



# New Jersey Beach Profile Network

## Atlantic County

Little Egg Inlet  
to Great Egg Harbor Inlet

NJBPN Profile #'s  
134 - 126

## New Jersey Beach Profile Network Atlantic County Site Locations

There are 10 NJBPN survey sites on the Atlantic County shoreline. The beach profile sites are located in the City of Brigantine, Atlantic City, the City of Ventnor, the City of Margate, and the Borough of Longport. The Atlantic County coastline consists of three barrier islands. Little Beach is part of the Forsythe National Wildlife Refuge and is not surveyed. Brigantine Island is south of Brigantine Inlet, the northern third of which remains undeveloped as part of North Brigantine Natural Area managed by the NJ Division of Lands and Forest. The Absecon Island communities, Atlantic City, Ventnor, Margate, and Longport, are all highly developed. There are six beach profile survey sites in the communities of Absecon Island.

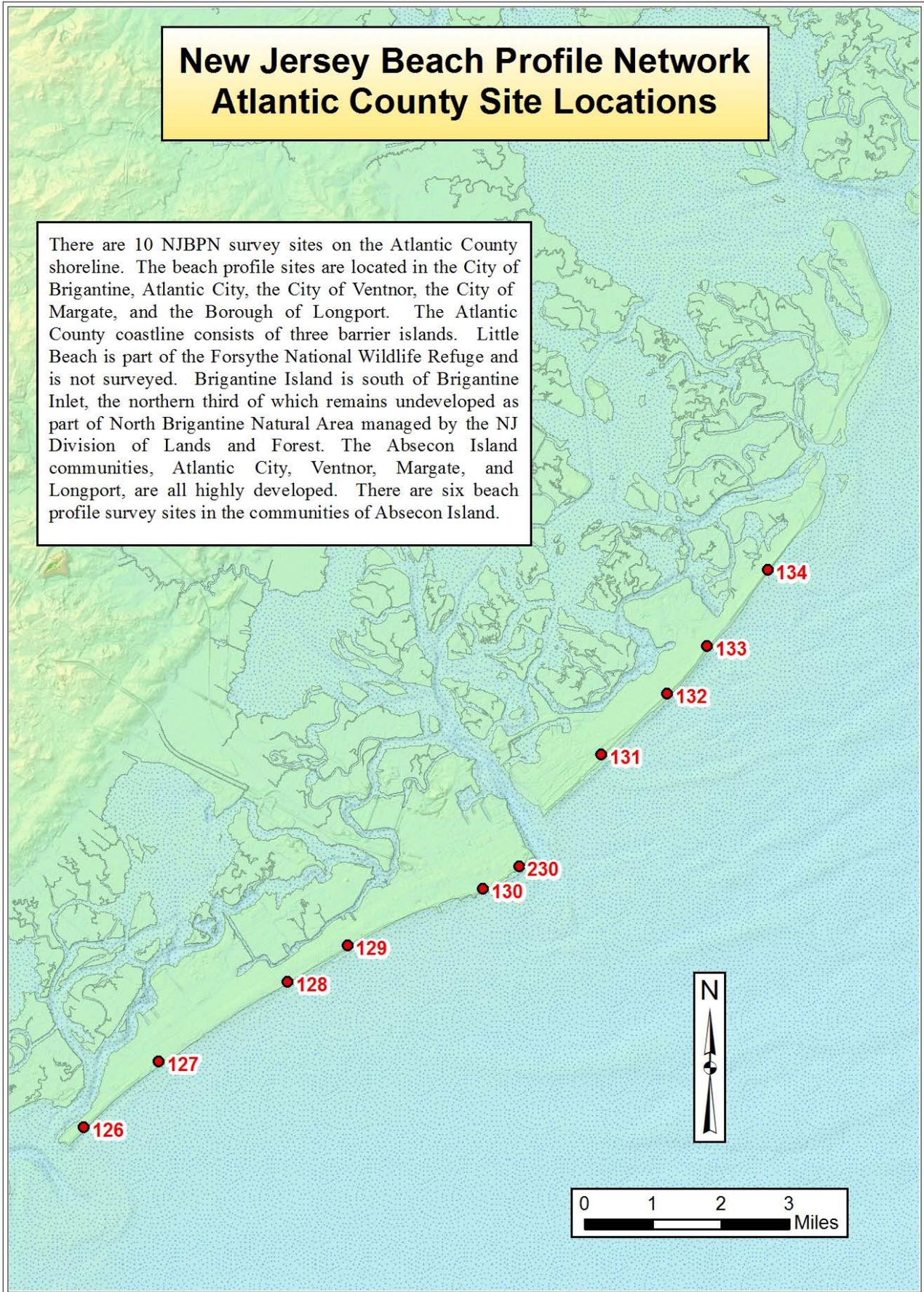


Figure 136. Location map for the 10 NJBPN profile sites in Atlantic County, NJ

## Atlantic County

Data collected at the ten Atlantic County NJBPN oceanfront beach profile locations cover the municipal beaches from the City of Brigantine Beach to the Borough of Longport. During the 2017 to 2018 evaluation, the third nourishment cycle of the Absecon Island Storm Damage Reduction (beachfill) project was underway that added sand to Atlantic City and Ventnor and commenced initial construction in Margate and Longport. (By spring 2018, work was completed this report provides the results of the sand placement as of spring 2018 following project completion. Also in 2018, the third federal maintenance cycle of the Brigantine Island Coastal Storm Risk Management (beachfill) project was completed. The evaluation of changes are included in this report. Little Beach on Pullen Island to the north of Brigantine is the third barrier island within Atlantic County but as a natural area is not included in the NJBPN assessment.

### **Shore Protection Summary;**

In 2002-3 the USACE, Philadelphia District, conducted an initial shore protection project from Absecon Inlet south to the Ventnor City/Margate City boundary on Absecon Island. The design was for a 150-foot wide beach in Atlantic City and a 100-foot beach width in Ventnor backed up by a 14.5-foot elevation at the dune crest that was vegetated and fenced with sand fencing and pedestrian access pathways to the beach. Since Margate and Longport declined to participate, their municipal shorelines did not receive direct sand placement. The maintenance cycles began in 2011 when the USACE placed sand on the northern portion of the Atlantic City shoreline. Fortunately, this task was completed (June 2012) prior to Hurricane Sandy. Although Sandy caused extensive erosion, the beach and dune provided oceanfront properties with protection from direct wave and storm surge impacts. A second beach maintenance cycle began in July 2013 in response to Sandy. This project authorized under PL 113-2 funding restored the constructed federal project beaches on both Absecon Island and Brigantine Island to project specifications at 100% federal cost.

The City of Margate filed litigation in Superior Court seeking relief from having dunes constructed as part of the USACE shore protection project within City oceanfront limits on Absecon Island. The case went to trial in February 2016 and a decision rendered April 11, 2016, affirmed the federal design and the relevance of dunes to the protection levels sought by the project. With this decision, without Margate City's further appeals, the project went to initial construction in 2017. During this project, the third nourishment cycle was included for Atlantic City and Ventnor in conjunction with initial construction of dunes and beach enhancements for Margate and Longport. The project commenced in spring 2017 and completed in 2018.

The federal Brigantine project area includes the northern third of the developed shoreline (approximately 1.8 miles.) A feeder beach designed into the project overfilled the 1,600 feet of the natural area north of development to supply sand to the downdrift beaches seaward of the developed areas. The project extends south to 5<sup>th</sup> Street South in the City. In 2006, the initial federal beach restoration was completed and extended the engineered beach footprint south of two prior State and local projects completed in 1997 and 2001. In 2011, an emergency maintenance effort completed under the Flood Control and Coastal Emergencies (FCCE) funding program used trucked-in sand. By February 2013, the Brigantine portion of Atlantic County's post Sandy recovery was complete using appropriations from PL-113-2. No further beach activity occurred in Brigantine until 2018 when the third nourishment cycle commenced over the winter.

### **Site Descriptions:**

#### **Brigantine #134, #133, #132, and #131;**

The northernmost profile site on the Island of Brigantine is located on the undeveloped northern end of the island now part of the State of New Jersey's open space program. This location is prone to periodic storm

overwash. Hurricane Sandy in 2012 was the most recent event to cause widespread overwash by waves from the ocean reaching to the bay marshes. Much of the vegetation survived the overwash, so re-colonization occurred rapidly, but at a more landward location causing a regression in the shoreline position episodically over time with larger storm events. The northeast storm of 1992 was the last time this had occurred.

Where development begins, the beach has been erosional due to the orientation difference between the fixed physical infrastructure to the south and the long-term regressive changes in the natural shoreline to the north. The Federal project includes sand placement on the southernmost part of this natural shoreline to act as a feeder beach to the worst of the erosional segment from 15<sup>th</sup> Street North to 9<sup>th</sup> Street North. Within this erosional hotspot, the beach is narrow with no oceanfront development on the east side of Brigantine Avenue a rock revetment provides the primary storm protection for public infrastructure and properties west of the road. This region's rapid erosion rate prevents development of a significant dune system despite several attempts during early-engineered beach projects to establish one. Consequently, this region has been subject to several episodes of storm overwash, the most recent occurred as Sandy moved onshore. South of 9<sup>th</sup> Street North, the bulkhead revetment bumps out seaward allowing development of properties east of Brigantine Avenue. The orientation of the shoreline has allowed for development of a dune system that widens moving from north to south towards 15<sup>th</sup> Street South. Multiple engineered beach projects over the last two decades significantly increased the sand budget in this region. Wider beaches and an increase in sand source continued the development of an expanding dune system through aeolian processes. The dunes prevented storm waves from affecting the oceanfront properties and infrastructure in this section of Brigantine. At 15<sup>th</sup> Street South, there is a transition to a depositional shoreline. A large, multi-story resort building interrupts the continuous footprint of the located dune north and south of this site. However, south of 15<sup>th</sup> Street South to the Absecon Inlet jetty, the ever-widening beaches continued to accumulate sand moving from north to south along the Brigantine shoreline. The wider beaches absorb storm wave energy allowing aeolian processes across these wide beaches to expand the dune system with a series of new foredune ridges forming a formal shore protection feature that protected the oceanfront properties in this region during Sandy.

At the erosional north end local engineered beach nourishment projects commenced with State sponsorship in 1997 and 2001 to mitigate deteriorating conditions. By 2006, the initial USACE project commenced followed by maintenance projects in 2011, 2013 and 2018. The Brigantine beaches within the engineered project area accumulated sand in between the fall 2017 and spring 2018 surveys with construction of the 3<sup>rd</sup> USACE maintenance project (754,090 cubic yards, Erik Rourke, USACE). At 4<sup>th</sup> Street North (NJBPN 133), the beach gained 90.94 yds<sup>3</sup>/ft. of sand while the shoreline position advanced seaward 160 feet during the project, net change for the study interval a gain of 85.73 yds<sup>3</sup>/ft. of sand. The northern natural beach (NJBPN 134) showed typical seasonal variation, gaining sand over the summer and losing sand during the winter, the net result was a minor volume gain of 0.28 yds<sup>3</sup>/ft. of sand during the study interval. Downdrift beaches continued to accumulate sand adding 13.49 yds<sup>3</sup>/ft. of sand at 15<sup>th</sup> Street South (NJBPN 132) and 48.53 yds<sup>3</sup>/ft. of sand at 43<sup>rd</sup> Street (NJBPN 131) during the same period. While sand accumulation on the southern beaches is typical, as prevailing sand movement along the Brigantine shoreline is from north to south, the large gain at 43<sup>rd</sup> is over half the sand volume placed at 4<sup>th</sup> Street during the recent USACE nourishment project. Demonstrating the extraordinary natural accretion rates and resiliency of this region as sand lost from the northern project area moves south accumulating updrift of the Absecon jetty. This region remains a potential source for mechanical sand back-passing efforts, moving sand north to the erosional area, as an option or complement to repetitive federal maintenance projects.

### **Atlantic City, #230, #130, and #129;**

Founded in 1852, Absecon Island has undergone continued development making it the most densely developed barrier island in New Jersey. To protect the properties and infrastructure from storm damages beach nourishment has been a part of the shoreline management strategy since the 1930's. Multiple projects including local, state and federally sponsored projects constructed bolstered the islands storm protection. In 2003, a

Federal project went to initial construction placing sand to restore dunes and widen the beaches. The USACE initial beach nourishment occurred only from Absecon Inlet to the Ventnor City/Margate City boundary. The towns of Margate and Longport (received 190,000 cubic yards in 1990) declined to participate in the Federal project. The dunes, constructed to an elevation of 14.5 feet NAVD88, were just high enough to withstand the wave run-up during Sandy. A maintenance project just prior to Sandy restored the oceanfront beach and dunes that prevented damage to the City's famous boardwalk. Emergency restoration during 2013 put the beach width and dune back to the design specifications following erosion from Sandy. In 2017, the USACE began the 3<sup>rd</sup> periodic nourishment cycle for Atlantic City and Ventnor plus included construction of the full federal dune and beach project for Margate and Longport, work was completed in spring 2018 with 3,493,599 cubic yards placed from 2017 to 2018.

The northernmost site in Atlantic City is at Rhode Island Ave (NJBPN 230), located approximately 1400 feet south of Absecon Inlet between the Vermont and Massachusetts Avenue groins. This site is subject to rapid erosion and is a hot spot of concern for Atlantic City due to its proximity to the inlet and associated wave and current dynamics. The beach and dune eroded from spring 2016 through spring 2017 but the USACE 3<sup>rd</sup> nourishment cycle restored the dune and beach in fall 2017. The project added 118.55 yds<sup>3</sup>/ft. of sand to the beach between spring and fall 2017 with a 165-foot shoreline position advance during the same interval. The cycle of erosion immediately returned over the winter, removing -61.44 yds<sup>3</sup>/ft. of sand by spring 2018. Erosion continued over the summer months and by fall 2018 another -26.39 yds<sup>3</sup>/ft. of sand was lost. Net change for the study interval was a moderate gain of 46.98 yds<sup>3</sup>/ft. of sand consisting mostly of sand retained in the dune system as the beach berm rapidly eroded over the first year.

NJBPN 130 is located at North Carolina Ave just south of the Steel Pier approximately 4800 feet south of Absecon Inlet. Beach and dune stability improves in this region but is still subject to long-term erosion. The 2017 USACE project added approximately 56.77 yds<sup>3</sup>/ft. of sand extending the beach berm and beachface slope seaward, the dune received no sand, as it remained intact. The additional sand extended the shoreline 53 feet seaward as of December 2017. From fall 2017, to spring 2018 an additional 32.91 yds<sup>3</sup>/ft. of sand accumulated as the USACE project continued to add sand to the system. This sand accumulated primarily nearshore and on the lower beachface slope. In response, the shoreline advanced 109 feet from spring 2017 to spring 2018 of the project. Over the summer, the site lost -34.87 yds<sup>3</sup>/ft. of sand, scoured from the berm and nearshore. For the study interval, Raleigh Avenue gained 54.77 yds<sup>3</sup>/ft. of sand and the shoreline advanced 41 feet, retreating nearly 69 feet by fall 2018 from its spring 2018 post project position.

Raleigh Avenue (NJBPN #129) is located at the south end of Atlantic City within the mid-section of Absecon Island where the beaches are wider and the dune system continued to expand through natural aeolian processes. No direct sand placement occurred here during the recent USACE project. Instead, the site-demonstrated typical seasonal variations gaining sand from spring 2017 to fall 2017 (17,84 yds<sup>3</sup>/ft.) then losing sand over the winter months (-18.71 yds<sup>3</sup>/ft.) from fall 2017 to spring 2018 followed by a modest summer gain (8.64 yds<sup>3</sup>/ft.) of sand from spring 2018 to fall 2018. Net result, a modest volume gain of 4.10 yds<sup>3</sup>/ft. of sand over the study interval while the shoreline advanced seaward 32 feet from spring 2017 to fall 2018.

### **Ventnor City, #128;**

NJBPN 128 located at Dorset Avenue in Ventnor City is approximately 850 feet north of the fishing pier. The pier does not appear to have a significant impact on sand transport or long-term stability of this region. Ventnor chose to participate in the 2002-2003 Federal beachfill and again received sand during subsequent nourishment projects including the recent 2017-2018 3<sup>rd</sup> nourishment cycle. The site is located about 15 blocks north of the original taper to the 2003 federal project beach and was subject to end-effect erosion as the adjacent downdrift unfilled beaches came to equilibrium with the up-drift filled beaches. In 2017, the USACE project in addition to maintenance nourishment finally constructed the full beach and dune template south of Ventnor City stabilizing the southern end of Ventnor City beaches, eliminating the end effect erosion here. Similar to Raleigh Avenue, the beaches in Ventnor City are located within the mid-section of Absecon Island and benefit

from the supply of sand moving north to south along the shoreline that form wider beaches and a stable to accretive dune system. Over the winter of 2017, the site lost -20.37 yds<sup>3</sup>/ft. of sand and 69 feet of shoreline width. Following the 2017 USACE project, the beach recovered 31.75 yds<sup>3</sup>/ft. of sand and 67 feet of shoreline. Over the winter months, the shoreline position retreated 19 feet with a loss of -16.65 yds<sup>3</sup>/ft. of sand from winter wave scour. Sand recovery occurred over the summer months and by November the seaward dune slope, beach and nearshore had gained 15.21 yds<sup>3</sup>/ft. of sand advancing the shoreline 55 feet. Net changes for the study period (spring 2017 to fall 2018) advanced the shoreline position seaward 104 feet with the addition of 29.6 yds<sup>3</sup>/ft. of sand.

### **Margate City, #127;**

Margate City declined to participate in the 2003 USACE project to construct dunes and widen beaches City beaches. The Margate beaches did benefit indirectly from the project through an influx of sand by littoral currents moving sediment from the up-drift project beaches towards the downdrift Margate shoreline (end effect erosion). During Sandy, Margate City suffered from significant amounts of water washing over the timber bulkhead at the development limit that inundated the streets and properties immediately landward. At the Benson Avenue site (NJBPN 127), a lack of consistent dunes, but a very wide beach permitted wave energy to deposit sand to the very top of the bulkhead, over it and into the street. Some spots did have “island” dunes that acted to protect from the overwash process, but in many cases the water breached into the City. During 2015, some street-end oceanfront bulkheads were raised to elevation 13.0 NAVD 1988, but storm water drain scuppers on each side of the street end allowed ocean water into the street often flooding curb to curb (Jonas 1-23-2016).

In 2017, the USACE started construction of work in Margate and Longport as part of the flood and coastal storm damage reduction project for Absecon Island, work was completed in spring 2018. From spring 2017, through fall 2017 as the project progressed the shoreline position advanced seaward 110 feet. During the same interval, the site accumulated 55.50 yds<sup>3</sup>/ft. of sand occurring from spring 2017 to fall 2017 as the project moved into the region. The USACE project continued in the region until spring 2018 building the dune and beach berm adding additional sand to the system. From fall 2017 to spring 2018 another 59.54 yds<sup>3</sup>/ft. of sand accumulated during the project. The dune system created during the project is approximately 150 wide at the base and 80 wide on the crest at elevation 14 feet NAVD88 significantly enhancing storm protection. As did the additional beach berm width that extended approximately 400 feet seaward of the street end bulkhead. The shoreline position advanced seaward an additional 51 feet as the project continued. Net changes during the project from spring 2017 to spring 2018 produced 161 feet of shoreline position seaward advancement and an accumulation of 117.48 yds<sup>3</sup>/ft. of sand. Following the project there was a modest sand volume loss of -18.86 yds<sup>3</sup>/ft. of sand primarily from nearshore and offshore with 11 feet of shoreline position retreat. The net study interval change from spring 2017 to fall 2018 include 149 feet of shoreline position advancement with the addition of 103.39 yds<sup>3</sup>/ft. of sand.

### **Borough of Longport, #126;**

The site at 17<sup>th</sup> Street in Longport (NJBPN 126) is the southernmost site on Absecon Island. Located approximately 1800 feet north of the Great Egg Harbor Inlet the beach is subject to inlet dynamics that affect sediment distribution around the mouth of the inlet. The southern community has a narrow, low elevation beach seaward of an old concrete seawall with a buried rock revetment protecting some of the development. Similar to Margate, some residents and property owners successfully fought to block construction of the initial USACE project in 2003. During Sandy, waves crashed into the wall and poured over it and down most of the Borough streets into Atlantic Avenue. Since the homes are very close to the wall, house damage was evident as well. Eventual local agreement resulted in Longport’s inclusion in the Absecon Island shore protection plan with construction finally starting in 2017-2018 on the engineered dune and beach. This inclusion of Longport

and Margate completes the federal project that extends across Absecon Island from Absecon Inlet to Great Egg Inlet.

The site at 17<sup>th</sup> Street in Longport (NJBP 126) is the southernmost site on Absecon Island. Located approximately 1800 feet north of the Great Egg Harbor Inlet the beach is subject to inlet dynamics that affect sediment distribution around the mouth of the inlet. Although the USACE project had not reached this site by fall 2017 sand had begun to accumulate on the beachface slope and nearshore. Between spring 2017 and fall 2107, the shoreline position advanced seaward 50 feet with the natural addition of 25.34 yds<sup>3</sup>/ft. of sand. From fall 2017 to spring 2018, the USACE project pumped another 95.33 yds<sup>3</sup>/ft. of sand onto this beach. The shoreline advanced seaward 116 feet supporting development of a wider beach berm and a new dune ridge. This new dune feature was established approximately 20 feet seaward of the concrete and rock revetment, approximately 100 feet wide at the dune toe with a crest elevation of approximately 14 feet NAVD88. A beach berm at approximately 8 feet NAVD88 extended nearly 250 feet seaward of the seawall location. Both features significantly enhance storm protection for the local community. Over the summer months, aeolian transport moved sand to the upper beach building a new foredune ridge on the seaward dune slope while nearshore scouring and bar migration removed some sand as the new profile adjusted to the wave climate. Net change from spring 2018 to fall 2108 included a modest loss of -18.86 yds<sup>3</sup>/ft. of sand and 29 feet of shoreline retreat. Overall, for the study interval the shoreline position advanced seaward 137 feet with an accumulation of 100.92 yds<sup>3</sup>/ft. of sand completing the USACE project for Absecon Island.

The summary tables below displays Shoreline and Volume changes at each site for the study interval. Values for shoreline change are in feet while volume changes are cubic yards per foot.

**Table Two - Shoreline Changes**

Profile Site	S2017-F2017 (ft.)	F2017-S2018 (ft.)	S2018-F2018 (ft.)	S2017-F2018 (ft.)	S2017-S2018 (ft.)	F2017-F2018 (ft.)
134: Brigantine, Green Acres Area	20.00	-36.00	54.25	38.25	-16.00	18.25
133: Brigantine, 4 th Street North	-18.50	159.75	-32.50	108.75	141.25	127.25
132: Brigantine, 15 th Street South	-5.75	-18.00	35.25	11.50	-23.75	17.25
131: Brigantine, 43 rd Street South	-21.75	-14.25	42.75	6.75	-36.00	28.50
230: Atlantic City, Rhode Island Ave.	165.25	-122.75	-5.50	37.00	42.50	-128.25
130: Atlantic City, North Carolina Ave.	52.50	56.75	-68.50	40.75	109.25	-11.75
129: Atlantic City, Raleigh Avenue	4.00	20.50	7.75	32.25	24.50	28.25
128: Ventnor, Dorset Avenue	67.25	-18.50	54.98	103.73	48.75	36.48
127: Margate, Benson Avenue	110.13	50.50	-11.25	149.38	160.63	39.25
126: Longport, 17 th Street	49.50	116.25	-28.50	137.25	165.75	87.75

**Table Three - Volume Changes**

Profile Site	S2017-F2017 (yds <sup>3</sup> /ft.)	F2017-S2018 (yds <sup>3</sup> /ft.)	S2018-F2018 (yds <sup>3</sup> /ft.)	S2017-F2018 (yds <sup>3</sup> /ft.)	S2017-S2018 (yds <sup>3</sup> /ft.)	F2017-F2018 (yds <sup>3</sup> /ft.)
134: Brigantine, Green Acres Area	17.41	-20.17	1.14	0.28	-2.84	-20.51
133: Brigantine, 4 th Street North	-3.83	90.94	-9.66	85.73	91.11	79.63
132: Brigantine, 15 th Street South	18.63	8.67	-12.48	13.49	26.06	-3.43
131: Brigantine, 43 rd Street South	15.03	19.44	18.87	48.53	30.38	38.22
230: Atlantic City, Rhode Island Ave.	118.55	-61.44	-26.39	46.98	67.90	-89.74
130: Atlantic City, North Carolina Ave.	56.77	32.91	-34.87	54.77	89.56	-1.92
129: Atlantic City, Raleigh Avenue	17.84	-18.71	8.64	4.10	-0.14	-12.74
128: Ventnor, Dorset Avenue	31.75	-16.65	15.21	29.60	13.49	-1.24
127: Margate, Benson Avenue	55.50	59.54	-18.86	103.39	116.50	46.40
126: Longport, 17 th Street	25.34	95.33	-19.49	100.92	117.48	74.92

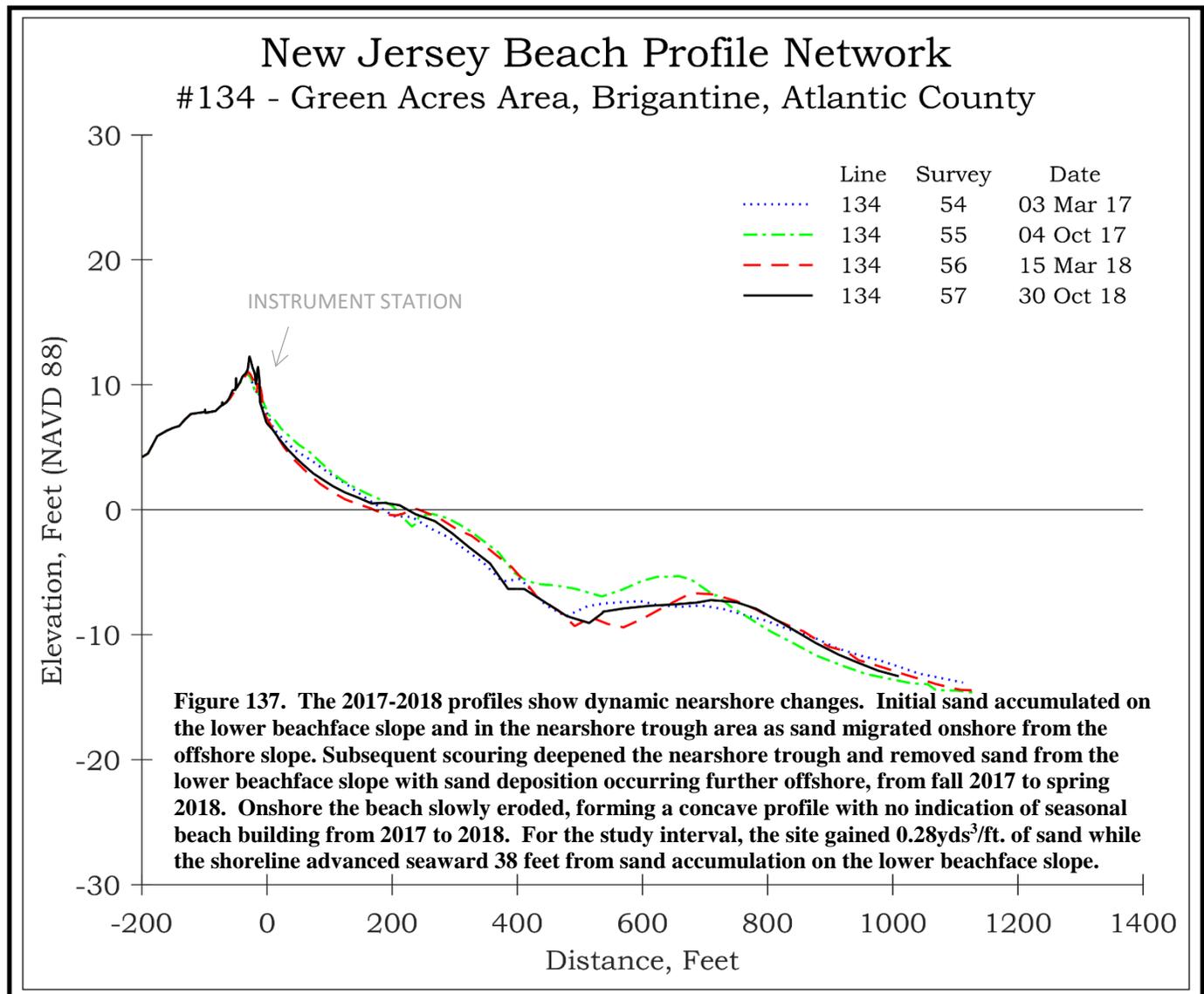
**Site Photographs and Profile Plots:**

On the following pages are a series of photographs and profile plots (figures 136-145) for each location. The photographs show the annual changes in conditions while the profile plots the semi-annual changes over the study interval (spring 2017 to fall 2018). A brief figure caption for each photo series and profile plot describe the changes shown.

**NJBPN 134 – Green Acres Area, Brigantine**



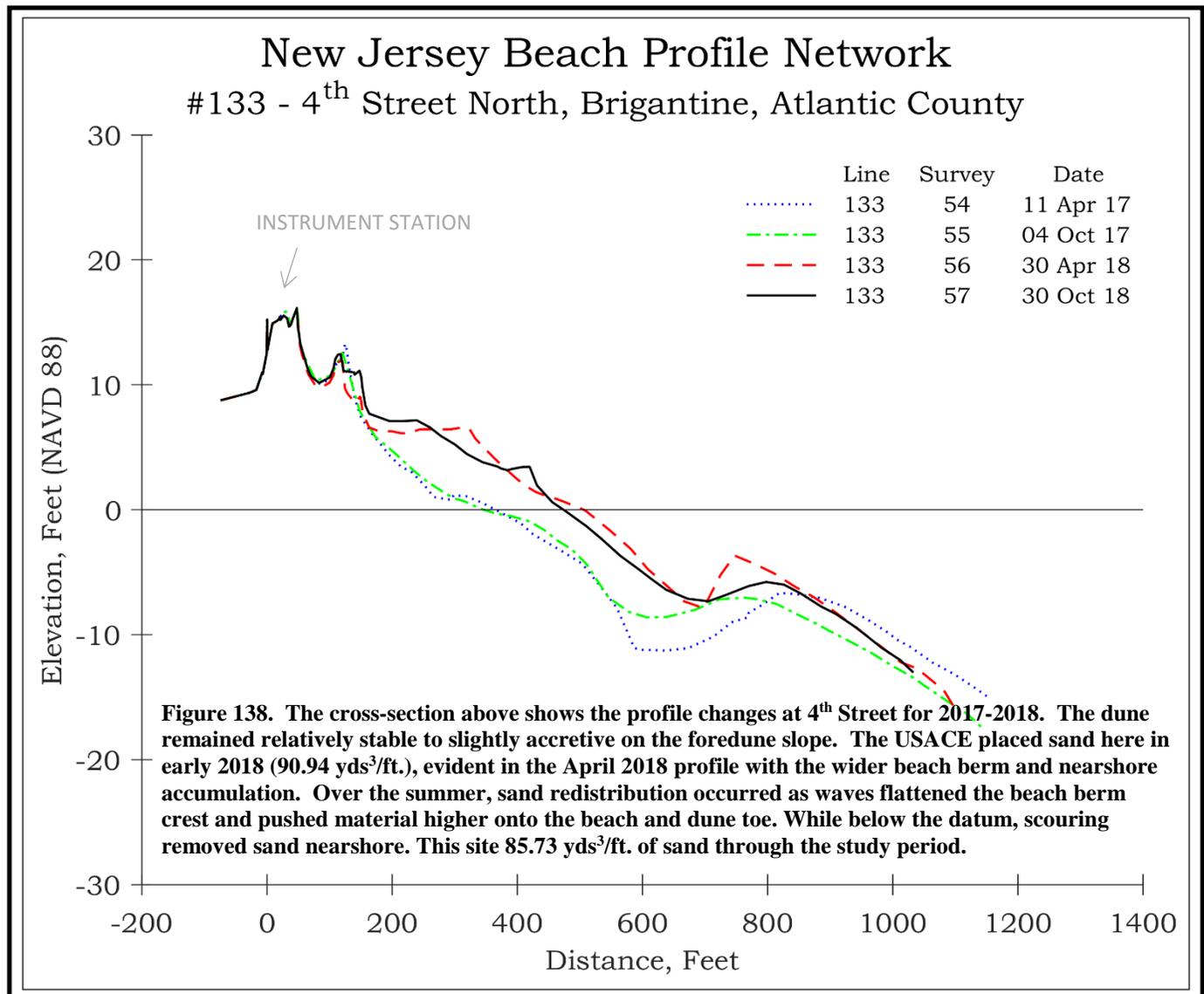
This site is located in the natural area on the northern segment of Brigantine Island preserved as public open space. On the left (October 4, 2017) the view is south along the upper beach. Beach width is relatively wide but with a flat low elevation slope. Photo on the right taken October 30, 2018 is a similar view from the seaward dune crest showing the extent of the low elevation dune in this region. Beach width and elevation remained relatively constant during this study interval.



NJBPN 133 – 4<sup>th</sup> Street North, Brigantine



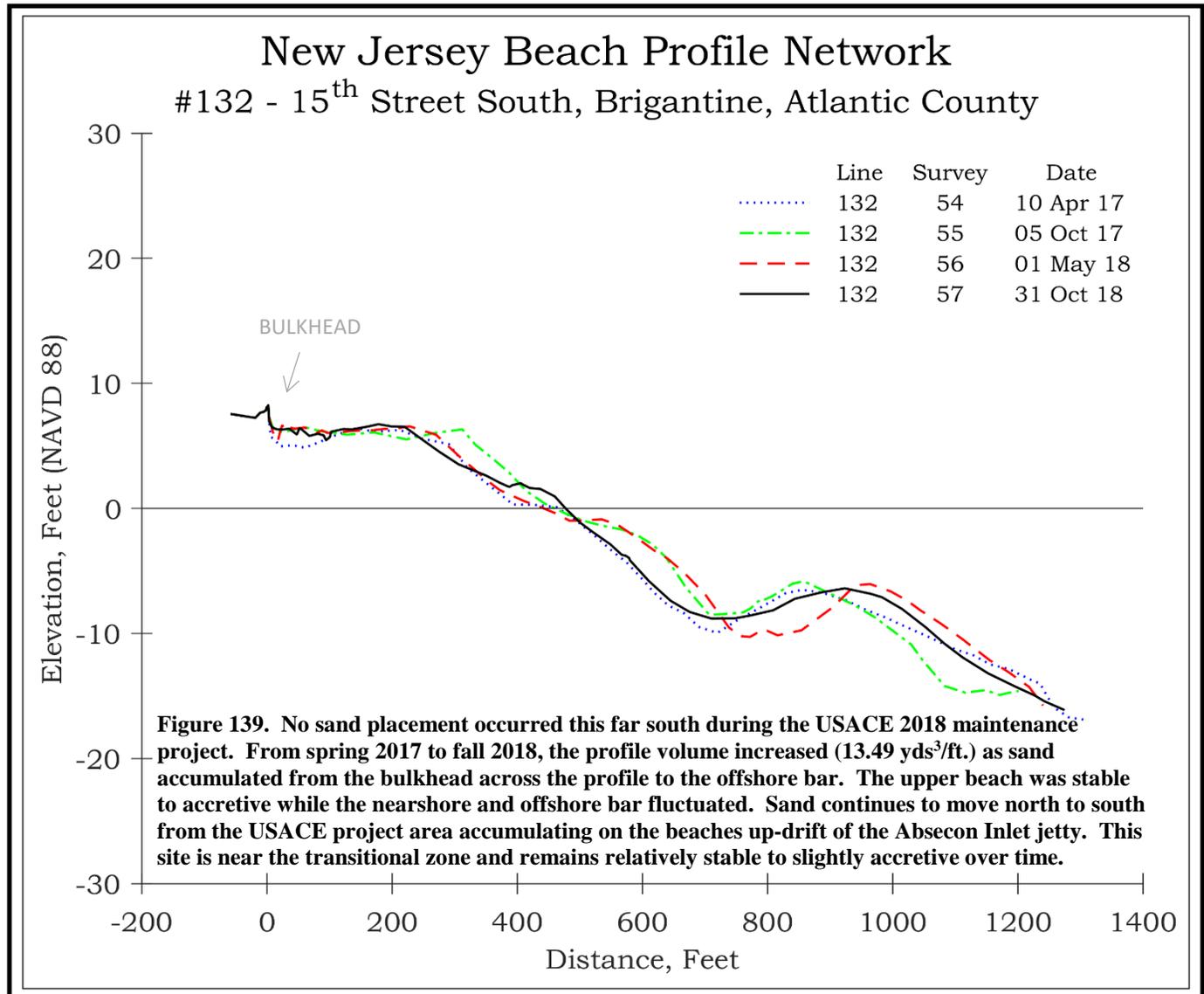
This site is located near the northern limit of development and within the 1997, 2001, 2006, 2013 and 2018 beach fill projects. Photo on the left (October 4, 2017) is a view down the foredune ridge built naturally from sand extracted from the beach by the wind over time and now fully colonized by American Beach grass. Photo on the right (October 30, 2018) shows continued aeolian sand accumulation around rows of dune fence now nearly buried and the wider beach after the spring 2018 project.



**NJBPN 132 – 15<sup>th</sup> Street South, Brigantine**



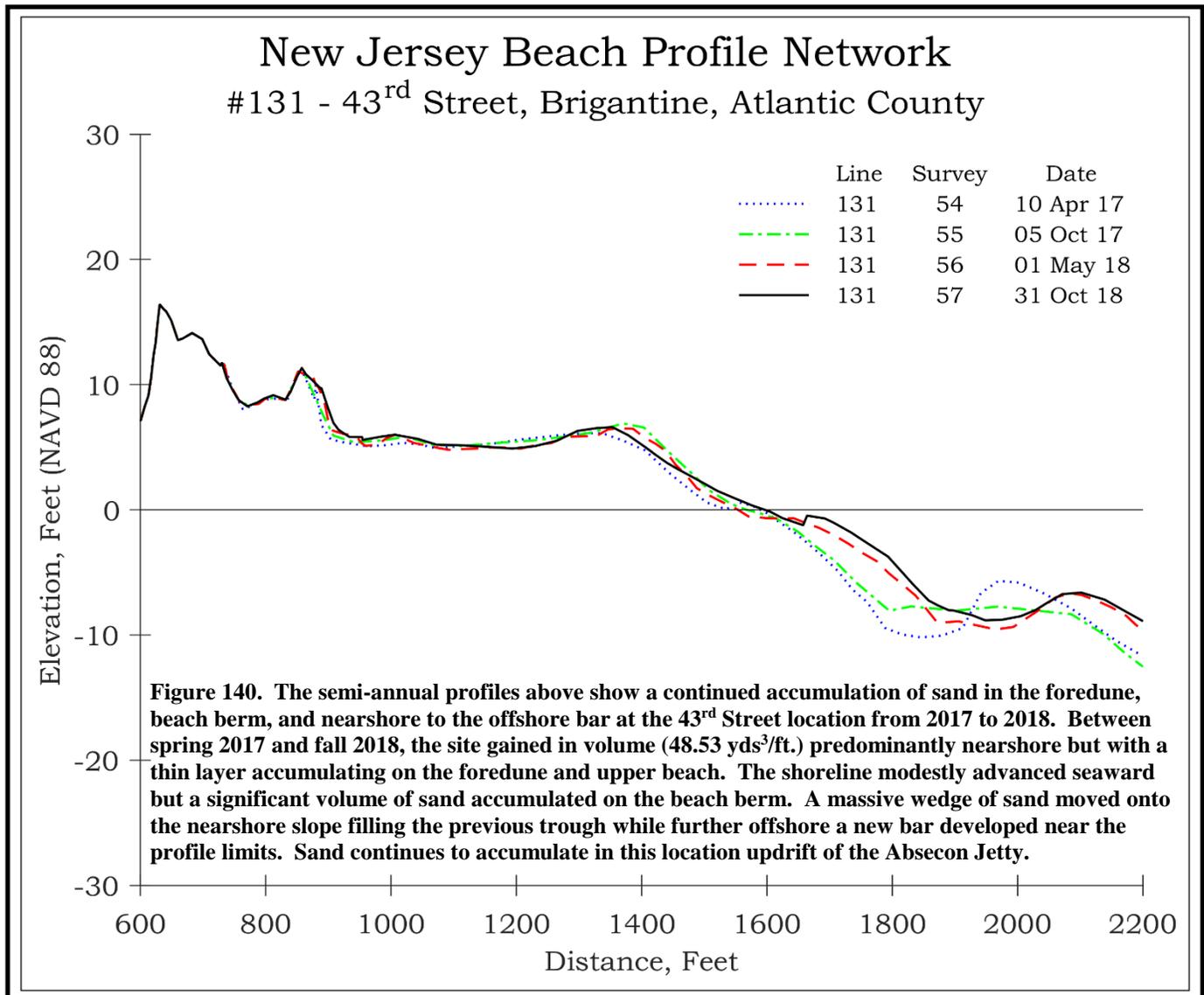
The left photo taken October 5, 2017, shows the view north and seaward of the beach club with no dune feature and a wide beach seaward of the structures. Photo on the right shows the same view on October 31, 2018, the beach was relatively stable over the past year and the structure remained within the footprint alignment of the dune adjacent to this site, north and south.



NJBPN 131 – 43<sup>rd</sup> Street South, Brigantine



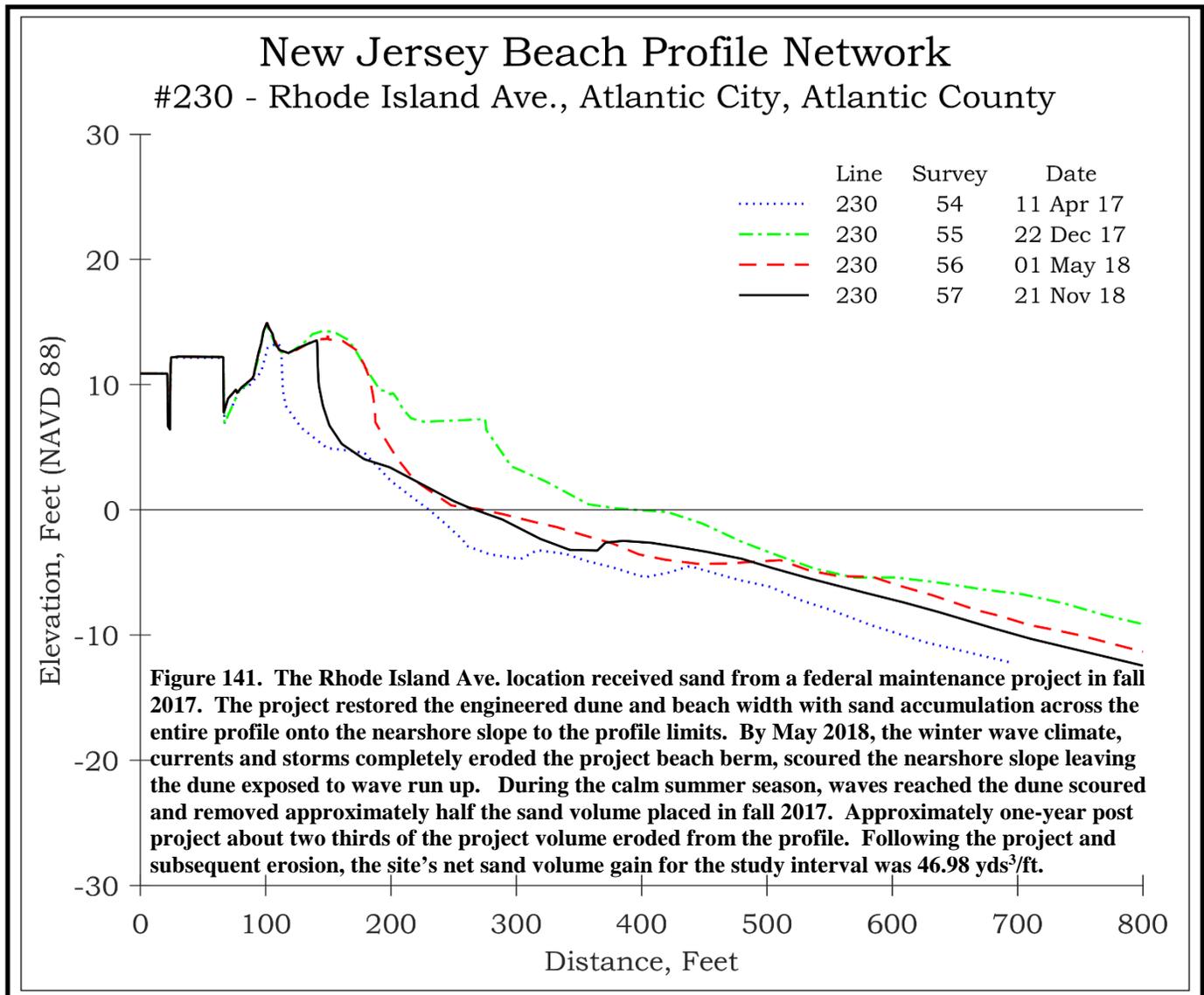
The photo on the left is a view to the north taken on October 5, 2017, shows the massive 600-foot wide recreational beach located between the dune and high water line. Photo on the right taken October 31, 2018 shows evidence of recent berm top ponding on the upper beach from an overwash event, note the darker damp sand and ripple patterns in foreground. The overwash ponding likely resulted during a northeast storm that struck the coast on October 27, 2018.



**NJBPN 230 – Rhode Island Avenue, Atlantic City**



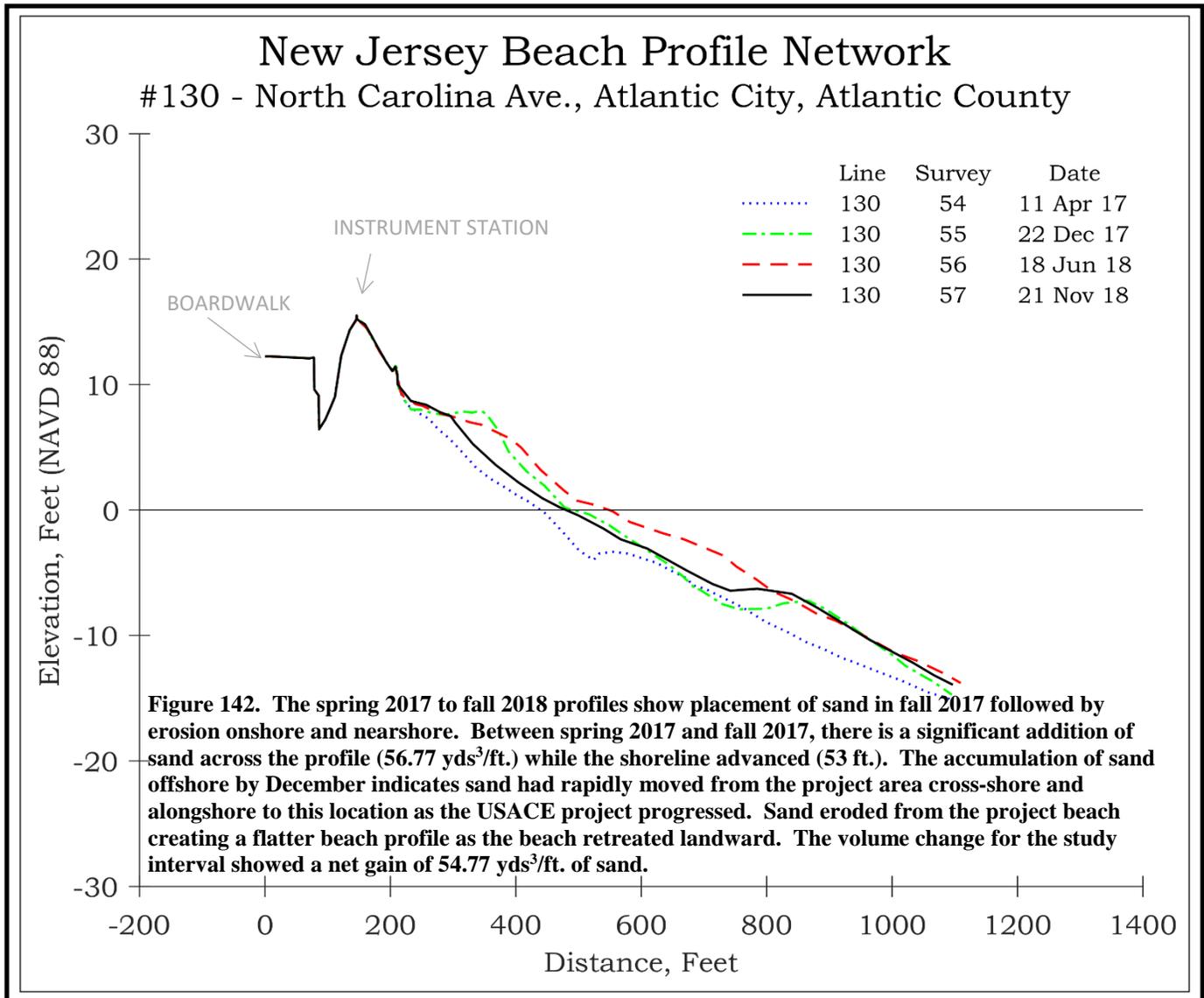
This profile site is located near the Absecon Inlet south jetty. The left photo (taken December 22, 2017) shows the restored beach and dune following the USACE 2017 maintenance project. By November 21, 2018 (right photo) erosion had lowered the beach berm elevation reduced the overall width that allowed storm waves to cut into the seaward dune slope. This site remains an erosional hotspot for Atlantic City despite rehabilitation and modifications to the adjacent rock groins.



**NJBPN 130 – North Carolina Avenue, Atlantic City**



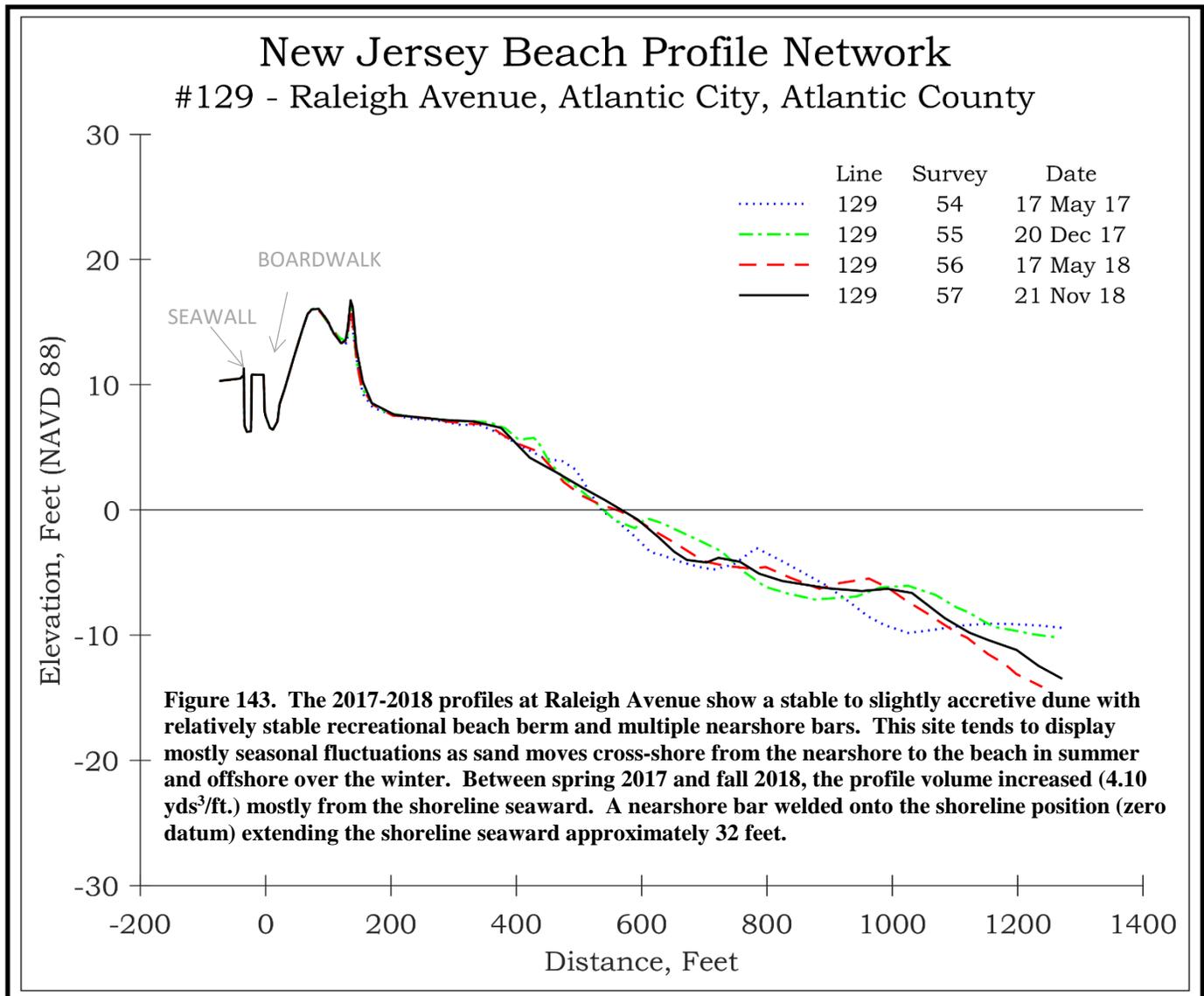
This location is also within the Absecon Island Federal shore protection project just south of Steel Pier. The left photo, taken December 22, 2017, shows the beach under construction. Photo shows the beach and seaward dune toe one-year post construction (November 21, 2018). At this location, the project beach is relatively stable and supports the established dune.



NJBPN 129 – Raleigh Avenue, Atlantic City



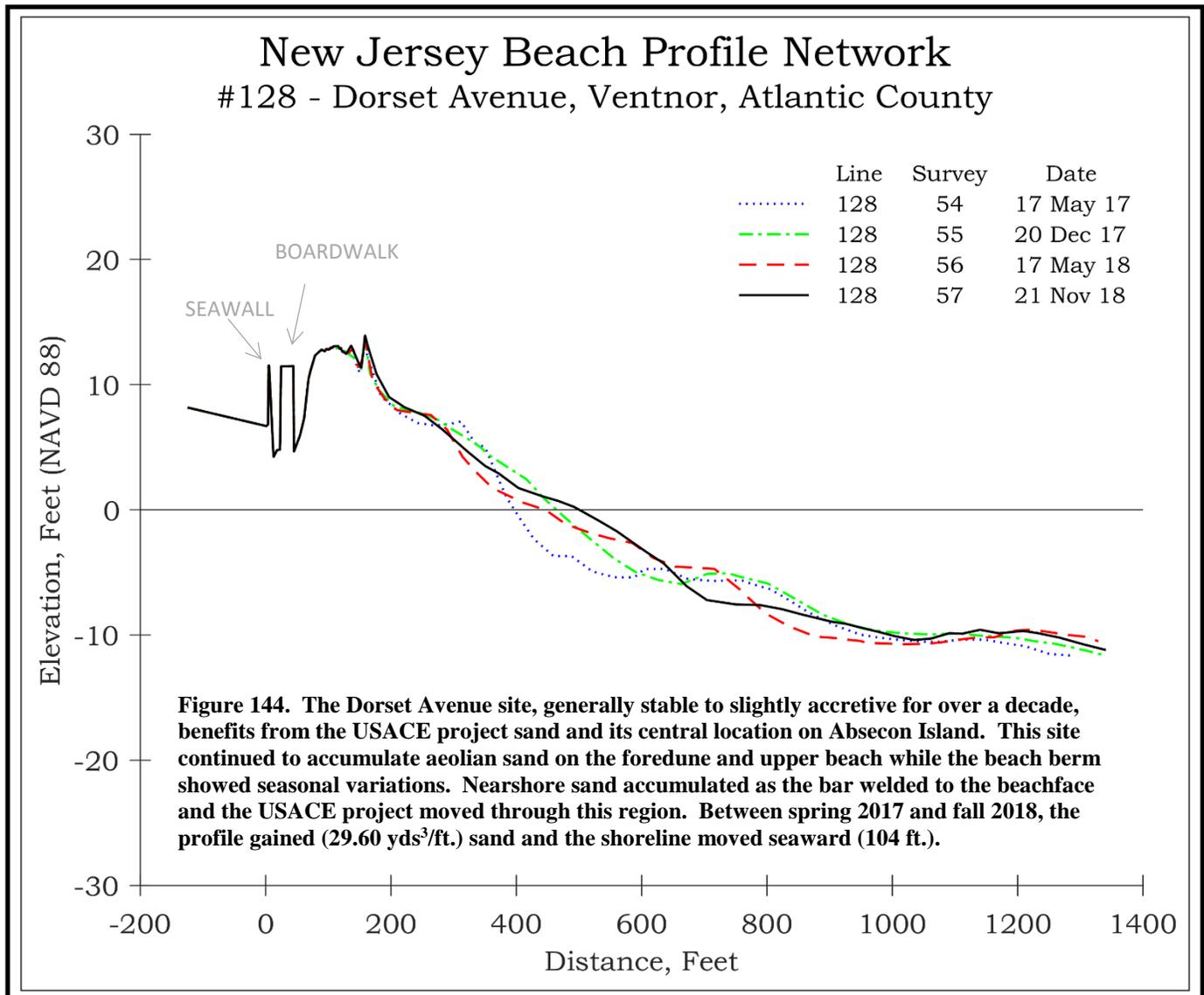
This site lies near the middle of the initial USACE shore protection project on Absecon Island where erosional loss is minimal. Photo on the left taken December 20, 2017 shows that sand accumulated at the fence now completely buried, dune grass colonized the seaward slope to the toe forming a new foredune ridge. Photo on the right taken November 21, 2018 shows the foredune was continuing to expand seaward onto the wide stable beach that provides an abundant source of aeolian sand.



**NJBPN 128 – Dorset Avenue, Ventnor City**



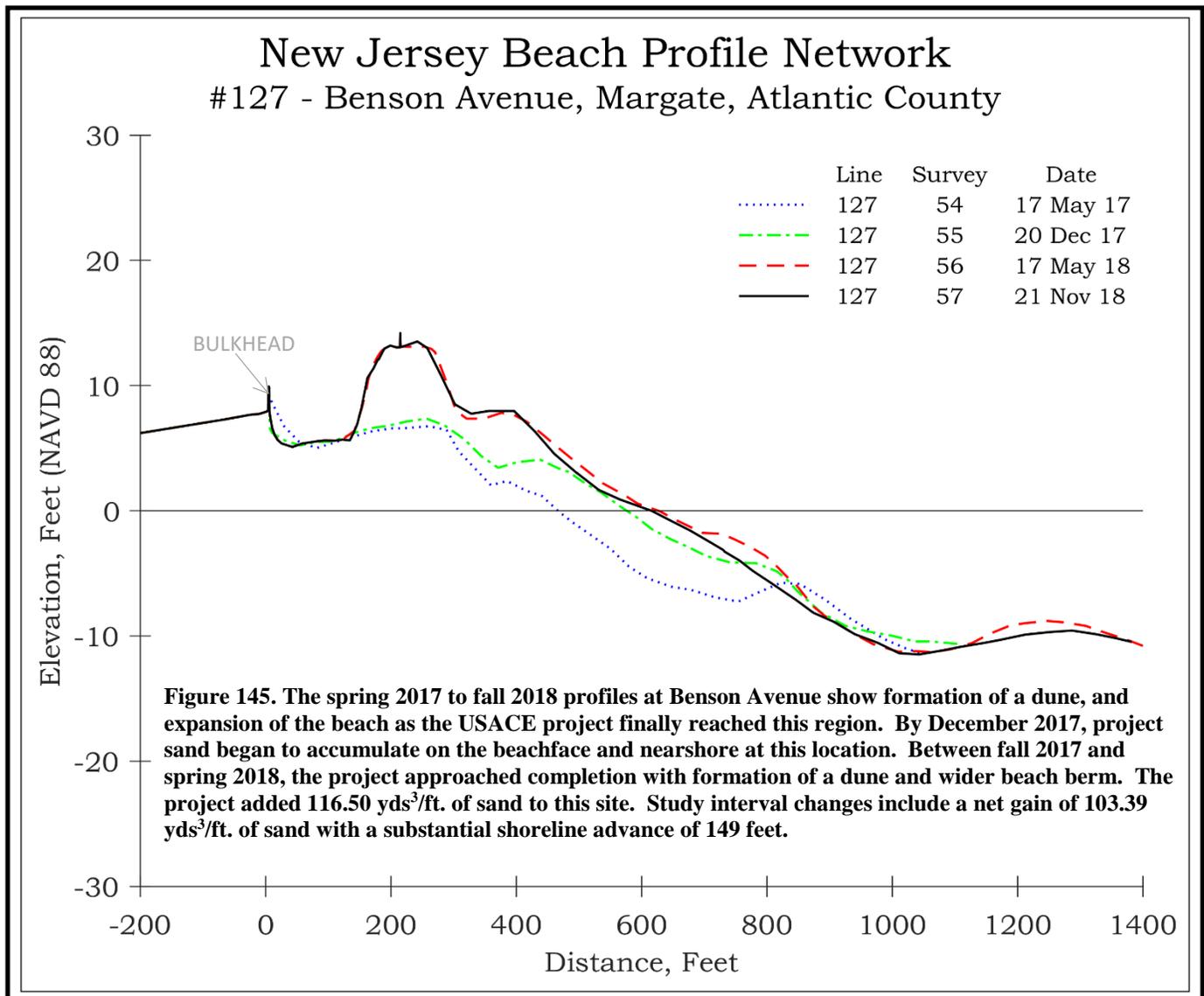
The Dorset Avenue site positioned centrally on Absecon Island is stable in terms of net storm losses, seasonal changes and any long-term erosion trends. Left photo taken December 20, 2017 shows a view from the seaward dune crest looking south with modest sand accumulation at the dune toe and on the upper beach. A similar view taken on November 21, 2018 shows a continuation of aeolian accumulation at the dune toe and the relatively stable upper beach.



**NJBPN 127 – Benson Avenue, Margate City**



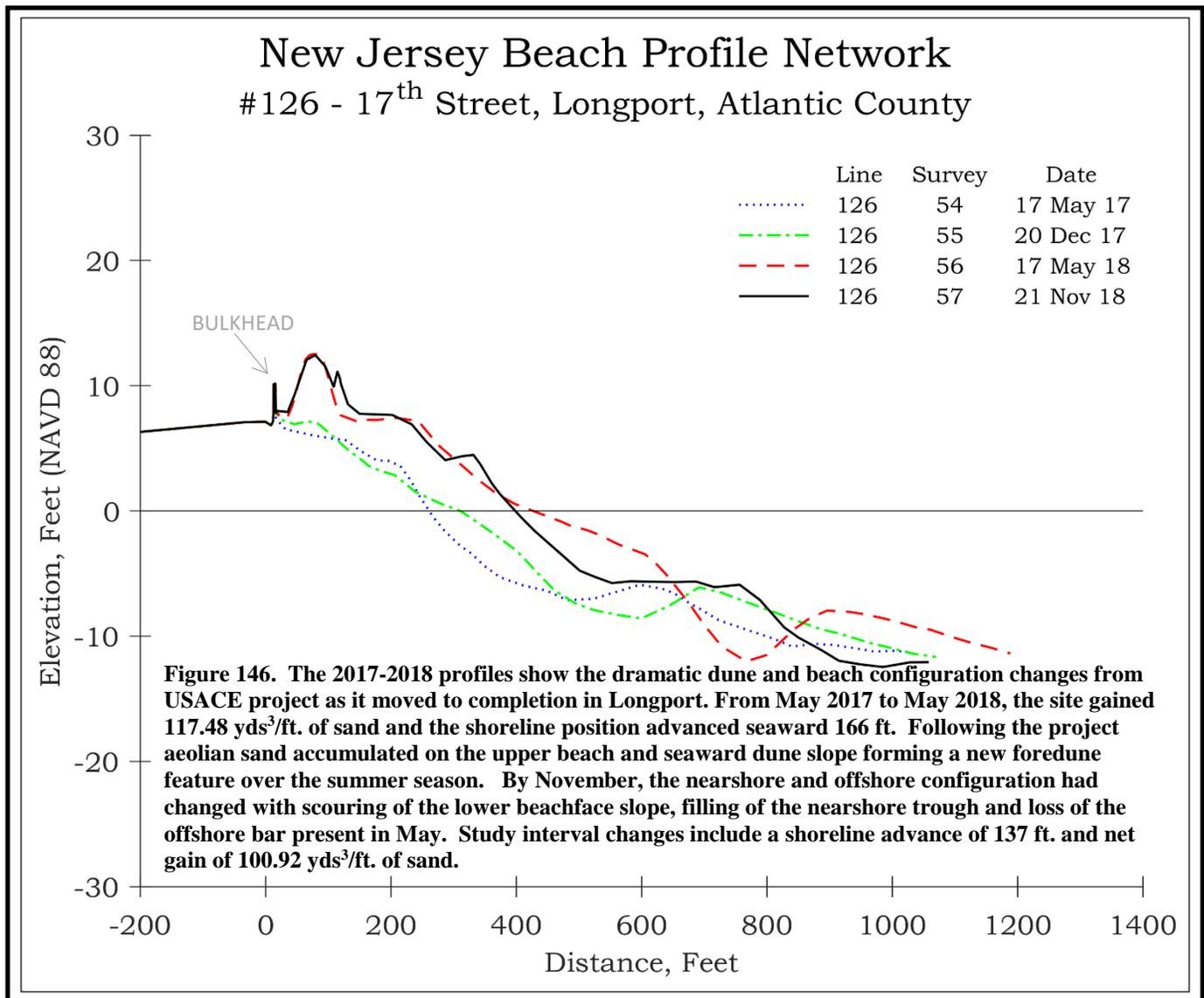
The Benson Avenue site is located approximately one mile south of the end of the original USACE project in Ventnor. The left photo taken December 20, 2017 looking south shows the start of the USACE project in this region had finally begun with dune construction underway. By November 21, 2018, the project is complete in Margate with a wider and higher beach elevation plus a newly established dune system that planted with American Beach grass from the landward toe to the seaward crest.



**NJBPN 126 – 17<sup>th</sup> Street, Longport**



The 17<sup>th</sup> Street profile is located about 6 blocks north of the Great Egg Harbor Inlet jetty and well south of the constructed USACE project. The right photo, taken December 20, 2017, shows modest sand accumulation on the upper beach but no indication of the USACE project under construction in Margate. By November 21, 2018 (right photo), the USACE project is complete. A newly established dune buried the seawall while the beach extends seaward supporting dune growth and stability.



## Summary & Conclusions

The USACE scheduled the 3<sup>rd</sup> nourishment cycle on Absecon Island that began in spring 2017 and completed in spring 2018. On Brigantine Island, restoration work began during the winter of 2018 and completed in spring 2018. For Absecon Island, storm damage from Sandy in Longport convinced Borough officials to seek inclusion in the 2017 USACE project to continue construction of the full dune and beach design template south from Ventnor. Some residents in Margate continued to oppose the USACE project design and took legal action to block construction. In 2016, the Superior Court ruled in favor of the NJ DEP and USACE that the project specifications and accepted design were not arbitrary and capricious as they applied to the Margate City oceanfront. This decision, allowed the execution of the remainder of the Absecon Island shore protection effort to proceed through Margate City with construction starting in spring 2017.

Tables 1 and 2 provide the seasonal and annual profile shoreline and volume changes for Atlantic County. Between the spring of 2017 and the fall of 2018, the Absecon Island average sand volume change at the six cross sections gained 56.63 yds<sup>3</sup>/ft. in sand volume accompanied by a 83.4-foot average shoreline advance. These numbers provide an average across the federal project beach with the 2017/2018 nourishment project the major influencing factor. The most significant changes occurred at Rhode Island Avenue at the north end of Atlantic City within the erosional hotspot where the seaward dune slope and beach restored during the project quickly retreated landward to within about 75 feet of the boardwalk by fall 2018. The USACE project placed approximately 118.55 yds<sup>3</sup>/ft. of sand on this site between spring 2017 and fall 2017, resulting in 165 feet of seaward shoreline position advancement and nearly 100 feet of additional dune width. By spring 2018, the shoreline had retreated 123 feet with a loss of -61.44 yds<sup>3</sup>/ft. of sand. North Carolina site showed a similar pattern receiving approximately 89.56 yds<sup>3</sup>/ft. of sand from spring 2017 to spring 2018 followed by rapid erosion that removed -34.87 yds<sup>3</sup>/ft. of sand from spring 2018 to fall 2018. At Benson Avenue in Margate, the net gain (spring 2017 to fall 2018) was 103.39 yds<sup>3</sup>/ft. of sand with 149 feet of shoreline position advancement as the USACE project extended south through Longport. The 17<sup>th</sup> Street site in Longport advanced seaward 137 feet with a volume gain of 100.92 yds<sup>3</sup>/ft. of sand. Volume gains at mid-island sites on Absecon Island were more moderate ranging from 29.60 yds<sup>3</sup>/ft. at Dorset Avenue in Ventnor to 4.10 yds<sup>3</sup>/ft. at Raleigh Ave in Atlantic City.

On Brigantine Island, the four cross sections gained an average of 37.01 yds<sup>3</sup>/ft. of sand from spring 2017 to fall 2018. The site at 4<sup>th</sup> Street north located within the federal project received 90.94 yds<sup>3</sup>/ft. of sand through the recent USACE maintenance project from fall 2017 to spring 2018. The remaining three sites gained on average 20.77 yds<sup>3</sup>/ft. of sand with the largest gain (48.53 yds<sup>3</sup>/ft.) at 43<sup>rd</sup> Street while 15<sup>th</sup> Street South gained only 13.49 yds<sup>3</sup>/ft. of sand. The north end natural site remained essentially unchanged for the study interval gaining 0.28 yds<sup>3</sup>/ft. of sand. The average shoreline change advanced seaward 41 feet during the study interval for the four profile sites. The 4<sup>th</sup> Street North site skewed the average with a large shoreline position advance of 109 feet on the engineered beach having advanced 160 feet seaward immediately following the project. The three other sites in Brigantine advanced 38 feet to 7 feet with the largest occurring at the Green Acres site.

Absecon Island has the highest density of development on any New Jersey barrier island with a moderate storm exposure risk, even with completion of the federal project. Completion of the initial construction for Margate and Longport with maintenance nourishment for Atlantic City and Ventnor City finished from 2017-2018, added 3,493,599 cubic yards of sand into the Absecon Island sediment budget. With this additional sand and completion of the southern community beaches, the stable middle segment of the Absecon Island oceanfront will likely extend south well into Margate City. The northern hotspot will likely persist between Absecon Inlet and Steel Pier driven by proximity to the inlet and island orientation. While at the south end absence of any planned changes to the terminal groin at 11<sup>th</sup> Street or jetty system at Longport Point to reduce terminal losses and sand bypassing into Great Egg Inlet will be problematic.

From the Oriental Jetty towards Gardner's Basin the USACE constructed 0.3 miles of bulkhead, seawall and boardwalk, completed in April 2018. This work replaced an aging rock structure and the severely damaged inlet boardwalk. The project design reduced coastal storm damage risk while restoring city access and recreational opportunities along the inlet. Approximately 99,000 tons of stone placed in the new shore protection structure extending 1,776 feet fronting 2,650 feet of new boardwalk. Information regarding the project can be found at the USACE Philadelphia District website (<http://www.nap.usace.army.mil/Media/News-Stories/Article/1534767/district-celebrates-completion-of-absecon-inlet-seawall-and-boardwalk/>).

The southern two thirds of Brigantine Island has the lowest storm damage risk due to expansion of the beach width over the last 60 years, a result of extending the north jetty at Absecon Inlet and a persistent southerly littoral drift, moving sand along the shoreline. Consequently, sand placement on the federal project beach at the northern erosional hotspot will continue to feed sand north to south along the island shoreline. This continuing process supports development of a sand back-passing program established on the southern beaches to remove a small percentage of the accumulated sand and transfer north back to the federal project beaches. The program would help sustain the design template in the erosional zone between nourishment cycles enhancing community storm protection in this often critically exposed region where development and infrastructure remain vulnerable. Moving sand at a sustainable rate from the southern beaches to the federal project area would keep sand in the system and benefit the regional sediment budget significantly extending the period between required large scale and expensive nourishment projects.