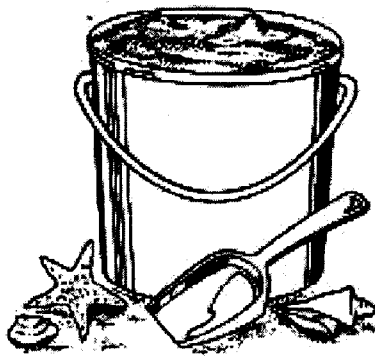


South Carolina's Annual State of the Beaches Report

March 2002



D H E C



PROMOTE PROTECT PROSPER

Ocean and Coastal
Resource Management

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This report was prepared by the staff of the South Carolina Department of Health and Environmental Control, Office of Ocean and Coastal Resource Management. Funding for beach monitoring was provided by a grant from the U.S. Geological Survey. For additional information or copies of this report, contact Bill Eiser, staff oceanographer.

Introduction

The following report summarizes changes to South Carolina's beaches during the past year. The results are based on beach profile surveys conducted during 2001 at approximately 400 monitoring stations throughout the state. Surveys start at a benchmark located landward of the primary dune or seawall, and continue down the beach face to a depth of -25 ft or an offshore distance of 5000 ft, whichever is reached first. Across the dune, data is collected on foot using a GPS receiver. On the upper beach and intertidal beach (at low tide), data is collected using a GPS receiver mounted on an ATV. For the offshore portion of the profile, data is collected from a boat with a GPS receiver and fathometer. These three data sets can then be integrated into one seamless beach profile.

The actual elevation used for the surveys, and all elevations referenced in this report, is the North American Vertical Datum of 1988 (NAVD88), which is approximately the same as mean sea level. The resulting profile shows a cross-section of the beach shape at the time of the survey. The 2001 data can then be compared to similar data from 2000 to determine what changes have occurred to the beach profile during the past year.

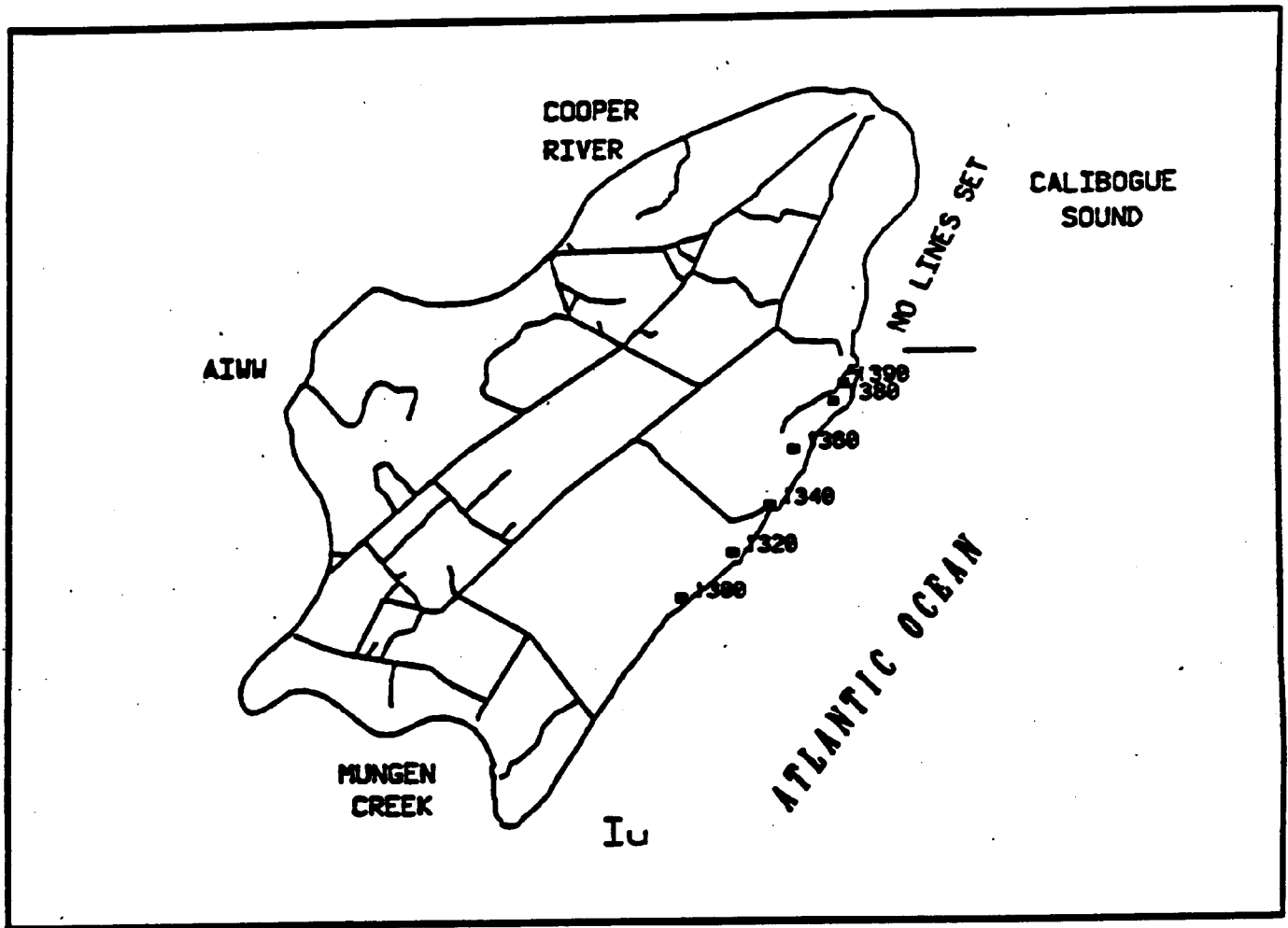
Profiles are analyzed for dune erosion or scarping, changes in beach slope, and changes in unit-width sand volume, the amount of sand from the dune down to a chosen cutoff elevation per linear foot of shoreline. This sand volume is expressed as cubic yards per linear foot of beach. The presence or absence of a berm, the shelf of dry sand between the dune and the high-water mark, is noted, as well as any sand bars and corresponding troughs. Berm width is particularly important, since it represents the amount of recreational dry-sand beach seaward of the dune that is available at high tide.

Most beaches in South Carolina go through a yearly cycle of profile change. In the summer, smaller waves tend to push sand up the beach, forming a wider berm and a steeper beach slope below mean high water. In the winter, higher energy waves erode sand from the berm and move it to an offshore bar, resulting in a narrower high-tide

beach and a more gently sloping beach below mean high water. In many cases this seasonal profile variation is greater in magnitude than the long-term trend for a particular island or beach—that is, the change observed from October to April and then from April back to October can be greater than the change observed for subsequent Octobers or consecutive Aprils.

As called for under the Beachfront Management Act, all beaches in the state have been classified as standard zones or inlet zones. Inlet zones are regions in close proximity to a tidal inlet, where the presence of the inlet plays a dominant role in erosion or accretion patterns on the beach. Most inlet zones are unstabilized, meaning the inlet channel is not anchored by jetties or groins, and the surrounding shoreline is often quite dynamic. On the location maps that appear in this report, standard zones are designated as “S”, unstabilized inlet zones as “Iu”, and stabilized inlet zones as “Is”. In general, the larger Sea Islands in Charleston and Beaufort counties consist of a standard zone in the central portion of the island and an inlet zone at either end. The smaller Sea Islands are entirely inlet zones. In the Grand Strand, the shoreline is a continuous standard zone, interrupted by small inlet zones at the swashes.

The remainder of this report contains individual summaries for each island or beach in the state surveyed during the past year. Summaries are presented in a south-to-north progression. The geographic setting of each beach is discussed, along with any significant long-term trends. A typical beach profile plot is provided, with a location map showing survey monument locations. Finally, a state-wide summary is found at the end of the report, along with an assessment of beach renourishment needs.

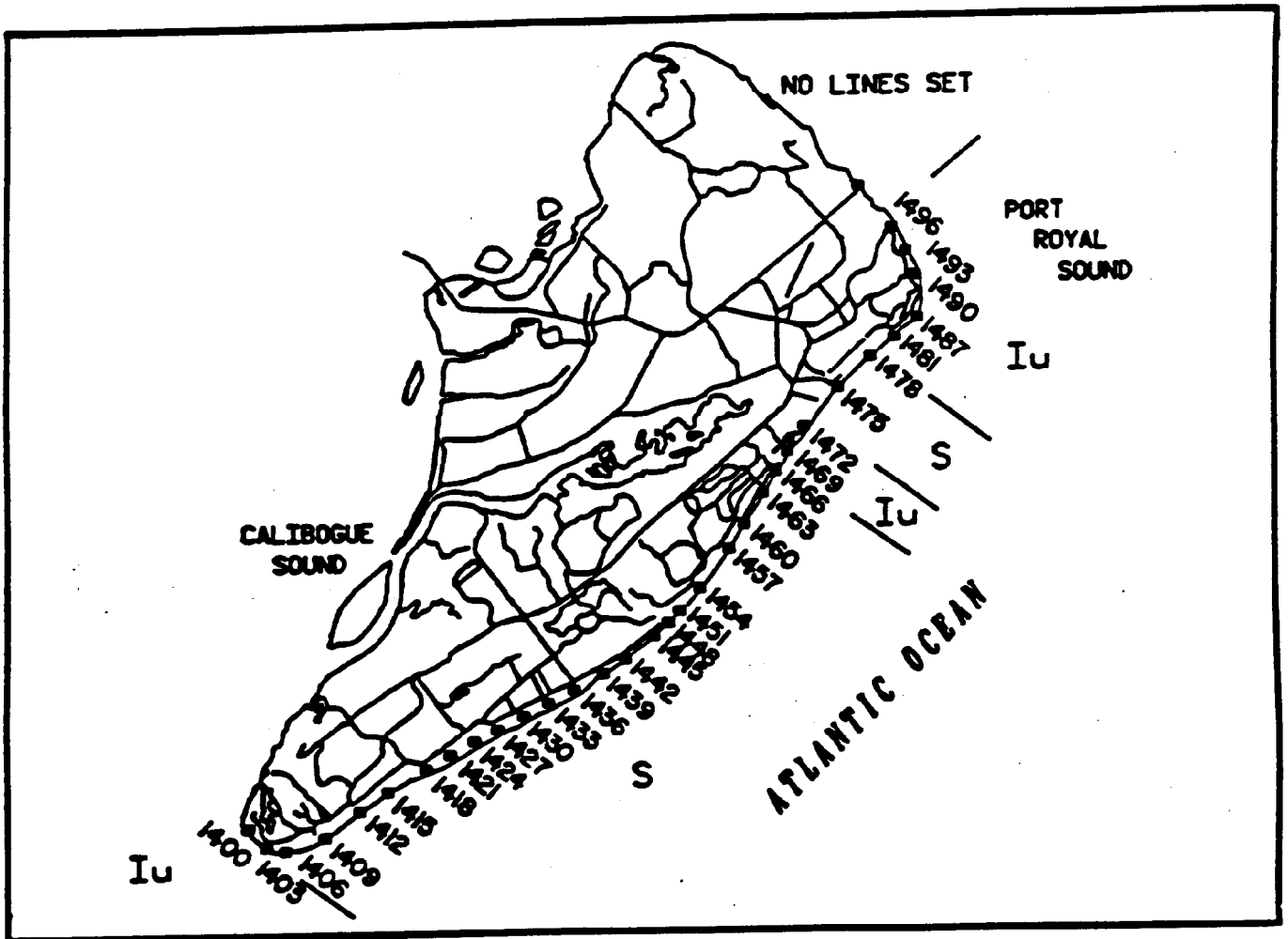


Daufuskie Island

Daufuskie Island

Daufuskie Island is located to the south of Hilton Head Island, between Calibogue Sound to the northeast and Mungen Creek to the southwest. The entire island has been classified as an unstabilized inlet zone. Long-term erosion rates on the island average -4 to -5 ft per year, with the highest rates of -10 to -11 ft per year found at the southern end of the Melrose Tract and the northern end of the Oakridge Tract. There is a wooden bulkhead approximately 4000 ft long in the center of the island. A renourishment project was constructed here in December 1998.

There are 12 monitoring stations on Daufuskie Island. The earliest beach survey data was collected in 1988, and the island has been surveyed almost continuously since then. However, no profile data was collected in 2001, so all statements about Daufuskie for the past year are qualitative. In general the 1998 renourishment project continues to perform very well, and an adequate beach width exists for most of Daufuskie. The exception is the extreme southern end of the island, at Bloody Point, where short-term beach erosion rates have been drastically higher than the long-term rate of -5 ft per year.



Hilton Head Island

Hilton Head Island

Hilton Head Island, located between Calibogue Sound to the southwest and Port Royal Sound to the northeast, is one of the state's largest barrier islands. Hilton Head Island can be divided into five geomorphologic reaches, which are each discussed below. A beach renourishment project placed 2.5 million cubic yards of sand on the Hilton Head shoreline between May and November 1997. Beach survey data was collected in November 1999 and May 2001.

The portion of Sea Pines Plantation bordering on Calibogue Sound is an unstabilized inlet zone, subject to the influence of the Sound. The long-term shoreline change rate is 2 to 5 ft per year of accretion. This area experienced moderate erosion during the mid 1990's, but was renourished in the winter of 1999. SCCC monuments 1400-1409 are located here. As a result of the renourishment the beach width here was increased by as much as 250 ft, and even with some erosion over the past 3 years is still more than adequate.

The second zone on Hilton Head is a 10 mile-long standard zone that extends from station 1412 in Sea Pines Plantation to station 1469, just south of the Folly. This area includes South Forest Beach, North Forest Beach, and Palmetto Dunes. Both North Forest Beach and Palmetto Dunes were included in the 1997 renourishment project, which began at the Hilton Head Inn. Long-term shoreline change rates vary in this zone--they are accretional south of Coligny Circle and erosional north of Coligny Circle, with the rate of erosion increasing with distance from the Circle.

Most stations in Sea Pines, monuments 1412 through 1424, showed little change during the report period. This area is generally one of the most stable sections of Hilton Head Island, and has a well-established dune. Stations in South Forest Beach, 1427 through 1436, are also stable with a well-established dune.

In North Forest Beach and Palmetto Dunes the long-term shoreline change rates become erosional, with the erosion rates becoming progressively higher with movement toward the northeast. Beach profiles here showed sand deficits prior to renourishment,

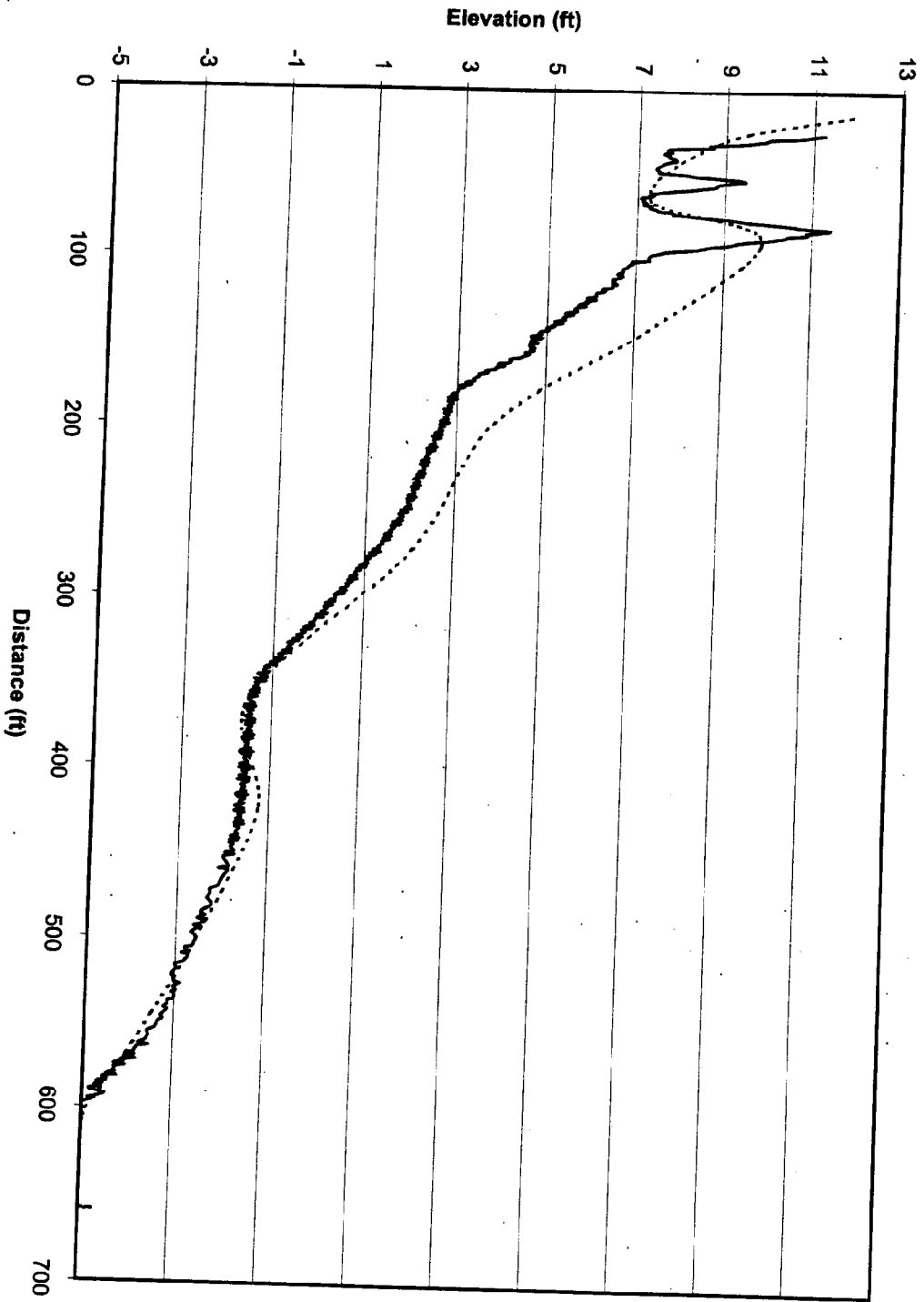
but unit-width volumes increased dramatically as a result of the 1997 beach fill project. Stations 1437 through 1448, located in North Forest Beach, showed substantial erosion of the renourishment berm between September 1998 and November 1999, but only minimal loss of renourishment sand since then. Stations 1451 through 1466 are located in Palmetto Dunes and showed the same general trend as the North Forest Beach stations. Long-term erosion rates reach a maximum of -6 ft per year at station 1460, near Dinghy St. in Palmetto Dunes.

The third zone on Hilton Head is a 2200-ft long unstabilized inlet zone, located on either side of the Folly. Stations 1468, 1469 and 1472 are the monitoring stations in this reach, which historically was very dynamic because of the inlet channel. However, a small jetty constructed on the south side of the Folly in 1997 has helped stabilize this region. Long-term erosion rates here are around -2 ft per year. During 2001 the beach remained fairly stable.

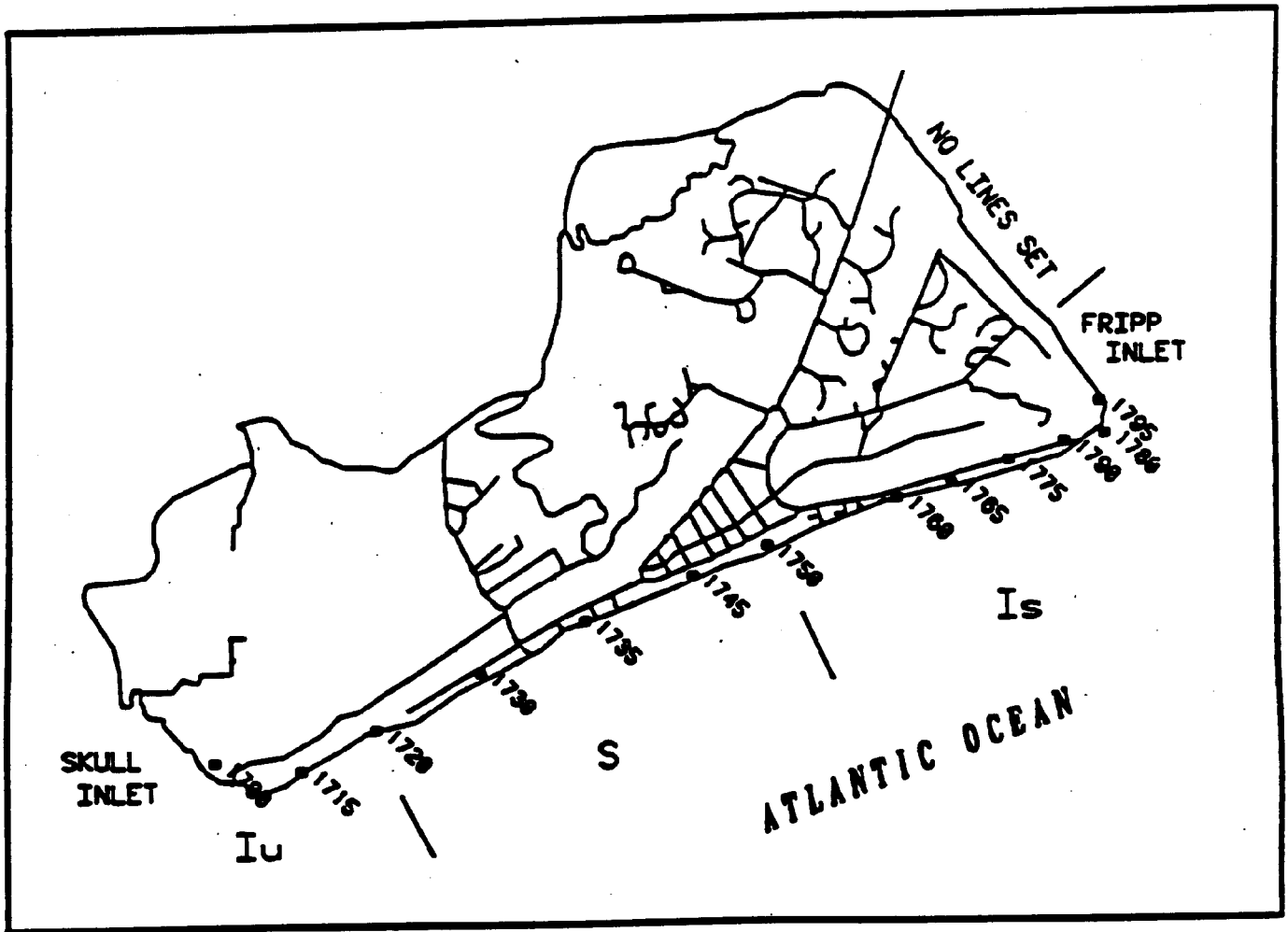
The fourth zone is a 1.3 mile-long standard zone that extends from just north of Burke's Beach Road to the Westin Hotel and includes stations 1474 through 1478. Long-term shoreline change rates are stable, and from November 1999 through May 2001 the beach showed only minor changes.

The fifth zone is an unstabilized inlet zone that includes all of the Port Royal Plantation shoreline. Survey stations 1481 through 1496 are located here. This region shows two distinct shoreline trends, with long-term accretion along the Atlantic shoreline to station 1484, and erosion of -3 to -4 ft per year along Port Royal Sound. The upper-beach portion of the profile along Port Royal Sound is generally steeper than the Atlantic shoreline beach due to the lower wave energy, but the offshore portion can be flatter due to the presence of sand bars.

Station 1438



..... May-00
———— Sep-01



Fripp Island

Fripp Island

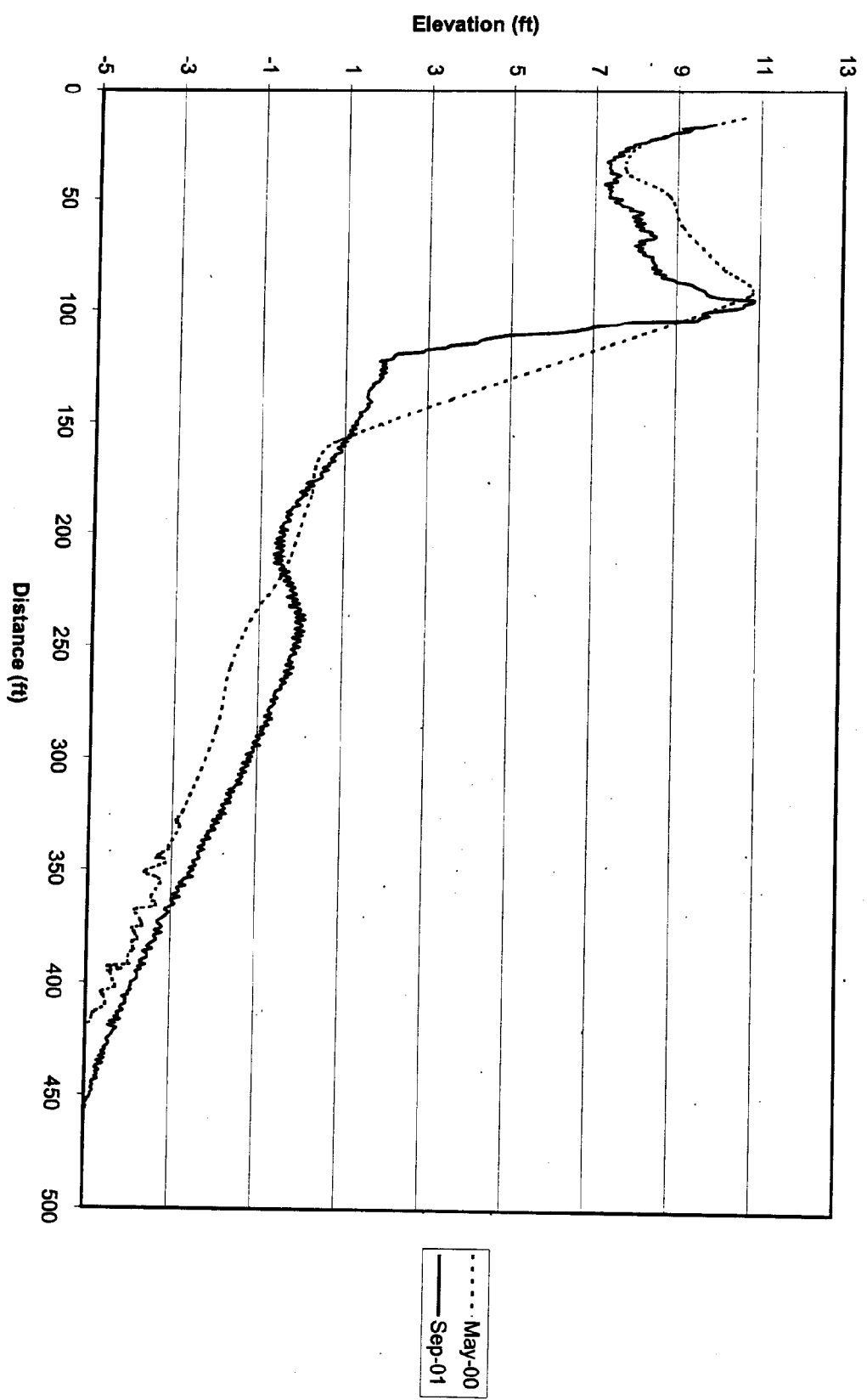
Fripp Island is a three mile long barrier island located between Pritchards Island and Skull Inlet to the southwest, and Hunting Island and Fripp Inlet to the northeast. Development on the island is primarily single family residential, and the island is almost continuously armored with revetments. The central portion of the island is classified as a standard zone, with an unstabilized inlet zone at the southwest end and a stabilized inlet zone at the northeast end. An analysis of long-term erosion trends has shown the island to be stable, although sand-bypassing events across Fripp Inlet, with a period of decades, can cause significant changes to the beach profiles on the island.

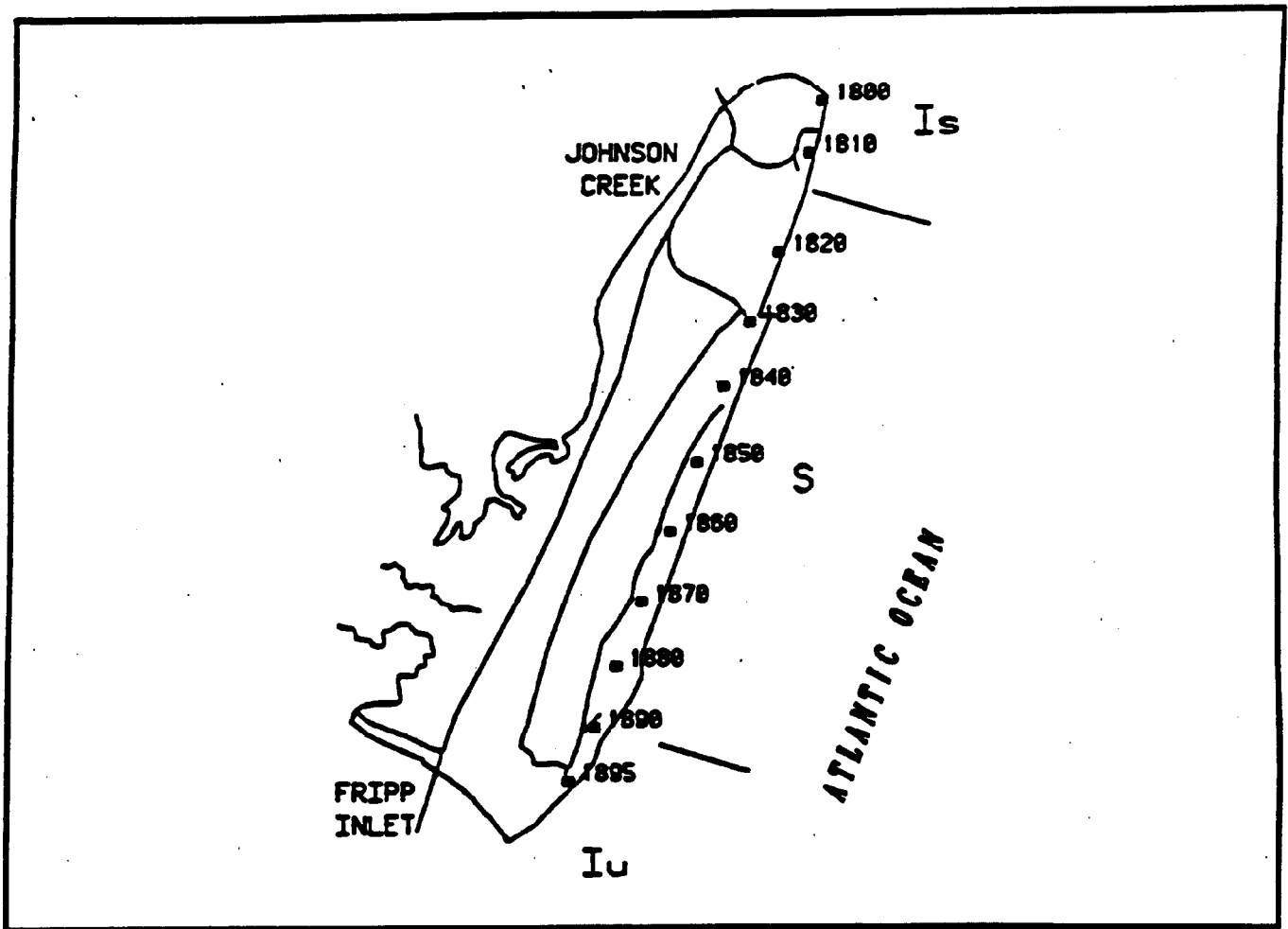
There are 15 beach survey monuments located on Fripp Island, some of them dating back to 1988. Most recent profile data was collected in May 2000 and September 2001. Station 1700, on Skull Inlet, is sheltered from the open ocean and shows virtually no change from year to year. Stations 1715 through 1735 face the Atlantic Ocean along the southern half of Fripp Island. The beach width is narrower here, and at high tide there is little to no dry sand seaward of the substantial rock revetment. Portions of the revetment were damaged by storms during the fall of 2001.

The beach condition changes at station 1745, on Winter Trout Rd. North of here and up to station 1775, at the end of Marlin Drive, the beach has been strongly accretional in recent years and has gained a tremendous amount of sand. The beach here is now significantly wider than along the southern half of the island, and includes a broad dry-sand beach. Stations 1790 and 1780, near the northeastern end of the island, are the last two monitoring stations that face the Atlantic Ocean. The beach is much narrower here, and there is no dry-sand beach seaward of the revetment. These two stations are very similar to the southern end of the island.

The final two monitoring stations on Fripp Island are 1795 and 1798, located on Fripp Inlet. These stations show typical inlet profiles--very steep, no dry-sand beach, and only minor changes from year to year.

Station 1735





Hunting Island

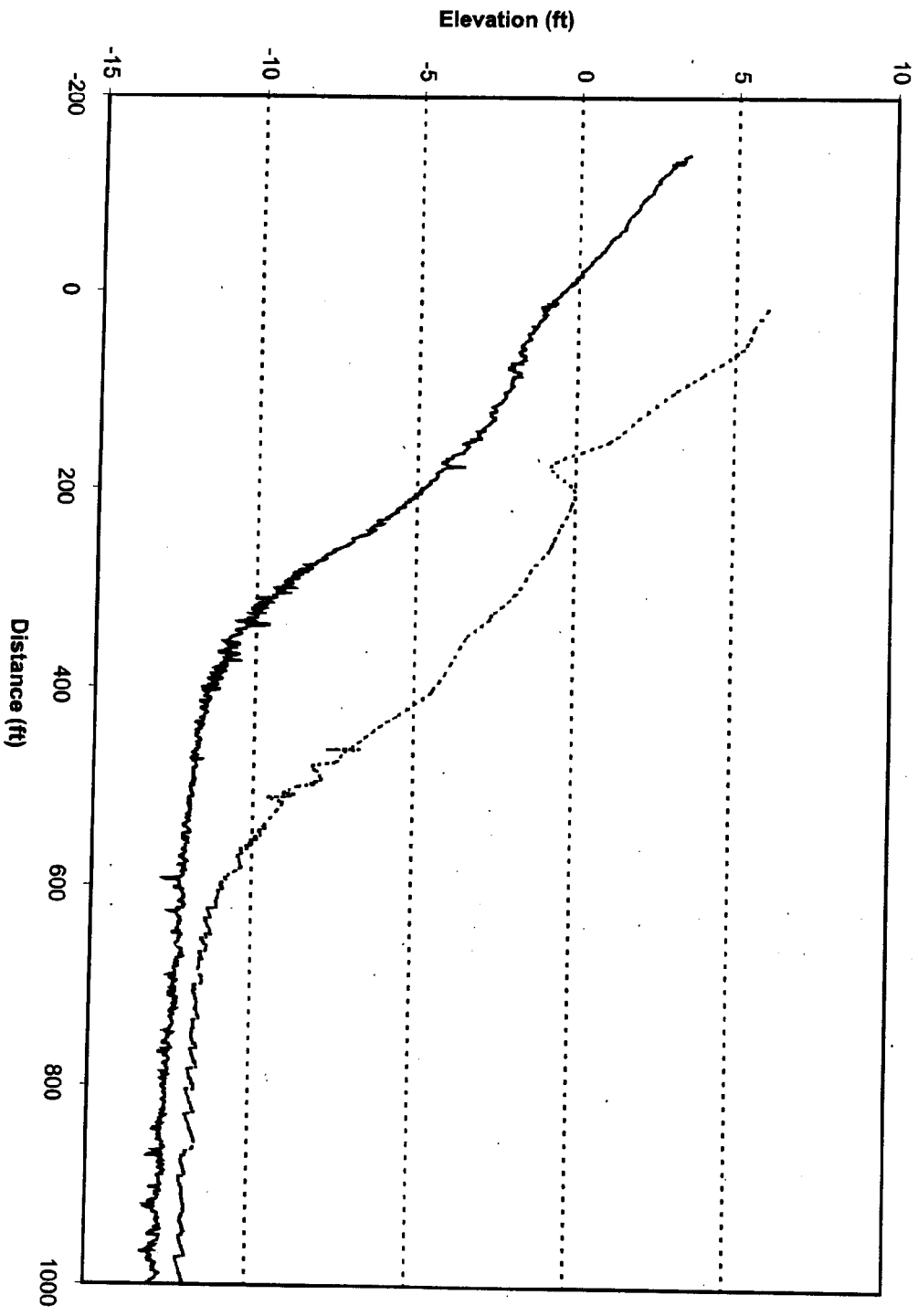
Hunting Island

Hunting Island is a state park located between Fripp Island and Harbor Island. The island has historically been strongly erosional, with long-term rates ranging from -7 to -15 ft per year. The central portion of the island is a standard zone, while the southern end along Fripp Inlet is an unstabilized inlet zone and the northern end along St. Helena Sound is an inlet zone stabilized by an 800-ft terminal groin. Hunting Island has been renourished several times in the past 20 years, most recently in March 1991, but is presently in a critically eroded state.

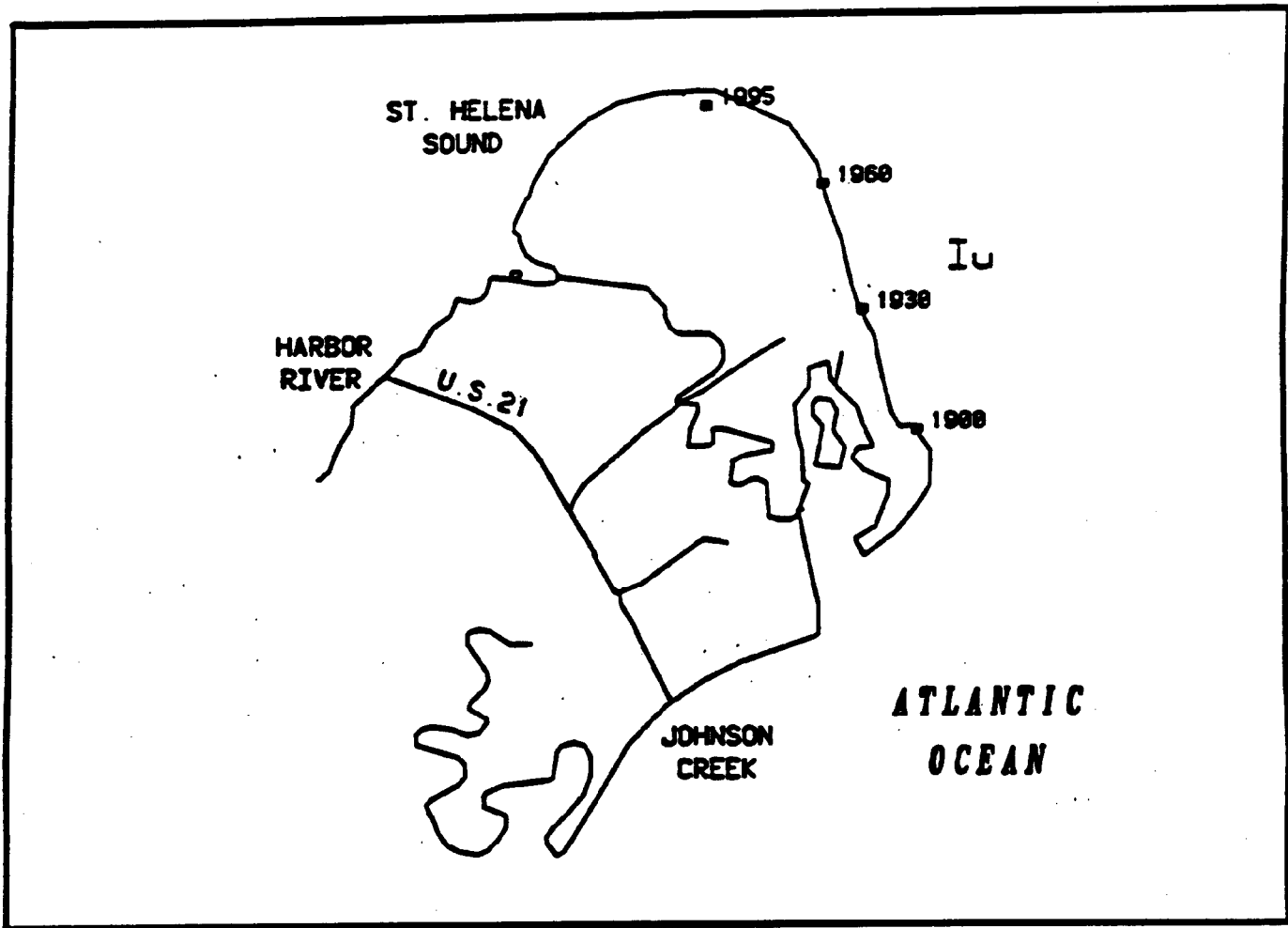
The 11 beach monitoring stations on Hunting Island are unique in that their identification numbers increase from north to south. Most recent surveys were conducted during May 2000 September 2001. This profile data shows that the beach at Hunting Island continues to erode. An example plot is shown for station 1850, where the upper beach has eroded by hundreds of feet. With the exception of the extreme southwest and northeast ends of the island there are no sand dunes or high-tide beach here. Instead, the subtropical maritime forest vegetation literally falls off into the ocean.

The US Army Corps of Engineers is planning an ecosystem restoration project at Hunting Island, to include beach renourishment, but project construction is still probably several years away. In the mean time, Hunting Island remains one of the state's most critically eroded beaches.

Station 1850



..... May-00
———— Sep-01



Harbor Island

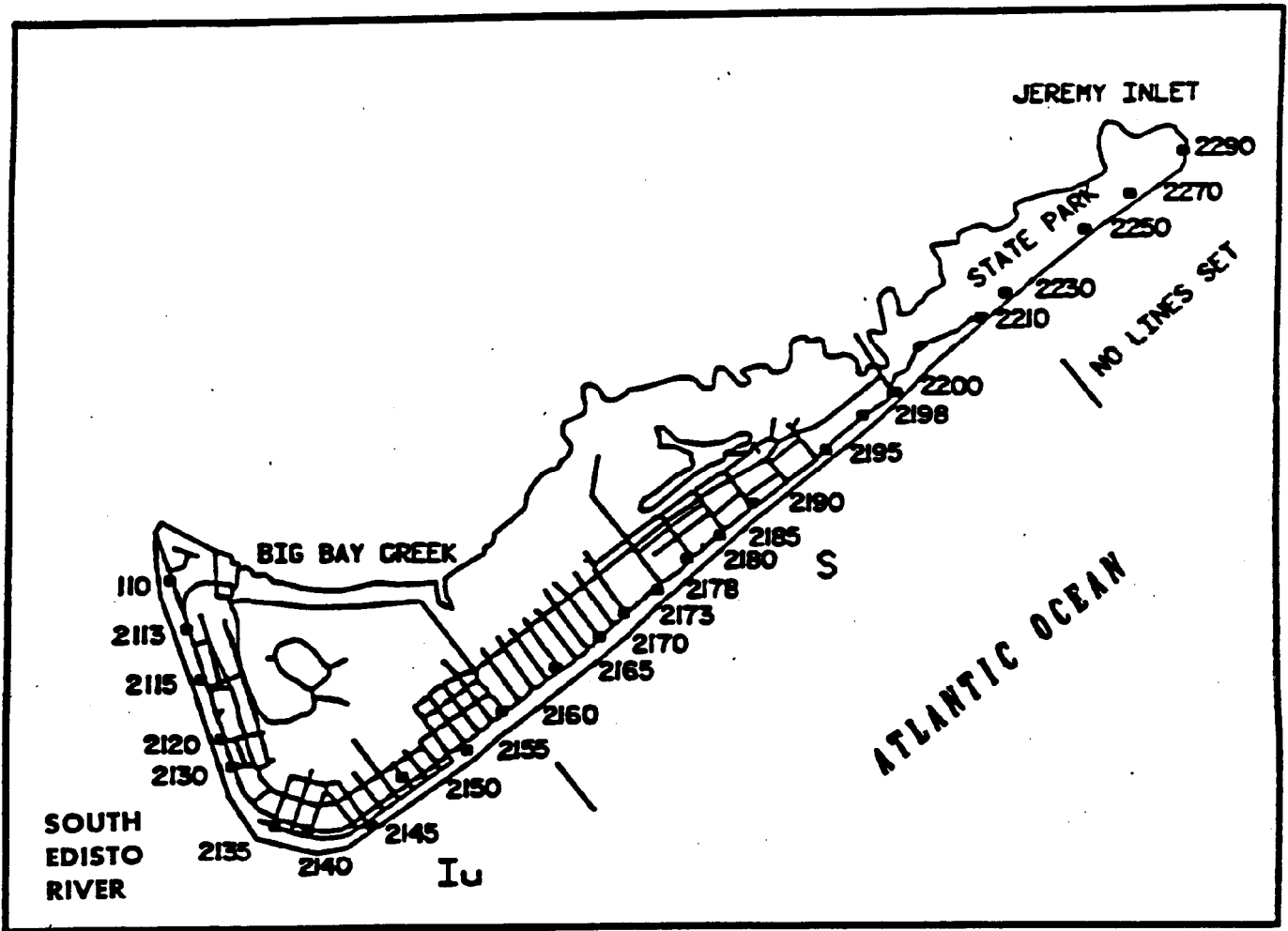
Harbor Island

Harbor Island is located between Hunting Island and Johnson Creek to the southwest and St. Helena Sound to the northeast. Beachfront development is primarily single-family residential, with a few condominium buildings. The entire island is classified as an unstabilized inlet zone, and while the shoreline is very dynamic it is generally accretional in the long term. The beach width decreases dramatically from south to north. There are a total of six beach monitoring stations on Harbor Island, four of which were installed in 1988, with the remaining two installed in June 1990. Most recent surveys were conducted here in November 1999 and May 2000. Some comments are based on qualitative field observations in March 2001.

Stations 1900 and 1930 are located at the southern end of the island, where the beach is wide and accretional. Station 1900 is located closest to Johnson Creek and the beach profile here is extremely wide, over 2000 ft. A series of intertidal sand bars and troughs are constantly shifting back and forth in this area, changing the shape of the lower beach profile. Some mud outcrops are presently visible on the lower beach at this station. At station 1930, near the multi-family units, the beach sand volume is also greater than average.

The beach width narrows significantly at station 1960, on Harbor Island Drive North. The beach here was erosional several years ago but has since stabilized, and does not appear to have experienced any erosion during 2001. The erosion problem deteriorates farther to the north and becomes worst at station 1980, also on Harbor Drive North. The beach here appears to be stable for 2001 but has no sand dune, and the high-tide swash line is very close to several houses.

At station 1995, located where the shoreline begins to curve onto St. Helena Sound, the beach is wider and has a small, well-vegetated dune with no sign of active erosion. Station 1998 is located within the lower wave energy environment of St. Helena Sound, so that the beach profile drops off fairly rapidly. The beach here typically shows only minor changes from year to year.



Edisto Beach

Edisto Beach

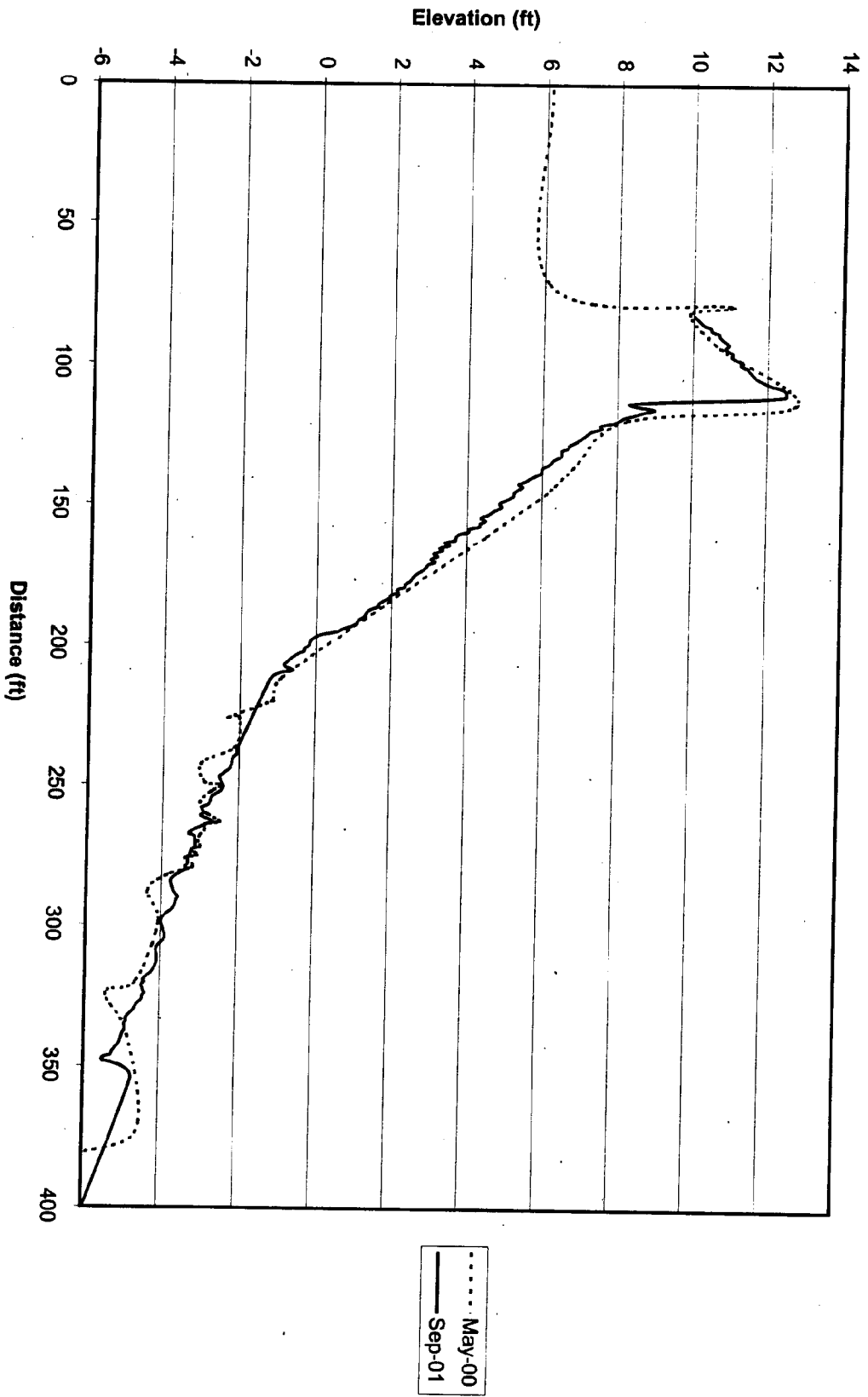
Edisto Beach is a barrier island situated between the South Edisto River and Jeremy Inlet. The northeastern portion of Edisto Beach is a state park, which includes camping sites, while the remainder of the island is primarily single-family residential. An extensive groin field on the island serves to stabilize the shoreline position. South of station 2160 (Marianne St.), the island is classified as an unstabilized inlet zone and is slightly accretional. The rest of the island, including the state park, is a standard zone and is fairly stable in the long term. There are 27 beach survey monuments on Edisto Beach, which were surveyed in May 2000 and September 2001.

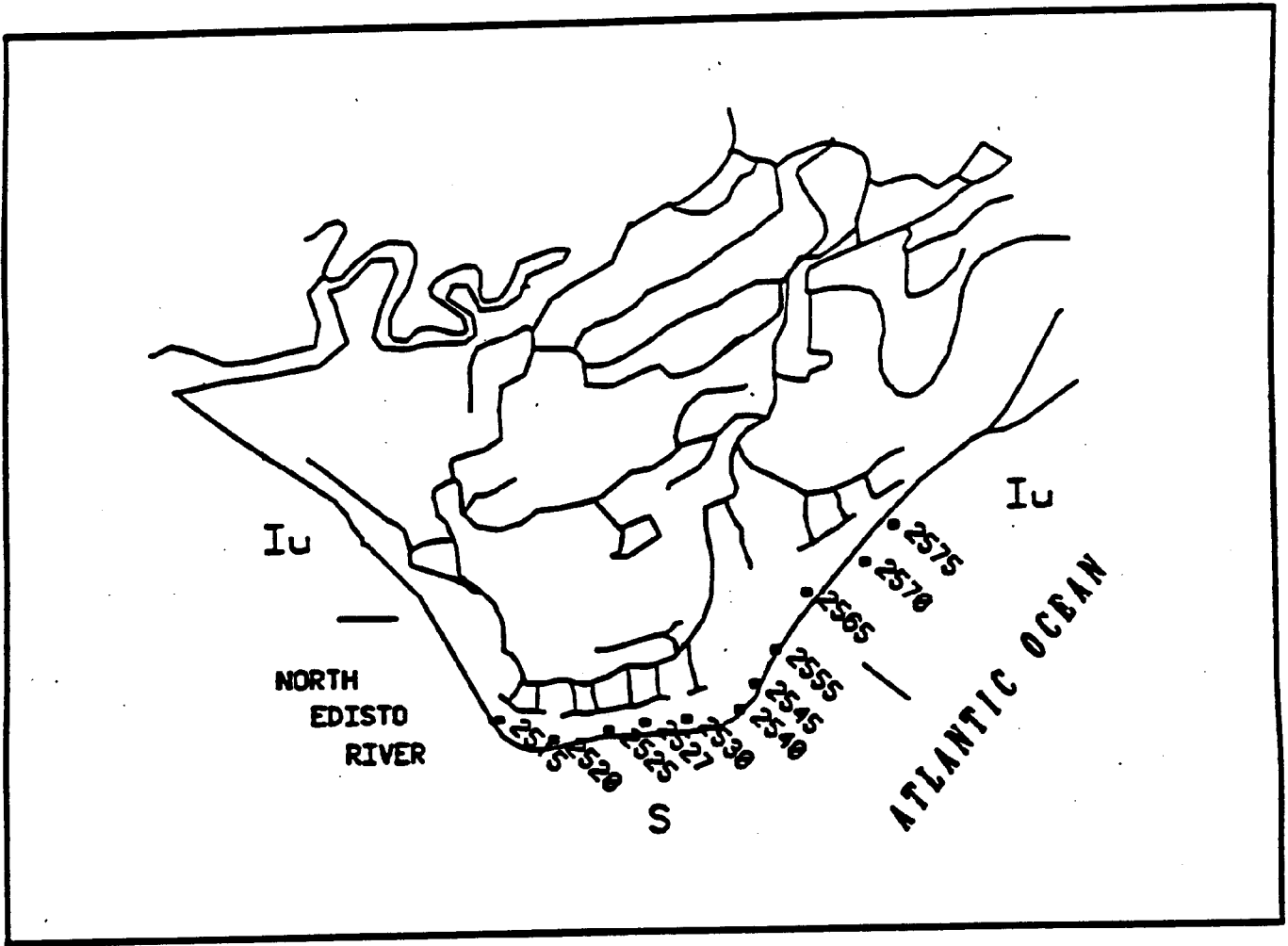
Stations 2110-2130 are located along the South Edisto Inlet shoreline. These stations are sheltered from the open ocean and generally experience only modest seasonal changes on the intertidal beach. A localized erosion hotspot developed in this reach between Mikell and Edisto Streets in 2000, but stabilized in 2001. Stations 2135 at Edisto Street and 2140 at Billow Street are located on The Point, the shoreline curve between the South Edisto River and the Atlantic Ocean. Historically this section of beach can be very dynamic, but has remained stable in recent years.

The oceanfront southern half of Edisto Beach, from stations 2145 to 2165, has the widest oceanfront beach on Edisto. Most stations here experienced only minor volume changes for the year. The northern half of developed Edisto Beach, from station 2170 to station 2200 at the Pavilion, remains one of the most critically eroded sections of beach anywhere in the state. The beach here was fairly stable from May 2000 through September 2001, as shown on the example plot from station 2180, but suffers from a considerable sand deficit and has virtually no beach at high tide and no protective dune between the ocean and the development. Several wooden bulkheads and houses here were damaged by a strong northeast storm in November 2001.

Stations 2200 to 2230 in Edisto Beach State Park are comparable to the northern half of developed Edisto Beach. With a sand shortage the coastline and park infrastructure, including campsites and access roads, are very vulnerable to erosion.

Station 2180





Seabrook Island

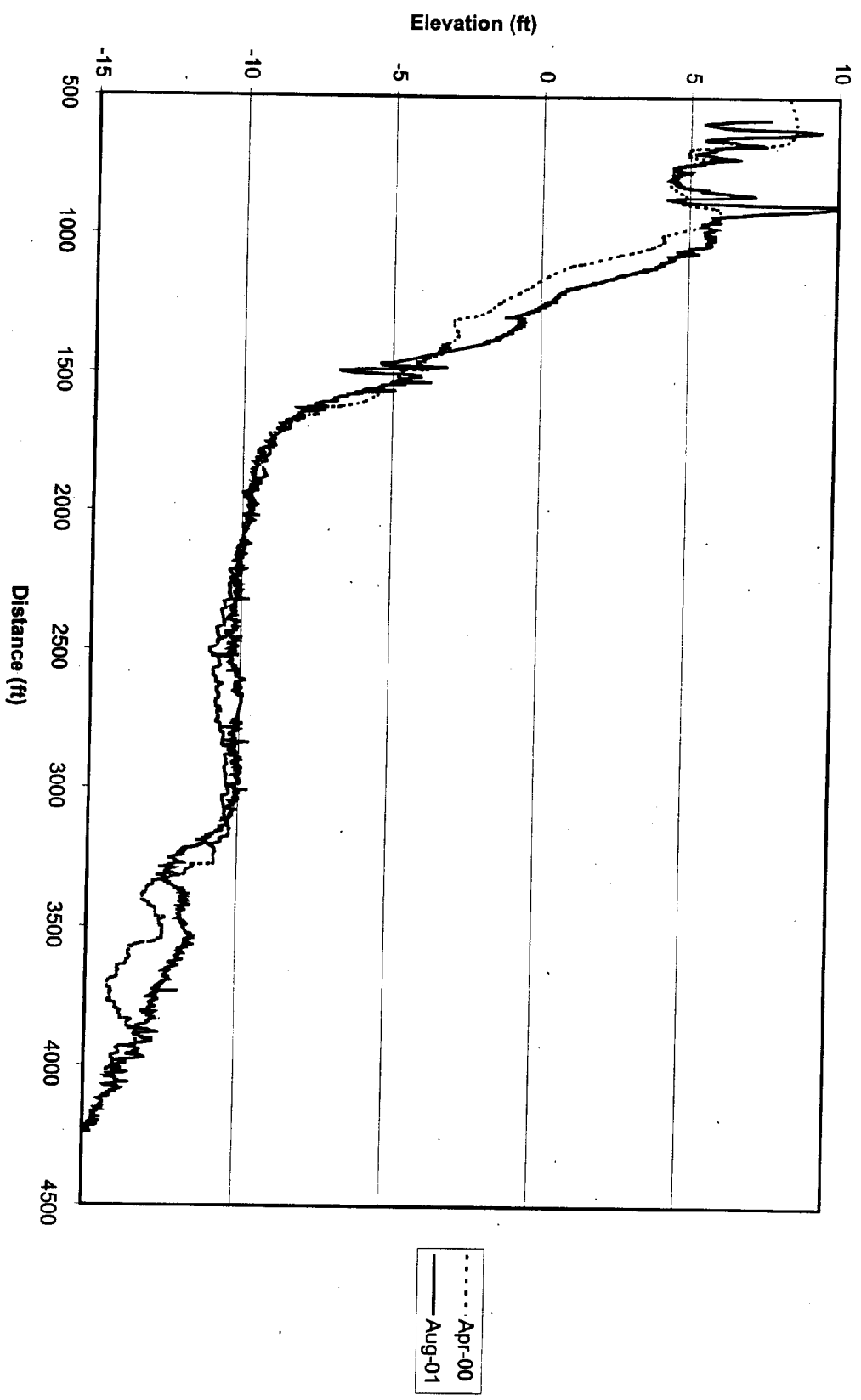
Seabrook Island

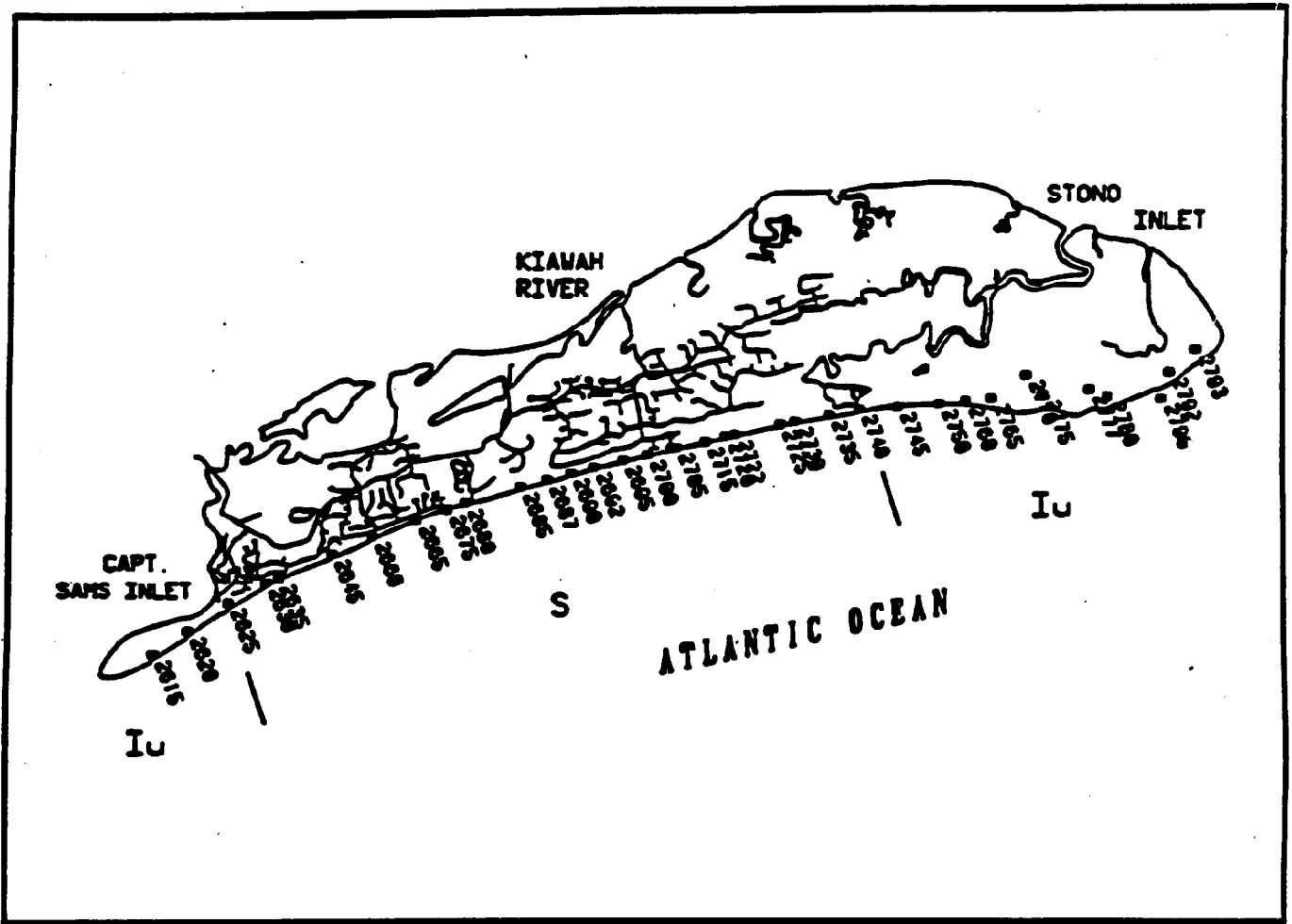
Seabrook Island is a barrier island approximately 4 miles long, situated between North Edisto Inlet and Captain Sams Inlet. Development on the island is a mix of single-family and multi-family structures. A continuous 5000-ft section of shoreline is armored with rock revetments and a few seawalls. The entire island is classified as an inlet zone—the armored portion is a stabilized inlet zone, while the remainder is unstabilized. Shoreline change patterns have been quite dynamic over the past 50 years. There are 11 beach monitoring stations here, which were surveyed during April 2000 and August 2001.

Station 2515, at Beach Club Villas along the North Edisto River, is a typical inlet profile—very steep and fairly stable. Stations 2520 through 2540 are located along the revetment, from the Beach Club to Renken Point. This section of Seabrook Island has consistently lacked a dry-sand beach for many years. The northern flood channel of the North Edisto River is fairly deep and pinches in very close to the shoreline here, which creates a steep profile and makes it difficult to retain a dry-sand beach. Work is currently underway to scrape sand from the intertidal portion of the beach to the north, which is much wider, and move it to this section.

In the North Beach area, from station 2545 to 2575, the high-tide beach averages over 500 ft in width. This area is closer to Captain Sam's Inlet and its nearness to the inlet causes the shoreline to be more dynamic, experiencing episodes of moderate erosion or accretion from one year to the next. However, the substantial width of the dry-sand beach makes these changes of less concern than they might be elsewhere. A typical plot from station 2565, near Seascape Court, shows that most of the profile from the primary dune down to the -4 ft contour gained sand between April 2000 and August 2001, causing the profile to shift seaward by about 50 ft.

Station 2565





Kiawah Island

Kiawah Island

Kiawah Island is a ten-mile long barrier island, located between Seabrook Island and Captain Sams Inlet to the west, and Stono Inlet and Folly Beach to the east. Kiawah is one of the most stable barrier islands in the state, although the eastern and western ends of the island are more dynamic due to their proximity to inlets. Most oceanfront development here is single-family residential, although there are some multi-family residential buildings, commercial structures, a golf course, and a public park.

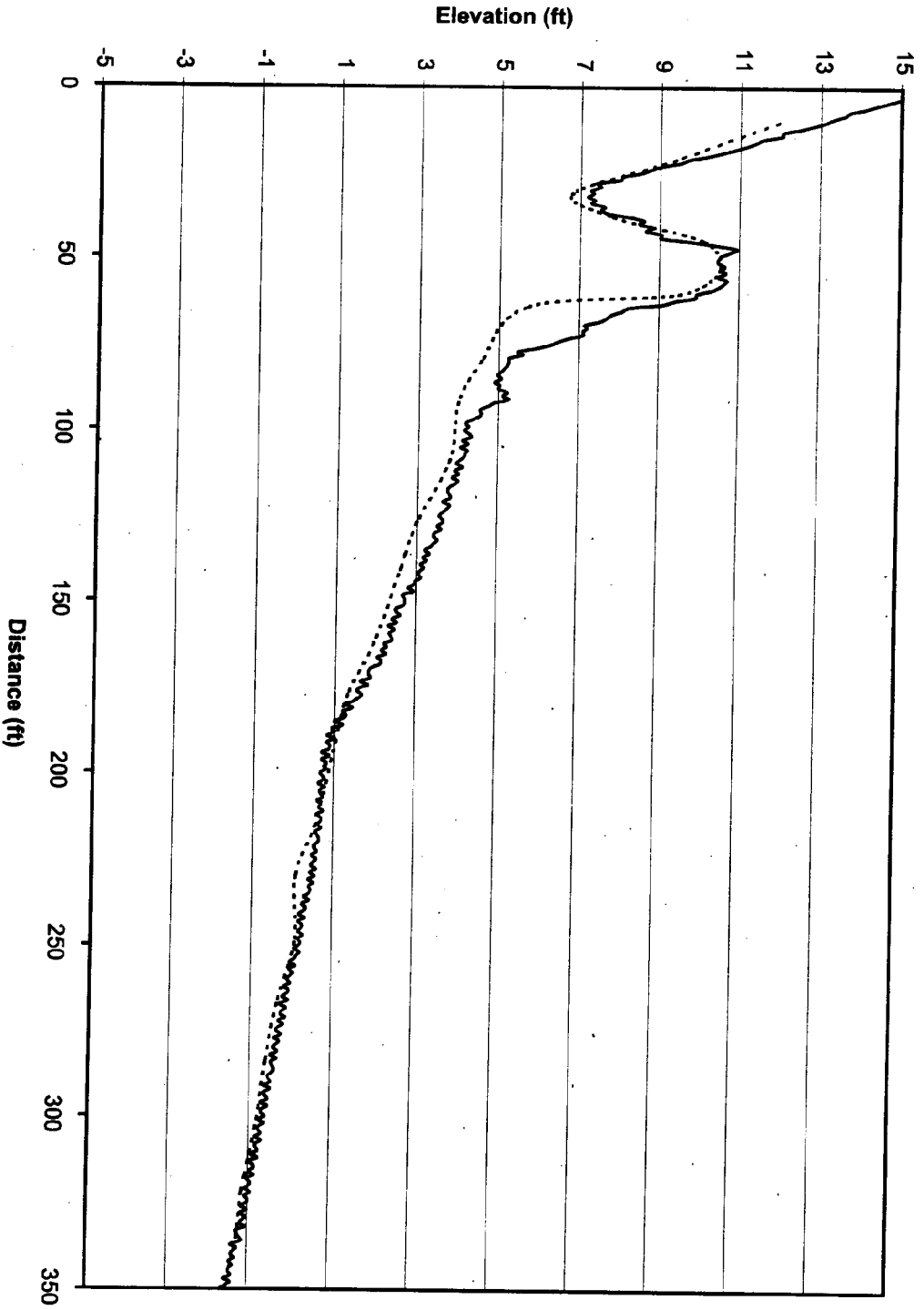
The 25 beach monitoring stations on Kiawah Island were surveyed in April 2000 and August 2001. Stations 2615 through 2645 are located at the western end of Kiawah, where land use consists of undeveloped property, a beach park, single-family homes, and some multi-family structures. This is usually one of the most stable sections of Kiawah Island. For most stations here the primary dune was stable and the beach profile seaward of the dune showed only minor changes between April 2000 and August 2001. An example is station 2645, which gained a small amount of sand seaward of the primary dune.

The area from station 2660, near the middle of Eugenia Ave., through station 2680, at the eastern end of Windswept Villas, experienced significant erosion in 1995 and 1996, then stabilized from 1997 through 1999. Between April 2000 and August 2001, the dunes here once again show signs of an erosion hotspot. As an example the primary dune at station 2675, on Eugenia Ave., was eroded by about 25 ft.

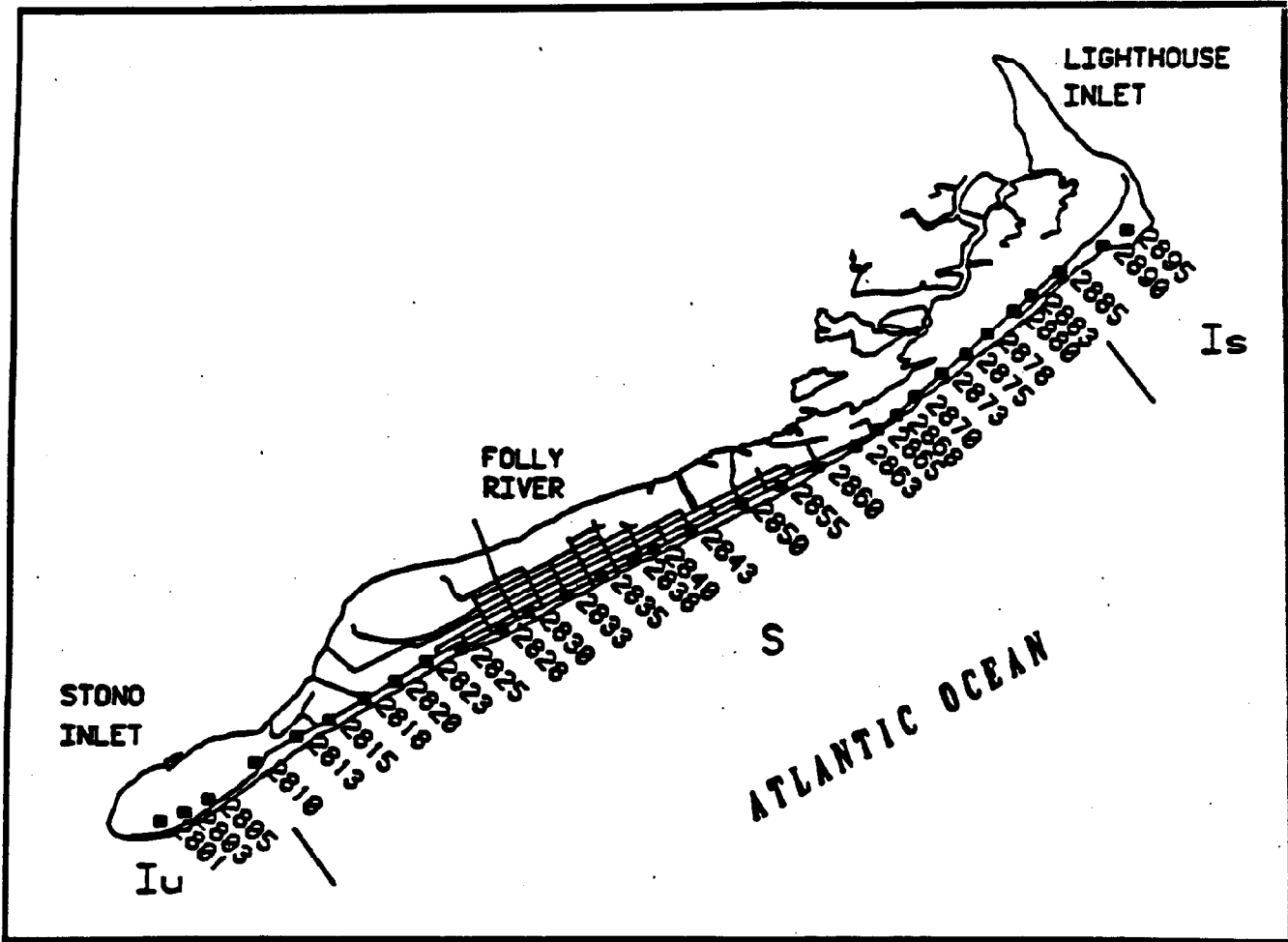
Oceanfront development along the eastern half of Kiawah, from station 2725 to 2785, is limited to some single-family structures, a golf course and associated amenities. Beach profile changes here historically have been more dramatic than along the western half of Kiawah. During the past year the dunes along stations 2725-2760, from Flyway Drive to the Ocean Course, were fairly stable, while the upper beach gained some sand.

Stations 2780 and 2785 are closest to Stono Inlet and historically are the most dynamic. Both continue to experience significant profile changes seaward of the dune, primarily from the movement of intertidal sand bars associated with the inlet.

Station 2645



--- Apr-00
— Aug-01



Folly Beach

Folly Beach

Folly Beach is located between Stono Inlet and Kiawah Island to the southwest, and Lighthouse Inlet and Morris Island to the northeast. Nearly all of Folly's shoreline is armored and contains groin fields. Oceanfront development is mostly single-family residential, with one large condominium and one large hotel in the center of the island, a public park at the southwest end, and a large tract of undeveloped property at the northeast end. There are 33 monitoring stations here that were surveyed in March 2000 and August 2001.

At the western end of the island in the county park, stations 2803 and 2805 continued to experience a trend of significant erosion that began in 1995. The upper beach at both stations has eroded back by over 300 ft since the 1993 renourishment project, and continues to be critically eroded. The remaining western section of Folly Beach, from station 2813 just outside the park to station 2825 at 3rd St. West, continues to maintain a small primary dune seaward of the buried line of revetments and seawalls. At station 2828, in front of the Holiday Inn seawall, the upper beach profile shifted landward by about 50 ft as the beach dropped as much as 2 ft.

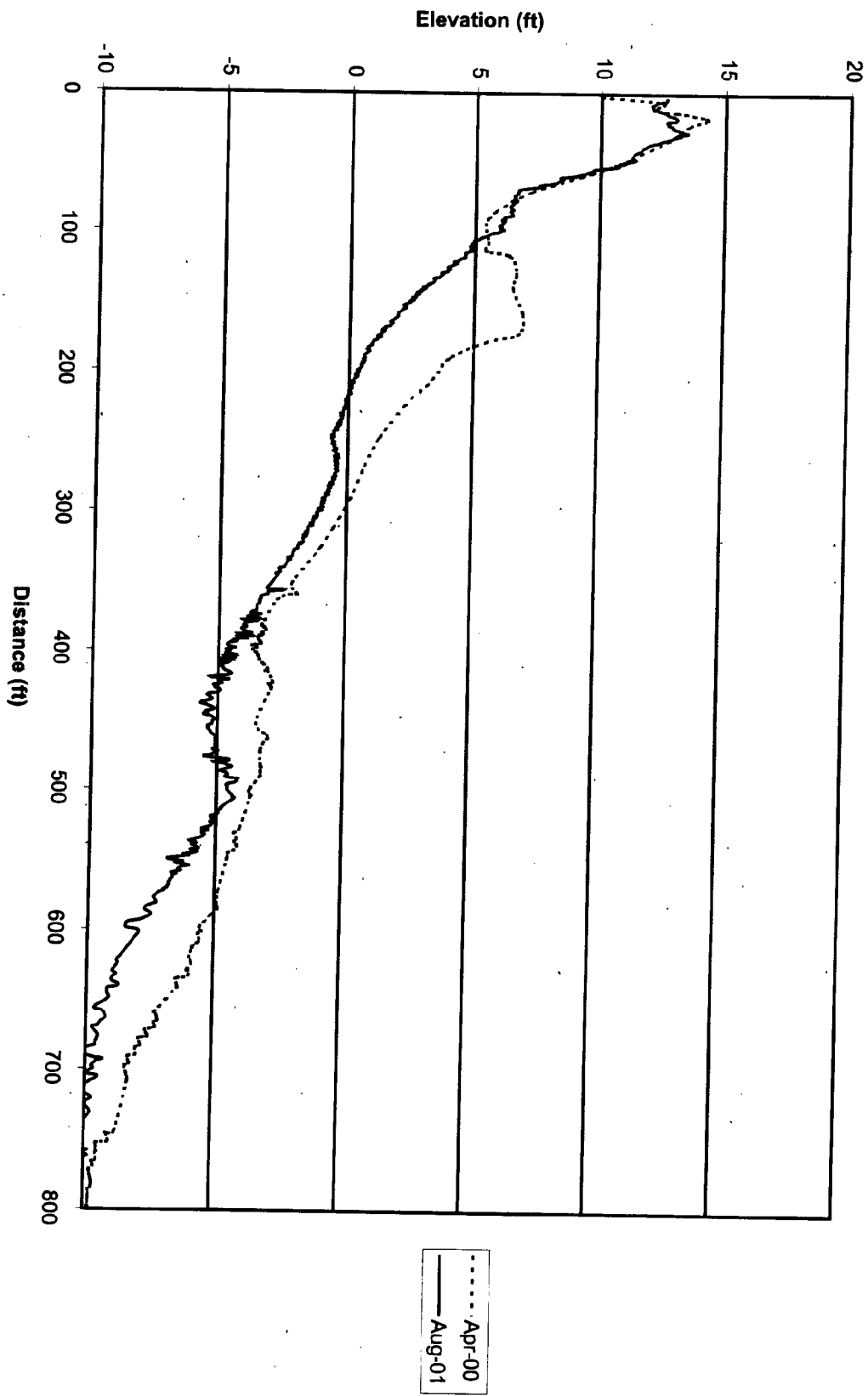
The next section of beach is the first twelve blocks east of the Holiday Inn, up to the Washout. Stations 2833 to 2855 are located here. Almost all profiles in this area were stable between April 2000 and August 2001, with a moderate dune on top of, or seaward of, the line of rock revetments.

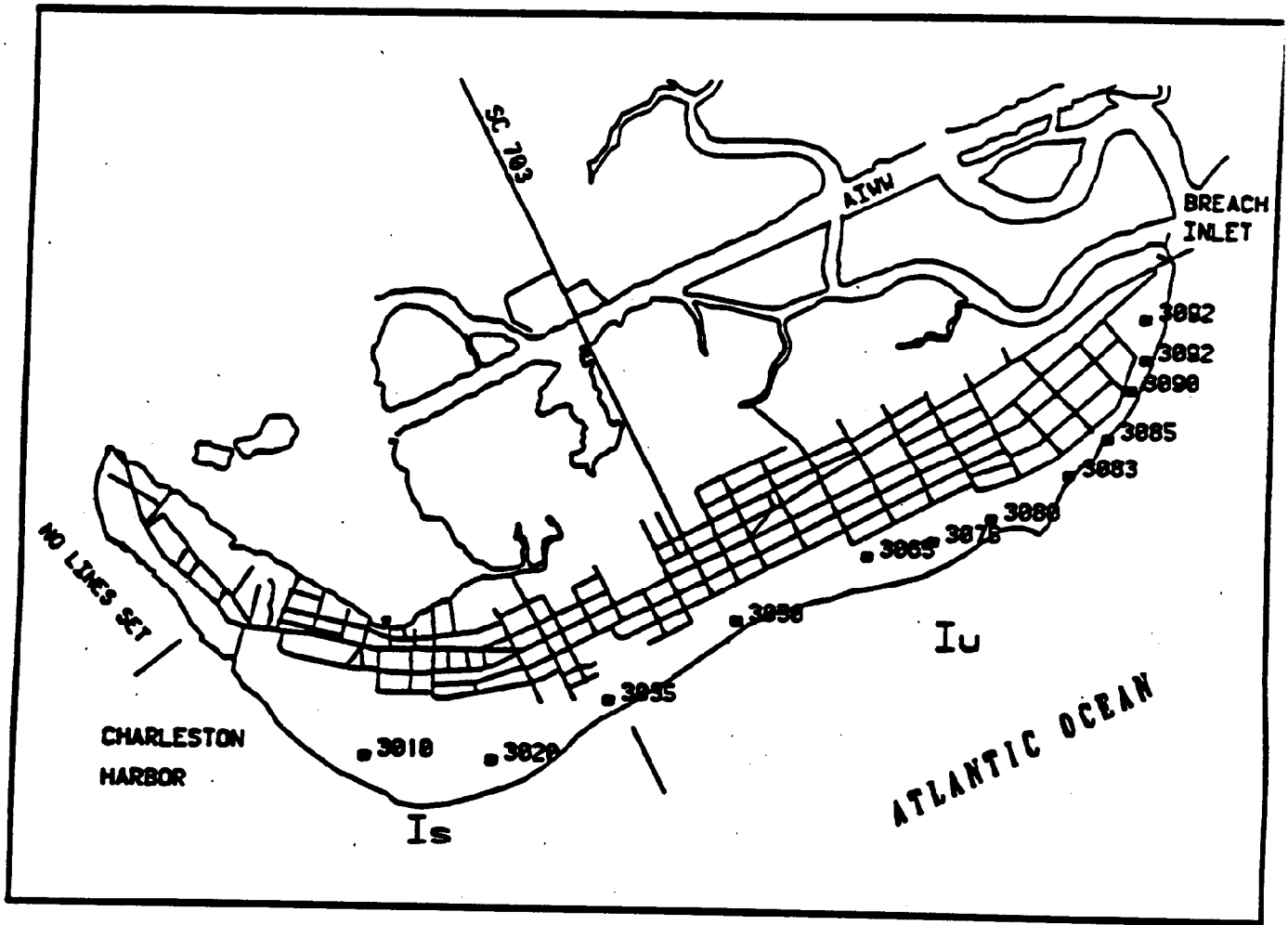
The next area, commonly referred to as the Washout, extends from station 2860 through 2873. The ocean is closest to the road in this section of beach, and there are no residential lots on the seaward side of Ashley Ave. Stations here were relatively stable for the study time period, although the beach here is still fairly narrow, with no dune, exposed revetment stone, and virtually no beach at high tide.

The region east of the Washout, stations 2878-2890, experienced a general trend of accretion from 1993 through 1997. This area then became erosional, with the magnitude of erosion increasing with movement toward the eastern end. During the

April 2000 - August 2001 time period the erosion was once again worst at the extreme eastern end of the island. At station 2885 near the end of Ashley Ave. East the beach profile eroded landward by about 50 ft, and a small, developing dune with a crest elevation of 7 ft eroded away. At station 2890 on the former Coast Guard base property the profile showed about 75 ft of erosion, and the same developing dune at crest elevation of +7 ft was also lost.

Station 2890





Sullivan's Island

Sullivans Island

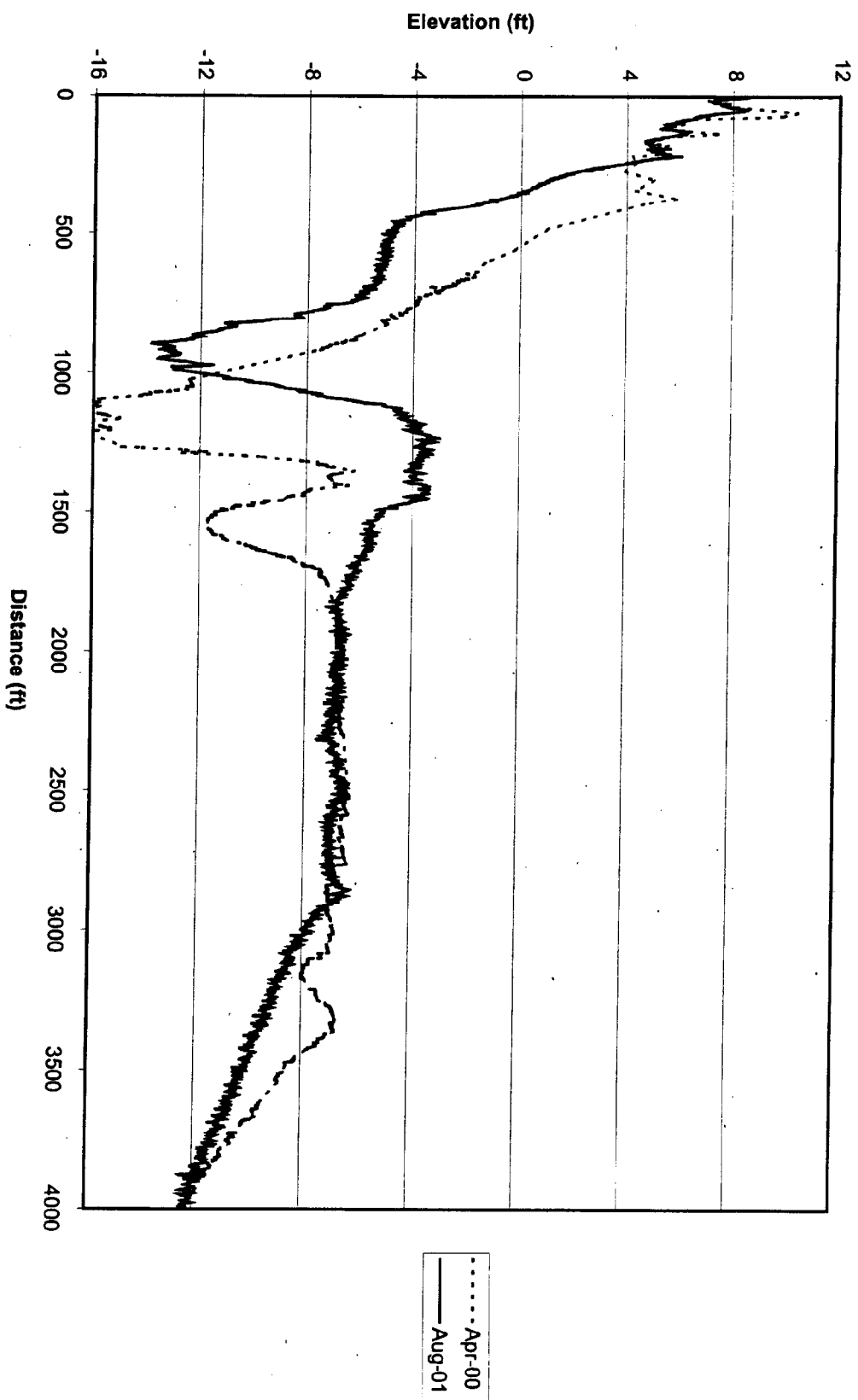
Sullivans Island is located between Charleston Harbor and Breach Inlet. The Charleston Harbor north jetty, which comes ashore on Sullivans Island, has caused the long-term shoreline trend to be stable or accretional for much of the island, although periodic shoal attachment and movement of the channel at Breach Inlet can cause the shoreline in this region to be quite dynamic. Beach surveys were conducted in April 2000 and August 2001.

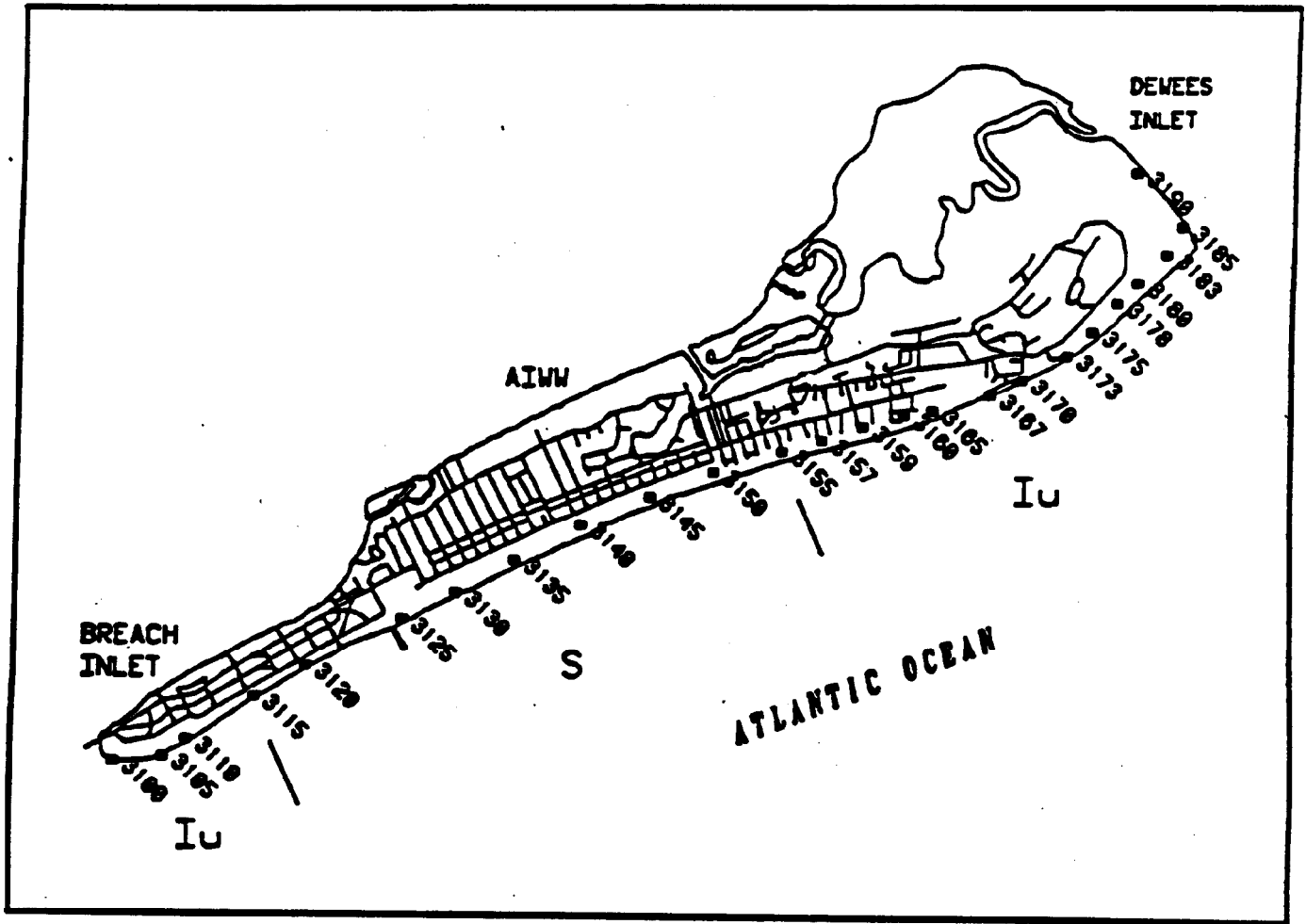
Survey monuments 3010-3035, between Station 16 and Station 19, are located within the Charleston Harbor north jetty. This area is extremely accretional in the long-term but has been stable or even erosional for the past several years. However, the tremendous beach buildup over the past century still leaves this as one of the widest beaches in South Carolina, as measured from the oceanfront row of houses to the high water line.

Survey monuments 3050-3080 are located along the center section of Sullivans Island, outside the north jetty. Sand shoals from Breach Inlet periodically attach to the beach here, and while long-term trends are accretional the shoreline is quite dynamic. At 3050, near Station 22½, the dune field increased in height, the upper beach remained stable, and the intertidal beach increased in width. At 3065, near Station 26, the upper and intertidal portions of the profile accreted significantly, as the profile shifted seaward by 200 ft. This gain was almost exactly matched by a loss at 3080, near Station 28, as the upper and intertidal beach eroded by about 175 ft. The offshore portion of the profile at this station also shows the landward movement of the inlet channel, at a depth of -14 ft, with a large offshore sand shoal following in behind it.

Monuments 3083 and 3085 are located in the transition zone between the accretional center section of the island and the erosional northeastern end of the island along Breach Inlet. The beach at 3083 has been moderately accretional in recent years, while 3085 has been stable. Monuments 3090 at Station 31, 3092 at Station 31½, and 3095 at Station 32, all located close to Breach Inlet, continue to show steep and narrow inlet profiles with a sand deficit, no dune, and no high-tide beach.

Station 3080





Isle of Palms

Isle of Palms

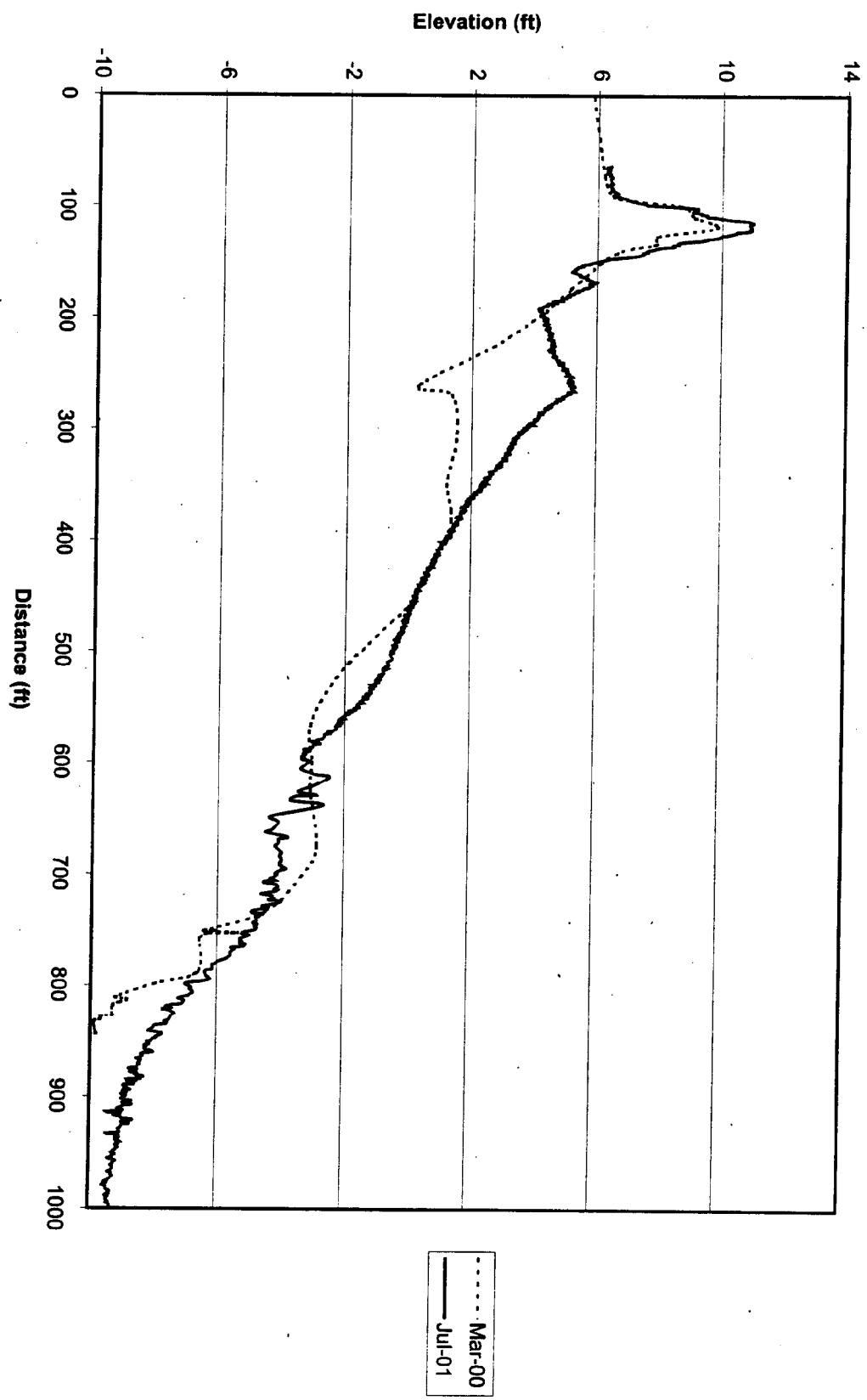
The Isle of Palms is located between Breach Inlet and Sullivans Island to the southwest, and Dewees Inlet and Dewees Island to the northeast. The island is generally accretional, primarily because the downdrift Charleston Harbor jetties interrupt the longshore flow of sand from north to south. There are 22 monitoring stations on the Isle of Palms, which were surveyed in March 2000 and July 2001. Stations 3100-3110, from Breach Inlet to 3rd Ave., are influenced by the inlet's channels and shoals and are usually more dynamic than the central portion of the island. However, this area is strongly accretional in the long term and rarely experiences any episodes of erosion.

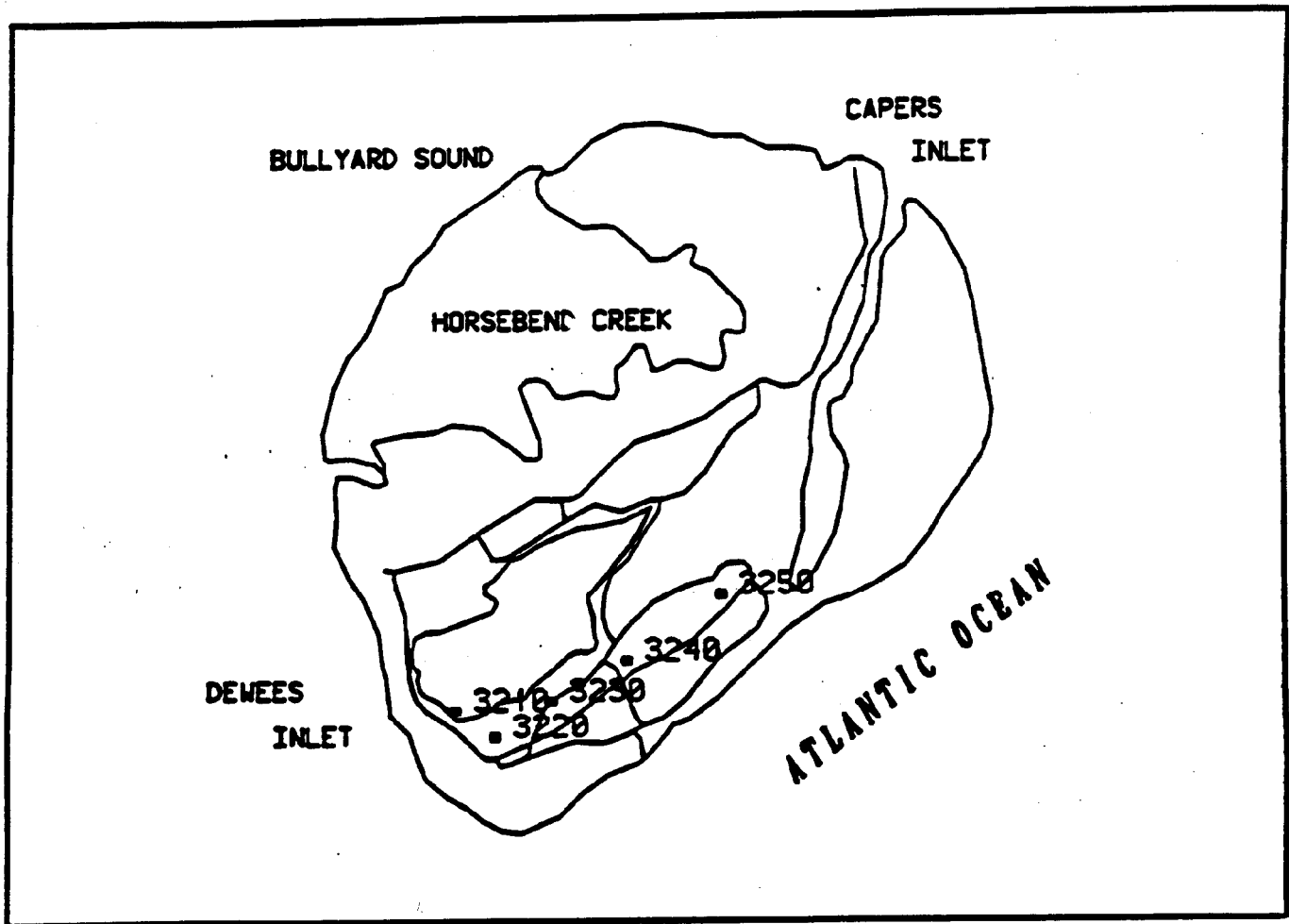
Stations 3115-3157, from 6th Ave. to 50th Ave., are located along the more stable portion of shoreline in the center of the island. Beach profiles here typically show a well-defined primary sand dune and only minor to moderate seasonal variations from year to year, although an occasional hotspot will crop up.

Beginning at station 3159 near 53rd Ave. and continuing on into Wild Dunes, beach profiles are close enough to Dewees Inlet to be effected by periodic bar bypassing from the inlet shoal complex, and as a result profiles here are more dynamic than the rest of the island. These shoal attachment episodes cause extreme accretion in the area of shoal attachment and severe but localized erosion immediately adjacent to the attachment site. These shoal attachment episodes occur about every 6-8 years and last about 18 months, with the most recent event terminating in the fall of 1996.

For the current report period, station 3159 at 53rd Ave. showed a significant sand gain on the upper beach, as the beach width increased by about 100 ft. At station 3165 near 57th Ave. a developing sand dune increased in height by several feet while the rest of the profile was stable. Station 3167 at the southwest end of Beachwood East also showed development of a small dune and a significant gain of sand over the entire beach profile down to the -5 ft contour. Station 3170, at the northeast end of Beachwood East, showed accretion in the low-lying dune field but erosion below the high-tide wave uprush line. At station 3175 near Mariners Walk the dune remained stable while the profile seaward of the dune gained sand.

Station 3159





Deweese Island

Dewees Island

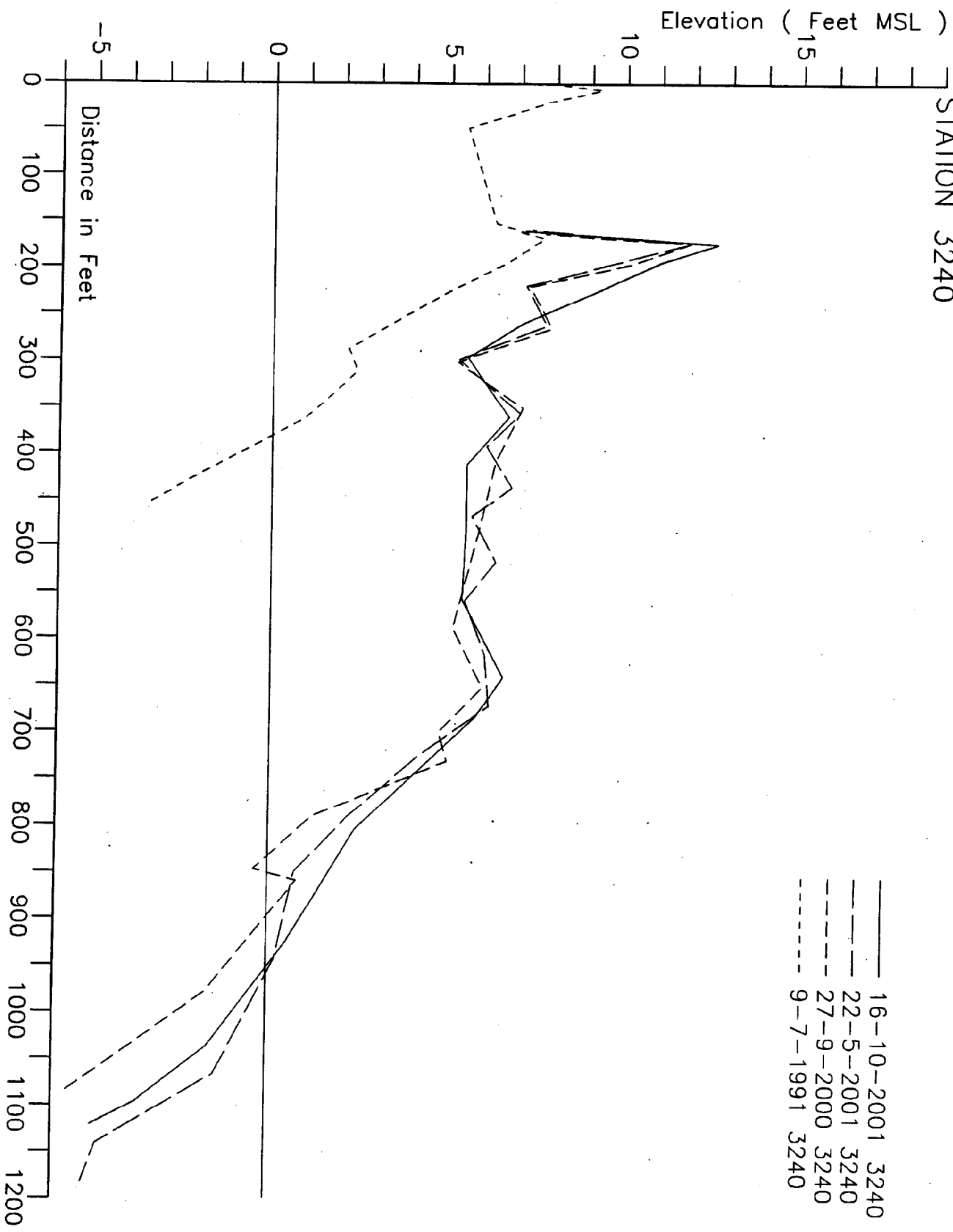
Dewees Island is located between Dewees Inlet to the southwest, and Capers Inlet to the northeast. The island is approximately two miles long, and is classified as an unstabilized inlet zone. The shoreline is very dynamic, with long-term erosion rates of -3 to -12 ft per year, although in recent years the entire island has been accreting. There is limited single-family development here. There are 9 monitoring stations on Dewees Island, which were surveyed in May and October 2001.

Station 3220 is located on top of a bluff along Dewees Inlet. The beach here can be very dynamic but was fairly stable in 2001, gaining some sand on the upper beach. Station 3230 continued its trend from 2000 and showed the biggest increase in sand volume, as the entire profile seaward of the primary dune shifted seaward by a distance of 50 to 150 ft. At 3240 and 3250, the other two stations on the southwest side of the dike, the beach profile showed only minor changes.

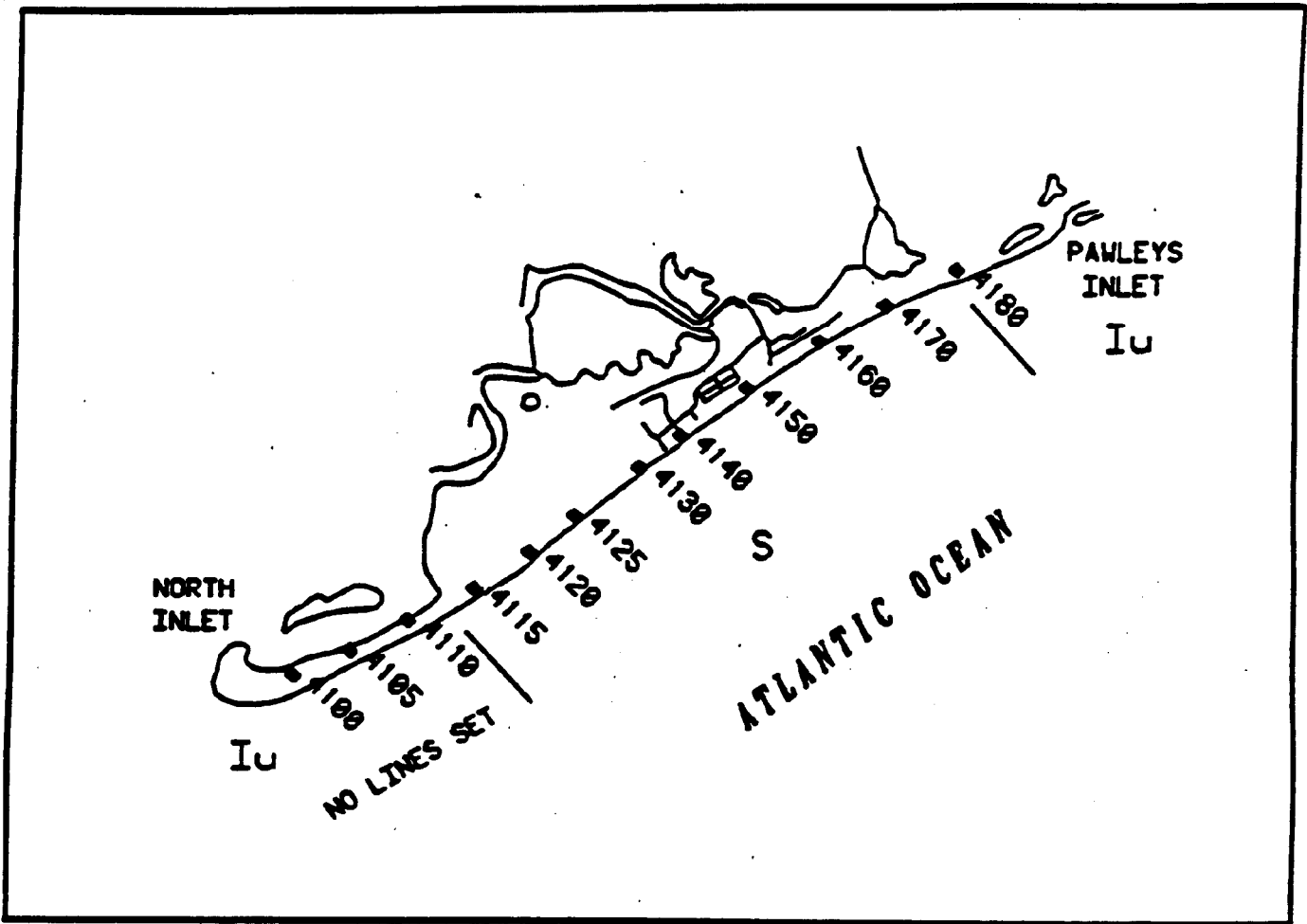
On the dike at station 3255 several rows of developing dunes showed moderate changes but the active beach seaward of the primary dune was stable. At station 3260 the active beach profile seaward of the primary dune scarped back by about 100 ft between September 2000 and May 2001, then stabilized through October 2001. Station 3270 also experienced about 100 ft of erosion seaward of the primary dune from September 2000 to May 2001, and then also stabilized through the rest of the year.

Station 3280 has a very wide, flat profile that extends out 700 ft at an elevation around + 5 ft. The last monitoring station, 3290, is located on Capers Inlet. The primary dune here is usually quite stable, while seaward of the dune a large sand flat, most of it intertidal, extends offshore for hundreds of feet.

3240 Dewees Island
STATION 3240



16-10-2001 3240
22-5-2001 3240
27-9-2000 3240
9-7-1991 3240



Debidue Island

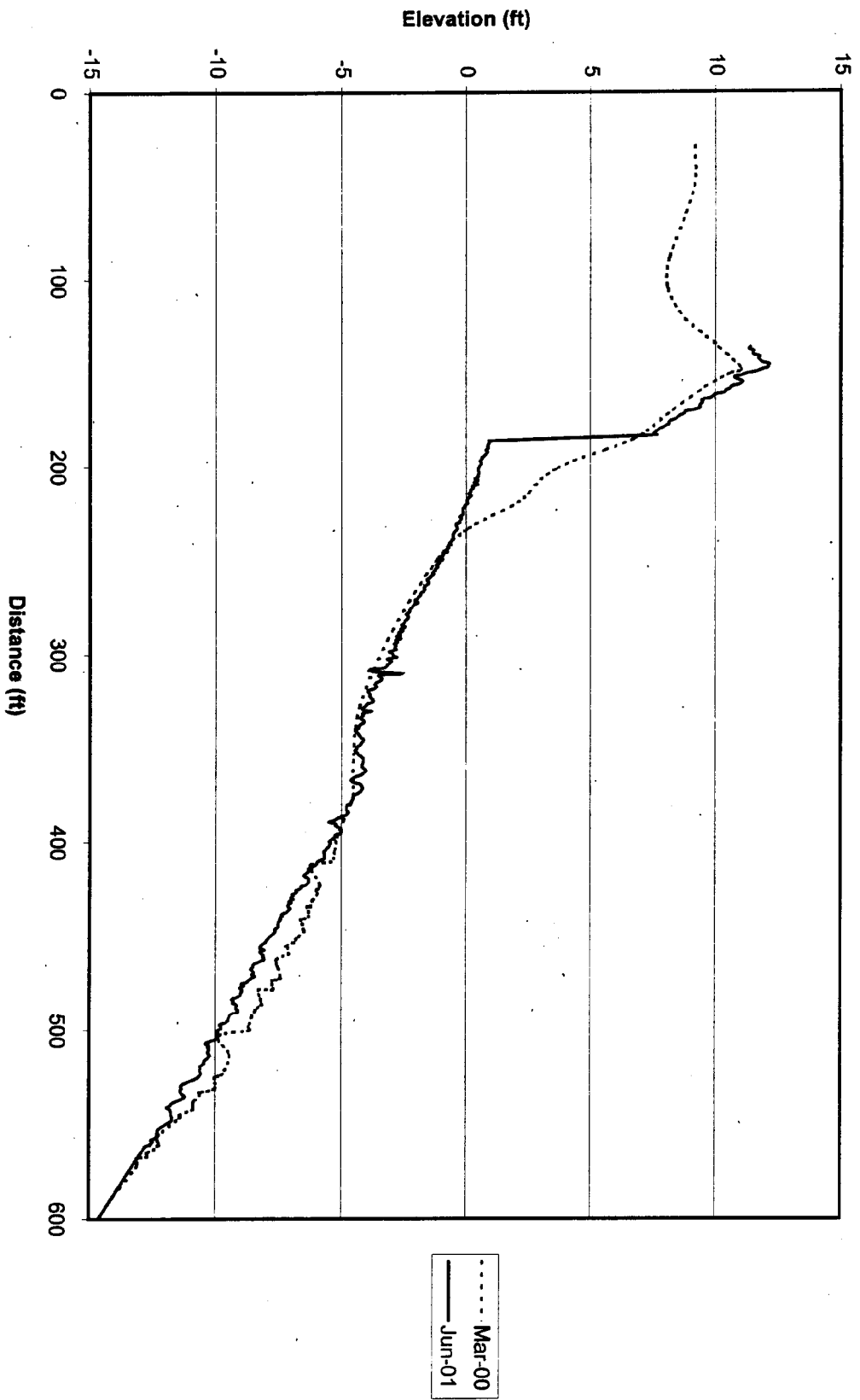
Debidue Beach

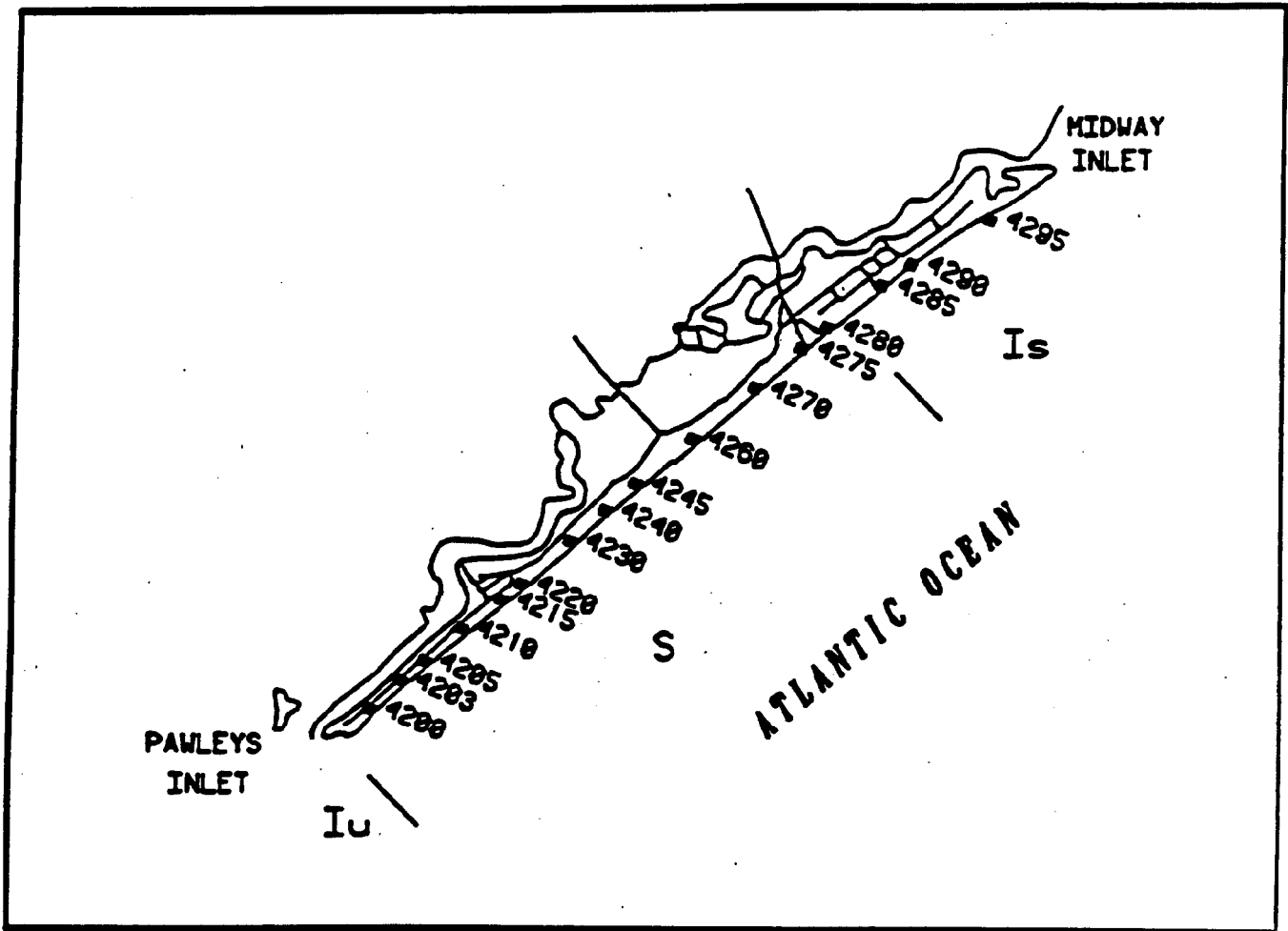
Debidue Beach, located between North Inlet and Pawleys Inlet, is the southernmost of the Grand Strand beaches. The central portion of Debidue is armored with a continuous 4500-ft long bulkhead. The area south of the bulkhead has experienced long-term erosion rates of -8 to -12 ft per year, while the area north of the bulkhead is stable to accretional. Stations here were surveyed in March 2000 and June 2001.

At station 4125, just south of the bulkhead, the long-term trend is erosional but the beach remained stable during 2001. At the south end of the bulkhead station 4130 lost sand from the upper profile as the beach dropped about 5 ft at the base of the bulkhead, while the rest of the profile below mean sea level was fairly steady. This south bulkhead section of beach has historically been the most critically sand-starved beach profile at Debidue. Station 4140, near the northern end of the bulkhead, lost a small amount of sand from the upper beach but otherwise showed little change. This station is the “pivot point” on Debidue – the beach erodes to the south and accretes to the north.

Stations 4150-4180 are located north of the bulkhead. This is a mostly undeveloped area with an extensive dune field. Results from the March 2000 to June 2001 time period show a continuation of the long-term trend, as the area keeps on accreting. All stations gained sand on the upper beach and also showed a considerable build up on the primary and secondary dune fields.

Station 4130





Pawleys Island

Pawleys Island

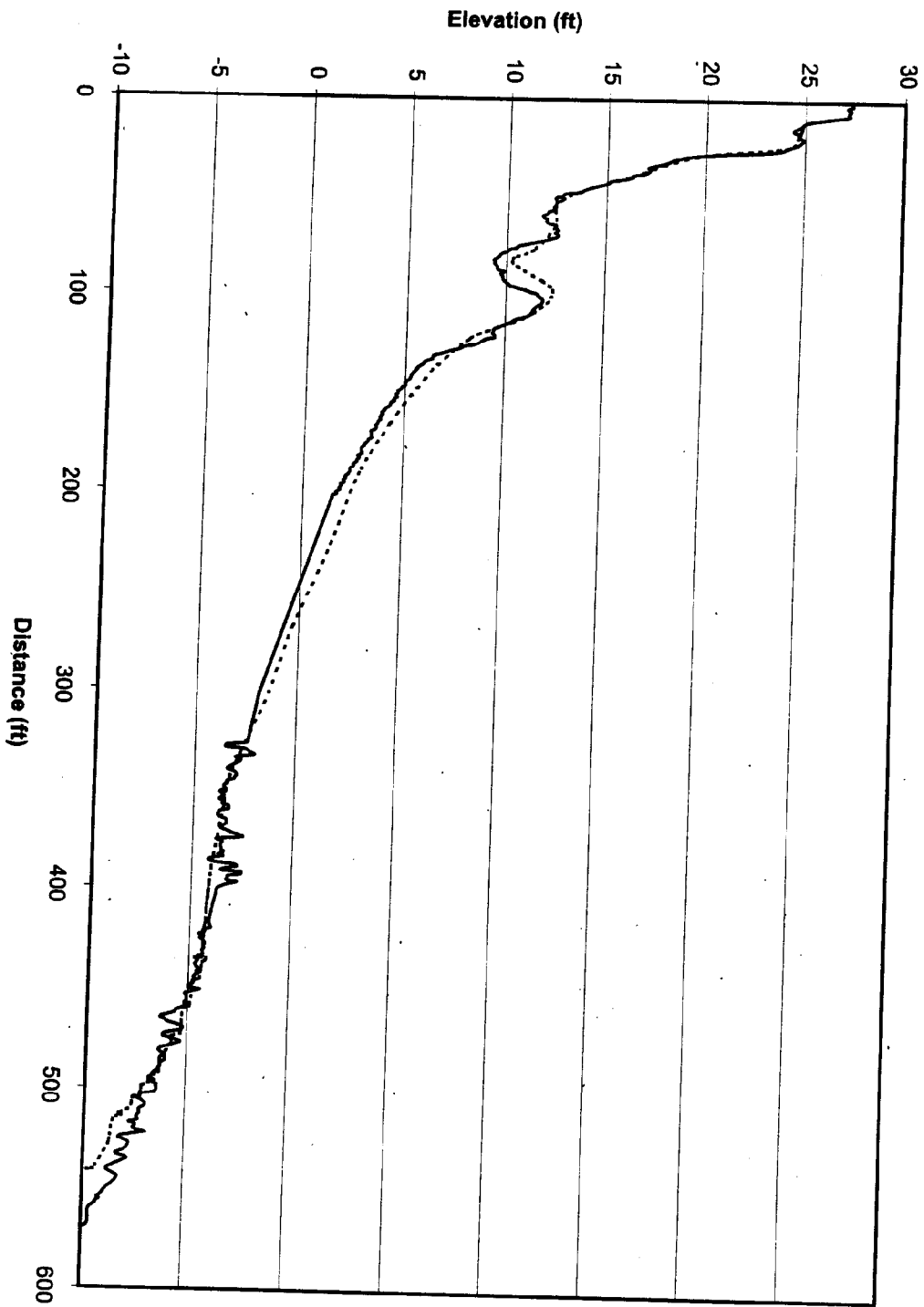
Pawleys Island is located between Pawleys Inlet and Midway Inlet. Groin fields on Pawleys have counteracted a slight erosional trend to produce a stable shoreline. The southern portion of Pawleys is low-lying, with little or no sand dunes. The central portion has some of the highest dunes in the state, while the northern, accretional end has a wide field of low dunes. A beach renourishment project using sand borrowed from the sand spit at the southern end of the island was completed in 1999. Sixteen monitoring stations at Pawleys were surveyed in December 1999 and April 2001.

While there are no monitoring stations on the sand spit at the southern end of the island, it is apparent from visual observations that the renourishment borrow area has filled back in with sand. Stations 4200-4220 are the 6 monitoring sites located in the developed, low-lying southern end of Pawleys Island. The southernmost groin cell, containing the last 13 houses on Pawleys, still has no sand dune to speak of. North of this groin cell the primary dune continues to increase in height but the beach seaward of the dune has experienced some erosion, which may be more profile adjustment following the renourishment project.

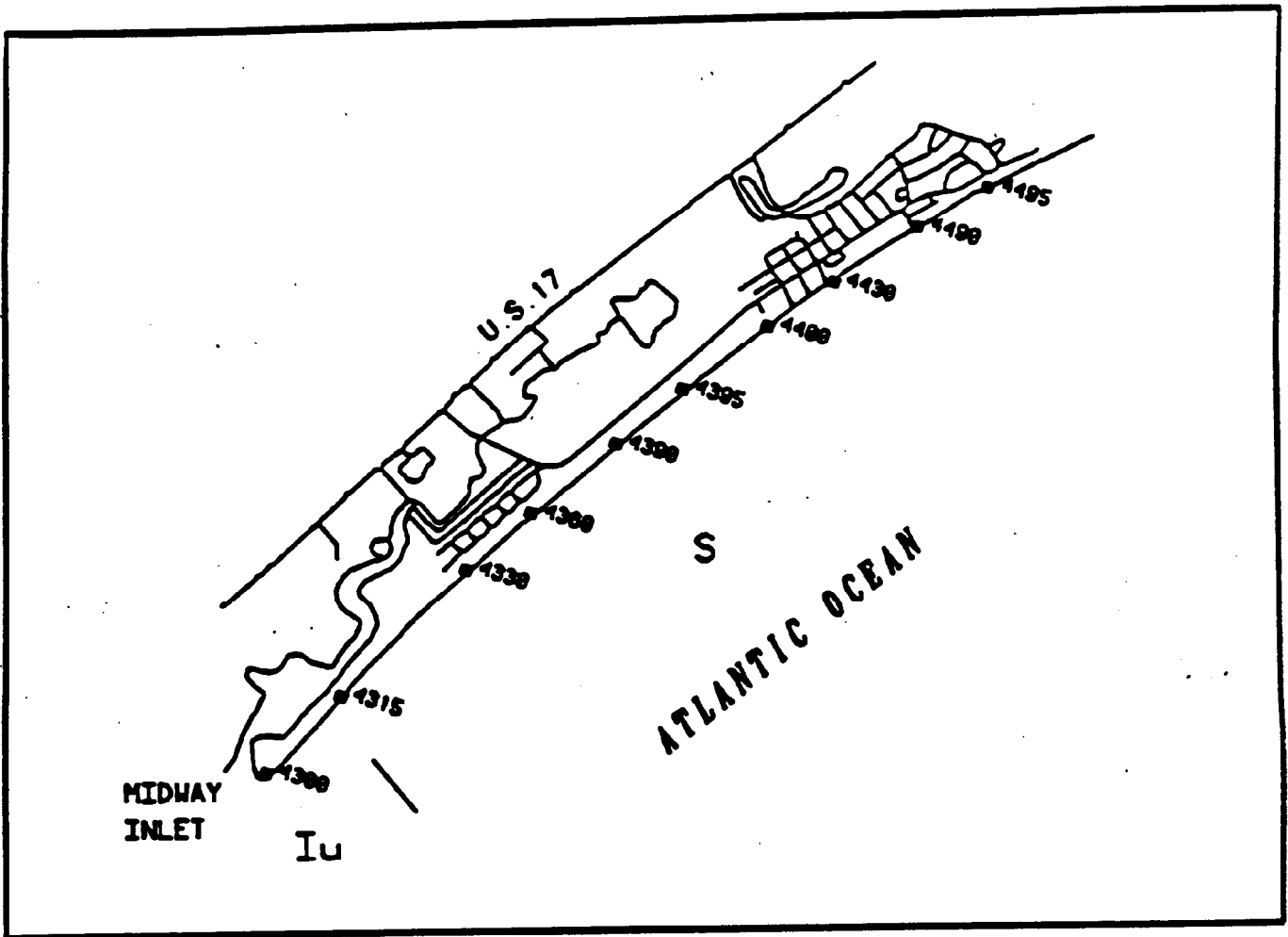
The central portion of Pawleys Island, with a large primary dune, is represented by stations 4230-4280. Most of the 7 profile stations here were fairly stable, gaining or losing a small amount of sand on the beach seaward of the primary dune. Historically, this entire section of beach has always been the most stable portion of Pawleys Island. It shows little change from year to year, has an adequate sand volume, and, in most places, a massive sand dune.

Stations 4285 to 4295 are located closest to Midway Inlet, where the beach is much wider and is generally more dynamic. The long-term trend here is accretional, and most houses are several hundred feet landward of the high-tide water line. Most monitoring stations here showed only minor changes between December 1999 and April 2001.

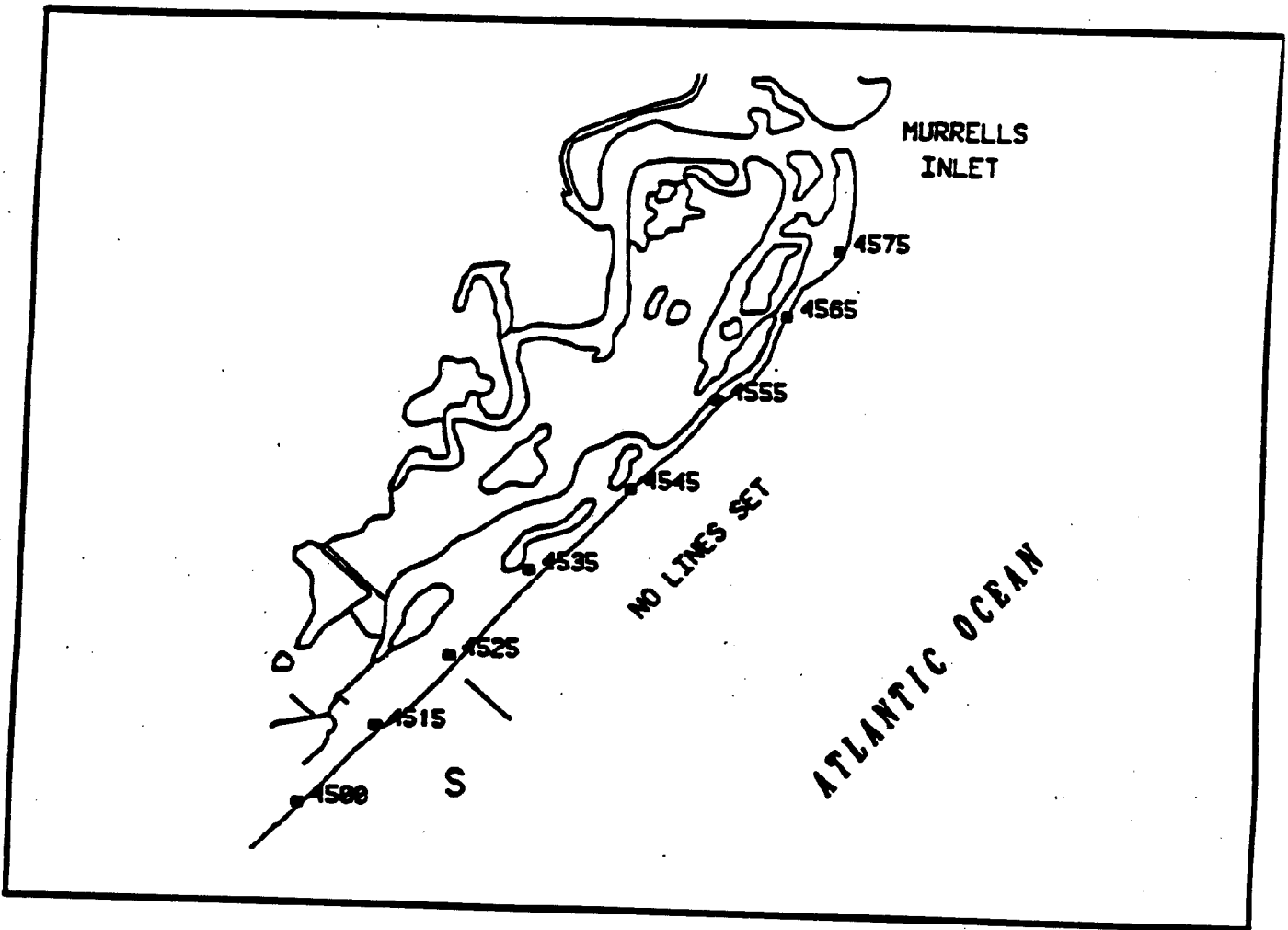
Station 4260



..... Dec-99
———— Apr-01



Litchfield Beach



Huntington Beach State Park

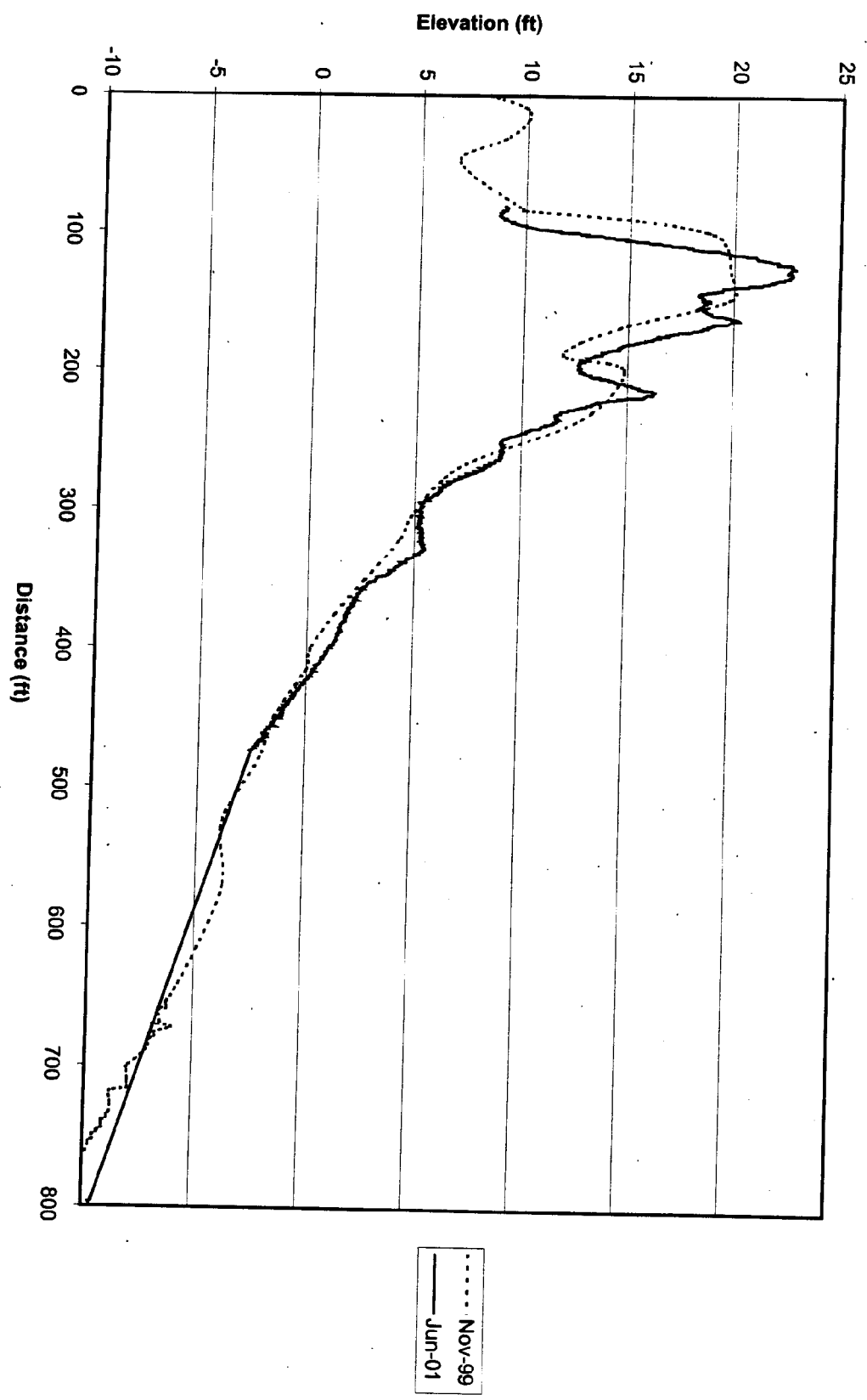
Litchfield Beach/Huntington Beach State Park

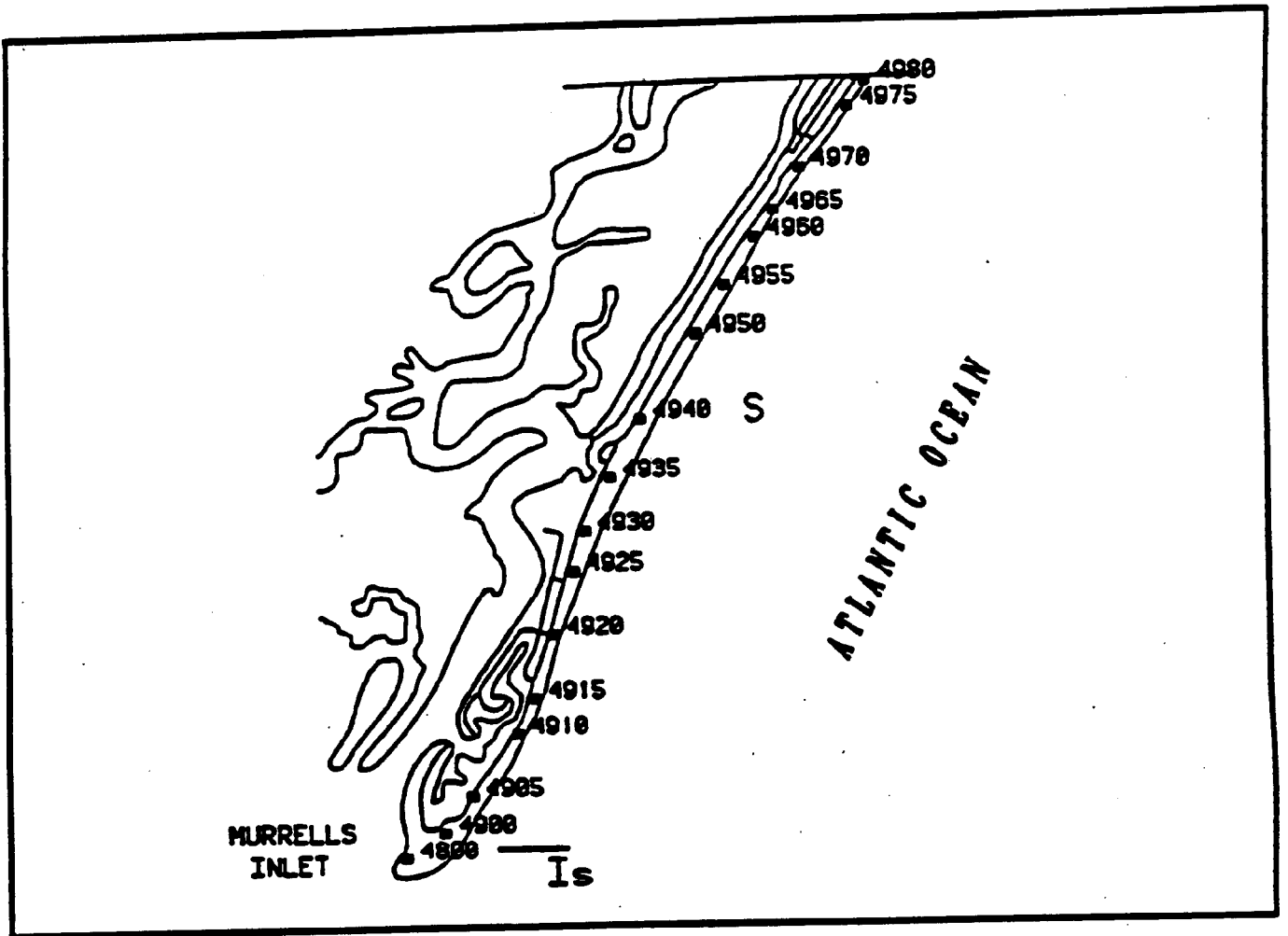
Litchfield Beach, North Litchfield, and Huntington Beach State Park represent a continuous, uninterrupted sediment budget compartment. This area is bounded by Midway Inlet to the south, and Murrells Inlet to the north. The southern spit at Litchfield is a low-lying area with a small dune field, while the central portion of this reach contains a large, well-defined primary dune, one of the largest in the state. The northern reach, in the state park, is directly influenced by Murrells Inlet and the south inlet jetty. Beach surveys were taken at 17 stations in November 1999 and June 2001.

The long-term shoreline trend is stable for this entire area, and in fact, Litchfield Beach and North Litchfield Beach are among the most stable beaches in South Carolina. All stations here have a significant primary dune that generally shows no sign of erosion from year to year, and changes to the beach profile are limited to minor sand gains or losses on the active beach, seaward of the dunes

Conditions change somewhat in Huntington Beach State Park. In the southern end of the park, stations 4500, 4515, and 4525 are similar to North Litchfield Beach. They have a stable, well-defined dune. As proximity to Murrells Inlet increases the primary dune becomes somewhat smaller and the shoreline can become more dynamic, although the inlet is stabilized by jetties that were constructed in the early 1980's. However, during the 2001 survey period stations 4555, 4565, and 4575, in the northern end of the Park and closest to the jetty, showed little change.

Station 4395





Garden City (Georgetown County)

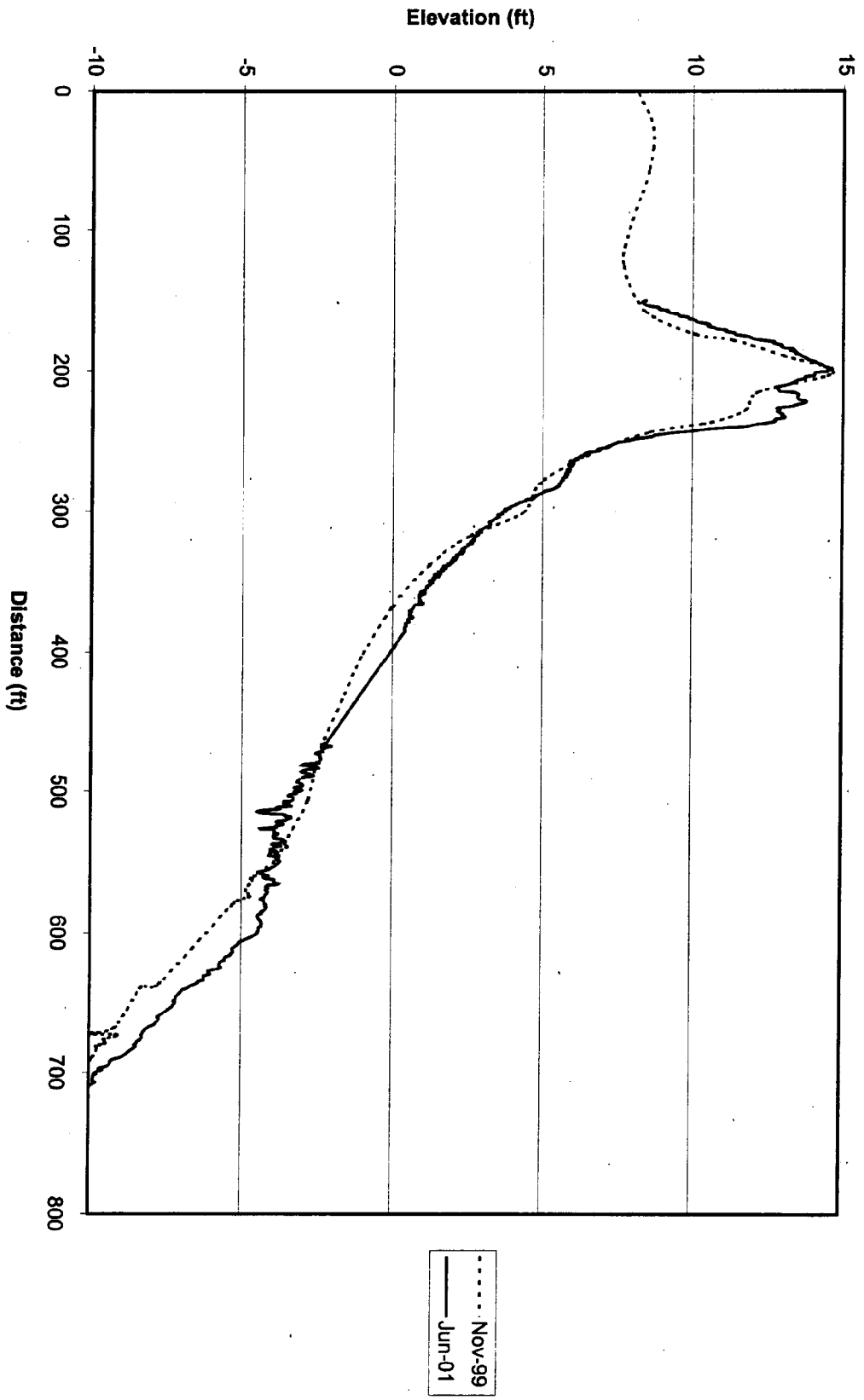
Garden City Beach

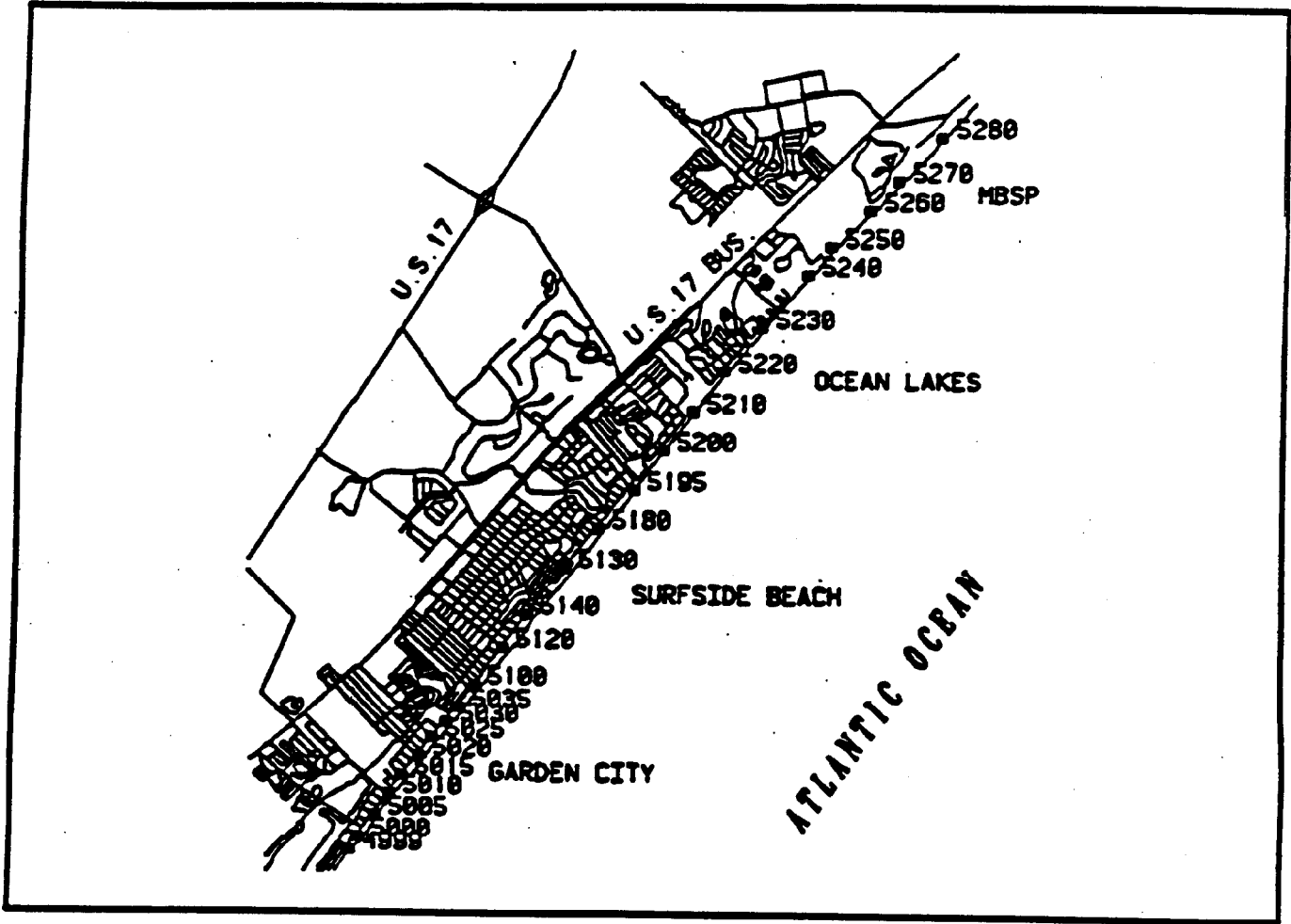
This section of shoreline begins at Murrells Inlet and extends northward to the southern limit of the Town of Surfside Beach. The southern half of Garden City contains few shore-protection structures, while in the northern half, between stations 4960 and 5030, seawalls and bulkheads become predominant. Generally, sand volumes are adequate in the unarmored section of Georgetown County, begin to decrease in the armored section of Georgetown County, and reach a minimum in the armored section of Horry County. Much of Garden City was renourished in 1998 as part of the US Army Corps of Engineers Grand Strand Renourishment Project, but the project has not performed as well here as in Myrtle Beach and North Myrtle Beach. There are 24 monitoring stations in Garden City, which were surveyed in November 1999 and June 2001.

Most stations in the standard zone from 4900 through 4955 are unarmored, have a well-defined dune, and are fairly stable. The exception is found along a 2000 ft section of beach south of Pompano Drive, at stations 4910 and 4915, where the shoreline is armored and bulges out, and the beach is narrower and more vulnerable. A considerable amount of sand has been lost in front of the bulkheads, which now show a 6-ft vertical drop from top to bottom, and several bulkheads were damaged during a storm in November 2001. Four derelict groins here were removed in the spring of 2001 but are intended to be replaced, which may help stabilize the area.

North of station 4960 the shoreline is predominantly armored and the beach width decreases. Stations 4965 through 4999, in Georgetown County, and station 5000, in Horry County just south of the pier, still show a minimal dry sand beach seaward of a small dune or bulkhead. Stations 5005 to 5035, the northernmost section of Garden City in Horry County from the pier to Melody Lane, are mostly armored but lack a dry-sand beach. The 1998 renourishment project has not performed as well here, and several commercial structures are located quite close to the active beach with no seawall or sand dune as a buffer.

Station 4925





Garden City (Horry County)
 Surfside Beach
 Unincorporated Horry County--South

Surfside Beach and Unincorporated Horry County—South

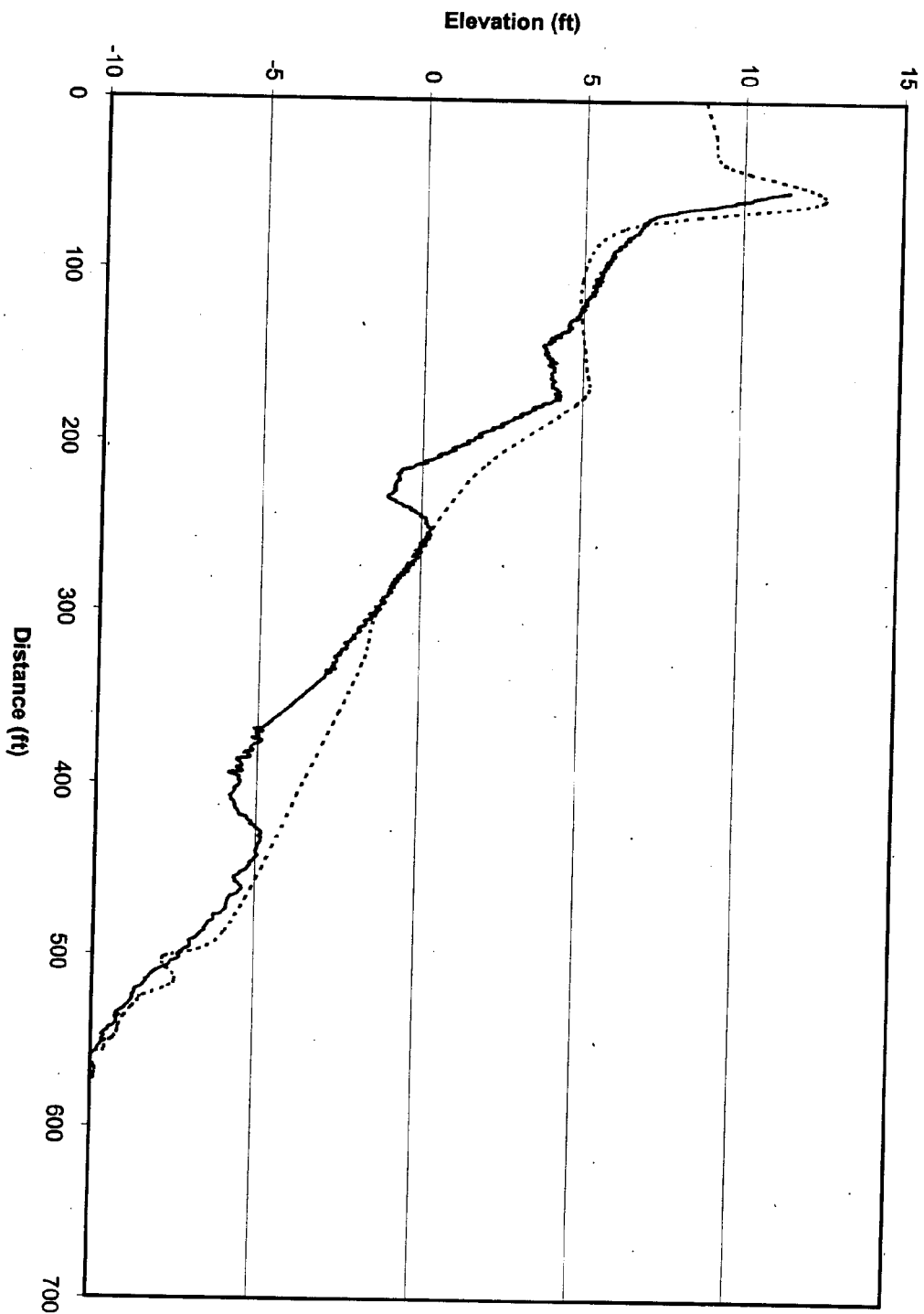
This section of the Grand Strand includes 6 monitoring stations in the Town of Surfside Beach, and 9 stations in the unincorporated region north of Surfside Beach—the campground region, Long Bay Estates, and Myrtle Beach State Park. Surveys here were completed in November 1999 and April 2001.

Stations 5100 at 16th Ave. South through 5195 at 16th Ave. North fall with the Town of Surfside Beach, and with the exception of station 5100, all have a well-established primary sand dune. The beach here has reached equilibrium following the 1998 renourishment project. Between November 1999 and June 2001 most profiles gained some sand on the seaward side of the primary dune and also on the upper and intertidal portions of the beach, leaving a moderately wide dry-sand beach even at high tide.

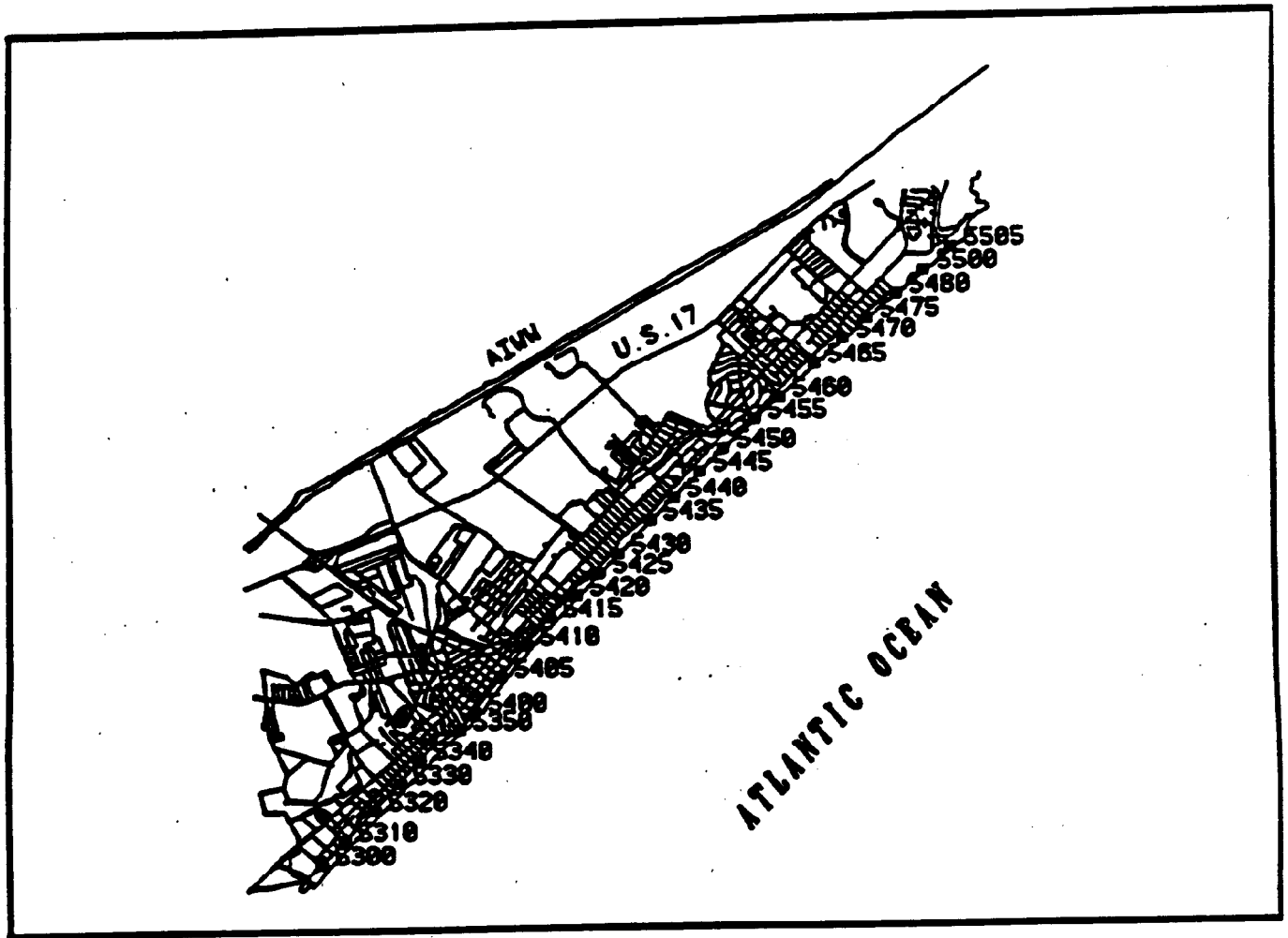
Stations 5200-5230 are located in the campground section. All stations except for 5220, which is armored, have a well-defined primary dune with crest elevation of 12-14 ft. Stations in this region also gained sand seaward of the dune on the upper and intertidal portions of the profile. Station 5240 in Long Bay Estates showed the same trend of dune building and upper beach accretion.

In Myrtle Beach State Park the profiles all have a well-established dune, and the beach is usually very stable. This area was not directly renourished, although it probably received an indirect benefit from renourishment to the north and south. Stations 5250 to 5270 are located here, and showed only minor changes in 2001. At station 5280, located at the Springmaid fishing pier, the beach profile was also stable.

Station 5260



..... Nov-99
———— Jun-01



Myrtle Beach

Myrtle Beach

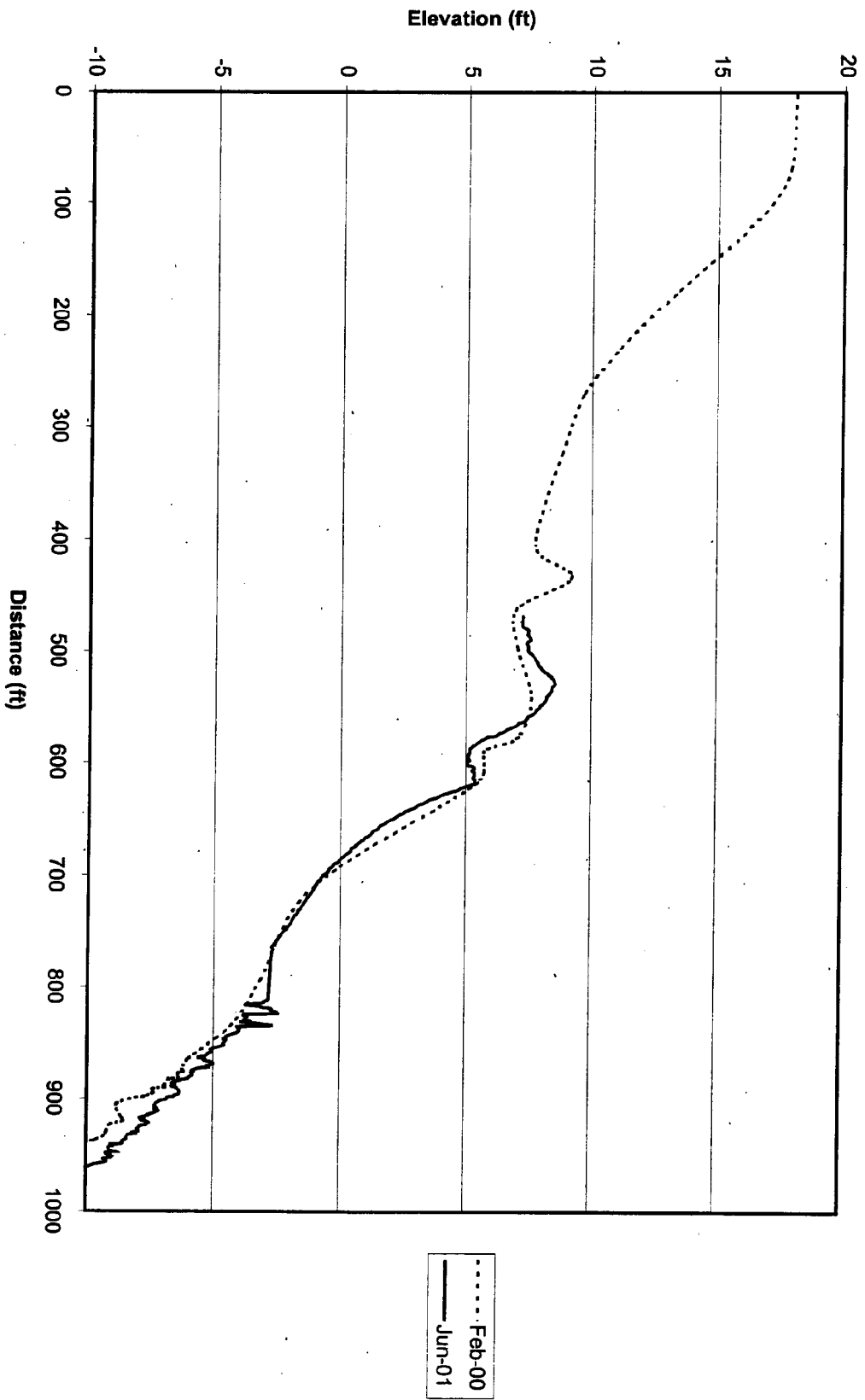
The next area discussed is the eight-mile section of shoreline within the Myrtle Beach city limits. Beach surveys were conducted at 23 monuments in February 2000 and June 2001. Myrtle Beach was renourished between May and December 1997 as part of the US Army Corps of Engineers Grand Strand Renourishment Project, so the more recent surveys show post-renourishment profile adjustment.

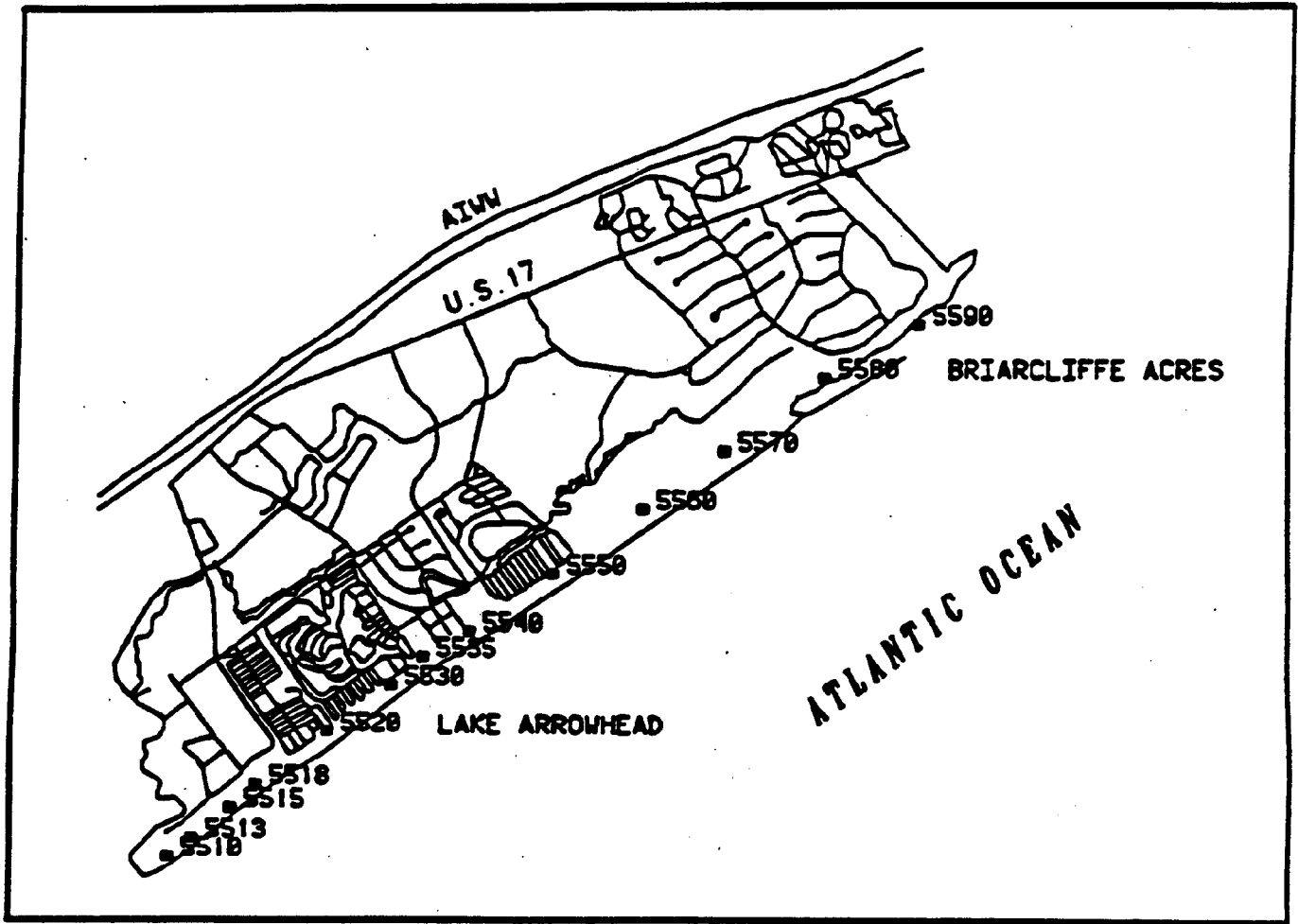
Stations 5300-5430, from 29th Ave. South to 31st Ave. North, are located in the southern commercial district. There are many seawalls and bulkheads in this region, and before renourishment sand volumes were relatively low. The renourishment project stabilized by 2000 and lost only a minor amount of sand from the upper beach during 2001. The dry-sand berm width here is still adequate, and continues to provide storm damage protection and a recreational benefit. Sand fencing has also helped to establish a small dune line over the past few years.

The area between stations 5435 and 5465, from 31st Ave. North to 67th Ave. North, is primarily a residential section with some commercial sites. There are few bulkheads or seawalls, and although a primary dune exists in many areas there are also unarmored sections where the highland, usually a residential lawn, simply slopes down to the berm. The renourishment sand in this region has held up as well as, if not better than, the beach in the southern commercial district. Several stations showed a slight gain of sand on the upper beach and continued growth of the developing dune along the new row of sand fencing.

Stations 5470 - 5480 are located in the northern commercial district, although there are several residential structures here as well. A small but well-defined primary dune exists along most of the beach here. During 2001 the beach experienced some moderate erosion on the upper part of the profile, from the seaward edge of the berm down to mean sea level. Generally speaking the 1998 renourishment project continues to hold up well in Myrtle Beach.

Station 5340





Unincorporated Horry County--North

Unincorporated Horry County—North

This area of unincorporated Horry County is located between the City of Myrtle Beach and White Point Swash, and includes the Shore Drive section, the campground section, and Briarcliffe Acres. There are 14 beach survey monuments located here, which were surveyed in January 2000 and July 2001.

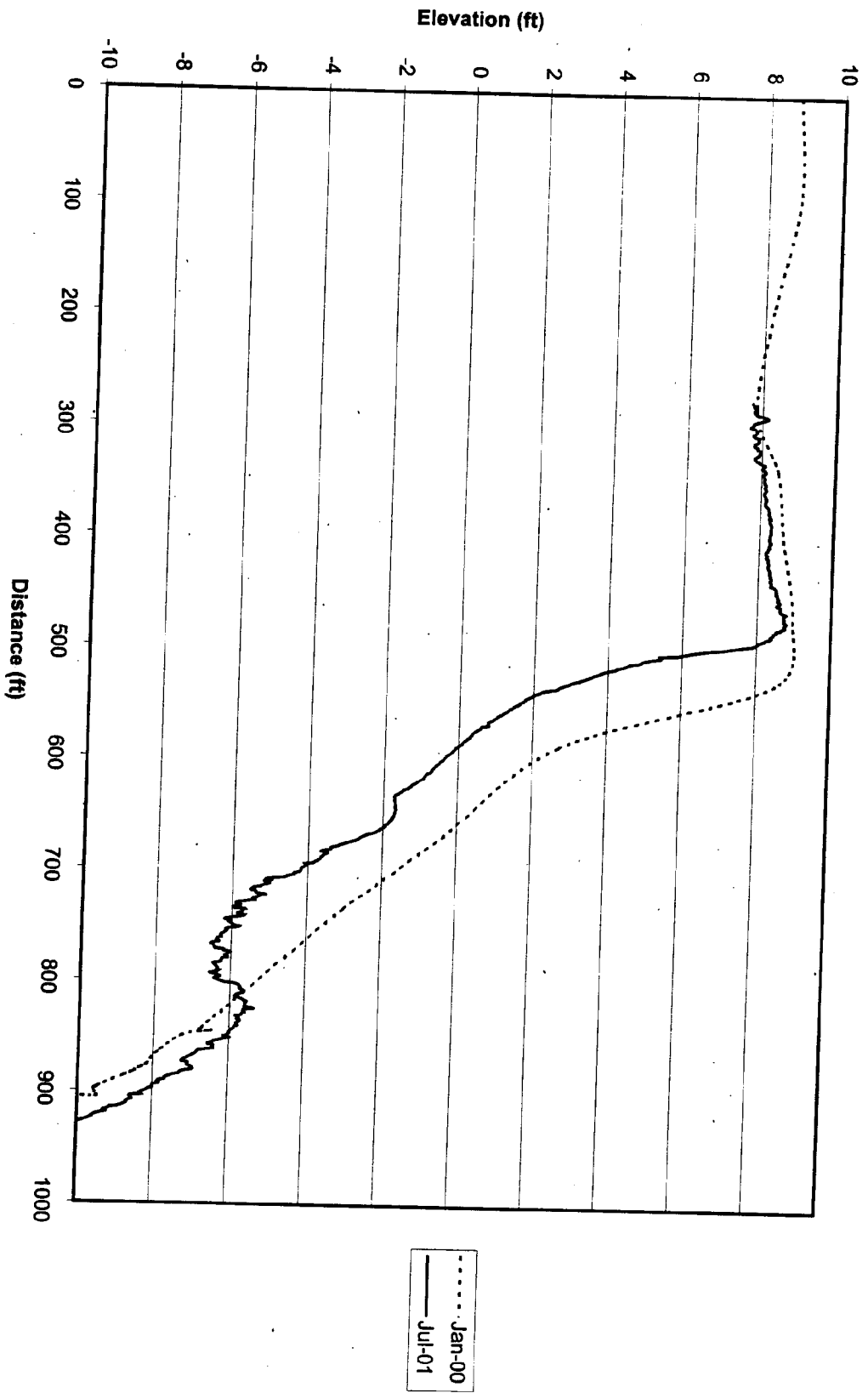
Stations 5500 and 5505 are located on Club Road, just north of the City of Myrtle Beach and south of Singleton Swash, where there is little oceanfront development. The beach here has a well-developed primary dune and the shoreline is usually quite stable from year to year.

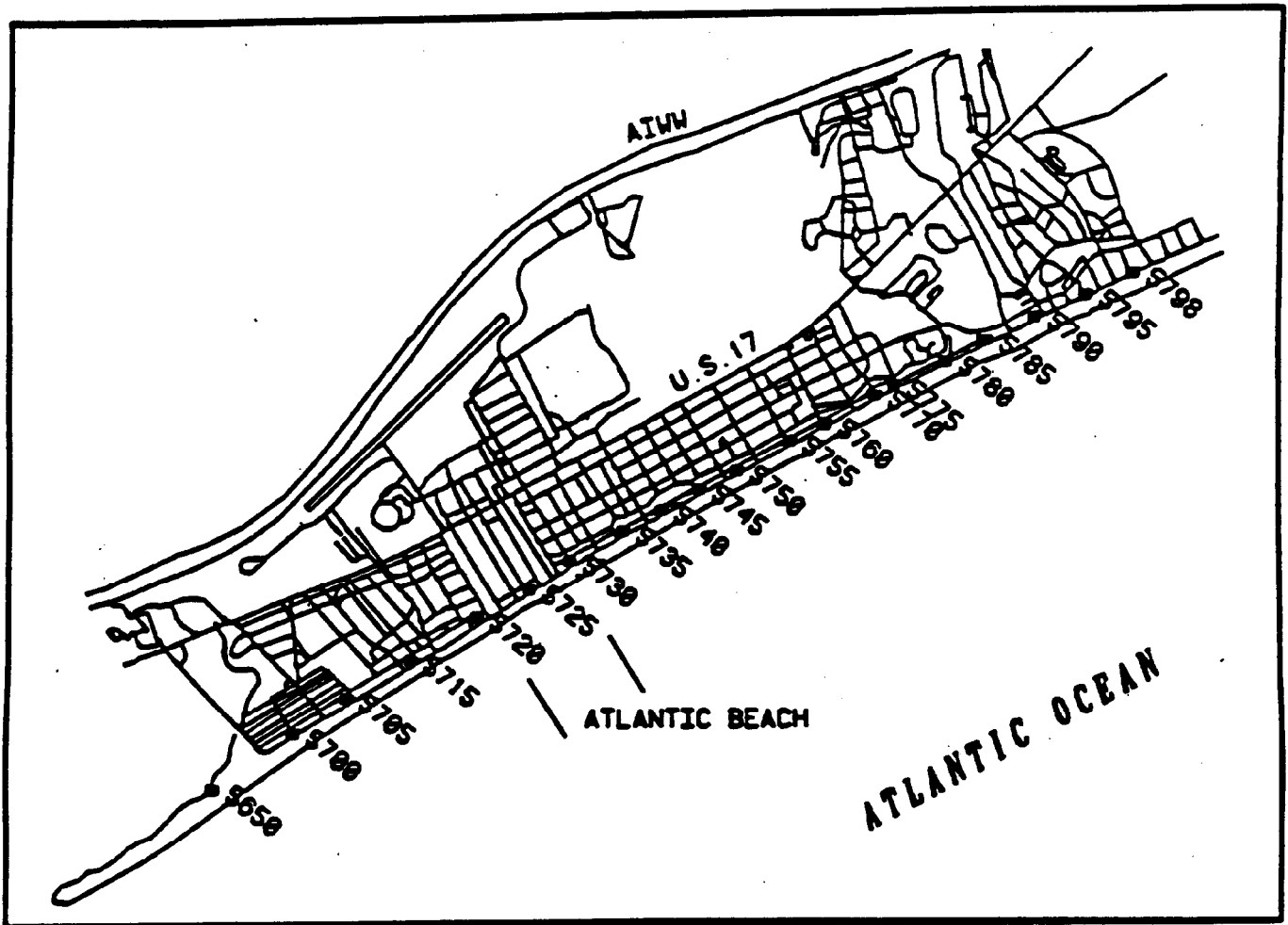
Stations 5510 to 5518 are located north of Singleton Swash along Shore Drive, where shoreline armoring is extensive and a dry-sand beach has generally been absent. This area was renourished by Horry County in 1999, when a 150-ft wide dry sand berm was created. The beach profile is still experiencing post-project adjustment. All stations here averaged about 50 ft of erosion between January 2000 and July 2000, from the top of the active profile at +8 ft down to the -5 ft contour.

Stations 5520-5550 are located in the campground section, where oceanfront development is a mixture of campsites and resort hotels. Although this section was not renourished it did receive some indirect benefits from the nearby Shore Drive renourishment project. During 2001 stations here showed little change on the upper beach and some accretion on the lower profile, most likely the deposition of sand eroded from Shore Drive.

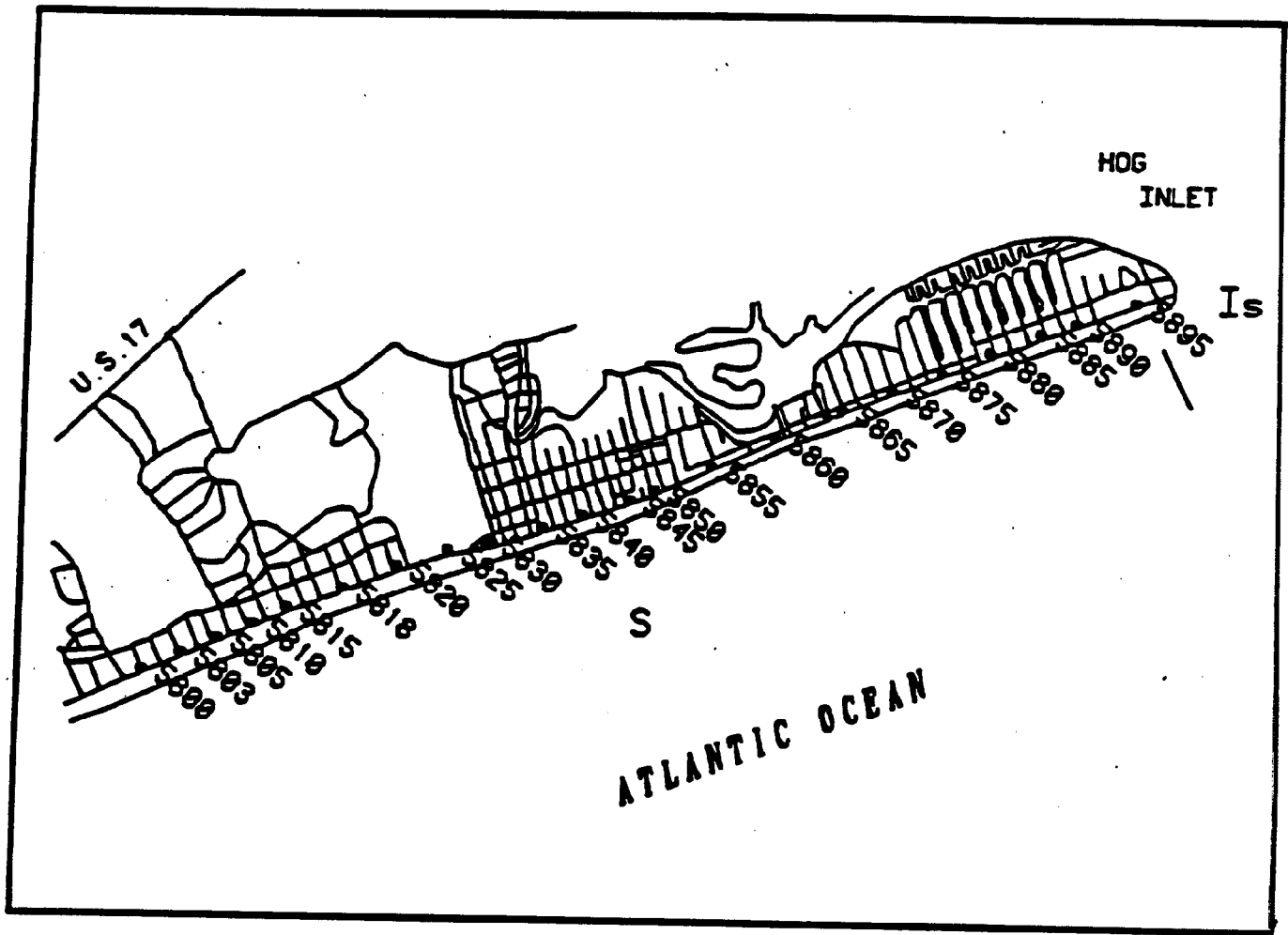
Stations 5560-5590 are located in Briarcliffe Acres, where the oceanfront is undeveloped and a well-defined primary dune exists with virtually no shoreline armoring. This area is usually stable but the very northern end has gone through some dune and upper beach erosion in recent years, as the White Point Swash channel migrated toward the south. This problem now seems to have stabilized.

Station 5518





North Myrtle Beach--Southern Half



North Myrtle Beach--Northern Half

North Myrtle Beach

This section includes the City of North Myrtle Beach and Atlantic Beach, from White Point Swash to Hog Inlet. The shoreline is heavily developed and much of it is armored, with alternating zones of commercial and residential structures. There are 43 beach survey monuments here, which were surveyed in April 2000 and October 2001. The beach at North Myrtle Beach is typically very wide and flat, primarily due to the sand size, which is finer-grained than other Grand Strand beaches. North Myrtle Beach was renourished by the US Army Corps of Engineers between September 1996 and April 1997, increasing the dry-sand beach width by over 100 ft and unit-width sand volumes by over 70 cubic yards per ft. The renourishment project has since stabilized, and some of the sand still remains on the upper beach.

In Windy Hill, the southernmost portion of North Myrtle Beach from 48th Ave. South to 37th Ave. South, stations 5650-5715 were fairly stable through 2000 and 2001. Typical profile changes here include a slight loss of sand from the upper beach and the continued growth of the emerging dune, along the line of sand fence and vegetation put in during 1997.

Crescent Beach extends from 28th Ave. South to 2nd Ave. North, where monitoring stations 5730 through 5798 are located. Most stations showed only minor changes to the profile during the current survey period, another indication that the 1997 renourishment project has stabilized and the remaining sand on the upper beach and berm is likely to remain. Survey stations 5800 to 5835 are located in Ocean Drive, from 2nd Ave. North to Sea Mountain Highway. Beach changes here were similar to Windy Hill—a stable upper beach and continued growth of the emerging sand dune.

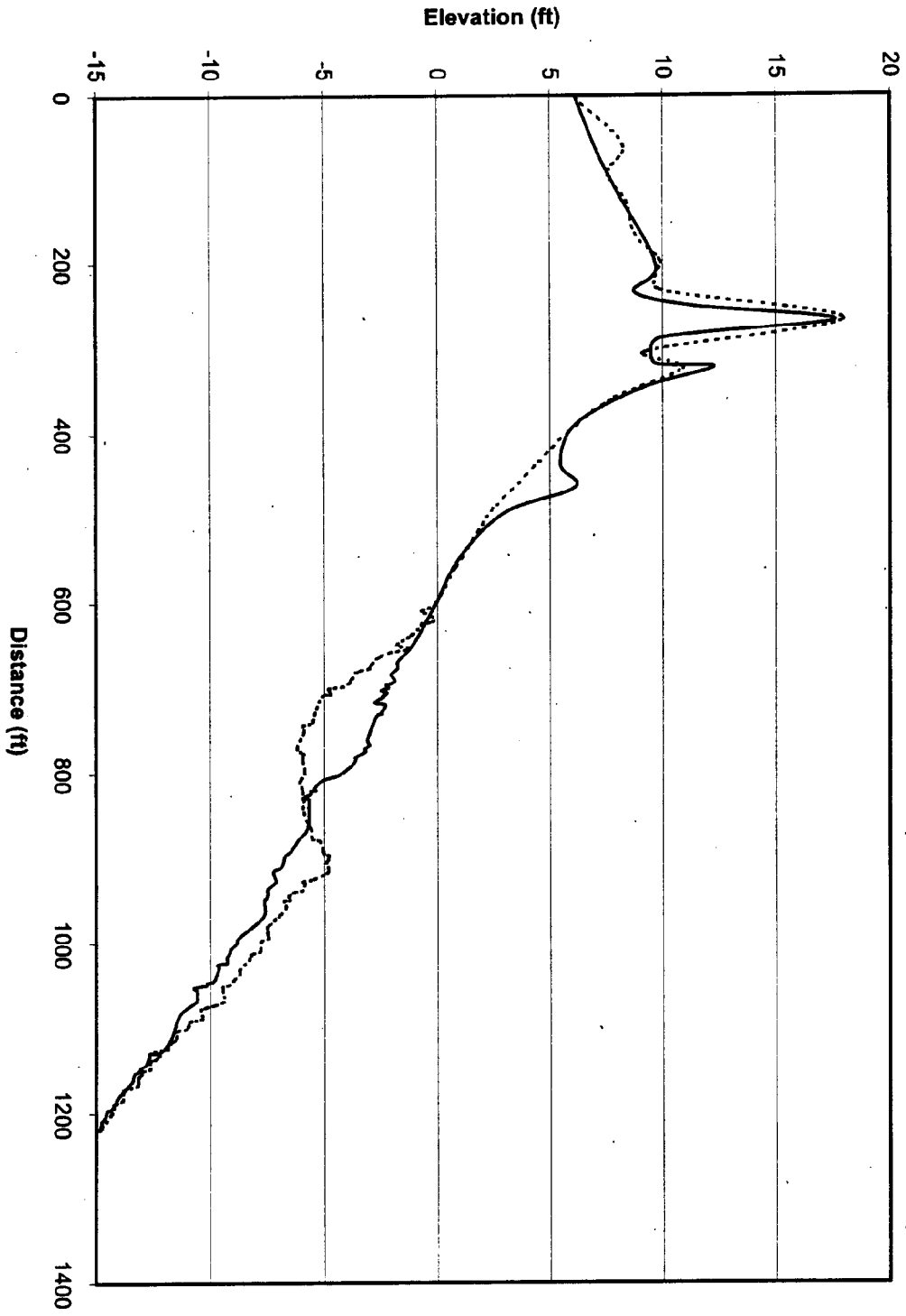
Cherry Grove encompasses the northern section of North Myrtle Beach, from Sea Mountain Highway to Hog Inlet. Survey stations 5840 to 5895 are located here. Much of this area is armored, and portions of Cherry Grove south of the 35th Ave. North pier experienced chronic sand deficits prior to renourishment. This same 7-block area south of the pier (from 35th Ave. North down to 28th Ave. North) also experienced higher

erosion rates following the renourishment project, and the beach here is currently not as wide as the beach north of the pier or south of 28th Ave. North.

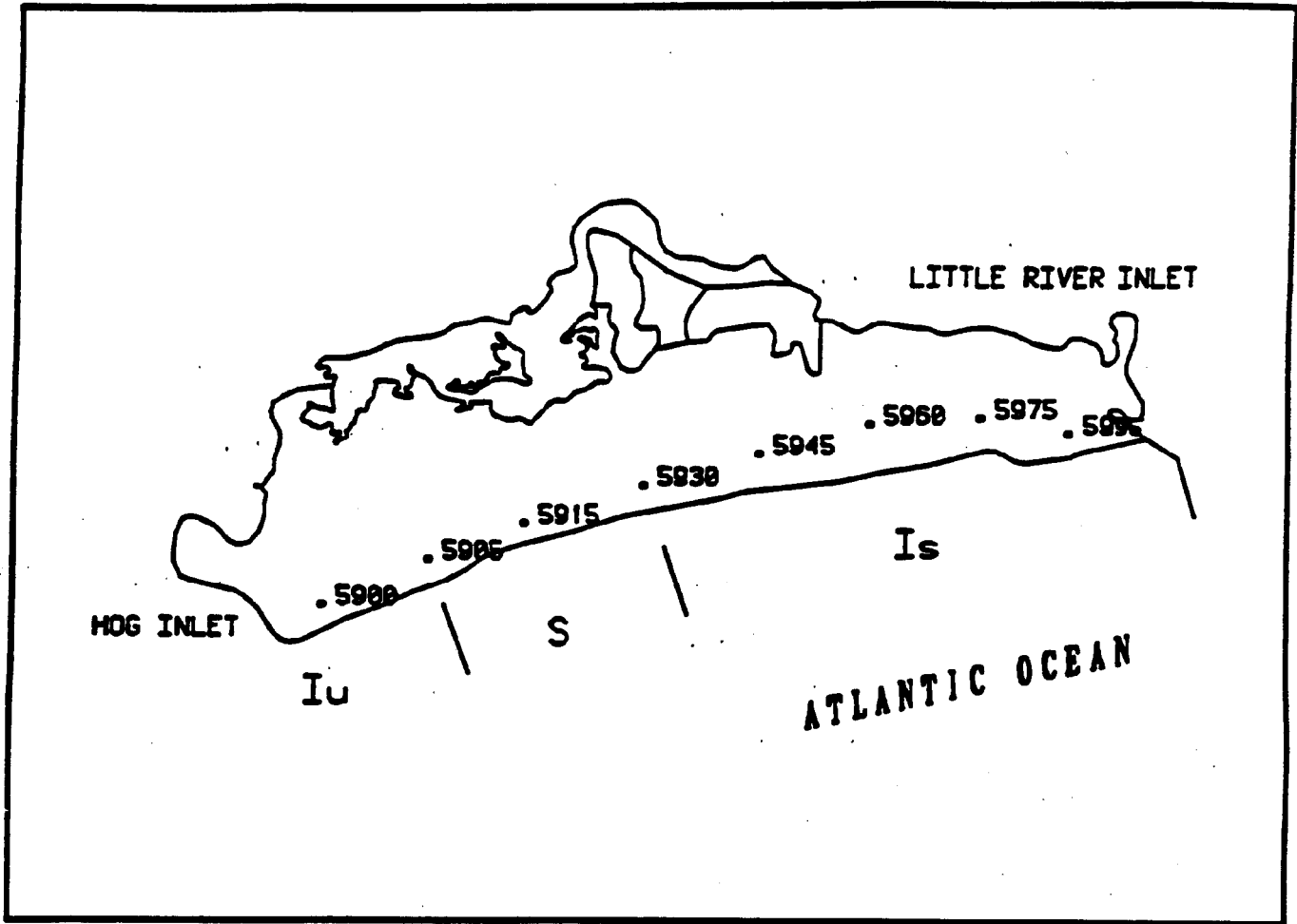
Beach survey results for Cherry Grove in 2001 were mixed. Stations 5840 at 26th Ave. North and 5845 at 30th Ave. North were stable on the dune and upper beach and gained sand on the lower beach. Station 5850 at 32nd Ave. North is closest to the south side of the pier and is most likely to experience erosion. As such it is usually the best indicator station for any erosion problems in Cherry Grove. During 2001 the upper beach eroded back by about 25 ft at this station, as the profile developed a more concave shape. This may signify continued erosion here.

For the rest of Cherry Grove north of the pier, the condition of the beach was more similar to the southern regions of North Myrtle Beach. These stations showed minor changes on the beach profile, indicating that the 1997 renourishment project has stabilized, as the sand that was remaining in 2000 is still present in 2001.

Station 5818



..... Apr-00
——— Oct-01



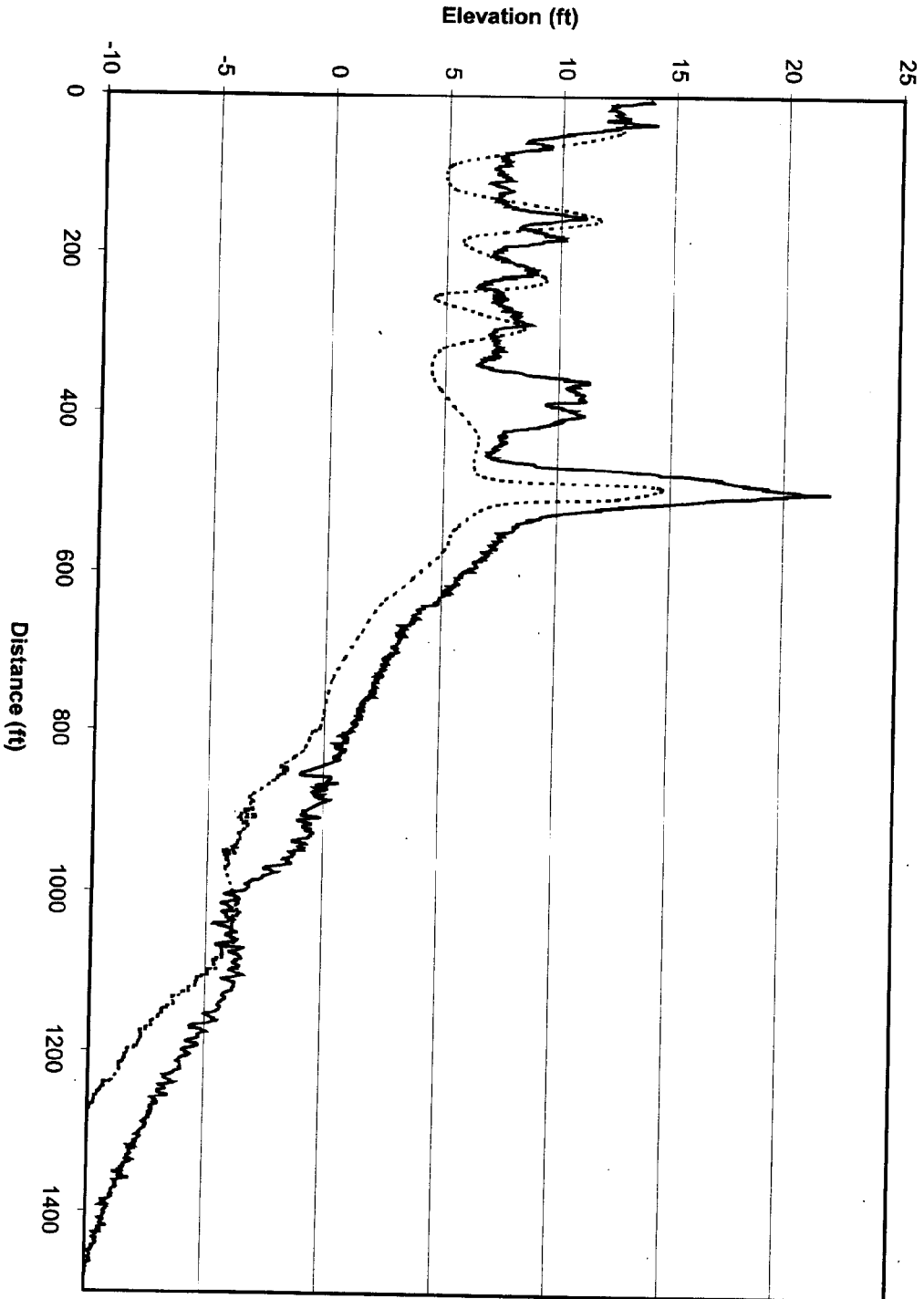
Waites Island

Waites Island

Waites Island is an undeveloped three-mile long barrier island located between Hog Inlet to the southwest and Little River Inlet to the northeast. Little River Inlet was stabilized by the construction of a jetty system between 1981 and 1983. The southwest end of Waites Island is an unstabilized inlet zone, the central portion is a standard zone, and the northeastern section is a stabilized inlet zone. Most of the island has a long-term erosion rate ranging from -4 to -10 ft per year, although jetty construction has helped to stabilize the shoreline and lessen the erosion. During most of the 1990's the Hog Inlet shoreline was extremely erosional, losing several hundred feet, but has changed to an accretional mode in recent years. There are 7 monitoring stations on Waites Island, which were surveyed in October 1999 and May 2001.

During the past year almost all profiles at Waites Island show signs of accretion. The primary dunes have increased in height and gained sand on their seaward side, and the upper beach profile seaward of the dune line has become wider. In general, it appears the accretional phase that began on the island several years ago has continued for 2001. This may be due to the long-term stabilizing influence of the Little River jetties, which may eventually decrease the officially adopted long-term erosion rates on Waites Island.

Station 5960



..... Oct-99
———— May-01

State-Wide Summary

The past year was a fairly mild one for the beaches of South Carolina. Three separate northeast storms approximately 10 days apart during March 2001 caused moderate erosion and damage to some oceanfront bulkheads. In September, Hurricane Gabrielle passed offshore as a strong cold front moved over South Carolina. The combination of these two weather systems produced 30-knot winds from the northeast, higher than normal tides and a large ocean swell, all of which resulted in minor beach erosion along most of the state's coast. In early November hurricane Michelle moved northeast over the Bahamas and then into the Atlantic, producing 20-knot northeast winds, tides 1 ft higher than predicted, and minor beach erosion in South Carolina.

Perhaps the worst erosion occurred during November 12-16, when 4 days of strong northeast winds and high predicted tides resulted in extensive erosion along the coast. The storm caused damage to portions of the rock revetment at Fripp Island. At Edisto Beach several bulkheads were damaged and the seaward section of a house collapsed as the pilings failed, while in Garden City several bulkheads were also damaged. Cabin Road at Hunting Island was partially washed out, and a condominium in Wild Dunes on the Isle of Palms had water under the building in spite of repeated minor beach renourishment.

There were no major beach renourishment project constructed in 2001, due in part to a lack of state funding during the July 2001 - June 2002 fiscal year.

In general the inlet zones, those beaches closest to unstabilized tidal inlets, are the most dynamic beaches and may experience the greatest shoreline erosion or accretion. Other sections of beach away from tidal inlets can still experience chronic beach erosion. Regardless of its designation as an inlet zone or standard zone, any section of beach with a sand deficit and a minimal beach width should be considered at-risk, since the dunes and dry-sand beach provide a buffer between the ocean and high-ground development. For the year 2001, these at-risk beaches with sand deficits include the following areas:

Beaufort County - the southwestern end of Fripp Island (which is protected by a substantial rock revetment), all of Hunting Island, and the northeastern end of Harbor Island.

Colleton County - the northeastern half of Edisto Beach, including the state park.

Charleston County - the central portion of Seabrook Island (which is protected by a substantial rock revetment), the county park at the southwestern end of Folly Beach, and the northeastern end of Sullivans Island on Breach Inlet.

Georgetown County - the southern end of Debidue Beach, including the southern end of the bulkhead, the southern end of Pawleys Island, and the southern end of Garden City.

The following represents a ranking of beach renourishment and beach restoration needs based upon OCRM Regulation 30-18, which sets forth criteria for evaluating beach renourishment projects. Proposed projects are ranked based upon the environmental impact of the project, the public recreational benefits, the storm damage mitigation benefits to adjacent buildings and structures, the expected useful life of the project, and the extent of support for the project.

First Priority: Hunting Island State Park, Beaufort County

Hunting Island State Park provides some of the best public access to the beach in Beaufort County. Unfortunately, Hunting Island suffers from a chronic erosion problem and needs periodic renourishment. The most recent project placed 1.5 million cubic yards of sand on the beach in 1991, but virtually all of that sand is gone now. The current proposal would place 1.5 million cubic yards of sand on the beach here, at an estimated cost of \$9 million. It is anticipated that half this amount will be federally funded, while the other half will be state funded with money that has already been allocated for this purpose. The US Army Corps of Engineers is still engaged in studies of the erosion problem here. It is expected that construction could start no sooner than 2003.

**Second Priority: The Town of Edisto Beach and Edisto Beach State Park,
Colleton County**

Edisto Beach State Park and the Town of Edisto Beach provide the only public beach access in Colleton County, and some of the best public beach access for residents of southern Charleston County. The beach within the Town limits was renourished with 150,000 cubic yards of sand in 1995, but most of that sand has been eroded away. The State Park was not included in this project, and as a result of chronic erosion primarily from winter storms, the park beach is now in a critically eroded state. An emergency renourishment project placed 25,000 cubic yards of sand on the beach here in March 1999, but a longer-term solution is needed. The northeastern portion of the beach within the Town limits is also sand-starved. It is estimated that a renourishment project for both the State Park and the Town would cost \$7 million.

Third Priority - Folly Beach, Charleston County

The City of Folly Beach, including Folly Beach County Park, was renourished in 1993. While the project has performed fairly well outside of the county park, erosion within the park has been extreme in recent years. Several small emergency renourishment projects have been constructed here, using sand dredged from the Folly River, but a larger-scale solution is needed as soon as possible. Maintenance renourishment may also be needed for all of Folly Beach as well within the next 2-3 years, as the 1993 project has reached the end of its 8-year design life. Cost estimates for this work are currently not available.

The following table provides a list of renourishment projects completed during the past ten years, with the State's share of the total project cost, as well as State money that has been allocated for future projects that are as yet unconstructed.

Area	Year	State's Cost	Completed
Hunting Island State Park	1991	\$2,900,000	Y
Folly Beach	1993	\$3,500,000	Y
Edisto Beach	1995	\$1,000,000	Y
Hilton Head Island	1997	\$0	Y
Daufuskie Island	1998	\$0	Y
Folly Beach County Park	1998	\$100,000	Y
Sullivans Island	1998	\$230,000	Y
Grand Strand	1998	\$10,000,000	Y
Debiduc Beach	1998	\$0	Y
Pawleys Island	1999	\$1,300,000	Y
Edisto Beach State Park	1999	\$250,000	Y
Sea Pines - Hilton Head Island	1999	\$0	Y
Hunting Island	1999	\$2,500,000	N
Hunting Island	2000	\$1,700,000	N
Shore Drive, Horry County	2000	\$1,000,000	Y
South Garden City	2000	\$1,000,000	N

Total state expenditures for 1991-2000 were \$25,480,000, an average of \$2,548,000 per year spent on beach renourishment. No state money was allocated for beach renourishment during the 2001-2002 fiscal year. No state funds were requested for beach renourishment for the 2002-2003 fiscal year, and none are expected to be allocated.

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