New Jersey Beach Profile Network

Atlantic County

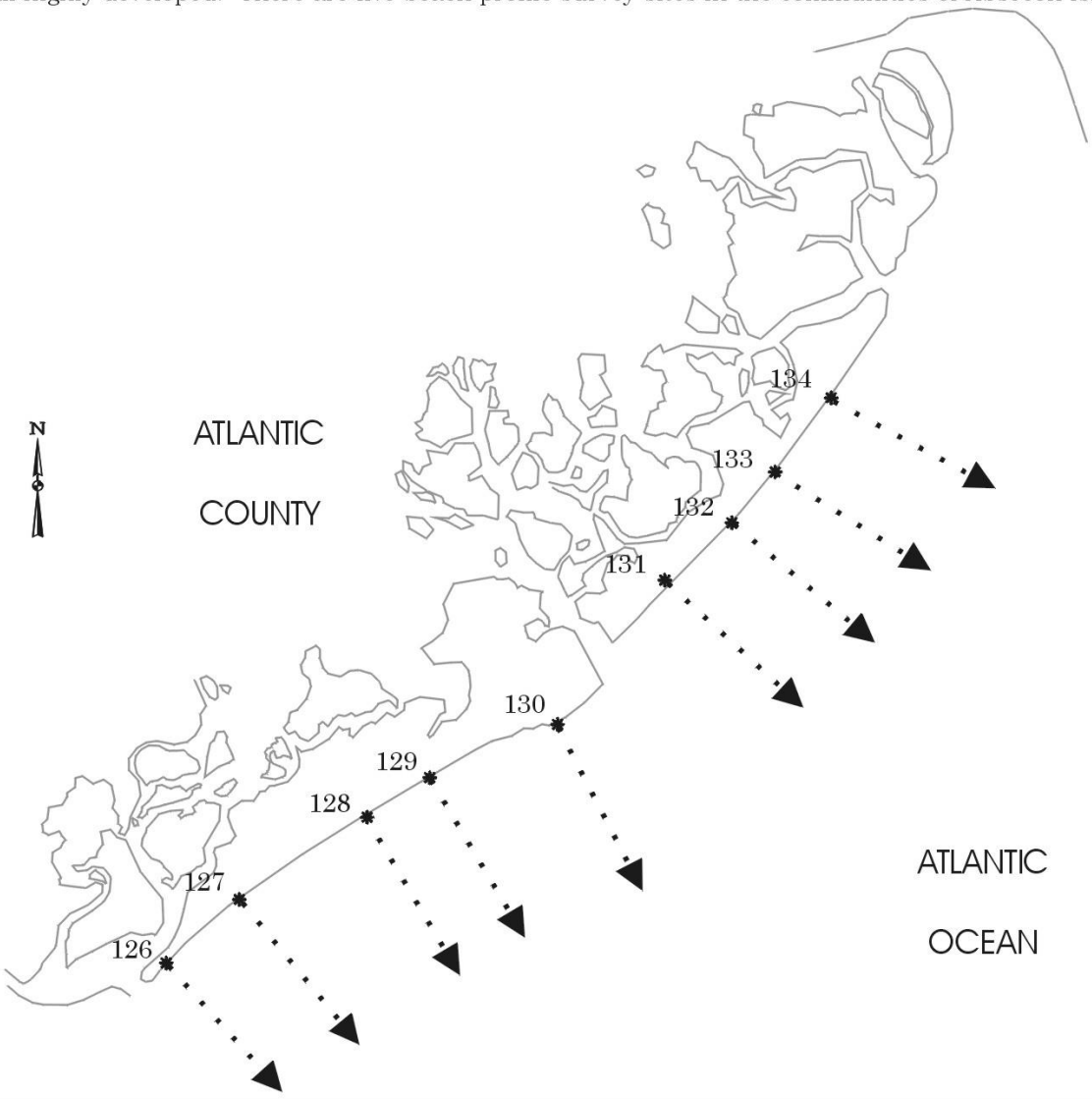
Little Egg Inlet
to Great Egg Harbor Inlet

NJBPN Profile #'s
134 - 126

New Jersey Beach Profile Network
Atlantic County Profile Site Locations

Figure 70

There are nine 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 bordered by Little Egg Inlet to the north and by Brigantine Inlet to the south. Little Beach is part of the Forsythe National Wildlife Refuge and is therefore not surveyed. South of Brigantine Inlet lay Brigantine Island, the northern third of which remains undeveloped as part of the New Jersey Green Acres program. There is one survey site along the undeveloped portion of the Brigantine shoreline and three additional sites on the developed portion. Absecon Inlet separates Brigantine Island from Absecon Island. The Absecon Island communities, Atlantic City, Ventnor, Margate, and Longport, are all highly developed. There are five beach profile survey sites in the communities of Absecon Island.



Photoplate 5a. Raleigh Avenue in Atlantic County taken in April 23, 2003. The boardwalk was protected by a narrow dune and a reasonable width beach. The storm debris line shows the average winter storm wave run-up position.

Photoplate 5b. By August 24, 2004, the Federal shore protection project was complete. The project stopped at the Ventnor/Margate City line. Dune planting and construction was finished, but serious erosion at the south end of the project started during the winter following this survey.

Photoplate 6a. Photograph taken April 24, 2003 looking north from 17th Street in Longport, NJ, prior to any sand placement on Absecon Island. The narrow beach allows wave run-up to nearly reach the concrete seawall on most days. The ridge to the right is evidence of beach accretion as the summer begins.

Photoplate 6b. By late August 2004, the beach was much wider with the photographer standing well landward of the high tide line compared to 6a above when the high tide line was to the left of the photo position. Sand may have moved south from the fill in the short time since project finish, but perhaps it was just a good summer's accretion.

TABLE 9
ATLANTIC COUNTY
ANNUAL BEACH VOLUME CHANGES
SPRING 2003 - SPRING 2004 & FALL 2003 - FALL 2004

PROFILE SITE LOCATION		Survey 26 - 28 S2003 - S2004 (volume expressed as cubic yards per foot)	Survey 27 - 29 F2003 - F2004 (volume expressed as cubic yards per foot)
134:	Brigantine, Green Acres	11.12	1.23
133:	Brigantine, 4th Street North	-11.52	-20.56
132:	Brigantine, 15th Street South	0.16	13.40
131:	Brigantine, 43rd Street South	-5.53	-2.12
130:	Atlantic City, North Carolina Ave.	135.85	113.28
129:	Atlantic City, Raleigh Ave.	172.29	167.94
128:	Ventnor City, Dorset Ave.	121.69	150.19
127:	Margate City, Benson Ave.	-11.70	-13.75
126:	Longport, 17th St.	16.63	0.40

TABLE 10
ATLANTIC COUNTY
ANNUAL SHORELINE CHANGES
SPRING 2003 - SPRING 2004 & FALL 2003 - FALL 2004

PROFILE SITE LOCATION		Survey 26 - 28 S2003 - S2004 (shoreline change expressed in feet)	Survey 27 - 29 F2003 - F2004 (shoreline change expressed in feet)
134:	Brigantine, Green Acres	8.3	-44.2
133:	Brigantine, 4th Street North	74.9	-70.1
132:	Brigantine, 15th Street South	-1.8	-5.9
131:	Brigantine, 43rd Street South	-51.1	-25.9
130:	Atlantic City, North Carolina Ave.	154.2	171.9
129:	Atlantic City, Raleigh Ave.	228.2	173.7
128:	Ventnor City, Dorset Ave.	154.7	208.6
127:	Margate City, Benson Ave.	-23.3	-24.5
126:	Longport, 17th St.	12.3	8.2

TABLE 11
ATLANTIC COUNTY
SEASONAL BEACH VOLUME CHANGES

PROFILE SITE LOCATION	Survey 26-27 S03-F03	27-28 F03-S04	28-29 S04-F04	26-29 S03-F04
	(volume expressed as cubic yards per foot of beachfront)			
134: Brigantine, Green Acres	31.85	-21.39	21.25	32.25
133: Brigantine, 4th Street North	19.53	-31.26	11.02	-0.57
132: Brigantine, 15th Street South	-3.17	4.10	9.87	9.49
131: Brigantine, 43rd Street South	11.11	-16.68	14.77	8.44
130: Atlantic City, North Carolina Ave.	4.03	131.86	-19.03	117.21
129: Atlantic City, Raleigh Ave.	-0.32	172.63	-4.29	167.61
128: Ventnor City, Dorset Ave.	-20.72	141.89	7.98	130.07
127: Margate City, Benson Ave.	7.36	-19.65	6.21	-6.54
126: Longport, 17th St.	19.52	-2.80	3.03	20.21

TABLE 12
ATLANTIC COUNTY
SEASONAL SHORELINE CHANGES

PROFILE SITE LOCATION	Survey 26-27 S03-F03	27-28 F03-S04	28-29 S04-F04	26-29 S03-F04
	(shoreline change expressed in feet)			
134: Brigantine, Green Acres	11.8	-3.4	-40.7	-32.4
133: Brigantine, 4th Street North	99.9	-24.9	-45.2	29.7
132: Brigantine, 15th Street South	-11.6	9.8	-15.7	-17.5
131: Brigantine, 43rd Street South	-13.6	-37.5	11.6	-39.5
130: Atlantic City, North Carolina Ave.	-25.4	179.5	-7.6	146.6
129: Atlantic City, Raleigh Ave.	2.2	226.0	-52.3	175.9
128: Ventnor City, Dorset Ave.	-64.0	218.6	-10.0	144.6
127: Margate City, Benson Ave.	-4.4	-19.0	-5.5	-28.8
126: Longport, 17th St.	2.3	10.0	-1.8	10.5

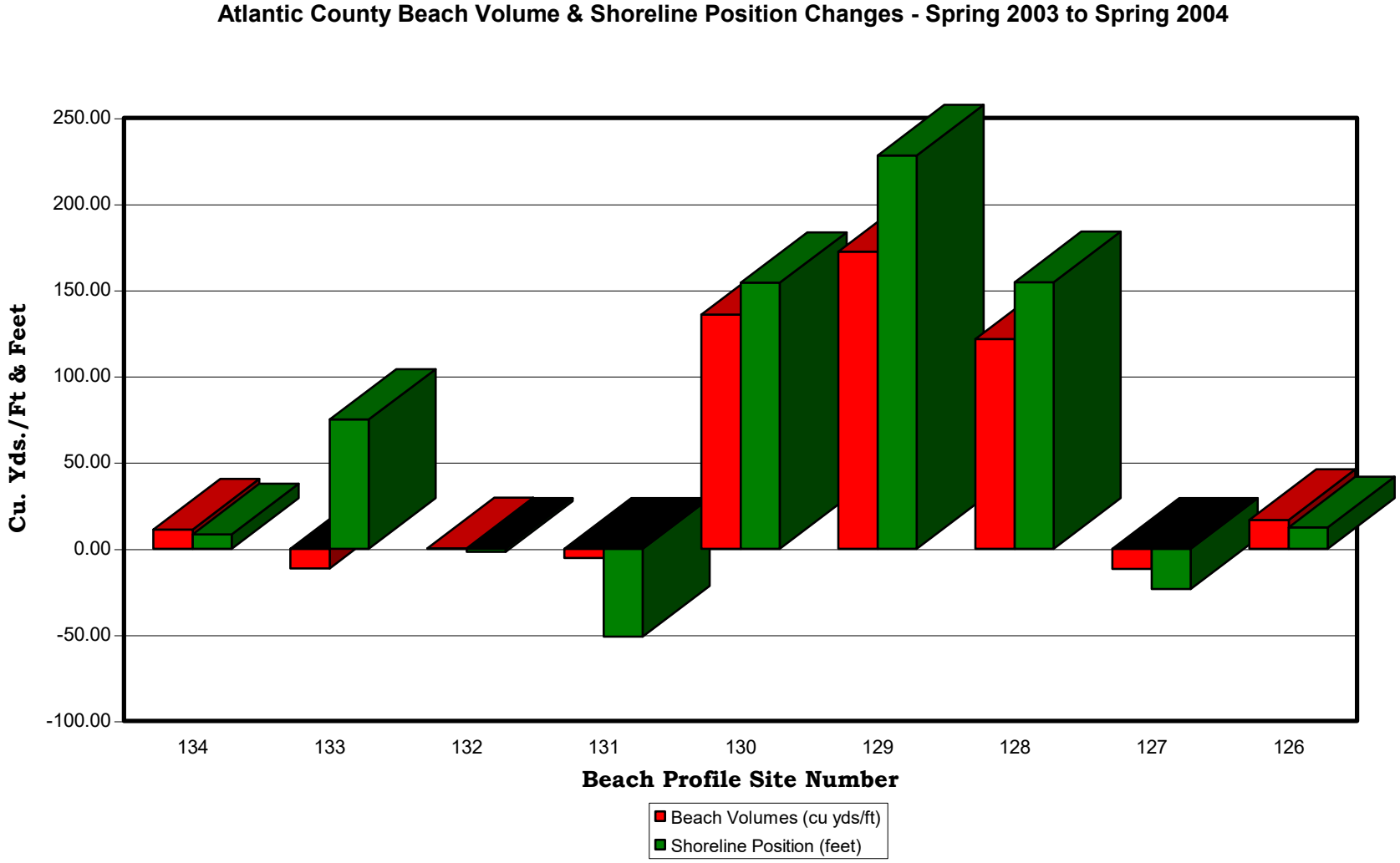


Figure 71a. This graph displays the year changes using the spring-to-spring surveys for the comparison. The three Absecon Island cross sections receiving beach nourishment from the US Army Corps of Engineers (ACOE) project show in the annual comparisons for both fall and spring surveys. Elsewhere in the county, other changes were minimal.

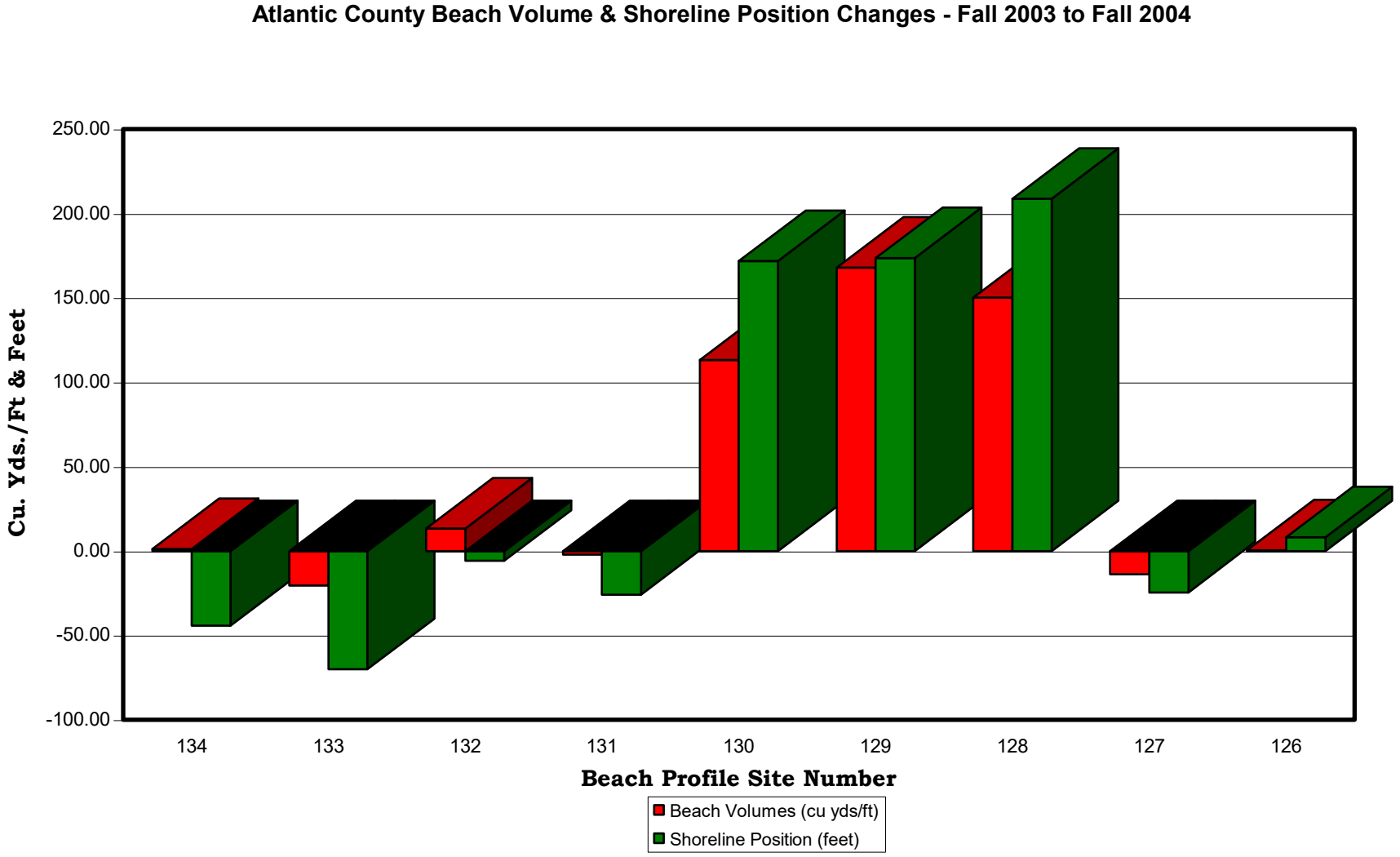


Figure 71b. The fall to fall comparison also shows the sand volumes and shoreline advances associated with the ACOE beach restoration project. Minor shoreline retreats occurred with minimal beach volume change elsewhere in the county.

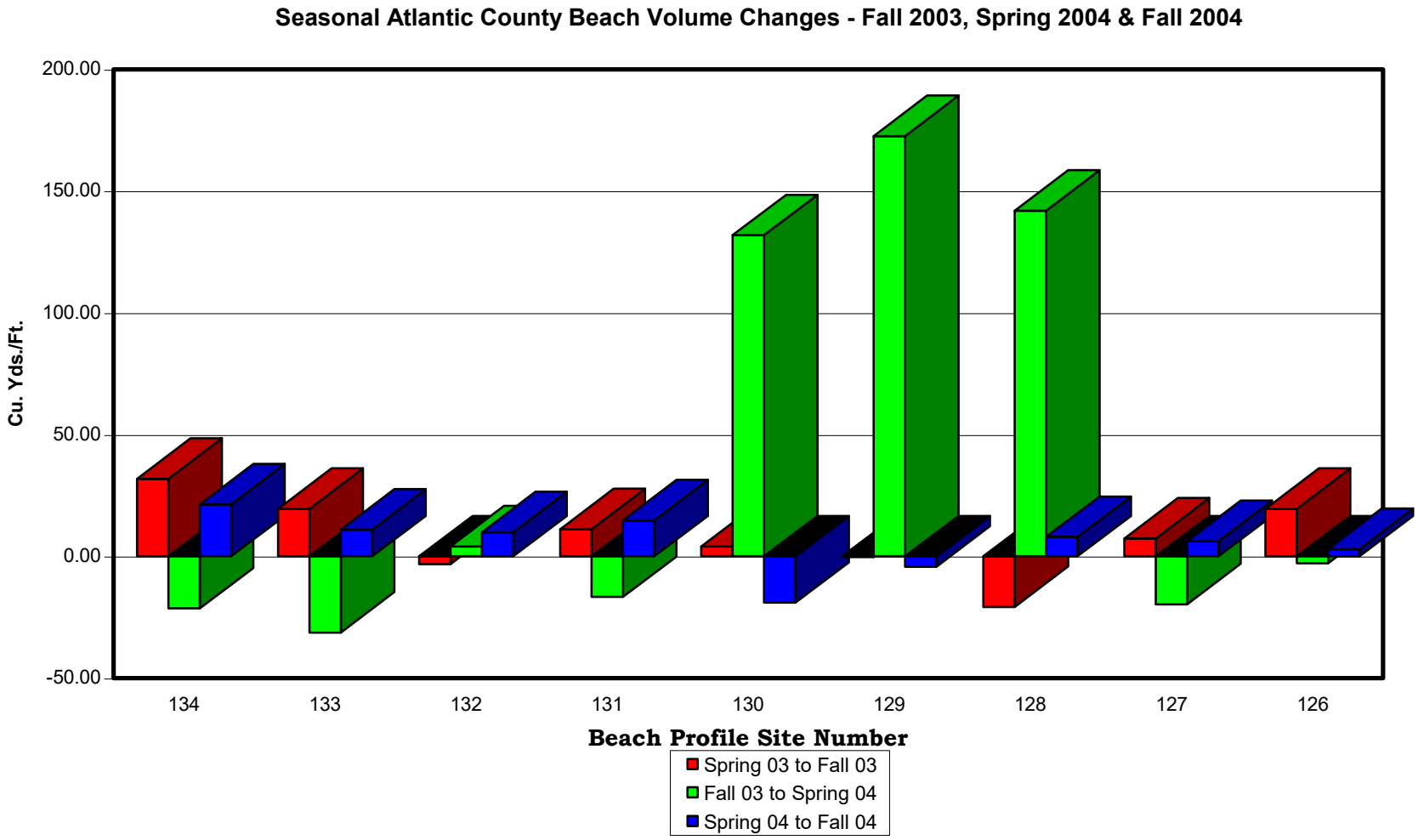


Figure 71c. The comparison of the six-month data shows the volume spike associated with the ACOE project in Atlantic City and Ventnor City. Each season produced gains in beach sand volume at the other sites in Atlantic County following minor losses during the 2003 to 2004 winter.

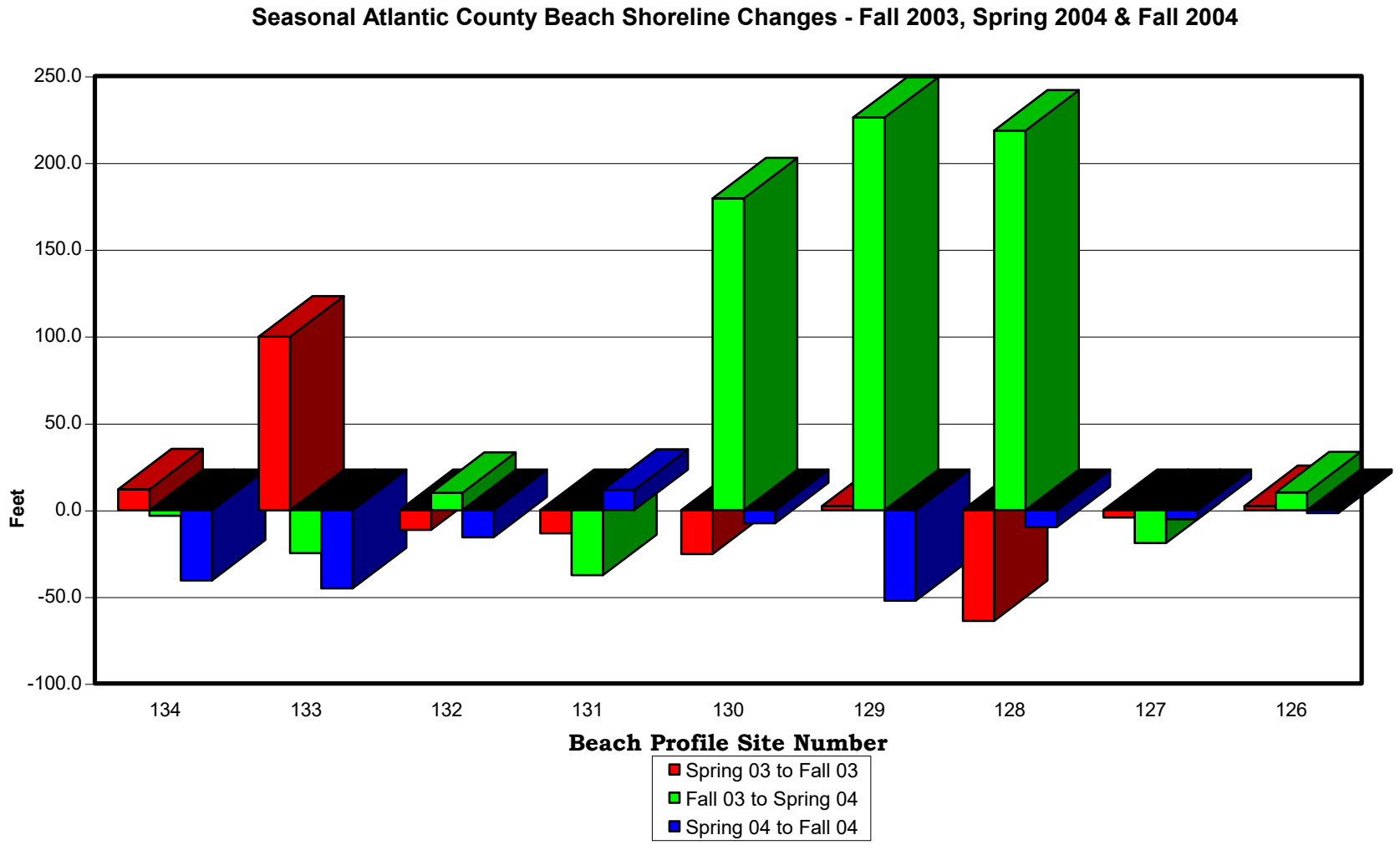


Figure 71d. Changes in the shoreline followed a similar pattern to the sand volumes, but with modest loss in position for most sites not in the fill area. Fill loss was relatively minor for six months following completion of the project.

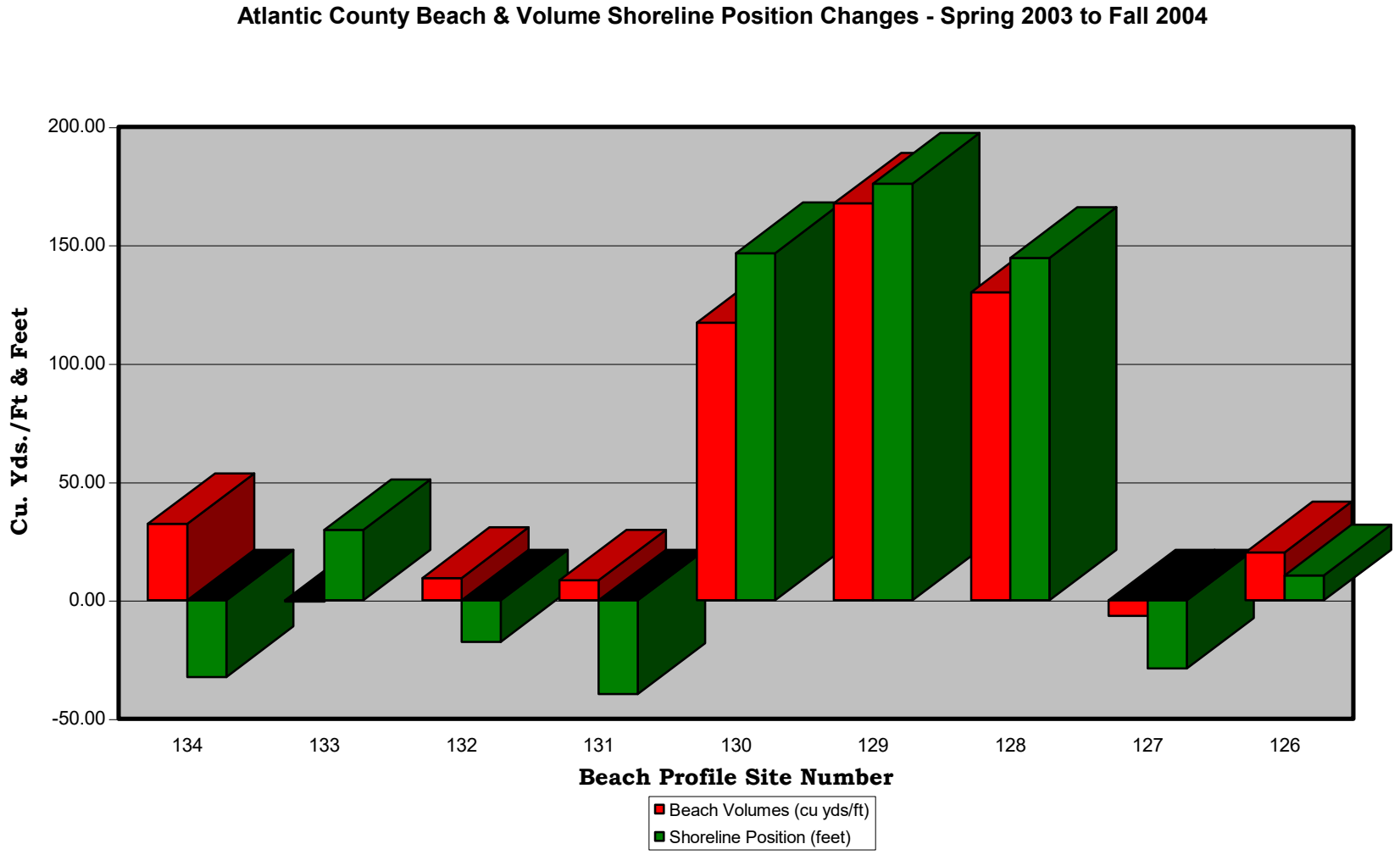


Figure 71e. For the 18-month interval, changes outside the ACOE project area were relatively minor. The sand volume on northern Absecon Island will adjust as storm activity moves some south and a lesser volume back toward Absecon Inlet.

SUMMARY OF INDIVIDUAL SURVEY STATIONS
LOCATED IN ATLANTIC COUNTY

- **Profile #134 - Green Acres, Brigantine, Atlantic County** (fig. 72)

The northern-most beach surveyed on Brigantine Island is located approximately 1 mile north of the north end of Brigantine Blvd. in the New Jersey Natural Area Preserve that comprises the northern 2 miles of the island. The beach elevation is relatively low allowing the area to overwash during storms. Since 1992, no storm activity has crossed over the dunes into Widgeon Bay. Dune grass mixed with sea rocket and goldenrod has colonized the seaward slope and dune crest aiding in the stabilization of the foredune slope. On the landward slope the dune grass is mixed with poison ivy. Phragmities inhabits the landward toe and continues west into the salt marsh. The site gained over 32 yds^3/ft of material for the study period, most of which was added offshore filling in the trough between the beach and the offshore bar.

In June 2003 there was a truly huge trough and bar system located about 600 feet from the reference position. It filled in during that summer as 31.11 yds^3/ft. was deposited in the trough. Sand continued to move ashore via bar-migration toward the shoreline and a sizable berm and much shallower nearshore region were the result. The 18-month comparison produced a 32.25 yds^3/ft. sand volume gain with a 32-foot shoreline retreat due to the steeper beachface slope.

- **Profile #133 – 4th Street North, Brigantine, Atlantic County** (fig. 73)

Profile #133 is located at the seaward end of 4th Street North near the northern end of the developed oceanfront in Brigantine. The profile begins at a monument located on the landward dune toe. The dune width is about 60 feet wide at the base and has a crest elevation of approximately 17 feet NGVD. The dune at this site continued to be stable.

This beach is located near the southern limit of the April 1997 Brigantine beach nourishment project placement zone. An additional 614,000 cubic yards of sand was placed on the project beaches during the winter and early spring of 2001. No sand was placed directly on the beach at 4th Street North since the placement zone for the project maintenance ended several hundred feet north of 4th Street. The site saw modest changes through the seasons over 18 months of study with sand added from offshore being lost each winter. The net change over the interval was –0.57 yds^3/ft. with a 30-foot shoreline advance. This beach remains stable four years following the maintenance effort largely due to placing almost half the sand north of the "hot" erosion zone located at the very north end of the developed shoreline. That sand moves into the erosional area feeding it over time.

- **Profile #132 – 15th Street South, Brigantine, Atlantic County** (fig. 74)

There are no dunes at this site because of the seaward position of the Ramada Inn (formerly the Brigantine Hotel) that occupies the footprint of an extensive dune system present both north and south of this structure. The profile begins along the sidewalk south of the Inn and includes the street end bulkhead that provides storm protection for the street end and Inn. The bulkhead elevation is 10 feet NGVD, consequently, this street end is vulnerable to overwash and wave over-top flooding during an event with a significant storm surge. This site was selected in 1973 as part of a shoreline-monitoring program established to review potential shoreline impacts from a proposed offshore nuclear power plant. Over 30 years of data indicate that this site represents a long-term balance between shoreline accretion south of this location and erosion to the north, with the balance presently tipped in favor of accretion due to long shore transport of the 1997 and 2001 beach nourishment sediment south along the shoreline.

Since there is no dune, the beach begins at a low elevation (6.3 feet NGVD) and actually rises seaward to the berm crest (7.58 feet) 174 feet seaward of the bulkhead reference location. Sand removed from the 1997 beach project has migrated to this site adding up to 125 feet to the berm width since 1999. The stability has been excellent in spite of no new sand added to the northern

beaches since 2001. The berm crest in September 2004 was 335 feet from the bulkhead. The seasonal variability of storm activity produced large differences in the offshore bar system across the time interval of the four surveys. There was a 9.49 yds^3/ft. gain with a 17-foot shoreline retreat over 18 months.

- **Profile #131 – 43rd Street South, Brigantine, Atlantic County** (fig. 75)

Profile #131 begins at the seaward end of 43rd Street with the original instrument station for surveying back on the landward dune ridge near the end of 43rd Street. That starting point was moved seaward about 390 feet to the top of the high, 100-foot wide dune at the landward edge of a 300-foot wide dry beach. The first 600 feet of the profile is now a template from the winter survey of 1997. The template is required since a thick stand of bayberry, shrubs and other plants prevent surveying a large portion of the dune without cutting a path through the dense area of vegetation cover. Located in the large swale between the multiple back ridges and the primary forward dune, this zone is extremely stable because the dense vegetation holds the sand in place. The large primary dune ridge, which blocks any significant volume of wind-transported sand from reaching the back dune region, prevents sand transfer between the beach and this region. Some sand does reach the landward toe of the primary dune, which is included in each of the surveys. In the event of a massive storm this template region would be resurveyed for changes. A minor volume of sand (3.03 yds^3/ft.) was added to the dune from the toe almost up to the crest, now at an elevation of 18 feet NGVD. The north jetty confining Absecon Inlet ultimately traps any sand moving south along the Brigantine Beach. This location is almost a mile from the jetty, but the beach has dramatically advanced seaward since the jetty was initially built in the 1940's. The 1940 shoreline is over 1,500 feet landward of the new primary dune shown on the cross section. Over the past 18 months, the beach and offshore varied around a narrow range of positions with the net sand volume shown as a gain of 8.44 yds^3/ft. with a 39-foot shoreline retreat.

- **Profile #130 – North Carolina Avenue, Atlantic City, Atlantic County** (fig. 76)

Profile #130 is located on the boardwalk at the seaward end of North Carolina Avenue in the commercial area of Atlantic City next to Resort's casino and hotel. The profile formerly included the boardwalk then continued through a swale between the boardwalk and a small dune feature.

The Absecon Island Shoreline Protection project completed by the US Army Corps of Engineers (ACOE) by early 2004 added 131.86 yds^3/ft. to the shoreline's sand volume advancing the shoreline by 180 feet. Changes during the summer were very modest yielding a loss of 19.03 yds^3/ft. (mostly in the offshore region) and an 8-foot shoreline retreat.

- **Profile #129 – Raleigh Avenue, Atlantic City, Atlantic County** (fig. 77)

The Raleigh Avenue site is located south of the casino and commercially developed region of the Atlantic City boardwalk. Atlantic City initiated dune development with dune fence installation on a relatively flat beach during the spring and summer of 1987. A reconfiguration of the primary dune by county maintenance workers by May 2002 resulted in a narrower, lower primary dune that was augmented by the US Army Corps of Engineers (ACOE) project (adding 12.75 yds^3/ft. just to the dune). This site is relatively stable as seen in the comparison of survey 26 to survey 27 (sand volume was –0.32 yds^3/ft. with a 2-foot shoreline advance). The ACOE project added 172.63 yds^3/ft. and a 226-foot shoreline advance by May 2004. The summer months continued adjustment to the cross section with a 4.29 yds^3/ft. loss in sand volume and a 52-foot shoreline retreat largely due to a steeper beachface slope at the end of the summer.

- **Profile #128 – Dorset Avenue, Ventnor, Atlantic County** (fig. 78)

This profile begins at the seaward end of Dorset Avenue and includes the street end, a concrete sea wall and the boardwalk. The US Army Corps of Engineers (ACOE) project replaced the dune removed by the City for its lifeguard shack at Dorset Avenue and added 141.89 yds^3/ft. of sand volume with a shoreline advance of 219 feet. The completion of the following summer project

produced a minor gain of 7.98 yds^3/ft. with a 10-foot shoreline retreat as adjustment proceeded. The project ended at the border with Margate City because of the failure of the two southern municipalities to sign an agreement with the State of New Jersey to continue the project throughout the entire island's oceanfront coastline.

- **Profile #127 – Benson Avenue, Margate, Atlantic County** (fig. 79)

Profile #127 is located at the seaward end of Benson Avenue set along the north curb sidewalk and includes the sidewalk and street end wooden bulkhead. The profile continues over the upper beach located in a wide break in the dune system. This open area is wider than the average Margate beach because the upland bulkhead line shifts landward at this street end. To the north a continuous dune ridge has developed seaward of the oceanfront properties and bulkhead position. The dunes continue to exist north and south of this site, but no effort has been made to develop dunes along the beach in a consistent fashion. Since the US Army Corps of Engineers (ACOE) project ended at the northern boundary with Ventnor City, the sand volume change seen here over the six to eight months since the work was completed, had not produced evidence of southerly transport of project sand to this site as of late August 2004. The net change over 18 months was a loss of 6.54 yds^3/ft. with a 29-foot shoreline retreat. The spring survey in 2005 may show influx of the project sediment.

- **Profile #126 – 17th Street, Longport, Atlantic County** (fig. 80)

The profile begins along 17th Street and includes the south sidewalk and the concrete sea wall, built along most of this community's shoreline. A dune system has never existed on this beach since the site was established in 1986. Instead, a concrete seawall provides property owners with shore protection. There are large rocks buried along the seaward base of the sea wall and a few are partially exposed just south of the profile line. During storm events early in the last decade waves overtopped this seawall causing some street flooding and property damage.

Large scale seasonal changes between the berm and offshore bar system-produced differences in the appearance of the profile cross sections, but little change in net sand volume. Even the shoreline positions remained nearly constant. The summer of 2004 saw the most complete transfer of sand from offshore onto the beach building a substantial berm (for this site). The net 18-month change was a sand volume gain of 20.21 yds^3/ft. with a shoreline advance of 11 feet. There is no documented evidence of ACOE project sand arriving at this site at this time.

SUMMARY OF ATLANTIC COUNTY:

Beach nourishment has been a factor in Atlantic County for decades. The majority of the projects have been done in Atlantic City since 1936 where 7,085,000 cubic yards of sand had been placed up to 1986 (Pilkey and Clayton 1989). Atlantic City conducted its own beach nourishment program in the summer of 1997 adding 640,000 cubic yards of sand between Illinois and Iowa Avenues. The most recent beach restoration activity elsewhere in Atlantic County was a spring 2001 beach nourishment maintenance project completed on Brigantine with 615,000 cubic yards of sand placed on the majority of the initial project's north end shoreline. The initial phase of this project was modeled after the design plan for Brigantine selected by the US Army Corps of Engineers. This local and State effort placed 999,827 cubic yards of sand on the north end beach in spring 1997 and has made a major difference to storm damage exposure along the northern developed municipal shoreline. In both cases sand movement to the south was seen with results along the Brigantine shoreline being far more obvious to even casual observers.

The commencement of the Philadelphia District Army Corps of Engineers Absecon Island Beach Restoration Project began in 2004. Below is the Philadelphia District's website description of the project.

Atlantic City: Construct a 200-foot wide beach with a dune (2-3 feet above boardwalk). Initial beachfill volume is approximately 3.2 million cubic yards. Construct outfall extensions and at Absecon Inlet replace 2 bulkheads with revetment (total 1600 ft.)

Ventnor: Construct a 100-foot wide beach with dune (1 foot above boardwalk). Initial beachfill volume is approximately 1.3 million cubic yards.

Margate: Construct a 100-foot wide beach with dune (2-2.5 feet above bulkheads). Initial sand volume will be determined just prior to construction. **PROJECT NOT DONE IN MARGATE.**

Longport: Construct a 100-foot wide beach with dune (2-2.5 feet above bulkheads). **NOT DONE.**

1.7 million cubic yards of sand will be utilized for periodic nourishment every 3 years for the 50-year project life. Sand source is a borrow area in Absecon Inlet.

Phase I officially began October 22, 2003 when the Notice to Proceed was issued to Great Lakes. Sand placement in Atlantic City began December 25, 2003 and is scheduled to conclude in March 2004. Crossovers, sand fencing, planting of dune grass and outfall extensions will be completed in May 2004 in Atlantic City. Construction will proceed from the northeast end of Atlantic City southwest through Ventnor. Sand placement in Ventnor is scheduled to begin in March 2004 and conclude in May 2004. Construction of crossovers and sand fencing will be completed in June 2004 in Ventnor. Dune grass planting will be completed by December 2004 due to November-April planting "window". The District considers Phase II to consist of the communities of Margate City and Longport that did not agree to participate in the initial project construction.

The Brigantine Island feasibility study was completed in August 1998, and the nourishment of this island is scheduled to start prior to October 2005 to be able to utilize the last funds available in the expiring Water Resources Development Act of 2002. Congress has acted to add $500,000 to FY 04 for construction despite no presidential request. This funding is to be used to start construction in the spring of 2005. On October 12, 2004 the ACOE sponsored a public signing ceremony in Brigantine to inaugurate the construction phase of this project.