



# 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 the New Jersey Green Acres program. 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.

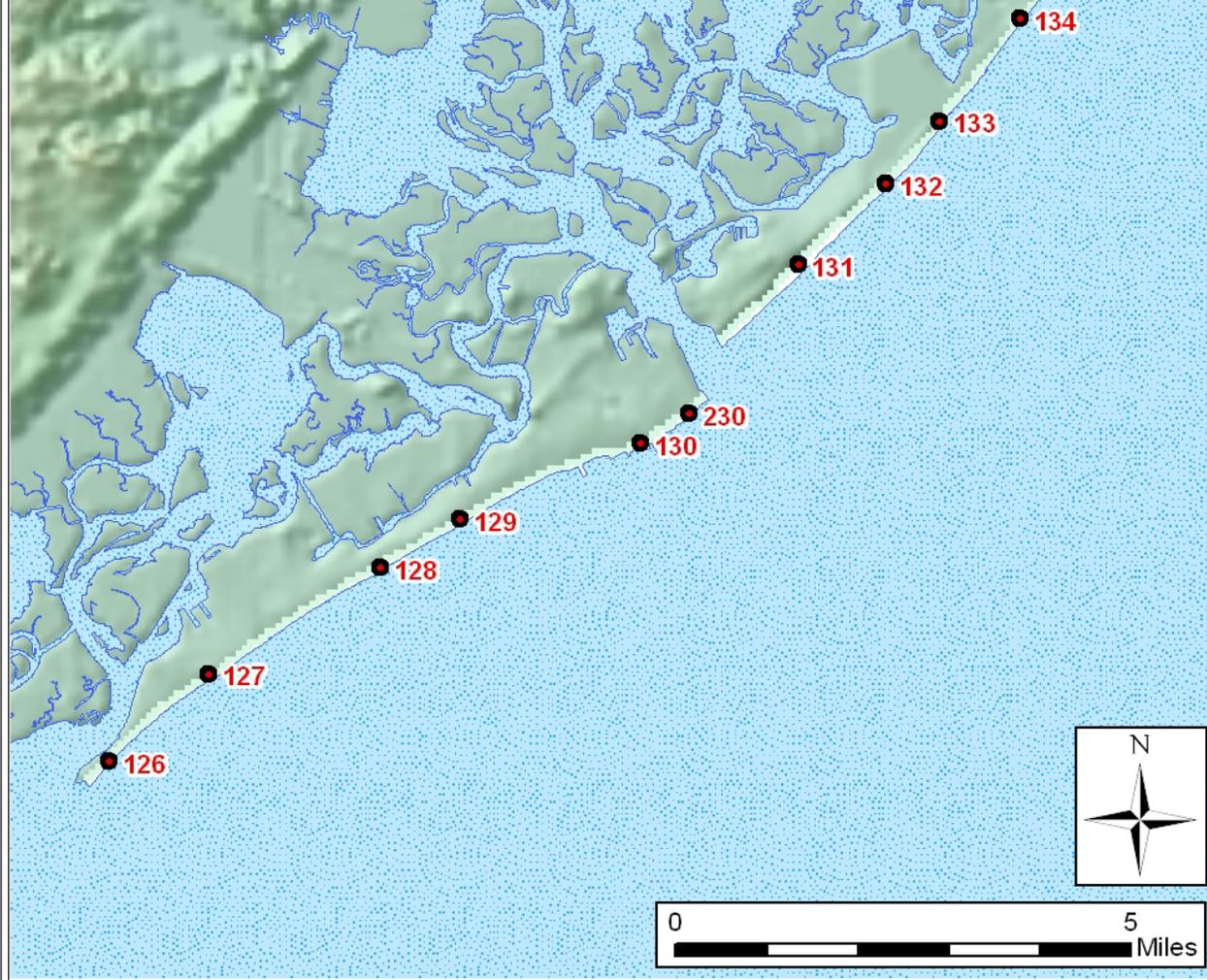


Figure 67. Location map for the 10 NJBPN profile sites in Atlantic County, NJ

## **Atlantic County Individual Site Descriptions:**

The spring and fall surveys of 2014 served to quantify the natural and human efforts to restore Atlantic County's beaches to pre-Sandy conditions or in the case of existing federal shore protection projects, back to the design parameters. Data collected at the 10 oceanfront beach profile locations cover the municipal beaches from the City of Brigantine Beach to the Borough of Longport. Both the Absecon Island and Brigantine Beach US Army shore protection projects have been re-supplied with sand from the authorized borrow zones and restored back to each project's design dune and beach cross section. Little Beach on Pullen Island to the north of Brigantine is a natural area and is not included in the NJBPN or any beach management program.

## **Federal or NJ State Coastal Projects;**

In 2002-3 the US Army Corps of Engineers, Philadelphia District, conducted a 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 crest dune 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 were delayed until 2011 when the ACOE returned to place sand on the northern portion of the Atlantic City shoreline. Fortunately, this task was very recently completed (June 2012) when Sandy came ashore. As an adjunct to the 2012 beach restoration, the Revel Entertainment Casino complex commissioned an offshore, submerged breakwater structure constructed between two groins, one at Massachusetts Avenue and a point just north of the Garden Pier (essentially between Connecticut and New Jersey Avenues). The objective was to more effectively impound the local sand supply for a longer time period at this relatively erosional segment of the Absecon Island coast. A second beach maintenance cycle began in July 2013 and shows in the final survey for that fall. An Absecon Inlet project to rebuild the inlet rock revetment to a uniform standard and remove over a century of accumulated debris from earlier shore protection efforts along the inlet sand beach moved to construction under ACOE jurisdiction and was essentially complete as to debris removal in May 2014. Actual re-construction on the inlet revetment has yet to start.

The ACOE project for Brigantine was focused on the northern third of the developed shoreline. A feeder beach was designed into the project at the southern 1,600 feet of the natural area north of development. 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 to the south of the footprint of two prior State and local projects from 1997 and 2001. In 2011, an emergency maintenance was completed under the Flood Control and Coastal Emergencies funding program using trucked-in sand. By February 2013 the Brigantine portion of Atlantic County's recovery was complete as a result of funding provided under PL-113-2 at no local sponsor cost to restore Hurricane Sandy damage to the Brigantine project.

## **Brigantine;**

The northern-most profile site on the Island of Brigantine is located on the undeveloped northern end of the island now in the possession of the State of New Jersey. This location was overwashed by waves from the ocean to the bay marshes by Sandy. The vegetation survived behind the dune ridge, so re-growth is assured, but at a more landward location. The northeast storm of 1992 was the last time this occurred.

Where development begins, the beach has been erosional due to the orientation difference between the physical infrastructure and the long-term changes in the shoreline. The Federal project includes a part of the natural shoreline where sand is placed to act as a feeder beach to the worst of the erosional segment. Prior to Sandy, the beach was wet to the toe of the rock revetment, so provided little protection. During Sandy, waves crashed over the promenade and flooded Brigantine Boulevard. Dunes and a dry beach begin near the southern end of the promenade where steep scarps were in evidence going south to approximately 25<sup>th</sup> Street South. The dune-

defended section did much better in stopping the storm waves except at 15<sup>th</sup> Street South where a large, multi-story building occupies the footprint of the dune. Both the 15<sup>th</sup> and 14<sup>th</sup> Street ends and the building's parking lot were overrun by waves and sand was transported into Brigantine Blvd. However, south of 15<sup>th</sup> Street South, the ever-widening beach absorbed the storm surge and the wave energy with no ill effects on any public or private property. Further south, extending to the Absecon Inlet jetty the berm was eroded and sand pushed landward into the seaward-most part of the dune area.

The inlet shoreline on the Brigantine side of Absecon Inlet is defended by a long, rock jetty that extends nearly to the St. George's Thorofare entrance. Problems immediately following the 2002 ACOE dredging of the borrow zone immediately into the Absecon Inlet channel some 400 feet from the rock jetty produced a period of intense erosion to the sand residing parallel with the jetty. As a result of a review of this situation the District determined not to utilize this particular borrow zone again for the Absecon Island beach restoration project's sand supply. Since then, the beach beside the jetty has not only stabilized, but re-developed to essentially that present prior to the 2002 excavation of over 600,000 cubic yards of material. The sand source has been the material by-passing the seaward end of the Brigantine jetty from the oceanfront beach.

### **Atlantic City;**

Absecon Island has been under development since 1852 when Atlantic City was founded. Beach nourishment has been a part of the shoreline management strategy since the 1930's with a Federal project in place since 2003. Most of the material has been placed between Absecon Inlet and Iowa Avenue. In 2003 the ACOE placed sand between Absecon Inlet and the Ventnor City/Margate City boundary. The towns of Margate and Longport declined to participate in the Federal project and the last beach material applied to either was 190,000 cubic yards deposited in Longport in 1990. The dunes were constructed to an elevation of 14.5 feet NAVD88 and were just high enough to withstand the wave run-up during Sandy. The oceanfront beach lost width and elevation, but the dunes prevented damage to the City's famous boardwalk. Restoration during 2013 put the beach width back to the design specifications and plans are moving toward completing the Absecon Island project into Margate and Longport. Opposition to the project still exists in Margate City as oceanfront owners object to the potential loss of view. Arguments in favor of depending on the timber bulkhead with a top elevation of 10 feet plus or minus were not proven capable of preventing losses during Sandy. This timber barrier needs to be at least 4 feet higher and 6 feet would be better yet. The proposed 14.5-foot elevation dune would be a better coastal feature than a timber, vertical hard structure.

### **Ventnor City;**

Ventnor chose to participate in the 2002-2003 Federal beach restoration project. The Dorset Avenue site saw no serious impact from Sandy other than beach elevation loss and a narrower berm width. Further south toward Margate, the end-effect losses to the Federal project allowed waves to reach the timber bulkhead protecting the upland development and water came over the bulkhead at a variety of locations. The end effect sand losses were significant and a significant reason to complete the project as designed.

### **Margate City;**

Margate City had significant amounts of water wash over the timber bulkhead at the development limit and inundate the streets and properties immediately landward. At the Benson Avenue site, 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 came into the City. Sand recovered from inland was hauled back to the beach, but since the federal project has yet to start there has been no organized dune building in Margate City.

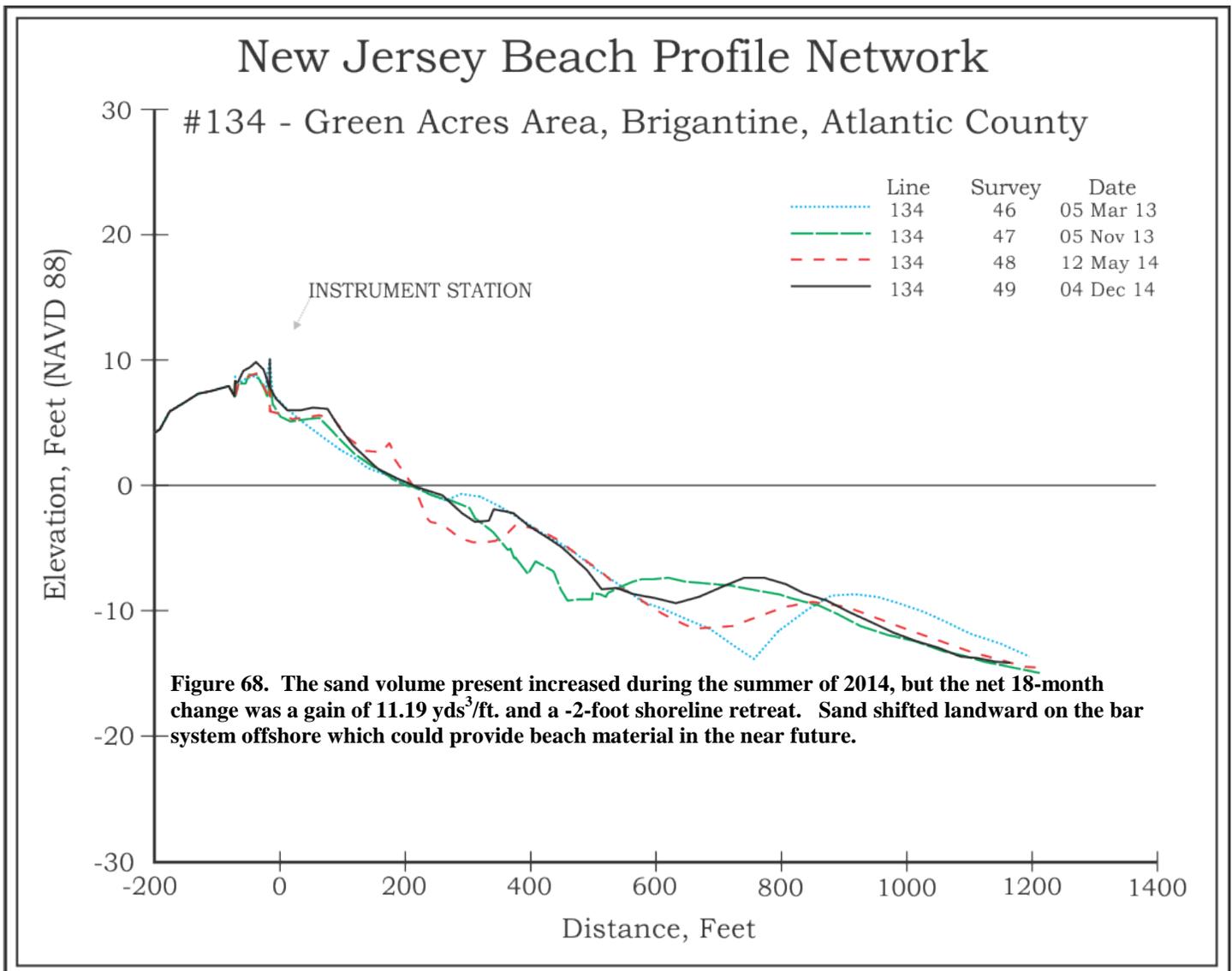
## **Borough of Longport;**

The southern community has an old concrete seawall protecting some of the development with a narrow, low elevation beach seaward. Waves crashed into the wall and poured over it down most of the Borough streets into Atlantic Avenue. Since the homes are very close to the wall, house damage was evident as well. Local agreement has resulted in Longport's eventual inclusion in the Absecon Island shore protection design plan with construction expected in late 2015. One issue remains to be decided is the means to effect better stability for the southernmost point of the oceanfront at Point Drive located just south of the 11<sup>th</sup> Street jetty that effectively defines the north entrance into Great Egg Inlet. This jetty is too short to retain the large volume of new sand proposed to be deposited along the Longport shoreline. Since the ACOE authorized project ends at the north side of the 11<sup>th</sup> Street jetty, no plans exist for extending the jetty to better retain sand before it moves out into the inlet mouth. Compounding this problem is the lack of serious protection afforded to about seven homes arrayed along the Point Drive at the very southern tip of the island. A low rock revetment and aging timber bulkhead are the only coastal protection elements these homes have. In 2001 the ACOE published a memorandum presenting alternatives to protect the Point Drive properties that included offshore breakwaters, extending the existing jetty, or building a new jetty at the very tip of the Longport spur jetty extending into Great Egg Inlet. This memorandum was reviewed in depth with new offshore and beach survey data provided to allow private interests to establish costs associated with several jetty extension proposals. The ACOE has maintained that any such project would be only considered as a project betterment to their work effort at the expense of the local state and municipal sponsors.

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



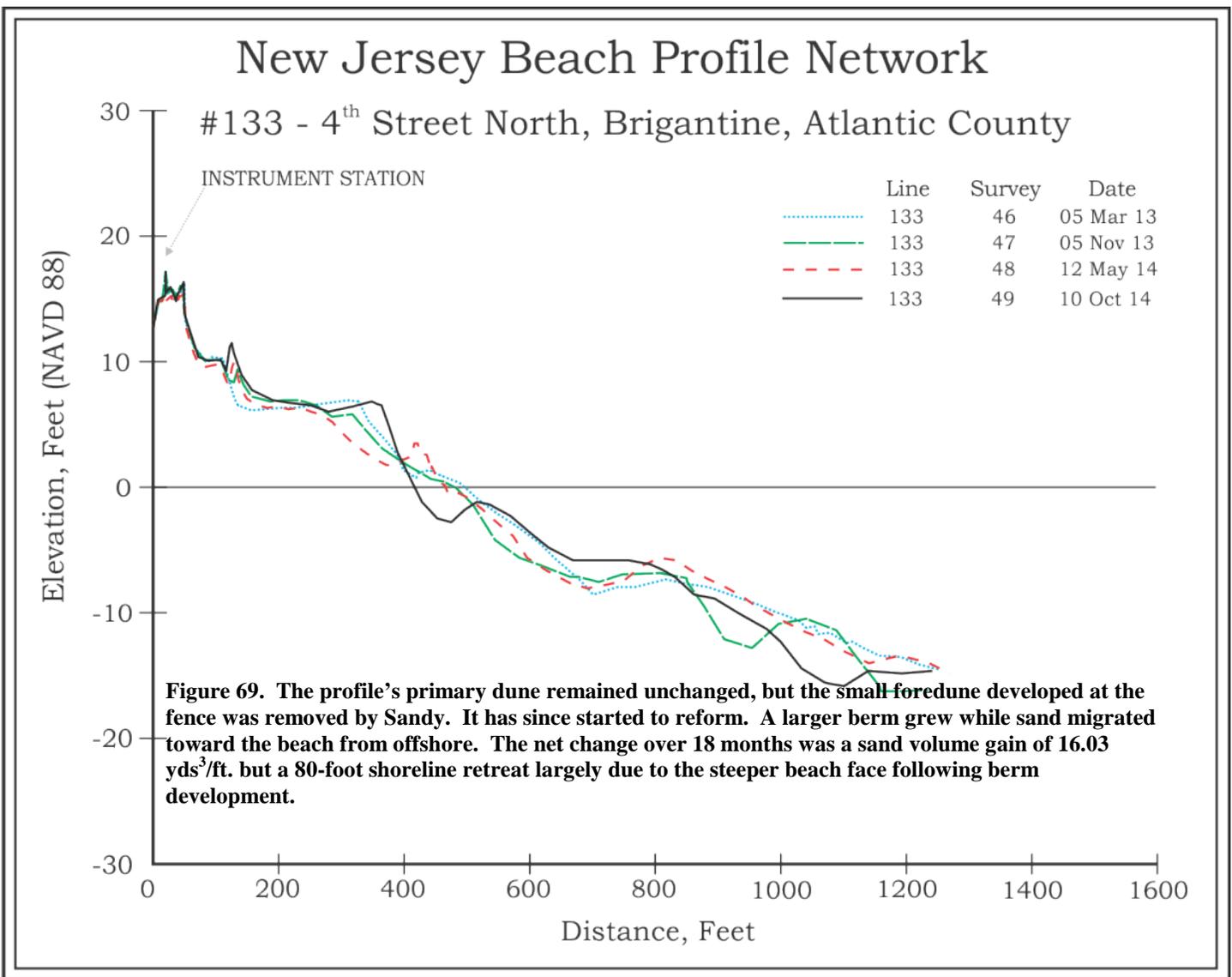
This site is located in the natural area on the northern segment of Brigantine Island and is preserved as public open space. On the left (November 5, 2013) nearly a year after Sandy, the shoreline remained in about the same position, though the elevation of the berm had been lowered significantly. During 2014 the dune grew vertically and the berm was added to, but the shoreline position was virtually unchanged.



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



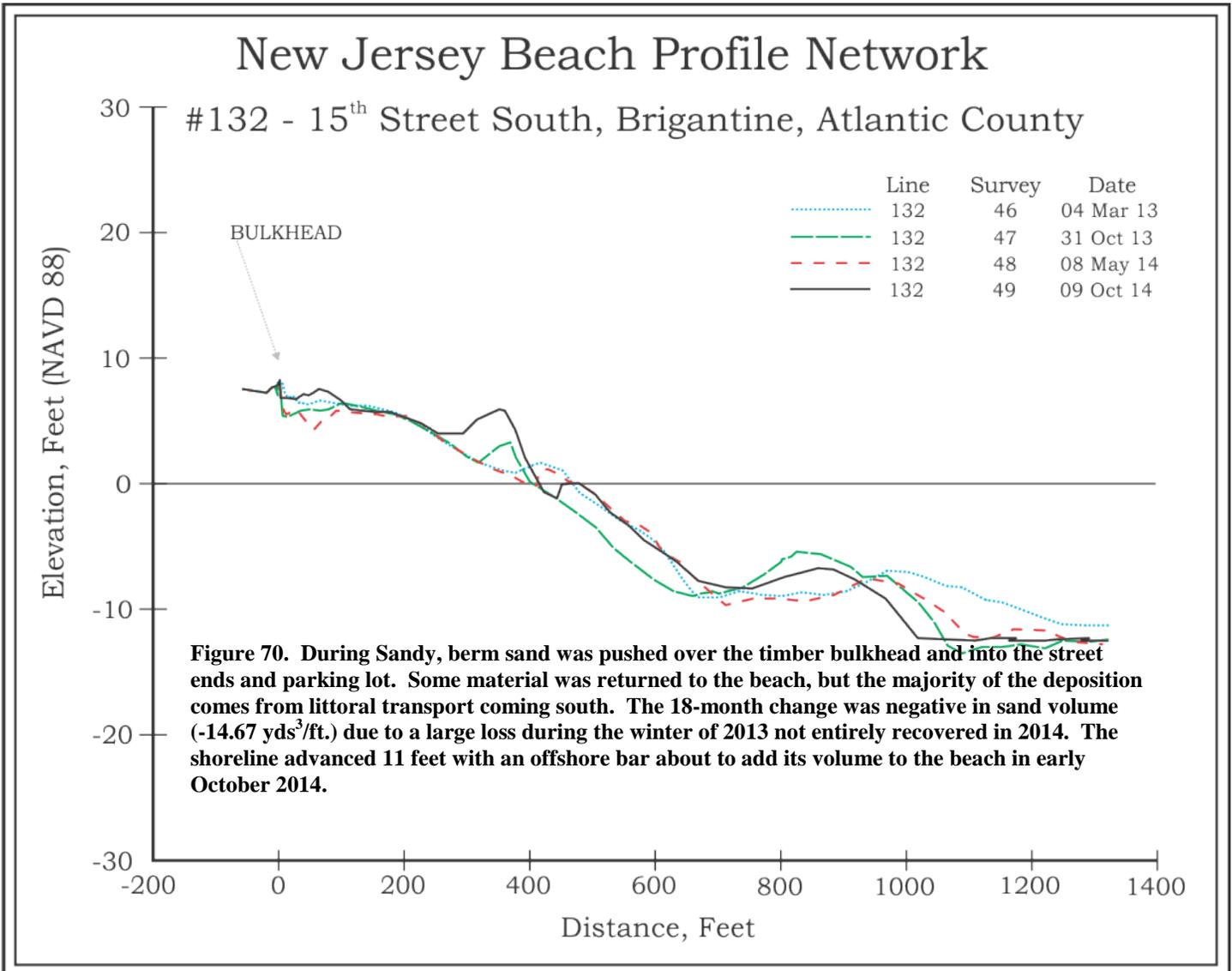
This site is located near the northern limit of development and within the 1997, 2001, 2006 and 2013 beach fill projects. On the left (November 5, 2013), the backshore and dune area that was eroded during Sandy was replanted with vegetation in an effort to trap sand. By October 10, 2014 a sizable foredune developed around the sand fencing on the right.



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



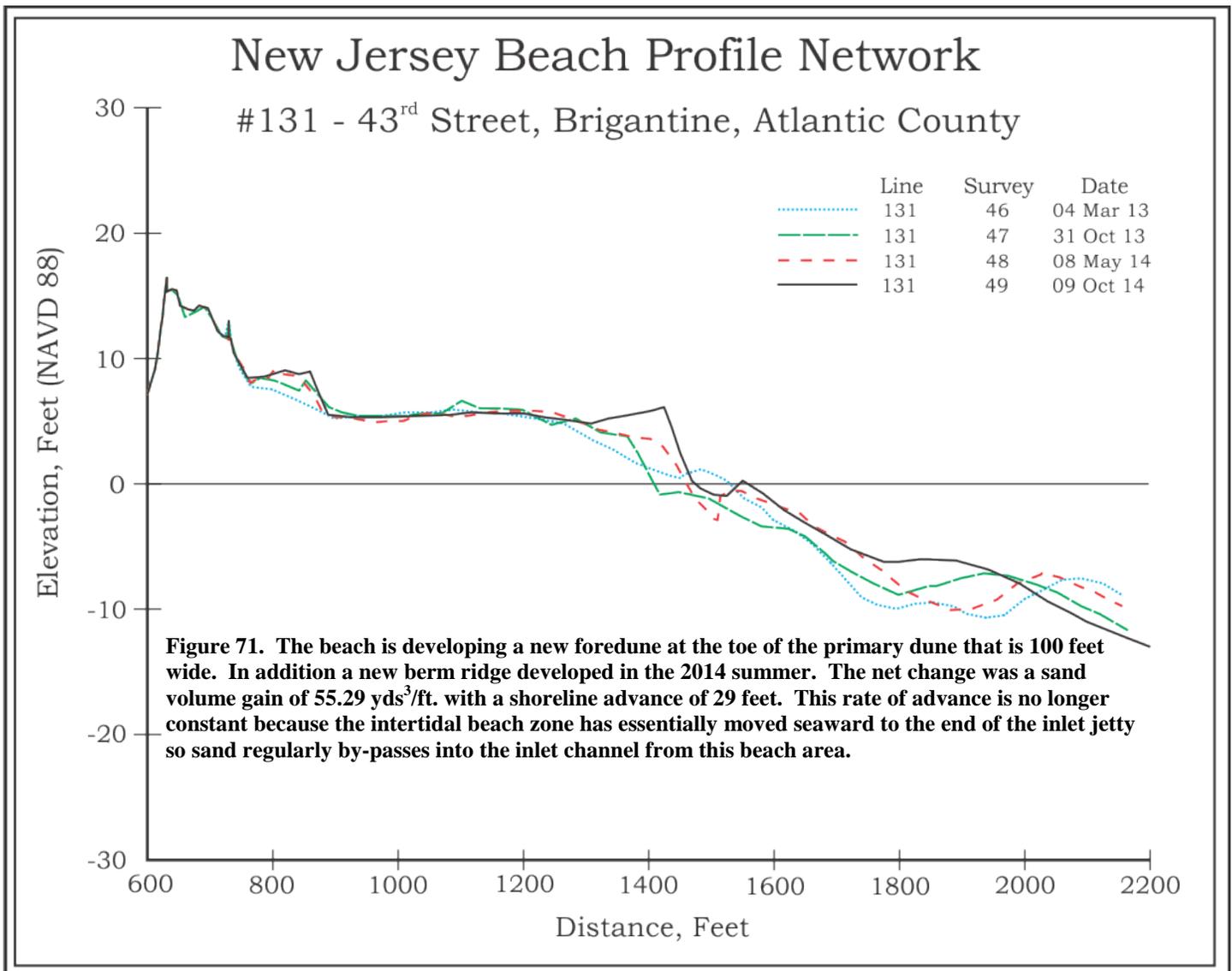
The left photo (October 31, 2013) shows the 400-foot wide beach that has developed at this site since 1972 when the initial profile was taken, the October 9, 2014 view is visually the same, but the graph below shows the addition of a substantial berm near the high tide line and a deposit of wind-transported sand within the area served by the bulkhead. The palm trees are real and part of the beach bar's décor.



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



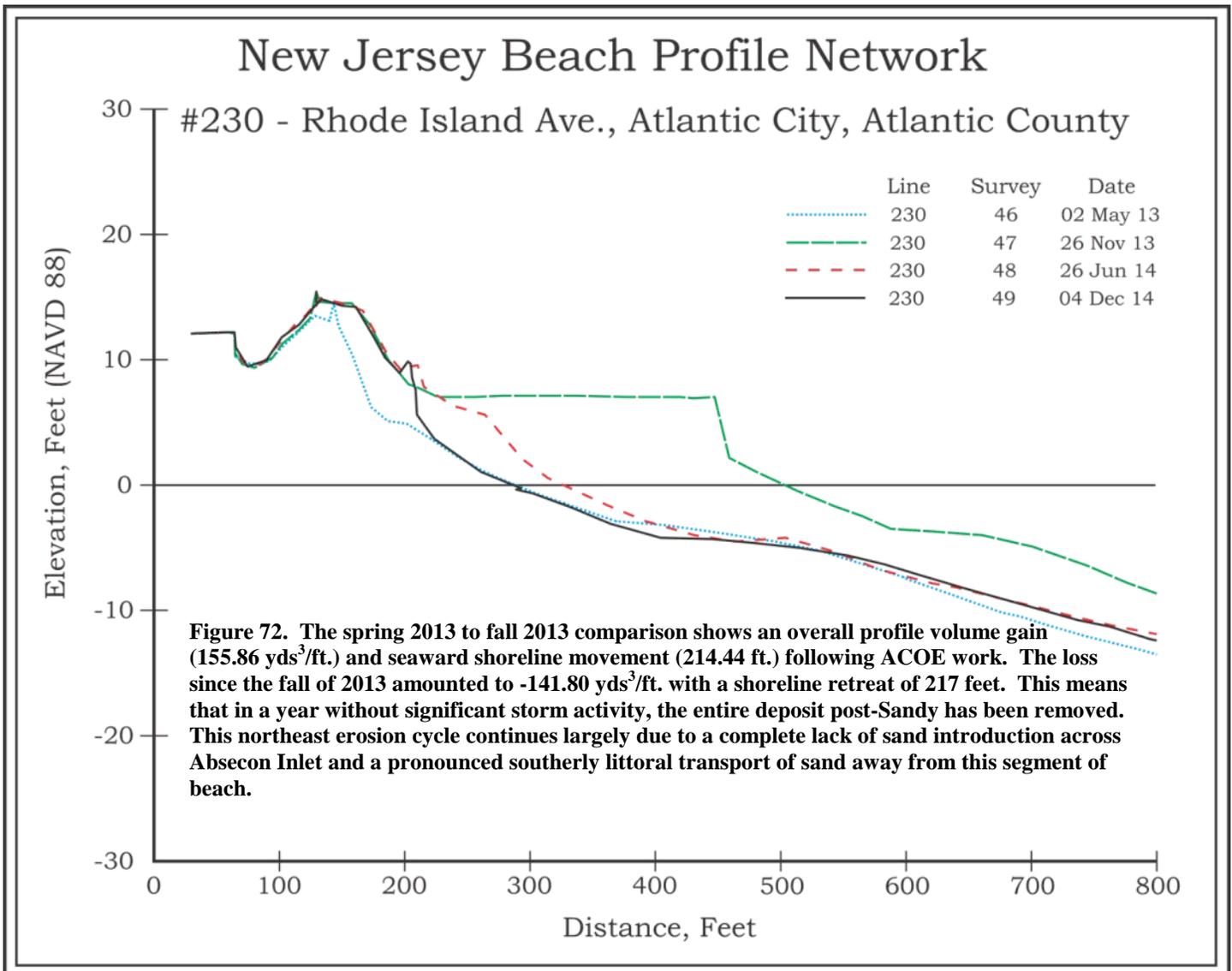
It is nearly impossible to gain the scope of this beach in just two views. The beach view on the left (October 31, 2013) versus a view to the north at the instrument station (October 9, 2014) can combine to give the feeling for the vast area of coastal beach/dune system of southern Brigantine. It is now 1,500 feet from the original 1986 instrument station to the high tide line with 2/3's of that distance generated by littoral transport of sand to the Absecon Inlet jetty (a mile south of this site).



NJBPN 230 – Rhode Island Avenue, Atlantic City



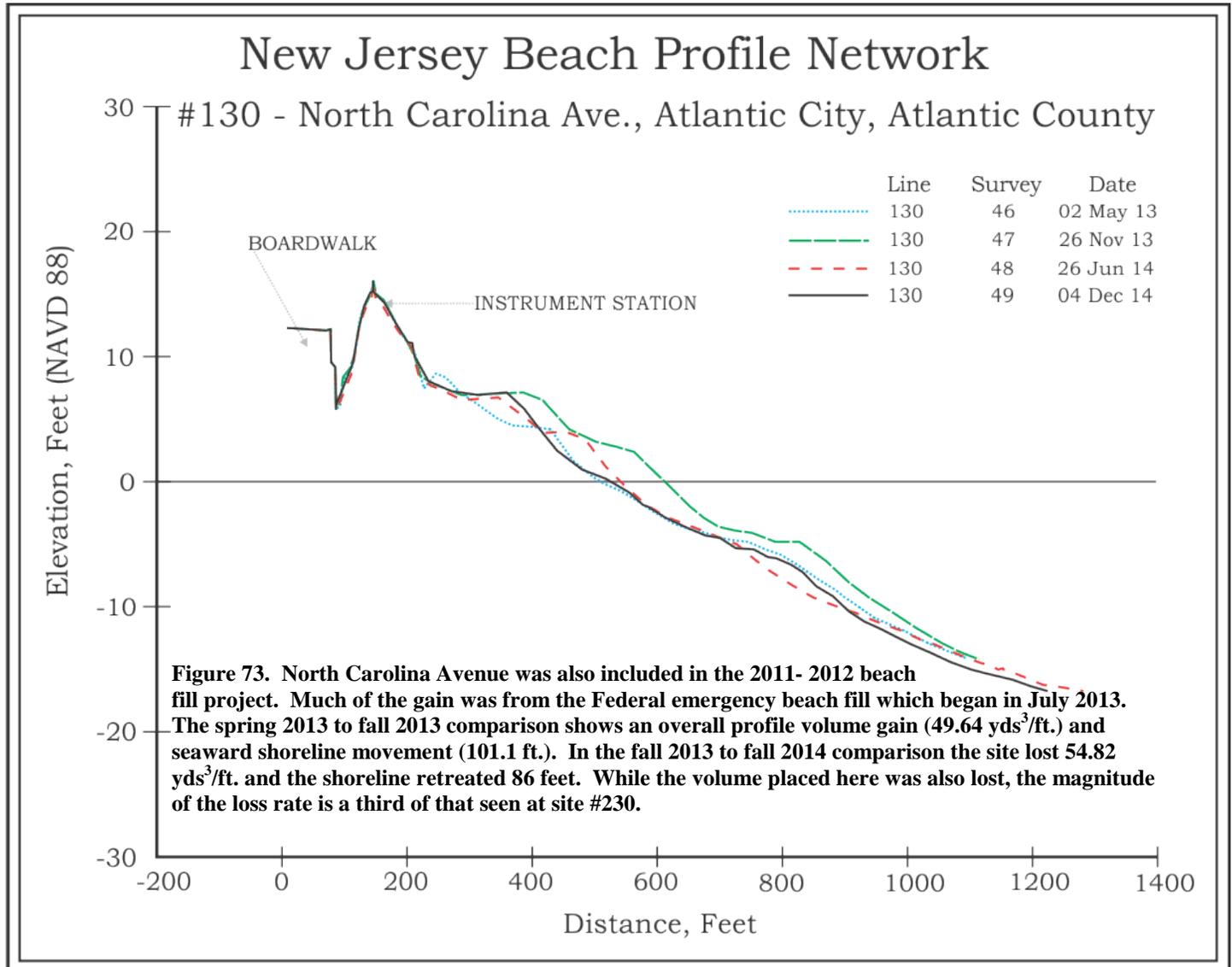
This profile site is located near the Absecon Inlet south jetty. The November 26, 2013 (left, view to the north) shows the profile site with a flat berm with a low scarp replaced as a result of the Federal emergency beach fill that was funded from the Disaster Relief Appropriations Act of 2013. Loss since then has cut the berm back to the point of dune erosion where the tiny foredune built over the summer of 2014 is at the edge of the erosional zone.



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



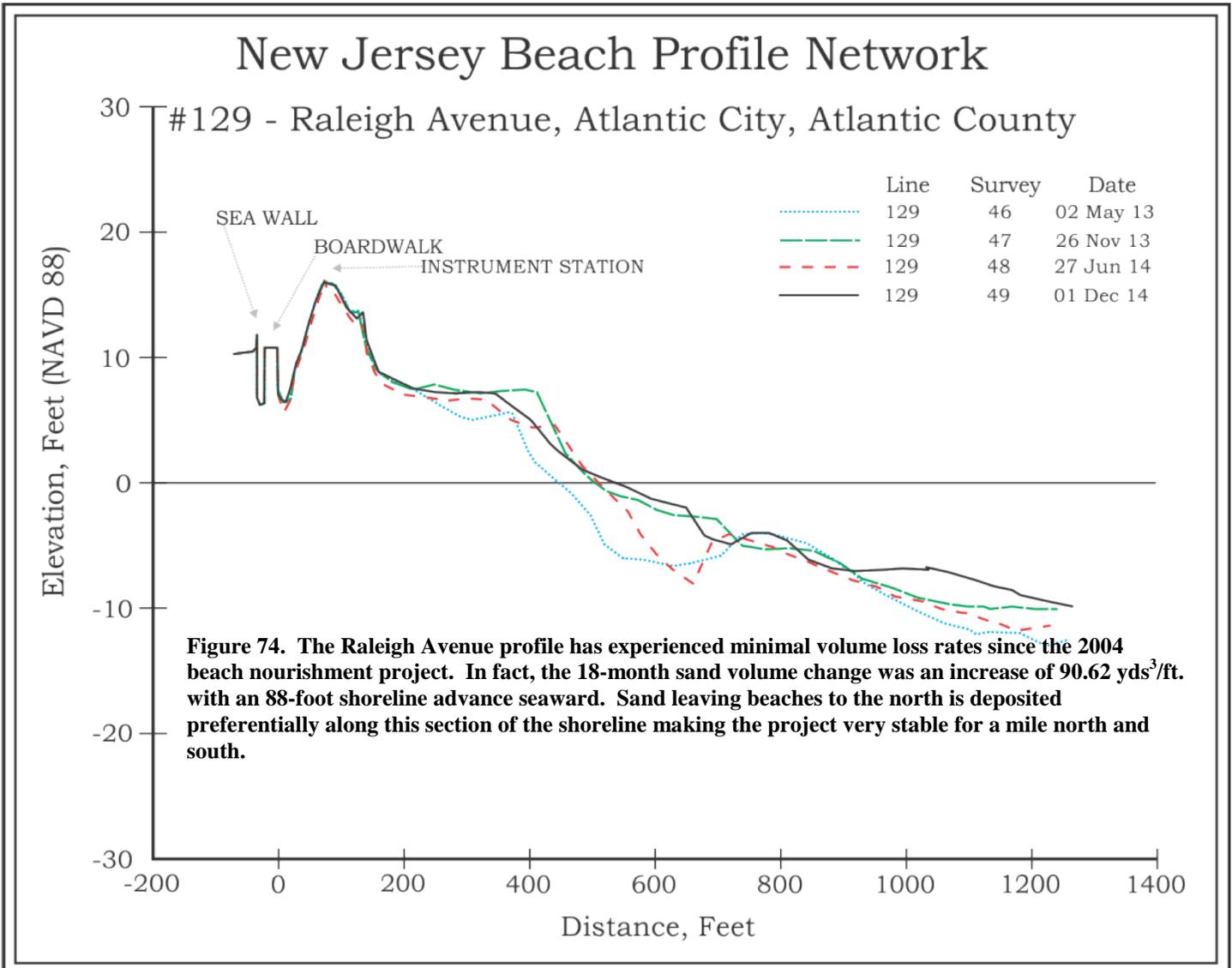
This location is also within the Absecon Island Federal shore protection project. The left photo (November 26, 2013) shows the profile site after the dune area had been replanted following the emergency fill. The right photo (December 4, 2014) views the beach to the north providing evidence that the profound erosion at site #230 opposite the large casino building in the upper left of the view is not found here. Some retreat has occurred, but sand coming south has materially slowed the rate of loss.



**NJBPN 129 – Raleigh Avenue, Atlantic City**



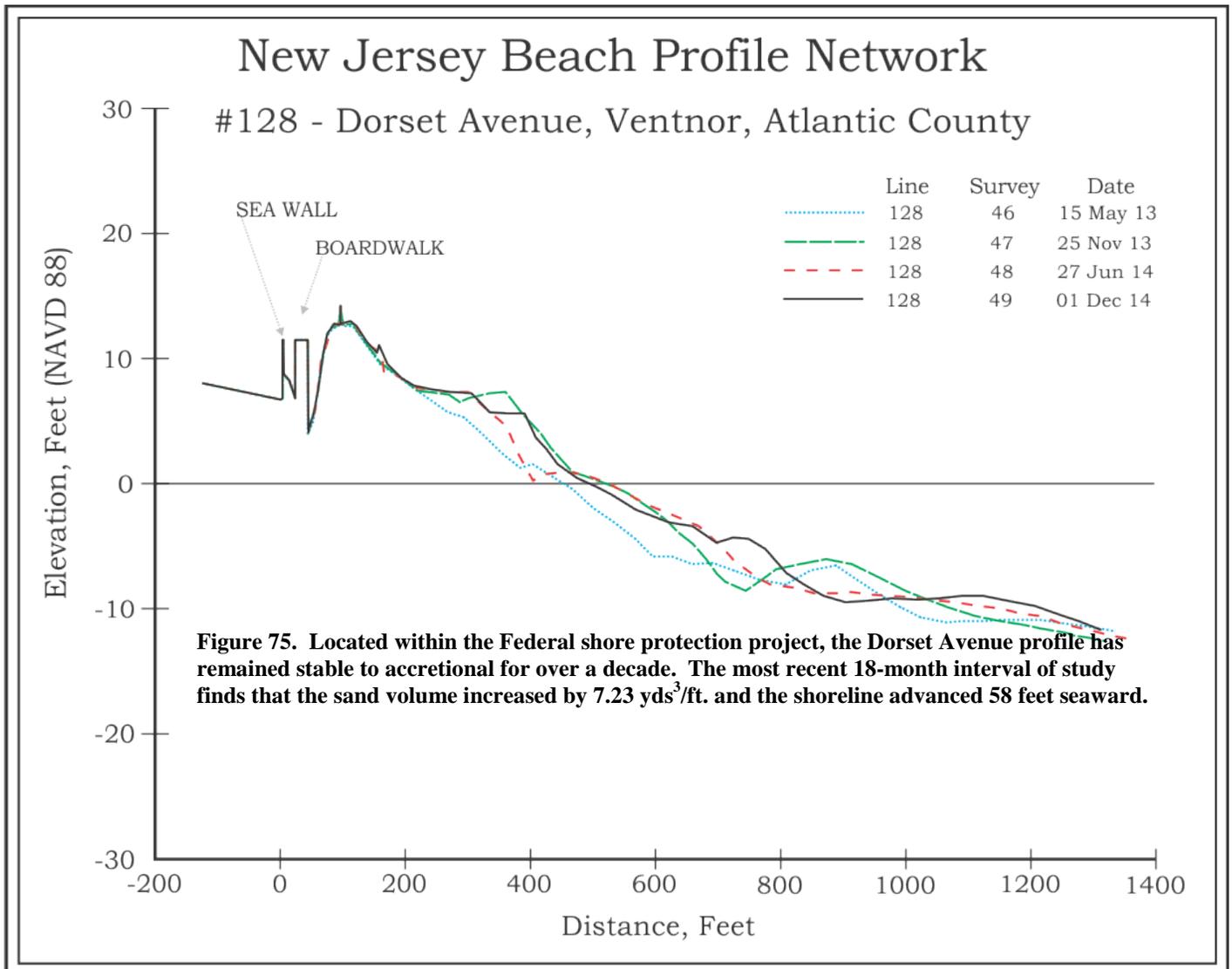
This site lies in the middle of the Federal shore protection project. On the left (November 26, 2013) the emergency beach fill was complete along with planting of dune vegetation. On the right (December 1, 2014) one can see sand has accumulated at the base of the fence and into the grass immediately landward. A minor loss is seen in the berm crest, but is compensated for by accumulation offshore.



NJBPN 128 – Dorset Avenue, Ventnor City



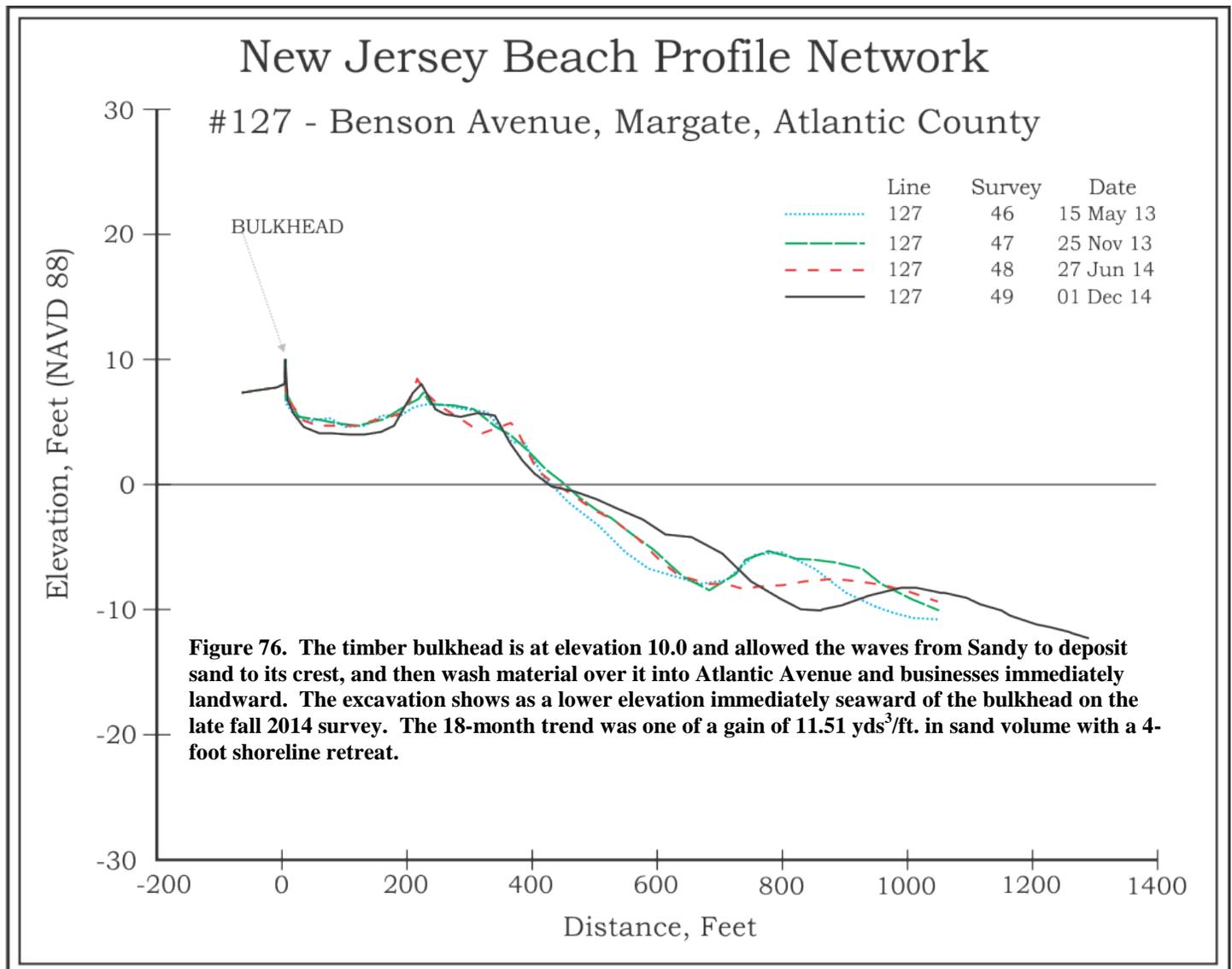
The Dorset Avenue site is positioned south-centrally in the portion of the federal shore protection project that went to construction in 2003. As such, the site is very stable in terms of storm losses, seasonal changes and any long term trend of erosion. The site contains more sand today than was pumped here in 2003, inheriting material from further north following subsequent maintenance nourishment activity. There has been no need of maintenance at this site.



NJBPN 127 – Benson Avenue, Margate City



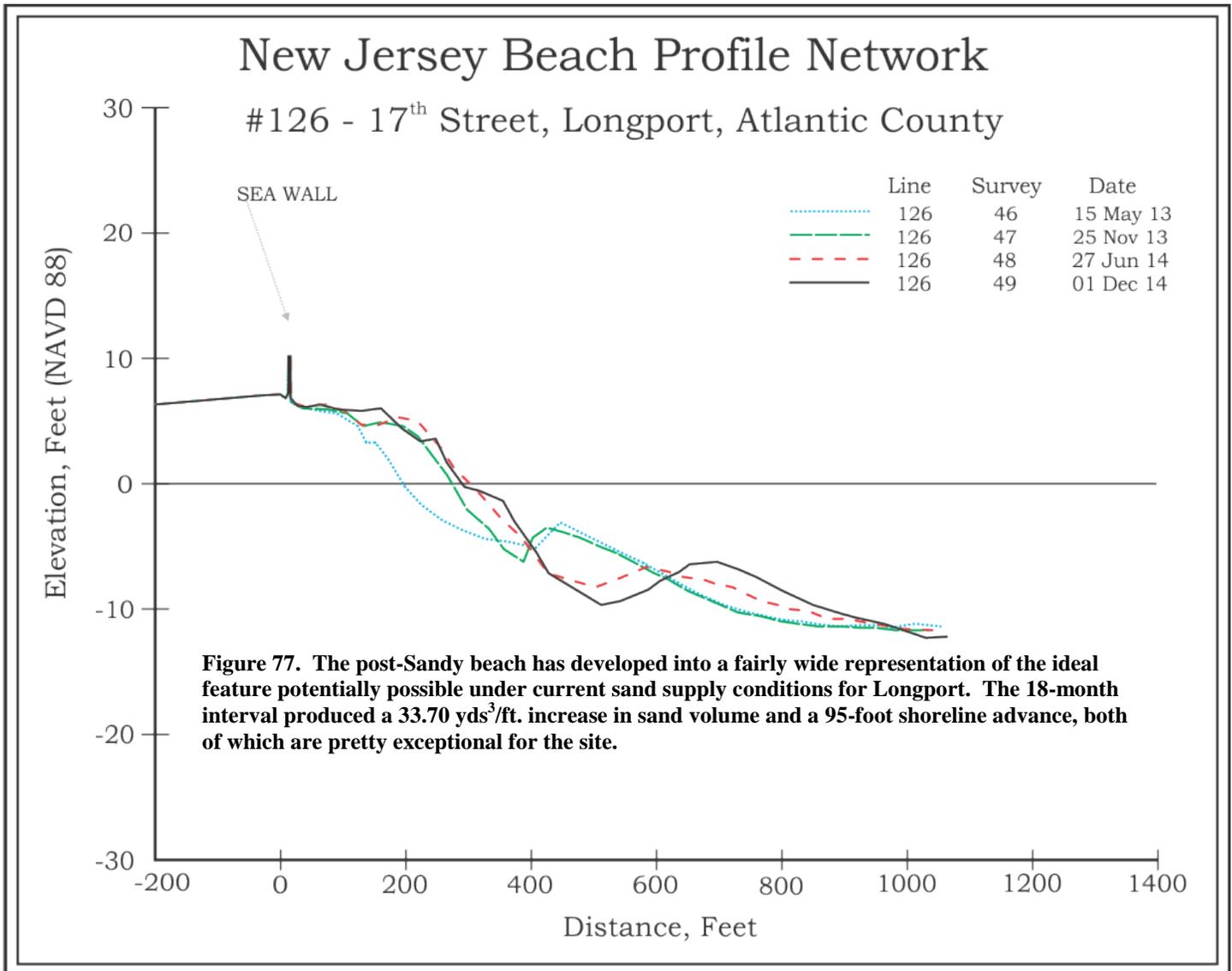
The Benson Avenue site is located approximately one mile south of the Federal shore protection project. The left photograph was taken November 25, 2013 looking south at the berm crest. To the right of the beach view on December 1, 2014 work was in progress moving sand brought in by Sandy excavated from just seaward of the bulkhead and taking it back to the beach.



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



The 17<sup>th</sup> Street profile is located about 15 blocks north of the Great Egg Inlet jetty and south of the constructed Federal shore protection project. The photo on the left (November 25, 2013) shows a wider berm over the summer of 2013. The beach grew slightly wider over 2014 with the fall 2014 cross section pretty similar to that present in June 2014.



## Summary & Conclusions

Atlantic County received maintenance related to recovery from Hurricane Irene in August 2011 by early 2012. This effort paid dividends during Hurricane Sandy in preventing certain damage to the new Revel Entertainment project at the north end of Atlantic City and mitigating some overwash damage in Brigantine's north end hot spot. The damage done in Longport and Margate convinced Longport to seek inclusion in the ACOE project to continue the work south from Ventnor. The Margate City council is equivocating because multiple oceanfront owners are strongly opposed to any dune as part of the project. They claim the timber bulkhead is sufficient protection for the City. This in spite of the fact that waves during Sandy went over the bulkhead in sufficient force and water volume to move sand into homes, businesses and the general infrastructure all along Atlantic Avenue. It appears like the entire project will be completed relatively soon. The remaining issue is what to do in terms of dealing with the influx of beach fill sand into Great Egg Inlet around the 11<sup>th</sup> Avenue Longport jetty. Alternatives exist and have been discussed, however, the ACOE project extent ends at the 11<sup>th</sup> Avenue jetty in Longport with no plans to participate in any jetty changes or extension of the beach project.

Longport, spring 2012 to fall 2012	<b>Beach loss</b>	= -22.39 yds <sup>3</sup> /ft.	<b>Offshore gain = 26.56 yds<sup>3</sup>/ft.</b>
Longport, fall 2012 to spring 2013	<b>Recovery</b>	= 22.15 yds <sup>3</sup> /ft.	<b>Offshore loss = -27.53 yds<sup>3</sup>/ft.</b>
Longport, spring 2013 to fall 2014	<b>2-year post Sandy</b>	= 33.70 yds <sup>3</sup> /ft.	<b>added across the profile</b>

Post-storm **beach recovery was 98.9%** of the sand volume lost with the offshore bar created by Sandy supplying 104% of the sand volume deposited during the storm. Continued influx of sand moved south by littoral currents added another 34 cubic yards of material to each foot of the Longport profile site region. Both the 43<sup>rd</sup> Street site in Brigantine and the Longport location performed the same way indicating a strong southerly longshore sand movement following Hurricane Sandy.

It was fortunate that post-storm emergency work in early 2012 had put sand on northern Absecon Island with a modest trunked-in fill accomplished on the Brigantine erosional hot spot prior to Hurricane Sandy. All such work helped but did not prevent the storm from removing nearly all the material. Wholesale overwash only occurred in the north natural area on Brigantine Island with some damage from overwash occurring south for four blocks on Brigantine's vulnerable north end development. Overwash damage was seen in Margate and Longport largely due to low elevation bulkheads and the ease with which waves came over the concrete seawall in Longport. Between Texas Avenue in Atlantic City and Dorset Avenue in Ventnor, the central portion of the Absecon Island Shore Protection Project performed admirably. The beach proximal to Absecon Inlet was severely eroded and the south end sand loss due to the artificial end to the work at the Margate City line were the only problem regions.

A massive federal inlet revetment re-construction is in final pre-construction and easement resolution stages. This work replaces an aging rock structure and the demolished inlet boardwalk that was located beyond the low tide shoreline. The top of the new revetment will serve as a public walkway to Gardner's Basin. The inlet beach will be re-developed with modest sand placement that would follow revetment construction. An extensive debris removal took place in 2013 extracting a great variety of ancient construction material from the shoreline.