New Jersey Beach Profile Network

Atlantic County

Little Egg Inlet to Great Egg Harbor Inlet

NJBPN Profile #'s 134 - 126

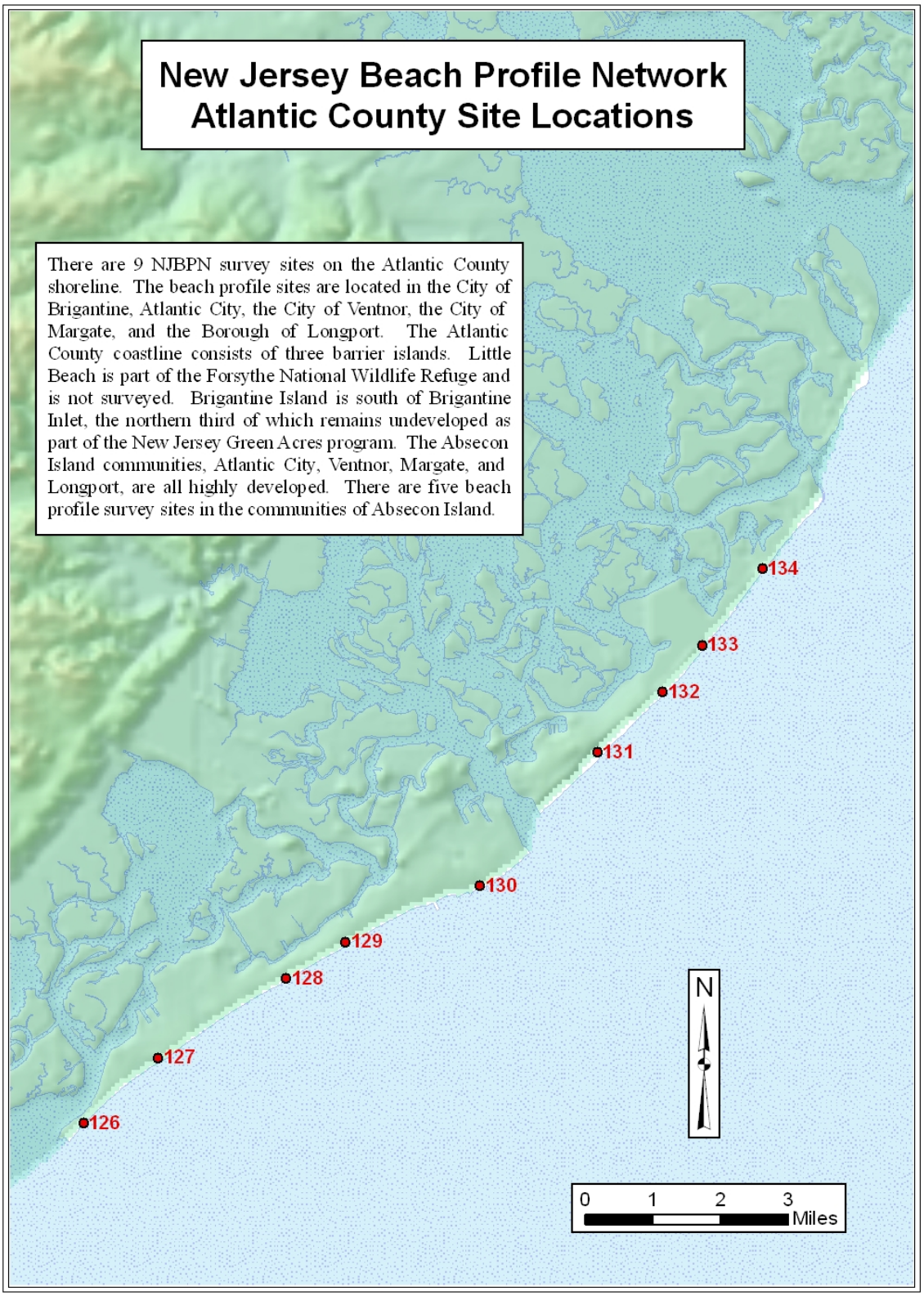

Figure74. Location map for the 9 NJBPN profile sites in Atlantic County, NJ

ATLANTIC COUNTY – SPRING 2007 to FALL 2008

The Atlantic County oceanfront shoreline consists of three barrier islands where the northern one, Little Beach Island and a third of the second, Brigantine Island, are undeveloped and in a natural state. The City of Brigantine occupies the remainder of the second island and Absecon Island is home to Atlantic City, Ventnor City, Margate City, and the Borough of Longport. These communities have been the direct and indirect beneficiaries of federally sponsored beach nourishment projects that have substantially added to the beach width, sand volume and enhanced the dune protection for landward properties. The Absecon Island project was completed between fall 2003 and spring 2004 with sand derived from Absecon Inlet. The refusal of Margate City and Longport to participate in the project has resulted in a significant loss of sand from the southern third of Ventnor City beaches through end-effect erosion were sand is transported (south) to the areas not initially replenished. The NJBPN surveys have documented substantial increases in sand volume at Benson Avenue in Margate and a minor increase all the way south at 17th Street in Longport. The Ventnor City profile is located in the middle of the municipal shoreline and has remained stable because it is well north of the project's termination at the border with Margate City. End-effect erosion from fill projects is a significant reason for continuity of projects across an entire barrier island or between inlets.

Erosion has raised concern for beach losses at the northernmost beaches of Atlantic City near Absecon Inlet. This erosional hot spot continued to retreat after completion of the federally-sponsored Absecon Island beach nourishment project. Erosion has brought wave action to the eastern edge of the boardwalk near Massachusetts Avenue. The dune profile has vanished across about a 400-foot distance after minor northeasters in the late spring of 2009.

The City of Brigantine received beach sand derived from Brigantine Inlet during 2006 to renourish the erosional area located at the northern end of the development on the island. This area has been the site of three projects between 1997, 2001 and 2006. The first two were NJ State and locally sponsored with the 1997 initial fill amounting to 1,000,000 cubic yards of new sand. Lesser amounts have been added subsequently during maintenance projects, but the segment at the extreme north end of development in the City of Brigantine is a continuing zone of instability. Sand moves south toward the north jetty at Absecon Inlet creating a massive beach seaward of the development at the 43rd Street profile site. The loss of sand to the north has been a direct benefit to the City beaches to the south. Suggestions have been made to seriously evaluate various methods to collect the sand in the south and transport it back to the erosion zone to begin the process all over again. This would do two things; lower the costs to mobilizing inlet or offshore pumping projects and recycle the sand supply so that repetitive mining of the Brigantine Inlet tidal shoals can be drastically reduced. Recently the ACOE professional staff has been evaluating recovery and by-passing capacity at the inlets used for nourishment sand supplies. The Absecon Inlet recovery since 2004 was 35.1% by October 2008 across six cells used for beach sand to supply Absecon Island (4.7 million cubic yards).

The two profiles selected for display cover the centers of both islands in Atlantic County with NJBPN survey locations. The Brigantine location was not provided with direct sand placement yet gained substantial sand volume as littoral transport moved material from the northern project location south into that part of the municipal beach. The Ventnor City site was within the Federal project for 2004 and shows positive impact from the 1997 project as well. The low loss rate is due to the available sand supply from either direction to replace any losses at the site. Further south toward the end point unanticipated in the design, the beach has retreated as sand moved south into Margate City, which did not participate. These "end-effect" losses reduce the project's efficiency to retain sand in the places which needed it.

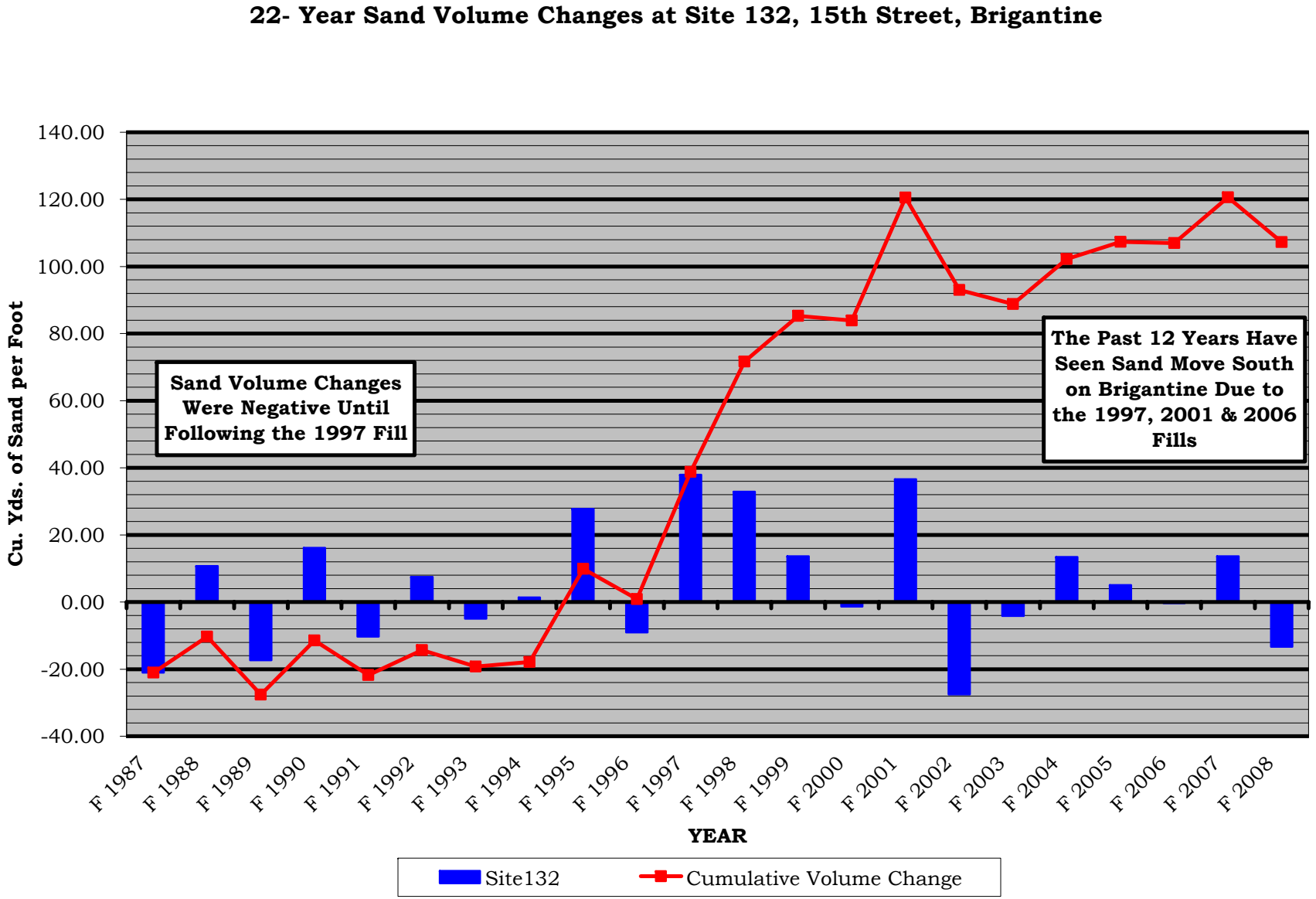

Figure 75. Brigantine Island is about three quarters developed with the northern section preserved in the NJ Green Acres program. This site lies in the center of development and about a mile south of the end of sand placement. The mild negative sand volume between 1987 and 1996 reflected sediment supply conditions at this location. Sand was pumped onto the northern third of Brigantine three times and southerly transport transferred over a 100 yds^3/ft. to this location since 1997. The ultimate barrier is the Absecon Inlet jetty.

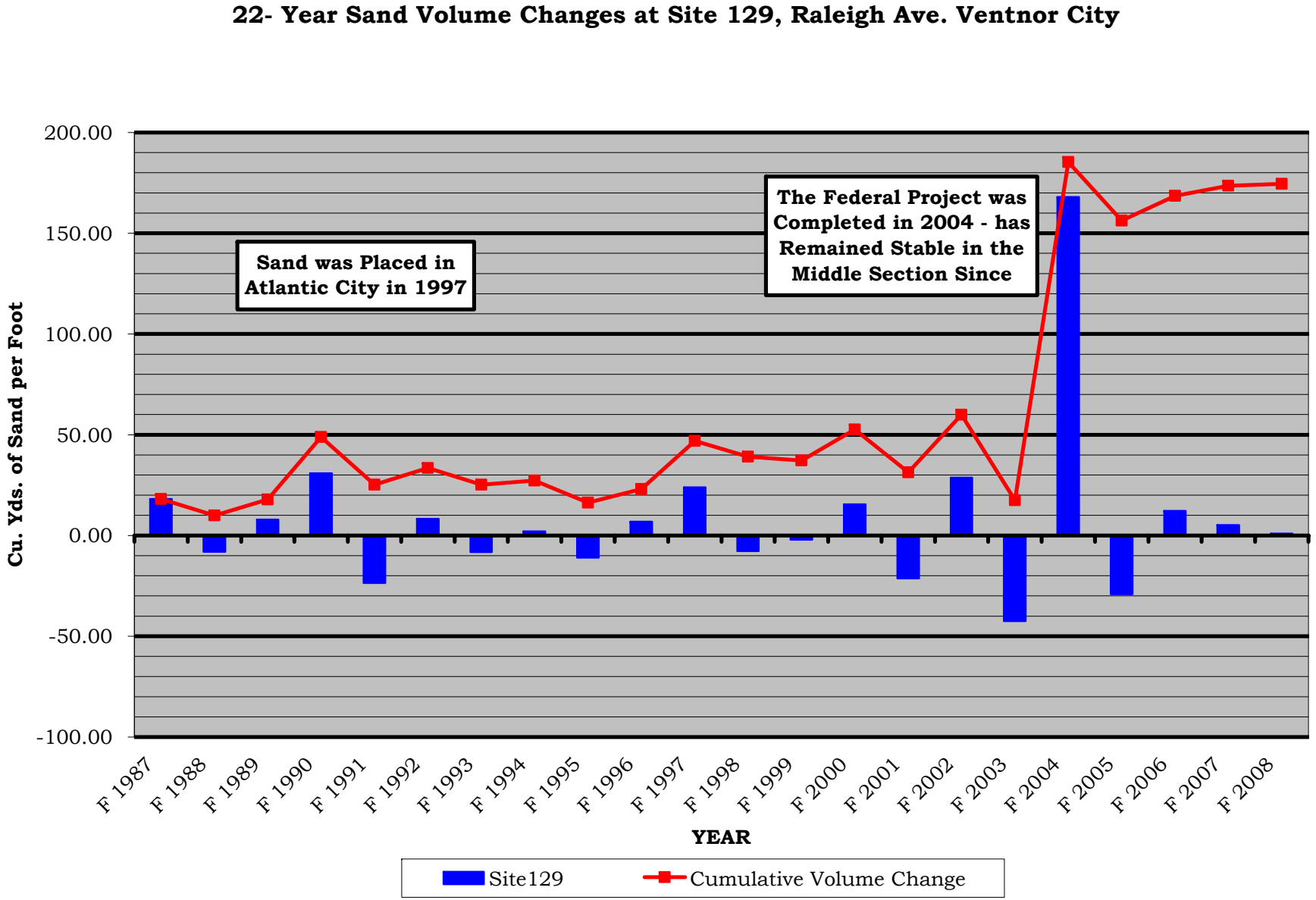

Figure 76. The Raleigh Avenue site in Ventnor City is located near the boundary with Atlantic City. Atlantic City pumped sand onto its shoreline in 1984 and again in 1997 prior to the 2003-2004 Federal project that placed sand on both municipal beaches. The dramatic gain shows in the 2004 fall survey as a 167 yds^3/ft. sand volume placement. Losses since have been minimal at this location near the project's center. The two communities at the southern end of the island elected not to participate in the project.

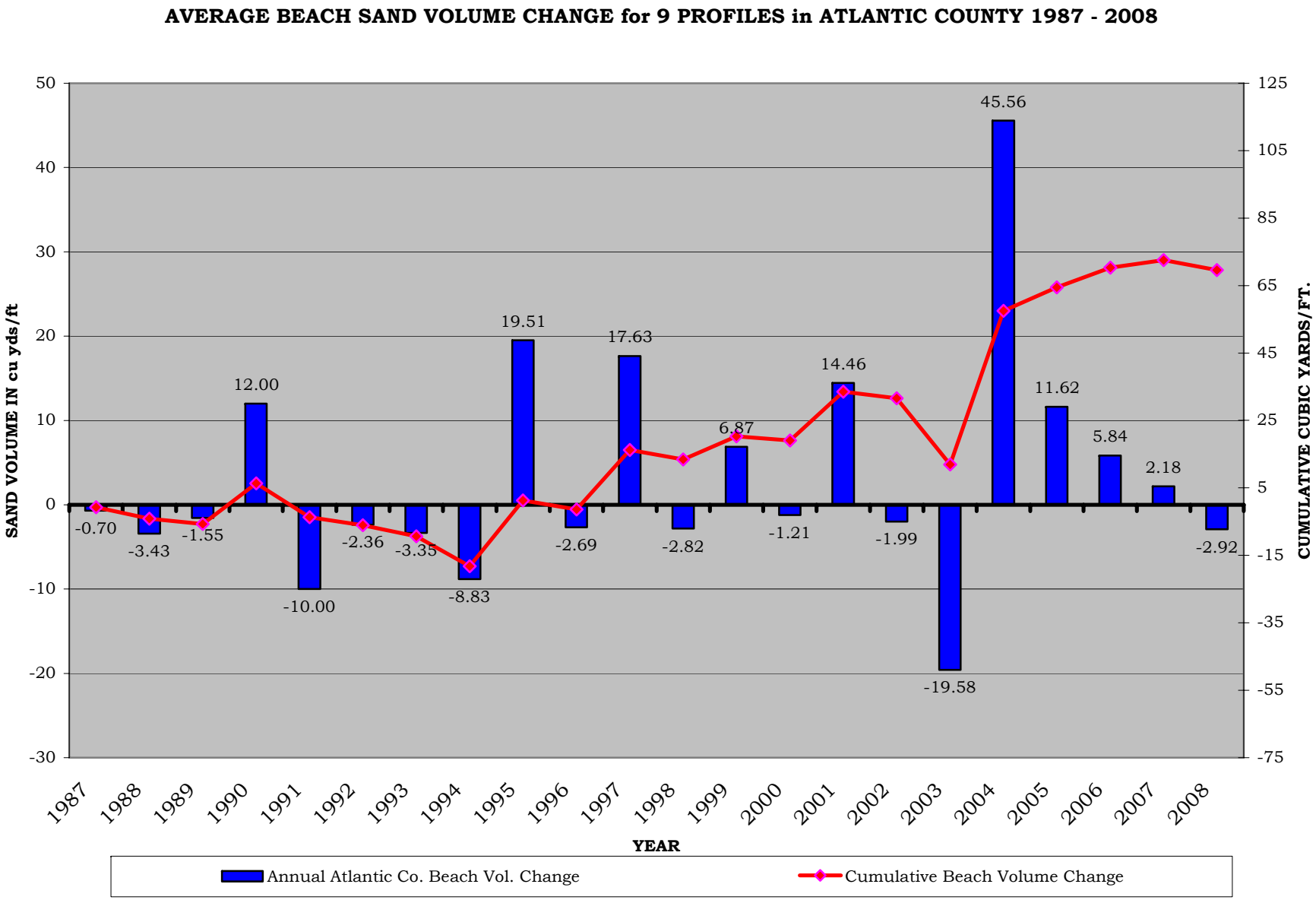

Figure 77. The 22-year average sand volume change data support the improvement made by the three Brigantine nourishment efforts and the two in Atlantic City, 1997 and 2004 (Federal). The trend between 1987 and 1994 was downward, then with the major projects starting, the trend reversed into positive territory. 2008 was the first year post-Federal fill that the average sand volume declined in Atlantic County.

The new Washington administration and Congress have instituted a massive public works package that contains ACOE public works funds. At this moment the word is that the Office of Management and Budget (OMB) is not considering beach nourishment as a viable expenditure of “stimulus funds”. The Absecon Island project is two years beyond its first maintenance date and the erosion is getting serious between Massachusetts and New Jersey Avenues at the northeast corner of the island. While the State is capable of providing project funding the municipal share becomes 25% of the project cost instead of 8.75% under a Federal, State and local partnership (25% of the 35% State/local share of a federally-funded project).

GREEN ACRES SITE - SITE 134

Located near Brigantine Inlet on the undeveloped segment of Brigantine Island, this site has been monitored since the fall of 1971 when Stockton conducted its initial semester of courses. This May 23rd 2007 view to the north shows a dune ridge and winter wrack line that was washed to within 50 feet of the seaward dune toe. This dune dates from recovery following the December 1992 northeast storm. Overwash took sand back into Widgeon Bay in the marsh. No subsequent storm has breached this dune since. The small dark line in the distance on the beach is the footing from a 19th Century US Lifesaving Station originally built behind the dunes. At that time a steam trolley line ran north from the hotels on Brigantine to this lifesaving station, the pilings from which occasionally show on the beach following a storm.

View to the north along the toe of the dune in December 8th 2008. Little changed along the profile line over the 18 months of comparison. The beach width increased by 20 feet while the sand volume only declined by 2.78 cubic yards per foot of shoreline.

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#134 - Green Acres Area, Brigantine, Atlantic County

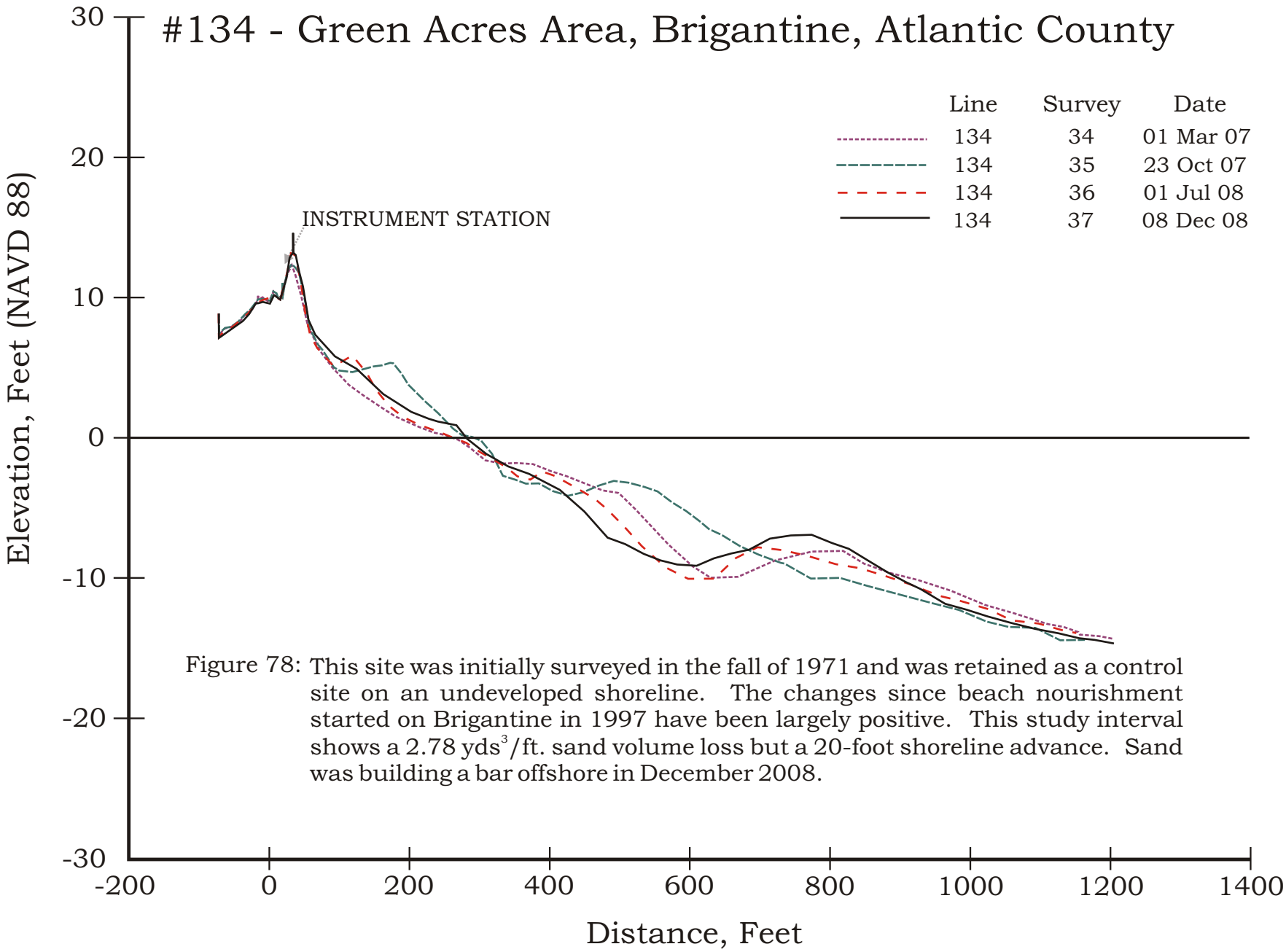

Figure 78: This site was initially surveyed in the fall of 1971 and was retained as a control site on an undeveloped shoreline. The changes since beach nourishment started on Brigantine in 1997 have been largely positive. This study interval shows a 2.78 yds^3/ft. sand volume loss but a 20-foot shoreline advance. Sand was building a bar offshore in December 2008.

4th STREET NORTH, BRIGANTINE - SITE 133

The 4th Street North site is located near the northern limit of development on Brigantine and at the southern edge of the 1997/2001 beach restoration projects. The ACOE fill included this site and extended 10 blocks further south in 2006. This May 23rd 2007 view to the north was taken at the seaward toe of the dunes and includes the reconstructed beach. This site benefits from a dominant transport of sand from north to south along this shoreline. Sand from the project moves by this site for an extended period of time following the project completion date.

Nearly the same view angle at 4th Street North on December 8th 2008 shows minor changes, but no significant loss to either the beach or dune. The 71-foot shoreline retreat was largely due to a much steeper gradient to the beachface in the fall of 2008

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#133 - 4th Street North, Brigantine, Atlantic County

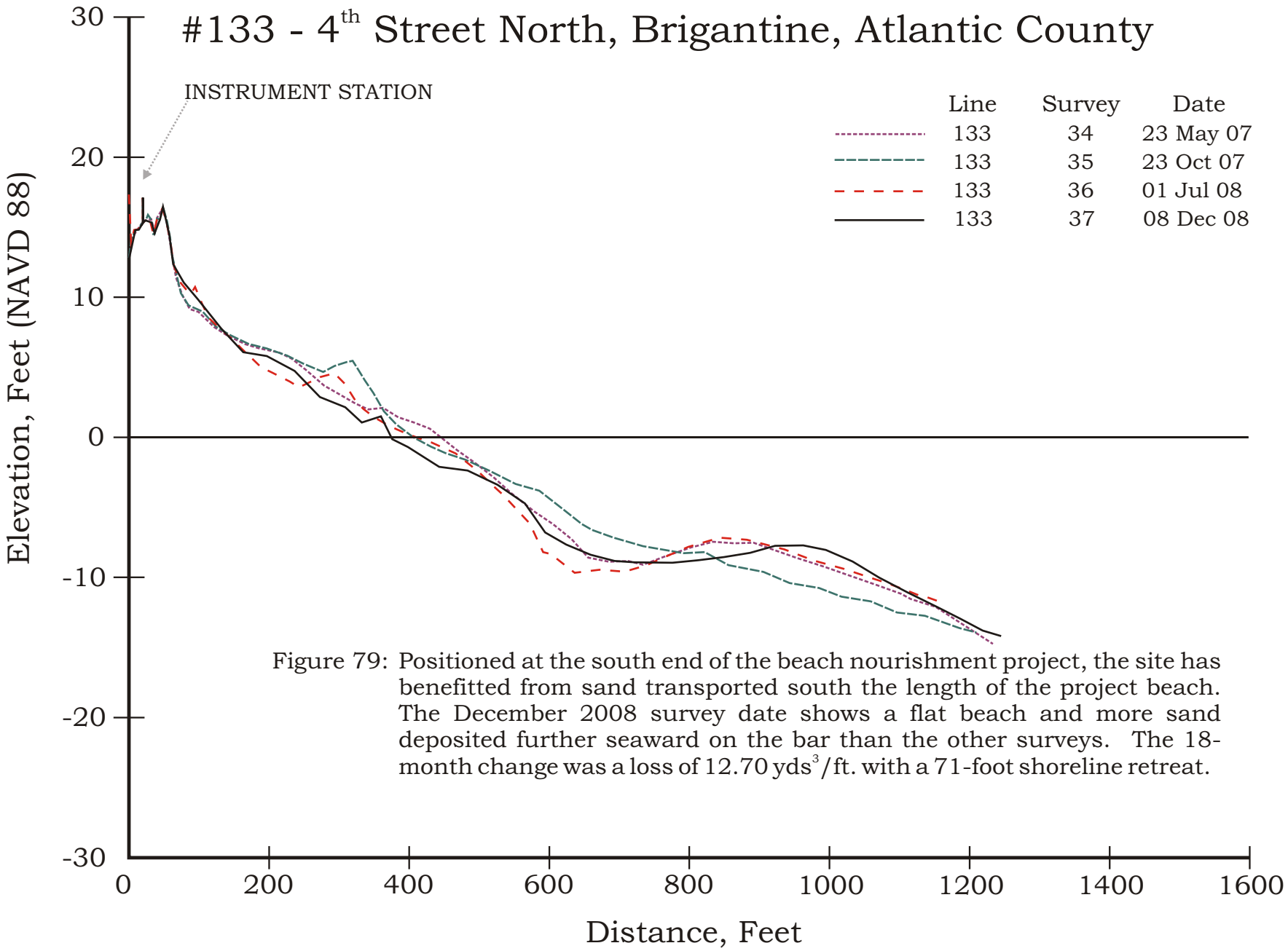

Figure 79: Positioned at the south end of the beach nourishment project, the site has benefitted from sand transported south the length of the project beach. The December 2008 survey date shows a flat beach and more sand deposited further seaward on the bar than the other surveys. The 18-month change was a loss of 12.70 yds^3/ft. with a 71-foot shoreline retreat.

15th STREET SOUTH, BRIGANTINE - SITE 132

May 24th 2007 looking south toward the Atlantic City skyline in the far distance. The isolated dune to the left has developed around a beach raking pile of debris over the past several years and the absence of strong northeast storm events has allowed it to grow in size.

December 9th 2008 shows a little clearer view of the Atlantic City skyline and the denser grass on the dunes. The beach lost 17.40 yds^3/ft. over 18 months while the shoreline retreated 35 feet. This change was not significant in light of the massive improvement seen since the 1997 and subsequent beach restoration efforts further north.

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#132 - 15th Street South, Brigantine, Atlantic County

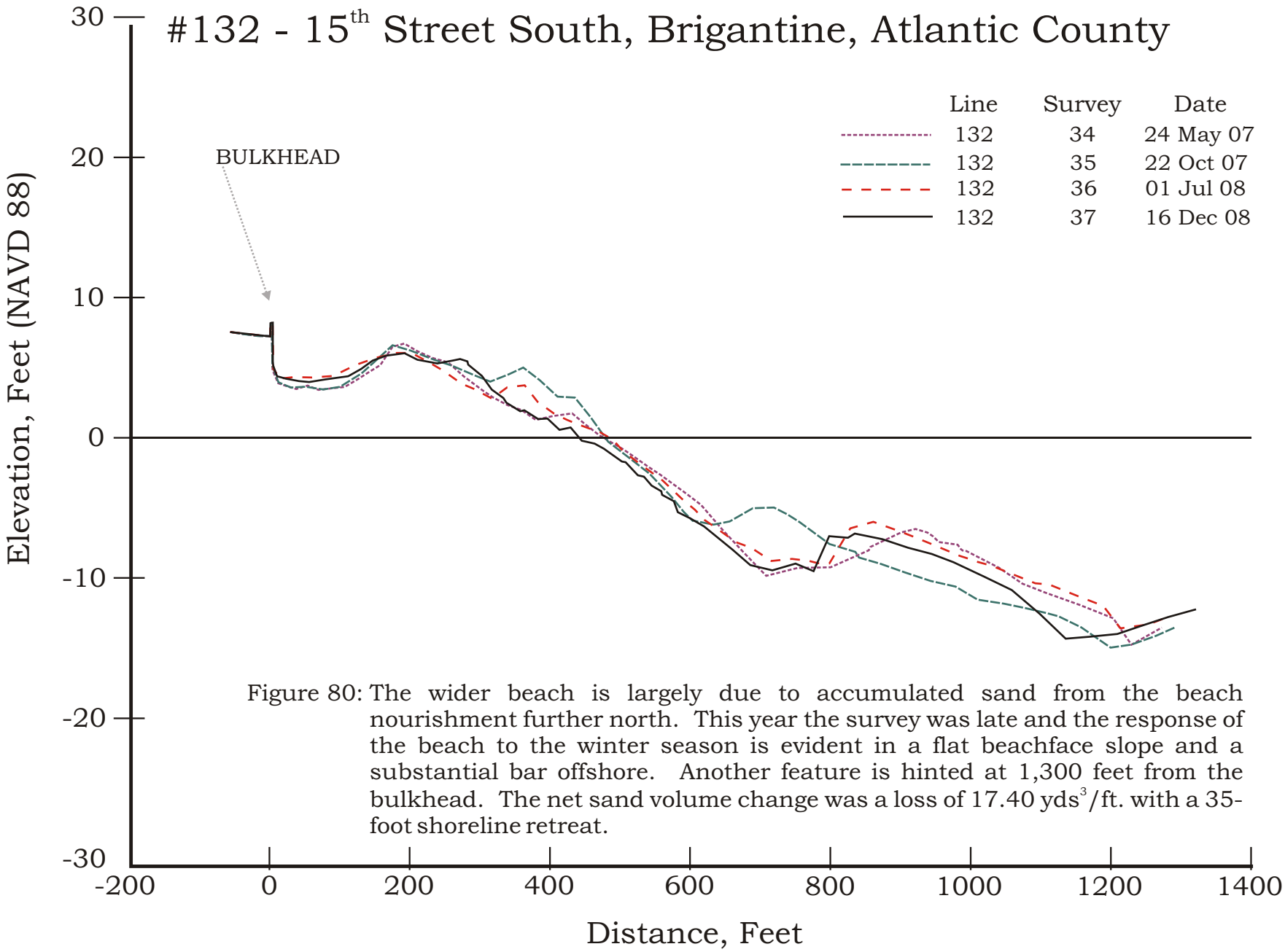

Figure 80: The wider beach is largely due to accumulated sand from the beach nourishment further north. This year the survey was late and the response of the beach to the winter season is evident in a flat beachface slope and a substantial bar offshore. Another feature is hinted at 1,300 feet from the bulkhead. The net sand volume change was a loss of 17.40 yds^3/ft. with a 35-foot shoreline retreat.

43rd STREET SOUTH, BRIGANTINE - SITE 131

At 43rd Street South the beach width has become more easily expressed in fractions of a mile between the development and the shoreline. This May 24th 2007 view from the seaward dune slope to the south shows the wide, dry beach, but fails to show the extensive growth in maritime forest vegetation landward for hundreds of feet.

December 9th 2008, eighteen months later, the dune grass is better developed, the beach a few feet wider and the same situation continues due to the sediment trapping effect of the north Absecon Inlet jetty. This structure has had a profound impact on the southern Brigantine shoreline as perhaps 15,000,000 cubic yards of beach sand from the northern half of the island has moved south toward Absecon Inlet to be confined north of this jetty. The net gain this past 18 months was 62.47 yds^3/ft. and a 61-foot advance occurred as the shoreline moved further seaward.

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#131 - 43rd Street, Brigantine, Atlantic County

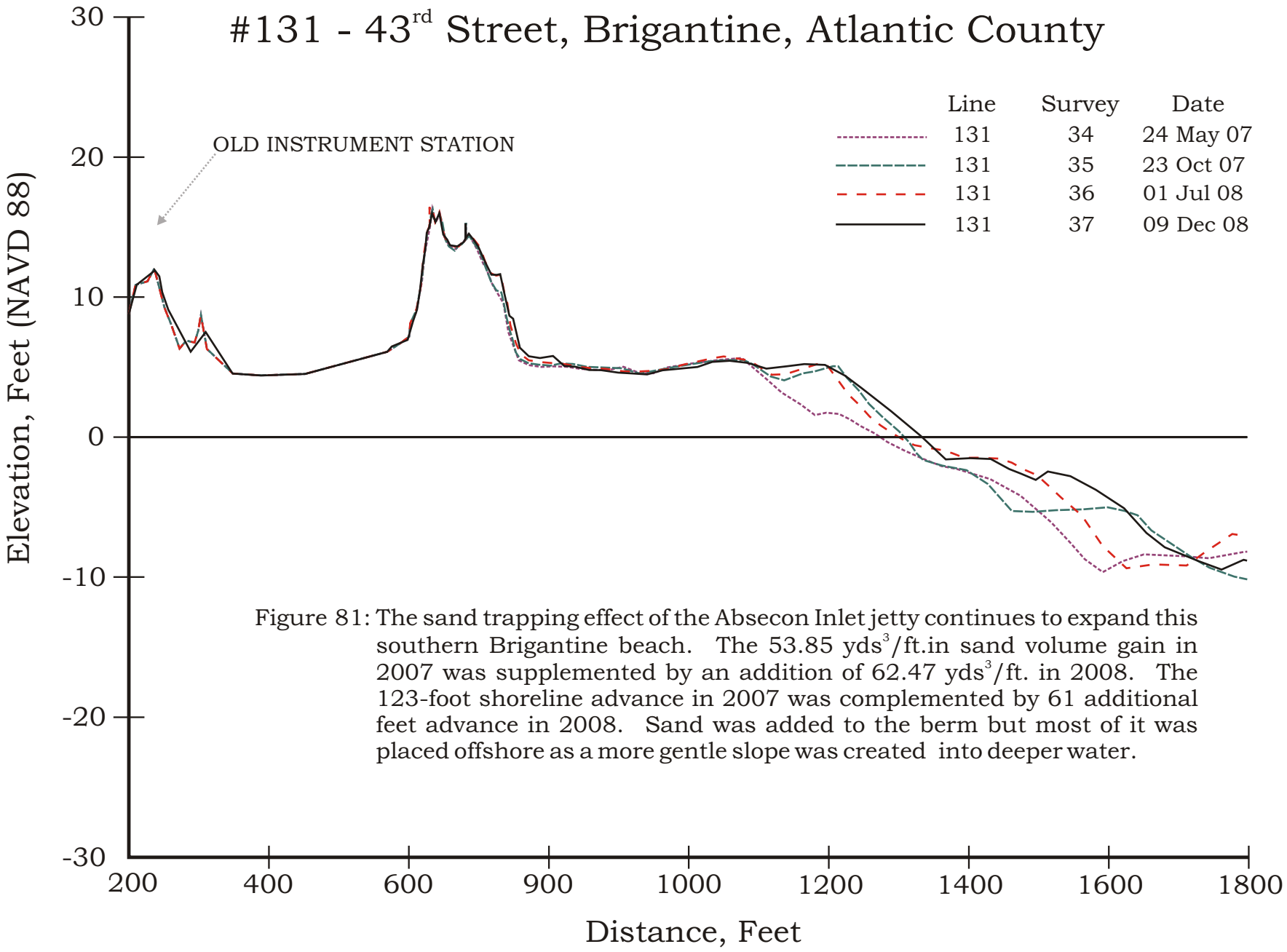

Figure 81: The sand trapping effect of the Absecon Inlet jetty continues to expand this southern Brigantine beach. The 53.85 yds^3/ft.in sand volume gain in 2007 was supplemented by an addition of 62.47 yds^3/ft. in 2008. The 123-foot shoreline advance in 2007 was complemented by 61 additional feet advance in 2008. Sand was added to the berm but most of it was placed offshore as a more gentle slope was created into deeper water.

NORTH CAROLINA AVENUE, ATLANTIC CITY - SITE 130

Looking north toward the Steel Pier in Atlantic City on April 7th 2007 shows the dune built following the 2002 Federal beach restoration effort. Some recession has been seen in the shoreline position since then, but the worst erosion is further north of the pier.

By November 26th 2008 the dune position was the same because no storm events reached the dune toe. The beach was 38 feet narrower as 35.71 yds^3/ft. in sand volume moved further south. Continued erosion north of the pier has created potential for storm damage to the boardwalk should a severe storm occur.

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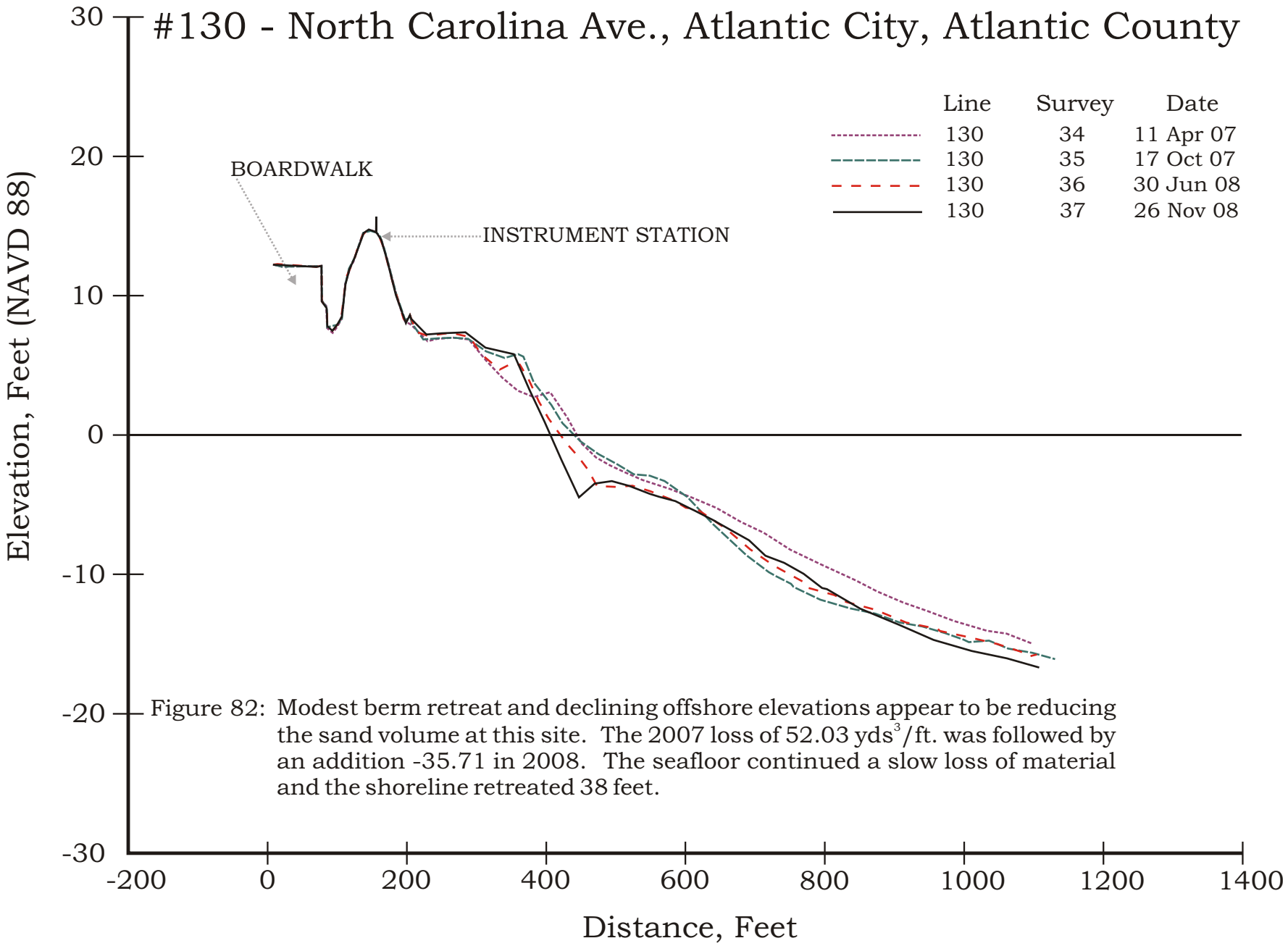

Figure 82: Modest berm retreat and declining offshore elevations appear to be reducing the sand volume at this site. The 2007 loss of 52.03 $yds^3/ft.$ was followed by an addition -35.71 in 2008. The seafloor continued a slow loss of material and the shoreline retreated 38 feet.

RALEIGH AVENUE, ATLANTIC CITY - SITE 129

The Raleigh Avenue site received beach material in 2002 and the dune was re-configured wider and higher. On April 7th 2007 the dune had accumulated sand along a 4-foot fence established earlier. The vegetation was absent on this new foredune. The beach width still reflects the 2003-04 ACOE project as sand lost to the south has been compensated by sand moving into this area from further north.

By November 19th 2008 the vegetation had taken over the bare foredune seaward of the ACOE project's dune development. This vegetation was planted in the fall of 2007 and has done well. The beach dimensions have remained nearly unchanged as 8.50 yds^3/ft. of sand was added as the shoreline retreated 18 feet.

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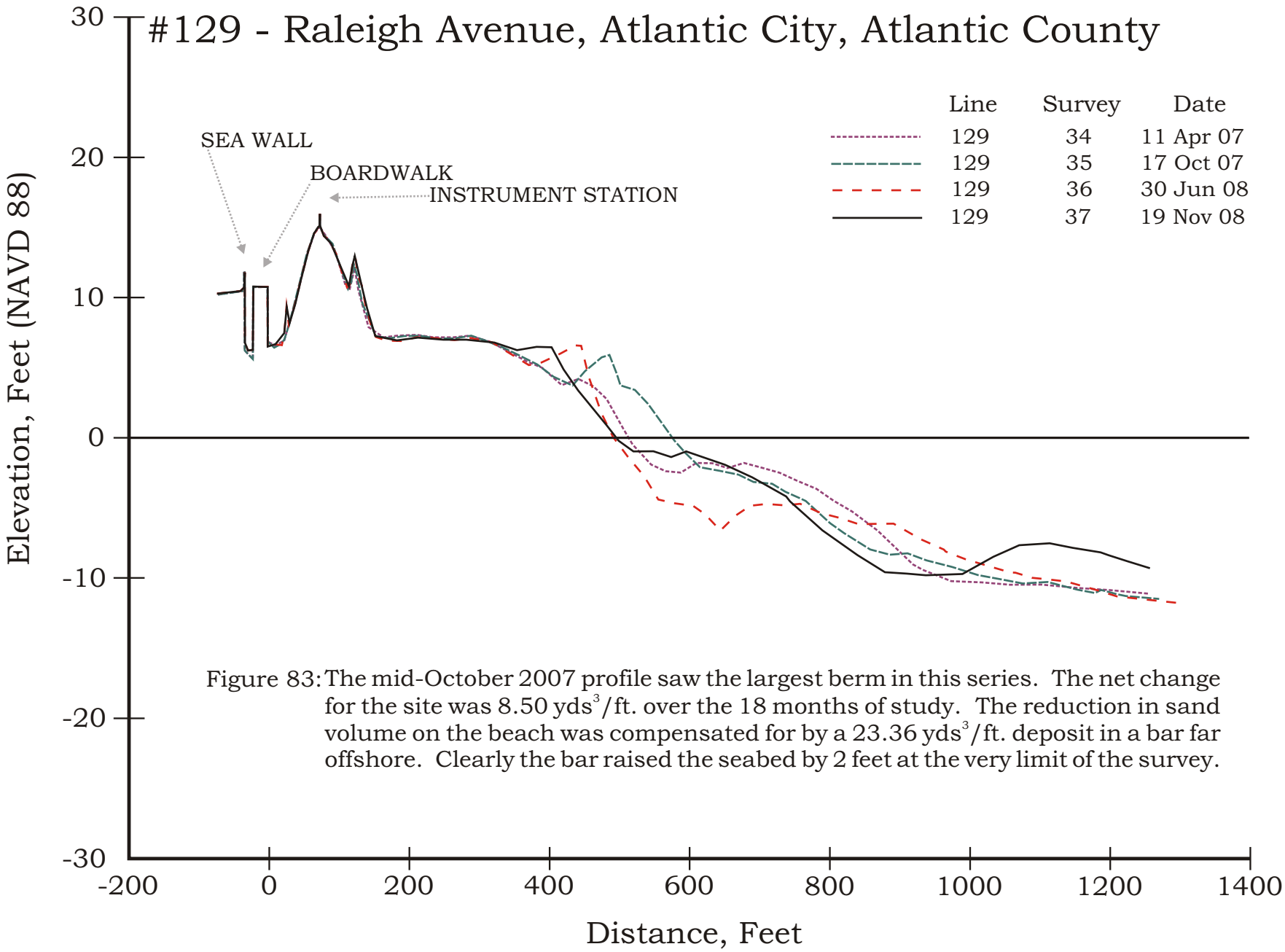

Figure 83: The mid-October 2007 profile saw the largest berm in this series. The net change for the site was 8.50 yds^3/ft. over the 18 months of study. The reduction in sand volume on the beach was compensated for by a 23.36 yds^3/ft. deposit in a bar far offshore. Clearly the bar raised the seabed by 2 feet at the very limit of the survey.

DORSET AVENUE, VENTNOR - SITE 128

The Dorset Avenue site was also nourished during 2003/04. There was a new dune built and vegetated. The April 11th 2007 view shows the beach at the berm with the fishing pier in the distance. The dune was re-established seaward of the original feature which was positioned just seaward of the boardwalk.

By June 27th 2008 the beach showed the presence of a berm and the dune vegetation has commenced a new growth season. The beach width narrowed by 37 feet as 16.76 yds^3/ft. in sand volume moved south. This section of the Absecon Island shoreline appears to be stable since the ACOE project was completed.

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#128 - Dorset Avenue, Ventnor, Atlantic County

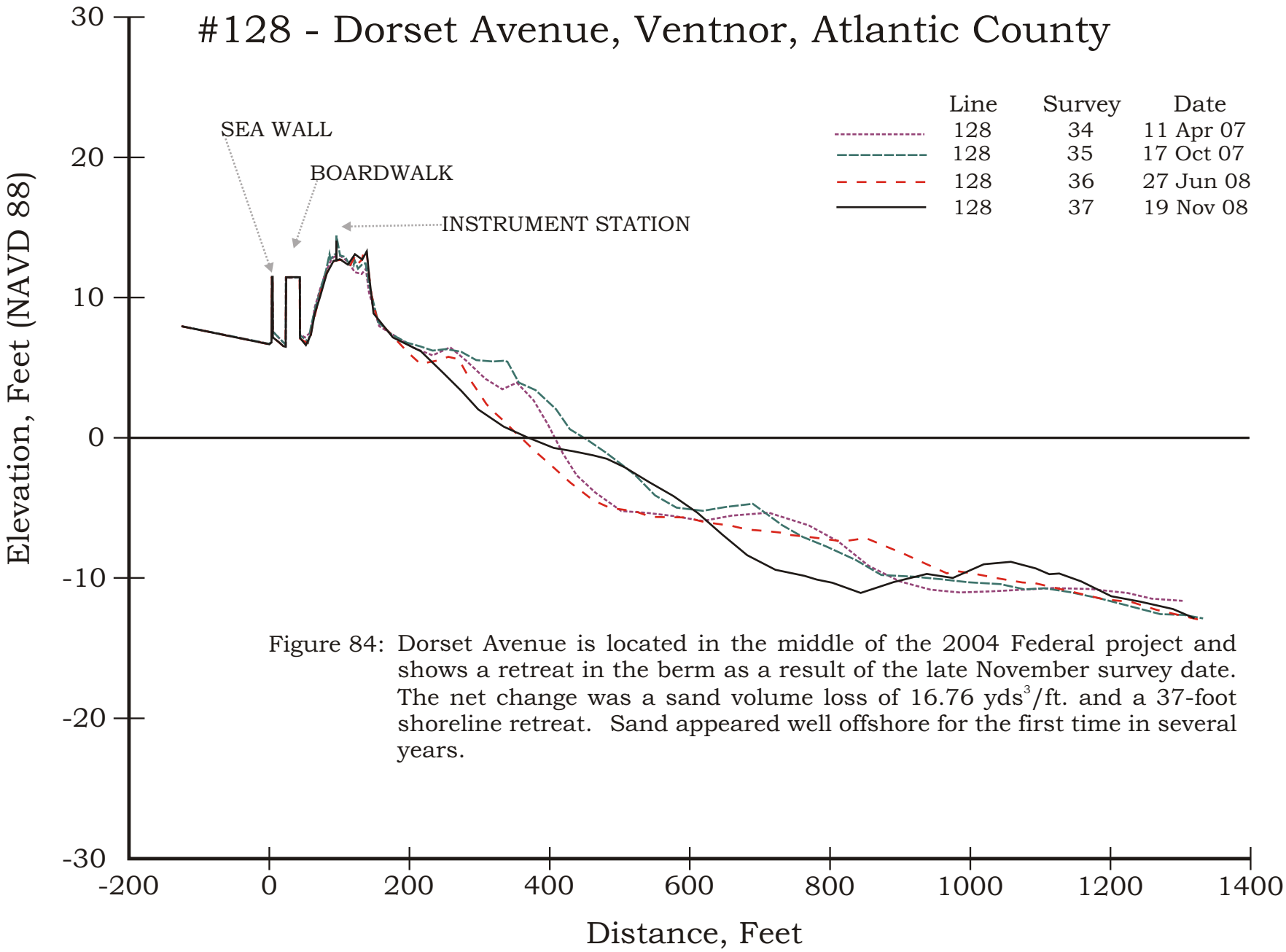

Figure 84: Dorset Avenue is located in the middle of the 2004 Federal project and shows a retreat in the berm as a result of the late November survey date. The net change was a sand volume loss of 16.76 yds^3/ft. and a 37-foot shoreline retreat. Sand appeared well offshore for the first time in several years.

BENSON AVENUE, MARGATE - SITE 127

Benson Avenue in Margate City lies about a mile south of the terminus of the ACOE beach restoration project because neither Margate or the Borough of Longport chose to participate in the project. The May 7th 2007 view shows the beach seaward of managed dunes using snow fencing. This beach has accumulated sand since 2003 derived from Ventnor City to the north. These recent gains have exceeded any from the prior 16 years, making loss from the ACOE project a probable source.

June 26th 2008 shows beach visitors sitting seaward of a new 4-foot snow fence placed seaward of the one present in 2007. These efforts tend to make the dune develop seaward and say relatively low in crest elevation. The sand volume increased by 9.07 yds^3/ft. while the beach width decreased by 22 feet.

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#127 - Benson Avenue, Margate, Atlantic County

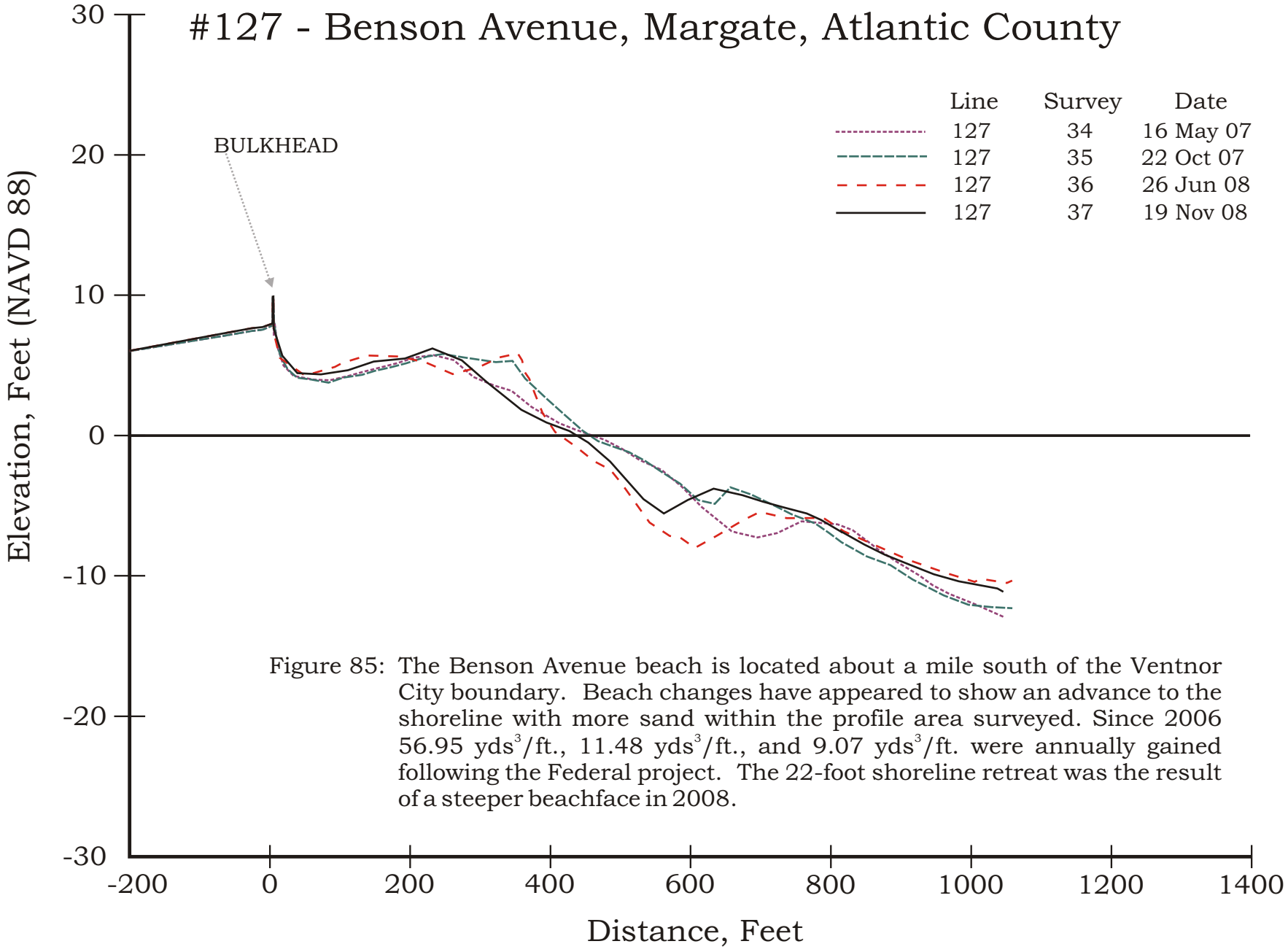

Figure 85: The Benson Avenue beach is located about a mile south of the Ventnor City boundary. Beach changes have appeared to show an advance to the shoreline with more sand within the profile area surveyed. Since 2006 56.95 $yds^3/ft.$, 11.48 $yds^3/ft.$, and 9.07 $yds^3/ft.$ were annually gained following the Federal project. The 22-foot shoreline retreat was the result of a steeper beachface in 2008.

17th STREET, LONGPORT - SITE 126

The Longport site is about 15 blocks from the terminal jetty to Great Egg Inlet at 11th Street. This October 22nd 2007 photograph shows the concrete seawall with sand ramped up to within three feet of the crest. Note that the armor stone seaward of the wall's base just barely appear. Insufficient beach width exists to establish a dune along this segment of shoreline.

By the spring of 2008 (June 27th 2008) the wall height had increased to 5 feet as sand was removed, exposing the tops of the surface rocks to the south of the access stairway. Since the Federal project's completion, this beach has gained 29.41 yds^3/ft. and the shoreline advanced seaward by 12 feet. The sand volume gain is considerably larger than seen in the past.

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#126 - 17th Street, Longport, Atlantic County

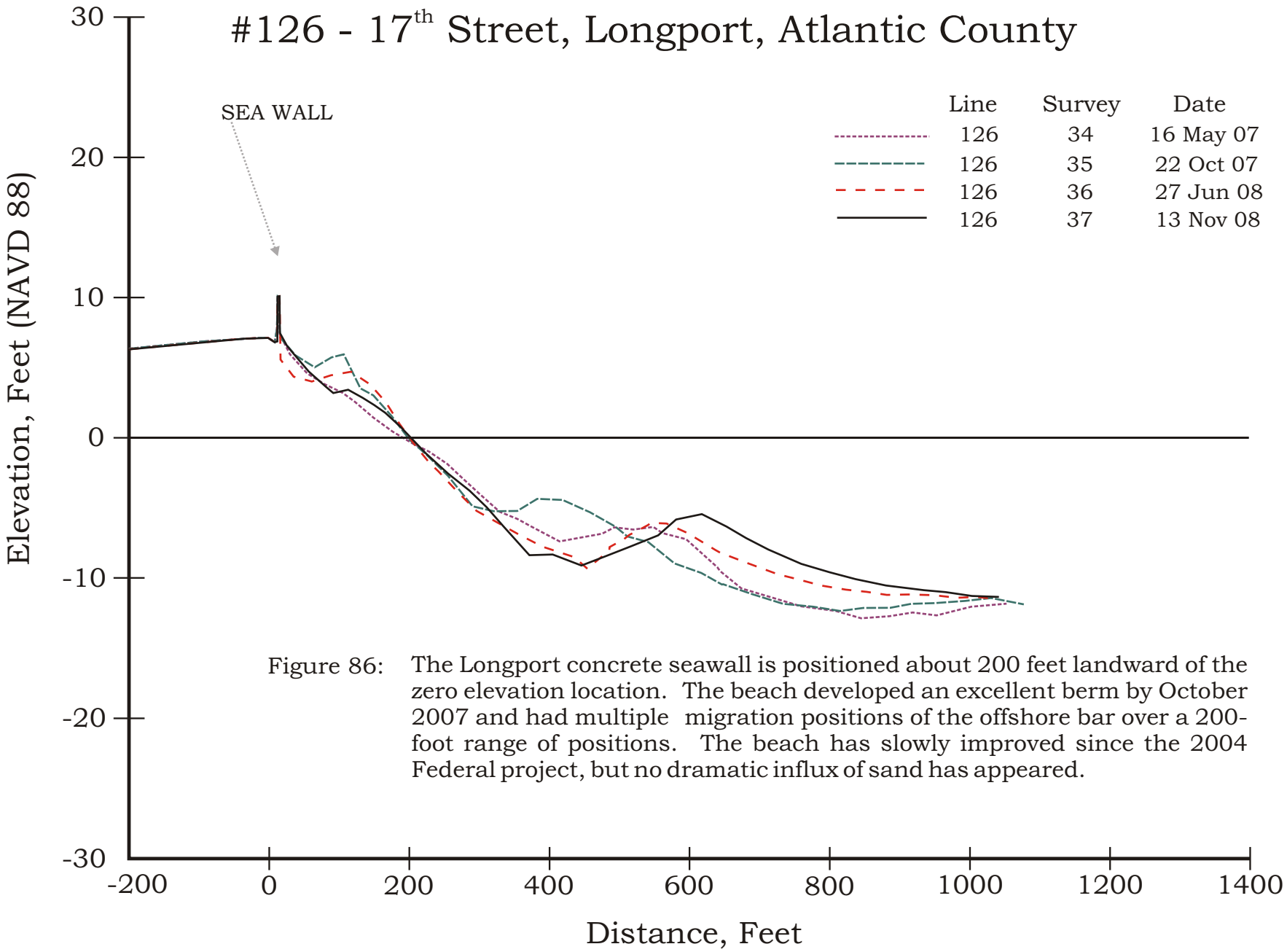

Figure 86: The Longport concrete seawall is positioned about 200 feet landward of the zero elevation location. The beach developed an excellent berm by October 2007 and had multiple migration positions of the offshore bar over a 200-foot range of positions. The beach has slowly improved since the 2004 Federal project, but no dramatic influx of sand has appeared.