

SAN DIEGUITO WETLANDS RESTORATION PROJECT

**06 OCTOBER 2016 BEACH PROFILES
CITY OF DEL MAR, CALIFORNIA**

Data Report



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1.0 INTRODUCTION

This report describes the beach profiles surveyed along the Del Mar and Solana Beach coastline near the San Dieguito Lagoon inlet on 06 October 2016. The survey program is designed to comply with permit conditions set forth in the Coastal Development Permit (No. 06-04-088) issued by the California Coastal Commission (CCC) for the San Dieguito Wetlands Restoration Project.

2.0 PERMIT REQUIREMENTS

The permit requires offshore beach profiles to be performed at seven (7) profile locations near the inlet to the San Dieguito Wetlands. Four (4) of the profiles are to be at historic profile locations, including DM-0590 (SIO1), DM-0580 (SIO2), SIO5B, and SIO6. Three (3) new profile locations are located south of SIO1: 500 feet (SIOA), 1,000 feet (SIOB), and 1,500 feet (SIOC) south of SIO1. Table 1 outlines the locations of the beach profiles.

The permit also requires that full profile (offshore/onshore) surveys are to be performed in the spring (April) and fall (October) for the seven profiles, and wading/onshore profiles are to be performed quarterly. All of the surveys are to be referenced to the City of Del Mar's Shore Protection Area (SPA) line, or to a fixed and identified feature for the site north of the SPA line (SIO6). The full profile surveys are to go to the depth of closure, where there are no substantial changes in bottom profile due to seasonal variations in wave conditions. The depth of closure has ranged from 35 ft to 50 ft in San Diego County (SANDAG, 2009).

This report provides beach profile data and analysis of the 2016 beach profile surveys carried out on 06 October 2016, as required by the permit.

3.0 METHODS AND PROCEDURES

The beach profiles were conducted from the benchmarks to wading depth by total station and prism. Data were acquired along each transect from the survey marker to an offshore limit below MLLW (Mean Lower Low Water). Each survey marker (benchmark) was located at the back beach at a fixed point, primarily along a protective seawall. Data were collected at least to -6 ft, MLLW.

Table 1. Beach profile onshore survey marker locations.

Benchmark	California State Plane Coordinates, Zone 6 (ft), NAD83		Elevation, NGVD29 (ft)
	Northing	Easting	
SIO1	1935951.7	6248823.5	13.5
SIO2	1934061.9	6249131.2	13.5
SIO5B	1936545.5	6248645.2	14.9
SIO6	1938477.3	6248035.2	18.0
SIOA	1935521.4	6248888.9	14.8
SIOB	1935008.3	6248975.3	14.3
SIOC	1934488.5	6249054.7	15.3

The beach and surf zone were surveyed using an electronic total station and survey rod. The total station was used to determine the position and elevation of the beach at each location occupied by the rod. A Sokkia Set-5A total station and Spectra Precision Ranger electronic field data logger were utilized to collect the nearshore portion of the profile, providing an accuracy of approximately 2-4 cm both horizontally and vertically. The total station method reflects an infrared beam sent from the device to a prism atop a fixed-length pole, where the instrument measures the slant distance and horizontal and vertical angles to the target (Figure 1). An electronic field data logger is used to store the data, which can then be set to known positions using permanent local benchmarks. Each transect was surveyed from the back beach seaward through the surf zone until the rod no longer protruded above the water surface.

The offshore portion of the beach profile was acquired with a digital acoustic echo sounder operated from a 27-ft shallow-draft survey vessel. A DGPS receiver was used to determine the position of each sounding. To improve the accuracy of each position, differential corrections transmitted in real time from U.S. Coast Guard beacons were utilized. All systems were interfaced to a laptop computer using the Hypack survey package.

At each transect, the boat traveled from the offshore limit to the surf zone guided by a DGPS navigation system. Soundings were acquired on a near-continuous basis (approximately four to five per second). Vessel positions were recorded at 1-second intervals and merged with the soundings using Hypack bathymetric survey software. The calibration of the echo sounder was checked at the beginning and end of each survey session using a standard “bar check” procedure.

The beach width was calculated from the Del Mar SPA line to 0 ft, NGVD, except for SIO6, which was calculated from the benchmark. The distance of the profile benchmarks to the SPA line is shown in Table 2. Volume density calculations were made for +3.0 ft, 0 ft, and -2.56 ft, NGVD, for each of the profiles, beginning at the benchmark elevation. The onshore and offshore areas of the beach profile were always overlapped to check the accuracy of both surveys.

4.0 BEACH PROFILE SURVEY RESULTS

The 2016 beach profile surveys were performed on 06 October 2016, along the four historic and three newly established profiles (Figure 2). The beach profiles are presented in Appendix A (Figures A-1 through A-7). The beach width for each of the profiles is presented in Appendix B (Tables B-1 and B-2).

5.0 REFERENCES

SANDAG, 2009. Regional Beach Monitoring Program. Annual Report, June 2010, Chatsworth, CA. 111 pp. + app.

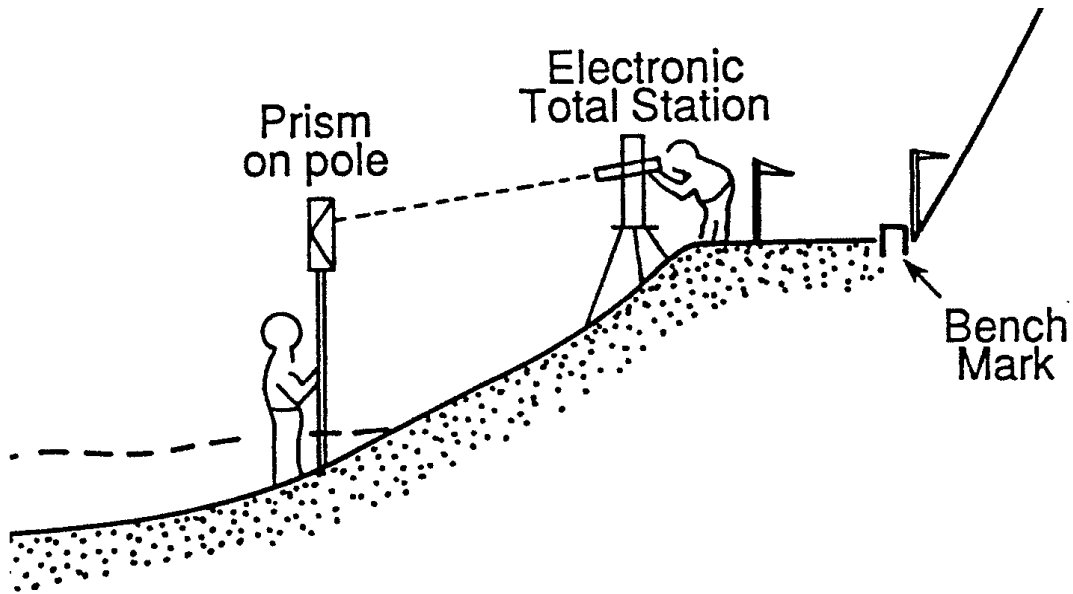


Figure 1. Schematic illustration of the survey method.

Table 2. Beach width adjustment to City of Del Mar Shoreline Protection Area Line.

Benchmark	Adjustment (ft)
SIO1	+1.4
SIO2	+1.0
SIO5B	+32.2
SIO6	0
SIOA	+1.5
SIOB	-4.2
SIOC	+9.3

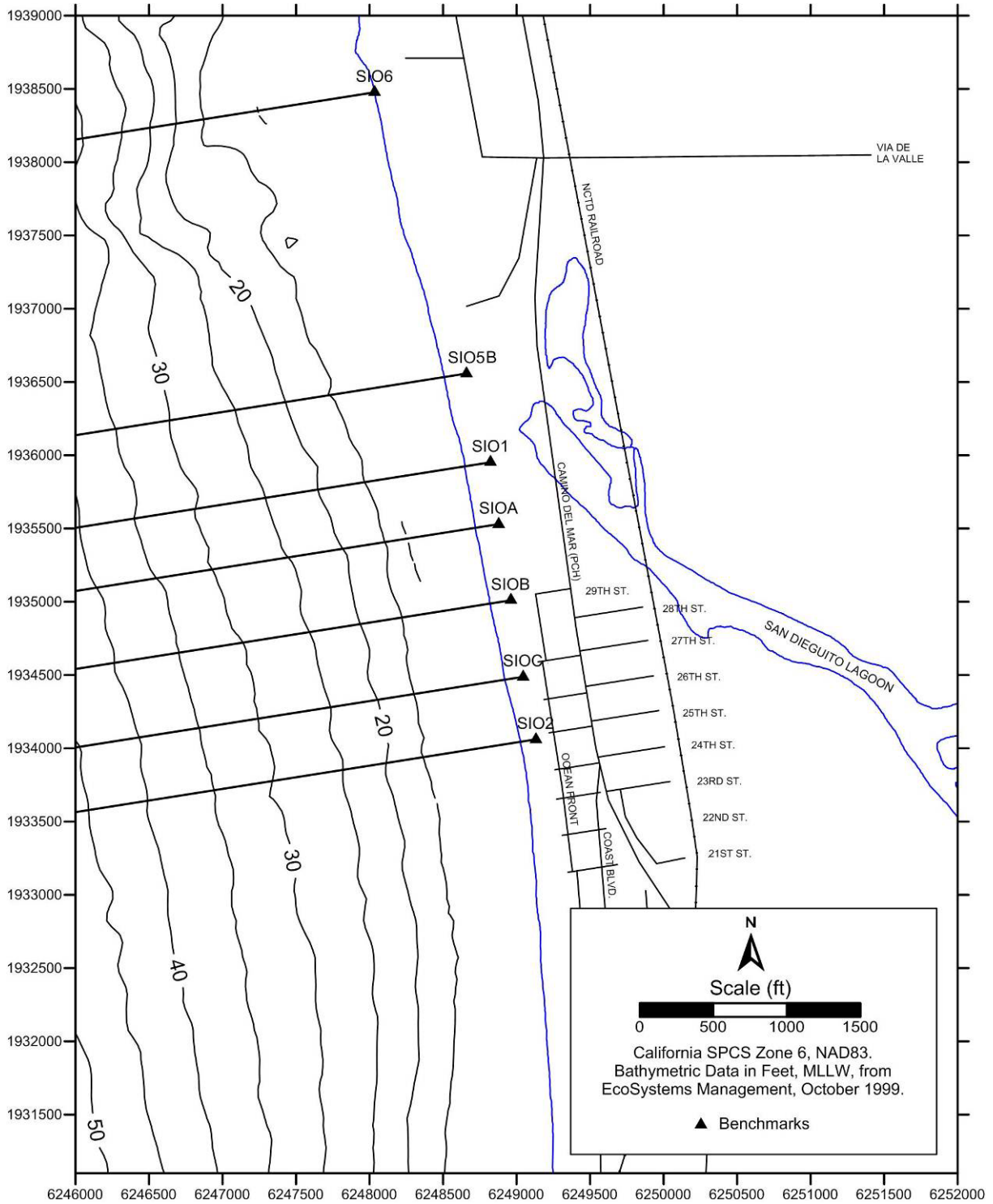


Figure 2. Beach profiles surveyed on 06 October 2016.

APPENDIX A
06 OCTOBER 2016
BEACH PROFILES

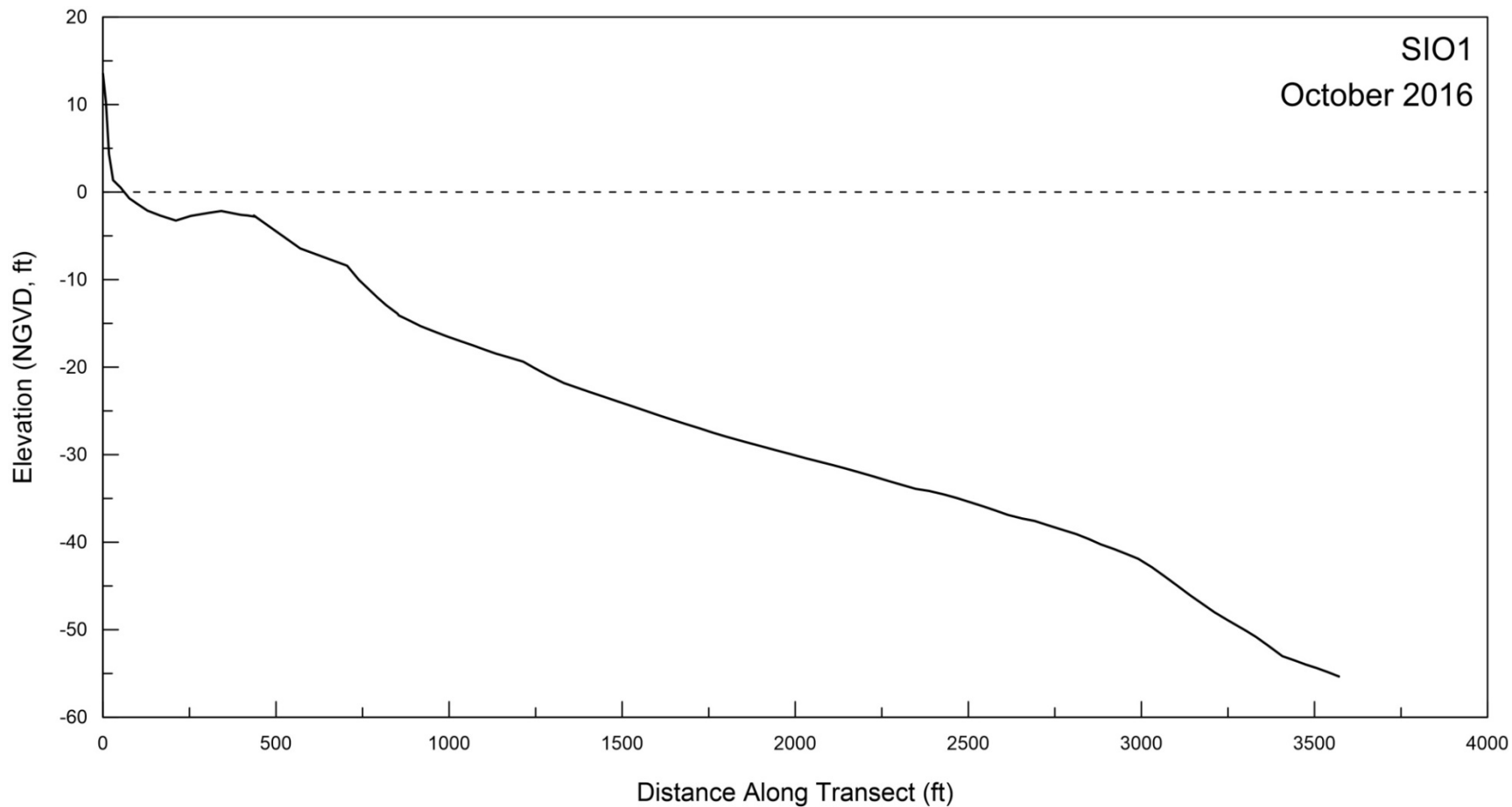


Figure A-1. Beach profile for SIO1 surveyed on 06 October 2016.

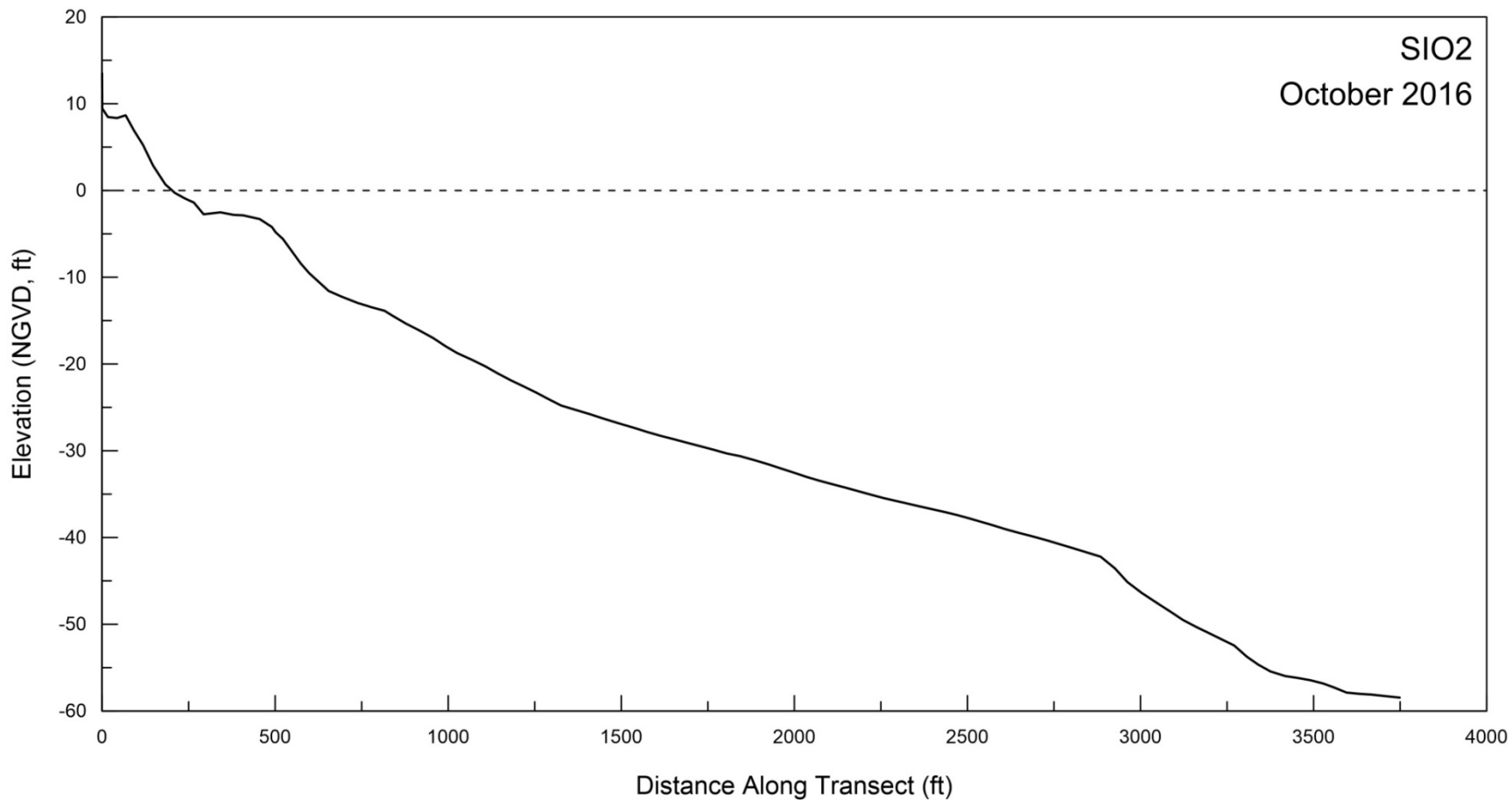


Figure A-2. Beach profile for SIO2 surveyed on 06 October 2016.

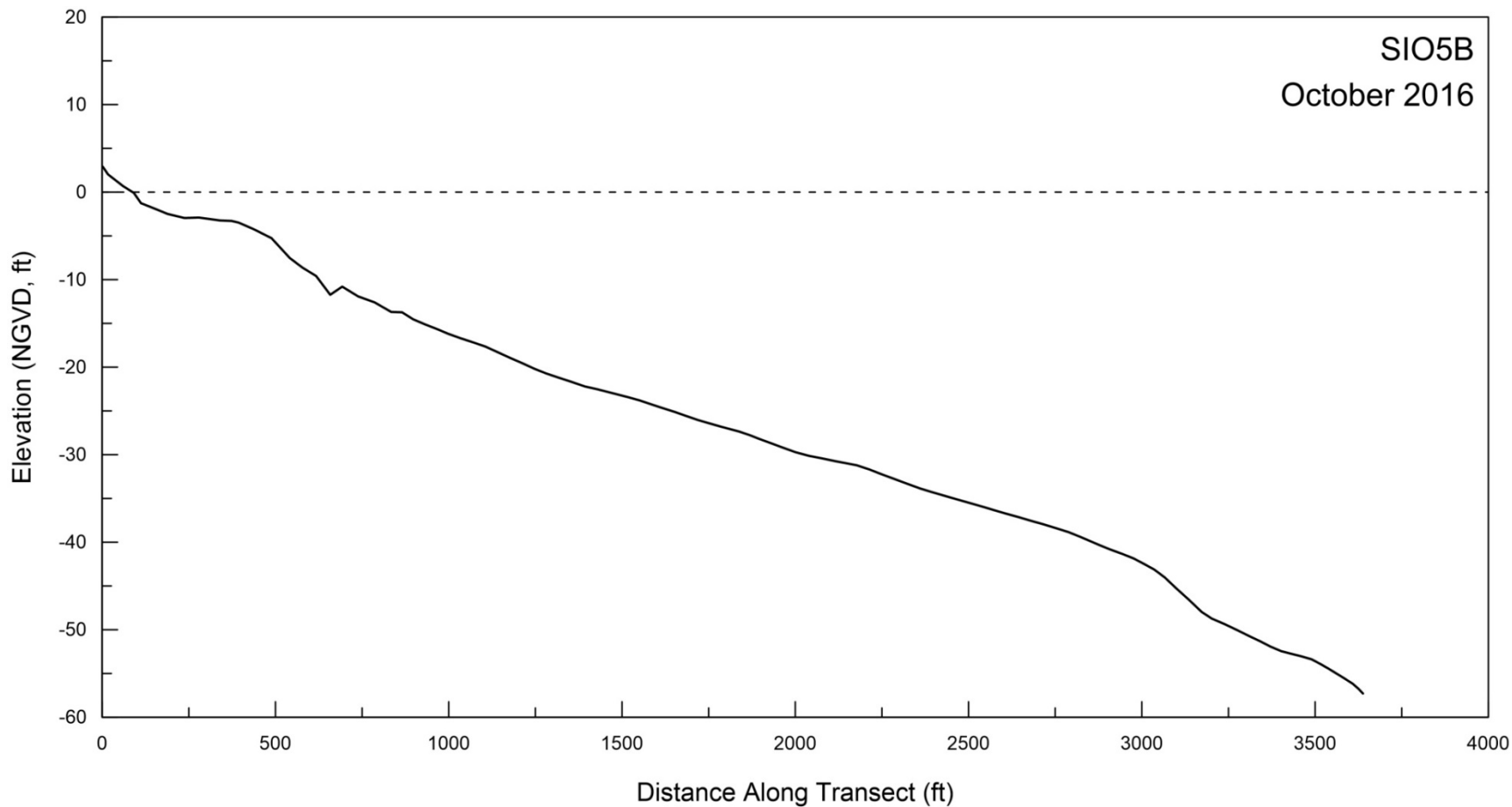


Figure A-3. Beach profile for SIO5B surveyed on 06 October 2016.

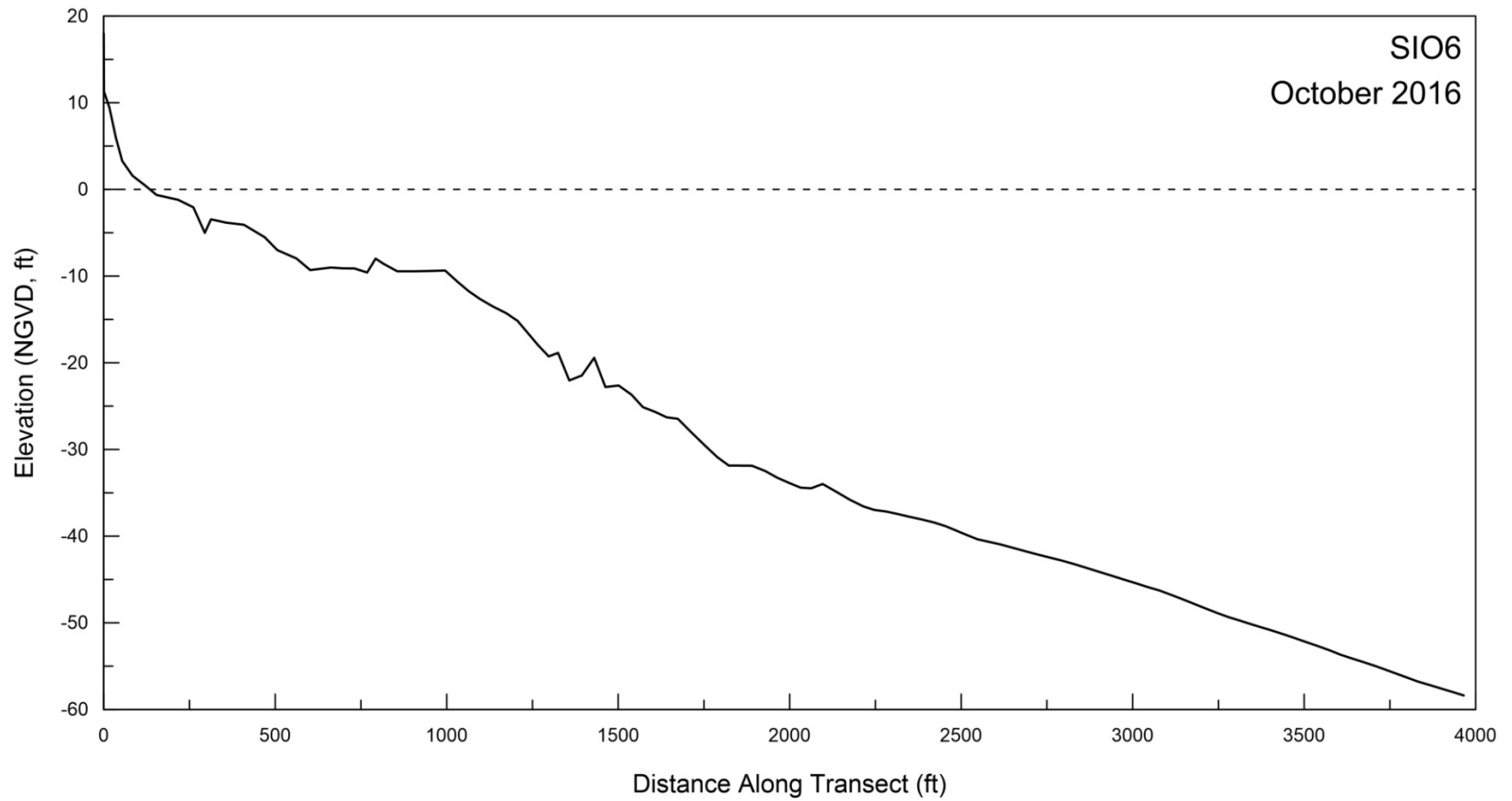


Figure A-4. Beach profile for SIO6 surveyed on 06 October 2016.

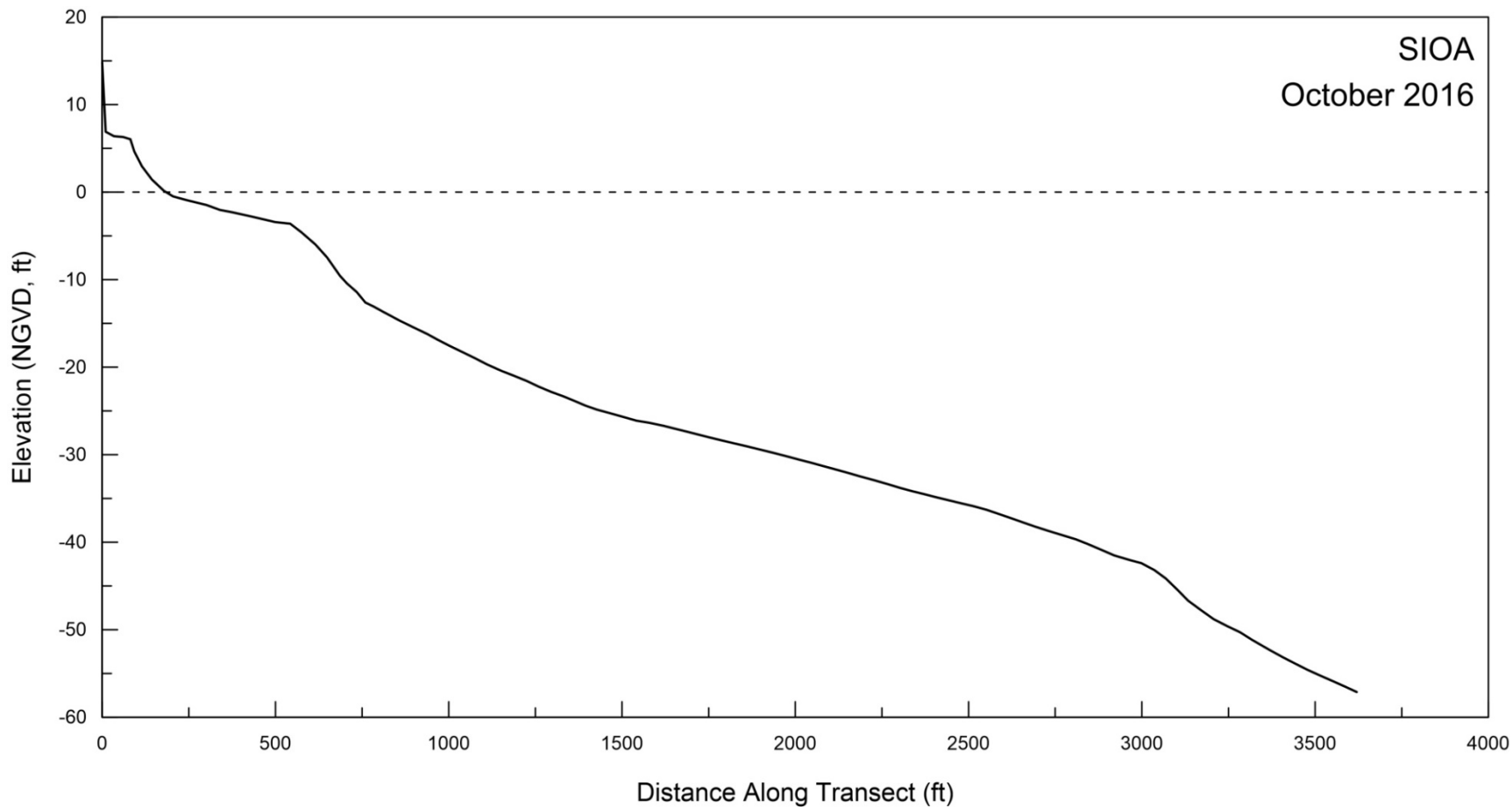


Figure A-5. Beach profile for SIOA surveyed on 06 October 2016.

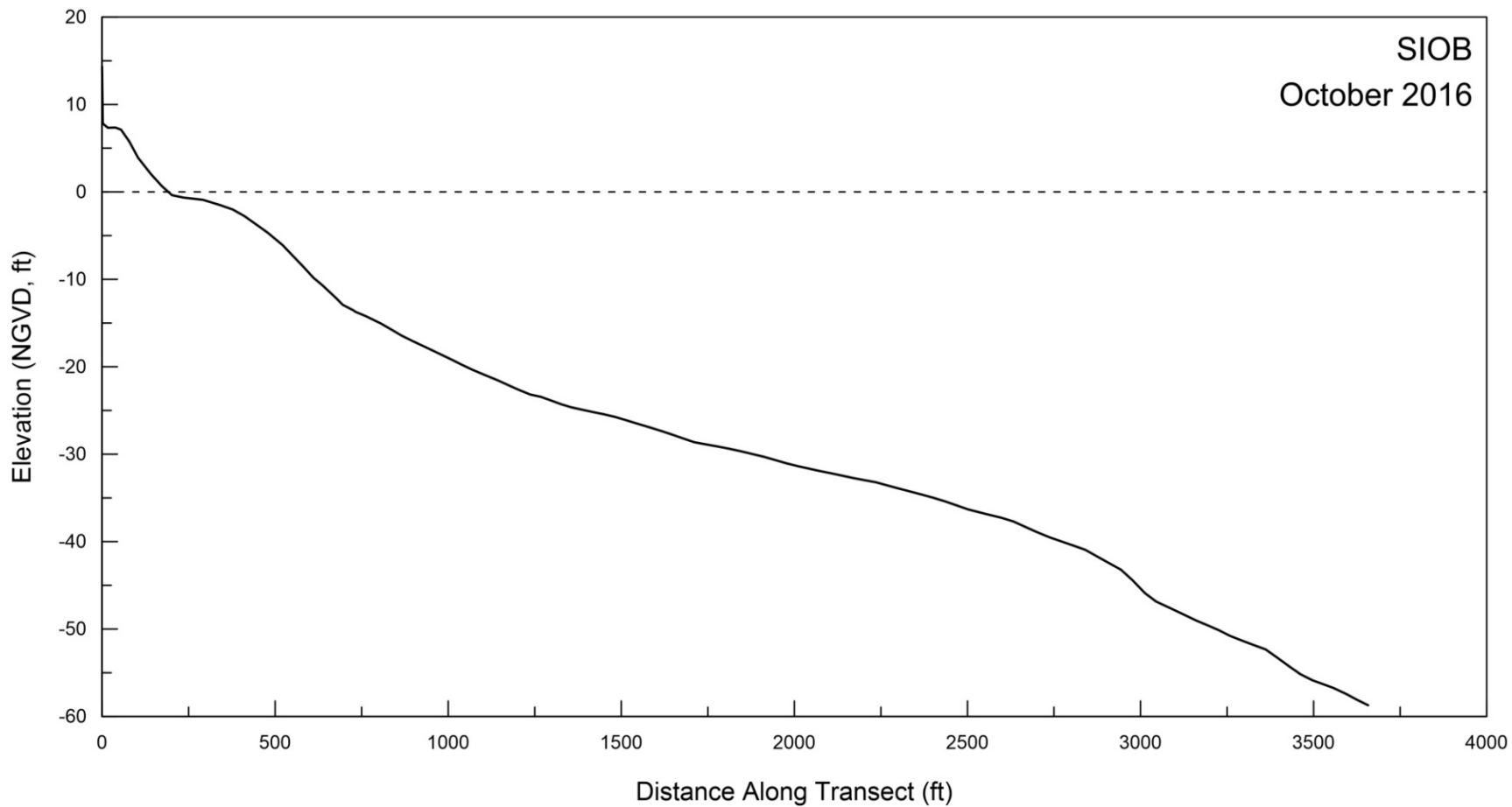


Figure A-6. Beach profile for SIOB surveyed on 06 October 2016.

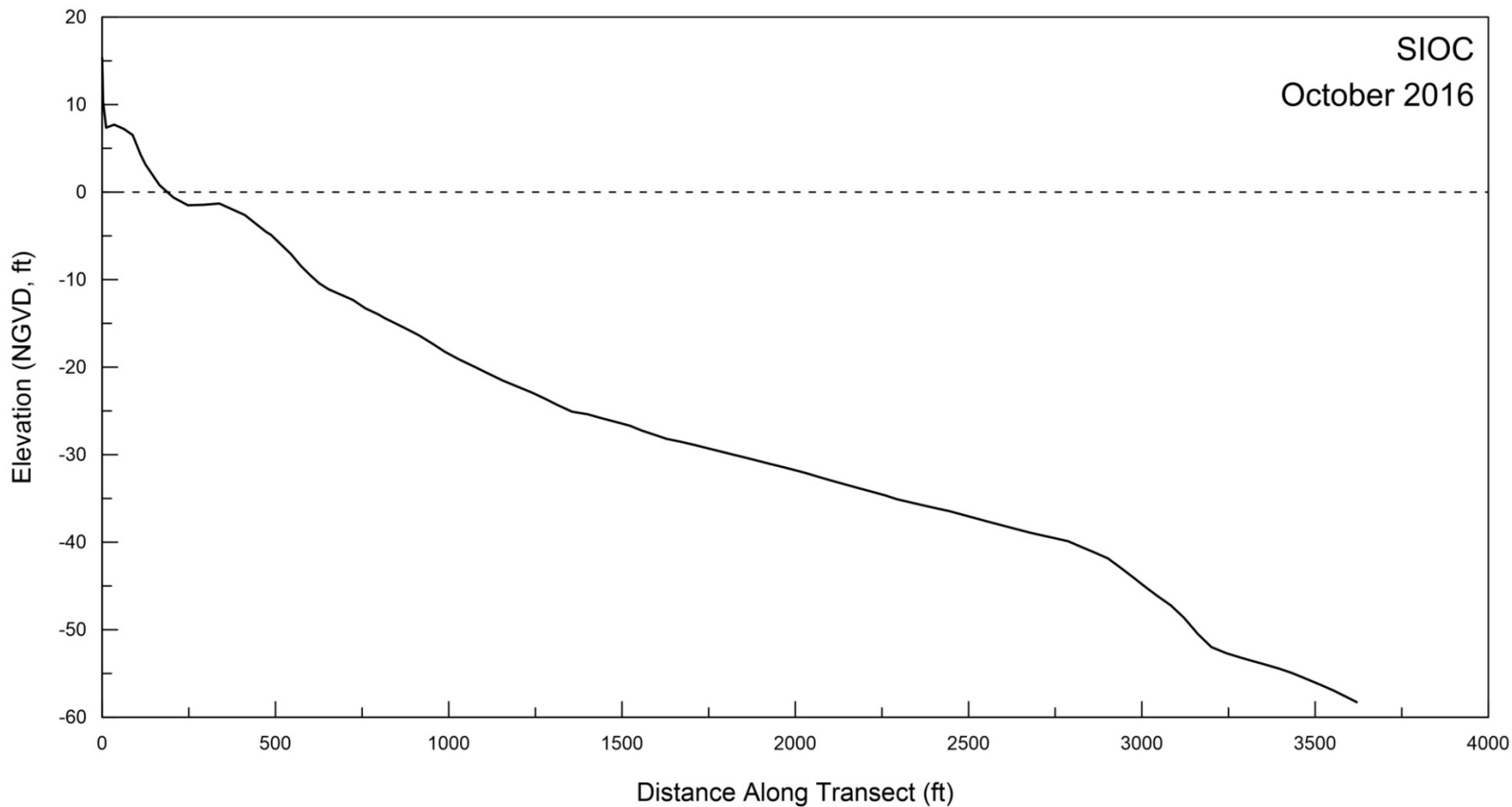


Figure A-7. Beach profile for SIOC surveyed on 06 October 2016.

APPENDIX B
06 OCTOBER 2016
BEACH WIDTHS

Table B-1. Beach widths (ft) from 06 October 2016 beach profile surveys referenced to benchmarks.

Date	SIO1	SIO2	SIO5B	SIO6	SIOA	SIOB	SIOC
06 October 2016	61.42	202.72	87.63	134.51	184.13	191.66	188.13

Table B-2. Beach widths (ft) from 06 October 2016 beach profile surveys adjusted to City of Del Mar Shore Protection Area.

Date	SIO1	SIO2	SIO5	SIO6	SIOA	SIOB	SIOC
06 October 2016	62.82	203.72	119.93	134.51	185.63	187.46	197.43

Note CCC conditions:

- (1) The beach width at DM-0590 (SIO1) is at or less than 32.4 feet (the lowest historically observed minimum);
- (2) The beach width at DM-0590 (SIO1) is at or less than 90 feet and there is more than a 180-foot difference in beach widths measured at DM-0590 and DM-0580 (SIO1 and SIO2); or
- (3) The beach width at SD-0595 (SIO5) is at or less than 74 feet (the lowest historically observed minimum).