New Jersey Beach Profile Network

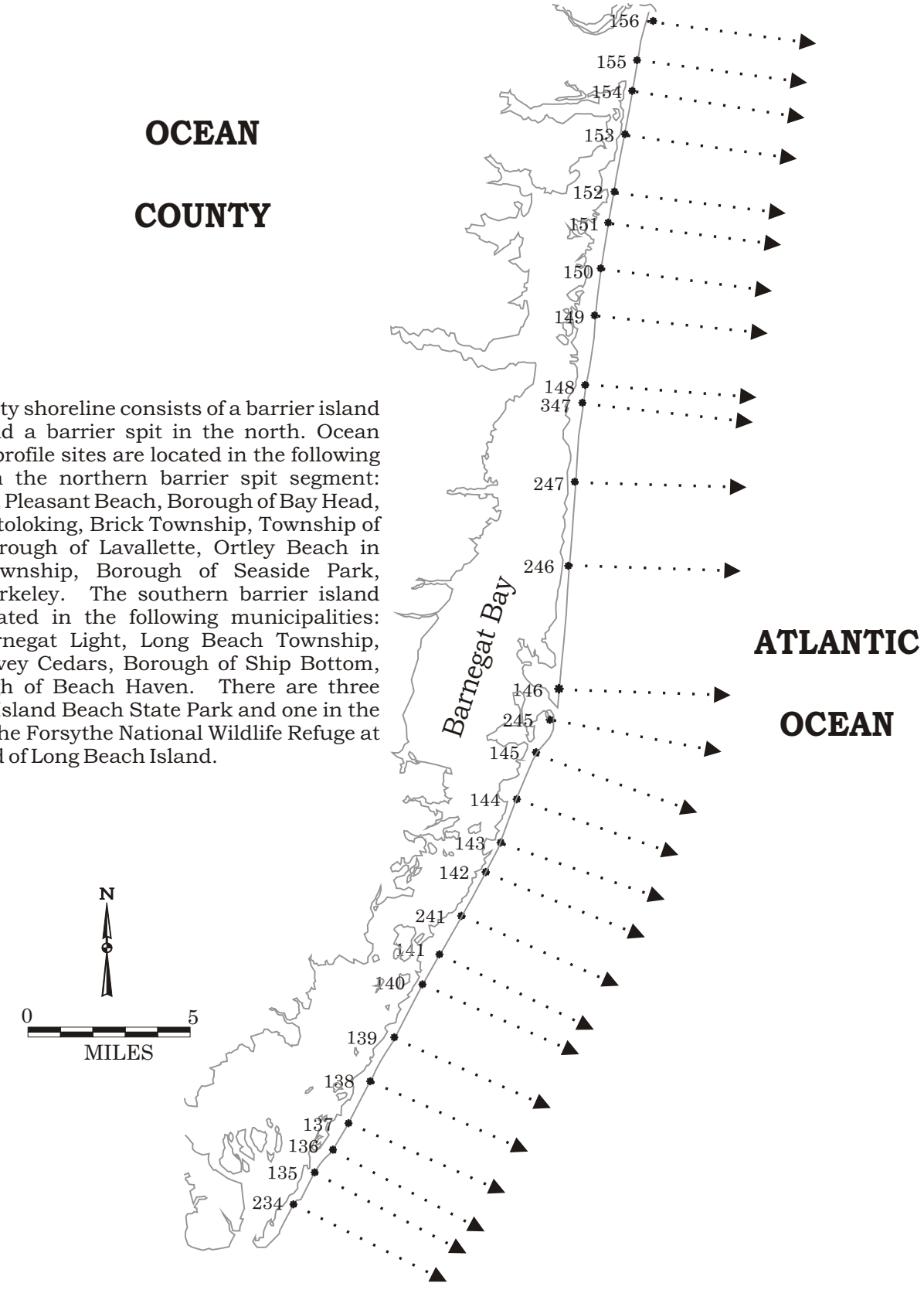
Ocean County

Manasquan Inlet to Little Egg Inlet

NJBPN Profile #'s 156 - 234

New Jersey Beach Profile Network
Ocean County Profile Site Locations

Figure 107



The Ocean County shoreline consists of a barrier island in the south and a barrier spit in the north. Ocean County NJBPN profile sites are located in the following communities on the northern barrier spit segment: Borough of Point Pleasant Beach, Borough of Bay Head, Borough of Mantoloking, Brick Township, Township of Toms River, Borough of Lavallette, Ortley Beach in Toms River Township, Borough of Seaside Park, Township of Berkeley. The southern barrier island profiles are located in the following municipalities: Borough of Barnegat Light, Long Beach Township, Borough of Harvey Cedars, Borough of Ship Bottom, and the Borough of Beach Haven. There are three locations in the Island Beach State Park and one in the Holgate Unit of the Forsythe National Wildlife Refuge at the southern end of Long Beach Island.

OCEAN COUNTY 2006 to 2008

Ocean County finally started to benefit from long-awaited startup of Federal beach nourishment projects when sand was pumped onto Surf City, Long Beach Island in late 2006. This effort was not without serious setbacks unrelated to storm activity or erosion events. Unfortunately a major segment of the Ocean County shoreline remains under private ownership. Elsewhere most communities acquired title to the beachfront as the municipality evolved in the late 19th Century or early 20th Century. This private ownership to the high water line produced the necessity for each lot owner to provide the State with an easement granting access and for the placement of sand on the property in "perpetuity". This did not appeal to many owners plus excessive rumors circulated alleging that each owner "would be forced to allow unlimited access across the entire private lot; be required to provide porta-potties for beach visitors; the project would ruin the view of the ocean; and limit the private owner's rights in various and sundry other ways".

This conflict held up and finally forced the ACOE to cancel the proposed multi-community project on Long Beach Island after completing Surf City by April 2006. The second setback was the discovery of obsolete military munitions hardware in the sediment pumped onto the Surf City beaches just before the Memorial Day weekend. The press employed the term "BOMB" more that once, which further fed the fires of discontent with beach nourishment. The "I had a BLAST on LBI" tee-shirts did not help either. The ACOE was forced to spend millions of dollars sweeping the new beach for metal parts (fuses, detonators and other munitions hardware from WW I) then proceed to excavate the beach and sort the sand for buried ordinance. This effort continues to this day as the effort will excavate the entire deposit and process the sand to catch anything that passed through the dredge. The metal was sucked up off the borrow zone sea bottom, went through the pumps into the transfer ship, then was re-pumped through the pipeline onto the beach. New requirements for screens to trap such items on offshore dredging for beach restoration purposes should preclude this problem from reoccurring.

Congressional failure to appropriate funding for 2007 and 2008 for maintenance and new construction of beach nourishment projects does not bode well for the future. The decline in Federal enthusiasm for beach nourishment combined with increased hurricane frequency and intensity is cause for concern down the road. Ocean County continues to have many of the more vulnerable areas within the state because no concerted effort has materialized to generate an "issue-free" project along the county shoreline. Northern Ocean County has an ACOE project that has moved into the Design Memorandum phase, but new construction permits are getting increasingly difficult along with declining levels of appropriation from the US Congress.

Both summer seasons (2006 and 2007) saw wave activity move larger than normal amounts of sand from the offshore bar system back to the beaches by September of each year. The effect is most pronounced from Point Pleasant Beach south to Island Beach State Park. A similar impact was not seen on Long Beach Island. There the winter/summer beach differences were more related to each groin compartment's sand supply and the quantity arriving into the space between groins. The 2007 season was more active in the exchange between offshore and the beach based on the evidence provided by the surveys. Ocean County's northern shoreline is situated in a

zone of limited littoral transport in either direction because the impact of northeast storm events driving sand south is about equal to the northerly thrust generated by tropical swell and local southeast winds during the summer months. Sand transport is therefore limited to transport across the shoreline by winter storms to the offshore bars and back again from offshore by the long-period summer swell waves. The lack of groins along much of this part of the shoreline also permits sand to flow unrestricted across a long segment of beachfront keeping the average sand volume present in all locations relatively constant. Sand accumulates at both inlet jetties; Barnegat Inlet in the south and Manasquan Inlet in the north. These deposits have expanded the beach width to levels that afford considerable storm protection. Of course, the southern 13 miles of the Northern Ocean County shoreline is the natural area known as Island Beach State Park where visitation is done on a daily basis and large regions are open to native species of all types.

The Borough of Mantoloking is seeking to cooperate with neighboring communities to achieve some measure of beach nourishment for the Borough with the ultimate goal to be the specifications outlined in the Federal Feasibility Study for the Northern Ocean County reach.

Figure 108. The beach along much of Point Pleasant Beach has no dune because the community leaders desire a unobstructed view of the ocean beach from the boardwalk and the large number of summer beach visitors. This series of profiles has resulted in expanded berm growth between each pair of surveys. The distance from the boardwalk to the berm crest increased by 100 feet during the 18-month study period, the majority occurring between March and October 2007.

WATER STREET, POINT PLEASANT
SITE 156

Figure 109. The October 8, 2007 view is to the north and compared with the May 4, 2006 view above to the south, shows the expanse of dry beach seaward of the boardwalk in Point Pleasant Beach. The beach volume grew by 49.06 $yds^3/ft.$ with a shoreline advance of 59 feet during the course of the recent survey history. This advance may be due to the very beneficial conditions acting to build a significant berm at multiple sites along the northern part of the county. By mid-October the beaches between the Manasquan Inlet and Seaside Park were in ideal "summer profile" condition. This sand may have been supplied by littoral transport from the south over the summer.

New Jersey Beach Profile Network

#156 - Water Street, Point Pleasant, Ocean County

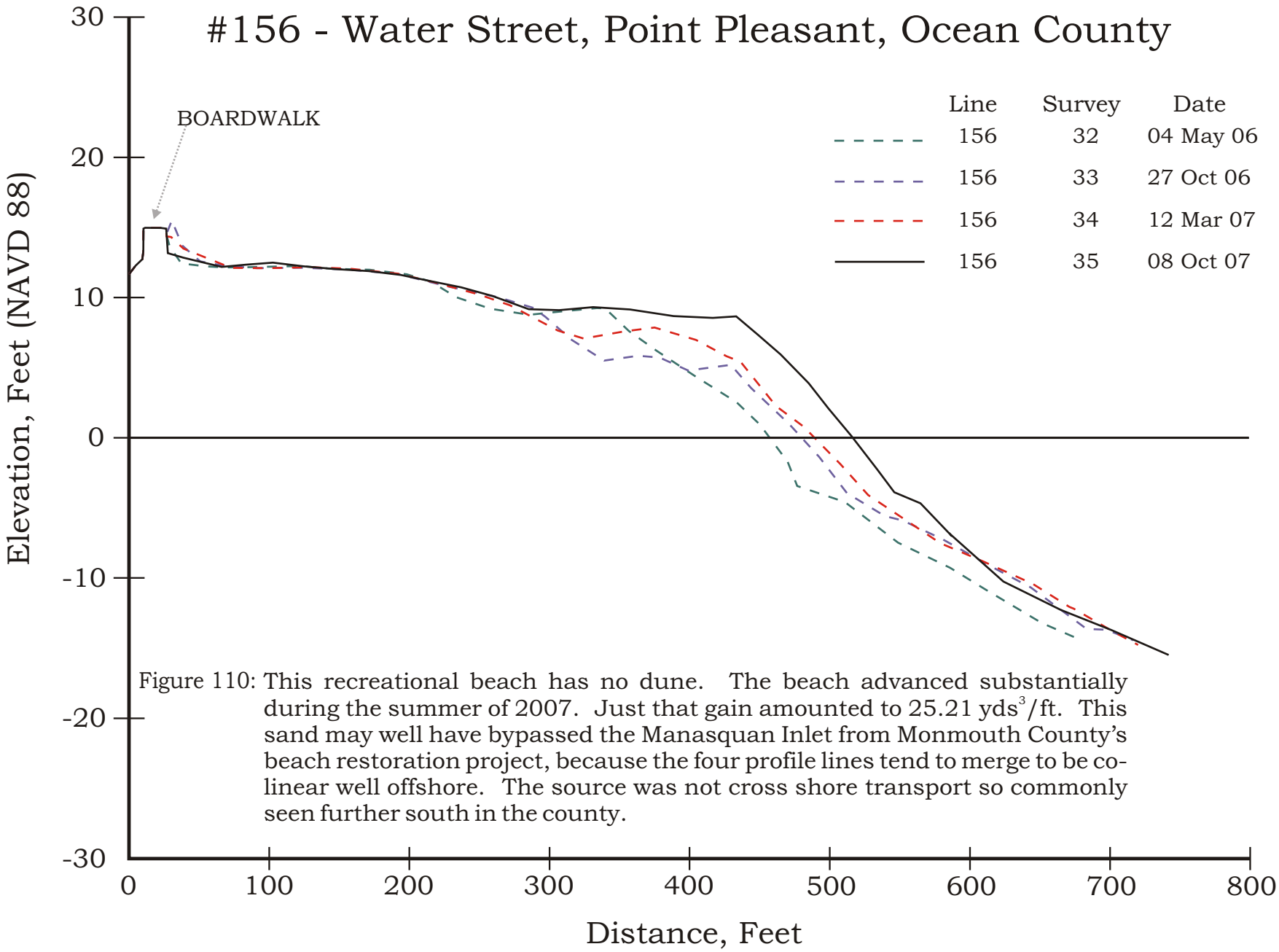


Figure 110: This recreational beach has no dune. The beach advanced substantially during the summer of 2007. Just that gain amounted to 25.21 yds^3/ft. This sand may well have bypassed the Manasquan Inlet from Monmouth County's beach restoration project, because the four profile lines tend to merge to be co-linear well offshore. The source was not cross shore transport so commonly seen further south in the county.

Figure 111. Looking north across the dunes to the beach one gets the feeling for the size of this massive feature. Sand has accumulated nearly to the crest on most years since 1986 and this year the berm developed at 10-foot elevations because of a very conducive wave climate. The left photograph was taken May 4, 2006.

MARYLAND AVENUE, POINT PLEASANT BEACH – SITE 155

Figure 112. This view taken October 9, 2007, shows the entire width of the dunes back to development looking north toward Manasquan Inlet. The beach volume declined by 18.04 yds^3/ft. largely due to the transfer of the sand offshore onto the beach. The beach advance was actually a return toward the May 2006 position because the shoreline value was advanced to within 12.06 feet of the 2006 position. The fall 2006 shoreline position was the furthest seaward of the four surveys.

New Jersey Beach Profile Network

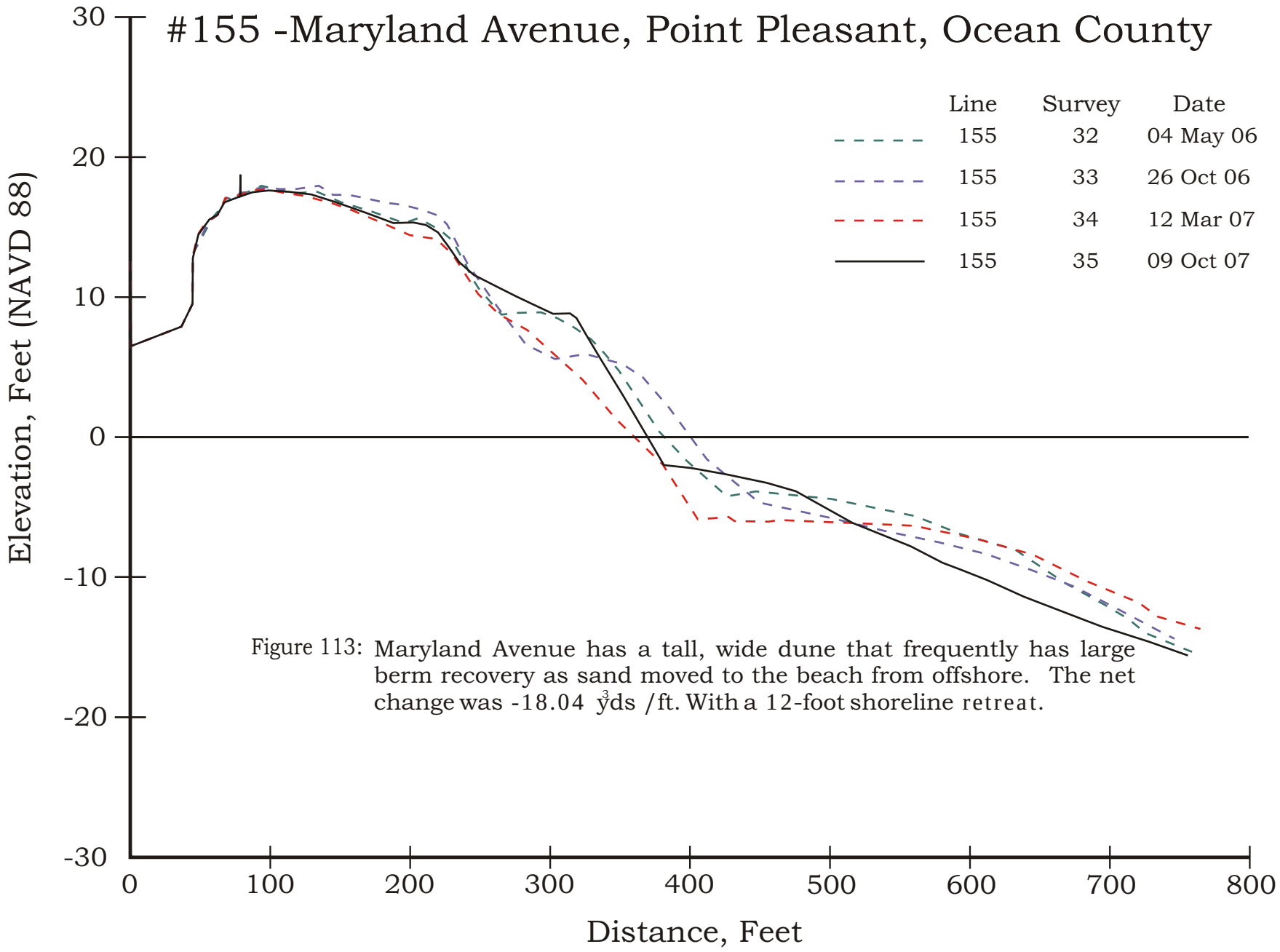


Figure 113: Maryland Avenue has a tall, wide dune that frequently has large berm recovery as sand moved to the beach from offshore. The net change was -18.04 yds^3 /ft. With a 12-foot shoreline retreat.

Figure 114. The Bay Head location also developed an enormous berm by the October 2007 survey. The development was confined to the summer of 2007 accretion because the other three survey dates show a much smaller berm feature.

JOHNSON AVENUE, BAY HEAD
SITE 154

Figure 115. The October 9, 2007 view is to the south and shows the berm and wider beach very clearly. The net change was a gain of 7.43 yds^3/ft. with the beach representing 32.20 yds^3/ft. as a gain to just the berm, but the offshore contributed 24.63 yds^3/ft. to that growth. The shoreline advanced 59 feet during the 18-month interval.

New Jersey Beach Profile Network

#154 - Johnson Avenue, Bay Head, Ocean County

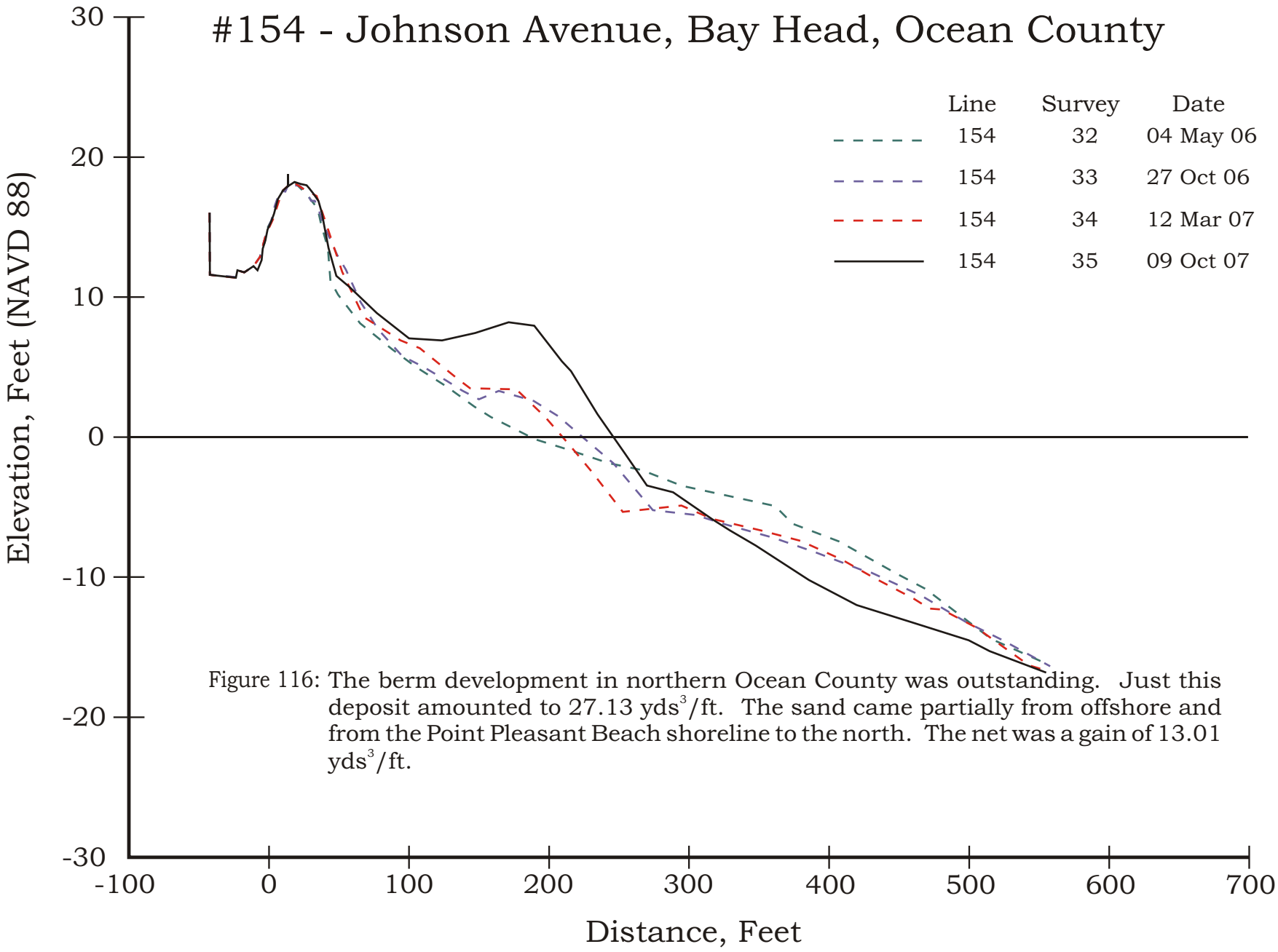


Figure 116: The berm development in northern Ocean County was outstanding. Just this deposit amounted to 27.13 yds^3/ft. The sand came partially from offshore and from the Point Pleasant Beach shoreline to the north. The net was a gain of 13.01 yds^3/ft.

Figure 117. This view was taken March 16, 2006 following winter erosion on the beach. The scarp had dried and slumped into an "angle of repose" slope on the seaward dune slope as the berm recovered some sand. The municipality has a policy of requiring oceanfront owners to contract to have sand pushed up from the berm to restore the dune's width and slope following these erosional episodes.

1117 OCEAN AVE., MANTOLOKING
SITE 153

Figure 118. By October 15, 2007 this owner had restored the dune with sand derived from the summer's accretion on the berm. This process does two things: 1). It acts to keep the dune crest elevation at a height that can absorb a significant wave run-up during a storm surge event. 2). It acts to prevent or reduce dune retreat into the properties landward of the crest over time. Grass planting and zig-zag fencing are also part of the owner responsibility.

This beach gained 4.44 yds^3/ft because the sand supply has not been augmented by beach nourishment, but the shoreline did advance 86 feet seaward due to extensive cross shore sand transport during the summer of 2007.

New Jersey Beach Profile Network

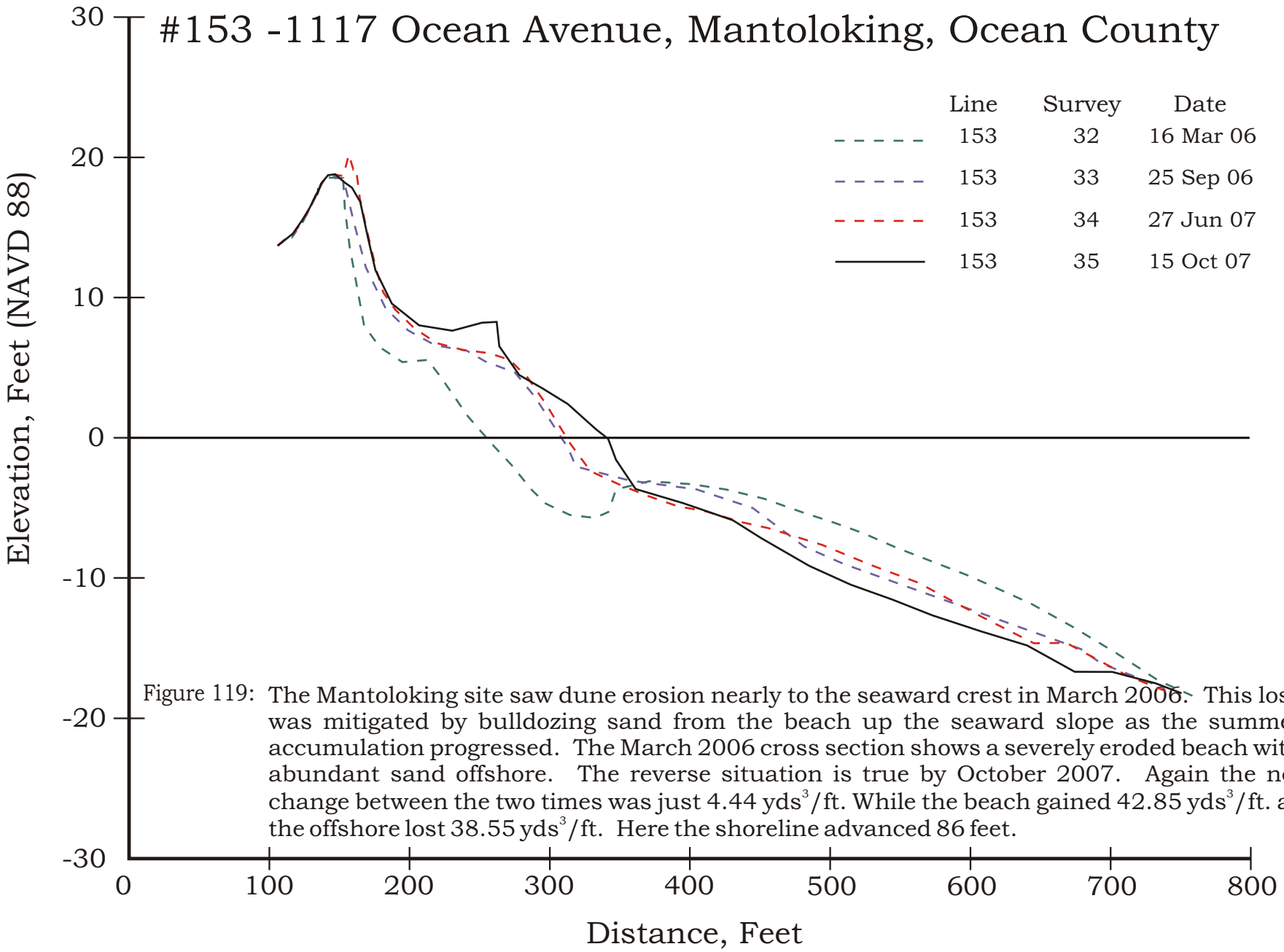


Figure 119: The Mantoloking site saw dune erosion nearly to the seaward crest in March 2006. This loss was mitigated by bulldozing sand from the beach up the seaward slope as the summer accumulation progressed. The March 2006 cross section shows a severely eroded beach with abundant sand offshore. The reverse situation is true by October 2007. Again the net change between the two times was just 4.44 yds^3/ft. While the beach gained 42.85 yds^3/ft. as the offshore lost 38.55 yds^3/ft. Here the shoreline advanced 86 feet.

Figure 120. This view was taken from the crest of the dune looking north on April 14, 2006. This site has seen substantial dune growth over the decades since the beach became public. The recreational use is extensive since much of the northern Ocean County shoreline is privately owned.

PUBLIC BEACH #3, BRICK TOWNSHIP
SITE 152

Figure 121. The change by October 10, 2007 was one of substantial beach accretion due to unusually effective cross-shore sand transport during the summer of 2007. Both the photography and the beach cross sections easily show the impact of this process at work. The sand volume on the beach increased by 17.22 yds^3/ft, but the offshore region lost 24.32 yds^3/ft during the same time interval. Therefore the net beach change between the parking lot and a depth of -16.3 feet NAVD 88 offshore was a loss of 7.11 yds^3/ft between April 2006 and October 2007.

New Jersey Beach Profile Network

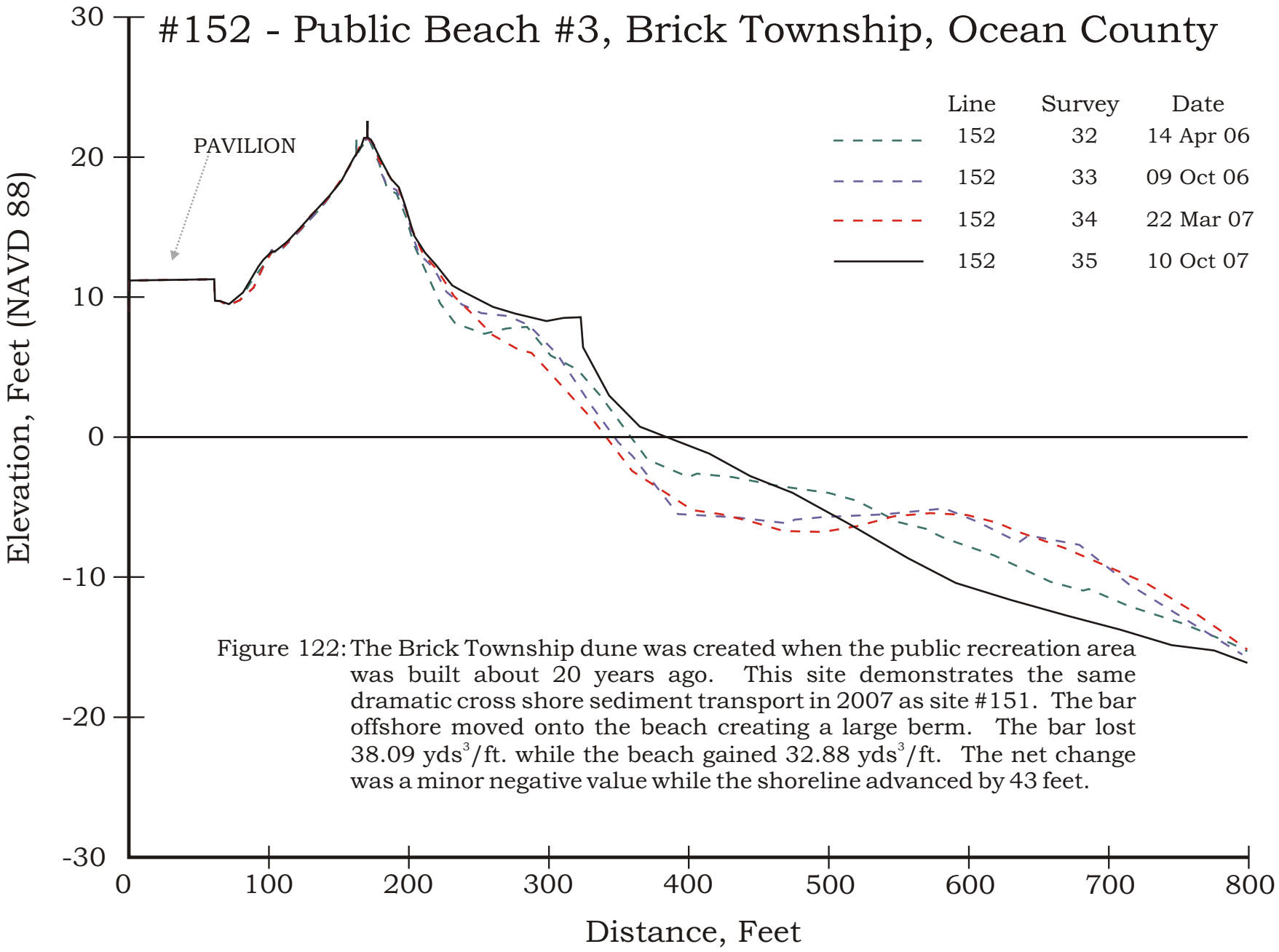


Figure 122: The Brick Township dune was created when the public recreation area was built about 20 years ago. This site demonstrates the same dramatic cross shore sediment transport in 2007 as site #151. The bar offshore moved onto the beach creating a large berm. The bar lost 38.09 yds^3/ft. while the beach gained 32.88 yds^3/ft. The net change was a minor negative value while the shoreline advanced by 43 feet.

Figure 123. This view of the beach was taken looking across the dune on April 14, 2006. Sand sloped down from the dune crest to the berm without much of a transition zone.

1st AVENUE, NORMANDY BEACH
SITE 151

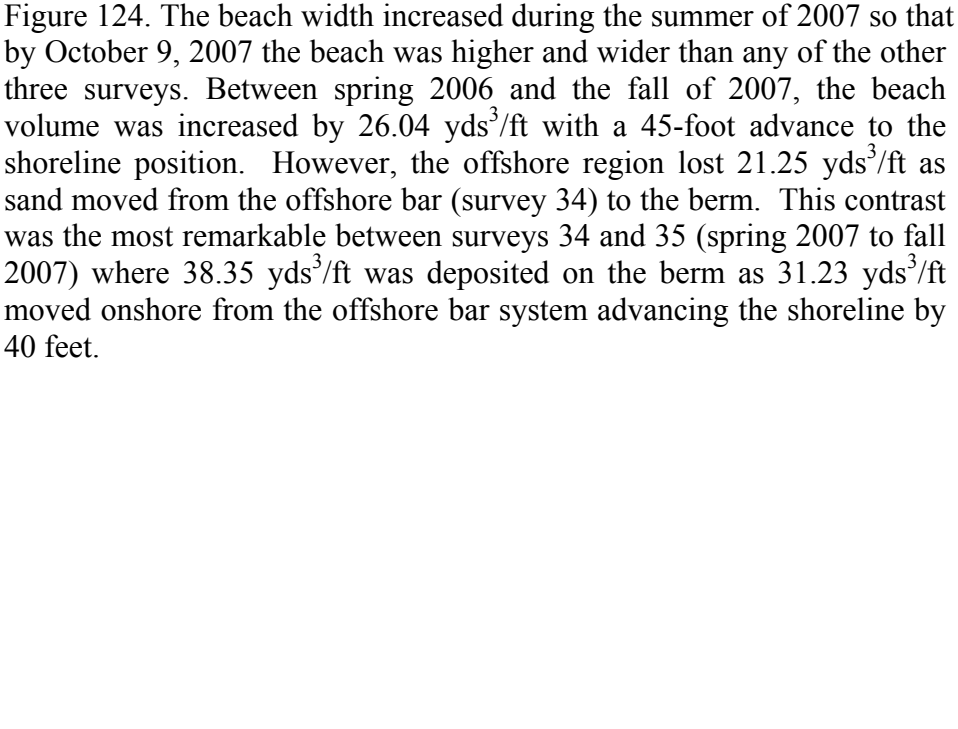


Figure 124. The beach width increased during the summer of 2007 so that by October 9, 2007 the beach was higher and wider than any of the other three surveys. Between spring 2006 and the fall of 2007, the beach volume was increased by 26.04 yds^3/ft with a 45-foot advance to the shoreline position. However, the offshore region lost 21.25 yds^3/ft as sand moved from the offshore bar (survey 34) to the berm. This contrast was the most remarkable between surveys 34 and 35 (spring 2007 to fall 2007) where 38.35 yds^3/ft was deposited on the berm as 31.23 yds^3/ft moved onshore from the offshore bar system advancing the shoreline by 40 feet.

New Jersey Beach Profile Network

#151 - 1st Avenue, Normandy Beach, Ocean County

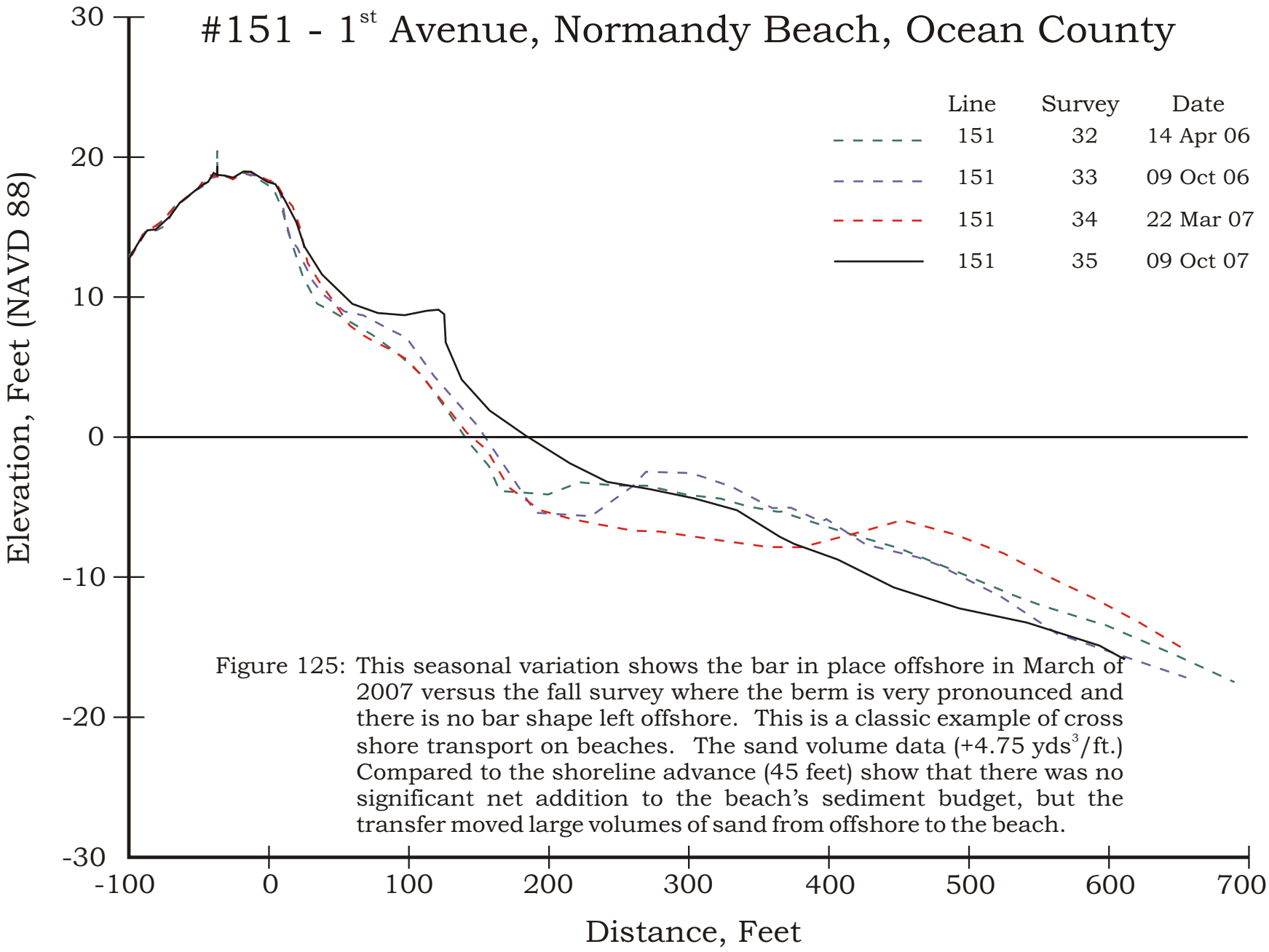


Figure 125: This seasonal variation shows the bar in place offshore in March of 2007 versus the fall survey where the berm is very pronounced and there is no bar shape left offshore. This is a classic example of cross shore transport on beaches. The sand volume data (+4.75 yds^3/ft.) Compared to the shoreline advance (45 feet) show that there was no significant net addition to the beach's sediment budget, but the transfer moved large volumes of sand from offshore to the beach.

Figure 126. The dunes in Lavallette occupy a substantial percentage of the beach zone seaward of the ocean promenade in the community. The sparse vegetation allows sand to move across the dune onto the promenade and beyond, but the dunes are significant barriers to minor and moderate storms. The picture to the left was taken April 14, 2006

WHITE AVENUE, LAVALLETTE
SITE 150

Figure 127. The same view taken October 10, 2007 does show better grass growth, but still a relatively sparsely vegetated dune. The profile plots show the pattern of cross shore deposition that produced the well developed berm in the fall of 2007. The offshore bar system nearly completely migrated to the beach creating a 36.08 yds^3/ft gain on the beach as 36.10 yds^3/ft moved landward from the offshore bar. These data are for the comparison of surveys 34 and 35. The 18-month changes were 20.74 yds^3/ft gained across the entire profile length with a 64-foot shoreline advance.

New Jersey Beach Profile Network

#150 - White Avenue, Lavallette, Ocean County

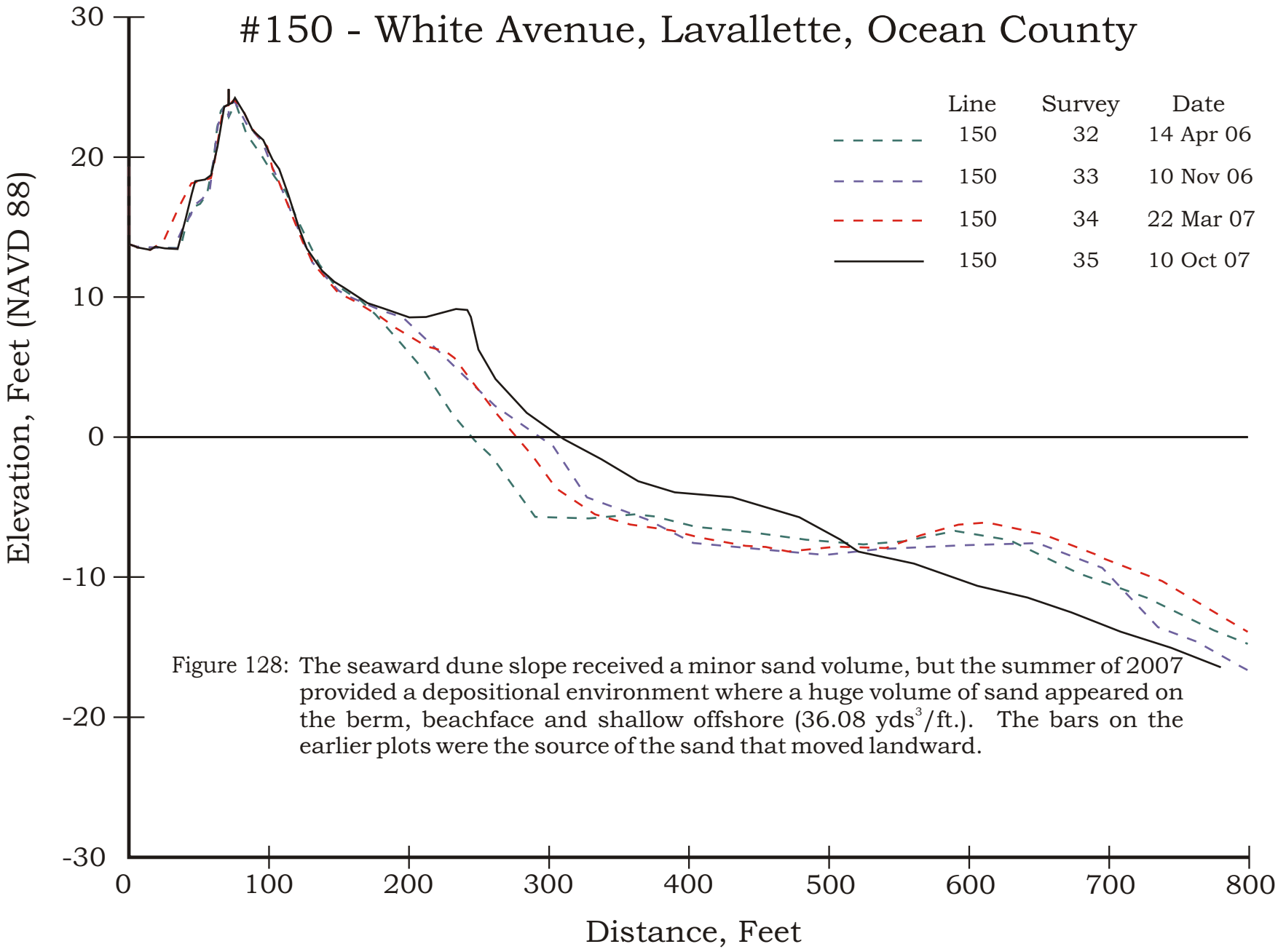


Figure 128: The seaward dune slope received a minor sand volume, but the summer of 2007 provided a depositional environment where a huge volume of sand appeared on the berm, beachface and shallow offshore (36.08 $yds^3/ft.$). The bars on the earlier plots were the source of the sand that moved landward.

Figure 129. The Ortley Beach site has a modest dune that protects the boardwalk from minor storms. The beach is narrow enough to allow minor storms to impact the toe of the dune. The spring 2006 (April 10, 2006) survey showed a moderate width beach and an offshore bar system positioned close to the shoreline.

8th AVENUE, ORTLEY BEACH – SITE 149

Figure 130. This view taken October 12, 2007, shows the entire width of the beach from a small scarp notched into the berm, back to the toe of the dunes. The plots show a higher, more pronounced berm than seen the previous summer. The spring to fall 2007 comparison is another in the series of observed cross-shore transport of sand from the offshore bar to the beach. The beach gained 40.78 yds^3/ft while the offshore system lost 44.69 yds^3/ft.(shoreline advance of 43 feet). The 18-month comparison showed a loss of 28.19 yds^3/ft and a 14-foot advance in the shoreline position mostly due to the depletion of the large offshore deposit present in the spring of 2006.

New Jersey Beach Profile Network

#149 - 8th Avenue, Ortley Beach, Ocean County

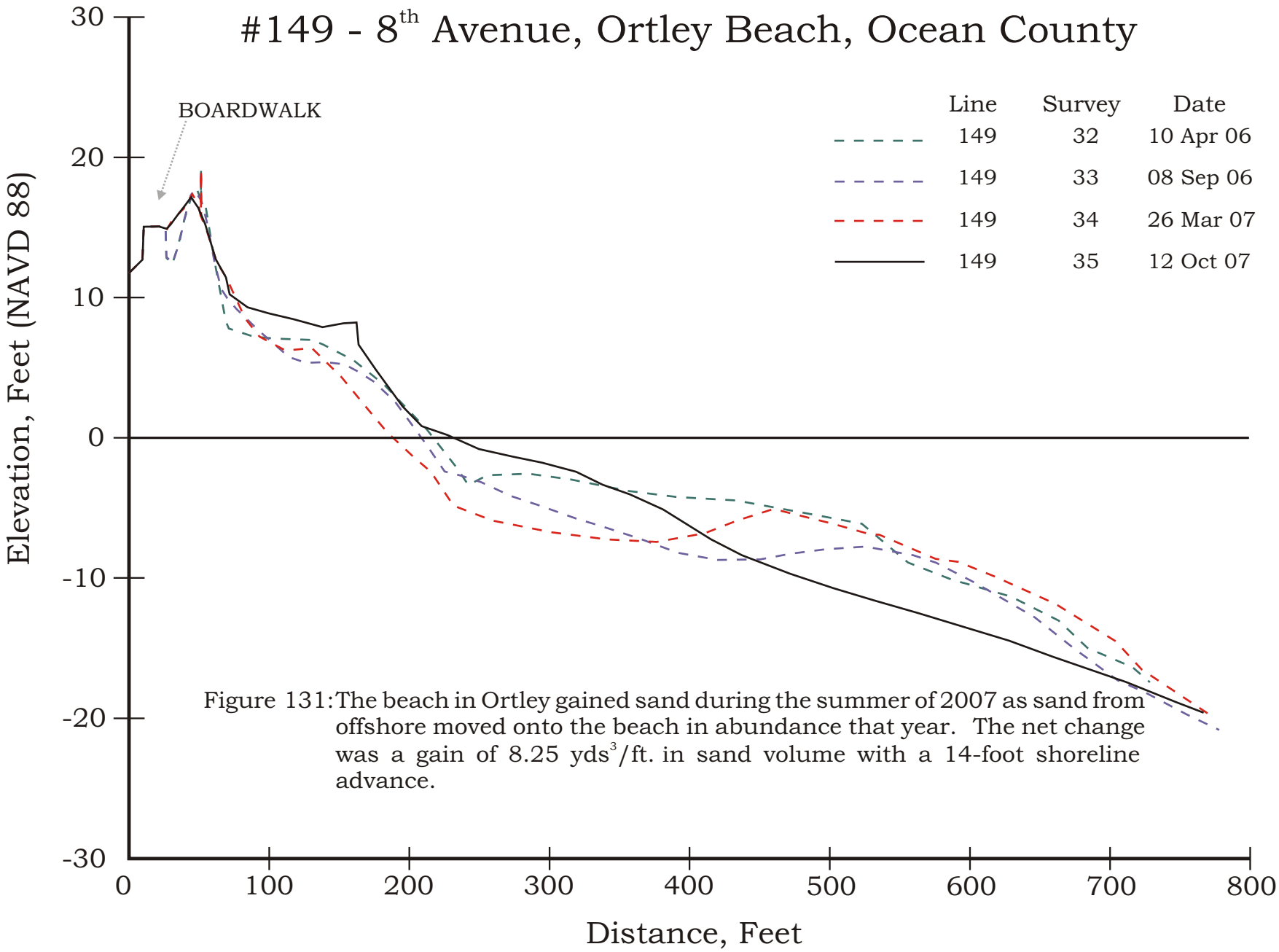


Figure 131: The beach in Ortley gained sand during the summer of 2007 as sand from offshore moved onto the beach in abundance that year. The net change was a gain of 8.25 $yds^3/ft.$ in sand volume with a 14-foot shoreline advance.

Figure 132. This view to the north along the dune crest shows the boardwalk and Ocean Avenue in Seaside Park. The picture was taken April 10, 2006.

4th AVENUE, SEASIDE PARK
SITE 148

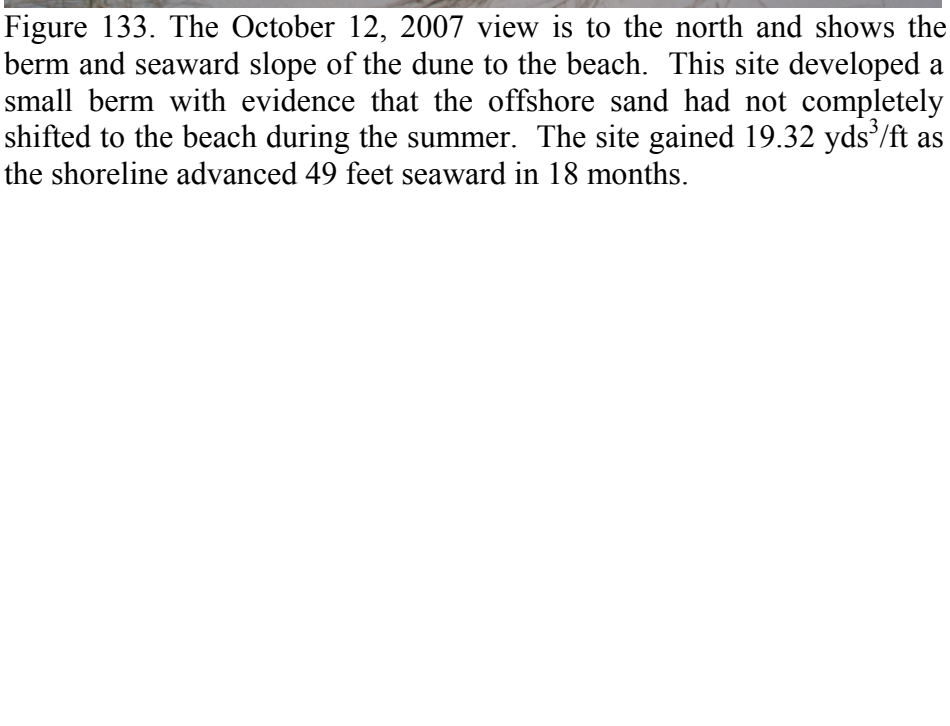


Figure 133. The October 12, 2007 view is to the north and shows the berm and seaward slope of the dune to the beach. This site developed a small berm with evidence that the offshore sand had not completely shifted to the beach during the summer. The site gained 19.32 yds^3/ft as the shoreline advanced 49 feet seaward in 18 months.

New Jersey Beach Profile Network

#148 - 4th Avenue, Seaside Park, Ocean County

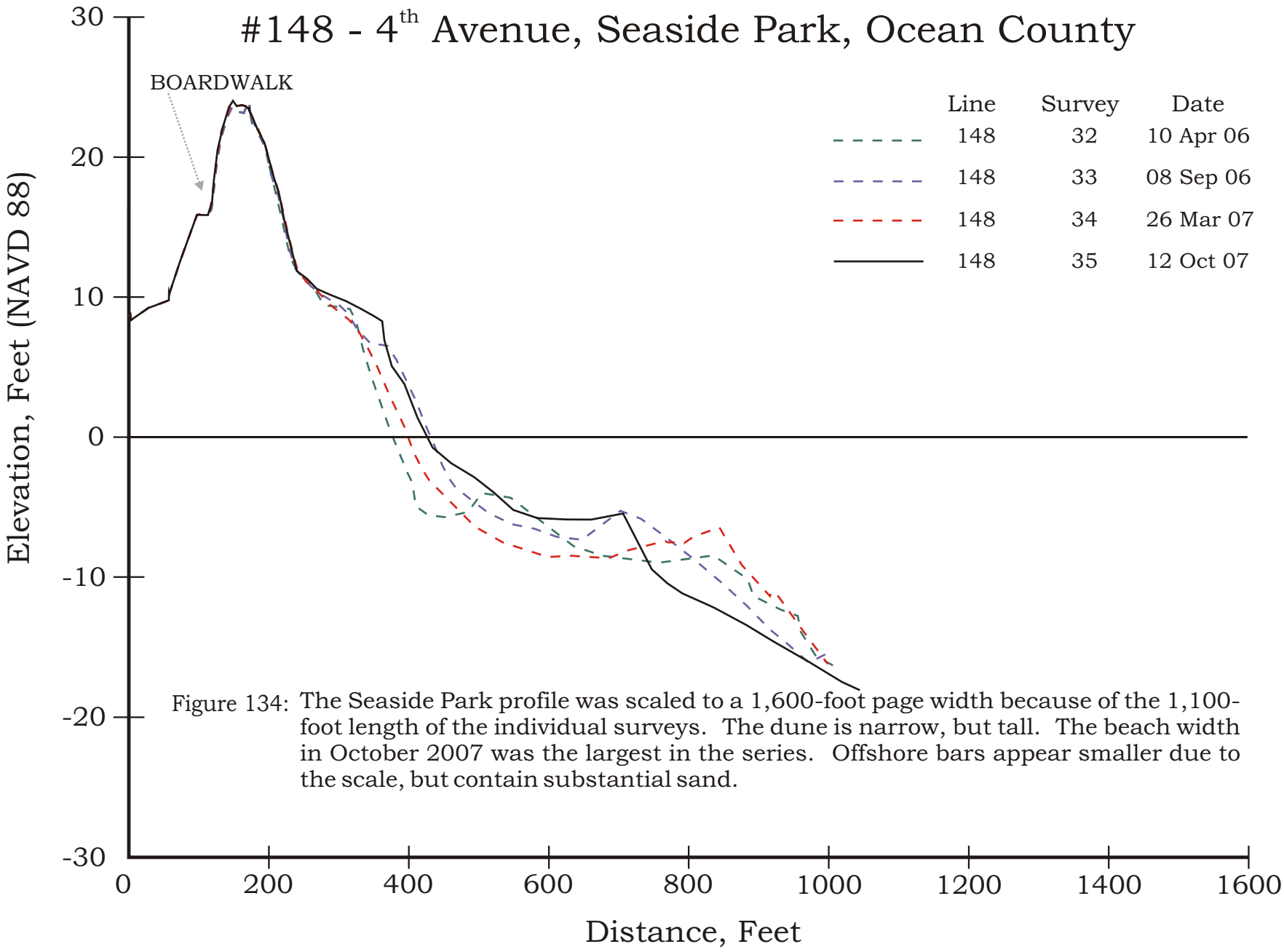


Figure 134: The Seaside Park profile was scaled to a 1,600-foot page width because of the 1,100-foot length of the individual surveys. The dune is narrow, but tall. The beach width in October 2007 was the largest in the series. Offshore bars appear smaller due to the scale, but contain substantial sand.

Figure 135. The Midway Beach site was moved south of the access pathway a couple of years ago so that the dune could be part of the profile surveyed. Initially there was no dune along this beach, but efforts were made of develop a dune system that have been fairly effective. The picture was taken April 10, 2006

6th LANE, MIDWAY BEACH – SITE 347

Figure 136. This view taken October 9, 2007, shows a similar view where the beach did produce a minor berm, but all the offshore sand moved toward the shoreline as a seaward sloping ramp from the zero datum elevation. No bars are in evidence offshore October 2007. The beach gained 16.74 yds3, with a 20-foot shoreline advance.

New Jersey Beach Profile Network

#347 - 6th Lane, Midway Beach, Ocean County

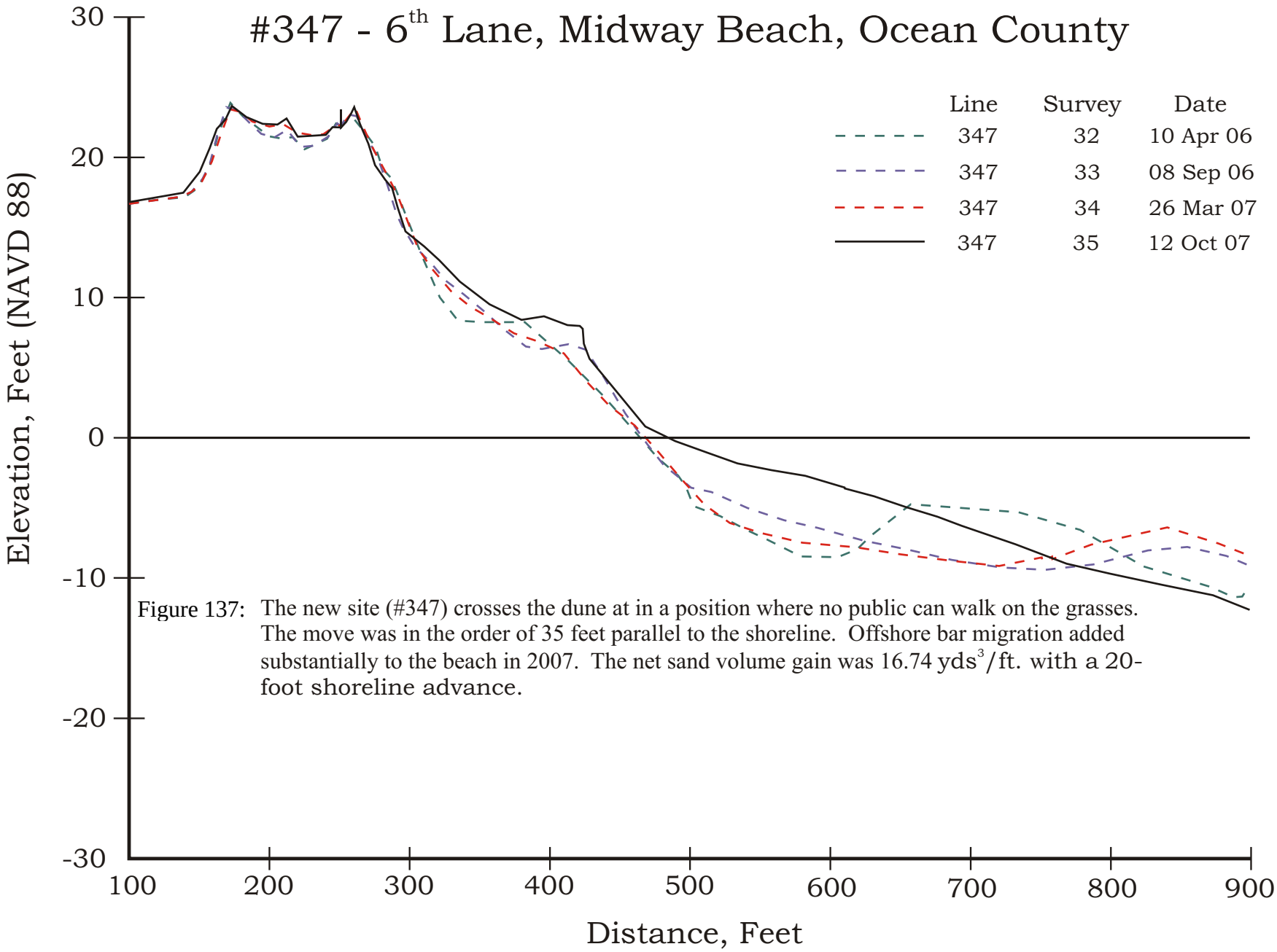


Figure 137: The new site (#347) crosses the dune at in a position where no public can walk on the grasses. The move was in the order of 35 feet parallel to the shoreline. Offshore bar migration added substantially to the beach in 2007. The net sand volume gain was 16.74 $yds^3/ft.$ with a 20-foot shoreline advance.

Figure 138. Island Beach State Park represents an extraordinary resource for the citizens of New Jersey. This expanse of dunes to the right might well have contained private homes or condominiums had not the property been held by one individual who ultimately sold it to the State. This site is in the northern third of the 13-mile natural shoreline ending at Barnegat Inlet.

NORTH END, ISLAND BEACH STATE PARK - SITE 247

Figure 139. The November 7, 2007 situation shows the width of the beach as well as the expanse of seaward dune slope present. The berm and offshore bar were present with sand added to the berm over the summer, but not in excess of either the November 2006 or the June 2007 survey situation. The site lost 7.85 yds^3/ft in sand volume with a 15-foot shoreline retreat, however, the June 2006 survey was one where the beach was maximized at the expense of the offshore bar. The fall 2007 shoreline was advanced by 25 feet over the two mid-interval surveys.

New Jersey Beach Profile Network

#247 -North End, Island Beach State Park, Ocean County

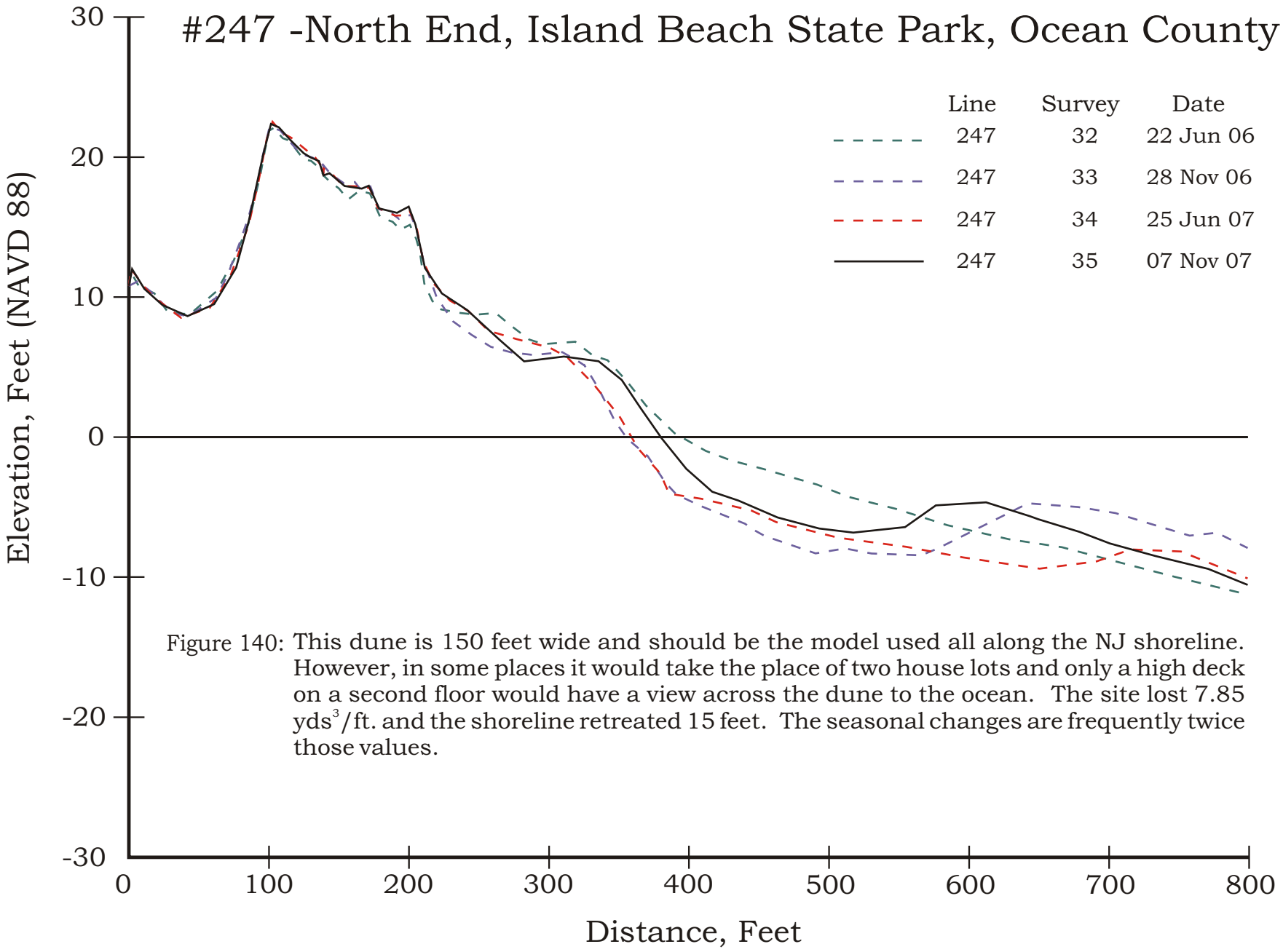


Figure 140: This dune is 150 feet wide and should be the model used all along the NJ shoreline. However, in some places it would take the place of two house lots and only a high deck on a second floor would have a view across the dune to the ocean. The site lost 7.85 $yds^3/ft.$ and the shoreline retreated 15 feet. The seasonal changes are frequently twice those values.

Figure 141. Positioned in the middle of the park shoreline, this site also sits at the crest of a substantial dune. The beach is reasonably wide with few events that attack the dunes directly.

ISLAND BEACH STATE PARK – SITE 246

Figure 142. The November 7, 2007 picture to the right shows the beach and most of the island's width. The beach had a berm and a relatively well defined offshore bar. To the south the pronounced impact of the cross shore transport was less dramatic as was seen in the northern part of the county shoreline. The net change was a loss of 9.22 yds^3/ft as the shoreline advanced 9 feet.

New Jersey Beach Profile Network

#246 - Island Beach State Park, Ocean County

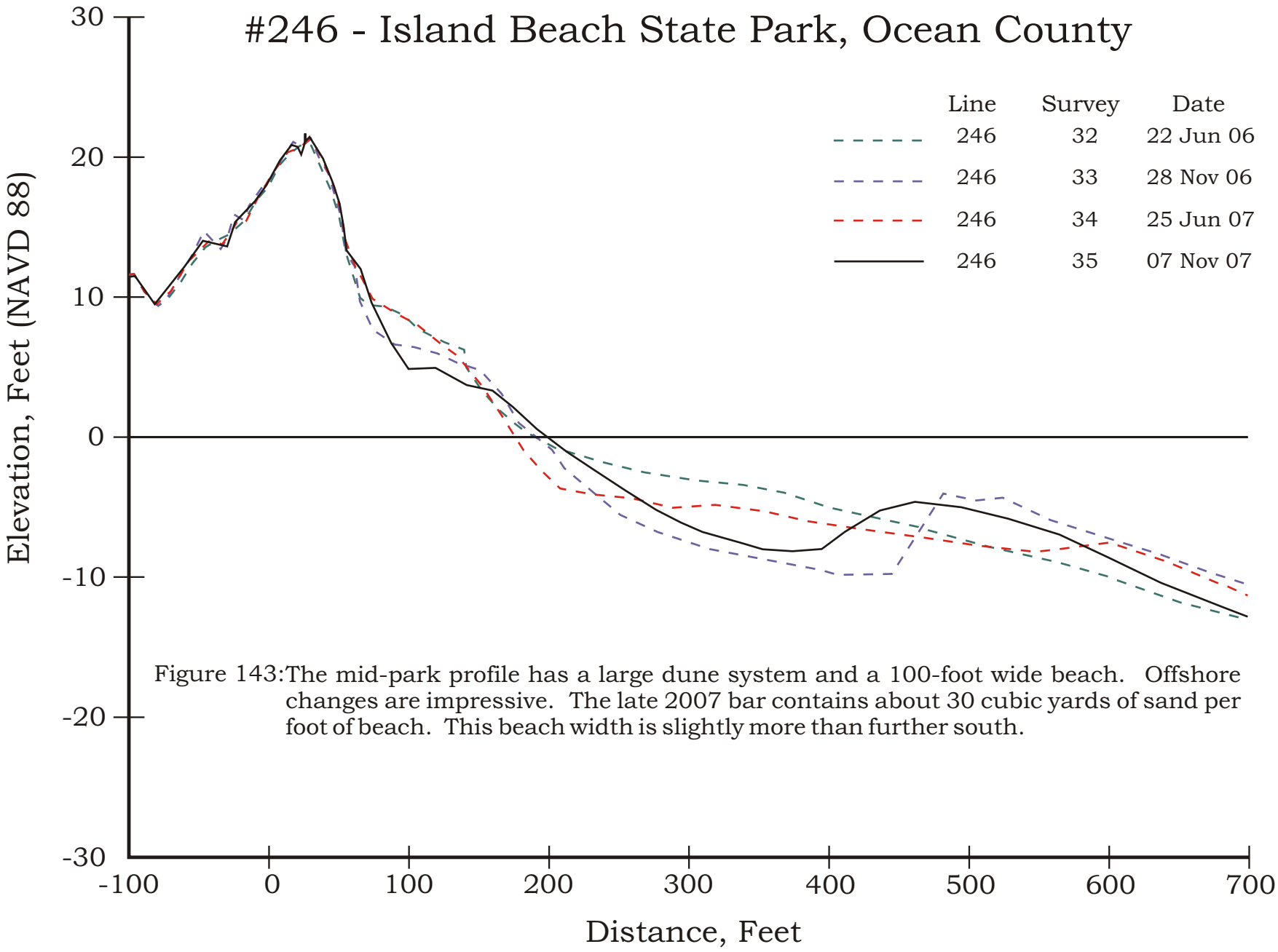


Figure 143: The mid-park profile has a large dune system and a 100-foot wide beach. Offshore changes are impressive. The late 2007 bar contains about 30 cubic yards of sand per foot of beach. This beach width is slightly more than further south.

Figure 144. At the south end of the park the beach gets progressively wider due to the north jetty to Barnegat Inlet trapping sand. The dunes to the left were all generated since this project commenced in 1986. The beach width was reduced as the dune grew wider. The view to the left was taken June 22 2006

SOUTH END, ISLAND BEACH STATE PARK - SITE 146

Figure 145. The November 7, 2007 view to the right shows essentially the same beach and toe slope. The berm crest was lower than other surveys in the recent past, but the offshore bar was closer to the shoreline than the other surveys. The sand volume increased by 18.22 yds^3/ft as the shoreline advanced 54 feet seaward in 18 months.

New Jersey Beach Profile Network

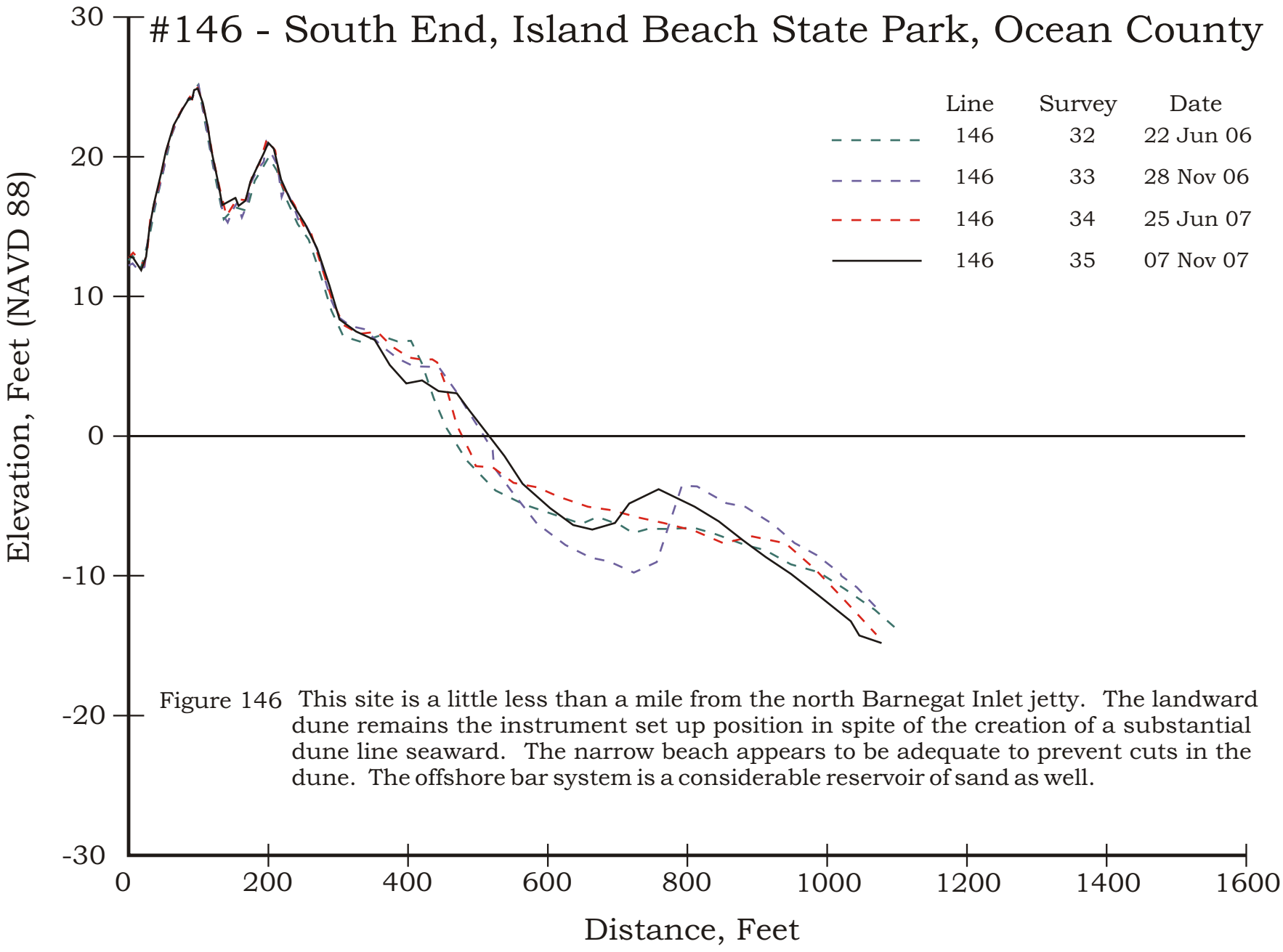


Figure 146 This site is a little less than a mile from the north Barnegat Inlet jetty. The landward dune remains the instrument set up position in spite of the creation of a substantial dune line seaward. The narrow beach appears to be adequate to prevent cuts in the dune. The offshore bar system is a considerable reservoir of sand as well.

Figure 147. Looking south from the instrument station across the grasses prior to the growing season April 3, 2006. The pole on the left of the photograph is the mast of a ship that sank in the inlet channel before the realignment of the inlet jetties occurred and the shoreline advanced up to 2,000 feet seaward at the new south jetty.

10th STREET. BARNEGAT LIGHT
SITE 245

Figure 148. This view taken August 28, 2007 shows all the land that once was seafloor to the right of the Barnegat Inlet lighthouse in the distance. This area is the largest accretion of beach/dune real estate on any New Jersey barrier beach in the last 75 years. Inlet jetty construction has dramatically impacted the immediate shorelines of several barrier islands in similar fashion (Wildwood Beach in Cape May County due to construction of the Cold Springs Inlet jetties in 1911). In the past 18 months this site gained 55.49 yds^3/ft in sand volume while the shoreline advanced 56 feet seaward.

New Jersey Beach Profile Network

#245 - 10th Street, Barnegat Light, Ocean County

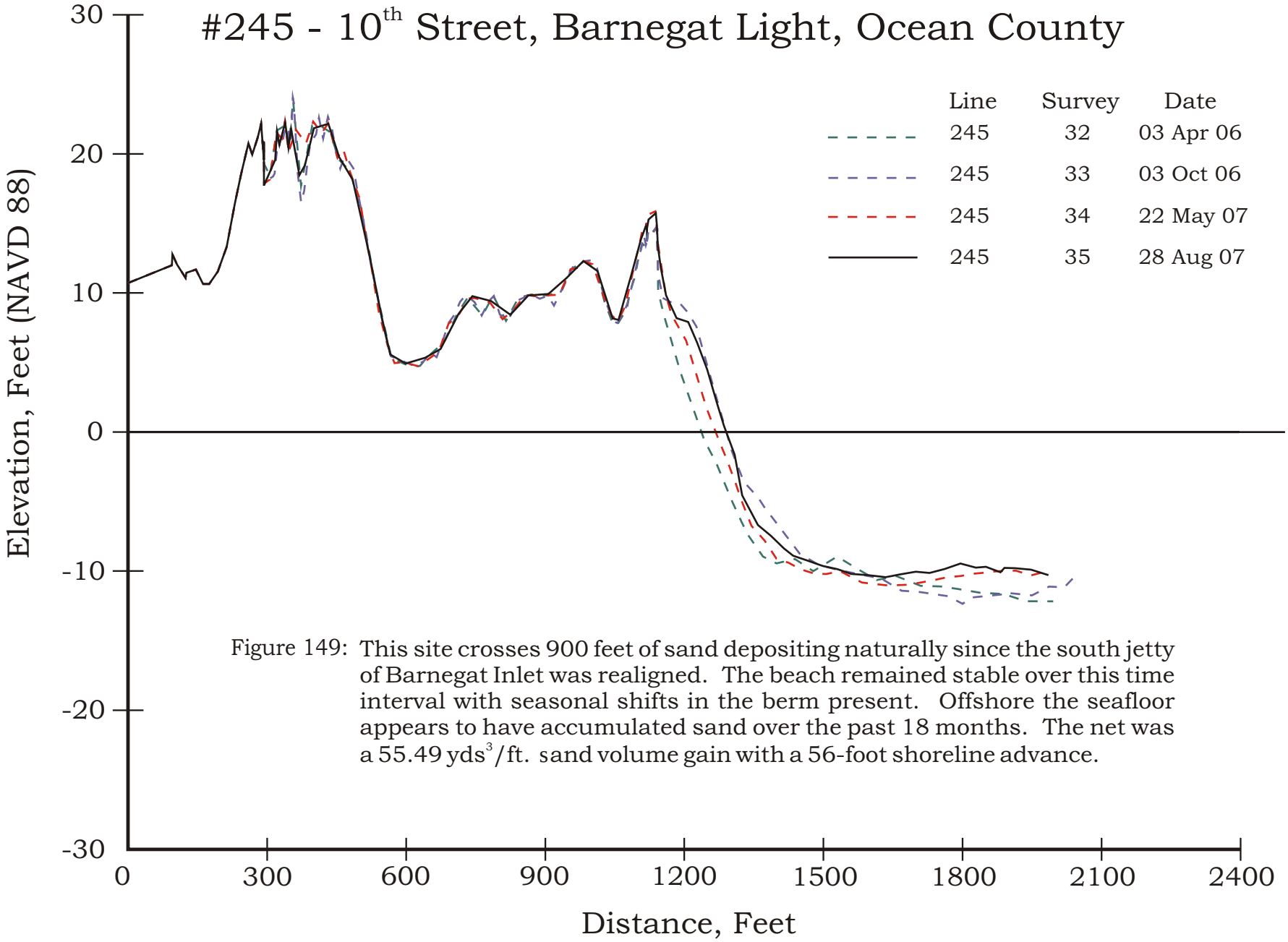


Figure 149: This site crosses 900 feet of sand depositing naturally since the south jetty of Barnegat Inlet was realigned. The beach remained stable over this time interval with seasonal shifts in the berm present. Offshore the seafloor appears to have accumulated sand over the past 18 months. The net was a 55.49 yds^3/ft. sand volume gain with a 56-foot shoreline advance.

Figure 150. The impact of jetty realignment extends south past this site as the dunes in the middle of the picture to the left are all developed on the beach as it widened following the 1991 completion of the new south jetty to Barnegat Inlet. This picture was taken May 3, 2006.

26th STREET, BARNEGAT LIGHT
SITE 145

Figure 151. During the 18 months of study the beach continued to expand with a net sand volume increase of 39.25 yds^3/ft. and a 41-foot shoreline advance. The summer of 2007 saw a beach volume increase of 27.47 yds^3/ft with a 38-foot shoreline advance just in 3 months.

New Jersey Beach Profile Network

#145 - 26th Street, Barnegat Light, Ocean County

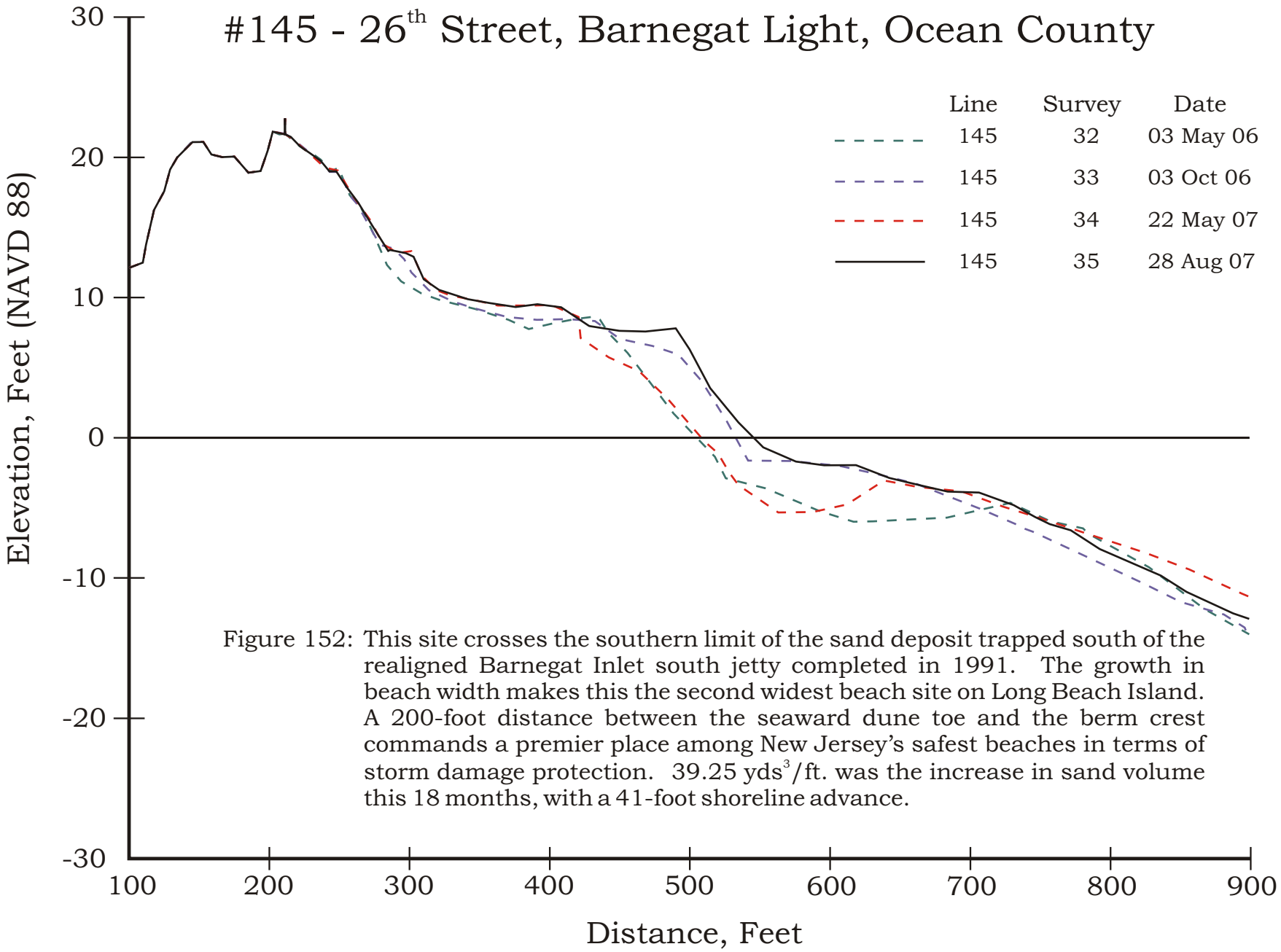


Figure 152: This site crosses the southern limit of the sand deposit trapped south of the realigned Barnegat Inlet south jetty completed in 1991. The growth in beach width makes this the second widest beach site on Long Beach Island. A 200-foot distance between the seaward dune toe and the berm crest commands a premier place among New Jersey's safest beaches in terms of storm damage protection. 39.25 yds^3/ft. was the increase in sand volume this 18 months, with a 41-foot shoreline advance.

Figure 153. This view to the north was taken across the dune crest on May 3, 2006 and shows a narrow beach reaching up to the toe of the dune where sand has been cut from the seaward slope during the past winter. The limited set-back for the homes is also a potential problem if and when a significant storm occurs.

LA BAIA STREET, LOVELADIES
SITE 144

Figure 154. By the end of the summer August 28, 2007, accretion had moved substantial sand onto the berm as the offshore bar system moved close to the beach. The site gained 23.47 yds^3/ft as the shoreline advanced 26 feet. This shoreline advanced 37 feet between May 11 and August 28, 2007.

New Jersey Beach Profile Network

#144 - La Baia Street, Loveladies, Ocean County

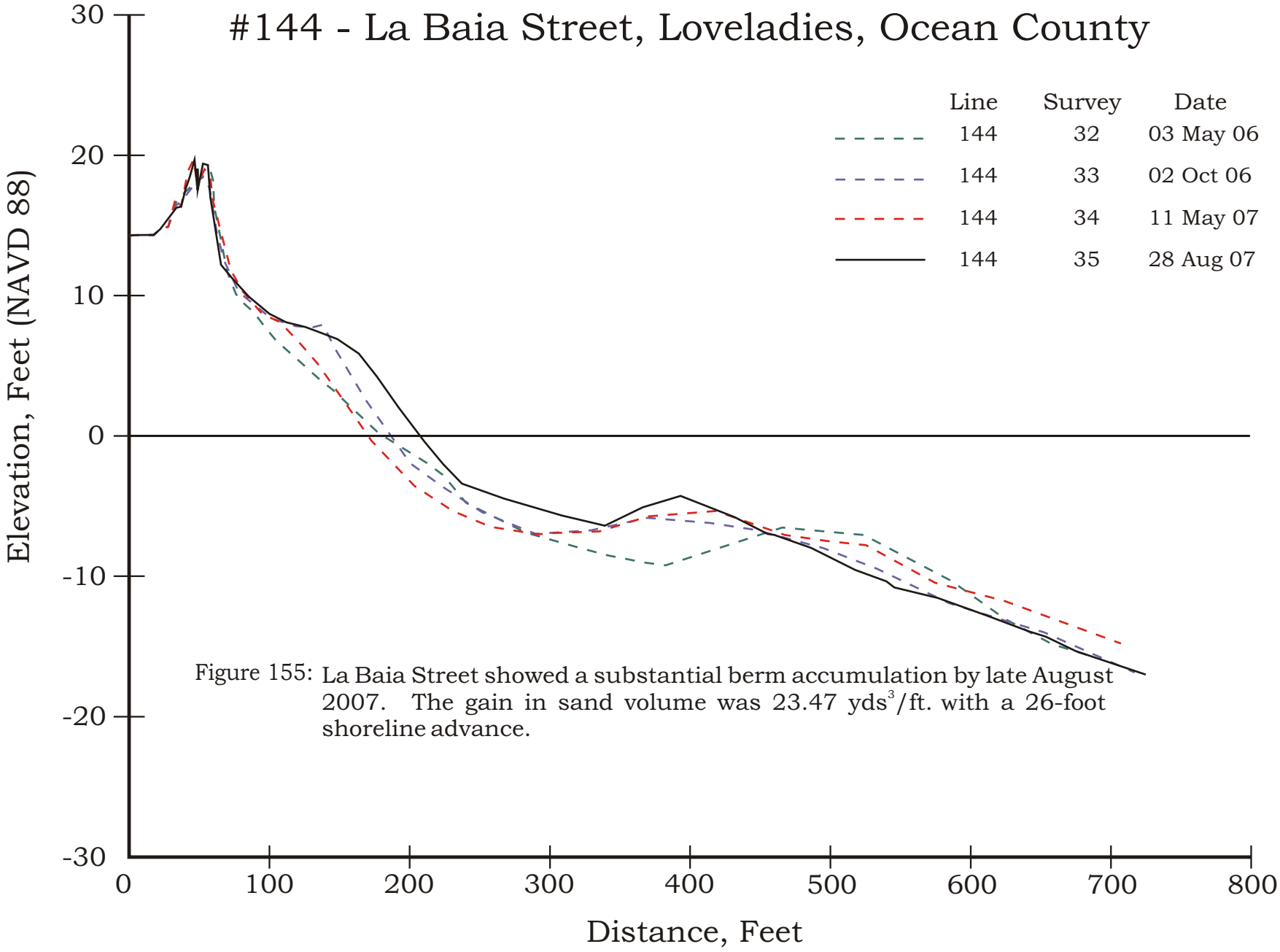


Figure 155: La Baia Street showed a substantial berm accumulation by late August 2007. The gain in sand volume was 23.47 yds^3/ft. with a 26-foot shoreline advance.

Figure 156. The dune is not sufficient to withstand a serious storm, but it is not the least along the Long Beach Island shoreline either. This view follows a winter where the dune toe was cut back modestly. The picture was taken May 3, 2006.

73rd STREET, HARVEY CEDARS
SITE 143

Figure 157. 18 months later the beach had recovered in width as sand moved landward from the offshore bar. The same position was achieved by the 2006 summer accumulation as seen in the four cross sections. This site was photographed August 29, 2007. The sand volume had increased by 7.13 yds^3/ft. with a 28-foot shoreline advance. The near equivalence of the two summer's sand volume gains means that this location is essentially in equilibrium with the beach slightly narrower than would be desired.

New Jersey Beach Profile Network

#143 - 73rd Street, Harvey Cedars, Ocean County

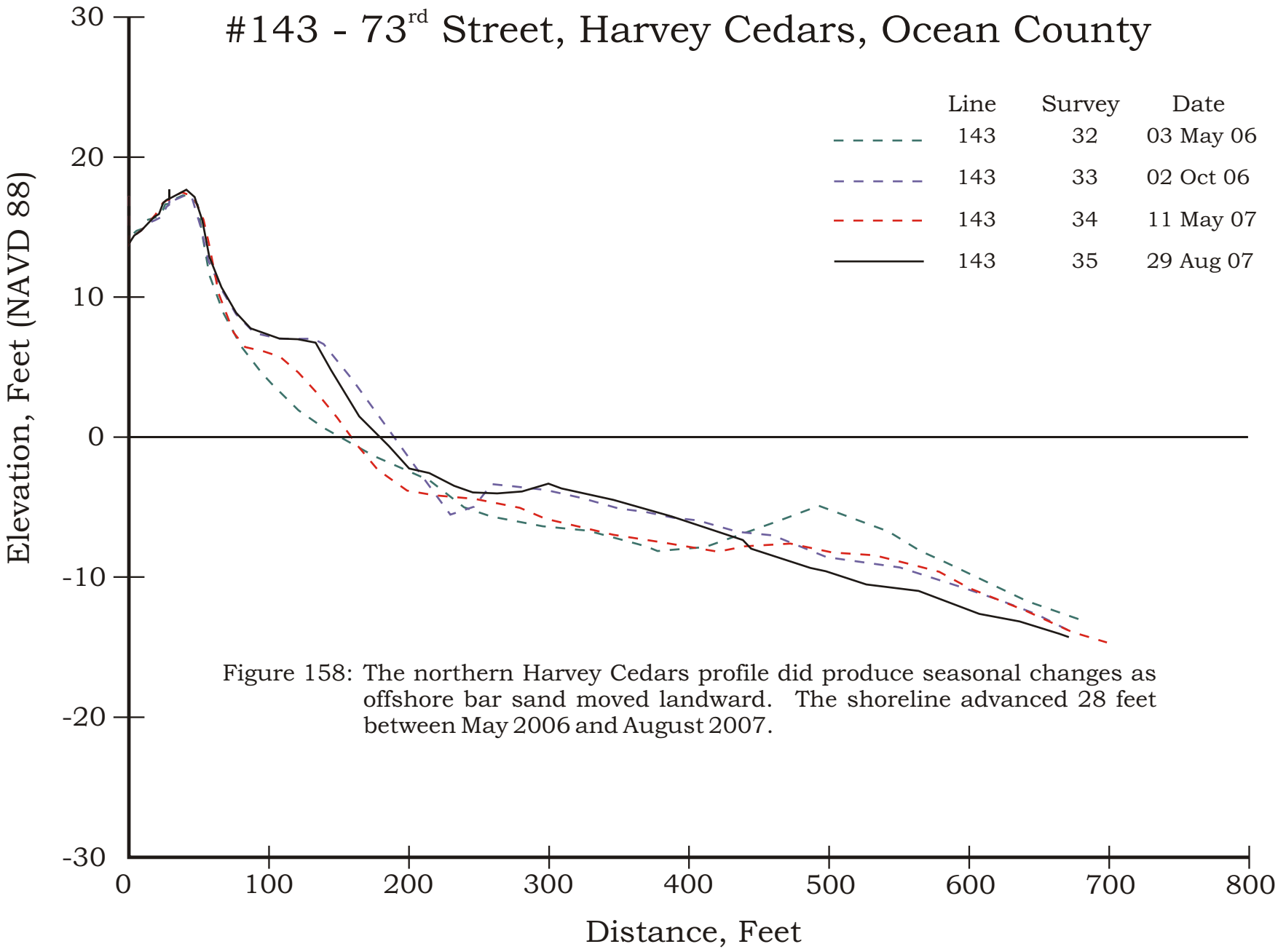


Figure 158: The northern Harvey Cedars profile did produce seasonal changes as offshore bar sand moved landward. The shoreline advanced 28 feet between May 2006 and August 2007.

Figure 159. The beach at Tranquility Drive is narrow and the dunes are not sufficient to withstand moderate storm events. This April 20, 2006 photograph shows the beach following some municipal beach bulldozing to reinforce the dunes.

TRANQUILITY DRIVE, HARVEY CEDARS - SITE 142

Figure 160. By the end of the summer August 29, 2007, the beach was only slightly ahead of the May 2007 position and behind the position gained by the summer's end 2006. A small volume of sand was added to the seaward dune crest, but not enough to make a significant difference in storm protection. The sand volume decreased by 13.52 yds^3/ft and the shoreline advanced 4 feet over 18 months of study.

New Jersey Beach Profile Network

#142 - Tranquility Drive, Harvey Cedars, Ocean County

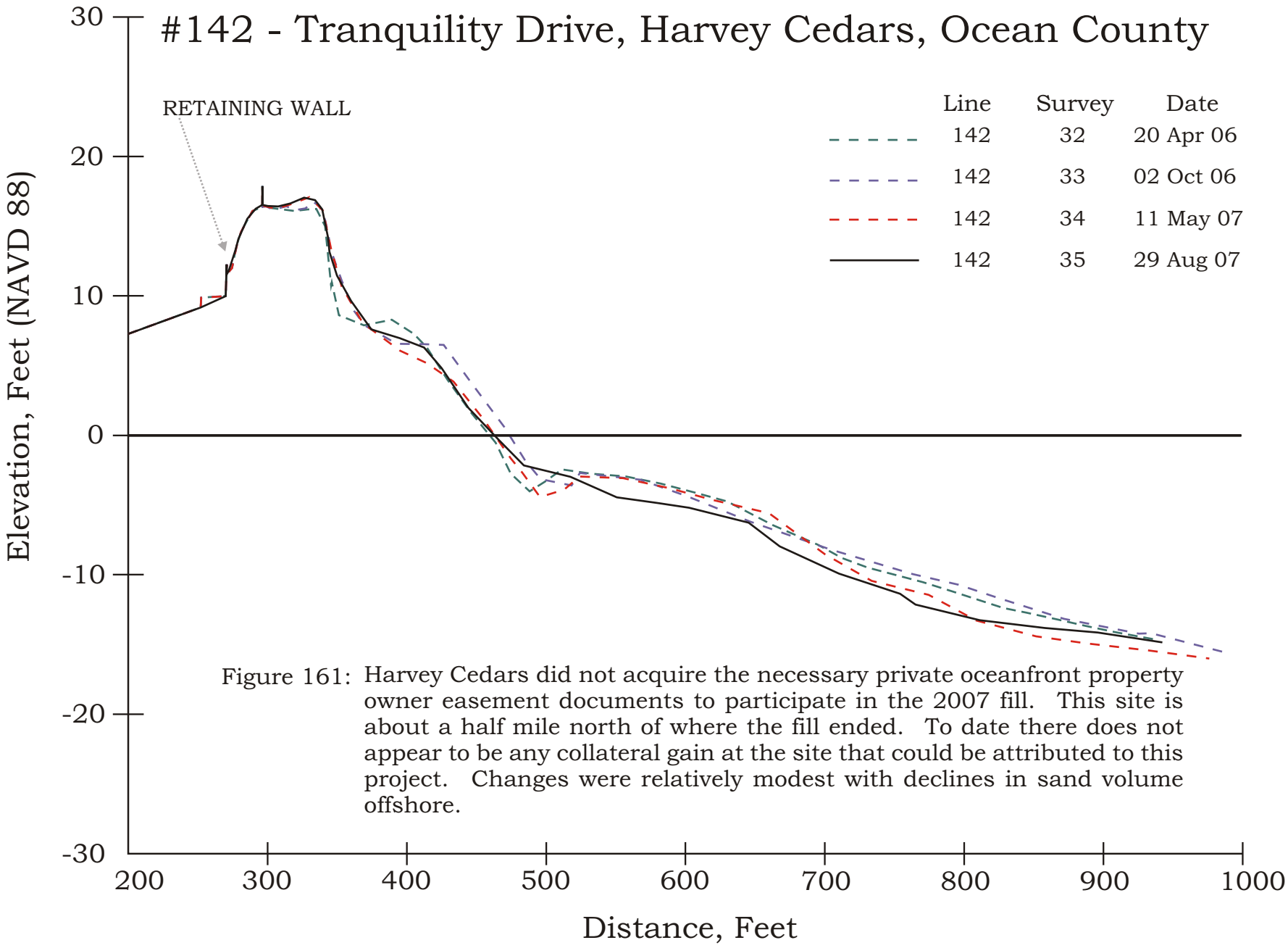


Figure 161: Harvey Cedars did not acquire the necessary private oceanfront property owner easement documents to participate in the 2007 fill. This site is about a half mile north of where the fill ended. To date there does not appear to be any collateral gain at the site that could be attributed to this project. Changes were relatively modest with declines in sand volume offshore.

Figure 162. The Surf City location was surveyed twice in 2006 prior to the construction of the Federal beach restoration project. This dune was at sufficient elevation to meet the design standards and was widened about 20 feet with sand added to the slope from the crest to the toe. The April 20, 2006 photograph of the property owner's beach access stairs demonstrates the ease with which the sea can reach the dune toe and remove sand prior to the project's start.

20th STREET, SURF CITY - SITE 241

Figure 163. By august 29, 2007 the Federal project was complete with new plants and fencing on the dune and a 100-foot wider beach to the berm crest. The volume change was 67.26 yds^3/ft with a 99-foot advance in the shoreline position. The comparison of surveys 33 and 34 showed a sand volume increase of 86.59 yds^3/ft and a 111-foot shoreline advance between October 2, 2006 and May 3, 2007. This pair of surveys bracketed the fill and is the best determination of the project's impact available under the NJBPN program.

New Jersey Beach Profile Network

#241 -20th Street, Surf City, Ocean County

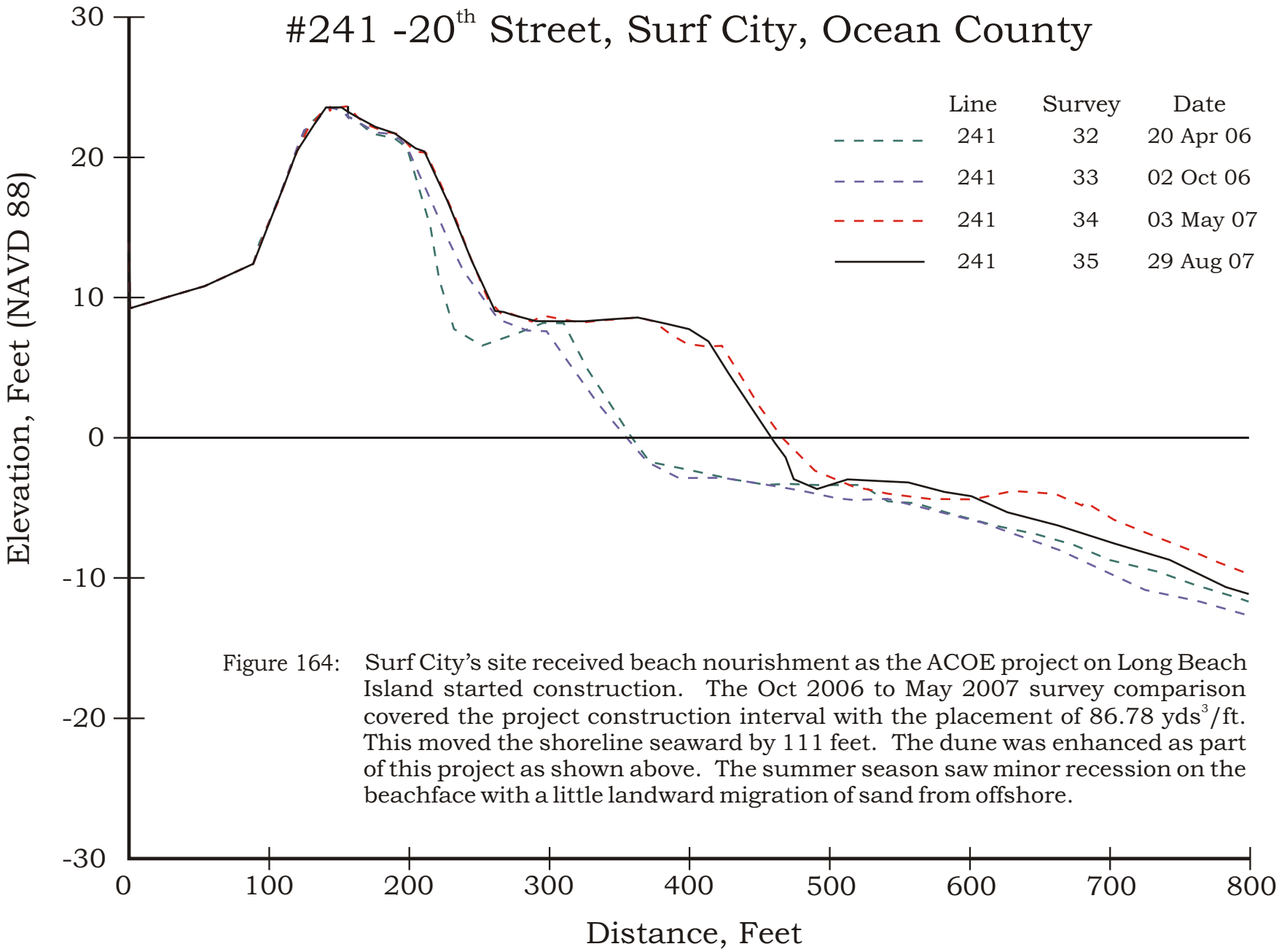


Figure 164: Surf City's site received beach nourishment as the ACOE project on Long Beach Island started construction. The Oct 2006 to May 2007 survey comparison covered the project construction interval with the placement of 86.78 yds^3/ft. This moved the shoreline seaward by 111 feet. The dune was enhanced as part of this project as shown above. The summer season saw minor recession on the beachface with a little landward migration of sand from offshore.

Figure 165. The US Army Corps project had an impact on Ship Bottom too, but at a lower volume of sand placed. This April 20, 2006 photograph covers the beach and dune toe following the winter storm events.

8th STREET, SHIP BOTTOM - SITE 141

Figure 166. The beach can be seen as considerably wider in this August 29, 2007 photograph to the right. The berm was 40 to 50 feet wider as of the May 3, 2007 survey. The 18-month comparison saw 46.22 yds^3/ft. with 41 feet of shoreline advance due to the project. The comparison of October 4, 2006 to May 3, 2007 showed a sand volume increase of 56.17 yds^3/ft and a 38-foot shoreline advance. This volume for the fill carried out to the end of the profile 835 feet from the reference position and includes additions to the offshore bar as well.

New Jersey Beach Profile Network

#141 - 8th Street, Ship Bottom, Ocean County

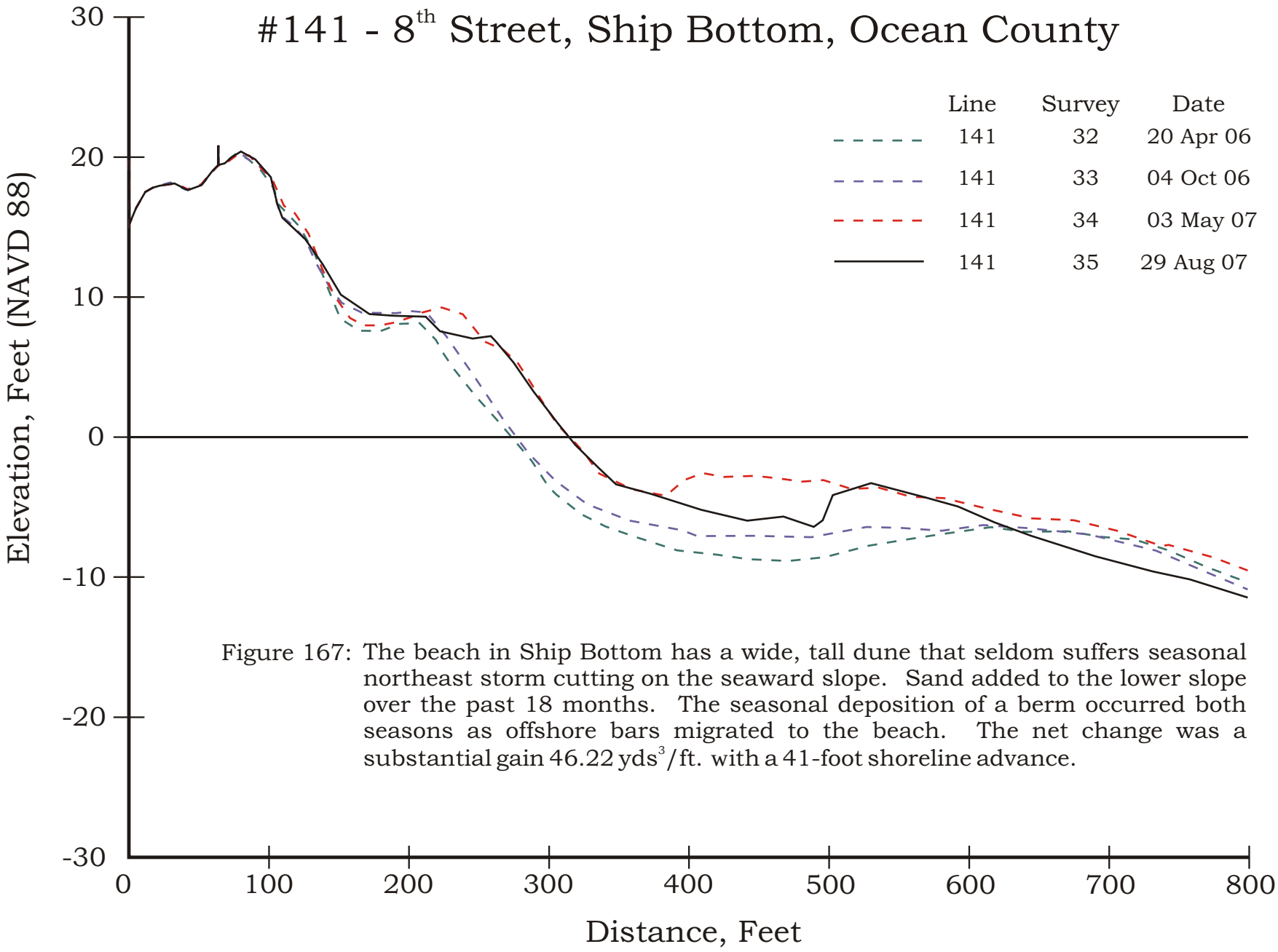


Figure 167: The beach in Ship Bottom has a wide, tall dune that seldom suffers seasonal northeast storm cutting on the seaward slope. Sand added to the lower slope over the past 18 months. The seasonal deposition of a berm occurred both seasons as offshore bars migrated to the beach. The net change was a substantial gain 46.22 $yds^3/ft.$ with a 41-foot shoreline advance.

Figure 168. This beach has a better-than-average dune width and elevation with a 70-foot wide summer beach that potentially is created during the summer accretional season. In both 2006 and 2007 summer seasons this beach accreted to the same position and elevation of the berm. The scope of the change between the spring profiles and the following summer was in the range of 42 to 44 cubic yards of sand per foot added to the beach mostly derived from the offshore bar system.

32nd STREET, LONG BEACH TOWNSHIP
SITE 140

Figure 169. The September 5, 2007 view to the right shows the dune toe and the summer berm developed by the September survey date. The previous spring saw retreat of the beach to the toe of the dune, but no erosion of the dune itself. The 18-month change amounted to 21.32 yds^3/ft. in sand volume with a 29-foot shoreline advance. About a third of the sand volume accumulating on the beach came from offshore, with the balance moving in from the beaches to the north or south.

New Jersey Beach Profile Network

#140 - 32nd Street, Long Beach Township, Ocean County

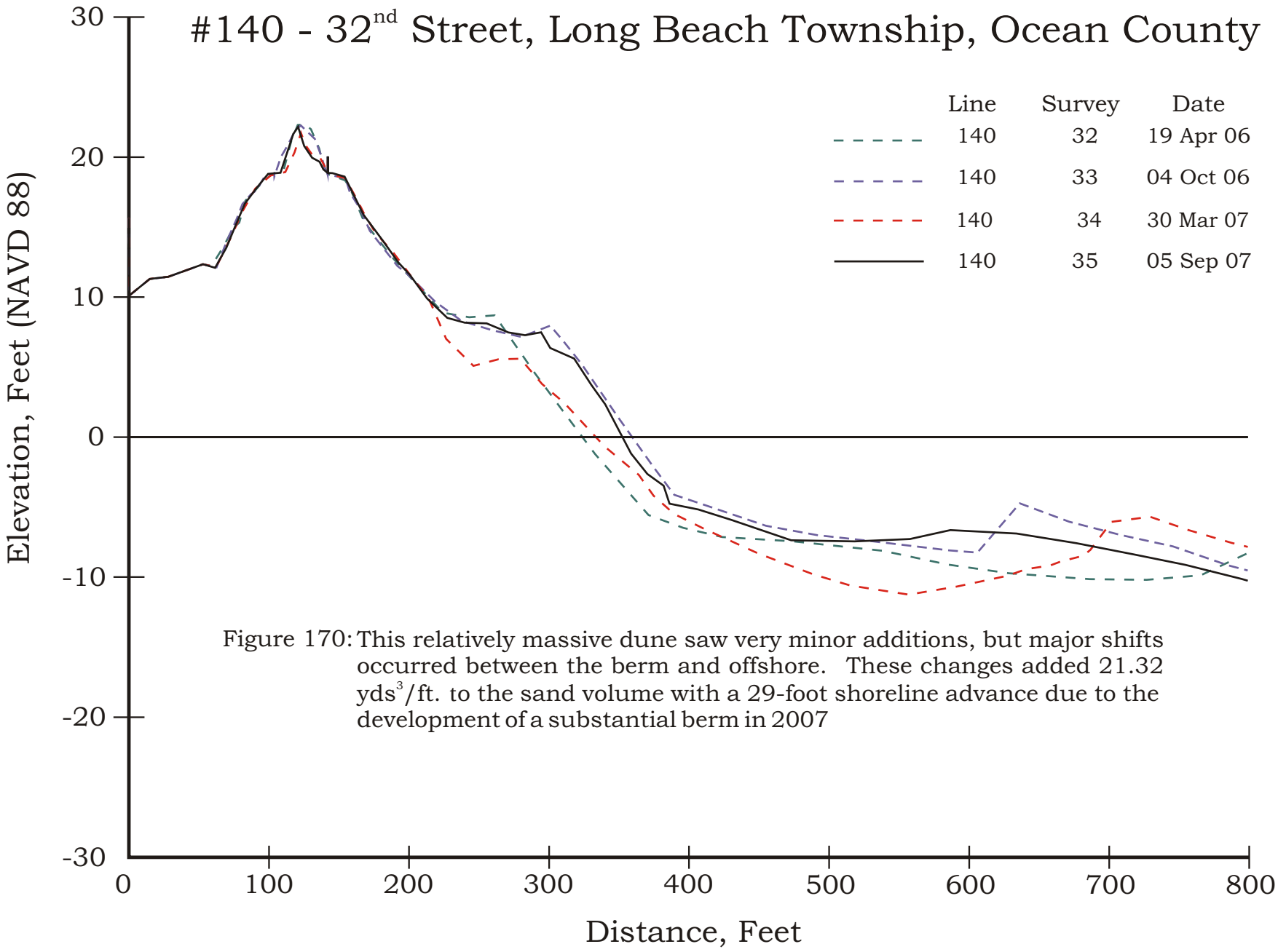


Figure 170: This relatively massive dune saw very minor additions, but major shifts occurred between the berm and offshore. These changes added 21.32 $yds^3/ft.$ to the sand volume with a 29-foot shoreline advance due to the development of a substantial berm in 2007

Figure 171. At 81st Street the dune is far lower and much narrower than at site #140. The storm protection is minimal and limited to minor events or a couple of annual storms back to back. The winter-summer exchange of sand with the offshore region is also fairly small.

81st STREET, LONG BEACH TOWNSHIP
SITE 139

Figure 172. The annual change at this site was a loss of 15.56 yds^3/ft. combined with a 5-foot retreat in the shoreline. This survey was completed September 5, 2007 following a significantly better season for beach/berm growth. This site saw a similar summer berm both years with the loss during the 2006-2007 winter exceeding that seen in the spring of 2006. At the time of survey 34, the sand was concentrated in the offshore bar, which shows clearly in the plots.

New Jersey Beach Profile Network

#139 - 81st Street, Long Beach Township, Ocean County

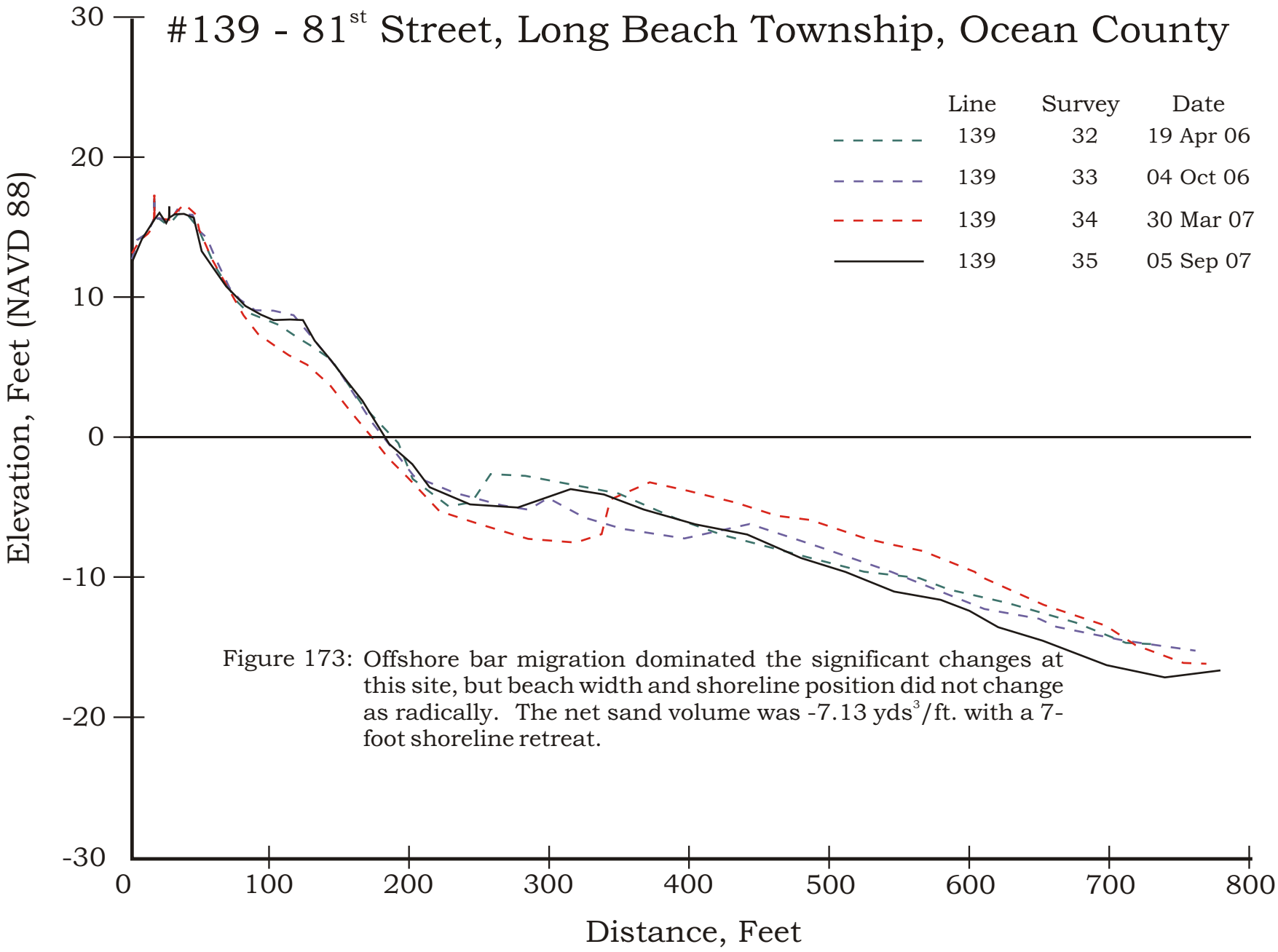


Figure 173: Offshore bar migration dominated the significant changes at this site, but beach width and shoreline position did not change as radically. The net sand volume was -7.13 yds^3/ft. with a 7-foot shoreline retreat.

Figure 174. The dune at this site is higher and wider than some in other locations on Long Beach Island. The recent winter seasons have failed to reach the dune toe, which shows in the cross section plots. This photograph to the left was taken April 19, 2006 following the winter storm events.

OLD WHALING ROAD, LONG BEACH TOWNSHIP - SITE 138

Figure 175. By September 5, 2007 the beach was in fairly good condition with a berm and the majority of the sand transferred onto the beach from the offshore bar system. This process was quite pronounced during the 2006 to 2007 winter season as the March 30th to September 5th surveys show. The 18-month change in sand volume was a loss of 4.78 yds^3/ft. with an 11-foot shoreline advance.

New Jersey Beach Profile Network

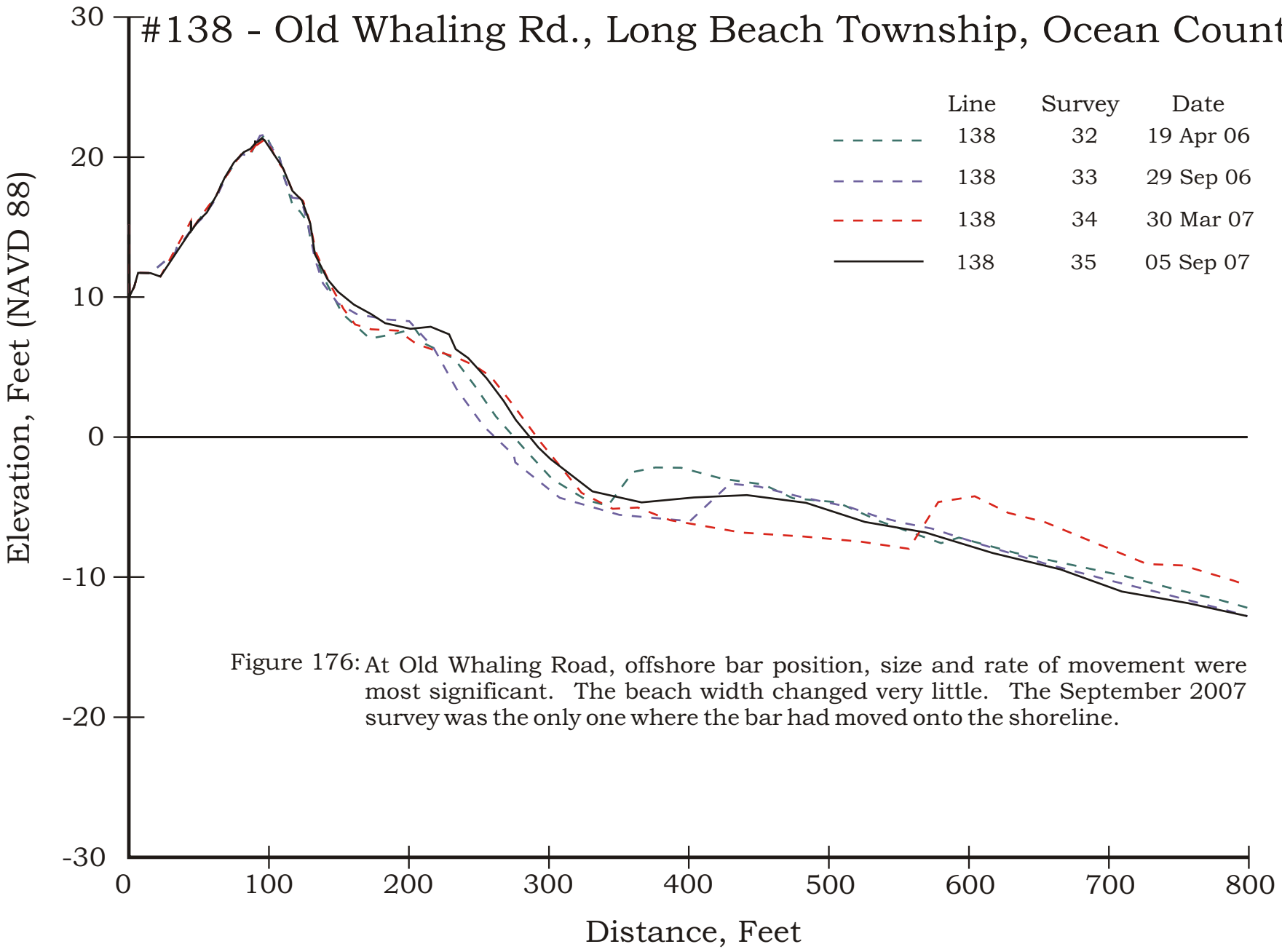


Figure 176: At Old Whaling Road, offshore bar position, size and rate of movement were most significant. The beach width changed very little. The September 2007 survey was the only one where the bar had moved onto the shoreline.

Figure 177. Taylor Avenue has a lower, but wider dune that is easily reached by minor northeast storms. The view along the toe to the south taken April 18, 2006 shows a scarp with sand presently blending the erosion into the new toe.

TAYLOR AVENUE, BEACH HAVEN
SITE 137

Figure 178. The view taken September 7, 2007 shows the dune and the beach from the instrument station. The seasonal changes are modest at this site with the berm slightly smaller in 2007 than it was in 2006. The net change across 18 months was a sand volume change of 1.77 yds^3/ft. and a shoreline advance of 8 feet. This was not a significant alteration to the beach profile.

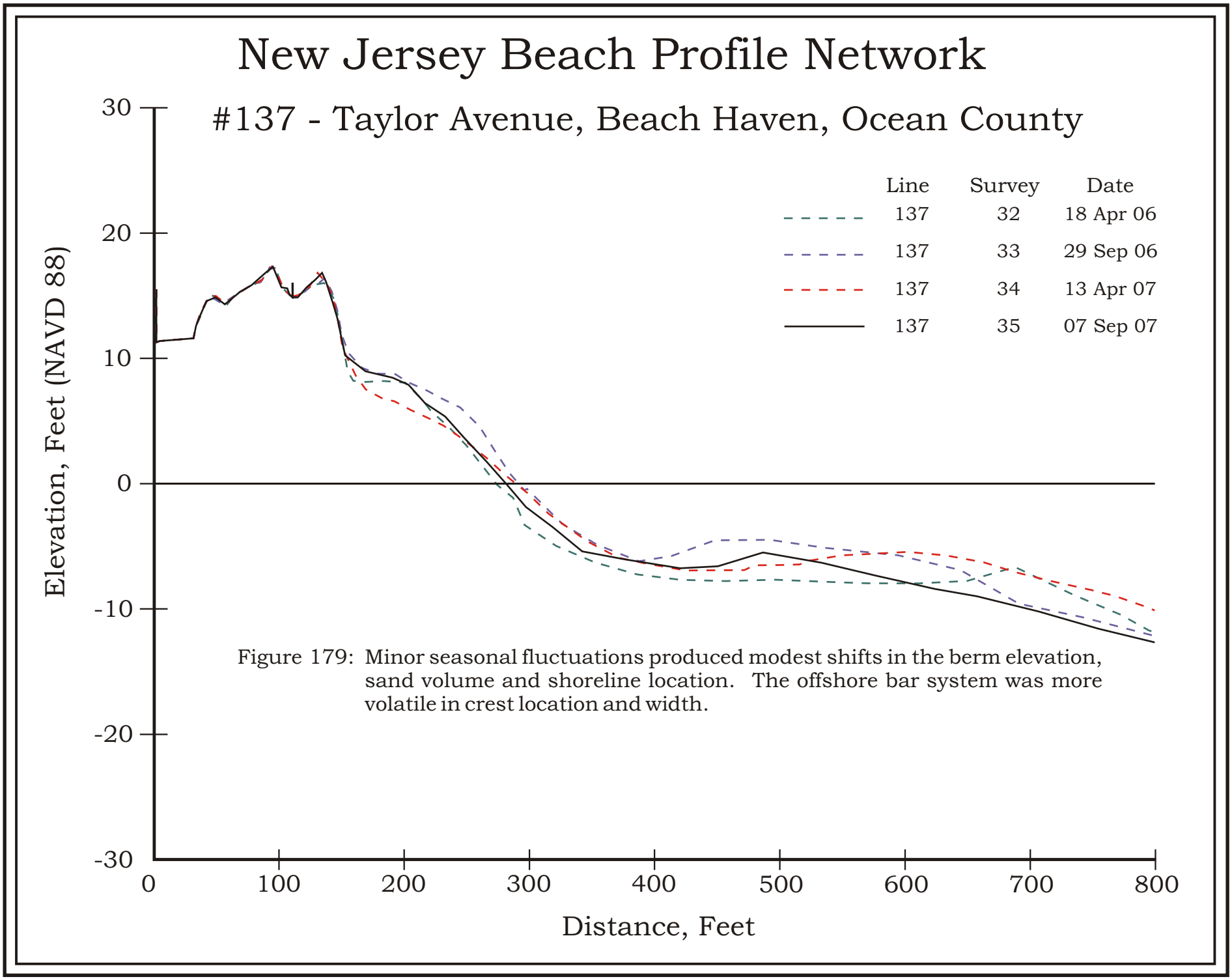


Figure 179: Minor seasonal fluctuations produced modest shifts in the berm elevation, sand volume and shoreline location. The offshore bar system was more volatile in crest location and width.

Figure 180. This site supports a larger berm during certain seasons, but can lose the entire feature with a minor storm event. Sand moves offshore and escapes the area as it crosses the groin shown to the south of the profile location. The dune is moderate in height and adequate in width to resist moderate storms. The past two winters have not produced wave erosion at the dune toe. The picture was taken April 18, 2006.

DOLPHIN AVENUE, BEACH HAVEN
SITE 136

Figure 181. This view to the left was taken on the beach berm September 7, 2007 following relatively complete berm development. In late August 2006, the berm was wider and more sand was closer to the shoreline than in 2007, a difference in the pattern that prevailed in Ocean County that year. The net change was a sand volume gain of 3.29 yds^3/ft. with an 8-foot shoreline advance.

New Jersey Beach Profile Network

#136 - Dolphin Avenue, Beach Haven, Ocean County

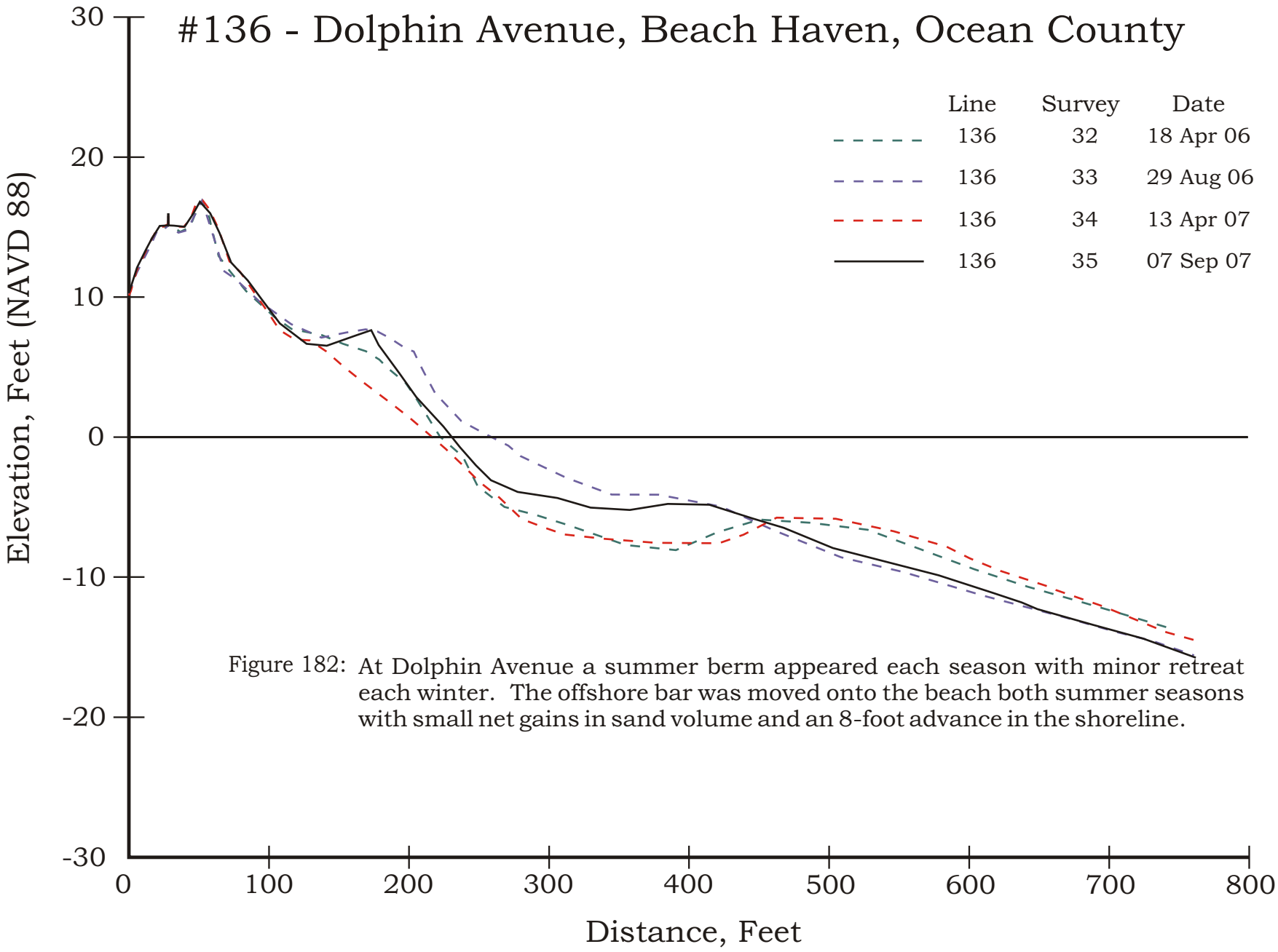


Figure 182: At Dolphin Avenue a summer berm appeared each season with minor retreat each winter. The offshore bar was moved onto the beach both summer seasons with small net gains in sand volume and an 8-foot advance in the shoreline.

Figure 183. The Webster Avenue site has a tall dune with a near vertical seaward face due to periodic erosion by storms. The width and height is sufficient to withstand minor to moderate storms. The berm grows wide in the summer and disappears to the offshore bar system each winter. There was a dramatic difference between the berm development in 2006 and that seen in 2007. This picture to the left was taken April 18, 2006.

WEBSTER AVENUE, LONG BEACH TOWNSHIP - SITE 135

Figure 184. The berm was over 60 feet wide by September 7, 2007 as most of the offshore bar moved onto the beach. This process is dependant on regular swell that reaches the sand offshore in sufficient power to push it landward as the tide rises. This creates a stable berm that serves to mitigate the initial winter storms that are generated off Cape Hatteras as the season changes. The net change was a beach volume gain of 40.20 yds^3/ft. with only 3.4 yds^3/ft. supplied from offshore. Most of the sand came from the groin-cell to the north. The net was a gain of 38.44 yds^3/ft. with a shoreline advance of 65 feet.

New Jersey Beach Profile Network

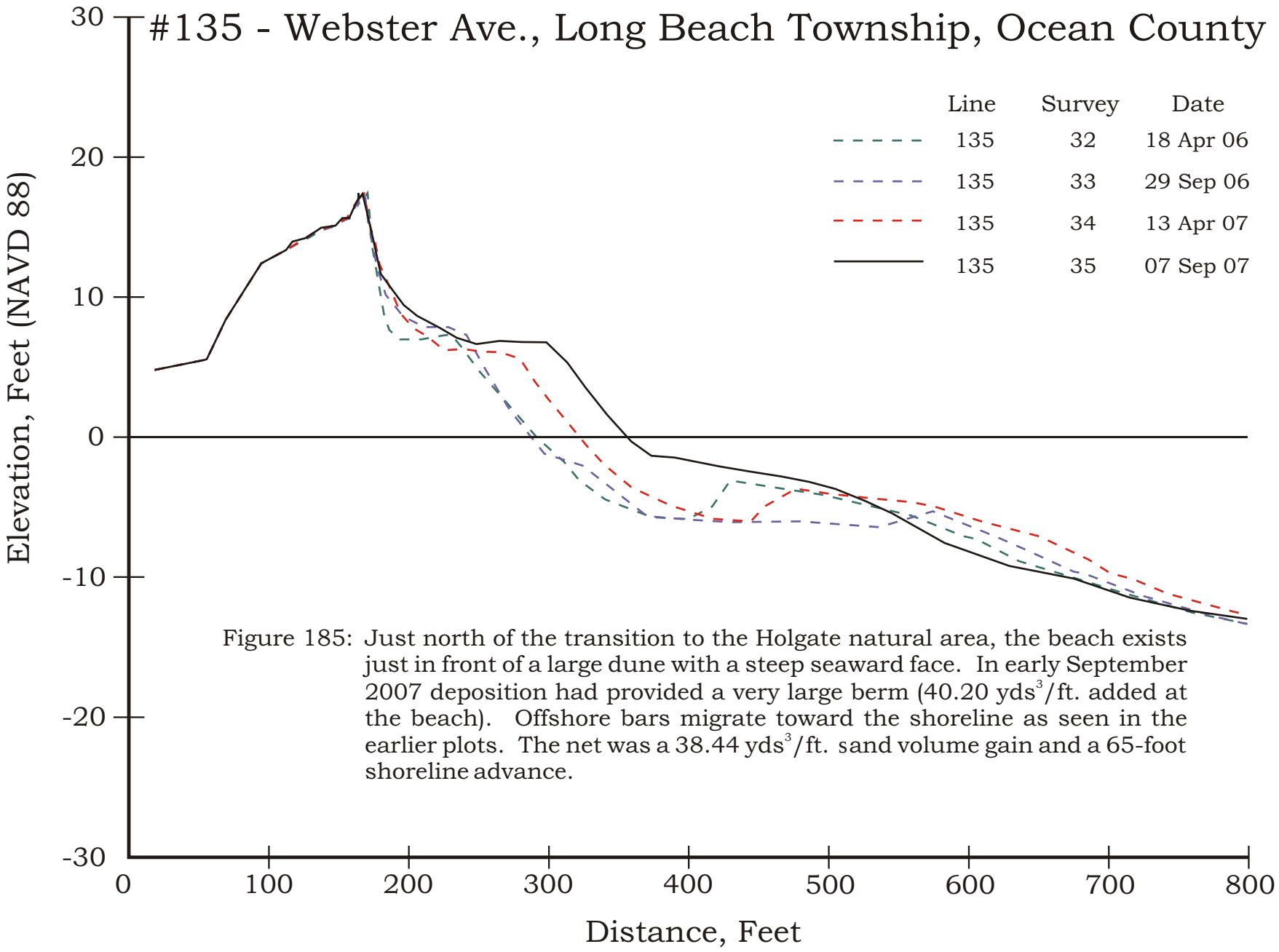


Figure 185: Just north of the transition to the Holgate natural area, the beach exists just in front of a large dune with a steep seaward face. In early September 2007 deposition had provided a very large berm (40.20 yds^3/ft. added at the beach). Offshore bars migrate toward the shoreline as seen in the earlier plots. The net was a 38.44 yds^3/ft. sand volume gain and a 65-foot shoreline advance.

Figure 186. Located on the southern tip of Long Beach Island, this undeveloped section belongs to the Forsythe National Wildlife Refuge. The site lies immediately south of the terminal groin in the series of 98 that have been constructed along the island. Here the dune is low and narrow because of frequent storm overwash wiping out the line of dunes. The lack of storms has allowed a modest dune to exist. The picture to the left was taken April 3, 2006.

NATURAL AREA, LONG BEACH TOWNSHIP - SITE 234

Figure 187. There were few changes to report at this site other than the fact that the summer beach on September 7, 2007 was much narrower that that surveyed in late August 2006. This is seen in the 18-month sand volume comparison where 23.98 yds^3/ft. were lost with a 16-foot shoreline advance as a flatter gradient beach was developed. There was no offshore bar present in any of the four surveys.

New Jersey Beach Profile Network

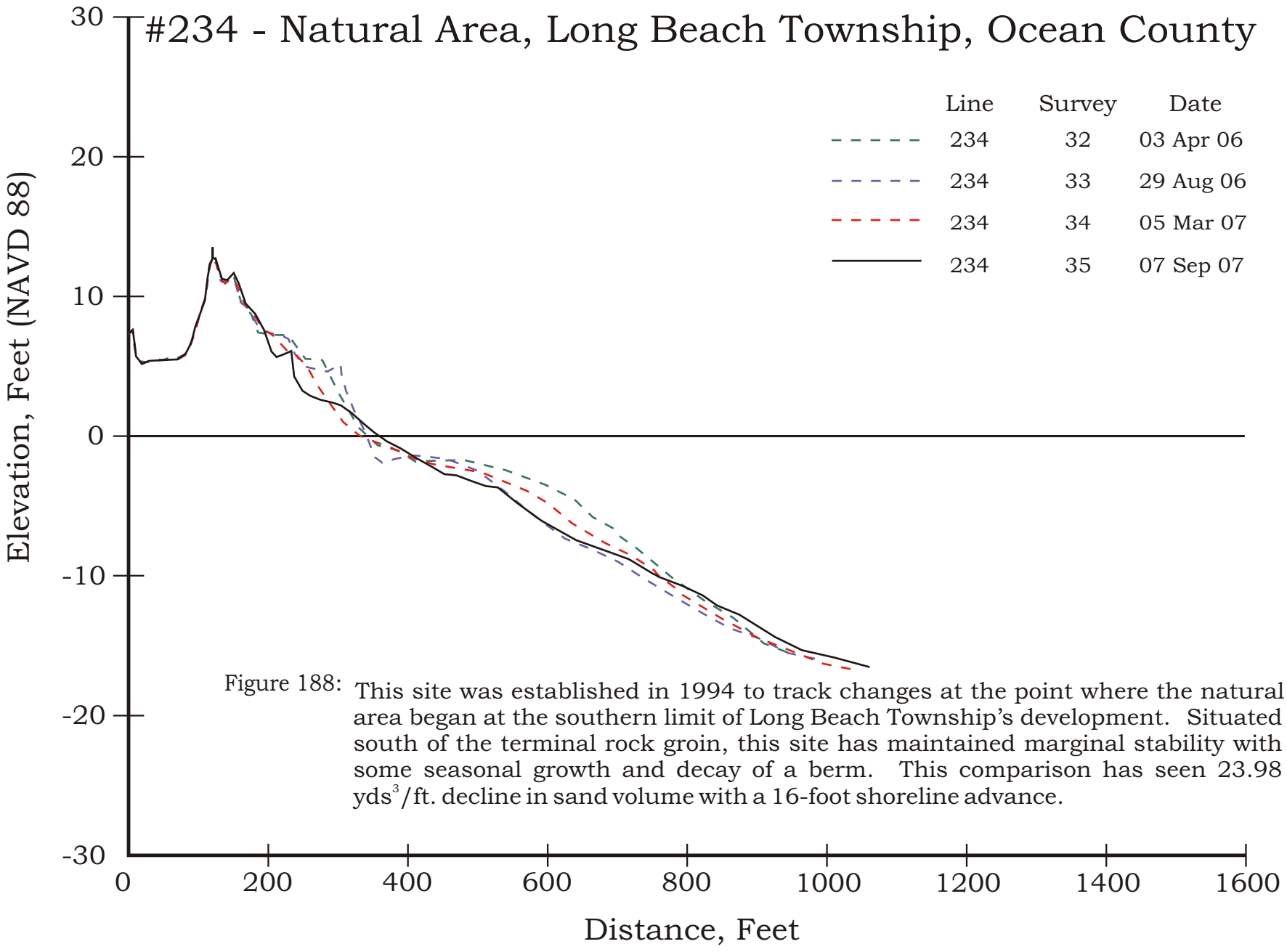


Figure 188: This site was established in 1994 to track changes at the point where the natural area began at the southern limit of Long Beach Township's development. Situated south of the terminal rock groin, this site has maintained marginal stability with some seasonal growth and decay of a berm. This comparison has seen 23.98 yds^3/ft. decline in sand volume with a 16-foot shoreline advance.