



THE RICHARD STOCKTON COLLEGE OF NEW JERSEY

The Honorable Anita VanHeeswyk  
Borough Commissioners  
Borough of Cape May Point  
PO Box 490  
Cape May Point, NJ 08212-0490

June 2, 2014

**Introduction:**

The annual survey of the nine cross section stations on the municipal beach was completed by the Richard Stockton College of New Jersey Coastal Research Center on April 8 and 10, 2014. These were compared to previous studies that were completed in April 2012 and April 2013. This work completes the annual review of the municipal beaches prior to the 2014 tourist season.

Following Sandy the focus in 2013 was on restoration of the Jersey shore, its beaches and dunes. Local, State and Federal efforts have helped shore communities devastated by the storm recover and rebuild. In Cape May Point those efforts included a federal beach nourishment maintenance project to restore the engineered project beaches. Over the course of the last four years there has been five Presidential disaster declarations made for New Jersey's coast in response to three northeast storms and two hurricanes, starting with a strong nor'easter November 11-13, 2009 to most recently Hurricane Sandy on October 29, 2012. The USACE responded using FY12 funds to award a contract to complete the 2nd renourishment cycle. The contract was awarded in September 2012 construction began in November 2012 with sand pumping completed in January 2013. Because this project started immediately after Hurricane Sandy any storm erosion from the hurricane was repaired through this project no additional authorization was required. The USACE placed a reported 345,000 cubic yards of sand onto the Lower Cape May Meadows – Cape May Point project beaches with approximately 108,697 placed on the Borough's beaches (Dwight Pakan, USACE).

**Beach Monitoring Program:**

The CRC established the Borough's beach monitoring program in 1991 to address the changes observed along the shoreline. Nine permanent monitoring survey lines are located at the following sites along the Borough's ocean and bay shorelines. Each profile starts at a fixed reference position behind the dunes, crosses the dunes, beach and extends over 600 feet into the water, ending at a depth of 12-16 feet. Each cross section is located midway between the rock groins that define each of the beach cells.

CMP-0: Lighthouse Avenue  
CMP-1: Lehigh Ave  
CMP-2: Whilddin Ave

CMP-3: Coral Ave  
CMP-4: Lake Drive  
CMP-5: Cape Avenue

CMP-6: Pearl Avenue  
CMP-7: Stites Avenue  
CMP-8: Alexander Avenue

**Review of Each of the Beach Cells in Cape May Point:**

This section describes the changes documented at each profile location to show general trends in sediment movement along the municipal beaches for 2013-2014. Beach volume and shoreline changes were calculated from April 2013 to April 2014. The individual site review includes photos taken during the

surveys and annual comparison plots to document shoreline changes at each location. Individual site descriptions are included for each profile.

### Lighthouse Avenue



*By April 2013 a new row of fencing was added seaward of the partially buried row present earlier. The berm elevation was higher and further seaward than a year earlier.*

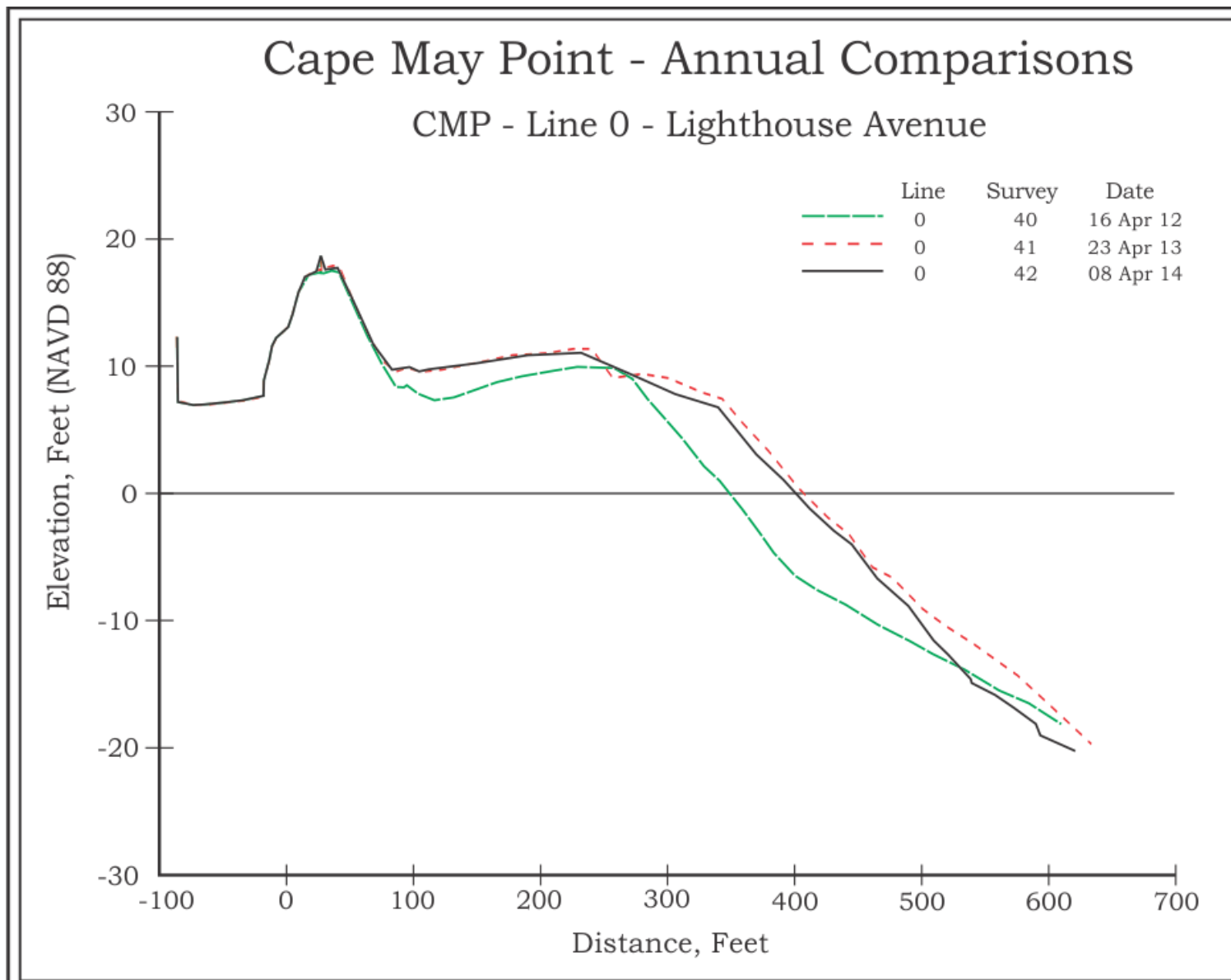


*The photo taken on April 2014 shows the dune and beach remained remarkably stable this year. There were no visible changes to the beach or dune system.*

CMP-0 (Cell 0) is the northeastern-most cell that borders the State Park and is bounded to the west by a rock groin. This location has benefited tremendously from the USACE Lower Cape May Meadows – Cape May Point shore stabilization and ecosystem restoration project, initial construction was completed June 2007. The project added over 250 feet of recreational beach berm and established a stable dune system 100 feet wide at the toe with a crest elevation of 18 feet NAVD88. Prior to the initial project the beach was narrow that exposed the dune system to frequent severe erosion from the ocean wave climate forcing the installation of hard structures including tensor mats to armor the seaward slope.

Although the dune system has remained remarkably stable to accretive since construction the beach has been exposed to multiple storms, waves generated during the recent severe events resulted in moderate beach erosion. By April 2012 the beach elevation and width were reduced. The USACE authorized a second maintenance project with construction from November 2012 to January 2013. The project restored the design beach width and elevation. The beach width increased by 58 feet with 63.13yds<sup>3</sup>/ft. of sand added to each foot of shoreline seaward from the dune toe. Following the project the beach elevation ranged from 10-12 feet NAVD 88 and extended 275 feet seaward of the seaward dune toe.

The beach and dune system remained stable through April 2014. Modest beach erosion along the beachface slope removed some sand from the system. The shoreline retreated a modest 6 feet while 17.28 yds<sup>3</sup>/ft. of sand eroded from the site. Most of the eroded sand (-13.35yds<sup>3</sup>/ft.) was from the offshore slope with a modest loss of sand from the berm and beachface. This beach still provides ample storm protection to prevent significant storm damage to the dune system and oceanfront properties while aeolian sand from the beach continues to feed sand to the seaward dune slope and foredune around installed dune fences. The beach configuration on April 8, 2014 closely mimicked the April 2013 profile. The beachface slope remains relatively steep at a rate of approximately 10 to 1 so that within 200 feet the seafloor goes from 0 to -20 feet NAVD 88. Proximity to the nearshore tidal channel also causes stronger longshore currents along this shoreline.



**Figure 1. Following Hurricane Sandy the USACE 2<sup>nd</sup> maintenance nourishment project restored the beach sand adding to the recreational beach berm and beachface. The project increased the beach elevation up to 2.5 feet (10-11ft. NAVD88) and pushed the beach width seaward 60 feet. The beach remained relatively stable with modest erosion along the beachface. By April 8, 2014 the shoreline position retreated 5.8 feet with a modest loss of 17.28 yds<sup>3</sup>/ft. of sand mostly derived from offshore losses.**

## Lehigh Avenue



*The photo taken on April 2013 the cell is completely filled with sand added to the berm elevation burying most of the exposed groin rock at the beachface.*

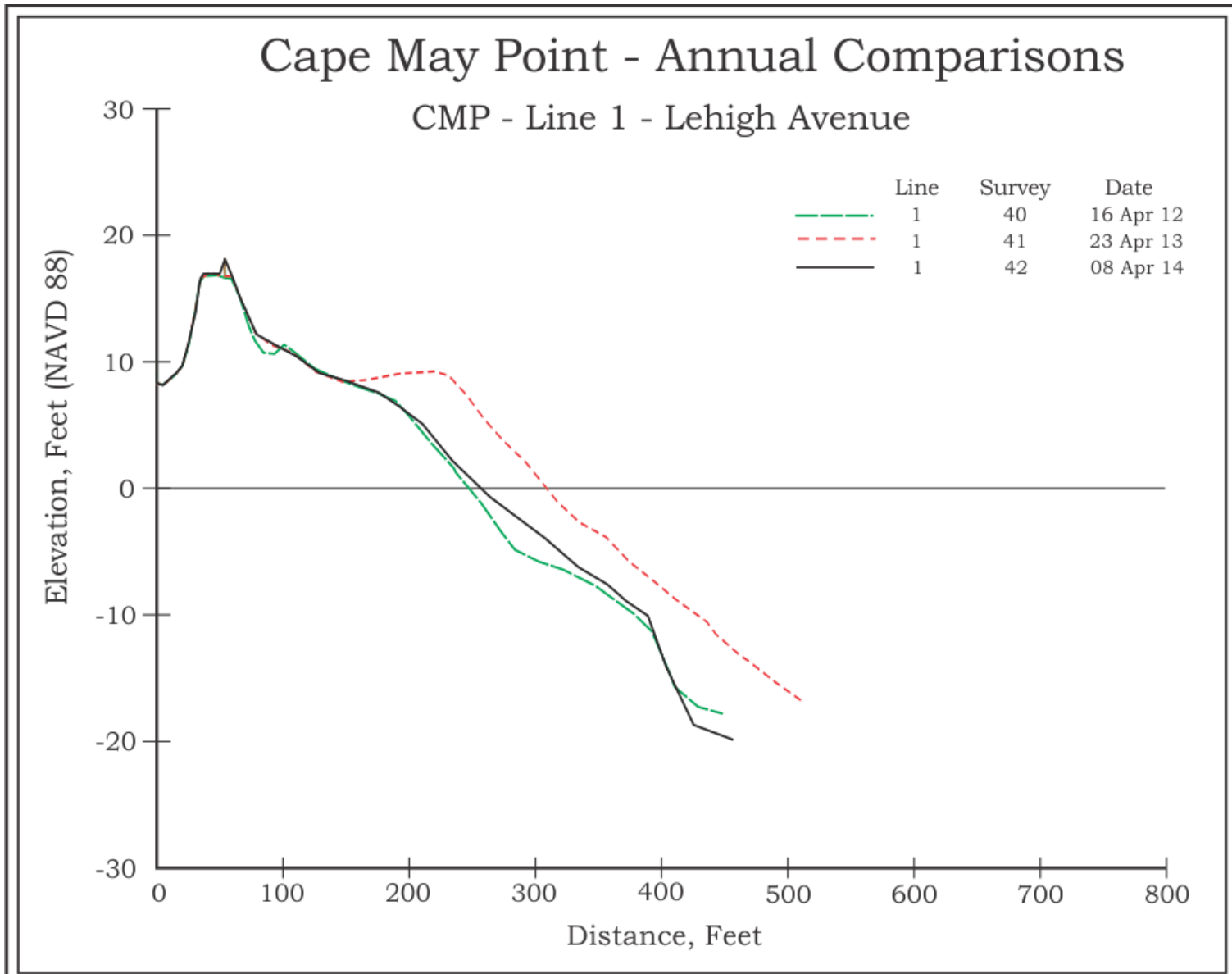


*Taken on April 8, 2014 this photo shows beachface erosion has exposed more of the rocks along the shoreline. Note the positions of the red arrows in each photo.*

CMP-1 (Cell 1) stretches from the Lighthouse Avenue groin to Lehigh Avenue. Prior to the initial USACE project no dry beach was present between the rock groins. Shore protection was provided by a rock seawall that armored the seaward dune slope. Beyond the groins the seafloor steeply dropped into the adjacent tidal channel. The initial USACE project re-established a dry recreational berm and covered the seawall with sand to restore the dune.

Although the dune system has remained remarkably stable to accretional since construction the beach has been exposed to multiple storms waves generated during the recent severe events that resulted in moderate beach erosion. By April 2012 the beach elevation and width were reduced. The USACE authorized a second maintenance project with construction from November 2012 to January 2013. The project restored the design beach width and elevation. The beach width increased by 60 feet with 56.39 yds<sup>3</sup>/ft. of sand added to each foot of shoreline seaward from the dune toe. Following the project the beach elevation was 10 feet NAVD 88 and extended about 170 feet seaward of the seaward dune toe.

The project beach rapidly eroded through April 2014. Moderate beach erosion along the beachface slope removed some sand from the system. The shoreline retreated 51 feet while 51.78 yds<sup>3</sup>/ft. of sand eroded from the site. Most of the eroded sand (-32.57 yds<sup>3</sup>/ft.) was on the offshore slope with the other third from the berm and beachface. This beach still provides ample storm protection to prevent significant storm damage to the dune system and oceanfront properties while aeolian sand from the beach continues to feed sand to the seaward dune slope and foredune around installed dune fences. The beach configuration on April 8, 2014 closely mimicked the April 2012 profile. The beachface slope remains relatively steep within the initial 125 feet the slope then steepens to an angle of repose slope into the adjacent tidal channel. Proximity to the nearshore tidal channel also causes stronger longshore currents near the end of the groins.



**Figure 2. Again following Hurricane Sandy the USACE 2<sup>nd</sup> maintenance nourishment project restored the beach sand adding to the recreational beach berm and beachface. The project pushed the beach width seaward 60 feet at elevation 10 NAVD88. The beach rapidly eroded and removed nearly all of the sand placed during the project. By April 8, 2014 the shoreline position retreated 51 feet with a loss of 51.78yds<sup>3</sup>/ft. of sand mostly derived from the project area that included the steep offshore slope.**



## Lehigh to Whilldin Avenues



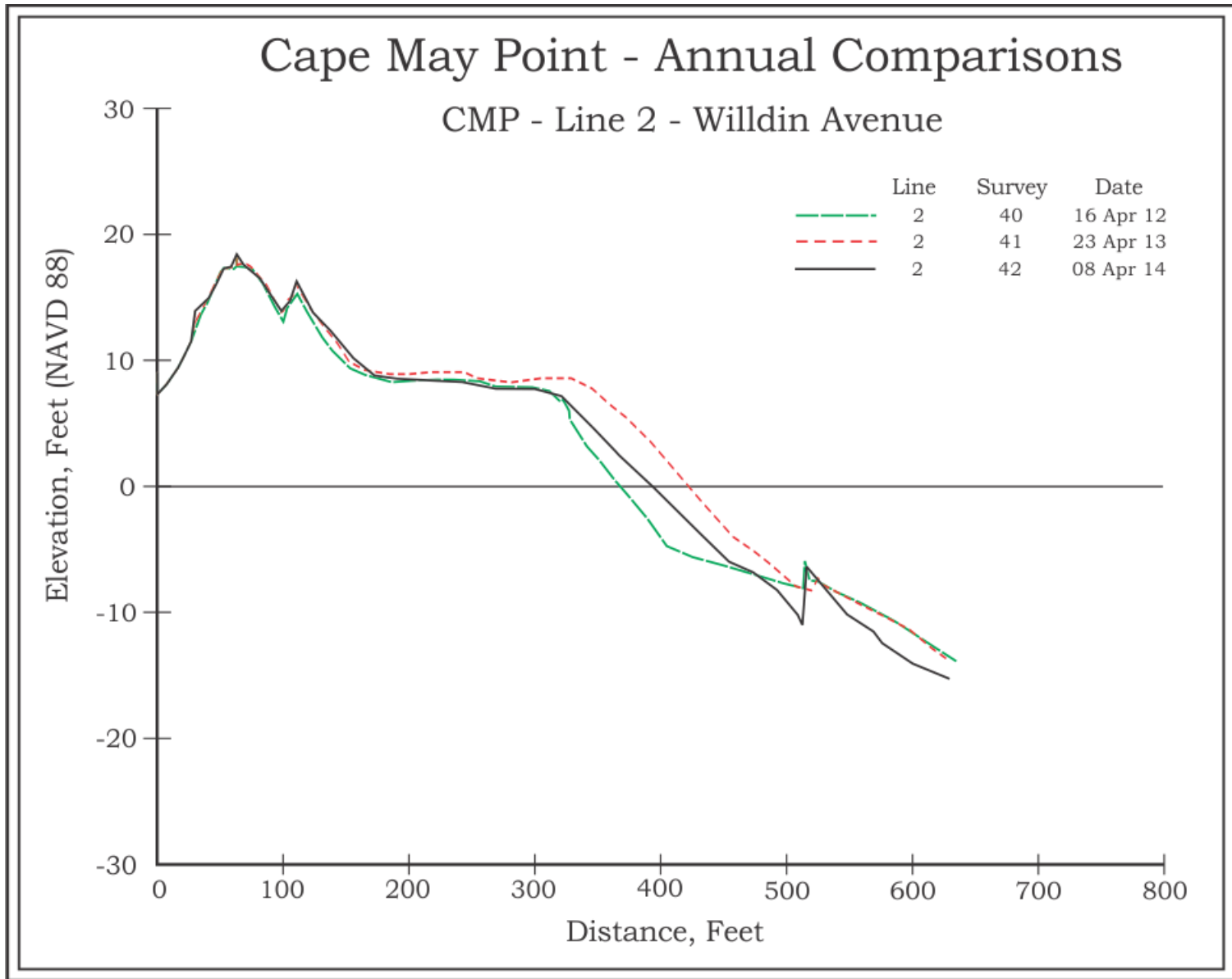
*The photo above was taken from along the seaward dune toe in April 2013. Plants are colonizing the seaward dune slope where aeolian deposition has expanded the feature seaward.*

*The photo taken on April 8, 2014 shows continued aeolian accumulation and colonization of plants seaward onto the open beach. The overall beach width and elevation remained relatively stable over the year.*

The CMP-2 (Cell 2) beach is the northeastern-most of the groin cells with an early installation of the “Beachsaver” units from 1993, which still show on the profile cross-section at the 520-foot distance from the reference point and remain relatively stable. Sand added to the system during the initial USACE project has resulted in the near burial of the entire beach reef structure and a rock seawall that protect the seaward dune slope prior to the project. No additional sand was placed here during the recent 2nd maintenance cycle.

Sand shed from the recent project beaches accumulated rapidly in this cell during 2013. The site gained 32.58 yds<sup>3</sup>/ft. of sand and the shoreline advanced seaward 32 feet. Accumulation of sand continued from the foredune seaward to the profile limits. However, by April 2014 over half of this gain eroded primarily shed from the beachface and berm. The shoreline position retreated 28 feet with a loss of 26.64 yds<sup>3</sup>/ft. of sand eroded from the beachface. A deeper trough (-11 feet NAVD88) was scoured landward of the “Beachsaver” units while beyond the units offshore sand remained in place.

The “Beachsaver” unit crest protrudes about two feet above the beach slope offshore due to the deposition of 2 feet of sand vertically offshore. Landward of the units a deep trough was scoured that exposed 5 feet of the vertical landward face of the reef. The reef crest is 125 feet seaward of the zero elevation shoreline position (about mid-tide position) with the concrete units residing in -11 feet (landward) and -8.0 feet (seaward) of water below the NAVD 88 zero elevation. The crest protrudes up to elevation - 6 feet NAVD88. In this instance the reef units are unlikely to be encountered by swimmers this season within the middle of the groin cell. As always caution and restrictions should be in place closer to the groins.



**Figure 3. No sand was placed directly on this beach during the recent USACE project. It does appear that the rapid erosion of the updrift project beach shed some sand to this adjacent beach. The April 2013 survey conducted approximately 4 months following construction was completed showed gains on the beachface and beach. Subsequent erosion resulted in the beachface and shoreline landward retreat of nearly 30 feet with the loss of 26.64 yds<sup>3</sup>/ft. of sand removed from the beachface and offshore.**

## Whilldin to Coral Avenues;



*The 2013 photo shows a well-developed dune system and wider beach. Plants have colonized the expanding foredune feature.*



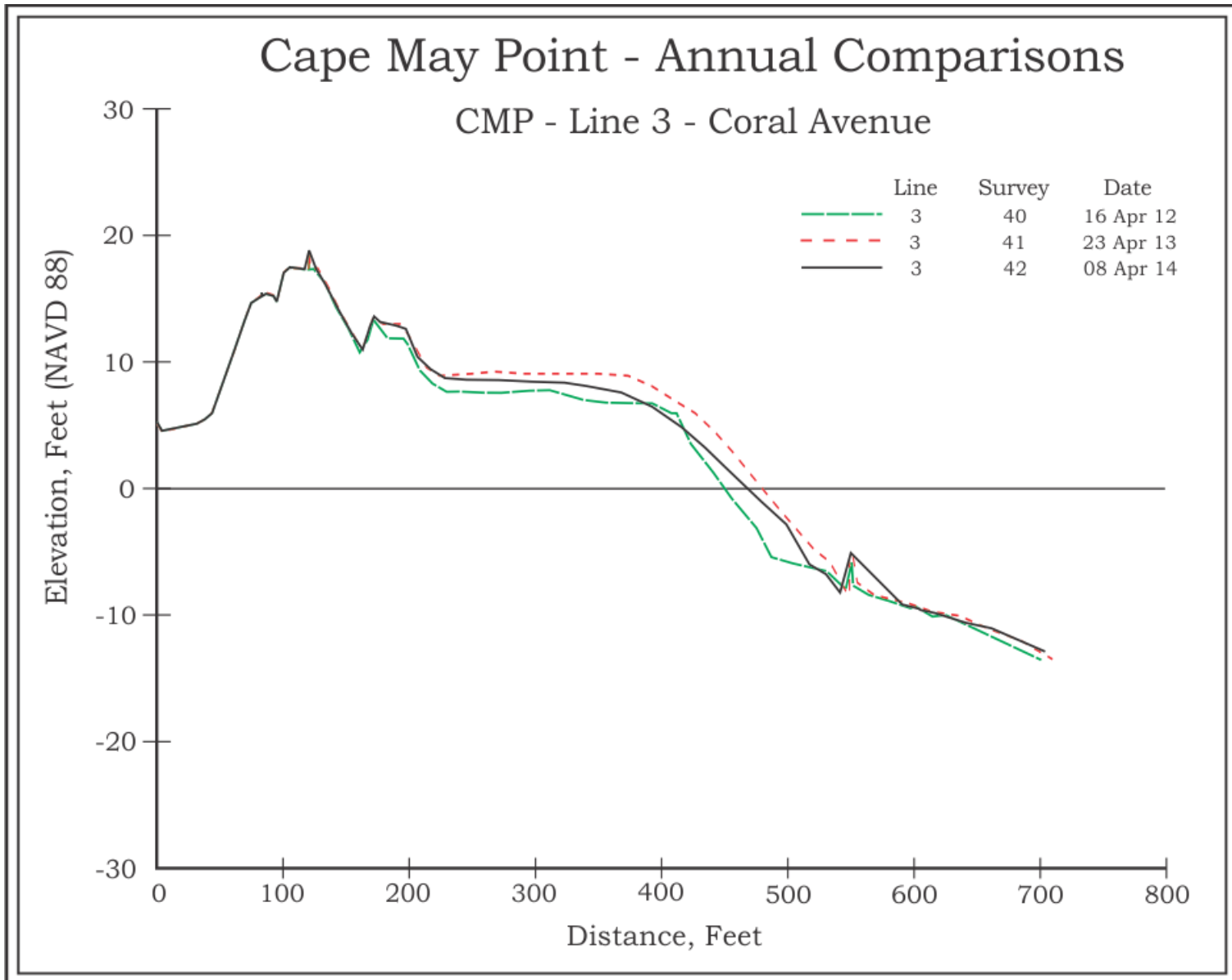
*The 2014 photo taken on April 8 shows the dune and beach have remained relatively stable. Plants continue to spread over the foredune slope and onto the upper beach.*

CMP-3 (Cell 3 bounded by rock groins at Whilldin Avenue and Coral Avenue) is the other beach cell with an original “Beachsaver” unit installation. Sand added to the system during the initial USACE project has resulted in the near burial of the entire beach reef structure. No additional sand was placed here during the 2nd maintenance cycle.

Following episodes of erosion through 2012 sand accumulated in this cell naturally in 2013. Wind-blown sand enhanced the foredune from its 2012 configuration and sand accumulated seaward across the beach offshore to the “Beachsaver” reef. The shoreline advanced 29 feet with an addition of 28.90 yds<sup>3</sup>/ft. of sand to this site. As of April 2013 the shoreline advance brought the reef units to within 70 feet from the zero elevation shoreline position location on the beach itself.

By April 2014 the beach had eroded along with the beachface slope. The shoreline position retreated landward 11 feet with a modest loss of 11.21 yds<sup>3</sup>/ft. of sand. This modest loss of beach width kept the units in relative close proximity to the shoreline approximately 80 feet. The concrete crest lies in 5.0 feet of water at mid-tide (NAVD 88 zero datum). This location remains the most problematic in terms of swimmers encountering the structure while using the beach. There is no deep trough at the landward side of the reef structure. If the guards are diligent in keeping swimmers close to shore in shallow water less than 3-4 feet deep regardless of the tide level, water access could be allowed here. Water access near the groins where the units are closer to shore should be prohibited.





**Figure 4. Again no sand was reportedly placed directly on this beach during the recent USACE project. Longshore and cross-shore transport moved sand onto this beach by April 2013 elevating the beach and pushing the beach seaward nearly 30 feet. Subsequent erosion in late 2013 through April 2014 reduced nearly half the elevation and beach width gained last year. The result was a shoreline retreat of 11 feet with 11.22 yds<sup>3</sup>/ft. of sand stripped from the site this year.**

## Coral Avenue to Lake Drive



*By April 2013 the beach had returned to a width seen in 2011. Sand was blown into the foredune zone and added to the berm by the events of the past winter.*

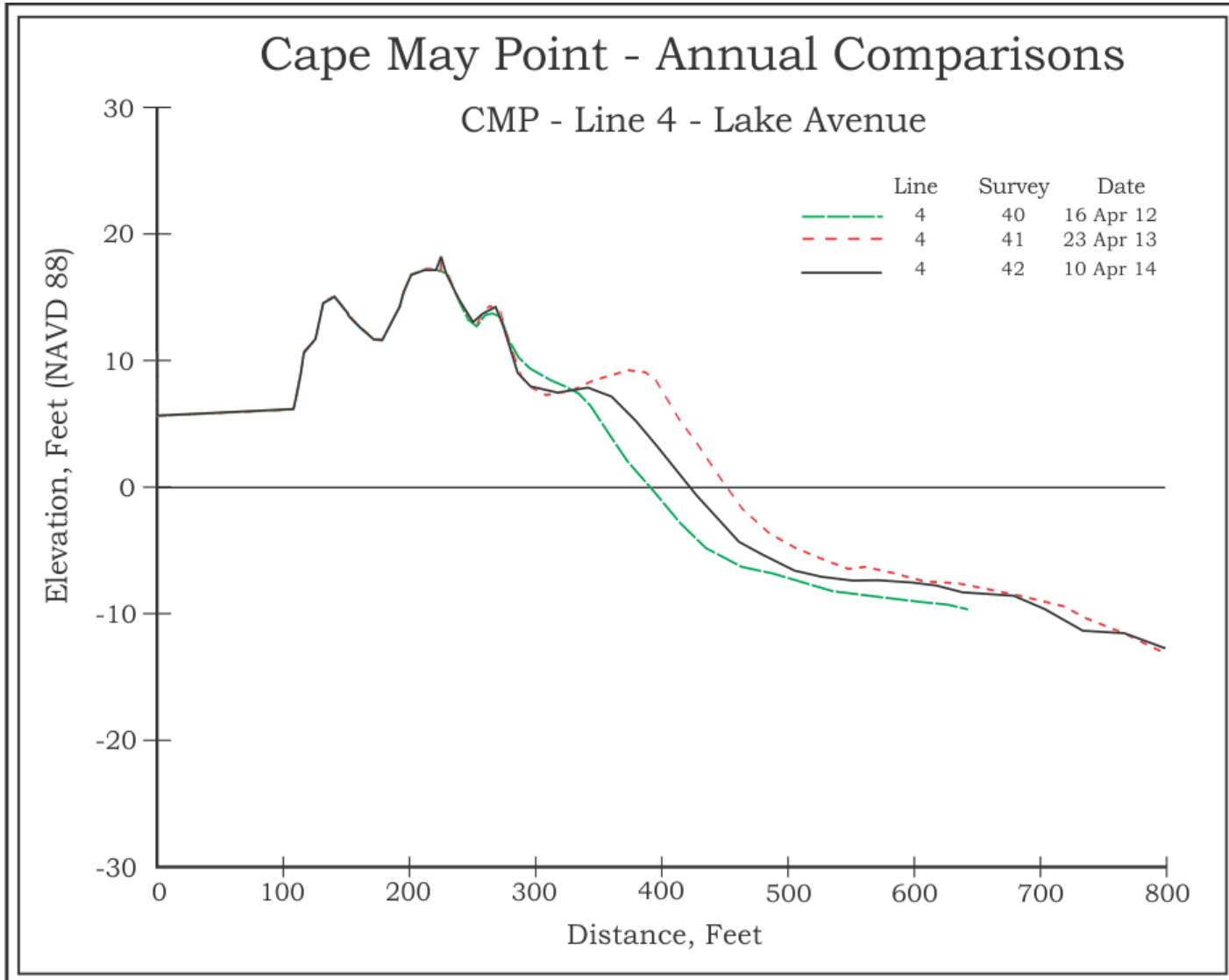


*Photo above was taken from the dune toe on April 8, 2014. The dune system remained stable but the beachface had eroded nearly 40 feet landward this year.*

The Lake Drive (CMP-4, Cell 4) beach cell is bounded by the rock groins at Coral Avenue and south of Lake Drive (closer to Surf Avenue). Following a period of erosion the recreational beach berm had retreated, by April 2012 it extended just 50 feet seaward of the dune toe. This cell does not contain any nearshore structures but received sand during the recent 2<sup>nd</sup> maintenance cycle nourishment project.

Over the 2012/2013 winter the USACE reported sand placement of 37,000 cubic yards in the Lake Drive beach cell (Dwight Pakan, USACE). The beach berm width advanced to approximately 125 feet seaward of the dune toe at elevation 10 feet NAVD 88 with 43.63 yds<sup>3</sup>/ft. of sand added, the shoreline position advanced seaward 60 feet. Aeolian sand accumulated along the foredune crest.

By April 2014 approximately half the beach width added during the recent project was eroded. The shoreline retreated 29 feet with a loss of 24.79 yds<sup>3</sup>/ft. of sand scoured from the beachface slope and swept by longshore currents from the beach cell. The dune and offshore seafloor were relatively stable. Despite the recent losses this beach should still support recreational activity this summer. This location remains one of the more desirable bathing beaches in the Borough with approximately 80 feet of dry recreational beach, a gradual descent into deeper water and a relatively large, shallow offshore platform area for recreational swimming.



**Figure 5. Following Hurricane Sandy the USACE 2nd maintenance nourishment project restored the beach approximately 37,000 cubic yards of sand was added to the recreational beach berm and beachface at the Lake Avenue beach cell. The project increased the beach elevation up to 2.5 feet (10-11ft. NAVD88) and pushed the beach width seaward 60-70 feet. By April 10, 2014 erosion resulted in a shoreline position retreat of 29 feet with a loss of 24.79 yds<sup>3</sup>/ft. of sand cut from the beachface slope.**

## Surf to Cape Avenues



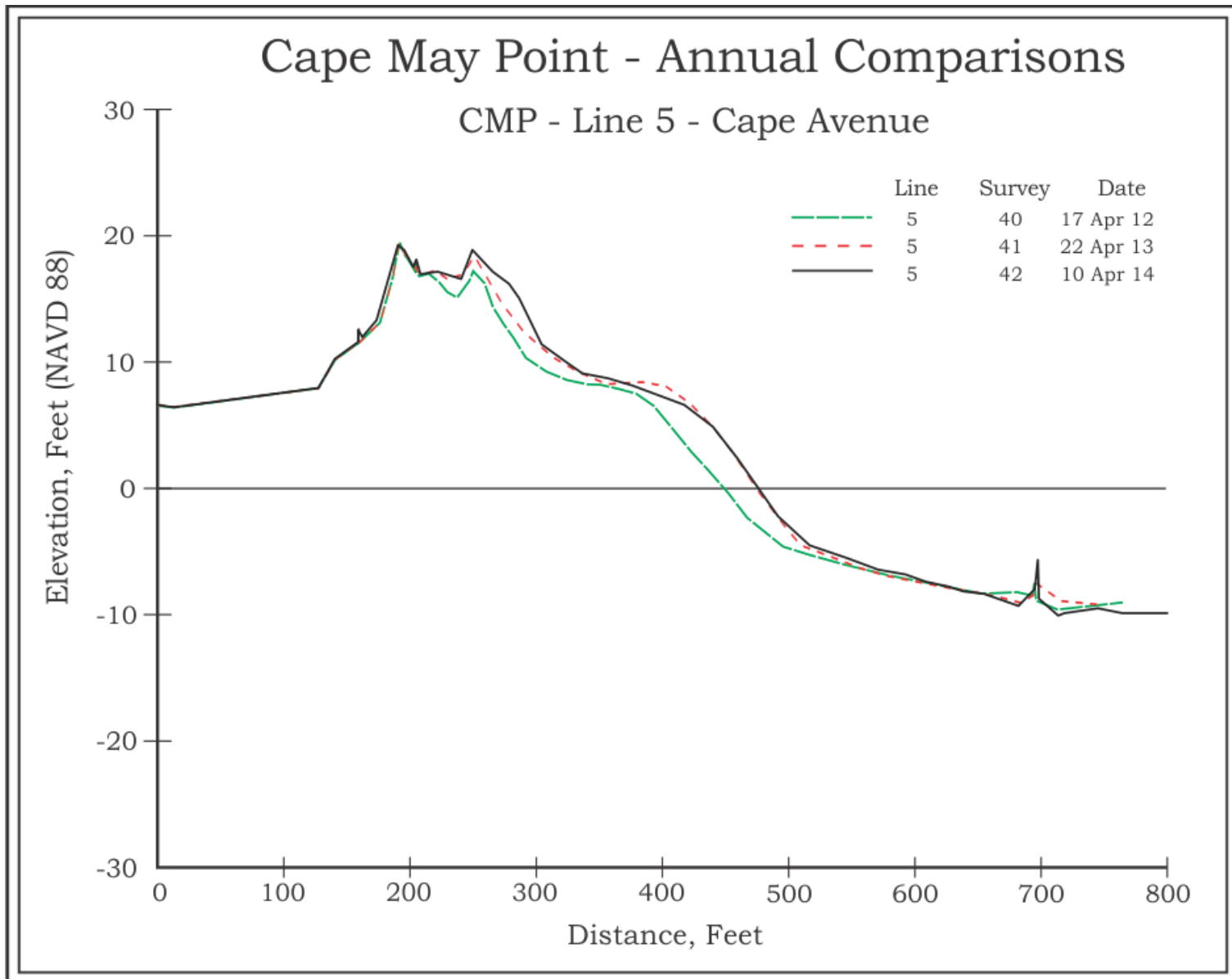
*The April 2013 photo shows a well-developed dune system and wide recreational beach berm. Dune grass had colonized the seaward slope to the dune toe.*



*The photo taken on April 10, 2014 shows a significant accumulation of aeolian sand on the seaward slope. Sand deposition buried the dune grass on the seaward slope. The beach berm remained stable this year.*

CMP-5 (Cell 5) contains the nearshore breakwater unit installed in 2002 during the USACE CMP-227 experimental project. The breakwater units are still present, but nearly buried in sand approximately 200-feet seaward of the zero elevation position. These units are lowest in elevation in the cell's mid-section where swimming is allowed that prevents individuals from encountering the units. In this cell the units pose little threat to recreational swimming but swimming along the rock groins should be restricted where the units are closer to shore.

In 2012 the beach width declined in width and elevation. No sand was placed west of Lake Drive during the 2013/2013 USACE project but natural recovery added 20.63 yds<sup>3</sup>/ft. of sand to the system pushed the shoreline position seaward 25 feet and restored most of the eroded beach width and elevation. Aeolian sand accumulated on the seaward slope and crest of the dune. Through April 2014 the beach width remained relatively stable with aeolian sand added to the dune system across the seaward crest to the toe. The sand added to the dune produced a modest volume gain with 3.49 yds<sup>3</sup>/ft. of sand added. By April 10<sup>th</sup> the dune system had expanded to 200 feet in width with a landward and seaward ridge crest elevation of 19 feet NAVD 88. This additional volume, width and height added to the dune enhanced the system's storm protection for oceanfront properties and infrastructure.



**Figure 6. No sand was reportedly placed directly on this beach during the recent USACE project. Longshore and cross-shore transport moved sand onto this beach by April 2013 elevating the beach and pushing the beach seaward nearly 30 feet, aeolian sand accumulates across the seaward dune slope onto the seaward dune crest. From April 2013 to April 2014 the beach remained remarkably stable while aeolian sand that accumulated on the seaward dune slope added 3.49 yds<sup>3</sup>/ft. of sand here.**



## Cape to Pearl Avenues



*The photo taken on April 2013 shows dune grass partially buried in recent aeolian sand deposition. The dune system and beach are well-developed and stable.*

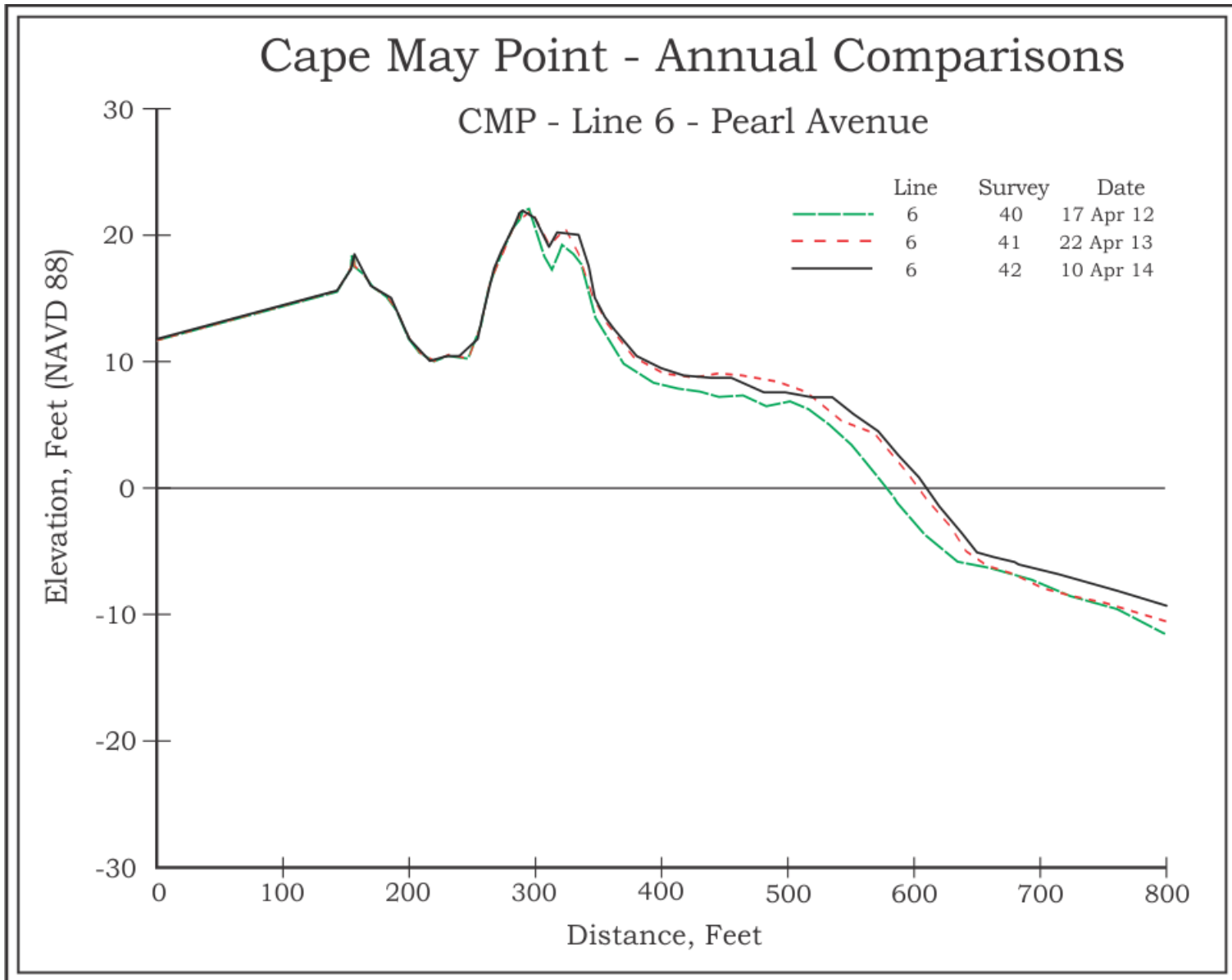


*Aeolian sand continued to accumulate and has buried the dune grass on the seaward slope by April 10, 2014. The recreational beach berm remained stable and provides ample recreational space for beach patrons.*

CMP-6 (Cell 6) is bounded by the rock groins at Cape Avenue and Pearl Avenue (approximately 350 feet to the northwest from the Cape Avenue groin). The nearshore bay floor contains the “Double Tee” structures that were installed as part of the USACE CMP-227 experimental project and have remained buried by sand in the past five annual surveys. At this time, the structures have limited ability in influencing sand retention. With sand shed from the project beaches moving into this site seasonally by predominant longshore drift it is unlikely erosion will expose these units in the near future provided the USACE continues to remain committed to regular project maintenance by adding sand to the system. As a result of the units being buried beneath several feet of sand there is no probability of swimmers reaching the submerged Double Tee structures. These units are located on the seafloor 11 feet below the zero datum and buried by 4 feet of sand nearly 100 feet offshore. The units however might be accessible adjacent to the rock groins, and any recreational activity in the water close to the rock groins should already be prohibited.

Recent changes here were similar to Cape Avenue. Following a period of erosion prior to the April 2012 survey the beach width and elevation were reduced. No sand was placed this far west during the USACE 2<sup>nd</sup> maintenance cycle so the recovery seen by April 2013 was natural as sand shed from the eastern project area was transferred to the western beaches by predominate longshore drift. This site gained 23.83 yds<sup>3</sup>/ft. of sand across nearly the entire profile length from the foredune crest seaward to the survey offshore limits. The additional sand pushed the shoreline position seaward 24 feet.

By April 2014 more sand had entered the system. Sand accumulated offshore and on the beachface slope, aeolian sand was deposited on the foredune slope and crest. The site gained an additional 11.61 yds<sup>3</sup>/ft. of sand by April 10 again likely derived from sand shed off the project beaches and carried west by longshore currents. By the April 2014 survey the dry recreational beach berm extended nearly 200 feet seaward of the dune toe at elevation 8.5 feet NAVD88 with a relatively gentle slope onto a shallow platform that continued offshore nearly 200 feet from the current shoreline position. These beach and nearshore changes make this beach an excellent option for most recreational activities.



**Figure 7. No sand was reportedly placed directly on this beach during the most recent USACE project. Natural processes moved 23.38 yds<sup>3</sup>/ft. of sand onto this beach by April 2013 elevated the beach up to 2 feet and pushed the beach seaward nearly 30 feet, aeolian sand accumulated across the seaward dune slope onto the seaward dune crest. From April 2013 to April 2014 the beach remained remarkably stable to accretive on the offshore slope with 11.61 yds<sup>3</sup>/ft. of sand added here.**

## Pearl to Stites Avenues



*The April 2013 photo shows sand was added everywhere between the crest of the dune to the berm ridge. Dune grass plants are partially buried by the new aeolian deposition.*

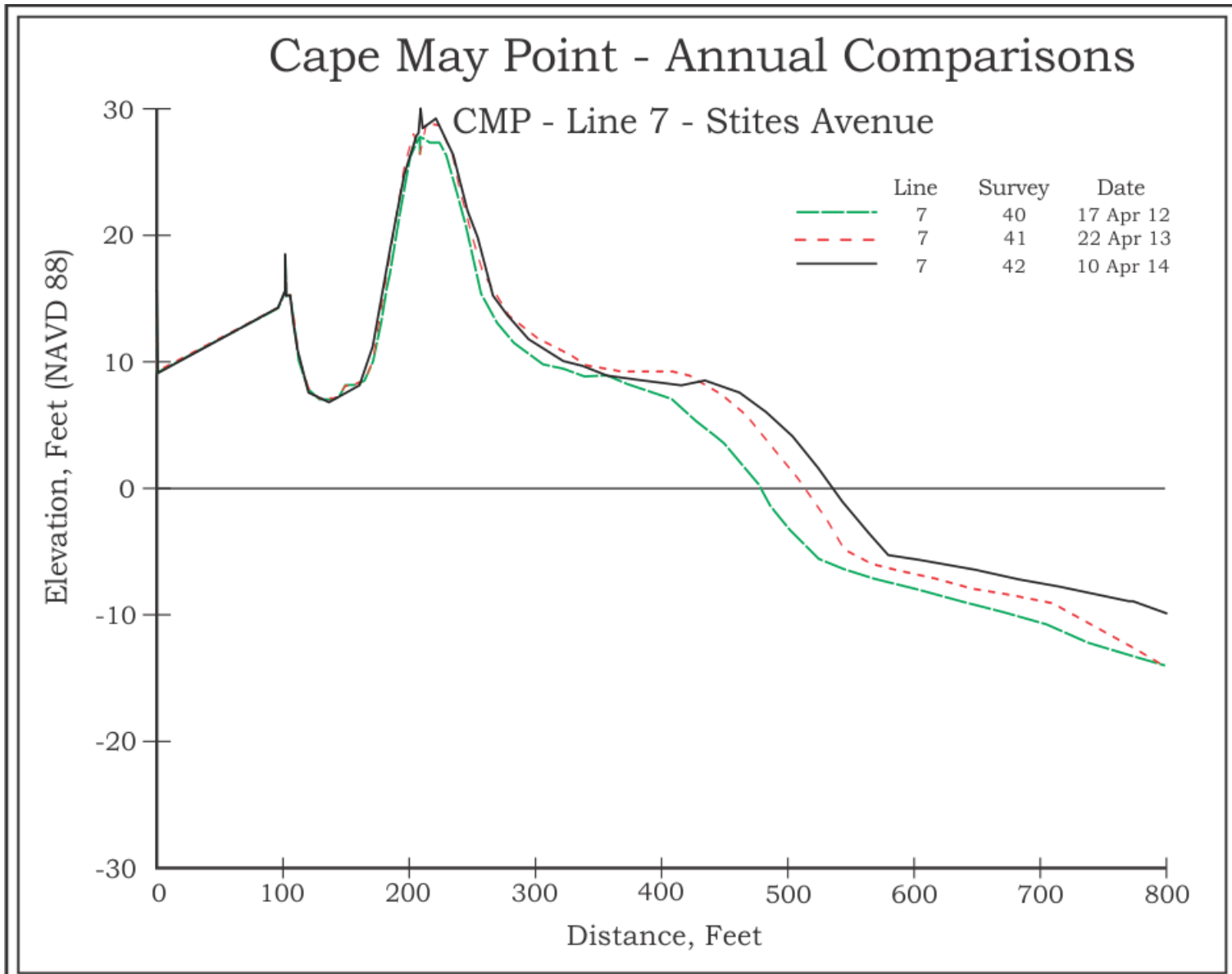


*The April 10, 2014 photo shows continued sand accumulation on the seaward dune slope. The recreational beach berm width has expanded seaward approximately 20 feet during the year.*

Profile CMP-7, located southeast of Brainard Avenue, (Cell 7) is bounded by the rock groins near Pearl Avenue and Stites Avenue. The cell has not received any sand directly from the past USACE beach restoration or maintenance projects. The beach and nearshore here are influenced by the tidal processes of the Delaware Estuary which continue to bring sand to the western beach cells. Sand has accumulated across the entire profile length from the dune crest to the offshore seafloor limits this process continued through April 2014.

In 2013 the annual net gain was 44.21 yds<sup>3</sup>/ft. and 34 feet of seaward shoreline position advance and nearly 40 feet of recreational berm width. Sand accumulation was nearly continuous across the entire profile length seaward from the dune crest to the offshore profile limits. The wind transport effect was most evident in the complete in-filling of the Stites Avenue beach access pathway where 4 feet of sand was deposited completely burying the pathway and seating area at the dune crest with new material.

By April 2014 another lobe of sand had moved landward from offshore onto the nearshore and beachface slope up to the berm crest. Modest aeolian transport deposited a thin veneer of sand across the primary dune feature. The net annual gain was 33.51 yds<sup>3</sup>/ft. of sand with a 22-foot advance in the shoreline position. Sand added to the offshore slope raised the seafloor elevation that created a shallow platform that extended approximately 250 feet seaward of the shoreline position (zero datum). From 2012 to 2014 sand added to the nearshore and offshore seafloor has raised the elevation between 2-4 feet. With no structures present at this location the wide dry beach should provide beach patrons with abundant recreational area and good nearshore swimming conditions for the summer season. As always caution should be used when determining if swimming should be allowed in deeper water near the end of the groins or along the rocks.



**Figure 8. No sand was reportedly placed directly on this beach during the most recent USACE project. Natural processes moved 44.21 yds<sup>3</sup>/ft. of sand onto this beach by April 2013 elevated the beach several feet and pushed the beach seaward approximately 30 feet, aeolian sand accumulated across the seaward dune slope onto the seaward dune crest. From April 2013 to April 2014 the beach gained sand from the beachface seaward to the offshore limits with 33.51 yds<sup>3</sup>/ft. of sand added here as the shoreline advanced seaward 22 feet.**

## Stites to Alexander Avenues



*In spite of being two cells removed from direct sand placement in 2011, this cell has gained sand on the dune and beach with little change offshore as longshore drift moved sand west filling behind the terminal groin.*



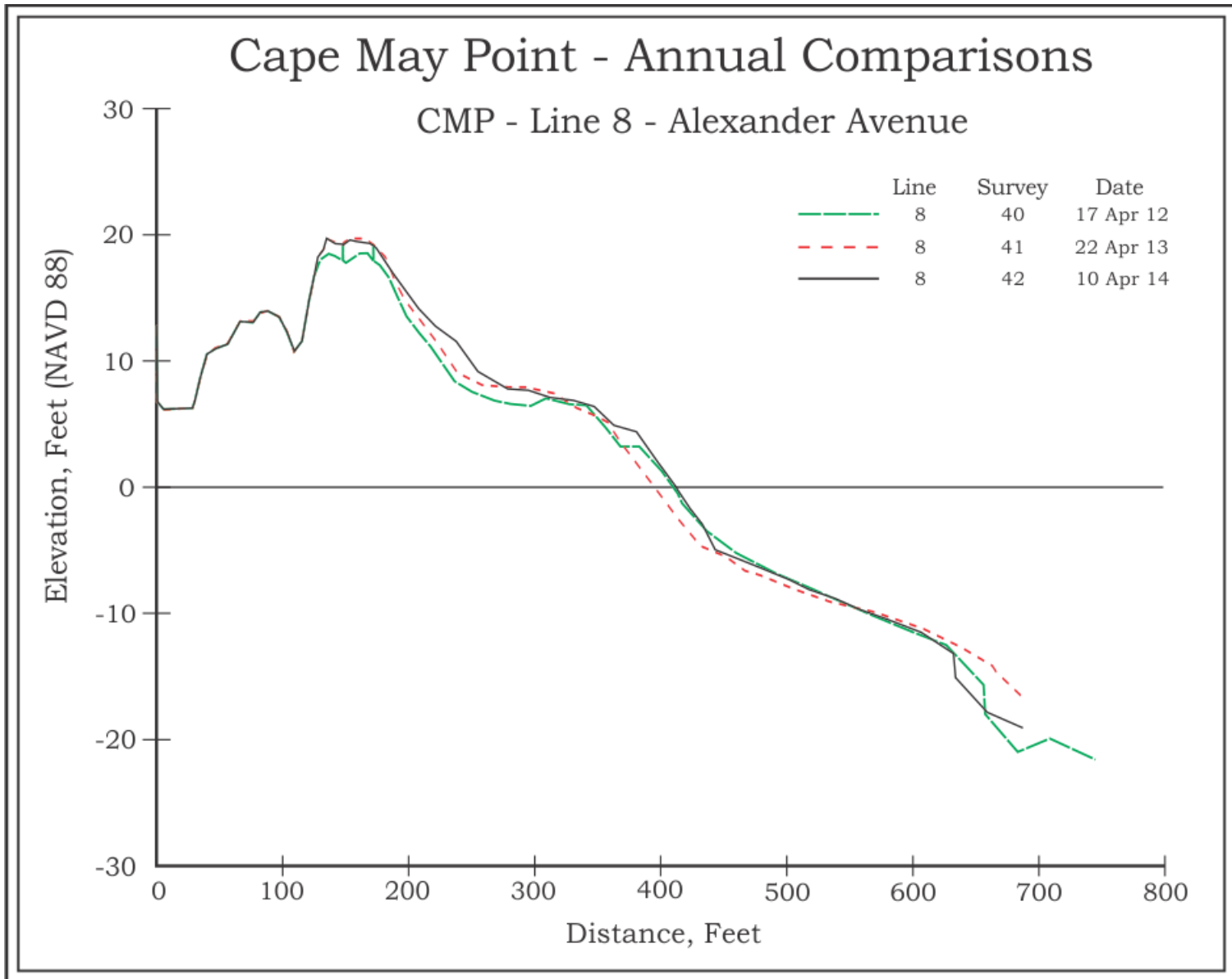
*Sand continued to accumulate both on the beachface and across the recreational beach berm. By April 10, 2014 aeolian sand had buried much of the dune grass that had colonized the lower slope and dune toe in 2013.*

The Alexander Avenue location, CMP-8 the westernmost cell (Cell 8), is positioned between the last two groins in Cape May Point. Again sand was never placed on the shoreline here during the USACE projects. Despite the lack of sand placement this cell is nearly full to the tip of the western groin so loss to the western Delaware Bay shoreline is considerable. The offset in the beach west of the Alexander Avenue groin means that most of the sand is lost to the nearby bay floor and does not appear on the Sunset Beach shoreline.

Approximately 800 cubic yards of new sand was added between the dune crest most distant along the right hand photograph extending the dune across the Alexander Avenue access pathway to the timber bulkhead at the first private property at the beach on the west side of Alexander Avenue. This action closed a beach-surface elevation storm wave pathway into the western part of Cape May Point by raising the dune barrier about 6-7 feet in elevation. Pedestrian cross over paths and vegetation were later added. The Borough took advantage of an offer by the NJDEP to fund the addition of sand here as a post-Sandy betterment to increase storm resilience for the Delaware Bay shoreline of the community.

After several years of accumulation the beach continued the trend in 2013 and accumulated sand primarily on the dune and upper beach. A gain offshore offset modest erosion of the beachface slope for a net annual gain of 7.24 yds<sup>3</sup>/ft. of sand by April 2013. Through the rest of 2013 to April 2014 the dune continued to accumulate sand from the seaward crest to the seaward toe. Sand moved onshore added to the beachface slope that advanced the shoreline position seaward 17 feet. The net annual volume change was a modest gain of 4.45 yds<sup>3</sup>/ft. of sand with onshore gains partially offset by a loss in the seafloor elevation near the profile limits. The dry beach remains wide enough to support summer recreational activity onshore while the nearshore slope is steeper in this cell with water depths of -10 feet NAVD88 within 100 feet of the shoreline. The steeper slope and drop off near the end of the groins along with strong tidal currents in this region should probably limit swimming activity by most to the shallow nearshore region.





**Figure 9.** Again no sand was placed directly on this beach during the most recent USACE project. Natural processes moved 7.23 yds<sup>3</sup>/ft. of sand onto this beach by April 2013 sand accumulated across the upper beach and seaward dune slope onto the seaward dune crest. From April 2013 to April 2014 the dune, beach and beachface slope continued to gain sand the shoreline advanced seaward 17 feet with a modest net volume gain of 4.45 yds<sup>3</sup>/ft of sand.

**Table 1.**  
**Summary of Shoreline and Profile Sand Volume Changes**  
**Between**  
**April 2013 and April 2014 at the Cape May Point Beaches**

Profile Number	Shoreline Change (feet)	Volume Change (yds <sup>3</sup> /ft)	Cell Distance (feet)	Net Volume Change (yds <sup>3</sup> )
CMP-0	-5.8	-17.28	420	-7,258
CMP-1	-51.3	-51.78	445	-23,042
CMP-2	-28.1	-26.64	460	-12,254
CMP-3	-11.0	-11.22	450	-5,049
CMP-4	-28.5	-24.79	675	-16,733
CMP-5	1.7	3.49	690	2,408
CMP-6	6.8	11.61	710	8,243
CMP-7	21.9	33.51	680	22,787
CMP-8	17.5	4.45	660	2,937

**Total Volume Change for Cape May Point = -27,961**

The summary table above compiles the annual shoreline and beach volume change information between 2013 and 2014. The changes are based on the advance (seaward) or the retreat (landward) of the zero elevation datum position on each cross section. This elevation represents the “shoreline” position; it approximates the proper change horizontally for any shoreline point selected on the beachface subject to daily wave run-up. The unit sand volume computed for the cross section in cubic yards of sand per foot of shoreline is multiplied by the distance between the groins in Cape May Point to arrive at the net volume in the right column for each cell. For the April 2013 to April 2014 time frame, the Borough’s beaches recorded a modest net loss of 27,961 cubic yards of sand focused on the eastern beaches.

The 345,000 cubic yards of sand added to the Lower Cape May Meadows – Cape May Point project beaches by the USACE in November 2012 to January 2013 has provided a vast influx of sand to the Cape May Point beaches. Approximately 108,697 cubic yards (cy) of sand was placed directly on the Borough’s beaches during the project limited to CMP 0, CMP 1 (71,697cy) and CMP 4 (37,000cy) cells. Sand accumulation in the remaining cells and especially along the western shoreline is largely derived from sand shed from the USACE project beaches and transferred longshore from the natural area into Cape May Point where the westerly curve of the shoreline into Delaware Bay allowed deposition on the beach. This process has continued through April 2014.

The project beach at Lighthouse Avenue remained stable as sand readily feeds into this location from the natural area and Cape May City unimpeded by structures. From CMP 1 to CMP 4 the beaches all lost sand with modest to moderate erosion along the beachface. Shoreline and beach width retreat at these

sites ranged from -11 to -51 feet with corresponding volume losses of -11.22 yds<sup>3</sup>/ft. to -51.78 yds<sup>3</sup>/ft. of sand eroded from these beaches.

This erosional trend rapidly transitioned moving west along the Cape May Point shoreline to a region of accretion and expansion both on the recreational beach and dune system. From CMP 5 where the shoreline was relatively stable to CMP 7 where the shoreline advanced 22 feet with the accumulation of 33.51 yds<sup>3</sup>/ft. of sand shed from the project beaches then transported to this region on longshore currents. In the past two years the beach width at Stites Avenue has expanded seaward 60 feet all from natural processes that has redistributed sand placed on the project beaches to the western shoreline. Similar gains but less dramatic have occurred at each beach from Cape Avenue to Alexander Avenue during the same time frame. The wide beaches have provided a source of sand for aeolian processes to move sand to the dune system. Sand added to the crest and seaward slope has raised the crest elevation and expanded the overall width of the system. The individual cross sections show a uniform deposition of sand from nearly each dune crest, down to the beach and across the berm into the water this could only be true if large volumes of new sand were being introduced.

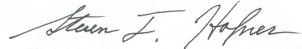
The impact of these changes to the degree of safety from collisions by bathers on the submerged breakwater units improved the situation from last year.

1. Cells 0 and 1 do not have structures the beach at Lighthouse remained relatively stable with a slightly steeper slope further offshore while the Lehigh Avenue beach rapidly eroded. These two beaches still have steep slopes into deep water with strong tidal currents into and out of Delaware Bay.
2. The zero elevation position (NAVD 88 zero, which equals about 1.5 feet above the average low tide) in Cell 2 at Whilldin Avenues is now about 125-foot distance from the breakwater structure. A deeper trough has developed between the water's edge and the breakwater units nearly -11 feet immediately landward of the units. While about 50 feet landward of the units the depth is approximately -6 feet. The swimming area is limited, but may again be manageable this year. The CRC again recommends installing a line of floats indicating the maximum distance for swimming that should be about 30 feet from the breakwater reef. Swimming near the groins has been avoided in all cells, but here additional caution should be used as the units are slightly closer to the beach adjacent to the rocks.
3. Cell 3 at Coral Avenue the shoreline position has retreated slightly the breakwater units in April were approximately 75 – 80 feet from the shoreline position (zero datum). The beachface slope remains fairly steep with development of a small trough landward of the units -8 feet. In the current beach configuration this location would only allow approximately half the distance between the reef and the mid-tide beach's water edge as safe for water activity. It is the CRC recommendation that entry into the water be limited to no more than 3-foot depths.
4. Cell 4 has no structures offshore and a relatively flatter nearshore slope. This site remains overall a good option for a swimming beach in Cape May Point this season. The shallow slope in the water will be very welcome at low tide for children and their parents/grandparents.
5. Cells 5 and 6 contain the newer units but pose minimal risk for swimming in 2014. Both reef structures lie in greater than - 8 feet of water several hundred feet from the water line at low tide. The "Double Tee" structure in Cell 6 is once again buried with additional sand. Swimming near the groins should always be avoided since the units are slightly closer to the beach adjacent to the rocks.
6. Cells 7 and 8 beaches are significantly enhanced with a much wider berm area and shallower water offshore at the Stites Avenue beach. Available recreational area and swimming has been substantially improved at these beaches since 2005. Other issues have guided the Borough's decision to close the Alexander Avenue beach to swimming due to its heavy use by fishermen plus

very strong tidal currents moving into Delaware Bay past this beach with a major offset landward in the beach west of the Alexander Avenue groin making for a serious rescue situation should a swimmer be swept past this groin on a flood tide interval. This condition has not changed.

The Coastal Research Center (CRC) will continue to monitor the conditions on the Cape May Point beaches at the Borough's request. Please contact the CRC with any questions or concerns.

Sincerely,



Steven Hafner, PSM  
Assistant Director Field Research  
Coastal Research Center