (80th to 105th Streets) fill activities.

SH-82 is located at 82nd Street along 1st Avenue and seaward of the 82nd Street recreation area. The profile line is set approximately midway between the Avalon border and the groin at 84th Street. This site is included in the Borough's monitoring program to represent typical beach conditions on the Borough's only stretch of beach without a groin (in the northern section of the community). The profile is located about 800 feet south of the Avalon border and about 1,350 feet south of the USACE federal project taper. This site consists of 200 feet of primary dune width seaward of the asphalt promenade that is set on top of the revetment from its landward offset at 83rd Street to 80th Street.

Over the past year, the dune remained stable, though with a steep seaward dune face. Erosion of the berm between June and October contributed to the gains found below the datum and captured in nearshore sand bar .

Site SH-82 – 82nd Street (Photoplates 1a-1c)

Photoplate 1a – Photo taken October 14, 2016 shows a low, flat berm and sparsely vegetated dune.

Photoplate 1b - Photo taken June 12, 2017 days after completion of the beach fill at the Borough's north end.

Photoplate 1c – Photo taken October 3, 2017. The profile gained volume between fall 2016 and fall 2017 due to the beach fill that added 10.53 yds^3/ft. above the 0.0 ft. datum.

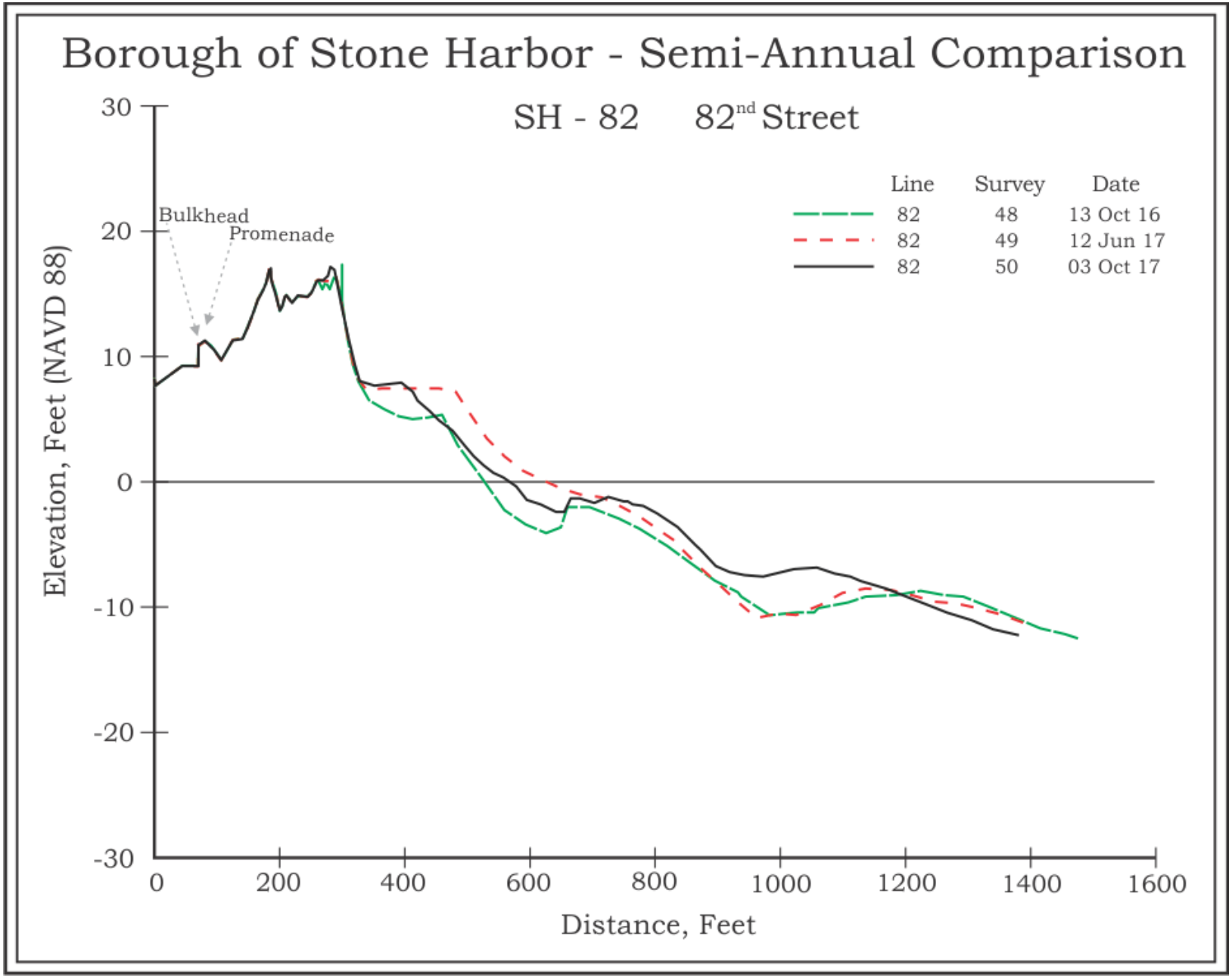


Figure 1. The profile cross sections show the conditions before, immediately after, and four months following the beach fill in the Borough's north end beaches. Nearshore sand bars captured the majority of the total volume gain of 46.8 yds^3/ft. between October 2016 and October 2017. This is probably attributable to the waves generated by Hurricane Jose moving sand offshore from the beachface two weeks earlier.

SH-90, is located at 90th Street and was originally established in 1986 as a survey site for the New Jersey Beach Profile Network (NJBPN). The profile line is set north of the public beach access path to provide a typical cross-sectional representation of the dune and beach that is bounded by groins at 84th Street and 92rd Street. The dune system consists of two ridges approximately 150 feet wide extending from the street end revetment to the seaward dune toe.

The June beach fill added elevation to the berm and moved the shoreline seaward by 80 ft. from its position in October 2016. The major profile changes occurred below the datum. The dunes remained relatively untouched over the course of the year.

Site SH-90 – 90th Street (Photoplates 2a-2c)

Photoplate 2a – Photo taken October 13, 2016 shows a narrow beach and gently-sloped backshore to the dune.

Photoplate 2b - Photo taken June 12, 2017 shortly after completion of the north end beach fill which raised the berm elevation from its October 2016 position.

Photoplate 2c - Photo taken October 3, 2017 shows a relatively wide beach but less so than the June conditions.

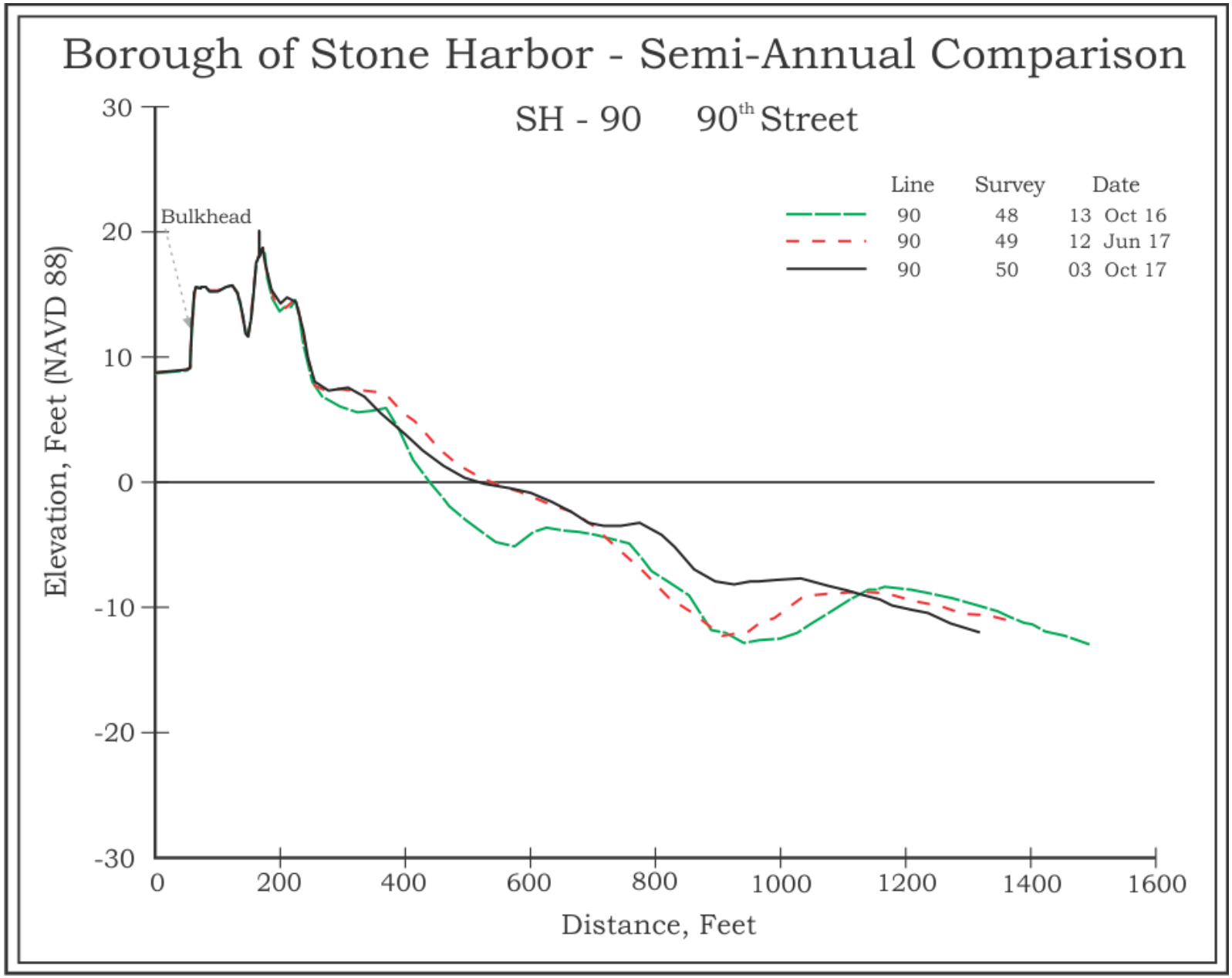


Figure 2. The cross sections show a significant change between October 2016 and October 2017 due to the north end beach fill and summer sand gains raising berm and nearshore elevations. Total volume gains were 74.1 yds^3/ft. where below datum gains amounted to nearly 85% of the total. This change likely follows the pattern set by the passage of Hurricane Jose.

SH-95, the 95th Street site was established along the north side of 95th Street and the beach access path. The profile line crosses the municipal parking lot, a wooden bulkhead, access ramp and dune located just north of the municipal beach observation platform. The dune system is essentially a single ridge that extends seaward 140 feet from the street end revetment to the seaward dune toe with a crest elevation of 15 feet NAVD88.

Sand that was added to the berm in June 2017 increased its elevation by 2 ft. and expanded the dry beach by nearly 100 ft. from its October 2016 position.

Site SH-95 – 95th Street (Photoplates 3a-3c)

Photoplate 3a - Photo taken October 13, 2016 shows a low berm which was the same width as it was in the fall of 2015.

Photoplate 3b – The June 12, 2017 photo shows a higher berm and wider beach from the previous survey.

Photoplate 3c – The photo taken October 3, 2017 shows a wide beach however, the shoreline moved 52 feet landward from its June 2017 position.

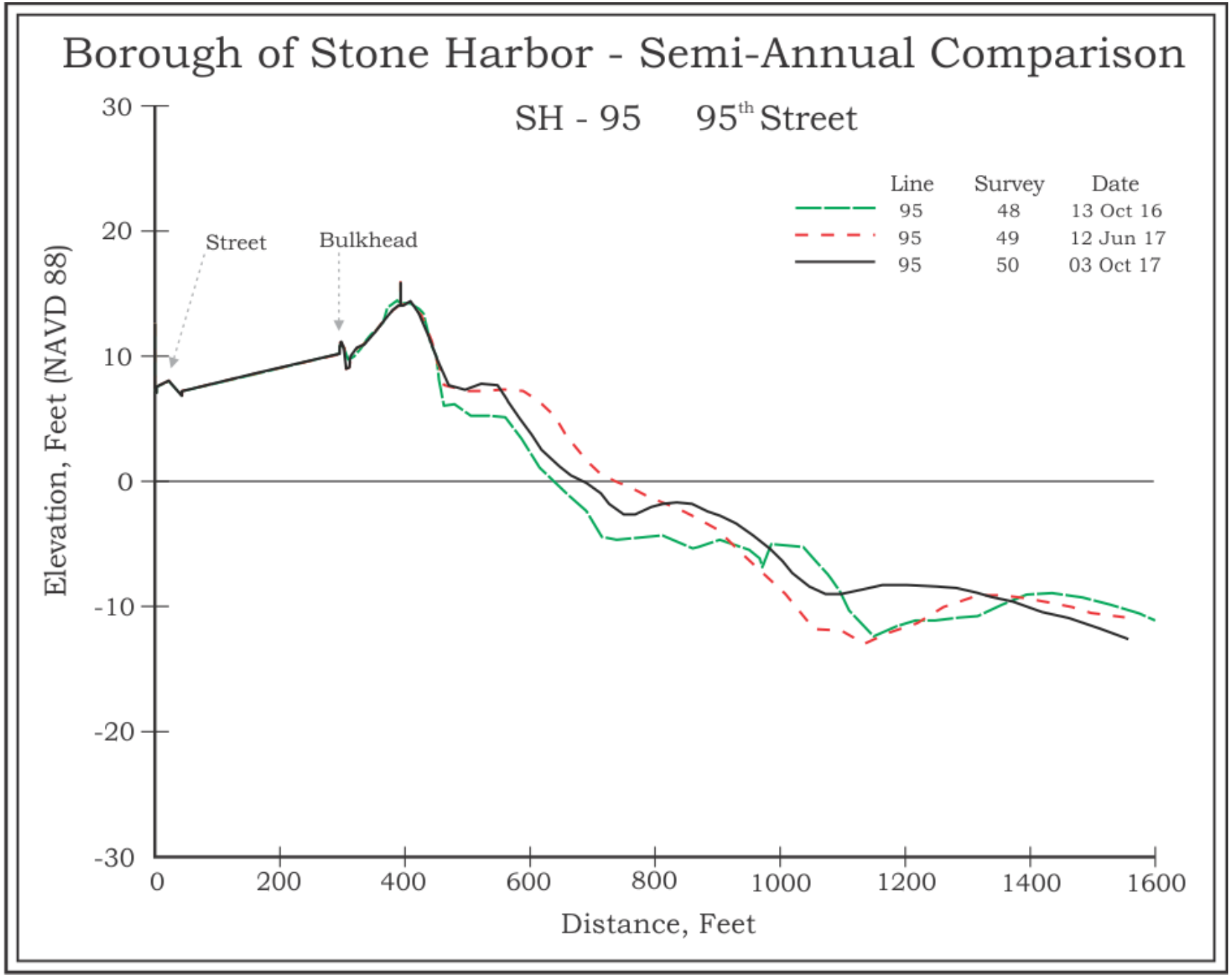


Figure 3. The profile cross sections at 95th Street show the elevation gains produced by the June beach fill. Annual volume gains amounted to 44.7 yds^3/ft. gain across the whole profile. The October 2017 profile shows the filling of the nearshore trough from relocated berm sand or from the cross-shore transport of sand from offshore.

SH-103, located at 103rd Street was established for the Borough's beach monitoring program at the seaward end of 103rd Street along the north sidewalk. When the site was originally established in 1996, the profile crossed the bulkhead and dropped to the rock revetment at the toe of the bulkhead. An extremely narrow beach just seaward of the rocks provided limited recreational area for beach patrons. Storm waves and surge overtopped the revetment and caused local flooding. This beach continued to erode until by 1998 no dry beach existed seaward of the rock revetment. Sand was placed here during the 1998 municipal beach fill re-establishing a dry beach berm and dune ridge. In 2003 the initial Federal project enhanced the width of both the dune and beach. Several subsequent projects have been required to provide periodic beach maintenance that included the 2009 state/municipal project, the spring/summer 2011 federal project, and the summer 2013 Hurricane Sandy emergency beach fill.

In October 2016, the berm elevation was less than 5 ft NAVD88 and the slope from the backshore to the dune increased the risk of dune erosion from storm waves. Though volume losses were recorded between June and October, the annual volume gain across the profile was 88.5 yd^3/ft.

Site SH-103 – 103rd Street (Photoplates 4a-4c)

Photoplate 4a - Photo taken October 13, 2016 shows the low elevation berm and steep backshore to dune toe.

Photoplate 4b - Photo taken June 12, 2017 shows the southern limits of the north end beach fill. The beach width gained 200 ft. from its October 2016 position.

Photoplate 4c – Photo taken October 3, 2017 showing sand fencing placed seaward of the dune toe. The shoreline moved landward 64 ft. from its June position.

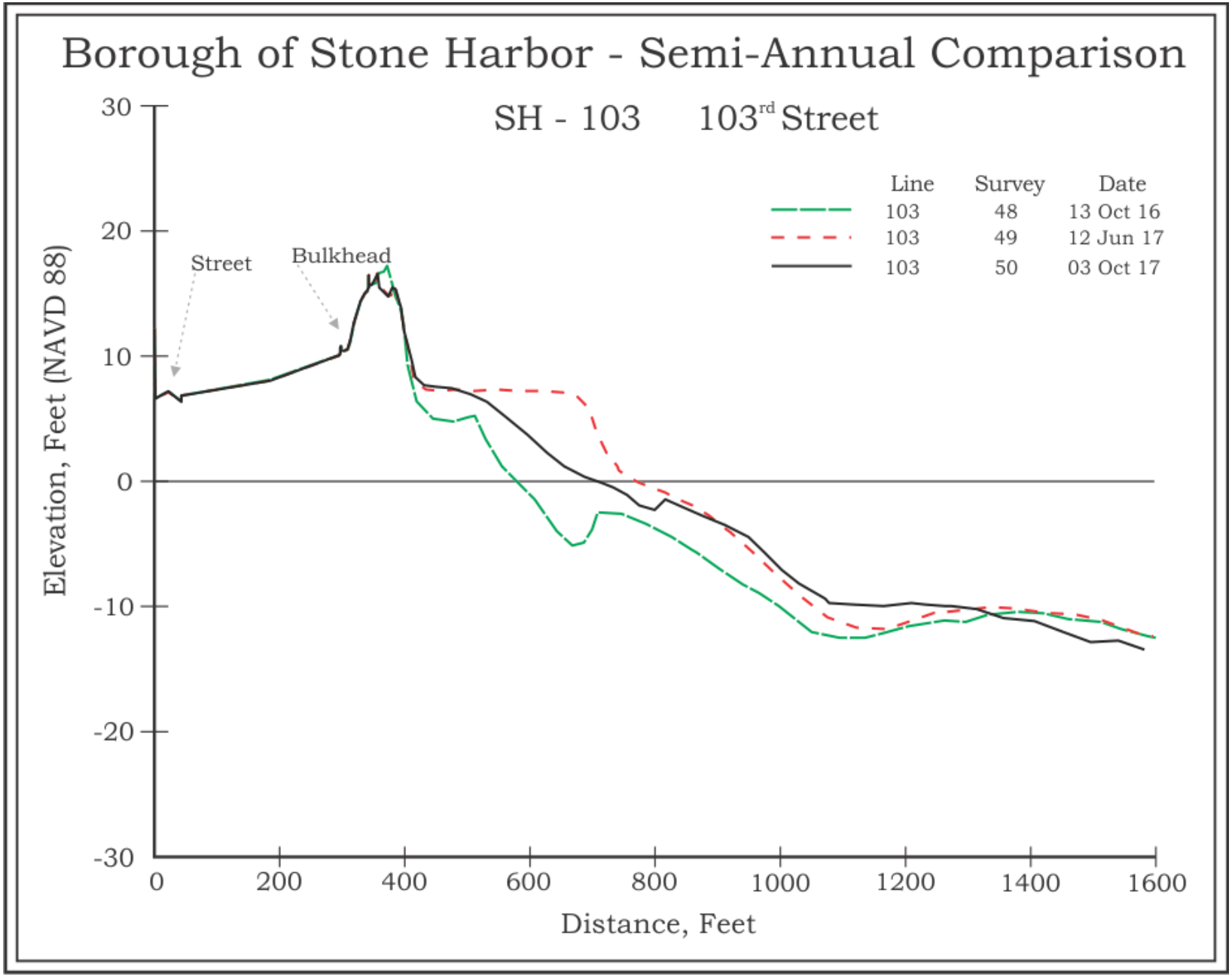
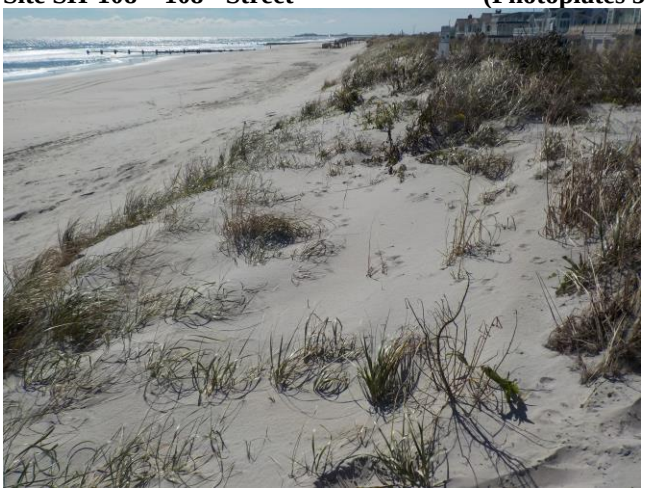


Figure 4. The cross sections at 103rd Street show a lowered dune elevation between October 2016 and June 2017. Sand was added to the dune toe and berm during the May-June beach fill. Profile volume losses (-30.2 yd^3/ft.) occurred between June and October, mostly from above the 0.0 ft. datum. Two weeks prior to survey 50, Hurricane Jose passed offshore generating large waves which acted to flatten the beachface slope.

SH-108, is located at the end of 108th Street and was placed near the middle of the groin cell. This site shares a history similar to site SH-103. The original 1996 profile crossed the bulkhead and dropped to the rock revetment at the bulkhead toe and a narrow beach just seaward of the rocks provided limited recreational area for beach patrons. Exposure of the rocks accelerated the beach erosion as waves refracted off the hard structure and scoured the sandy beach. Larger storm waves and surge overtopped the revetment and caused local flooding. Sand was placed here during the 1998 municipal beach fill that re-established a dry beach and dune ridge. In 2003, the initial Federal project enhanced the width of both the dune and beach. Post Hurricane Sandy beach fill commenced in 2013 to cover erosion from the previous storms, but the site showed repeated volume losses since the 2013 fill.

The February-March beach fill significantly increased the berm elevation from its October 2016 position. Annual volume gain totaled 74.4 yd^3/ft. across the entire profile with most of the gain occurring below the 0.0 ft. datum.

Site SH-108 – 108th Street (Photoplates 5a-5c)



Photoplate 5a – The October 13, 2016 photo shows the sparsely vegetated dune and nearly 150-ft wide low-elevation berm. Erosion of the dune occurred during northeast storm Jonas in January 2016.

Photoplate 5b – The photo taken March 27, 2017 shows the wide berm from sand placed in the February-March beach fill.

Photoplate 5c – Photo taken October 3, 2017 shows sand fencing to protect the seaward dune toe. The wide berm had reduced in size and elevation from its March position.

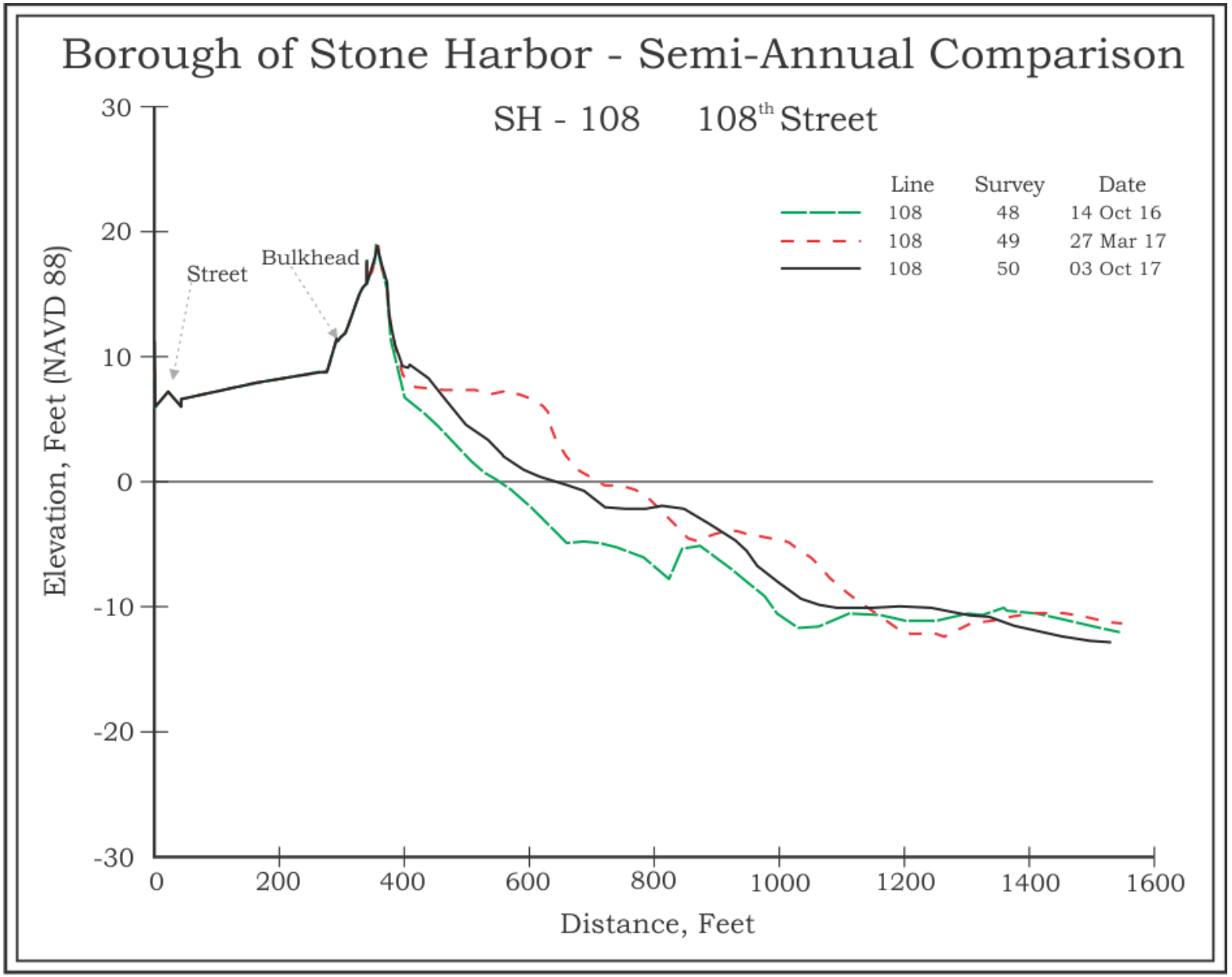


Figure 5. The cross sections show a significant lowering of the berm between the March beach fill and the October survey. During this time period, the profile lost volume (-49.1 yd^3/ft.) and the shoreline moved landward (-66.1 ft.). This is another case where Hurricane Jose's wave generation removed the high berm and generated a flatter slope into the water. Here large sand volumes did not appear offshore.

SH-112 is located on the open lot adjacent to the Villa Maria Catholic retreat that occupies the paper location of 112th Street. The profile line extends landward to a reference location along 2nd Avenue. An open grass lot occupies the city block between 2nd Avenue and the wooden bulkhead revetment. The wooden revetment runs parallel to the beach the entire length of the Borough along the oceanfront property lines and seaward street ends. The bulkhead is significantly offset landward at 111th Street, providing additional area for dune development to occur naturally. As a result, the width of the primary dune was nearly 200 feet from the bulkhead to the seaward dune toe. This location has a very significant primary dune largely due to the limited oceanfront development on this parcel. Occupied by the Catholic Church as a retreat for over a century, the site has no structures directly at the landward dune toe. The dunes spill over the bulkhead and occupy most of the original dry beach that existed prior to the USACE project in 2004.

The dune was scarped during northeast storm Jonas in January 2016 and left to recover on its own. The February-March 2017 beach fill supplemented the berm by raising its elevation. Annual volume change was 41.9 yd^3/ft.

Site SH-112 – 112th Street (Photoplates 6a-6c)

Photoplate 6a – The October 13, 2016 photo shows evidence wave run-up to near the dune toe.

Photoplate 6b - Photo taken March 27, 2017 shows the conditions after the placement of sand a few weeks prior.

Photoplate 6c – Photo taken October 3, 2017 shows sand fencing at the seaward dune toe. The shoreline moved 29 ft. seaward from its March position.

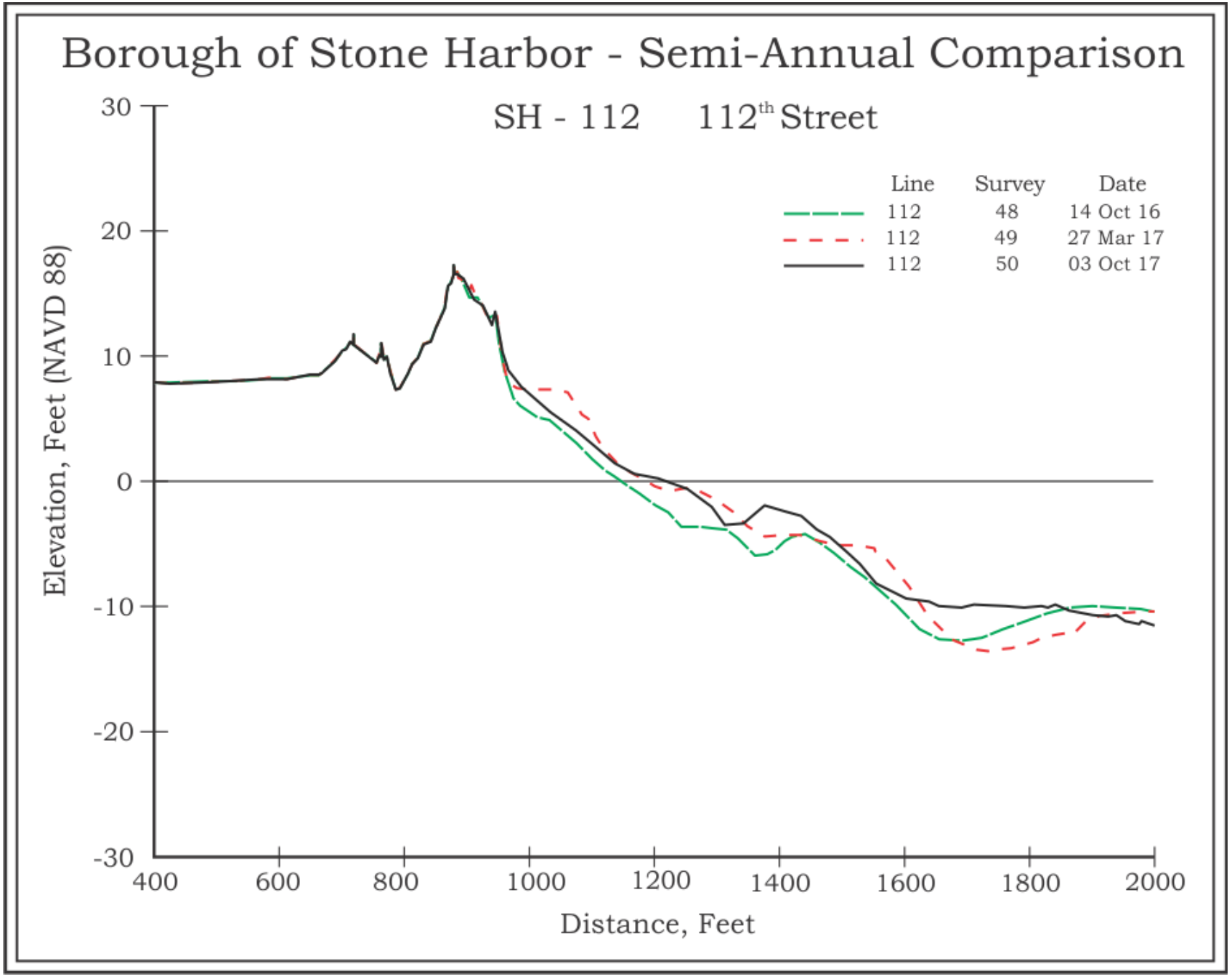


Figure 6. The profiles at 112th Street show the annual change to the beach and nearshore between October 2016 and October 2017. The berm sand that was placed in March was redistributed into a nearshore sand bar by October 2017. The below datum volume gain was 11.1 yd^3/ft. between surveys #49 and #50. Hurricane Jose had a smaller impact at this site than further north, but the steeper berm slope was significantly flattened.

SH-116 is located along the west side of 2nd Avenue and 116th Street. Seaward of the bulkhead at 116th Street is the best-established natural dune system in the Borough. A landward offset in the bulkhead just north of this site produced the area on which this dune developed, sheltered from storm overwash by the 114th Street groin and the bulkhead offset to the west. The dune system consists of two distinct ridges with a combined width of nearly 300 feet from the street end bulkhead to the seaward dune toe with a crest elevation of 16.5 feet NAVD88. Some berm erosion occurred during northeast storm Jonas in January 2016.

Though the 116th Street site was included in the February-March beach fill project area, the March profile does not show a distinct berm configuration. After years of seaward progression, the dune system has encroached into the USACE shore protection project's jurisdictional area. Since the seaward dune toe is now developed on the project's designated berm area, no sand was placed on the berm as a result.

Site SH-116 – 116th Street (Photoplate 7a-7c)

Photoplate 7a - Photo taken October 14, 2016 shows sand accumulation around vegetation and a sand bar near the water's edge.

Photoplate 7b – Photo taken March 27, 2017 showing the installation of fencing at the toe of the dune.

Photoplate 7c – Photo taken October 3, 2017 shows sand trapped by the sand fencing. This management practice allows the dunes to progress seaward.

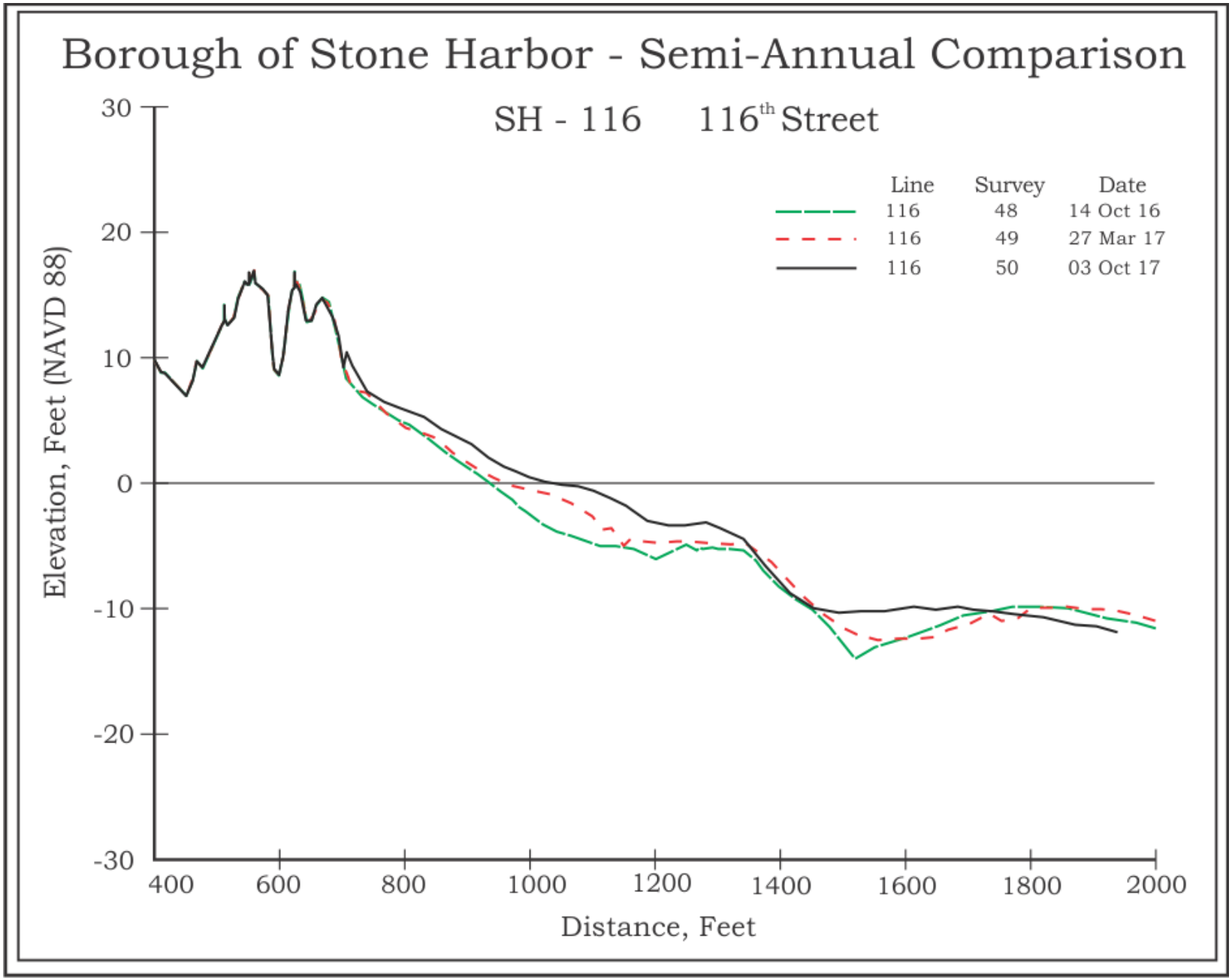


Figure 7. The 116th Street location includes a double dune system enhanced by local management practices. Because of the extensive dune, this site did not receive sand because the dune lies on the dry beach limits of the federal nourishment project. Between October 2016 and October 2017, the shoreline moved seaward (100.5 ft.) and the profile gained in volume (68.4 yd^3/ft.). Over 77% of the volume gains were below the 0.0 ft. datum.

SH-123 is located at 123rd Street south of the developed part of town and just north of the terminal groin originally constructed by the Philadelphia District of the U.S. Army Corps of Engineers. In 1994, the site was added to the NJBPN in the expansion of the State's monitoring project and as a replacement cross section for former site #112 that was erased from South Pointe by weather events in 1990 where the entire natural zone south of the terminal groin was eroded to a shoal at and below low tide. Because of this prior history of data collection and its proximity to Hereford Inlet, this site was included in the Borough's beach monitoring project. The profile reference marker is located in a dense stand of bayberry west of a vehicle access path to the Hereford Inlet terminal groin. This site has benefited tremendously since the completion of the initial USACE project both from direct sand placement and from longshore currents that have carried a substantial volume of sand shed from the northern project beaches south toward South Pointe. The result has been a larger dune system that completely buries the revetment that was once exposed along this beach and the formation of an expansive point that stretches over a mile from the terminal groin into Hereford Inlet. However, like the other Borough project beaches this location suffered significant erosion of the dry beach berm and dune during Hurricanes Irene and Sandy and several northeasters including the January 2016 Jonas storm.

This site was included in the February-March 2nd Periodic Nourishment project area. The additional sand was the source for the positive annual volume change (28.5 yds^3/ft.) and the shoreline moved seaward 13 ft.

Site SH-123 – 123rd Street (Photoplate 8a-8c)

Photoplate 8a - Photo taken September 14, 2016 showing sand fence at the seaward dune toe. The profile shows a summer accumulation of sand on the berm.

Photoplate 8b – Photo taken March 27, 2017 after the placement of sand from the 2nd Periodic Nourishment project.

Photoplate 8c – The photo taken October 3, 2017 shows dune conditions similar to previous survey dates. Most of the changes occurred below the 0.0 ft. datum.

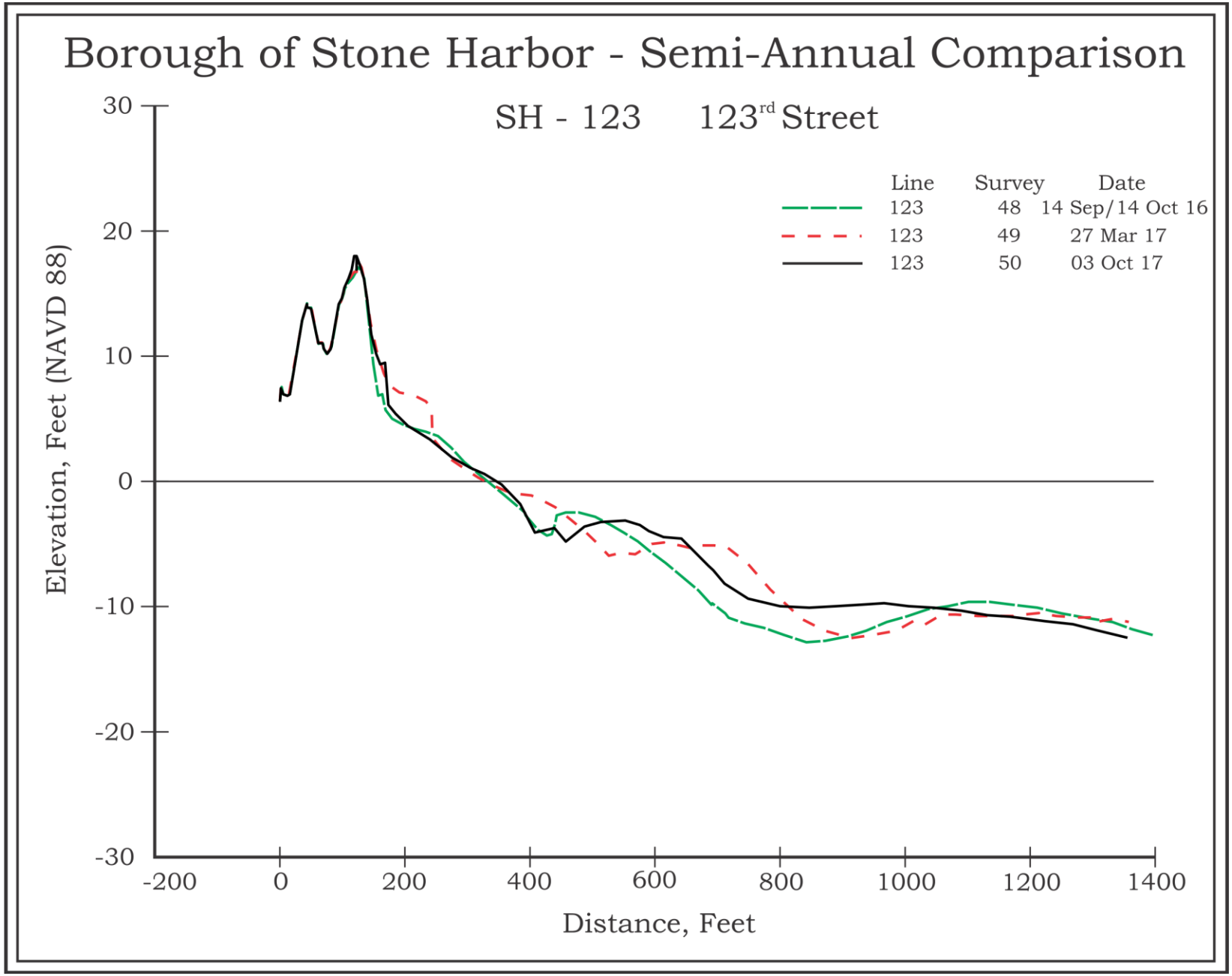


Figure 8. The cross sections at 123rd Street show erosion of the berm sand that was placed in the February-March beach fill. The total volume change between surveys #49 and #50 was not incredibly significant (-1.1 yds^3/ft.). The above-datum losses nearly balanced the below-datum gain. The shoreline moved 16.5 ft. seaward.

Summary

In the years following the last major beach fill in 2013, the beaches within the Borough of Stone Harbor were impacted by moderate to significant northeast storm events that, while did not create dune breaches or major damages, stressed the beaches enough to reduce their storm protection capacity. The most damaging of the recent storms occurred in January 2016 (northeast storm Jonas), a 10-year event with 65 MPH winds occurring during a spring tide. This event produced a volume loss of 292,889 cubic yards, adding a loss that culminated in losing 116% of the fill volume that was placed in the 2013 post-Sandy beach fill. The dunes survived but the beach narrowed as a result of the storm.

Local, State, and Federal efforts helped to obtain the funding for repairing the damages to the Borough's shoreline. Over the past year, the Borough's beaches received sand in two separate installments. The first NJ State funded operation occurred between February and March 2017 and included the south beaches (105th Street to 123rd Street). These locations received sand via the 2nd Periodic Nourishment Cycle of the Seven-Mile Island Flood and Coastal Storm Damage Reduction project. The project is scheduled for periodic nourishment at three-year intervals. The source of the sand for the south beaches was Hereford Inlet. Continued sand pumping from Hereford Inlet has become dependent on State and local funding sources. Since the borrow zone in Hereford Inlet lies in the Coastal Barrier Resources System NJ-09 zone, using federal funds to extract sand even for a neighboring coastal community has been determined, following the Hurricane Sandy project, to be not allowed by the exemptions in the CBRA 1982 Congressional legislation. Lifting this ban, will likely require Congressional action to modify the 1982 act.

The second installment occurred in May and June 2017 and included the north end beaches (80th Street to 105th Street.) This project was funded through the Federal Flood Control Coastal Emergency Act (FCCE) program. Because of the CBRA resource issues with the Hereford Inlet site, the borrow area from Townsends Inlet was selected for the north end beaches.

The Borough's beaches logged a significant gain in volume between October 2016 and October 2017 – 827,448 cubic yards of sand and seaward movement of the shoreline at all monitored locations. Volume losses began to appear in the spring to fall evaluation with SH-103 and SH-108 losing the most volume and the greatest shoreline retreat rates within the Borough (see Table 2).

Conclusions & Recommendations:

The periodic maintenance and FCCE projects brought the Borough's beaches to a higher level of storm protection. Since the sand source for future projects from the Hereford Inlet site is not available for Federally funded efforts to use, coordination is necessary with the NJ State non-federal sponsor to continue work with sand taken from Hereford Inlet. Any material derived from Hereford Inlet shoals, eventually returns along the South Pointe shoreline to these shoals. The use of this sand source needs to be presented to the local congressional delegation to encourage modifications to the CBRA Act exemptions so that the use of Federal dollars to maintain adjacent community beaches is allowed.

The CRC conducts annual surveys of Hereford Inlet and the surrounding shoreline as part of an ongoing monitoring program for the State of NJDEP DCE (Division of Coastal Engineering). These surveys have revealed that the South Pointe spit continues to grow in width, elevation and length as additional sand shed from project beaches in the north moves south carried by the dominant direction of littoral currents. The point has continued to grow at a rate of about 500 feet a year accumulating in an advance of 7,200 feet since 2006, and is now well over a mile long stretching from the terminal groin south of 123rd Street to the tip of the point.

The following recommendations are the result of this year's findings:

- The zigzag pattern of the installed fence captured wind-blown sand and as a result, the dune toe moved seaward. Fence installation should follow recommendations summarized in past CRC reports and from

the New Jersey Department of Environmental Protection Division of Coastal Engineering and Division of Land Use Regulation.

- New regular interval maintenance efforts including sand harvesting and transfer from South Pointe to the project area should be considered to maintain the beach near its full design template through recycling longshore erosional losses to reduce the frequency of large scale beach nourishment projects and increase the resiliency of Stone Harbor's dune and beaches in future storm events. The issues that would have to be addressed include:
    - Determining the regions on South Point least likely to impact bird habitat.
    - Determining the allowable depths of excavation into the beachface.
    - Determining the sand volume extracted from each excavation zone on the beach.
    - Determining the extent along the beachface for each excavation zone.
    - The timing of the work to allow natural shoreline adjustment to erase the impacts before March 15th.
    - Designing a project palatable to both the NJ Endangered Species Program and the US Fish & Wildlife Service.

  We do not expect enthusiastic support from the USF&WS or NJ Endangered Species program staff for any South Point sand harvesting, but it might be worth the effort to make an initial request. This option is called sand "Backpassing" and is essentially a recycling effort taking material from zones of excessive accumulation and transferring it without resorting to the expense of a hydraulic dredge and its supporting crews. Avalon has backpassed sand from the mid-island zone and North Wildwood has harvested over 400,000 cubic yards of material from the City of Wildwood and Wildwood Crest beaches. This is the current methodology the USACE is considering for their federal project for the Wildwoods.
- The CRC recommends that all such maintenance sand be deposited on the northern portion of groin cells because sand tends to move south between the cells fairly quickly.
- The CRC recommends that the Borough act forcefully and in concert with the City of North Wildwood to seek the restoration of Federal agencies' ability to access the Hereford Inlet borrow zone for major shore protection projects. Department of the Interior attorneys have re-interpreted exceptions to the Coastal Barrier Resource Act (CBRA) restrictions on spending federal dollars within such areas with the effect to eliminate the US Army Corps of Engineers ability to fund future beach maintenance activity in Stone Harbor or allow FEMA to fund storm damage to the North Wildwood project using federal funds to mine sand from the ebb-tidal delta borrow zone in Hereford Inlet. In 1996 a determination was made that taking Hereford Inlet sand was acceptable for federal funding to support USACE projects adjacent to the CBRA unit. A dispute arose when North Wildwood sought to piggyback on the federal restoration of Sandy damage to their project using FEMA Category "G" reimbursement funds that was settled in their favor by congressional intervention. Subsequently, the USACE has been firmly told that the latest group of lawyers to examine this statute have decided that the three noted exceptions to using federal money in a CBRA unit - to alter the environment or extract sand - is not to be allowed unless Congress changes the law or Stone Harbor gets slammed by another Hurricane Sandy. This news came to the USACE the very day they opened the bids to undertake a scheduled maintenance restoration of the project on Seven-Mile-Island. The CRC is willing to assist the Borough in drafting a letter to the NJ congressional delegation and the two NJ State Senatorial offices.