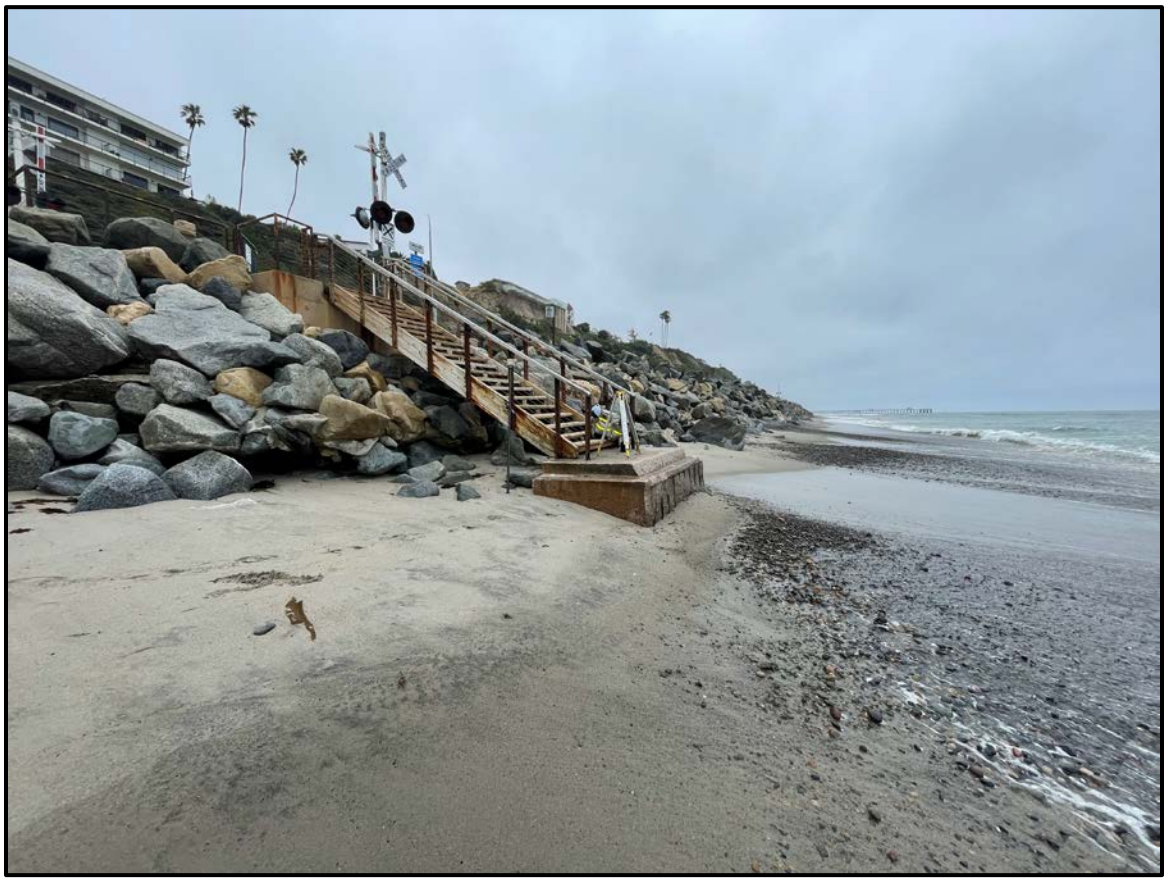
COASTAL

FRONTIERS



Dije Court, Transect SC-1695 – May 23, 2023

CITY OF SAN CLEMENTE
BEACH MONITORING PROGRAM
SPRING 2023 BEACH PROFILE SURVEY REPORT

Prepared for:

City of San Clemente

Coastal Frontiers Corporation
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CFC-1156d

CITY OF SAN CLEMENTE BEACH MONITORING PROGRAM

SPRING 2023 BEACH PROFILE SURVEY REPORT

Prepared for:

City of San Clemente

Prepared by:

Coastal Frontiers Corporation
Moorpark, California

August 2023
Rev. 0

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CITY OF SAN CLEMENTE
BEACH MONITORING PROGRAM

SPRING 2023 BEACH PROFILE SURVEY REPORT

1. INTRODUCTION

This report presents the methods and results of the City of San Clemente Spring 2023 Beach Profile Survey. The sections that follow provide an overview of the Monitoring Program, describe the Spring 2023 survey, and present the results. Beach profile plots accompany the report in Appendix A, while Mean Sea Level (MSL) and Mean High Water (MHW) beach widths are provided in Appendices B and C, respectively. ***(It should be noted that the offsets used to calculate beach widths at several transects will be revised at the time of the Fall 2023 survey based on input from community stakeholders.)***

The vertical datum employed throughout this report is National Ocean Service (NOS) Mean Lower Low Water (MLLW) for the 1983-2001 Epoch. The horizontal datum is California State Plane Zone 6 relative to the North American Datum of 1983 (NAD83(2011)2010.00), with units of U.S. Survey Feet.

2. PROGRAM OVERVIEW

The general objective of the monitoring program is to document changes in the condition of the shorezone between Dana Point Harbor and San Mateo Point, thereby providing a basis for evaluating the impacts of both natural events and beach replenishment operations. The program includes semi-annual beach profile surveys at 12 representative coastal sites.

Shoreline monitoring programs within the study area have been conducted intermittently. Ten surveys were performed by the U.S. Army Corps of Engineers (USACE) between November 1983 and December 1989 under the auspices of the Coast of California Storm and Tidal Waves Study – San Diego Region (CCSTWS-SD; USACE, 1991). Between October 2001 and May 2007, eleven surveys were conducted on behalf of the City's Beach Monitoring Program (Coastal Frontiers, 2007). Four additional wading-depth surveys were later performed between November 2016 and November 2017 exclusively at North Beach to document the placement of opportunistic nourishment. The

City's Beach Monitoring Program, consisting of all twelve sites within the study area, was resumed in October 2022 following a nearly 16-year hiatus from the May 2007 survey. The May 2023 survey marks the second survey performed under the recently resumed Monitoring Program.

The twelve shore-perpendicular beach profile transects within the study area are shown in Figure 1 and listed in Table 1. Five of these were established specifically for the Beach Monitoring Program and were surveyed for the first time in Fall 2001 (Coastal Frontiers, 2001). Six transects had been established previously by the USACE and were included in the CCSTWS-SD (USACE, 1991). An additional transect (SC-1702, North Beach) was established in May 2005 to monitor the fate of approximately 5,000 cy of sand nourishment material placed at the site (Coastal Frontiers, 2005).

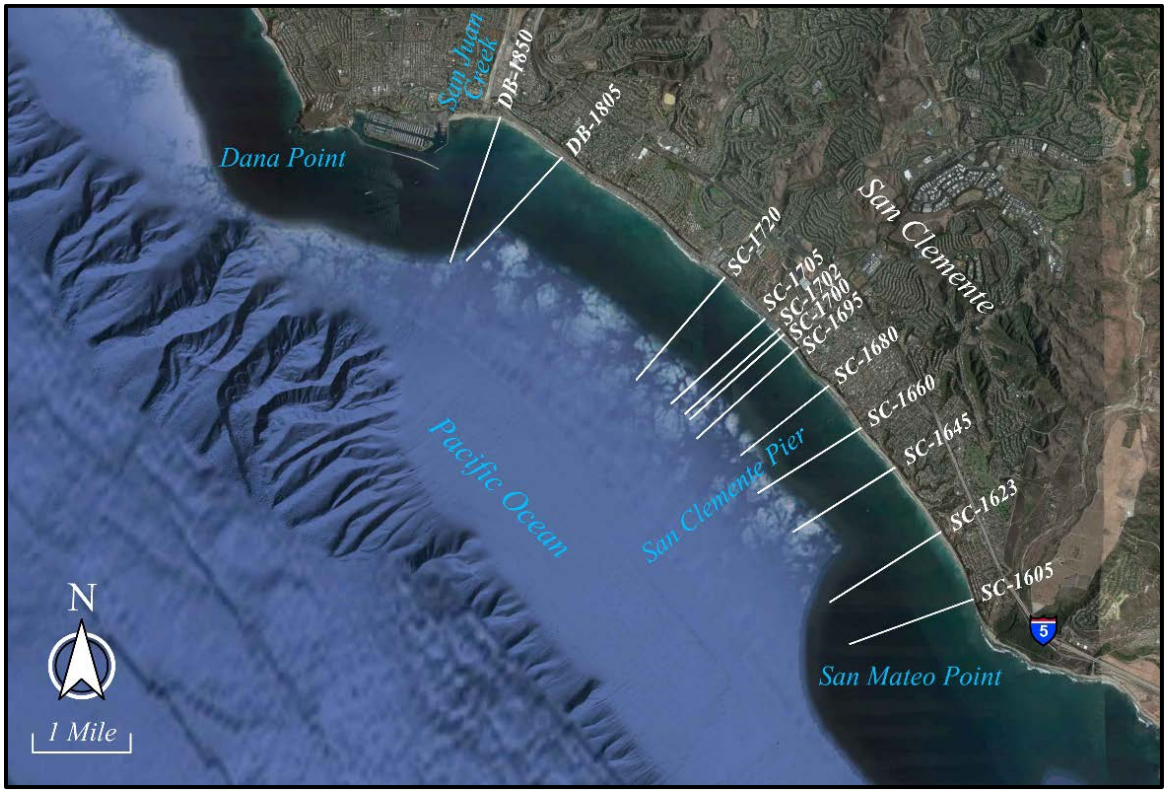


Figure 1. Transect Location Map

Table 1. San Clemente Area Beach Profile Transects

Transect Designation	Location	Origin
DB-1850	North Doheny State Beach	Historical (CCSTWS)
DB-1805	South Doheny State Beach	Historical (CCSTWS)
SC-1720	Shorecliffs	Historical (CCSTWS)
SC-1705	Capistrano Trailer Court	Established Oct. 2001
SC-1702	North Beach	Established May 2005
SC-1700	North Beach	Established Oct. 2001
SC-1695	Dije Court	Established Oct. 2001
SC-1680	Linda Lane	Historical (CCSTWS)
SC-1660	T-Street	Historical (CCSTWS)
SC-1645	Lost Winds	Established Oct. 2001
SC-1623	San Clemente State Beach	Historical (CCSTWS)
SC-1605	Cottons Point	Established Oct. 2001

3. SPRING 2023 BEACH PROFILE SURVEY

3.1 Field Activities

The Spring 2023 beach profile survey was conducted on May 23 in good conditions with light winds, and wave heights generally less than 2 ft. The wading and bathymetric portions of the survey were performed concurrently by two separate crews. Data were acquired along each transect from the back beach to either the 45 ft isobath relative to MLLW, or a distance of 6,000 ft seaward of the transect origin (whichever was first reached when proceeding offshore).

The above-water beach and surf zone were surveyed using an electronic total station and a survey rodman. The total station was used to determine the position and elevation of the beach at each location occupied by the rodman. Each transect was surveyed from the back beach seaward through the surf zone until the survey rod no longer protruded above the water surface when held vertically. This location, typically in a water depth of 10 to 12 ft below MLLW, provided substantial overlap with the landward portion of the bathymetric survey.

Bathymetric data were collected with a digital acoustic echo sounder operated from a shallow-draft survey vessel. A motion reference unit (MRU), which provides real-time corrections to the echo sounder for wave-induced vessel heave, also was utilized. A dual antenna Global Positioning System (GPS) receiver was used to determine the vessel heading and the position of each sounding. To improve the accuracy of each position, differential corrections transmitted in real-time from Wide Area Augmentation System (WAAS) were utilized (DGPS). All systems were interfaced to a laptop computer using the Hypack Survey software package.

The boat traveled from the offshore terminus to the surf zone guided by DGPS navigation. The sounding and MRU data were acquired on a continuous basis. Positions were recorded at 2 Hz, with interpolated values assigned to the soundings acquired between position fixes.

The calibration of the echo sounder was checked at the beginning and end of the survey using a standard "bar check" procedure. Additionally, the speed of sound in sea water was obtained at the offshore end of each transect using a device that measures conductivity, temperature, and depth (CTD) along a vertical profile within the water column.

3.2 Data Reduction

Data from the wading portion of the survey were processed using software developed by Spectra Precision. The raw total station data were read by the software, and the coordinates and elevation of each data point were calculated and subsequently verified in a surface modelling utility (Trimble Terramodel).

The raw data from the bathymetric portion of the survey consisted of Hypack files containing the position data and heave-compensated soundings. The raw soundings were corrected based on the speed-of-sound profiles obtained at the end of each transect. The soundings then were adjusted to the MLLW datum using water level measurements made by NOAA at La Jolla (Station ID 9410230). To provide a more accurate representation of local tide conditions, the water levels recorded at La Jolla were adjusted using the time and height differences for San Clemente published by NOAA.

The adjusted soundings were edited for outliers using the Hypack single-beam processing module. The MRU utilized during the survey removed the majority of the wave contamination from the record in real time. However, to further minimize the influence of wave-induced vessel motion, selected portions of the echo sounder record were filtered using Hypack.

The processed soundings were thinned to a nominal interval of 10 ft to produce a file suitable for developing beach profile plots. The resulting x, y, z data (easting, northing, and elevation) were inserted into the surface modelling utility containing the wading data. As indicated above, the field work was conducted in such a manner as to provide substantial overlap between the wading and bathymetric portions of the survey. The data were examined in this region to ensure that the two data sets were compatible. Once this confirmatory inspection had been completed, only the more detailed data in the region of overlap were retained (typically the bathymetric data). The less detailed data were purged, after which the wading and bathymetric data were merged to create a single digital beach profile data file (*.bpd) containing range and elevation pairs along the transect alignment.

Based on past experience, the vertical accuracy of the processed soundings is approximately ±0.5 ft. According to the Hemisphere GNSS equipment specifications, the root mean square (RMS) accuracy of the horizontal positions obtained in the manner described above is approximately 2.0 ft (95% confidence). The electronic total station used to conduct the survey is capable of measuring ranges to within ±0.5 ft and elevation differences to within ±0.1 ft. However, because the rodman was subjected to waves and currents in the surf zone, the horizontal distance perpendicular to each transect (parallel to the shoreline) may vary from minimal at short ranges to approximately ±15 ft at the offshore end.

4. RESULTS

4.1 Data Products

Beach profile plots developed from the May 2023 survey data accompany the report in Appendix A. To place the survey results into historical context, each profile is plotted in concert with the envelope of profiles measured during the roughly 5.5-year period that comprises the most recent phase of the Monitoring Program (Fall 2001 to Spring 2007). In addition, the profiles from the April 1986, May 2002, May 2007 and October 2022 surveys are shown, where such data are available. The range on each profile plot represents the distance in feet seaward of the transect origin measured along the transect alignment. The elevation is given in feet relative to MLLW for the 1983-2001 National Tidal Datum Epoch.

In 2003, NOAA implemented the current National Tidal Datum Epoch (1983-2001) to account for changes in sea level along the coast (NOAA, 2003). While historical surveys conducted prior to 2003 by the City and the USACE referenced the previous epoch (1960-1978), all data presented in this report have been updated to the current epoch to facilitate direct comparison.

Mean Sea Level (MSL) and Mean High Water (MHW) beach widths derived from the profile data are presented in Appendices B and C, respectively. The beach width was computed as the horizontal distance, in feet, between the landward limit of the beach and the point at which the beach profile intersected the plane of the respective tidal datum (Figure 2). MSL lies 2.73 ft above MLLW, while MHW is located 4.60 ft above MLLW, based on the published tidal datum elevations at La Jolla, CA (Station ID 9410230; NOAA, 2023). As indicated above, the 0 ft range on the beach profile plots corresponds to the transect origin. The horizontal offset between the transect origin and the landward limit of the beach is provided in Appendices B and C. As noted in Section 1, this offset will be modified for several transects at the time of the Fall 2023 survey based on input from community stakeholders.

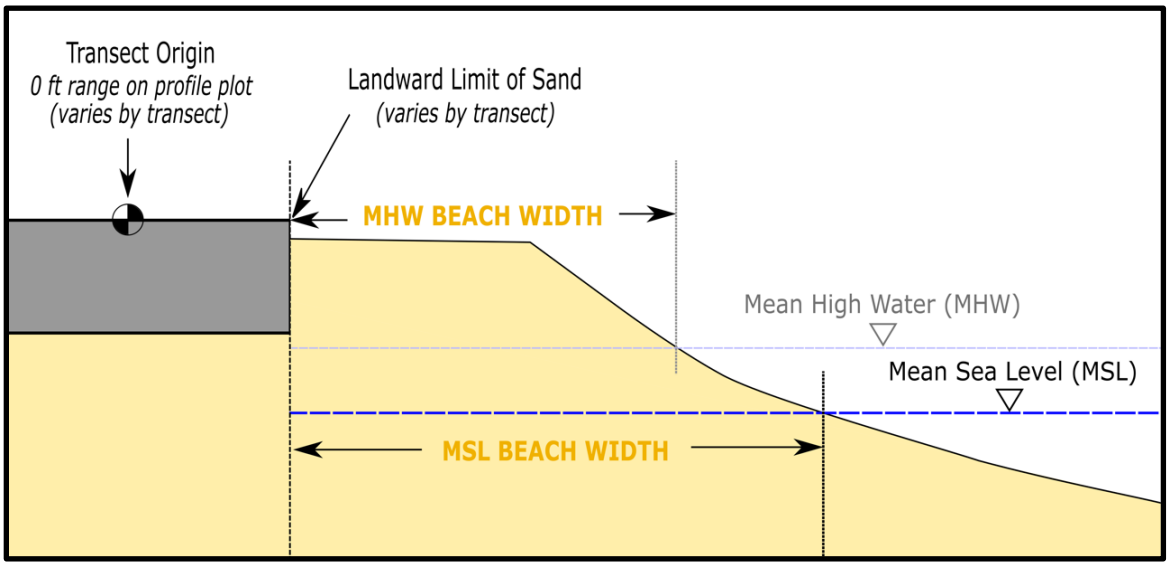


Figure 2. Mean Sea Level and Mean High Water Beach Widths

Notwithstanding the use of MLLW as the elevation reference for the profile data, MSL was adopted as the shoreline reference in the belief that it provides a more accurate indicator of changes in beach configuration. Alternatively, MHW beach widths may be used to generally characterize "towel space."

As part of the 2022 survey, the landward terminus of the beach was documented at each of the twelve sites (Appendix B). In several cases, this location differed from that used historically due to physical changes at the back beach. For all historical survey data, the MSL and MHW beach widths were recomputed to reflect the updated landward termini. ***These revised beach widths supersede those provided prior to 2022.***

The Spring 2023 Beach Profile Survey data are included in a compressed (*.zip) folder attached to the electronic submittal of this report. The *.zip folder contains ASCII

files of: (1) range and elevation pairs for each profile (*.bpd), and (2) northing, easting, and elevation triplets (*.nez) for the entire survey. In the case of the georeferenced data, the horizontal positions are in U.S. Survey Feet relative to California State Plane Zone 6, NAD83(2011)2010.00. A header within each file provides relevant details for the data, including date, location, and datums.

4.2 Observations

A detailed analysis of the state of the City's beaches exceeds the present Scope of Work. General observations are offered, however, based on the profile plots and MSL beach widths provided in Appendices A and B, respectively. In the interest of completeness, MHW beach widths are provided in Appendix C. For clarity, the term "beach width" discussed herein refers to MSL beach width.

Beach Widths and Shoreline Changes

1. **MSL Beach Widths (Appendix B, Figure 3):** MSL beach widths at the time of the Spring 2023 survey are illustrated in Figure 3. The envelope of historical Spring beach widths is provided for context (comprised of all surveys conducted during the months of April through June between 1984 and 2007). Spring 2023 beach widths ranged from 23 ft at Cotton's Point (Transect SC-1605) to 210 ft at Lost Winds (SC-1645). Beach widths in Spring 2023 fell near, or below, the lower bound of the historical range from Doheny State Beach (DB-1850) to Dije Court (SC-1695), and at Cotton's Point (SC-1605). In the region from Linda Lane (SC-1680) to San Clemente State Beach (SC-1623), the Spring 2023 beach widths were near, or exceeded, the upper bound of the envelope.

2. **Shoreline Change Trends (Appendix B):** The time series plots provided in Appendix B illustrate a trend of decreasing beach widths at Doheny State Beach (DB-1850 and DB-1805), which resulted in historical minimums at both sites by the time of the October 2022 survey. The shoreline position at Shorecliffs (SC-1720) has remained fairly stable, with current conditions comparable to those that existed in the 1980's. A modest trend of beach width loss has prevailed at Capistrano Trailer Court and Dije Court (SC-1705 and SC-1695), and the shoreline retreated to the revetment by the time of the October 2022 survey At the four sites from Linda Lane (SC-1680) to San Clemente State Beach (SC-1623), a trend of shoreline advance has occurred over the past two decades. As a result, recent beach widths at these sites are among the widest on record. The most pronounced beach width change in the study area occurred at Cotton's Point (SC-1605), with the beach width decreasing about 150 ft relative the early 2000's.

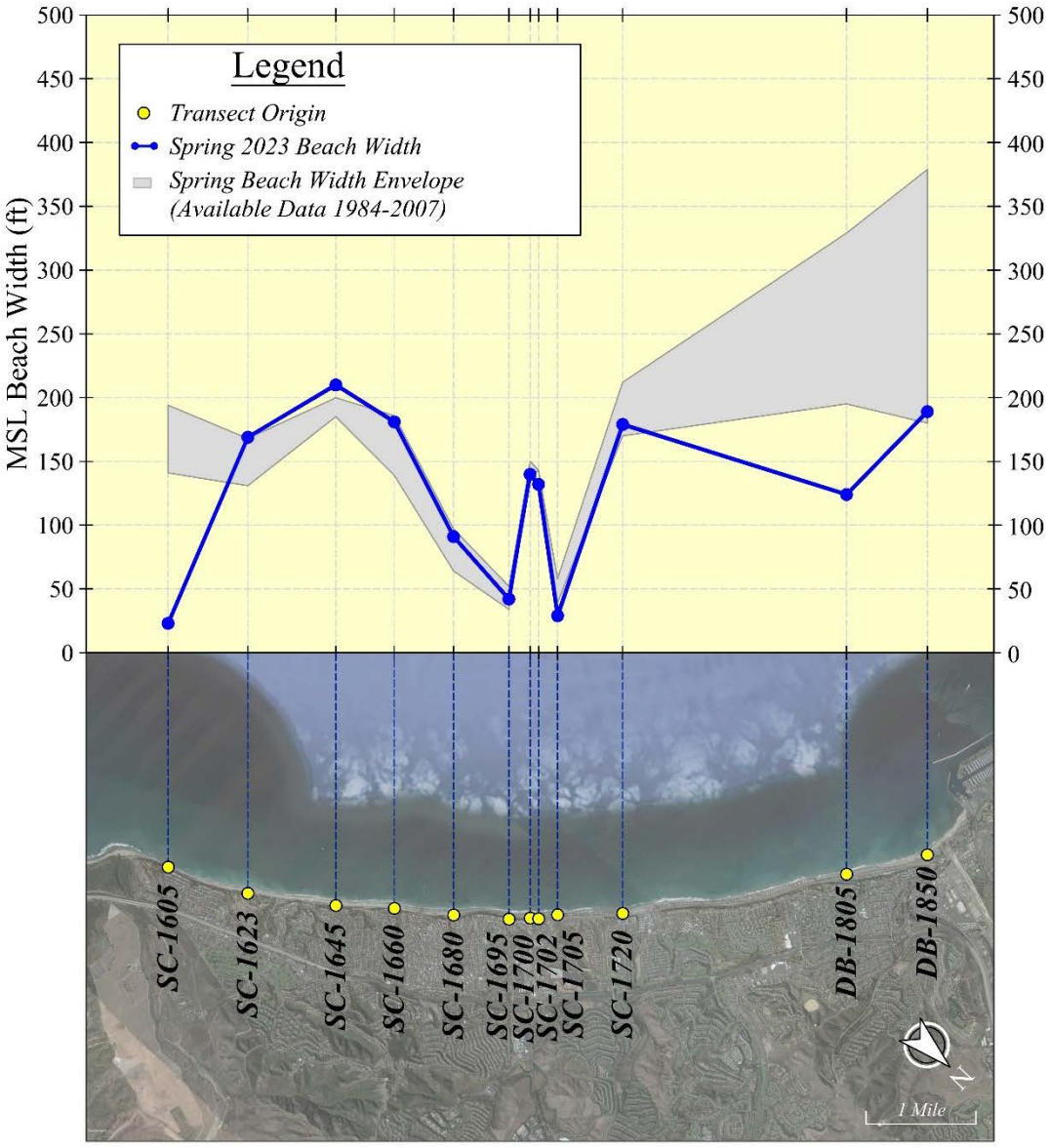


Figure 3. Spring 2023 MSL Beach Widths
Relative to 1984-2007 Historical Spring Beach Width Envelope

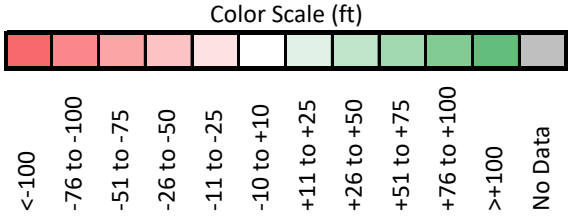
3. **<u>Winter Seasonal Beach Width Changes – Oct 2022 to May 2023 (Table 2, Fig. 4)</u>:** Over the most recent winter season (October 2022 to May 2023), beach widths increased at the northern four sites from North Doheny State Beach (DB-1850) to Capistrano Trailer Court (SC-1705). The minor shoreline advance that occurred at North Doheny State Beach (DB-1850; 16 ft) contrasts with the sizeable gains that were noted at the site in May 2005 following a winter season with similarly high precipitation (gain of 180 ft). This outcome suggests that the rains during the most

recent winter season either failed to deliver significant quantities of sediment to the shoreline or that such material was not captured at the transect at the time of the May 2023 survey.

Shoreline retreat predominated at the sites located further to the south. The exceptions were Dije Court (SC-1695) and Cotton's Point (SC-1605), where the shoreline advanced. The greatest gain within the study area (42 ft) was measured at Dije Court (SC-1695), while the largest loss (60 ft) occurred at Linda Lane (SC-1680). The average beach width change across the study area over the recent winter was a loss of 4 ft.

Table 2. MSL Beach Width Changes at San Clemente Area Transects

Transect	Location	MSL Beach Width Change (ft)	
		Winter Seasonal Oct 2022 – May 2023 (~7 Months)	Long-Term Apr 1986 - May 2023 (37 Years)
DB-1850	N. Doheny SB	16	-127
DB-1805	S. Doheny SB	12	-176
SC-1720	Shorecliffs	11	-10
SC-1705	Capistrano Trailer Ct	29	--
SC-1702	North Beach	-19	--
SC-1700	North Beach	-11	--
SC-1695	Dije Court	42	--
SC-1680	Linda Lane	-60	18
SC-1660	T-Street	-18	22
SC-1645	Lost Winds	-28	--
SC-1623	San Clemente SB	-34	1
SC-1605	Cottons Point	15	--



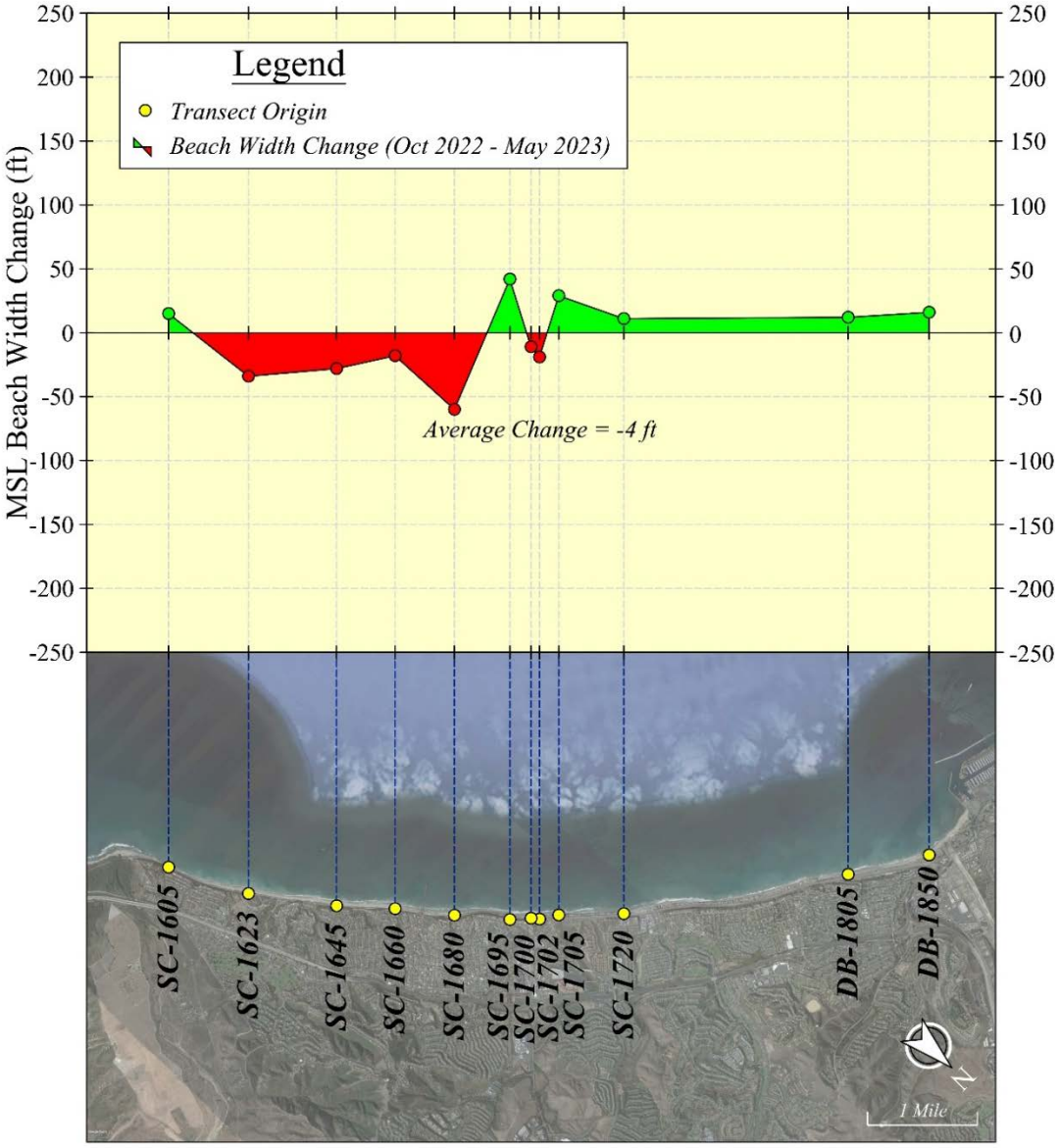


Figure 4. Winter Seasonal Beach Width Changes, October 2022 to May 2023

4. **<u>Long Term Beach Width Changes – April 1986 to May 2023 (Table 2, Fig 5)</u>:** When the 37-yr period between the April 1986 to May 2023 is considered, shoreline losses prevailed at the northern portion of the study area (DB-1850 to SC-1720) and modest gains occurred at the southern portion of study area (SC-1680 to SC-1623) Losses ranged from of 176 ft at DB-1805 to 10 ft at SC-1720. Near the pier, modest gains of 18 and 22 ft were measured at SC-1680 and SC-1660, respectively. At San Clemente State Beach (SC-1623), the beach width was essentially unchanged over the 37-yr period.

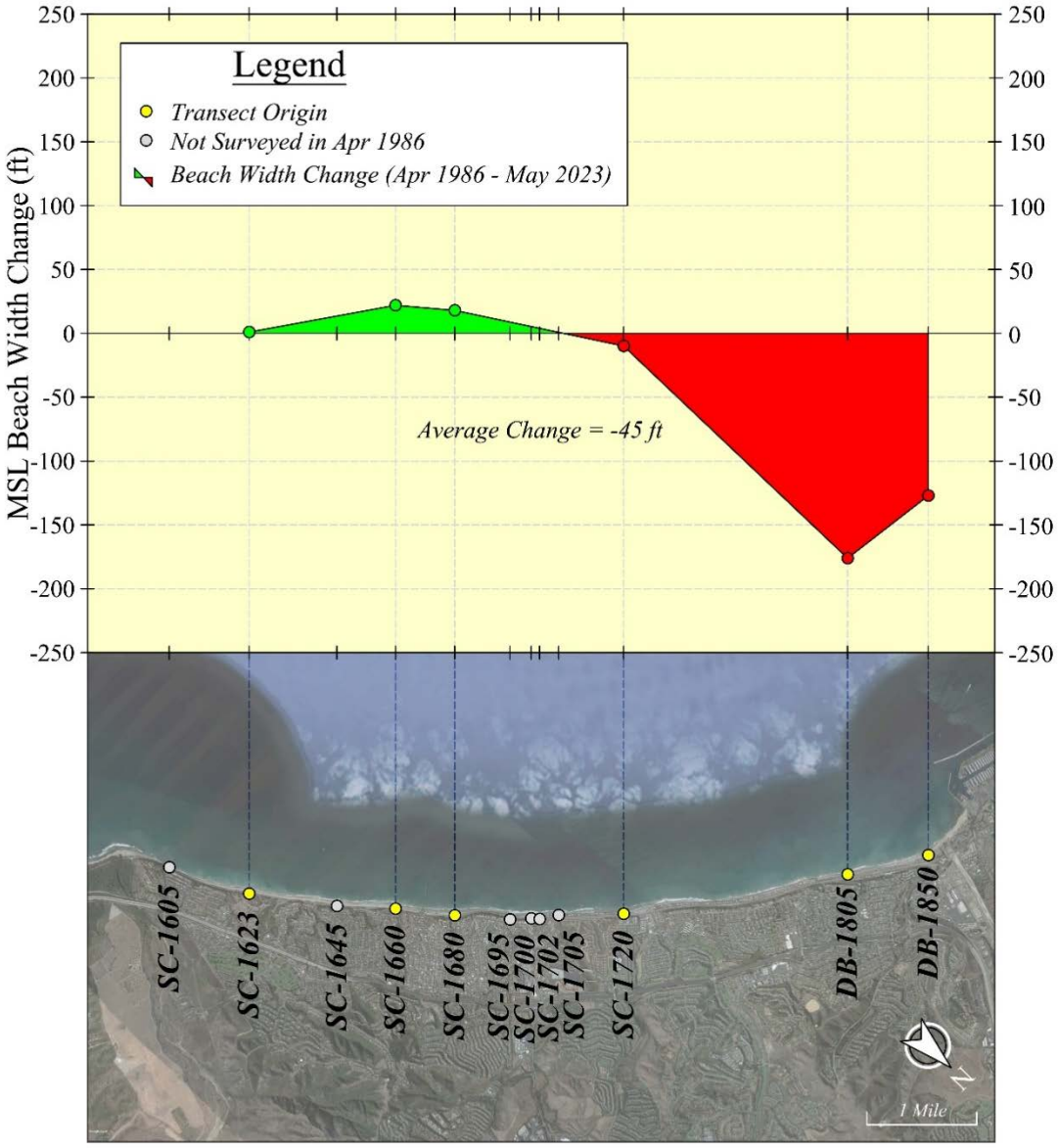


Figure 5. Long Term Beach Width Changes, April 1986 to May 2023

Profile Changes

Southern California Edison constructed the 376-acre artificial Wheeler North Reef (WNR) offshore of the San Clemente shoreline during three phases between 1999 and 2020. While the Phase 1 Experimental Reef (22.4 acres) was installed in 1999 prior to the 2001-2007 Beach Monitoring Program, the majority of the reef was constructed after the May 2007 Survey as Phase 2 (152 acres, June to September 2008; Coastal Environments,

2018) and Phase 3 (202 acres, July 2019 to July 2020; SCE, 2020). Changes evident in the recent profiles relative to the historical data in depths greater than about 40 ft at Transects SC-1720 through SC-1605 are believed to be artifacts of the WNR.

1. **Doheny State Beach:** Modest above-water accretion prevailed at the two Doheny State Beach (Transects DB-1850 and DB-1805) sites during the most recent winter (October 2022 to May 2023). These gains were accompanied by losses in the nearshore bar out to depths of about 10 ft. This outcome contrasts with changes observed in May 2005 following a similar winter season with high precipitation when substantial quantities of sediment were delivered to the coast (Coastal Frontiers, 2005). While the May 2023 profile at North Doheny State Beach (DB-1850) fell near the lower limit of the historical profile envelope, the profile at South Doheny State Beach (DB-1805) was significantly more eroded than the beach conditions which existed between Fall 2001 and Spring 2007.

2. **Shorecliffs:** Winter seasonal changes were mild at Shorecliffs (SC-1720), and consisted of minor above-water gains with losses in the nearshore bar. The May 2023 profile was among the most eroded conditions on record, falling well below the historical envelope.

3. **Capistrano Trailer Court:** Winter seasonal profile changes at Capistrano Trailer Court (SC-1705), were confined to the relatively small region from the revetment to just below MLLW. Modest accretion occurred in front of the revetment, with losses prevailing just below water. Further offshore, the profile was generally unchanged. With the exception of the distinct trough that formed just below water, the May 2023 profile is comparable to past conditions.

4. **North Beach:** During the winter season (October 2022 to May 2023) modest above-water losses at the North Beach sites were partially balanced by gains in the nearshore bar (SC-1702 and SC-1700). The losses reduced the above-water beach to a more eroded state than documented during the Fall 2001 to Spring 2007 period.

5. **Dije Court:** The winter seasonal changes at Dije Court (SC-1695) mirrored those at Capistrano Trailer Court (SC-1705) - accretion in front of the revetment accompanied by modest below-water losses. The May 2023 profile generally fell within the historical range.

6. **Linda Lane to San Clemente State Beach:** Winter seasonal profile changes (October 2022 to May 2023) were mixed among the four transects between Linda Lane and San Clemente State Beach. At Linda Lane (SC-1680), losses from the above-water beach

were balanced by below-water gains in the nearshore bar. The May 2023 condition at Linda Lane exceeded the upper limit of the historical profile envelope at the nearshore bar.

South of the pier (T-Street; SC-1660 and Lost Winds; SC-1645), comparison of the October 2022 and May 2023 profiles indicate only minor changes over the recent winter. In comparison to historical conditions (Fall 2001 to Spring 2007 envelope), the above-water berm in May 2023 is more accreted at both sites.

At San Clemente State Beach (SC-1623), erosion prevailed during the recent winter from the back beach to roughly MLLW (October 2022 to May 2023). Below water, the profile remained generally unchanged. The May 2023 profile fell near the middle of the historical range.

7. **Cottons Point:** At Cottons Point (SC-1605), the most eroded condition measured at the site occurred at the time of the previous survey in October 2022. Modest gains occurred during the recent winter season between the revetment and depth of about 10 ft. Nevertheless, the May 2023 profile depicts one of the most eroded conditions on record.

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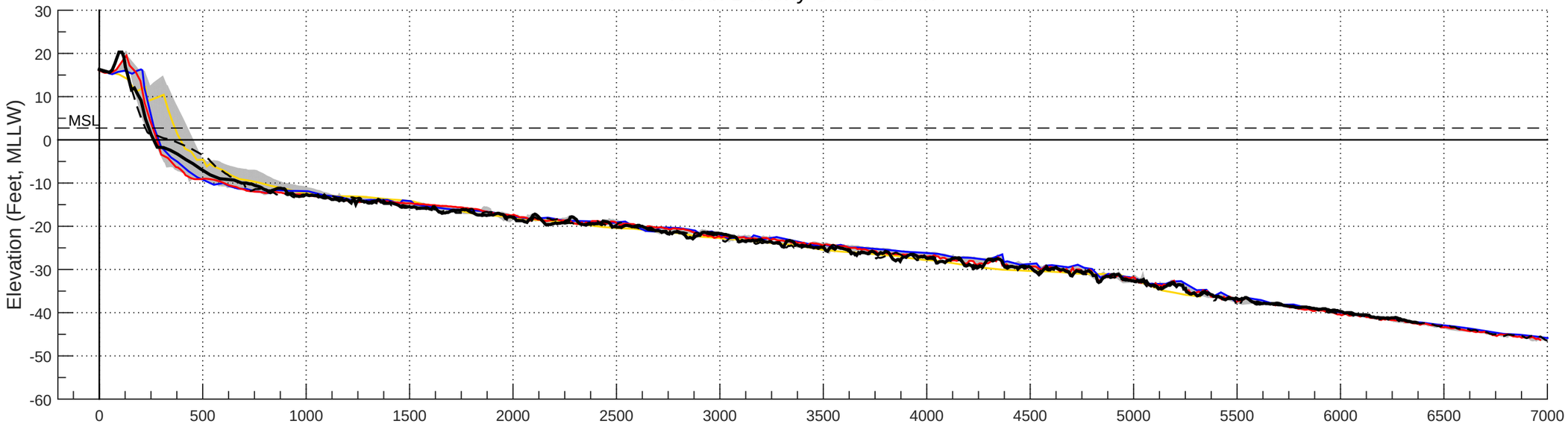
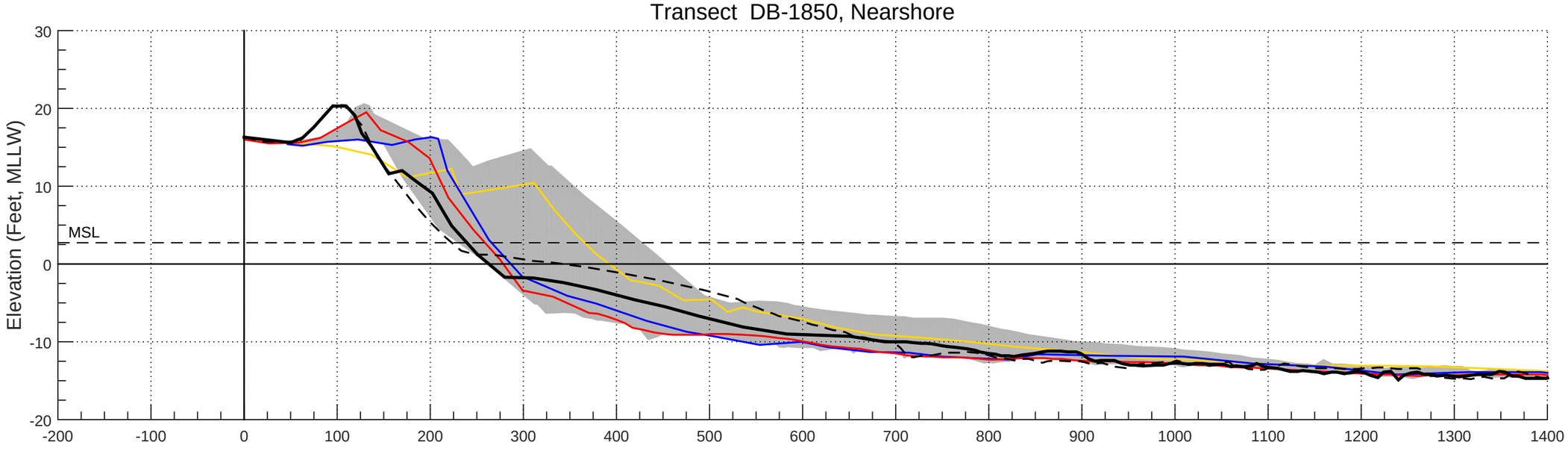
APPENDIX A

BEACH PROFILE PLOTS

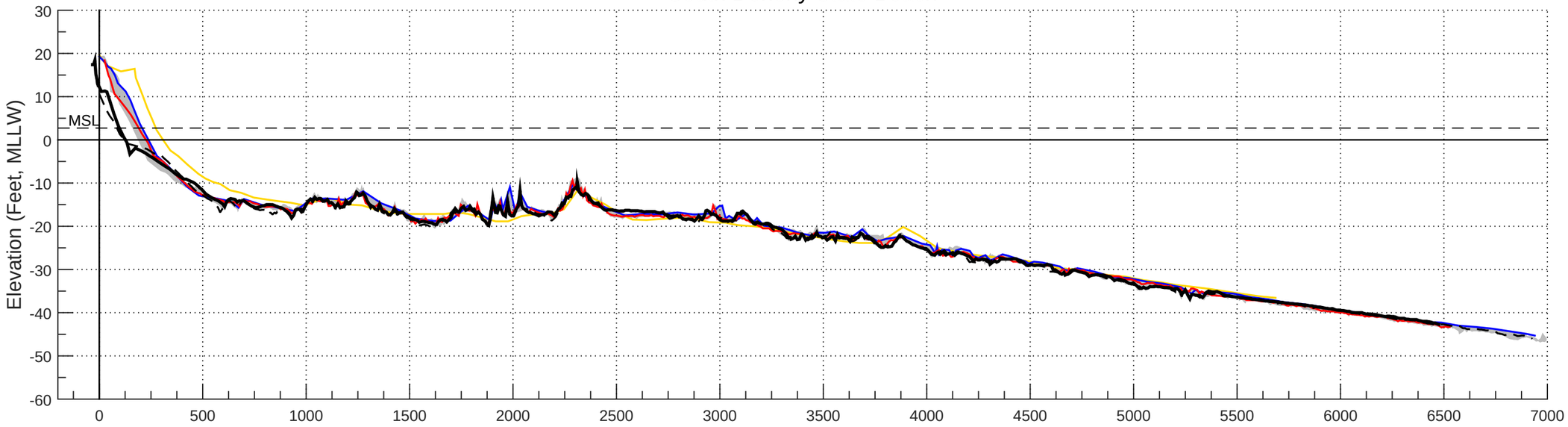
Transect DB-1850
North Doheny State Beach



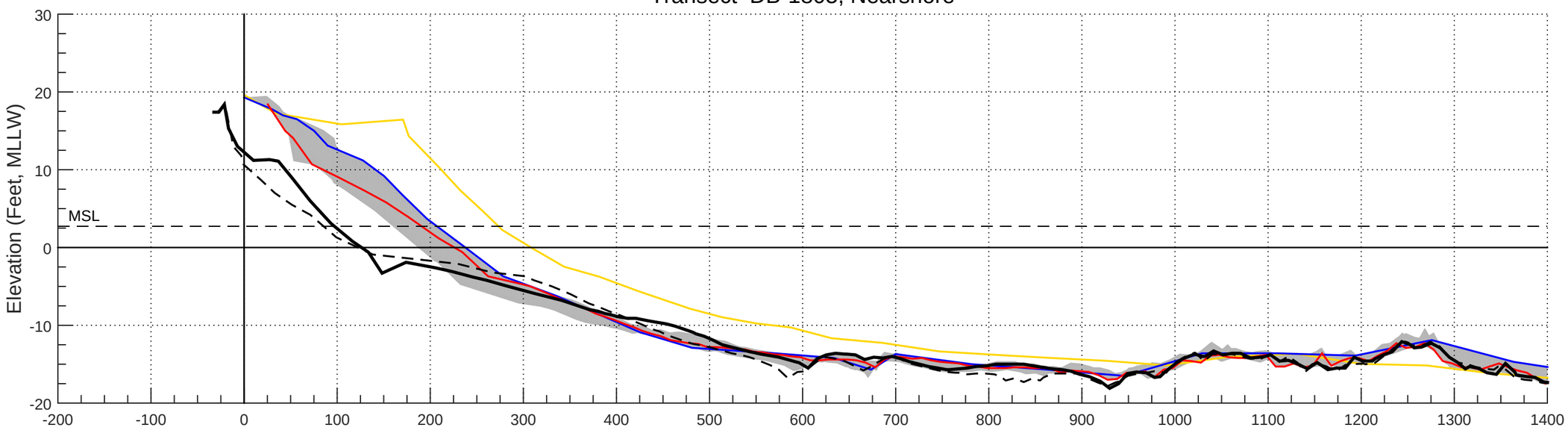
Transect DB-1850, Nearshore



Transect DB-1805
South Doheny State Beach



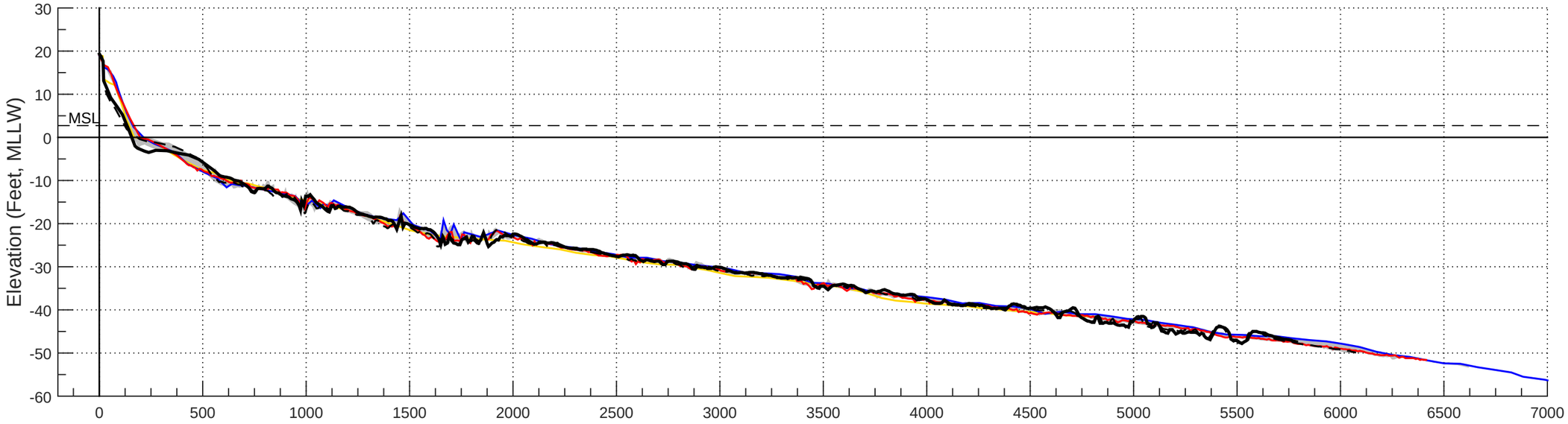
Transect DB-1805, Nearshore



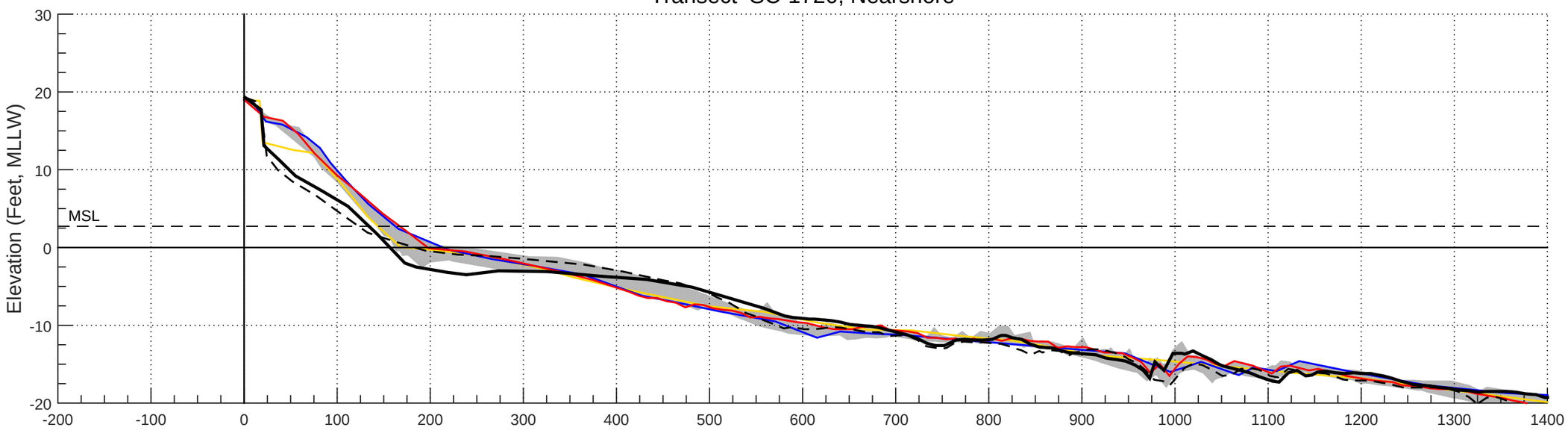
Cross-Shore Distance (Feet Seaward of Transect Origin)

Profile Envelope (Fall 2001 - Spring 2007) | Apr 1986 | May 2002 | May 2007 | Oct 2022 | May 2023

Transect SC-1720
Shorecliffs



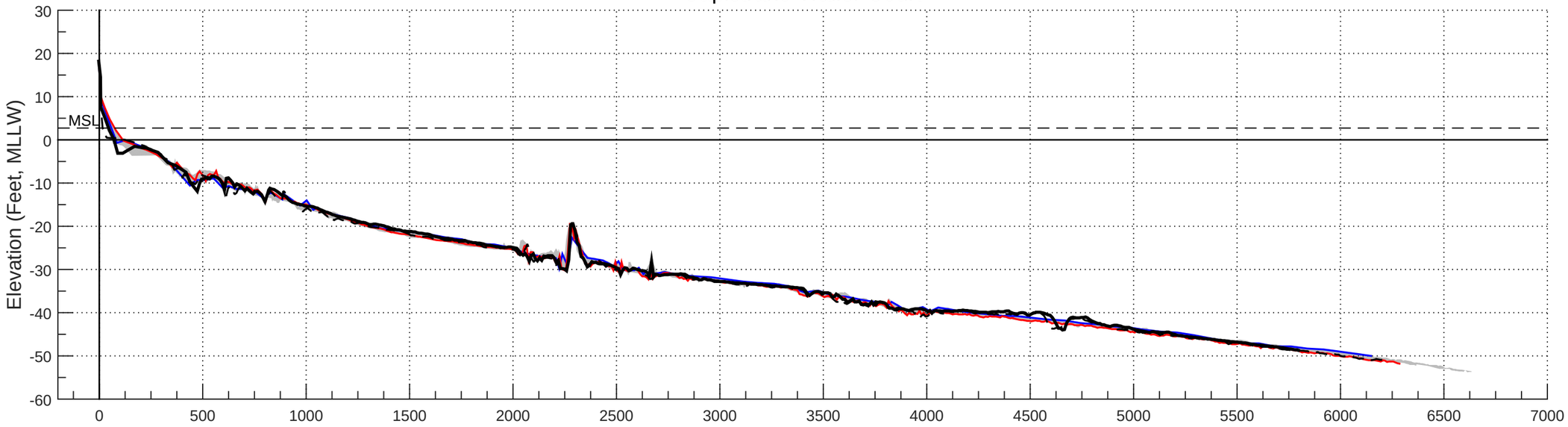
Transect SC-1720, Nearshore



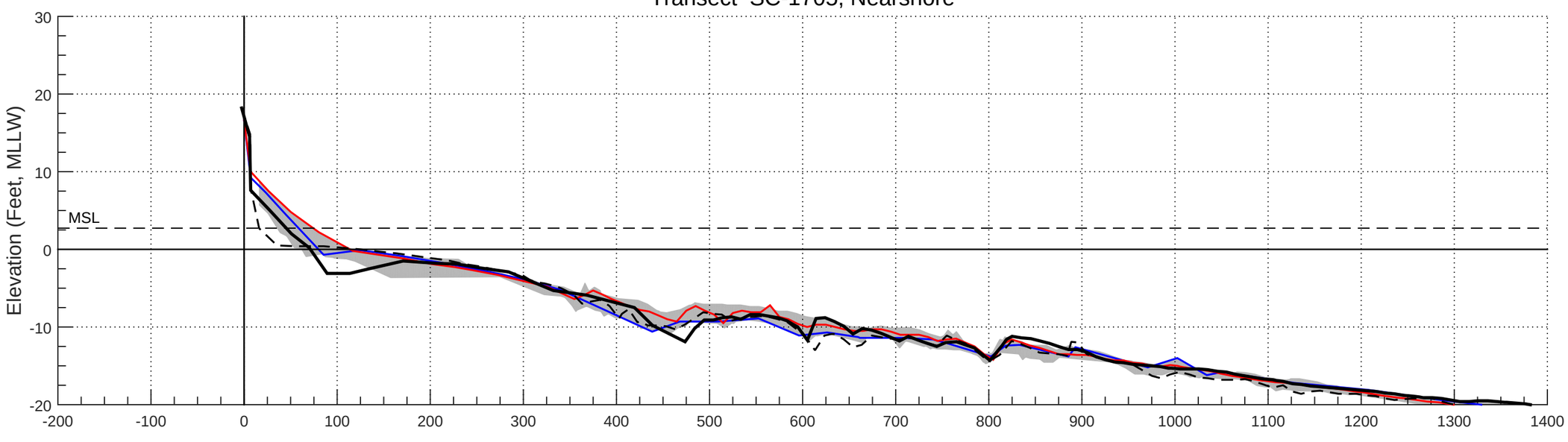
Cross-Shore Distance (Feet Seaward of Transect Origin)

Profile Envelope (Fall 2001 - Spring 2007) | Apr 1986 | May 2002 | May 2007 | Oct 2022 | May 2023

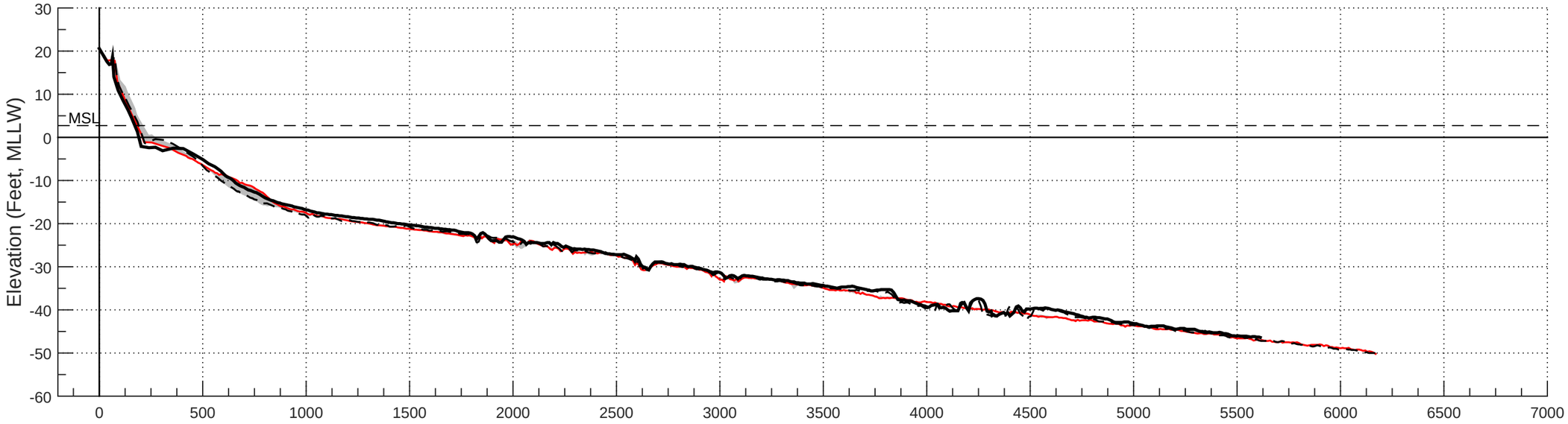
Transect SC-1705
Capistrano Trailer Court



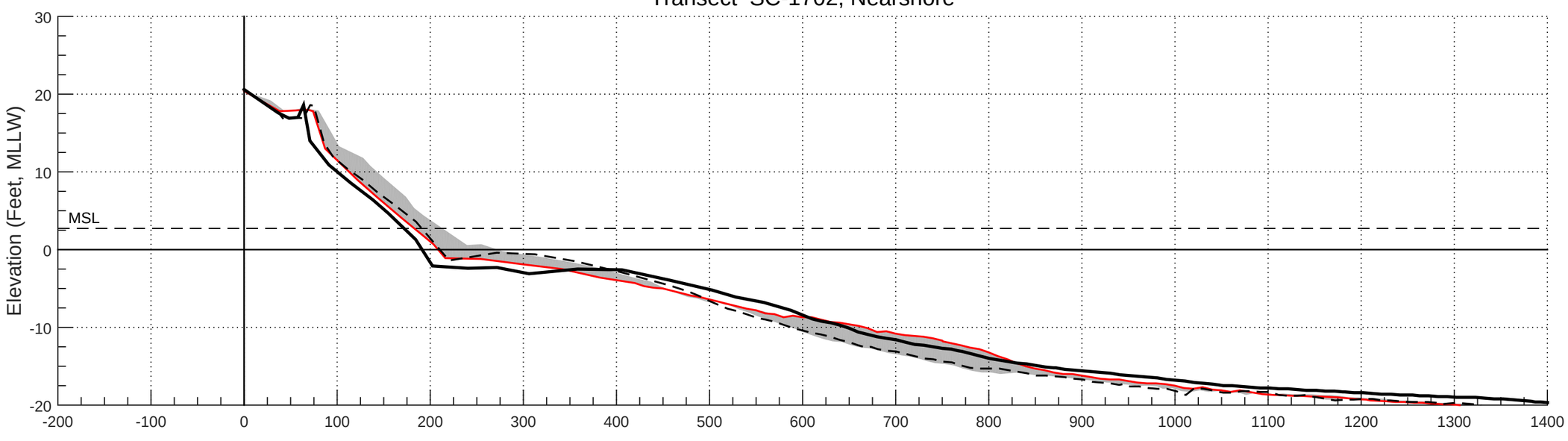
Transect SC-1705, Nearshore



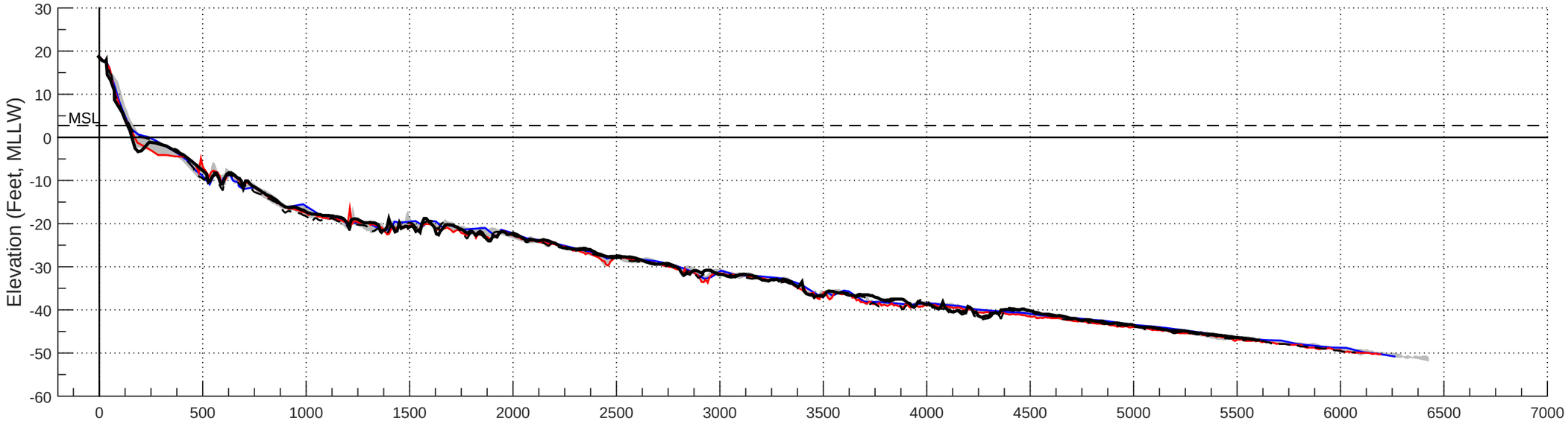
Transect SC-1702
North Beach



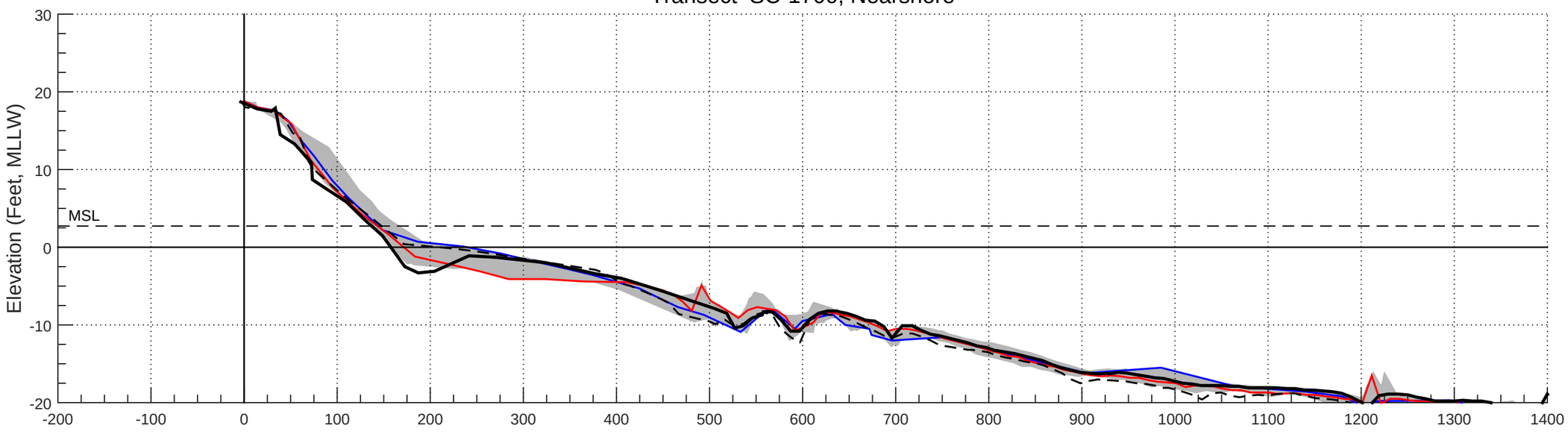
Transect SC-1702, Nearshore



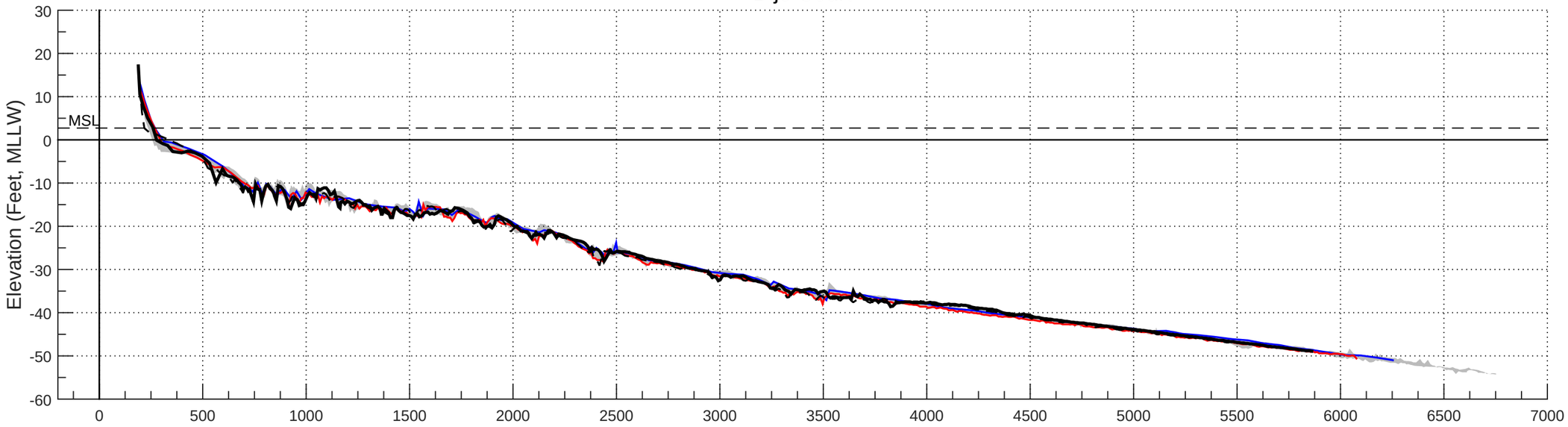
Transect SC-1700
North Beach



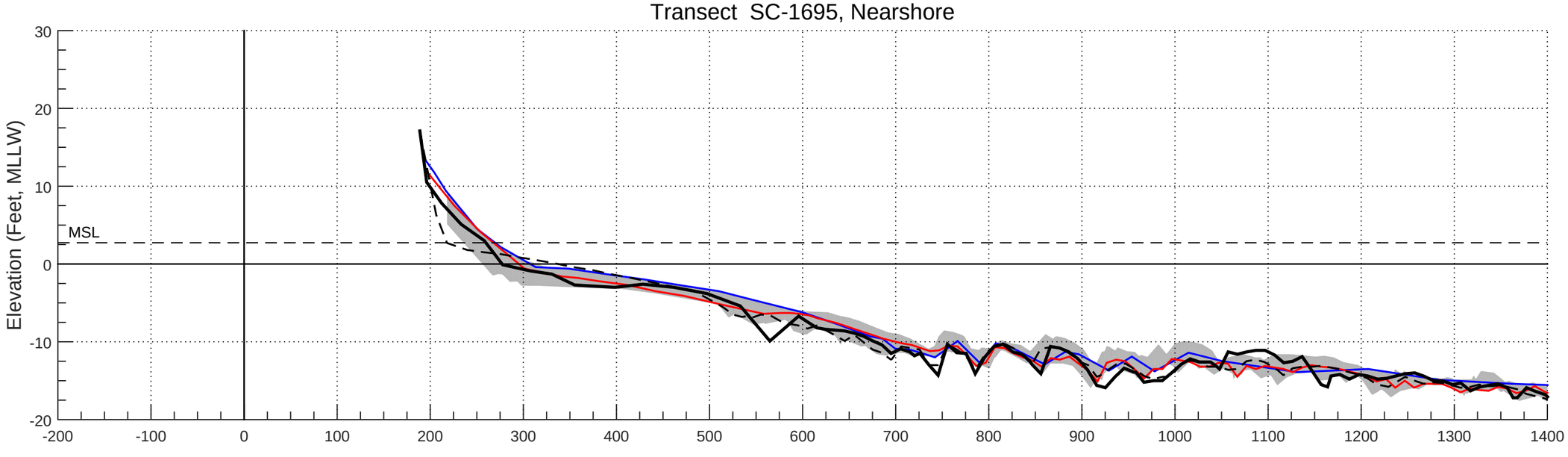
Transect SC-1700, Nearshore



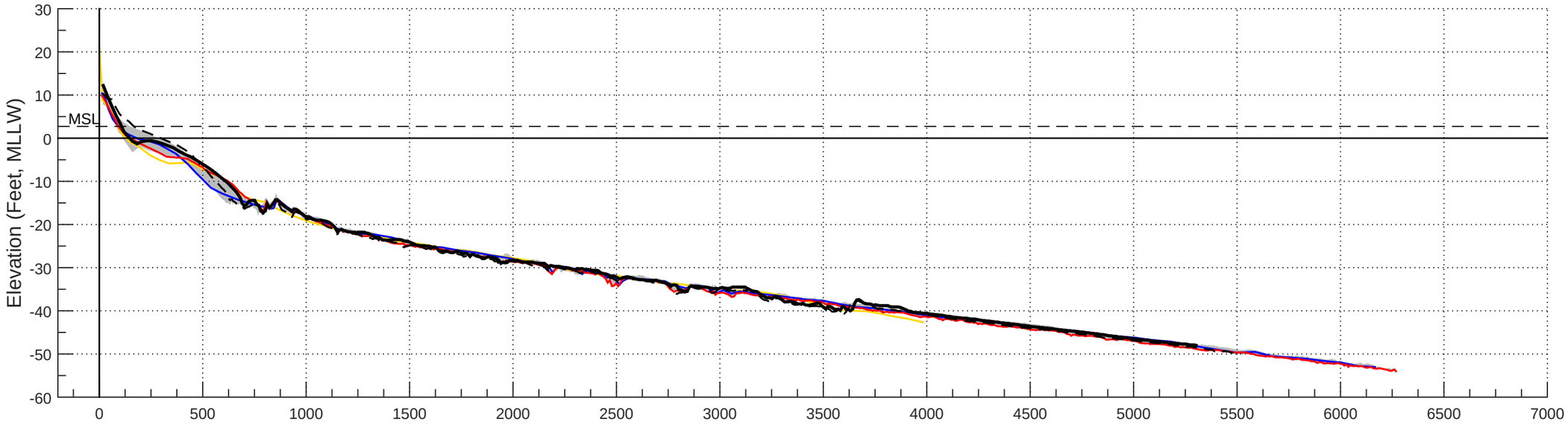
Transect SC-1695
Dije Court



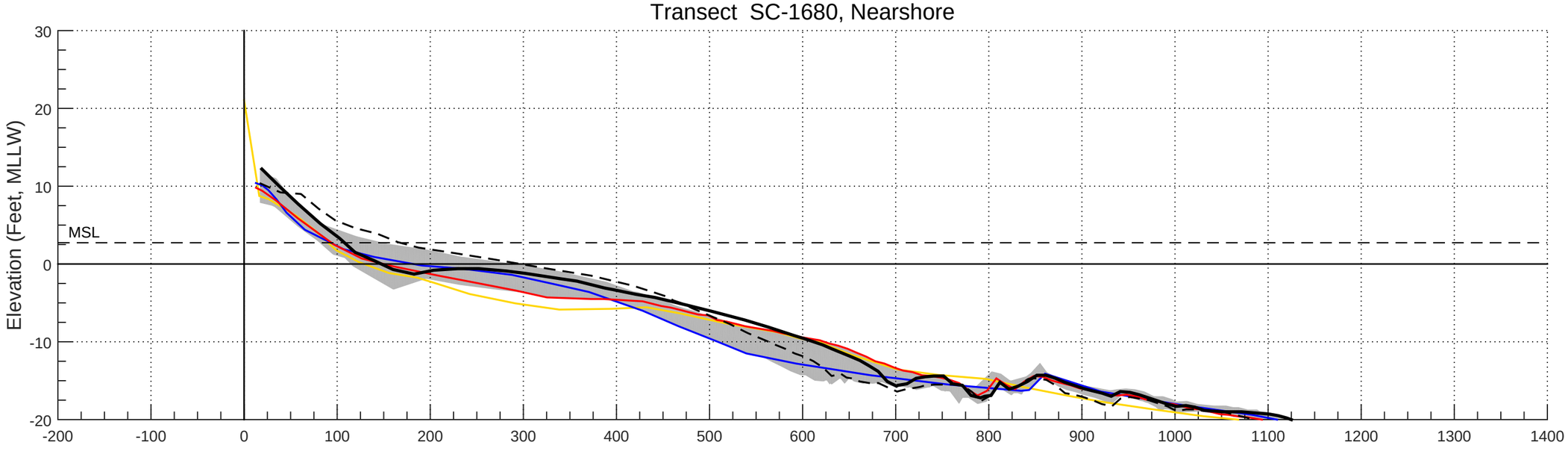
Transect SC-1695, Nearshore



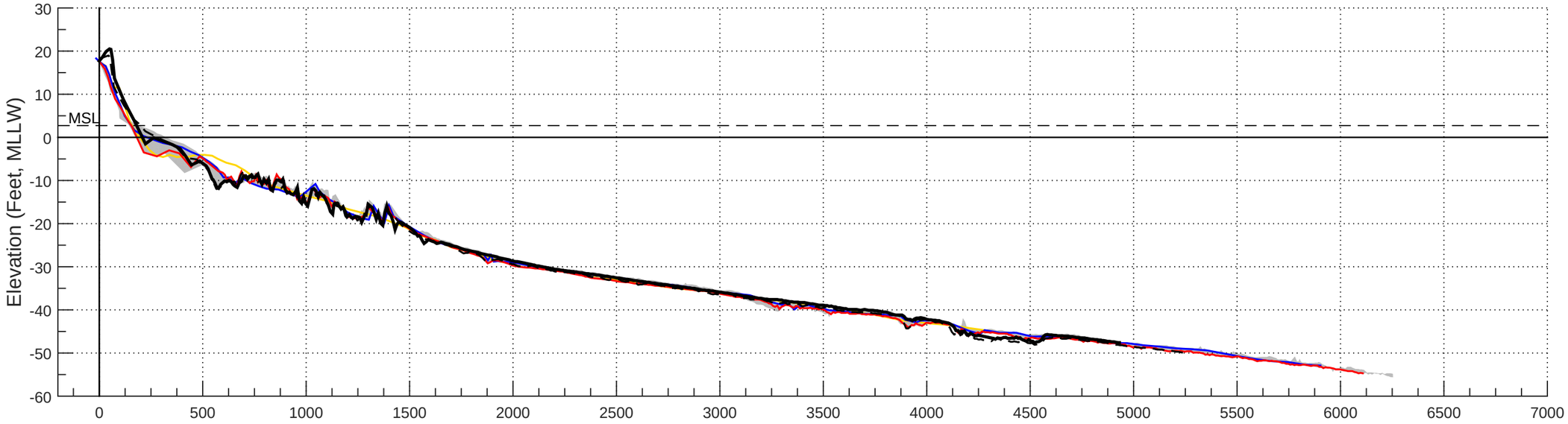
Transect SC-1680
Linda Lane



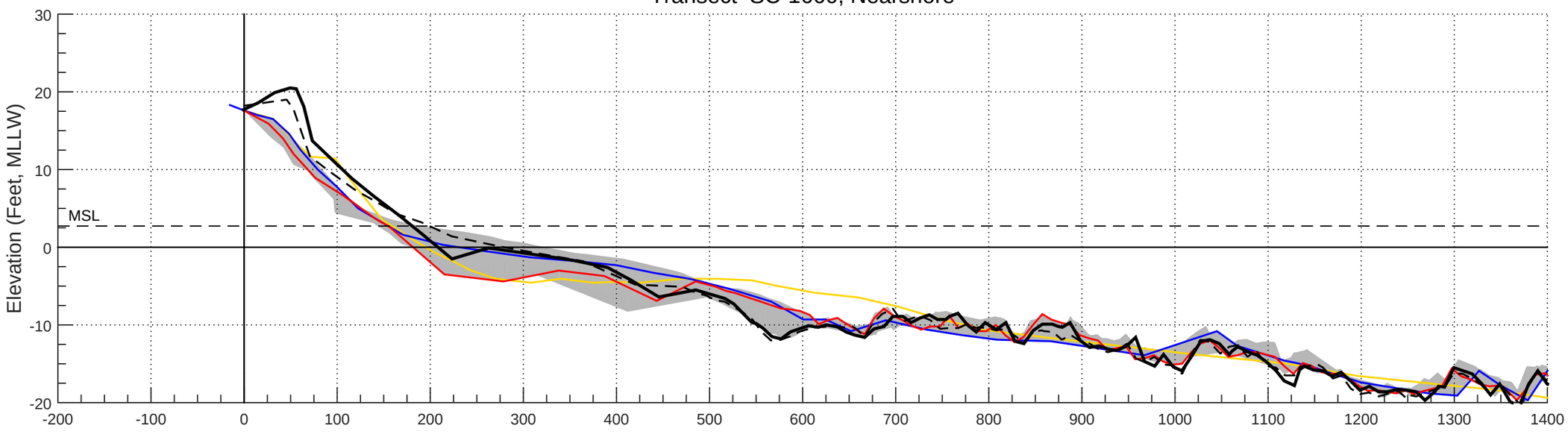
Transect SC-1680, Nearshore



Transect SC-1660
T-Street



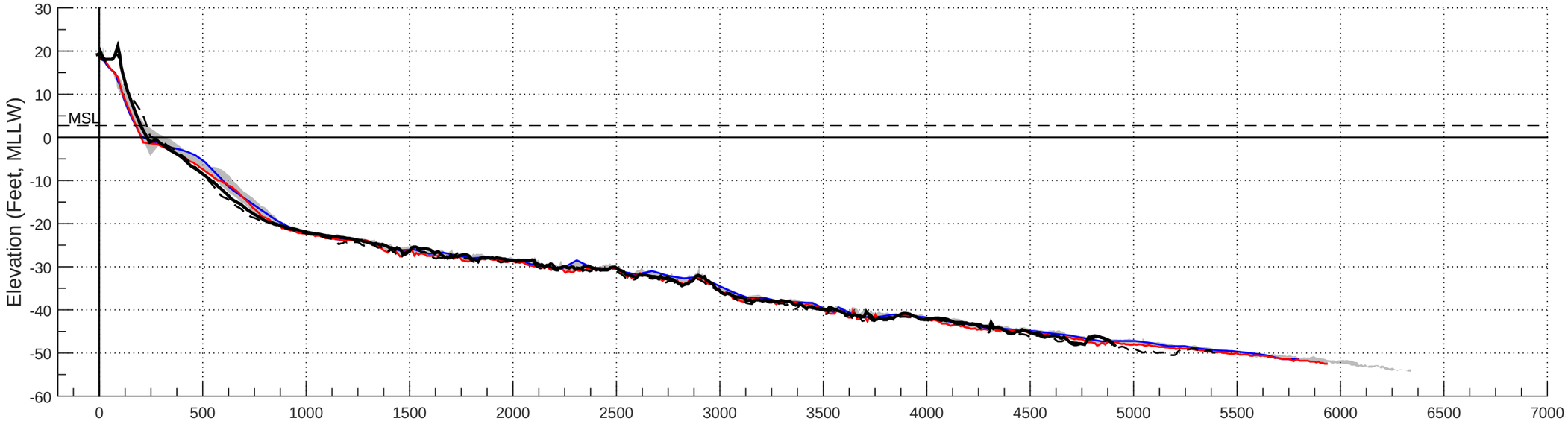
Transect SC-1660, Nearshore



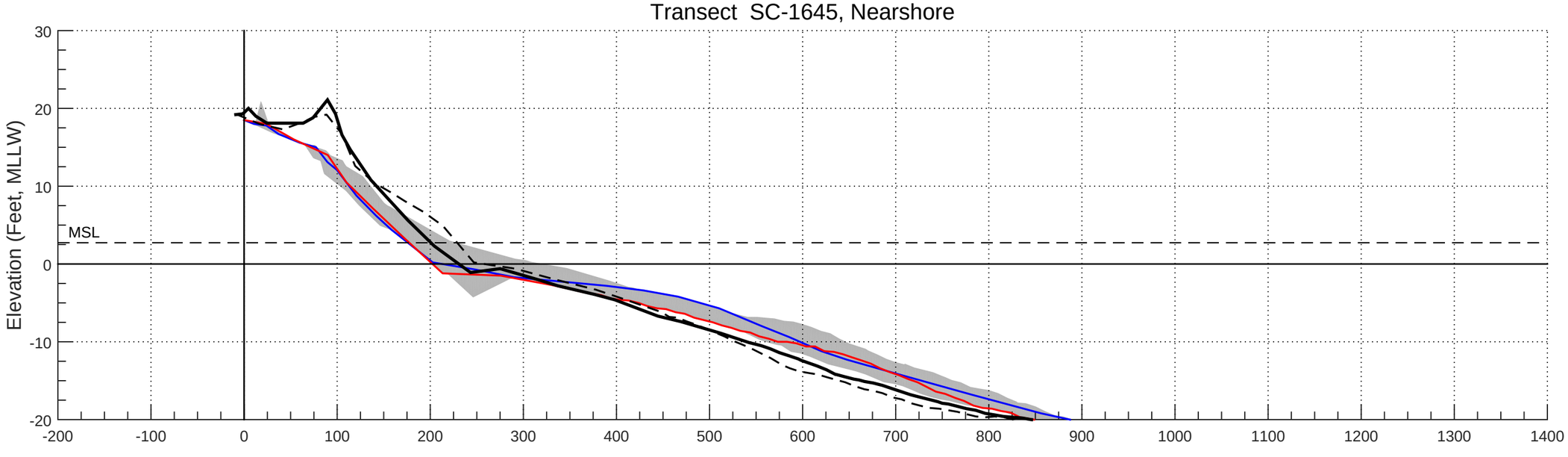
Cross-Shore Distance (Feet Seaward of Transect Origin)

Profile Envelope (Fall 2001 - Spring 2007) | Apr 1986 | May 2002 | May 2007 | Oct 2022 | May 2023

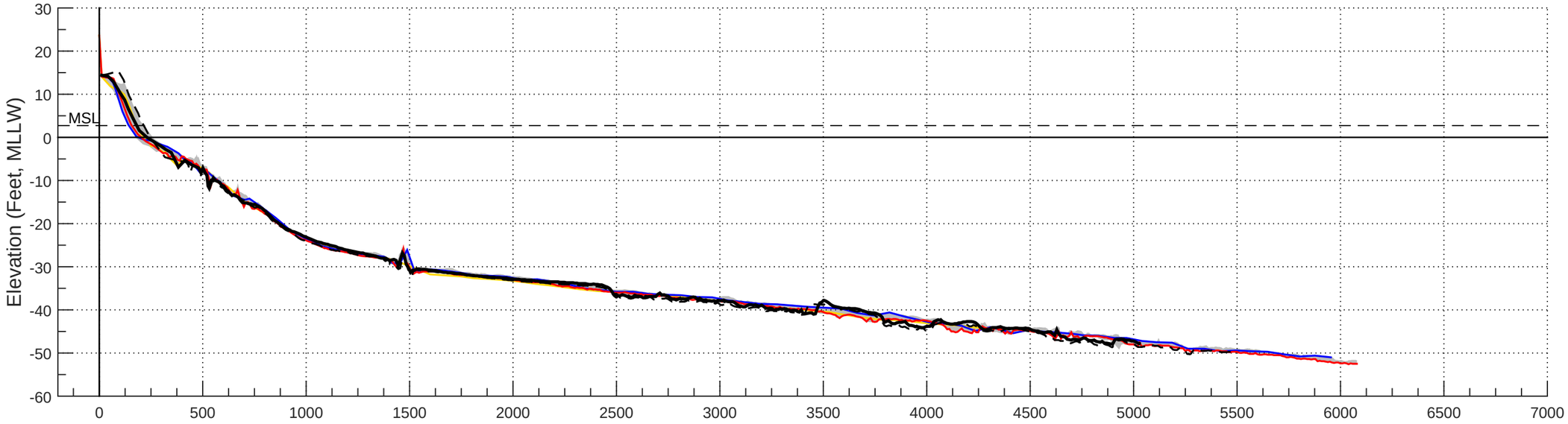
Transect SC-1645
Lost Winds



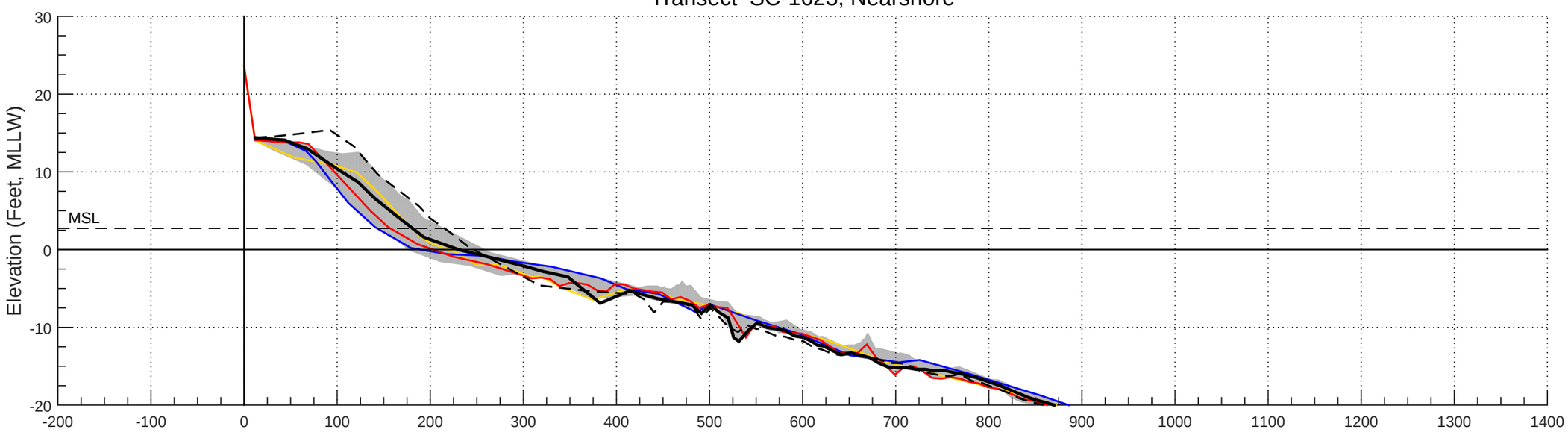
Transect SC-1645, Nearshore



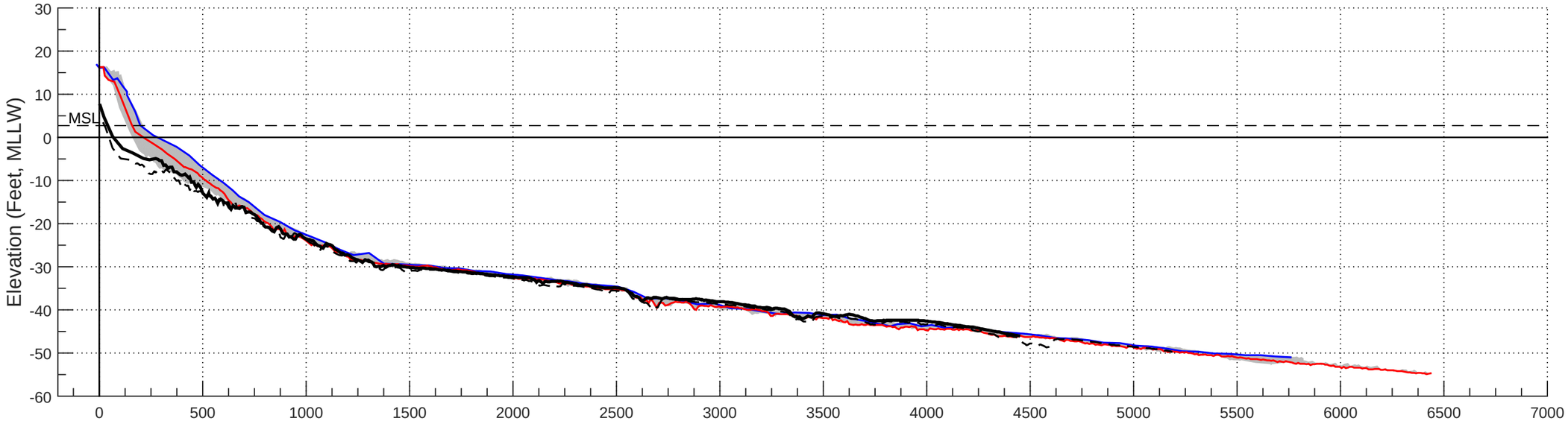
Transect SC-1623
San Clemente State Beach



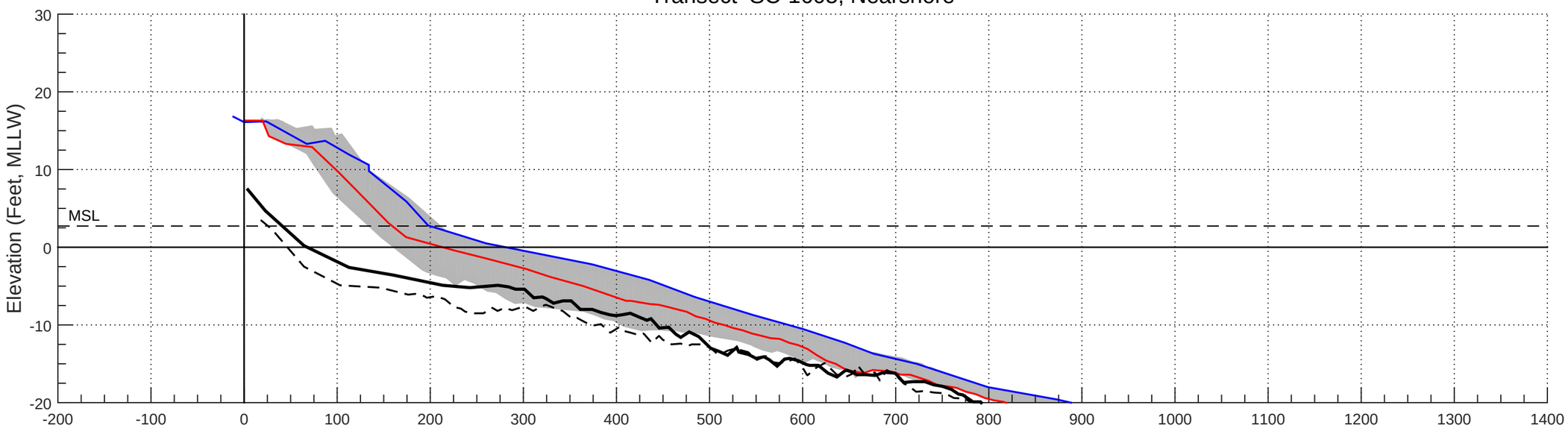
Transect SC-1623, Nearshore



Transect SC-1605
Cottons Point



Transect SC-1605, Nearshore



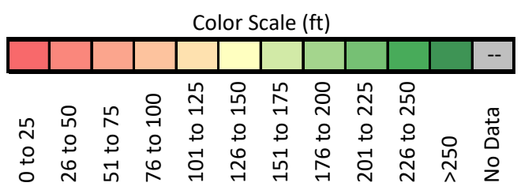
APPENDIX B

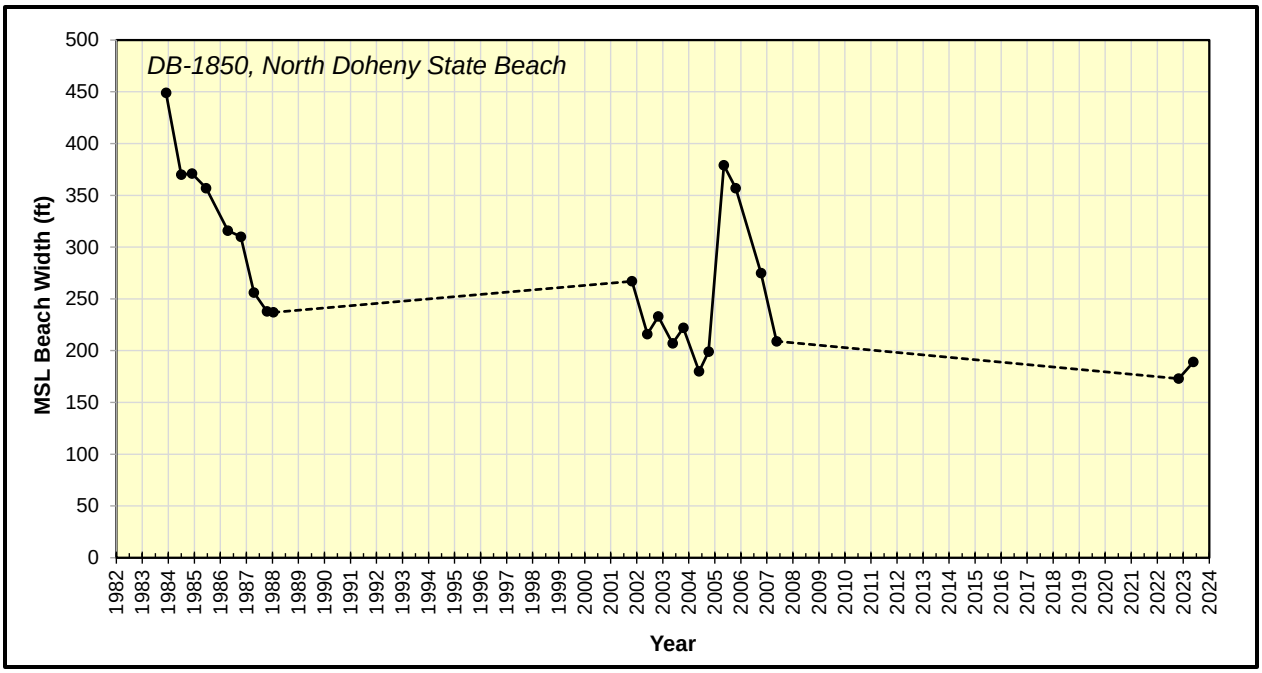
MEAN SEA LEVEL BEACH WIDTHS DERIVED FROM BEACH PROFILE DATA

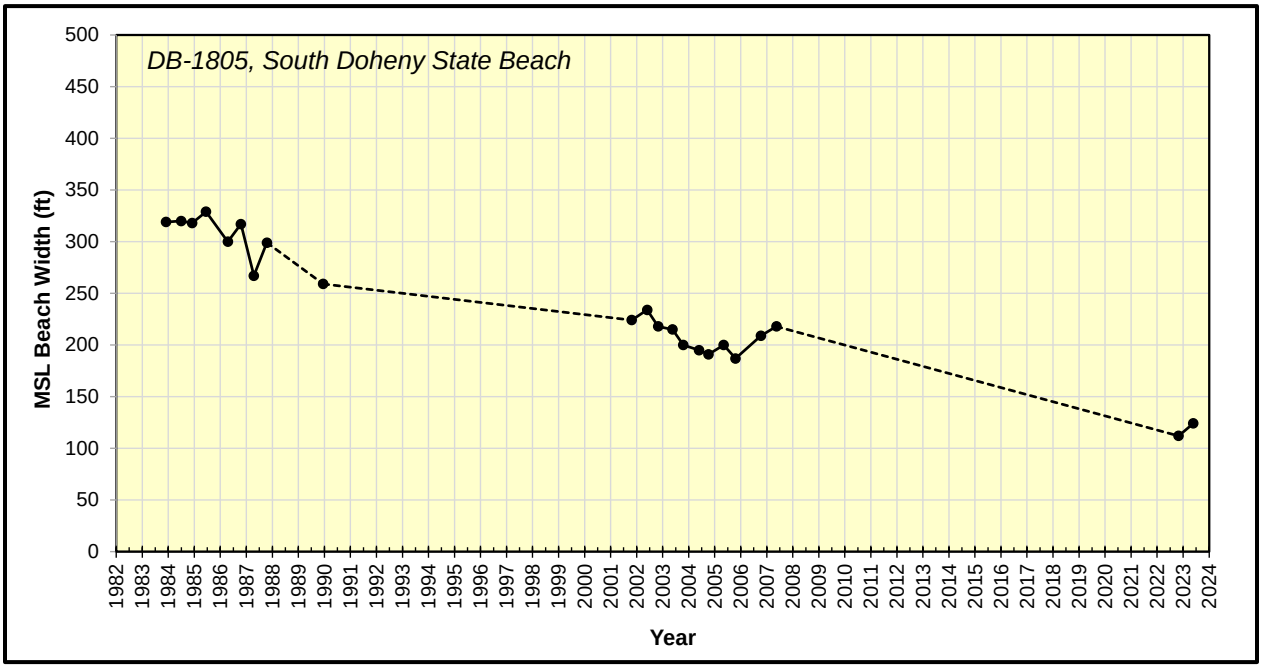
Mean Sea Level Beach Widths Derived from Beach Profile Surveys

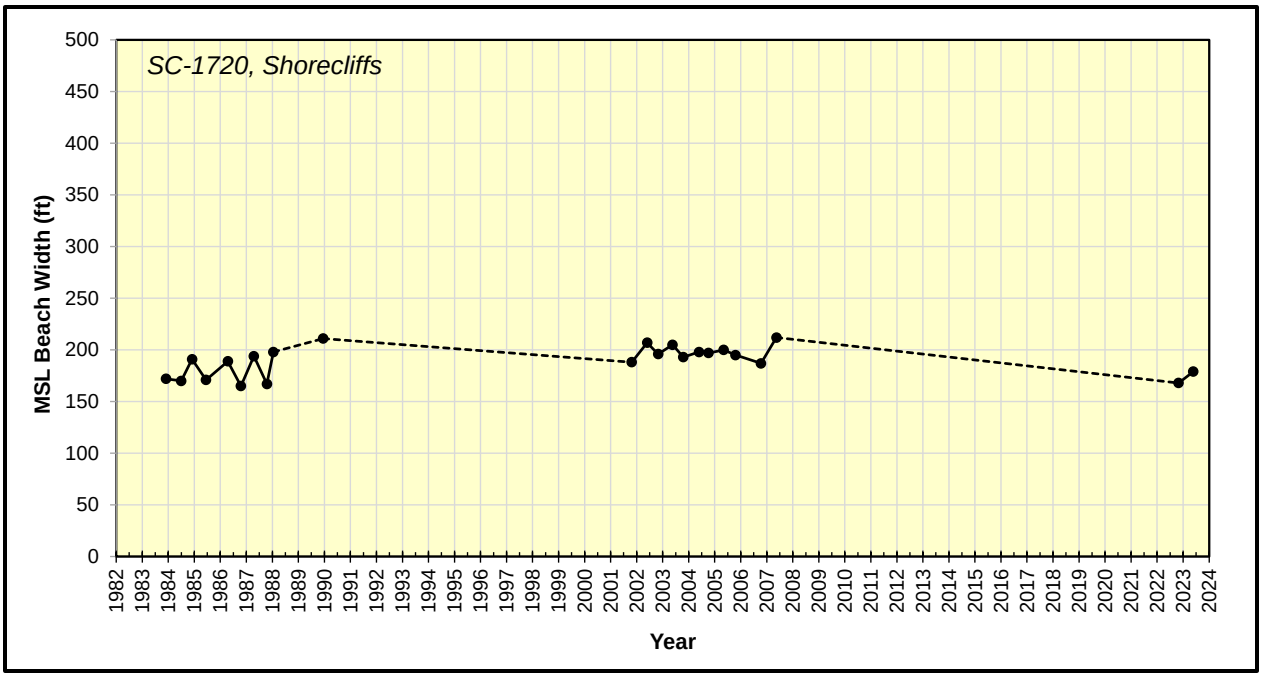
Transect	Mean Sea Level Beach Width (feet) [1]																									Landward Limit of Sand (offset from origin) [2]
	Nov/Dec 1983	Jun/Jul 1984	Nov/Dec 1984	Jun 1985	Apr 1986	Oct 1986	Apr 1987	Oct 1987	Jan 1988	Dec 1989	Oct 2001	May 2002	Oct 2002	May 2003	Oct 2003	May 2004	Oct 2004	May 2005	Oct 2005	Oct 2006	May 2007	Nov 2016	Dec 2016	May 2017	Nov 2017	Oct 2022	May 2023	
DB-1850 North Doheny State Beach	449	370	371	357	316	310	256	238	237	--	267	216	233	207	222	180	199	379	357	275	209	--	--	--	--	173	189	Campground (50 ft)
DB-1805 South Doheny State Beach	319	320	318	329	300	317	267	299	--	259	224	234	218	215	200	195	191	200	187	209	218	--	--	--	--	112	124	Bike Path (-27 ft)
SC-1720 Shorecliffs	172	170	191	171	189	165	194	167	198	211	188	207	196	205	193	198	197	200	195	187	212	--	--	--	--	168	179	Railroad Pad (-45 ft)
SC-1705 Capistrano Trailer Court	--	--	--	--	--	--	--	--	--	--	27	43	32	48	24	39	31	47	25	19	58	23	47	40	16	0	29	Revetment (16 ft)
SC-1702 North Beach	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	173	159	143	152	134	141	155	151	132	Revetment (40 ft)
SC-1700 North Beach	--	--	--	--	--	--	--	--	--	--	162	147	156	138	155	150	163	138	171	161	146	159	145	144	151	151	140	Railroad Fence (-3 ft)
SC-1695 Dije Court	--	--	--	--	--	--	--	--	--	--	26	52	36	50	26	34	18	36	27	26	50	32	41	42	23	0	42	Revetment (218 ft)
SC-1680 Linda Lane	--	92	106	97	73	138	64	127	--	132	90	76	111	64	100	75	110	65	126	133	77	--	--	--	--	151	91	Tunnel Headwall (17 ft)
SC-1660 T-Street	241	186	172	176	159	204	139	175	146	203	151	155	158	143	165	147	168	149	159	189	155	--	--	--	--	199	181	Light Post (0 ft)
SC-1645 Lost Winds	--	--	--	--	--	--	--	--	--	--	201	185	203	200	208	195	234	198	219	238	187	--	--	--	--	238	210	Railroad Fence (-9 ft)
SC-1623 San Clemente State Beach	188	156	171	153	168	180	159	185	--	216	178	131	204	134	175	138	185	155	186	190	145	--	--	--	--	203	169	Tunnel Headwall (12 ft)
SC-1605 Cottons	--	--	--	--	--	--	--	--	--	--	148	182	128	180	171	194	146	156	115	126	141	--	--	--	--	8	23	Revetment (18 ft)

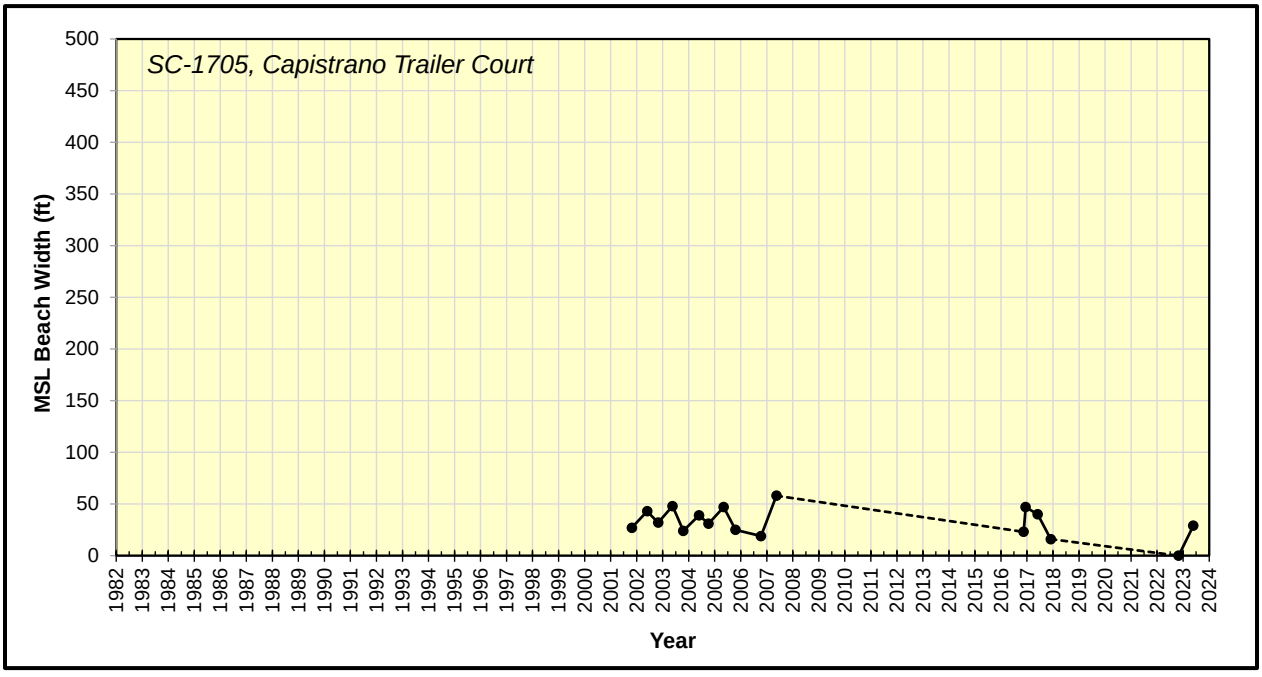
Notes:
[1] Color-coded cells illustrate each beach width value per the color scale shown to the right.
[2] Horizontal distance from transect origin to landward limit of sand. A (+) positive value indicates the landward limit of sand is seaward of transect origin. A (-) negative value indicates landward limit of sand is landward of transect origin.

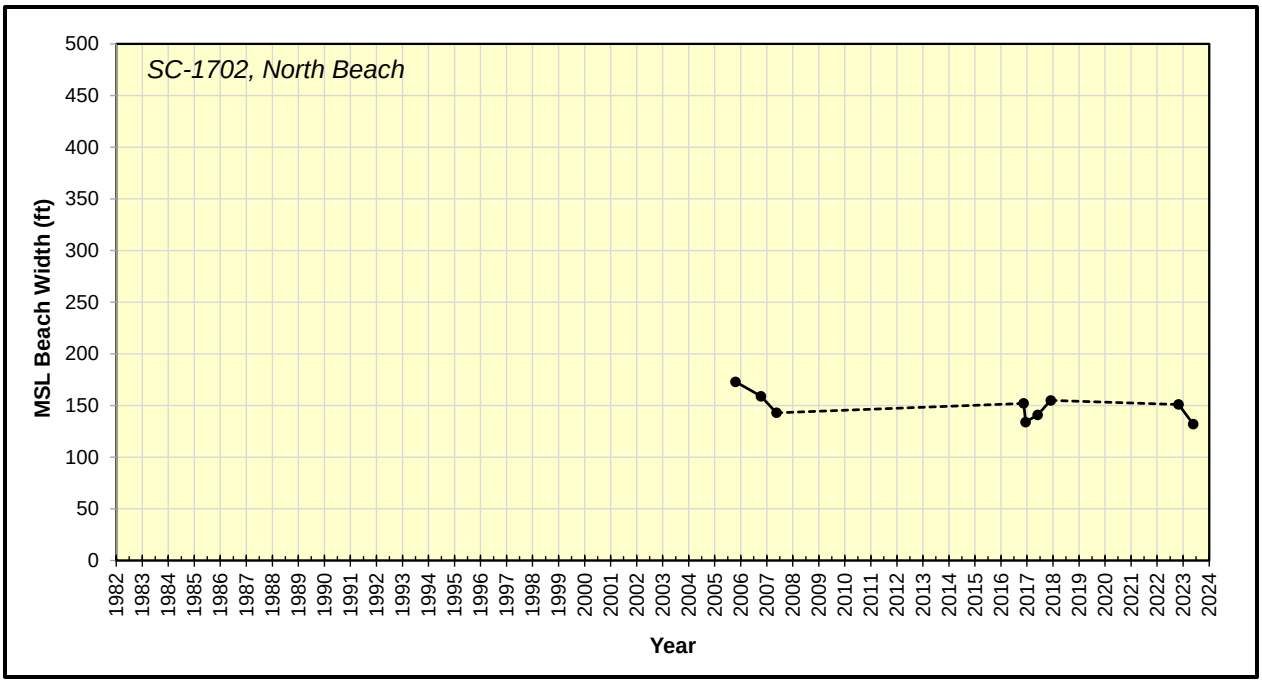


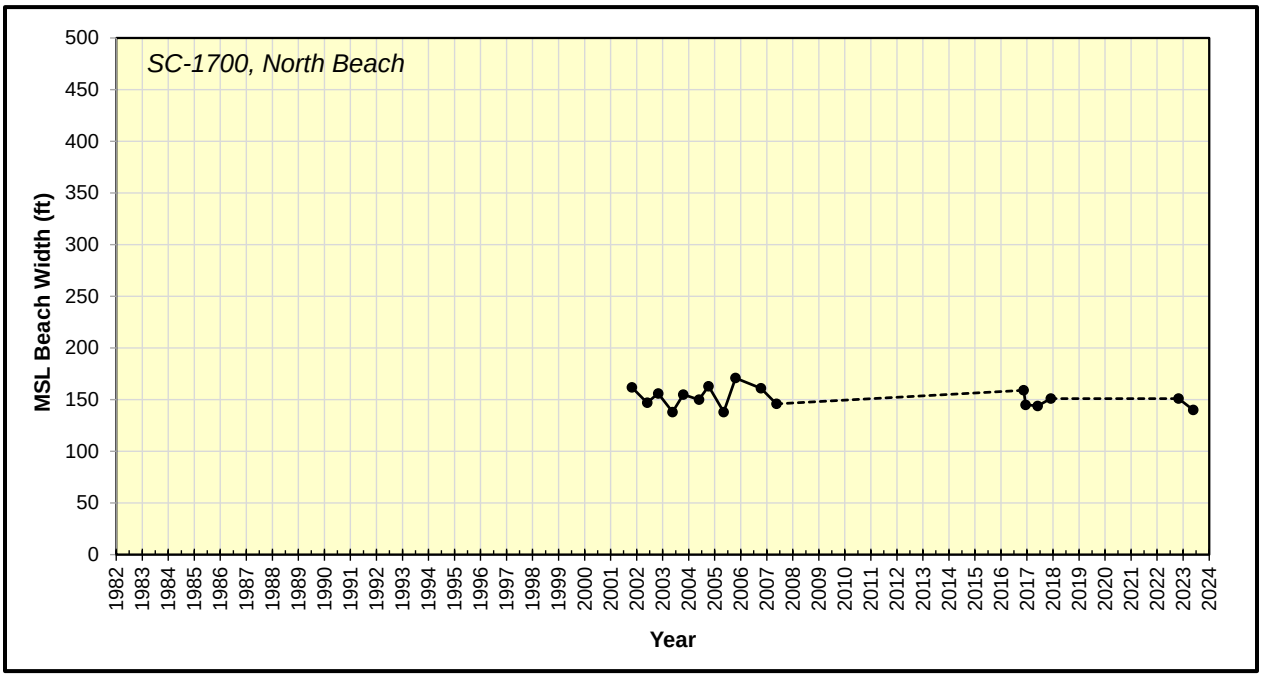

DB-1850, North Doheny State Beach
MSL Beach Width (ft)
Year

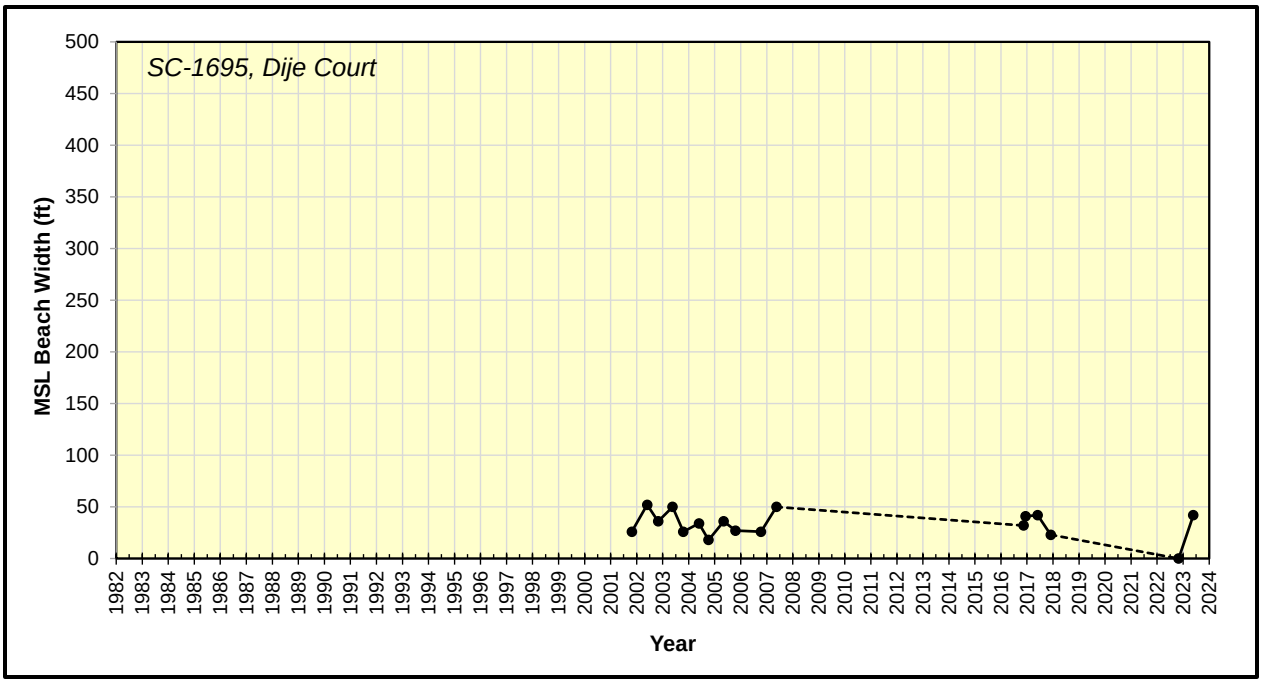

DB-1805, South Doheny State Beach
MSL Beach Width (ft)
Year

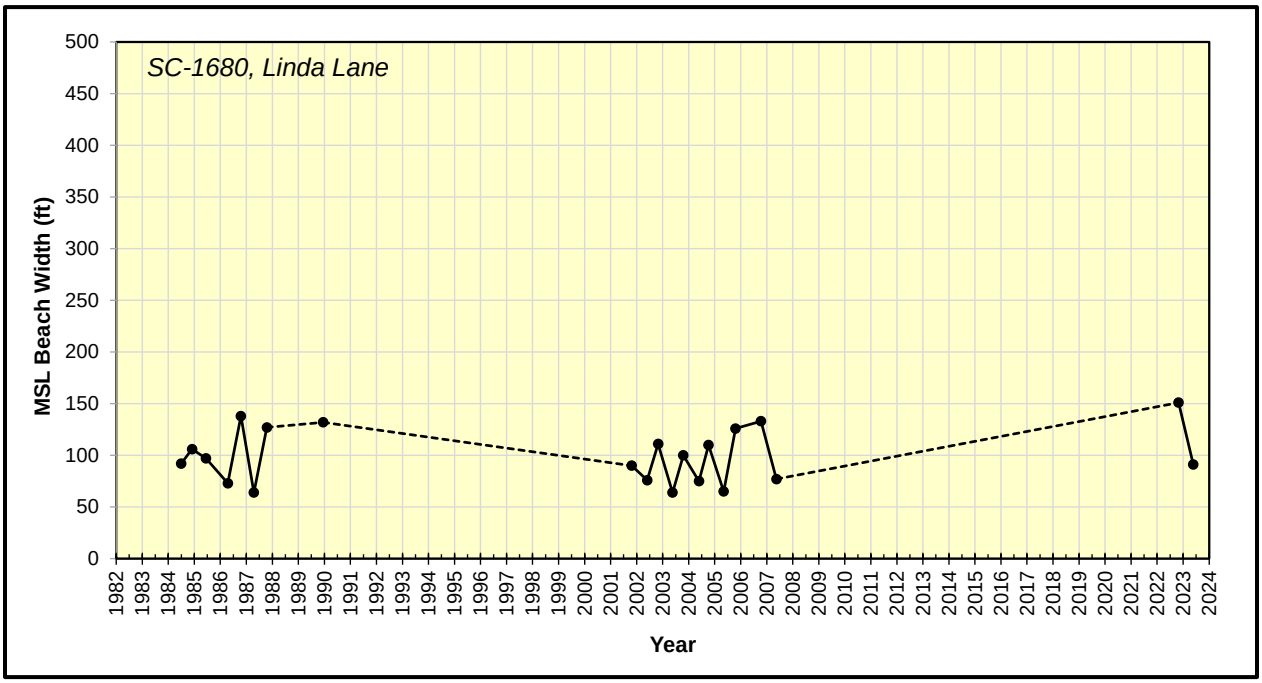

SC-1720, Shorecliffs
MSL Beach Width (ft)
Year

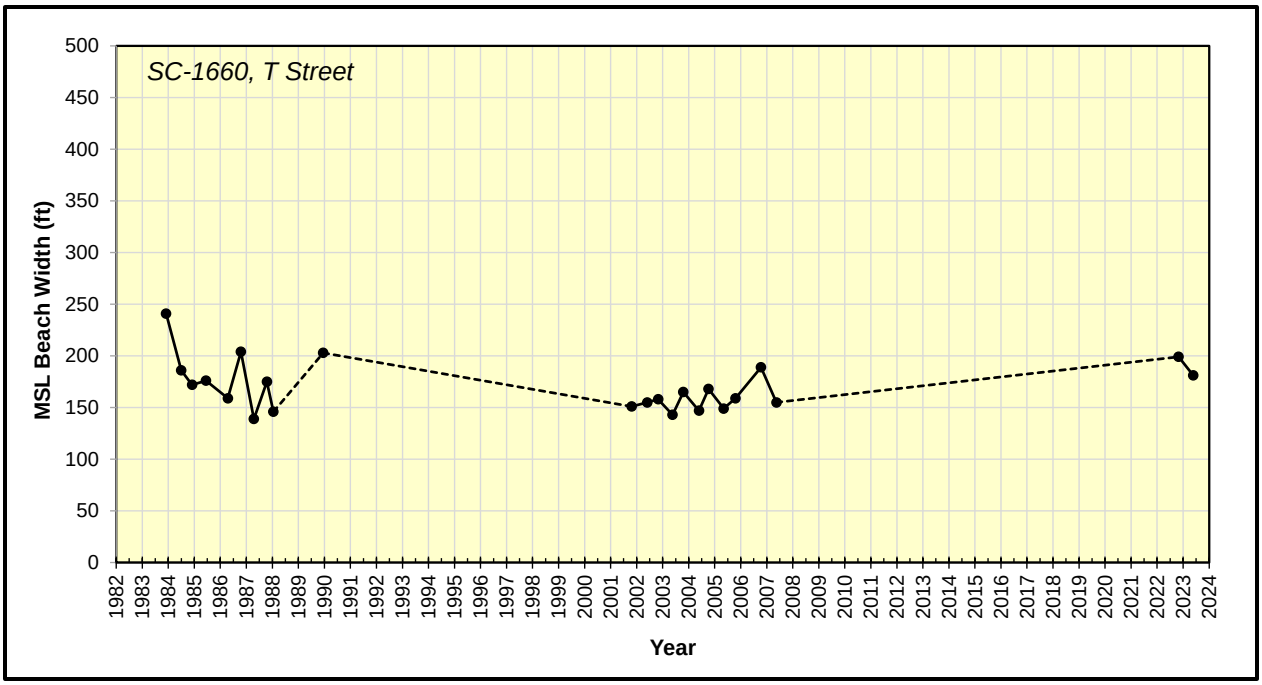

SC-1705, Capistrano Trailer Court
MSL Beach Width (ft)
Year


SC-1702, North Beach
MSL Beach Width (ft)
Year


SC-1700, North Beach
MSL Beach Width (ft)
Year


SC-1695, Dije Court
MSL Beach Width (ft)
Year


SC-1680, Linda Lane
MSL Beach Width (ft)
Year


SC-1660, T Street
MSL Beach Width (ft)
Year
0
50
100
150
200
250
300
350
400
450
500
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
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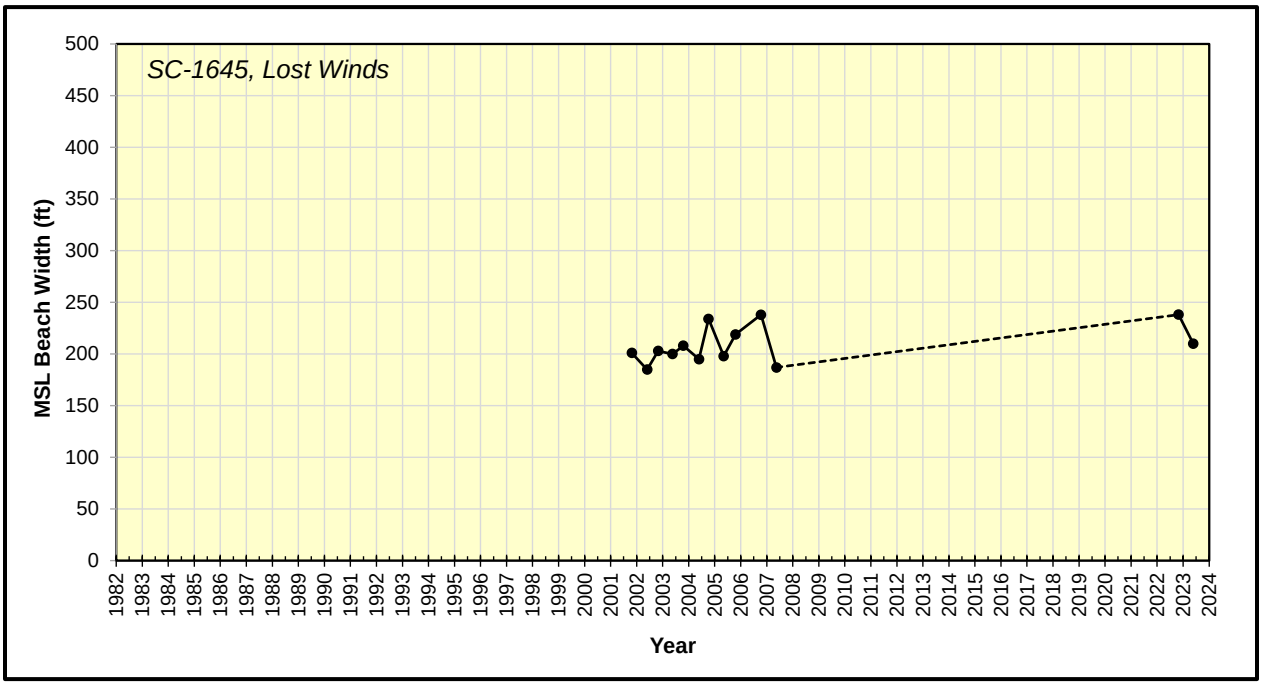
2022
2023
2024


SC-1645, Lost Winds
MSL Beach Width (ft)
Year
0
50
100
150
200
250
300
350
400
450
500
1982
1983
1984
1985
1986
1987
1988
1989
1990
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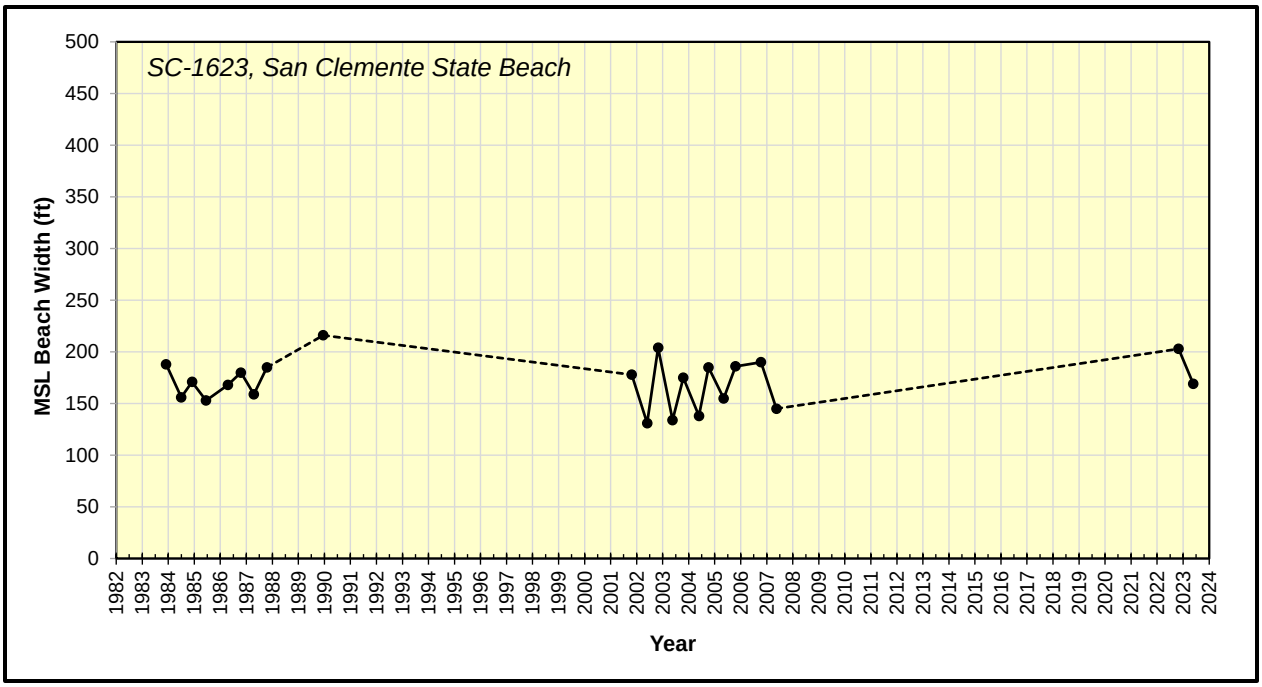
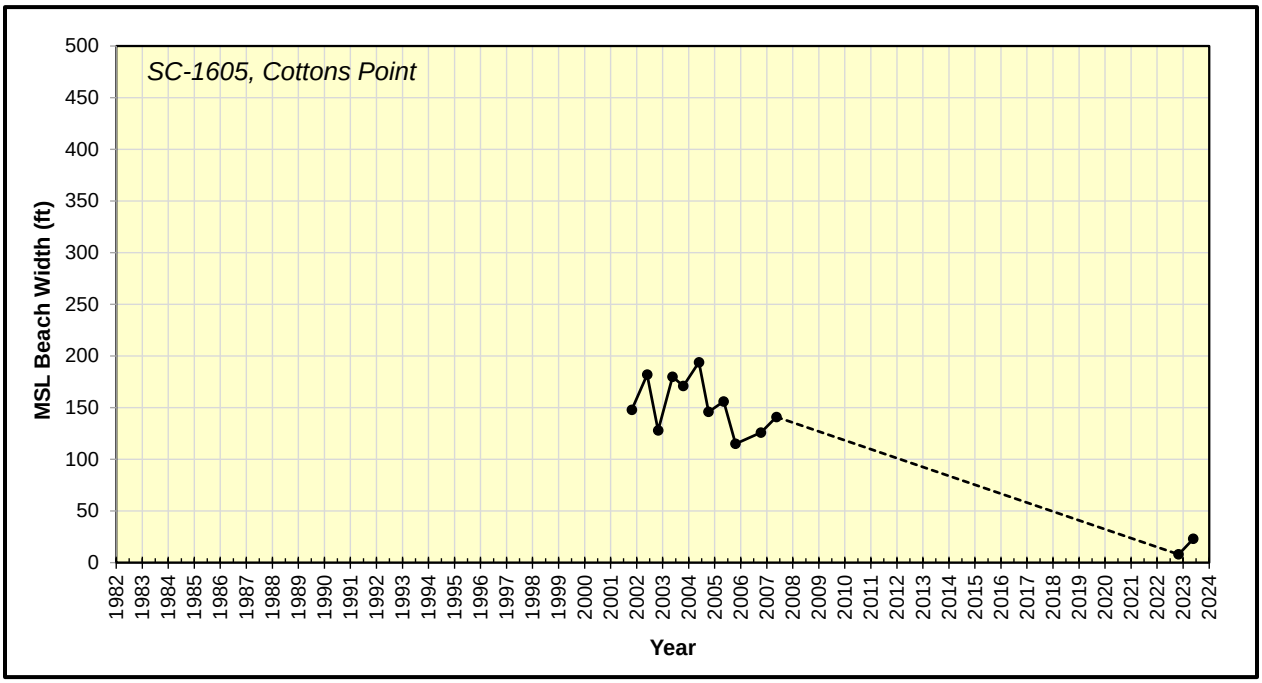
2024


SC-1623, San Clemente State Beach
MSL Beach Width (ft)
Year


SC-1605, Cottons Point
MSL Beach Width (ft)
Year

APPENDIX C

MEAN HIGH WATER BEACH WIDTHS DERIVED FROM BEACH PROFILE DATA

Mean High Water Beach Widths Derived from Beach Profile Surveys

Transect	Mean High Water Beach Width (feet) [1]																								Landward Limit of Sand (offset from origin) [2]	
	Nov/Dec 1983	Jun/Jul 1984	Nov/Dec 1984	Jun 1985	Apr 1986	Oct 1986	Apr 1987	Oct 1987	Jan 1988	Dec 1989	Oct 2001	May 2002	Oct 2002	May 2003	Oct 2003	May 2004	Oct 2004	May 2005	Oct 2005	Oct 2006	May 2007	Nov 2016	Dec 2016	May 2017	Nov 2017	Oct 2022	May 2023	
DB-1850 North Doheny State Beach	429	355	358	341	301	299	243	223	218	--	253	205	218	189	210	158	184	360	339	258	195	--	--	--	--	156	175	Campground (50 ft)
DB-1805 South Doheny State Beach	301	315	301	303	284	300	253	280	--	237	211	216	196	196	181	176	170	175	168	182	195	--	--	--	--	92	109	Bike Path (-27 ft)
SC-1720 Shorecliffs	148	151	150	149	174	151	180	153	184	179	172	189	179	188	182	180	183	184	185	175	192	--	--	--	--	146	163	Railroad Pad (-45 ft)
SC-1705 Capistrano Trailer Court	--	--	--	--	--	--	--	--	--	--	13	28	12	32	14	23	16	32	12	9	37	7	25	20	4	0	15	Revetment (16 ft)
SC-1702 North Beach	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	151	147	124	135	119	125	141	134	116	Revetment (40 ft)
SC-1700 North Beach	--	--	--	--	--	--	--	--	--	--	148	131	143	123	144	134	149	123	149	149	126	142	130	126	139	131	123	Railroad Fence (-3 ft)
SC-1695 Dije Court	--	--	--	--	--	--	--	--	--	--	11	32	15	30	15	18	4	20	6	6	32	17	26	24	7	0	21	Revetment (218 ft)
SC-1680 Linda Lane	--	73	75	70	56	94	34	79	--	90	66	47	71	46	67	59	73	43	79	73	55	--	--	--	--	103	71	Tunnel Headwall (17 ft)
SC-1660 T-Street	196	157	138	142	141	161	124	132	124	154	97	128	122	127	131	127	132	132	128	135	130	--	--	--	--	159	161	Light Post (0 ft)
SC-1645 Lost Winds	--	--	--	--	--	--	--	--	--	--	176	165	162	184	181	182	207	183	190	203	170	--	--	--	--	225	194	Railroad Fence (-9 ft)
SC-1623 San Clemente State Beach	169	141	151	128	153	165	144	166	--	202	163	113	176	117	158	122	170	140	172	177	127	--	--	--	--	184	149	Tunnel Headwall (12 ft)
SC-1605 Cottons	--	--	--	--	--	--	--	--	--	--	130	166	107	151	154	176	132	139	98	115	125	--	--	--	--	0	6	Revetment (18 ft)

Notes: [1] Color-coded cells illustrate each beach width value per the color scale shown to the right.

[2] Horizontal distance from transect origin to landward limit of sand. A (+) positive value indicates the landward limit of sand is seaward of transect origin. A (-) negative value indicates landward limit of sand is landward of transect origin.