

**2021 FINAL REPORT - TO THE CITY OF NORTH WILDWOOD
ON THE
CONDITION OF THE CITY BEACHES**



View of the northern oceanfront beach and the Hereford Inlet shoreline on June 12, 2021. The sand stockpile had been distributed from its northernmost deposition point south of 7th Avenue to 3rd Avenue for the bathing season. Note the long ebb-tidally oriented shallow water “tail” of white water emanating from the shoal island in the inlet off New Jersey Avenue extended. This became the intertidal sand surface accumulating between the inlet jetty and Surf Avenue this summer. (photo by Ted Kingston)

**PREPARED FOR: THE CITY OF NORTH WILDWOOD
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NORTH WILDWOOD, NJ 08260**

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NOVEMBER 4, 2021**

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Introduction:

This past spring North Wildwood was determined to provide beach access and shore protection by means of moving sand from the City of Wildwood back to the North Wildwood oceanfront beach. The effort was beyond any yet attempted since 2011 when the initial back-pass operation was completed. The sand volume moved reached the value of 357,000 cubic yards exceeding any other year's work. The sand was spread across 3,000 feet of oceanfront adding to the dune width, restoring some of the dune field north of the lifeguard building.

The Stockton University Coastal Research Center completed its spring survey in June 2021 covering all the inlet and oceanfront cross sections. This survey was completed following all sand transfer from the City of Wildwood plus the majority of the regrading and dune reconstruction seaward of the newest section of the steel bulkhead. In October of 2021 the fall survey was completed at the array of cross sections again. This effort showed that sand had accumulated along the Hereford Inlet beach from the jetty northwest to Surf Avenue and extended well out into Hereford Inlet as the channel close to the inlet beach closed. The main ebb-tidal channel presently exits to the northeast of a shoal island that has been migrating toward the inlet opening to the sea allowing that accumulated reservoir of sand to merge with sand moving north from the oceanfront beach, all now adding to the beach shoreline.



Figure 1. A view along the North Wildwood northern oceanfront and Hereford Inlet shoreline September 25, 2021. The ebb-tidal channel that appeared to be closing at the seaward end as of March 13, 2021 has done so with breaking waves extending northeast from the jetty into the inlet and along the edge of the island shoal's ebb-sand deposit "tail". The inlet cross section starting at the base of the jetty extended almost 2,200 feet into the inlet without the rod holder needing to swim at low tide on October 19, 2021.

Figure 2 was taken on September 25, 2021 looking northeast along the axis of the North Wildwood oceanfront beach starting in Wildwood. The three piers, the older dunes north of the piers and the restored beachfront beyond the old dunes all show a tapering beach width extending to the jetty with some dry sand exposed along the final 5 city blocks of oceanfront. The white water in the inlet defines the growing shallows accumulating adjacent to the North Wildwood inlet shoreline.

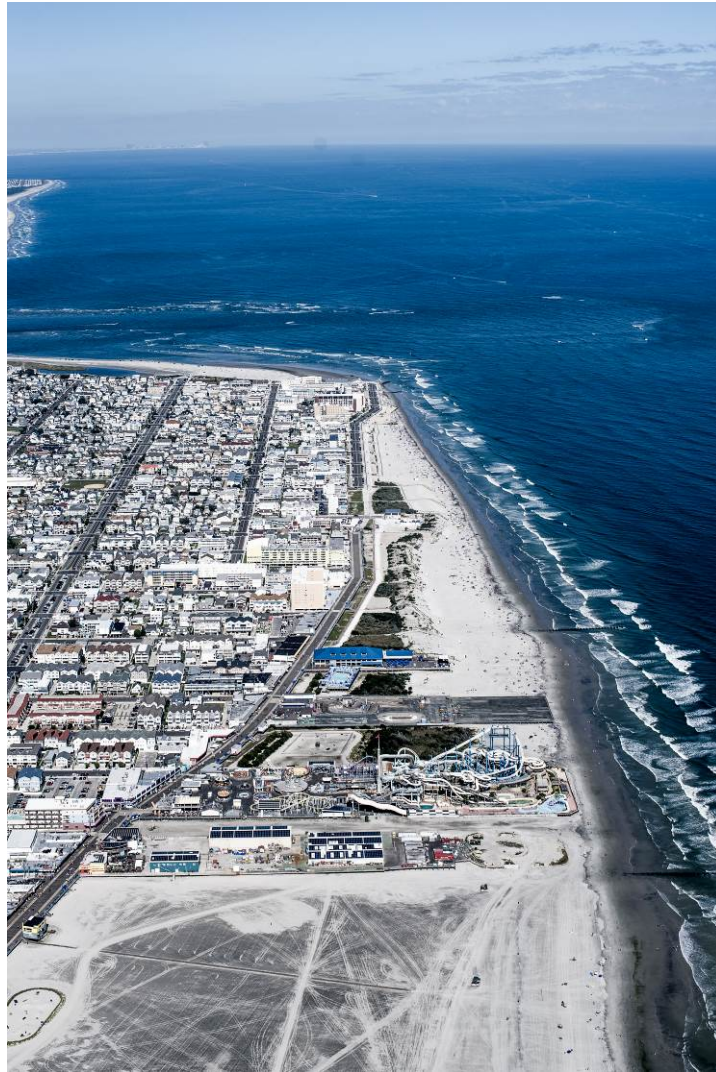


Figure 2. This view of the North Wildwood oceanfront beach from September 25, 2021 shows the post-summer beachfront as it evolved following sand back-passing this past spring.

Beach nourishment began in 2009 with a joint North Wildwood and NJ State effort. However, that work was subject to a series of storms classified as FEMA disaster events and therefore subject to Category “G” reimbursement for losses suffered from a declared storm event. Sand was restored following Hurricane Irene plus the three other northeast storm declarations in 2011. The damage from Irene was compensated for by hauling 93,000 cubic yards of sand from the beaches of Wildwood Crest to the northern municipal shoreline. Hurricane Sandy damage was more extensive, but the City cooperated with the contractor dredging sand from Hereford Inlet’s borrow zone to restore Stone Harbor’s beach damage and piggybacked onto that project to add 153,000 cubic yards of sand to the erosion zone with FEMA reimbursement as the last approved transfer using any federal funding of Hereford Inlet sand to either inlet-adjacent community for beachfront restoration using sand nourishment from Hereford Inlet.

Since Sandy, back passing provided 171,000 cubic yards by mid-May 2016, another 190,000 cubic yards by May 2017, 153,375 cubic yards were moved by Memorial Day, May 2018, and in 2019 another 164,776 cubic yards of sand were stockpiled at the northern dune toe. Sand hauling totals, prior to 2021, equals 899,151 cubic yards of sand originally found on North Wildwood beaches, but transported southwest into Wildwood City over time. This year by Memorial Day 2021, the sand volume extracted from Wildwood grew by 357,000 additional cubic yards of sand that was spread and graded into the final beach profile that was present this past summer.

North Wildwood Engineered Beach History/Performance:

Any hydraulic dredging for sand from Hereford Inlet will require new permits from both the NJDEP and USACE. The CBRA issues remain un-resolved because of litigation implemented to stay the Interior Secretary's fall 2020 letter was dismissed when the new administration reversed it entirely (reference is made to the July 2021 letter concurring with said reversal by Secretary Haaland). Another option is to withdraw the Hereford Inlet authorized sand borrow zone footprint from the CBRS mapping to exclude it from future consideration as a part of the CBRS unit #9. The borrow zone footprint lies offshore over a mile from any potential bird habitat, is entirely an ebb-tidal delta sand deposit so supports no benthic fauna and is subject to severe wave turbulence either twice daily at low tide or all day if waves are larger than usual. This effort continues with the support of Congressman Jeff VanDrew.

Oceanfront Beach Surveys:

These surveying activities continue a monitoring program that began in 2009 following the initial City/State beach restoration project. The profile stations are spaced 200-feet apart and were established to determine cumulative changes and performance of the beach restoration project. The close spacing is necessary to provide the required sand volume lost during a Federal Disaster Declaration for a damaging storm. This allows FEMA to conduct its damage assessment and provide reimbursement to restore the engineered beachfront to pre-storm conditions. Since they would pay the mobilization, adding additional material at that time would be far less costly at the "per yard delivered" contract rate. However, with the current CBRS restrictions in place, moving sand with FEMA funding would not be allowed and other sources would have to be found.

The following is a list of the studies included in this report and the respective survey dates are:

- **Survey 37** **July 7, to July 14, 2020**
- **Survey 38** **January 21 and 22, 2021**
- **Survey 39** **June 9, 14 and 16, 2021**
- **Survey 40** **October 19 and 24, 2021**

Tables 1 through 3 on the following pages are composites of all 40 transects (5 on the Hereford Inlet shoreline and 35 on the oceanfront) surveyed at a 200-foot parallel spacing along the shoreline. The area at the 2nd Ave. jetty is calculated as an arc between two profile transects extending at a right angle from the jetty base, one into the ocean and the other into the inlet.

Each transect was run from the landward dune toe into the ocean to a depth of approximately 12 feet of water. The older dunes templates have been updated to reflect their replacement. Each of the new dune transects between 4th Ave. and 16th Ave. was surveyed to generate a new template for later surveys. Sand volumes were computed between the June 2021 and October 2021 surveys. The values for sand volume changes in cubic yards per foot of shoreline were averaged between adjacent transects, divided by two, then multiplied by 200 to gain the sand quantity in each 200-foot wide cell. The three tables are all based on the same survey comparison, but the CRC separated the numbers generated along each profile to sand volume changes seen between the dune reference point and the zero-elevation position on each profile (Table 2); the sand volume changes seaward of the zero-elevation position on each profile to the last point taken (Table 3); and the sand volume changes computed for each profile transect in its entirety (Table 1).

In Summary:

1. Large sand quantities have been deposited along the Hereford Inlet shoreline extending seaward from Surf Avenue to the jetty and wrapping around onto the northern 600 feet of oceanfront beach.
2. The back-pass sand deposited on the beach to the mean low water line appears to have migrated offshore reducing the beach width and elevation along the northern 5,500 feet of oceanfront.

3. Some oceanfront material has moved around the inlet jetty onto the inlet beach and immediate offshore areas.
4. Gains offshore appear to generally have been derived from erosion of the sand graded out on the beach.
5. Some sand accumulated along the southernmost 1,000 feet of North Wildwood's oceanfront beaches indicating continued transport south back into Wildwood City.
6. The loss on the beach above zero elevation was offset somewhat by gains in sand volume offshore. The net sand volume change between June and October 2021 was -8,452 cubic yards.
7. The beach/dune area lost 45,566 cubic yards while the offshore region gained 37,113 cubic yards. The lions share of that offshore gain came from the 45,305-cubic yard overall gain between Surf Avenue on the inlet beach and 4th Avenue on the oceanfront beach including the jetty.

Table 1						
North Wildwood Beach Fill						
Shoreline and Sand Volume Changes (Entire Profile)						
June 2021 to October 2021						
Profile	Shoreline	Volume	Avg. Volume	Distance	Summary	Cumulative
	Change	Change	(cu yds./ft.)	Between	Profile Chg.	Sand Vo.
	(feet)	(cu yds./ft.)	(cu yds./ft.)	(feet)	(cu yds)	(cu yds)
<i>Hereford Inlet Shoreline</i>						
-6+00	282	30.72				
			37.69	200	7,538	7,538
-4+00	508	44.65				
			59.35	200	11,870	19,407
-2+00	553	74.05				
			57.56	200	11,511	30,919
-0+00	110	41.07				
		Arc = 90.0	26.98	10,832	10,832	41,751
0+00	13	12.89				
			13.23	200	2,645	44,396
2+00	3	13.56				
			7.21	200	1,442	45,838
4+00	4	0.86				
			-2.66	200	-533	45,305
6+00	-3	-6.19				
			-11.93	200	-2,386	42,919
8+00	-36	-17.68				
			-16.39	200	-3,278	39,641
10+00	-42	-15.11				
			-16.53	200	-3,306	36,335
12+00	-35	-17.95				
			-17.67	200	-3,533	32,802
14+00	-30	-17.38				
			-15.56	200	-3,112	29,690
16+00	-26	-13.74				
			-13.92	200	-2,784	26,905
18+00	-22	-14.10				
			-13.71	200	-2,743	24,163
20+00	-27	-13.33				
			-16.00	200	-3,199	20,964
22+00	-24	-18.66				
			-19.58	200	-3,915	17,048
24+00	-28	-20.49				
			-18.15	200	-3,631	13,417
26+00	-15	-15.81				
			-16.62	200	-3,325	10,093
28+00	-11	-17.44				
			-15.26	200	-3,052	7,040
30+00	-15	-13.09				
			-13.36	200	-2,673	4,368
32+00	-4	-13.64				
			-9.92	200	-1,983	2,384
34+00	20	-6.19				
			-5.76	200	-1,153	1,232
36+00	13	-5.33				
			-4.94	200	-987	245
38+00	20	-4.54				
			-4.34	200	-869	-624
40+00	17	-4.15				
			-1.61	200	-322	-946
42+00	22	0.93				
			0.82	200	165	-781
44+00	26	0.71				
			3.41	200	681	-100
46+00	25	6.10				
			0.02	200	4	-96
48+00	-50	-6.06				
			-6.03	400	-2,413	-2,509
50+00						
				200		-2,509
52+00	-10	-6.01				
			-4.04	200	-807	-3,316
54+00	6	-2.06				
			-2.25	200	-450	-3,766
56+00	14	-2.44				
			-5.14	200	-1,027	-4,794
58+00	6	-7.84				
			-8.09	200	-1,619	-6,412
60+00	29	-8.35				
			-6.73	200	-1,345	-7,757
62+00	42	-5.10				
			-5.32	200	-1,064	-8,822
64+00	-56	-5.55				
			-1.08	200	-215	-9,037
66+00	50	3.39				
			2.92	200	585	-8,452
68+00	23	2.46				
						-7,507

Table 2								
North Wildwood Beach/Dune Change								
Shoreline & Sand Volume Changes on the Beach (Zero Elevation)								
June 2021 to October 2021								
Profile	Shoreline	Volume	Avg. Volume	Distance	Total Profile	Cumulative		
	Change	Change	(cu yds./ft.)	Between	Changes	Sand Vo.		
	(feet)	(cu yds./ft.)	(cu yds./ft.)	(feet)	(cu yds)	(cu yds)		
<i>Hereford Inlet Shoreline</i>								
-6+00	282	21.98						
			29.08	200	5,816	5,816		
-4+00	508	36.18						
			32.79	200	6,557	12,373		
-2+00	553	29.39						
			15.60	200	3,120	15,493		
-0+00	110	1.81						
		Arc = 90.0	1.11	441	441	15,935		
0+00	13	0.41						
			0.49	200	97	16,032		
2+00	3	0.56						
			-3.07	200	-613	15,419		
4+00	4	-6.69						
			-8.10	200	-1,619	13,799	North end & Inlet changes	4th Ave.
6+00	-3	-9.50						
			-11.56	200	-2,313	11,486		
8+00	-36	-13.63						
			-14.66	200	-2,933	8,554		
10+00	-42	-15.70						
			-18.23	200	-3,646	4,908		
12+00	-35	-20.76						
			-20.86	200	-4,172	736		
14+00	-30	-20.96						
			-19.60	200	-3,920	-3,184		
16+00	-26	-18.24						
			-17.96	200	-3,591	-6,775		
18+00	-22	-17.68						
			-17.80	200	-3,559	-6,743		
20+00	-27	-17.91					Northern 2000 ft. oceanfront	
			-19.56	200	-3,911	-10,654	-30,180	
22+00	-24	-21.20						
			-21.00	200	-4,199	-10,942		
24+00	-28	-20.79						
			-20.98	200	-4,196	-15,138		
26+00	-15	-21.17						
			-21.59	200	-4,318	-15,260		11th Ave.
28+00	-11	-22.01						
			-19.40	200	-3,880	-19,139		
30+00	-15	-16.79						
			-16.77	200	-3,354	-18,613		
32+00	-4	-16.75						
			-14.46	200	-2,891	-21,504		
34+00	20	-12.16						
			-11.13	200	-2,226	-20,839		
36+00	13	-10.09						
			-9.86	200	-1,972	-22,811		
38+00	20	-9.63						
			-8.79	200	-1,758	-22,597		
40+00	17	-7.96					Central 2000 ft. Oceanfront	
			-6.81	200	-1,362	-23,959	-30,156	
42+00	22	-5.67						
			-3.71	200	-741	-23,339		
44+00	26	-1.75						
			0.88	200	175	-23,163		
46+00	25	3.50						
			-0.46	200	-92	-23,430		
48+00	-50	-4.42						
			-1.95	400	-782	-24,212		
50+00		0.00						
					0	-24,212		
52+00	-10	0.51						
			0.70	200	141	-24,072		
54+00	6	0.90						
			-1.27	200	-255	-24,326		
56+00	14	-3.44						
			-3.09	200	-618	-24,945		
58+00	6	-2.74						
			-1.52	200	-303	-25,248		
60+00	29	-0.29						
			0.92	200	183	-25,064		
62+00	42	2.13						
			0.49	200	97	-24,967		
64+00	-56	-1.15						
			1.10	200	220	-24,747		Juniper Ave
66+00	50	3.35						
			4.05	200	809	-23,938	-1,166	Sand Gain at the southern beach
68+00	23	4.75						

Table 3									
North Wildwood Beach/Dune Change									
Shoreline & Sand Volume Changes Offshore (Below Zero Elev)									
June 2021 to October 2021									
Profile	Shoreline Change (feet)	Volume Change (cu yds/ft.)	Avg. Volume (cu yds./ft.)	Distance Between (feet)	Total Profile Changes (cu yds)	Cumulative Sand Vo. (cu yds)			
<i>Hereford Inlet Shoreline</i>									
-6+00	282	8.75							
			8.61	200	1,722	1,722			
-4+00	508	8.47							
			26.56	200	5,313	7,034			
-2+00	553	44.65							
			41.96	200	8,391	15,425			
-0+00	110	39.26							
		Arc = 90.0	25.87	10,391	10,391	25,816			
0+00	13	12.48							
			12.74	200	2,548	28,364			
2+00	3	13.00							
			10.28	200	2,055	30,420			
4+00	4	7.55							
			5.43	200	1,087	31,506	North end & Inlet changes	4th Ave.	
6+00	-3	3.31							
			-0.37	200	-73	31,433			
8+00	-36	-4.05							
			-1.73	200	-346	31,088			
10+00	-42	0.59							
			1.70	200	340	31,427			
12+00	-35	2.80							
			3.19	200	639	32,066			
14+00	-30	3.58							
			4.04	200	808	32,873			
16+00	-26	4.49							
			4.04	200	807	33,681			
18+00	-22	3.58							
			4.08	200	816	33,689			
20+00	-27	4.58					Northern 2000 ft. oceanfront		
			3.56	200	712	34,402	9,393		
22+00	-24	2.54							
			1.42	200	284	33,973			
24+00	-28	0.30							
			2.83	200	565	34,538			
26+00	-15	5.35							
			4.96	200	993	34,966		11th Ave.	
28+00	-11	4.57							
			4.14	200	827	35,793			
30+00	-15	3.70							
			3.40	200	681	35,647			
32+00	-4	3.11							
			4.54	200	908	36,554			
34+00	20	5.97							
			5.37	200	1,073	36,720			
36+00	13	4.76							
			4.93	200	985	37,705			
38+00	20	5.09							
			4.45	200	890	37,609			
40+00	17	3.81					Central 2000 ft. Oceanfront		
			5.20	200	1,040	38,650	8,246		
42+00	22	6.60							
			4.53	200	906	38,515			
44+00	26	2.46							
			2.53	200	506	39,021			
46+00	25	2.60							
			0.48	200	96	38,611			
48+00	-50	-1.64							
			-4.08	400	-1,632	36,979			
50+00		0.00							
					0	36,979			
52+00	-10	-6.52							
			-4.74	200	-948	36,032			
54+00	6	-2.96							
			-0.98	200	-195	35,836			
56+00	14	1.01							
			-2.04	200	-409	35,428			
58+00	6	-5.10							
			-6.58	200	-1,316	34,112			
60+00	29	-8.06							
			-7.64	200	-1,529	32,583			
62+00	42	-7.22							
			-5.81	200	-1,162	31,422			
64+00	-56	-4.39							
			-2.18	200	-435	30,987		Juniper Ave	
66+00	50	0.04							
			-1.12	200	-225	30,762	-6,342	Sand Gain at the southern beach	
68+00	23	-2.29							

Back Pass Operations:

The State of NJ and any local or county governmental entity is free to take sand from the CBRS area in Hereford Inlet with appropriate state and federal permits, but the cost to North Wildwood is fixed at 25% of the project cost instead of 8.75% if federal money was involved with both a USACE effort and a NJ State partnership. The 2009 initial beach restoration effort was a State and local partnership without federal funding. FEMA reimbursed the City at 75% of expenses for repair efforts made following a number of federal storm disaster declarations starting with the Veteran’s Day storm of 2009, ending with Hurricane Sandy in 2012. The Jonas northeaster in late January 2016 was incorporated into the initial back passing operation after permits were revised to allow taking sand from Wildwood City beaches.

Sand back pass work commenced in 2016 with	165,000 cubic yards moved.
During 2017 spring	190,000 cubic yards were moved.
In 2018 work at the stormwater outfalls produced	153,375 cubic yards of sand moved to North Wildwood.
The same source in 2019 produced	164,776 cubic yards of sand.
By the spring of 2020 another	220,000 cubic yards of sand had been moved.
As of this year’s extraordinary effort	357,000 cubic yards of sand were transferred in.

These numbers total to: 1,250,151 cubic yards of sand hauled back into North Wildwood since 2016. This total volume is in the same ballpark as other major hydraulic pump-fill beach nourishment efforts.

The eventual USACE Wildwoods project remains anticipated with earnestness. But in a reversal of the 2020 Interior Department deciding to allow sand extraction from a CBRS zone for with federal financial support that are “designed to mimic, enhance or restore a natural stabilization system” (16 U.S.C. §3505(a)(6)(G) has produced further difficulties in funding formulas to arrange large scale sand supplies hydraulically mined from the Hereford Inlet ebb-tidal shoals. Currently the municipalities of North Wildwood, Stone Harbor and Avalon are seeking a meeting in Washington DC with the Director of the US Fish and Wildlife Service (arrangement by Congressman VanDrew) to discuss extracting the ebb-tidal shoals authorized as the specific area to remove inlet sand supplies for beach nourishment, from the CBRA NJ unit 9 defined space on the maps. This, if successful, would allow the federal funding to return to the three communities greatly reducing the maintenance or initial construction of existing and authorized federal Corps of Engineers shore protection projects.

Individual Site Review:

This section describes the shoreline and volume changes documented at selected profile locations to show general trends in sediment movement along the City’s beaches between summer of 2021 and fall of 2021.

Site 00+00 (at the inlet jetty)

The first profile line just south of the inlet jetty is included to show the additions to the offshore region in the immediate vicinity of the Hereford Inlet jetty. This line starts at the oceanfront side of the jetty and extends perpendicular to the seawall into the ocean. There has been a wet low tide beach at the site the majority of the last two years. Some of the time the rocks have been white water at low tide due to sand loss rates exceeding resupply from the inlet. As of the mid-October survey the northern two oceanfront beach transects saw 12 to 3-foot shoreline advances as sand accumulated offshore near the zero-elevation position.



Figure 3. View to the south taken June 14, 2021 looking along the rock revetment past the 3rd Ave. gazebo to the point where northerly transport has moved sand toward the jetty this past summer. The beach here has gained sand since mid-June 2021 both from the inlet ebb-tidal transport and littoral movement north from the graded-out stockpile. The rocks are still wet at high tide, but there is a wide, low gradient slope seaward into the offshore where most of the sand is deposited.

**North Wildwood - Semi-Annual Comparison
Line 00+00 Comparison**

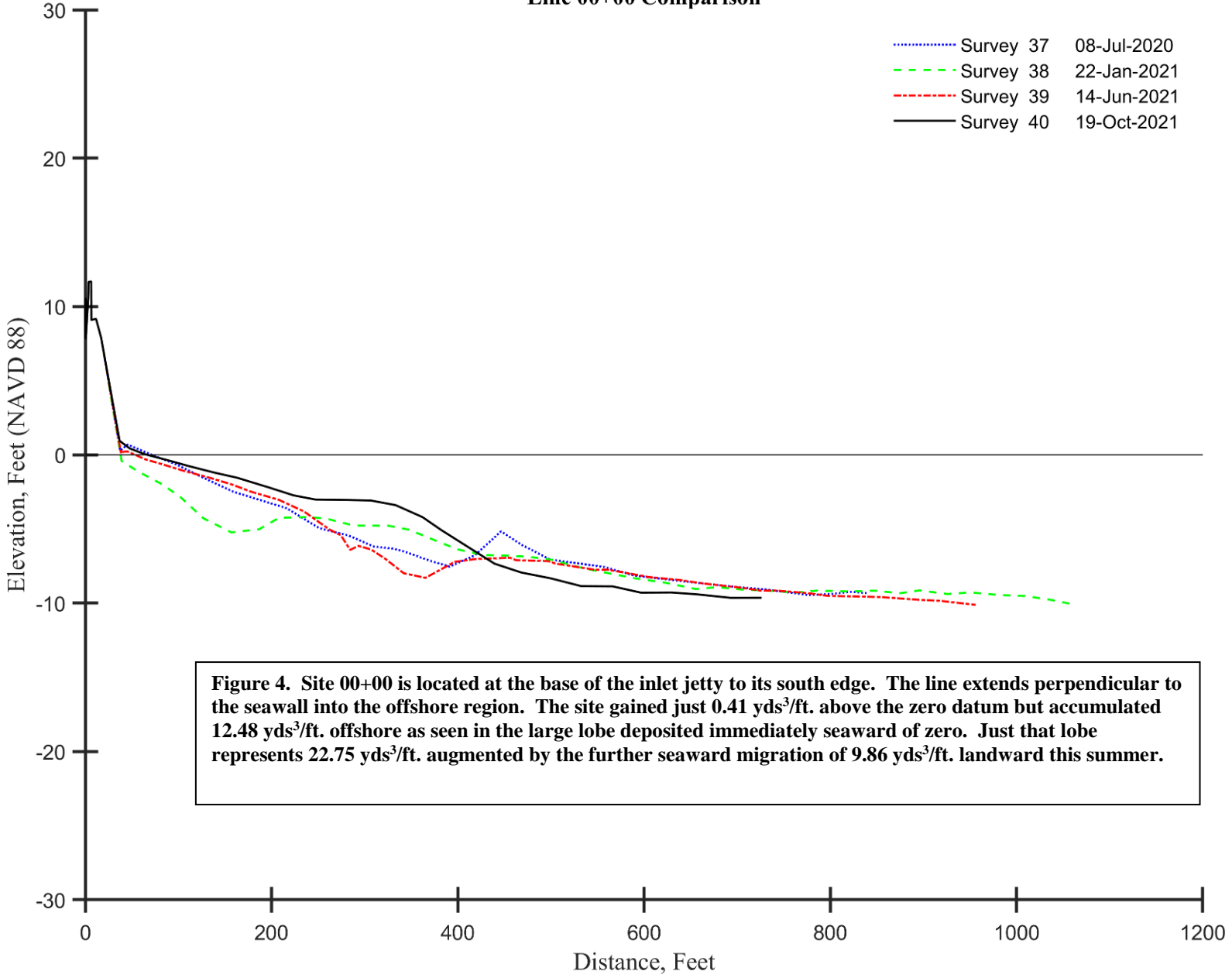


Figure 4. Site 00+00 is located at the base of the inlet jetty to its south edge. The line extends perpendicular to the seawall into the offshore region. The site gained just 0.41 yds³/ft. above the zero datum but accumulated 12.48 yds³/ft. offshore as seen in the large lobe deposited immediately seaward of zero. Just that lobe represents 22.75 yds³/ft. augmented by the further seaward migration of 9.86 yds³/ft. landward this summer.

Site 02+00 (about 100 feet south of the inlet gazebo)

Station 02+00 crosses the 3rd Avenue storm water pipeline into the ocean south of it. The beach gained minimally (0.56 yds³/ft.) while offshore, 13.00 yds³/ft. accumulated as a lobe deposited just beyond the zero-elevation position. Little change occurred above zero, but sand did appear offshore at this site. See Figure 3 for the view along this segment of the shoreline.

North Wildwood - Semi-Annual Comparison
Line 02+00 Comparison

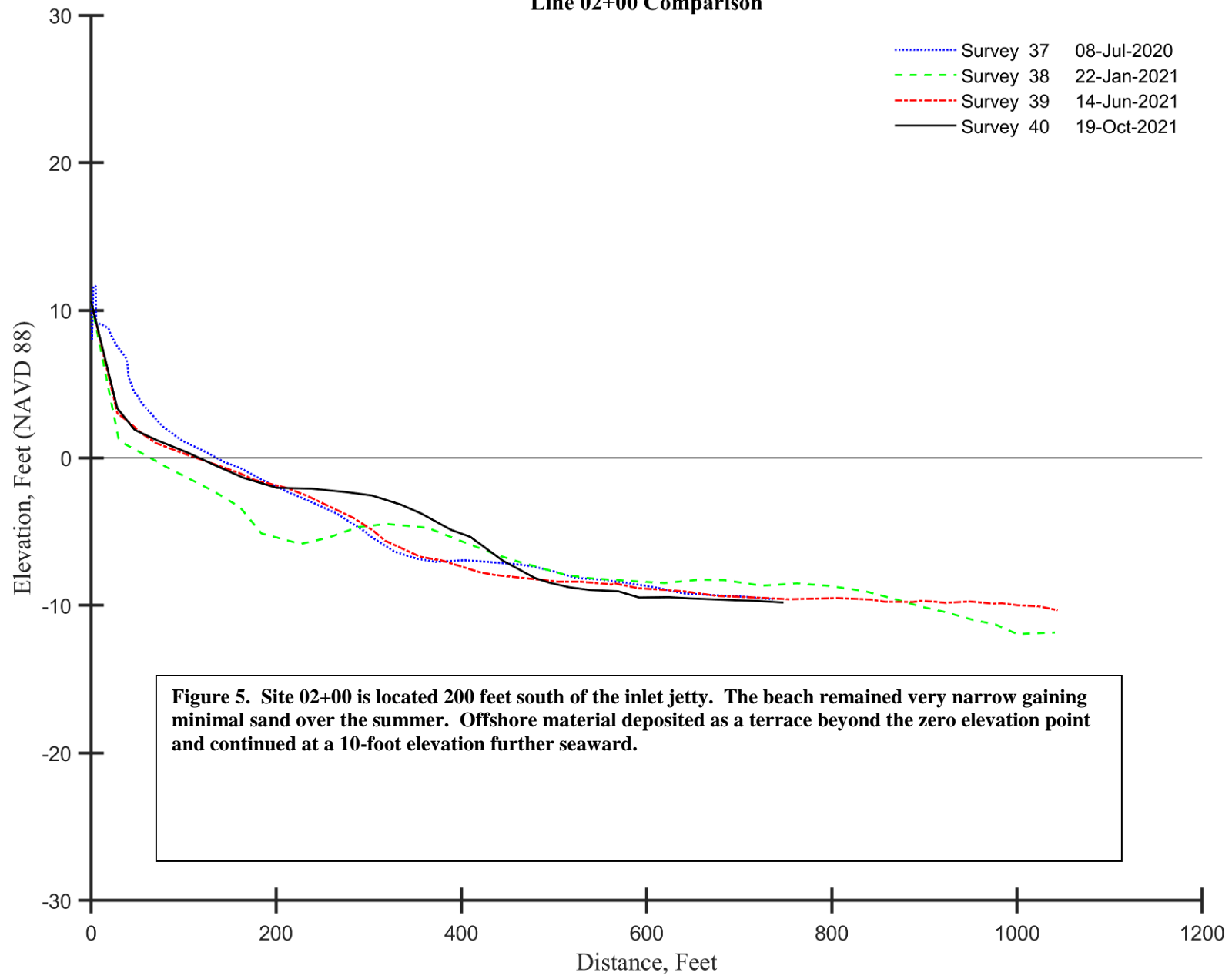


Figure 5. Site 02+00 is located 200 feet south of the inlet jetty. The beach remained very narrow gaining minimal sand over the summer. Offshore material deposited as a terrace beyond the zero elevation point and continued at a 10-foot elevation further seaward.

Site 04+00 (between 3th and 4th Avenues)

The site is located in the northern portion of the island adjacent to Hereford Inlet 400 feet south of the 2nd Avenue jetty. This area has typically been an erosional shoreline due to its proximity to the inlet and the direct impact from northeast storms. A narrow dry beach was prepared for the summer season and remained in place although eroded somewhat by October 2021. The complex of offshore deposition is extensive and well-illustrated by the photograph below.



Figure 6. Aerial view taken September 4, 2021 showing a close-in shot of the northern beachfront. The large deposit of sand at low tide elevations north of the jetty is quite dramatic. The dry sand beach for the transects 200 and 400 feet south of the jetty are narrow, but heavily used the Saturday of Labor Day weekend. Bathers are flocked to the water's edge and out to the bar at the extreme right of the photograph.

**North Wildwood - Semi-Annual Comparison
Line 04+00 Comparison**

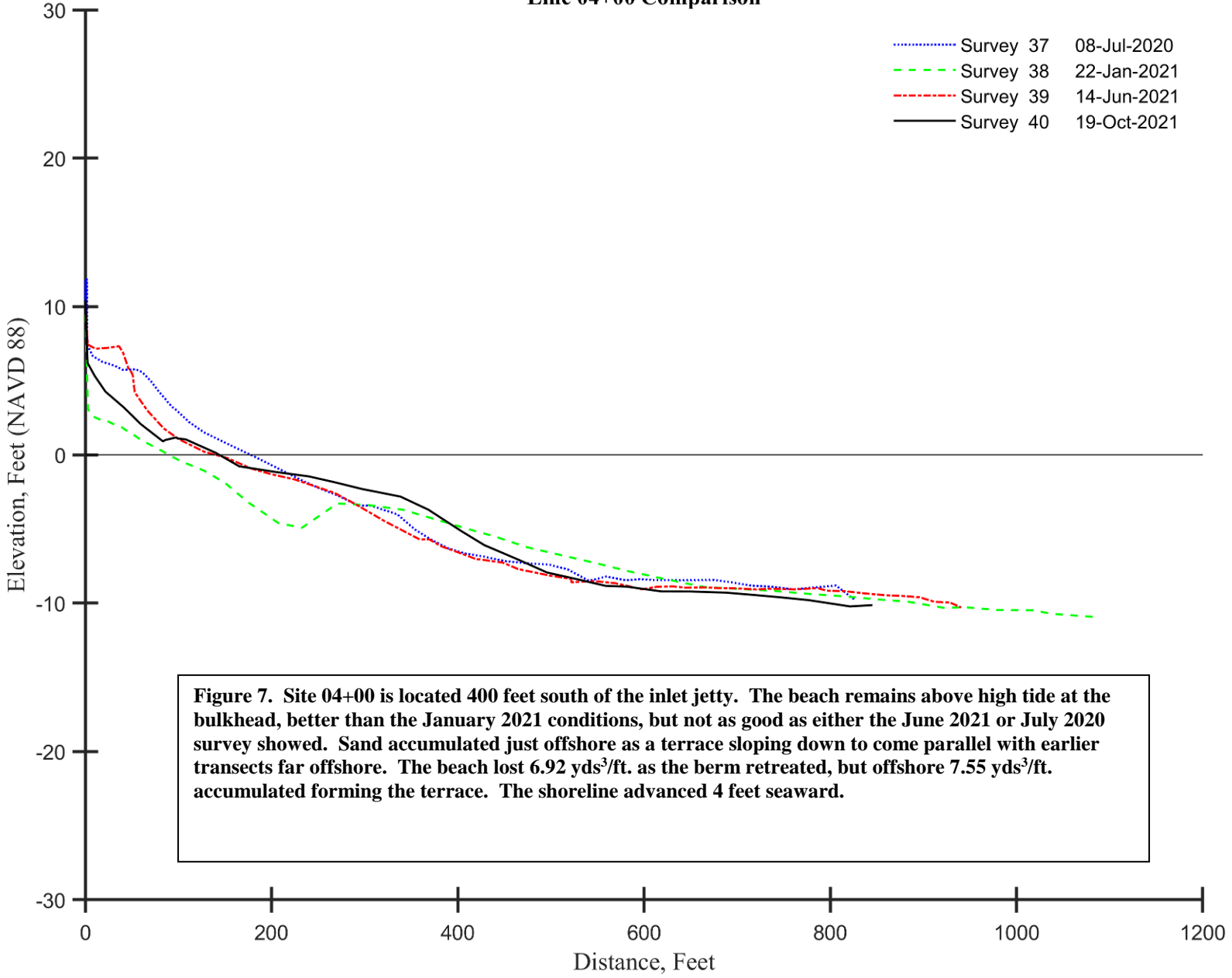


Figure 7. Site 04+00 is located 400 feet south of the inlet jetty. The beach remains above high tide at the bulkhead, better than the January 2021 conditions, but not as good as either the June 2021 or July 2020 survey showed. Sand accumulated just offshore as a terrace sloping down to come parallel with earlier transects far offshore. The beach lost 6.92 yds³/ft. as the berm retreated, but offshore 7.55 yds³/ft. accumulated forming the terrace. The shoreline advanced 4 feet seaward.

Site 06+00 (approximately at 4th Avenue)

This location is at the end of 4th Avenue where the new bulkhead was completed in early 2018. Sand loss from the placed stockpile material was evident taking the majority of the berm by October 2021. The amount of sand lost from the berm was deposited as a broad terrace in the intertidal zone. The beach lost 9.80 yds³/ft., however, offshore 13.50 yds³/ft. were deposited as this intertidal terrace and material from the bar, present in June 2021, moved landward as well (-9.59 yds³/ft. contributed by the June bar system). The net sand volume change was a loss of 6.19 yds³/ft. with a 3-foot shoreline retreat.



Figure 8. This June 14, 2021 view shows the sand spread from the stockpile into this region with a low scarp cut into the material spreading sand offshore as a wide terrace at low tide that persisted in this area all summer. The view is to the south from profile 6+00 starting 600 feet south of the inlet jetty.

North Wildwood - Semi-Annual Comparison
Line 06+00 Comparison

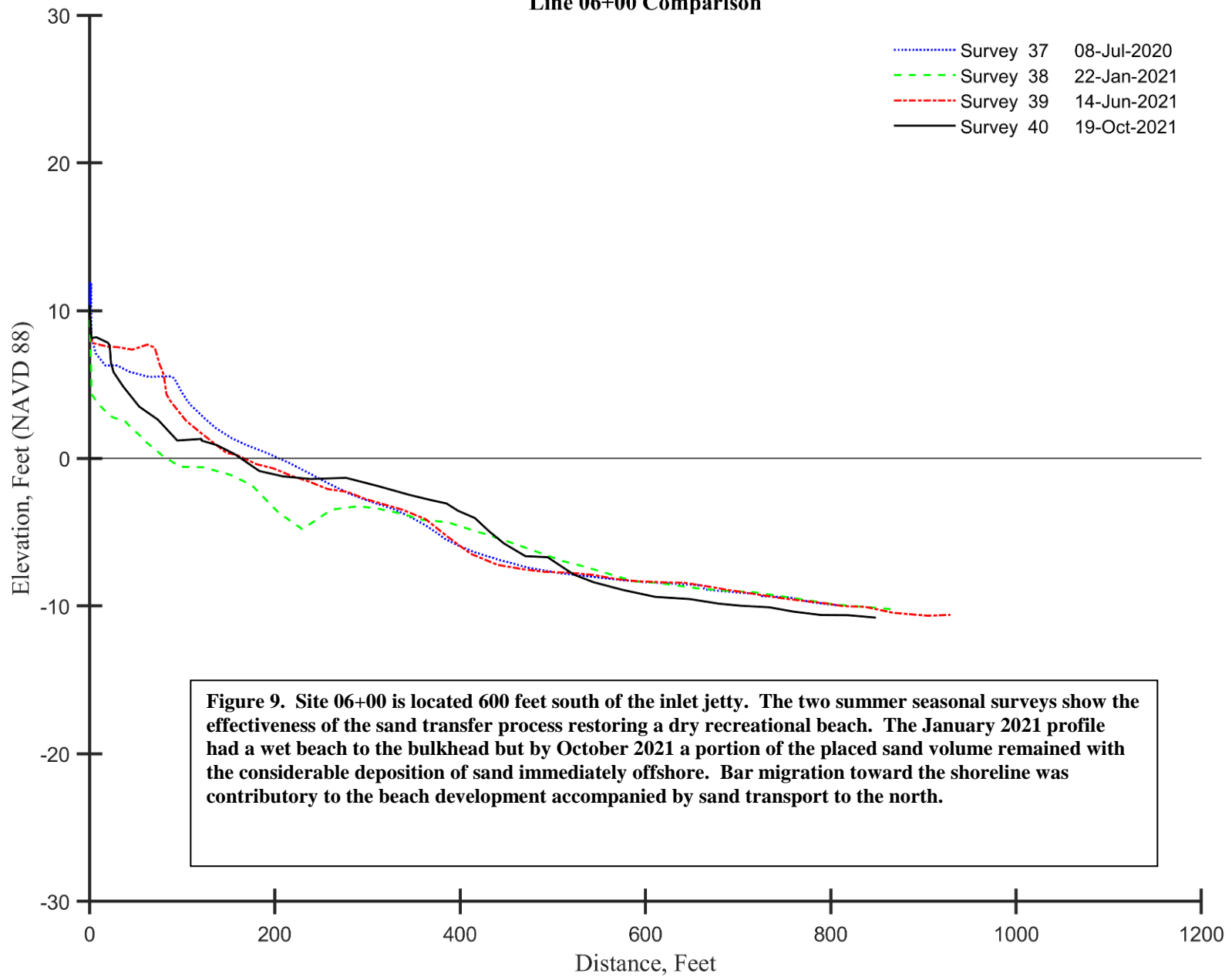


Figure 9. Site 06+00 is located 600 feet south of the inlet jetty. The two summer seasonal surveys show the effectiveness of the sand transfer process restoring a dry recreational beach. The January 2021 profile had a wet beach to the bulkhead but by October 2021 a portion of the placed sand volume remained with the considerable deposition of sand immediately offshore. Bar migration toward the shoreline was contributory to the beach development accompanied by sand transport to the north.

Site 20+00 (between 9th and 10th Avenues)

This site is located 2,000 feet south of the inlet jetty and had been relatively stable until early 2021 when erosion took the dunes and most of the beach. The 80-foot wide berm built by June 2021 has been reduced by 75% as of October as the view below shows. There is a very wide low tide terrace deposited due to bar migration toward the beach. The entire region hundreds of feet north or south of this site lost in the range of 17.91 yds³/ft. (the net beach loss at 20+00), but most sites gained substantially offshore near the beach particularly (11.20 yds³/ft.). The shoreline retreated 27 feet, a smaller value due to the very low gradient beachface as a result of the sand deposition just offshore.



Figure 10. View to the south toward the profile site 2,000 feet south of the jetty where a dry beach and very broad low tide terrace extends into the ocean where an offshore bar is present. October 19, 2021 had a strong blow-out low tide that revealed more of the intertidal zone than normally exposed.

**North Wildwood - Semi-Annual Comparison
Line 20+00 Comparison**

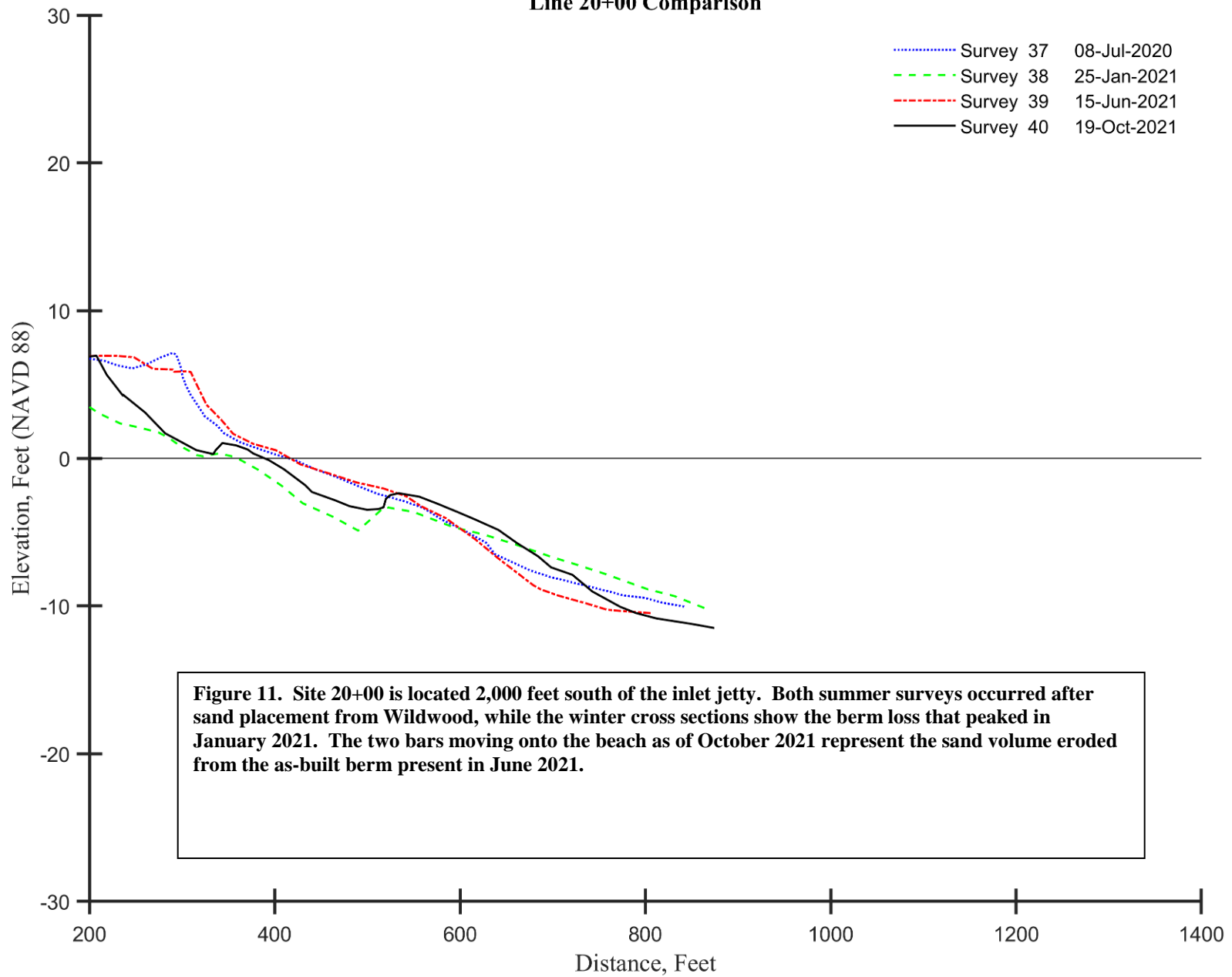


Figure 11. Site 20+00 is located 2,000 feet south of the inlet jetty. Both summer surveys occurred after sand placement from Wildwood, while the winter cross sections show the berm loss that peaked in January 2021. The two bars moving onto the beach as of October 2021 represent the sand volume eroded from the as-built berm present in June 2021.

Site 40+00 (17th Avenue)

Positioned 4,000 feet south of the 2nd Avenue jetty, this site is located two blocks south of the lifeguard station in the mid-section of the City's oceanfront beaches. The beach here wider because all material eroded further north and transported by the littoral drift process passes through these sites on its way back to Wildwood. The past summer saw modest sand volume losses at the beach (-7.96 yds³/ft.) with deposition offshore (2.55 yds³/ft. in one bar and 12.25 yds³/ft. in one further seaward). The shoreline advanced seaward 17 feet because the closer bar system was above elevation zero at the time of the survey.



Figure 12. View to the north along the upper beach on October 20, 2021. The beach remained graded out to provide a wide recreational area during the summer season. The vehicle entrance pathway shows in the dunes coming in from the life guard headquarters building at 15th Avenue.



Figure 13. View to the south from transect 38+00 showing the existing dunes and the beach width following the summer season as of October 20, 2021. Note the two bars offshore are exposed during this extremely low tide that occurred during this survey.

**North Wildwood - Semi-Annual Comparison
Line 40+00 Comparison**

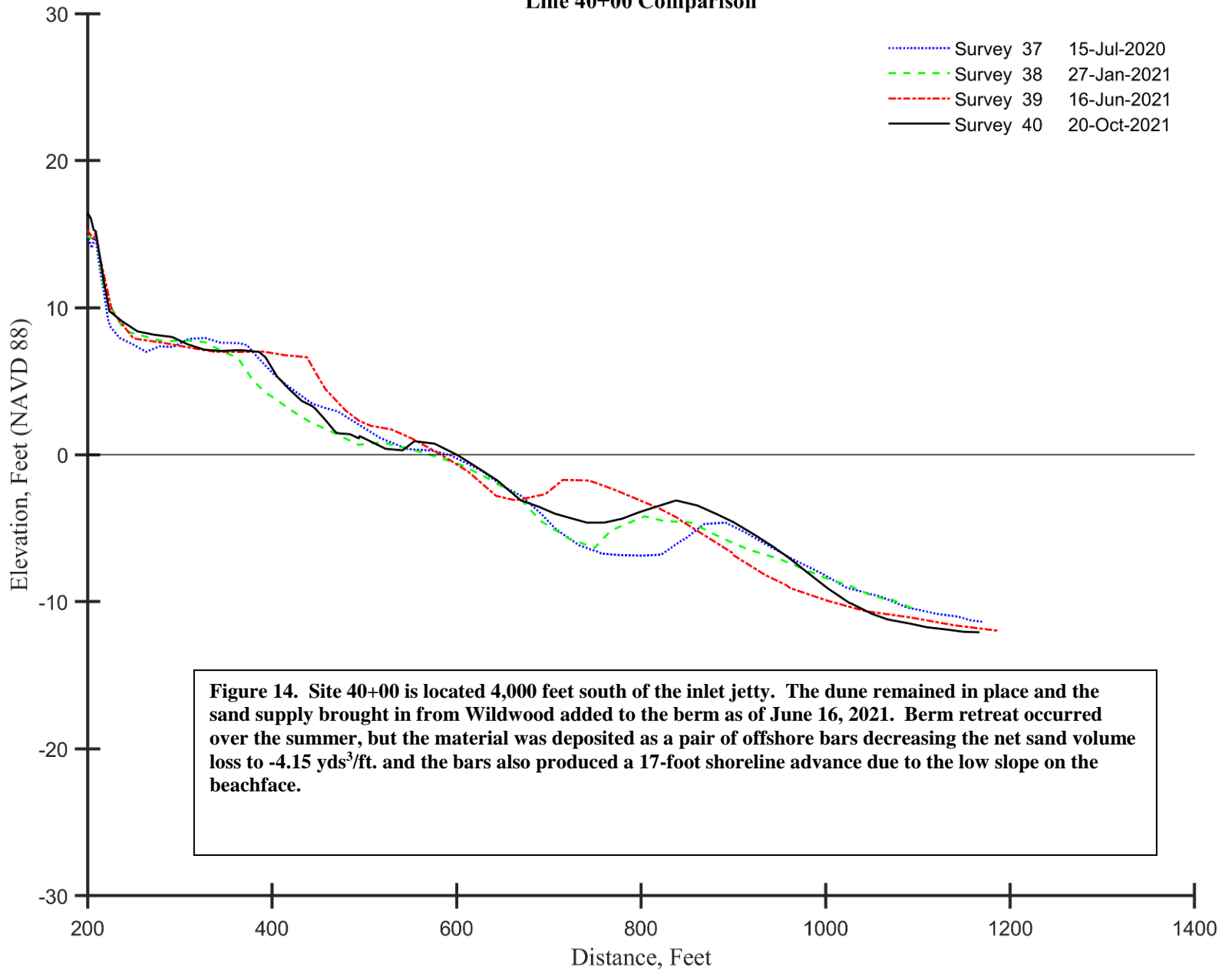


Figure 14. Site 40+00 is located 4,000 feet south of the inlet jetty. The dune remained in place and the sand supply brought in from Wildwood added to the berm as of June 16, 2021. Berm retreat occurred over the summer, but the material was deposited as a pair of offshore bars decreasing the net sand volume loss to -4.15 yds³/ft. and the bars also produced a 17-foot shoreline advance due to the low slope on the beachface.

Site 52+00 (21st Avenue)

The beach above the zero-elevation position retreated 10 feet since June 2021 but with no loss in sand volume. The net change above zero was 0.51 yds³/ft. Offshore, a bar size decrease produced a small net loss for the entire site of -6.01 yds³/ft.



Figure 15. View to the north taken from the site 52+00 on October 20, 2021 showing the dry beach and dune toe present.



Figure 16. View to the south from transect 52+00 with the two timber piers and Morey's Surfside Pier in view.

North Wildwood - Semi-Annual Comparison
Line 52+00 Comparison

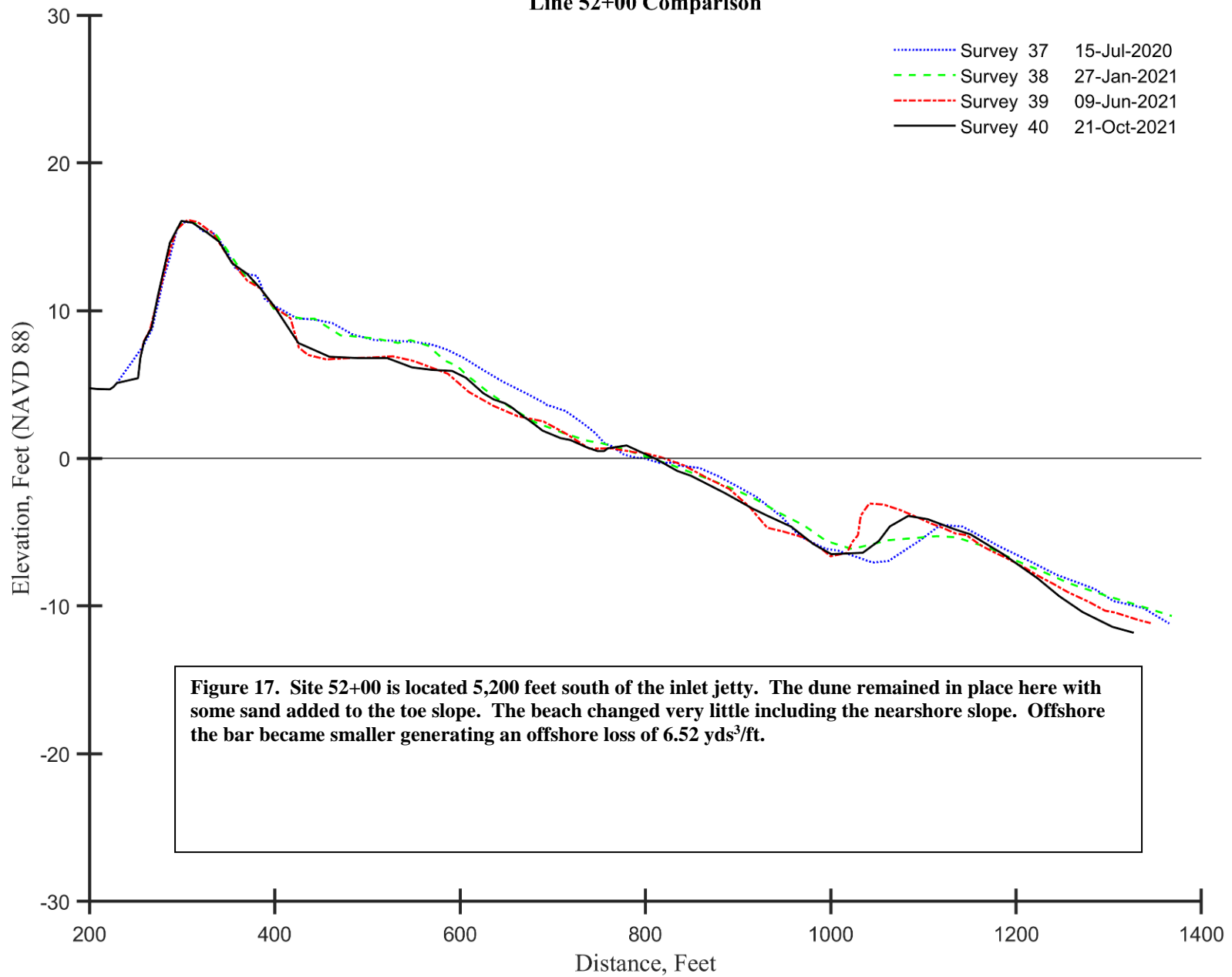


Figure 17. Site 52+00 is located 5,200 feet south of the inlet jetty. The dune remained in place here with some sand added to the toe slope. The beach changed very little including the nearshore slope. Offshore the bar became smaller generating an offshore loss of 6.52 yds³/ft.

Site 58+00 (Between 23rd & 24th Avenues)

This site is in the southern section of the City's oceanfront where the engineered dune system was originally constructed seaward of the piers. This year the high tide line was at to slightly landward of the longer timber pier at this profile location. The extremely low tide also exposed the offshore bar crest on the day the survey was taken.

The sand volume decrease at 58+00 amounted to 7.84 yds³/ft. with a 6-foot shoreline advance seaward since June 2021. Of that total, 2.74 yds³/ft. were lost from the beach above the zero-elevation position and 6.10 yds³/ft. were lost offshore.



Figure 18. The June 16, 2021 view to the south looks across the front of the timber pier with the high tide line about 2 rows of pilings under the pier. The beach was wide and with a very low gradient which favors bathers but serves little in terms of storm protection.



Figure 19. View to the north looking toward the widest part of the North Wildwood oceanfront beach. The extremely low tide the day of the survey exposed both the bar close to the beachface toe as well as the crest of the bar further seaward.

**North Wildwood - Semi-Annual Comparison
Line 58+00 Comparison**

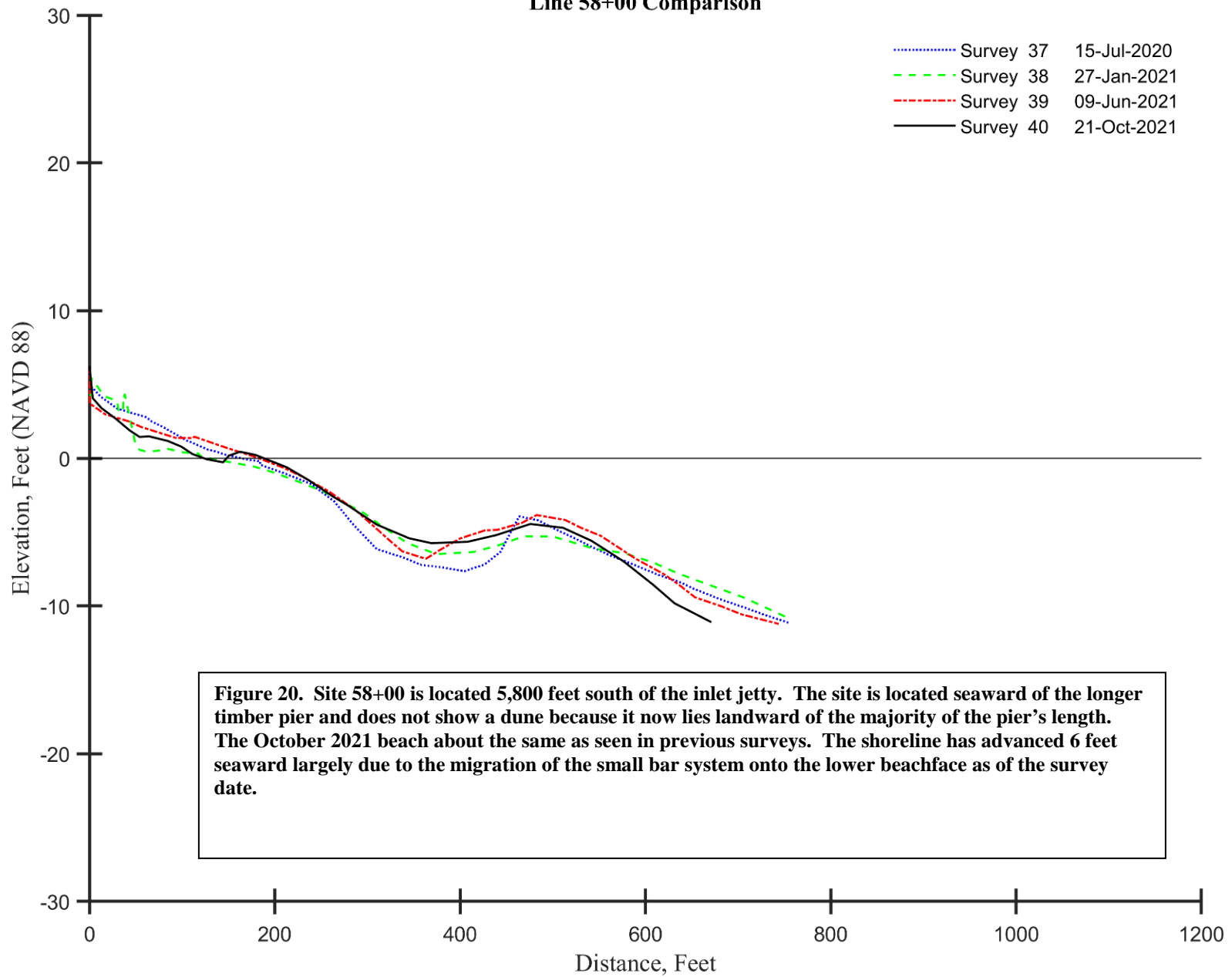


Figure 20. Site 58+00 is located 5,800 feet south of the inlet jetty. The site is located seaward of the longer timber pier and does not show a dune because it now lies landward of the majority of the pier's length. The October 2021 beach about the same as seen in previous surveys. The shoreline has advanced 6 feet seaward largely due to the migration of the small bar system onto the lower beachface as of the survey date.

Site 64+00 (between 25th and 26th Avenues)

This is the southern-most cross section of the selected profiles within the larger database. Located seaward of the Surfside Pier and Ocean Oasis Water Park and Beach Club this site represents conditions at the south end engineered beach and its taper near the Wildwood and North Wildwood border. Dune protection presently involves older island dunes where beach raking materials were deposited and became vibrant dune islands that were connected with sand ridges to the piers to provide a measure of wave protection. This transect (64+00) behaved similar to those among the other two piers in that the beachface lost a modest 1.15 yds³/ft. while the shoreline retreated 56 feet toward the steel wall. Offshore shifts in the bar system toward the shoreline produced a small net loss of 2.29 yds³/ft.



Figure 21. View to the north taken on June 6, 2021 seaward of Morey's Surfside Pier with the steel bulkhead protection positioned just at the last high tide mark indicated by the plant debris at the foot of the bulkhead. This is not a beach where shore protection is significant. The gradient is relatively flat as can be seen looking toward the timber pier in the distance.



Figure 22. Transect 64+00 looking south into Wildwood City beaches shows that the beach width dramatically increases south of the Surfside Pier into Wildwood. Project maintenance efforts were dropped south to transect 73+00 following Hurricane Sandy and objections by Wildwood to managing the sand within the City limits.

**North Wildwood - Semi-Annual Comparison
Line 64+00 Comparison**

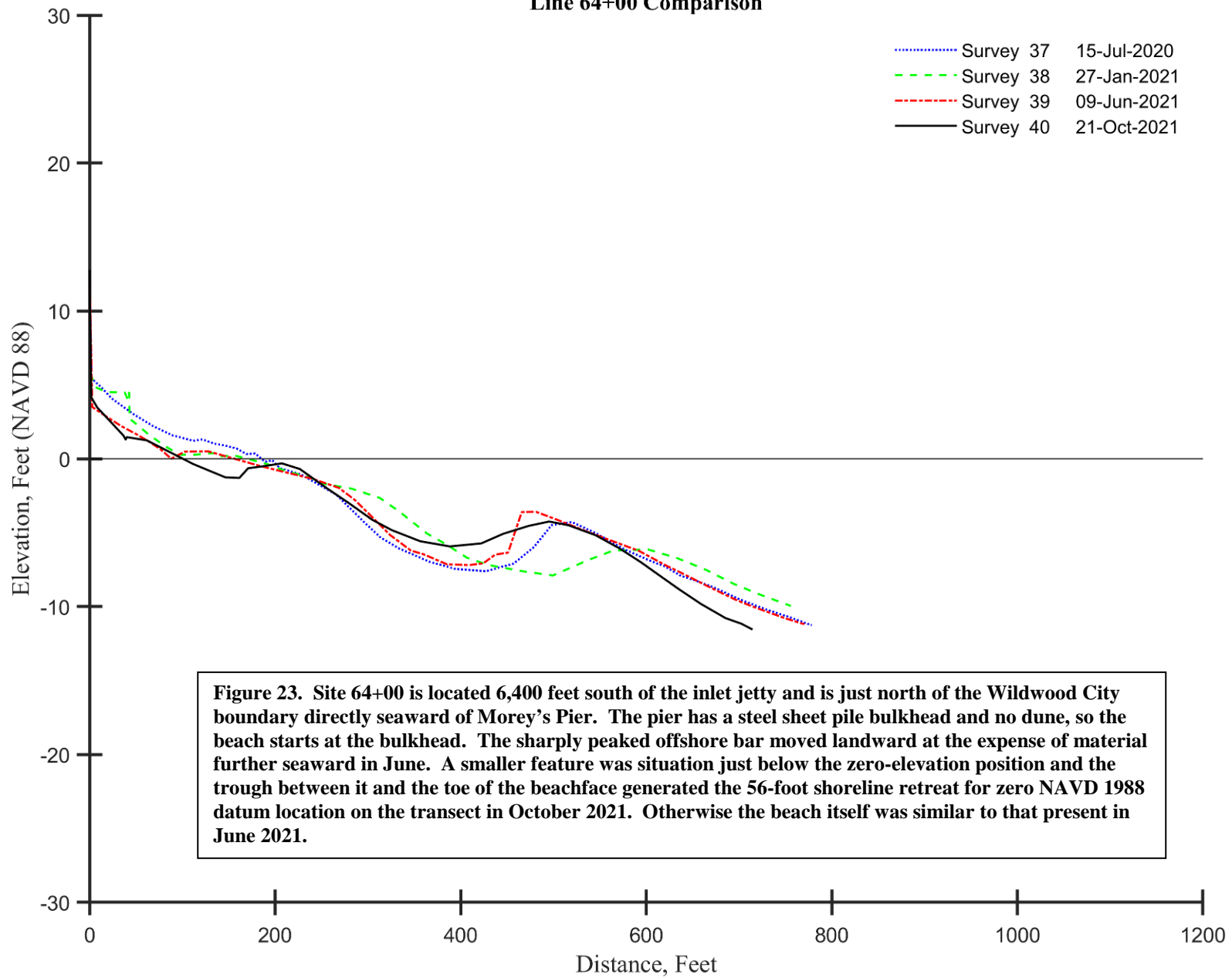


Figure 23. Site 64+00 is located 6,400 feet south of the inlet jetty and is just north of the Wildwood City boundary directly seaward of Morey’s Pier. The pier has a steel sheet pile bulkhead and no dune, so the beach starts at the bulkhead. The sharply peaked offshore bar moved landward at the expense of material further seaward in June. A smaller feature was situation just below the zero-elevation position and the trough between it and the toe of the beachface generated the 56-foot shoreline retreat for zero NAVD 1988 datum location on the transect in October 2021. Otherwise the beach itself was similar to that present in June 2021.

Site -06+00 (near the end of Surf Avenue on the Hereford Inlet shoreline)

This is the northwestern most cross section on beaches open to public bathing. Further up the inlet the beach is closed for endangered species bird nesting every summer starting March 15th until August 30th. The shoal island, seen in the aerial photograph in Figure 1 has developed a long trailing sand tail extending to the inlet mouth visible at the outer end of the January 2020 survey line. Water depths show that that a broad, shallow platform developed seaward of the area between the jetty and the Surf Avenue beach. The deposition has created a second intertidal spit extending northwest up along the inlet shoreline as of the end of 2021.



Figure 24. This view on October 18, 2021 shows the vast increase in the width of the intertidal beach zone looking back toward the jetty in the distance on the right. Sand from both the Hereford Inlet island shoals that have been migrating toward the inlet opening to the sea and from sand moved north along the North Wildwood oceanfront beaches have added together to form a depositional sand surface not seen in two decades. Since it is still intertidal in elevation, wave action remains an impact force on the beachfront structures and dry sand supplies. The aerial photographs (Figure 1 & 2) detail the extent of this location on the North Wildwood side of Hereford Inlet.

**North Wildwood - Semi-Annual Comparison
Line -00+06 Comparison**

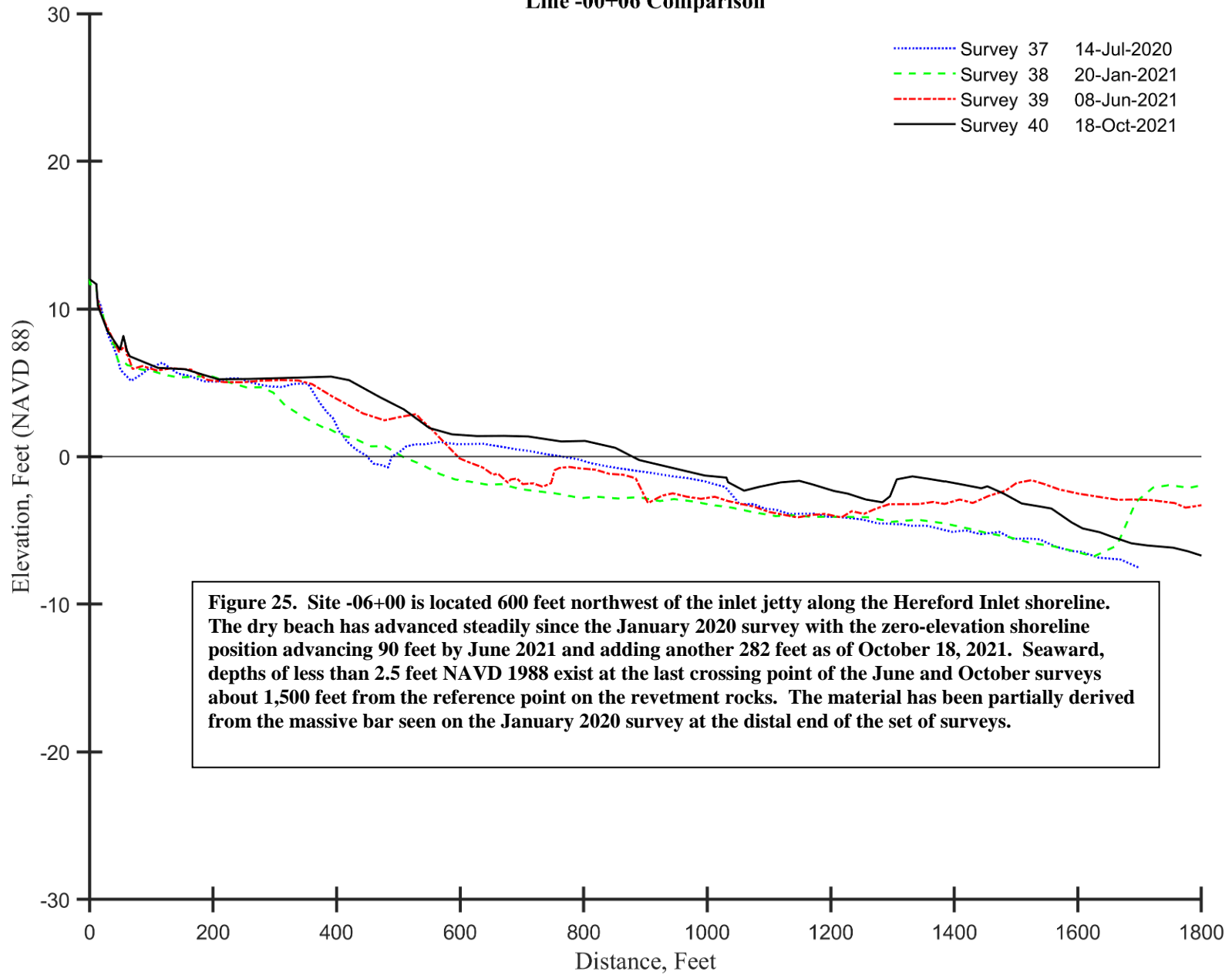


Figure 25. Site -06+00 is located 600 feet northwest of the inlet jetty along the Hereford Inlet shoreline. The dry beach has advanced steadily since the January 2020 survey with the zero-elevation shoreline position advancing 90 feet by June 2021 and adding another 282 feet as of October 18, 2021. Seaward, depths of less than 2.5 feet NAVD 1988 exist at the last crossing point of the June and October surveys about 1,500 feet from the reference point on the revetment rocks. The material has been partially derived from the massive bar seen on the January 2020 survey at the distal end of the set of surveys.

Summary/Conclusions:

February of 2021 saw the worst northeast storm of the season where the flooding and wave damage effects were significant making the sand restoration absolutely essential along nearly all the North Wildwood oceanfront. There were other minor storms including a Memorial Day weekend of northeast winds making it a less than perfect start to the 2021 tourist season. Hurricane Ida passed overland through New Jersey generating tornados, heavy rains and some additional wave erosion to the beaches on the Jersey shore. Multiple moderate northeast storms have occurred during the fall including a multi-day event in late October 2021 that came after the final survey for this year.

North Wildwood conducted the largest ever sand transfer in New Jersey beach nourishment history in the spring of 2021 by moving 357,000 cubic yards of sand from the beach in the City of Wildwood north to vast stockpiles along the oceanfront beach. Redistribution is readily seen in the sand volume changes between a January 2021 survey at the CRC survey from June 2021. While the January survey just preceded the worst northeast storm of the season, the sand volume added still reached 175,000 cubic yards even though the February storm took at least 125,000 additional cubic yards from the beachfront during that event.

The US Army Hereford Inlet to Cold Springs Inlet shore protection project remains authorized, but unconstructed for another year. Recent activity including Congressman Jeffery Van Drew who is seeking to assemble a conference in Washington DC with the Director of the US Fish and Wildlife Service and the mayors of Avalon, North Wildwood and Stone Harbor to attempt to formulate an agreement to utilize the authorized borrow sites in Hereford Inlet's ebb-tidal delta sand deposits offshore. These previously used excavation locations are away from vital environmental habitat along the South Point and marsh land areas.

Hydraulic beach restoration from Hereford Inlet remains possible if just the State of NJ and North Wildwood participate in the project at the 75% State vs. 25% Local cost split. Should the City seek to conduct another hydraulic project, both NJDEP and US Army Corps permits need to be re-applied for. The existing permits are nearing expiration and were modified to capture the Wildwood City sand instead of the inlet material. Should the Division of Coastal Engineering offer to renew the 2009 project at some level, they would do the permit work, design and bid the project, then monitor its implementation, leaving the City to monitor the change following construction as done previously.

The relative success with the enhanced sand transport north from the City of Wildwood did provide North Wildwood with quite reasonable beach widths this summer. Erosion has diminished the berm elevation and its width to zero elevation north of profile site 10+00 (1,000 feet south of the inlet jetty), but sand was deposited offshore in all the cross sections north of Morey's Pier. Enormous accretion occurred along the Hereford Inlet shoreline extending northwest past Surf Avenue beach. During a later October 2021 wind-generated blow-out low tide, the beach surveys extended over 1,500 feet into Hereford Inlet on wet sand near the inlet jetty. This material provides little storm wave protection for developed infrastructure, but if moved onto a dry beach environment over time might enhance the existing levels of storm protection.

Both ground surveys and aerial reconnaissance are to be continued to assist the City in determining its shore protection steps in the coming year.