

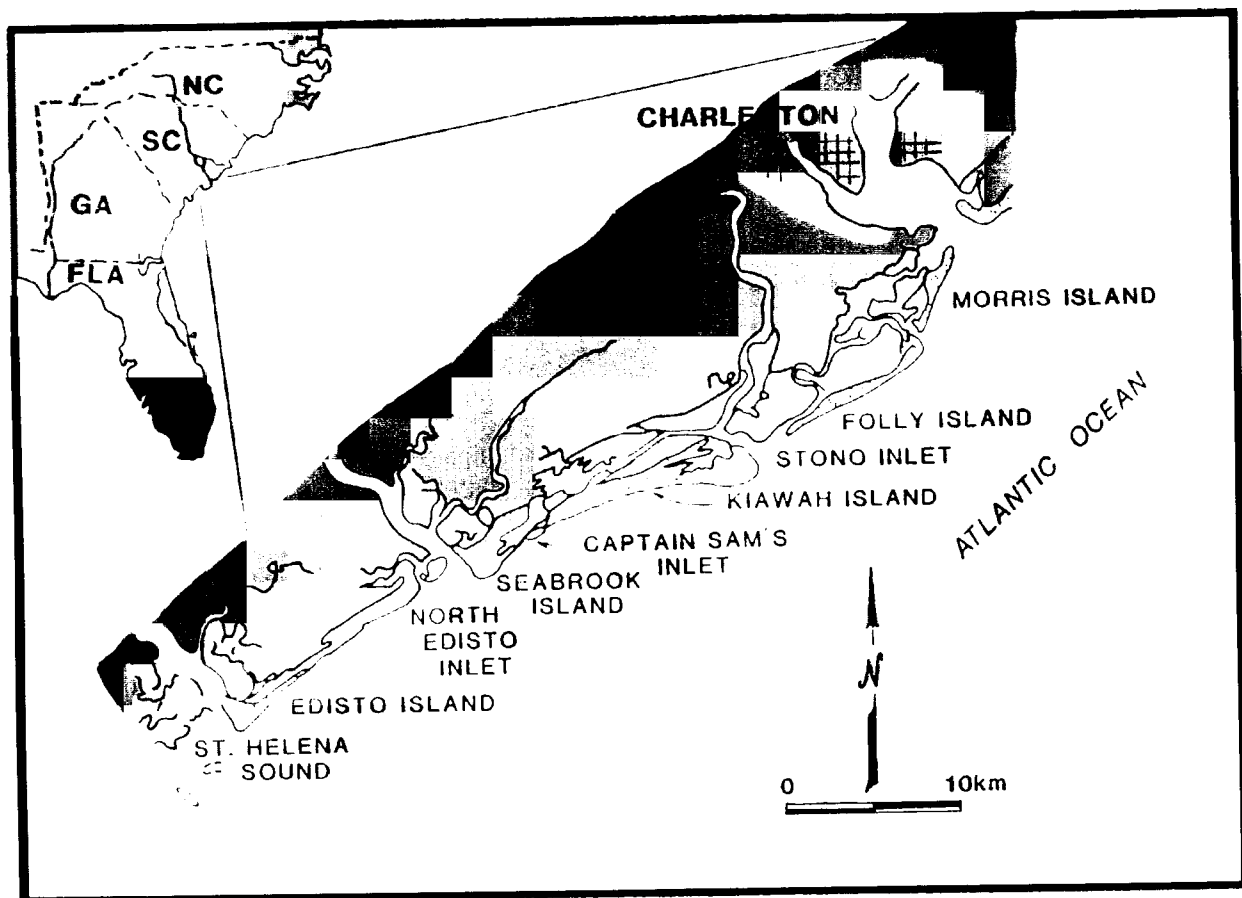
Study of Shoreline Migration Rates and Sediment Budgets for Seabrook, Kiawah and Folly Islands, South Carolina

prepared by

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University of Charleston



Final Report

South Carolina Task Force on Offshore Resources
a cooperative program with the
State of South Carolina
and the
Minerals Management Service

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Executive Summary

The primary objectives for this study were twofold; 1) to investigate the accretional and erosional trends, and the changes in sediment budgets for selected barrier islands, and 2) to address the success of prior renourishment projects as well as to determine the need for future beach renourishment for a segment of the South Carolina coastline. The coastal region studied consisted of three contiguous barrier islands, which included Folly, Seabrook and Kiawah Islands, all of which are located south of the entrance to Charleston Harbor. The shoreline migration rates and sediment budget information presented in this report were compiled from beach survey data collected as part of the statewide coastal zone monitoring program. It is quite apparent that these ground surveys can serve an important role in ascertaining recent changes in shoreline morphology, documenting sediment migration rates, and assessing future beach renourishment needs.

Prior beach renourishment projects undertaken on Seabrook Island have not been successful in stabilizing the shoreline. Past efforts have not provided an adequate recreational beach particularly along the southern half of the island. There is a definite need for another major renourishment project, consisting of an estimated 1.5 million cubic yards of sand, in the future. However, the success of any further renourishment for this island, or other coastal regions remains uncertain. The Folly Beach Renourishment Program which was completed in 1993, has met a similar fate. More than seventy-five percent of the beach fill placed on the island two years ago has already succumbed to wave erosion. The projected eight year "project life" for the program is already in jeopardy, and additional renourishment will be needed in the immediate future. Kiawah Island, which has historically been one of the few accretional islands along the South Carolina coast, is also currently experiencing high erosion rates primarily along the middle of the island. Although no immediate beach restoration is being considered, this coastal community has already voiced its concern over the recent erosional trends.

It has become quite apparent that a strong coastal zone management plan is needed to address future beach renourishment requirements for the South Carolina coastline. This plan should include a thorough assessment of previous projects, as well as a realistic prediction of the likelihood for success of any projects planned for the future.

Study of Shoreline Migration Rates and Sediment Budgets for Seabrook, Kiawah and Folly Islands, South Carolina

1. Introduction

Many of the barrier islands along the South Carolina coast are eroding due to natural and anthropogenic causes. Along a given stretch of coastline, a beach can either be eroding or accreting, and the rate of change can vary significantly. The location and magnitude of shoreline change is not constant. In some locations, the rate of erosion is great enough to cause severe shoreline retreat. To protect beachfront property, local, state, and federal governments have implemented costly beach renourishment projects along these eroding coastlines. Juxtaposed to eroding sections of coast can be areas of long-term accretion. This temporal and spatial variability adds complexity to the overall management of beaches. To better understand the reasons for coastal erosion, comprehensive examination of beach survey data can be utilized to determine annual and seasonal changes in sediment budget and shoreline position for barrier island systems. The determination of the amount and rate of change can also be used to develop a model to better understand sediment transport and changes in shoreline morphology. Also, knowledge of changes in sediment volume and shoreline migration along a barrier island should be used by federal and state agencies (working alongside local officials from coastal communities) in making better decisions concerning coastal zone management, as well as developing a comprehensive plan for future nourishment projects.

Over the past five years, the Office of Ocean and Coastal Resource Management (formerly the S.C. Coastal Council) has funded a Beach Monitoring Program for developed areas along the coast. Wading depth beach profiles have been obtained twice a year at 361 monitoring sites from North Myrtle Beach to Hilton Head Island. Comparisons of sequential beach profiles are extremely valuable in assessing sediment budgets, as well as documenting changes in beach morphology and analyzing sediment transport.

The objectives for year two of the study are as follows:

- (1) Compute annual erosion/accretion rates for selected coastal localities based upon available survey data (over six years of beach survey data has been analyzed).
- (2) Begin to produce a series of coastal change maps which clearly delineate the relative shoreline stability for different segments of the South Carolina coastline.

- (3) Determine volumetric changes for each monitoring station, and sediment budgets for Kiawah, Folly and Seabrook Islands.
- (4) Determine the quantity of sand required to produce a desired beach width for those locations along the coast where renourishment will be needed in the future.

Three barrier islands were selected to be investigated in this phase of the study, these include; Folly, Kiawah and Seabrook Islands. These islands form a 30 km long continuous segment of coastline stretching from just south of Charleston Harbor to the mouth of the North Edisto River (Fig. 1). Aside from their geographic proximity and inherent relationship with regard to longshore sediment migration patterns, these islands are historically very different from one another with regard to past and future beach management concerns.

2. Historical Perspectives

Folly Island has had a long history of shoreline erosion as evidenced by an average rate of shoreline retreat of 1.2 to 1.4 m/year (Fitzgerald, 1979). This high rate of erosion can be attributed to the reduction in longshore sediment supply as a result of the construction of the Charleston Harbor jetties (Katuna, et al. 1993). Jetty construction has also played an important role by changing the wave energy and incidence pattern which resulted in the erosion of the Charleston Harbor ebb tidal delta shoals that once served to protect the island from wave attack. The extreme long-term erosion problem on the island resulted in the development and implementation of the Folly Beach Renourishment Project. The first phase of this project was completed in May, 1993. This project is a fifty-year nourishment plan (initial cost estimated at 15-18 million dollars) which included an initial beach fill volume of 2.48 million cubic yards of sand. The plan has an estimated "project life" of eight years, and will require four additional 1.7 million cubic yard (cy) additions of sand (at eight year intervals), and a final renourishment consisting of 2.1 million cy during the last ten years of the project (U.S. Army Corps, 1991). This is the first major renourishment project for the island, however, several smaller renourishment efforts involving the south end of the island were completed in previous years.

In contrast to the erosional problems on Folly Island, Kiawah Island has historically been one of the few islands on the South Carolina coast that has been prograding. Hayes, et al. (1976) estimated that over the last 100 years, Kiawah Island has accreted seaward at a rate of 10's of meters each year. They attributed this growth

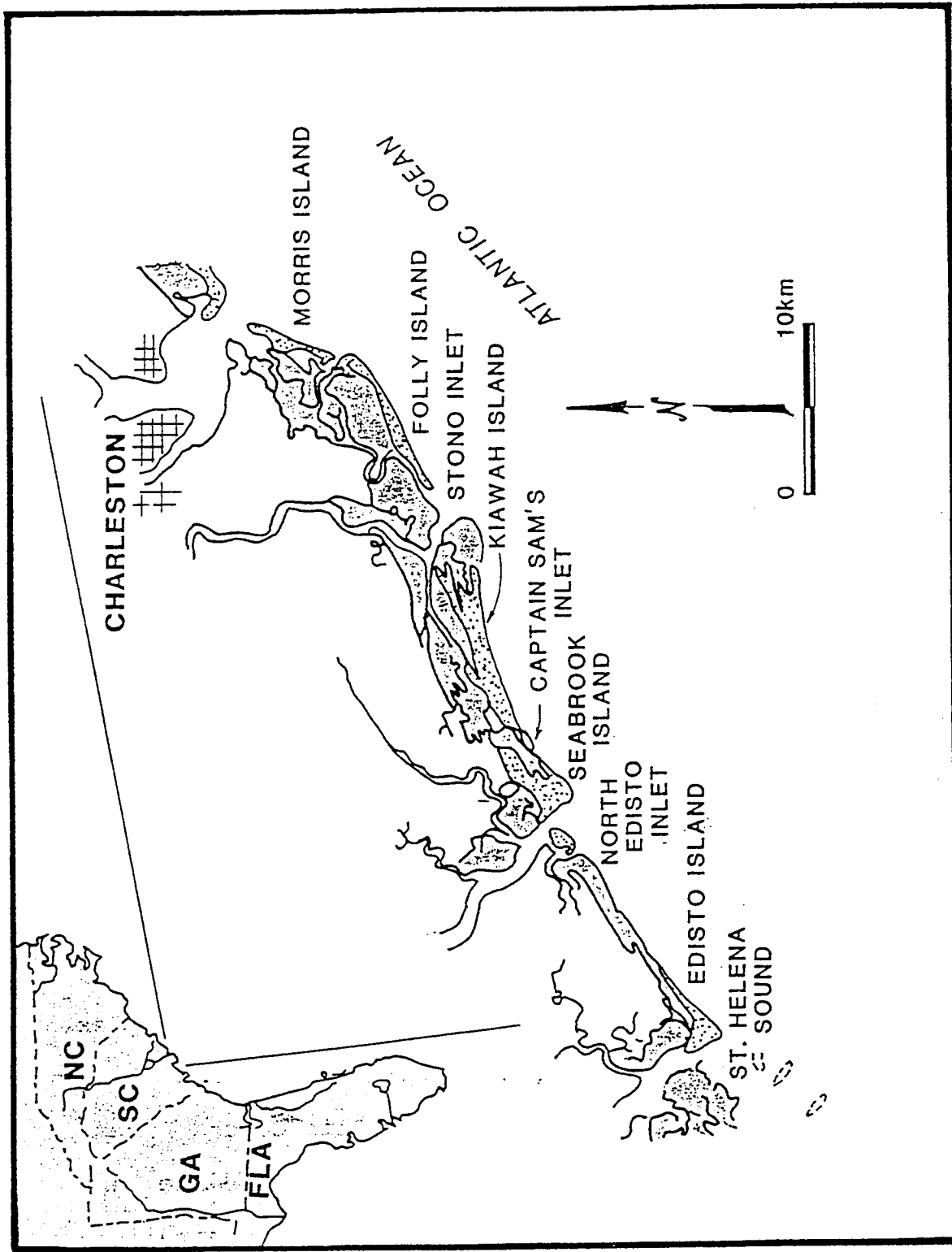


Figure 1. Map showing the location of Folly, Kiawah, and Seabrook Islands along the central South Carolina coast (after Barwis and Sexton, 1986)

to the influx of sediment derived from the extensive erosion of the updrift islands (Folly and Morris Islands), and to additional sediment derived from the erosion of the offshore shoals which were once located south of the Charleston Harbor jetties. Currently, the coastal stability and long term accretional history of the island is somewhat in jeopardy as recent beach surveys indicate an erosional trend along the central portion of the island. Although not recognized as a renourishment priority, Kiawah Island will need to be continually monitored in the future to observe if this trend continues.

Seabrook Island is located 25 km south of Charleston Harbor, and like Folly Island, Seabrook continues to have problems with coastal erosion. Four beach replenishment projects have been completed on this island within the last thirteen years. In 1983, a major beach restoration project involving the relocation of Captain Sam's Inlet added 1.5 million cubic yards of sand to the north end of the island. A 1990 nourishment project involved the placing of 685,000 cubic yards of sand on the south end of the island (Kana, 1993). In addition, two smaller projects consisting of 75,000 cubic yards (1982) and 225,000 cubic yards (1983) were completed to control erosion in localized areas along the island.

These renourishment projects have had mixed success in solving the erosional problems that exist on the island. The 1983 project has temporarily stabilized the north end of the island, however significant erosion problems still exist for the armored (seawall) southern portion. The landward migration of the Northern Channel (associated with the North Edisto ebb tidal delta), which also serves to transport sand away from the adjacent eroding beach, continues to impose a shoreline stabilization problem along the south end of the island (Kana, 1993). Seabrook Island will require additional beach renourishment in the future (Kana, et al. 1991).

3. Methods

In 1986, the then South Carolina Coastal Council initiated a state-wide beach monitoring program. Monitoring stations or benchmarks were erected along most of the inhabited portion of the South Carolina coastline. The elevations of these benchmarks are based on the 1929 National Geodetic Vertical Datum (NGVD), and their geographic coordinates are referenced to the SC State Plane Coordinate System. Biannual ground surveys are conducted at each monitoring station to ascertain the amount of erosion or accretion, and to document any modification in shoreline morphology. The ground surveys (wading depth profiles) are conducted

perpendicular to the beach from the fixed benchmark locations to water depths of -1.5 m (-5.0 feet) MSL.

Beach survey data collected from 1990 to 1995 was compiled into a computer database for each of the three islands under investigation in this study. A beach profile data reduction program (BSPLOT) developed by Douglas Nelson (Coastal Carolina University) was used to calculate the cross-sectional unit-area volume of sand present along each beach transect. Unit area volume determinations were calculated in cubic yards (cy) of sand per linear foot of shoreline. These volumetric determinations include using the volume of sand contained within a cross sectional area of beach bounded by the benchmark elevation and the -1.5 m (-5.0 feet) MSL contour (Fig. 2). However, in those areas where anthropogenic structures, such as roadways, seawalls, revetments, etc., would enter into the cross sectional profile, these features were eliminated from the calculations by shifting the starting point seaward. The starting point for the volume calculations was selected to correspond with the crest of the primary dune ridge, or the toe of the seawall, etc., in order to accurately determine the volume of sand within the "active beach" zone. By limiting the volumetric determinations to this zone, we were also able to provide a better estimate of the total sediment volume for each of the islands.

The change in sediment volume for sequential profiles (every six months) was also calculated for each monitoring station. Since each beach transect is assumed to represent a typical sediment volume for that portion of the island, a sediment budget can be determined by multiplying the average unit area volume of sand by the total length of shoreline (summation of the distance between stations), Eiser et al. (1988). A sediment budget was calculated for each profiling event. Comparisons of sequential sediment volume determinations from 1990 through 1995 provide a good estimate of the annual loss or gain of sand for the entire island. In those cases where the benchmark was lost, either due to natural causes or as a result of human intervention, an average unit area volume was used in making the calculations in order to provide a more realistic estimate of sediment volume.

In addition to determining and comparing the loss or gain of sediment for each monitoring station and the sediment budget for each island, we also calculated the shoreline migration rate. The shoreline migration rate was ascertained by noting the change in distance of the 0.00 MSL contour relative to the base station. We chose the most seaward position of the 0.00 MSL contour in cases where ridge and runnel systems were present on the beach. This method of determination provided us with a better estimate of shoreline migration, and a clearer indication of the

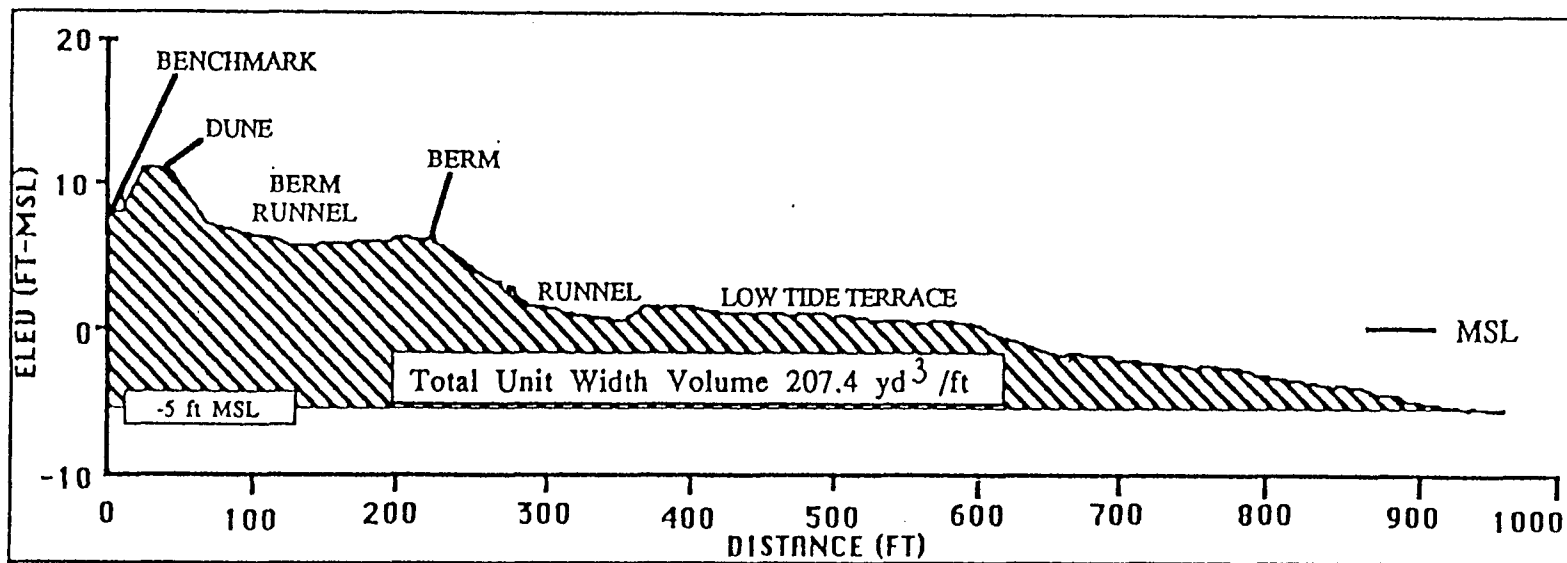


Figure 2. Reference cross section used in the computation of unit-area sediment volumes for selected beach profiles (after Kana et al., 1984)

relative stability for different beach segments.

4. Data Interpretation

4.1 *Seabrook Island*

Seabrook Island can be subdivided into two distinct coastal segments. A southern segment (stations 2515 through 2545), which is protected by a continuous 10-15 foot high rock seawall (Fig. 3). This segment is devoid of dune ridges and a "dry beach" at times of high tide. In contrast, the northern segment (stations 2555 through 2575) is characterized by a fairly wide beach, as well as a series of dune ridges located seaward of a currently "inactive" seawall. The inactive seawall is located between 150 and 700 feet landward of the primary dune line. Longshore sediment transport along the island is to the south towards the mouth of the North Edisto River. Erosional constraints for the island consist of the position of the marginal tidal channel (Northern Channel) which increases the rate of erosion along the southern portion of Seabrook Island (as discussed previously), and the shifting of the ebb tidal channel located at Captain Sam's Inlet which affects the northern end of the island.

A total of eleven monitoring stations are located on Seabrook Island (Fig. 3). These stations have been surveyed at approximately six month intervals from December 1990 to May 1995. Analysis of the unit area sand volumes over this six year period clearly delineates the wider beach present at the northern end of the island from the sediment starved southern segment (Fig. 4 and Appendix A). However, changes in sediment volume clearly indicate that with the exception of the most northern station (2575), loss of sand is occurring along the entire length of the island. During this six year monitoring period the average unit area profile has decreased from 115 cy/ft to 62.8 cy/ft. Volumetrically, the loss of sand is greatest along the northern segment of the island primarily because of the large volume of sand residing in this area. In contrast, the impoverished southern end has lost less sand by virtue of its narrow, subtidal profile.

The overall sediment volume for the island also has decreased from 908,681 cubic yards in 1990 to 448,082 cubic yards in 1995 (Fig. 5 and Appendix A). Two reasons can be given to explain this large loss in sand volume. The 170,092 cubic yard decrease in sand volume which occurred between December 1990 and October 1991 can be attributed in part to the immediate loss of a large percentage of the 1990 beach fill. Sediment loss was more noticeable along the southern renourished

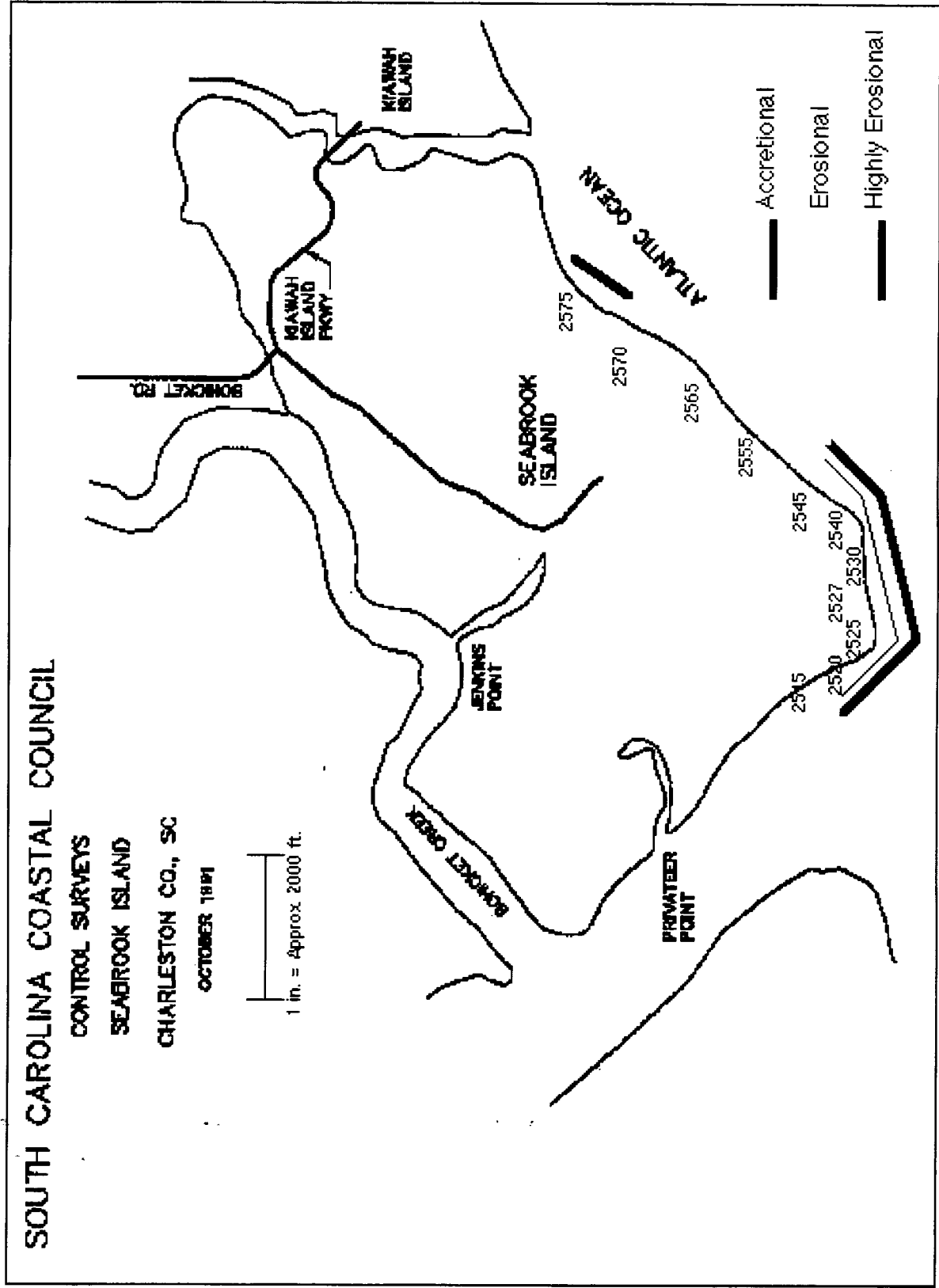


Figure 3. Base map of Seabrook Island showing the location of monitoring stations and shoreline stability.

SEABROOK ISLAND
Unit Area Sediment Volumes (yd³/ft)

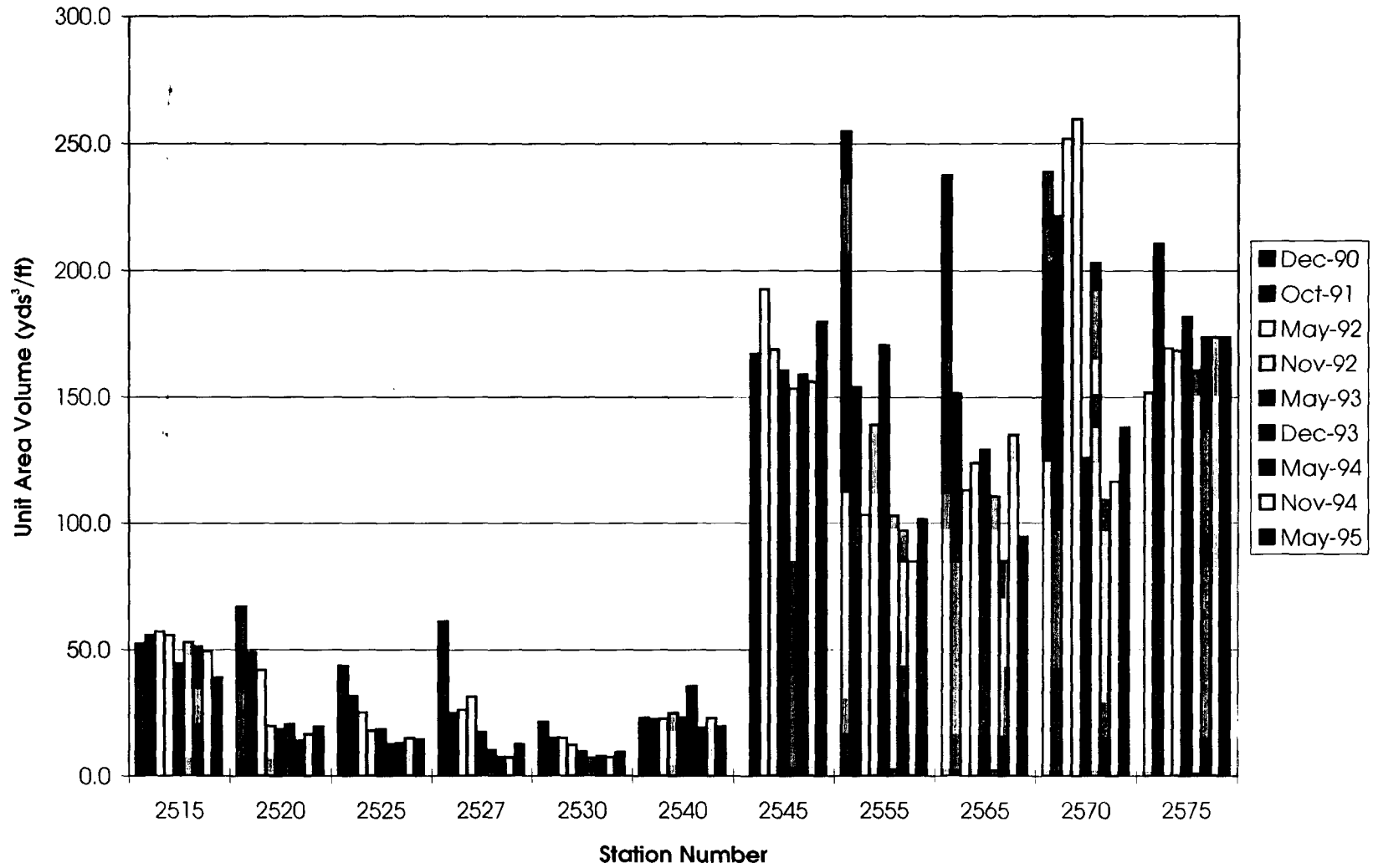


Figure 4. Changes in unit-area sediment volumes for stations 2515-2575 on Seabrook Island.

**SEABROOK ISLAND
Sediment Budget
(1990-1995)**

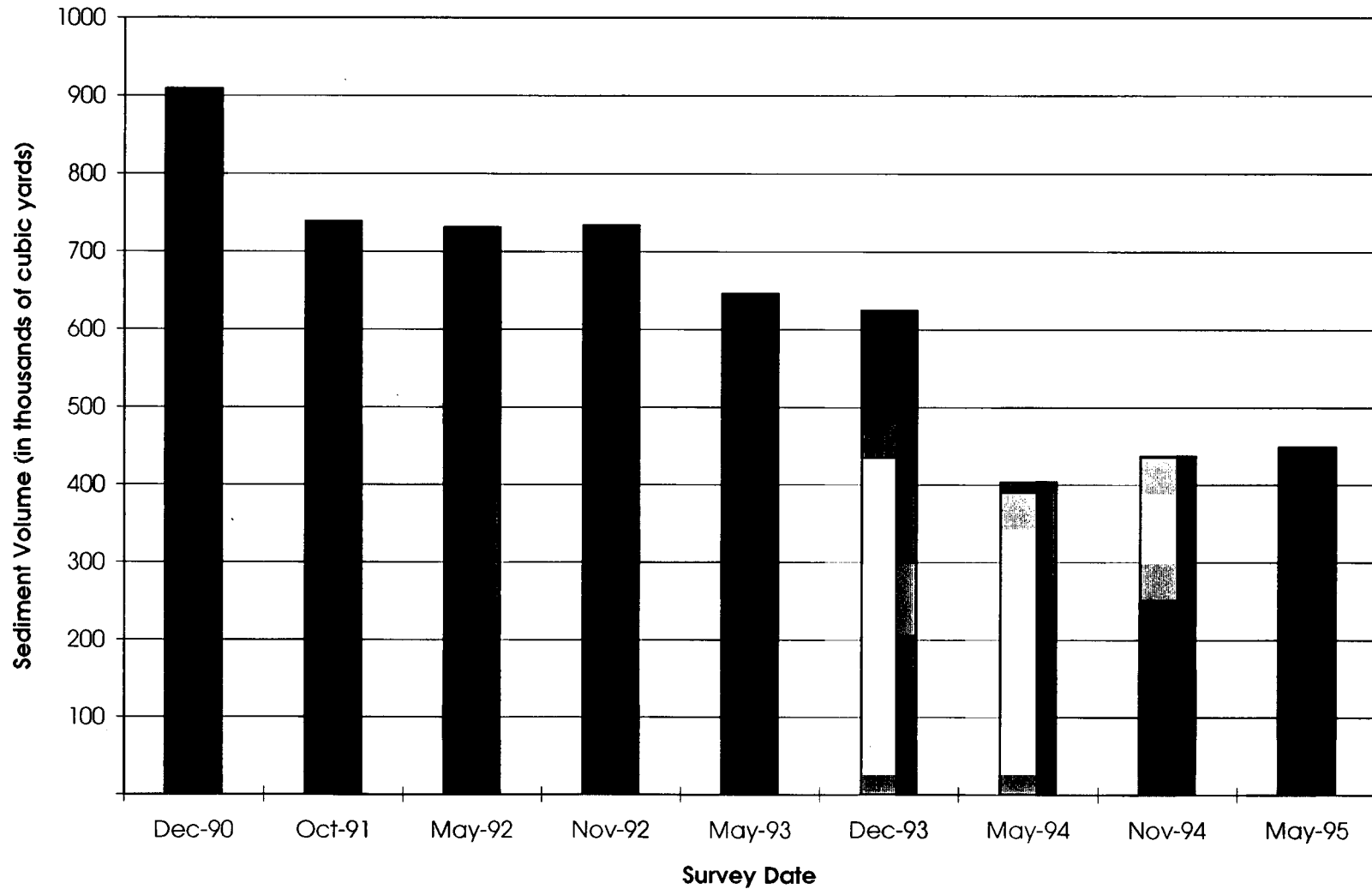


Figure 5. Total sediment budget for Seabrook Island (1990-1995).

segment of the island, between stations 2525 and 2545. The coincident loss of sediment which occurred along the northern segment of the island may be attributed to the southerly migration of Captain Sam's Inlet which still poses a significant erosional problem. These results are contrary to those of Kana (1993) who classified this same area as being stable to accretionary. However, his evaluation was based upon analysis of longer profile lengths (-22 feet MSL) which showed an increase in sand volume within the "underwater profile". Our data indicates that Seabrook Island has lost approximately 500,000 cubic yards of sediment over the six year survey period. Much of this loss occurred during the first year (1991) preceding the renourishment project. Since this time, the total sediment budget has increased to 448,000 cubic yards (an increase of 45,751 cy over the last two years). This recent increase in sediment may be explained by an increase in the amount of longshore sediment transport derived from the erosion of the updrift barrier islands.

The shoreline migration data also indicates a substantial landward shift in the 0.00 MSL contour from its initial position in 1990 to 1995 (Fig. 6 and Appendix A). The position of 0.00 MSL contour has regressed an average of 131.4 feet or 21.0 ft/year. This is another indication of the high rate of erosion for Seabrook Island over the past six years.

With regard to future renourishment needs, it is obvious from analyzing the data that the southern portion of Seabrook Island would require yet another beach nourishment project if a dry or high tide beach is desirable (Fig. 7). Kana (1993) estimated that it would require a cross-sectional unit area volume of 50 to 70 cy/ft of sand (between the seawall and -5 ft MSL) to provide a minimum dry beach along the southern half of the island. If one employs a conservative fill volume of 100 cy/ft (since 1/3 of the estimated amount would be lost immediately after nourishment, Kana, 1993) then 1,464,593 cubic yards of sand would be required to nourish this 3,871 foot segment of the island.

However, under the existing inlet dynamic conditions, it is highly unlikely that the beach fill would remain for any significant length of time. The 1990 renourishment project which added 685,000 cy of sand to this same area, lasted less than six months. The design plan for any future renourishment projects would have to include the construction of a terminal groin at the southern tip of the island. The groin would control the loss of sand into the adjacent tidal channel where it is likely to be transported landward into the inlet. The presence of a groin would also allow for less expensive periodic beach scraping to restore the adjacent

Average Change in the Distance to M.S.L. (1990-1995) for Seabrook Island (ft/yr)

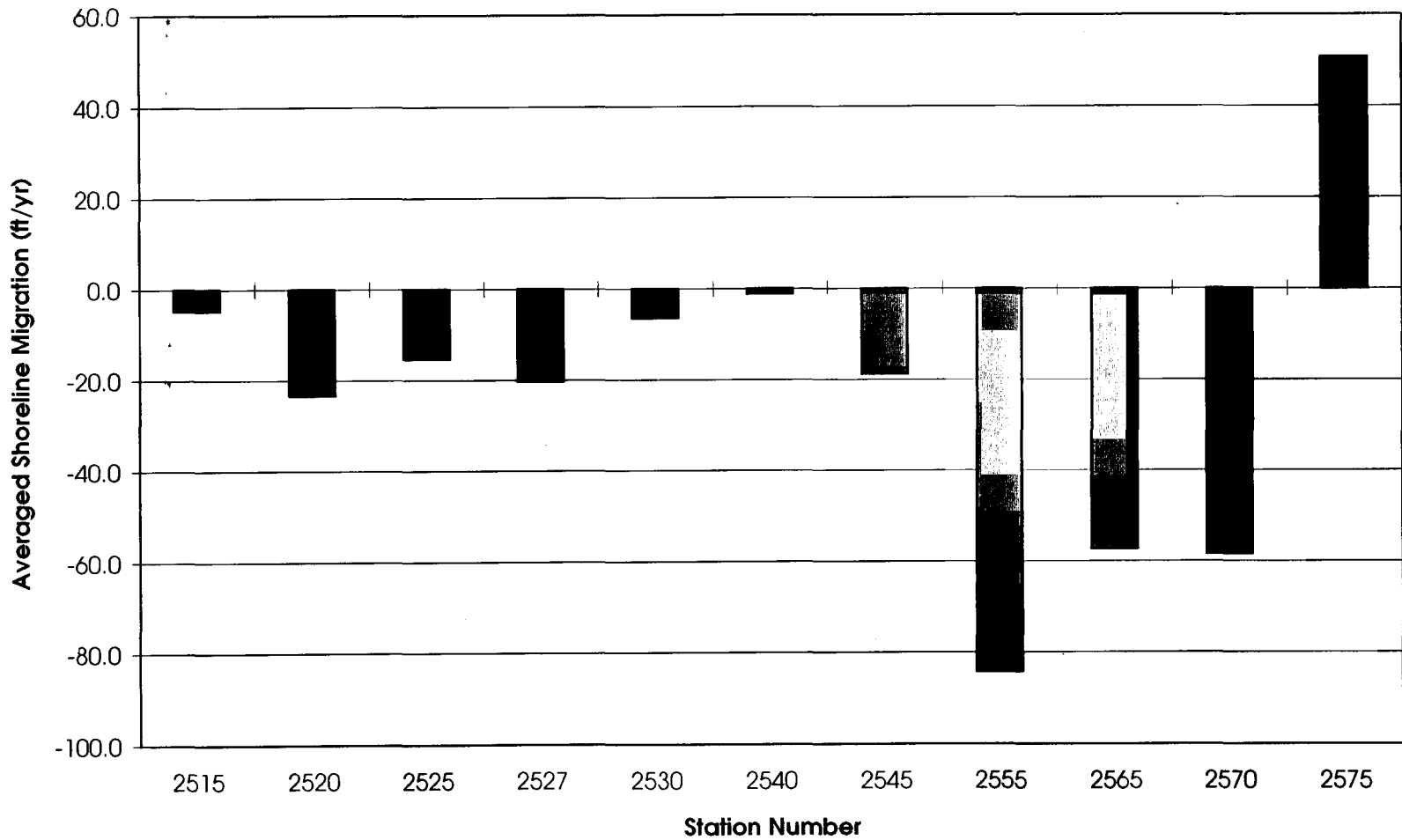


Figure 6. Average shoreline migration for stations 2515-2575 on Seabrook Island.

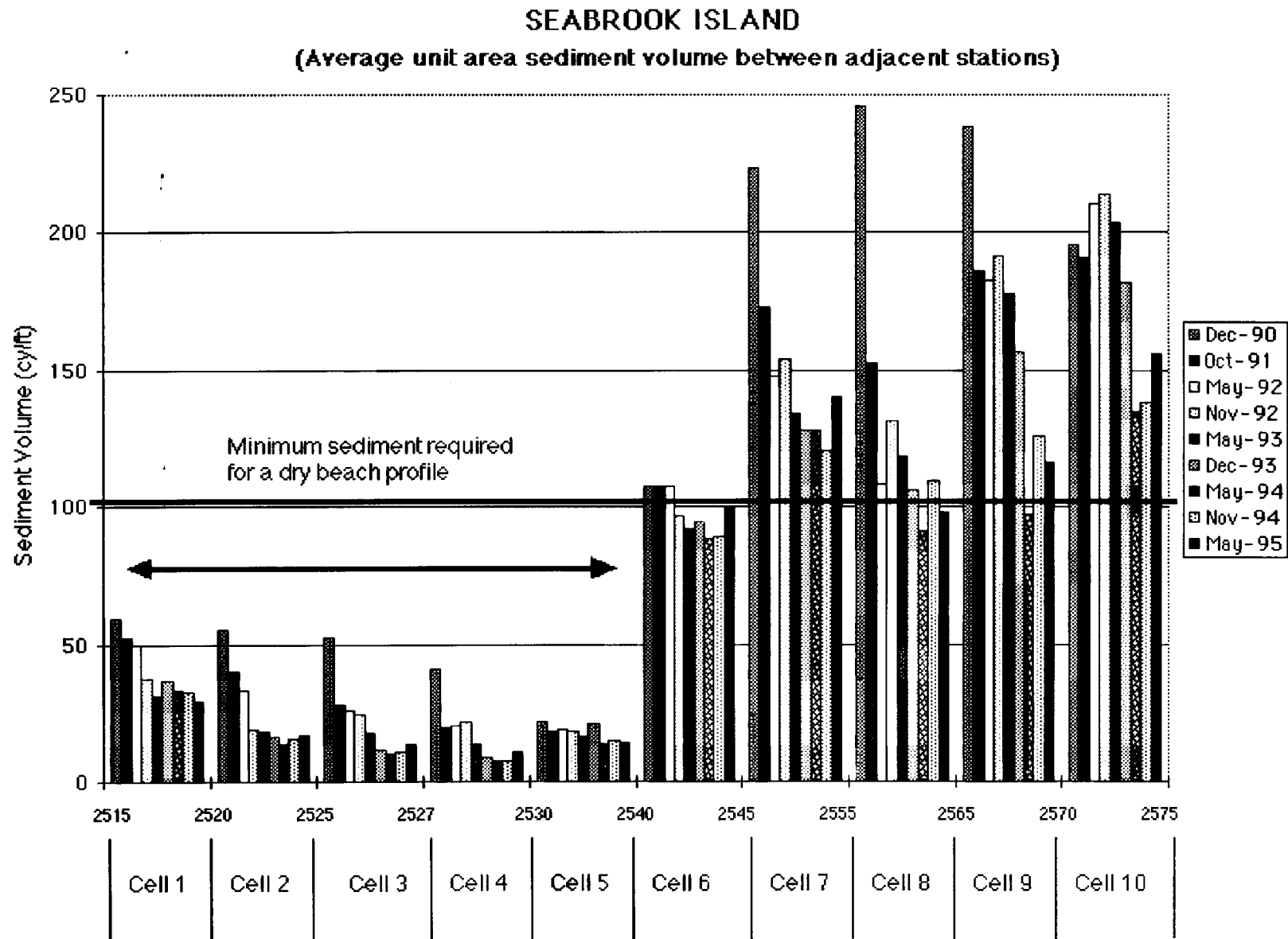


Figure 7. Future renourishment needs for Seabrook Island. Arrow indicates the beach segment (cells 1-5) in need of additional sand.

beach.

4.2 *Kiawah Island*

As mentioned previously, Kiawah Island is one of the few accretional barrier islands along the South Carolina coast. However, certain sections of the island can be classified as erosional or unstable (Fig. 8). The northern end of the island (stations 2785 and 2780) has been relatively unstable for the past twenty years. Station 2785 has experienced a loss of 150.53 yd³/ft of sand in six years (Fig. 9 and Appendix B). Hayes, et al. (1976) considered the erosional nature of this portion of the island to be related to the migration of the Stono River Inlet. Its proximity to the adjacent inlet can account for the erratic shifts in sediment volume experienced in this area. In addition to the extreme northern end of the island, the beach along the central section of the island (between station 2645 and 2695, a distance of 3.25 miles) has also experienced net erosion over the six year study period. The highest erosion rate of -22.98 cy/ft (or -3.83 cy/year) was recorded at station 2645 located 2 miles northeast of the southwest end of the island. Field observations indicate that the primary dune ridge is severely truncated in this region. It is not known as to why this central section of the island is erosional while the surrounding shoreline has been accreting during this time. Perhaps, the configuration of the offshore bar system, and changes in the wave approach angle can account for this anomaly.

Overall, the sediment budget for Kiawah Island indicates a considerable increase in sediment volume of almost 211,000 cubic yards of sand from 1990 to 1995. The largest increase in sediment volume (+586,900 cy) occurred between December 1990 and November of 1991 (Fig. 10 and Appendix B). In contrast, the low volume of sand (less than 9.4 million cy) present on the island in June 1993 can be attributed to the passage of a severe noreaster which occurred on March 13, 1993. It is also very clear that the volume changes observed are seasonally related, with a greater volume of sand being present on the beach during the time of fall surveys as opposed to the spring. This seasonal fluctuation in sand availability is classic, and is related to changes in wave energy during the ensuing summer and winter seasons. The prominent ridge and runnel systems present along the shoreline, and their seasonal onshore-offshore migration can account for the biannual cyclicity observed in the sediment budget data. These bar welding events can also be observed in analyzing the changes in beach width or position of the 0.00 MSL contour (Fig. 11 and Appendix B).

SOUTH CAROLINA COASTAL COUNCIL

CONTROL SURVEYS

KIAWAH ISLAND
CHARLESTON CO., SC
OCTOBER 1991

1 inch = 7500 feet

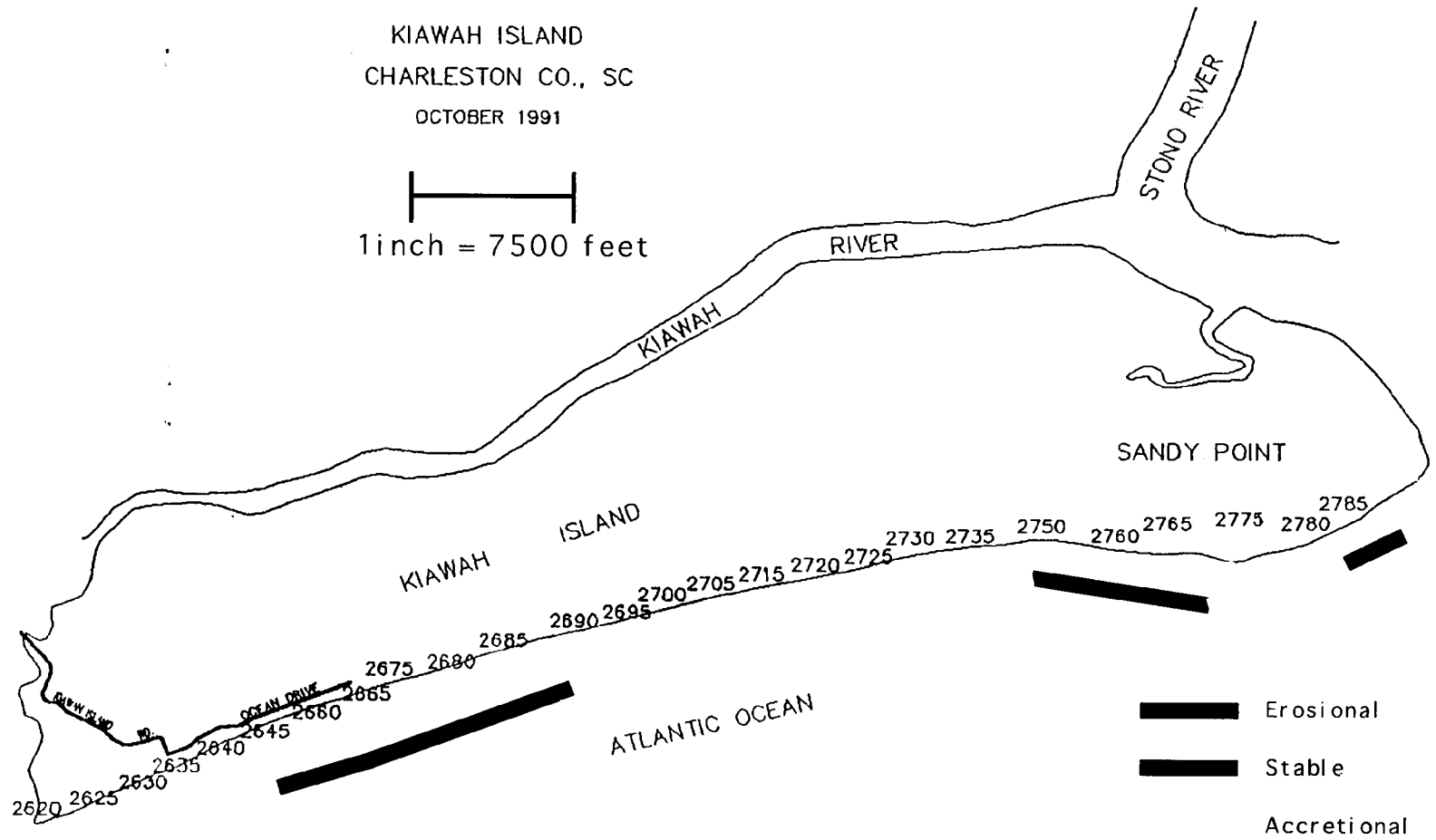


Figure 8. Base map of Kiawah Island showing the location of monitoring stations and shoreline stability.

KIAWAH ISLAND

Unit Area Sediment Volumes (yd³/ft)

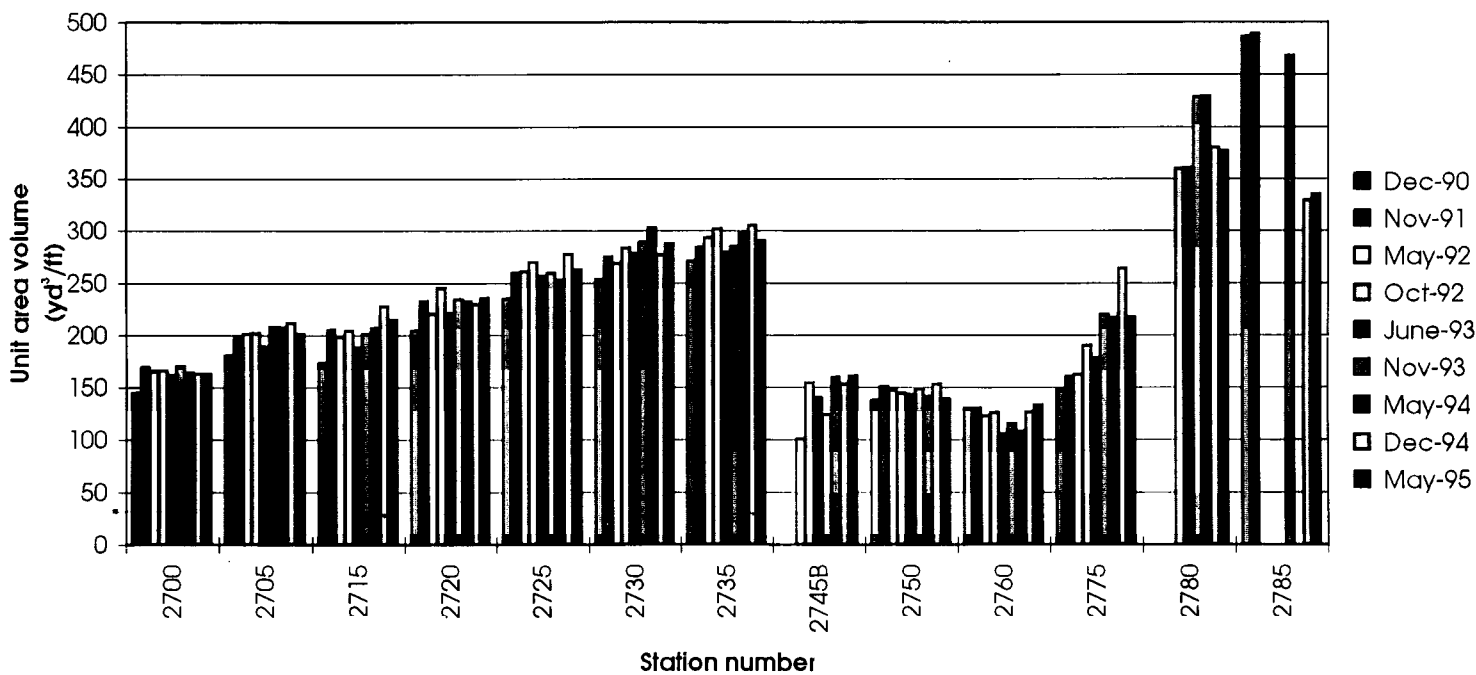
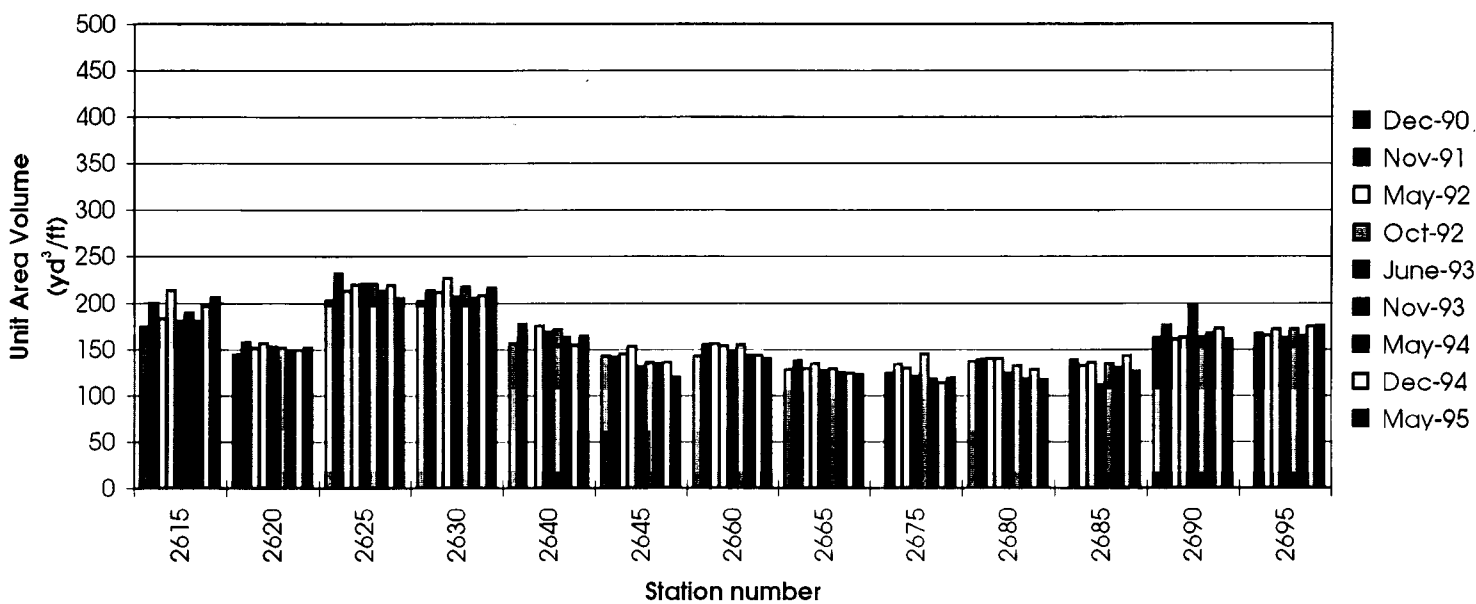


Figure 9. Changes in unit-area sediment volumes for Kiawah Island (1990-1995).

KIAWAH ISLAND
Total Sediment Budget
(1990-1995)

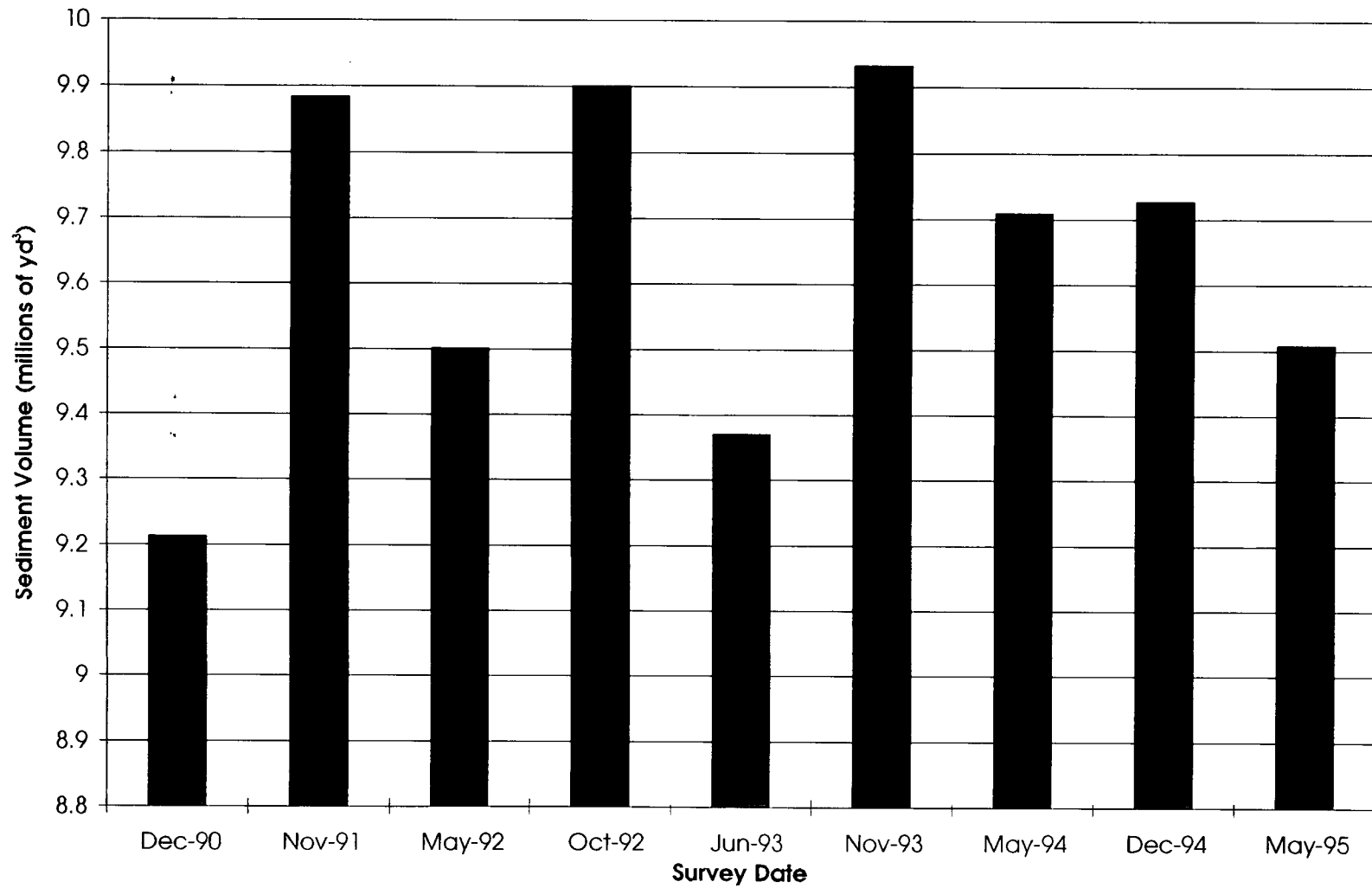


Figure 10. Total sediment budget for Kiawah Island (1990-1995).

KIAWAH ISLAND
Distance to M.S.L.
(in feet)
(1990-1995)

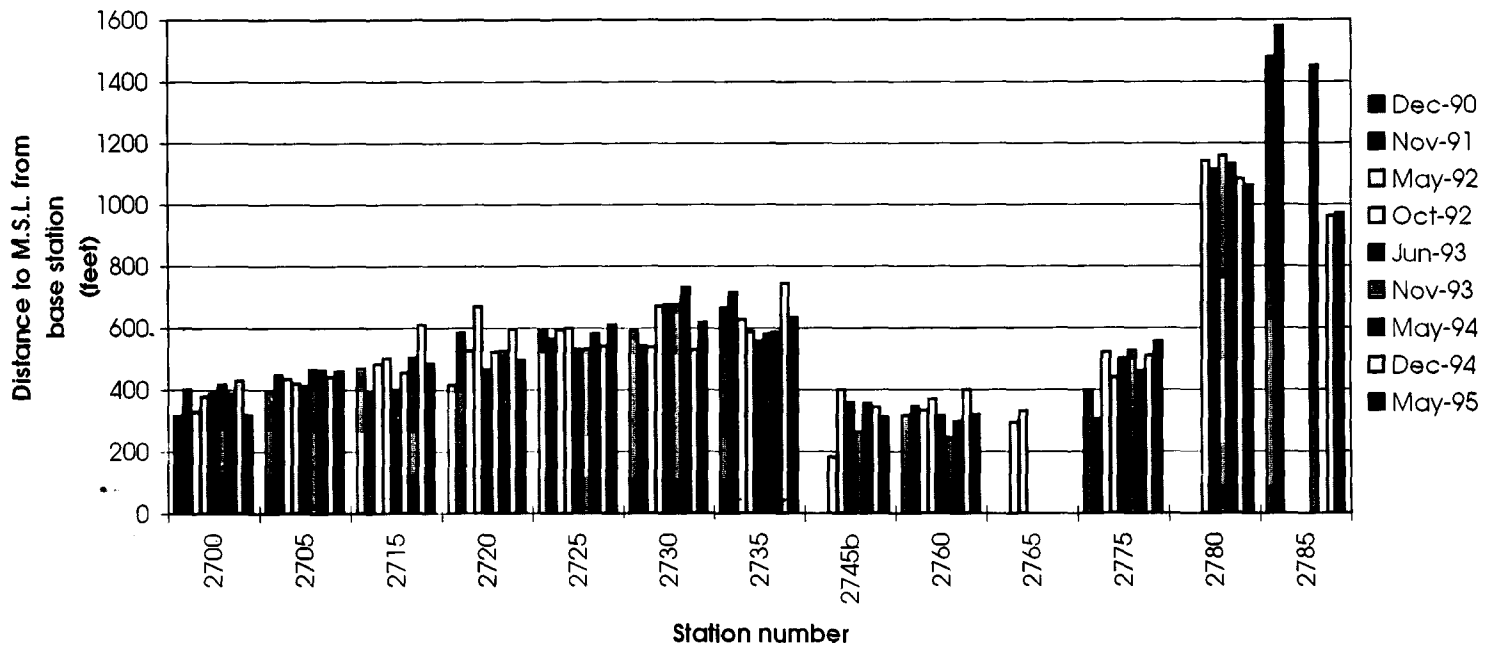
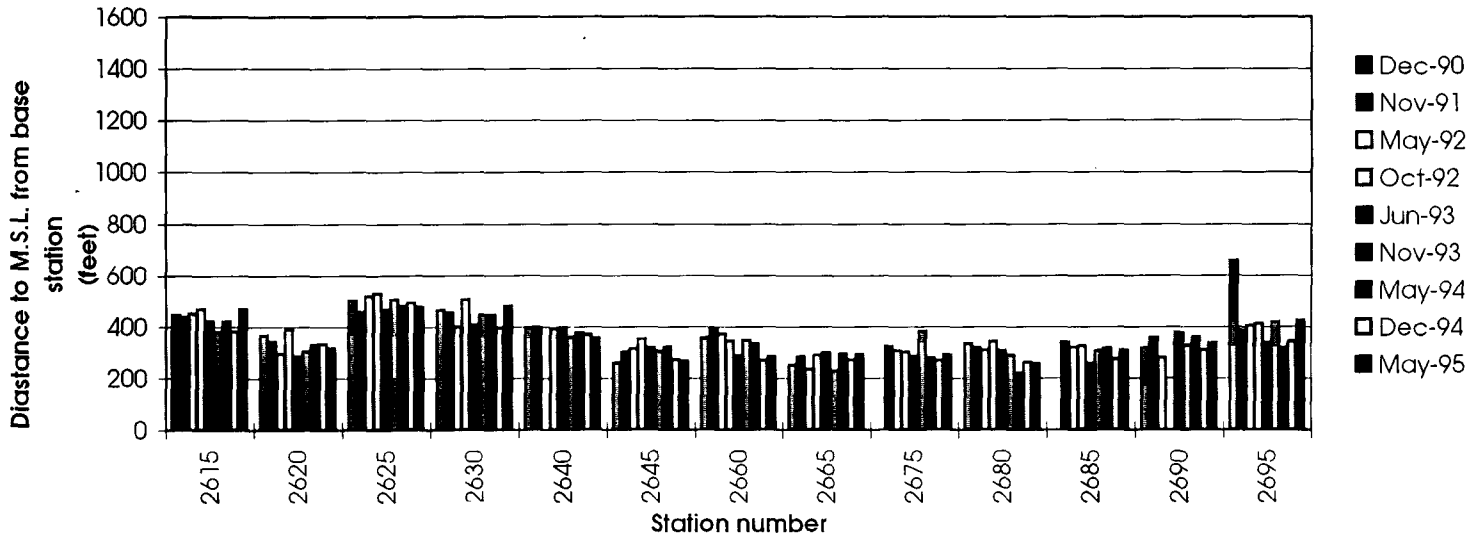


Figure 11. Average shoreline migration for stations 2615-2785 on Kiawah Island.

4.3 Folly Island

In May 1993, a multi-million dollar renourishment project was completed on Folly Island. A total of 2.48 million cubic yards of sand was added to a 5.34 mile (28,200 ft) long stretch of the island. In an effort to determine the status of the project, beach surveys were conducted at thirty monitoring stations soon after its completion (May 1993), and again in May 1995 (Fig. 12). Comparisons of sediment volumes were also made using pre-renourishment data acquired in May 1992. All pre- and post-renourishment data used for comparison purposes were based on wading depth profiles (-5.0 ft. MSL) (Appendix C).

The renourishment project did not encompass the entire 6.1 mile length of the island. The extreme northern and southern ends of the island were left unnourished to allow for longshore sediment transport to naturally replenish these segments. Three monitoring stations (2885, 2890, and 2895) fell outside the project limits, and therefore were omitted from the calculations dealing with the fate of the beach fill.

As of May 1992, the total volume of sand present on the beach within the project limits was 2,157,205 cubic yards (Table 1). In May 1993, soon after the renourishment project was completed, the volume of sand determined for this same coastal segment consisted of 3,341,331 cubic yards or a 64.5% increase since 1992. If one takes into account the 2.48 million yards of sand that was added to the beach during the project (which began in January 1993), by May 1993 the beach had already lost nearly 1.3 million cubic yards of sand within the first five months. This quantity of sand loss was probably the result of wave erosion of the seaward "sacrificial" berm that was purposely created according to the project design plan. The erosion of the seaward berm was intended to widen the beach profile, and to provide sand to the subtidal zone. By May 1995, the volume of sand within the project limits had again decreased by 2,742,442 cubic yards. This volume represents a loss of an additional 598,889 cubic yards of sand since the completion of the project. The total loss in sediment volume from the beginning of the project (Jan. 1993) to May 1995 consisted of 1,894,763 cubic yards or 40.9% (Figs.13 and 14).

Only 585,237 cubic yards (or 23.6%) of the original 2.48 million cubic yards of beach fill added during the renourishment project can be accounted for based upon wading depth profiles. It appears that in excess of 75% of the renourishment sand has been lost from the high tide or recreational beach within the first two years following project completion. According to the project plan, periodic post-renourishment is called for after eight years, or when the design fill volume reaches

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FOLLY BEACH
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OCTOBER 1991

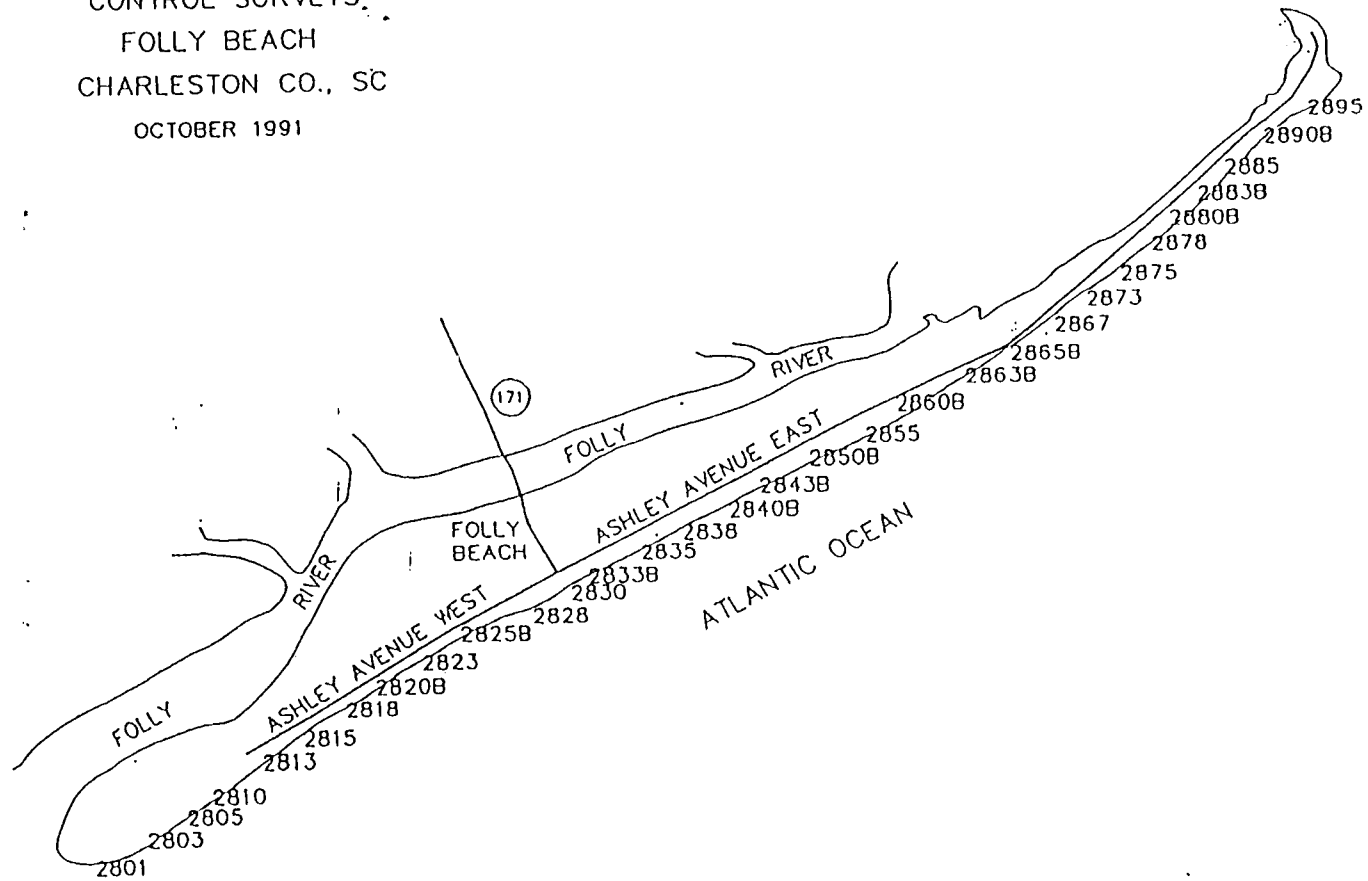


Figure 12. Base map of Folly Island showing the location of monitoring stations.

Table 1
Summary of Results for the Folly Beach
Renourishment Project

<u>Survey Date</u>	<u>Sediment Budget</u>
May 1992	2,157,205 yd ³
Total Beach Fill Added	2,480,000 yd ³
Initial Renourishment Budget (Jan 93)*	<u>4,637,205 yd³</u>
May 1993	3,341,331 yd ³
Gain/Loss (Jan 93 to May 93)	-1,295,874 yd ³
% Gain/Loss	-27.9 %
May 1995	2,742,442 yd ³
Gain/Loss (May 93 to May 95)	-598,889 yd ³
% Gain/Loss	-17.9 %
Total Volume Change	
Jan 93 to May 95	-1,894,763 yd³
% Change	-40.9 %
Total Beach Fill Remaining	<u>585,237 yd³</u>
(Within project limits)	(23.6 %)
<hr/>	
Project Design Volume*	738,500 yd³
Beach Fill Volume Below	-153,263 yd³
Design Requirements	
% Deficit	-20.7 %

* See text for explanation

FOLLY BEACH
Unit Area Volumes (yd³/ft)

May-92 to May-95
 (Within Project Limits)

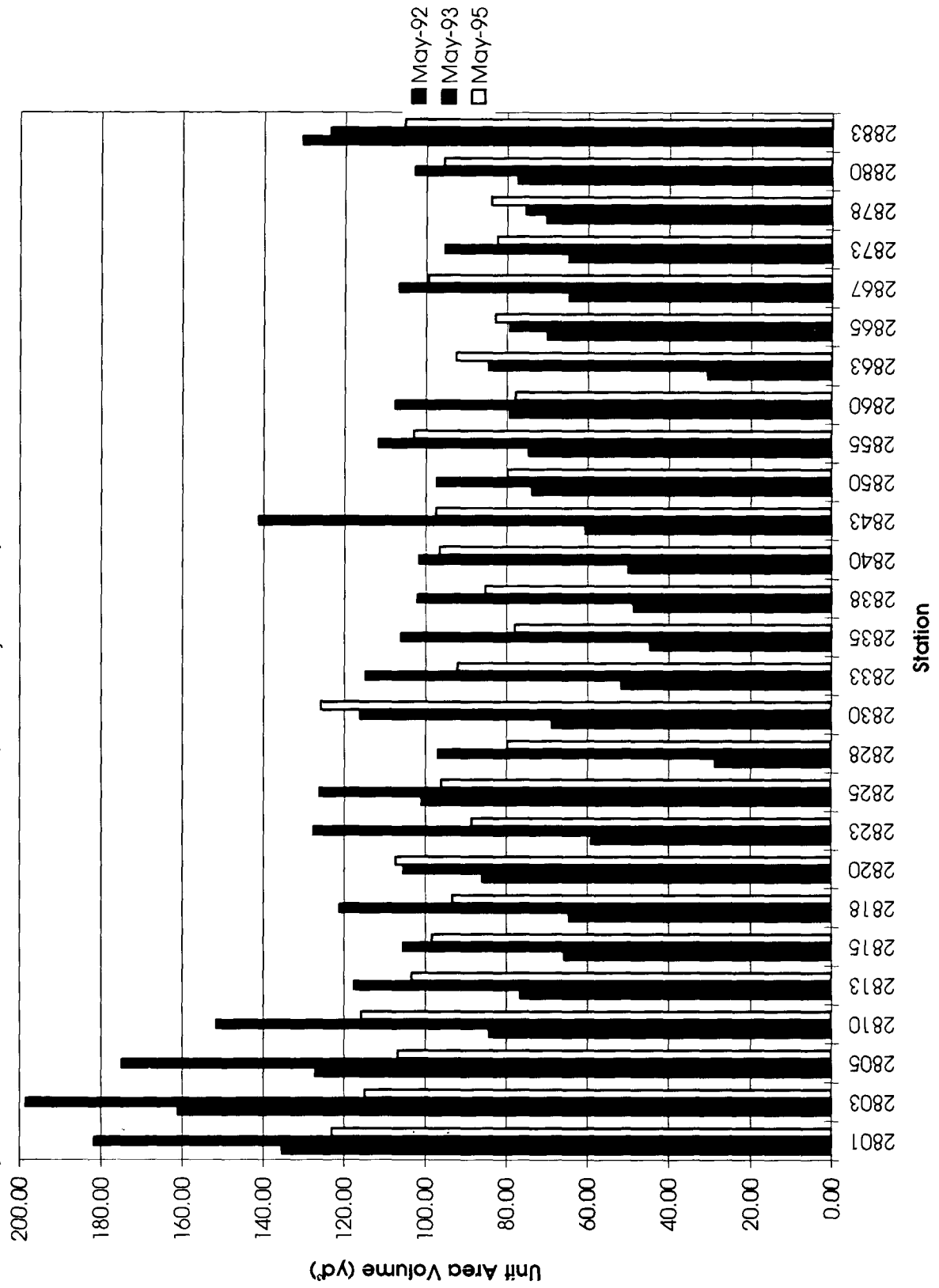


Figure 13. Changes in unit area sediment volumes for Folly Island from May 1992 to May 1995.

FOLLY BEACH

Distance to M.S.L.

May-92 to May-95
(Within Project Limits)

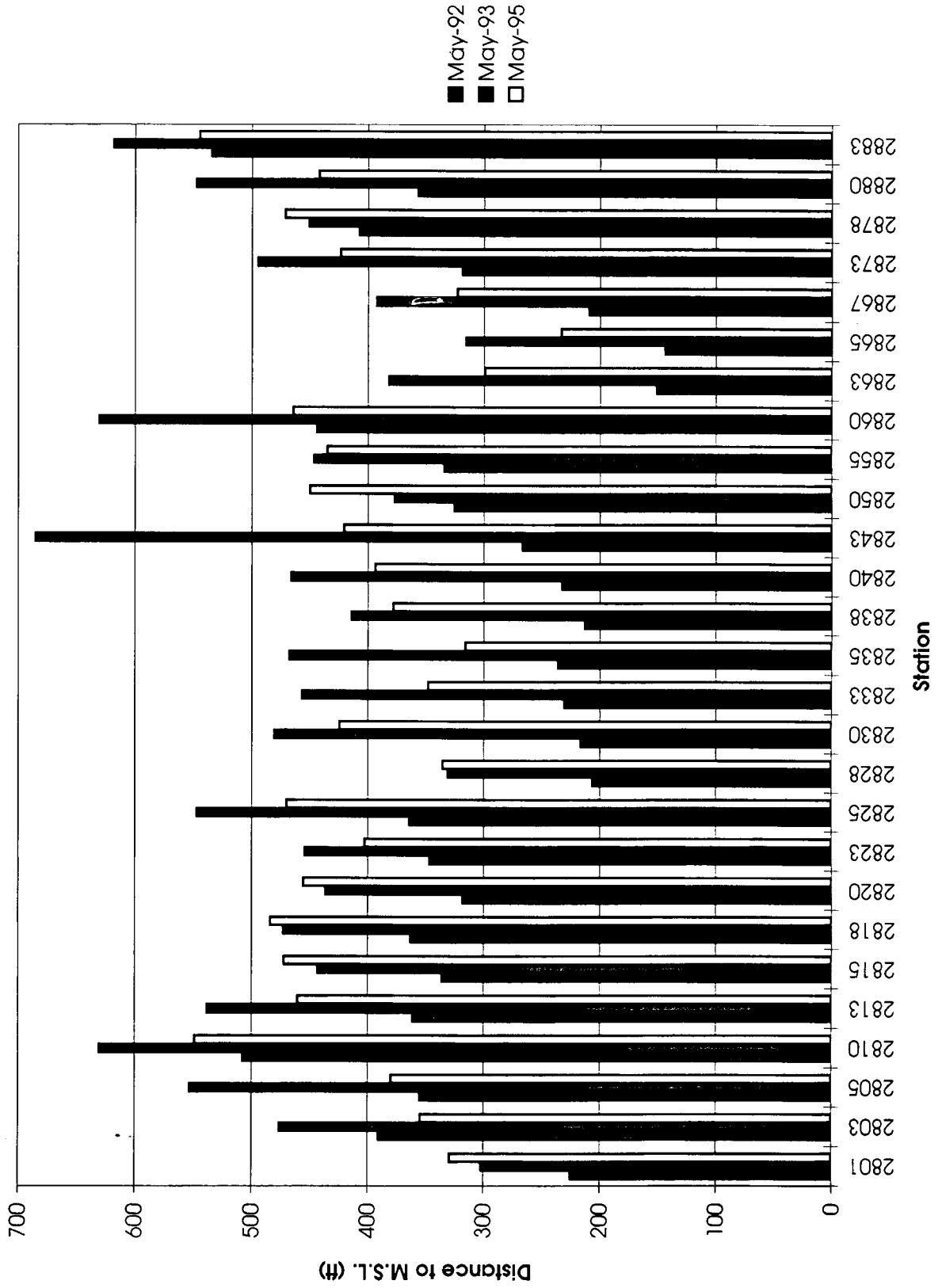


Figure 14. Shoreline migration for stations 2801-2883 on Folly Island.

less than 738,500 cubic yards of sand remaining (U.S. Army Corps, 1991). We believe, based upon the May 1995 survey data, that the current volume of sediment left on Folly Beach is already 20.7% below the design fill limit.

Most of the sand loss can be attributed to longshore sediment transport to the northern and southern ends of the island (as predicted), and to wave erosion resulting in the offshore transport of a significant volume of sand. An increase in sand volume has been realized at station 2890 (+36.2 yd³/ft) and station 2895 (+53.8 yd³/ft) at the northern end of Folly Island. Both of these stations fell outside the project limits, hence the increase in sediment volume at these locations is evidence for longshore sediment dispersal. Monitoring stations do not exist at the extreme southern end of the island, but visual field observations also indicate substantial sediment accretion adjacent to the Stono River Inlet. According to Millard Dowd of the Army Corps of Engineers (Pers. Comm, 1995) longer offshore beach surveys that were conducted in conjunction with the project can account for 92% of the original fill out within the depth of closure (-12 feet MSL). However, there is little evidence to indicate that this sand will ever make its way back onshore to increase the volume of sand or the width of the high tide beach.

5. Acknowledgments

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Appendices

Appendix A. Beach survey data and tables for Seabrook Island.

Appendix B. Beach survey data and tables for Kiawah Island.

Appendix C. Beach survey data and tables for Folly Island.

Appendix A. Beach survey data and tables for Seabrook Island.

SEABROOK ISLAND
Unit Area Sediment Volumes
(yds³/ft)
(1990-1995)

STATION	Dec-90	Oct-91	May-92	Nov-92	May-93	Dec-93	May-94	Nov-94	May-95	Average Volume
2515	52.3	55.7	57.3	55.8	44.6	53.1	51.3	49.4	38.9	50.9
2520	66.9	48.7	41.8	19.8	18.5	20.4	13.7	16.6	19.6	29.6
2525	43.4	31.5	25.0	17.8	18.4	12.6	12.9	14.9	14.4	21.2
2527	61.0	24.8	26.1	31.3	17.1	10.1	7.4	7.2	12.6	22.0
2530	21.3	14.9	15.0	12.2	9.6	7.1	7.8	7.5	9.4	11.6
2540	22.8	22.2	22.5	24.9	22.9	35.5	18.9	23.0	19.6	23.6
2545	167.1*	167.1	192.6	168.8	160.5	153.3	158.8	156.0	179.7	167.1
2555	254.6	153.9	103.2	138.9	170.5	103.0	97.1	84.9	101.6	134.2
2565	237.4	151.3	113.0	123.9	128.9	110.5	85.1	134.9	94.5	131.1
2570	238.8	221.3	251.6	259.4	125.8	202.9	109.1	116.5	137.8	184.8
2575	151.7	210.6	169.1	168.3	181.7	160.5	173.7	173.7	173.7	173.7

* Numbers in bold indicate average unit area volumes substituted in place of missing data.

SEABROOK ISLAND
Unit Area Volume Change
(yds³/ft)
(1990-1995)

STATION	Dec-90 to Oct-91	Oct-91 to May-92	May-92 to Nov-92	Nov-92 to May-93	May-93 to Dec-93	Dec-93 to May-94	May-94 to Nov-94	Nov-94 to May-95
2515	3.4	1.6	-1.5	-11.2	8.5	4.8	-3.7	-10.5
2520	-18.2	-6.9	-22.0	-1.3	1.9	-6.7	2.9	3.0
2525	-11.9	-6.5	-7.2	0.6	-5.8	0.3	2.0	-0.5
2527	-36.2	1.3	5.2	-14.2	-7.0	-2.7	-0.2	5.4
2530	-6.4	0.1	-2.8	-2.6	-2.5	0.7	-0.3	1.9
2540	-0.6	0.3	2.4	-2.0	12.6	-16.6	4.1	-3.4
2545	ND	ND	-23.8	-8.3	-7.2	5.5	-2.8	23.7
2555	-100.7	-50.7	35.7	31.6	-67.5	-5.9	-12.2	16.7
2565	-86.1	-38.3	10.9	5.0	-18.4	-25.4	49.8	-40.4
2570	-17.5	30.3	7.8	-133.6	77.1	-93.8	7.4	21.3
2575	58.9	-41.5	-0.8	13.4	-21.2	ND	ND	ND

**Distances from Base Station to Landward Most Point
of Profile Calculations for Seabrook Island
(feet)**

Station #	Start distance from base station (ft)	Starting point for profile within the station profile
2515	65	Primary Dune
2520	35	Base of Seawall
2525	40	Base of Seawall
2527	52	Base of Seawall
2530	85	Base of Seawall
2540	40	Base of Seawall
2545	40	Base of Seawall
2555	340	Primary Dune
2565	780	Primary Dune
2570	240	Primary Dune
2575	254	Primary Dune

SEABROOK ISLAND
Sediment Budget
(1990-1995)

Average Unit Area Volume Change

	Dec-90	Oct-91	May-92	Nov-92	May-93	Dec-93	May-94	Nov-94	May-95	Cumulative Change
avg. unit area (cu. yds/ft)	115.	93.5	92.5	92.8	81.7	79.	56.4	61.1	62.8	
avg. unit area change (cu. yds/ft)		-21.5	-1.0	0.3	-11.1	-2.7	-22.6	4.7	1.7	-52.2

Sediment Volume Change

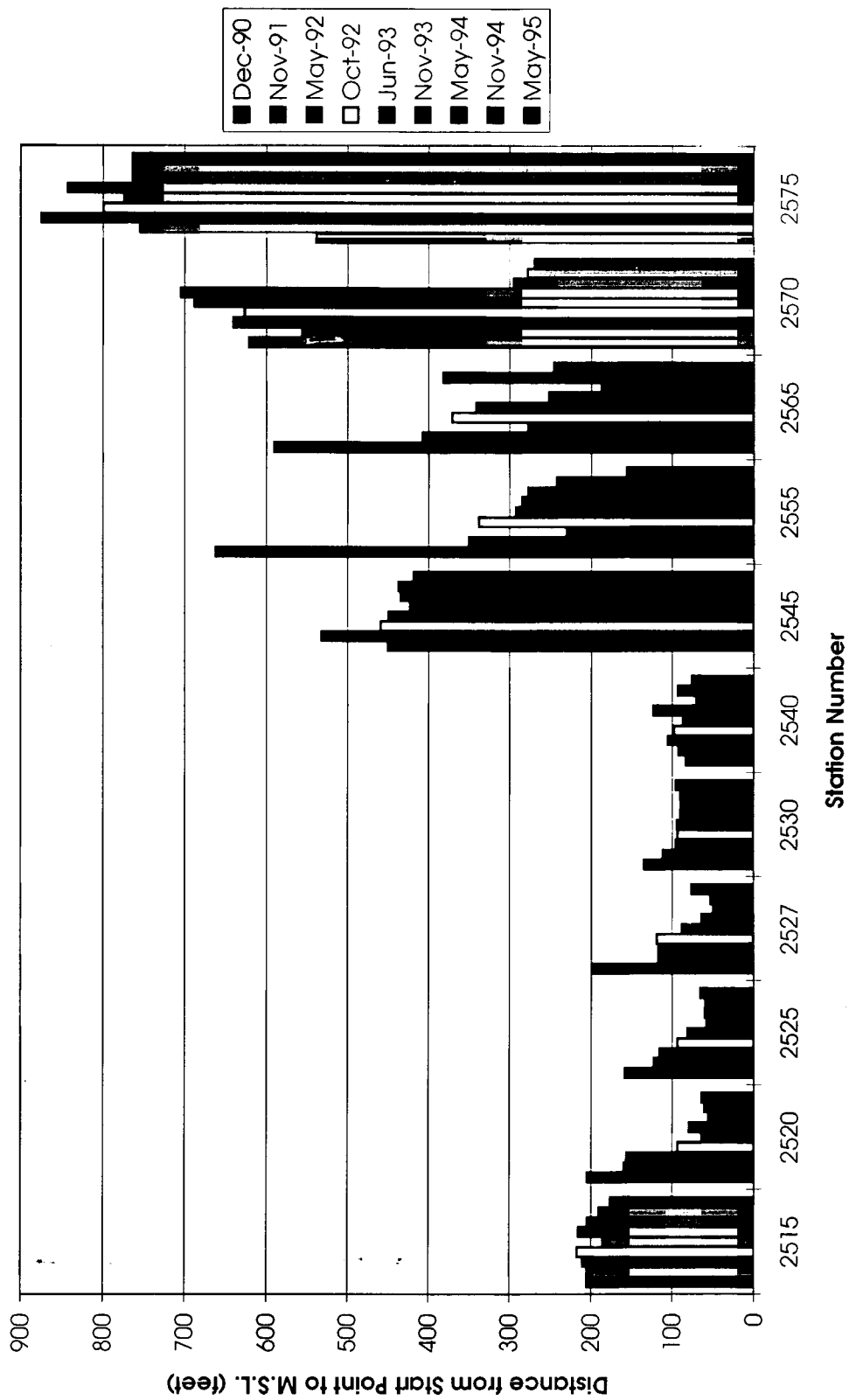
		Dec-90 to Oct-91	Oct-91 to May 92	May-92 to Nov-92	Nov-92 to May-93	May-93 to Dec-93	Dec-93 to May-94	May-94 to Nov-94	Nov-94 to May-95	
sed. volume (cu. yds)	908,681	738,590	730,553	733,354	645,303	624,116	402,331	435,865	448,082	
sed. volume change (cu. yds)		-170,092	-8,037	2,801	-88,052	-21,187	-221,784	33,533	12,218	-460,599

SEABROOK ISLAND
Shoreline Location
(1990-1995)
(Distance to M.S.L. in feet from Profile Starting Point)

STATION	Dec-90	Nov-91	May-92	Oct-92	Jun-93	Nov-93	May-94	Nov-94	May-95	Avg. Change Dec-90 to May-95 (ft/yr)	Overall Change (1990-1995)
2515	204.9	204.8	210.3	217.3	185.3	214.8	204.1	190	175.9	-4.8	-29
2520	204.8	159.2	155.7	93.2	64.2	78.8	55.6	60.2	64	-23.5	-140.8
2525	158	122.4	115.5	93.3	81.3	57.4	59.9	58.8	65.2	-15.5	-92.8
2527	198.5	116.8	116.9	118.6	87.9	63.7	49.2	52.8	76.2	-20.4	-122.3
2530	134.8	111.5	95.3	93.4	94.2	89.9	89.4	89.7	95.2	-6.6	-39.6
2540	83.3	92.3	105.3	97.7	86.7	122.9	69.9	93	75.9	-1.2	-7.4
2545	450.3 *	450.3	531.6	459.2	449.6	422.6	434.5	436.7	417.9	-19.0	-113.7
2555	661.4	349.5	229.2	337.6	292.2	284.6	277.2	242	155.5	-84.3	-505.9
2565	590	407	277.1	370.6	341	251.7	186.8	381.1	245.6	-57.4	-344.4
2570	621.2	555.9	640.5	626.6	687.6	704.5	294.5	278.5	270.1	-58.5	-351.1
2575	538.5	754.1	874.4	798.8	773.6	842.1	763.6	763.6	763.6	50.6	303.6
Average Shoreline Migration										-21.9 ft/yr	

* Numbers in bold indicate averaged distances.

SEABROOK ISLAND
Distances to M.S.L. (in feet) from Start Point
(1990-1995)



Shoreline migration on Seabrook Island.

SEABROOK ISLAND
Station 2515
(1990-1995)

12/14/90			11/21/92			9/5/94	
Distance	Elevation		Distance	Elevation		Distance	Elevation
0.00	7.87		0	7.87		0	7.87
18.00	6.78		13	8.49		11	8.22
47.00	6.10		26	6.37		25	6.22
56.00	7.17		52	7.60		46	6.44
105.00	6.52		82	6.25		54	8.59
126.00	5.16		107	6.93		65	6.47
154.00	3.97		135	4.85		99	4.78
220.00	-1.18		174	3.72		122	3.83
237.00	-6.87		211	1.16		175	1.04
			218	-0.10		242	-1.9
			255	-3.50		266	-4.17
10/27/91						283	-5.65
Distance	Elevation						
0.00	7.87		5/21/93				
17.00	6.80		Distance	Elevation		11/5/94	
44.00	6.34		0	7.87		Distance	Elevation
58.00	6.69		10	8.41		0	7.87
102.00	6.38		16	6.79		22	6.03
104.00	5.89		46	6.46		49	7.91
139.00	6.52		55	7.36		61	4.97
201.00	0.37		103	5.08		101	3.91
239.00	-3.36		140	2.17		186	1.49
			184	0.06		253	-2.31
			221	-1.94		295	-6.17
			249	-4.84			
5/18/92						5/11/95	
Distance	Elevation					Distance	Elevation
0	7.87		12/12/93			0	7.87
16	6.98		Distance	Elevation		24	6.14
45	6.72		0	7.87		48	8.56
59	6.78		11	8.34		60	4.59
124	6.58		25	6.19		90	3.25
146	4.88		45	6.43		150	1.54
195	0.79		52	7.75		200	-1.44
231	-1.05		64	6.42		248	-3.22
256	-4.09		97	5.59		258	-5.41
			126	5.27		270	-6.59
			136	3.75			
			213	0.14			
			245	-2.08			
			267	-4.22			

SEABROOK ISLAND
Station 2530
(1990-1995)

12/14/90			5/21/93			5/9/94	
Distance	Elevation		Distance	Elevation		Distance	Elevation
0.00	10		0	10.00		0	10.00
70.00	9.46		10	9.36		50	9.38
80.00	2.99		55	5.85		54	6.20
118.00	0.74		69	6.04		71	9.58
151.00	-1.38		71	9.55		92	-1.27
244.00	-4.76		99	0.38		110	-1.62
			125	-1.93		153	-3.75
			159	-3.90		172	-5.26
10/27/91			194	-5.52			
Distance	Elevation					11/5/94	
0	10				Distance	Elevation	
58	9.35		12/12/93		0	10	
72	9.58		Distance	Elevation	35	9.73	
87	0.78		0	10.00	62	5.97	
136	-0.98		51	9.37	67	9.41	
202	-4.95		53	5.99	89	-0.85	
			67	6.09	139	-3.07	
			69	9.58	182	-7.12	
5/18/92			92	-0.89	201	-7.88	
Distance	Elevation		124	-2.66			
0	10.00		157	-4.50			
68	7.80		203	-6.70			
71	9.59				9/5/95		
95	0.31				Distance	Elevation	
147	-1.36		5/9/94		0	10	
222	-5.31		Distance	Elevation	22	9.78	
			0	10	34	9.71	
			50	9.38	34	8.04	
11/21/92			54	6.2	54	6.89	
Distance	Elevation		71	9.58	64	5.87	
0	10.00		92	-1.27	68	10.07	
35	9.74		110	-1.62	96	-0.36	
62	6.44		153	-3.75	172	-4.92	
70	9.51		172	-5.26	180	-4.99	
85	0.62						
120	-0.73						
134	-1.91						
197	-4.99						

SEABROOK ISLAND
Station 2540
(1990-1995)

12/14/90		5/21/93		11/5/94	
Distance	Elevation	Distance	Elevation	Distance	Elevation
0.00	13.14	0	13.14	0	13.14
6.00	13.53	8	12.81	8	12.59
43.00	2.12	21	1.67	46	0.99
72.00	0.71	80	0.21	73	0.77
118.00	-1.24	123	-1.09	182	-3.62
340.00	-4.87	190	-3.80	239	-6.7
		223	-5.62		
10/27/91		12/12/93		9/5/95	
Distance	Elevation	Distance	Elevation	Distance	Elevation
0	13.14	0	13.14	0	13.14
45	1.49	8	12.77	54	0.95
76	0.67	48	1.47	120	-1.93
131	-1.6	117	-2.62	156	-3.64
192	-4.59	160	-4.43	194	-4.23
		200	-6.77	203	-4.99
5/18/92		5/9/94			
Distance	Elevation	Distance	Elevation		
0	13.14	0	13.14		
4	13.35	7	12.78		
43	0.88	43	0.49		
98	0.24	92	-0.5		
138	-1.04	123	-2.01		
160	-2.29	174	-3.85		
203	-5.25	197	-3.54		
11/21/92					
Distance	Elevation				
0	13.14				
9	12.48				
40	-0.31				
96	0.09				
158	-1.66				
210	-4.46				

SEABROOK ISLAND
Station 2545
(1990-1995)

5/18/92		12/12/93		5/9/95	
Distance	Elevation	Distance	Elevation	Distance	Elevation
0	11.13	0	11.13	0	11.13
18	13.56	14	13.83	18	13.48
39	8.56	39	8.44	56	8.92
70	6.37	91	6.25	102	5.87
145	7.16	160	6.46	162	6.36
234	5.04	223	8.57	204	8.37
303	6.42	246	5.66	232	6.17
367	3.84	314	2.13	280	3.77
455	1.64	393	0.54	316	2.33
547	-0.34	478	-0.96	388	1.48
640	-3.88	510	-2.57	422	-0.2
		582	-5.06	504	-2.95
		664	-6.36	544	-4.23
				574	-4.89
				578	-4.99
12/21/92		5/9/94			
Distance	Elevation	Distance	Elevation		
0	11.13	0	11.13		
16	13.46	13	13.88		
40	8.41	37	9.05		
57	8.90	95	5.73		
72	6.43	217	8.73		
145	5.82	235	6.31		
241	7.05	264	4.67		
380	1.63	375	1.19		
502	-0.90	449	-0.28		
590	-3.47	525	-2.94		
		554	-3.86		
5/20/93		11/5/94			
Distance	Elevation	Distance	Elevation		
0	11.13	0	11.13		
12	14.00	16	13.49		
40	8.51	55	8.05		
80	6.16	115	5.89		
151	6.39	169	6.53		
221	7.05	212	7.57		
285	4.53	226	6.35		
315	4.13	308	2.26		
383	1.66	401	1.07		
435	0.64	525	-3.14		
507	-2.58	560	-6.3		
571	-4.48	618	-7.2		

SEABROOK ISLAND
Station 2555
(1990-1995)

12/14/90		5/18/92		5/20/93		5/9/94		5/9/95	
Distance	Elevation	Distance	Elevation	Distance	Elevation	Distance	Elevation	Distance	Elevation
0.00	12.31	0	12.31	0	12.31	0	12.31	0	12.31
18.00	12.07	15	12.10	17	12.08	17	12.16	16	12.06
47.00	7.24	40	7.06	34	6.15	36	6.73	40	7.37
56.00	6.06	77	7.85	67	7.68	84	6.49	91	6.53
74.00	8.19	108	5.07	125	5.20	154	5.25	324	5.55
153.00	5.30	217	5.55	205	5.65	250	5.06	362	6.55
216.00	6.25	262	5.04	288	5.35	340	8.37	391	9.12
335.00	7.12	346	7.86	350	8.51	521	5.21	552	5.78
393.00	6.33	465	5.27	432	5.10	624	8.07	597	7.16
429.00	5.56	633	7.26	553	8.15	641	10.41	613	5.15
486.00	5.85	718	6.92	592	6.07	664	6.42	662	2.59
583.00	5.74	739	2.81	644	7.14	707	4.35	719	1.88
662.00	6.49	814	1.02	702	4.42	768	1.88	747	1.26
697.00	5.77	924	-1.23	783	2.17	854	0.79	775	1.11
858.00	2.12	995	-2.38	855	1.14	944	-0.4	815	0.12
932.00	-0.59	1082	-2.94	885	0.28	991	-1.15	922	-2.15
986.00	0.48	1195	-5.52	916	0.13	1094	-4.08	984	-4.32
1061.00	-0.82	1290	-6.39	964	-0.18	1131	-5.3		
1242.00	-4.62			1054	-2.05				
		11/21/92		1165	-4.94	11/5/94			
		Distance	Elevation			Distance	Elevation		
10/27/91		0	12.31	12/12/93		0	12.31		
Distance	Elevation	17	12.09	Distance	Elevation	16	12.11		
0	12.31	38	7.17	0	12.31	40	7.29		
16	12.17	79	7.84	16	12.14	636	7.92		
36	7	160	5.00	33	6.64	650	5.86		
77	7.94	235	5.91	79	7.73	696	3.02		
143	5.29	342	7.70	150	5.33	743	1.64		
225	5.74	446	6.31	232	5.57	816	0.96		
341	7.16	525	5.25	301	5.41	1050	0.17		
384	8.38	681	6.81	347	9.65	1130	-1.21		
487	5.42	734	6.54	371	6.34	1204	-3.42		
585	5.36	831	3.29	452	5.22	1268	-5.64		
648	6.74	972	0.68	580	7.60				
707	6.87	1088	-1.04	604	5.51				
773	3.61	1271	-3.39	641	8.46				
857	1.86			662	6.57				
905	1.1			758	2.31				
940	-0.38			843	0.85				
1001	-0.3			932	-0.62				
1156	-1.88			1005	-0.86				
1205	-4.86			1070	-2.10				
				1117	-3.64				
				1172	-5.62				
				1190	-7.07				

**SEABROOK ISLAND
Station 2570
(1990-1995)**

12/14/90		11/21/92		12/12/93		11/5/94	
Distance	Elevation	Distance	Elevation	Distance	Elevation	Distance	Elevation
0.00	10.42	0	10.42	0	10.42	0	10.42
49.00	7.13	16	7.73	58	7.04	238	10.47
97.00	4.97	66	6.30	128	5.21	271	7.14
145.00	5.43	112	4.76	211	7.52	329	11.28
212.00	6.90	183	6.07	252	6.67	347	7.68
330.00	6.82	207	7.98	278	9.08	402	2.6
395.00	4.12	282	7.11	308	9.15	464	5.31
484.00	1.90	317	7.32	328	6.28	569	3.06
570.00	0.43	384	5.10	381	6.27	651	1.23
590.00	0.69	468	2.93	406	5.06	702	-0.84
668.00	-1.06	571	0.94	461	2.90	802	-3.04
791.00	-4.35	657	-0.52	501	2.04	978	-4.26
		862	-3.26	608	0.19		
				662	-0.23		
10/27/91		5/20/93		5/9/94		5/9/95	
Distance	Elevation	Distance	Elevation	Distance	Elevation	Distance	Elevation
0	10.42	0	10.42	781	-3.68	0	10.42
15	7.64	33	6.90	934	-5.89	184	6.85
47	9.43	49	9.38	974	-6.37	214	7.32
107	4.49	130	4.98			230	10.34
155	5.06	182	5.69			260	7.19
198	8.4	195	7.92			278	7.65
224	8.78	245	6.61			296	11.31
273	6.51	297	9.66	0	10.42	311	8.03
300	7.02	330	5.84	22	7.76	351	5.88
360	3.61	483	4.83	57	7.11	415	5.06
446	1.49	532	3.55	77	5.44	474	3.4
531	0.75	633	1.49	140	5	544	2.14
588	-0.97	728	-0.22	188	5.85	608	1.05
704	-4.01	755	-0.10	223	7.85	631	1.58
		793	-0.65	254	6.67	660	1.19
		843	-1.64	290	9.17	756	-1.92
5/18/92				340	6.52	808	-3.76
Distance	Elevation			396	4.77		
0	10.42			476	2.38		
36	6.96			528	1.38		
48	9.12			592	0.56		
78	5.32			670	-0.64		
125	4.76			753	-2.25		
277	6.71			858	-5.25		
311	6.36			974	-5.75		
379	4.77						
465	2.40						
542	1.20						
598	0.69						
713	-1.18						
828	-2.75						
897	-3.98						

**SEABROOK ISLAND
Station 2575
(1990-1995)**

12/14/90		5/18/92		5/18/93	
Distance	Elevation	Distance	Elevation	Distance	Elevation
0.00	10.98	0	10.98	0	10.98
53.00	5.98	33	7.43	23	9.29
113.00	4.48	63	5.43	51	6.49
254.00	6.43	117	4.50	93	4.89
355.00	2.68	223	7.72	145	5.24
440.00	1.45	266	5.37	186	6.43
535.00	0.55	332	2.90	203	6.36
539.00	-0.75	368	0.59	254	4.83
626.00	-0.39	420	1.80	340	3.25
690.00	-0.98	519	1.87	351	1.12
786.00	-4.35	603	1.12	365	0.51
		685	1.96	390	2.12
		818	0.47	489	1.96
		873	-3.00	591	1.76
		881	-3.14	709	0.39
				759	0.17
				943	-1.94
				1059	-5.22
10/27/91		11/21/92		12/12/93	
Distance	Elevation	Distance	Elevation	Distance	Elevation
0	10.98	0	10.98	0	10.98
46	6.76	44	6.86	19	10.56
96	4.81	100	4.71	43	6.82
141	5.07	218	6.78	87	5.06
173	5.68	266	5.40	147	5.72
224	7.26	308	3.77	191	6.37
263	6.5	319	1.79	220	7.16
278	5.69	343	0.86	231	1.78
309	6.16	381	1.50	319	1.06
349	4.8	393	2.67	364	1.26
423	2.03	489	2.78	429	1.42
491	2.85	591	1.30	486	2.04
589	2.05	636	0.25	549	1.85
689	0.81	709	1.00	621	1.70
756	-0.05	821	-0.32	696	1.28
899	-0.65	956	-3.10	786	0.72
1109	-2.21			870	-0.36
				955	-2.29
				1022	-3.87
				1104	-5.98

Appendix B. Beach survey data and tables for Kiawah Island.

KIAWAH ISLAND
Unit Area Sediment Volumes (yd³/ft)
(1990-1995)

STATION	Dec-90	Nov-91	May-92	Oct-92	June-93	Nov-93	May-94	Dec-94	May-95	average unit area volume (1990-1995)
2785	486.72	488.98	421.48*	421.48*	421.48*	467.76	421.48*	328.78	335.19	421.48
2780	389.13*	389.13*	389.13*	359.86	360.40	428.39	429.09	380.28	376.81	389.13
2775	147.14	160.23	162.40	190.01	177.73	219.37	216.72	264.09	217.24	194.99
2760	130.41	130.31	123.06	125.96	105.96	115.60	108.26	126.61	133.64	122.20
2750	137.50	150.38	147.34	144.27	143.44	149.11	141.34	153.10	139.04	145.06
2745B	142.15*	142.15*	100.79	154.66	140.50	124.44	159.99	153.35	161.36	142.15
2735	271.16	284.31	293.49	302.26	279.48	284.94	298.65	304.85	290.38	289.95
2730	253.46	274.65	268.81	283.72	277.89	289.15	303.44	277.06	288.09	279.59
2725	234.64	259.70	261.07	269.74	256.32	259.24	252.72	277.62	262.68	259.30
2720	204.14	232.28	219.98	245.05	220.96	234.04	232.24	229.27	235.47	228.16
2715	173.23	204.95	198.16	204.33	188.49	201.00	206.47	227.48	214.77	202.10
2705	180.22	196.48	201.37	201.84	188.69	207.74	206.95	211.69	201.22	199.58
2700	144.49	169.43	165.67	166.26	161.81	170.52	164.14	162.97	162.97	163.14
2695	169.14*	167.36	165.11	172.09	162.13	172.11	164.14	175.00	175.17	169.14
2690	162.14	176.26	161.01	162.70	197.26	163.03	167.53	172.76	160.65	169.26
2685	131.41*	138.42	132.74	136.11	110.63	134.37	129.42	143.18	126.47	131.41
2680	137.30	139.58	140.12	140.08	124.42	132.31	117.73	128.34	117.37	130.81
2675	125.58*	124.31	133.96	129.91	120.73	145.22	117.82	113.55	119.19	125.58
2665	128.49	138.05	129.10	134.59	127.17	128.96	124.95	123.92	123.02	128.69
2660	142.82	155.17	155.69	154.03	147.60	155.04	143.67	143.73	140.34	148.68
2645	142.99	141.66	145.20	153.45	131.16	135.91	134.38	135.70	120.01	137.83
2640	157.03	177.84	166.42*	175.75	168.19	171.19	162.63	154.56	164.23	166.42
2630	202.11	213.45	211.46	226.61	206.39	217.78	205.32	207.71	216.64	211.94
2625	202.48	231.62	213.24	220.07	220.22	220.70	213.06	218.98	205.04	216.16
2620	144.07	157.23	151.19	156.92	152.36	152.05	148.92	149.28	151.84	151.54
2615	174.24	200.01	182.81	213.90	180.02	189.66	180.02	196.63	205.62	191.43

Numbers in bold indicate average unit area volumes substituted in place of missing data.

KIAWAH ISLAND
Unit Area Sediment Volume Changes (yd³/ft)
(1990-1995)

STATION	Dec-90 to Nov-91	Nov-91 to May-92	May-92 to Oct-92	Oct-92 to June-93	June-93 to Nov-93	Nov-93 to May-94	May-94 to Dec-94	Dec-94 to May-95	Cumulative change Dec-90 to May-95
2785	2.26	ND	ND	ND	-21.22†	ND	-138.98††	6.41	-151.53
2780	ND	ND	-29.27	0.54	67.99	0.70	-48.81	-3.47	-12.32
2775	13.09	2.17	27.61	-12.28	41.64	-2.65	47.37	-46.85	70.10
2760	-0.10	-7.25	2.90	-20.00	9.64	-7.34	18.35	7.03	3.23
2750	12.88	-3.04	-3.07	-0.83	5.67	-7.77	11.76	-14.06	1.54
2745B	ND	-41.36	53.87	-14.16	-16.06	35.55	-6.64	8.01	19.21
2735	13.15	9.18	8.77	-22.78	5.46	13.71	6.20	-14.47	19.22
2730	21.19	-5.84	14.91	-5.83	11.26	14.29	-26.38	11.03	34.63
2725	25.06	1.37	8.67	-13.42	2.92	-6.52	24.90	-14.94	28.04
2720	28.14	-12.30	25.07	-24.09	13.08	-1.80	-2.97	6.20	31.33
2715	31.72	-6.79	6.17	-15.84	12.51	5.47	21.01	-12.71	41.54
2705	16.26	4.89	0.47	-13.15	19.05	-0.79	4.74	-10.47	21.00
2700	24.94	-3.76	0.59	-4.45	8.71	-6.38	-1.17	ND	18.48
2695	-1.78	-2.25	6.98	-9.96	9.98	-7.97	10.86	0.17	6.03
2690	14.12	-15.25	1.69	34.56	-34.23	4.50	5.23	-12.11	-1.49
2685	7.01	-5.68	3.37	-25.48	23.74	-4.95	13.76	-16.71	-4.94
2680	2.28	0.54	-0.04	-15.66	7.89	-14.58	10.61	-10.97	-19.93
2675	-1.27	9.65	-4.05	-9.18	24.49	-27.40	-4.27	5.64	-6.39
2665	9.56	-8.95	5.49	-7.42	1.79	-4.01	-1.03	-0.90	-5.47
2660	12.35	0.52	-1.66	-6.43	7.44	-11.37	0.06	-3.39	-2.48
2645	-1.33	3.54	8.25	-22.29	4.75	-1.53	1.32	-15.69	-22.98
2640	20.81	-11.42	9.33	-7.56	3.00	-8.56	-8.07	9.67	7.20
2630	11.34	-1.99	15.15	-20.22	11.39	-12.46	2.39	8.93	14.53
2625	29.14	-18.38	6.83	0.15	0.48	-7.64	5.92	-13.94	2.56
2620	13.16	-6.04	5.73	-4.56	-0.31	-3.13	0.36	2.56	7.77
2615	25.77	-17.20	31.09	-33.88	9.64	-9.64	16.61	8.99	31.38

† Volume change for November 1991 to November 1993.
†† Volume change for November 1993 to December 1994.

KIAWAH ISLAND
Sediment Budget
(1990-1995)

	Dec-90	Nov-91	May-92	Oct-92	June-93	Nov-93	May-94	Dec-94	May-95	Cumulative change Dec-90 to May-95
avg. unit area (yd ³ /ft)	189.71	201.69	193.88	202.04	191.21	202.68	198.12	198.48	194.02	
avg. unit area change (yd ³ /ft)		11.98	-7.81	8.16	-10.83	11.47	-4.56	0.36	-4.46	4.30
sed. volume (yd ³ /ft)	9,295,614	9,882,514	9,499,700	9,899,629	9,368,939	9,930,901	9,707,499	9,725,221	9,506,538	
sed. volume change (yd ³ /ft)		586,900	-382,814	399,929	-530,690	561,963	-223,403	17,722	-218,684	210,923

KIAWAH ISLAND
Shoreline location
(Distance to M.S.L. in feet)
(1990-1995)

STATION	Dec-90	Nov-91	May-92	Oct-92	Jun-93	Nov-93	May-94	Dec-94	May-95
2785	1478	1580	ND	ND	ND	1452	ND	962	972
2780	ND	ND	ND	1142	1112	1159	1132	1083	1062
2775	398	304	521	440	499	526	460	511	557
2765	ND	ND	295	332	ND	ND	ND	ND	ND
2760	317	345	334	369	314	244	298	399	319
2745b	ND	ND	182	401	359	263	356	343	312
2735	664	715	628	588	555	580	584	744	634
2730	589	541	538	670	675	675	732	530	620
2725	593	565	595	600	531	532	581	542	611
2720	416	584	525	668	466	523	526	595	497
2715	470	397	483	501	400	456	503	610	486
2705	393	448	435	421	413	465	462	441	461
2700	315	401	330	379	387	416	387	430	319
2695	655	385	403	413	336	418	318	341	424
2690	317	356	281	ND	378	328	362	310	338
2685	ND	339	319	325	256	308	316	275	310
2680	335	319	309	342	306	290	219	263	258
2675	ND	324	307	303	285	383	279	269	293
2665	253	285	234	290	301	229	298	273	295
2660	357	393	372	345	287	347	335	270	283
2645	260	301	316	352	319	305	323	271	266
2640	396	399	ND	391	398	359	378	370	357
2630	467	454	400	508	408	446	447	396	483
2625	503	458	519	529	466	507	481	495	478
2620	366	341	294	389	285	304	333	335	317
2615	447	437	453	470	422	379	422	381	469

KIAWAH ISLAND
Shoreline change
(Distance to M.S.L. in feet)
(1990-1995)

STATION	Dec-90 to Nov- 91	Nov-91 to May-92	May-92 to Oct-92	Oct-92 to June- 93	June-93 to Nov- 93	Nov-93 to May- 94	May-94 to Dec- 94	Dec-94 to May- 95	Avg. Change Dec- 90 to May- 95
2785	101.2	ND	ND	ND	ND	ND	ND	0.0	50.6
2780	ND	ND	ND	-29.4	46.6	-27.2	-48.7	-21.5	-16.0
2775	-94.0	217.1	-81.0	58.7	27.3	-66.3	51.0	117.3	28.8
2765	ND	ND	37.0	ND	ND	ND	ND	ND	37.0
2760	27.7	-10.9	35.1	-54.9	-70.7	54.7	100.6	45.9	15.9
2745b	ND	ND	219.0	-42.1	-95.7	93.5	-13.4	-106.9	9.1
2735	50.6	-86.6	-39.9	-32.7	24.5	4.6	159.6	155.0	29.4
2730	-47.3	-3.8	132.7	4.9	0.0	56.9	-202.1	-259.0	-39.7
2725	-27.9	30.1	5.0	-68.9	1.1	48.6	-38.5	-87.1	-17.2
2720	168.3	-59.0	143.1	-202.5	57.2	2.6	69.3	66.7	30.7
2715	-73.2	86.8	18.1	-101.3	56.3	46.8	106.8	60.0	25.0
2705	54.2	-12.9	-13.5	-8.1	51.7	-3.2	-20.5	-17.3	3.8
2700	85.5	-70.6	49.3	7.2	29.7	-29.4	43.2	72.6	23.4
2695	-270.8	18.8	9.5	-76.6	81.5	-100.2	23.5	123.7	-23.8
2690	39.2	-75.1	ND	ND	-50.0	34.0	-51.7	-85.7	-31.6
2685	ND	-20.2	6.5	-68.8	51.3	8.6	-41.3	-49.9	-16.3
2680	-15.7	-10.8	33.3	-36.0	-16.2	-70.3	43.6	113.9	5.2
2675	ND	-17.6	-3.8	-17.7	97.6	-104.2	-9.6	94.6	5.6
2665	31.9	-50.4	55.6	10.8	-71.2	68.2	-24.5	-92.7	-9.0
2660	36.1	-21.4	-26.7	-58.1	60.4	-12.1	-65.1	-53.0	-17.5
2645	41.3	14.4	36.6	-32.9	-14.0	17.1	-51.5	-68.6	-7.2
2640	3.1	ND	ND	7.3	-39.5	19.5	-8.0	-27.5	-7.5
2630	-13.4	-53.8	107.6	-99.6	37.8	1.4	-51.3	-52.7	-15.5
2625	-45.0	61.6	9.1	-62.4	41.0	-26.6	14.5	41.1	4.2
2620	-25.1	-47.2	95.4	-104.8	19.6	28.4	2.4	-26.0	-7.2
2615	-10.5	15.7	17.0	-47.2	-43.2	43.2	-41.4	-84.6	-18.9

KIAWAH ISLAND
Station 2615
(1990-1995)
(all values in feet)

121290			231191			28 592			241092			131193	
distance	elevation		distance	elevation		distance	elevation		distance	elevation		distance	elevation
0.0	12.7		0.0	12.7		0.0	12.7		0.0	12.7		0.0	12.7
24.0	8.5		56.1	8.0		16.1	8.6		12.1	9.1		5.9	10.9
65.0	8.1		86.0	13.4		84.0	13.3		38.1	9.1		18.0	8.7
84.0	13.3		140.1	7.9		107.0	9.0		68.9	7.9		37.1	9.2
111.9	8.0		169.9	6.6		213.9	5.5		86.0	14.4		59.1	8.0
160.1	6.1		237.2	4.0		263.1	2.8		166.0	7.3		86.0	13.4
210.0	4.6		300.2	2.6		315.9	0.9		205.1	4.6		123.0	8.2
266.1	2.7		400.3	0.9		354.0	0.8		269.0	3.0		136.2	10.1
330.1	0.9		537.1	-2.3		384.2	0.6		385.2	1.2		148.0	7.4
367.1	0.0		709.3	-3.8		442.3	0.3		443.2	0.7		182.1	5.6
419.9	0.5		790.4	-4.8		488.2	-1.0		515.1	-1.2		232.9	3.8
480.0	-0.6					541.0	-3.3		676.2	-2.8		324.1	2.3
600.1	-5.1											390.1	-0.5
												413.1	-1.0
												445.2	-0.4
												513.1	-1.0
												591.2	-2.8
												758.2	-5.5
1 693			5 594			31294			23 595				
distance	elevation		distance	elevation		distance	elevation		distance	elevation			
0.0	12.7		0.0	12.7		0	12.7		0.0	12.7			
62.0	8.1		62.0	8.1		66	8.2		14.1	8.8			
86.9	12.1		86.9	12.1		84	13.0		68.9	8.4			
131.9	8.3		131.9	8.3		104	8.7		86.9	13.3			
139.1	6.8		139.1	6.8		126	8.6		102.0	9.1			
171.9	5.7		171.9	5.7		137	11.7		127.0	8.6			
219.2	4.4		219.2	4.4		155	7.9		139.1	12.1			
311.0	2.0		311.0	2.0		261	3.3		151.9	8.9			
397.0	0.5		397.0	0.5		355	1.6		190.0	6.3			
490.2	-1.3		490.2	-1.3		395	-0.8		245.1	5.8			
523.3	-2.8		523.3	-2.8		419	-1.6		316.9	2.7			
570.2	-4.2		570.2	-4.2		441	-1.1		388.1	1.2			
594.2	-4.1		594.2	-4.1		490	-0.1		419.9	0.2			
694.2	-5.8		694.2	-5.8		635	-3.7		456.0	0.2			
						846	-5.5		503.9	-0.7			
									586.9	-3.0			
									707.0	-3.4			

KIAWAH ISLAND
Station 2645
(1990-1995)

121290			231191			28 592			241092			1 693	
distance	elevation		distance	elevation		distance	elevation		distance	elevation		distance	elevation
0.00	16.57		0.00	16.57		0.00	16.57		0.00	16.57		0.00	16.57
28.87	8.40		15.09	8.46		29.86	8.50		5.91	12.76		29.86	8.17
55.12	9.97		62.99	11.32		61.02	13.58		29.86	8.17		46.92	10.79
77.10	8.60		73.16	9.22		90.88	7.28		45.93	10.96		64.96	11.88
85.96	6.17		86.94	8.14		119.09	5.18		61.02	9.94		72.18	6.53
104.99	4.89		93.18	6.40		171.92	4.23		64.96	11.65		88.91	5.25
166.01	1.80		129.92	4.53		227.03	2.40		76.12	9.74		100.07	6.00
			183.07	2.99		314.96	0.03		96.13	7.25		180.12	2.53
			226.05	2.07		349.08	-1.48		158.14	3.51		266.08	0.46
			292.98	0.56		401.25	-1.05		187.99	2.40		346.13	-0.23
			328.08	-1.80		484.25	-3.48		280.18	1.64		431.10	-2.40
			421.26	-1.15		531.50	-5.09		342.19	0.43		507.22	-4.76
			527.23	-3.08					356.96	-0.20		612.20	-4.46
			676.18	-6.33					486.22	-2.49		731.30	-7.12
									531.17	-3.58			
									585.30	-3.64			
									639.11	-4.33			
131193			5 594			31294			23 595				
distance	elevation		distance	elevation		distance	elevation		distance	elevation			
0.00	16.57		0.00	16.57		0.00	16.57		0.00	16.57			
29.86	8.60		21.00	9.15		32.00	8.55		30.84	8.69			
62.01	11.19		62.99	11.12		64.00	11.61		46.92	10.79			
79.07	6.92		69.88	7.94		79.00	6.62		56.10	10.17			
113.19	4.49		102.03	5.15		160.00	3.23		69.88	7.48			
221.13	1.90		163.06	2.40		241.00	1.58		104.00	5.61			
285.10	0.16		245.08	1.02		277.00	-0.27		170.93	2.46			
350.07	-0.36		308.07	0.30		324.00	-2.26		229.00	0.23			
472.11	-3.05		388.12	-1.35		353.00	-0.69		262.14	0.16			
556.10	-4.04		463.25	-2.33		416.00	-0.89		311.02	-1.80			
602.03	-4.82		519.03	-4.27		483.00	-2.41		352.03	-2.00			
700.13	-6.79		580.05	-5.28		488.00	-4.63		390.09	-2.66			
			639.11	-5.84		642.00	-5.04		496.06	-4.43			
						787.00	-7.64		669.95	-6.73			

KIAWAH ISLAND
Station 2665
(1990-1995)

121290			231191			28 592			241092			1 693	
distance	elevation		distance	elevation		distance	elevation		distance	elevation		distance	elevation
0.00	16.63		0.00	16.63		0.00	16.63		0.00	16.63		0.00	16.63
21.00	10.86		23.95	10.83		26.90	11.06		20.01	11.48		26.90	10.76
43.96	15.03		42.98	15.78		42.98	15.81		43.96	15.62		43.96	15.85
106.96	3.97		63.98	7.97		70.87	6.86		61.02	8.83		58.07	6.07
145.01	2.66		68.90	6.59		90.88	5.28		70.87	6.36		110.89	5.71
207.02	1.74		117.13	4.40		108.92	4.53		113.19	3.64		182.09	1.71
268.04	-0.59		180.12	2.72		147.97	2.40		147.97	2.59		200.13	0.07
293.96	-1.25		245.08	0.82		241.14	-0.20		196.19	1.90		213.91	0.56
336.94	-0.59		334.97	-1.05		267.06	-0.23		251.97	0.69		283.14	0.26
370.08	-1.41		411.09	-1.35		335.96	-0.89		320.21	-0.56		333.01	-0.49
471.13	-4.17		498.03	-3.12		449.15	-2.79		431.10	-2.82		419.95	-2.10
			648.29	-6.07					537.07	-3.44		504.27	-6.04
									588.25	-4.23		607.28	-5.09
												712.27	-6.43
131193			5 594			41294			2665			23 595	
distance	elevation		distance	elevation		distance	elevation		distance	elevation		distance	elevation
0.00	16.63		0.00	16.63		0	16.64		0.00	16.63			
22.97	11.02		26.90	11.09		28	10.5		28.87	10.83			
42.98	15.49		42.98	15.35		40	15.35		40.03	12.80			
59.06	6.73		61.02	6.66		55	5.75		49.87	7.02			
135.17	3.22		138.12	2.53		145	1.85		81.04	5.15			
211.94	0.75		213.91	1.25		212	1.65		199.15	1.61			
245.08	-0.69		284.12	0.30		289	-0.43		265.09	0.43			
291.99	-0.30		342.19	-0.98		357	-1.38		311.02	-0.52			
386.15	-1.35		384.19	-1.94		403	-1.76		373.03	-1.57			
460.96	-3.35		474.08	-3.81		457	-2.98		446.85	-2.82			
519.03	-4.27		498.03	-5.58		520	-4.37		530.84	-4.79			
611.22	-4.00		559.06	-5.02		588	-4.51		614.83	-6.76			
665.03	-5.61					646	-5.44						
709.32	-6.20					735	-7.48						

KIAWAH ISLAND

Station 2675

(1990-1995)

231191		28 592		241092		1 693			
distance	elevation	distance	elevation	distance	elevation	distance	elevation		
0.00	13.52	0.00	13.52	0.00	13.52	0.00	13.52		
25.92	14.80	17.06	13.48	12.14	13.39	12.14	13.45		
54.13	6.56	25.92	15.09	24.93	14.70	27.89	13.71		
98.10	4.10	38.06	8.50	46.92	7.81	55.12	5.81		
163.06	1.71	54.13	6.79	58.07	6.73	118.11	3.94		
213.91	1.57	95.14	4.79	127.95	3.02	205.05	1.87		
318.24	0.13	113.19	4.30	192.91	1.64	333.01	-1.12		
416.01	-2.00	150.92	2.00	278.22	0.39	427.17	-2.69		
500.98	-4.17	199.15	2.30	344.16	-0.66	510.17	-5.28		
678.15	-6.50	242.13	1.67	411.09	-2.17	658.14	-5.15		
		342.19	-0.92	535.10	-3.87				
		451.12	-2.40	580.05	-4.30				
		652.56	-5.09	639.76	-5.09				
131193		5 594		41294		2675		23 595	
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	13.52	0.00	13.52	0	13.25	0.00	13.52	0.00	13.52
18.04	13.62	24.93	14.80	20	13.85	21.98	14.01	21.98	14.01
25.92	14.86	33.14	8.99	33	5.86	26.90	7.45	26.90	7.45
41.99	6.96	48.88	6.33	156	1.97	57.09	5.81	57.09	5.81
131.89	2.99	93.18	4.07	190	0.18	185.04	2.17	185.04	2.17
227.03	0.66	130.91	2.66	205	-0.29	267.06	0.52	267.06	0.52
341.21	0.85	175.20	2.00	218	-0.03	421.92	-2.82	421.92	-2.82
434.06	-1.05	326.12	-0.92	240	0.28	522.97	-4.99	522.97	-4.99
547.24	-2.36	414.04	-2.03	444	-1.98				
665.03	-5.12	483.27	-4.49	497	-3.73				
		528.22	-5.18	706	-6.38				

KIAWAH ISLAND

Station 2705
(1990-1995)

131290		231191		28 592		251092		2 693	
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	14.83	0.00	14.83	0.00	14.83	0.00	14.83	0.00	14.83
31.17	8.30	31.17	8.30	21.98	8.79	27.89	8.30	25.92	8.46
75.13	11.48	78.08	11.52	76.12	11.68	72.18	11.88	70.87	11.78
114.17	7.68	111.88	7.58	113.19	7.64	118.11	7.38	109.91	7.61
169.95	5.64	167.98	5.97	166.01	6.14	138.12	8.07	146.00	8.20
262.14	2.46	231.96	3.77	243.11	5.31	184.06	6.76	175.20	5.74
323.16	1.18	313.98	2.10	272.97	4.23	229.00	4.49	175.20	5.74
346.13	1.51	387.14	1.54	329.07	2.17	269.03	2.46	209.97	6.04
417.98	-0.79	495.08	-1.21	402.23	0.20	336.94	2.76	270.01	1.51
459.97	-0.16	542.98	-2.03	483.27	-0.30	451.12	-0.98	372.05	1.35
535.10	-1.41	583.99	-1.90	570.21	-1.44	508.20	-0.10	436.02	-0.75
626.31	-4.53	632.22	-2.26	653.22	-3.25	583.99	-1.87	463.25	-0.52
		744.09	-4.69			623.03	-3.84	512.14	-1.15
						692.26	-3.94	620.08	-2.79
						780.18	-4.40	658.14	-4.53
								728.35	-5.64
131193		5 594		41294		23 595			
distance	elevation	distance	elevation	distance	elevation	distance	elevation		
0.00	14.83	0.00	14.83	0	14.84	0.00	14.83		
26.90	8.33	25.92	8.23	27	8.18	36.09	7.91		
77.10	11.75	75.13	11.65	63	11.58	74.15	11.42		
114.17	7.64	111.88	7.74	92	10.16	121.06	7.71		
134.19	9.58	135.17	9.48	116	7.59	131.89	10.83		
165.03	6.56	223.10	5.58	140	10.15	164.04	6.99		
192.91	6.36	310.04	3.02	172	7.14	307.09	2.17		
300.20	3.71	368.11	1.94	245	4.51	425.85	1.61		
370.08	1.44	437.99	0.30	335	2.56	500.98	-1.80		
460.96	0.13	519.03	-0.72	391	1.94	538.06	-1.54		
507.22	-1.51	606.30	-2.49	478	-1.35	686.02	-4.13		
545.28	-1.90	677.17	-4.46	519	-2.58				
652.23	-2.76			616	-1.45				
717.19	-4.20			711	-3.49				
773.29	-4.86			909	-5.58				

KIAWAH ISLAND
Station 2720
(1990-1995)

131290		71291		29 592		251092		2 693	
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	13.88	0.00	13.88	0.00	13.88	0.00	13.88	0.00	13.88
27.89	8.73	27.89	8.66	27.89	8.66	28.87	8.79	25.92	8.66
69.88	11.35	75.13	10.79	68.90	10.99	70.87	11.38	70.87	11.19
100.07	9.81	100.07	9.71	83.01	9.88	90.88	9.55	98.10	9.38
121.06	10.37	122.05	10.40	127.95	9.97	108.92	11.06	124.02	10.27
156.17	7.25	155.18	7.78	159.12	7.74	182.09	6.56	154.20	6.96
228.02	5.18	228.02	6.69	197.18	6.23	219.16	8.30	216.21	6.07
295.93	2.99	288.06	4.86	243.11	5.81	239.17	6.92	239.17	5.22
319.23	3.35	355.97	2.62	300.20	3.94	305.12	4.00	261.15	5.74
383.20	1.35	403.22	0.52	337.93	2.36	387.14	1.67	341.21	2.46
447.18	-1.28	436.02	-0.89	377.95	1.77	425.20	-0.66	426.18	1.97
509.19	-0.46	468.18	0.00	404.20	0.95	534.12	0.26	510.17	-2.20
593.18	-1.74	517.06	0.56	437.99	1.38	648.29	2.33	557.09	-0.52
705.05	-5.31	588.25	-0.03	500.00	0.89	703.08	-4.00	610.24	-1.18
		677.17	-2.30	573.16	-1.67	752.30	-2.89	724.08	-3.51
		884.19	-5.54	733.27	-4.20	841.21	-4.63	769.36	-5.25
				783.79	-5.09	855.97	-5.09		
141193		6 594		41294		24 595			
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	13.88	0.00	13.88	0	13.87	0.00	13.88		
12.14	10.66	24.93	8.79	26	8.53	37.07	8.63		
26.90	8.63	59.06	9.42	53	10.09	161.09	7.64		
72.18	11.48	70.87	11.32	100	10.01	208.01	9.61		
116.14	9.32	90.88	9.74	144	9.94	215.88	7.22		
162.07	7.81	145.01	10.04	163	7.71	303.15	4.99		
162.07	7.81	161.09	7.78	193	7.45	389.11	2.26		
206.04	8.14	204.07	8.40	207	9.55	426.84	1.08		
216.21	6.73	232.94	6.50	227	6.92	466.86	1.48		
303.15	4.23	273.95	5.61	287	4.9	535.10	-1.90		
366.14	1.97	313.98	4.23	376	2.67	597.11	-1.08		
386.15	0.95	360.24	2.79	439	-0.17	771.98	-2.82		
405.18	0.10	414.04	1.64	492	-3.07	856.96	-5.05		
423.23	1.35	456.04	0.36	526	-0.28				
466.21	1.67	477.03	1.08	593	0				
564.30	-1.21	513.12	0.33	688	-1.67				
614.17	-1.67	568.24	-1.12	779	-4.58				
655.18	-1.31	625.00	-1.80	887	-4.95				
696.19	-2.03	717.19	-3.18	1028	-6.71				
757.22	-3.38	762.14	-4.95						
940.29	-5.91	770.67	-5.09						

KIAWAH ISLAND

Station 2730

(1990-1995)

131290				71291				29 592				251092				2 693	
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32
36.09	7.91		22.97		7.74		27.89		7.81		29.86		7.94		143.04		7.61
63.98	9.22		66.93		9.06		62.01		9.12		66.93		9.22		166.99		10.37
87.93	7.68		135.17		7.84		81.04		7.87		104.00		8.01		195.21		8.37
101.05	8.69		166.99		11.38		102.03		8.83		166.99		11.25		249.02		7.25
130.91	7.22		193.90		8.17		145.01		7.15		201.12		8.17		290.03		7.94
167.98	11.29		220.14		10.50		166.01		11.38		218.18		10.20		331.04		5.58
195.21	7.94		270.01		6.73		196.19		7.91		287.07		6.66		356.96		5.45
220.14	10.10		326.12		6.99		219.16		10.24		328.08		7.09		478.02		2.03
243.11	6.92		368.11		4.99		245.08		7.41		380.25		4.89		535.10		1.80
329.07	5.15		439.96		2.95		273.95		7.19		429.13		1.84		620.08		-1.02
473.10	0.89		503.28		1.80		324.15		6.96		504.27		3.08		669.29		-0.92
500.98	-0.10		558.07		-0.79		392.06		5.15		521.98		2.07		700.13		-1.48
547.24	0.72		590.22		-2.30		454.07		2.76		600.07		-1.57		793.31		-2.53
613.19	-0.43		629.27		-0.66		512.14		1.12		670.28		0.00		878.28		-5.51
667.32	-2.13		695.21		-0.62		554.13		-0.72		768.04		-2.92		902.23		-6.23
740.16	-4.33		792.32		-2.33		597.11		-0.16		826.12		-2.26				
813.32	-2.72		968.18		-5.22		652.23		-0.72		970.14		-4.49				
940.29	-4.82						731.30		-1.35								
							832.35		-4.76								
141193		6 594		41294		24 595											
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32	0.00	13.32
29.86	7.78		29.86		7.71		36.00		7.94		29.86		7.78		29.86		7.78
99.08	7.58		64.96		9.28		169.00		11.18		62.01		9.25		62.01		9.25
166.01	11.42		83.99		7.64		217.00		10.26		82.02		7.71		82.02		7.71
195.21	8.20		104.99		8.20		280.00		7.38		104.99		8.46		104.99		8.46
220.14	10.27		134.19		7.45		322.00		6.90		151.90		6.96		151.90		6.96
257.22	9.38		164.04		11.42		492.00		1.23		166.99		10.66		166.99		10.66
349.08	6.73		204.07		8.27		543.00		-0.46		195.87		8.23		195.87		8.23
446.19	3.28		220.14		10.37		592.00		-1.88		216.86		10.07		216.86		10.07
484.25	1.90		240.16		8.04		699.00		-0.98		240.16		7.41		240.16		7.41
520.01	2.40		253.94		9.09		809.00		-2.49		255.91		9.38		255.91		9.38
577.10	-0.10		280.18		7.45		900.00		-5.27		274.93		7.32		274.93		7.32
607.28	-1.15		326.12		6.46		1042.00		-5.04		294.95		8.63		294.95		8.63
632.22	-0.46		439.96		2.56		1112.00		-7.19		321.85		6.40		321.85		6.40
675.20	0.00		505.25		2.43						353.02		5.54		353.02		5.54
783.14	-2.49		565.29		1.67						392.06		6.27		392.06		6.27
837.27	-3.90		633.20		1.71						483.92		2.00		483.92		2.00
1004.27	-4.33		708.33		0.43						549.87		1.77		549.87		1.77
1094.16	-6.73		763.12		-0.56						603.02		0.20		603.02		0.20
			794.29		-2.62						652.89		-0.39		652.89		-0.39
			860.24		-1.94						700.13		-0.03		700.13		-0.03
			939.30		-2.89						751.97		-0.95		751.97		-0.95
			980.31		-4.30						809.06		-3.84		809.06		-3.84
											879.92		-4.00		879.92		-4.00
											1002.95		-4.36		1002.95		-4.36

KIAWAH ISLAND
Station 2735
(1990-1995)

131290				71291		29 592		251092		2 693	
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	13.42	0.00	13.42	0.00	13.42	0.00	13.42	0.00	13.42	0.00	13.42
40.03	7.12	46.92	7.35	43.96	7.22	36.09	7.61	46.92	7.28	46.92	7.28
65.94	10.43	72.18	10.73	60.04	10.20	67.91	9.78	80.05	10.83	80.05	10.83
113.19	7.15	105.97	7.22	100.07	7.32	100.07	7.45	104.00	7.22	104.00	7.22
130.91	8.89	118.11	9.12	121.06	10.50	124.02	10.79	118.11	10.33	118.11	10.33
148.95	8.27	148.95	7.45	150.92	8.17	147.97	8.23	147.97	7.22	147.97	7.22
171.92	9.84	170.93	10.47	182.09	10.73	185.04	11.15	167.98	10.04	167.98	10.04
196.19	7.78	203.08	8.66	207.02	8.63	209.97	8.83	201.12	8.53	201.12	8.53
220.14	9.88	221.13	12.20	237.20	10.66	239.17	10.60	217.19	11.91	217.19	11.91
249.02	10.50	271.00	7.28	270.01	7.74	271.98	7.28	269.03	6.89	269.03	6.89
293.96	6.73	280.18	8.83	295.93	8.53	291.01	8.50	280.18	8.86	280.18	8.86
364.17	5.91	313.98	6.40	321.19	6.59	325.13	6.73	335.96	6.73	335.96	6.73
435.04	3.77	355.97	6.59	346.13	6.79	378.94	6.50	368.11	5.22	368.11	5.22
512.14	0.16	409.12	4.72	398.95	5.58	423.23	4.69	427.17	5.28	427.17	5.28
535.10	-1.21	467.19	2.79	474.08	4.66	515.09	2.66	520.01	2.20	520.01	2.20
615.16	0.75	548.23	-1.18	479.00	3.12	585.30	0.16	560.04	-0.30	560.04	-0.30
653.22	0.33	646.33	0.43	538.06	1.25	613.19	-1.54	597.11	-2.92	597.11	-2.92
788.06	-3.81	712.27	0.07	577.10	-0.95	702.10	-1.12	617.13	-0.07	617.13	-0.07
855.97	-5.54	814.30	-2.89	610.24	0.16	749.34	-2.46	683.07	-0.20	683.07	-0.20
		856.30	-4.59	751.31	-1.15	942.26	-3.54	740.16	-1.71	740.16	-1.71
		934.38	-6.00	879.27	-4.56	1021.33	-3.81	855.31	-6.14	855.31	-6.14
		1010.17	-7.38			1159.45	-4.59	942.26	-5.15	942.26	-5.15
								1126.31	-6.73	1126.31	-6.73
								0.00	0.00	0.00	0.00
141193		6 594		41294		24 595					
distance	elevation	distance	elevation	distance	elevation	distance	elevation				
0.00	13.42	0.00	13.42	0	13.43	0.00	13.42				
44.95	7.32	49.87	7.22	44	7.19	51.84	7.38				
70.87	10.50	82.02	10.24	79	10.57	182.09	9.97				
101.05	7.35	116.14	7.81	101	7.27	273.95	7.02				
125.00	10.40	132.87	10.20	119	10.45	319.88	9.32				
150.92	7.84	184.06	11.65	153	7.45	354.99	6.23				
217.19	9.84	212.93	8.56	220	12.19	412.07	5.61				
271.00	7.15	243.11	11.06	269	7.29	481.96	3.28				
306.10	8.07	288.06	6.59	322	9.07	547.90	1.44				
367.13	6.07	335.96	8.20	361	6.71	611.88	0.36				
444.23	3.64	422.24	5.58	506	2.74	667.98	-0.56				
529.20	2.30	491.14	3.25	589	0.13	735.89	-1.35				
586.29	-0.30	536.09	2.36	606	-1.99	782.15	-2.82				
621.06	-1.77	609.25	-1.21	659	-2.09	941.93	-4.89				
743.11	-0.82	675.20	-1.08	681	-0.54	1051.84	-5.97				
847.11	-3.41	717.19	-1.25	743	0.1						
971.13	-4.66	750.33	-0.75	843	-3.14						
1085.30	-6.89	802.17	-2.30	909	-4.22						
		867.13	-5.51	995	-3.72						
		884.19	-6.43	1146	-5.57						

KIAWAH ISLAND
Station 2745B
(1990-1995)

29 592		251092		2 693		141193		6 594	
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	12.93	0.00	12.93	0.00	12.93	0.00	12.93	0.00	12.93
12.14	9.91	54.13	6.79	16.08	9.38	23.95	9.19	26.90	8.69
56.10	6.73	103.02	6.96	66.93	8.07	47.90	7.58	63.98	9.19
97.11	7.41	175.20	4.04	80.05	5.94	67.91	8.56	75.13	7.41
120.08	5.97	250.98	1.15	127.95	5.28	99.08	6.36	140.09	5.09
157.15	0.95	285.10	0.03	196.19	3.05	189.96	3.02	210.96	3.12
213.91	-1.25	375.00	0.82	252.95	0.56	255.91	0.07	240.16	3.25
242.13	-2.30	493.11	-2.95	266.08	-0.95	308.07	-0.43	290.03	1.74
272.97	-1.57	579.07	-2.53	331.04	0.20	359.25	-2.36	380.25	-0.62
321.19	-1.97			386.15	-0.20	406.17	-2.40	426.18	-0.20
400.26	-4.49			446.19	-2.43	515.09	-5.15	489.17	-0.85
520.01	-3.51			519.03	-2.59	655.18	-5.97	528.22	-2.53
660.10	-6.73			742.13	-6.36	0.00	0.00	586.29	-3.77
								620.08	-5.64
41294		24 595							
distance	elevation	distance	elevation						
0.00	12.93	0.00	12.93						
44.00	7.83	30.84	8.92						
65.00	11.06	65.94	11.09						
91.00	7.15	85.96	6.66						
260.00	1.92	159.12	4.30						
324.00	0.78	259.84	2.10						
411.00	-2.90	324.15	-0.49						
484.00	-3.83	339.90	-0.89						
530.00	-2.27	361.88	-0.66						
694.00	-4.33	381.89	-0.75						
791.00	-6.80	419.95	-0.43						
		512.14	-0.98						
		574.15	-3.61						
		644.03	-4.27						
		719.16	-4.59						

KIAWAH ISLAND
Station 2775
(1990-1995)

131290		71291		29 592		251092		2 693	
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	13.75	0.00	13.75	0.00	13.75	0.00	13.75	0.00	13.75
21.00	10.86	26.90	10.83	25.92	10.40	23.95	10.56	18.04	11.12
36.09	12.50	38.06	12.60	38.06	12.63	38.06	12.76	38.06	12.60
62.99	7.32	64.96	7.64	64.96	7.55	56.10	8.04	59.06	8.17
121.06	5.45	80.05	7.32	77.10	8.07	68.90	9.12	70.87	9.84
211.94	2.56	132.87	4.99	86.94	5.91	83.01	6.69	113.19	5.54
239.17	2.43	200.13	2.49	125.98	3.15	109.91	3.97	146.98	4.72
319.23	0.36	277.23	1.12	170.93	0.92	129.92	2.17	183.07	5.54
380.25	0.43	328.08	-0.98	203.08	-0.07	150.92	3.87	274.93	1.05
412.07	-0.33	406.17	-3.71	232.94	0.46	193.90	3.90	394.03	-2.66
510.17	-4.27	444.23	-0.82	265.09	-0.33	246.06	3.58	413.06	0.66
528.54	-5.02	482.28	-0.95	328.08	-1.05	255.91	3.12	499.02	0.00
0.00	0.00	529.20	-2.30	368.11	-1.74	316.93	2.23	557.09	-2.03
		675.20	-3.15	386.15	1.08	387.14	2.30	678.15	-4.33
		842.19	-4.92	448.16	0.82	479.00	-1.67	765.09	-3.18
		861.22	-5.02	509.19	0.26	538.06	-2.56	941.27	-6.17
		0.00	0.00	579.07	-1.25	623.03	-2.89		
				698.16	-3.58	707.02	-1.77		
						837.27	-4.30		
141193		6 594		41294		5 595			
distance	elevation	distance	elevation	distance	elevation	distance	elevation		
0.00	13.75	0.00	13.75	0	13.73	0	13.73		
13.12	11.35	39.04	12.30	22	10.84	23	10.15		
39.04	12.66	59.06	8.04	39	12.79	37	11.24		
54.13	8.60	72.18	11.25	53	9.02	53	7.41		
67.91	10.47	113.19	5.58	70	11.56	71	9.55		
154.20	6.07	154.20	6.46	105	7.62	116	2.96		
160.10	6.33	240.16	5.45	271	6.38	233	6.14		
220.14	2.92	323.16	1.57	480	1.86	289	5.14		
261.15	1.67	388.12	2.07	523	-0.55	319	2.55		
314.96	2.99	469.16	-0.26	581	-1.62	374	0.33		
369.09	2.59	577.10	-3.67	680	-1.44	380	2.41		
468.18	1.38	640.09	-1.38	839	-2.08	490	1.31		
531.17	1.08	751.31	-2.76	936	-3.49	529	1.11		
633.20	-2.46	830.05	-3.58	1000	-5.6	616	-2.41		
698.16	-3.48	957.35	-4.56			678	-1.84		
863.19	-3.54					729	-2.83		
900.26	-4.23					906	-4.69		
1001.31	-6.40					912	-5.99		

KIAWAH ISLAND
Station 2785
(1990-1995)

21 790		131290		24 591		71291		141193	
distance	elevation	distance	elevation	distance	elevation	distance	elevation	distance	elevation
0.00	12.50	0.00	12.50	0.00	12.50	0.00	12.50	0.00	12.50
24.93	8.76	25.92	8.96	88.91	6.43	28.87	9.09	26.90	8.76
43.96	9.71	42.98	10.01	116.14	7.84	41.01	10.01	86.94	5.68
86.94	5.61	93.18	4.99	142.06	5.28	73.16	6.43	109.91	8.66
106.96	8.46	104.00	7.51	208.99	4.82	104.99	7.41	144.03	6.36
132.87	7.02	144.03	5.74	305.12	3.08	125.00	7.81	161.09	6.07
189.96	6.89	241.14	4.23	429.13	5.15	146.98	5.54	182.09	6.76
231.96	4.17	356.96	1.71	508.86	2.03	202.10	4.86	213.91	4.59
296.92	2.99	411.09	4.27	532.15	-0.89	407.15	4.76	348.10	4.10
346.13	1.21	495.08	4.00	577.10	-5.05	493.11	3.22	422.24	3.08
388.12	0.79	546.26	1.64	704.07	0.07	540.03	1.35	492.13	2.03
453.08	3.28	708.33	-1.12	935.04	0.46	583.01	-1.90	550.20	0.56
527.23	4.56	841.21	2.49	1063.98	1.18	633.20	-1.57	570.21	-0.43
639.11	2.36	993.11	3.64	1208.99	0.10	695.21	-1.21	594.16	-2.95
703.08	0.03	1136.15	4.79	1369.09	-0.16	805.12	0.85	610.24	-1.51
792.32	-1.44	1391.40	0.95	2624.67	-5.02	860.24	-0.92	640.09	0.00
868.11	-1.97	1658.46	-1.97	0.00	0.00	955.38	3.08	660.10	3.12
1019.36	-2.89	1936.35	-5.02			1023.29	3.15	735.24	2.95
1119.42	-3.38					1102.36	5.81	827.10	2.79
1197.18	-0.82					1168.31	5.97	842.19	2.46
1284.45	-0.66					1241.47	6.23	871.06	2.69
1364.50	-1.12					1295.28	3.31	940.29	4.63
1411.42	-1.54					1380.25	2.62	1025.26	5.68
1447.51	-0.72					1474.41	0.82	1103.35	3.90
1518.37	-0.89					1510.50	0.33	1160.43	2.33
1569.55	-2.43					1531.50	0.85	1199.15	1.54
1661.42	-3.71					1570.54	0.33	1218.18	2.17
1724.41	-2.79					1642.39	-2.26	1284.44	1.84
1905.51	-3.12					1718.50	-5.02	1345.47	1.80
1989.50	-4.27					0.00	0.00	1414.37	0.75
2099.74	-5.02							1485.24	-0.66
								1555.45	-2.56
								1625.66	-4.46
								1695.87	-6.36
								0	0
41294		24 595							
distance	elevation	distance	elevation						
0.00	12.49	0.00	12.50						
84.00	5.74	32.15	8.96						
110.00	8.53	55.12	8.30						
215.00	4.62	94.16	5.05						
367.00	3.69	109.91	8.60						
484.00	2.25	155.84	5.97						
565.00	0.64	183.07	6.68						
575.00	-1.29	266.08	4.23						
650.00	2.53	362.86	3.41						
770.00	3.69	414.04	3.58						
836.00	1.97	441.93	2.92						
963.00	0.00	458.99	2.17						
1124.00	-3.17	465.88	3.12						
1195.00	-5.53	485.89	3.35						
1230.00	-6.98	562.01	2.66						
		580.05	0.98						
		641.08	2.03						
		681.10	1.67						
		691.93	2.17						
		714.90	1.38						
		729.99	2.99						
		806.10	2.72						
		925.85	1.18						
		1025.92	-1.28						
		1100.07	-2.62						
		1158.14	-4.33						
		1200.13	-5.54						

Appendix C. Beach survey data and tables for Folly Island.

FOLLY BEACH

Shoreline Position

Distance to Mean Sea Level (ft)
(Entire Monitoring Range)

STATION	May-92	May-93	May-95
2801	225	302	329
2803	391	476	354
2805	355	553	380
2810	508	630	549
2813	361	538	461
2815	336	444	472
2818	363	473	484
2820	318	437	456
2823	347	454	403
2825	364	547	470
2828	206	331	335
2830	216	480	425
2833	231	457	348
2835	236	468	316
2838	213	414	378
2840	232	466	394
2843	266	685	421
2850	325	377	450
2855	334	447	435
2860	444	630	464
2863	151	382	299
2865	144	315	233
2867	209	393	323
2873	318	494	424
2878	408	451	472
2880	357	547	442
2883	534	618	545
2885	712	815	713
2890	562	628	683
2895	286	557	652

FOLLY BEACH
Unit Area Volumes (yd3/ft)
 May-92 to May-95
 (Within Project Limits)

UNIT AREA VOLUMES (yd3/ft)

STATION	May-92	May-93	May-95
2801	135.40	181.70	123.09
2803	160.96	198.34	<i>114.90</i>
2805	127.13	<i>174.96</i>	106.70
2810	84.16	151.57	115.74
2813	76.44	117.48	103.26
2815	65.59	105.47	<i>98.31</i>
2818	64.46	121.10	93.35
2820	85.89	105.40	107.24
2823	58.99	127.81	88.61
2825	100.88	126.24	96.13
2828	28.74	97.00	79.74
2830	68.70	116.15	125.86
2833	51.62	114.79	92.02
2835	44.71	106.00	77.94
2838	48.62	102.05	85.26
2840	49.98	101.63	96.54
2843	60.64	141.21	97.41
2850	73.76	97.36	79.74
2855	74.67	111.66	102.89
2860	79.17	107.54	77.83
2863	30.53	84.52	92.63
2865	70.00	79.25	82.85
2867	64.61	106.70	99.44
2873	64.80	95.45	82.37
2878	70.24	75.41	83.81
2880	77.33	102.79	95.56
2883	<i>130.68</i>	123.69	105.29
AVG. PROFILE	75.88	117.53	96.46

(Italics indicates estimated volumes)

UNIT AREA VOLUME CHANGES (yd3/ft)

STATION	92 -93	93 -95	92 -95
2801	46.30	-58.61	-12.31
2803	37.38	-83.45	-46.07
2805	47.83	-68.26	-20.43
2810	67.41	-35.83	31.58
2813	41.04	-14.22	26.82
2815	39.88	-7.16	32.72
2818	56.64	-27.75	28.89
2820	19.51	1.84	21.35
2823	68.82	-39.20	29.62
2825	25.36	-30.11	-4.75
2828	68.26	-17.26	51.00
2830	47.45	9.71	57.16
2833	63.17	-22.77	40.40
2835	61.29	-28.06	33.23
2838	53.43	-16.79	36.64
2840	51.65	-5.09	46.56
2843	80.57	-43.80	36.77
2850	23.60	-17.62	5.98
2855	36.99	-8.77	28.22
2860	28.37	-29.71	-1.34
2863	53.99	8.11	62.10
2865	9.25	3.60	12.85
2867	42.09	-7.26	34.83
2873	30.65	-13.08	17.57
2878	5.17	8.40	13.57
2880	25.46	-7.23	18.23
2883	-6.99	-18.40	-25.39
AVG. CHANGE	41.65	-21.07	20.59

FOLLY BEACH
Station 2803
 May-92 to May-95

2803	14/5/92		2803	4/5/93		2803	1/4/95
Elevation	Distance		Elevation	Distance		Elevation	Distance
7.78	0		7.78	0			
7.78	32.2		10.76	9.8		NO	DATA
17.32	44.9		8.27	14.1			
11.42	60		7.15	133.9			
4.76	78.1		7.45	215.9			
2.85	128.9		6.79	248			
0.49	175.9		6.17	274.9			
1.02	227		5.41	278.9			
0.72	290		1.97	331			
0.26	332		1.02	412.1			
0.13	384.8		-0.3	495.1			
-1.21	445.9		-0.85	585			
-2.85	522		-1.41	613.8			
-3.08	628.9		-2.85	629.9			
-5.02	863.2		-3.31	637.1			
			-2.66	655.8			
			-3.02	665			
			-4.1	700.1			
			-4.49	726			
			-2.95	769			
			-2.66	794			
			-2.99	800.9			
			-2.46	845.1			
			-2.92	891.1			
			-4.23	1009.8			
			-5.28	1089.6			
			-5.02	1134.8			

FOLLY BEACH
Station 2865
 May-92 to May-95

2865		2865	6/5/93	2865		8/5/95
14/5/92		Elevation	Distance	Elevation	Distance	
		7.78	0	7.78	0	
	0	8.1	1	9.35	57.1	
	46.9	8.99	57.1	10.27	66.9	
	62	8.14	74.1	5.87	81	
	96.1	9.48	80.1	2.3	146	
	141.1	9.55	99.1	1.15	192.9	
	180.1	6.96	124	-0.52	251	
	216.9	7.35	153.9	-2.82	317.9	
	352	6.36	167	-4.4	346.1	
	487.2	2.53	219.2	-3.31	425.9	
		0.1	312	-5.05	495.4	
		-2.3	389.1			
		-4.66	461			
		-6.1	496.1			

FOLLY BEACH
Station 2885
 May-92 to May-95

2885 15/5/92		2885 5/5/93		2885 8/5/95	
Elevation	Distance	Elevation	Distance	Elevation	Distance
10.2	0	10.2	0	10.2	0
9.15	63	10.24	0	7.55	211
12.27	120.1	8.56	100.1	14.01	250
7.97	211	11.55	130.9	11.45	255.9
14.14	246.1	9.94	184.1	8.46	271
7.12	275.9	7.61	211	8.69	300
7.41	307.1	9.35		6.53	321.9
6.1	317.9	11.65		6.89	345.1
5.94	383.9			7.81	356
6.04	443.9			9.35	360.9
5.41	480			6.73	389.1
2.26	594.2			5.84	471.1
0.46	693.9			3.87	529.9
-1.25				71	574.1
-3.67				6	671.9
-2					771
					830.1
					854
					878
					901.9

FOLLY BEACH
Station 2883
 May-92 to May-95

2883 6/5/93		2883 8/5/95	
Elevation	Distance	Elevation	Distance
9.78	0	9.74	180.1
9.78	1	10.3	205.1
10.63	91.9	7.09	226
37	146	8.6	255.9
	163.1	8.2	352
	173.9	5.68	405.8
		3.54	454.1
		1.61	529.9
		0.36	616.1
		-1.77	660.1
		-3.31	678.1
			696.2
			14.2

