

STOCKTON UNIVERSITY COASTAL RESEARCH CENTER



This view is of New Jersey's coastline from mid-Long Beach Island to Cape May Point from the International Space Station taken July 17, 2019 and provided to the Coastal Center by Christina Hammock-Koch, NASA astronaut.

New Jersey Beach Profile Network 2018 Annual Report on Shoreline Changes in New Jersey's Four Coastal Counties Raritan Bay to Delaware Bay Spring of 2017 Through Fall of 2018

Prepared for:
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The Stockton University Coastal Research Center



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On

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TABLE OF CONTENTS

• Executive Summary	1
• Acknowledgements	3
• Introduction	3
• Storm Recovery and Beach Project Effectiveness	3
• Monmouth County	4
Figures 1a-1d. Monmouth County Station Locations	5
Site Descriptions	9
Site Information – Cliffwood Beach to Riverside Drive (Figs 3 – 104)	29
Summary & Conclusions	131
• Ocean County	132
Figure 105. Ocean County Station Locations	133
Site Descriptions	134
2018 Beach Fills in Ocean County	134
Figure 106 USACE Design Profile for Ocean County’s Project	134
Figure 107 Mantoloking’s Shoreline January 2016 compared to March 2019	135
Table 1 2018 Storm Activity	137
Site Information – Water Street to Beach Haven (Figs 108 - 135)	138
Summary & Conclusions	166
• Atlantic County	167
Figure 135. Atlantic County Station Locations	168
Atlantic County Shore Protection Summary	169
Site Descriptions	169
Tables 2 & 3 Shoreline & Sand Volume Changes S2017 – F2018	173
Site Information – Brigantine Natural Area to Longport (Figs 137 – 146)	174
Summary & Conclusions	184
• Cape May County	186
Figure 147. Cape May County Station Locations	187
Cape May County & Delaware Bay	188
Site Descriptions	188
Site Information – Gardens Road to Reeds Beach (Figs 148 – 178)	191
Summary and Conclusions	222

APPENDIX & BIBLIOGRAPHY

• Monmouth County Sand Volume & Shoreline Change Values (Tables 4 & 5)	224
• Ocean County Sand Volume & Shoreline Change Values (Tables 6 & 7)	228
• Atlantic County Sand Volume & Shoreline Change Values (Tables 8 & 9)	230
• Cape May County Sand Volume & Shoreline Change Values (Tables 10 & 11)	231
• Typical New Jersey Beach Profile Terminology	233
• Glossary of Coastal Terms	234
• Bibliography	236



EXECUTIVE SUMMARY

The New Jersey Department of Environmental Protection (NJDEP) collaborated with the Stockton University Coastal Research Center (CRC) in 1986 to create the New Jersey Beach Profile Network (NJBPN). This project commenced as an annual oceanfront and Raritan and Delaware Bay shoreline survey in the fall between 1986 and 1993, then switched to a spring and a fall survey at each site in 1994. This allowed the CRC to summarize winter storm damage each spring and review beach accretion following the summer season. The 2018 report is divided into four coastal county segments and gives a summary of beach changes in each county.

The US Army Corps of Engineers (USACE) has established coastal shore protection projects along 100% of the 97 miles of New Jersey's oceanfront shoreline with the NY District responsible for Raritan Bay efforts and the oceanfront from Sandy Hook National Seashore, south to Manasquan Inlet. The Philadelphia District manages from Manasquan Inlet south to Cape May Point and into Delaware Bay. Currently, the only segment where construction of the selected shore protection effort has yet to be constructed encompasses North Wildwood to Lower Township (The Wildwoods). Here, a project is under final implementation processes at the District to complete work along the NJ shoreline.

2018 Shoreline Management:

The post Hurricane Sandy USACE work on authorized coastal storm damage reduction projects was completed by the end of 2015. By the fall of 2017 the USACE Absecon Island project, initially completed for Atlantic City and Ventnor in 2003, was extended through Margate and Longport. Work continued in Margate with the construction of a stormwater management/ocean drainage system to replace the existing process of ocean street-end discharge onto the beach landward of the dunes.

In 2017, work commenced on the Manasquan Inlet to Barnegat Inlet project for the developed portion of Northern Ocean County. Multiple dredges have operated since spring 2017 to carry sand from the offshore borrow sites and place the material on the beach to build the design beach/dune cross section. The project stops at the Island Beach State Park northern boundary in the south and tapers off to no added material in the northernmost third of Point Pleasant Beach Borough located just south of Manasquan Inlet. As of the fall of 2018, the project was complete across much of northern Ocean County with Bay Head and Point Pleasant Beach Boroughs still to be completed. Litigation continues in both communities as oceanfront owners object to the easement requirement needed to legally have the federal government's contractors place sand above the mean high-water line on private land.

The USACE continues its evaluation of the proposed Wildwoods coastal storm damage reduction project where sand derived from the excess material accumulating on the Wildwood and Wildwood Crest municipal beaches will be excavated and used to restore the losses on the northernmost North Wildwood oceanfront. Again, private ownership to the mean high-water line in the City of Wildwood is delaying the start of construction, perhaps until 2022.

At the request of the New York District US Army Corps of Engineers (NY District), the NJDEP Division of Coastal Engineering (NJDEP DCE) and the CRC, surveyed 65 new profile locations in the fall of 2017. These

were selected from existing NY District survey sites between the present NJBPN survey locations. The CRC installed or upgraded survey markers and backup monumentation at the new locations. These sites are distributed among the original 34 oceanfront locations. Including the three Raritan Bay sites, the number of NJBPN sites for Monmouth County is 102 (Figure 1a-d). The 2018 contract included surveys completed at the old and new Monmouth County locations in the spring and fall of 2018. The Monmouth County section of this report contains comparisons among the three existing surveys to show changes to the NY District’s Monmouth County coastal storm damage reduction effort between Sandy Hook National Seashore and Manasquan Borough. The number of NJBPN locations now totals 171 coast-wide.

All NJBPN survey data were analyzed to show changes in shoreline position and sand volume in each coastal county for an 18-month study interval. The seasonal, annual, and 18-month summaries are provided as county-wide averages in the tables below and in expanded tables for each site and each survey at the end of the report.

All four counties maintained a positive sand volume gain during the study interval at double digit values for the 18-month evaluation. Two counties lost minor amounts of sand volume during the winter (F 2016 to S 2017 surveys). In the summer of 2017e protection project (Table 1a).

	Sand Volume Changes at the NJ Oceanfront			
	S 17 – F 17	F 17 – S 18	S 18 – F 18	S 17 – F 18
	Cu. yds./ft.	Cu. yds./ft.	Cu. yds./ft.	Cu. yds./ft.
Monmouth County	2.62	-5.69	-5.07	-2.48
Ocean County	8.21	6.34	33.81	46.56
Atlantic County	35.30	18.99	-7.79	48.78
Cape May County	2.87	1.82	-9.50	-5.87

The shoreline change values represent the difference in horizontal distance of the zero elevation position (0.0 ft. NAVD88) from the reference monument on the two profiles being compared. Advances seaward are presented as positive integers and retreat landward are negative. Each number shown in the table below is the average change for all the sites in each county. Ocean and Atlantic County shoreline positions averaged double digit advances seaward over the 18-month period. This is directly related to the USACE’s ongoing beach projects. Monmouth and Cape May County averaged minor shoreline retreat values (Table 1b).

	Shoreline Position Shifts Landward (-) or Seaward (+) at the NJ Oceanfront			
	S 17 – F 17	F 17 – S 18	S 18 – F 18	S 17 – F 18
	Feet	Feet	Feet	Feet
Monmouth County	9.77	-10.02	-7.08	-6.67
Ocean County	32.31	-7.16	34.73	59.88
Atlantic County	42.26	19.43	4.87	66.56
Cape May County	4.58	1.04	-11.48	-5.87

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INTRODUCTION:

The New Jersey Beach Profile Network (NJBPN) project provides site-specific information that can be expanded into a regional assessment of NJ coastal zone changes. It is designed to document seasonal and storm-related damage assessments of the New Jersey shoreline. Each of the original sites has been visited annually in the fall since 1986. Semi-annual visits, each spring and fall, began in 1994 following the passage of Public Law 93. The program was expanded to take surveys every spring following the winter northeasters and in the fall following summer beach accretion. During the first decade of work, new sites were established in the gaps of coverage and at all shorelines adjacent to tidal inlets. The information collected consists of photographs of the beach/dune system at each site, a topographic profile of the dune, beach and seafloor to a minimum depth of 15-18 feet, and field notes on significant geomorphic changes. Also, construction activity is noted and necessary information regarding quantity and duration of such activity is gathered. The field data are used to generate graphical cross section plots, which can be used for comparison across the width of the active coastal zone. The direct comparison of any two cross sections can be used to calculate sand volume and shoreline position changes during the time interval between the two surveys.

The major innovation in recent years has been the CRC, NJDEP DCE, and the USACE-New York District coordinated efforts to add 65 new profile sites to Monmouth County that were distributed along the oceanfront coastline south from Sandy Hook National Seashore. The USACE sites were added to provide more continuous coverage of shoreline changes within the recently renourished Sea Bright to Manasquan coastal segment. Each of the USACE sites was initially surveyed during the fall of 2017. Each was included in the 2018 contract work, which will allow individual site change calculations to be completed for the 2018 annual report. Ground photographs at each of the new sites replace the Google Earth views used last year to show site locations. The tables of computed shoreline and sand volume changes among the four seasonal survey dates do not include values for these new locations in Monmouth County for the spring of 2017 because the fall 2017 data reflects the initial survey of these new sites.

A series of mild to moderate northeast storms did have an impact between early March and just prior to Memorial Day in 2018, but serious storm events were absent including Atlantic hurricane tracks in proximity to the NJ coastline during the 2018 hurricane season. The tables of beach volume and shoreline change data are found after the county site descriptions for Cape May County in the appendix. A summary of each county's coastal zone activities follows the county profile site location diagram at the start of each county discussion. Conclusions based on the study data for this time interval appear at the end of each county section.

STORM RECOVERY AND BEACH PROJECT EFFECTIVENESS:

It is now over 6 years since Hurricane Sandy, and based on both the recovery rates observed following the 1992 northeast storm and recovery since Sandy, the vast majority of natural sand migration back to the NJ beachfront has occurred. The massive effort by the NJ DCE and the two Army Corps Districts was critical in instituting a significant recovery in the level of beachfront storm protection for NJ coastal communities. It is a testimony to the efforts of local leaders, the NJDEP DCE staff and leadership, the federal planners and engineers, and the interest by local citizens that New Jersey is the only US state with 100% of its developed oceanfront shoreline under federal jurisdiction with either completed projects or one final project about ready to be built. In addition, work has been completed or in final planning along the NJ Raritan Bay at three sites (Port Monmouth, Keansburg, and Union Beach). The Philadelphia District has completed projects along the Delaware Bay shoreline in NJ with several in the design stages for Fortescue, Money Island, and Villas.