Designation Procedure and Delineation of Areas for General Permit Application

IV. General Permit Line for the S.W. Gulf Region of Florida

Prepared by

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FOREWORD

The Bureau of Beaches and Coastal Systems (BBCS) is responsible for programs for the protection and management of beaches and coastal systems of the State of Florida. This responsibility includes the administration and implementation of a coastal regulatory program for coastal construction and other development-related activities seaward of established coastal construction control lines around the State.

The use of general permits for improved efficiency of the regulatory process is authorized through provisions of subsection 161.053(19), Florida Statutes (F.S.). Specific procedures, criteria, and requirements for general permit (GP) implementation is set forth in Chapter 62B-34, Florida Administrative Code (F.A.C.).

A GP report series has been prepared to provide general procedural, as well as, region-specific information and results of the GP evaluation and designation determination. The purpose of Volume I of the series, the General Description and Procedural Report, is to define and document procedures, criteria, and technical basis for GP line evaluation and designation determination. The Volume I report provides a description of the systematic process used in assessing a coastal county for delineation of an area for GP application and implementation.

Accompanying report volumes, including this Volume IV report, General Permit Line for the S.W. Gulf Region of Florida, present recommended locations for GP lines on a regional and county-by-county basis. Detailed background and evaluation information, as well as, illustrative maps and tabular summaries are contained in each regional report volume.

The GP line study work and report preparation was conducted by the Florida State University, Beaches and Shores Resource Center (BSRC), under contract with the Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems (BBCS). The report series will be revised and updated as new data becomes available for evaluation, as appropriate, and as directed by the BBCS.

This report was written and prepared by Mark Leadon, P.E., Associate Director of the BSRC. BSRC staff assistance was provided by Gary Cook and Michael Peacock who contributed GIS and analytical support and preparation of GP-related graphics, maps and tabular summaries. Shoreline erosion rate, 30-year erosion projection, and GP summary graphic support was provided by Nhan Nguyen of BSRC.

Trend/stochastic erosion analysis and results were provided by Dr. Todd Walton, Jr. and Jenny Cheng of BSRC. Rule-based 30-year erosion projection analysis information was provided by Emmett Foster, P.E., of BSRC. GP line determination consultation was provided by Gene Chalecki, P.E., Tony McNeal, P.E., and Fritz Wettstein of BBCS.

Designation Procedure and Delineation of Areas for General Permit Application

Volume IV. General Permit Line for the S.W. Gulf Region of Florida

1.0 Background

The results of the General Permit (GP) line evaluation process for the SW region are contained in this volume of the report. The general procedural information for evaluation and determination of GP lines are contained in Volume I of the GP report series. Recommended GP lines are defined and depicted within this volume of the report series for each of the SW coastal counties. Detailed descriptions and depictions of the results for each county are provided. A general location map of the SW region is provided in Figure 1 below.

Figure 1. General location map of SW region counties.

Graphical illustrations of the GP lines, and other related information, overlain on the most current aerial photography, obtained through the BBCS regional coastal monitoring program, can be viewed on the internet. The GP line graphic depiction on aerial

photomaps is accessible through the FDEP consolidated web mapping application (RCMD) website at the following address: http://bcs.dep.state.fl.us/rcmd/

A digital copy of the GP report series can be accessed through the BBCS website at: http://www.floridadep.org/beaches/publications/tech-rpt.htm#GeneralPermit

2.0 Summary of the GP Line for the S.W. Gulf Region

In the SW region, the extent of GP lines varies considerably as a result of consideration of the various evaluation factors and criteria through each county. The presence of beach restoration projects and coastal armoring are considered for their effect on the rule-based 30-yr. erosion projections.

There are a number of locations where the rule-based 30-year erosion projection is stopped or retarded as a result of substantial armoring or beach restoration or nourishment effects (Foster, 2006). There are no recommended GP lines in locations where the GP line extends seaward of the rule-based 30-year erosion projection.

The trend/stochastic 30-year erosion projection does extend landward of the recommended GP lines in a number of locations, as well as landward of the CCCL in some locations south of inlets. The GP lines are recommended in those locations based on all other review considerations, including the rule-based 30-year erosion projections.

The extent of development and its impact to the beach/dune system varies greatly through the SW region. The line of construction relative to the CCCL and CCSBL varies considerably and greatly influences the GP line determinations.

More detailed descriptions and depictions of the results for each county are provided in the next section of the report. A summary table of GP line extent for the entire SW region is given in Table 1.

Table 1 – Relative GP Line Lengths for SW Region

County	Length of County (mi.)	Length of GP Line (mi.)	GP %
Pinellas	37.2	N/A	N/A
Manatee	12.3	10.4	84.1%
Sarasota	34.7	26.4	76.1%
Charlotte	12.2	2.75	22.5%
Lee	47.3	21.7	46.1%
Collier	34.1	11.1	32.5%
TOTAL	177.8	72.4	40.7%

Based on the values in the above table, a total of over 40% of the total length of the SW coastline regulated by the CCCL program is recommended for GP line adoption. Sarasota has the longest recommended GP line length, followed by Lee. Manatee has the greatest percent of coastal length with recommended GP lines, followed by Sarasota.

It should be noted that the total county lengths in Table 1 include all public lands, as well as private, developed lands. If only the developed lands, where the GP provisions are applicable, are considered, then the relative GP line coverages are higher.

The bar graph below in Figure 2 shows the relative comparisons of the total county lengths, the developed lengths, and the GP line lengths. The graph in Figure 3 shows similar comparisons of the percentages of GP lines to total county lengths, and to the developed lengths.

As mentioned above, the most benefit of GP line establishment within the SW region, in terms of total GP lengths, is expected to be in Sarasota County followed by Lee, Collier, and Manatee counties (in that order). GP line limitations in Charlotte County, in particular, as well as in Lee and Collier counties are a result of the relatively large extent of lower density development or undeveloped coastal barrier islands within those counties. The regional map in Figure 4 depicts the GP line locations for the coastal counties in the SW region.

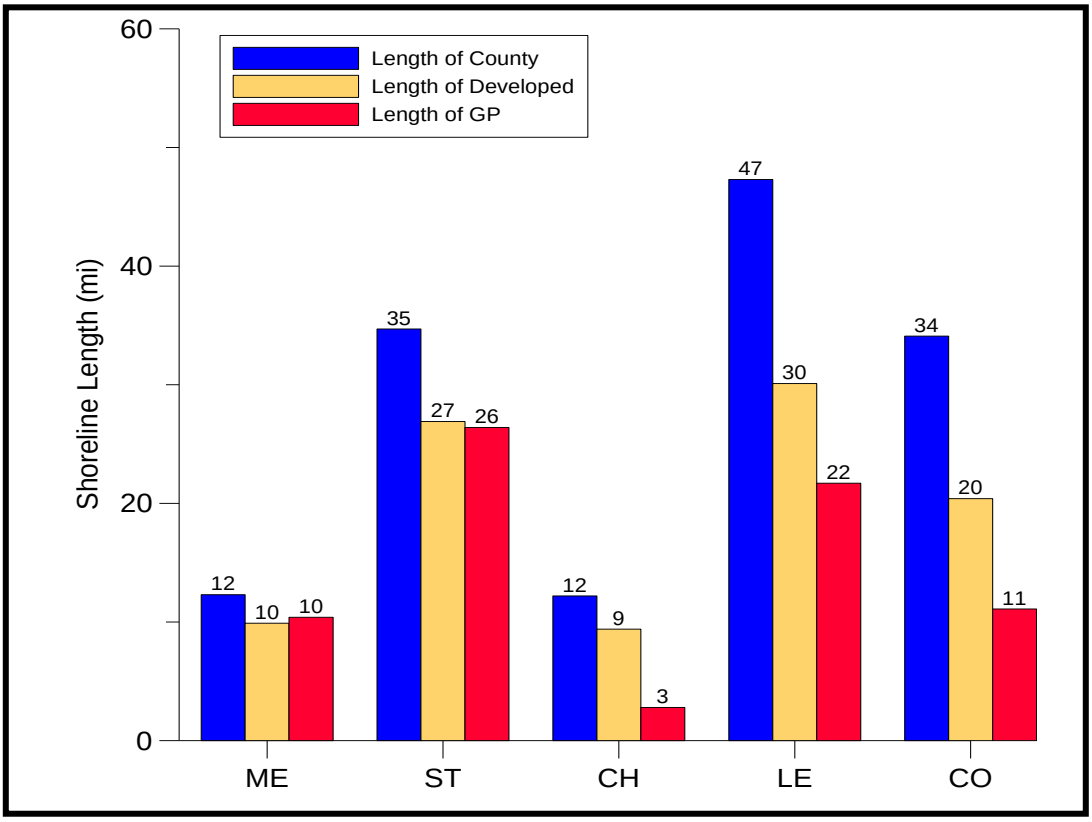

Figure 2. Comparison of GP line lengths vs. developed lengths and total lengths for SW.

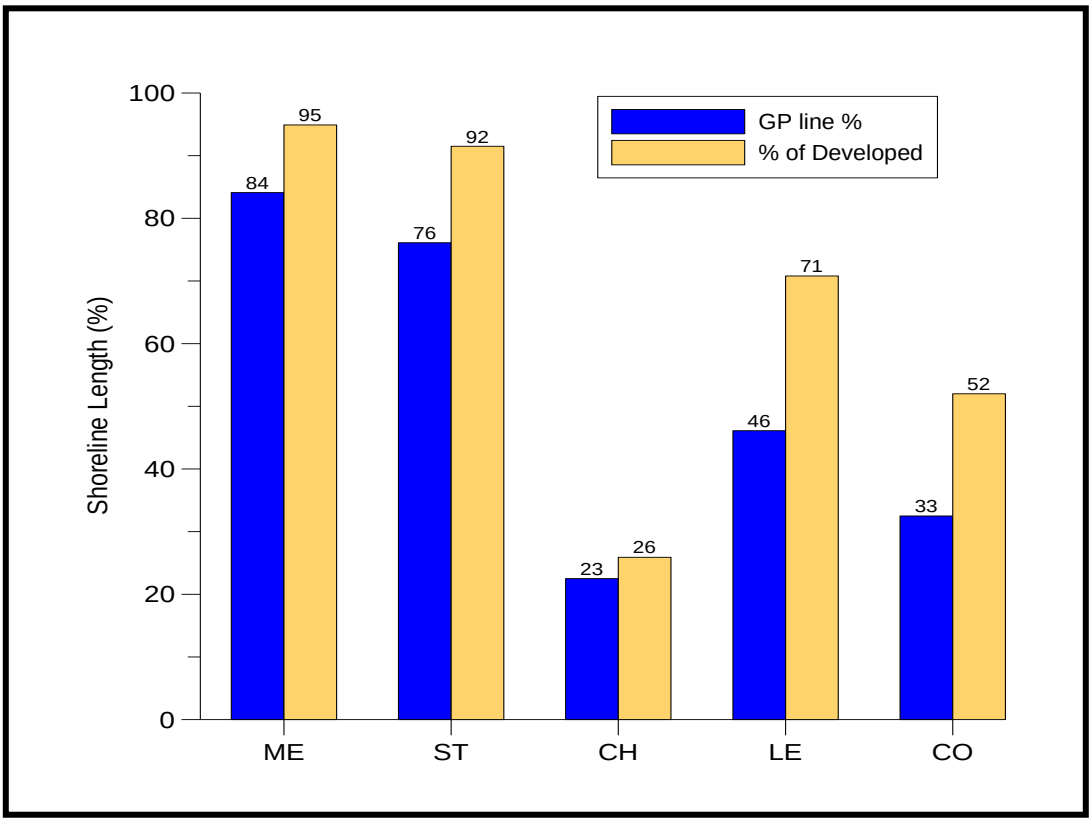

Figure 3. Comparison of GP line length percent of total and developed lengths for SW.

Figure 4. General permit line locations for the SW region counties.

3.0 Specific SW County GP Line Evaluations and Delineations

3.1 MANATEE COUNTY - GP Line Delineation

The series of GIS-derived maps contained herein display the specific conditions and factors in Manatee County that are the basis for the GP line identified and recommended for the County. As seen in these maps, the coastal area of interest in Manatee County consists of Anna Maria Island, a coastal barrier island which includes portions of the town of Bradenton Beach, and the northern half of Longboat Key, a coastal barrier island which extends into the northern portion of Sarasota County.

Anna Maria Island is bounded to the north by entrance waters leading toward Tampa Bay and is separated from Longboat Key to the south by Longboat Pass. The final map in the series in this section shows the location of the recommended GP line for Manatee County.

As stated in the Background Section earlier in this report volume, the SW region was always anticipated to be an area of the State which would benefit to a large extent from the GP provisions. This has been determined to be the case for Manatee County as seen in the results described and illustrated in this portion of the report and presented in detail below. The entire coastal length of the county (R1-R67), from Anna Maria Island through the northern part of Longboat Key, has been included in the GP evaluation for this county.

Land Development Trends

As shown in the general coastal land use classification map in Figure ME-1, coastal lands along the open Gulf of Mexico shoreline in Manatee County consists of both developed lands and undeveloped public lands on two barrier islands, Anna Maria Island to the north, and the northern portion of Longboat Key to the south. Anna Maria Island is bounded to the north by entrance waters to Tampa Bay and to the south by Longboat Pass which separates Longboat Key from Anna Maria Island.

There are extensive developed areas throughout most of Anna Maria Island, particularly along the north and central portions of the island including the Holmes Beach and Bradenton Beach areas consisting of a mix of single and multi-family dwellings and commercial structures . The south end of the island, from approximately R34-R41, is a county beach recreational park. The land-use summary table for Manatee County contained in Appendix II of this report volume provides detailed locations and summary percentages of development types for the County.

The island has a history of shoreline erosion, discussed in more detail further below, and contains extensive coastal armoring, much of which was buried by sand fill from an island-wide beach restoration project initially completed in February 1993. All of the Gulf of Mexico shoreline along Anna Maria Island has been designated as a critically eroded beach area (FDEP, 2006).

The portion of Longboat Key within Manatee County (R42-R67) consists of extensive development, including single and multi-family dwelling construction, as well as, some commercial structures. The northern approximately 1200 feet of Longboat Key is undeveloped coastal barrier island lands. The developed portions of northern Longboat Key have experienced long-term shoreline recession

throughout much of that area and, as a result, were extensively armored with seawalls and rock revetments.

As with Anna Maria Island, much of the coastal armoring has been buried by sand fill from beach restoration project activity which was completed along this portion of Longboat Key in August 1993. Similar to Anna Maria Island, all of the Longboat Key Gulf of Mexico shoreline has been designated as a critically eroded beach area (FDEP, 2006).

It was not possible to determine an accurate, precise length of existing coastal armoring along the Gulf of Mexico shoreline in Manatee County. Problems associated with making an accurate assessment of coastal armoring structure locations include lack of availability of existing aerial photography depicting the armoring immediately prior to initiation of the beach restoration projects and, subsequently, the burial of much of the armoring by the beach fill itself.

As a result, the depicted locations of coastal armoring in Figure ME-1 and the listing of total length are considered to be approximate across the entire developed areas. Specific locations of coastal armoring, as well as, gaps in the armoring were not mapped as a part of this GP evaluation work.

Shoreline Erosion Conditions

Shoreline change rates and associated 30-yr erosion projections compiled from long-term survey data evaluation are shown graphically in Figures ME-3 and ME-4, respectively, for background reference purposes. The rates and projections are given for both methods described in the General Description and Procedural Report (Volume I) of the GP report series, the rule-based method (FDEP, Foster, 2006) and trend/stochastic method (Walton and Cheng, 2004).

Tabulated compilation of these shoreline change rate and 30-yr projection values are provided in Appendix I of this report. These provided rates and projections are based on the most current topographic survey data available at the time of the GP evaluation for this county, including the 2005 BBCS regional coastal monitoring data.

It is noted that rule-based erosion rate values are not shown nor listed for the beach restoration project areas on Anna Maria Island and Longboat Key. The two project areas were given 30-year credit with regard to projected shoreline recession landward from the project erosion control lines (Foster, 2006). The corresponding 30-year erosion projections identified for the project areas are based on the measured distances from mean high water to seasonal high water and projected landward from the erosion control line (ECL) (Foster, 2006).

The north end of Anna Maria Island (R1 through approximately R12) has a history of significant shoreline fluctuations, contains intermittent shoreline armoring structures, and is predominantly outside of the limits of the beach restoration project. As such, it is a very difficult area to establish reliable shoreline change trends and provide a 30-year erosion projection within this area.

There has been some recent fill placement within this area by Manatee County; however, it is not located within the Federal project limits. As a result of the uncertainties in this area at this time, no definitive rule-based 30-year erosion projection has been determined for this area. A conservative approach has been taken in terms of GP line designation, and no GP line has been proposed within this area at this time.

The initial Anna Maria Island beach nourishment project, completed in February 1993, consisted of placement of approximately 2.3 million cubic yards of sand along approximately 4.6 miles of shoreline. A renourishment project completed in May 2002 consisted of an additional placement of approximately 1.9 million cubic yards of sand fill along 5.2 miles of shoreline. This project has performed very well as exemplified by a renourishment interval of nearly 10 years.

The initial beach nourishment project at Longboat Key, completed in August 1993, consisted of placement of approximately 3.13 million cubic yards of sand along approximately 9.3 miles of shoreline, of which about half is within Manatee County. Additional renourishment activity along the Key was performed in 1997 (3 events), 1998, 2001, 2003, and 2006. More details on both of these projects can be viewed at the Beach Erosion Control Project Monitoring Database Information System on-line at: http://beach15.beaches.fsu.edu/

The inclusion of the beach nourishment projects into the shoreline erosion analysis for Anna Maria Island and Longboat Key results in rule-based 30-year erosion projections which are not expected to reach the habitable development throughout much of these areas. It is therefore concluded that a GP line can be designated for these project areas in terms of 30-year erosion projection estimates.

As with other regions of the State, the stochastic/trend method results in 30-year erosion projections which extend landward of habitable construction in the Anna Maria Island and Longboat Key beach nourishment project areas. However, as discussed in Section 2 of this report volume, this method did not include specific consideration of the long-term presence of a beach nourishment project and of coastal armoring and associated affects of those features on stabilizing that shoreline.

GP Line Recommendations

Most of the developed portions of Manatee County, specifically along Anna Maria Island and Longboat Key, are favorable for consideration of designation of a GP line. The presence of established beach restoration/nourishment projects on Anna Maria Island and Longboat Key serve to retard long-term shoreline erosion conditions in these areas.

As a result of the nourishment projects, GP line designation is recommended throughout most of the developed portions of Manatee County. The recommended GP line segments extend throughout the nourishment project areas from FDEP range R1 through R36 and vary in location depending on the estimated line of construction alignment. The GP line varies in location from the position of the FDEP's old coastal construction setback line (CCSBL) to landward buffer distances landward of the CCSBL, generally from 25 feet to 50 feet landward.

The general location of the recommended GP line is depicted on the Manatee County GP line map shown in Figure ME-5. A more detailed depiction of the recommended GP line overlain on aerial photomaps can be viewed on the FDEP Regional Coastal Monitoring Database (RCMD) consolidated web mapping application website at the following address: http://bcs.dep.state.fl.us/rcmd/

General Permit Summary information for Manatee County is provided in the table below. A detailed listing of the stochastic/trend and rule-based long-term erosion rates and 30-year erosion projections is provided in tabular form in Appendix I of this report volume.

Detailed listings of the general coastal land-use classification information and recommended GP line locations are provided in tabular form in Appendix II of this report volume. The precise location of the GP line will be defined by a legal description prepared by the BBCS professional land surveyor.

Manatee County - GP Summary Information

Shoreline Category	Length (mi.)	Percent of Total
Total Shoreline (Gulf Shorefront)	12.3	
Public Shorefront (Gulf)	2.4	19.6%
Developed Shorefront (Gulf)	9.9 (Total)	80.4 %
SFD	2.2	18.2 %
MFD	4.0	33.1 %
Mixed (SFD/MFD/commercial)	3.6	29.1 %
Coastal Armoring:	9.7 *	84.5 %
Beach Nourishment:	9.4 **	76.4 %
Dune Restoration:	none	0.0 %
GP Line	10.4 9.4 (in developed)	84.1 % (of total) 94.9 % (of developed)

* Note Armoring not contiguous; length provided is total length of area within which armoring is located.

** Note: The Beach Nourishment length includes the reported 5.2 mile Anna Maria Island project and the northern portion of the 9.3 mile Longboat Key project which is located in Manatee County and consist of approximately 4.7 miles in length.

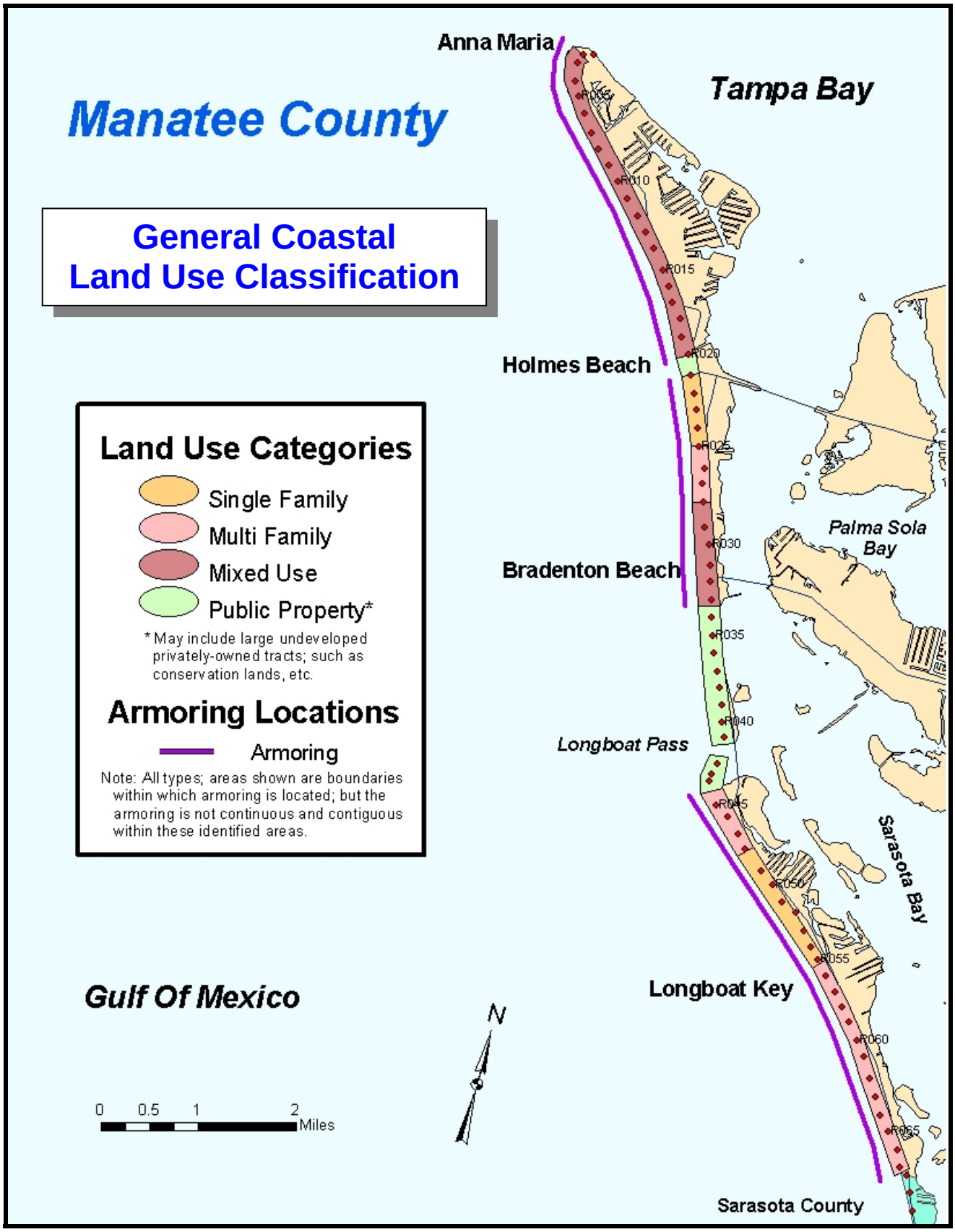

Figure ME-1. General Coastal Land Use Classification Map for Manatee County.

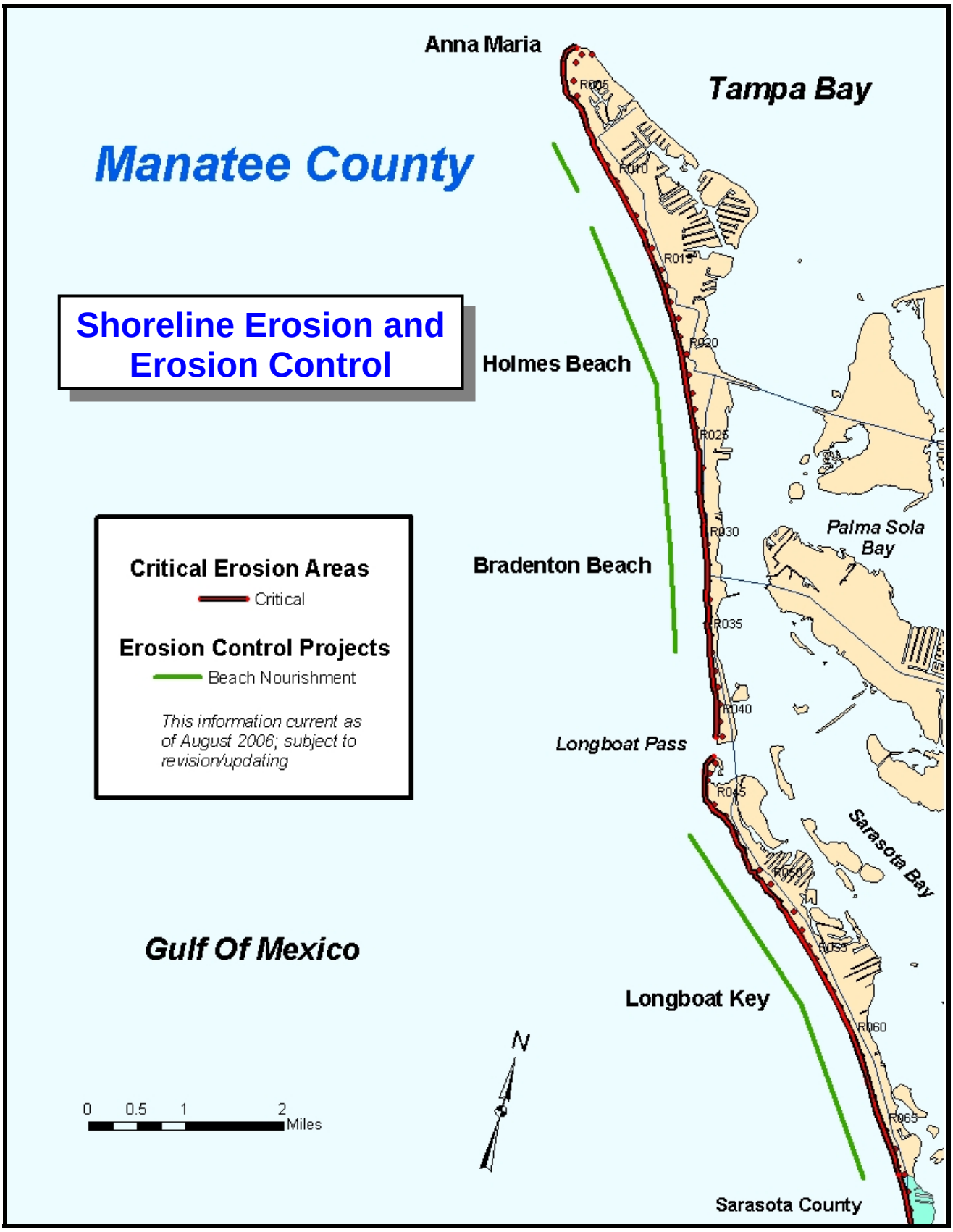

Figure ME-2. Critical Erosion Areas and Erosion Control Projects in Manatee County.

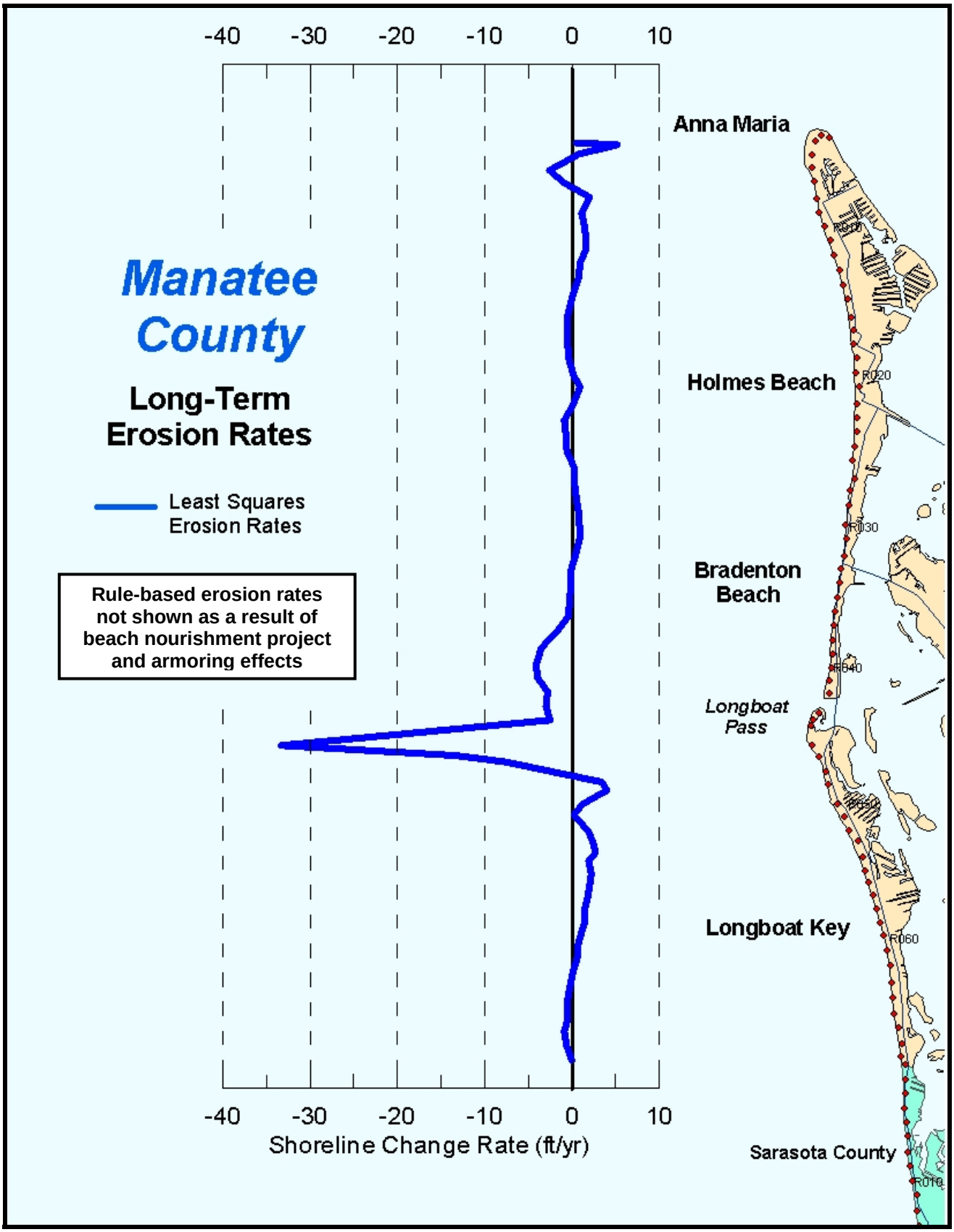

Figure ME-3. Long-term erosion rates for Manatee Co.; rule-based rates not shown.

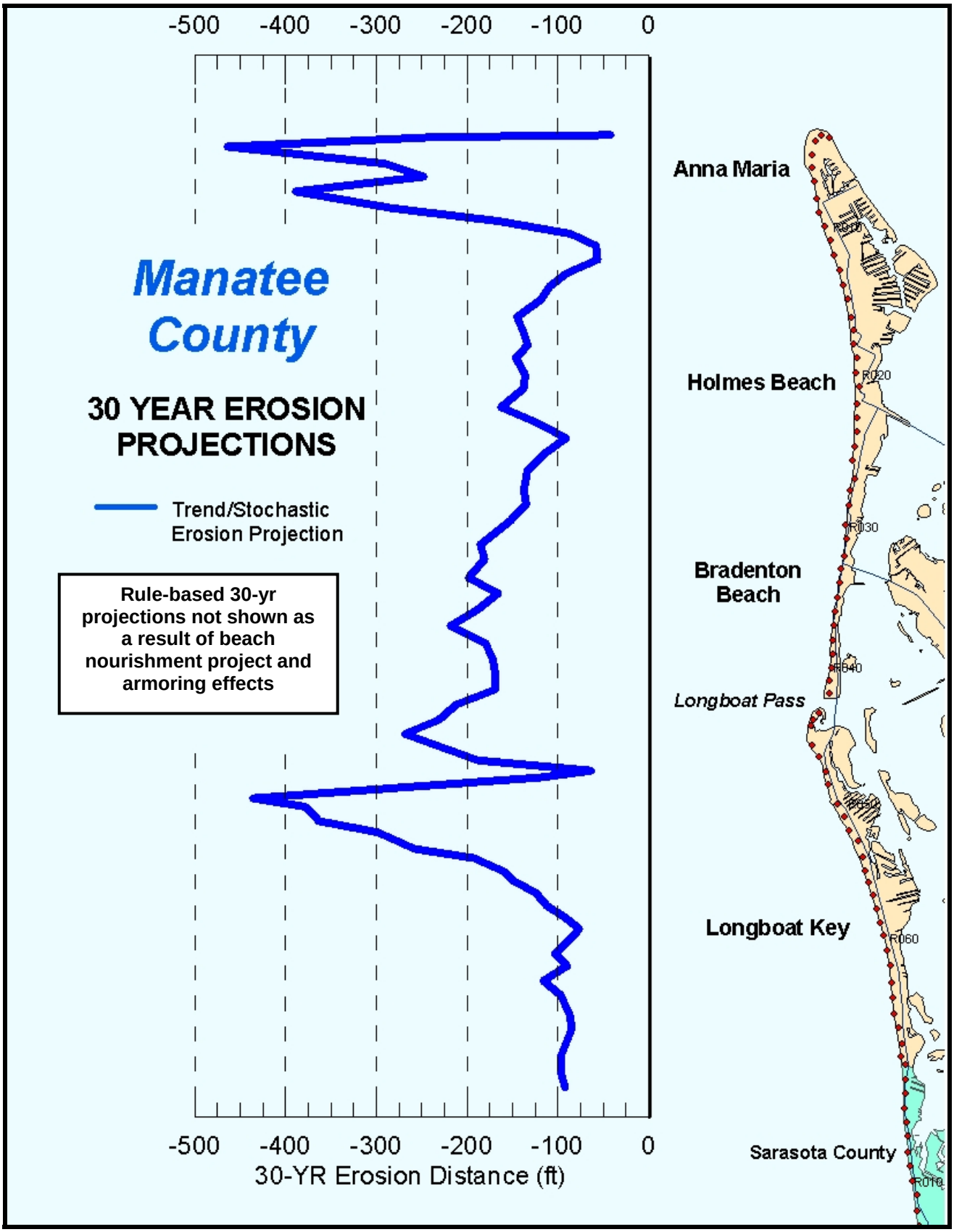

Figure ME-4. Manatee Co. 30-year erosion projections; rule-based projection not shown.

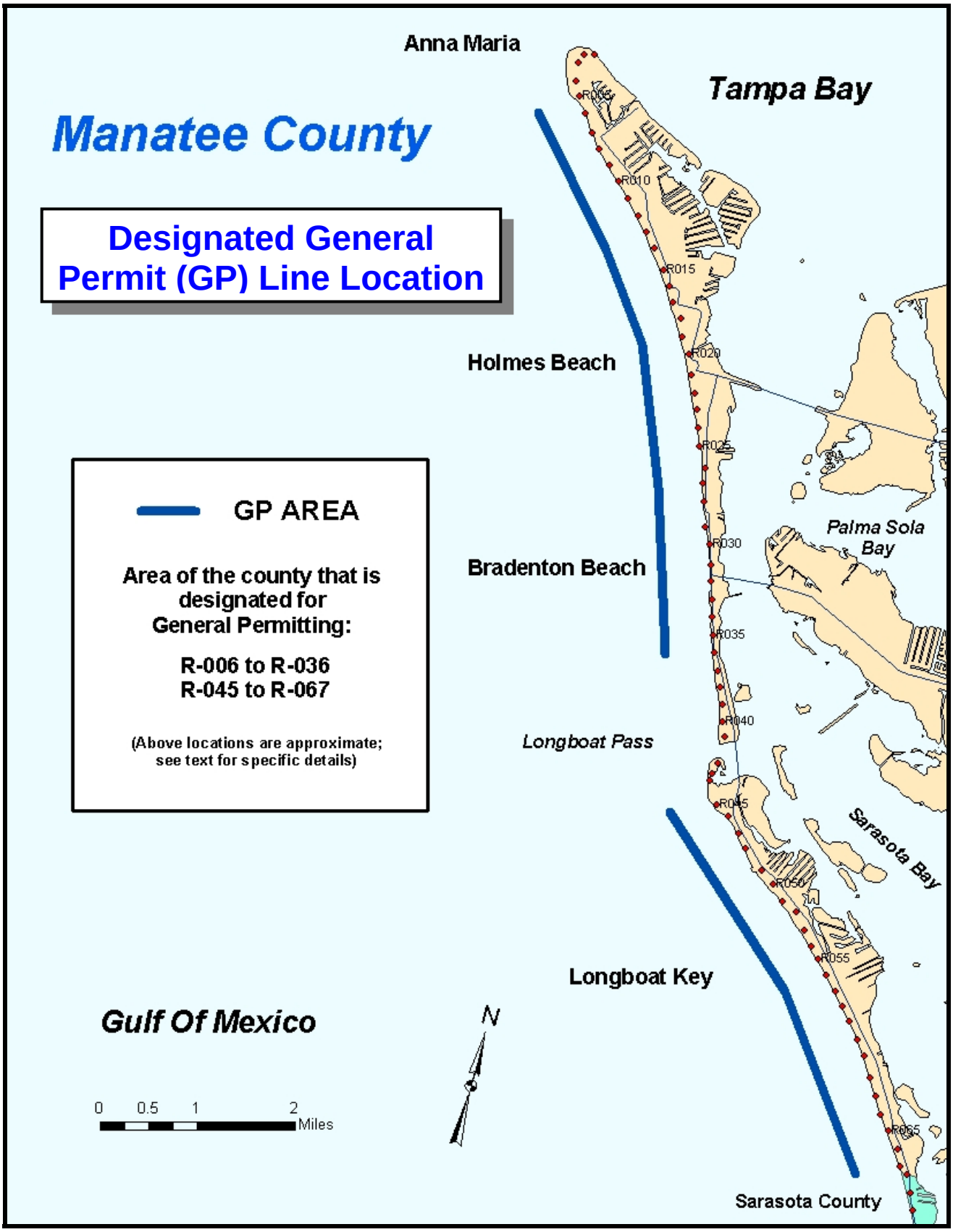

Figure ME-5. Designated General Permit (GP) line location for Manatee County.

3.2 SARASOTA COUNTY - GP Line Delineation

The series of GIS-derived maps contained herein display the specific conditions and factors in Sarasota County that are the basis for the GP line identified and recommended for the County. As seen in these maps, the coastal area of interest in Sarasota County consists of portions or all of a number of coastal barrier islands, as well as, coastal mainland areas situated along the Gulf of Mexico coast.

Extending from north to south, Sarasota County includes the southern half of Longboat Key, which is separated from Lido Key, the barrier island to the south by New Pass. Siesta Key, a coastal barrier island, is located to the south of Lido Key, separated by Big Sarasota Pass. South of Siesta Key is Casey Key, another coastal barrier island, which is bounded to the south by Venice Inlet. The City of Venice is located south of Venice Inlet and is situated on a mainland portion of the coast. Coastal barrier island areas at Manasota Key extend southward from the Venice area to the Charlotte county line and the Englewood Beach area. The final map in the series in this section shows the location of the recommended GP line for Sarasota County.

Based on coastal development trends and conditions, as well as, extent of coastal and shore protection projects, the SW region has been found to be an area of the State which is very favorable for implementation of GP provisions. This has been determined to be the case for Sarasota County as seen in the results described and illustrated in this portion of the report and presented in detail below. Most all of the coastal length of the county has been included in the GP evaluation for this county, although some areas were excluded as unfavorable for evaluation based on unacceptable line of construction, potential beach and dune impacts, and/or erosion conditions.

Land Development Trends

As shown in the general coastal land use classification map in Figure ST-1, coastal lands along the open Gulf of Mexico shoreline in Sarasota County consists of both developed lands and undeveloped public lands. The type of development alternates and varies extensively throughout the county. The land-use summary table for Sarasota County contained in Appendix II of this report volume provides detailed locations and summary percentages of development types for the County.

Developed areas on Longboat Key, Lido Key, northern Siesta Key, and the City of Venice contain predominantly multi-family dwelling construction. This is in contrast to the vast majority of the remaining developed areas of the County which are of single-family dwelling type construction, such as along the southern portions of Siesta Key, and along Casey Key and Manasota Key. There are some small interspered areas of mixed-use development, as well.

The County has a history of shoreline erosion throughout much of the developed portions of the County as discussed in more detail further below. Concurrently, there has been extensive coastal armoring constructed to protect the development within the eroding areas. As in Manatee County, beach nourishment projects have provided some sand cover and restored beach areas within the armored areas.

Beach nourishment projects have been performed and maintained throughout the southern portion of Longboat Key, the central part of Lido Key, and within the Gulf-front portion of the City of Venice

south of the south jetty at Venice Inlet. These projects are performing well and resulting in a great contribution to the overall shoreline stability and beach recovery within those portions of the County. Some other developed areas experiencing erosion, including designated critical eroded areas on Siesta Key, Casey Key, and southern Manasota Key, are under consideration for beach nourishment projects in the future. The Bureau of Beaches and Coastal Systems has mapped all designated critical eroded areas for Sarasota County including these areas (FDEP, 2006).

As in Manatee County, much of the coastal armoring has been buried by sand fill within the beach restoration project areas in Sarasota County. Similar to Manatee County, it was not possible to determine an accurate, precise length of existing coastal armoring along the Gulf of Mexico shoreline in Sarasota County.

Problems associated with making an accurate assessment of coastal armoring structure locations include lack of availability of existing aerial photography depicting the armoring immediately prior to initiation of the beach restoration projects and, subsequently, the burial of much of the armoring by the beach fill itself.

As a result, the depicted locations of coastal armoring in Figure ST-1 and the listing of total length are considered to be approximate across the entire developed areas. Specific locations of coastal armoring, as well as, gaps in the armoring were not mapped as a part of this GP evaluation work.

Shoreline Erosion Conditions

Shoreline change rates and associated 30-yr erosion projections compiled from long-term survey data evaluation are shown graphically in Figures ST-3 and ST-4, respectively, for background reference purposes. The rates and projections are given for both methods described in the General Description and Procedural Report (Volume I) of the GP report series, the rule-based method (FDEP, Foster, 2006) and trend/stochastic method (Walton and Cheng, 2004).

Tabulated compilation of these shoreline change rate and 30-yr projection values are provided in Appendix I of this report. These provided rates and projections are based on the most current topographic survey data available at the time of the GP evaluation for this county, including the 2005 BBCS regional coastal monitoring data.

It is noted that rule-based erosion rate values are not shown nor listed for the beach restoration project areas on Longboat Key and Lido Key and within the City of Venice. The project areas were given 30-year credit with regard to projected shoreline recession landward from the project erosion control lines (Foster, 2006). The corresponding 30-year erosion projections identified for the project areas are based on the measured distances from mean high water to seasonal high water and projected landward from the erosion control line (ECL) (Foster, 2006).

Some other non-project locations also do not show rule-based values. This is the result of complications encountered in establishing the values as a result of factors, such as a history of significant shoreline fluctuations and influence of intermittent shoreline armoring structures. These types of conditions result in a high level of uncertainty in determining reliable 30-year erosion projections. As such, it is very difficult to establish reliable shoreline change trends and provide 30-year erosion projections within some of these areas. Therefore, 30-year projections along some shoreline segments in Sarasota County are given as either conservative worst-case limits, such as in

portions of Casey and Manasota Keys, or, not at all, such as at the north tip of Siesta Key (R46, R47), adjacent to Big Sarasota Pass.

The initial beach nourishment project at Longboat Key, completed in August 1993, consisted of placement of approximately 3.13 million cubic yards of sand along approximately 9.3 miles of shoreline, of which about half is within Sarasota County. Additional renourishment activity along the Key was performed in 1997 (3 events), 1998, 2001, 2003, and 2006.

The initial beach nourishment project at Lido Key was performed in 1998 and consisted of placement of approximately 285,000 cubic yards of sand along approximately 0.84 miles of shoreline between FDEP monument locations R35.5 and R40. Supplemental renourishment fill placements included 360,000 cubic yards in March-April 2001 along 1.36 miles between R36.5 and R44.2., and 125,000 cubic yards in December 2002-February 2003 along 1.17 miles between R35.5 and R43.2.

The initial beach nourishment project (Phase I) at the City of Venice, completed in November 1994, consisted of placement of approximately 895,000 cubic yards of sand along 1.44 miles of shoreline between R116 and R123A. Additional renourishment (Phase II) consisted of placement of 901,000 cubic yards activity along 1.87 miles of shoreline between R123A-R133.

More details on both of these projects can be viewed at the Beach Erosion Control Project Monitoring Database Information System on-line at: http://beach15.beaches.fsu.edu/

As with other regions of the State, the stochastic/trend method results in 30-year erosion projections which extend landward of habitable construction in the beach nourishment project areas of the County. However, this method did not include specific consideration of the long-term presence of a beach nourishment project and of coastal armoring and associated affects of those features on stabilizing that shoreline.

GP Line Recommendations

The Sarasota County coastal area consists of varying conditions with respect to acceptability for designation of a GP line. Overall, the County has a relatively high portion of the shoreline within which a GP line is favorable, even though the benefits of a GP line are limited through many of the favorable areas. Although there is a high percentage of developed land which is single-family dwelling type development, erosion conditions, as well as, inconsistent line of construction and beach-dune impact issues reduce the acceptability of many areas for GP line designation.

Most of the developed portions of Longboat Key, Lido Key, and the City of Venice are favorable for consideration of designation of a GP line. The presence of established beach nourishment projects within these areas serve to retard long-term shoreline erosion conditions in these areas. It is noted that, as a result of inconsistent line of construction of the mostly multi-family dwelling construction in these areas, benefits of a GP line are limited within these areas of the County.

There are a number of intermittent areas along the Siesta Key, Casey Key, and Manasota Key shorelines which are favorable for GP line designation. These favorable areas include locations where there are multiple lines or rows of construction extending landward from the shoreline. The more landward construction within these areas make these areas particularly favorable for GP line

designation. The unfavorable portions of these areas results from erosional conditions, as well as, inconsistent line of construction and beach-dune impact issues. Even in the favorable portions of these areas, the recommended GP lines have been place further landward as a result of fluctuating and uncertain erosional conditions.

The general location of the recommended GP line is depicted on the Sarasota County GP line map shown in Figure ST-5. A more detailed depiction of the recommended GP line overlain on aerial photomaps can be viewed on the FDEP Regional Coastal Monitoring Database (RCMD) consolidated web mapping application website at the following address: http://bcs.dep.state.fl.us/rcmd/

General Permit Summary information for Sarasota County is provided in the table below. A detailed listing of the stochastic/trend and rule-based long-term erosion rates and 30-year erosion projections is provided in tabular form in Appendix I of this report volume.

Detailed listings of the general coastal land-use classification information and recommended GP line locations are provided in tabular form in Appendix II of this report volume. The precise location of the GP line will be defined by a legal description prepared by the BBCS professional land surveyor.

Sarasota County - GP Summary Information

Shoreline Category	Length (mi.)	Percent of Total
Total Shoreline (Gulf Shorefront)	34.7	
Public Shorefront (Gulf)	7.8	22.6%
Developed Shorefront (Gulf)	26.9 (Total)	77.5 %
SFD	17.4	50.2 %
MFD	8.6	24.7 %
Mixed (SFD/MFD/commercial)	0.9	2.5 %
Coastal Armoring:	8.5 *	24.5 %
Beach Nourishment:	10.6 **	30.6 %
Dune Restoration:	0.0	0.0 %
GP Line	26.4	76.1 % (of total)
	24.6 (in developed)	91.5 % (of developed)

* Note: Armoring not contiguous; length provided is total length of area within which armoring is located.

** Note: The Beach Nourishment length includes the southern portion of the 9.3 mile Longboat Key project, the approximately 1.4 mile length of the Lido Key project, and the approximately 3.3 mile length of the City of Venice project.

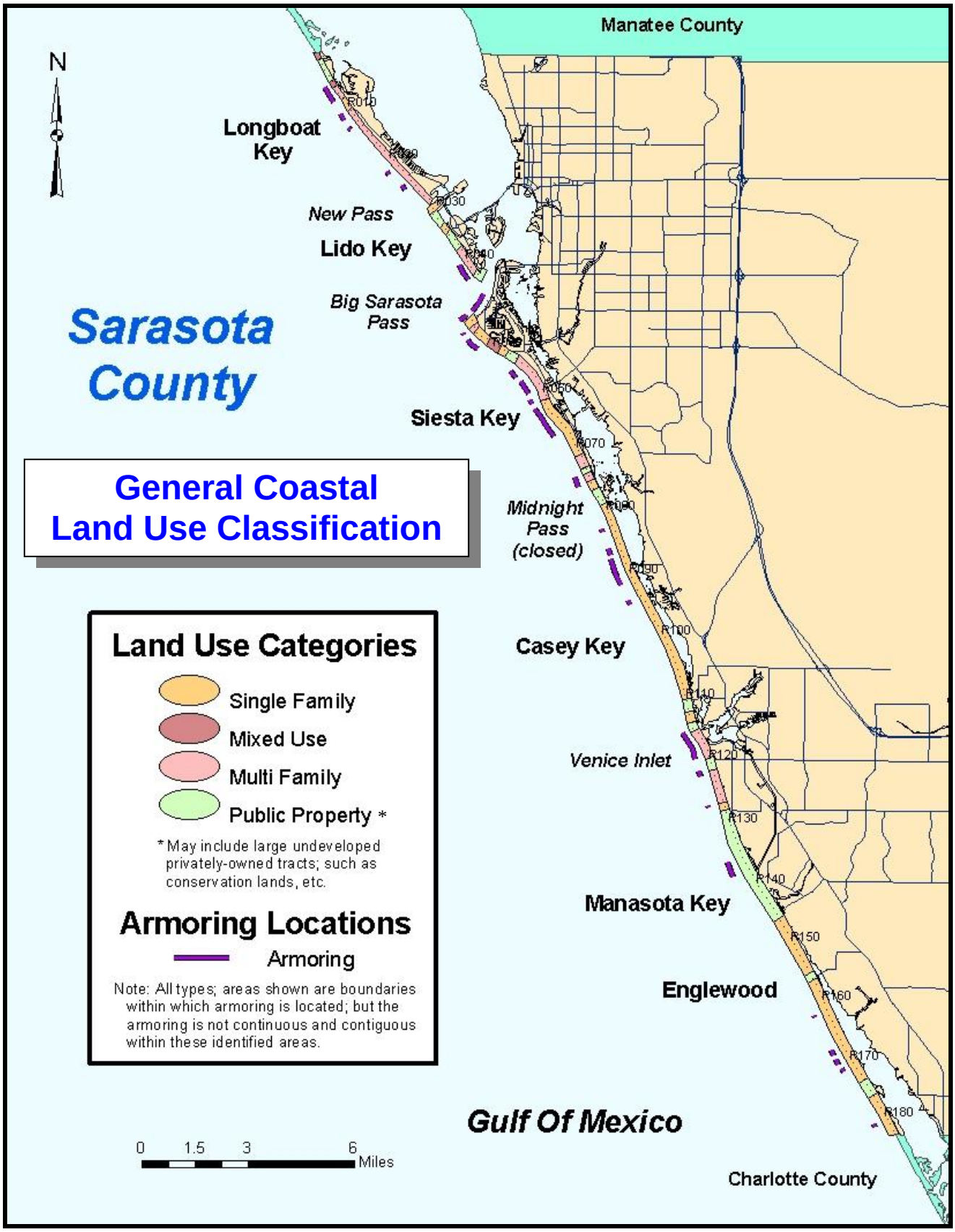

Figure ST-1. General Coastal Land Use Classification Map for Sarasota County.

Figure ST-2. Critical Erosion Areas and Erosion Control Projects in Sarasota County.

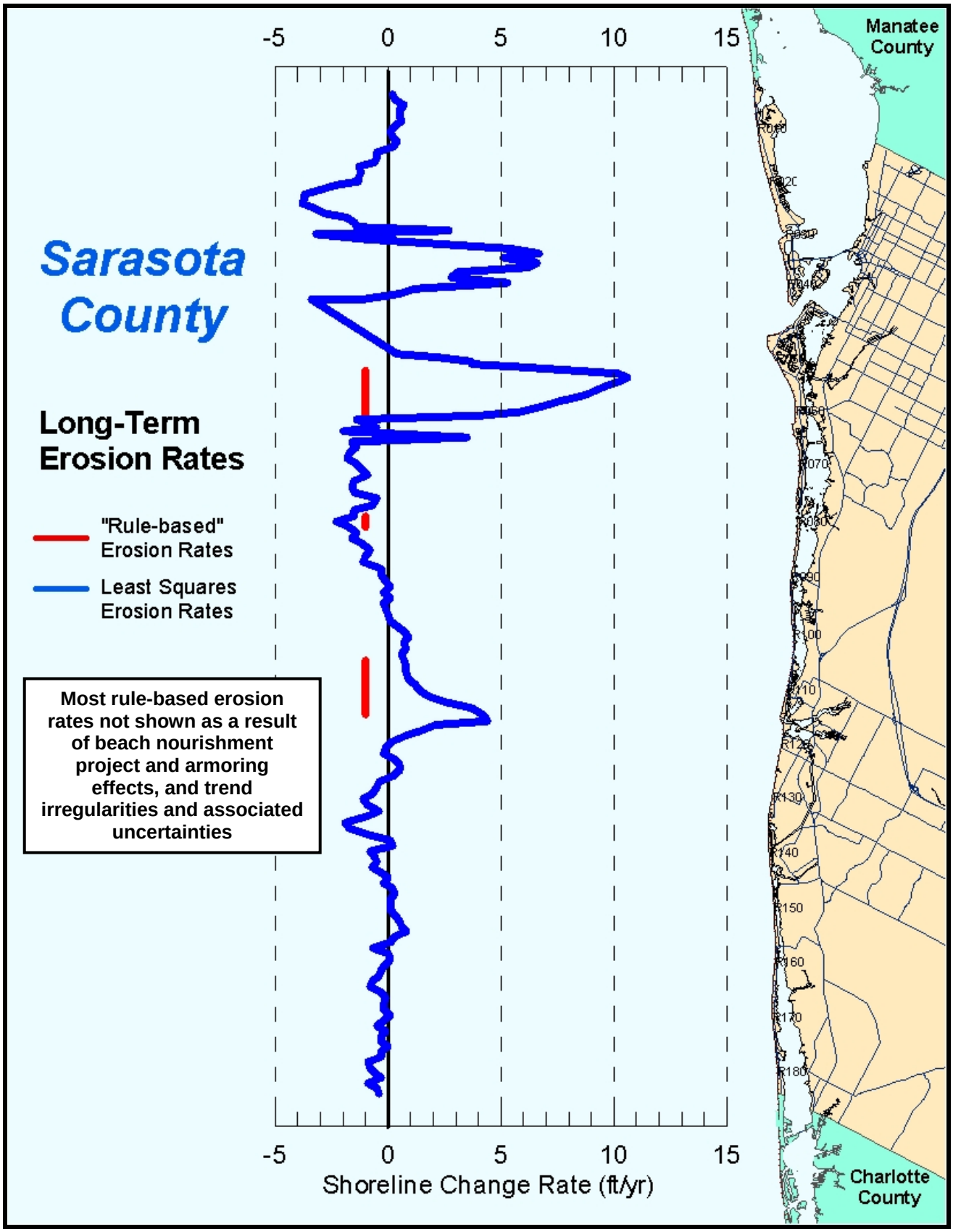

Figure ST-3. Long-term shoreline change rates for Sarasota County.

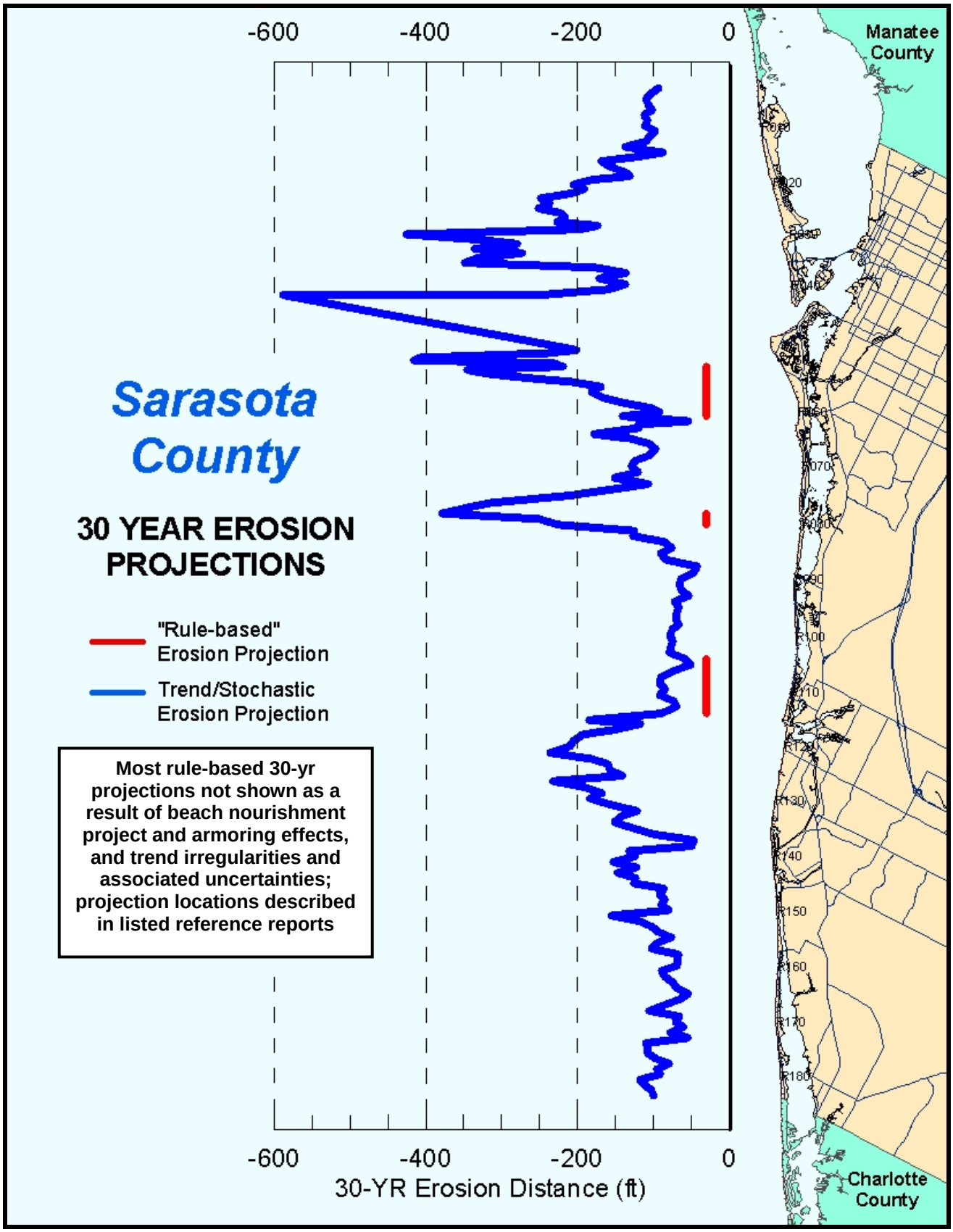

Figure ST-4. 30-year erosion projections for Sarasota County.

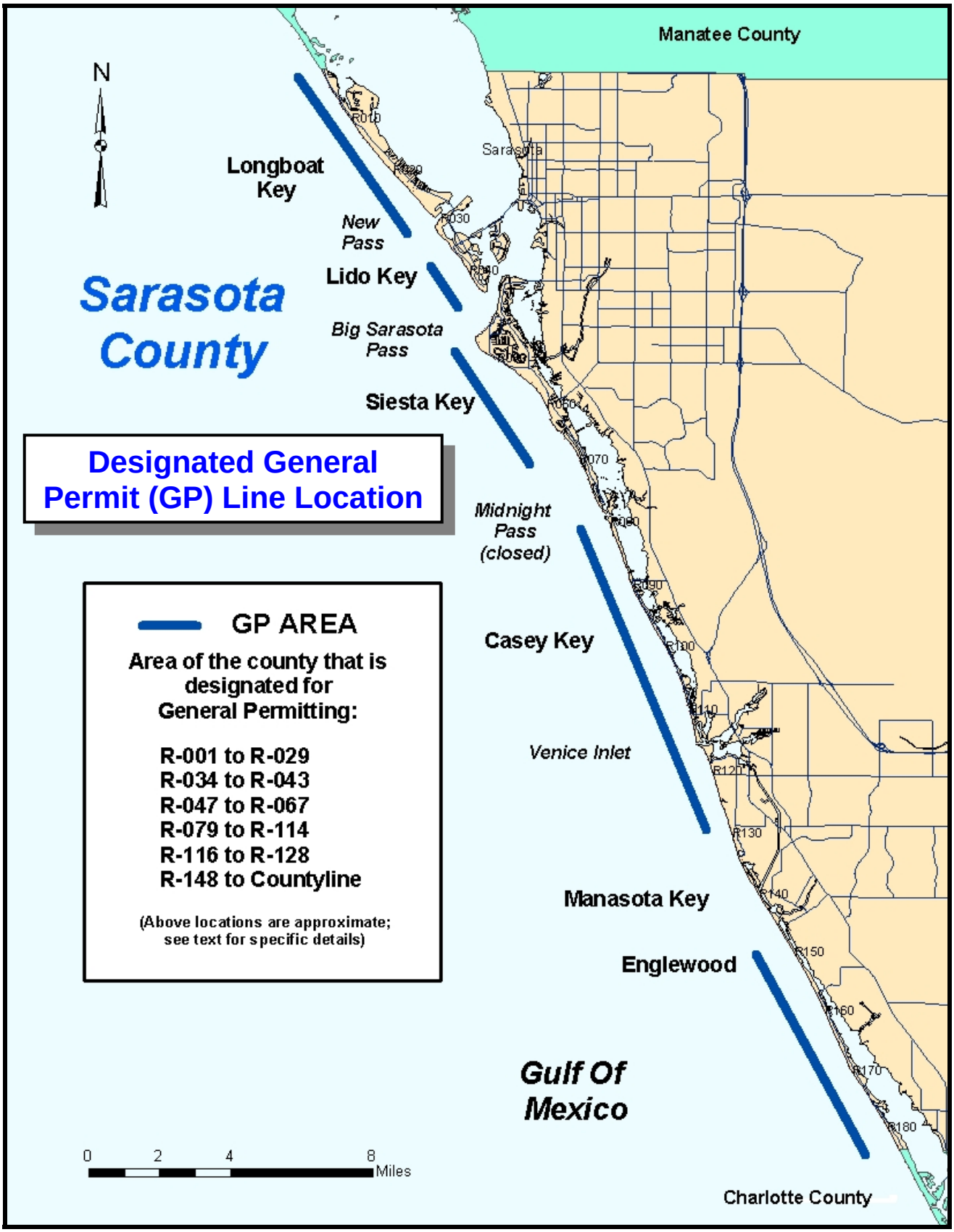

Figure ST-5. Designated General Permit (GP) line location for Sarasota County.

3.3 CHARLOTTE COUNTY - GP Line Delineation

The series of GIS-derived maps contained herein display the specific conditions and factors in Charlotte County that are the basis for the GP line identified and recommended for the County. As seen in these maps, the coastal area of interest in Charlotte County consists of portions or all of a number of coastal barrier islands along the Gulf of Mexico coast.

Extending from north to south, Charlotte County includes the southern portion of Manasota Key, the Englewood Beach area, and the Stump Pass Beach State Park areas to the north of Stump Pass (see Figure CH-1). South of Stump Pass is the barrier island complex currently forged into one continuous island feature with the north end consisting of Knight Island and, further to the south, Bocilla Island. As this island complex extends southward, it transitions into Little Gasparilla Island which in bordered to the south by Gasparilla Pass. Another barrier Island, Gasparilla Island, is located south of Gasparilla Pass. The Charlotte County south boundary line is located on Gasparilla Island approximately 2 miles south of Gasparilla Pass. The final map in the series in this section shows the location of the recommended GP line for Charlotte County.

Based on coastal development trends and conditions, as well as, extent of coastal and shore protection projects, the SW region has been found to be an area of the State which is very favorable for implementation of GP provisions. However, this has not been found to be the case for most of Charlotte County as seen in the results described and illustrated in this portion of the report presented below. Most all of the coastal length of the county has been determined to be unsuitable for GP designation at this time because of unacceptable line of construction, potential beach and dune impacts, and/or erosion conditions.

Land Development Trends

As shown in the general coastal land use classification map in Figure CH-1, coastal lands along the open Gulf of Mexico shoreline in Charlotte County consists of both developed lands and undeveloped public lands. The type of development varies throughout the county, but is predominantly single-family dwelling development. The land-use summary table for Charlotte County contained in Appendix II of this report volume provides detailed locations and summary percentages of development types for the County.

Developed areas on Manasota Key, including the Englewood Beach area, alternate between single and multi-family dwelling structures. The barrier islands to the south, at Knight Island, Bocilla Island, and Little Gasparilla Island contain single-family dwelling development almost exclusively, other than a small extent of townhouse structures near the north end of Knight Island just south of Stump Pass. Development along the northern, Charlotte County portion of Gasparilla Island includes a segment of single-family structures sothward from Gasparilla Pass followed by mixed type construction, with both single-family and multi-family dwelling construction, further to the south.

There are two significant areas of public land north of Stump Pass, including the Stump Pass Beach State Park, as well as, a segment of public land along the Bocilla Island shoreline area.

Similar to other the southwest Florida coastal counties, Charlotte County has a history of shoreline erosion throughout much of the developed portions of the County as discussed in more detail further below. Coastal armoring construction has not been extensive within the developed portions of Charlotte County, although parts of Englewood Beach in the northern, Manasota Key area of the County contain coastal armoring structures along eroded shoreline locations. It was not possible, within the scope of this GP evaluation work, to determine an accurate, precise length of existing coastal armoring along the Gulf of Mexico shoreline in Charlotte County.

Problems associated with making an accurate assessment of coastal armoring structure locations include lack of availability of existing aerial photography depicting the armoring immediately prior to initiation of the beach restoration projects and, subsequently, the burial of much of the armoring by the beach fill itself. As a result, the depicted locations of coastal armoring in Figure CH-1 and the listing of total length are considered to be approximate across the entire developed areas. Specific locations of coastal armoring, as well as, gaps in the armoring were not mapped as a part of this GP evaluation work.

Beach nourishment projects associated with the dredging of Stump Pass have been performed with dredged sand placement both north of the Pass along the Stump Pass Beach State Park shoreline and to the south along eroded portions of Knight Island. These projects have historically been performed as isolated beach nourishment events, but, more recently, have not been conducted as part of the Charlotte County Erosion Control Project. Future sand placement within these areas is dependent and subject to the on-going stability of Stump Pass and related shoreline stability of the adjacent and downdrift beaches. Continued periodic beach monitoring will assist in long-term beach management activities within these areas and the entire Gulf of Mexico shoreline throughout the County.

Critical erosion areas have been designated throughout the southern Manasota Key/Englewood Beach areas (R1-R17), areas of Knight Island and Bocilla Island (R28-R39), and a short segment of Little Gasparilla Island (R47.5-R49.5). These areas continue to be evaluated for possible future beach nourishment project consideration. The Bureau of Beaches and Coastal Systems has mapped and documented all of these designated critical eroded areas for Charlotte County (FDEP, 2006).

Shoreline Erosion Conditions

Shoreline change rates and associated 30-yr erosion projections compiled from long-term survey data evaluation are shown graphically in Figures CH-3 and CH-4, respectively, for background reference purposes. The rates and projections are given for both methods described in the General Description and Procedural Report (Volume I) of the GP report series, the rule-based method (FDEP, Foster, 2006) and trend/stochastic method (Walton and Cheng, 2004).

Tabulated compilation of these shoreline change rate and 30-yr projection values are provided in Appendix I of this report. These provided rates and projections are based on the most current topographic survey data available at the time of the GP evaluation for this county, including the 2005 BBCS regional coastal monitoring data.

It is noted that rule-based erosion rate values and 30-yr erosion projections are not shown nor listed for the entire length of the County. This is the result of complications encountered in establishing the values as a result of factors, such as a history of significant shoreline fluctuations, the beach fill

events, and influences of intermittent shoreline armoring structures. These types of conditions result in a high level of uncertainty in determining reliable 30-year erosion projections. As such, it was determined that establishment of reliable rule-based shoreline change trends and associated 30-year erosion projections is not recommended at this time (Foster, 2006). However, for the County coastal segment determined to be favorable for GP line designation, upland locations were proposed (Foster, 2006) as conservative, worst-case conditions for 30-year projection locations for the purposes of this GP evaluation work.

Stump Pass was dredged in 1980 in a project in which the Pass was realigned in a more northerly orientation. Dredged sand from that project was predominantly placed to the north of the Pass along the Stump Pass Beach State Park. Sand placement from the Stump Pass channel and shoals onto downdrift areas on Knight Island was conducted in 1994 and in 1998.

A subsequent dredging project to re-align the Pass channel back to the 1980 alignment was completed in July 2003. Supplemental dredging from a nearshore shoal borrow site south of the Pass was included in this project. A total of 925,000 cubic yards of sand was dredged with 100,000 cubic yards placed on the State Park beaches north of Stump Pass, and the remainder split between a north fill site (196,300 cubic yards) between R22 and R25.5 and a south fill site (628,700 cubic yards) between R29 and R40 on Knight Island/Bocilla Island/Don Pedro Island beaches.

A follow-up re-dredging of the Pass for channel maintenance and realignment purposes was completed in June 2006. This re-dredging project resulted in placement of an additional 453,000 cubic yards placed on adjacent beaches, including 6,200 cubic yards in the north fill site on Knight Island between R22 and R24, 148,800 cubic yards on Manasota Key between R14.5 and R18, and 298,200 cubic yards in the Knight Island/Don Pedro Island south fill site between R29 and R40.

More details on these projects can be found in specific project monitoring reports and viewed at the Beach Erosion Control Project Monitoring Database Information System on-line at: http://beach15.beaches.fsu.edu/

As with other regions of the State, the stochastic/trend method results in 30-year erosion projections which extend landward of habitable construction in the beach nourishment project areas of the County. However, this method did not include specific consideration of the long-term presence of a beach nourishment project and of coastal armoring and associated affects of those features on stabilizing that shoreline.

GP Line Recommendations

Evaluation of the Charlotte County coastal area has resulted in minimal portions of the County found to be acceptable for designation of a GP line at this time. Overall, there is only a relatively small portion of the County shoreline within which a GP line is favorable. Although there is a high percentage of developed land which is single-family dwelling type development, erosion conditions, as well as, inconsistent line of construction and beach-dune impact issues reduce the acceptability of many areas for GP line designation.

The GP evaluation process resulted in determination that the northern portion of the County, within the Manasota Key/Englewood Beach areas, was favorable for GP line designation. This includes, specifically, the segment of shoreline from the north County line at R1 through the area extending to

approximately 350 feet south of R15, which is the north boundary of the State Park. During an initial evaluation screening process, it was determined that all of the coastal areas on the barrier island complex including Knight, Bocilla, Don Pedro, and Little Gasparilla was unfavorable for GP designation for of the reasons listed in the paragraph above. Initial screening suggested possible favorable conditions for GP line designation along the southerly portion of the County on Gasparilla Island, but further evaluation did not result in favorable determination for GP line designation in that area.

The general location of the recommended GP line is depicted on the Charlotte County GP line map shown in Figure CH-5. A more detailed depiction of the recommended GP line overlain on aerial photomaps can be viewed on the FDEP Regional Coastal Monitoring Database (RCMD) consolidated web mapping application website at the following address: http://bcs.dep.state.fl.us/rcmd/

General Permit Summary information for Charlotte County is provided in the table below. A detailed listing of the stochastic/trend and rule-based long-term erosion rates and 30-year erosion projections is provided in tabular form in Appendix I of this report volume. Detailed listings of the general coastal land-use classification information and recommended GP line locations are provided in tabular form in Appendix II of this report volume. The precise location of the GP line will be defined by a legal description prepared by the BBCS professional land surveyor.

Charlotte County - GP Summary Information

Shoreline Category	**Length (mi.)**	**Percent of Total**
Total Shoreline (Gulf Shorefront)	12.2	
Public Shorefront (Gulf)	2.8	22.9%
Developed Shorefront (Gulf)	9.4 (Total)	77.0 %
SFD	7.3	59.8 %
MFD	2.1	17.2 %
Mixed (SFD/MFD/commercial)	0.0	0.0 %
Coastal Armoring:	1.23 *	10.0 %
Beach Nourishment:	3.8 **	31.1 %
Dune Restoration:	0.0	0.0 %
GP Line	2.75	22.5 % (of total)
	2.43 (in developed)	25.9 % (of developed)

* Note: Armoring not contiguous; length provided is total length of area within which armoring is located.

** Note: The Beach Nourishment length includes a 0.75 mile segment at Stump Pass State Park, a 0.3 mile segment along northern Knight Island, and a 2.7 mile segment along Knight Island/Don Pedro Island.

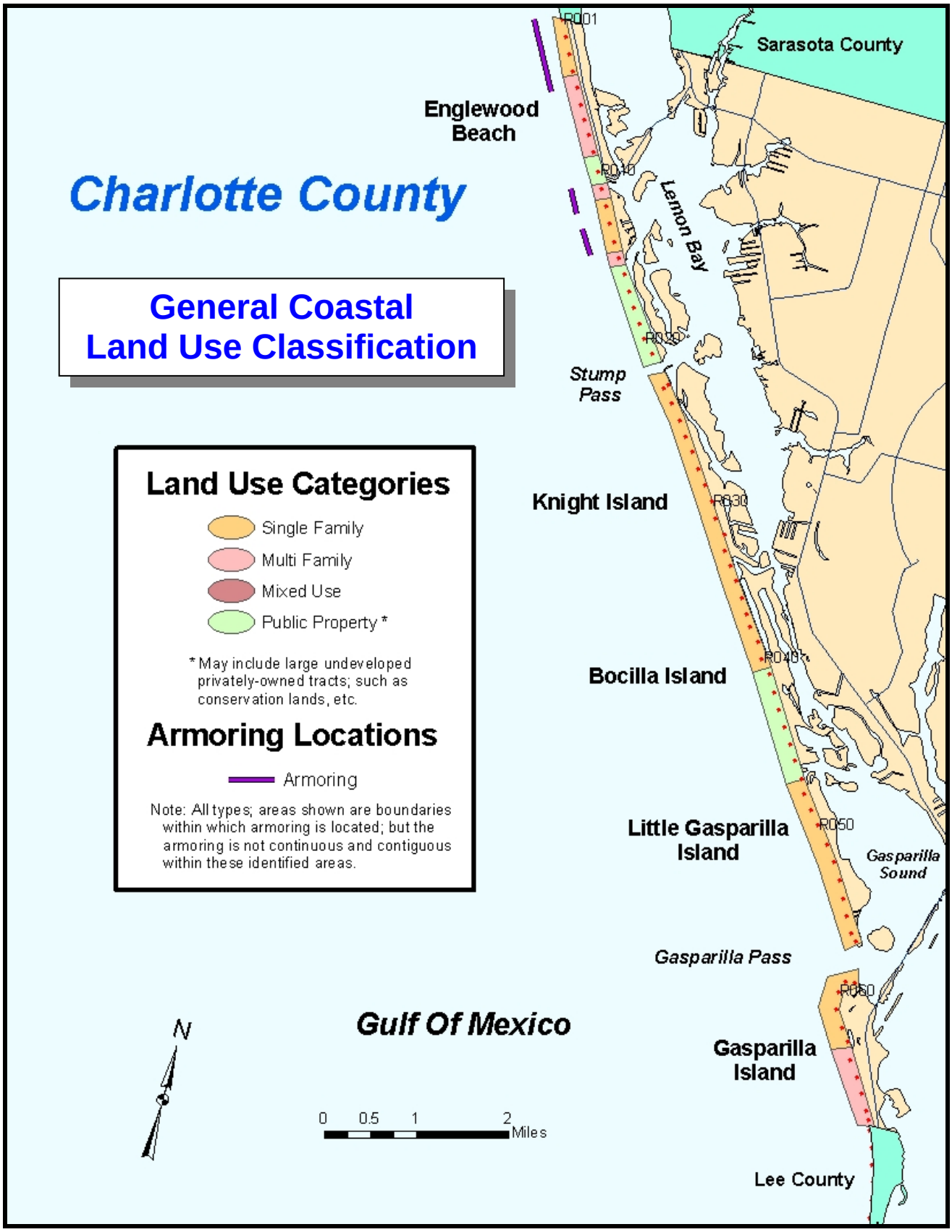

Figure CH-1. General Coastal Land Use Classification Map for Charlotte County.

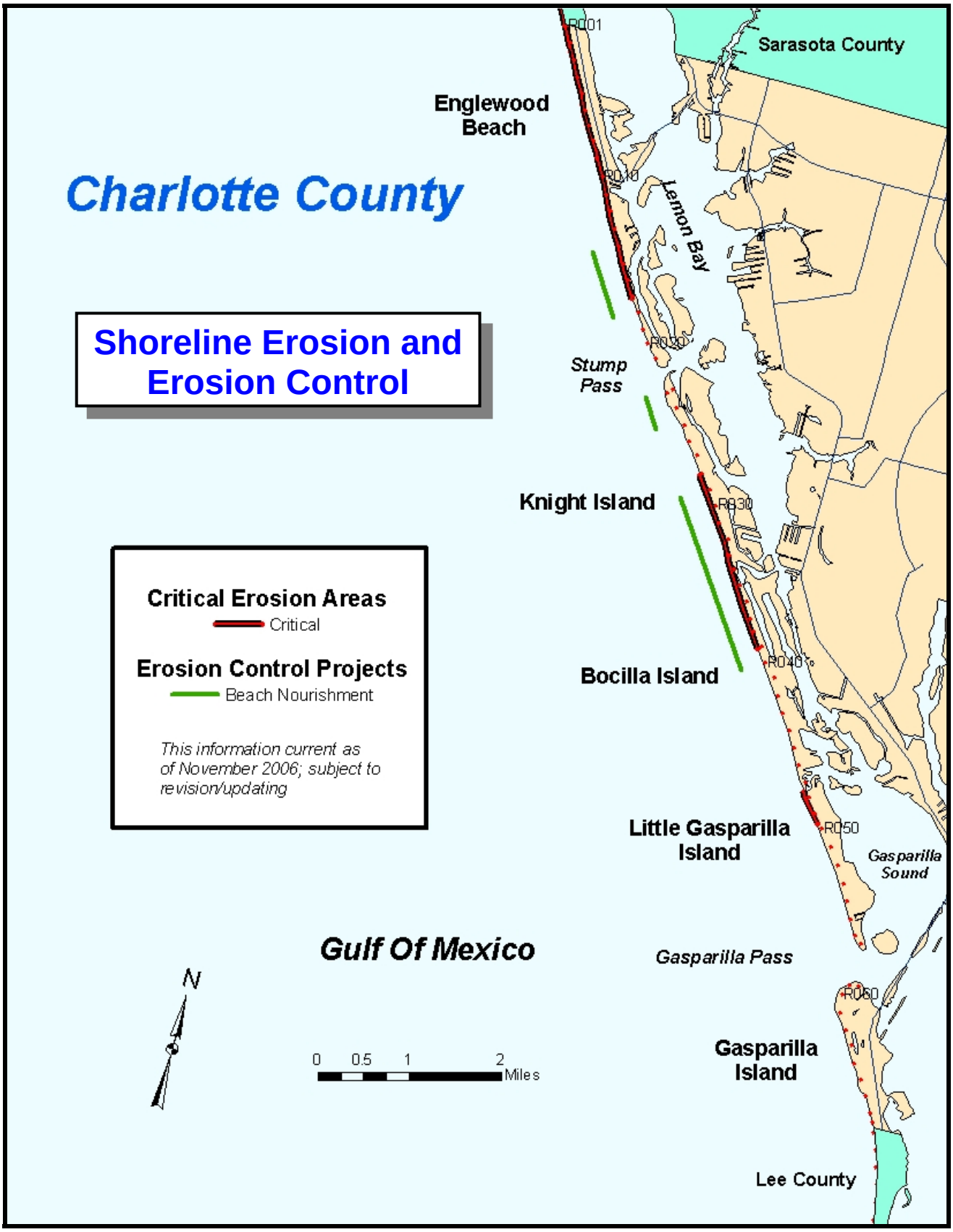

Figure CH-2. Critical Erosion Areas and Erosion Control Projects in Charlotte County.

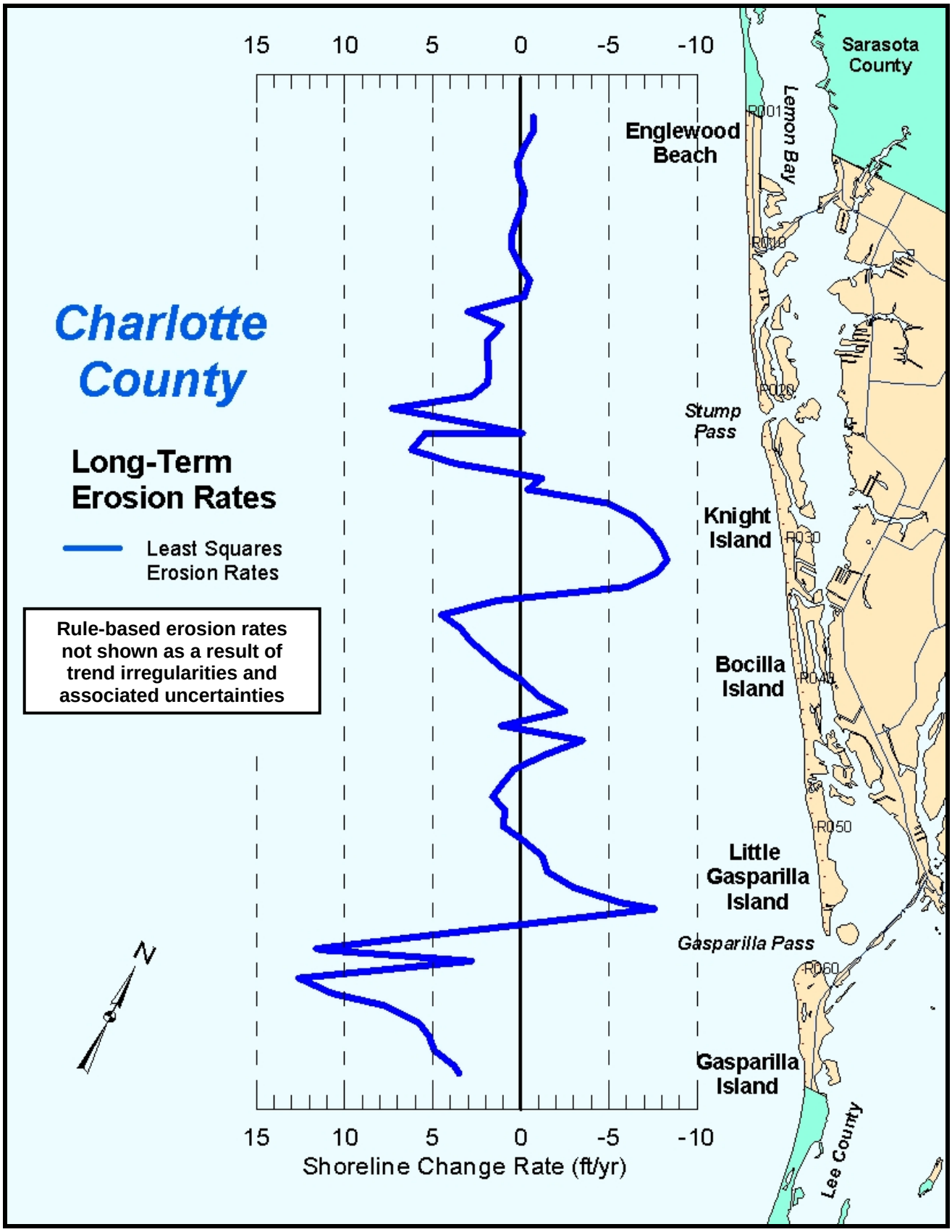

Figure CH-3. Long-term erosion rates for Charlotte Co.; rule-based rates not shown.

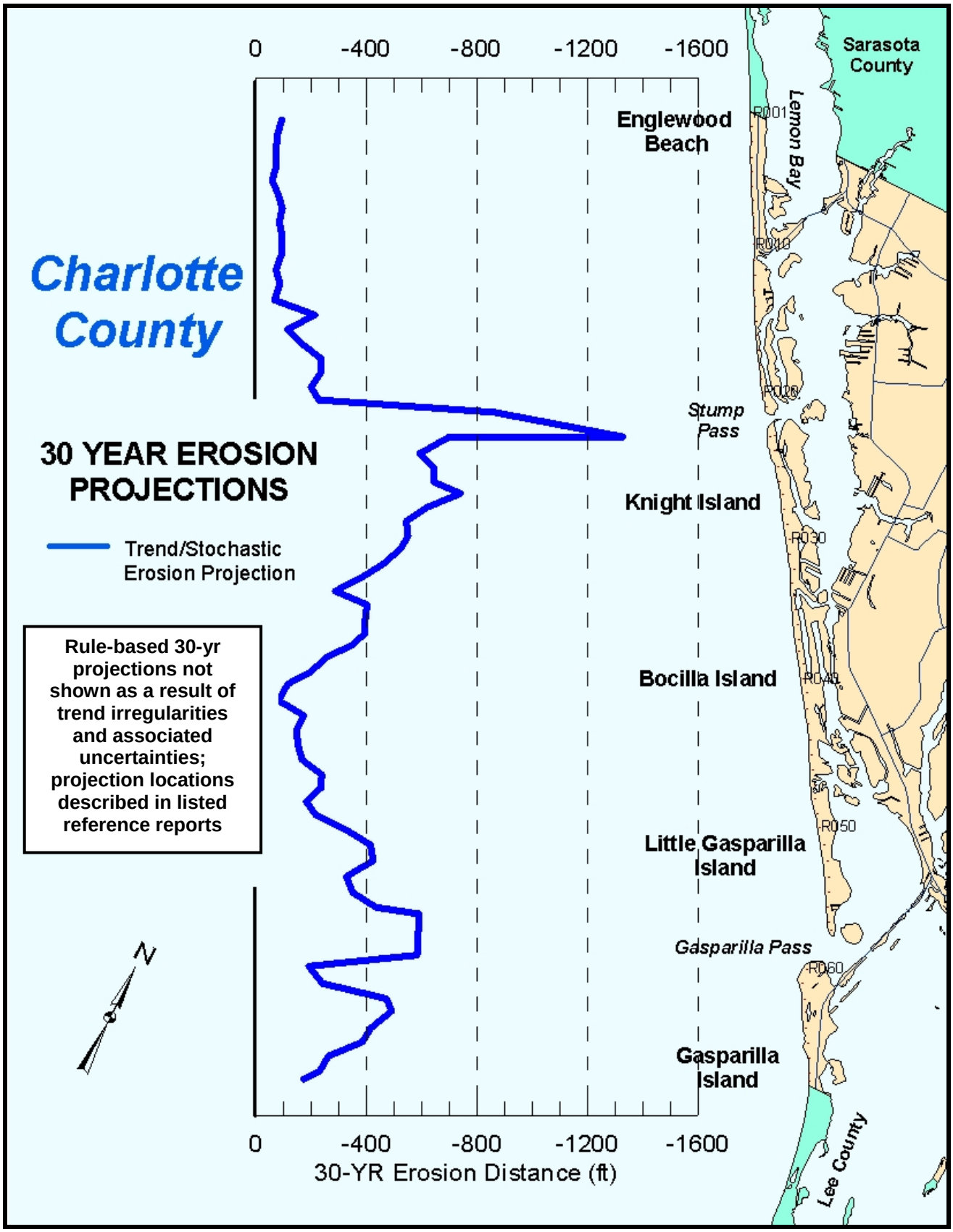

Figure CH-4. Charlotte Co. 30-year erosion projections; rule-based projection not shown.

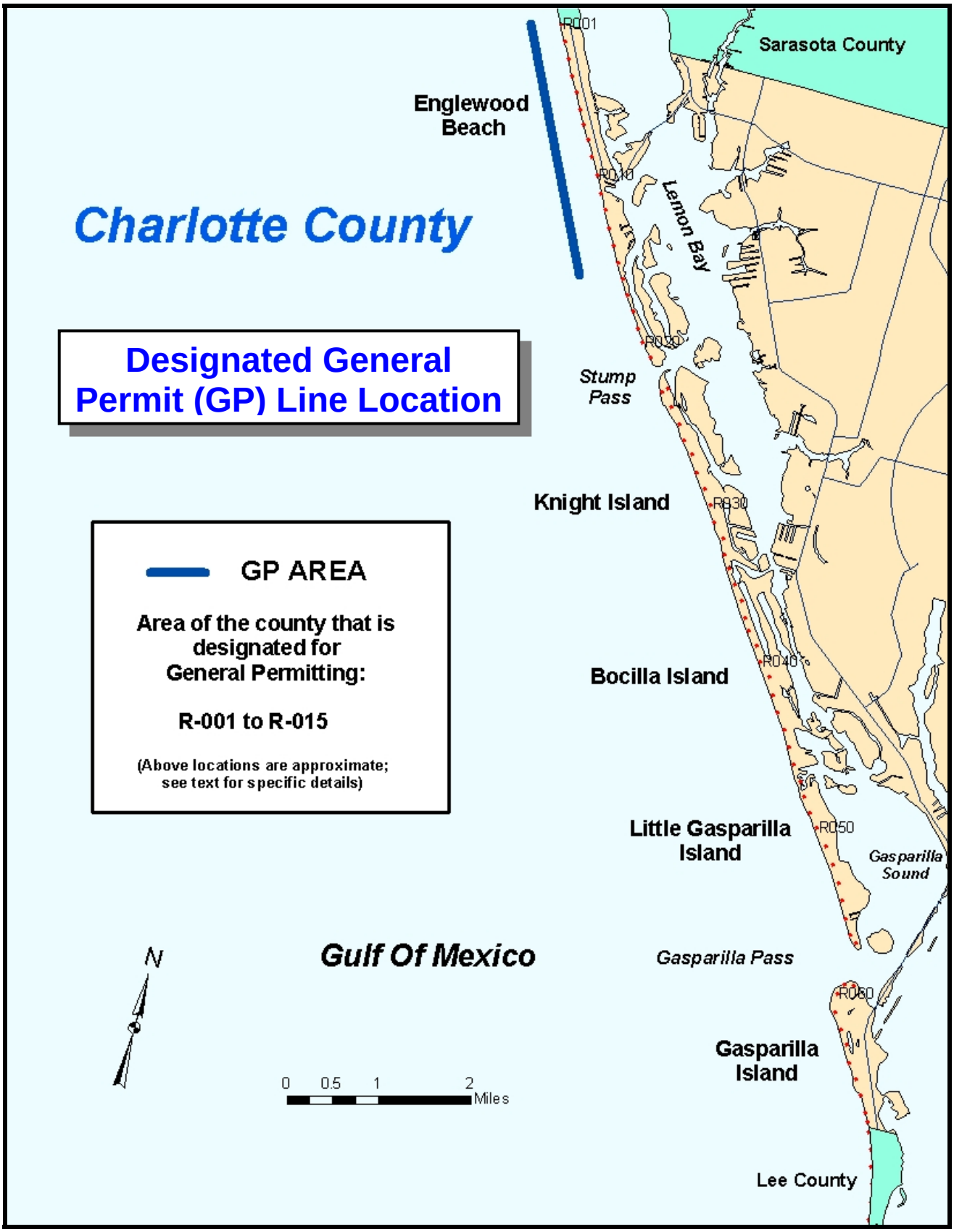

Figure CH-5. Designated General Permit (GP) line location for Charlotte County.

3.4 LEE COUNTY - GP Line Delineation

The series of GIS-derived maps contained herein display the specific conditions and factors in Lee County that are the basis for the GP line identified and recommended for the County. As seen in these maps, the coastal area of interest in Lee County consists of portions or all of a number of coastal barrier islands along the approximate 47 miles of Gulf of Mexico coast (see Figure LE-1).

Extending from north to south, the series of barrier islands along the Lee County coast commences at the north with the southern portion of Gasparilla Island which is bounded to the south by Boca Grande Pass. South of Boca Grande Pass is the large state-owned and undeveloped barrier island Cayo Costa Island. To the south of Cayo Costa lies Captiva Pass which separates Cayo Costa Island from North Captiva Island. North Captiva Island was recently bisected in 2004 by Hurricane Charley which created a new inlet breach area now known as Charley's Cut. The south end of North Captiva Island is bounded by Redfish Pass which also serves as the northern boundary of Captiva Island. Captiva Island is separated from Sanibel Island to the south by Blind Pass.

Sanibel Island is bounded to the south by the tidal entrance to San Carlos Pass which forms the north boundary of Estero Island. Estero Island, which includes the Ft. Myers Beach area, is bounded by Big Carlos Pass at its south end. To the south of Big Carlos Pass is Lover's Key, a state-owned public property which includes Lover Key State Park. South of Lovers Key is New Pass which serves as the northern boundary of Big Hickory Island. Big Hickory Pass separates Big Hickory Island from Little Hickory Island to the south, which includes the Town of Bonita Beach, and extends southward to the south Lee County boundary line. The final map in the series in this section shows the location of the recommended GP line for Lee County.

Based on coastal development trends and conditions, as well as, extent of coastal and shore protection projects, the SW region has been found to be an area of the State which is very favorable for implementation of GP provisions. This has been found to be the case for Lee County, as seen in the results described and illustrated in this portion of the report and presented in detail below. Most all of the coastal length of the county has been included in the GP evaluation for this county, although the largely undeveloped, unbridged barrier islands, such as Cayo Costa Island and North Captiva Island, were excluded in entirety. Some other areas within the County were excluded as unfavorable for evaluation based on unacceptable line of construction, potential beach and dune impacts, and/or erosion conditions.

Land Development Trends

As shown in the general coastal land use classification map in Figure LE-1, coastal lands along the open Gulf of Mexico shoreline in Lee County consists of both developed lands and undeveloped public lands. The type of development varies throughout the county, but is predominantly single-family dwelling development. The land-use summary table for Lee County contained in Appendix II of this report volume provides detailed locations and summary percentages of development types for the County.

Similar to other the southwest Florida coastal counties, Lee County has a history of shoreline erosion throughout much of the developed portions of the County as discussed in more detail further below. Developed areas of Lee County on Gasparilla Island are predominantly single-family

dwelling construction with some multi-family dwelling construction interspersed. The Gasparilla Island shoreline is heavily armored with extensive seawall and rock revetment construction throughout much of its length. Some beach nourishment has occurred along Gasparilla Island, particularly at the southern tip of the island. A more extensive beach restoration project sponsored by Lee County which includes erosion control structural components has been planned and designed, but not constructed as of the time of this report preparation.

As mentioned, Cayo Costa Island is undeveloped, public land, and thus an area where GP provisions are essentially non-applicable. North Captiva Island contains predominantly single-family construction at the north and south ends of the now breached barrier island with large undeveloped segments of shoreline within the central portions of the island. Initial screening evaluation determined that North Captiva Island would not evaluated for GP line designation as a result of erosion, line of construction, and beach-dune impact issues.

Development along Captiva Island alternates between single and multi-family dwelling construction as does Sanibel Island to the south. A large-scale beach restoration project has been constructed along the entire length of Captiva Island, including approximately 4.9 miles of beach nourishment fill placement, between Redfish Pass and Blind Pass. The island-long project was initially constructed in 1988-89, after an earlier small project was placed at South Seas Plantation at the northern end of the island in 1981. A island-long renourishment project in 1996 also included an additional mile of fill placement along the north end of Sanibel Island. Another renourishment project in 2006 added an additional half mile further south along Sanibel Island for a total project length of 6.4 miles.

A very small, one-time beach fill project was constructed on Sanibel Island in May 1996 in the Gulf Shores-Gulf Pines-West Gulf Drive area consisting of approximately 220,000 cubic yards of sand along 3,400 feet of shoreline, between FDEP range locations R129 and R133. Extensive single-family and multi-family development exists throughout the Ft. Myers Beach area along Estero Island. There is extensive coastal armoring, predominantly seawalls, throughout much of the island. A beach restoration project, which includes much of the Estero Island shoreline, has been planned and authorized, but not constructed as of the time of this report as a result of funding issues.

As mentioned, Lover's Key, south of Big Carlos Pass, is a state park and development is limited to recreational facilities. Shoreline erosion has threatened some of the recreational facilities and a beach nourishment project was completed in October 2004 and consisted of over 570,000 cubic yards placed along approximately 5,900 feet of shoreline. Big Hickory Island to the south is undeveloped other than very limited recreational construction near the north end of the island.

The south end of the County at Bonita Beach consists of extensive multi-family development from Big Hickory Pass southward for approximately 0.9 miles and then transitions into predominantly single-family development for approximately 1.7 miles south toward the south County line. Extensive shoreline erosion of the north end of Bonita Beach has resulted in erosional threat to multi-family dwelling structures and a subsequent beach restoration project to provide increased storm protection and restoration of recreational beach for that area.

The project was initially constructed in 1995 and consisted of placement of approximately 217,000 cubic yards along approximately 4,100 feet of shoreline between R223 and R230. The project included construction of two terminal groin structures at the north end of the project. A

renourishment project consisting of placement of approximately 145,000 cubic yards of sand along approximately 3,900 feet of shoreline was completed in June 2004.

There is extensive coastal armoring construction throughout much of the developed portions of Lee County, particularly on Gasparilla Island, Captiva Island, Estero Island, and the Bonita Beach areas. It was not possible, within the scope of this GP evaluation work, to determine an accurate, precise length of existing coastal armoring along the Gulf of Mexico shoreline in Lee County.

Problems associated with making an accurate assessment of coastal armoring structure locations include lack of availability of existing aerial photography depicting the armoring immediately prior to initiation of the beach restoration projects and, subsequently, the burial of much of the armoring by the beach fill itself.

As a result, the depicted locations of coastal armoring in Figure LE-1 and the listing of total length are considered to be approximate across the entire developed areas. Specific locations of coastal armoring, as well as, gaps in the armoring were not mapped as a part of this GP evaluation work. Beach erosion control projects, including the beach restoration projects described above, are depicted in the illustrative map contained in Figure LE-2.

More details on the beach restoration projects can be found in specific project monitoring reports submitted as permit requirements to the BBCS. Some of this information can be viewed at the Beach Erosion Control Project Monitoring Database Information System on-line at: http://beach15.beaches.fsu.edu/

Critical erosion areas have been designated throughout developed portions of Lee County, as well as a number of non-critical erosion areas in undeveloped areas. Most of the critical erosion areas coincide with locations of the beach restoration projects described above. The Bureau of Beaches and Coastal Systems has mapped and documented all of these designated critical and non-critical eroded areas for Lee County (FDEP, 2006).

Shoreline Erosion Conditions

Shoreline change rates and associated 30-yr erosion projections compiled from long-term survey data evaluation are shown graphically in Figures LE-3 and LE-4, respectively, for background reference purposes. The rates and projections are given for both methods described in the General Description and Procedural Report (Volume I) of the GP report series, the rule-based method (FDEP, Foster, 2006) and trend/stochastic method (Walton and Cheng, 2004).

Tabulated compilation of these shoreline change rate and 30-yr projection values are provided in Appendix I of this report. These provided rates and projections are based on the most current topographic survey data available at the time of the GP evaluation for this county, including the 2005 BBCS regional coastal monitoring data.

It is noted that rule-based erosion rate values, as well as some 30-yr erosion projections, are not shown nor listed for some shoreline locations within areas of the County found to be favorable for GP line designation. This is the result of complications encountered in establishing the values in these locations as a result of various factors, such as a history of significant shoreline fluctuations and/or current signs of increased erosion, beach nourishment fill events, and influences of

intermittent shoreline armoring structures. These types of conditions result in a high level of uncertainty in determining reliable 30-year erosion projections in these areas. As such, it was determined that establishment of reliable rule-based shoreline change trends and associated 30-year erosion projections in these areas of the County are not recommended at this time (Foster, 2006).

However, in some of the locations where no rule-based rates were identified, upland locations were proposed (Foster, 2006) as conservative, worst-case conditions for 30-year projection locations for the purposes of this GP evaluation work.

As with other regions of the State, the stochastic/trend method results in 30-year erosion projections which extend landward of habitable construction at some locations within the beach nourishment project areas of the County. However, this method did not include specific consideration of the long-term presence of a beach nourishment project and of coastal armoring and associated affects of those features on stabilizing that shoreline.

GP Line Recommendations

Evaluation of the Lee County coastal area has resulted in extensive portions of the County found to be acceptable for designation of a GP line at this time. Overall, there are a number of areas spread throughout the County shoreline within which a GP line is favorable. A relatively high percentage of the developed land within the County was found to be favorable for GP line designation. Locations found to be unfavorable for GP line designation were unacceptable as a result of erosion conditions, as well as, inconsistent line of construction, and beach-dune impact issues.

The GP evaluation process resulted in determination that a number of areas throughout the County were favorable for GP line designation. These areas include portions of Gasparilla Island, Captiva Island, Sanibel Island, Estero Island, and Little Hickory Island. Specific GP locations are listed in tabular form in the report appendices as described further below. During an initial evaluation screening process, it was determined that all of the North Captiva Island shoreline was unfavorable for GP designation for the reasons listed in the paragraph above. Other locations found as unfavorable during initial screening included the predominantly undeveloped barrier islands of Cayo Costa Island, Lover's Key, and Big Hickory Island.

The general location of the recommended GP line is depicted on the Lee County GP line map shown in Figure LE-5. A more detailed depiction of the recommended GP line overlain on aerial photomaps can be viewed on the FDEP Regional Coastal Monitoring Database (RCMD) consolidated web mapping application website at the following address:
http://bcs.dep.state.fl.us/rcmd/

General Permit Summary information for Lee County is provided in the table below. A detailed listing of the stochastic/trend and rule-based long-term erosion rates and 30-year erosion projections is provided in tabular form in Appendix I of this report volume.

Detailed listings of the general coastal land-use classification information and recommended GP line locations are provided in tabular form in Appendix II of this report volume. The precise location of the GP line will be defined by a legal description prepared by the BBCS professional land surveyor.

Lee County - GP Summary Information

Shoreline Category	Length (mi.)	Percent of Total
Total Shoreline (Gulf Shorefront)	47.3	
Public Shorefront (Gulf)	17.2	36.4%
Developed Shorefront (Gulf)	30.1 (Total)	63.6 %
SFD	17.7	37.4 %
MFD	10.5	22.2 %
Mixed (SFD/MFD/commercial)	1.9	4.0 %
Coastal Armoring: *	8.35	17.7 %
Beach Nourishment: **	8.9	18.9 %
Dune Restoration:	0.0	0.0 %
GP Line	21.73	46.1 % (of total)
	21.31 (in developed)	70.8 % (of developed)

* Note: Armoring not contiguous; length provided is total length of area within which armoring is located.

** Note: The Beach Nourishment length includes the 6.4 mile length of the Captiva Island-Sanibel Island project, the 0.64 mile length of the Gulf Shores-Gulf Pines-West Gulf Drive project, the 1.12 mile length of the Lover's Key project, and the 0.78 mile length of the Bonita Beach project.

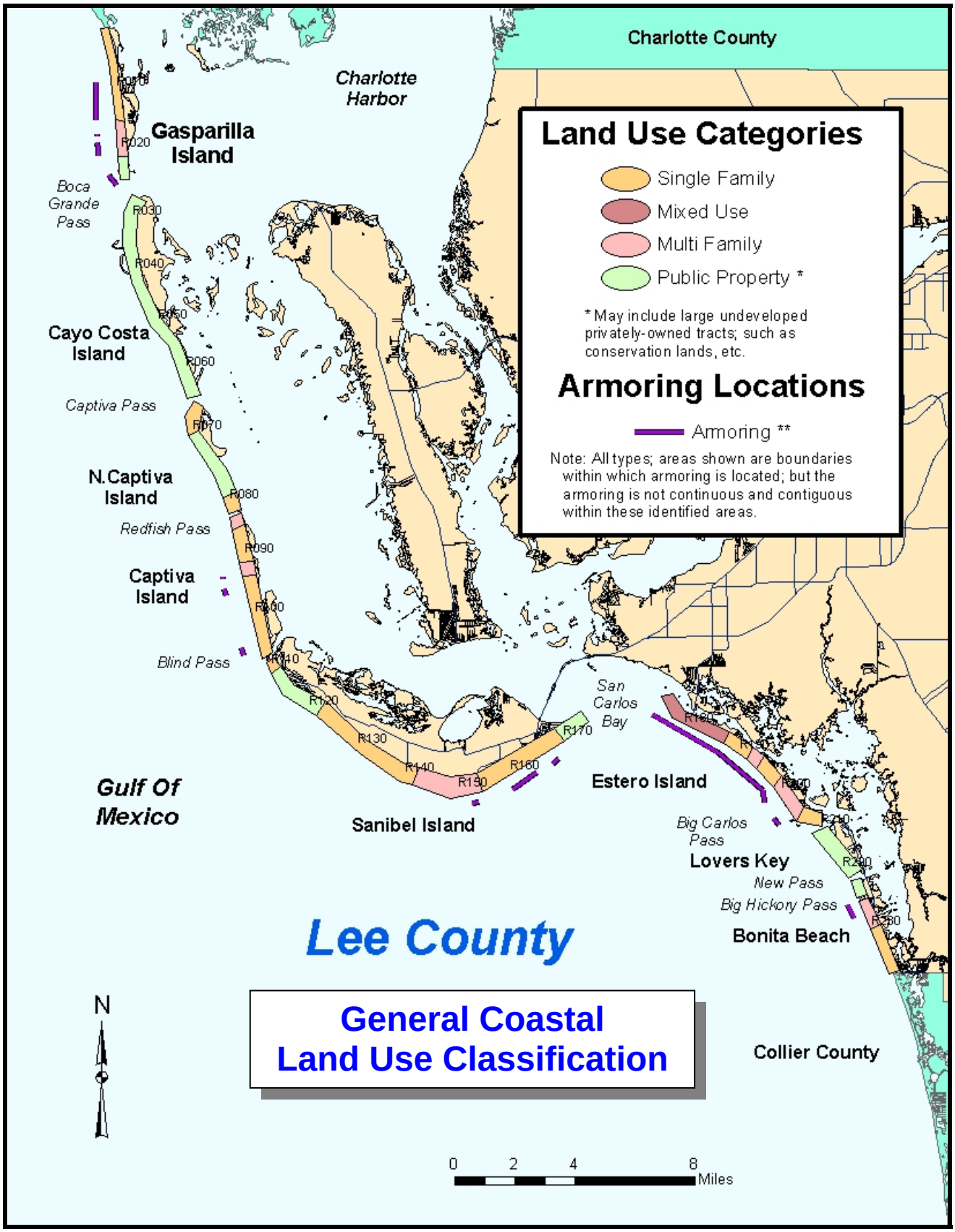

Figure LE-1. General Coastal Land Use Classification Map for Lee County.

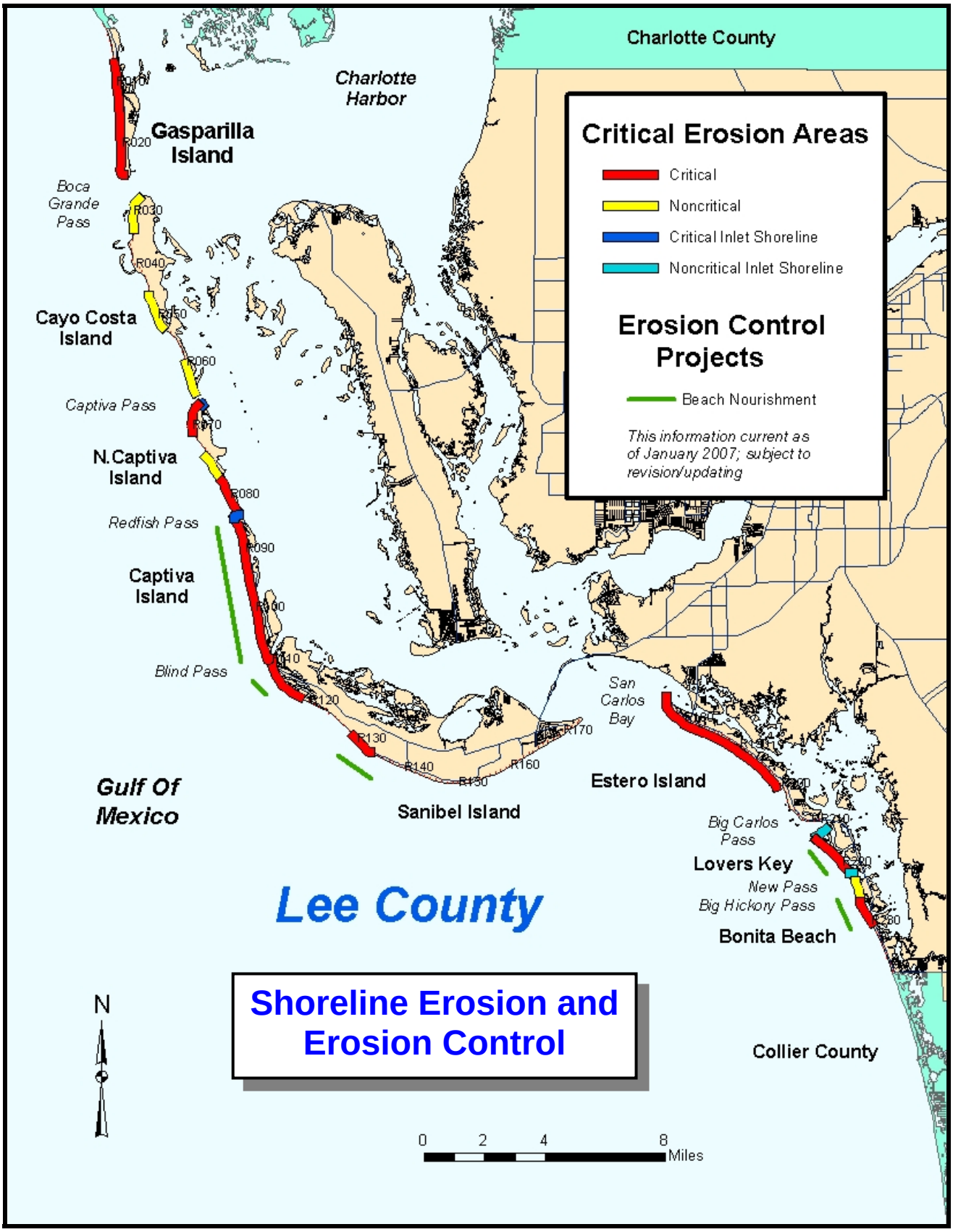

Figure LE-2. Critical Erosion Areas and Erosion Control Projects in Lee County.

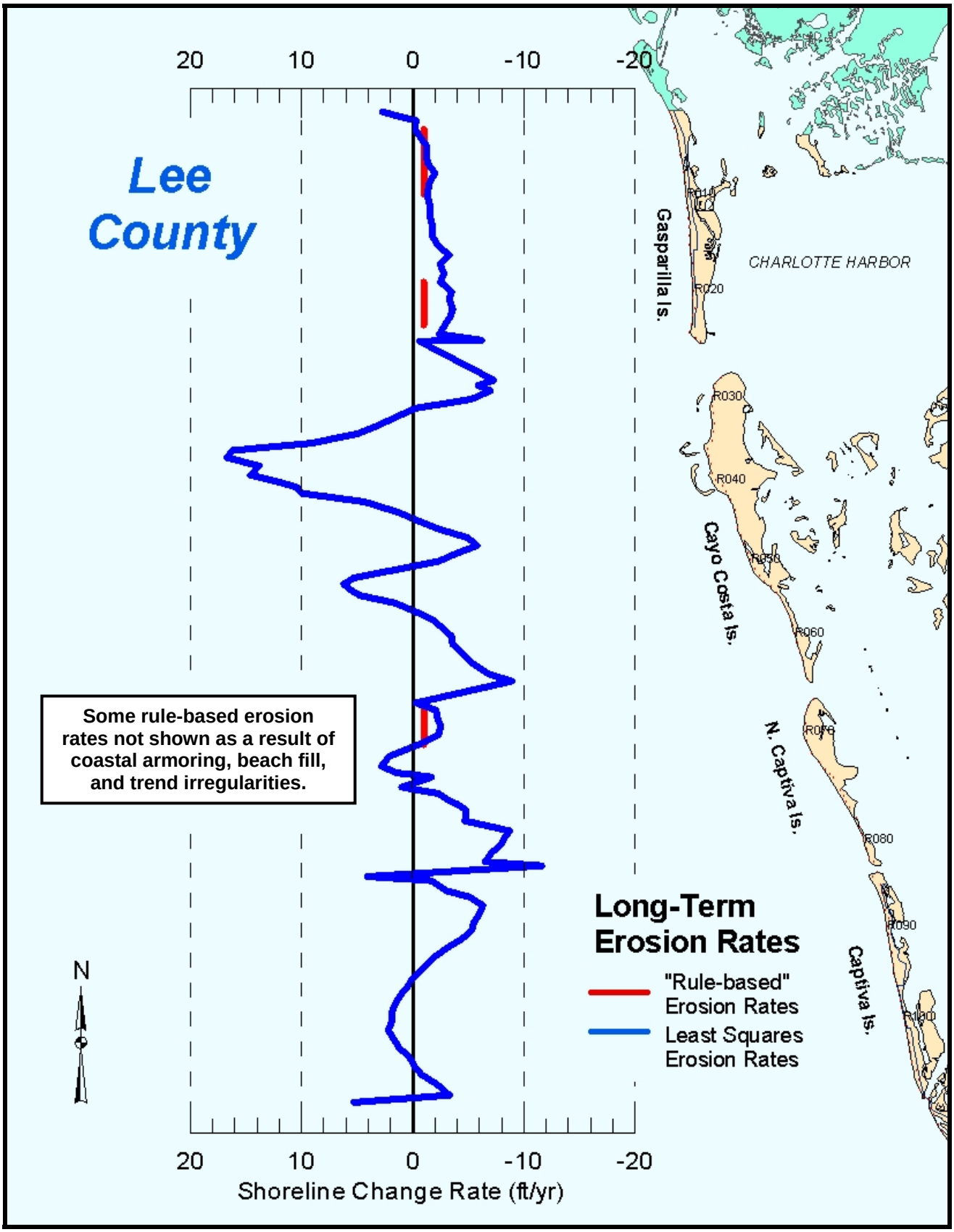

Figure LE-3a. Long-term erosion rates for northern Lee County.

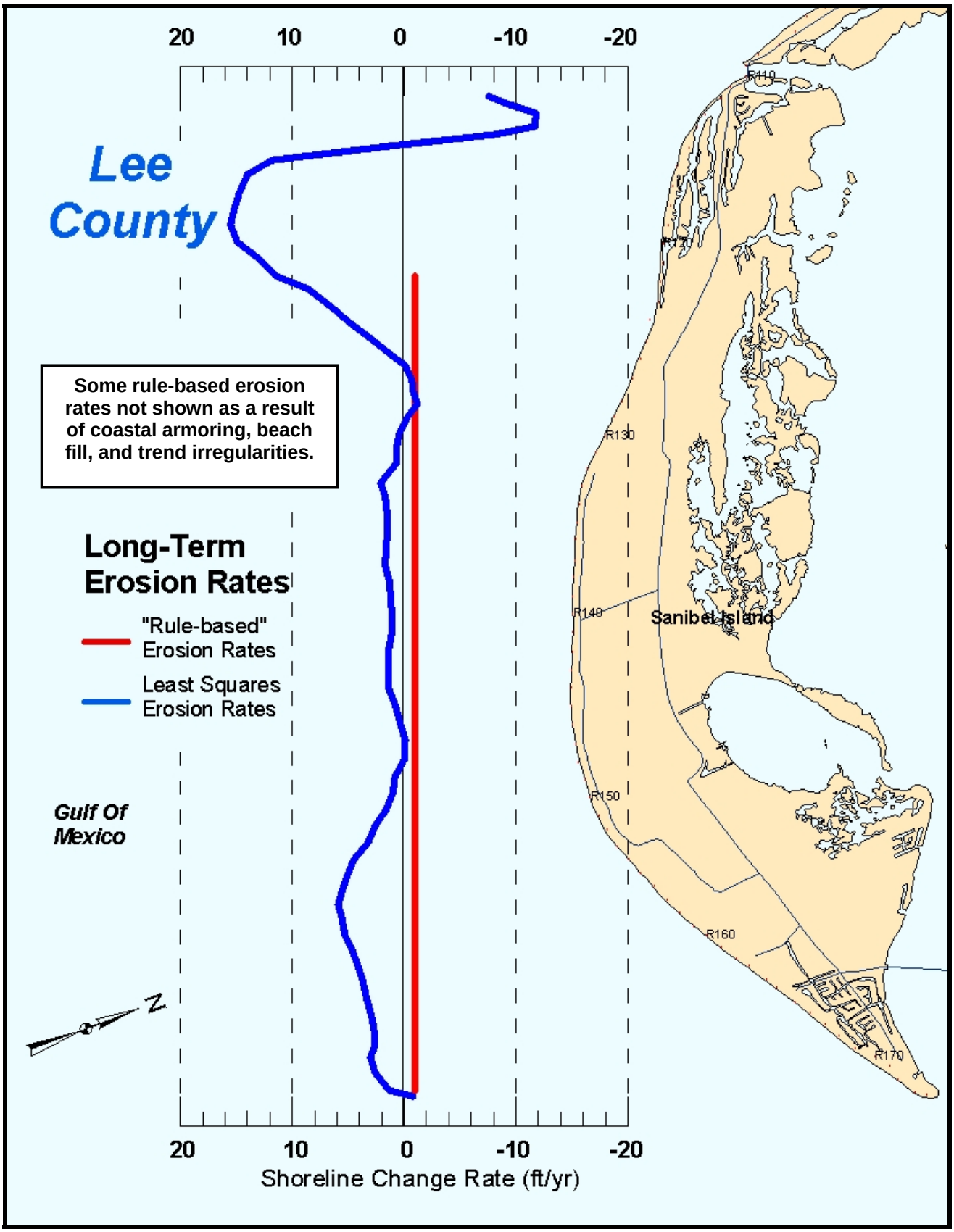

Figure LE-3b. Long-term erosion rates for central Lee County.

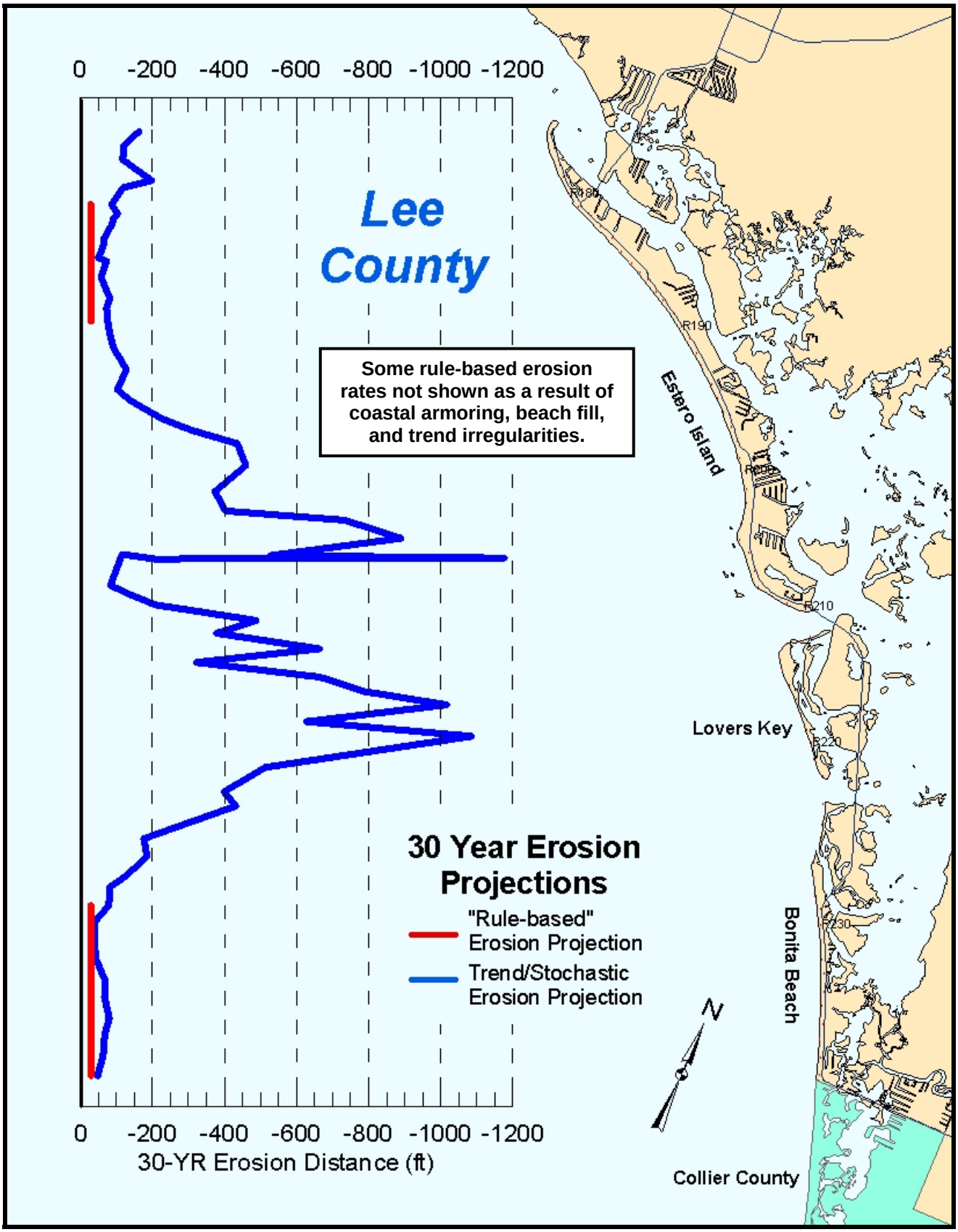

Figure LE-3c. Long-term erosion rates for southern Lee County.

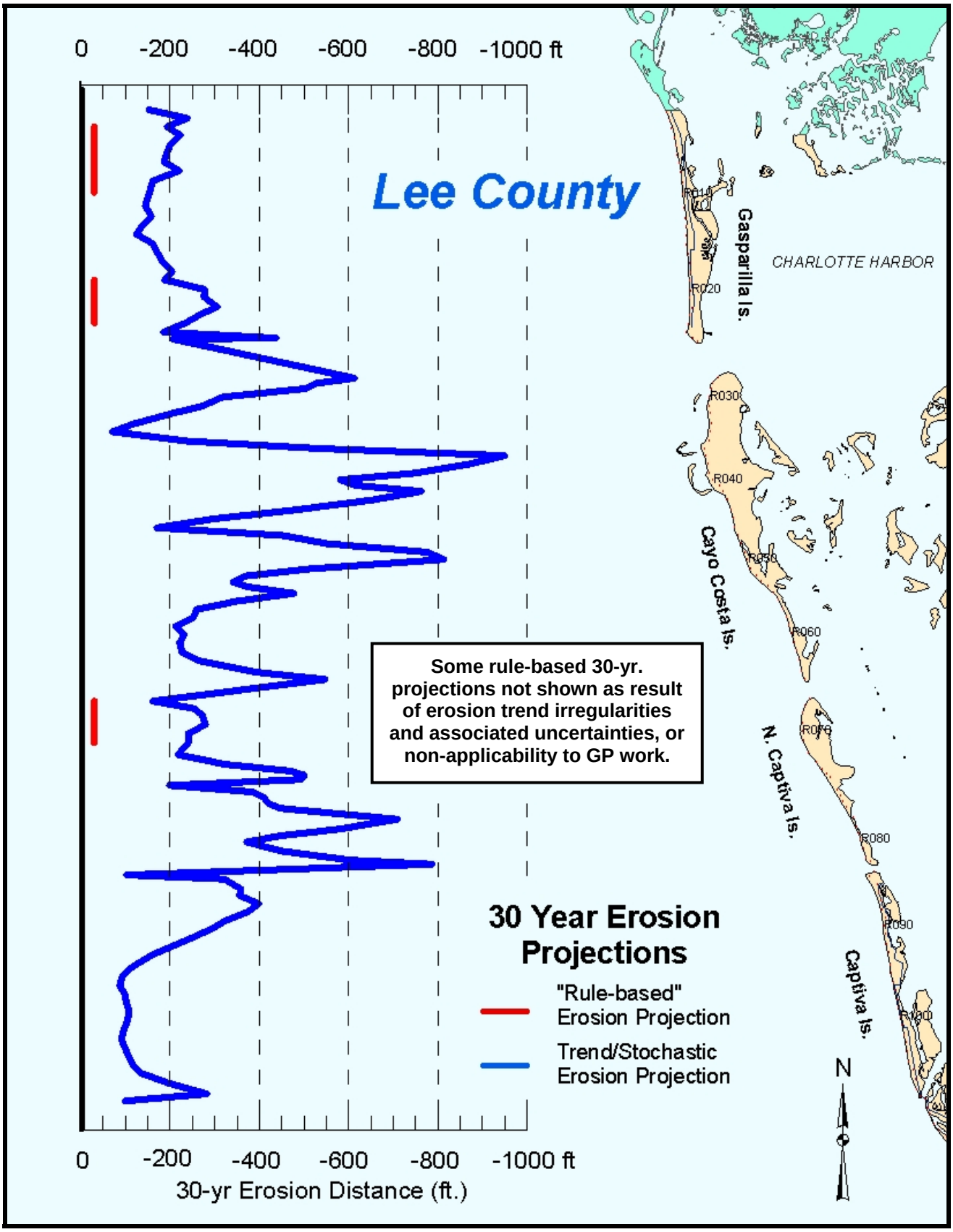

Figure LE-4a. 30-year erosion projections for northern Lee County.

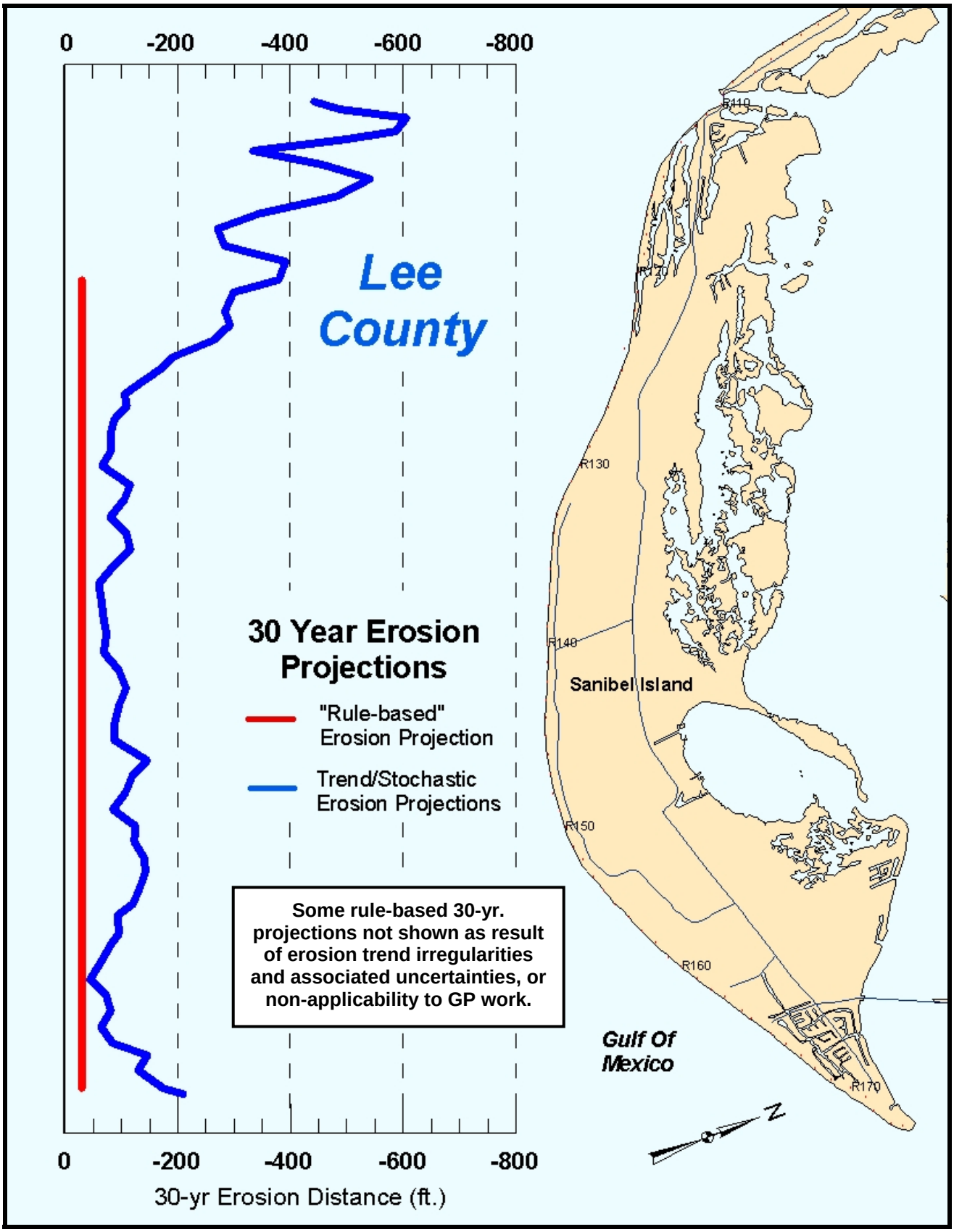

Figure LE-4b. 30-year erosion projections for central Lee County.

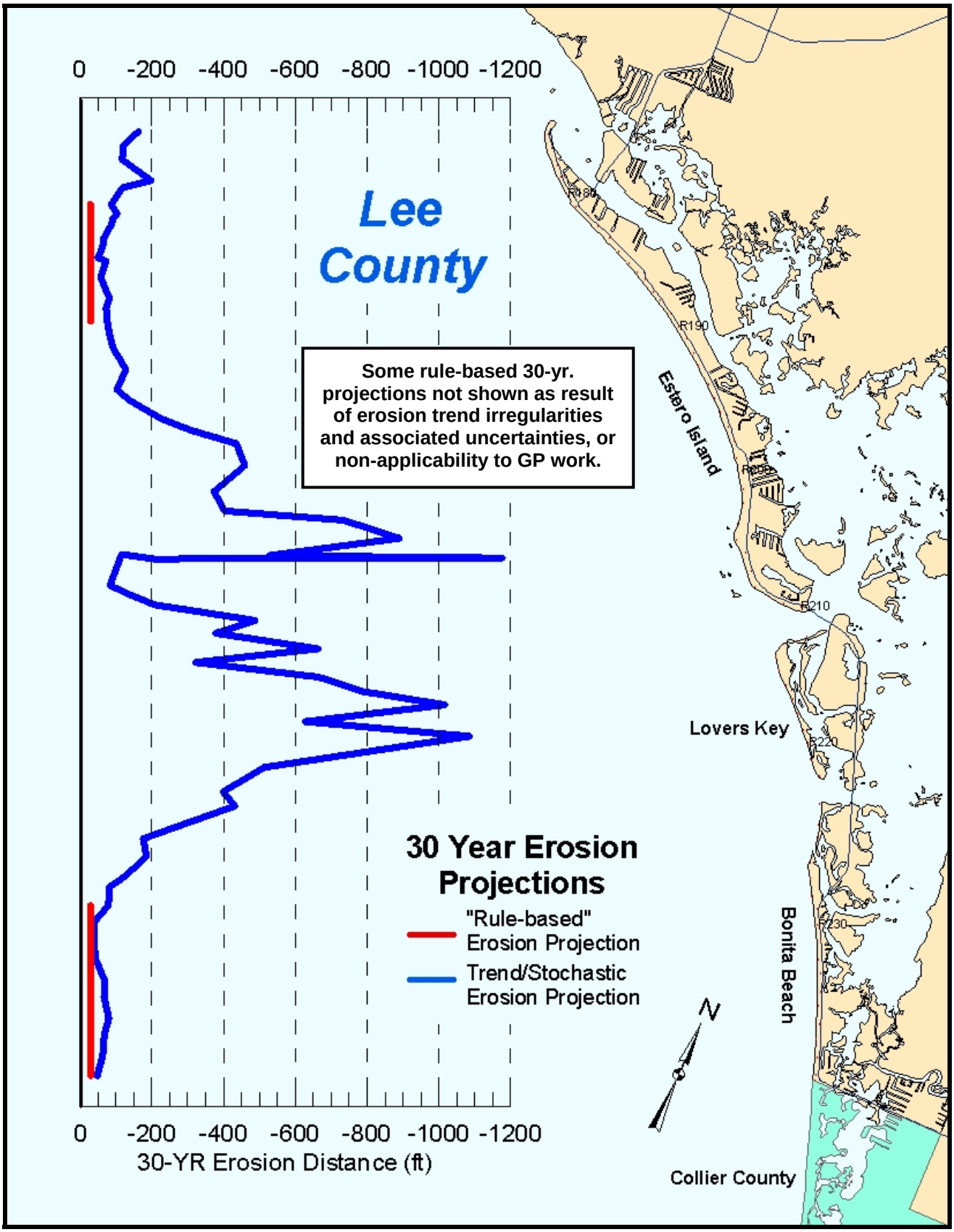

Figure LE-4c. 30-year erosion projections for southern Lee County.

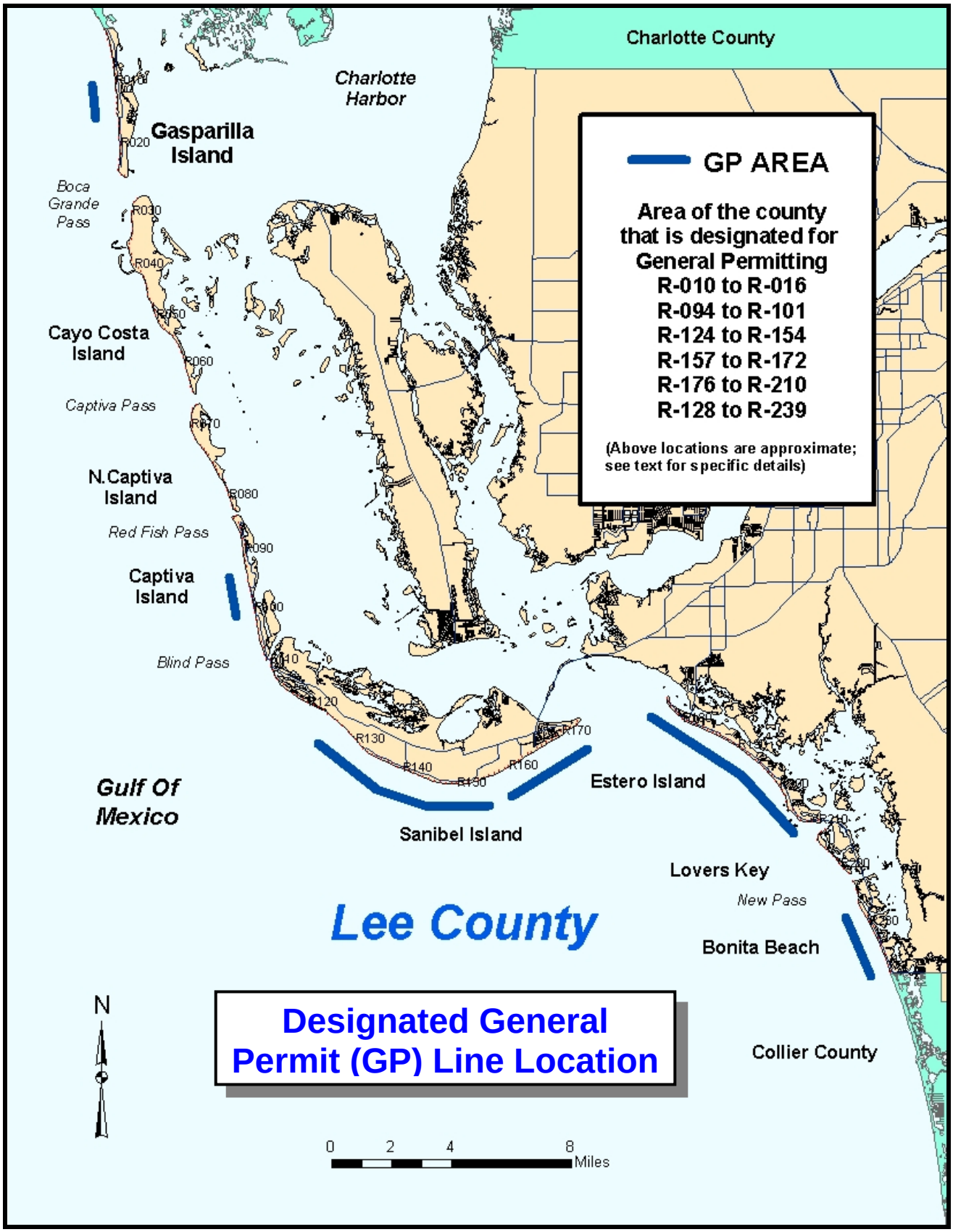

Figure LE-5. Designated General Permit (GP) line location for Lee County.

3.5 COLLIER COUNTY - GP Line Delineation

The series of GIS-derived maps contained herein display the specific conditions and factors in Collier County that are the basis for the GP line identified and recommended for the County. As seen in these maps, the coastal area of interest in Collier County consists of alternating segments of coastal barrier islands, coastal barrier spits, and coastal mainland areas along the approximate 34 miles of Gulf of Mexico coast (see Figure CO-1).

Extending from north to south, the Collier County coastline consists of a series of alternating coastal barrier islands and segments of coastal mainland. The north portion of the County extends southward from the north County boundary line, located near the south end of Bonita Beach, along the southern part of Little Hickory Island. This northern segment of coastline extends southward through the Barefoot Beach development area and Barefoot Beach Preserve to Wiggins Pass. South of Wiggins Pass, the coastline extends through Delnor-Wiggins Pass State Park, southward through Vanderbilt Beach, the Pelican Bay and Clam Bay areas, and Park Shores to Doctors Pass.

South of Doctors Pass, the City of Naples extends southward for several miles to Gordon Pass. Keewaydin Island, a coastal barrier island unattached to the mainland by any bridges, extends southward from Gordon Pass for several miles toward a complex of tidal inlet passes and barrier island to the south, including Little Marco Pass, Sea Oat Island, Capri Pass, Coconut Island, and Big Marco Pass. South of Big Marco Pass, Marco Island extends for approximately 4-5 miles southward to Caxambas Pass. South of Caxambas Pass, two unbridged barrier islands Kice Island and, further south, Morgan Island are separated by Morgan Pass. The County terminates at the south tip of Morgan Island at Cape Romano. The final map in the series in this section shows the location of the recommended GP line for Collier County.

Based on coastal development trends and conditions, as well as, extent of coastal and shore protection projects, the SW region has been found to be an area of the State which is very favorable for implementation of GP provisions. This has been found to be the case for Collier County, as seen in the results described and illustrated in this county segment of the SW regional report and presented in detail below. Much of the coastal length of the county has been included in the GP evaluation for this county, although the largely undeveloped, unbridged barrier islands, including Keewaydin Island, Kice Island, and Morgan Island, were excluded in entirety (the latter two of these islands are not regulated under the CCCL program). Some other areas within the County were excluded as unfavorable for evaluation based on unacceptable line of construction, potential beach and dune impacts, and/or erosion conditions.

Land Development Trends

As shown in the general coastal land use classification map in Figure CO-1, coastal lands along the open Gulf of Mexico shoreline in Collier County consists of both developed lands and undeveloped public and private lands. The type of coastal development varies throughout the county, with overall predominant development consisting of single-family dwelling development. There are, however, large alternating segments of coastal development where predominant development is multi-family development, such as in Vanderbilt Beach and Marco Island, intermixed with the areas of predominantly single-family development, such as in Naples. The land-use summary table for

Collier County contained in Appendix II of this report volume provides detailed locations and summary percentages of development types for the County.

Similar to other the southwest Florida coastal counties, Collier County has a history of shoreline erosion throughout much of the developed portions of the County as discussed in more detail further below. Developed areas of Collier County seaward of the CCCL in the most northerly north part of the County at Barefoot Beach are predominantly single-family dwelling construction, but trend to multi-family dwelling construction further south in this area.

The next major developed area south of Delnor-Wiggins Pass State Park, which includes the Vanderbilt Beach, Pelican Bay, North Park Shore and Park Shore areas (approximately R22 through R57), is predominantly large multi-family dwelling construction with a short segment of interspersed single-family dwelling construction in Vanderbilt Beach between R24 and R26.

Two segments of beach restoration have been conducted in this area as part of the Collier County Beach Restoration Project. The northern of these two fill area segments is the Vanderbilt Beach/Pelican Bay segment between R22 and R37. This segment was initially constructed in 1996 and included only a 1.6 mile segment of Vanderbilt Beach (R22 through R30) where approximately 323,000 cubic yards of fill was placed. A renourishment project completed in March 2006 included placement of approximately 121,500 cubic yards over 1.66 miles in Vanderbilt Beach (R22-R31) and added a 1.16 mile southern addition to this northerly fill segment with placement of approximately 57,000 cubic yards of fill at Pelican Bay between R31 and R 37.

The North Park Shore/Park Shore beach fill segment included initial fill placement of approximately 91,000 cubic yards of sand fill over about 0.75 miles between R50 and R54 in 1996. Renourishment work completed in April 2006 placement of 27,705 cubic yards over 0.57 miles at North Park Shore (R45 through R48) and 114, 034 cuibic yards of sand fill along 1.43 miles between R48 and R55.

Development south of Doctors Pass in northern Naples, starting at a location between R57 and R58 and extending southward to a location between R64 and R65, contains predominantly large multi-family dwelling construction. From that point southward through the remainder of Naples to Gordon Pass (just south of R89), development consists of, exclusively, single-family dwelling construction. The Naples shoreline has experienced long-term erosion impacts, as discussed in more detail further below, and much of the shoreline through this area contains coastal armoring construction.

The Naples segment of the Collier County Beach Restration Project included an initial fill segment of 3.4 miles from R58 through R77 where placement of approximately 760,000 cubic yards of sand fill was completed in May 1996. A renourishment project completed in May 2006 placed an additional 347,381 cubic yards along 3.59 miles between R 58A and R79.

Development south of Gordon Pass on Keewaydin Island consists of predominantly low-density single-family dwelling construction. During initial review screening, it was determined that this island would not be evaluated for GP line designation primarily as a result of line of construction and beach-dune impact issues. The north end of Marco Island at Hideaway Beach contains single-family dwelling construction bordering along the Big Marco Pass shoreline, although this development is predominantly upland of the CCCL jurisdiction. The shoreline in this area is subject to dynamic sediment transport, inlet hydraulic influences, and associated erosional stresses. A small

beach nourishment project has been constructed along the south shore of Big Marco Pass along the Hideaway Beach shoreline and has included construction of rock rubble-mound shore protection structures, such as T-head groin structures. This developed area was not included as part of the GP analyses.

The northern Gulf-fronting coast of Marco Island includes a County public park at Tigertail Beach. Development to the south of Tigertail Beach through the south end of Marco Island at Caxambas Pass consists of predominantly large multi-family hotels and condominium structures. A large-scale beach nourishment project, initially constructed in 1990-1991, extends along the Marco Island shoreline in three separate fill segments.

The north segment consist of the Hideaway Beach area discussed above. The central fill segment extends from just north of R135 through a location just south of R139 (approximately 0.8 miles). The southern fill segment extends from just north of R143 to the south tip of the island south of R148 (approximately 1.1 miles). A total of 1.2 million cubic yards of sand were placed in the initial fill project. Several smaller fill placements have been conducted within the project since the initial fill placement.

Rock-mound fill stabilizing structures, including three offshore breakwaters and two terminal groins were constructed at the south end of the south fill segment. The south tip of the island is also armored with seawall/revetment coastal armoring structures. There are coastal armoring structures at various locations throughout Marco Island which are buried or protected by the beach nourishment project. Problems associated with making an accurate assessment of coastal armoring structure locations include lack of availability of existing aerial photography depicting the armoring immediately prior to initiation of the beach restoration projects and, subsequently, the burial of much of the armoring by the beach fill itself.

As a result, the depicted locations of coastal armoring in Figure CO-1 and the listing of total length are considered to be approximate across the entire developed areas. Specific locations of coastal armoring, as well as, gaps in the armoring were not mapped as a part of this GP evaluation work. Beach erosion control projects, including the beach restoration projects described above, are depicted in the illustrative map contained in Figure CO-2.

The two barrier islands at Morgan Island and Kice Island, south of Caxambas Pass, are largely undeveloped and consists of very low-density single-family construction which is not regulated under the CCCL program.

More details on the beach restoration projects can be found in specific project monitoring reports submitted as permit requirements to the BBCS. Some of this information can be viewed at the Beach Erosion Control Project Monitoring Database Information System on-line at: http://beach15.beaches.fsu.edu/

Critical erosion areas have been designated throughout developed portions of Collier County, as well as a number of non-critical erosion areas in undeveloped areas. Most of the critical erosion areas coincide with locations of the beach restoration projects described above. The Bureau of Beaches and Coastal Systems has mapped and documented all of these designated critical and non-critical eroded areas for Collier County (FDEP, 2006).

Shoreline Erosion Conditions

Shoreline change rates and associated 30-yr erosion projections compiled from long-term survey data evaluation are shown graphically in Figures CO-3 and CO-4, respectively, for background reference purposes. The rates and projections are given for both methods described in the General Description and Procedural Report (Volume I) of the GP report series, the rule-based method (FDEP, Foster, 2006) and trend/stochastic method (Walton and Cheng, 2004).

Tabulated compilation of these shoreline change rate and 30-yr projection values are provided in Appendix I of this report. These provided rates and projections are based on the most current topographic survey data available at the time of the GP evaluation for this county, including the 2005 BBCS regional coastal monitoring data.

It is noted that rule-based erosion rate values, as well as associated 30-yr erosion projections, are not shown nor listed for some shoreline locations within areas of the County which were identified during initial screening review to be unfavorable for GP line designation and, therefore, not needed. It is also noted that 30-yr projections initially mapped for locations R136 and R137 were found to be excessive distances inland from the nourished shoreline. This is the result of very low, flat topography at these locations. Consequently, the associated distances from the MHW to SHW locations are relatively large distances. Those distances measured from the ECL result in 30-yr projections which are much farther inland, upland of the CCCL, than the 30-yr projections at adjacent range locations. In order to provide more consistent 30-yr projections throughout this northern portion of Marco Island, average MHW to SHW distances obtained from adjacent range locations at R134, R135, R138, and R139 were used to provide 30-yr projections at R136 and R137.

As with other regions of the State, the stochastic/trend method results in 30-year erosion projections which extend landward of habitable construction, and subsequent recommended GP line locations, at some locations within the beach nourishment project areas of the County. However, this method did not include specific consideration of the long-term presence of a beach nourishment project and of coastal armoring and associated affects of those features on stabilizing that shoreline.

GP Line Recommendations

Evaluation of the Collier County coastal area has resulted in extensive portions of the County found to be acceptable for designation of a GP line at this time. Overall, there are a number of areas spread throughout the County shoreline within which a GP line is favorable. A relatively high percentage of the developed land within the County was found to be favorable for GP line designation. Locations found to be unfavorable for GP line designation were unacceptable as a result of erosion conditions, as well as, inconsistent line of construction, and beach-dune impact issues.

The GP evaluation process resulted in determination that a number of areas throughout the County were favorable for GP line designation. These areas include a relatively short segment at the north part of the County at Barefoot Beach (~R1-R5), portions of Vanderbilt Beach (~R22-R29) and Park Shore (~R52-R57), most of the Naples shoreline (~R57-R89), and most of the Marco Island shoreline region (R135-R148). Specific GP locations are listed in tabular form in the report appendices as described further below. During an initial evaluation screening process, it was

determined that all of the Keewaydin Island shoreline area was unfavorable for GP designation for of the reasons listed in the paragraph above.

The general location of the recommended GP line is depicted on the Collier County GP line map shown in Figure CO-5. A more detailed depiction of the recommended GP line overlain on aerial photomaps can be viewed on the FDEP Regional Coastal Monitoring Database (RCMD) consolidated web mapping application website at the following address: http://bcs.dep.state.fl.us/rcmd/

General Permit Summary information for Collier County is provided in the table below. A detailed listing of the stochastic/trend and rule-based long-term erosion rates and 30-year erosion projections is provided in tabular form in Appendix I of this report volume. Detailed listings of the general coastal land-use classification information and recommended GP line locations are provided in tabular form in Appendix II of this report volume. The precise location of the GP line will be defined by a legal description prepared by the BBCS professional land surveyor.

Collier County - GP Summary Information

Shoreline Category	**Length (mi.)**	**Percent of Total**
Total Shoreline (Gulf Shorefront)	34.1	
Public Shorefront (Gulf)	13.7	40.2%
Developed Shorefront (Gulf)	20.4 (Total)	59.8 %
SFD	9.9	29.0 %
MFD	10.5	30.8 %
Mixed (SFD/MFD/commercial)	0.0	0.0 %
Coastal Armoring: *	6.29	18.4 % (of total) 30.8 % (of developed)
Beach Nourishment: **	11.4	33.3%
Dune Restoration:	0.0	0.0 %
GP Line	11.08 10.89 (in developed)	32.5 % (of total) 53.4 % (of developed)

* Note: Armoring not contiguous; length provided is total length of area within which armoring is located.

** Note: The Beach Nourishment length includes the following project lengths (in miles): Vanderbilt Beach - 1.6; Pelican Bay – 1.16; North Park Shores/Park Shores – 2.0; Naples – 3.6; Hideaway Beach area – 1.1; Marco Island – 1.9.

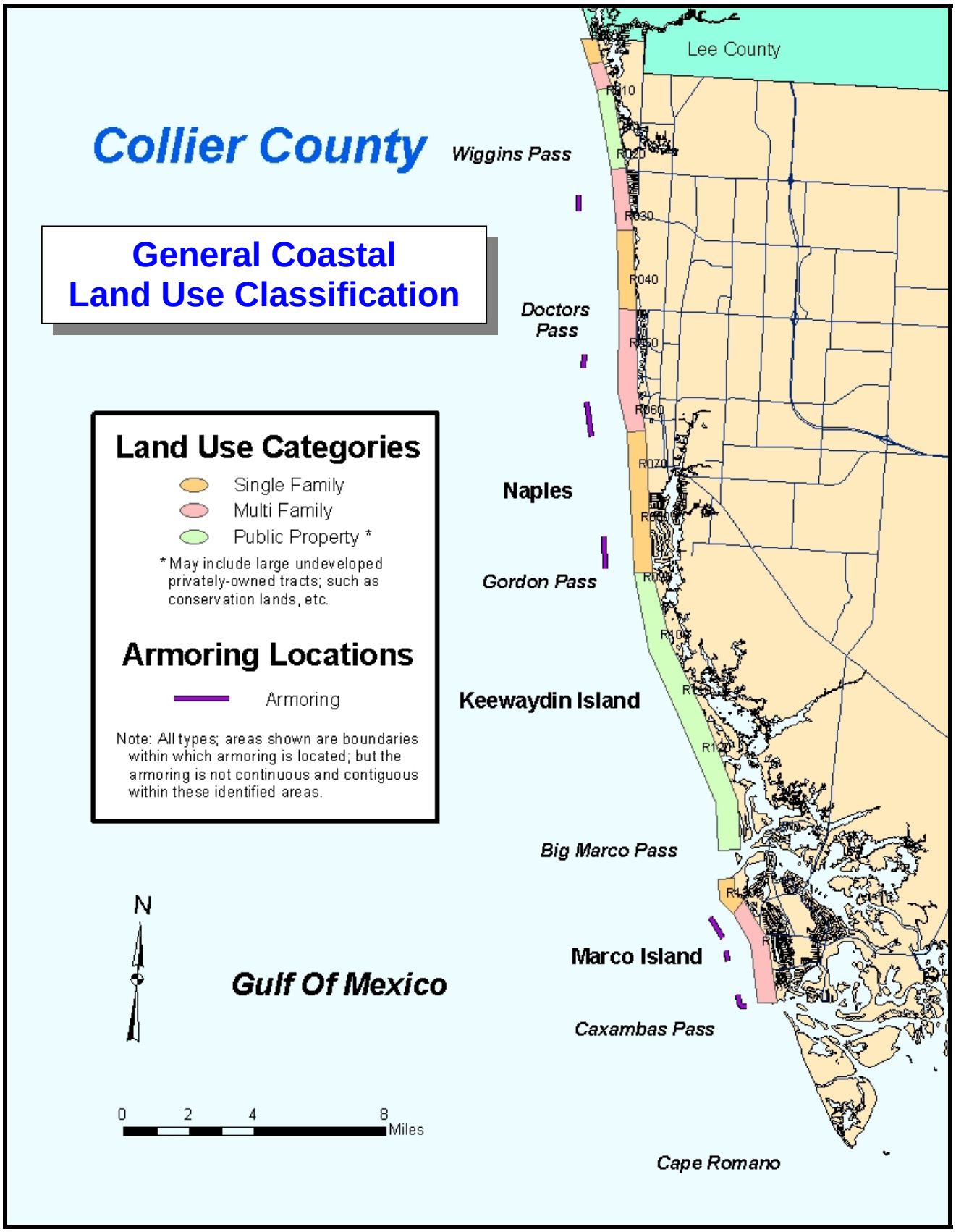

Figure CO-1. General Coastal Land Use Classification Map for Collier County.

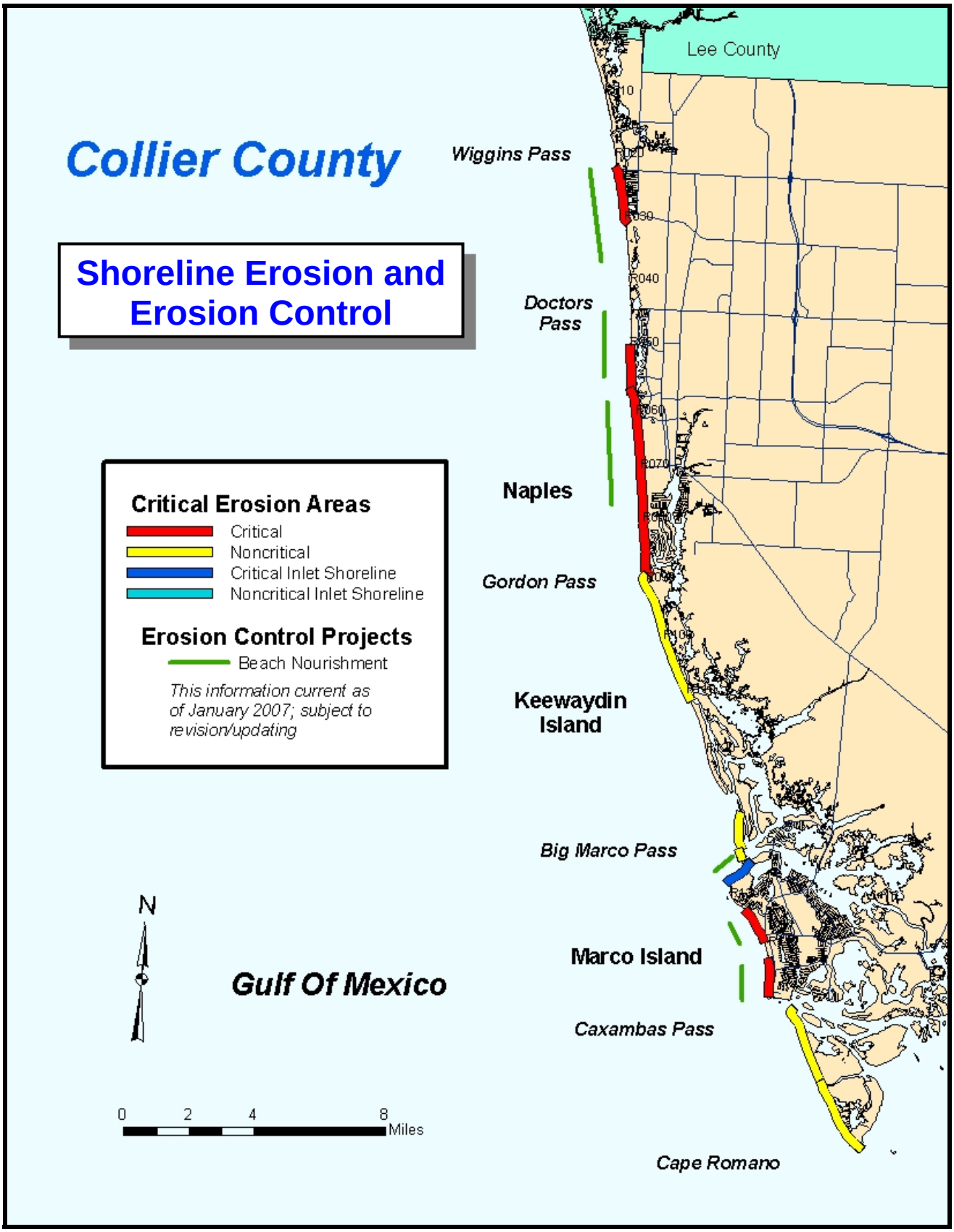

Figure CO-2. Critical Erosion Areas and Erosion Control Projects in Collier County.

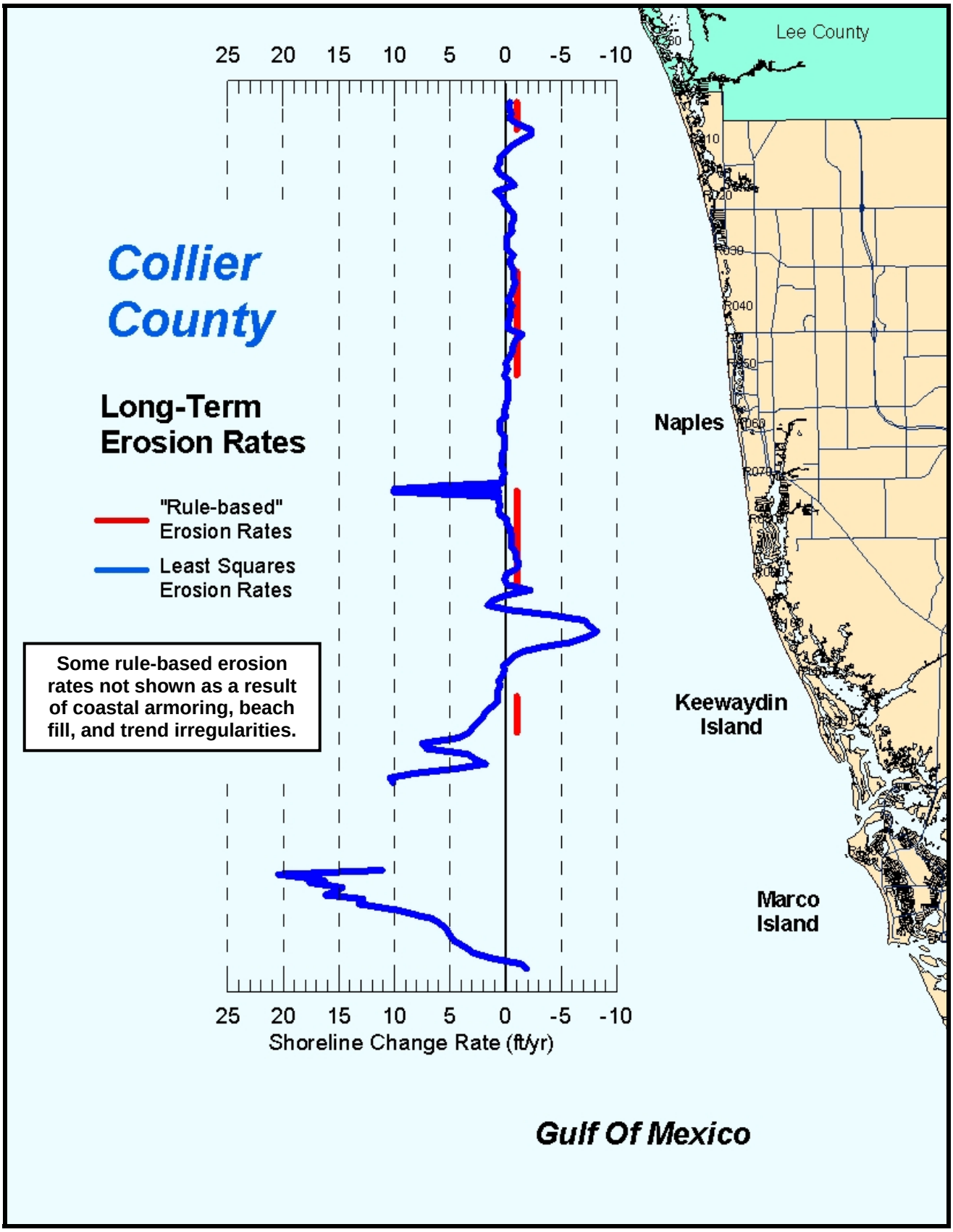

Figure CO-3. Long-term erosion rates for Collier County.

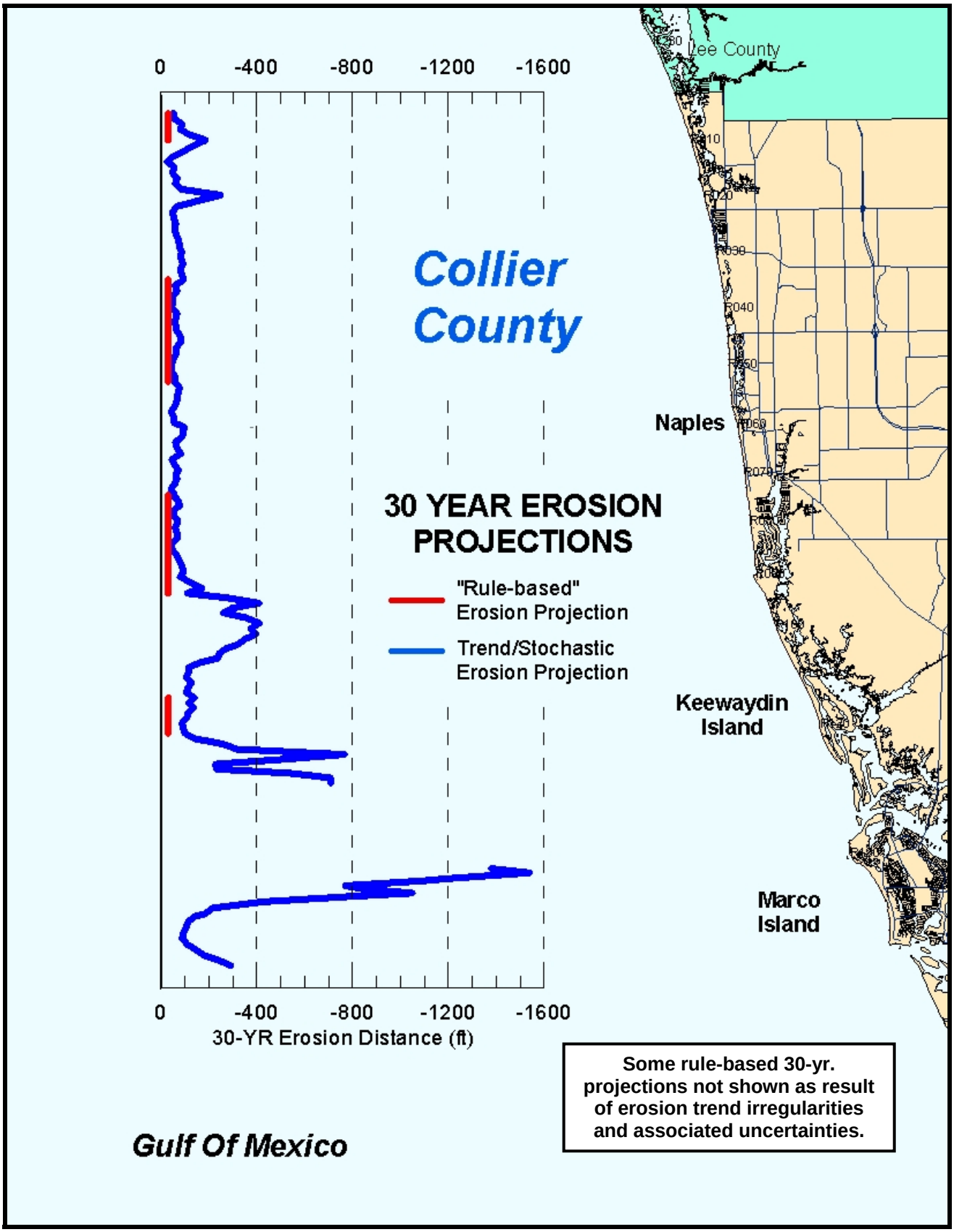

Figure CO-4. Collier Co. 30-year erosion projections.

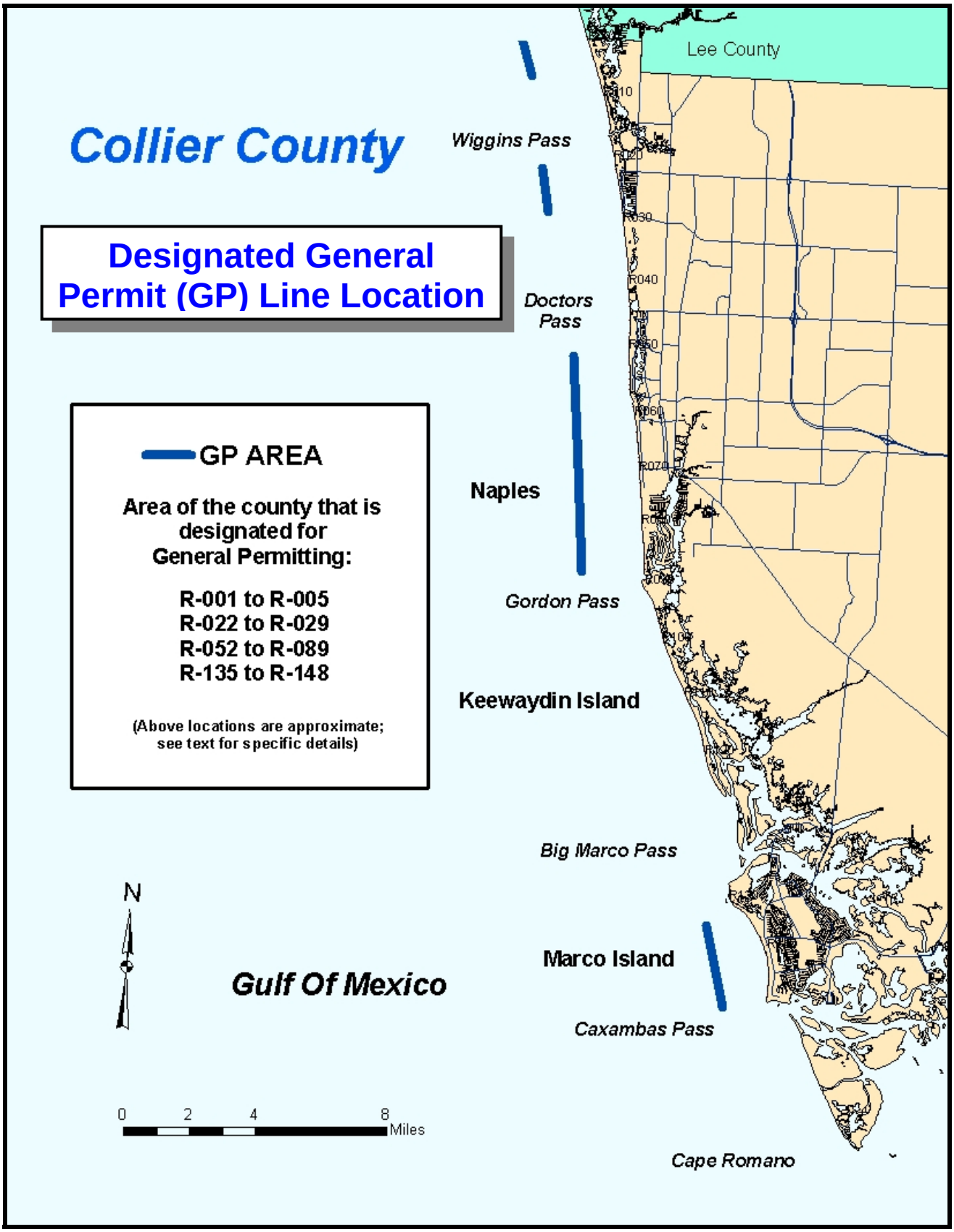

Figure CO-5. Designated General Permit (GP) line location for Collier County.

4.0 References

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12) Florida Department of Environmental Protection (FDEP), Bureau of Beaches and Coastal Systems (BBCS), Joint Coastal Permit (JCP) permit file database. http://www.dep.state.fl.us/beaches/permitting/permits.htm
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16) Florida State University, Beaches and Shores Resource Center, "Designation Procedure and Delineation of Areas for General Permit Application, Volume I. General Description and Procedural Report", December 2004. http://www.dep.state.fl.us/beaches/publications/tech-rpt.htm#GeneralPermit
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Designation Procedure and Delineation of Areas
for General Permit Application

Appendix I.

Shoreline Erosion Rate and 30-Year Erosion Projection Tables for the SW Gulf Region of Florida

Appendix I Information Notes:

1) These tables provide both trend/stochastic 30-year erosion projection values based on the least-squares erosion rates, also provided, and rule-based erosion rates. The trend/stochastic values are shown as positive values, but are intended as erosion values to be measured in a landward direction from MHW (see Walton and Cheng, 2004). These tables were compiled by Jenny Cheng (trend/stochastic values) and Emmett Foster (rule-based values).

2) The following are definitions of column headers in the attached tables:

   ER - Erosion rate
   SD - Standard deviation
   30xER - Thirty times the erosion rate
   1.96SD - 1.96 times the standard deviation
   GPTS - 30-year erosion projection based on trend/stochastic method
   (EF)ER - Rule-based erosion rate
   (EF)ERx30 - Rule-based 30-year erosion projection

Manatee Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R- 1	0.50	21.30	16.20	0.00	41.70	41.70		
R- 2	5.20	121.00	156.30	0.00	237.20	237.20		
T- 3	0.80	237.00	22.50	0.00	464.50	464.50		
R- 4	-2.60	148.60	-78.60	78.60	291.20	369.80		
R- 5	-0.90	126.40	-28.20	28.20	247.70	275.90		
R- 6	2.00	198.70	59.40	0.00	389.40	389.40		
R- 7	1.10	144.20	34.50	0.00	282.60	282.60		
R- 8	1.40	84.00	42.00	0.00	164.60	164.60		
R- 9	1.60	44.00	49.50	0.00	86.20	86.20		
R- 10	1.60	29.70	48.00	0.00	58.20	58.20		
R- 11	0.90	28.70	27.30	0.00	56.30	56.30		
R- 12	0.80	46.00	24.90	0.00	90.30	90.30		
R- 13	0.30	55.80	10.20	0.00	109.40	109.40		
R- 14	-0.10	60.20	-2.40	2.40	118.10	120.50		
R- 15	-0.60	74.00	-17.40	17.40	145.10	162.50		
R- 16	-0.50	70.90	-13.50	13.50	138.90	152.40		
R- 17	-0.50	68.00	-14.40	14.40	133.30	147.70		
R- 18	-0.40	74.70	-10.80	10.80	146.50	157.30		
T- 19	0.10	69.40	3.90	0.00	136.00	136.00		
R- 20	0.90	70.20	25.80	0.00	137.60	137.60		
T- 21	0.10	82.90	2.10	0.00	162.60	162.60		
R- 22	-0.90	62.40	-26.10	26.10	122.30	148.40		
R- 23	-0.70	46.50	-21.00	21.00	91.00	112.00		
R- 24	-0.60	59.50	-17.40	17.40	116.60	134.00		
R- 25	0.20	68.20	4.80	0.00	133.80	133.80		
R- 26	0.30	70.10	10.50	0.00	137.30	137.30		
R- 27	0.50	68.90	13.50	0.00	135.00	135.00		
R- 28	0.80	78.00	24.90	0.00	152.80	152.80		
R- 29	0.90	94.60	26.10	0.00	185.40	185.40		
T- 30	0.50	92.30	16.20	0.00	180.90	180.90		
R- 31	-0.10	101.20	-1.50	1.50	198.30	199.80		
R- 32	-0.10	84.70	-3.00	3.00	166.00	169.00		
R- 33A	-0.30	96.20	-10.20	10.20	188.60	198.80		
R- 34	-0.40	111.40	-11.40	11.40	218.30	229.70		
R- 35	-1.80	91.80	-53.10	53.10	180.00	233.10		
R- 36	-3.50	87.70	-103.80	103.80	171.90	275.70		
R- 37	-4.10	86.10	-123.30	123.30	168.80	292.10		
R- 38	-4.00	86.10	-119.10	119.10	168.80	287.90		
R- 39	-2.80	108.20	-83.70	83.70	212.00	295.70		
R- 40	-3.00	118.00	-88.80	88.80	231.20	320.00		
R- 41	-2.50	137.20	-74.70	74.70	268.90	343.60		
R- 42W	-33.30	96.00	-998.70	998.70	188.30	1187.00		
R- 43	-13.30	32.30	-398.10	398.10	63.20	461.30		
R- 44	-7.60	60.30	-227.70	227.70	118.10	345.80		
R- 45	3.40	222.60	100.50	0.00	436.30	436.30		
R- 46A	4.00	192.80	120.60	0.00	377.90	377.90		

Manatee Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30
							SEE NOTE	
R- 47	1.20	185.30	35.40	0.00	363.30	363.30		
R- 48	0.20	152.30	6.90	0.00	298.50	298.50		
R- 49	1.80	131.80	52.50	0.00	258.40	258.40		
R- 50	2.30	98.20	68.70	0.00	192.40	192.40		
R- 51	2.70	81.50	81.00	0.00	159.70	159.70		
R- 52	1.90	76.80	57.90	0.00	150.50	150.50		
R- 53	2.20	63.40	65.10	0.00	124.20	124.20		
R- 54A	2.00	57.30	60.00	0.00	112.30	112.30		
R- 55A	1.80	47.50	54.90	0.00	93.10	93.10		
R- 56	1.50	38.90	43.80	0.00	76.30	76.30		
R- 57	1.50	45.40	44.40	0.00	89.00	89.00		
R- 58	1.10	52.70	34.50	0.00	103.30	103.30		
R- 59	0.70	45.80	21.00	0.00	89.80	89.80		
T- 60	0.60	59.20	17.70	0.00	116.00	116.00		
R- 61	0.10	49.70	1.50	0.00	97.40	97.40		
R- 62A	-0.30	44.50	-7.80	7.80	87.30	95.10		
R- 63	-0.60	43.10	-18.90	18.90	84.50	103.40		
R- 63A	32.50	47.20	974.40	0.00	92.40	92.40		
R- 64	-0.50	46.70	-15.00	15.00	91.60	106.60		
R- 65	-0.90	49.50	-26.10	26.10	97.10	123.20		
R- 66	-0.60	49.40	-17.10	17.10	96.70	113.80		
R- 67	0.00	47.00	1.20	0.00	92.10	92.10		

Notes:

- All units are feet.
- ER and GPTS are trend-stochastic erosion rates and 30-yr erosion projections.
- (EF)ER and (EF)ERx30 are rule-based erosion rates and 30-yr erosion projections.
- Only non-park or non-federal areas have (EF)ER estimates shown above.
- Rule-based 30-yr erosion projections for Ranges 7 through 36 on Anna Maria Island and for Ranges R45 through 68 on Longboat Key include a 30-yr credit for the beach nourishment project. No (EF)ER and (EF)ERx30 values provided for R1-R10.
- See report text and listed references for more details on evaluation results and above values.

Sarasota Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
T- 1	0.20	47.50	6.00	0.00	93.00	93.00		
R- 2	0.30	52.50	9.00	0.00	102.90	102.90		
R- 3A	0.70	55.90	21.00	0.00	109.60	109.60		
R- 4	0.50	54.40	14.70	0.00	106.60	106.60		
R- 5A	0.50	51.80	15.00	0.00	101.60	101.60		
T- 6	0.60	57.20	17.10	0.00	112.00	112.00		
R- 7	0.30	54.90	8.40	0.00	107.50	107.50		
R- 8	0.10	56.60	2.40	0.00	111.00	111.00		
R- 9	0.20	49.80	5.40	0.00	97.60	97.60		
R- 10	0.40	52.90	13.20	0.00	103.60	103.60		
R- 11	0.20	56.30	4.80	0.00	110.30	110.30		
R- 12	-0.50	63.10	-13.50	13.50	123.80	137.30		
R- 13	-0.50	37.30	-14.10	14.10	73.10	87.20		
R- 14	-0.60	53.00	-18.00	18.00	103.90	121.90		
T- 15	-1.30	66.70	-37.80	37.80	130.70	168.50		
R- 16	-1.20	62.70	-35.40	35.40	123.00	158.40		
R- 17	-1.30	50.60	-37.50	37.50	99.10	136.60		
R- 18	-1.30	47.40	-37.50	37.50	92.80	130.30		
R- 19	-2.30	57.60	-69.00	69.00	112.80	181.80		
R- 20	-3.00	58.20	-91.20	91.20	114.10	205.30		
R- 21	-3.70	40.60	-111.30	111.30	79.60	190.90		
T- 22	-3.70	49.70	-112.20	112.20	97.50	209.70		
T- 23	-3.80	68.60	-114.30	114.30	134.50	248.80		
R- 24	-3.20	71.30	-96.90	96.90	139.80	236.70		
R- 25	-2.80	86.10	-83.10	83.10	168.80	251.90		
R- 26	-1.80	86.20	-54.30	54.30	168.90	223.20		
R- 27	-1.50	87.40	-44.70	44.70	171.30	216.00		
R- 28	-1.40	94.60	-41.70	41.70	185.50	227.20		
R- 29W	2.70	88.50	80.10	0.00	173.40	173.40		
R- 30	-3.20	51.60	-94.80	94.80	101.10	195.90		
R- 31	-1.00	202.10	-30.00	30.00	396.00	426.00		
R- 32	2.60	167.70	79.50	0.00	328.80	328.80		
R- 33	5.40	142.50	162.60	0.00	279.20	279.20		
R- 34	6.70	171.30	201.30	0.00	335.80	335.80		
R- 35	5.10	139.10	152.40	0.00	272.60	272.60		
T- 36	6.60	170.20	198.00	0.00	333.70	333.70		
R- 37	6.20	178.20	187.20	0.00	349.20	349.20		
R- 38	3.10	90.40	91.80	0.00	177.20	177.20		
R- 39	2.80	69.60	83.10	0.00	136.30	136.30		
R- 40	5.30	87.60	158.40	0.00	171.60	171.60		
R- 41	1.20	69.80	35.70	0.00	136.70	136.70		
R- 42	0.50	81.20	15.30	0.00	159.20	159.20		
R- 43	-1.00	107.90	-29.70	29.70	211.50	241.20		
R- 44	-3.40	247.90	-102.90	102.90	485.80	588.70		
R- 47	0.40	102.60	12.00	0.00	201.00	201.00		
R- 48	2.10	123.20	61.80	0.00	241.50	241.50		

Sarasota Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R- 49	3.70	208.10	109.80	0.00	407.90	407.90		
R- 50	3.70	212.40	111.00	0.00	416.30	416.30		
T- 51	5.90	118.00	176.70	0.00	231.30	231.30		
R- 52	8.00	111.70	241.20	0.00	218.90	218.90	-1.00	-30.00
R- 53	10.20	176.60	305.40	0.00	346.10	346.10	-1.00	-30.00
R- 54	10.60	163.20	317.10	0.00	319.80	319.80	-1.00	-30.00
R- 55	10.20	134.30	305.40	0.00	263.30	263.30	-1.00	-30.00
R- 56	9.70	106.50	289.50	0.00	208.70	208.70	-1.00	-30.00
R- 57	9.20	86.10	274.50	0.00	168.80	168.80	-1.00	-30.00
R- 58	8.70	92.60	259.80	0.00	181.50	181.50	-1.00	-30.00
R- 59	7.60	85.20	228.60	0.00	167.00	167.00	-1.00	-30.00
R- 60	6.80	70.30	204.30	0.00	137.70	137.70	-1.00	-30.00
R- 61	5.90	51.60	175.80	0.00	101.20	101.20	-1.00	-30.00
R- 61A	4.10	46.80	123.90	0.00	91.60	91.60	-1.00	-30.00
R- 62	-1.40	50.20	-42.60	42.60	98.40	141.00	-1.00	-30.00
R- 63	-0.80	14.90	-24.60	24.60	29.20	53.80		
R- 64	-0.50	54.00	-13.80	13.80	105.70	119.50		
R- 65	-2.00	29.90	-60.60	60.60	58.60	119.20		
R- 66	3.50	91.00	105.30	0.00	178.40	178.40		
R- 67	-1.60	42.20	-48.30	48.30	82.80	131.10		
R- 68	-1.40	32.80	-41.40	41.40	64.30	105.70		
R- 69	-1.70	24.10	-49.80	49.80	47.20	97.00		
R- 70	-1.80	26.00	-53.70	53.70	51.00	104.70		
R- 71	-1.40	41.80	-42.00	42.00	81.90	123.90		
R- 72	-1.20	47.70	-35.70	35.70	93.40	129.10		
R- 73	-0.90	47.20	-27.60	27.60	92.50	120.10		
R- 74	-1.50	53.80	-45.90	45.90	105.50	151.40		
R- 75	-1.60	29.10	-49.50	49.50	57.00	106.50		
R- 76	-1.50	57.60	-45.60	45.60	112.90	158.50		
R- 77	-0.50	98.80	-15.60	15.60	193.70	209.30		
R- 78W	-0.70	149.40	-20.70	20.70	292.90	313.60		
R- 79S	-1.50	150.90	-46.20	46.20	295.80	342.00		
R- 80	-1.50	171.10	-43.80	43.80	335.40	379.20	-1.00	-30.00
R- 81	-2.30	93.50	-67.50	67.50	183.40	250.90	-1.00	-30.00
R- 82	-1.70	88.30	-52.20	52.20	173.10	225.30	-1.00	-30.00
R- 83	-1.40	43.10	-40.80	40.80	84.40	125.20		
R- 84	-1.60	40.90	-46.80	46.80	80.20	127.00		
R- 85	-1.10	26.30	-33.90	33.90	51.50	85.40		
R- 86	-0.80	26.00	-24.90	24.90	50.90	75.80		
R- 87	-1.00	30.60	-30.30	30.30	60.00	90.30		
R- 88	-1.10	26.30	-31.50	31.50	51.60	83.10		
R- 89	-0.30	17.00	-9.00	9.00	33.20	42.20		
R- 90	-0.30	19.00	-9.60	9.60	37.30	46.90		
R- 91	-0.10	31.80	-1.50	1.50	62.30	63.80		
R- 92	0.10	33.30	1.50	0.00	65.20	65.20		
R- 93	-0.20	29.30	-5.40	5.40	57.40	62.80		

Sarasota Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R- 94	0.10	27.00	1.50	0.00	53.00	53.00		
R- 95	-0.20	33.40	-6.60	6.60	65.50	72.10		
R- 96	-0.10	32.20	-3.60	3.60	63.00	66.60		
R- 97	0.00	35.30	0.00	0.00	69.20	69.20		
R- 98	0.10	35.80	2.40	0.00	70.20	70.20		
R- 99	0.40	33.90	10.80	0.00	66.50	66.50		
R-100	0.70	38.30	21.60	0.00	75.00	75.00		
R-101	0.90	39.90	28.20	0.00	78.20	78.20		
R-102	0.70	38.00	21.30	0.00	74.40	74.40		
R-103	0.80	39.20	22.50	0.00	76.80	76.80		
R-104	0.60	40.40	18.00	0.00	79.10	79.10		
R-105	0.70	29.80	20.40	0.00	58.50	58.50	-1.00	-30.00
R-106	0.80	25.70	23.70	0.00	50.40	50.40	-1.00	-30.00
R-107	0.80	37.80	22.50	0.00	74.00	74.00	-1.00	-30.00
R-108	0.90	45.90	27.60	0.00	89.90	89.90	-1.00	-30.00
R-109	1.20	46.80	35.70	0.00	91.60	91.60	-1.00	-30.00
R-110	1.40	43.10	41.40	0.00	84.50	84.50	-1.00	-30.00
R-111	1.80	46.70	53.10	0.00	91.50	91.50	-1.00	-30.00
R-112	2.60	37.40	78.00	0.00	73.30	73.30	-1.00	-30.00
T-113	3.70	35.40	111.90	0.00	69.40	69.40	-1.00	-30.00
R-114	4.20	46.10	125.40	0.00	90.30	90.30	-1.00	-30.00
R-115B	4.40	94.50	132.00	0.00	185.30	185.30		
R-116	2.10	59.80	63.60	0.00	117.10	117.10		
R-117	1.50	76.40	44.70	0.00	149.70	149.70		
R-118	0.80	98.60	22.80	0.00	193.20	193.20		
R-119	0.20	104.40	4.80	0.00	204.60	204.60		
R-120	-0.10	105.80	-2.70	2.70	207.40	210.10		
R-121	-0.20	117.30	-6.60	6.60	229.90	236.50		
T-122	0.30	92.80	9.00	0.00	181.80	181.80		
R-123A	0.50	81.40	13.80	0.00	159.60	159.60		
R-124	0.50	80.40	14.70	0.00	157.70	157.70		
R-125	0.20	71.90	6.30	0.00	140.90	140.90		
R-126	-0.40	112.90	-11.40	11.40	221.30	232.70		
T-127	-0.50	89.90	-16.20	16.20	176.20	192.40		
R-128	-0.70	75.60	-19.50	19.50	148.20	167.70		
R-129	-1.10	76.30	-34.50	34.50	149.60	184.10		
R-130	-0.90	66.70	-26.40	26.40	130.70	157.10		
T-131	-0.40	55.60	-12.00	12.00	109.00	121.00		
R-132	-1.00	57.90	-29.40	29.40	113.40	142.80		
R-133	-1.90	47.80	-57.60	57.60	93.60	151.20		
T-134	-1.70	38.60	-51.00	51.00	75.60	126.60		
R-135	-0.90	36.50	-27.30	27.30	71.50	98.80		
R-136	0.10	23.60	1.80	0.00	46.20	46.20		
T-137	0.20	25.10	4.80	0.00	49.30	49.30		
R-138A	-0.80	54.40	-25.50	25.50	106.60	132.10		
R-139	-0.60	54.00	-18.30	18.30	105.90	124.20		

Sarasota Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
T-140	-0.50	70.00	-15.90	15.90	137.30	153.20		
R-141	-0.70	51.80	-20.40	20.40	101.50	121.90		
R-142	-0.30	70.50	-9.30	9.30	138.10	147.40		
R-143	0.00	62.40	-0.90	0.90	122.40	123.30		
R-144	-0.20	61.80	-4.80	4.80	121.10	125.90		
R-145	0.20	44.00	5.10	0.00	86.20	86.20		
R-146	0.30	46.90	8.70	0.00	92.00	92.00		
R-147	0.10	43.40	3.00	0.00	85.10	85.10		
R-148	0.10	45.80	4.20	0.00	89.70	89.70		
T-149	0.10	40.70	4.50	0.00	79.80	79.80		
R-150	0.30	79.50	10.50	0.00	155.70	155.70		
R-151	0.50	59.80	14.10	0.00	117.30	117.30		
R-152	0.60	52.10	17.70	0.00	102.10	102.10		
R-153	0.80	47.50	24.90	0.00	93.10	93.10		
R-154	0.30	38.70	10.50	0.00	75.90	75.90		
R-155	0.10	48.70	1.80	0.00	95.40	95.40		
R-156	-0.70	41.50	-21.30	21.30	81.40	102.70		
R-157	0.00	33.40	-1.20	1.20	65.50	66.70		
R-158	0.10	35.00	4.50	0.00	68.60	68.60		
R-159	-0.10	33.60	-2.70	2.70	65.80	68.50		
R-160	-0.30	41.50	-7.80	7.80	81.40	89.20		
R-161	-0.40	37.70	-10.80	10.80	74.00	84.80		
R-162	-0.70	28.00	-19.80	19.80	54.80	74.60		
R-163	-0.80	22.90	-24.90	24.90	44.80	69.70		
R-164	-0.30	23.60	-8.10	8.10	46.20	54.30		
R-165	-0.10	32.10	-2.40	2.40	63.00	65.40		
T-166	-0.20	40.60	-6.60	6.60	79.50	86.10		
R-167	-0.20	51.20	-5.40	5.40	100.40	105.80		
R-168	0.10	33.50	2.70	0.00	65.60	65.60		
R-169	-0.20	33.10	-6.00	6.00	64.90	70.90		
R-170	-0.50	23.60	-14.10	14.10	46.20	60.30		
R-171	-0.10	37.60	-4.20	4.20	73.80	78.00		
R-172	-0.30	23.00	-9.30	9.30	45.10	54.40		
R-173	-0.30	52.00	-8.10	8.10	101.90	110.00		
R-174	0.00	54.60	-0.30	0.30	107.10	107.40		
R-175	-0.30	49.60	-10.20	10.20	97.20	107.40		
R-176	-0.30	45.90	-7.50	7.50	90.00	97.50		
R-177	-0.90	27.10	-25.80	25.80	53.10	78.90		
R-178	-0.80	35.80	-25.20	25.20	70.20	95.40		
R-179	-0.60	36.60	-19.20	19.20	71.70	90.90		
R-180	-0.30	56.00	-7.80	7.80	109.80	117.60		
R-181	-0.90	42.40	-28.50	28.50	83.10	111.60		
R-182	-0.50	45.60	-13.50	13.50	89.30	102.80		
R-183A	-0.40	44.50	-12.30	12.30	87.10	99.40		

Notes:

- All units are feet.
- ER and GPTS are trend-stochastic erosion rates and 30-yr erosion projections.
- (EF)ER and (EF)ERx30 are rule-based erosion rates and 30-yr erosion projections.
- Only non-park or non-federal areas have (EF)ER estimates shown above.

- Rule-based 30-yr erosion projections for Ranges 1 through 29 on Longboat Key, R34 through R44 on Lido Key, and R115 through R134 in Venice include a 30-yr credit for the beach nourishment project. No (EF)ER values provided for other locations with no values shown above.
- See report text and listed references for more details on evaluation results and above values.

Charlotte Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R- 1	-0.7	37.9	-20.1	20.1	74.2	94.3		
R- 2-A	-0.7	30.1	-19.8	19.8	59.0	78.8		
R- 3	-0.2	35.2	-4.8	4.8	69.0	73.8		
R- 4	0.2	38.4	5.7	0.0	75.3	75.3		
R- 5	0.1	30.3	3.0	0.0	59.4	59.4		
R- 6	-0.2	38.0	-6.6	6.6	74.5	81.1		
R- 7	-0.1	48.6	-1.5	1.5	95.2	96.7		
R- 8	0.2	43.1	6.0	0.0	84.6	84.6		
R- 9	0.5	49.0	15.0	0.0	96.0	96.0		
R- 10	0.5	48.8	15.6	0.0	95.7	95.7		
R- 11-A	0.0	37.3	0.6	0.0	73.2	73.2		
R- 12	-0.5	37.6	-13.8	13.8	73.7	87.5		
R- 13	-0.2	31.6	-6.3	6.3	61.9	68.2		
R- 14	3.0	109.2	89.7	0.0	213.9	213.9		
R- 15	1.1	57.6	33.0	0.0	112.9	112.9		
R- 16	1.9	86.4	55.5	0.0	169.3	169.3		
R- 17	1.9	120.8	55.8	0.0	236.7	236.7		
R- 18	1.8	119.5	52.5	0.0	234.3	234.3		
R- 19	1.9	102.1	56.1	0.0	200.1	200.1		
R- 20	2.8	116.7	84.0	0.0	228.8	228.8		
R- 21	7.3	438.6	218.7	0.0	859.7	859.7		
R- 22	-0.1	676.0	-3.3	3.3	1324.9	1328.2		
R- 23	5.4	357.5	160.8	0.0	700.7	700.7		
R- 24	6.2	302.6	185.7	0.0	593.2	593.2		
R- 25	3.7	329.3	111.3	0.0	645.3	645.3		
R- 26	-1.2	310.9	-35.7	35.7	609.5	645.2		
R- 27	-0.4	371.8	-12.6	12.6	728.6	741.2		
R- 28	-4.9	241.7	-147.3	147.3	473.8	621.1		
R- 29	-6.5	179.1	-193.5	193.5	351.0	544.5		
R- 30	-7.4	167.1	-223.2	223.2	327.5	550.7		
R- 31	-7.9	146.3	-238.2	238.2	286.7	524.9		
R- 32	-8.3	108.1	-249.0	249.0	211.8	460.8		
R- 33	-7.7	79.0	-230.4	230.4	154.9	385.3		
R- 34	-6.0	54.8	-180.0	180.0	107.3	287.3		
R- 35	1.3	205.5	37.8	0.0	402.8	402.8		
R- 36	4.5	202.1	135.3	0.0	396.2	396.2		
R- 37	3.4	202.0	102.9	0.0	396.0	396.0		
R- 38	2.9	179.8	86.7	0.0	352.3	352.3		
R- 39	2.1	131.7	64.5	0.0	258.2	258.2		
R- 40	1.1	100.6	33.9	0.0	197.1	197.1		
R- 41	0.0	59.0	1.2	0.0	115.7	115.7		
R- 42	-1.0	27.6	-28.8	28.8	54.1	82.9		
R- 43	-2.5	50.5	-75.6	75.6	98.9	174.5		
R- 44	1.1	75.2	32.4	0.0	147.5	147.5		
R- 45	-3.5	23.7	-105.9	105.9	46.4	152.3		
R- 46	-1.3	65.6	-39.3	39.3	128.5	167.8		

Charlotte Erosion Rates - 30 Year Projections

R- 47	0.4	121.7	12.0	0.0	238.5	238.5
R- 48	1.0	121.2	29.7	0.0	237.5	237.5
R- 49	1.6	93.0	46.8	0.0	182.2	182.2
R- 50	0.9	110.5	27.9	0.0	216.6	216.6
R- 51	1.0	170.7	29.7	0.0	334.6	334.6
R- 52	-0.1	210.2	-3.6	3.6	411.9	415.5
R- 53	-1.2	197.6	-37.2	37.2	387.3	424.5
R- 54	-1.5	143.6	-45.9	45.9	281.4	327.3
R- 55	-3.0	134.0	-88.8	88.8	262.7	351.5
R- 56	-5.6	137.4	-166.8	166.8	269.4	436.2
R- 57	-7.6	184.6	-228.9	228.9	361.9	590.8
R- 58	11.6	298.2	348.9	0.0	584.6	584.6
R- 59	11.2	297.1	334.8	0.0	582.3	582.3
R- 60	2.8	98.0	83.7	0.0	192.1	192.1
R- 60-1	21.5	236.9	645.3	0.0	464.3	464.3
R- 61	12.6	123.1	376.5	0.0	241.2	241.2
R- 62	10.7	241.3	320.1	0.0	473.0	473.0
R- 63	7.7	251.1	231.9	0.0	492.1	492.1
R- 64	5.8	212.4	172.5	0.0	416.3	416.3
R- 65	5.2	197.2	156.0	0.0	386.5	386.5
R- 66	4.9	134.0	148.2	0.0	262.7	262.7
R- 67	3.8	118.1	114.9	0.0	231.5	231.5
R- 68	3.5	88.1	103.5	0.0	172.6	172.6

Notes:

- All units are feet.
- ER and GPTS are trend-stochastic erosion rates and 30-yr erosion projections.
- (EF)ER and (EF)ERx30 are rule-based erosion rates and 30-yr erosion projections.
- Only non-park or non-federal areas have (EF)ER estimates shown above.
- No (EF)ER and (EF)ERx30 values provided for locations with no values shown above.
- See report text and listed references for more details on evaluation results and above values.

Lee Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R- 1	2.70	78.00	81.90	0.00	152.80	152.80		
R- 2	-0.30	117.40	-8.10	8.10	230.00	238.10		
R- 3	-0.20	95.80	-5.40	5.40	187.80	193.20	-1.00	-30.00
R- 4	-0.70	102.20	-22.20	22.20	200.30	222.50	-1.00	-30.00
R- 5	-1.30	83.30	-37.50	37.50	163.20	200.70	-1.00	-30.00
R- 6	-1.20	79.50	-36.60	36.60	155.80	192.40	-1.00	-30.00
R- 7	-1.40	74.30	-40.50	40.50	145.50	186.00	-1.00	-30.00
R- 8	-2.00	81.90	-60.00	60.00	160.50	220.50	-1.00	-30.00
R- 9	-1.50	59.50	-44.40	44.40	116.70	161.10	-1.00	-30.00
R- 10	-1.30	58.50	-39.00	39.00	114.60	153.60	-1.00	-30.00
R- 11	-1.60	48.50	-49.50	49.50	95.00	144.50		
R- 12	-1.60	55.20	-49.50	49.50	108.20	157.70		
R- 13	-1.80	43.00	-54.00	54.00	84.40	138.40		
R- 14	-1.80	36.20	-53.70	53.70	71.00	124.70		
R- 15	-2.30	46.60	-68.70	68.70	91.40	160.10		
R- 16	-3.30	37.70	-98.10	98.10	74.00	172.10		
R- 17	-2.50	54.40	-76.20	76.20	106.70	182.90		
R- 18	-2.80	61.90	-82.80	82.80	121.40	204.20		
R- 19	-2.50	57.50	-75.00	75.00	112.60	187.60	-1.00	-30.00
R- 20	-3.50	87.80	-104.70	104.70	172.10	276.80	-1.00	-30.00
R- 21	-3.30	89.80	-99.90	99.90	176.00	275.90	-1.00	-30.00
R- 22	-3.60	99.90	-109.20	109.20	195.70	304.90	-1.00	-30.00
R- 23	-3.40	84.70	-101.70	101.70	166.10	267.80	-1.00	-30.00
R- 24	-2.90	75.00	-87.60	87.60	147.10	234.70	-1.00	-30.00
R- 25	-2.40	58.30	-71.10	71.10	114.30	185.40		
R- 26	-6.20	128.20	-186.00	186.00	251.30	437.30		
R- 26A	-0.60	96.60	-16.50	16.50	189.30	205.80		
R- 27	-7.30	201.20	-218.40	218.40	394.40	612.80		
R- 28	-5.90	178.40	-177.00	177.00	349.60	526.60		
R- 29	-7.00	149.70	-209.70	209.70	293.40	503.10		
R- 30	-5.30	81.50	-157.50	157.50	159.80	317.30		
R- 31	-0.30	133.90	-9.00	9.00	262.40	271.40		
R- 32	1.20	104.10	35.70	0.00	204.10	204.10		
R- 33	3.20	60.20	95.10	0.00	118.00	118.00		
R- 34	5.00	36.10	150.00	0.00	70.80	70.80		
R- 35	9.10	122.20	273.00	0.00	239.60	239.60		
R- 36	16.20	270.60	485.10	0.00	530.30	530.30		
R- 37	16.70	484.40	502.20	0.00	949.50	949.50		
R- 38	13.80	445.20	415.20	0.00	872.60	872.60		
R- 39	14.60	381.50	438.60	0.00	747.80	747.80		
R- 40	12.10	296.60	363.90	0.00	581.40	581.40		
R- 41	10.40	313.80	311.70	0.00	615.00	615.00		
R- 42	10.00	389.30	299.70	0.00	763.00	763.00		
R- 43	4.30	333.40	130.20	0.00	653.50	653.50		
R- 44	1.30	241.40	38.70	0.00	473.20	473.20		
R- 45	-0.50	144.00	-15.30	15.30	282.20	297.50		

Lee Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER SEE NOTE	(EF) ERx30
R- 46	-2.50	48.40	-75.00	75.00	94.90	169.90		
R- 47	-4.90	156.10	-146.70	146.70	306.00	452.70		
R- 48	-5.80	192.30	-174.60	174.60	377.00	551.60		
R- 49	-3.80	338.40	-112.50	112.50	663.40	775.90		
R- 50	-2.30	379.30	-70.20	70.20	743.40	813.60		
R- 51	2.00	261.40	60.30	0.00	512.30	512.30		
R- 52	5.30	187.60	159.90	0.00	367.60	367.60		
R- 53	6.20	174.30	186.60	0.00	341.70	341.70		
R- 54	5.70	191.30	170.40	0.00	374.90	374.90		
R- 55	4.80	243.70	144.00	0.00	477.60	477.60		
R- 56	1.60	178.80	48.00	0.00	350.40	350.40		
R- 57	-0.20	129.20	-6.00	6.00	253.30	259.30		
R- 58	-1.80	101.10	-53.10	53.10	198.10	251.20		
R- 59	-2.70	66.70	-81.60	81.60	130.70	212.30		
R- 60	-3.50	64.70	-104.10	104.10	126.80	230.90		
R- 61	-3.60	57.70	-108.00	108.00	113.20	221.20		
R- 62	-4.50	47.80	-133.50	133.50	93.60	227.10		
R- 63	-5.30	54.80	-158.10	158.10	107.40	265.50		
R- 64	-6.80	94.10	-205.50	205.50	184.50	390.00		
R- 65	-8.90	142.90	-267.30	267.30	280.00	547.30		
R- 66	-0.30	76.90	-10.50	10.50	150.70	161.20	-1.00	-30.00
R- 67	-2.10	97.00	-63.30	63.30	190.10	253.40	-1.00	-30.00
R- 68	-2.20	105.30	-65.40	65.40	206.50	271.90	-1.00	-30.00
R- 69	-2.50	104.10	-75.30	75.30	204.10	279.40	-1.00	-30.00
R- 70	-2.30	87.00	-69.60	69.60	170.60	240.20	-1.00	-30.00
R- 71	-0.50	115.30	-14.10	14.10	225.90	240.00	-1.00	-30.00
R- 72	2.10	111.10	64.20	0.00	217.70	217.70		
R- 73	2.80	164.50	82.80	0.00	322.50	322.50		
R- 74	1.50	239.10	44.70	0.00	468.70	468.70		
R- 74A	-1.70	229.80	-50.70	50.70	450.30	501.00		
R- 75	-0.60	241.70	-18.60	18.60	473.80	492.40		
R- 75A	1.00	101.10	28.80	0.00	198.20	198.20		
R- 76	-2.30	161.20	-67.50	67.50	316.00	383.50		
R- 76A	-3.10	161.90	-93.30	93.30	317.40	410.70		
R- 77	-4.10	151.60	-122.10	122.10	297.20	419.30		
R- 77A	-4.80	154.10	-142.50	142.50	302.10	444.60		
R- 78	-4.70	290.70	-140.10	140.10	569.70	709.80		
R- 79	-8.70	160.70	-261.90	261.90	315.00	576.90		
R- 79A	-8.30	102.30	-247.80	247.80	200.50	448.30		
R- 80	-8.00	66.70	-240.60	240.60	130.70	371.30		
R- 81	-7.10	120.80	-212.70	212.70	236.80	449.50		
R- 81A	-6.50	207.20	-195.30	195.30	406.20	601.50		
R- 82	-11.60	223.40	-349.20	349.20	437.90	787.10		
R- 83	4.10	52.40	122.70	0.00	102.60	102.60		
R- 84	-1.70	138.30	-50.10	50.10	271.00	321.10		
R- 85	-3.00	137.40	-89.70	89.70	269.40	359.10		

Lee Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R- 86	-5.10	103.40	-153.00	153.00	202.70	355.70		
R- 87	-6.30	106.50	-189.60	189.60	208.60	398.20		
R- 88	-6.00	98.60	-180.00	180.00	193.30	373.30		
R- 89	-5.50	80.70	-165.90	165.90	158.20	324.10		
R- 90	-5.30	69.10	-157.50	157.50	135.40	292.90		
R- 91	-4.40	60.50	-131.40	131.40	118.70	250.10		
R- 92	-3.00	56.20	-89.40	89.40	110.10	199.50		
R- 93	-2.00	49.90	-60.30	60.30	97.80	158.10		
R- 94	-0.70	45.30	-20.10	20.10	88.80	108.90		
R- 95	0.00	47.50	0.30	0.00	93.00	93.00		
R- 96	0.50	44.10	14.40	0.00	86.50	86.50		
R- 97	1.10	49.70	32.10	0.00	97.40	97.40		
R- 98	1.60	51.90	46.50	0.00	101.80	101.80		
R- 99	1.90	54.90	56.40	0.00	107.60	107.60		
R-100	1.90	53.40	55.50	0.00	104.60	104.60		
R-101	2.20	49.40	65.40	0.00	96.80	96.80		
R-102	1.60	46.30	48.60	0.00	90.80	90.80		
R-103	1.20	49.50	36.60	0.00	97.00	97.00		
R-104	0.30	54.40	10.50	0.00	106.70	106.70		
R-105	-0.20	57.00	-5.70	5.70	111.60	117.30		
R-106	-0.80	56.80	-24.00	24.00	111.30	135.30		
R-107	-2.20	65.80	-67.20	67.20	128.90	196.10		
R-108	-3.30	92.70	-99.90	99.90	181.60	281.50		
R-109	5.30	50.30	158.40	0.00	98.60	98.60		
R-110	-7.60	109.60	-226.80	226.80	214.90	441.70		
R-111	-9.30	105.70	-280.20	280.20	207.10	487.30		
R-112	-11.80	128.30	-354.30	354.30	251.50	605.80		
R-113	-11.70	120.20	-351.00	351.00	235.60	586.60		
R-114	-8.00	131.50	-240.30	240.30	257.80	498.10		
R-115	1.30	169.90	38.40	0.00	333.10	333.10		
R-116	11.80	233.50	355.20	0.00	457.60	457.60		
R-117	14.00	276.10	419.10	0.00	541.20	541.20		
R-118	14.70	245.80	441.90	0.00	481.70	481.70		
R-119	15.20	176.00	456.90	0.00	345.00	345.00		
R-120	15.50	138.10	465.30	0.00	270.70	270.70		
R-121	14.90	144.70	448.20	0.00	283.50	283.50		
R-122	13.10	199.80	393.30	0.00	391.60	391.60		
R-123	11.40	193.50	342.00	0.00	379.30	379.30	-1.00	-30.00
R-124	8.60	152.70	257.10	0.00	299.30	299.30	-1.00	-30.00
R-125	6.40	144.90	192.60	0.00	284.00	284.00	-1.00	-30.00
R-126	5.00	149.40	151.20	0.00	292.80	292.80	-1.00	-30.00
R-127	3.20	135.40	97.20	0.00	265.30	265.30	-1.00	-30.00
R-128	1.30	98.10	38.10	0.00	192.30	192.30	-1.00	-30.00
R-129	-0.10	85.50	-3.60	3.60	167.50	171.10	-1.00	-30.00
R-130	-0.70	57.70	-20.70	20.70	113.10	133.80	-1.00	-30.00
T-131	-0.80	41.60	-24.60	24.60	81.50	106.10	-1.00	-30.00

Lee Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30
							SEE NOTE	
R-132	-1.20	38.20	-34.80	34.80	74.90	109.70	-1.00	-30.00
R-133	-0.30	39.40	-10.20	10.20	77.20	87.40	-1.00	-30.00
R-134	0.40	41.10	11.70	0.00	80.70	80.70	-1.00	-30.00
R-135	0.70	41.70	20.10	0.00	81.70	81.70	-1.00	-30.00
R-136	0.70	33.70	21.30	0.00	66.00	66.00	-1.00	-30.00
T-137	2.10	59.00	62.70	0.00	115.60	115.60	-1.00	-30.00
R-138	1.70	54.00	51.60	0.00	105.90	105.90	-1.00	-30.00
R-139	1.50	40.90	43.50	0.00	80.10	80.10	-1.00	-30.00
R-140	1.50	55.70	45.60	0.00	109.10	109.10	-1.00	-30.00
R-141	1.60	59.40	48.30	0.00	116.40	116.40	-1.00	-30.00
R-142	1.70	43.20	50.40	0.00	84.70	84.70	-1.00	-30.00
R-143	1.30	30.80	38.70	0.00	60.30	60.30	-1.00	-30.00
R-144	1.20	32.80	35.70	0.00	64.30	64.30	-1.00	-30.00
R-145	1.10	34.70	33.00	0.00	68.00	68.00	-1.00	-30.00
R-146	1.10	37.50	33.60	0.00	73.50	73.50	-1.00	-30.00
R-147	1.40	35.30	41.40	0.00	69.20	69.20	-1.00	-30.00
R-148	1.40	48.80	41.40	0.00	95.70	95.70	-1.00	-30.00
R-149	1.40	55.40	42.30	0.00	108.50	108.50	-1.00	-30.00
R-150	0.80	49.00	25.20	0.00	96.10	96.10	-1.00	-30.00
T-151	0.30	44.70	10.20	0.00	87.60	87.60	-1.00	-30.00
R-152	-0.10	43.40	-3.00	3.00	85.10	88.10	-1.00	-30.00
R-153	0.00	73.80	-0.90	0.90	144.60	145.50	-1.00	-30.00
R-154	0.80	60.70	24.90	0.00	118.90	118.90	-1.00	-30.00
R-155	1.00	54.80	31.20	0.00	107.40	107.40	-1.00	-30.00
R-156	1.60	43.60	48.30	0.00	85.40	85.40	-1.00	-30.00
R-157	2.60	63.50	77.10	0.00	124.50	124.50	-1.00	-30.00
R-158	3.20	62.90	97.20	0.00	123.30	123.30	-1.00	-30.00
R-159	4.50	72.50	136.20	0.00	142.00	142.00	-1.00	-30.00
R-160	5.00	72.50	150.30	0.00	142.10	142.10	-1.00	-30.00
R-161	5.50	67.50	165.60	0.00	132.30	132.30	-1.00	-30.00
R-161A	5.90	61.70	177.60	0.00	120.90	120.90	-1.00	-30.00
R-162	5.60	47.90	167.70	0.00	93.90	93.90	-1.00	-30.00
R-163	5.30	48.90	160.50	0.00	95.80	95.80	-1.00	-30.00
R-164	4.80	41.60	142.80	0.00	81.50	81.50	-1.00	-30.00
R-165	4.10	31.10	121.80	0.00	61.00	61.00	-1.00	-30.00
R-166	3.70	22.50	111.90	0.00	44.20	44.20	-1.00	-30.00
R-167	3.40	37.00	100.80	0.00	72.50	72.50	-1.00	-30.00
R-168	3.00	41.50	90.30	0.00	81.30	81.30	-1.00	-30.00
R-169	2.70	32.80	81.90	0.00	64.30	64.30	-1.00	-30.00
R-170	2.60	42.90	79.50	0.00	84.20	84.20	-1.00	-30.00
R-171	3.00	74.60	90.30	0.00	146.20	146.20	-1.00	-30.00
R-172	2.60	66.20	78.00	0.00	129.80	129.80	-1.00	-30.00
R-173	1.30	89.10	37.50	0.00	174.70	174.70	-1.00	-30.00
R-174E	-3.50	65.10	-105.30	105.30	127.60	232.90		
R-174	-0.80	94.50	-24.90	24.90	185.10	210.00		
R-175N	11.70	102.80	352.20	0.00	201.40	201.40		

Lee Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R-175W	8.90	83.50	266.10	0.00	163.70	163.70		
R-176	2.50	60.90	74.10	0.00	119.30	119.30		
R-177	3.10	60.40	92.10	0.00	118.30	118.30		
R-178	3.80	101.50	114.00	0.00	198.90	198.90		
R-179	0.80	61.00	23.70	0.00	119.50	119.50		
R-180	-0.10	42.50	-4.20	4.20	83.20	87.40	-1.00	-30.00
R-181	0.60	52.90	16.50	0.00	103.60	103.60	-1.00	-30.00
R-182	0.90	47.30	28.50	0.00	92.70	92.70	-1.00	-30.00
R-183	1.30	45.40	40.20	0.00	89.00	89.00	-1.00	-30.00
R-184	1.40	34.00	42.90	0.00	66.70	66.70	-1.00	-30.00
R-185	1.60	33.00	47.10	0.00	64.70	64.70	-1.00	-30.00
R-186	1.70	30.00	51.90	0.00	58.80	58.80	-1.00	-30.00
R-186A	1.60	25.80	48.90	0.00	50.60	50.60	-1.00	-30.00
R-187	1.40	37.50	41.70	0.00	73.60	73.60	-1.00	-30.00
R-187A	1.10	32.00	33.90	0.00	62.80	62.80	-1.00	-30.00
R-188	0.70	29.80	21.30	0.00	58.40	58.40	-1.00	-30.00
R-189	0.50	35.00	14.70	0.00	68.60	68.60	-1.00	-30.00
R-190	0.10	41.80	2.70	0.00	82.00	82.00	-1.00	-30.00
R-191	-0.80	25.00	-24.30	24.30	49.00	73.30	-1.00	-30.00
R-192	-0.80	26.90	-23.40	23.40	52.60	76.00	-1.00	-30.00
R-193	-1.00	26.70	-29.70	29.70	52.40	82.10		
R-194	-1.20	28.80	-36.60	36.60	56.50	93.10		
R-195	-1.20	41.00	-35.40	35.40	80.30	115.70		
R-196	-1.00	49.80	-30.30	30.30	97.60	127.90		
R-197	-0.40	46.90	-11.10	11.10	91.90	103.00		
R-198	0.50	69.90	15.00	0.00	136.90	136.90		
R-199	1.20	114.40	36.90	0.00	224.20	224.20		
R-200	2.80	157.00	82.80	0.00	307.70	307.70		
R-201	4.60	222.40	138.90	0.00	436.00	436.00		
R-202	5.80	234.30	173.40	0.00	459.30	459.30		
R-203	8.60	190.50	259.20	0.00	373.40	373.40		
R-204	7.40	205.70	222.90	0.00	403.20	403.20		
R-205	4.70	374.50	141.60	0.00	733.90	733.90		
R-206	3.50	453.90	105.30	0.00	889.60	889.60		
R-207	4.20	269.40	124.50	0.00	528.10	528.10		
R-208	-5.90	509.40	-178.20	178.20	998.40	1176.60		
R-209	-0.40	99.90	-12.00	12.00	195.80	207.80		
R-210	-0.70	48.60	-20.70	20.70	95.30	116.00		
R-211	-1.30	22.90	-39.30	39.30	44.90	84.20		
R-212	-1.70	46.80	-51.00	51.00	91.60	142.60		
R-213	8.20	106.00	245.40	0.00	207.80	207.80		
R-214	-3.10	200.80	-93.90	93.90	393.60	487.50		
R-215	-4.80	120.30	-143.10	143.10	235.80	378.90		
T-216	-0.10	336.20	-3.90	3.90	658.90	662.80		
R-217	-4.20	99.60	-127.20	127.20	195.20	322.40		
R-218	-3.00	293.30	-90.00	90.00	574.80	664.80		

Lee Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30
							SEE NOTE	
R-219	-0.40	394.70	-13.20	13.20	773.60	786.80		
R-220	2.30	518.60	70.20	0.00	1016.50	1016.50		
R-221	-5.30	239.10	-158.40	158.40	468.60	627.00		
R-222	-18.40	271.50	-552.90	552.90	532.10	1085.00		
R-223	-7.90	140.90	-237.90	237.90	276.20	514.10		
R-224	-7.70	85.00	-232.20	232.20	166.50	398.70		
R-225	-7.10	112.00	-212.10	212.10	219.50	431.60		
R-226	2.50	90.00	74.10	0.00	176.50	176.50		
R-227	3.50	94.20	105.60	0.00	184.70	184.70		
R-228	2.30	65.20	68.10	0.00	127.80	127.80		
R-229	1.10	42.40	33.30	0.00	83.00	83.00		
R-230	2.20	40.30	65.10	0.00	79.10	79.10	-1.00	-30.00
R-231	1.40	20.40	40.80	0.00	40.00	40.00	-1.00	-30.00
R-232	0.30	20.10	10.50	0.00	39.40	39.40	-1.00	-30.00
R-233	-0.10	21.00	-2.40	2.40	41.20	43.60	-1.00	-30.00
R-234	-0.50	27.50	-15.30	15.30	53.90	69.20	-1.00	-30.00
R-235	-0.60	25.20	-17.70	17.70	49.40	67.10	-1.00	-30.00
R-236	-0.50	33.00	-15.60	15.60	64.70	80.30	-1.00	-30.00
R-237	-0.30	30.60	-8.10	8.10	59.90	68.00	-1.00	-30.00
R-238	-0.20	29.90	-4.80	4.80	58.60	63.40	-1.00	-30.00
R-239	-0.40	18.30	-12.90	12.90	35.90	48.80	-1.00	-30.00

Notes:

- All units are feet.
- ER and GPTS are trend-stochastic erosion rates and 30-yr erosion projections.
- (EF)ER and (EF)ERx30 are rule-based erosion rates and 30-yr erosion projections.
- Only non-park or non-federal areas have (EF)ER estimates shown above.
- Rule-based 30-yr erosion projections for Ranges 85 through 112 on Captiva Island/north Sanibel Island include a 30-yr credit for the beach nourishment project. No (EF)ER values provided for other locations with no values shown above.
- See report text and listed references for more details on evaluation results and above values.

Collier Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R- 1	-0.40	20.00	-12.90	12.90	39.20	52.10	-1.00	-30.00
T- 2	-0.30	24.90	-7.80	7.80	48.80	56.60	-1.00	-30.00
R- 3	-0.50	37.50	-14.10	14.10	73.40	87.50	-1.00	-30.00
R- 4	-0.40	35.80	-12.00	12.00	70.20	82.20	-1.00	-30.00
R- 5	-1.10	44.50	-32.10	32.10	87.20	119.30	-1.00	-30.00
R- 6	-2.30	60.30	-67.50	67.50	118.10	185.60	-1.00	-30.00
R- 7	-2.30	35.00	-67.80	67.80	68.50	136.30		
T- 8	-1.30	29.00	-37.50	37.50	56.80	94.30		
R- 9	-0.50	19.10	-14.10	14.10	37.40	51.50		
R- 10	-0.10	12.80	-1.50	1.50	25.00	26.50		
R- 11	0.50	28.30	13.80	0.00	55.50	55.50		
R- 12	0.50	24.40	15.90	0.00	47.70	47.70		
R- 13	0.80	34.50	24.00	0.00	67.60	67.60		
R- 14	0.50	30.50	14.40	0.00	59.90	59.90		
R- 15	-0.30	39.10	-7.80	7.80	76.70	84.50		
R- 16	-0.80	113.80	-25.20	25.20	223.10	248.30		
R- 17	0.90	75.90	26.40	0.00	148.70	148.70		
R- 18	0.30	32.30	7.80	0.00	63.40	63.40		
R- 19	0.10	24.30	2.70	0.00	47.70	47.70		
R- 20	-0.30	23.60	-7.50	7.50	46.20	53.70		
R- 21	-0.70	20.90	-20.40	20.40	41.00	61.40		
R- 22	-0.70	17.90	-21.90	21.90	35.10	57.00		
R- 23	-0.50	24.10	-16.20	16.20	47.20	63.40		
T- 24	-0.60	28.90	-17.40	17.40	56.70	74.10		
T- 25	-0.10	36.50	-4.50	4.50	71.60	76.10		
T- 26	-0.10	41.80	-4.50	4.50	82.00	86.50		
R- 27	-0.10	39.90	-2.70	2.70	78.30	81.00		
T- 28	-0.70	36.50	-19.50	19.50	71.40	90.90		
R- 29	-0.40	35.00	-12.60	12.60	68.60	81.20		
R- 30	-0.50	35.60	-15.60	15.60	69.80	85.40		
R- 31	-0.80	36.40	-23.10	23.10	71.40	94.50	-1.00	-30.00
R- 32	-0.70	18.80	-21.30	21.30	36.90	58.20	-1.00	-30.00
R- 33	-0.90	20.10	-27.30	27.30	39.50	66.80	-1.00	-30.00
R- 34	-0.70	14.30	-21.30	21.30	28.00	49.30	-1.00	-30.00
R- 35	-0.50	16.40	-16.20	16.20	32.10	48.30	-1.00	-30.00
R- 36	-0.20	20.10	-4.80	4.80	39.50	44.30	-1.00	-30.00
R- 37	-0.60	25.50	-16.80	16.80	50.00	66.80	-1.00	-30.00
R- 38	-0.40	24.90	-12.00	12.00	48.80	60.80	-1.00	-30.00
R- 39	-0.40	24.40	-12.30	12.30	47.80	60.10	-1.00	-30.00
R- 40	-0.20	29.20	-7.20	7.20	57.20	64.40	-1.00	-30.00
R- 41	-0.20	38.40	-4.80	4.80	75.20	80.00	-1.00	-30.00
T- 42	-1.50	19.90	-44.10	44.10	38.90	83.00	-1.00	-30.00
R- 43	-0.90	19.80	-25.80	25.80	38.80	64.60	-1.00	-30.00
R- 44	-0.70	21.50	-21.90	21.90	42.20	64.10	-1.00	-30.00
R- 45	-0.60	18.10	-17.70	17.70	35.60	53.30	-1.00	-30.00
T- 46	-0.30	16.70	-9.90	9.90	32.80	42.70	-1.00	-30.00

Collier Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
T- 47	0.00	20.90	-1.20	1.20	40.90	42.10	-1.00	-30.00
U- 48	-0.20	25.90	-5.10	5.10	50.70	55.80	-1.00	-30.00
T- 49	0.10	28.70	2.40	0.00	56.20	56.20	-1.00	-30.00
T- 50	-0.20	35.70	-7.20	7.20	70.00	77.20		
R- 51	-0.20	32.00	-6.30	6.30	62.80	69.10		
R- 52	-0.20	31.50	-4.80	4.80	61.70	66.50		
R- 53	-0.20	26.80	-5.70	5.70	52.60	58.30		
T- 54	0.00	21.20	-0.30	0.30	41.50	41.80		
U- 55	0.10	28.30	2.70	0.00	55.50	55.50		
T- 56	0.00	27.60	-0.60	0.60	54.20	54.80		
T- 57	0.50	49.50	15.90	0.00	97.10	97.10		
T- 58	0.50	44.80	16.20	0.00	87.80	87.80		
R- 59	0.10	30.80	3.30	0.00	60.40	60.40		
R- 60	0.10	34.00	3.60	0.00	66.70	66.70		
R- 61	0.10	42.00	3.90	0.00	82.30	82.30		
T- 62	0.30	23.30	9.30	0.00	45.70	45.70		
T- 63	0.30	28.80	9.90	0.00	56.40	56.40		
R- 64	0.40	37.60	11.10	0.00	73.70	73.70		
T- 65	0.20	31.50	6.60	0.00	61.70	61.70		
R- 66	0.10	33.60	4.50	0.00	65.90	65.90		
T- 67	0.30	30.00	7.80	0.00	58.80	58.80		
R- 68	0.30	22.80	8.40	0.00	44.70	44.70		
P- 1	6.30	21.20	189.90	0.00	41.60	41.60		
P- 2	7.00	23.60	209.40	0.00	46.20	46.20		
T- 69	0.70	26.40	19.50	0.00	51.80	51.80		
P- 3	9.90	22.60	298.50	0.00	44.40	44.40		
P- 4	10.00	20.10	300.30	0.00	39.40	39.40		
P- 5	9.40	20.80	282.90	0.00	40.70	40.70		
P- 6	9.50	23.60	284.70	0.00	46.30	46.30	-1.00	-30.00
P- 7	10.10	25.30	303.00	0.00	49.60	49.60	-1.00	-30.00
R- 70	0.60	31.40	16.80	0.00	61.50	61.50	-1.00	-30.00
P- 8	7.90	29.50	237.30	0.00	57.80	57.80	-1.00	-30.00
R- 71	0.60	37.10	19.20	0.00	72.80	72.80	-1.00	-30.00
R- 72	0.60	39.20	17.70	0.00	76.80	76.80	-1.00	-30.00
T- 73	0.50	28.10	15.30	0.00	55.00	55.00	-1.00	-30.00
R- 74	0.60	25.40	16.50	0.00	49.90	49.90	-1.00	-30.00
T- 75	0.50	34.00	15.30	0.00	66.60	66.60	-1.00	-30.00
R- 76	-0.10	32.40	-2.40	2.40	63.50	65.90	-1.00	-30.00
R- 77	-0.10	28.30	-2.40	2.40	55.40	57.80	-1.00	-30.00
R- 78	-0.40	28.10	-11.40	11.40	55.00	66.40	-1.00	-30.00
R- 79	-0.50	27.40	-15.60	15.60	53.80	69.40	-1.00	-30.00
U- 80	-0.50	13.70	-14.40	14.40	26.80	41.20	-1.00	-30.00
R- 81	-0.50	18.50	-14.40	14.40	36.30	50.70	-1.00	-30.00
T- 82	-0.90	20.10	-27.30	27.30	39.40	66.70	-1.00	-30.00
R- 83	-0.90	25.50	-27.00	27.00	50.00	77.00	-1.00	-30.00
R- 84	-1.20	26.80	-36.30	36.30	52.60	88.90	-1.00	-30.00

Collier Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
U- 85	-1.00	32.00	-29.40	29.40	62.80	92.20	-1.00	-30.00
T- 86	-0.10	38.60	-4.50	4.50	75.70	80.20	-1.00	-30.00
T- 87	0.10	63.40	4.50	0.00	124.30	124.30	-1.00	-30.00
R- 88	-0.20	84.60	-5.10	5.10	165.70	170.80	-1.00	-30.00
R- 89	-2.20	21.60	-67.20	67.20	42.40	109.60	-1.00	-30.00
R- 90	-0.10	142.70	-4.50	4.50	279.70	284.20		
R- 91	1.10	208.40	33.00	0.00	408.40	408.40		
R- 92	1.60	151.40	47.10	0.00	296.70	296.70		
R- 93	-0.30	128.10	-10.20	10.20	251.20	261.40		
R- 94	-4.10	116.80	-122.70	122.70	228.80	351.50		
R- 95	-7.10	101.30	-211.80	211.80	198.60	410.40		
R- 96	-7.60	75.00	-228.60	228.60	147.00	375.60		
R- 97	-8.20	76.10	-247.20	247.20	149.10	396.30		
T- 98	-7.40	66.50	-222.00	222.00	130.40	352.40		
T- 99	-5.80	73.10	-174.60	174.60	143.30	317.90		
R-100	-3.40	85.20	-101.70	101.70	166.90	268.60		
R-101	-1.60	99.30	-48.00	48.00	194.70	242.70		
R-102	-0.80	108.80	-24.60	24.60	213.30	237.90		
R-103	-0.30	76.10	-9.60	9.60	149.20	158.80		
R-104	0.20	59.00	4.80	0.00	115.60	115.60		
R-105	0.10	58.90	2.70	0.00	115.40	115.40		
R-106	0.30	53.80	9.30	0.00	105.40	105.40		
R-107	0.60	64.50	17.10	0.00	126.40	126.40		
R-108	0.50	57.70	14.10	0.00	113.10	113.10		
R-109	0.70	53.90	22.20	0.00	105.50	105.50		
R-110	0.70	71.10	22.20	0.00	139.40	139.40	-1.00	-30.00
R-111	0.70	59.40	21.30	0.00	116.30	116.30	-1.00	-30.00
R-112	1.20	69.50	36.60	0.00	136.10	136.10	-1.00	-30.00
R-113	1.80	57.00	52.50	0.00	111.70	111.70	-1.00	-30.00
R-114	2.00	55.20	61.20	0.00	108.10	108.10	-1.00	-30.00
R-115	2.50	44.80	75.90	0.00	87.80	87.80	-1.00	-30.00
R-116	2.90	47.10	86.10	0.00	92.40	92.40	-1.00	-30.00
R-117	3.30	50.60	98.10	0.00	99.20	99.20	-1.00	-30.00
R-118	4.20	70.80	125.40	0.00	138.70	138.70		
R-119	7.50	130.30	225.60	0.00	255.40	255.40		
R-120	7.10	161.70	212.40	0.00	317.00	317.00		
R-121	3.40	390.10	100.50	0.00	764.60	764.60		
R-122	2.80	271.20	84.60	0.00	531.50	531.50		
R-123	1.80	116.50	53.70	0.00	228.30	228.30		
R-124	4.60	117.90	137.40	0.00	231.00	231.00		
R-125	8.30	282.40	249.90	0.00	553.40	553.40		
R-126	10.40	360.90	312.00	0.00	707.40	707.40		
R-127	10.10	362.00	303.30	0.00	709.60	709.60		
T-128	11.10	704.00	331.80	0.00	1379.90	1379.90		
T-129	20.40	784.80	612.60	0.00	1538.10	1538.10		
U-130	16.30	609.20	487.50	0.00	1194.10	1194.10		

Collier Erosion Rates - 30 Year Projections

Range	ER	SD	30xER_1	30xER_2	1.96SD	GPTS	(EF) ER	(EF) ERx30 SEE NOTE
R-131	17.60	554.80	526.80	0.00	1087.40	1087.40		
R-132	14.70	393.10	440.10	0.00	770.40	770.40		
T-133	15.10	433.40	451.80	0.00	849.40	849.40		
R-134	16.20	535.20	486.00	0.00	1049.00	1049.00		
T-135	12.80	381.90	385.20	0.00	748.60	748.60		
T-136	13.20	215.90	396.60	0.00	423.10	423.10		
T-137	9.70	109.60	289.80	0.00	214.80	214.80		
T-138	7.70	94.50	229.50	0.00	185.30	185.30		
R-139	6.60	73.00	196.80	0.00	143.10	143.10		
R-140	5.90	59.70	177.90	0.00	117.00	117.00		
R-141	5.30	53.40	159.00	0.00	104.60	104.60		
T-142	5.00	47.90	150.30	0.00	93.90	93.90		
R-143	4.60	45.10	139.20	0.00	88.40	88.40		
R-144	3.60	55.50	108.00	0.00	108.80	108.80		
R-145	2.90	75.40	86.40	0.00	147.80	147.80		
R-146	1.20	92.50	35.70	0.00	181.30	181.30		
T-147	-1.40	103.60	-42.90	42.90	203.10	246.00		
T-148	-1.90	120.40	-55.50	55.50	236.00	291.50		

Notes:

- All units are feet.
- ER and GPTS are trend-stochastic erosion rates and 30-yr erosion projections.
- (EF)ER and (EF)ERx30 are rule-based erosion rates and 30-yr erosion projections.
- Only non-park or non-federal areas have (EF)ER estimates shown above.
- Rule-based 30-yr erosion projections for Ranges 22 through 31 in Vanderbilt Beach, Ranges 58 through 78 in Naples, and Ranges 134 through 148 in Marco Island include 30-yr credit for the beach nourishment projects. No (EF)ER values provided for other locations with no values shown above.
- See report text and listed references for more details on evaluation results and above values.

Designation Procedure and Delineation of Areas
for General Permit Application

Appendix II.

Detailed Listings of General Coastal Land Use Classification and Recommended GP Line Locations for the SW Gulf Region of Florida

MANATEE COUNTY

General Coastal Land Use Classification

From	To	SF	MIX	MF	PUB
Referenced to FDEP Range Locations		Values Below in Feet			
R-001	R-002				
R-002	R-020 S200		12600		1400
R-020 S200	R-021 N200				700
R-021 N200	R-025 S200	3550			600
R-025 S200	R-028 N300			2900	
R-028 N300	R-033 S350		6300		450
R-033 S350	INLET				8600
INLET	R-044 S100				800
R-044 S100	R-048 S150			4500	150
R-048 S150	R-055 S250	8250			
R-055 S250	COUNTYLINE			14100	
	TOTAL (ft.)	11800	18900	21500	12700
	TOTAL (mi.)	2.23	3.58	4.07	2.41

Total County Shoreline Length = 12.3 miles (R. Clark, BBCS T&DM 89-1))

Percent of Total Shoreline	18.2%	29.1%	33.1%	19.6%

Note:
SF = Single Family Development
MIX = Mixed SFD/MFD/Commercial Development
MF = Multi-family Development
PUB = Public Lands

SARASOTA COUNTY

General Coastal Land Use Classification

From	To	SF	MIX	MF	PUB
Referenced to FDEP Range Locations		Values Below in Feet			
R-001	R-002		1000		
R-002	R-006 N200				3600
R-006 N200	R-007 S200		1550		
R-007 S200	R-009 N150			1700	
R-009 N150	R-011 N250	1900			
R-011 N250	R-029 S400			17900	
R-030	R-031 S450	1400			
R-031 S450	R-034 S350				2650
R-034 S350	R-035 S300	900			
R-035 S300	R-038 S400				2900
R-038 S400	R-043 S100			4600	
R-043 S100	R-043 S950				850
R-045 N300	R-045 S600	1000			
R-045 S600	R-046 S400			600	
R-046 S400	R-048	1500			
R-048	R-050		2000		
R-050	R-051 S650	1600			
R-051 S650	R-054				2400
R-054	R-062			8100	
R-062	R-072 N400	9200			
R-072 N400	R-074 N450			1950	
R-074 N450	R-075 N250				1200
R-075 N250	R-076 N200			1050	
R-076 N200	R-077	1200			
R-077	R-079 S400				1450
R-079 S400	R-111 N450	31000			
R-111 N450	R-112 S100				1700
R-112 S100	R-114 N200	1750			
R-114 N200	R-114 S750				950
R-116 N600	R-120			4500	
R-120	R-122				1950
R-122	R-127 S300			4900	
R-127 S300	R-128 S550	1300			
R-128 S550	R-147 N500				17750
R-147 N500	R-156 N100	9300			
R-156 N100	R-157 S200				1300
R-157 S200	R-174 S250	16400			
R-174 S250	R-177 N100				2700
R-177 N100	COUNTYLINE	6800			
	TOTAL (ft.)	92050	4550	45300	41400
	TOTAL (mi.)	17.43	0.86	8.58	7.84
	TOTAL DEVELOPED (mi):		26.88		

Percent of Total Shoreline	50.2%	2.5%	24.7%	22.6%
Percent of Developed Shoreline	64.9%	3.2%	31.9%	

Notes:
Total County Shoreline Length = 34.7 miles (R. Clark, BBCS T&DM 89-1))
SF = Single Family Development
MIX = Mixed SFD/MFD/Commercial Development
MF = Multi-family Development
PUB = Public Lands

CHARLOTTE COUNTY

General Coastal Land Use Classification

From	To	SF	MIX	MF	PUB
Referenced to FDEP Range Locations		Values Below in Feet			
R-001	R-004 S200	3325			
R-004 S200	R-009 S150			3850	
R-009 S150	R-010 S750				1770
R-010 S750	R-011 S800			1200	
R-011 S800	R-014 S650	3070			
R-014 S650	R-015 S350			670	
R-015 S350	INLET				6550
INLET	R-40 S550	18000			
R-40 S550	R-047				6650
R-047	INLET	10600			
INLET	R-063 S200	3530			
R-063 S200	COUNTYLINE			5200	
	TOTAL (ft.)	38525	0	10920	14970
	TOTAL (mi.)	7.30	0.00	2.07	2.84
	TOTAL DEVELOPED (mi):		9.36		
Percent of Total Shoreline		59.8%	0.0%	17.0%	23.2%
Percent of Developed Shoreline		77.9%	0.0%	22.1%	

Notes:
Total County Shoreline Length = 12.2 miles (R. Clark, BBCS T&DM 89-1))
SF = Single Family Development
MIX = Mixed SFD/MFD/Commercial Development
MF = Multi-family Development
PUB = Public Lands

LEE COUNTY

General Coastal Land Use Classification

From	To	SF	MIX	MF	PUB
Referenced to FDEP Range Locations		Values Below in Feet			
R-001	R-013 N100	13900			
R-013 N100	R-013 S600				700
R-013 S600	R-014			400	
R-014	R-016 S450	2600			
R-016 S450	R-018 N300				1400
R-018 N300	R-022 S300			4700	
R-022 S300	R-024 S500				2100
R-024 S500	R-025 S250			800	
R-025 S250	R-026 (INLET)				1200
R-027	R-065 (INLET)				39200
R-066	R-071 S150	5800			
R-071 S150	R-080				14600
R-080	R-082 (INLET)	1900			
R-084	R-092 N250	7900			
R-092 N250	R-094 N150			2500	
R-094 N150	R-099 N150	5000			
R-099 N150	R-100 S50			1000	
R-100 S50	R-108 S250	9000			
R-108 S250	R-110				1200
R-110	R-112	1900			
R-112	R-122 S500				11700
R-122 S500	R-142	19700			
R-142	R-154 S500			28300	
R-154 S500	R-169 (INLET)	3700			
R-172 S600	R-174 (INLET)				1500
R-175 N500	R-175 S500				1000
R-175 S500	R-176 N500			1600	
R-176 N500	R-180		2400		
R-180	R-181 N300				600
R-181 N300	R-187		7500		
R-187	R-192 N200	4700			
R-192 N200	R-194 S300			2800	
R-194 S300	R-199 S400	5200			
R-199 S400	R-206 N100			6900	
R-206 N100	R-209 S150	3400			
R-209 S150	R-210 S500			1700	
R-210 S500	R-226				15200
R-226	R-231 N250			4800	
R-231 N250	R-239 N300	8700			
R-239 N300	COUNTYLINE				600
	TOTAL (ft.)	93400	9900	55500	91000
	TOTAL (mi.)	17.69	1.88	10.51	17.23
	TOTAL DEVELOPED (mi):		30.08		
Percent of Total Shoreline		37.4%	4.0%	22.2%	36.4%
Percent of Developed Shoreline		58.8%	6.2%	34.9%	

Notes:
Total County Shoreline Length = 47.3 miles (R. Clark, BBCS T&DM 89-1))
SF = Single Family Development
MIX = Mixed SFD/MFD/Commercial Development
MF = Multi-family Development
PUB = Public Lands

COLLIER COUNTY

General Coastal Land Use Classification

From	To	SF	MIX	MF	PUB
Referenced to FDEP Range Locations		Values Below in Feet			
R-001	R-001 S600			600	
R-001 S600	R-005 S100	4250			
R-005 S100	R-009			4900	
R-009	R-022 S350				15550
R-022 S350	R-025 N300			2900	
R-025 N300	R-026	1500			
R-026	R-032 S500			7700	
R-032 S500	R-044 S500	14500			
R-044 S500	R-060 S500			20000	
R-060 S500	R-061 S300				900
R-061 S300	R-063 S550			2600	
R-063 S550	R-081 S400	18300			
R-081 S400	R-082			400	
R-082	INLET	8250			
INLET	INLET				53900
INLET	R133 S350	5450			
R133 S350	R134 S400				1200
R134 S400	R138			4800	
R138	R-139 S400				1000
R-139 S400	INLET			11400	
	TOTAL (ft.)	52250	0	55300	72550
	TOTAL (mi.)	9.90	0.00	10.47	13.74
	TOTAL DEVELOPED (mi):		20.37		
Percent of Total Shoreline		29.0%	0.0%	30.7%	40.3%
Percent of Developed Shoreline		48.6%	0.0%	51.4%	

Notes:
Total County Shoreline Length = 34.1 miles (R. Clark, BBCS T&DM 89-1))
SF = Single Family Development
MIX = Mixed SFD/MFD/Commercial Development
MF = Multi-family Development
PUB = Public Lands

MANATEE COUNTY

General Permit Line Locations

From	To	Location	GP	Reason for Decision
500' S R001	R005	Anna Maria Island	No	Erosion problems
R005	R006	Anna Maria Island	Yes	GP @ 100' buffer landward of CCSBL
R006	R007	Anna Maria Island	Yes	GP @ 50' buffer landward of CCSBL (Due to erosion project)
R007	R009	Anna Maria Island	Yes	GP @ 25' buffer landward of CCSBL
R009	R012	Anna Maria Island	Yes	GP @ 50' buffer landward of CCSBL
R012	R024	Anna Maria Island	Yes	GP @ 25' buffer landward of CCSBL
R024	R036	Anna Maria Island	Yes	GP @ CCSBL (CCSBL moves landward)
R036	R041	Anna Maria Island	No	(Public Lands)
		Longboat Pass		
R042	R045	Longboat Key	No	(Public Lands; erosion R44-45)
R045	R050	Longboat Key	Yes	GP @ 25' buffer landward of CCSBL
R050	R051	Longboat Key	Yes	GP @ line connecting point at 50' buffer at R050 with point at 200' seaward of CCCL at R051
R051	475' S R054	Longboat Key	Yes	GP @ 200' seaward of CCCL
475' S R054	County Line	Longboat Key	Yes	GP @ 50' buffer landward of CCSBL
Length of GP Line: 54,624.72 ft. or 10.35 mi.				Percent of total county shoreline: 84.15
		9.4 mi in developed		Percent of developed shoreline: 94.94
Length of Armoring: 10.4mi				Percent of total county shoreline: 84.5
				Percent of developed shoreline: 100.0
* Note Armoring not contiguous; length provided is total length of area within which armoring is located.				
** Note: The Beach Nourishment length includes the reported 5.2 mile Anna Maria Island project and the northern portion of the 9.3 mile Longboat Key project which is located in Manatee County and consist of approximately 4.7 miles in length.				

SARASOTA COUNTY

General Permit Line Locations

From	To	Location	GP	Reason for Decision
R001	280' N of R020	Longboat Key	Yes	50' Buffer Landward of CCSBL
280' N of R020	R026	Longboat Key	Yes	75' Buffer Landwardof CCSBL
R026	150' N R029	Longboat Key	Yes	100' Buffer Landward of CCSBL
150' N of R029	385' S R029	Longboat Key	No	Line of construction; dune impact issues
		New Pass Inlet		
60' N R030	450' S of R034	Lido Key	No	Line of construction; dune impact issues
450' S of R034	R039	Lido Key	Yes	200' seaward of CCCL
R039	R040	Lido Key	Yes	200' @ R039 to 250' @ R040 seaward of CCCL
R040	100' S of R043	Lido Key	Yes	250' seaward of CCCL
100' S of R043	600' N R044	Lido Key	No	Line of construction; erosion issues
		Big Sarasota Pass		
R044C	R047	Siesta Key	No	Line of construction; erosion issues
R047	R052	Siesta Key	Yes	25' Buffer Landward of CCSBL
R052	R053	Siesta Key	Yes	25' CCSBL Buffer to 200' seaward of CCCL
R053	R056	Siesta Key	Yes	200' seaward of CCCL
R056	300' S of R056	Siesta Key	Yes	200' seaward of CCCL to 50' CCSBL Buffer
300' S of R056	R067	Siesta Key	Yes	50' Buffer Landward of CCSBL
R067	R078	Siesta Key	No	Line of construction issues
		Midnight Pass		
700' S of R079	R081	Casey Key	Yes	25' Buffer Landward of CCSBL
R081	R082	Casey Key	Yes	25' CCSBL Buffer to 150' seaward of CCCL
R082	R088	Casey Key	Yes	150' seaward of CCCL
R088	200' S of R088	Casey Key	Yes	150' seaward of CCCL to 25' CCSBL buffer
200' S of R088	200' N of R094	Casey Key	Yes	25' Buffer Landward of CCSBL
200' N of R094	R99	Casey Key	Yes	75' Buffer Landward of CCSBL
R99	500' S of R101	Casey Key	Yes	75' CCSBL Buffer to 25' CCSBL Buffer
500' S of R101	R114	Casey Key	Yes	25' Buffer Landward of CCSBL
		Venice Inlet		
R115	550' N of R116	City of Venice	No	Line of construction issues; public lands
550' N of R116	R128	City of Venice	Yes	50' Buffer Landward of CCSBL
R128	R148	Manasota Key	No	Line of construction, dune impact issues; undeveloped/public lands
R148	R155	Manasota Key	Yes	25' buffer from CCSBL
R155	R156	Manasota Key	Yes	25' CCSBL Buffer to 50' CCSBL Buffer
R156	R163	Manasota Key	Yes	50' buffer from CCSBL
R163	R164	Manasota Key	Yes	50' CCSBL Buffer to 25' CCSBL Buffer
R164	CH Co. Line	Manasota Key	Yes	25' Buffer Landward of CCSBL
Length of GP Line:139379.64 ft. or 26.4 mi.				Percent of total county shoreline: 76.08
		24.62 mi in developed		Percent of developed shoreline: 91.52
Length of Armoring: 44,845.6ft. or 8.5mi.				Percent of total county shoreline: 24.5
				Percent of developed shoreline: 31.6

CHARLOTTE COUNTY

General Permit Line Locations

From	To	Location	GP	Reason for Decision
Co. Line	R002	Englewood	Yes	25' buffer landward of CCSBL
R002	R005	Englewood	Yes	CCSBL
R005	R014	Englewood	Yes	25' buffer landward of CCSBL
R0014	350 S' of R015	Englewood	Yes	Follow trend-stochastic 30-yr erosion line
350 S' of R015	R021	Englewood	No	Public lands
		Stump Pass		
R022	R046.5	Knight/Bocilla Is.	No	Line of construction, dune impact, erosion issues
R046.5	R057.5	Little Gasparilla Is.	No	Line of construction, dune impact, erosion issues
		Gasparilla Pass		
R058	130' S of R064	Gasparilla Is.	No	Line of construction, dune impact, erosion issues
130' S of R064	R068	Gasparilla Is.	No	Line of construction, dune impact, erosion issues
Length of GP Line: 14,501.84 ft. or 2.75 mi.				Percent of total county shoreline: 22.50
		2.43 mi. in Developed		Percent of developed shoreline: 25.85
Length of Armoring: 6,500 ft. or 1.23 mi.				Percent of total county shoreline: 10.00
				Percent of developed shoreline: 13.10

LEE COUNTY
General Permit Line Locations

From	To	Location	GP	Reason for Decision
R001	R010	Gasparilla Is.	No	LOC, erosion &/or dune impact issues
R010	400' N R016	Gasparilla Is.	Yes	GP @ 50' buffer off of CCSBL
400' N R016	320' N R018	Gasparilla Is.	No	erosion issues; public, undeveloped lands
320' N R018	R026A	Gasparilla Is.	No	LOC, erosion &/or dune impact issues
		Boca Grande Pass		
R027	R083	Cayo Casta, N Captiva	No	LOC, erosion &/or dune impact issues
R083	R094	Captiva Island	No	LOC, erosion &/or dune impact issues
R094	300' S R101	Captiva Island	Yes	GP @ 50' buffer off of CCSBL
		Blind Pass		
R109	500' N R124	Sanibel Island	No	LOC, erosion & dune impact issues, public lands Note: No 30 yr. projection provided by E. Foster for R113-R122
500' N R124	700' S R127	Sanibel Island	Yes	GP @ 10' buffer landward of CCSBL
700' S R127	500' N R129	Sanibel Island	Yes	GP @ 25' buffer off of CCSBL
500' N R129	75' S R131	Sanibel Island	Yes	GP @ 10' buffer landward of CCSBL Note: ECL @ approximately R129.5-R132.6
75' S R131	R133	Sanibel Island	Yes	GP follows trend-stochastic 30-yr erosion line
R133	600' W R154	Sanibel Island	Yes	GP @ 10' buffer landward of CCSBL
600' W R154	200' W R157	Sanibel Island	No	LOC, undeveloped land issues
200' W R157	600' W R172	Sanibel Island	Yes	GP @ 10' buffer landward of CCSBL
600' W R172	300' E R174	Sanibel Island	No	LOC, undeveloped land issues
		San Carlos Bay Entrance		
500' N R175	100' N R176	Ft. Myers Beach	No	public, undeveloped lands
100' N R176	640' N R178	Ft. Myers Beach	Yes	GP @ 50' buffer off of CCSBL
640' N R178	R182	Ft. Myers Beach	Yes	GP line follows trend-stochastic 30-yr erosion line
R182	R183	Ft. Myers Beach	Yes	GP transition from trend-stochastic 30-yr erosion line at R182 to 75' landward of CCSBL at R183
R183	R189	Ft. Myers Beach	Yes	GP @ 75' buffer landward of CCSBL
R189	R190	Ft. Myers Beach	Yes	75' CCSBL buffer to trend-stochastic 30-yr erosion line
R190	R191	Ft. Myers Beach	Yes	trend-stochastic 30-yr erosion line to 75' CCSBL buffer
R191	R193	Ft. Myers Beach	Yes	75' CCSBL buffer
R193	R194	Ft. Myers Beach	Yes	75' CCSBL buffer to trend-stochastic 30-yr erosion line
R194	200' N R197	Ft. Myers Beach	Yes	trend-stochastic 30-yr erosion line
200' N R197	400'E R210	Ft. Myers Beach	Yes	GP @ 75' buffer off of CCSBL
		Big Carlos Pass		
75' N R211	R225	Lover's Key, Big Hickory Is.	No	public, undeveloped lands
		Big Hickory Pass		

LEE COUNTY
General Permit Line Locations

From	To	Location	GP	Reason for Decision
200' N R226	R228	Bonita Beach	No	LOC, erosion &/or dune impact issues
R228	400' S of R230	Bonita Beach	Yes	trend-stochastic 30-yr erosion line
400' S of R230	150'N of R234	Bonita Beach	Yes	GP @ 15' buffer off of CCSBL
150'N of R234	130' N R238	Bonita Beach	Yes	trend-stochastic 30-yr erosion line
130' N R238	County Line	Bonita Beach	Yes	GP @ 15' buffer off of CCSBL
Length of GP Line: 144,744.25 ft. or 21.73 mi.				Percent of total county shoreline: 46.08
		21.31 in developed		Percent of developed shoreline: 70.79
Length of Armoring: 44,100 ft. or 8.35 mi.				Percent of total county shoreline: 17.7
				Percent of developed shoreline: 27.7

COLLIER COUNTY

General Permit Line Locations

From	To	Location	GP	Reason for Decision
R001	150' S R005	Barefoot Beach	Yes	GP @ 25' buffer off of CCSBL
150' S R005	350' S R022	Barefoot Beach Preserve	No	LOC, dune impact issues; public lands
350' S R022	R024	Vanderbilt Beach	Yes	GP @ 100' buffer off of CCSBL
R024	R029	Vanderbilt Beach	Yes	GP @CCSBL
R029	R052	Pelican Bay/Park Shore	No	LOC, dune impact issues
R052	R057	Park Shore	Yes	GP @CCSBL
		Doctors Pass		
R057	800' S of R057	Naples	No	No GP
800' S of R057	R058	Naples	Yes	GP @CCSBL
R058	R079	Naples	Yes	GP @ 25' buffer off of CCSBL
R079	100' S R081	Naples	Yes	Connect GP pt. @ R079 w/GP pt. @ 100'S of R081
100' S R081	R089	Naples	Yes	GP @ 25' buffer off of CCSBL
		Gordon Pass		
R089	R127	Keewaydin Island	No	LOC, dune impact issues, erosion issues
		Big Marco Pass		
R128	R135	Marco Island	No	LOC, erosion issues, public lands
R135	350' S R137	Marco island	Yes	GP @ 100' seaward of CCCL
350' S R137	500' S R139	Marco island	Yes	100' seaward of CCCL to 100' seaward of CCCL
500' S R139	R140	Marco island	Yes	GP @ 100' seaward of CCCL
R140	R142	Marco island	Yes	GP from 100' seaward of CCCL @ R140 to GPts @ R141 to 100' seaward of CCCL @ R142
R142	R148	Marco island	Yes	GP @ 100' seaward of CCCL
		Caxambas Pass		
Length of GP Line: 58540.65 ft. or 11.08 mi.				Percent of total county shoreline: 32.6
Length of GP Line in developed area: 57540.65 ft. or 10.89 mi.				Percent of developed shoreline: 53.4
Length of Armoring: 33,211 ft. or 6.29 mi.				Percent of total county shoreline: 18.4
				Percent of developed shoreline: 30.8