

RESOLUTION NO. 2024- 570

**A RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF ST. JOHNS COUNTY, FLORIDA, AMENDING RESOLUTION 2024-433, TO REMOVE FROM EXHIBITS A1 AND A-2 THE COUNTY PROPERTY APPRAISER PARCEL ID NUMBERS, THE NAMES OF THE LISTED OWNERS, AND THE SQUARE FOOTAGE, WHICH WERE INADVERTENTLY INCLUDED IN THE EXHIBITS; TO ASSIGN ACQUISITION PARCEL NUMBERS TO THE PERPETUAL EASEMENTS TO BE ACQUIRED BY THE COUNTY UPON THE PRIVATE PROPERTY DESCRIBED IN EXHIBITS A-1 AND A-2; AND TO OTHERWISE RE-ADOPT THE FINDINGS IN RESOLUTION 2024-433 AS TO THE REVISED EXHIBITS A-1 AND A-2, FINDING THAT ACQUISITION OF PERPETUAL EASEMENTS UPON THE PRIVATE PROPERTY DESCRIBED IN EXHIBITS A-1 AND A-2, THROUGH NEGOTIATED CONVEYANCE OR THE COUNTY'S EMINENT DOMAIN POWER SERVES A PUBLIC PURPOSE AND IS NECESSARY FOR THE ST. JOHNS COUNTY FLORIDA COASTAL STORM RISK MANAGEMENT PROJECT (SOUTH PONTE VEDRA BEACH AND VILANO BEACH REACHES) ALONG THE ATLANTIC OCEAN; AUTHORIZING THE COUNTY ATTORNEY AND ALL OTHERS DESIGNATED TO ACT ON ITS BEHALF TO ACQUIRE VIA NEGOTIATED CONVEYANCE OR EMINENT DOMAIN THE PERPETUAL EASEMENTS DESCRIBED IN EXHIBITS A-1 AND A-2, AND TO TAKE ALL ACTIONS THAT THEY DETERMINE ARE REASONABLY NECESSARY, INCLUDING, BUT NOT LIMITED TO, ENGAGING EXPERT WITNESSES AND CONSULTANTS, TO ACQUIRE THE PERPETUAL EASEMENTS DESCRIBED IN EXHIBITS A-1 AND A-2.**

**WHEREAS**, this resolution amends Resolution 2024-433, in order to: (1) to remove from Exhibits A-1 and A-2 the County Property Appraiser Parcel ID Numbers, the names of the listed owners, and the square footage of the property legally described in Exhibits A-1 and A-2; and (2) to assign acquisition parcel numbers to the perpetual easements to be acquired by the County upon the private property described in Exhibits A1 and A-2, which acquisition parcel numbers are listed in Exhibits A-1 and A-2 respectively;

**WHEREAS**, except as amended above, the findings in Resolution 2024-433, are otherwise unchanged, and are adopted herein with respect to the amended Exhibits A-1 and A-2 as follows;

**WHEREAS**, the Atlantic Coast of St. Johns County, Florida, has experienced erosion of its shoreline over the last several decades, and the federally authorized segments of the St. Johns County Florida Coastal Storm Risk Management Project (South Ponte Vedra Beach and Vilano Beach Reaches) are designated “critically-eroded shoreline” by the State of Florida; and

**WHEREAS**, to maintain safe and sufficient hurricane evacuation routes, protect upland structures and infrastructures, preserve nesting habitat for sea turtles, and benefit other threatened species, among other goals, it is necessary to elevate and widen certain areas of the shoreline and plant dune vegetation along the Atlantic Ocean in the South Ponte Vedra Beach and Vilano Beach Reaches; and

**WHEREAS**, in Section 161.088, Florida Statutes, the State of Florida has determined that beach erosion is a serious menace to the economy and general welfare of the people of Florida and that erosion has advanced to emergency proportions, and has declared it to be a necessary governmental responsibility to properly manage and protect Florida beaches fronting the Atlantic Ocean from erosion; and

**WHEREAS**, the State of Florida has declared in Section 161.088 that beach restoration and nourishment projects serve the public interest in areas designated as “critically eroded shoreline”; and

**WHEREAS**, the State of Florida has mandated in Section 161.088 “that beach restoration and nourishment projects . . . be funded in a manner that encourages all cost-saving strategies, fosters regional coordination of projects, improves the performance of projects, and provides long-term solutions;” and

**WHEREAS**, the St. Johns County Florida Coastal Storm Risk Management Project (South Ponte Vedra Beach and Vilano Beach Reaches) being performed in conjunction with the United States Army Corp of Engineers (“USACOE”) as a federal partner, provides an opportunity for funding and cost-saving, fosters regional coordination, and promotes a long-term solution to the aforementioned problems; and

**WHEREAS**, in March 2017, the USACOE completed the Coastal Storm Risk Management Project Final Integrated Feasibility Study and Environmental Assessment (“2017 Study”), which evaluated project alternatives, long range planning, safety, cost, and environmental factors to develop a recommended Coastal Storm Risk Management project for St. Johns County; and

**WHEREAS**, the 2017 Study recommended construction of a 60-foot equilibrated berm

extension from Florida Department of Environmental Protection (“FDEP”) monuments R103.5 to R116.5 along 2.6 miles of shoreline in the South Ponte Vedra Beach and Vilano Beach Reaches, with the addition of tapers that result in sand placement from FDEP monuments R102.5 to R117.5 along three miles of shoreline, with periodic renourishment approximately every 12 years, which may vary depending on erosion and storm events, as more particularly described in the 2017 Study (“the Project”); and

**WHEREAS**, on August 8, 2017, the USACOE submitted the 2017 Study and its recommendations for transmission to Congress; and

**WHEREAS**, in 2018, Congress enacted Section 1401(3) of the Water Resources Development Act of 2018, Public Law 115-270, authorizing the Project in the South Ponte Vedra Beach and Vilano Beach Reaches, as proposed in the 2017 Study; and

**WHEREAS**, on April 23, 2019, St. Johns County and the USACOE entered into a Project Partnership Agreement delineating the rights and responsibilities of each party with respect to the Project; and

**WHEREAS**, on May 16, 2023, St. Johns County and the USACOE entered into Amendment No. 1 to the Project Partnership Agreement for the Project; and

**WHEREAS**, the Project Partnership Agreement, as amended, requires that St. Johns County, as the local sponsor, acquire the real property interest needed for construction and maintenance of the Project, and to “ensure the public use of, and access to, such [easements] by all on equal terms in a manner compatible with the authorized purpose of the Project”; and

**WHEREAS**, the USACOE evaluated the proposed perpetual easements described in *Exhibits A-1* and *A-2*, and their boundaries with respect to the authorized design, construction template, estimated erosion rates, and renourishment triggers laid out in the 2017 Study; and

**WHEREAS**, the USACOE determined that the perpetual easements attached as *Exhibits A-1* and *A-2* are reasonable, sufficient, and necessary to fulfill the needs and objectives of the Project; and

**WHEREAS**, the USACOE requires that the County acquire the perpetual easements attached as *Exhibits A-1* and *A-2* before additional construction of the Project is scheduled;

**WHEREAS**, a holistic approach to combatting the impacts of storm-induced erosion, inundation, and wave attack is needed on a regional basis, and the Project will promote that objective; and

**WHEREAS**, the Federal Cost Share to be provided as part of the Project is significant, critical to the long-term success and sustainability of the Project, and promotes cost savings consistent with the State of Florida's legislative directive; and

**WHEREAS**, the Project is also needed to protect State Road A1A, which is a National Scenic and Historic Coastal Byway, a major north-south thoroughfare for the area, and the only evacuation route for the region; and

**WHEREAS**, in addition to being consistent with legislative directives from the State of Florida, the Project also is consistent with the Goals, Objectives, and Policies in the County Coastal/Conservation Management Element, which (a) requires the County to manage, conserve, protect, and enhance coastal resources and protect human life from natural disasters; (b) requires the County to implement post natural disaster hazard mitigation measures, such as the provision of shoreline stabilization, to reduce risks to human life and to public and private property; and (c) requires the County to investigate alternatives to funding sources for projects that fund shoreline stabilization for the areas of critical erosion and manage coastal waterfront communities; and

**WHEREAS**, the Board of County Commissioners of St. Johns County, Florida, finds that the Project is necessary and will serve the best interest of the public's health, safety and welfare; and

**WHEREAS**, the Board of County Commissioners of St. Johns County, Florida, finds that it is necessary to acquire the perpetual easements described in *Exhibits A-1* and *A-2* by negotiated conveyance or the County's eminent domain power and to employ legal counsel, a real estate appraiser, and all other experts reasonably necessary to accomplish such acquisitions as are necessary for the Project; and

**WHEREAS**, pursuant to Chapters 73, 74 and 127 of the Florida Statutes, the County is authorized to exercise the right and power of eminent domain.

**NOW, THEREFORE BE IT RESOLVED** by the Board of County Commissioners of St. Johns County, Florida, as follows:

1. The recitals above are true and correct and incorporated herein by this reference. The Board adopts all findings in the recitals above.

2. It is found that the Project is necessary for the public purposes described herein, and that acquisition of perpetual easements via negotiated conveyance or eminent domain upon certain real property as described in *Exhibits A-1* and *A-2* located in St. Johns County, Florida, is necessary for the Project.

3. The Office of the County Attorney and those designated to act on its behalf are authorized and directed to acquire or condemn the interests in real property described herein at *Exhibits A-1* and *A-2*. The Office of the County Attorney and those designated to act on its behalf are authorized to initiate and institute eminent domain proceedings pursuant to Chapters 73, 74 and 127 of the Florida Statutes and to file petitions, pleadings, declarations of taking, and any other documents authorized by Florida Statute or rule of court to accomplish said acquisition. The Office of the County Attorney and those designated to act on its behalf are specifically further authorized to obtain title to and possession of the perpetual easements in advance of entry of final judgment through quick-take proceedings, as provided by law and determined necessary by this Commission for the public purposes set forth herein.

4. To the extent that there are typographical and/or administrative errors and/or omissions that do not change the tone, tenor, or context of this Resolution, then this Resolution may be revised without subsequent approval of the Board of County Commissioners.

5. This resolution shall be effective immediately upon adoption.

**DONE, ORDERED and ADOPTED** in Regular Session this 17<sup>th</sup> day of

December, 2024.

ATTEST:

BRANDON J. PATTY, CLERK OF THE  
CIRCUIT COURT & COMPTROLLER

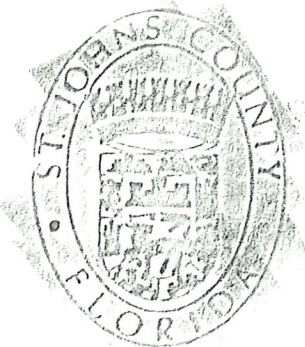
By: *Crystal Smith*  
Deputy Clerk

Rendition Date: DEC 17 2024

BOARD OF COUNTY COMMISSIONERS  
OF ST. JOHNS COUNTY, FLORIDA

By: *[Signature]*  
Krista Joseph, Chair

Effective Date: DEC 17 2024



**EXHIBIT A-1**  
**ACQUISITION PARCEL NO. 2024-1**

A perpetual and assignable easement in, on, over, and across the land described below for use by the Board of County Commissioners of St. Johns County, Florida, the project sponsor of the St. Johns County Coastal Storm Risk Management Project (South Ponte Vedra Beach and Vilano Beach Reaches), its representatives, agents, contractors, and assigns to construct; preserve; patrol; operate; maintain; repair; rehabilitate; and replace; a public beach, a dune system and other erosion control and storm damage reduction measures together with appurtenances thereto, including the right to deposit sand; to accomplish any alterations of contours on said land; to construct berms and dunes; to nourish and renourish periodically; to move, store and remove equipment and supplies; to erect and remove temporary structures; and to perform any other work necessary and incident to the construction, periodic renourishment and maintenance of the project, together with the right of public use and access; to plant vegetation on said dunes and berms; to erect, maintain and remove silt screens and sand fences; to facilitate preservation of dunes and vegetation through the limitation of access to dune areas; to trim, cut, fell, and remove from said land all trees, underbrush, debris, obstructions, and any other vegetation, structures and obstacles within the limits of the easement.

The foregoing easement shall not permit members of the public to enter upon any dune constructed, repaired, rehabilitated, replaced, renourished and vegetated or maintained in the easement area in compliance with the authorized purposes of the project and in accordance with federal, state and local laws regulations and policies. Such laws, regulations and policies shall be applied on equal terms and in a manner compatible with the project for the public's lawful use of the dry sand beach seaward of the toe of any such dune to engage in customary uses of the beach such as sunbathing, picnicking, jogging, hiking, shell collecting, and other similar uses as regulated in St. Johns County's Beach Code, Ordinance 2007-19, as amended.

Grantors, their successors and assigns reserve the right to construct dune overwalk structures in accordance with any applicable federal, state, or local laws or regulations, provided that such structures shall not violate the integrity of the dune in shape, dimension or function. Prior approval of the plans and specifications for such structures is obtained from the designated representative of the project sponsor and provided further that such structures are subordinate to the construction, operation, maintenance, repair, rehabilitation and replacement of the project which may require removal of such structures at Grantors' expense.

Grantors, their successors and assigns further reserve all such rights and privileges as may be used and enjoyed by a fee owner without interfering with or abridging any right or privilege acquired by St. Johns County in this easement, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Easement legal description:

A part of lots 3 and 4, block 22, North Beach Subdivision, according to the map or plat thereof, as recorded in map book 3, page 28, of the public records of St. Johns county, Florida, a part of Atlantic avenue (a right of way as now established) & a part of those lands lying easterly of said

Atlantic avenue, all lying in government lot 2, section 29, township 6 south, range 30 east and being more particularly described as follows:

Commence at the southwest corner of those lands described and recorded in official records 3804, page 449, public records of said St. Johns County, said point being situate on the easterly right of way line of State road A1A (a 66 foot right of way as now established) and the northerly right of way line of Sixth Street (a 60 foot right of way as now established); thence  $n66^{\circ}41'10''e$ , along the southerly line of said lands described and recorded in official records 3804, page 449, a distance of 48.09 feet to the point of beginning; thence  $n18^{\circ}36'18''w$ , a distance of 1.36 feet to an intersection with the southerly side of an existing 3.3 foot wide concrete seawall; thence  $n59^{\circ}46'34''e$ , along said southerly side of said concrete seawall, a distance of 28.55 feet to an angle point in said concrete seawall; thence  $n06^{\circ}36'44''w$ , along the easterly side of said concrete seawall, a distance of 99.40 feet to an intersection with the northerly line of said lands described and recorded in official records 3804, page 449; thence  $n66^{\circ}41'10''e$ , along said northerly line of said lands described and recorded in said official records volume 3804, page 449 and its easterly prolongation, a distance of 140.50 feet to an intersection with the "St. Johns r102.5 to 117.5 Erosion Control Line St. Johns County, Florida" as adopted and recorded in Erosion Control Line book 14, pages 8 through 14 pursuant to the provisions of Chapter 161.181 Florida Statutes; thence  $s15^{\circ}00'05''e$ , along said erosion control line, a distance of 18.00 feet; thence  $s16^{\circ}43'15''e$ , continuing along said erosion control line, a distance of 82.73 feet to an intersection with the easterly prolongation of the southerly line of said lands described and recorded in official records 3804, page 449; thence  $s66^{\circ}41'10''w$ , along said easterly prolongation, along said northerly right of way line of Sixth Street and said southerly line of said lands described and recorded in Official Records Book 3804, page 449, a distance of 185.42 feet to the point of beginning.

**EXHIBIT A-2**  
**ACQUISITION PARCEL NO. 2024-2**

A perpetual and assignable easement in, on, over, and across the land described below for use by the Board of County Commissioners of St. Johns County, Florida, the project sponsor of the St. Johns County Coastal Storm Risk Management Project (South Ponte Vedra Beach and Vilano Beach Reaches), its representatives, agents, contractors, and assigns to construct; preserve; patrol; operate; maintain; repair; rehabilitate; and replace; a public beach, a dune system and other erosion control and storm damage reduction measures together with appurtenances thereto, including the right to deposit sand; to accomplish any alterations of contours on said land; to construct berms and dunes; to nourish and renourish periodically; to move, store and remove equipment and supplies; to erect and remove temporary structures; and to perform any other work necessary and incident to the construction, periodic renourishment and maintenance of the project, together with the right of public use and access; to plant vegetation on said dunes and berms; to erect, maintain and remove silt screens and sand fences; to facilitate preservation of dunes and vegetation through the limitation of access to dune areas; to trim, cut, fell, and remove from said land all trees, underbrush, debris, obstructions, and any other vegetation, structures and obstacles within the limits of the easement.

The foregoing easement shall not permit members of the public to enter upon any dune constructed, repaired, rehabilitated, replaced, renourished and vegetated or maintained in the easement area in compliance with the authorized purposes of the project and in accordance with federal, state and local laws regulations and policies. Such laws, regulations and policies shall be applied on equal terms and in a manner compatible with the project for the public's lawful use of the dry sand beach seaward of the toe of any such dune to engage in customary uses of the beach such as sunbathing, picnicking, jogging, hiking, shell collecting, and other similar uses as regulated in St. Johns County's Beach Code, Ordinance 2007-19, as amended.

Grantors, their successors and assigns reserve the right to construct dune overwalk structures in accordance with any applicable federal, state, or local laws or regulations, provided that such structures shall not violate the integrity of the dune in shape, dimension or function. Prior approval of the plans and specifications for such structures is obtained from the designated representative of the project sponsor and provided further that such structures are subordinate to the construction, operation, maintenance, repair, rehabilitation and replacement of the project which may require removal of such structures at Grantors' expense.

Grantors, their successors and assigns further reserve all such rights and privileges as may be used and enjoyed by a fee owner without interfering with or abridging any right or privilege acquired by St. Johns County in this easement, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.



Easement legal description:

A part of Government lot 2, Section 32, Township 6 south, Range 30 east, St. Johns county Florida and being more particularly described as follows: commence at the southwest corner of those lands described and recorded in Official Records 1315, page 958, said point being situate at the intersection of the easterly right of way line of State Road A1A (a 66 foot right of way as now established) and the northerly line of a 30 foot strip of land reserved for public road purposes; thence n17°34'56"w, along said easterly right of way line, a distance of 300.00 feet to the southwest corner of those lands described and recorded in Official Records 3505, page 1596; thence n71°14'04"e, along the southerly line of said lands described and recorded in Official Records 3505, page 1596, a distance of 54.30 feet to the point of beginning; thence n17°28'12"w, a distance of 100.00 feet to an intersection with the northerly line of said lands described and recorded in Official Records 3505, page 1596; thence n71°14'04"e, along said northerly line of said Official Records 3505, page 1596 and its easterly prolongation, a distance of 127.78 feet to an intersection with the "St. Johns r102.5 to 117.5 Erosion Control Line St. Johns County, Florida" as adopted and recorded in Erosion Control Line Book 14, Pages 8 through 14 pursuant to the provisions of Chapter 161.181 Florida Statutes; thence s17°08'26"e, along said erosion control line, 77.15 feet; thence s16°40'40"e, continuing along said erosion control line, a distance of 22.88 feet to an intersection with the easterly prolongation of the southerly line of said lands described and recorded in Official Records 3505, page 1596; thence s71°14'04"w, along said easterly prolongation and said southerly line of said lands described and recorded in Official Records 3505, page 1596, a distance of 127.02 feet to the point of beginning.

RESOLUTION 2024- \_\_\_\_\_

**AA RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF ST. JOHNS COUNTY, FLORIDA, AMENDING RESOLUTION 2024-433. TO REMOVE FROM EXHIBITS A1 AND A-2 THE COUNTY PROPERTY APPRAISER PARCEL ID NUMBERS, THE NAMES OF THE LISTED OWNERS, AND THE SQUARE FOOTAGE, WHICH WERE INADVERTENTLY INCLUDED IN THE EXHIBITS; TO ASSIGN ACQUISITION PARCEL NUMBERS TO THE FINDING THAT ACQUISITION OF PERPETUAL EASEMENTS UPON THE PRIVATE PROPERTY PERPETUAL EASEMENTS TO BE ACQUIRED BY THE COUNTY UPON THE PRIVATE PROPERTY DESCRIBED IN EXHIBITS A-1 AND A-2; AND TO OTHERWISE RE-ADOPT THE FINDINGS IN RESOLUTION 2024-433 AS TO THE REVISED EXHIBITS A-1 AND A-2. FINDING THAT ACQUISITION OF PERPETUAL EASEMENTS UPON THE PRIVATE PROPERTY DESCRIBED IN EXHIBITS A-1 AND A-2, THROUGH NEGOTIATED CONVEYANCE OR THE COUNTY'S EMINENT DOMAIN POWER SERVES A PUBLIC PURPOSE AND IS NECESSARY FOR THE ST. JOHNS COUNTY FLORIDA COASTAL STORM RISK MANAGEMENT PROJECT (SOUTH PONTE VEDRA BEACH AND VILANO BEACH REACHES) ALONG THE ATLANTIC OCEAN; AUTHORIZING THE COUNTY ATTORNEY AND ALL OTHERS DESIGNATED TO ACT ON ITS BEHALF TO ACQUIRE VIA NEGOTIATED CONVEYANCE OR EMINENT DOMAIN THE PERPETUAL EASEMENTS DESCRIBED IN EXHIBITS A-1 AND A-2, AND TO TAKE ALL ACTIONS THAT THEY DETERMINE ARE REASONABLY NECESSARY, INCLUDING, BUT NOT LIMITED TO, ENGAGING EXPERT WITNESSES AND CONSULTANTS, TO ACQUIRE THE PERPETUAL EASEMENTS DESCRIBED IN EXHIBITS A-1 AND A-2.**

WHEREAS, this resolution amends Resolution 2024-433, in order to: (1) to remove from Exhibits A-1 and A-2 the County Property Appraiser Parcel ID Numbers, the names of the listed owners, and the square footage of the property legally described in Exhibits A-1 and A-2; and (2) to assign acquisition parcel numbers to the perpetual easements to be acquired by the County upon the private property described in Exhibits A1 and A-2, which acquisition parcel numbers are listed in Exhibits A-1 and A-2 respectively;

Formatted: Font: Not Bold

WHEREAS, except as amended above, the findings in Resolution 2024-433, are otherwise unchanged, and are adopted herein with respect to the amended Exhibits A-1 and A-2

Formatted: Font: (Default) Times New Roman

Formatted: Font: (Default) Times New Roman

**WHEREAS**, the 2017 Study recommended construction of a 60-foot equilibrated berm extension from Florida Department of Environmental Protection (“FDEP”) monuments R103.5 to R116.5 along 2.6 miles of shoreline in the South Ponte Vedra Beach and Vilano Beach Reaches, with the addition of tapers that result in sand placement from FDEP monuments R102.5 to R117.5 along three miles of shoreline, with periodic renourishment approximately every 12 years, which may vary depending on erosion and storm events, as more particularly described in the 2017 Study (“the Project”); and

**WHEREAS**, on August 8, 2017, the USACOE submitted the 2017 Study and its recommendations for transmission to Congress; and

**WHEREAS**, in 2018, Congress enacted Section 1401(3) of the Water Resources Development Act of 2018, Public Law 115-270, authorizing the Project in the South Ponte Vedra Beach and Vilano Beach Reaches, as proposed in the 2017 Study; and

**WHEREAS**, on April 23, 2019, St. Johns County and the USACOE entered into a Project Partnership Agreement delineating the rights and responsibilities of each party with respect to the Project; and

**WHEREAS**, on May 16, 2023, St. Johns County and the USACOE entered into Amendment No. 1 to the Project Partnership Agreement for the Project; and

**WHEREAS**, the Project Partnership Agreement, as amended, requires that St. Johns County, as the local sponsor, acquire the real property interest needed for construction and maintenance of the Project, and to “ensure the public use of, and access to, such [easements] by all on equal terms in a manner compatible with the authorized purpose of the Project”; and

**WHEREAS**, the USACOE evaluated the proposed perpetual easements described in *Exhibits A-1* and *A-2*, and their boundaries with respect to the authorized design, construction template, estimated erosion rates, and renourishment triggers laid out in the 2017 Study; and

**WHEREAS**, the USACOE determined that the perpetual easements attached as *Exhibits A-1* and *A-2* are reasonable, sufficient, and necessary to fulfill the needs and objectives of the Project; and

**WHEREAS**, the USACOE requires that the County acquire the perpetual easements attached as *Exhibits A-1* and *A-2* before additional construction of the Project is scheduled;

**WHEREAS**, a holistic approach to combatting the impacts of storm-induced erosion, inundation, and wave attack is needed on a regional basis, and the Project will promote that

Formatted: Not Highlight  
Formatted: Font: (Default) Times New Roman  
Formatted: Font: (Default) Times New Roman

necessary for the Project.

3. The Office of the County Attorney and those designated to act on its behalf are authorized and directed to acquire or condemn the interests in real property described herein at Exhibits A-1 and A-2. The Office of the County Attorney and those designated to act on its behalf are authorized to initiate and institute eminent domain proceedings pursuant to Chapters 73, 74 and 127 of the Florida Statutes and to file petitions, pleadings, declarations of taking, and any other documents authorized by Florida Statute or rule of court to accomplish said acquisition. The Office of the County Attorney and those designated to act on its behalf are specifically further authorized to obtain title to and possession of the perpetual easements in advance of entry of final judgment through quick-take proceedings, as provided by law and determined necessary by this Commission for the public purposes set forth herein.

4. To the extent that there are typographical and/or administrative errors and/or omissions that do not change the tone, tenor, or context of this Resolution ~~and the underlying Memorandum of Understanding~~, then this Resolution may be revised without subsequent approval of the Board of County Commissioners.

5. This resolution shall be effective immediately upon adoption.

**DONE, ORDERED and ADOPTED** in Regular Session this \_\_\_\_ day of

\_\_\_\_\_, December, 2024.

ATTEST:

BRANDON J. PATTY, COUNTY CLERK & COMPTROLLER

BOARD OF COUNTY COMMISSIONERS OF ST. JOHNS COUNTY, FLORIDA

By: \_\_\_\_\_  
Deputy Clerk

By: \_\_\_\_\_  
Sarah S. Arnold Krista Joseph, Chair

Rendition Date: \_\_\_\_\_

Effective Date: \_\_\_\_\_

Formatted: Font: (Default) Times New Roman  
Formatted: Font: (Default) Times New Roman

Atlantic avenue, all lying in government lot 2, section 29, township 6 south, range 30 east and being more particularly described as follows:

Commence at the southwest corner of those lands described and recorded in official records 3804, page 449, public records of said St. Johns County, said point being situate on the easterly right of way line of State road A1A (a 66 foot right of way as now established) and the northerly right of way line of Sixth Street (a 60 foot right of way as now established); thence n66°41'10"e, along the southerly line of said lands described and recorded in official records 3804, page 449, a distance of 48.09 feet to the point of beginning; thence n18°36'18"w, a distance of 1.36 feet to an intersection with the southerly side of an existing 3.3 foot wide concrete seawall; thence n59°46'34"e, along said southerly side of said concrete seawall, a distance of 28.55 feet to an angle point in said concrete seawall; thence n06°36'44"w, along the easterly side of said concrete seawall, a distance of 99.40 feet to an intersection with the northerly line of said lands described and recorded in official records 3804, page 449; thence n66°41'10"e, along said northerly line of said lands described and recorded in said official records volume 3804, page 449 and its easterly prolongation, a distance of 140.50 feet to an intersection with the "St. Johns r102.5 to 117.5 Erosion Control Line St. Johns County, Florida" as adopted and recorded in Erosion Control Line book 14, pages 8 through 14 pursuant to the provisions of Chapter 161.181 Florida Statutes; thence s15°00'05"e, along said erosion control line, a distance of 18.00 feet; thence s16°43'15"e, continuing along said erosion control line, a distance of 82.73 feet to an intersection with the easterly prolongation of the southerly line of said lands described and recorded in official records 3804, page 449; thence s66°41'10"w, along said easterly prolongation, along said northerly right of way line of Sixth Street and said southerly line of said lands described and recorded in Official Records Book 3804, page 449, a distance of 185.42 feet to the point of beginning.

~~Containing 15,006.80 square feet or 0.344 acres, more or less~~

~~Parcel ID Number: 1456000030~~

~~Owner: The Coastal Highway Realty Trust u/a/d June 26, 2024  
C/O: Robert F. Morrissey and Michael G. Lynch, Co Trustees~~

Easement legal description:

A part of Government lot 2, Section 32, Township 6 south, Range 30 east, St. Johns county Florida and being more particularly described as follows: commence at the southwest corner of those lands described and recorded in Official Records 1315, page 958, said point being situate at the intersection of the easterly right of way line of State Road A1A (a 66 foot right of way as now established) and the northerly line of a 30 foot strip of land reserved for public road purposes; thence n17°34'56"w, along said easterly right of way line, a distance of 300.00 feet to the southwest corner of those lands described and recorded in Official Records 3505, page 1596; thence n71°14'04"e, along the southerly line of said lands described and recorded in Official Records 3505, page 1596, a distance of 54.30 feet to the point of beginning; thence n17°28'12"w, a distance of 100.00 feet to an intersection with the northerly line of said lands described and recorded in Official Records 3505, page 1596; thence n71°14'04"e, along said northerly line of said Official Records 3505, page 1596 and its easterly prolongation, a distance of 127.78 feet to an intersection with the "St. Johns r102.5 to 117.5 Erosion Control Line St. Johns County, Florida" as adopted and recorded in Erosion Control Line Book 14, Pages 8 through 14 pursuant to the provisions of Chapter 161.181 Florida Statutes; thence s17°08'26"e, along said erosion control line, 77.15 feet; thence s16°40'40"e, continuing along said erosion control line, a distance of 22.88 feet to an intersection with the easterly prolongation of the southerly line of said lands described and recorded in Official Records 3505, page 1596; thence s71°14'04"w, along said easterly prolongation and said southerly line of said lands described and recorded in Official Records 3505, page 1596, a distance of 127.02 feet to the point of beginning.

Containing 12,744.78 square feet or 0.292 acres, more or less

Parcel ID Number: 1426300000

Owner: Hayes

shoreline”; and

**WHEREAS**, the State of Florida has mandated in Section 161.088 “that beach restoration and nourishment projects . . . be funded in a manner that encourages all cost-saving strategies, fosters regional coordination of projects, improves the performance of projects, and provides long-term solutions;” and

**WHEREAS**, the St. Johns County Florida Coastal Storm Risk Management Project (South Ponte Vedra Beach and Vilano Beach Reaches) being performed in conjunction with the United States Army Corp of Engineers (“USACOE”) as a federal partner, provides an opportunity for funding and cost-saving, fosters regional coordination, and promotes a long-term solution to the aforementioned problems; and

**WHEREAS**, in March 2017, the USACOE completed the Coastal Storm Risk Management Project Final Integrated Feasibility Study and Environmental Assessment (“2017 Study”), which evaluated project alternatives, long range planning, safety, cost, and environmental factors to develop a recommended Coastal Storm Risk Management project for St. Johns County; and

**WHEREAS**, the 2017 Study recommended construction of a 60-foot equilibrated berm extension from Florida Department of Environmental Protection (“FDEP”) monuments R103.5 to R116.5 along 2.6 miles of shoreline in the South Ponte Vedra Beach and Vilano Beach Reaches, with the addition of tapers that result in sand placement from FDEP monuments R102.5 to R117.5 along three miles of shoreline, with periodic renourishment approximately every 12 years, which may vary depending on erosion and storm events, as more particularly described in the 2017 Study (“the Project”); and

**WHEREAS**, on August 8, 2017, the USACOE submitted the 2017 Study and its recommendations for transmission to Congress; and

**WHEREAS**, in 2018, Congress enacted Section 1401(3) of the Water Resources Development Act of 2018, Public Law 115-270, authorizing the Project in the South Ponte Vedra Beach and Vilano Beach Reaches, as proposed in the 2017 Study; and

**WHEREAS**, on April 23, 2019, St. Johns County and the USACOE entered into a Project Partnership Agreement delineating the rights and responsibilities of each party with respect to the Project; and

**WHEREAS**, on May 16, 2023, St. Johns County and the USACOE entered into Amendment No. 1 to the Project Partnership Agreement for the Project; and

welfare; and

**WHEREAS**, the Board of County Commissioners of St. Johns County, Florida, finds that it is necessary to acquire the perpetual easements described in *Exhibits A-1* and *A-2* by negotiated conveyance or the County's eminent domain power and to employ legal counsel, a real estate appraiser, and all other experts reasonably necessary to accomplish such acquisitions as are necessary for the Project; and

**WHEREAS**, pursuant to Chapters 73, 74 and 127 of the Florida Statutes, the County is authorized to exercise the right and power of eminent domain.

**NOW, THEREFORE BE IT RESOLVED** by the Board of County Commissioners of St. Johns County, Florida, as follows:

1. The recitals above are true and correct and incorporated herein by this reference. The Board adopts all findings in the recitals above.

2. It is found that the Project is necessary for the public purposes described herein, and that acquisition of perpetual easements via negotiated conveyance or eminent domain upon certain real property as described in *Exhibits A-1* and *A-2* located in St. Johns County, Florida, is necessary for the Project.

3. The Office of the County Attorney and those designated to act on its behalf are authorized and directed to acquire or condemn the interests in real property described herein at *Exhibits A-1* and *A-2*. The Office of the County Attorney and those designated to act on its behalf are authorized to initiate and institute eminent domain proceedings pursuant to Chapters 73, 74 and 127 of the Florida Statutes and to file petitions, pleadings, declarations of taking, and any other documents authorized by Florida Statute or rule of court to accomplish said acquisition. The Office of the County Attorney and those designated to act on its behalf are specifically further authorized to obtain title to and possession of the perpetual easements in advance of entry of final judgment through quick-take proceedings, as provided by law and determined necessary by this Commission for the public purposes set forth herein.

4. To the extent that there are typographical and/or administrative errors and/or omissions that do not change the tone, tenor, or context of this Resolution and the underlying Memorandum of Understanding, then this Resolution may be revised without subsequent approval of the Board of County Commissioners.

5. This resolution shall be effective immediately upon adoption.



## EXHIBIT "A-1"

A perpetual and assignable easement in, on, over, and across the land described below for use by the Board of County Commissioners of St. Johns County, Florida, the project sponsor of the St. Johns County Coastal Storm Risk Management Project (South Ponte Vedra Beach and Vilano Beach Reaches), its representatives, agents, contractors, and assigns to construct; preserve; patrol; operate; maintain; repair; rehabilitate; and replace; a public beach, a dune system and other erosion control and storm damage reduction measures together with appurtenances thereto, including the right to deposit sand; to accomplish any alterations of contours on said land; to construct berms and dunes; to nourish and renourish periodically; to move, store and remove equipment and supplies; to erect and remove temporary structures; and to perform any other work necessary and incident to the construction, periodic renourishment and maintenance of the project, together with the right of public use and access; to plant vegetation on said dunes and berms; to erect, maintain and remove silt screens and sand fences; to facilitate preservation of dunes and vegetation through the limitation of access to dune areas; to trim, cut, fell, and remove from said land all trees, underbrush, debris, obstructions, and any other vegetation, structures and obstacles within the limits of the easement.

The foregoing easement shall not permit members of the public to enter upon any dune constructed, repaired, rehabilitated, replaced, renourished and vegetated or maintained in the easement area in compliance with the authorized purposes of the project and in accordance with federal, state and local laws regulations and policies. Such laws, regulations and policies shall be applied on equal terms and in a manner compatible with the project for the public's lawful use of the dry sand beach seaward of the toe of any such dune to engage in customary uses of the beach such as sunbathing, picnicking, jogging, hiking, shell collecting, and other similar uses as regulated in St. Johns County's Beach Code, Ordinance 2007-19, as amended.

Grantors, their successors and assigns reserve the right to construct dune overwalk structures in accordance with any applicable federal, state, or local laws or regulations, provided that such structures shall not violate the integrity of the dune in shape, dimension or function. Prior approval of the plans and specifications for such structures is obtained from the designated representative of the project sponsor and provided further that such structures are subordinate to the construction, operation, maintenance, repair, rehabilitation and replacement of the project which may require removal of such structures at Grantors' expense.

Grantors, their successors and assigns further reserve all such rights and privileges as may be used and enjoyed by a fee owner without interfering with or abridging any right or privilege acquired by St. Johns County in this easement, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

### Easement legal description:

A part of lots 3 and 4, block 22, North Beach Subdivision, according to the map or plat thereof, as recorded in map book 3, page 28, of the public records of St. Johns county, Florida, a part of Atlantic avenue (a right of way as now established) & a part of those lands lying easterly of said Atlantic avenue, all lying in government lot 2, section 29, township 6 south, range 30 east and

## EXHIBIT "A-2"

A perpetual and assignable easement in, on, over, and across the land described below for use by the Board of County Commissioners of St. Johns County, Florida, the project sponsor of the St. Johns County Coastal Storm Risk Management Project (South Ponte Vedra Beach and Vilano Beach Reaches), its representatives, agents, contractors, and assigns to construct; preserve; patrol; operate; maintain; repair; rehabilitate; and replace; a public beach, a dune system and other erosion control and storm damage reduction measures together with appurtenances thereto, including the right to deposit sand; to accomplish any alterations of contours on said land; to construct berms and dunes; to nourish and renourish periodically; to move, store and remove equipment and supplies; to erect and remove temporary structures; and to perform any other work necessary and incident to the construction, periodic renourishment and maintenance of the project, together with the right of public use and access; to plant vegetation on said dunes and berms; to erect, maintain and remove silt screens and sand fences; to facilitate preservation of dunes and vegetation through the limitation of access to dune areas; to trim, cut, fell, and remove from said land all trees, underbrush, debris, obstructions, and any other vegetation, structures and obstacles within the limits of the easement.

The foregoing easement shall not permit members of the public to enter upon any dune constructed, repaired, rehabilitated, replaced, renourished and vegetated or maintained in the easement area in compliance with the authorized purposes of the project and in accordance with federal, state and local laws regulations and policies. Such laws, regulations and policies shall be applied on equal terms and in a manner compatible with the project for the public's lawful use of the dry sand beach seaward of the toe of any such dune to engage in customary uses of the beach such as sunbathing, picnicking, jogging, hiking, shell collecting, and other similar uses as regulated in St. Johns County's Beach Code, Ordinance 2007-19, as amended.

Grantors, their successors and assigns reserve the right to construct dune overwalk structures in accordance with any applicable federal, state, or local laws or regulations, provided that such structures shall not violate the integrity of the dune in shape, dimension or function. Prior approval of the plans and specifications for such structures is obtained from the designated representative of the project sponsor and provided further that such structures are subordinate to the construction, operation, maintenance, repair, rehabilitation and replacement of the project which may require removal of such structures at Grantors' expense.

Grantors, their successors and assigns further reserve all such rights and privileges as may be used and enjoyed by a fee owner without interfering with or abridging any right or privilege acquired by St. Johns County in this easement, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.



▲ Range Monuments

▨ A-1

▨ A-2

— Affidavit Line OR Book 4786, Page 1244

**St. Johns County, Florida**  
**Coastal Storm Risk Management Project**

(South Ponte Vedra Beach and Vilano Beach Reaches)

0 150 300 Feet



**DISCLAIMER:**  
 This map is for reference only. Data provided are derived from multiple sources with varying levels of accuracy. The St. Johns County GIS Division disclaims all responsibility for the accuracy or completeness of the data shown hereon.  
 Map Prepared: 9/5/2024 120373

INTEGRATED FEASIBILITY REPORT  
& ENVIRONMENTAL ASSESSMENT

March 2017

---


ST. JOHNS COUNTY, FLORIDA  
South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches  
Coastal Storm Risk Management Project

RESPONSIBLE AGENCY: U.S. Army Corps of Engineers, Jacksonville District

THIS PAGE INTENTIONALLY LEFT BLANK

March 2017

## Using this Document

 **Report Reference Materials:** To ease navigation through the report, a fold-out map (Figure 1-1) has been provided at the end of the report to be used while reading the document to serve as a reference with key points and landmarks.

Organization of this report follows Exhibit G-7 (Feasibility Report Content) provided in Appendix G of ER 1105-2-100 (30 June 2004), documenting the iterative **U.S. Army Corps of Engineers (USACE) Plan Formulation Process**. The planning process consists of six major steps:

- (1) Specification of problems and opportunities
- (2) Inventory, forecast, and analysis of existing conditions within the study area
- (3) Formulation of alternative plans
- (4) Evaluation of the effects of the alternative plans
- (5) Comparison of the alternative plans
- (6) Selection of the Recommended Plan based upon the comparison of the alternative plans

Steps may be repeated as problems become better understood and new information becomes available.

**Steps 1 and 2** are discussed in **Chapters 1-2**, and provide the foundation for developing alternative plans and selection of a Recommended Plan outlined in **Chapter 3**.

Each chapter, summary graphic, as well as the executive summary describes plan development as it progresses through the integrated environments that shape a Coastal Storm Risk Management (CSRM) project: the **physical environment** (currents, tides, sea level rise, etc.) and the **economic environment** (infrastructure and its vulnerability to damages). Concerns relative to plan formulation and National Environmental Policy Act (NEPA) review are summarized and encapsulated in the discussions of these environments.

The recommended format of an **Environmental Assessment (EA)** is provided in 40 CFR 1502.10 and has been integrated into this Feasibility Report.

**Note that sections pertinent to the NEPA analysis are denoted with an asterisk.**

Table of Contents

2.3.3	THREATENED AND ENDANGERED SPECIES .....	2-32
2.3.4	ESSENTIAL FISH HABITAT (EFH).....	2-40
2.3.5	COASTAL BARRIER RESOURCES .....	2-47
2.3.6	WATER QUALITY .....	2-49
2.3.7	HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE.....	2-50
2.3.8	AIR QUALITY .....	2-51
2.3.9	NOISE .....	2-51
2.3.10	AESTHETIC RESOURCES .....	2-51
2.3.11	RECREATION RESOURCES.....	2-52
2.3.12	NAVIGATION .....	2-52
2.3.13	CULTURAL RESOURCES AND HISTORIC PROPERTIES .....	2-53
2.3.14	NATIVE AMERICANS.....	2-55
2.4	ECONOMIC ENVIRONMENT .....	2-56
2.4.1	DAMAGE ELEMENTS - STRUCTURE & CONTENTS VALUE.....	2-56
2.4.2	STRUCTURE INVENTORY .....	2-57
2.4.3	BEACH-FX MODEL SET-UP.....	2-59
2.4.4	BEACH-FX MODEL ASSUMPTIONS.....	2-59
2.4.5	BEACH-FX FUTURE WITHOUT-PROJECT DAMAGE RESULTS.....	2-60
<b>3</b>	<b>PLAN FORMULATION.....</b>	<b>3-1</b>
3.1	PLAN FORMULATION RATIONALE .....	3-1
3.2	SCOPING* .....	3-2
3.2.1	FEDERAL .....	3-2
3.2.2	AGENCY AND PUBLIC FEEDBACK .....	3-2
3.3	PROBLEMS AND OPPORTUNITIES*.....	3-2
3.3.1	PROBLEMS.....	3-3
3.3.2	OPPORTUNITIES.....	3-3
3.4	CONSTRAINTS .....	3-4
3.4.1	PLANNING CONSTRAINTS.....	3-4
3.4.2	LOCAL CONSTRAINTS .....	3-4
3.5	OBJECTIVES.....	3-5
3.5.1	FEDERAL OBJECTIVES.....	3-5
3.5.2	STATE AND LOCAL OBJECTIVES.....	3-7
3.6	SUMMARY OF MANAGEMENT MEASURES.....	3-8
3.6.1	IDENTIFICATION OF MANAGEMENT MEASURES.....	3-8
3.7	SCREENING OF MANAGEMENT MEASURES.....	3-12
3.7.1	PRELIMINARY SCREENING .....	3-12
3.7.2	FORMULATION STRATEGY.....	3-28
3.8	ALTERNATIVES MILESTONE .....	3-30

Table of Contents

5.2.3	FISH AND WILDLIFE RESOURCES (OTHER THAN THREATENED AND ENDANGERED SPECIES).....	5-2
5.2.4	THREATENED AND ENDANGERED SPECIES.....	5-3
5.2.5	ESSENTIAL FISH HABITAT (EFH).....	5-8
5.2.6	COASTAL BARRIER RESOURCES.....	5-9
5.2.7	WATER QUALITY.....	5-9
5.2.8	HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE.....	5-9
5.2.9	AIR QUALITY.....	5-10
5.2.10	NOISE.....	5-14
5.2.11	AESTHETIC RESOURCES.....	5-15
5.2.12	RECREATION RESOURCES.....	5-15
5.2.13	NAVIGATION.....	5-15
5.2.14	CULTURAL RESOURCES AND HISTORIC PROPERTIES.....	5-16
5.2.15	NATIVE AMERICANS.....	5-17
5.2.16	NATURAL OR DEPLETABLE RESOURCES.....	5-17
5.2.17	CUMULATIVE IMPACTS.....	5-17
5.2.18	IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES.....	5-20
5.2.19	UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS.....	5-20
<b>6</b>	<b>COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS*</b> .....	<b>6-1</b>
6.1	NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA).....	6-1
6.1.1	SCOPING AND ISSUES.....	6-1
6.1.2	AGENCY COORDINATION AND COOPERATING AGENCIES.....	6-2
6.1.3	LIST OF RECIPIENTS.....	6-2
6.1.4	COMMENTS RECEIVED AND RESPONSE.....	6-2
6.2	ENDANGERED SPECIES ACT OF 1973.....	6-2
6.3	FISH AND WILDLIFE COORDINATION ACT OF 1958.....	6-3
6.4	NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA).....	6-3
6.5	CLEAN WATER ACT OF 1972.....	6-3
6.6	CLEAN AIR ACT OF 1972.....	6-3
6.7	COASTAL ZONE MANAGEMENT ACT OF 1972.....	6-4
6.8	FARMLAND PROTECTION POLICY ACT OF 1981.....	6-4
6.9	WILD AND SCENIC RIVER ACT OF 1968.....	6-4
6.10	MARINE MAMMAL PROTECTION ACT OF 1972.....	6-4
6.11	ESTUARY PROTECTION ACT OF 1968.....	6-5
6.12	FEDERAL WATER PROJECT RECREATION ACT.....	6-5
6.13	MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976	6-5

**Appendices**

APPENDIX A – ENGINEERING

APPENDIX B – COST ENGINEERING AND RISK ANALYSIS

APPENDIX C – ECONOMIC ANALYSIS

APPENDIX D – GEOTECHNICAL

APPENDIX E – REAL ESTATE PLAN

APPENDIX F – PUBLIC ACCESS AND COST SHARING

APPENDIX G – NEPA

ATTACHMENT 1 – 404

ATTACHMENT 2 – CZMA

ATTACHMENT 3 – PERTINENT CORRESPONDENCE



## Problems and Opportunities

It is projected that storm-induced erosion, inundation, and wave attack in the study area will continue damaging infrastructure and limiting habitat. Without a Federal project, it is likely that the sponsor and private homeowners would take steps to combat erosion and property loss, risking that these efforts might not be coordinated in a holistic fashion or incorporate regional concerns, such as sediment movement and environmental/habitat considerations.

Seawalls, or other protective armor, have been constructed along portions of all three, and it is anticipated that more will be constructed in the coming years. Such structures often protect one property while causing accelerated erosion to adjacent, unarmored properties, while cutting off the vital exchange of sand from dunes to the beach during storm events. By accelerating erosion and cutting off the dunes, the structures also negatively impact the habitat of species such as nesting sea turtles.

Without a project, certain portions of the study area, such as Summer Haven, may require abandonment and retreat in order to protect lives and property. Continued erosion, breaching, and overwash of Summer Haven may eventually impact the Intracoastal Waterway (IWW) which follows the Matanzas River to the east of Summer Haven (Figure 1-1).

Storm damages, especially erosion, throughout most of the project area could jeopardize SR A1A, which is designated as a National Scenic and Historic Coastal Byway and is the only evacuation route for the region and a major north-south thoroughfare for the area. After the 2008 hurricane season, areas of the dune were eroded to within five feet of SR A1A in portions of the Vilano Beach reach. SR A1A has already been relocated westward within the Summer Haven reach due to erosion. Additional detail is provided in Chapter 2 – Existing and Future Without-Project Conditions.

Existing problems in the study area include:

- Storm damages due to erosion, inundation, and waves threatening infrastructure
- Loss of natural habitat
- Shoreline erosion threatening recreational opportunities
- Shoreline erosion threatening hurricane evacuation route (SR A1A)
- Beach/dune interaction limited or eliminated

Opportunities are positive conditions in the study area that may result from implementation of a Federal project such as:

- Reduce storm damage to infrastructure
- Protect/enhance habitat/environmental resources
- Retain recreation

dredge. Dredging of the St. Augustine Inlet Federal navigation channel also typically uses a hydraulic dredge. Therefore three Federal projects in the same vicinity could potentially use the same dredge for construction or maintenance. Each time construction or maintenance of the projects could be combined would result in minimization of environmental impacts and a cost savings of at least \$4,000,000 by combining three separate dredge mobilizations into one.

### Environmental Considerations

Most of the adverse effects of the Recommended Plan would be temporary in nature, and would primarily occur during, or within one year, of construction. Ultimately, the Recommended Plan would have a beneficial effect on sea turtle nesting habitat through the maintenance of a nesting beach and the prevention of seawall structures being constructed along this stretch of shoreline. USACE has developed measures through continued coordination with resource agencies throughout the state to minimize the temporary effects to nesting sea turtles resulting from beach placement of sand. The Recommended Plan also maintains nesting and foraging habitat for shorebirds and seabirds. Effects to Essential Fish Habitat would be temporary in nature due to turbidity during construction, and there are no hardbottom habitats in the project area that would be affected.

### Cost Estimate and Implementation

Total project first costs and cost share breakdown in FY17 price levels are tabulated in Tables ES-1 and ES-2. The Project First Costs are \$78,417,000 over 50 years. Initial construction will be cost shared at 23% Federal and 77% non-federal. Periodic nourishments will be cost shared at 17.7% Federal and 82.3% non-federal.

**ES-2: Recommended Plan Cost Sharing (Project First Cost) (FY17 Price Levels).**

<b>St. Johns County, FL CSRM Project</b> <b>Summary of Project Cost Sharing (Project First Costs) (FY17 Price Levels)</b> <b>R102.5 - R117.5 (total placement area, including tapers)</b>					
<b>Initial Construction</b>					
Item	Federal Cost Share	Federal Cost	Non-federal Cost Share	Non-federal Cost	Project First Cost
Coastal Storm Risk Management Costs	23.0%	\$5,712,000	77.0%	\$19,122,000	\$24,834,000
Non-federal LERRD Contribution*	0.0%	\$0	100.0%	\$943,000	
Non-federal Cash Contribution				\$18,179,000	
<b>Periodic Nourishment</b>					
Periodic Nourishment	17.7%	\$9,484,000	82.3%	\$44,099,000	\$53,583,000
<b>Initial Construction + Periodic Nourishment</b>					
Final Project Cost Share and Cost (50 years)	-	\$15,196,000	-	\$63,221,000	\$78,417,000
* Includes non-federal admin costs only NOTE: Dollar values are rounded					

The average annual costs and benefits, shown in Table ES-3, of the Recommended Plan in FY17 price levels and 2.875% discount rate, are \$2,031,000 and \$2,653,000 respectively. The average annual net benefits for the recommended plan are \$622,000 and the benefit cost ratio (BCR) is 1.3 to 1.

## ES-4: Equivalent Annual Benefits and Costs.

<b>Equivalent Annual Benefits and Costs</b>	
<b>October 2016 (FY17) Price Level, 50-Year Period of Analysis, 2.875% Discount Rate</b>	
Initial Construction	\$ 24,834,000
1st Renourishment	\$ 16,926,000
2nd Renourishment	\$ 16,926,000
3rd Renourishment	\$ 18,521,000
3rd Renourishment to Project End	\$ 1,209,000
Total First Cost <sup>1</sup>	\$ 78,416,000
Interest During Construction (IDC)	\$ 47,000
<b>Total Investment Cost</b>	<b>\$ 78,463,000</b>
Average Annual Investment Cost	\$ 1,996,000
Annual OMRR&R (100% non-federal)	\$ 35,000
<b>Total Average Annual Cost</b>	<b>\$ 2,031,000</b>
Average Annual Storm Damage Reduction Benefits (Including Land Loss)	\$ 1,961,000
Average Annual Recreation Benefits	\$ 692,000
<b>Average Annual Total Benefits</b>	<b>\$ 2,653,000</b>
<b>Average Annual Net Benefits</b>	<b>\$ 622,000</b>
Benefit-Cost Ratio (computed at 2.875%)	1.3

<sup>1</sup>Does not match Total Project Cost Summary (TPCS) exactly due to rounding.

### Coordination with Agencies and the Public

An initial scoping period for the project was conducted from August 17, 2005 through September 17, 2005. As the study progressed, USACE anticipated that an Environmental Impact Statement (EIS) might be required. A second scoping period was held from September 16, 2008 to October 16, 2008. A notice of intent to draft an EIS was published in the Federal Register on April 5, 2010. Subsequently, it became evident that no significant impacts to the human or natural environments were anticipated. USACE decided to initially prepare an Environmental Assessment (EA), rather than continue with the previous plans to draft an EIS. The draft EA and draft Finding of No Significant Impact (FONSI) were made available to the public for a 45-day public comment period from February 17, 2016 to April 4, 2016.

This proposed project has been coordinated with the following agencies: U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), U.S. Environmental Protection Agency (EPA), Florida

**Table ES-5: Roles for Public Safety.**

	<b>Can Do</b>	<b>Can Not Do</b>
<b>St. Johns County</b>	<ul style="list-style-type: none"> <li>• Can implement non-structural risk reduction efforts including building and zoning regulations.</li> <li>• Can implement emergency management plans and strategies.</li> <li>• Can sponsor and cost share in a Federal Recommended Plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Cannot conduct a coastal storm risk management study in a systems context encompassing all engineering and environmental considerations on their own.</li> </ul>
<b>State of Florida</b>	<ul style="list-style-type: none"> <li>• Can implement non-structural risk reduction efforts including building and zoning regulations.</li> <li>• Can implement emergency management plans and strategies.</li> <li>• Can perform maintenance of SR A1A and repair on an emergency basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Cannot conduct a coastal storm risk management study in a systems context encompassing all engineering and environmental considerations on their own.</li> </ul>
<b>U.S. Army Corps of Engineers</b>	<ul style="list-style-type: none"> <li>• Can implement a cost-shared Recommended Plan that reduces coastal risk and damage to infrastructure, providing additional protection to critical evacuation route SR A1A beyond what the county and state can provide.</li> </ul>	<ul style="list-style-type: none"> <li>• Cannot enforce building and zoning regulations.</li> <li>• Cannot implement local emergency management plans or strategies.</li> </ul>

**THIS PAGE INTENTIONALLY LEFT BLANK**



maintenance of environmental habitat and recreation for three reaches along the Atlantic shoreline of St. Johns County, Florida. The non-federal sponsor is St. Johns County, Florida.

The three reaches in this study comprise 9.8 miles and include, from north to south:

- South Ponte Vedra: R84 – R104 (3.8 miles)
- Vilano Beach: R104 to R117 (2.6 miles) and R117 to St. Augustine Inlet north sand trap groin (1.1 miles) totaling 3.7 miles
- Summer Haven: R197 – R209 (2.3 miles)

\*R-monuments refer to Florida Department of Environmental Protection (FDEP) survey monuments used for geographic reference.

The St. Augustine Beach reach, separate from the above reaches and not included in this study, has previously been studied and authorized for Federal participation in coastal storm risk management for a period of 50 years of Federal participation. The St. Augustine Beach reach spans 2.5 miles of St. Johns County Atlantic Ocean shoreline between FDEP R monuments R137 through R150, including the southern portion of Anastasia State Park and the northern portion of the City of St. Augustine Beach.

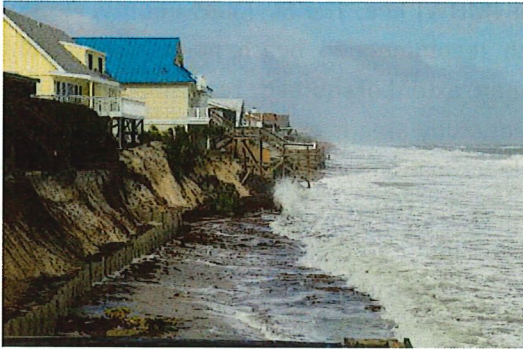
The boundaries of all of the subject reaches and the FDEP R monuments are illustrated in Figure 1-1 located on the following page. Figure 1-1 has also been included as a foldout on the last page of the report to aid periodic reference of study area boundaries, and other key reference points, while reading this document.



Figure 1-1: Map of the study area showing the boundaries of the three reaches (South Ponte Vedra, Vilano Beach, and Summer Haven) and the FDEP R monuments (R84, R104, R117, R197, R209) used for geographic reference.



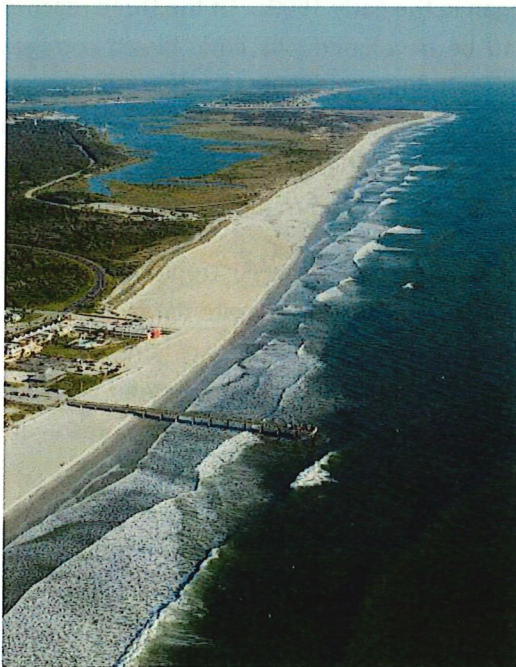
In recent years, both South Ponte Vedra Beach and Vilano Beach have experienced erosion and infrastructure damage prompting state assistance. Impacts to homes and infrastructure since 2004 have resulted in the construction of temporary structures, such as seawalls, by property owners. Summer Haven has experienced significant erosion and threats to infrastructure since the mid-1900s, resulting in the construction of a protective rock revetment and landward relocation of SR A1A.



South Ponte Vedra Beach Reach



Vilano Beach Reach



St. Augustine Beach – Constructed



Summer Haven Reach

**Figure 1-2:** South Ponte Vedra Beach, Vilano Beach, and Summer Haven reaches of the project area. The constructed St. Augustine Beach project, located south of St. Augustine Inlet, is also shown.

St. Johns County is located in the northeast Atlantic coast of Florida, midway between the Florida/Georgia state line and Cape Canaveral. The county is bounded to the north by Duval County and to the south by

Protection of SR A1A is of major importance since it is the only hurricane evacuation route leading to roads off the islands. Dependence on this one artery for evacuation makes safe escape from coastal storms difficult for residents in the project area. Maintenance of SR A1A in Summer Haven became so problematic that the road was relocated landward in 1979. In areas of Vilano Beach, erosion of the protective dunes reached within five feet of SR A1A in 2008.

The project area was defined, and expanded upon as necessary, by the FDEP designation of critically eroded beaches in the area. The FDEP defines a “critically eroded area” as “...a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost,” (FDEP 2015). Gaps between critically eroded areas may also be deemed critical if their inclusion is needed to maintain design integrity of beach management projects. South Ponte Vedra Beach was designated as a critically eroded area in 2007, Vilano Beach in 2006, and Summer Haven in 1989.

### 1.3 STUDY SPONSOR

The non-federal sponsor is St. Johns County, Florida.

### 1.4 STUDY PURPOSE AND NEED\*

The purpose of this study is to determine whether there is economic justification and Federal interest in coastal storm risk management in additional reaches of St. Johns County. If it is found that there is a Federal interest, the further purpose of the study is to analyze alternatives and formulate a recommended plan for coastal storm risk management to include incidental opportunities for maintenance of environmental habitat within the South Ponte Vedra Beach, Vilano Beach, and Summer Haven reaches of the St. Johns County coastline.

Problems and opportunities within the study area are summarized below and described in detail in Chapter 3. Specific problems in the study area include:

- Storm damages due to erosion, inundation, and waves threatening infrastructure
- Loss of natural habitat
- Shoreline erosion threatening recreational opportunities
- Shoreline erosion threatening a hurricane evacuation route (SR A1A)
- Beach/dune interaction limited or eliminated

study area for the reconnaissance report included the entire St. Johns coastline, but focused on the Vilano Beach and Summer Haven reaches because those were designated as critically eroded areas by the FDEP at that time. The South Ponte Vedra Beach reach was added to the study area after the reconnaissance report was completed in 2004. Its addition was requested by the sponsor due to increased erosion occurring around R90 in 2007. Significant and rapid loss of beach width and dunes protecting several structures led to FDEP designating R84 to R94 (2 miles) a critically eroded area due to threats to private development and SR A1A. South Ponte Vedra Beach's geographic proximity to the Vilano Beach reach, as well as its similar development and storm damage issues, made its inclusion in this feasibility study reasonable. The southern boundary of the South Ponte Vedra Beach reach was extended to R104 to abut the Vilano Beach reach and to investigate the feasibility of providing uninterrupted shore protection along the coast.

## 1.6 RELATED DOCUMENTS\*

### 1.6.1 RELATED USACE STUDIES

Summaries of prior Federal studies relevant to this project are as follows:

- a. 1965 – Beach Erosion Control (BEC) Study, St. Johns County, Florida (USACE 1965). The report was completed in response to a resolution of the Committee on Public Works of the U.S. Senate, adopted January 7, 1963, and a resolution of the Committee on Public Works of the House of Representatives, adopted June 19, 1963. The report recommended protective and recreational beaches with periodic nourishment (60 feet wide at 11 feet above mean sea level) for 2.2 miles of shoreline at South Ponte Vedra Beach, 1.4 miles at Anastasia State Park and St. Augustine Beach, and 1.4 miles at Crescent Beach. The Benefit-to-Cost Ratio (BCR) ratio was 1.2. The Board of County Commissioners of St. Johns County advised that the local share of the cost of the considered improvements was entirely prohibitive, therefore the District and Division Engineers recommended that no improvements for beach erosion control be undertaken by the U.S. Army Corps of Engineers (USACE) at that time (negative report – no sponsor support).
- b. 1977 (Revised 1979) – St. Johns County Beach Erosion Control (BEC) Project Feasibility Report (USACE 1979). The study area included the entire St. Johns County coastline. Study efforts, after preliminary investigation of the county's Atlantic coastline, were concentrated primarily on the problem area along the ocean shoreline of St. Augustine Beach and Anastasia State Recreation Area. The report recommended construction of a sand beach width of 60 feet at elevation 12 feet above mean low water from "A" Street north to include the southern 4,000 feet of the recreation area. The total length of the coastline to be protected, including transitions, would be 2.5 miles. The BCR equaled 1.25. A significant portion of the project benefits were associated with predicted increases in recreational output. Sec. 501 (Title V) of WRDA 1986 authorized the project as

- i. 2004 – Reconnaissance Report (905(b) Analysis) St. Johns County, Florida, Shore Protection Project (USACE 2004). Authorized by 2000 H.Res. 2646, the report recommends that the St. Johns County, Florida, Shore Protection Study proceed into the feasibility stage. Authority for the report authorized a survey of the shores of St. Johns County with particular reference to the advisability of providing beach erosion control works in the areas north of St. Augustine Inlet, the shoreline in the vicinity of Matanzas Inlet, and adjacent shorelines. The report focused on Vilano Beach and Summer Haven.
- j. 2005 – Project Information Report - Rehabilitation Effort for the St. Johns County Erosion Control and Hurricane Protection Project, St. Johns County, Florida (USACE 2005). The report determined that the project area (St. Augustine Beach) was eligible for emergency renourishment due to impacts from the 2004 hurricane season.
- k. 2006 – Project Information Report - Rehabilitation Effort for the St. Johns County, Erosion Control and Hurricane Protection Project, St. Johns County, Florida (USACE 2006). The report determined that the project area (St. Augustine Beach) did not meet key criteria related to a significant storm event and therefore was not eligible for emergency renourishment.
- l. 2016 - Regional Sediment Management Strategies for the Vicinity of St. Augustine Inlet, St. Johns County, Florida – Engineer Research and Development Center (ERDC) Technical Report, ERDC/CHL TR-16-12 (USACE 2016).

## 1.6.2 RELATED NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) STUDIES

- a. 1998 – General Reevaluation Report (GRR) with Final Environmental Assessment (EA) and Findings of No Significant Impact (FONSI), St. Johns County, Florida, Shore Protection Project. The EA evaluated the construction of a 60- foot berm at a location approximately 2.7 miles south of St. Augustine Inlet, with placement extending to the south approximately 2.5 miles along the shoreline of St. Augustine Beach. The sand source for the project was the St. Augustine Inlet ebb tide shoal and navigation channel.
- b. 2010 – Final Environmental Assessment (EA) and Findings of No Significant Impact (FONSI), Maintenance Dredging, St. Augustine Inlet and Adjacent Intracoastal Waterway, St. Johns County, Florida. This document evaluates maintenance dredging of the St. Augustine Inlet and the adjacent Intracoastal Waterway (IWW), including IWW Cuts SJ-28 to SJ-30, a portion of the inlet flood shoal, and a portion of the inlet entrance channel along Porpoise Point. The placement location for beach-quality material is the shoreline within Anastasia State Park and St. Augustine Beach between R132 and R152. The placement location for non-beach-compatible material would be placed in a nearshore placement area between R141 and R146. There was a FONSI associated with this document signed on January 19, 2011.

north of the inlet. This plan is not a USACE report and does not authorize new Federal actions or modify any existing authorizations. The Federal St. Johns County Shore Protection Project uses St. Augustine Inlet as its authorized, least cost, sand source, thereby accomplishing a portion of the sand bypassing described in the report. This feasibility study also proposes to use the inlet as the most economical sand source. Such use would be in keeping with the state's plan, accomplishing sand bypassing to the north of the inlet. Sand bypassing to the north, within the Recommended Plan area, does not currently occur and would not occur without authorization of the Recommended Plan and is therefore not included in the existing condition or the future without-project condition.

- e. 2015 – Strategic Beach Management Plan for the Northeast Atlantic Coast Region (Florida Department of Environmental Protection, June 2015). The report presents data, analysis, and recommendations for managing the northeast Florida coastline, specifically St. Johns, Flagler, and Volusia counties' beaches and inlets. Special attention is placed on determining strategies for inlets and critically eroded beaches.
- f. 2015 – Critically Eroded Beaches in Florida (FDEP 2015). This report provides an inventory of Florida's erosion problem areas, including areas within this report's study area.

## 1.7 FEDERAL PROJECTS NEAR STUDY AREA

Projects near the study area include:

- a. St. Johns County, Florida Shore Protection Project, St. Augustine Beach, Florida. The project area is comprised of the 2.5 miles of St. Johns County Atlantic Ocean shoreline located between FDEP R monuments R137 through R150. The project area includes the southern portion of Anastasia State Park and the northern portion of St. Augustine Beach. The Recommended Plan consists of beach-fill with 600-foot transition sections at the northern and southern limits of the project. The design template berm elevation is +12.0 feet (MLW) and would result in extension of the pre-project Mean High Water shoreline by 60 feet (USACE 1998). At the location of the seaward extent of the design berm, the design template slopes 1V:20H seaward to the location of the MLW line and 1V:30H out to the intersection with the existing profile. Initial construction of the project required placement of approximately 2,100,000 cubic yards of design fill and 1,600,000 cubic yards of advance material; 3,700,000 cubic yards total. During initial construction, additional material was dredged and placed north of the project area within Anastasia State Park. This work was funded by FDEP. The primary borrow source for construction was the St. Augustine Inlet ebb shoal located approximately 4.5 miles from the center of the project area. Periodic nourishment would be provided every five years over the 50-year period of Federal participation using about 1,600,000 cubic yards of material per event. The project was completed in January 2003 and renourished in 2005 and 2012.

**THIS PAGE INTENTIONALLY LEFT BLANK**



overwash of Summer Haven may eventually impact the Intracoastal Waterway (IWW), which follows the Matanzas River to the west of Summer Haven (Figure 1-1).

Storm damages, especially erosion, throughout most of the project area could jeopardize State Road A1A (SR A1A), which is designated as a National Scenic and Historic Coastal Byway, and is the only evacuation route for the region and a major north-south thoroughfare for the area. After the 2008 hurricane season, areas of the dune line were eroded to within five feet of SR A1A in portions of the Vilano Beach reach. SR A1A has already been relocated westward within the Summer Haven reach due to erosion.

## 2.2 PHYSICAL ENVIRONMENT (CONDITIONS)\*

The study area consists of an open sandy coast subject to frequent storm events. Properties adjacent to the shoreline can be categorized as urban, and include residential, commercial, and recreational properties. Many factors influence the coastal processes characteristic to the St. Johns County, Florida shoreline. Natural factors include winds, tides, currents, waves, storm effects, and sea level rise. Human-related (anthropogenic) factors include other shore protection projects, navigation projects, and development. The role of each of these factors, and their contribution to beach erosion in St. Johns County, are briefly described in the following paragraphs. The county's population is approximately 220,000 and increases seasonally with tourist visits. An estimated 6.5 million tourists visit the county annually (sponsor-provided information) of which a large percentage visit the barrier islands and coastline.

### 2.2.1 STUDY REACHES

The 9.8 mile length of the study area is separated into three reaches referenced to FDEP R monuments:

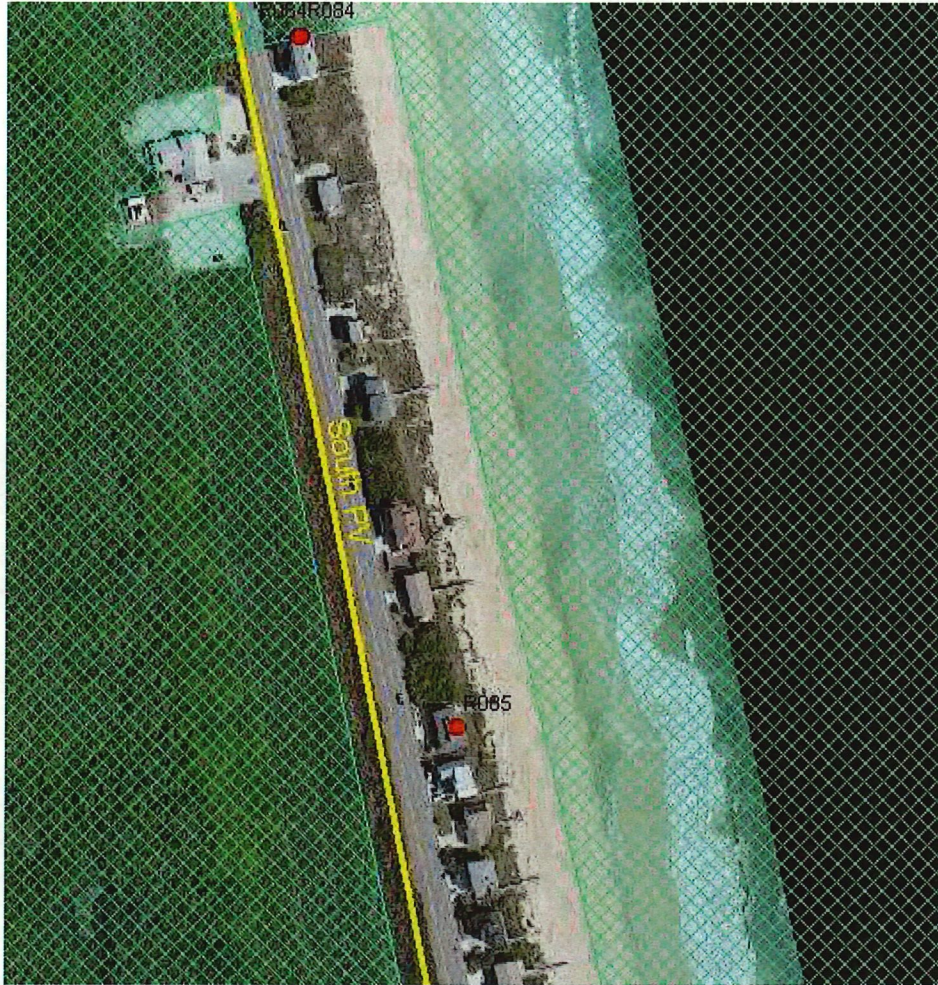
- South Ponte Vedra: R84 – R104 (3.8 miles)
- Vilano Beach: R104 to R122 (3.7 miles)
- Summer Haven: R197 – R209 (2.3 miles)

#### 2.2.1.1 SOUTH PONTE VEDRA BEACH

Census data are not available for South Ponte Vedra Beach. The website HomeTownLocator.com offers the following population information for the entire community of South Ponte Vedra Beach in which the study reach is located. South Ponte Vedra Beach has a population of 2,300. The population increases periodically throughout the year as vacationers visit the beach. 84% of housing units are occupied and 73% of these are occupied by the owner. The median household income is \$146,000 (HomeTownLocator.com).



with a marsh bordering the western extent of construction. The northern end of the reach is surrounded by the Guana-Tolomato-Matanzas National Estuarine Research Reserve (GTMNERR), which extends, west to east, from the marsh into the Atlantic Ocean (Figure 2-2).



**Figure 2-2.** Guana-Tolomato-Matanzas National Estuary and Research Reserve boundary (green hatching) bordering the northern portion of the South Ponte Vedra Beach reach.

#### 2.2.1.2 VILANO BEACH

According to the 2010 census, Vilano Beach has a population of 2,700 with a median age of 52. The population increases periodically throughout the year as vacationers visit the beach. Twenty-one percent of the population is over age 65, and 11.5% of the population is under age 15. Seventy-eight percent of housing units are occupied and 77% of these are occupied by the owner. The median household income is \$52,000, and 11% of the population is below poverty level (2010-2014 American Community Survey Five-Year Estimates).

The northern extent is geographically similar to the South Ponte Vedra reach with a narrow beach and a single row of private homes constructed on top of, or just landward of, a 20-foot high dune. The southern extent of the reach is typified by a 14-foot high dune (on average), multiple rows of development seaward of A1A, and a slightly wider beach north of St. Augustine Inlet. Throughout the reach, multiple rows of development are sited between SR A1A and the marsh.

### 2.2.1.3 SUMMER HAVEN

Census data is not available for Summer Haven. However, the population is much smaller than both the South Ponte Vedra Beach and Vilano reaches. Additionally, the population does not vary much during tourist seasons due to fewer rental properties, less available beach area, and lack of public beach access. There are approximately 60 structures, mainly single-family homes, within the Summer Haven reach.

The Summer Haven reach begins at R197, just south of the Matanzas Inlet. Development in this reach is sited on a narrow strip of land between a shallow marsh and the Atlantic Ocean. Shore protection of upland development has likely been necessary since original development occurred in the early 1900s. After severe nor'easters in 1962, the President declared St. Augustine Beach and Summer Haven disaster areas, and USACE constructed an 1,800-foot granite revetment along the northern portion of the reach between R197 and R200 (Figure 2-4). After Hurricane Dora in 1964, USACE added 1,070 linear feet of granite revetment to the existing revetment. This revetment fronts the majority of the upland development in the reach. South of the revetment, development is limited to one row of single-family residences. When possible, St. Johns County has been purchasing structures and lands in this southern area and not allowing further development.

SR A1A was originally built along the eastern edge of the reach, between the Atlantic Ocean and private homes. Frequent storm damage to the road prompted its re-siting landward to its current location. Approximately 2,700 feet and 3,600 feet of the original paved road (now called Old SR A1A) remain in the northern and southern extents of the reach respectively (Figure 2-4 and Figure 2-5).

As seen in Figure 1-1, the GTMNERR borders the western perimeter of the reach, but does not extend offshore of the reach as it does in South Ponte Vedra Beach. Figure 2-6 illustrates an example of the GTMNERR bordering a portion of the Summer Haven reach.



**Figure 2-6.** GTMNERR boundary (green hatching) bordering the Summer Haven reach.

A narrow beach is exposed at low- to mid-tide north of the revetment, however no significant beach exists seaward of the revetment. South of the revetment, a narrow beach and low dune system fronting private homes is periodically overwashed and breached by storm surge and waves. The most recent breaches occurred in September 2008 (Figure 2-7) during Tropical Storm Fay and October 2016 during Hurricane Matthew. The southern extent of the reach is fronted by a narrow beach exposed at low- and mid-tide and a constructed dune approximately five feet high.

The Florida Department of Transportation (FDOT) has preliminary designs, but no permit or scheduled plans, to construct a seawall in this area for protection of the road. FWOP Beach-fx modeling for this study includes future construction of a seawall in this area. If the road were damaged, hurricane evacuation, emergency response, and storm recovery operations could be jeopardized. Compromising such operations could have life safety consequences.

Within the Summer Haven reach, SR A1A has been relocated landward and elevated, and the new location is west of the study area. Within the Summer Haven reach only, SR A1A is not considered subject to notable damage in its relocated position. However, approximately 2,700 feet and 3,600 feet of the original paved road (now called Old SR A1A) remain in the northern and southern extents of the reach and would be used by a limited number of locals during an evacuation. Old SR A1A is subject to erosion and inundation.

### 2.2.3 GEOLOGY

The St. Johns County barrier islands have inlets at St. Augustine and at Fort Matanzas. There are low tidal marshes and lagoons between the barrier islands and the mainland. The barrier islands are composed principally of quartz and carbonate sand, and are underlain by silty, clayey marsh deposits that formed at lower sea level stages. The sands are principally fine to medium-grained sand-sized quartz with variable amounts of shell and shell fragments.

Offshore of the beaches and modern barrier islands is the continental shelf. The continental shelf has a broad, shallow, low relief and extends approximately 80 miles offshore near St. Johns County. The shelf contains relic Pleistocene and Holocene terraces and submerged beach sand ridges. The wave climate and sediment transportation system creates a linear sandy coastline.

The northeast coast of Florida consists of a series of sandy barrier islands broken occasionally by inlets. The barrier islands are characterized by dunes and shore parallel beach ridges. Many of the islands display relic beach ridges formed during higher stands of sea level. The formations exposed at the surface are undifferentiated sediments and the Anastasia Formation of Pleistocene and Holocene age (Scott, et al., 2001). These deposits consist of fine to medium quartz sand and lenses of shell and clay of varying thickness. Thick shell beds and erosion of the outcrops of the Anastasia formation near the coast have been firmly cemented to form coquina rock (see Section 2.3.4 for additional information).

The quartz component of the modern barrier island sand has deposited from sand migrating southward along the Atlantic coast, from the reworking of the Pamlico Sand that was previously deposited over the entire region. The remaining component of coastal sediments are typically carbonates, locally produced by calcite-producing plants and animals. Additional carbonate materials are from reworked materials from outcropping Pleistocene formations offshore (Duane and Meisburger, 1969).

St. Augustine Inlet Management Plan states 278,000 cubic yards of sand can be dredged from the inlet system per year. The material obtained from the inlet system shall be distributed to the adjacent Atlantic Ocean fronting beaches with a placement ratio of approximately one third of material placement to the north and two thirds of material placement to the south. Further details on the inlet system sand sources are available in the Geotechnical Appendix.

#### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

Without a project, the channel and shoals of the St. Augustine Inlet will continue to require regular maintenance dredging as part of the authorized Federal navigation project. Accretion of sediment within the inlet system has the potential to increase habitat for wintering shorebirds that congregate on ephemeral, unvegetated shoals near inlets. In addition, the northern end of Anastasia State Park may migrate and change. This may affect beach mouse habitat if the dunes are altered, which could be either a positive or negative impact depending on the future morphology of the northern shoreline.

#### 2.2.5.2 OFFSHORE SAND SOURCES

##### EXISTING CONDITIONS

The offshore sand sources are sand shoals on the Outer Continental Shelf. Additional details on the offshore sand sources are available in the Geotechnical Appendix. There are an estimated 400 million cubic yards of sand within the North Offshore Borrow Area (NOBA). Of this, 16 million cubic yards has been fully developed with core borings and related analysis. There are an estimated 130 million cubic yards of sand within the South Offshore Borrow Area (SOBA), of which 14 million cubic yards has been fully developed.

##### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The future without-project conditions of the offshore borrow areas (NOBA and SOBA) are similar to the existing conditions described above.

#### 2.2.6 SHORELINE CHANGE AND EROSION RATES

##### EXISTING CONDITIONS

Shoreline surveys dating back to 1952 indicate that the St. Johns County shoreline as a whole is experiencing erosion at a rate of 1.0 feet/year (FDEP 2000). Shoreline changes fluctuate over time along the study area. The shoreline of St. Johns County has fluctuated throughout history, with areas undergoing both advancement and recession of the Mean High Water (MHW) position. The analysis detailed in the Engineering Appendix showed that over the long term, from 1972 to 2015, the study area has been receding. In the time between 1972 and 2015, the MHW position in South Ponte Vedra receded an average of 1.3 feet/year. In the Vilano Beach 1 segment, the MHW position receded 1.7 feet/year on

(causing long period swells) and local storms (causing short period steep waves). Tropical storm passage is relatively frequent for the study area and even without landfall a system passing within several hundred miles may cause extensive erosion damage to the area. The Engineering Appendix provides additional detail on waves.

### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The future without-project conditions of waves are similar to the existing conditions described above.

## **2.2.9 ASTRONOMICAL TIDES**

### EXISTING CONDITIONS

Astronomical tides are created by the gravitational pull of the moon and sun and are well understood and predictable in magnitude and timing. The National Oceanic and Atmospheric Administration (NOAA) regularly publishes tide tables for selected locations along the coastlines of the United States and selected locations around the world. These tables provide times of high and low tides, as well as predicted tidal amplitudes.

Tides in St. Johns County area are semidiurnal, meaning two high tides and two low tides occur per tidal day. Tidal datums for St. Augustine Beach (NOAA station 8720587) and Vilano Beach ICWW (NOAA station 8720554) are summarized in Table 2-1 and Table 2-2, respectively. The St. Augustine Beach water level station is located on the St. Augustine Beach pier and represents open ocean water levels while the Vilano Beach water level station is located in the Intracoastal Waterway on the SR A1A bridge and represents tides affecting the marsh side of the barrier islands. The difference between Mean High Water (MHW) and Mean Low Water (MLW), known as the mean tide range, equals 4.61 feet at St. Augustine Beach and 4.24 feet at Vilano Beach, Intracoastal Waterway gage.

## 2.2.10 CURRENTS

### EXISTING CONDITIONS

Nearshore currents affect the supply and distribution of sediment on the sandy beaches of St. Johns County and are composed of alongshore and cross-shore components. Alongshore currents, induced by oblique wave energy, generally determine the long-term direction and magnitude of littoral transport. Cross-shore currents may have a more short-term impact, but can result in both temporary and permanent erosion. The magnitude of these currents is determined by the wave characteristics, angle of waves from offshore, configuration of the beach, and the nearshore profile. For St. Johns County beaches, the net sediment transport is from north to south. This is due to the dominant wave activity from the northeast during the fall and winter months, particularly nor'easter storms.

Adjacent to the St. Augustine Inlet, currents are affected by the ebb and flood tidal flow through the inlet. The terminal groin structure on the north side of St. Augustine Inlet also provides varying degrees of influence on nearshore currents depending on its exposure level.

### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The future without-project conditions of currents are similar to the existing conditions described above.

## 2.2.11 STORM EFFECTS

### EXISTING CONDITIONS

The beaches of St. Johns County are influenced by tropical systems during the summer and fall and by nor'easters during the late fall, winter, and spring. Although hurricanes typically generate larger waves and storm surge, nor'easters typically have a greater cumulative impact on the shoreline due to longer storm duration and greater frequency of event occurrence. Periodic and unpredictable hurricanes and coastal storms, with their energetic breaking waves and elevated water levels, can change the width and elevation of beaches and accelerate erosion as depicted in Figure 2-8.

The shoreline is expected to naturally modify its beach profile during storms. Storms erode and transport sediment from the subaerial beach into the active zone of storm waves. Once caught in the waves, this sediment is carried along the shore and redeposited farther down the beach, or is carried offshore and stored temporarily in submerged sand bars.

## 2.2.12 STORM SURGE

### EXISTING CONDITIONS

Storm surge is defined as the rise of the ocean surface above its astronomical tide level due to physical forces. Surges occur primarily as a result of atmospheric pressure gradients and surface stresses created by wind blowing over a water surface. Strong onshore winds pile up water near the shoreline, resulting in elevated water levels along the coastal region and inland waterways. In addition, the lower atmospheric pressure which accompanies storms also contributes to a rise in water surface elevation. Extremely high wind velocities coupled with low barometric pressures (such as those experienced in tropical storms, hurricanes, and very strong nor'easters) can produce very high damaging water levels. Water level (with storm surge) time series are critical for input into shoreline response and coastal storm risk modeling applications. An increase in water depth may increase the potential for coastal flooding and allow larger storm waves to attack the shore.

The return period storm surge events can provide insight into the vulnerabilities of a given location through comparison with the existing topography. Table 2-3 provides peak storm surge heights by return period for St. Augustine Inlet, Florida. Storm surge levels versus frequency of occurrence presented in Table 2-3 were obtained from data compiled by the University of Florida for the Florida Department of Transportation (Sheppard and Miller, 2003).

**Table 2-3. Peak Storm Tide Elevations.**

Storm Return Period (years)	Peak Storm Surge Height		
	ft-NGVD29	ft-NAVD88	ft-MSL
10	3.6	2.5	1.8
20	5.4	4.3	3.6
50	9.6	8.5	7.8
100	12.3	11.2	10.5
200	14.5	13.4	12.7
500	16.9	15.8	15.1

### FUTURE WITH-OUT PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The future without-project conditions of storm surge are similar to the existing conditions described above. As sea level in the study area rises in the future, storm surge will be occurring on top of that elevated water level. This will result in higher observed total water levels associated with storm surge events.



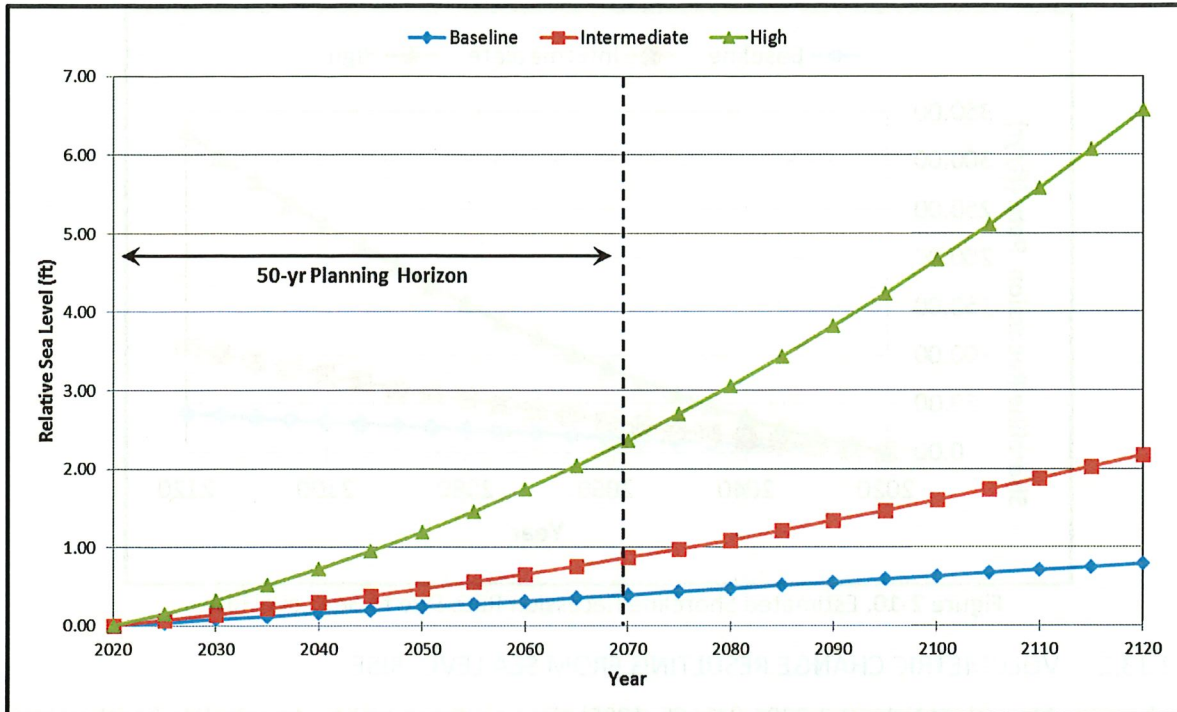


Figure 2-9. Relative Sea Level Change, St. Johns County, FL.

### 2.2.13.1 SHORELINE CHANGE RESULTING FROM SEA LEVEL RISE

An estimate of the rate of shoreline recession can be based on the local rate of SLC in some cases. With a change in sea level, the beach profile will attempt to reestablish the same bottom depths relative to the surface of the sea that existed prior to sea level change. That is, the natural profile will be translated upward and shoreward to maintain equilibrium. If the longshore littoral transport in and out of a given shoreline is equal, then the quantity of material required to reestablish the nearshore slope must be derived from erosion of the shore.

The above estimation is applicable to long straight sandy beaches with an uninterrupted supply of sand and should only be used for estimating long-term changes. Additional detail is given in the Engineering Appendix. Figure 2-10 provides an estimate of the potential shoreline changes within the project area attributable to projected changes in sea level.

### 2.2.13.3 INCORPORATION OF ER 1100-2-8162 AND ETL 1100-2-1: GUIDANCE FOR SEA LEVEL CHANGE

The SLC ETL 1100-2-1, supporting ER 1100-2-8162, suggests a tiered analysis to determine the risk of potential SLC and resulting incorporation into the plan formulation process. Incorporation of potential SLC into the USACE planning process will require active focus on risk-based scoping to define pertinent needs, opportunities, and the appropriate level of detail for conducting investigations. In particular, close attention is needed at the beginning of each study in order to screen planning/scoping decisions. The tiered analysis for SLC is incorporated into the six-step planning process used in this report. Mean Sea Level (MSL) is used as an elevation reference in this section of the report, as it is generally more intuitive for readers when describing changes to existing water elevations.

In order to evaluate SLC impacts to infrastructure, critical resources, and the population residing in the study area, a qualitative matrix was developed in Table 2-4. Resources evaluated in the matrix were based on those identified by the USACE Coastal Systems Portfolio Initiative (CSPI). CSPI describes the resource risk in a project area relative to the density of the resource, the population density that the resource serves, or in the case of environment, habitat, and recreation, the value placed on the resource. See <http://navigation.usace.army.mil/CSPI> for more information. The evaluation criteria shown in the table is from, *Technical Review of Coastal Projects: Storm Risk Management, Navigation and Ecosystem Restoration for Nation's Coastlines* (USACE, Spring 2012.)

The qualitative matrix shown in Table 2-4 evaluates the resources on which the study area depends. In addition to the CSPI evaluation criteria, Table 2-4 evaluates the vulnerability to resources from potential SLC, or SLR in the case of the study area. Averaging the "Vulnerability from SLR" to resources gives an average of 1.2, equating to a relatively low vulnerability of resources. This indicates that SLR is not a major contributor to overall resource vulnerability within the 50-year period of analysis.

Overall, the initial analysis above indicates that the project area vulnerability to SLC is relatively low. A relatively low risk from SLC in the project area, combined with high uncertainty over potential accelerations in the rate of SLC, lead to an adaptive management strategy as shown in Figure 2-12.

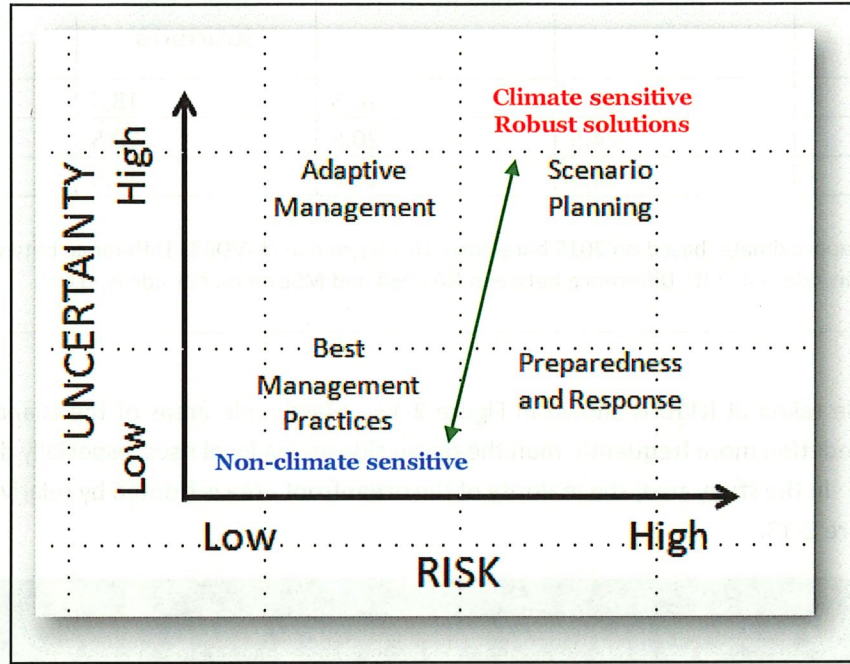


Figure 2-12. Consideration of risk and uncertainty in climate change related decision-making.

Elevations within the study area (Atlantic Ocean side of the island) are some of the highest on the barrier island, about 14.5 to 20.5 feet above Mean Sea Level (MSL). Elevations on the marsh side of the island are significantly lower. Although the marsh side of the island is not within the current study area, stakeholders should be aware of increased risk to infrastructure there as sea level rises. Cross-island profiles were taken at three points throughout the study area, shown in Table 2-5. As reflected in the table, the profiles of the island slope downward from the dune, located on the Atlantic Ocean, to the marsh side of the island where structures are generally located around 5.5 to 6.5 feet above current MSL. There may be other locations with lower elevations. However, these cross-island profiles represent the general topography within, and adjacent to, the study area.

A key question, when assessing the vulnerability of the study area to SLC, is when critical thresholds will be crossed, if at all, by potential SLC. Throughout the study area, the dune crest height represents a critical threshold. The average dune height from Table 2-5 is 19 feet (MSL). SR A1A, and other infrastructure, is located slightly lower, on average, at 17 feet (MSL). Since the dune lies between the ocean and infrastructure, the dune height (19 feet) will be used as the ocean side critical elevation.

The maximum 50-year storm tide elevation in the study area is given as 7.8 feet MSL in Table 2-3. Water elevations during such storm events could reach the top of the dunes (19 feet MSL) once sea level increases by about 11.2 feet (7.8 feet storm tide + 11.2 feet sea level increase = 19 feet). This estimate does not take erosion of the dune height into consideration, which could occur over time. At the end of 50 years, sea level may increase by 2.4 feet under the high SLR scenario, significantly below the threshold of 11.2 feet.

ETL 1100-2-1 recommends that systems related to, but existing outside the study area, should also be evaluated for vulnerability to SLC. The marsh side of the island does not contain any critical infrastructure on which the study area depends, such as hospitals or emergency services. However, although the study area is not dependent on marsh side infrastructure, the marsh side of the island is potentially vulnerable to SLC. Infrastructure on the marsh side is generally built at, or above, 6 feet MSL as seen in Table 2-5. This side of the island is mainly affected by tides, not storm surge. Tidal range on the marsh side of the island is smaller than the ocean side.

Table 2-2 shows that Mean Higher High Water (MHHW) is equal to 2.4 feet MSL. Infrastructure could be periodically impacted once sea level increases by about 3.6 feet (2.4 feet + 3.6 feet sea level increase = 6 feet). At the end of 50 years, sea level may increase by 2.4 feet under the high SLR scenario, which is below the threshold of 3.6 feet. The high scenario is predicted to surpass this threshold in approximately 85 years after the base year, as seen in Figure 2-14. In such a case, infrastructure on the back side of the island could be impacted during higher high tide events, dependent on current and future construction to protect against elevated water levels such as seawalls and bulkheads.

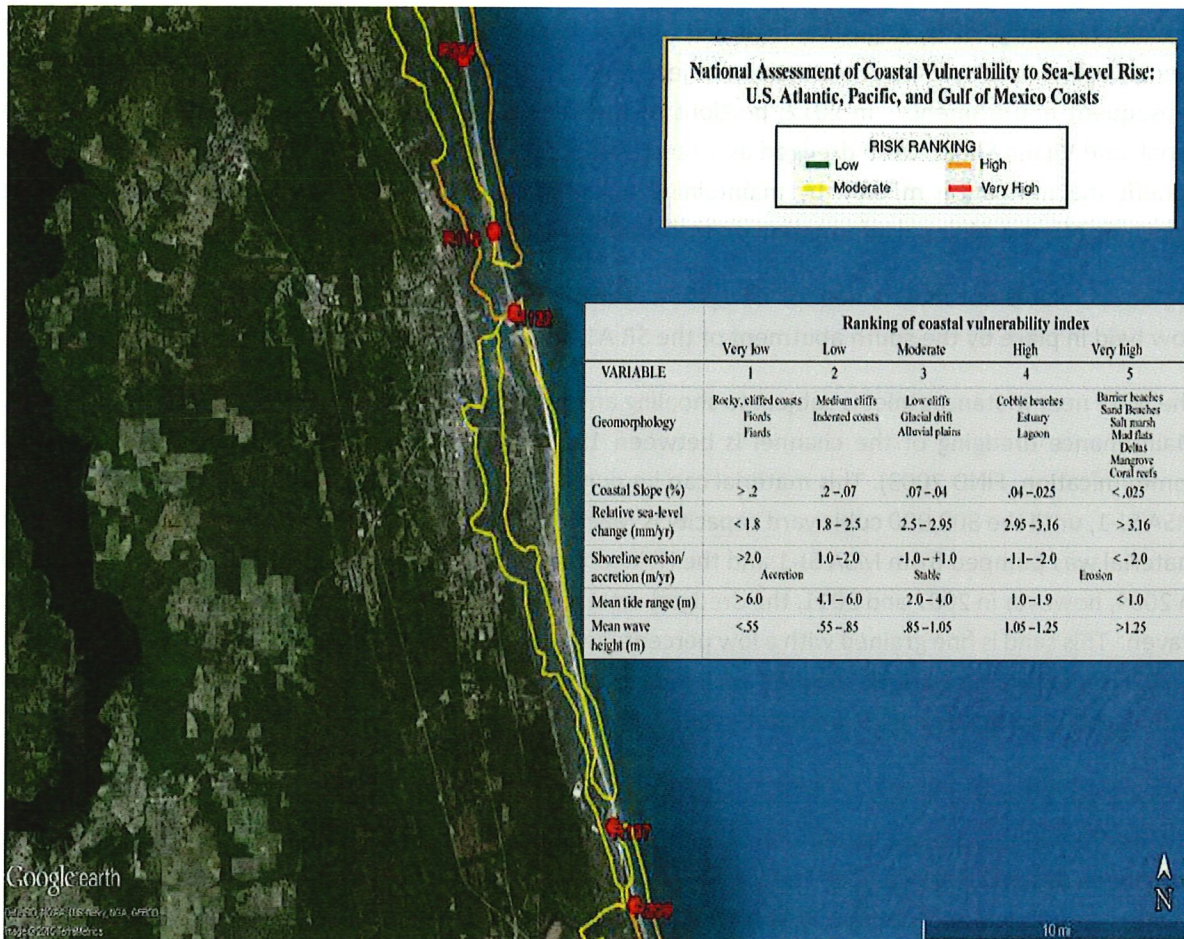


Figure 2-15. USGS Coastal Vulnerability Index.

## 2.2.14 EFFECTS OF OTHER COASTAL STORM RISK MANAGEMENT (CSRM) AND NAVIGATION PROJECTS

### EXISTING CONDITIONS

St. Augustine Harbor Federal Navigation Project is located adjacent to the southern end of the Vilano Beach reach. The harbor inlet is stabilized by a northern sand trap groin and southern jetty. Both of the structures act to impound material. Sediment transport around the tip of the north sand trap groin is visible in the form of nearshore shoaling in an area referred to alternately as Vilano Point, Vilano Shoal, or Porpoise Point. The inlet itself acts as an effective sediment sink, experiencing accretion in the channel, as well as the developing ebb and flood shoals. Throughout this report all of these accretional areas, including the shoals and inlet channel, are referred to as the, “inlet system.”

or signed public parking, severely limiting any Federal participation in a potential project. In the northern extent of the reach, unofficial public parking is available on the shoulder of Old SR A1A between the revetment and the road between R198 and R199. However, no signs indicate “public parking.”

Figure 2-16 depicts signed public access and parking within the South Ponte Vedra Beach and Vilano Beach reaches. The green points are existing public access locations with free public parking recorded by FDEP and verified by USACE, Jacksonville District. Pink points indicate public accesses without parking.

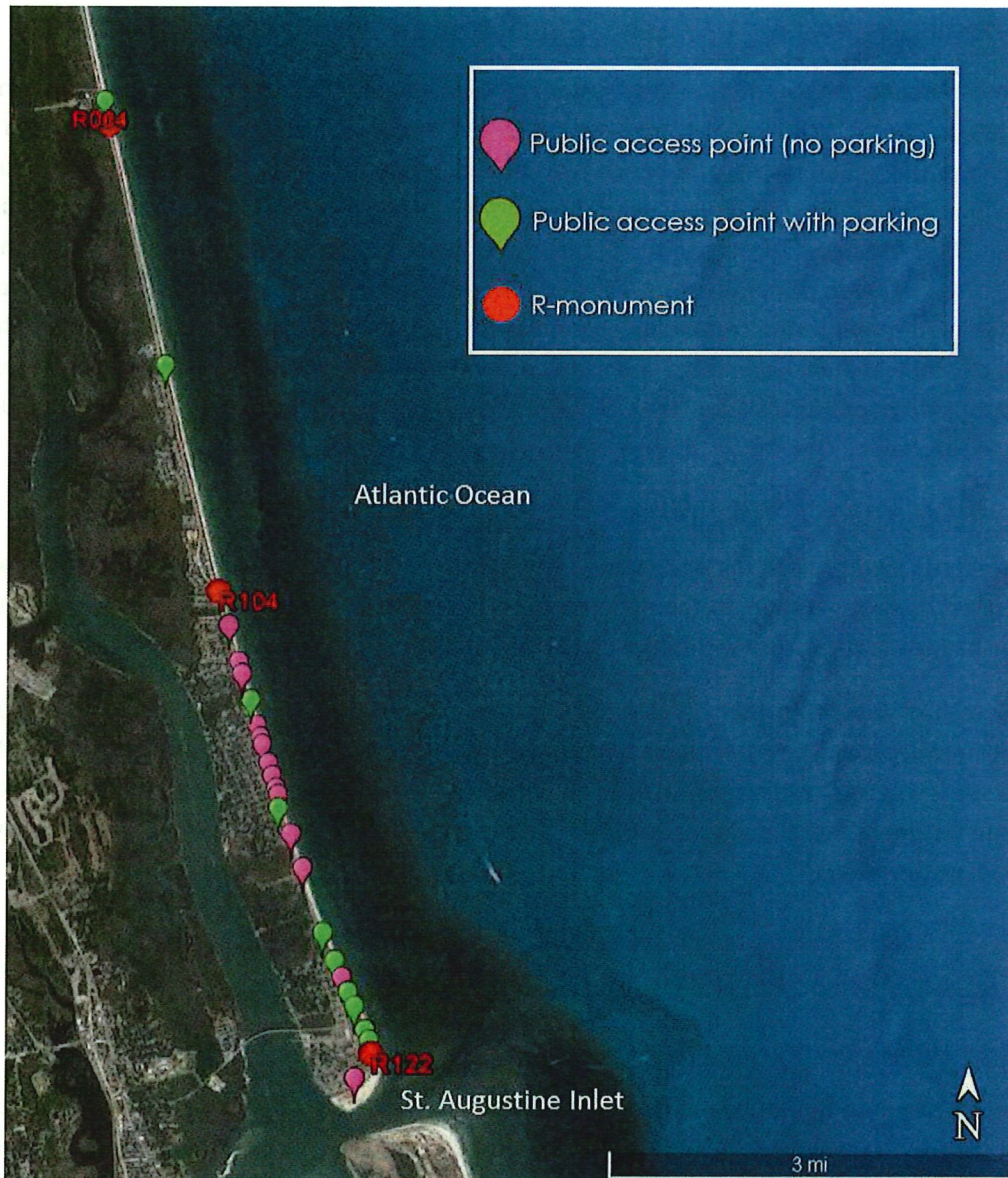


Figure 2-16. Public access and parking within the South Ponte Vedra Beach and Vilano Beach Reaches.

conditions are faced with very little competition from other organisms. Receding waves tend to wash amphipods (shrimp-like crustaceans) and isopods (small crustaceans such as woodlice) out of their burrows and suspend these organisms in the water column where they serve as an important food source for a variety of nearshore fish, including species among the snapper-grouper complex. A variety of polychaete worms that are also adapted to this highly dynamic and stressful environment can be found within the intertidal zone of the St. Johns County beaches. These intertidal organisms provide an important food source for foraging shore and wading birds, including least tern (*Sternula antillarum*), Wilson’s plover (*Charadrius wilsonia*), black skimmer (*Rynchops niger*), and American oystercatcher (*Haematopus palliatus*). The dominant invertebrate found along the shoreline of St. Johns County is the Atlantic coquina clam, *Donax variabilis*. Highly visible decapod crustaceans of the St. Johns County swash zone also include the ghost crab (*Ocypode quadrata*), mole crab (*Emerita talpoida*), and Atlantic fiddler crab (*Uca pugilator*). These organisms are highly motile, and burrow into the moist sand for refuge and to retard water evaporation from their bodies during aerial exposure. Coastal inlets provide migration routes for larvae entering nursery areas, and for sub-adults leaving nursery areas to mature and spawn offshore. Important species utilizing the St. Augustine Inlet and its ebb shoal include king mackerel (*Scomberomorus cavalla*), Atlantic Spanish mackerel (*Scomberomorus maculatus*), and cobia (*Rachycentron canadum*).

**FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)**

Species that utilize the beach environment may decrease in number due to continued erosion of the beach and dune system in the future without-project condition. No changes to fish and wildlife resources that reside below the swash zone would occur in the future without-project condition.

**2.3.3 THREATENED AND ENDANGERED SPECIES**

Threatened and endangered species that may occur in the project area and be affected by the proposed work are found in Table 2-6.

**Table 2-6.** Species protected under the Endangered Species Act that are located in the project area and that may be affected by the proposed project.

Common Name	Scientific Name	Federal Listing Status under ESA
Green Turtle	<i>Chelonia mydas</i>	Endangered
Loggerhead Turtle	<i>Caretta caretta</i>	Threatened
Leatherback Turtle	<i>Dermochelys coriacea</i>	Endangered
Kemp’s Ridley Turtle	<i>Lepidochelys kempii</i>	Endangered
Hawksbill Turtle	<i>Eretmochelys imbricata</i>	Endangered
West Indian Manatee	<i>Trichechus manatus</i>	Endangered
Piping Plover	<i>Charadrius melodus</i>	Threatened
Red Knot	<i>Calidris canutus</i>	Threatened

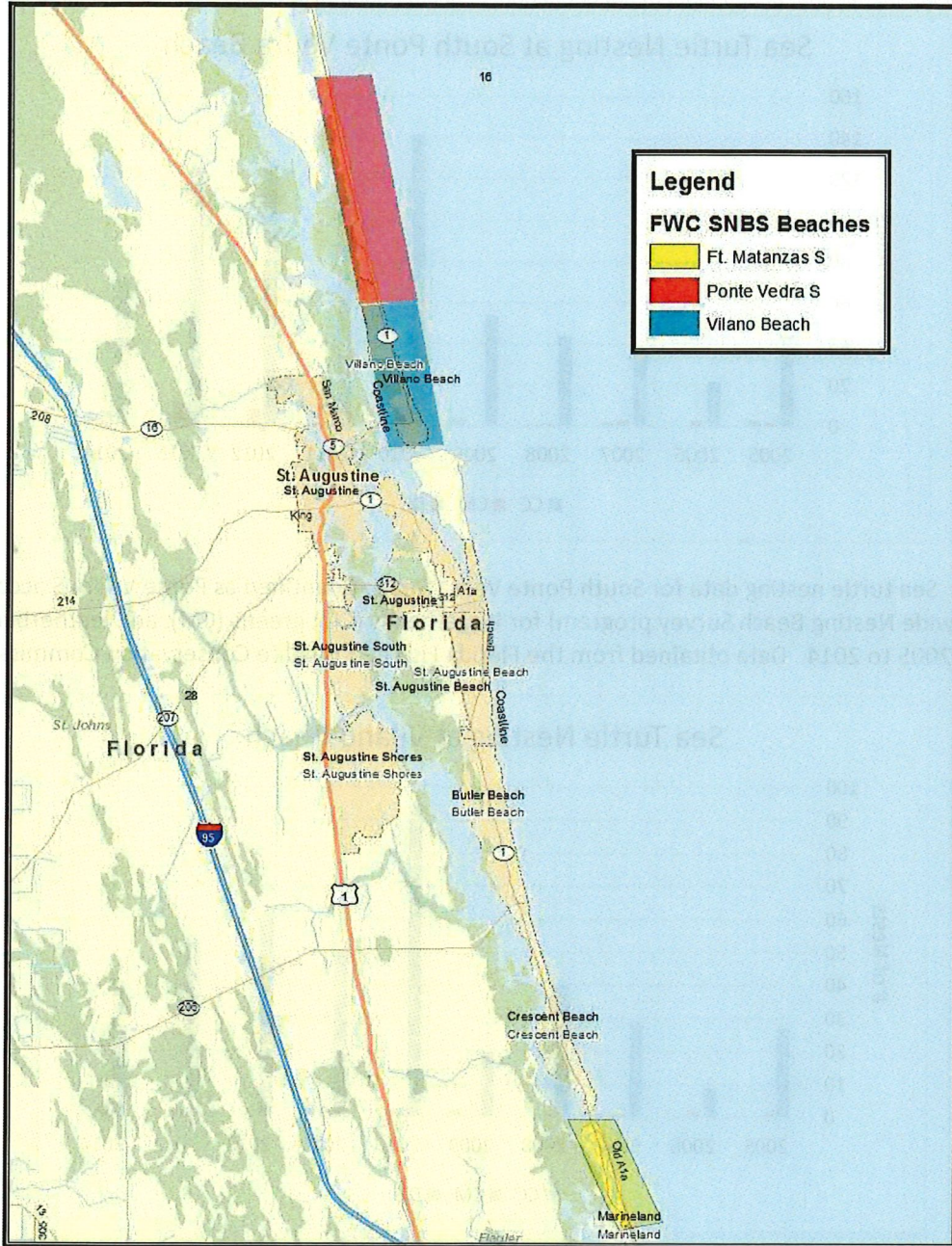
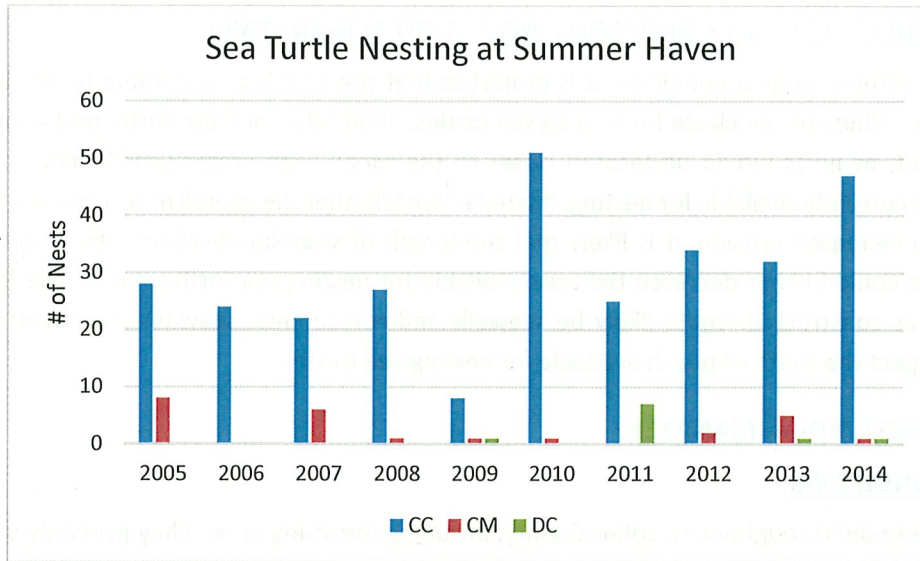
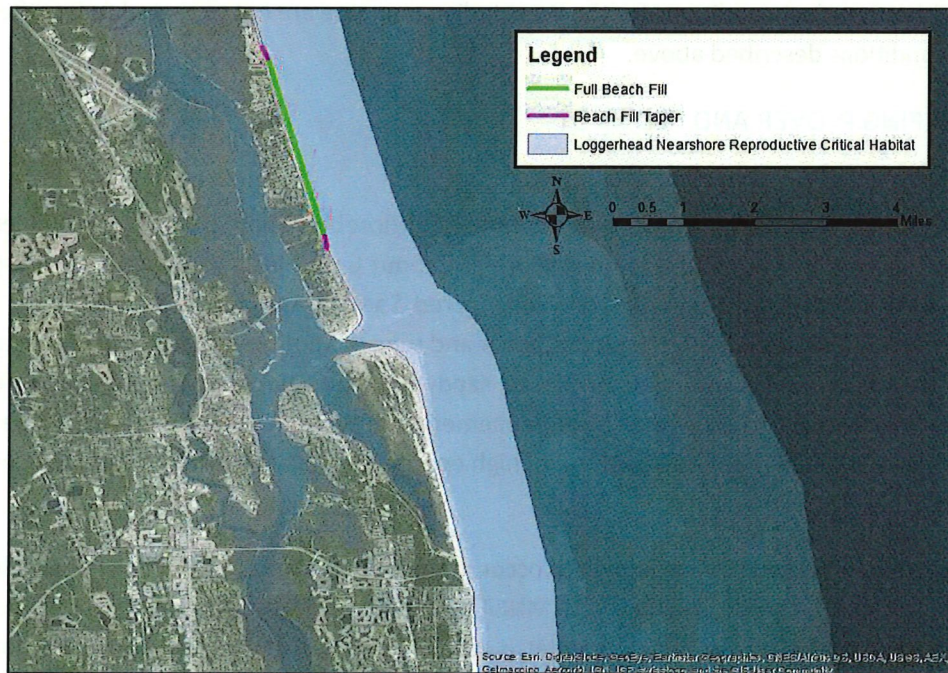


Figure 2-17. Map showing the location of the three Statewide Nesting Beach Survey (SNBS) reaches in the study area.





**Table 2-9.** Sea turtle nesting data for Summer Haven (identified as Ft. Matanzas South by the Statewide Nesting Beach Survey program) for loggerheads (CC), greens (CM), and leatherbacks (DC) from 2005 to 2014. Data obtained from the Florida Fish and Wildlife Conservation Commission.



**Figure 2-18.** Location of loggerhead nearshore reproductive critical habitat in the project area.

### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The continued erosion of the shoreline in the proposed placement area may reduce some habitat currently utilized by piping plover and red knot; however, the infrequent usage of these areas by these species suggests that the future without-project conditions would be similar to the existing conditions with respect to these species.

Allowing sediment to overtop the dune and create overwash fans in the Summer Haven reach would have a beneficial effect by enhancing habitat for piping plover and red knot.

#### **2.3.3.4 ANASTASIA ISLAND BEACH MOUSE**

The endangered Anastasia Island beach mouse (*Peromyscus polionotus phasma*) inhabits the primary and secondary dune systems within a 14.5 mile length of Anastasia Island and sections of the GTMNERR (Figure 2-19).

### EXISTING CONDITIONS

The Anastasia Island beach mouse may have ranged from Florida's St. John's River in Duval County, south to Anastasia Island in St. Johns County. The beach mouse currently occurs on Anastasia Island, primarily on the north (Anastasia State Park) and south (Fort Matanzas National Monument) ends of the island. In 1992, mice from these two populations were reintroduced into suitable historical habitat between Ponte Vedra Beach and South Ponte Vedra Beach in north St. John's County at the GTMNERR. The reintroduced population is surviving, although in low numbers (USFWS, 2015). There is no evidence of beach mice utilizing the study reaches.

## FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The presence of whales in the study area is not likely to be altered from the existing conditions if the project were not constructed.

### 2.3.4 ESSENTIAL FISH HABITAT (EFH)

Waters and substrate within the project area have been identified as Essential Fish Habitat (EFH) by the South Atlantic Fishery Management Council (SAFMC; SAFMC 1998). EFH is defined as those waters and substrate necessary for fish to spawn, breed, feed, or grow to maturity. Pursuant to the 1999 Finding between USACE and NMFS, USACE's Notice of Availability of the draft EA initiated USACE's consultation under the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSFCMA). NMFS provided comments on the draft EA on April 4, 2016, which are incorporated into this document. This section describes the existing conditions of the EFH in the project area, as well as the individual and cumulative impacts of the No Action Alternative. Section 5.2.5 describes the individual and cumulative impacts of the Recommended Plan and other reasonable alternatives. This NEPA document satisfies the coordination requirement for EFH under the MSFCMA (see also Section 6.13).

#### 2.3.4.1 HABITAT AREAS OF PARTICULAR CONCERN

##### 2.3.4.1.1 Coastal Migratory Pelagics

Areas which meet the criteria for Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs) include sandy shoals of Capes Lookout, Cape Fear, and Cape Hatteras from shore to the ends of the respective shoals, but shoreward of the Gulf Stream; The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and Hurl Rocks (South Carolina); The Point off Jupiter Inlet (Florida); Phragmatopoma (worm reefs) reefs off the central east coast of Florida; nearshore hard bottom south of Cape Canaveral; The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; Pelagic Sargassum; and Atlantic coast estuaries with high numbers of Spanish mackerel and cobia based on abundance data from the Estuarine Living Marine Resources Program. Estuaries meeting this criteria for Spanish mackerel include Bogue Sound and New River, North Carolina; Bogue Sound, North Carolina (Adults May-September salinity >30 ppt); and New River, North Carolina (Adults May-October salinity >30 ppt). For Cobia; Broad River, South Carolina (Adults & juveniles May-July salinity >25ppt).

The project area is considered EFH for Coastal Migratory Pelagics, which include king mackerel (*Scomberomorus cavalla*), Atlantic Spanish mackerel (*Scomberomorus maculatus*), and cobia (*Rachycentron canadum*).

### **Spinner Shark**

The spinner shark (*Carcharhinus brevipinna*) is a common, coastal-pelagic, warm-temperate and tropical shark of the continental and insular shelves (Compagno, 1984). It is often seen in schools, leaping out of the water while spinning. It is a migratory species, but its patterns are poorly known. EFH for all lifecycles of the spinner shark exists in the St. Augustine Inlet system sand source area.

### **Scalloped Hammerhead Shark**

The scalloped hammerhead (*Sphyrna lewini*) is a very common, large, schooling hammerhead of warm waters. It is the most common hammerhead in the tropics and is readily available in abundance to inshore artisanal and small commercial fisheries as well as offshore operations (Compagno, 1984). It migrates seasonally north-south along the eastern United States. Scalloped hammerhead sharks are widely distributed, but they are also dependent on discrete coastal nursery areas (Duncan et al., 2006). Neonate and Young-of-the-Year (YOY) would be more common within and near the St. Augustine Inlet during the summer months. EFH for all lifecycles of the scalloped hammerhead exists in the St. Augustine Inlet system sand source area.

### **Bonnethead Shark**

The Bonnethead (*Sphyrna tiburo*) is a small hammerhead shark that inhabits shallow coastal waters where it frequents sandy or muddy bottoms. It is confined to the warm waters of the western hemisphere (Castro, 1983). Bonnethead sharks feed mainly on benthic prey such as crustaceans and mollusks. They do not appear to exhibit long distance migratory behavior and thus, little or no mixing of populations (Lombardi-Carlson, 2007). EFH for all lifecycles of the Bonnethead shark exists in the project area.

### **Lemon Shark**

The lemon shark (*Negaprion brevirostris*) is common in the American tropics, inhabiting shallow coastal areas, especially around coral reefs. During migration, this species can be found in oceanic waters but tends to stay along the continental and insular shelves (Morgan, 2008). Lemon sharks are reported to use coastal mangroves as nursery habitats, although this is not well documented in the literature. EFH for all lifecycles of the Lemon shark exists in the project area.

### **Finetooth Shark**

The Finetooth shark (*Carcharhinus isodon*) is a common inshore species of the western Atlantic. It ranges from North Carolina to Brazil. It is abundant along the southeastern United States and the Gulf of Mexico (Castro, 1983). Finetooth sharks generally prefer water temperatures reach 22°C (mid-May) and remain until water temperatures drop to 20°C (October). EFH for all lifecycles of the Finetooth shark exists in the project area.

### **Coastal Migratory Pelagics**

The St. Augustine Inlet is considered EFH for Coastal Migratory Pelagics, which include king mackerel (*Scomberomorus cavalla*), Atlantic Spanish mackerel (*Scomberomorus maculatus*), and cobia (*Rachycentron canadum*). The ecological function of tidal inlets (including their ebb and flood tide shoals) is widely recognized for its contributions to spawning, egg and larval dispersal, juvenile recruitment, and as foraging habitat.

### **Blacknose Shark**

The blacknose shark (*Carcharhinus acronotus*) is a common coastal species that inhabits the western north Atlantic from North Carolina to southeast Brazil (Bigelow and Schroeder, 1948). It is very abundant in coastal waters from the Carolinas to Florida and the Gulf of Mexico during summer and fall (Castro, 1983). Schwartz (1984) hypothesized that there are two separate populations in the West Atlantic. EFH for all lifecycles of the blacknose shark exists in the project area.

### **Bull Shark**

The bull shark (*Carcharhinus leucas*) is a large, shallow water shark that is cosmopolitan in warm seas and estuaries (Castro, 1983). It often enters fresh water, and may penetrate hundreds of kilometers upstream; bull sharks are the only shark species that is known to be physiologically capable of spending extended periods in freshwater (Thorson et al., 1973). EFH for all lifecycles of the bull shark exists in the project area.

### **Dusky Shark**

The dusky shark (*Carcharhinus obscurus*) is common in warm and temperate continental waters throughout the world. It is a migratory species which moves north-south with the seasons. This is one of the larger species found from inshore waters to the outer reaches of continental shelves. It used to be important as a commercial species and a game fish, but is currently prohibited. The dusky shark is taken as bycatch in the swordfish and tuna fisheries. The dusky shark is one of the slowest growing requiem sharks and is often caught on both bottom and pelagic longlines, making it highly vulnerable to overfishing. Dusky sharks are currently prohibited and are a candidate for listing under the ESA. Neonate and adult life cycle stages are most likely to be found in the project area.

### **White Shark**

The white shark (*Carcharodon carcharias*) is the largest of the lamnid, or mackerel, sharks. It is a poorly known apex predator found throughout temperate, subtropical, and tropical waters. Its presence is usually sporadic throughout its range, although there are a few localities (e.g., off California, Australia, and South Africa) where it is seasonally common. Large adults prey on seals and sea lions and are sometimes found around their rookeries. The white shark is also a scavenger of large dead whales. It has been described as the most voracious of the fish-like vertebrates and has been known to attack bathers,

vegetation (e.g., seagrass); and subtidal and intertidal non-vegetated flats. This applies from North Carolina through the Florida Keys.

#### **South Atlantic Wahoo**

The wahoo (*Acanthocybium solandri*) is an oceanic pelagic fish found worldwide in tropical and subtropical waters. In the western Atlantic wahoo are found from New York through Columbia including Bermuda, the Bahamas, the Gulf of Mexico, and the Caribbean. Wahoo are present throughout the Caribbean area, especially along the north coast of western Cuba where it is abundant during the winter (from FAO species guide; FAO, 1978). There is pronounced seasonal variation in abundance of wahoo. They are caught off North and South Carolina primarily during the spring and summer (April-June and July-September), off Florida's east coast year-round, off Puerto Rico and the U.S. Virgin Islands year-round with peak catches between September and March, in the Gulf of Mexico year-round, in the eastern Caribbean between December and June, and in Bermuda between April and September (SAFMC, 1998a). The wahoo spawning season extends from June through August, with peak spawning in June and July.

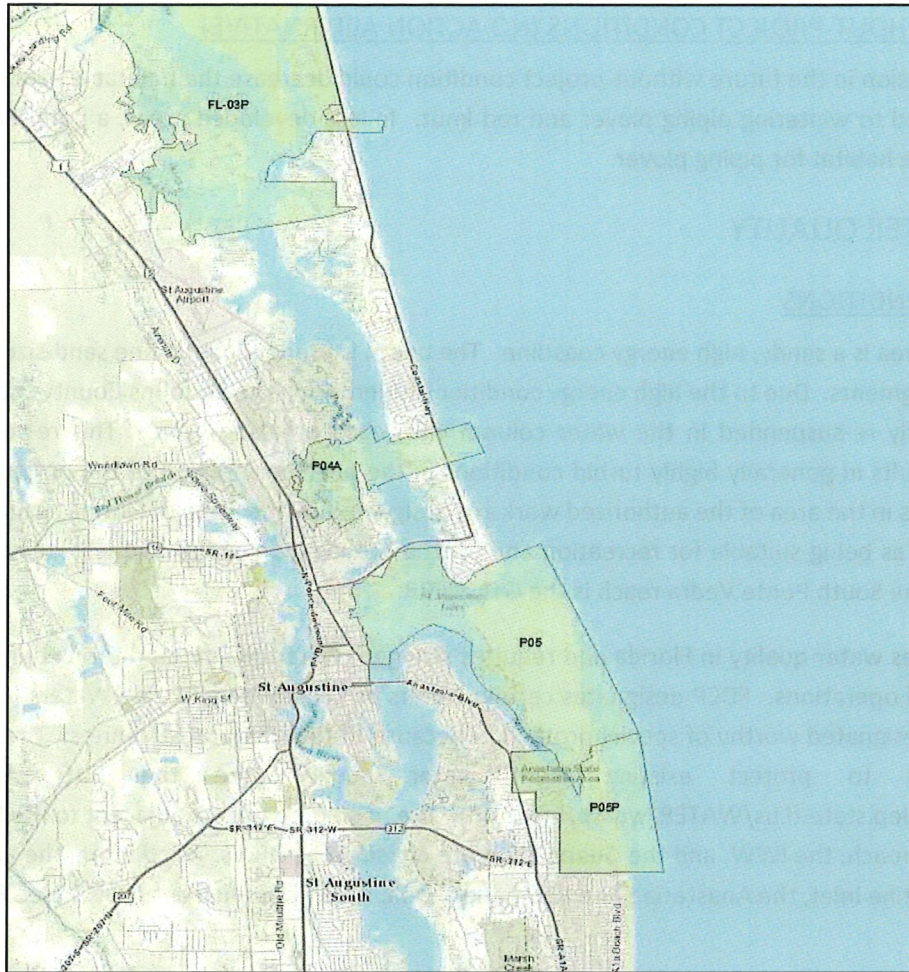
#### **2.3.4.3 HARDGROUNDS**

Hardgrounds provide substrate for benthic organisms, crevices where organisms can seek protection, and foraging habitat for a number of aquatic species. Hardgrounds can be of various types, artificial or natural, such as reefs, with high and/or low relief, and can be of any shape. Foster, Spurgeon, and Cheng (2000) note that "a long and relatively significant headland feature" extends from about R15 to R75. This feature is associated with submerged coquina and/or beachrock outcrops in the nearshore zone, which may contribute to the shell hash observed in the beach sediments in the South Ponte Vedra reach. Shell components in the sediments may possibly derive from active shellfish populations associated with the outcrop habitat.

The study area (R84 to R209) is located south of the headland feature that may have associated hardground features. While the shoreline adjacent to the headland feature has been relatively stable, the zone between the headland feature and St. Augustine Inlet has been progressively erosive from south to north. In 1994, a side-scan sonar survey was conducted over 2.7 square miles of nearshore substrate, to determine the presence and extent of hard bottom areas in the vicinity of the project. There were no distinguishable bottom features that could be classified as exposed hard bottom or outcrops. Based on core borings, it was determined that rock formations did not exist within the placement area. The existing geologic formation was covered with approximately 10-20 feet of sand (USFWS, 1994). No features such as hardbottoms or rock outcrops are located in the project's impact area (USACE, 1996).

#### **FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)**

The presence of EFH in the study area is not likely to be altered from the existing conditions if the project were not constructed.



**Figure 2-20.** Location of Coastal Barrier Resource System (CBRS) units in the study area.

Portions of the Vilano Beach reach of the study area are within CBRS Unit P04A, Usinas Beach, while the southern portion of the Summer Haven reach lies within CBRS Unit P05A, Matanzas River (see Figure 2-20). The presence of CBRS units may limit federally-implementable alternatives, but not alternatives which could be carried out by the state or local sponsor. The effects of CBRA on plan formulation are discussed later in this report.

Portions of the South Ponte Vedra Beach reach lie within OPA FL-03P. The only Federal funding prohibition within OPAs is related to Federal flood insurance. The presence of this OPA will not constrain plan formulation.

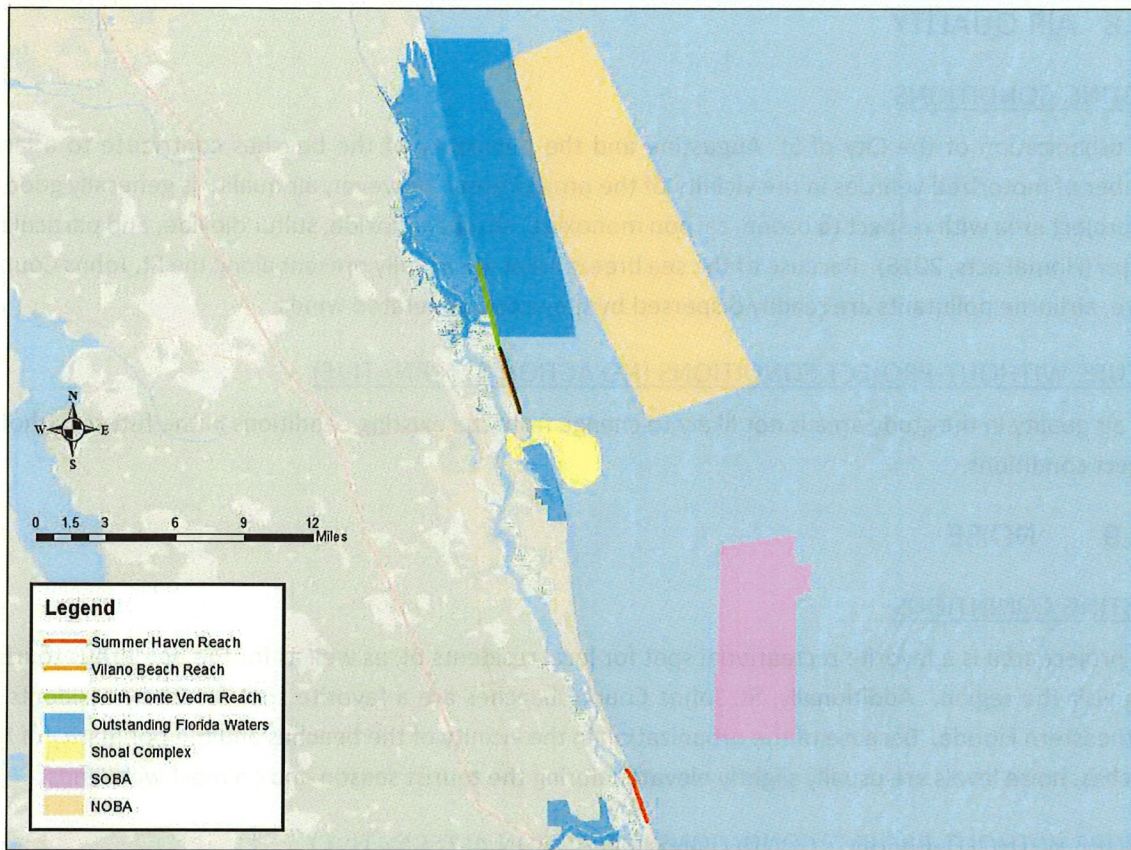


Figure 2-21. Location of OFWs in the Study Area.

### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The water quality in the study area is not likely to change from the existing conditions in the future without-project conditions.

### 2.3.7 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

#### EXISTING CONDITIONS

The coastline in the project area is located adjacent to predominantly residential and recreational areas. There are no known industrial activities in the immediate area. There are no known sources of hazardous or toxic wastes in the project area, and USACE is not aware of any records indicating these activities occurred in the project area in the past.

#### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The presence/absence of hazardous or toxic wastes in the study area is not likely to change from the existing conditions in the future without-project conditions.



### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The aesthetics of the study area is anticipated to decline in the future without-project condition due to increased erosion and the continued narrowing of the beach.

#### 2.3.11 RECREATION RESOURCES

##### EXISTING CONDITIONS

The project area is a local favorite for county residents to spend much of their leisure time sunbathing, surfing, sailing, walking, and riding bicycles, in addition to a variety of other active and passive activities. The spring, summer, and fall months of the year are the most active times for recreational activities, with the summer months comprising the peak use period. During the winter months, the St. Johns County beaches have low recreational usage due to relatively low air and water temperatures (45-65°F and 56-61°F, respectively; NOAA 2015) and the frequency of northeast winds that produce strong waves and high tides.

##### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The recreational usage of the study area are anticipated to decline in the future without-project condition due to increased erosion and the continued narrowing of the beach, which will make it less suitable for recreating.

#### 2.3.12 NAVIGATION

##### EXISTING CONDITIONS

The St. Augustine Inlet is an improved tidal inlet connecting the San Sebastian River and the IWW Federal navigation channel to the Atlantic Ocean. Originally a natural inlet located south of its current location, the inlet was relocated in 1940 as part of the St. Augustine Harbor Navigation Project in response to public interests. Efforts to stabilize the inlet and improve navigation between 1941 and 1957 resulted in the construction of a north sand trap groin approximately 1,880 feet in length and a 3,695 foot south jetty. The authorized 16-foot inlet entrance channel is maintained at the best natural alignment, while the geographically fixed IWW channel is maintained at 12 feet deep.

##### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

The St. Augustine Inlet is currently maintained with the IWW Federal navigation channels, and will be maintained regardless of whether this project moves forward. Navigation conditions should not change for the St. Augustine Inlet from the existing conditions in the future without-project conditions.

In the Summer Haven reach, continued erosion in the future without-project condition could result in overwash or a possible breach of the island. Increased sediment due to overwash in the IWW would need to be addressed during a maintenance dredging event of that channel.

USACE surveyed all three reaches (South Ponte Vedra, Vilano, and Summer Haven) for the presence of cultural resources in 2010. Two archaeological sites (8SJ5442 and 8SJ7988) have been previously documented within the South Ponte Vedra and Vilano Beach reaches; however, both of these sites were assessed as isolated finds that were washed onto the beach after storm events. The Chainplate site (8SJ5442) was documented in 2007 and was composed of isolated shipwreck components originating from a wooden sailing ship. LAMP archaeologists documented and removed the items for conservation at that time. The Vilano Beach Rudder site (8SJ4988) was a 12-foot long, wooden rudder recovered in 2005 by the St. Johns County archaeologist and documented as probably belonging to a late nineteenth-century, wooden sailing vessel. The rudder was the only component identified on the beach at this location. Considering the high energy environment, materials buried within the beach are often exposed by storms only to be reburied, or are washed up onto the beach from further offshore. Further monitoring after storm events was recommended for both site locations. However, no materials were identified in either area during the USACE 2010 shoreline survey and none have been reported to LAMP or to the St. Johns County Archaeologist since the artifacts were recovered in 2005 and 2007 suggesting that the sources of these isolated artifacts lie submerged offshore. The only known offshore wreck north of the inlet is Compton's Wreck (8SJ3525), which is documented as a more modern wooden sailing vessel. Currently, there is insufficient information on the significance of this site, but the resource is located sufficiently offshore to be exempt from impacts during nearshore or beach placement.

In addition to the 2010 USACE survey, several archaeological assessments have been conducted along the Summer Haven reach, between range monuments R197 – R209. Several archaeological surveys have been conducted along this stretch of SR A1A as a result of bridge replacement and highway construction activities by the Florida Department of Transportation (FDOT). Three archaeological sites (8JS0046, 8SJ2527, and 8SJ4887) have been identified west of the proposed beach renourishment area and west of State Road A1A. All three sites were recorded as thick, multi-component shell middens with dominant Orange Period (4,000 – 2,500 BP) components. The Summer Haven site (8SJ0046), located at the northern end of the peninsula, was first recorded in the 1950s and contained human burials within the site, although no additional burials have been identified at the site since this time. Unfortunately, the majority of all three sites has been destroyed from canal excavations, residential development, and road construction and no portion of these sites were documented as being within the proposed renourishment area. The 2010 USACE survey did not identify any archaeological resources within the project area; however, monitoring of any staging and access routes closer to SR A1A for beach renourishment activities will be required by USACE in consultation with the Florida State Historic Preservation Officer (SHPO) and appropriate federally-recognized tribes in the event such activities are planned.

Just west of the project reaches is the SR A1A National Scenic and Historic Coastal Byway. Along the road on both the east and west sides spanning the entire project area are numerous historic structures, none of which are currently listed on the National Register of Historic Places (NRHP). While outside the project area, their presence should be noted as continued erosional forces may have long-term effects on such

and throughout the United States. Prior consultation under Section 106 of the National Historic Preservation Act on various aspects of the project has not indicated any historic use, although it certainly remains possible. Consultation will be updated with both tribes in regards to project impacts.

#### FUTURE WITHOUT-PROJECT CONDITIONS (NO ACTION ALTERNATIVE)

Selection of the No Action Alternative would have no adverse effect on Native American groups. As discussed above, portions of the project have been consulted upon with both federally-recognized tribes living in the region.

## 2.4 ECONOMIC ENVIRONMENT

### EXISTING CONDITIONS

Information on the existing economic conditions along the St. Johns County study area coastline was collected for economic modeling purposes using Beach-fx. The information on the coastal assets detailed in this section was collected from mapping resources, site visits, and contractors.

#### 2.4.1 DAMAGE ELEMENTS - STRUCTURE & CONTENTS VALUE

The following discussion includes structure and contents value for the South Ponte Vedra Beach and Vilano Beach reaches. As will be discussed later in this report, the Summer Haven reach was screened out of formulation due to a variety of reasons. As a result, only the two northern reaches were included in intermediate and final alternative analysis employing Beach-fx, and only those structure and content variables relevant to Beach-fx analysis are included here. Beach-fx is an event-driven life-cycle model that estimates damages and associated costs over a period of analysis based on storm probabilities, tidal cycle, tidal phase, beach morphology, and many other factors (Rogers et al., 2009). Damages to developed shorelines include damages to buildings, pools, patios, parking lots, roads, utilities, seawalls, revetments, bulkheads, etc., all classified as “damage elements.” Erosion of land resulting in the need to place backfill is also considered a damage. Economists, real estate specialists, and engineers have collected and compiled detailed information on damage elements within the study area including:

- 397 single-family residences
- 37 multi-family residences
- Commercial structures
- 251 dune walks
- SR A1A
- Several parking lots, gazebos, garages, pools, tennis courts, and bath houses

In total, attribute information for 817 separate damage elements was populated for economic modeling using Beach-fx. The proximity of these damage elements to the beach makes them potentially vulnerable to erosion, wave attack, and inundation.

**Table 2-11. Distribution of Structures and Structure Value by Reach.**

Distribution of Structures & Structure Value by Reach					
Beach-Fx Reach	DE Count	Structure Value	Content Value	Total Value	% of Total Value
84	8	\$ 1,108,437	\$ 376,268	\$ 1,484,705	1%
85	20	\$ 3,175,145	\$ 1,275,190	\$ 4,450,335	2%
86	20	\$ 3,627,217	\$ 1,469,831	\$ 5,097,048	2%
90	27	\$ 3,928,659	\$ 1,603,997	\$ 5,532,656	2%
91	22	\$ 3,149,707	\$ 1,233,206	\$ 4,382,913	2%
92	15	\$ 2,085,649	\$ 816,325	\$ 2,901,974	1%
93	28	\$ 4,067,044	\$ 1,681,022	\$ 5,748,066	2%
87	32	\$ 6,612,213	\$ 2,861,777	\$ 9,473,990	4%
88	22	\$ 3,851,535	\$ 1,641,533	\$ 5,493,068	2%
89	28	\$ 6,237,679	\$ 2,715,902	\$ 8,953,581	3%
94	8	\$ 844,758	\$ 140,214	\$ 984,972	0%
95	19	\$ 2,015,648	\$ 584,794	\$ 2,600,442	1%
96	26	\$ 4,281,210	\$ 1,761,098	\$ 6,042,308	2%
97	20	\$ 3,430,500	\$ 1,383,555	\$ 4,814,055	2%
98	61	\$ 16,869,267	\$ 7,846,416	\$ 24,715,683	9%
100	46	\$ 11,714,035	\$ 5,313,803	\$ 17,027,838	6%
101	25	\$ 4,181,708	\$ 1,711,544	\$ 5,893,252	2%
102	8	\$ 10,049,865	\$ 4,680,000	\$ 14,729,865	5%
103	12	\$ 13,796,355	\$ 6,419,700	\$ 20,216,055	8%
104	22	\$ 5,035,899	\$ 2,181,137	\$ 7,217,036	3%
105	15	\$ 3,488,390	\$ 1,350,185	\$ 4,838,575	2%
106	20	\$ 3,880,670	\$ 1,665,604	\$ 5,546,274	2%
107	30	\$ 4,970,238	\$ 2,068,742	\$ 7,038,980	3%
108	11	\$ 2,723,804	\$ 1,074,022	\$ 3,797,826	1%
109	15	\$ 3,003,386	\$ 862,898	\$ 3,866,284	1%
110	18	\$ 2,510,368	\$ 888,944	\$ 3,399,312	1%
111	31	\$ 5,272,445	\$ 2,241,253	\$ 7,513,698	3%
112	22	\$ 5,522,167	\$ 2,198,746	\$ 7,720,913	3%
114	16	\$ 5,263,067	\$ 2,141,249	\$ 7,404,316	3%
115	11	\$ 3,216,410	\$ 1,287,180	\$ 4,503,590	2%
116	12	\$ 2,077,290	\$ 655,080	\$ 2,732,370	1%
117	10	\$ 1,285,292	\$ 360,946	\$ 1,646,238	1%
118	36	\$ 5,326,818	\$ 2,186,154	\$ 7,512,972	3%
119	33	\$ 4,767,243	\$ 2,059,374	\$ 6,826,617	3%
120	36	\$ 16,351,882	\$ 7,684,346	\$ 24,036,228	9%
121	19	\$ 5,315,967	\$ 2,575,266	\$ 7,891,233	3%
122	13	\$ 2,588,949	\$ 1,279,362	\$ 3,868,311	1%
<b>Total</b>	<b>817</b>	<b>\$ 187,626,916</b>	<b>\$ 80,276,658</b>	<b>\$ 267,903,574</b>	<b>100%</b>

is considered conservative for Florida where coastal development has historically increased in density and value.

### 2.4.5 BEACH-FX FUTURE WITHOUT-PROJECT DAMAGE RESULTS

Future without-project (FWOP) damages across the study area range between \$46.8 and \$149.8 M present value dollars.

- **Structure Damage:** Economic losses resulting from the structures situated along the coastline being exposed to wave attack, inundation, and erosion damages. Structure damages account for approximately 53.7% of the total FWOP damages.
- **Contents Damage:** The material items housed within the aforementioned structures (usually air conditioned and enclosed) that are potentially subject to damage. Content damages make up approximately 21.5% of the total FWOP damages.
- **Coastal Armor Cost:** Beach-fx provides the capability to estimate the costs incurred from measures likely to be taken to protect coastal assets and/or prevent erosion in the study area. Based on the existence of coastal armor units throughout the study area, Beach-fx was used to estimate the costs of erecting such measures throughout the period of analysis. Armor costs account for approximately 24.8% of the total FWOP damages.

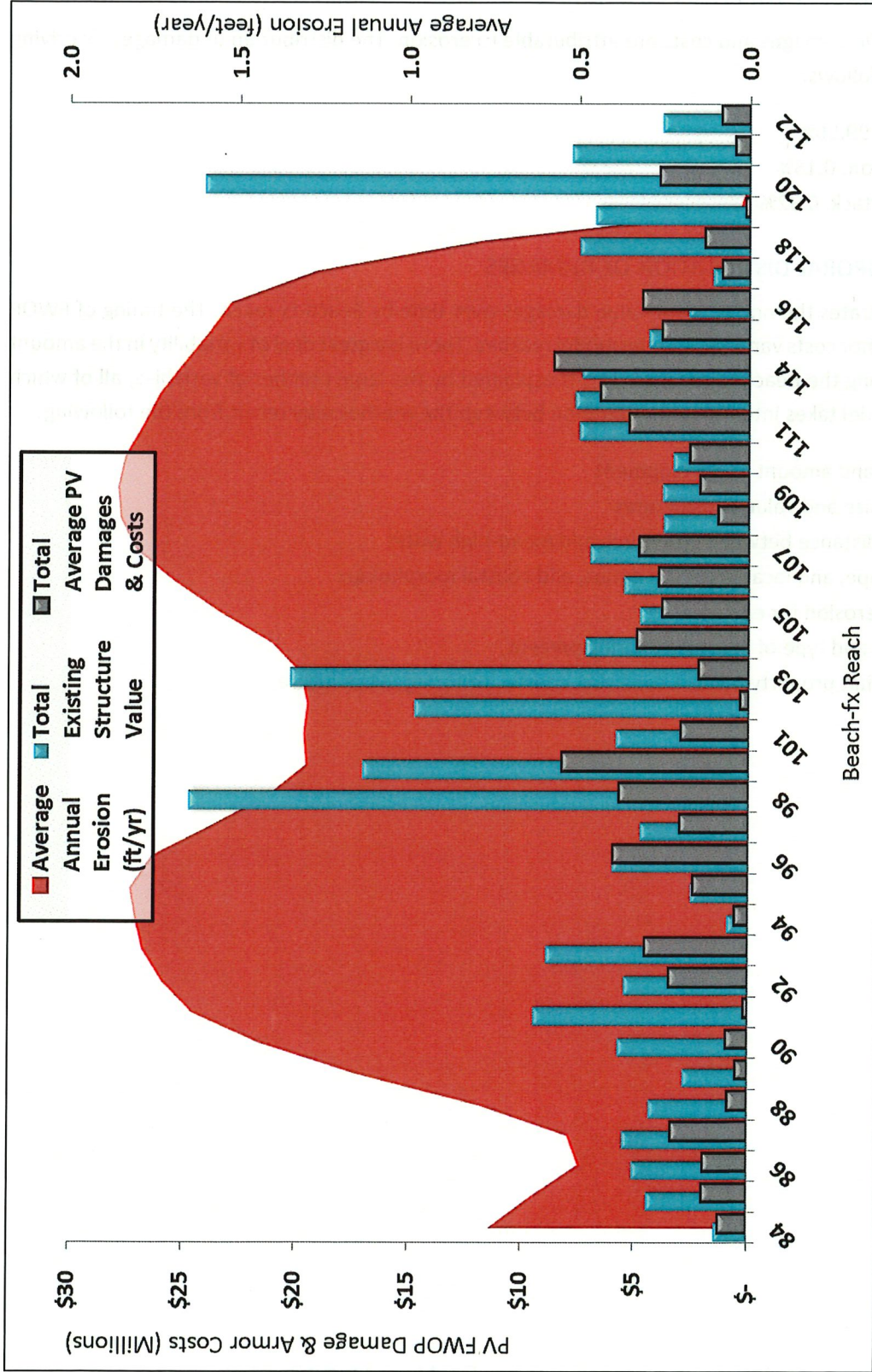


Figure 2-22. Spatial Distribution of Damages and Erosion Rates by Reach.

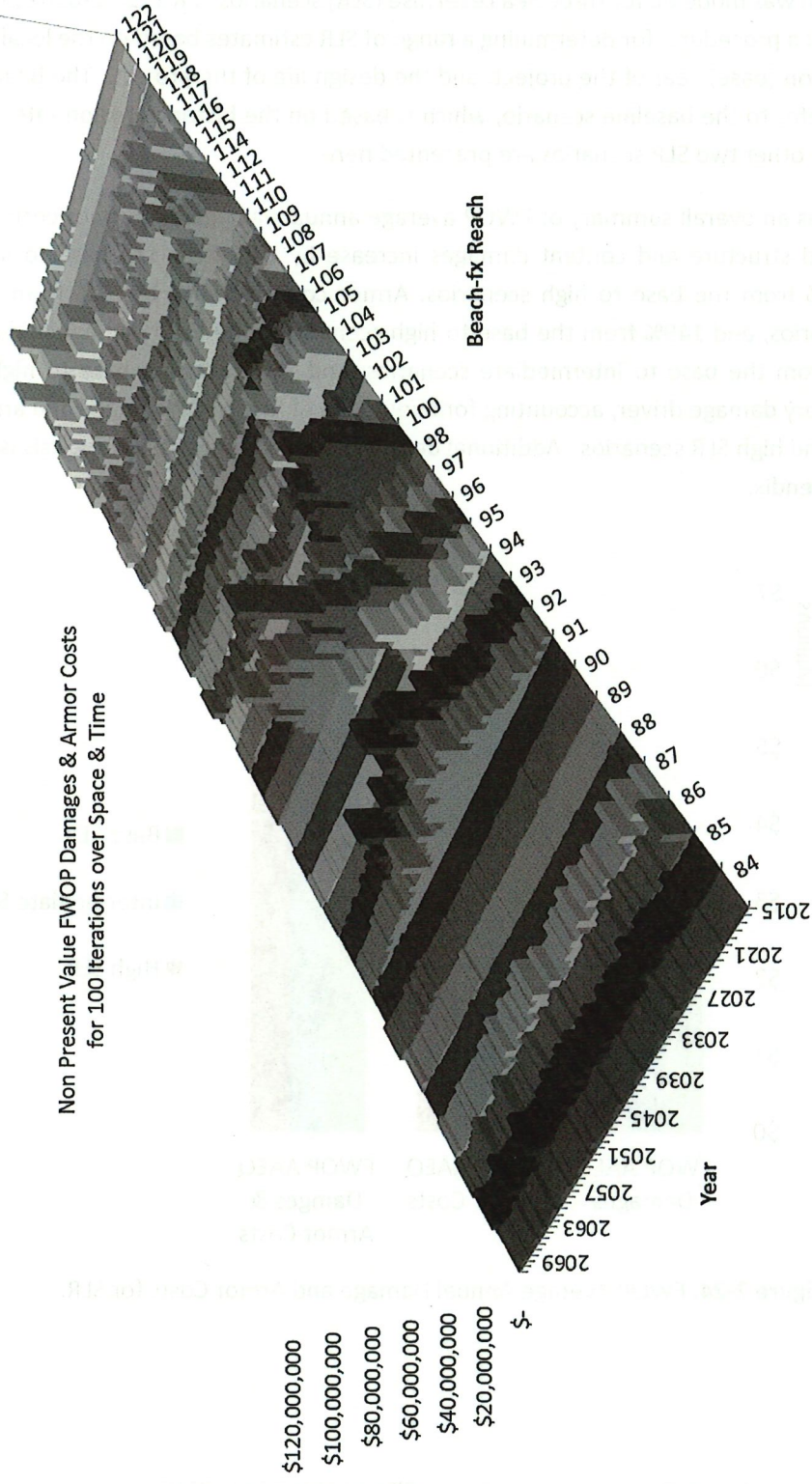


Figure 2-23. Non-Present Value FWOP Damages and Armor Costs over Space and Time.

#### 2.4.5.5 FUTURE WITHOUT PROJECT CONDITION CONCLUSION

The following points summarize the FWOP conditions:

- Most of the FWOP damages are associated with single-family residences located along the shoreline.
- The majority of the damage and armoring is caused by erosion.
- Damages in the FWOP condition increase in the accelerated SLR scenarios.

THIS PAGE INTENTIONALLY LEFT BLANK



CHAPTER 3  
PLAN  
FORMULATION

### 3 PLAN FORMULATION

#### 3.1 PLAN FORMULATION RATIONALE

Plan formulation is the process of developing alternative plans which meet the project-specific objectives while avoiding constraints.

The first step of plan formulation involves identifying all potential management measures for the given problems. A management measure is a structural or non-structural action that can be implemented at a specific geographic site to address one or more planning objectives.

An alternative plan is a set of one or more management measures functioning to address one or more objectives. Sometimes a plan consists of only one measure, but more often it's a combination of measures. Different alternative plans consist of different measures, or they combine the same measures in different ways, such as different dimensions, quantities, materials, locations, or implementation time frames. As the study evolves, favorable plans are reformulated to devise the most efficient, effective, complete, and acceptable plan.

Four accounts are established in the *Principles and Guidelines* (P&G 1983) to facilitate the evaluation of management measures and display the effects of alternative plans. The National Economic Development (NED) account displays the plan with the greatest net economic benefit consistent with protecting the nation's environment; the Environmental Quality (EQ) account displays non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of alternative plans; the Regional Economic Development (RED) account displays changes in the distribution of regional economic activity (e.g., income and employment); and the Other Social Effects (OSE) account displays plan effects on social aspects such as community impacts, health and safety, displacement, energy conservation, and others. The Federal *Principles and Guidelines* require that for Coastal Storm Risk Management (CSRM) projects, the NED plan is to be the selected plan unless an exception is granted. The NED plan must also be evaluated in consideration of the Principles and Guidelines criteria of completeness, effectiveness, efficiency, and acceptability. Each alternative plan is formulated in consideration of these four criteria.

and other agencies and groups, as well as scoping letter comments received from local residents and stakeholders to identify current coastal risk related problems affecting the study area.

### 3.3.1 PROBLEMS

Problems within the study area include:

- Storm damages due to erosion, inundation, and waves threatening infrastructure
- Loss of natural habitat
- Shoreline erosion threatening recreational opportunities
- Shoreline erosion threatening hurricane evacuation route SR A1A
- Beach/dune interaction limited or eliminated

Erosion, both long term and storm induced, is the greatest problem in the study area. Loss of protective beach and dunes due to shoreline erosion threatens infrastructure, including SR A1A which is a major hurricane evacuation route for most of the study area and a National Scenic and Historic Coastal Byway. Erosion also threatens natural habitat and recreational opportunities. The study area has experienced long-term erosion. Some natural recovery occurs in the short-term, but the long-term trend is erosional.

Homeowners seeking to protect their property have constructed some erosion control measures, such as seawalls. These structures limit, or eliminate, the natural interaction where dunes feed sand to the eroded beach during storm events. Limiting this natural protective function makes infrastructure, and the environment adjacent to protected properties, more susceptible to storm damages. Multiple homes in the South Ponte Vedra Beach and Vilano Beach reaches received permits from the Florida Department of Environmental Protection (FDEP) to construct temporary seawalls. Sea level rise and coastal storms will continue to exacerbate the erosion pressures in the study area. Additional problems associated with the eroding shoreline include impacts to tourism and loss of recreational resources and habitat.

### 3.3.2 OPPORTUNITIES

Opportunities exist to:

- Protect/enhance habitat/environmental resources
- Maintain recreation
- Protect hurricane evacuation route (SR A1A)
- Protect/enhance beach/dune interaction
- Implement recommendations in the State of Florida's St. Augustine Inlet Management Plan to use the inlet as a sand source for beaches to the north of the inlet

## 3.5 OBJECTIVES

### 3.5.1 FEDERAL OBJECTIVES

The Federal objective, as stated in The Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, established by the U.S. Water Resources Council on March 10, 1983 (P&G), is to contribute to national economic development (NED) consistent with protecting the nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. Contributions to NED are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net economic benefits that accrue in the study area and the rest of the nation.

The Federal objective does not seek to identify specific targets within objectives. For example, targeting a pre-defined storm frequency (100 year storm) relative to the storm damage reduction objective would be inappropriate. Rather, the planning process includes formulation of alternative plans to maximize benefits relative to costs.

#### 3.5.1.1 PLANNING OBJECTIVES

The planning objectives are statements of the study purpose. Planning objectives are more specific than the Federal and non-federal objectives and reflect the problems and opportunities in the study area. Federal and non-federal objectives are discussed later in this chapter. An objective is developed to address each of the identified problems and opportunities while being consistent with the study authority and the USACE mission of coastal storm risk management. Planning objectives represent desired positive changes. The planning objectives for the study area would be attained within the 50-year period of analysis for the study, from 2020 through 2070. All of the objectives focus on activity within the three reaches of the study. The planning objectives are:

- Reduce storm damage to infrastructure, including SR A1A, a major hurricane evacuation route
- Maintain existing recreation (beach and nearshore)
- Maintain environmental quality for human and natural use, including natural protection provided by beach/dune interaction, air and water quality, habitat, and aesthetics

The goal of the feasibility study is to develop a range of alternative plans that balance the objectives and avoid conflicts or, where necessary, demonstrate the trade-offs between conflicting objectives; and enabling decisions to be made.

**Goal 3:** Deliver support that responds to, recovers from, and mitigates disaster impacts to the nation.

**Goal 4:** Build resilient people, teams, systems, and processes to sustain a diverse culture of collaboration, innovation, and participation to shape and deliver strategic solutions.

These Campaign Plan goals, and associated objectives, will be addressed through the course of this feasibility study.

### 3.5.2 STATE AND LOCAL OBJECTIVES

The State of Florida is empowered by the Federal Coastal Zone Management Act (CZMA), and its implementing regulations at 15 CFR Part 930, to review Federal activities within or adjacent to its coastal zone, to comment on and concur with or object to a Federal agency's determination that the activity is consistent with the enforceable policies of the state's approved coastal management program. The Federal CZMA requires Federal activities to be consistent with a state's coastal zone program to the maximum extent practicable; it does not require compliance with a state's program. Florida's Coastal Zone Management Program was established under the Coastal Management Act of 1978 (Chapter 380.20, Florida Statutes) and approved by the Federal Coastal Zone Management office in 1981. Florida does not regulate its coastal zone through one comprehensive law, but rather through state statutes and administrative codes. Through Florida's comprehensive planning act, local governments are also given the opportunity to determine whether these activities are consistent with their goals and policies. FDEP is the lead state agency for the implementation of the CZMA.

The Beach and Shore Preservation Act (Chapter 161, Florida Statutes) is Florida's primary statute for developing and implementing the state's strategic beach management plan, regulating coastal construction seaward of the Mean High Water line, and regulating activities seaward of the coastal construction control lines. The act, administered by FDEP, was first passed in 1965 and has since been significantly amended. The objective of the Beach and Shore Preservation Act is to preserve and protect Florida's sandy beaches and adjacent beach and dune systems. FDEP strives to accomplish this objective with the following programs: Coastal Construction Control Lines, Joint Coastal Permit Program, Erosion Setbacks, Coastal Building Zone, Erosion Control Program, Erosion Control Line, and Inlet Management.

#### 3.5.2.1 LOCAL COMPREHENSIVE PLANNING

The state's Local Government Comprehensive Planning Act of 1985 (Chapter 163) requires that all local governments prepare, adopt, and implement comprehensive plans that address community growth and development needs. It requires that local, regional, and state comprehensive plans be consistent with each other and requires coastal counties and cities to

increasing the setback for construction, or increasing the standards for construction to reduce storm damages. The erosion of the shoreline would continue at the present rate, unabated by this measure.

NS-3: Moratorium on Construction. This management measure would not permit new construction in the area vulnerable to storm damages within the study area. As properties are damaged, reconstruction would not be permitted. The erosion of the shoreline would continue at the present rate, unabated by this measure. Although not a congressionally authorized activity, this measure could be implemented by state or local governments.

NS-4: Establish a No-Growth Program. This management measure would allow for existing structures and limited reconstruction following storm damage, but would not allow for an increased number of structures within the area vulnerable to storm damages adjacent to the study area. The erosion of the shoreline would continue at the present rate, unabated by this measure. Although not a congressionally authorized activity, this measure could be implemented by state or local governments.

NS-5: Relocation of Structures. This measure would allow the area to continue to erode and the land in this area would be lost. Structures vulnerable to storm damage in the study area would be identified, and where feasible, such structures would be moved further landward on their parcels to escape the vulnerable area.

NS-6: Flood Proofing of Structures. Flood proofing of existing structures, and regulation of flood plain and shorefront development, are management measures that state and local governments could implement. This measure would require changes to the building codes to further minimize flood damages associated with coastal storms. New construction, and substantial reconstruction, would be improved by new building code regulations. Existing structures could be improved through incentives and aid programs.

NS-7: Acquisition of Land and Structures. This measure would allow the shoreline to erode in the study area with a loss of land. Structures within the study area vulnerable to storm damage would be identified for acquisition. These structures would be demolished and natural areas would be restored. Such parcels would become public property, reducing the number of structures vulnerable to storm damages.

S-1: Seawalls. The construction of additional concrete seawalls, or improvements to and maintenance of, the existing bulkheads/seawalls would provide a significant degree of protection. The seawalls would be constructed at the seaward edge of the existing dune line. Existing seawalls may be demolished in favor of a new seawall to provide a seamless wall over the entire study area or select areas. This measure would stabilize the shoreline at the location of the bluff, allowing erosion to continue until the seawall becomes the water line. A concrete sheet pile wall

S-6: Submerged Artificial Reefs. This management measure would use the “perched beach concept” to limit the amount of underwater beach-fill and retain the dry beach for a longer period. Such construction would limit cross-shore losses of fill material. This would be accomplished by placement of a submerged artificial reef in shallow water with beach-fill material placed “perched” behind the reef structure. This measure may reduce initial nourishment (fill) quantities, reduce renourishment requirements, and offer mitigation for potential nearshore environmental impacts. The submerged artificial reef would be constructed out of large size rock with a foundation material to avoid subsidence. Typically, a structure perpendicular to the shore is constructed down-drift of the reef to stabilize fill. The beach-fill material would come from offshore and/or in combinations of other sources such as navigation dredging, upland disposal areas, etc.

S-7: Submerged Artificial Multi-purpose Reefs. This measure was chosen to fully account for the “maintain existing recreation (beach and nearshore)” objective. Multi-purpose reefs are intended to reduce wave energy by causing waves to break offshore over an artificial reef. The reef is designed to cause wave breaking in a form favorable for surfing and is constructed of material suitable for nearshore habitat. It is advisable to construct the reefs in combination with beach nourishment. A point of sand (or salient) typically forms in the wave shadow of the reef extending that portion of beach seaward. Sand that forms the salient would come from adjacent beaches. Pre-filling the project area with sand prior to, or with reef construction, would reduce adverse impacts to adjacent shorelines. Typically, these reefs are constructed of large, sand filled geotextile bags (or geotubes). Sand would come from offshore and/or in combinations of other sources such as navigation dredging, upland disposal areas, etc.

S-8: Nearshore Placement. Dredged material would be placed in the nearshore to dissipate wave energy, nourish the active profile, or placed as a combination of both. This method allows placement in water depths 15 feet and deeper. This management measure assumes that a portion of the sand placed in shallow water will move towards the beach under normal wave conditions. Over time, following construction, the sand bar will migrate towards the beach, attach to the beach, and shape into the normal equilibrium profile of the beach (thus adding material and enlarging the beach). The dredged material would come from offshore.

S-9: Breakwaters. The construction of breakwaters offshore along the St. Johns County study area is considered as a management measure to stabilize the existing beach. Such structures reduce the amount of wave energy reaching the shoreline behind them. As a result, the rate of annual erosion could decrease. The breakwaters would be constructed of large size rock with foundation materials to prevent subsidence. The breakwaters would be trapezoidal in profile and would be placed parallel to the shoreline in shallow water. The breakwaters would be constructed in segments separated from each other to prevent infilling between the existing beach and the

For the NED account, costs and benefits were not yet developed at this stage of plan formulation. The implementation of some measures, such as “Moratorium on Construction,” would impact damage to future construction, but not damage to the existing inventory, which the NED calculation is based on for this study. These statements were entered in the matrix under the NED account and all measures given a “1” rating, which effectively negates the weight of this account. This ensures that no measures, which could potentially be part of a NED plan were screened out at this time as a result of the NED account. Rough costs versus Beach-fx damages were later used to screen measures carried forward from this stage.

The OSE account considers how measures impact life safety risk, especially as related to hurricanes and other significant storm events. The sponsor and state have an effective hurricane education, preparedness, and evacuation program. This results in most measures not having a significant difference between the with-project and future without-project condition (FWOP) as it is assumed most residents are prepared and would evacuate when necessary. As reflected in Table 3-1, structural measures could minimally improve life safety risk as a result of protecting hurricane evacuation route SR A1A. However, this analysis assumes that the majority of the population evacuates damage prone areas in adequate time to effectively reduce life safety risk.

It is important to note, that no alternatives were screened out due to their inability to meet the planning objective to “Maintain existing recreation (beach and nearshore).” USACE participates in single purpose projects formulated exclusively for coastal storm risk management, with economic benefits equal to or exceeding the costs, based solely on damage reduction benefits, or a combination of damage reduction benefits and recreation benefits. Under current policy, recreation must be incidental in the formulation process and may not be more than 50% of the total benefits required for justification (ER 1105-2-100, 3-4.b.(4)(a)).

The management measures were evaluated and rated in Table 3-1 for their potential to accomplish planning objectives given project constraints: 0 = does not meet criteria, 1 = partially meets criteria, and 2 = fully meets criteria. If the total rating equals a number greater than 8, the measure partially meets, at least, over half of the objectives and constraints, and is carried forward for further analysis. If the total rating is equal to or less than 8, the measure is not considered further. The final total rating should not be inferred to be a ranking of measures against one another. A measure’s rating is only an indication of how likely it is to meet objectives given constraints, and therefore whether it is carried forward or not.

Management measures for the South Ponte Vedra Beach and Vilano Beach reaches were jointly screened due to their similarities and proximity to one another. The only significant difference between the reaches is the presence of the Coastal Barrier Resources System (CBRS) unit in the Vilano Beach reach. Federal law constrains Federal participation in a CBRS unit. Total ratings in Table 3-1 were significantly high or low enough that separate evaluation of the reaches was not



Table 3-1. Preliminary screening matrix.

South Ponte Vedra Beach and Vilano Beach Non-Structural Measures									
MEASURES	PROJECT OBJECTIVES			PROJECT CONSTRAINTS	FOUR ACCOUNTS				Measure Carried Forward Total [Yes/No]
	Reduce Storm Damage to Infrastructure, Including 3R, 2A/A	Maintain Existing Recreation Beach and Nearshore	Maintain Environmental Quality, Including Beach/Dune Interaction	Consistent with Federal Law	National Economic Development (NED)	Environmental Quality	Other Social Effects	Regional Economic Development (RED)	
NS-1 No-Action	<p>NS: Improvement</p> <p>0</p>	<p>No impact to nearshore recreation, beach/recreation.</p> <p>1</p>	<p>Natural and artificial loss due to private shore protection measures.</p> <p>0</p>	<p>Consistent with Federal Law.</p> <p>2</p>	<p>No project cost. No damages prevented.</p> <p>1</p>	<p>Possible loss of dune habitat. Loss of turtle nesting habitat due to decreased beach/dune width and private shore protection measures. Minimal change to other factors.</p> <p>1</p>	<p>Small life safety risk due to hurricane evacuation route damage. Loss of public safety (parking, lifeguard, lifeguard stand). Negatively affect an community cohesion due to perceived beach at risk.</p> <p>0</p>	<p>Loss of property value and tax value. Loss of other revenue related to existing beach at long term erosion.</p> <p>0</p>	<p>5</p> <p>Yes</p>
NS-2 Coastal Construction Control Line	<p>Increasing construction standards could decrease damage to future construction.</p> <p>1</p>	<p>No impact to nearshore recreation, beach/recreation.</p> <p>1</p>	<p>Natural and artificial loss due to private shore protection measures.</p> <p>0</p>	<p>Implemented by state/local government and is consistent with Federal Law.</p> <p>2</p>	<p>Would impact future construction but not impact damages to existing inventory which NED calculations based on for this study.</p> <p>1</p>	<p>Possible loss of dune habitat. Loss of turtle nesting habitat due to decreased beach/dune width and private shore protection measures. Minimal change to other factors.</p> <p>1</p>	<p>Small life safety risk due to hurricane evacuation route damage. Loss of public safety (parking, lifeguard, lifeguard stand). Negatively affect an community cohesion due to perceived beach at risk.</p> <p>0</p>	<p>Loss of property value and tax value. Loss of other revenue related to existing beach at long term erosion.</p> <p>0</p>	<p>6</p> <p>No</p>
NS-3 Moratorium on Construction	<p>No improvement to dune construction but elimination of damage to future construction.</p> <p>1</p>	<p>No impact to nearshore recreation, beach/recreation. Loss of beach/recreation.</p> <p>1</p>	<p>Natural and artificial loss due to private shore protection measures.</p> <p>0</p>	<p>Implemented by state/local government and is consistent with Federal Law.</p> <p>2</p>	<p>Would impact future construction but not impact damages to existing inventory which NED calculations based on for this study.</p> <p>1</p>	<p>Possible loss of dune habitat. Loss of turtle nesting habitat due to decreased beach/dune width and private shore protection measures. Minimal change to other factors.</p> <p>1</p>	<p>Small life safety risk due to hurricane evacuation route damage. Loss of public safety (parking, lifeguard, lifeguard stand). Negatively affect an community cohesion due to perceived beach at risk.</p> <p>0</p>	<p>Loss of property value and tax value. Loss of other revenue related to existing beach at long term erosion.</p> <p>0</p>	<p>6</p> <p>No</p>

Carried Forward  
  Eliminated  
  Fully Meets Obj/Constraint  
  Partially Meets Obj/Constraint  
  Does Not Meet Obj/Constraint

South Ponte Vedra Beach and Vilano Beach Structural Measures										
MEASURES	PROJECT OBJECTIVES			PROJECT CONSTRAINTS	FOUR ACCOUNTS				Measure Carried Forward (Yes/No)	
	Reduce Storm Damage to Infrastructure, Including SR A1A	Maintain Existing Recreation (Beach and Nearshore)	Maintain Environmental Quality (Including Beach/Dune Interaction)		National Economic Development (NED)	Environmental Quality	Other Social Effects	Regional Economic Development (RED)		Total
SOUTH PONTE VEDRA AND VILANO Structural Measures (S)	Reduce storm damage reduction where constructed. However, adjacent properties could be made more vulnerable due to erosive effects of structures.	Potential loss of beach recreation fronting structures. Steepening of profile and/or wave reflection may affect nearby recreation such as surfing.	Construction would eliminate beach/dune interaction. Properties adjacent to construction could be negatively affected.	Consistent with Federal Law except in CBRA zone.	Costs undetermined at this stage.	Negative effects to sea turtle nesting habitat and wildlife habitat.	Likely supported by homeowners but little support from others.	No change.	5	No
S-1 Seawalls	Would maximize storm damage reduction where constructed. However, adjacent properties could be made more vulnerable due to erosive effects of structures.	Sloped construction causes revetments to take up more beach width than seawalls. Potential loss of beach recreation fronting structures. Steepening of profile and/or wave reflection may affect nearby recreation such as surfing.	Construction would eliminate beach/dune interaction. Properties adjacent to construction could be negatively affected.	Supported by Federal law except in CBRA zone.	Costs undetermined at this stage.	Negative effects to sea turtle nesting habitat and wildlife habitat.	Likely supported by homeowners but little support from others.	No change.	5	No
S-2 Revetments	Would improve storm damage reduction.	Existing narrow beach may be maintained.	Beach/dune interaction would be maintained.	Supported by Federal law except in CBRA zone.	Costs undetermined at this stage.	Environmental quality is highly dependent on maintaining sand coverage of structure. Without adequate coverage dune habitat and sea turtle nesting could be negatively impacted. No impact to nearshore habitat.	Improvements in risk due to hurricane evacuation route protection. Protection of public facilities (parking, beach access, bathrooms).	Minimal increase to RED through improvement of tourism/beach economy. Protection of property value and tax value.	5	No
S-3 Sand Covered Soft Structure	Would improve storm damage reduction.	Existing narrow beach may be maintained.	Beach/dune interaction would be maintained.	Supported by Federal law except in CBRA zone.	Costs undetermined at this stage.	Environmental quality is highly dependent on maintaining sand coverage of structure. Without adequate coverage dune habitat and sea turtle nesting could be negatively impacted. No impact to nearshore habitat.	Improvements in risk due to hurricane evacuation route protection. Protection of public facilities (parking, beach access, bathrooms).	Minimal increase to RED through improvement of tourism/beach economy. Protection of property value and tax value.	10	Yes

Carried Forward  
  Eliminated  
  Fully Meets Obj/Constraint  
  Partially Meets Obj/Constraint  
  Does Not Meet Obj/Constraint

ST. JOHNS COUNTY COASTAL STORM RISK MANAGEMENT PROJECT  
 South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches  
 INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

MEASURES		PROJECT OBJECTIVES			CONSTRAINTS			FOUR ACCOUNTS			Measure Confirmed Forward (Yes/No)
		Reduce Storm Damage (Including SR AIA)	Maintain Existing Recreation (Beach and Nearshore)	Maintain Environmental Quality (Including Beach and Nearshore Interaction)	Consistent with Federal Law	National Economic Development (NEED)	Environment Quality	Other Social Effects	Regional Economic Development (RED)	Total	
S-7	Submerged Artificial Multi-Purpose Reefs	Construct in select locations to reduce storm damage and erosion. Reefs could serve as breakwaters to reduce storm damage and erosion.	In combination with beach nourishment, reefs could maintain or improve nearshore recreation such as surfing, fishing, and diving. Reefs could serve as breakwaters to reduce storm damage and erosion.	Beach dune recreation would be maintained.	Supported by Federal law except in CBRA zone.	Costs undetermined at this stage.	Reduces potential for negative effects to benthic invertebrates and nearshore habitat for short periods of time. With habitat recovery within one year, volume of sand needed to provide significant benefits could have negative impact to sea turtle nesting habitat.	Improved life safety risk due to hurricane due to reduction in wave height and protection of public facilities (parking, beach access, bathrooms). May receive more support from agencies.	Moderate increase in property value and tax value.	13	Yes
S-8	South Ponte Vedra Nearshore Placement	Could provide moderate storm damage reduction dependent on migration of fill.	Beach recreation could be maintained or improved dependent on fill migration. Nearshore recreation such as surfing and fishing could be impacted negatively or positively for a period of time after initial placement and future periodic placements.	Beach dune recreation would be maintained.	Consistent with Federal law.	Costs undetermined at this stage.	Minimal improvement to life safety risk due to hurricane evacuation route protection. Minimal protection of public facilities (parking, beach access, bathrooms).	Minimal protection of property value and tax value.	9	Yes	
S-8	Vidano Nearshore Placement	Could provide moderate storm damage reduction dependent on migration of fill.	Beach recreation could be maintained or improved dependent on fill migration. Nearshore recreation such as surfing and fishing could be impacted negatively or positively for a period of time after initial placement and future periodic placements.	Beach dune recreation would be maintained.	Supported by federal law except in CBRA zone.	Costs undetermined at this stage.	Minimal improvement to life safety risk due to hurricane evacuation route protection. Minimal protection of public facilities (parking, beach access, bathrooms).	Minimal protection of property value and tax value.	8	No	
S-9	Emergent Breakwaters	As a stand-alone measure, emergent breakwaters could reduce storm damage reduction.	Beach recreation could be maintained or improved dependent on such as surfing could be negatively impacted.	Beach dune recreation would be maintained.	Supported by Federal law except in CBRA zone.	Costs undetermined at this stage.	Potential negative impacts to sea turtle nesting habitat and migrating dependent on migration of fill.	Minimal improvement to life safety risk due to hurricane evacuation route protection. Minimal protection of public facilities (parking, beach access, bathrooms).	Minimal protection of property value and tax value.	9	Yes
S-10	Dunes and Vegetation	Could improve storm damage and erosion dependent on stand-alone measure.	Beach recreation could be maintained, but negatively impacted by nearshore recreation.	Beach dune recreation would be improved or maintained.	Supported by Federal law except in CBRA zone.	Costs undetermined at this stage.	Dune creation improves dune habitat for sea turtle nesting. No impact to nearshore habitat.	Minimal improvement to life safety risk due to hurricane evacuation route protection. Minimal protection of public facilities (parking, beach access, bathrooms).	Moderate increase in property value and tax value.	11	Yes

Carried Forward 
  Eliminated 
  Fully Meets Obj/Constraint 
  Partially Meets Obj/Constraint 
  Does NOT Meet Obj/Constraint

Summer Haven Non-Structural Measures										
MEASURES	PROJECT OBJECTIVES			PROJECT CONSTRAINTS	FOUR ACCOUNTS				Measure Carried Forward (Yes/No)	
	Reduce Storm Damage to Infrastructure, Including SR AIA	Maintain Existing Recreation (Beach and Nearshore)	Maintain Environmental Quality Including Beach/Dune Interaction		National Economic Development (NED)	Environmental Quality	Other Social Effects	Regional Economic Development (RED)		Total
Summer Haven Nonstructural Measures (NS)										
NS-5 Relocation of Structures	Relocating damageable elements would reduce damages.	No impact to nearshore recreation. Eventual narrowing of beach could cause loss of beach recreation.	Relocation could reduce private shore protection measures in the southern reach and maintain beach/dune interaction. Eventual beach/dune system could be worn ocean and Old AIA would limit or eliminate interaction.	Consistent with Federal law.	Costs undetermined at this stage.	Eventual narrowing of beach/dune system between ocean and Old AIA would limit or eliminate habitat. No impact to nearshore recreation. Minimal change to other factors.	Small risk due to hurricane evacuation route damage. Moderate risk to loss of public facilities (parking, beach access, bathrooms). Negative effect on community cohesion due to perceived inequality.	Loss of property value and tax value. Loss of other revenue related to existing beach as long-term erosion continues.	7	No
NS-6 Flood Proofing of Structures	Increasing construction standards could decrease damage to future construction.	No impact to nearshore recreation. Loss of beach recreation.	Natural and artificial loss due to private shore protection measures.	Implemented by state/local government and consistent with Federal law.	Costs undetermined at this stage.	Possible loss of dune habitat. Loss of turtle nesting habitat due to decreased beach/dune width and private shore protection measures. Minimal change to other factors.	Increased requirements/restrictions on future construction are typically unfavorable.	Loss of property value and tax value. Loss of other revenue related to existing beach as long-term erosion continues.	6	No
NS-7 Acquisition of Land and Structures	Removing damageable elements and conversion of property to residential would decrease storm damage reduction.	Creation of natural area/park would not impact beach recreation. This assumes removal of Old AIA in southern reach.	Creation of natural area and removal of Old AIA would maintain beach/dune interaction.	Consistent with Federal law.	Costs undetermined at this stage.	Creation of natural area/habitat would improve environment.	Overall, public may view measure as beneficial to local interests.	Minimal increase with creation of parkland and eco-tourism benefits.	13	Yes

Carried Forward  
  Eliminated  
  Fully Meets Obj/Constraint  
  Partially Meets Obj/Constraint  
  Does Not Meet Obj/Constraint

ST. JOHNS COUNTY COASTAL STORM RISK MANAGEMENT PROJECT  
 South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches  
 INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT  
 3-21

Summer Haven Structural Measures											
MEASURES	PROJECT OBJECTIVES		PROJECT CONSTRAINTS		FOUR ACCOUNTS					Measure Carried Forward (Yes/No)	
	Reduce Storm Damage to Infrastructure, Including SR A1A	Maintain Existing Recreation (Beach and Nearshore)	Maintain Environmental Quality Including Beach/Dune Interaction	Consistent with Federal Laws	National Economic Development (NED)	Environmental Quality	Other Social Effects	Regional Economic Development (RED)	Total		
Summer Haven Structural Measures [S]	Beach recreation would be maintained or improved. Nearshore recreation such as surfing and fishing could be impacted (negatively or positively) for a period of time after initial nourishment and periodic renourishments.	1	2	Supported by Federal law except in CBRA zone.	1	1	1	Moderate increase to RED through improvement of tourism/beach economy. Minimal protection of property value and tax value in northern reach due to existing protection provided by revetment. Increased protection fees in southern reach.	2	11	Yes
S-4 Beach Nourishment	Continuous nourishment structures of lengths of shoreline would maximize storm damage reduction.	2	2	Supported by Federal law except in CBRA zone.	1	1	1	Empirical evidence indicate potential negative effects to benthic invertebrates and nearshore habitat are for short periods of time, with habitat recovering within one year. Positive impact to sea turtle nesting habitat.	2	1	Yes
S-5 Groins	In combination with beach nourishment and periodic renourishments, periodic renourishments should be reduced due to stabilization effects of groins.	1	1	Supported by Federal law except in CBRA zone.	1	1	1	Periodic renourishments could be reduced due to stabilizing effect of groins. Empirical evidence indicate potential negative effects to benthic invertebrates and nearshore habitat from beach nourishment are for short periods of time, with habitat recovering within one year. Positive impact to sea turtle nesting habitat.	2	1	Yes

Carried Forward  
  Eliminated  
  Fully Meets Obj/Constraint  
  Partially Meets Obj/Constraint  
  Does Not Meet Obj/Constraint

Summer Haven Structural Measures											
MEASURES	PROJECT OBJECTIVES			PROJECT CONSTRAINTS	FOUR ACCOUNTS					Measure Carried Forward (Yes/No)	
	Reduce Storm Damage to Infrastructure, Including 3C A/V	Maintain Existing Recreation (Beach and Nearshore)	Maintain Environmental Quality including Beach/Dune Interaction		Consistent with Federal Laws	National Economic Development (NED)	Environmental Quality	Other Social Effects	Regional Economic Development (RED)		Total
Summer Haven Structural Measures [S]											
S-9 Emergent Breakwaters	As a stand-alone measure, emergent breakwaters could improve property damage reduction.	Beach recreation could be maintained. Nearshore recreation such as surfing could be negatively impacted.	Beach/dune interaction would be maintained.	Supported by Federal law except in CBA zone.	Costs undetermined at this stage.	Potential negative impacts to sea turtle nesting activities and hatching/entrapment.	Minimal improvement to life expectancy, hurricane evacuation route protection. Minimal protection of property value and tax value. Minimal protection of public facilities (parking, beach access, bathrooms).	No change.	0	8	No
S-10 Dunes and Vegetation	Could improve storm damage reduction as a stand-alone measure.	Beach recreation could be maintained. No impact to nearshore recreation.	Beach/dune interaction would be maintained or improved.	Supported by Federal law except in CBA zone.	Costs undetermined at this stage.	Dune creation improves dune habitat and potentially beach habitat for sea turtle nesting. No impact to nearshore habitat.	Minimal improvement to life expectancy, hurricane evacuation route protection. Minimal protection of property value and tax value. Minimal protection of public facilities (parking, beach access, bathrooms).	Moderate increase to RED through improvement of tourism/beach economy.	2	11	Yes

Carried Forward  
  Eliminated  
  Fully Meets Obj/Constraint  
  Partially Meets Obj/Constraint  
  Does Not Meet Obj/Constraint

constructed in Brevard County, Florida, have been problematic, mainly due to the difficulty in maintaining appropriate sand cover over the structure. Sand-covered soft structures are likely to operate best in combination with beach nourishment.

S-4: Beach Nourishment. This is the most common type of structural measure constructed for large storm damage reduction projects in Florida. The Florida coastline is typically composed of straight sand beaches periodically interrupted by inlets and other man-made structures, but with few natural obstructions. This creates an environment where sediment transport patterns span large areas which the construction structures can easily interrupt. Because of this, constructing a beach system with natural storm damage reduction and habitat functions typically serves as the most effective and environmentally sound solution.

S-5: Groins: Groins are typically constructed to stabilize a sandy beach in isolated sections of shoreline with high erosion rates (hot spots). Constructing groins on long straight sections of sandy beach, such as South Ponte Vedra and Vilano beaches, can cause erosion to adjacent beaches downdrift of the sand transport flow. Although the R114 vicinity in Vilano Beach is considered a hotspot, other measures, such as beach nourishment, would be more likely to meet project objectives without causing downdrift impacts. Groins will not be evaluated in the South Ponte Vedra Beach or Vilano Beach reaches. However the Summer Haven reach could benefit from groins, especially if constructed near the southern end of the existing revetment where breaches have occurred. Previous beneficial use placements of sand dredged from navigation projects have eroded at very high rates from this area and could be stabilized with groins.

S-6: Submerged Artificial Reefs. Such a structure is typically constructed to protect isolated areas experiencing erosion and to prevent sand from eroding in the cross shore direction. Construction on a long straight beach such as South Ponte Vedra or Vilano beaches may cause negative impacts on adjacent beaches. The cost to construct structures the length of the study area would likely be excessive. There would also be significant difficulties with construction and maintenance since the structure would be located in the surf zone. Construction of these structures in Summer Haven could be evaluated further, however, material costs for construction would likely exceed those for other structures (such as groins) that could provide similar benefits. Due to these points, submerged artificial reefs are eliminated from further analysis.

S-7: Submerged Artificial Multi-Purpose Reefs. These structures are typically constructed along isolated areas of high erosion and particularly in order to mitigate for impacts to recreation (such as surfing) and/or habitat. Negative impacts, as described for S-6, may not be such a factor with these reefs since they are constructed in deeper water. The technology is relatively new compared to other structural measures. However, construction techniques are improving, which could lower costs and improve performance. Construction of such a measure would be best offshore of an erosional hotspot, such as in the R114 vicinity of Vilano Beach or offshore of the Summer Haven breach, just south of the constructed revetment.

S-8: Nearshore Placement (South Ponte Vedra Beach reach only). Typically, nearshore placement is conducted when a sand source's characteristics do not match the native beach and direct placement on

Structures. The non-federal sponsor or state would not be as limited and may choose to implement other alternatives without Federal assistance.

There is also a CBRS unit located in the Vilano Beach reach that extends from just south of R114 to just south of R116, a distance of approximately 2,000 feet. Although no Federal expenditures are permitted in the unit that would be inconsistent with the purposes of the act, some alternatives may be implementable for the remainder of the reach. The location of the unit would allow for certain alternatives, such as beach nourishment, to be continuously implemented for justifiable lengths of the South Ponte Vedra Beach and Vilano Beach reaches, ending at the northern border of the CBRS unit. USFWS is amenable to beach nourishment next to a CBRS unit as long as natural sediment transport through the CBRS unit is not impeded. Further, placement can occur in a CBRS unit if the cost is incurred entirely by the non-federal sponsor.

Finally, the St. Augustine Inlet system is almost entirely located within a CBRS unit. The existing St. Augustine project currently obtains sand from this system, and the project has used this sand source for approximately 15 years. USACE initially coordinated with USFWS on the CBRS units in the project area on May 20, 2016, and provided additional information on the sand source location in a letter dated October 12, 2016. USFWS provided their determination that the use of the St. Augustine Inlet system as a sand source for this project was consistent with the purposes of the CBRA in a letter dated October 25, 2016.

Beach-fx modeling of the FWOP condition indicates very limited damages in the Vilano Beach reach from R117 through R122 at the St. Augustine Inlet. This indicates that it is highly unlikely any alternatives would provide a benefit justifying their cost to implement. Due to this, R117 – R122 of the Vilano Beach reach is eliminated from further analysis. Only the portion from R104 – R117 will be considered further.

#### Alternatives for South Ponte Vedra Beach and Vilano Beach reaches

- Acquisition of Land and Structures (NS-7)
- Beach nourishment (S-4)
- Dunes and vegetation (S-10)
- Beach nourishment (S-4) and sand covered soft structure (S-3)
- Beach nourishment (S-4) with emergent breakwaters (S-8)
- Beach nourishment (S-4) and multi-purpose artificial reef (S-7)

#### Alternatives for Summer Haven reach

In northern reach only, north of CBRS unit

- Beach nourishment (S-4)
- Beach nourishment (S-4) with multi-purpose artificial reef (S-7)
- Beach nourishment (S-4) with groin construction (S-5)

In southern reach only, within CBRS unit

- Acquisition of Land and Structures (NS-7)

As alternatives are developed, the alternative evaluation criteria of completeness, effectiveness, efficiency, and acceptability are considered. Completeness is satisfied by ensuring that the alternatives



Intracoastal Waterway (IWW) in the vicinity of Matanzas Inlet typically results in the beneficial placement of dredged sand within the Summer Haven Reach.

### 3.9 SECONDARY SCREENING: SCREENING WITH ROUGH ORDER OF MAGNITUDE COSTS

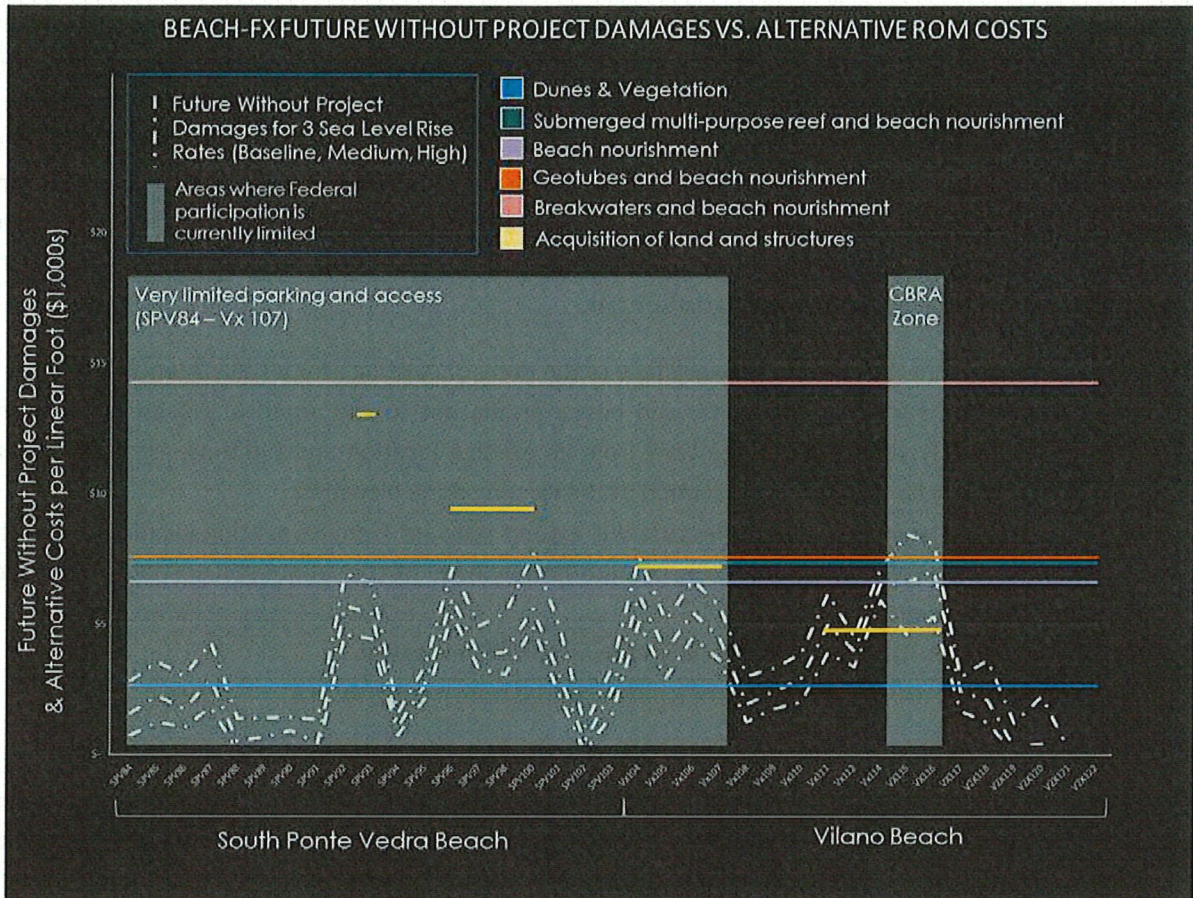
Elimination of the Summer Haven Reach resulted in further development of the following alternatives for the South Ponte Vedra Beach and Vilano Beach reaches:

- A. Buyout of Structures and Land Acquisition (NS-7)
- B. Beach nourishment (S-4)
- C. Dunes and vegetation (S-10)
- D. Beach nourishment (S-4) with sand covered soft structure (S-3)
- E. Beach nourishment (S-4) with emergent breakwaters (S-8)
- F. Beach nourishment (S-4) with submerged multi-purpose artificial reef (S-7)

In order to screen these alternatives prior to modeling alternatives in Beach-fx, rough order of magnitude (ROM) cost estimates were developed for each of the alternatives. The ROM cost estimates were developed using information from similar historical projects. The estimates were based on implementing a measure along one mile of shoreline. It was assumed that it would not be feasible, or practical, to implement any alternatives along a stretch of shoreline less than one mile. These ROM costs were brought to present value (PV) based on maintenance assumptions over 50 years, and broken down to a cost per linear foot (LF) of shoreline, shown in Table 3-2.

The four accounts, National Economic Development (NED), Environmental Quality (EQ), Other Social Effects (OSE), and Regional Economic Development (RED) are also shown in Table 3-2 for comparison.

PAGE INTENTIONALLY BLANK



**Figure 3-1.** Beach-fx Future Without-Project Damages vs. Alternative ROM Costs.

This step resulted in the following alternatives being carried forward for modeling in Beach-fx:

- Acquisition of land and structures in Beach-fx reaches 111 to 116 (Vilano Beach)
- Dunes and vegetation in Beach-fx reaches 92-101 (South Ponte Vedra) and 104-116 (Vilano Beach)
- Beach nourishment in Beach-fx reaches 92-101 (South Ponte Vedra) and 104-116 (Vilano Beach)

For Beach-fx modeling and evaluation of alternatives, the acquisition of land and structures alternative already had an adequate cost estimate. The two other alternatives were developed further for specific application in the designated reaches and more detailed cost estimates were prepared. Descriptions of the alternatives are as follows:

**Acquisition of Land and Structures:** This alternative would allow the shoreline to erode in the study area with a loss of land. Parcels, both developed and undeveloped, vulnerable to storm damage would be bought, and structures would be demolished. Parcels would be managed by the non-federal sponsor, remaining undeveloped into the future and reducing future storm damages.

Figure 3-2 shows profile views of the beach nourishment, dunes and vegetation, and a combination of both alternatives.

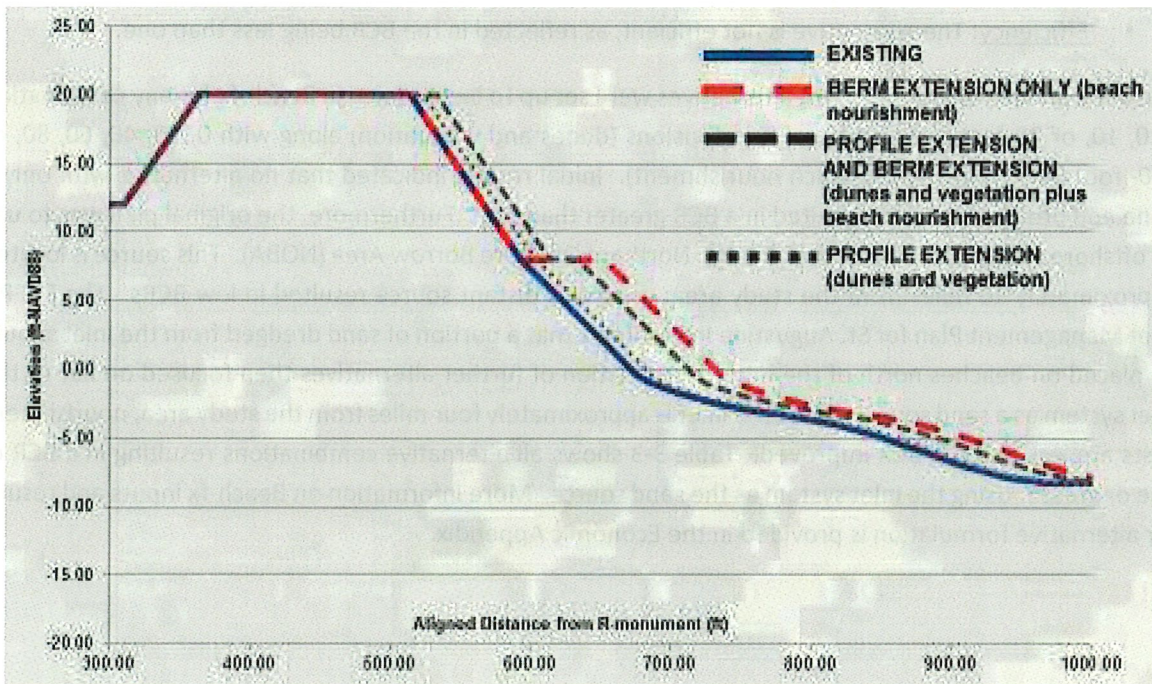


Figure 3-2. Profile view of dunes and vegetation and beach nourishment combinations.

### 3.9.1 FINAL SCREENING: FUTURE WITH PROJECT MODELING IN BEACH-FX

The non-structural alternative of Acquisition of Land and Structures in Beach-fx reaches 111 to 116 was modeled in Beach-fx by starting with a copy of the FWOP model setup, then deactivating all of the damage elements that were to be bought out and setting all of the lots to be bought out as unable to be armored. The Future With-Project (FWP) damages were compared to the FWOP damages to determine the benefits of this alternative over 50 years. This alternative only prevents 28% of the FWOP damages in reaches 111 to 116. Most of the FWOP damages in this area are associated with SR A1A and future armoring costs to protect the road. The alternative does nothing to prevent these damages. USACE, Jacksonville District Real Estate estimated the cost of this alternative to be \$30,226,584. The results showed that this alternative would not be economically justified, with a BCR of 0.45.

Additionally, the alternative did not meet the efficiency criterion and only partially meets the effectiveness criterion of the Principles and Guidelines (P&G) screening criteria:

**Table 3-3. Results Summary for Beach-fx Future With-Project Modeling (discount rate of 3.125%).**

Alternative Number	Dune and Profile Extension* (ft)	Berm Extension** (ft)	Shoreline Extent (Beach-fx Reaches)	Project Length (miles)	Average Nourishment Interval (years)	Average Annual Project Cost	Average Annual Project Benefits	Benefit to Cost Ratio	Average Annual Project Net Benefits
1	0	100	104 to 116	2.6	16	\$ 1,650,000	\$ 1,823,000	1.10	\$ 173,000
2	10	80	104 to 116	2.6	16	\$ 1,584,000	\$ 1,759,000	1.11	\$ 175,000
3	0	80	104 to 116	2.6	15	\$ 1,512,000	\$ 1,777,000	1.18	\$ 265,000
4	10	60	104 to 116	2.6	13	\$ 1,508,000	\$ 1,850,000	1.23	\$ 342,000
5	0	60	92 to 116	4.8	16	\$ 2,435,000	\$ 2,797,000	1.15	\$ 362,000
6	0	60	104 to 116	2.6	12	\$ 1,435,000	\$ 1,845,000	1.29	\$ 410,000
7	10	40	104 to 116	2.6	12	\$ 1,408,000	\$ 1,689,000	1.20	\$ 281,000
8	0	40	92 to 116	4.8	11	\$ 2,276,000	\$ 2,679,000	1.18	\$ 403,000
9	0	40	104 to 116	2.6	10	\$ 1,380,000	\$ 1,647,000	1.19	\$ 267,000
10	20	20	92 to 116	4.8	12	\$ 2,376,000	\$ 2,526,000	1.06	\$ 150,000
11	20	20	104 to 116	2.6	10	\$ 1,405,000	\$ 1,514,000	1.08	\$ 109,000
12	10	20	92 to 116	4.8	9	\$ 2,323,000	\$ 2,329,000	1.00	\$ 6,000
13	10	20	104 to 116	2.6	9	\$ 1,380,000	\$ 1,417,000	1.03	\$ 37,000

Notes:  
 Values based on 30 iteration runs, preliminary cost estimates, and only include structure, content, & armor damage.  
 Table is sorted by length of horizontal seaward dune and berm extension from greatest to least.  
 \*Value indicates the horizontal seaward extension of the dune and entire profile (feet). At a minimum, the 2015 dune profile is maintained.  
 \*\*Value indicates the horizontal seaward extension of the berm (feet) in addition to the dune and profile extension.

Alternative 6 results in the greatest net benefits. This alternative includes a 60-foot berm extension and maintenance of the 2015 dune position, but no extension of the dune and profile.

Table 3-3 includes alternatives that cover portions of both the South Ponte Vedra Beach and Vilano Beach reaches. As noted elsewhere in this report, the South Ponte Vedra Beach reach contains very limited public access and parking. Continued coordination with the sponsor on this issue resulted in the determination that no additional public access would be added to the reach prior to initial construction of any potential project. Additionally, the reach is separable from the Vilano Beach reach, meaning that no construction of a project in the South Ponte Vedra Beach reach has no impact on project performance in the Vilano Beach reach. **These factors resulted in screening out of the South Ponte Vedra Beach reach from further formulation.**

Screening out of the South Ponte Vedra Beach reach resulted in consideration of alternatives from Beach-fx reaches 104 through 116 in the final array. The top two alternatives covering these reaches were run in Beach-fx using 100 iteration simulations. The results of these simulations were used to determine the NED Plan. The results of the alternative comparison are presented in Table 3-4. The NED Plan is the plan with a BCR greater than one which maximizes net benefits. The NED Plan is Alternative 6 from Beach-fx reaches 104 - 116. As shown in Table 3-3, Alternative 6 is bracketed by a larger alternative, #3, and a smaller alternative, #9, demonstrating that a larger or smaller project would not result in greater net

last added increments, with the added idea of separation or detachment of the increment from the whole.” “Separable elements usually must be incrementally justified.”

Incremental analysis has been incorporated throughout plan formulation. The original study reaches, South Ponte Vedra Beach, Vilano Beach (R104 – R117), Vilano Beach (R117 – R122), and Summer Haven were designated based on geography, erosion rates, and the ability to be constructed as separable elements. As described earlier in this report R117 – R122 of the Vilano Beach reach was screened out due to the limited potential for justification. The Summer Haven reach was screened out for similar reasons. Figure 3-1 then screened and scaled potential alternatives, further refining the incremental analysis within the separable reaches. Finally, the South Ponte Vedra Beach reach was screened out, supported in part by the fact that it was separable from the Vilano Beach reach. Further formulation of the Recommended Plan then proceeded for the justifiable shoreline length.

On a long straight sandy coast like the Recommended Plan area, it is assumed that a project of less than approximately one mile of shoreline length would not be implemented as a separate action or project. Therefore the Recommended Plan area was divided into three separable elements of roughly one mile, as shown in Table 3-5.

**Table 3-5.** Incremental Analysis of the Recommended Plan (discount rate of 3.125%).

JUSTIFICATION OF SEPARABLE ELEMENTS (AVERAGE ANNUAL TERMS)				
Model Reaches	Capped Benefits Per Separable Element	Certified Placement Cost Per Separable Element	Capped Net Benefits Per Separable Element	Approx Length of Separable Elements (miles)
104-107	\$ 737,000	\$ 317,000	\$ 420,000	0.8
108-111	\$ 527,000	\$ 344,000	\$ 183,000	0.8
112-116	\$ 1,053,000	\$ 449,000	\$ 604,000	1

As shown in Table 3-5, each separable element has positive net benefits, demonstrating that each is incrementally justified. Figure 3-3 presents the same data with the blue line indicating that net benefits remain positive across all three elements.

CHAPTER 4  
RECOMMENDED PLAN

## 4 RECOMMENDED PLAN

The Recommended Plan will provide Coastal Storm Risk Management (CSRМ) to a number of residences and commercial structures, including 105 single-family residences, 9 multi-family residences, and 5 commercial structures.

The Recommended Plan will also reduce damages to a key piece of critical infrastructure, SR A1A, increasing the accessibility of the Recommended Plan area and uninterrupted ingress/egress of emergency vehicles and affected population during storm events, as well as the daily traffic count of up to 14,000 vehicles per day (<http://www2.dot.state.fl.us/floridatraficonline/viewer.html>).

According to the 2010 census, there are approximately 2,500 residents within the Recommended Plan area, and this population increases periodically throughout the year due to tourism. Notably, tourism can increase the population during summer months when the Recommended Plan area is most susceptible to hurricanes.

- **Description:** The Recommended Plan is Alternative 6, which includes construction of a 60-foot equilibrated berm extension from R103.5 to R116.5 along 2.6 miles of shoreline. The project template will include a dune feature that reflects the average 2015 dune position. Maximum length tapers of one thousand feet will extend from the northern and southern ends of the berm extension, connecting the extension to the existing shoreline. The addition of tapers results in sand placement from R102.5 to R117.5 along 3 miles of shoreline. A dredge will be used to fill the template with sand from the St. Augustine Inlet system, including the ebb, flood, Vilano Point shoals, and the Federal navigation channel and any associated shoals.
- **Average # Nourishment Events:** 1 initial construction event, 3 periodic nourishment events
- **Average Volume of Initial Construction:** 1,310,000 cubic yards
- **Average Volume of Each Periodic Nourishment:** 866,000 cubic yards
- **Average Periodic Nourishment Interval:** 12 years
- **Initial Construction Duration:** approximately 3.3 months

### 4.1 PROJECT DESIGN

The project design can be described by three factors; the dimensions of the dune, dimensions of the berm, and shoreline slopes.

#### 4.1.1 PROJECT DUNE

Existing dune elevations in the Recommended Plan area are between +14 and 20 feet NAVD88, generally increasing moving from south to north. Evaluation of the design alternatives has shown that the existing elevations, when combined with berm and/or dune extension, provide sufficient protection. Therefore, no additional elevation is included in the selected design plan.



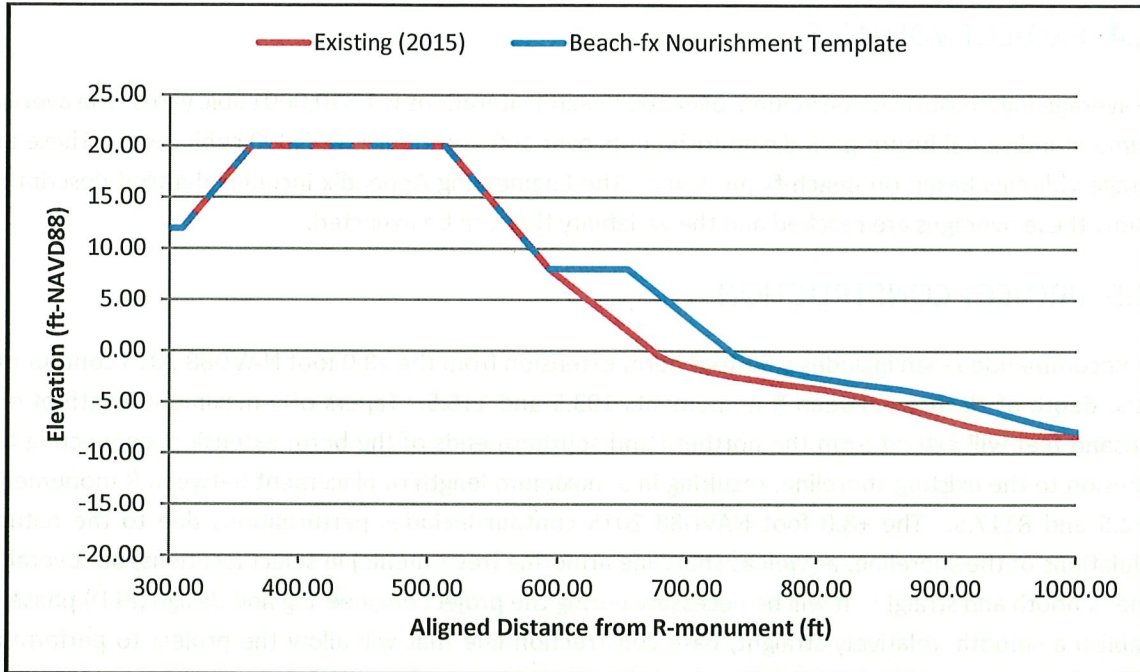


Figure 4-1. Typical Existing Idealized Profile and Nourishment Template.

### 4.1.3 PROJECT BEACH SLOPES

After waves adjust and sort the placed sand, the sand is expected to settle into an equilibrium beach slope, similar to the native beach. The native beach slopes in the area of the Recommended Plan vary between 1V:5H (1 vertical foot for every 5 horizontal feet) to 1V:10H at the dune, between 1V:9.09H and 1V:10H along the berm to the water's edge, and are round 1V:50H from the water's edge to -12 foot NAVD88. The estimate of the slope of the material after adjustment is based on averaging the beach profile slopes of the native beach from the mean low water datum to the approximate location of the 12-foot depth contour. Since sand from the sand source was determined to be a near match to the gradation of the existing beach, it is expected that the placed sand will equilibrate to a shape similar to the existing profile.

It is unnecessary and impractical to artificially grade beach slopes below the low water elevation since they will be shaped by wave action. For this reason, the front slope of the sand placed at the time of construction may differ from that of the natural profile. The final slope of the placed sand depends on the characteristics of the sand and the wave climate in the project area. With steep initial slopes, the sand will quickly adjust to the natural slopes.

Planning of renourishment events will be based on performance of the project. A survey of the project area (such as a monitoring or post-storm survey) will be analyzed to determine if berm erosion is progressing as expected. Volume changes between the latest survey, the design template, and the construction template will be calculated. If the project has lost sufficient volume due to storms, a renourishment may be necessary. Beach-fx has been used to determine the average renourishment interval of 12 years. It should be emphasized that this is an average and the need to renourish the project could occur before, or after, this period depending on storm events. The Engineering Appendix provides additional detail on renourishment triggers.

The average volume of individual future periodic nourishments over 100 iterations is 866,000 cubic yards. With an average time interval of 12 years, the nourishment years would be 2020 for initial construction, followed by the following years for periodic nourishment: 2032, 2044, and 2056. An additional volume of sand will be placed in 2056 to carry the project throughout its period of Federal participation. It would be uneconomical to plan for a periodic nourishment in 2068 with only two years left in the period of Federal participation.

#### 4.1.7 PROJECT MONITORING

Physical monitoring of the recommended project is necessary to assess project performance and to ensure that project functionality is maintained throughout the 50-year period of Federal participation in the project. The monitoring plan will be directed primarily toward accomplishing systematic measurements of the beach profile shape. Profile surveys should provide accurate assessments of dune and beach-fill volumes and a basis for assessing post-construction dune and beach-fill adjustments, as well as variation in the profile shape due to seasonal changes and storms. Monitoring will play a vital role in determining if project renourishment is necessary. Post-construction monitoring activities include topographic and bathymetric surveys of the placement area and adjacent areas on an annual basis for 3 years following construction and then biannually until the next construction event. Other monitoring efforts include bathymetric surveying of the sand source, which will be done as part of the pre-construction engineering and design (PED) phase prior to each nourishment. Measured wind, wave, and water level information will be obtained from the best available existing data sources. This data will be applied in support of previously discussed monitoring efforts. It will also be used to periodically assess the state of sea level rise and to determine if reassessment of the project volumes and/or renourishment intervals is required.

#### 4.1.8 OPERATIONS AND MAINTENANCE CONSIDERATIONS

33 U.S. Code § 426e (Federal aid in protection of shores) states, "When in the opinion of the Chief of Engineers the most suitable and economical remedial measures would be provided by periodic beach nourishment, the term "construction" may be construed for the purposes of sections 426e to 426h-1 of

2. Inlet sand transfer material shall be placed in designated critically eroded areas to the north or south of the inlet between R84 and R152, St. Johns County, in accordance with Implementation Strategy #1.
3. Inlet dredge material may be obtained from the Federal navigation channel, the intracoastal waterway channel, and encroaching flood shoals adjacent to the Federal channel, including the Porpoise [Vilano] Point borrow area, for placement in accordance with Implementation Strategies #1 and #2.

The Recommended Plan area is to the north of St. Augustine Inlet, between R102.5 and R117.5. As detailed in the Geotechnical Appendix, there is adequate beach quality sand (meeting FDEP permitting requirements for beach placement) to meet the estimated sand needs of the Recommended Plan. Currently, there is approximately 6.5 million cubic yards of compatible sand available within the inlet system. This volume is more than adequate to meet the initial construction volume. The periodic nourishment volume is 866,000 cubic yards every 12 years. The inlet management plan states that the bypassing objective is 278,000 cubic yards per year, of which one third should go to beaches to the north. One third of the bypassing objective is 92,666 cubic yards per year. Over 12 years, 1.1 million cubic yards would be available to meet the 866,000 cubic yard need for a periodic nourishment event.

Use of the inlet system would implement a Regional Sediment Management (RSM) strategy where maintenance of Federal navigation features can be combined with a Federal CSRSM project, realizing significant cost savings. It would be ideal if construction of the Recommended Plan could be coordinated with future construction of the already authorized and constructed Federal Shore Protection Project at St. Augustine Beach, south of the inlet. Such a strategy would realize significant cost savings and minimize potential environmental impacts from multiple dredge mobilizations, as outlined in the Engineer Research and Development Center (ERDC) 2016 technical report, *Regional Sediment Management Strategies for the Vicinity of St. Augustine Inlet, St. Johns County, Florida*, ERDC/CHL TR-16-12.

The existing Federal Shore Protection Project at St. Augustine Beach uses a hydraulic dredge to acquire sand from the St. Augustine Inlet system, and the Recommended Plan could potentially use the same dredge. Dredging of the Federal navigation channel through St. Augustine inlet also typically uses a hydraulic dredge. Therefore three Federal projects in the same vicinity could potentially use the same plant for construction or maintenance. Each time construction or maintenance of the projects could be combined would result in minimization of environmental impacts and a cost savings of at least \$4,000,000 by combining three separate dredge mobilization into one.

The existing St. Augustine Project has an average periodic nourishment interval of every five years. The Recommended Plan has an average periodic nourishment interval of twelve years. Since the given intervals are average it is likely that the periodic renourishments, or initial construction of the Recommended Plan, could coincide.

Use of the inlet system as the Recommended Plan's sand source is similar to any project's dependency on a sand source within state waters and subject to applicable regulation. The inlet system lies within CBRS Unit P05, and its use as a sand source for the Recommended Plan has been coordinated with the U.S. Fish

instructs that nearshore land values be used to estimate the value of land lost. The USACE, Jacksonville District Real Estate Department estimated a nearshore land value of \$14.00 per square foot for the St Johns Study Area.

Using the analysis technique described, the total present value of land loss benefits over the 50-year period of Federal participation is estimated at \$7,314,000, or \$278,000 in average annual terms (2.875% discount rate).

According to ER-1105-2-100, incidental recreation benefits can be calculated for CSRM projects. While recreation benefits cannot make up more than 50% of the total benefits needed for project justification, the guidance states, “if the criterion for participation is met, then all recreation benefits are included in the benefit to cost analysis.”

Additionally, ER-1105-2-100 specifies that benefits arising from recreation opportunities created by a project be measured in terms of willingness to pay. As described in the Economics Appendix, the unit day value (UDV) method was used to calculate the incidental recreation benefit provided by the Recommended Plan, resulting in an estimated total present value of recreation benefits of \$18,224,000 or \$692,000 average annual terms (2.875% discount rate). Table 4-3 provides a summary of the NED Plan with land loss and recreation benefits added, expressed in average annual equivalent terms.

**Table 4-3. Economic Summary.**

<b>Economic Summary</b>	<b>Primary Storm Damage Reduction Benefits</b>	<b>Primary Storm Damage Reduction + Incidental Recreation Benefits</b>
Price Level	FY17	FY17
FY17 Water Resources Discount Rate	2.875%	2.875%
Average Annual Structure & Contents Damage & Armor Costs Benefits	\$1,683,000	\$1,683,000
Average Annual Land Loss Benefits	\$278,000	\$ 278,000
Average Annual Incidental Recreation Benefits	\$ -	\$ 692,000
Average Annual Total Benefits	\$1,961,000	\$ 2,653,000
Average Annual Costs	\$2,031,000	\$2,031,000
Average Annual Net Benefits	<b>(\$70,000)</b>	<b>\$622,000</b>
<b>Benefit Cost Ratio</b>	<b>0.97</b>	<b>1.3</b>

## 4.6 COMPLIANCE WITH EXECUTIVE ORDER (EO) 11988

EO 11988 requires Federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities."

The Water Resources Council Floodplain Management Guidelines for implementation of EO 11988, as referenced in USACE ER 1165-2-26, require an eight-step process that agencies should carry out as part of their decision-making on projects that have potential impacts to, or within, the floodplain. The eight steps reflect the decision-making process required in Section 2(a) of the EO. The eight steps and responses to them are summarized below.

**1. Determine if a proposed action is in the base floodplain; the area which has a one percent or greater chance of flooding in any given year.**

Yes, the Recommended Plan footprint is within the base floodplain. However, this project reduces damages caused by erosion, and flooding (or inundation) does not cause significant future without-project damages.

**2. If the action is in the base floodplain, identify and evaluate practicable alternatives to the action, or to location of the action, in the base floodplain.**

This document has evaluated alternatives in earlier sections. Practicable measures and alternatives were formulated and evaluated, including non-structural measures such as acquisition of land and structures.

**3. If the action must be in the floodplain, advise the general public in the affected area and obtain their views and comments.**

Scoping letters were sent to all abutting property owners, and Federal and state agencies on August 17<sup>th</sup>, 2005, and on September 16, 2008, in fulfillment of NEPA requirements. Views and comments were received from residents, the FDEP, the Florida Fish & Wildlife Conservation Commission (FWC), the State Historic Preservation Office (SHPO), and NMFS.

**4. Identify beneficial and adverse impacts due to the action and any expected losses of natural and beneficial flood plain values. Where actions proposed to be located outside the base floodplain will affect the base floodplain, impacts resulting from these actions should also be identified.**

Potential impacts associated with the Recommended Plan are summarized in Chapters 3, 4, and 7 of this report. The project will not alter or impact natural or beneficial floodplain values.

## 4.8 NON-FEDERAL IMPLEMENTATION RESPONSIBILITIES

The non-federal sponsor for the CSRM project will be St. Johns County. The non-federal project sponsor would provide an up-front cash contribution for initial construction costs of the proposed project. The amount of the non-federal up-front cash contribution would be based on cost-sharing principles reflecting shoreline use, ownership, and public access in existence at the time of construction. The non-federal sponsor shall provide the entire cost of all material placed on or seaward of private undeveloped lands and developed private lands (which are inaccessible to the public). The non-federal sponsor shall provide lands, easements, and rights-of-way and bear a portion of the administrative costs associated with land requirements. The non-federal project sponsor will be responsible for all costs of operation, maintenance, repair, rehabilitation, and replacement of project features. Section 402 of the 1986 Water Resources Development Act (33 USC 701b-12) as amended by Section 14 of the 1988 Water Resources Development Act, states that "Before construction of any project for local flood protection or any project for hurricane or storm damage reduction, that involves Federal assistance from the Secretary, the non-federal interests shall agree to participate in and comply with applicable Federal floodplain management and flood insurance programs." The non-federal sponsor and communities must be enrolled in, and in compliance with, the National Flood Insurance Program (NFIP) to receive Federal funding for a recommended storm damage reduction project. St. Johns County is enrolled in, and in compliance with, the NFIP.

## 4.9 RECOMMENDED PLAN COST SHARING

Cost-sharing percentages are based on ownership and use of parcels landward of where the full 60-foot equilibrated berm extension and 2015 dune feature will be placed. Parcels landward of the 1,000 foot tapers are not used to calculate cost sharing, but construction of the tapers will be cost shared in the calculated amount. For full Federal cost sharing, public access with adequate parking (or another way for the public to reach access, such as a public bus or beach shuttle) must be provided every ½ mile. Figure 4-3 includes public access and parking locations for the Recommended Plan area and depicts the shoreline lengths that are covered by adequate public access and parking.

**Table 4-4. Recommended Plan Cost Sharing.**

Shore Ownership and Project Purpose (as defined in ER 1105-2-100)	INITIAL CONSTRUCTION				PERIODIC NOURISHMENT*		
	Maximum Level of Federal Participation in Construction Costs	Shoreline Length (feet)	Shoreline Length x Federal Participation %	Shoreline Length x non-Federal Participation %	% of Federal Participation for Periodic Nourishment	Shoreline Length x Federal Participation %	Shoreline Length x non-Federal Participation %
I. Federally Owned	100%	0	0	0	100%	0	0
II. Publicly and Privately Owned, Protection Results in Public Benefits							
A. Coastal Storm Risk Management (CSRM) on Developed Lands (Public/Private)	65%	3,835	2,493	1,342	50%	1,918	1,918
B. CSRM on Undeveloped Public Lands **	65%	948	616	332	50%	474	474
C. CSRM on Undeveloped Private Lands	0%	603	0	603	0%	0	603
III. Privately Owned, Use Limited to Private Interests (No public access within 1/4 mile)	0%	5,922	0	5,922	0%	0	5,922
IV. CBRA Zone	0%	2,190	0	2,190	0%	0	2,190
	<b>Total Distance:</b>	<b>13,498</b>	<b>3,109</b>	<b>10,389</b>	<b>Total Distance:</b>	<b>2,392</b>	<b>11,107</b>
		<b>Cost Shares:</b>	<b>23.0%</b>	<b>77.0%</b>	<b>Cost Shares:</b>	<b>17.7%</b>	<b>82.3%</b>

#### 4.10 RECOMMENDED PLAN COSTS

The Recommended Plan total project cost, including contingency, is \$78,417,000, as shown in Table 4-5 (FY17 price levels). The Cost Appendix provides additional detail.

**Table 4-6. Recommended Plan Cost Sharing (Project First Cost) (FY17 Price Levels).**

<b>St. Johns County, FL CSRM Project</b>					
<b>Summary of Project Cost Sharing (Project First Costs) (FY17 Price Levels)</b>					
<b>R102.5 - R117.5 (total placement area, including tapers)</b>					
<b>Initial Construction</b>					
<b>Item</b>	<b>Federal Cost Share</b>	<b>Federal Cost</b>	<b>Non-federal Cost Share</b>	<b>Non-federal Cost</b>	<b>Project First Cost</b>
Coastal Storm Risk Management Costs	23.0%	\$5,712,000	77.0%	\$19,122,000	\$24,834,000
Non-federal LERRD Contribution*	0.0%	\$0	100.0%	\$943,000	
Non-federal Cash Contribution				\$18,179,000	
<b>Periodic Nourishment</b>					
Periodic Nourishment	17.7%	\$9,484,000	82.3%	\$44,099,000	\$53,583,000
<b>Initial Construction + Periodic Nourishment</b>					
Final Project Cost Share and Cost (50 years)	-	\$15,196,000	-	\$63,221,000	\$78,417,000
* Includes non-federal admin costs only					
NOTE: Dollar values are rounded					

#### 4.11 HURRICANE MATTHEW (2016) EROSION IMPACT ANALYSIS

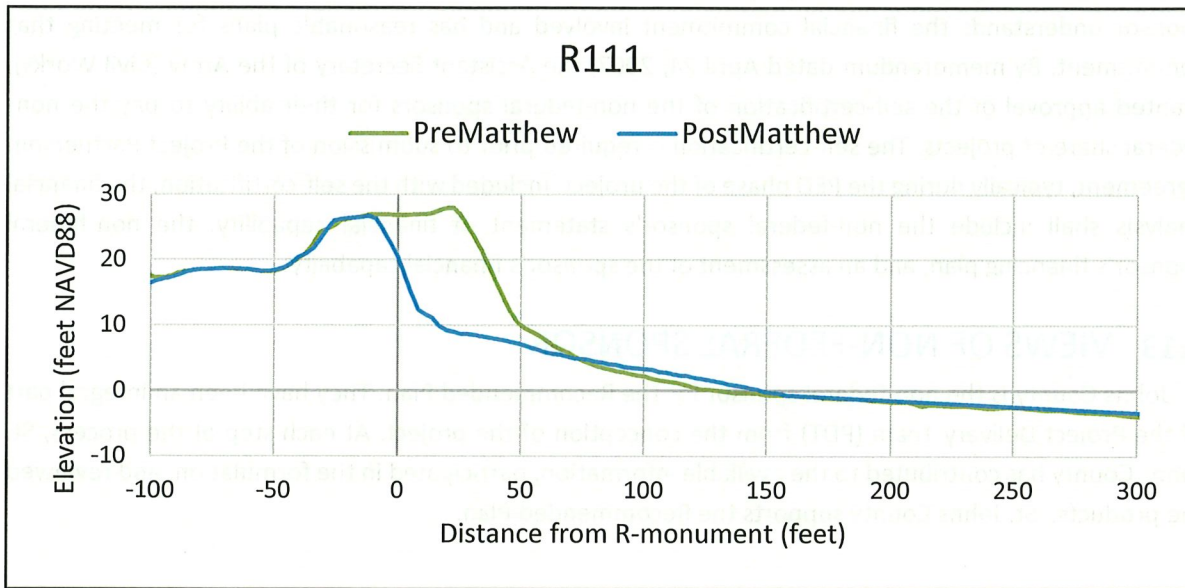
Hurricane Matthew, a strong category 3 hurricane, impacted northeast Florida from October 6th through 8th, 2016. The storm caused structural damage and dune erosion throughout the Recommended Plan area as shown in Figure 4-4, Figure 4-5, and Figure 4-6. An evaluation was completed to determine if the volume of sand eroded by Hurricane Matthew was significant enough to warrant reanalysis of the Recommended Plan.





**Figure 4-5.** Hurricane Matthew damage in the vicinity of R116 on Oct. 8, 2016. Note top of vinyl sheet pile seawall emerging from sand in foreground and dune scarping and erosion below pile-supported homes. Image courtesy of Florida Department of Environmental Protection.

For the evaluation, pre and post-storm LIDAR data collected by USACE was compared. Figure 4-7 includes pre and post-storm profiles showing the dune erosion experienced at R111, near the middle of the recommended plan area. Along the recommended plan shoreline approximately 165,000 cubic yards was eroded from the dune as a result of Hurricane Matthew. Erosional losses to the berm were minimal, as the sand eroded from the dune was spread out over the berm and nearshore area. The portions of the berm that did erode are expected to experience natural recovery in the months following the storm. However, natural recovery of dunes can take a very long time.



**Figure 4-7. Pre and Post-Storm LIDAR Profiles at R111.**

This result indicates that approximately 165,000 cubic yards of additional sand could be needed for initial construction in 2020. This volume is a relatively small amount and does not take into account any natural recovery of the dune that could occur prior to 2020. Furthermore, to understand how this volume compares to the Recommended Plan’s initial construction volume of 1,310,000 cubic yards, it is important to consider the probabilistic nature of Beach-*fx*.

Each complete Beach-*fx* model run consists of 100 iterations, with each iteration representing the 50-year planning horizon for the project. Each iteration, therefore, has a unique volume requirement for initial construction. Based on the Recommended Plan modeling, a range of volumes was determined for each initial construction event. The average initial construction volume modeled in Beach-*fx* is 1,310,000 cubic yards with a standard deviation of 189,000 cubic yards. The estimated 165,000 cubic yards of additional volume needed for initial construction as a result of Hurricane Matthew’s impact is within the standard deviation for the initial construction volume. The range of volumes for initial construction are shown in Table A-21 of the Engineering Appendix.

CHAPTER 5.0 EFFECTS OF THE RECOMMENDED PLAN

CHAPTER 5  
EFFECTS OF THE  
RECOMMENDED PLAN

## 5 EFFECTS OF THE RECOMMENDED PLAN\*

The effects of the Recommended Plan will include effects resulting from the use of the offshore sand sources identified in Section 2.2.5. The sand source is not included in the Recommended Plan; however, effects of the sand mining are discussed in the event that offshore sand may be sought as a borrow source in the future if economically justified.

### 5.1 GENERAL ENVIRONMENTAL EFFECTS\*

The environmental effects associated with the Recommended Plan are primarily temporary in nature, and most affected resources would return to pre-construction conditions either immediately after dredging (with respect to resources such as aesthetics and noise) or within one or two years (with respect to sea turtle nesting and benthic resources). However, dredging inlets and altering the shoreline has the potential to change how sediment transport occurs regionally. The use of the St. Augustine Inlet was extensively studied, and the FDEP Inlet Management Plan supports the usage of the inlet system as identified in the Recommended Plan.

### 5.2 NATURAL (GENERAL) ENVIRONMENT\*

This section is the scientific and analytic basis for the comparisons of the alternatives. Section 2 includes the effects resulting from the “no action alternative,” or the “future without-project conditions (FWOP).” The following section includes anticipated changes to the existing environment including direct, indirect, and cumulative effects as a result of the Recommended Plan, or the “future with-project conditions.”

#### 5.2.1 GENERAL CONDITIONS

##### 5.2.1.1 ST. AUGUSTINE INLET

###### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

Since the St. Augustine Inlet is currently maintained at a depth of 16 feet, the future with-project condition will not change the inlet. USACE modeled the sediment transport patterns in the ebb shoal of the inlet, and dredging the ebb shoal in the quantities proposed in the Recommended Plan will not increase shoaling rates associated with the inlet. The material from the inlet system will be distributed to the beaches north and south of the inlet in accordance with the FDEP Inlet Management Plan, which corresponds to the volumes outlined in the Recommended Plan.

If the offshore sand sources are used, there may be increased shoaling in the St. Augustine Inlet due to the increased volume of material in the sediment budget. However, the inlet will continue to be maintained as part of the Federal inlet and Intracoastal Waterway (IWW) projects. Therefore, no significant changes to the inlet are expected to occur.

2004; Thaxter et al. 2010). As a result, water clarity may play an important role in the foraging success of these, and other, species. Changes to water clarity resulting from the re-suspension of sediments during dredging operations would negatively affect the foraging capabilities of some species. However, turbidity would only be increased in the vicinity of the dredging and placement operations. In addition, the impact of increases in turbidity is likely to be dependent, both in scale and spatial extent, on initial background levels (Cook 2010). Water quality would quickly return to pre-dredging conditions upon completion of construction. Other than these effects, migratory birds would be minimally affected by dredging activities.

Although benthic organisms would be temporarily impacted at the beach placement site and at the sand source locations (including both the inlet system and the offshore sand source locations), recovery of the benthic community is expected to occur with normal seasonal recruitment patterns. Suitable foraging areas exist outside of the project area to prevent significant impacts to both shorebirds and fish species foraging on the benthic species impacted in the nearshore environment and at the ebb shoal. If construction occurs during the summer months, USACE would implement its migratory bird protection measures that include daily surveys for shorebird nesting activities. If nests were found, a buffer zone of at least 300 feet would be established around each nest. No significant adverse impacts to migratory birds are anticipated with the migratory bird protection measures in effect. Some opportunistic foraging during placement is expected by both fish and bird species. Other wildlife utilizing the dredging and placement sites would be temporarily displaced during construction.

If the offshore sand source were used, the impacts to fish and wildlife species other than those protected under the Endangered Species Act will be similar to those effects identified for the use of the inlet system.

#### 5.2.4 THREATENED AND ENDANGERED SPECIES

##### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

With the implementation of the protective measures listed in this section, USACE has determined that the Recommended Plan may affect, but is not likely to adversely affect, sea turtles in the water (may affect if a hopper dredge is used), manatees, piping plover, red knot, or whales. The Conservation Measures outlined in the 1991 National Marine Fisheries Service (NMFS) South Atlantic Division Regional Biological Opinion (SARBO; revised 1995 and 1997), the 2013 U.S. Fish and Wildlife Service (USFWS) Piping Plover Programmatic Biological Opinion (P3BO), and the 2015 USFWS Statewide Programmatic Biological Opinion (SPBO) will be adhered to for these species as appropriate. In addition, USACE has determined that the presence of a dredge in the nearshore waters and pipeline on the beach could temporarily impact the physical or biological features (PBF) and primary constituent elements (PCE) of loggerhead critical habitat unit LOGG-N-14 during construction. Hatchling egress from the water's edge to open water, and nesting female transit back and forth between the open water and the nesting beach during nesting season, could be hindered by the presence of the dredge and pipeline. However, the construction phase would typically last three to four months, approximately every 10-12 years (erosion due to storms could require more frequent events), and the daily construction activity would occur within only a small area at

ingress/egress of turtles, and waters with minimal manmade structures to promote predators and to disrupt wave patterns.

In the designation of Critical Nearshore Reproductive Habitat, NMFS indicates that dredging and disposal activities may “affect habitat conditions for efficient passage of hatchlings or females by creating barriers or dramatically altering the slope of the beach approach.” Dredging of the inlet system sand source will be located far enough away from nesting beaches to avoid impacting nesting and hatchling turtles, and will be at dredging depths shallow enough to avoid modifying wave energy reaching the shoreline. Dredging of the inlet system sand sources, or of the proposed offshore sand sources, would not “dramatically” alter the slope of the “beach approach” or disrupt wave patterns that would impact nesting female or hatchling ingress or egress to/from the beach. Additionally, in the final ruling for critical habitat, NMFS responded to a commenter that, “neither beach nourishment nor the dredging of sand from offshore borrow sites are expected to be significantly impacted by the critical habitat designation as proposed.”

Placement of sediment on the beach requires the use of a pipeline to convey the material from the dredge to the placement site. The pipeline typically includes floating and submerged components and approaches perpendicular to the beach. Though the pipeline will be located within the nearshore reproductive habitat, a pipeline located along the sea floor would not be an obstruction to ingressing/egressing sea turtles and would not affect the PCE’s that support nearshore reproductive habitat. Dredging and placement of beach-compatible sediment will not result in barriers or dramatic altering of the slope of the beach approach for nesting females because of the relatively fast equilibration of the constructed profile. The constructed profile immediately begins to equilibrate to the more natural equilibrium profile as the waves redistribute sediment along and cross-shore to the equilibration toe of fill. The beach profile will extend into the Nearshore Reproductive Habitat; however, the slope will quickly adjust and would not block or otherwise impede passage of hatchlings or females. Additionally, in the Final Rule for Nesting Beaches Critical Habitat, USFWS states that processes that “mimic these natural processes” (e.g., beach nourishment) are an important component of the physical and biological features of these high density nesting beaches. Since Critical Nearshore Reproductive Habitat is tied to the locations of these high nesting density beaches and beach nourishment projects can be essential to maintaining the long term nesting densities on highly erosive beaches, beach nourishment is not likely to adversely modify Critical Nearshore Reproductive Habitat.

Lighting on-board dredges and associated ancillary equipment/vessels is required for safe and efficient operations at night. Lighting associated with beach nourishment dredging is a temporary occurrence. However, while dredging sand sources, all lighting aboard dredges, support vessels, etc. operating within three nautical miles of sea turtle nesting beaches are limited to the minimal lighting necessary to comply with U.S. Coast Guard and/or OSHA requirements. All nonessential lighting on the dredge and supporting equipment/vessels shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to minimize illumination of the water to reduce potential disorientation effects on female sea turtles approaching the nesting beaches and sea turtle hatchlings making their way seaward from their natal beaches. Through the implementation of minimum lighting requirements on board dredges and

- If siltation barriers are used, they shall be made of material in which manatees and whales cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block entry to or exit from essential habitat.
- If a manatee were sighted within 100 yards of the project area, all appropriate precautions would be implemented by the contractor to ensure protection of the manatee. These precautions would include the operation of all moving equipment no closer than 50 feet of a manatee. If a manatee were closer than 50 feet to moving equipment or the project area, the equipment would be shut down and all placement activities would cease to ensure protection of the manatee. Placement activities would not resume until the manatee has departed the project area.
- The vessel operators shall maintain a 500-yard buffer between the vessel and any whale.
- All vessels associated with the project would operate at 'no wake' speeds at all times while in shallow waters or channels where the draft of the boat provides less than three feet clearance from the bottom. Boats used to transport personnel would be shallow draft vessels, preferably of the light-displacement category, where navigational safety permits. Vessels transporting personnel between the landing and any workboat would follow routes of deep water to the greatest possible extent. Shore crews would use upland road access if available.
- Mooring bumpers would be placed on all large vessels wherever and whenever there is a potential for manatees to be crushed between two moored vessels. The bumpers would provide a minimum stand-off distance of four feet.
- All personnel would be advised that there are civil and criminal penalties for harming, harassing, or killing manatees and whales, which are protected under the Endangered Species Act and the Marine Mammal Protection Act (discussed further in Section 6).

#### 5.2.4.4 PIPING PLOVER AND RED KNOT

##### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

As the placement area associated with the Recommended Plan is not optimal habitat for piping plover or red knot, effects (both adverse and beneficial) are minimal. Beach placement of material would temporarily impact wintering piping plover and red knot due to displacement from their foraging and roosting habitat. In addition, the benthic invertebrates on which these species feed will be affected by the placement of sand. Recovery of the benthic infauna should occur with normal seasonal recruitment patterns. During pump-out of the dredged material, there may be some opportunistic feeding at the placement area by shorebirds, including piping plover and red knot.

#### 5.2.4.5 ANASTASIA ISLAND BEACH MOUSE (AIBM)

##### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

Although AIBM have not been trapped within the GTMNERR since 2006 and are not likely to be affected by the beach placement activities, the following conditions for the AIBM from the SPBO would be followed.

Recommended Plan (R102.5 to R117.5). Since the direction of longshore sediment transport in this region is north to south, any potential rock outcrops located north of sand placement are unlikely to experience coverage by placed sand as it equilibrates.

## 5.2.6 COASTAL BARRIER RESOURCES

### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

The Federal government will not cost-share in the sand placement within Unit P04A (Usinas Beach). The proposed project does not include the construction of structures that would require Federal Flood Insurance. Although sand will be removed from Unit P05, the project will not result in effects that are contrary to the purposes of CBRA. Therefore, the Recommended Plan will not affect the Units P04A or P05 (Conch Island) with respect to the goals of CBRA. The USFWS found the project to be consistent with the purposes of CBRA in a letter dated October 25, 2016. Please see also Section 2.3.5 and Section 6.15.

## 5.2.7 WATER QUALITY

### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

The primary anticipated change in water quality at the beach placement site would be a temporary increase in turbidity. According to the State of Florida's Class III water quality standards, turbidity levels during placement of dredged material are not to exceed 29 nephelometric turbidity units (NTUs) above background levels at the edge of normally a 150-meter mixing zone, which would be the standard for the dredge and beach placement areas. Portions of the placement area are in close proximity to the Guana River Marsh Aquatic Preserve (approximately 0.5 miles), and the St. Augustine Inlet system adjacent to the Anastasia State Recreation Area. As both of these areas are classified as Outstanding Florida Waters (OFWs), increased turbidity levels at the OFWs that are a result of the dredging and placement activities at the project site cannot exceed 0 NTUs above background levels unless a variance is obtained from FDEP. In order to comply with these standards, turbidity will be monitored according to state protocols during the proposed beach placement work. If at any time the turbidity standards are exceeded, the activities causing the violation would temporarily cease.

## 5.2.8 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

As mentioned in Section 2.3.7, there are no known sources of hazardous or toxic wastes in the project area, and USACE is not aware of any records indicating these activities occurred in the project area in the past. Therefore, USACE does not anticipate that dredging in any of the proposed sand source locations would encounter hazardous, toxic, or radioactive wastes. USACE includes in all project specifications the procedures and protective measures to be taken should munitions be encountered during dredging operations.



- Hopper Dredge
- Cutterhead Dredge
- Tow Vessel
- Spreader/ Grater (Bulldozer)
- Spreader/ Grater (Front-end loader)
- Booster Pump
- Crew/ Survey Vessel
- Crane Barge/Hauler
- Tug Boats (2)

The horsepower of each piece of equipment, the hours each piece of equipment would be used each day, and the fuel consumed by that piece of equipment over a 24-hour period were determined. Additional information such as the anticipated contract duration and actual working days of each component was also determined.

Certain assumptions were made for each piece of dredging, construction, and support equipment regarding the number of hours a day that equipment would be used. These factors were utilized in the overall emissions calculations.

- Dredging vessels were assumed to be operating 24-hours a day, which does not account for downtime due to maintenance, refueling and repositioning.
- For sand placement operations using a hopper dredge, the beach-based equipment used to spread the sand and arrange the pipeline, and the booster itself were assumed to be operating approximately 5 hours a day.
- The crew boat/survey vessel was assumed to operate up to 5 hours a day.
- The two tug boats and crane barge would be used to mobilize and de-mobilize the pipeline into the selected corridor, and it is expected that the work will occur for 12 hours a day for up to 14 days.
- As actual contractor equipment is unavailable (a contract has not been awarded and USACE generally does not dictate the type of equipment a contractor may use), where a range of input values into the assessment was available, the value which would result in a “worst-case” analysis was chosen.

The daily values for each equipment type were then applied to each component of the Recommended Plan. The emissions values for the components were summed to compare against the EPA National Emissions Inventory for St. Johns County to determine the impact to air quality.

particulate matter (PM) are presented broken out on a per year basis for comparison with the per year *de minimus* standards.

**Table 5-3.** National De Minimus Annual Tons for an Area in Attainment Maintenance.

	CO	NOx	PM <sub>2.5</sub>	PM <sub>10</sub>	SOx	VOC
<i>de minimus</i> Annual Tons	100	100	100	100	100	100

**Table 5-4.** Emissions Totals (Tons/Year).

Construction Year	Duration (Months)	CO	NOx	PM <sub>2.5</sub>	PM <sub>10</sub>	SOx	VOC
2020	3.21	22.50	145.83	3.33	3.33	25.00	2.50
2032	2.52	17.66	114.48	2.61	2.61	19.63	1.96
2044	2.52	17.66	114.48	2.61	2.61	19.63	1.96
2056	2.52	17.66	114.48	2.61	2.61	19.63	1.96
2068	2.52	17.66	114.48	2.61	2.61	19.63	1.96

To date, EPA has not established CO<sub>2</sub> emission standards for temporary mobile emission sources, nor for equipment used in construction projects (e.g., dump trucks, cranes, and front end loaders). However, USACE calculated CO<sub>2</sub> emissions for each year of the project, which are reported below.

**Table 5-5.** CO<sub>2</sub> Emissions (Lbs/Year).

Construction Year	Emissions of Carbon Dioxide using a Hopper Dredge (Lbs/Year)	Emissions of Carbon Dioxide using a Cutterhead (Lbs/Year)
2020	15,587,880	5,058,214
2032	12,247,620	3,974,311
2044	12,247,620	3,974,311
2056	12,247,620	3,974,311
2068	12,247,620	3,974,311

One opportunity to decrease emissions would be to construct this project at the same time as other projects in this region, including maintenance of the IWW, maintenance of the St. Augustine Inlet, and renourishment of St. Augustine Beach. Not only would combining these projects result in cost savings, but it would reduce greenhouse gas emissions by requiring the dredge and associated equipment to mobilize only once to the project site.

waterway, site-specific hydrodynamic conditions, equipment maintenance status, and skill of the dredge plant operator (Dickerson et al., 2001).

Noise generated by the dredge may minimally impact those living on the beaches during project construction, but will likely not be too noticeable over ambient noise of wind and waves. Noise generated on the beaches by equipment placing the dredged material will be relatively low level, and will be of a short duration (construction period of approximately three to four months). Construction equipment such as booster pumps will be properly maintained to minimize effects of noise. Once dredging and beach placement have concluded, noise levels will drop back to background levels for the beach area. Since the increases to the current level of noise as a result of this project will be localized and minor, there will only be a temporary reduction in aesthetics and no expectation of adverse effects to the environment as a result of construction-related noise.

### 5.2.11 AESTHETIC RESOURCES

#### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

The aesthetics of the beach placement area would be temporarily adversely impacted during construction due to the presence of construction equipment on the beach. In the longer term, the beach aesthetics will be improved over the previously eroded shoreline with the construction of a more natural beach. Aesthetics of the sand source locations would also experience temporary adverse impacts due to the presence of dredge equipment during construction.

### 5.2.12 RECREATION RESOURCES

#### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

Recreational use of the beach, including sunbathing and surfing, would be temporarily disrupted for up to several months during construction due to the presence of construction equipment on the beach. In addition, recreational use of the inlet system and the offshore sand sources (e.g., boating, kayaking, and windsurfing) would be temporarily adversely affected by the dredging operations.

Recreational usage in the future with-project condition would be improved over the long-term due to the availability of a wider beach face.

### 5.2.13 NAVIGATION

#### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

Temporary impacts to vessel traffic could occur due to the presence of dredge equipment in St. Augustine Inlet during construction. If the inlet system is used as a sand source, the shoaling rate is not anticipated to increase in the inlet. However, an offshore sand source may cause additional shoaling in the inlet system due to the material added to the sediment budget in the region.

appropriate federally-recognized tribes. The consultation will be updated prior to project implementation. When finalized, 100% of the shoal complex will have been subject to cultural resource surveys. USACE does not expect any effects to historic properties contingent on use of buffers within the sand source areas for identified resources and targets. Consultation under Section 106 of the National Historic Preservation Act is ongoing and will be completed prior to project implementation. The project will maintain a fortuitous find policy that will halt use of an area should any resources be identified during maintenance dredging.

### 5.2.15 NATIVE AMERICANS

#### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

As part of the development of this project, consultation is ongoing between USACE and the two federally-recognized tribes within the immediate area of potential effect. As discussed in Chapter 3, there are no known Native American properties within the project area and the project should not have any effects to Native Americans. However, consultation with both federally-recognized tribes within the region is ongoing and will be updated upon further consultation on this project. Archaeological sites near the project area are discussed in the Cultural Resources section of this report. Once consultation is complete, additional updates may be needed.

### 5.2.16 NATURAL OR DEPLETABLE RESOURCES

#### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

Sand is a natural and depletable resource. However, the use of the material from the navigation channel serves two purposes: shoreline protection and enhanced navigation. As discussed in Section 4.1, the use of the inlet system would implement a Regional Sediment Management strategy where the material from the navigation project is beneficially used to nourish the adjacent beaches.

### 5.2.17 CUMULATIVE IMPACTS

#### FUTURE WITH-PROJECT (RECOMMENDED PLAN)

Cumulative impacts are defined in 40 CFR 1508.7 as those effects that result from:

*...the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

Material from the inlet system is currently used for the St. Augustine Beach CSRM project, which is expected to continue into the future. No other future beach nourishment, either public or private, are anticipated to occur in this region. Without a Federal beach nourishment project, it is expected that private property owners would begin armoring their properties individually with hard structures such as seawalls and revetments.

Table 5-6. Cumulative Impacts.

	Past (cumulative impacts due to Past Actions)	Present (cumulative impacts due to Present Actions)	Future without-project (cumulative impacts anticipated)	Future with Proposed Action (cumulative impacts anticipated)
Sand Resources	St. Augustine Inlet was created in the mid-1900s, and maintenance dredging of the Inlet and the IWW has occurred since that time. Material has been removed from the St. Augustine Inlet system has been used for the Federal shore protection project at St. Augustine Beach since the 1990s	offshore sand resources are not within an economic distance of the study site for use; shoal sediments at St. Augustine Inlet are abundant as sediment accumulates from alongshore transport	Material from navigational channels will continue to be periodically dredged, and the material will be placed on downdrift beaches; seawalls may be required to protect upland structures in the project area; future beach placement constructed by local entities would likely also use the shoal system, as offshore resources are not economically feasible	Sediments eroding from north of St. Augustine Inlet will be deposited into the inlet system; approximately 1/3 of the sediment in the system will be dredged and placed north of the Inlet
Protected Species	more abundant and widespread prior to development	erosion causing continued decline in habitat	Increased erosion in the future without-project condition will cause beach habitat to continue to shrink	individuals may be affected by dredging and placement activities; coastal habitat is sustained for life of project
Water Quality	Pristine prior to development; increasing recreational usage, and the development of the City of St. Augustine may have caused some decline in water quality	some degradation due to anthropogenic actions such as navigation through the inlet	no change to present condition; no known projects in the vicinity that may occur in the future and cause a decline in water quality	temporary increases in local turbidity due to construction; no long-term change

**THIS PAGE INTENTIONALLY LEFT BLANK**

## 6.0 COMPLIANCE WITH ENVIRONMENTAL REGULATIONS

The design, construction, operation and maintenance of the project shall comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders. The project shall also comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders.

## 6.1 NATIONAL AND STATE POLICY AND PROGRAMS

The project shall comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders. The project shall also comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders.

### 6.1.1 SCOPING AND ISSUES

An initial scoping meeting for the project was conducted from August 1, 2017 to August 2, 2017. The meeting was held at the project site and was attended by representatives of the project sponsor, the project engineer, and the project architect.

### **THIS PAGE INTENTIONALLY LEFT BLANK**

The project shall comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders. The project shall also comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders.

As the study progressed, the project engineer identified that the project would require the construction of a new building. The project engineer identified that the project would require the construction of a new building.

The project shall comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders. The project shall also comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders.

All environmental impacts shall be avoided, minimized, or mitigated. The project shall also comply with all applicable federal, state and local laws, rules, regulations, codes, ordinances, and orders.

### 6.1.2 AGENCY COORDINATION AND COOPERATING AGENCIES

This proposed project has been coordinated with the following agencies: U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), U.S. Environmental Protection Agency (EPA), Florida State Clearinghouse, Florida State Historic Preservation Officer (SHPO), and the Florida Department of Environmental Protection (FDEP). The FDEP, Bureau of Beaches and Coastal Systems, NMFS Habitat Conservation Division, and the Bureau of Ocean and Energy Management (BOEM) have all accepted USACE's invitations to participate as cooperating agencies in this study. These agencies were involved in the study during the plan formulation process to ensure that the Recommended Plan was consistent with their policies. BOEM's role in the study was limited following the selection of the Recommended Plan, which did not involve Outer Continental Shelf (OCS) resources. Correspondence with all Federal and state agencies is included in Appendix G-3.

### 6.1.3 LIST OF RECIPIENTS

A Notice of the Availability of the Draft EA and Draft FONSI was mailed to those listed in Appendix G-4, NEPA Mailing List on February 17, 2016. The document was also made available on USACE's website at [http://www.saj.usace.army.mil/About/DivisionsOffices/Planning/EnvironmentalBranch/EnvironmentalDocuments.aspx#St\\_Johns](http://www.saj.usace.army.mil/About/DivisionsOffices/Planning/EnvironmentalBranch/EnvironmentalDocuments.aspx#St_Johns).

### 6.1.4 COMMENTS RECEIVED AND RESPONSE

Comments received as a result of the public review of the draft EA are included in Appendix G, and are addressed in this document as appropriate.

## 6.2 ENDANGERED SPECIES ACT OF 1973

This project falls under the scope of the November 25, 1991 South Atlantic Regional Biological Opinion (SARBO; as amended in 1995 and 1997) for federally-listed marine species. USACE reinitiated consultation with NOAA Fisheries under the SARBO, which is ongoing. NOAA Fisheries provided guidance that projects found to be consistent with the SARBO as reinitiated for loggerhead critical habitat should not consult separately while consultation is ongoing for the programmatic opinion (R. Sweeney, email correspondence dated November 18, 2015). Therefore, no additional coordination is required with NOAA Fisheries for these species.

USACE has determined that the sand placement activities associated with this project fall within the scope of the USFWS SPBO (2011), as amended in 2015, and the P<sup>3</sup>BO (2013). The USFWS provided their comments on the project and their concurrence that the SPBO was appropriate to apply to the project in a letter dated December 22, 2016. The project is in compliance with the Endangered Species Act.



## 6.7 COASTAL ZONE MANAGEMENT ACT OF 1972

The Florida State Clearinghouse coordinated a review of the project in response to USACE's scoping letter dated August 17, 2005. Based on the information contained in the scoping notice and comments provided by their reviewing agencies, the state had no objections to the proposed activities. However, the state provided several comments in their letter dated October 14, 2005. FDEP staff noted that the project would require state water quality certification in the form of a Joint Coastal Permit. They did not object to investigating the offshore borrow areas, but expressed concern about the use of the ebb shoal. They suggested that further investigation of the nearshore area adjacent to Vilano Beach be conducted for the presence of hardbottom communities. Finally, they discouraged the use of structural alternatives. Please see Appendix G-3 for the FDEP comments, which will be addressed primarily during the FDEP permit process.

A Federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as Appendix G-2. USACE has determined that the project is consistent with the Florida Coastal Management Plan (FCMP) concerning acquisition of Water Quality Certifications and other state authorizations. The Draft EA and Section 404 (b)(1) Evaluation have been submitted to the state in lieu of a summary of environmental impacts to show consistency with the FCMP.

The state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process, in accordance with the 2006 Interagency Coordination Agreement. USACE has no indication that FDEP will not concur with our determination. At this time, this project is in compliance with this act.

## 6.8 FARMLAND PROTECTION POLICY ACT OF 1981

No prime or unique farmland would be impacted by implementation of this project. This act is not applicable to the project.

## 6.9 WILD AND SCENIC RIVER ACT OF 1968

No designated Wild and Scenic river reaches would be affected by project related activities. This project is in compliance with this act.

## 6.10 MARINE MAMMAL PROTECTION ACT OF 1972

USACE does not anticipate the take of any marine mammal during any activities associated with the project. Should a hopper dredge be utilized, a trained, government-certified sea turtle and marine mammal observer will be stationed on the dredge during all water-related construction activities. Appropriate actions will be taken to avoid adverse effects to listed and protected marine mammal species during project construction. Therefore, this project is in compliance with this act.

Federal monies can be spent within the CBRS units for certain activities, including, but not limited to, (1) projects for the study, management, protection, and enhancement of fish and wildlife resources and habitats; (2) establishment and operation and maintenance of navigation aids; (3) projects funded under the Land and Water Conservation Fund Act of 1965; (4) scientific research; (5) assistance for emergency actions essential to saving lives and the protection of property and the public health and safety, if preferred pursuant to the Disaster Relief Emergency Assistance Act and the National Flood Insurance Act and are necessary to alleviate the emergency; (6) maintenance, repair, or reconstruction, but not expansion, of publically owned or publically operated roads, structures, or facilities; (7) non-structural projects for shoreline stabilization that are designed to mimic, enhance, or restore a natural stabilization system; (8) any use or facility necessary for the exploration, extraction, or transportation of energy resources; (9) maintenance or construction of improvements of existing Federal navigation channels, including the disposal of dredge materials related to such projects; and (10) military activities essential to national security.

USACE coordinated with USFWS concerning the CBRS units in the project area to confirm that the project is in compliance with the act on May 20, 2016. This consultation focused on the beach placement area, and the USFWS provided confirmation that beach placement pursuant to the Recommended Plan was consistent with the purposes of the CBRA. The USACE consulted further with the USFWS on October 12, 2016, specifically to address the use of the St. Augustine Inlet system as a sand source for the project. The USFWS provided confirmation in a letter dated October 25, 2016, that the removal of sediment from CBRS Unit P05 (Conch Island Unit) for placement pursuant to the Recommended Plan was consistent with the purposes of CBRA. This project is in compliance with this act.

#### **6.16 RIVERS AND HARBORS ACT OF 1899**

The proposed work would temporarily obstruct navigable waters of the United States. The proposed action will be subject to the public notice, public hearing, and other evaluations normally conducted for activities subject to the act. The project is in compliance with this act.

#### **6.17 ANADROMOUS FISH CONSERVATION ACT**

This act authorizes the Secretaries of the Interior and Commerce to enter into cooperative agreements with the States and other non-federal interests for conservation, development, and enhancement of anadromous fish and to contribute up to 50% as the Federal share of the cost of carrying out such agreements. As this project is not receiving funding for these purposes, this act does not apply.

#### **6.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT**

Migratory birds would be minimally affected by dredging at the proposed sand source locations. The USACE will include our standard migratory bird protection requirements in the project plans and

area subject to high velocity wave action from storms.” The project shoreline is significantly developed, and further development is anticipated to be minimal.

CSRM projects are inherently located in coastal areas, and are often located in CHHAs based on the problems the project is seeking to alleviate. The primary objective of the St. Johns County CSRM Project is to reduce infrastructure damage. There is no practicable alternative that could be located outside of the CHHA that would achieve this objective.

For the reasons stated above, the project is in compliance with EO 11988, Floodplain Management.

### 6.23 E.O. 12898, ENVIRONMENTAL JUSTICE

On February 11, 1994, the President of the United States issued Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The Executive Order mandates that each federal agency make environmental justice part of the agency mission and to address, as appropriate, disproportionately high and adverse human health or environmental effects of the programs and policies on minority and low-income populations.

Any potential adverse effects of the proposed action would be more likely to affect those of higher socioeconomic status, such as large watercraft owners or those living in the coastal area surrounding the project. The beneficial effect of a wider, more sustainable beach at South Ponte Vedra Beach and Vilano Beach would benefit all members of the public who are able to obtain transportation to access the beach. The storm damage reduction benefits are primarily benefitting the landowners in this area. There are no disproportionate adverse impacts to minority or low income populations resulting from the implementation of the project.

### 6.24 E.O. 13045, DISPARATE RISKS INVOLVING CHILDREN

On April 21, 1997, the President of the United States issued Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. The Executive Order mandates that each Federal agency make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

As the proposed action does not affect children disproportionately from other members of the population, the proposed action would not increase any environmental health or safety risks to children.

### 6.25 E.O. 13112, INVASIVE SPECIES

The proposed action will require the mobilization of dredge equipment from other geographical regions. Dredge equipment has the potential to transport species from one region to another, introducing them to new habitats where they are able to out-compete native species. The benefits of the proposed project

**THIS PAGE INTENTIONALLY LEFT BLANK**

RECOMMENDATION

The project is recommended for approval by the Board of County Commissioners. The project is a critical component of the County's coastal storm risk management strategy and is essential for the protection of the County's coastal infrastructure and the safety of the County's residents. The project is a high-priority initiative and is recommended for immediate approval. The project is a critical component of the County's coastal storm risk management strategy and is essential for the protection of the County's coastal infrastructure and the safety of the County's residents. The project is a high-priority initiative and is recommended for immediate approval.

**THIS PAGE INTENTIONALLY LEFT BLANK**



Figure 7-1. Recommended Plan.

## 7.1 ITEMS OF LOCAL COOPERATION

Recommendations for provision of Federal participation in the Recommended Plan described in this report would require the project sponsor to enter into a written Project Partnership Agreement (PPA), as required by Section 221 of Public Law 91-611, as amended, to provide local cooperation satisfactory to the Secretary of the Army. Such local cooperation shall include:

- a. Per WRDA 1986, as amended, provide 35% of initial project costs assigned to hurricane and storm damage reduction, plus 100% of initial project costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits; and 50% of periodic nourishment costs assigned to hurricane and storm damage reduction, plus 100% of periodic nourishment costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits and as further specified below:
  - 1) Enter into an agreement that provides, prior to construction, 35% of design costs;
  - 2) Provide all lands, easements, and rights-of-way, and perform or ensure the performance of any relocations determined by the Federal Government to be necessary for the initial construction, periodic nourishment, and operation and maintenance of the project;
  - 3) Provide, during construction, any additional amounts as are necessary to make their total contribution equal to 35% of initial project costs assigned to hurricane and storm damage reduction, plus 100% of initial project costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits; and 50% of periodic nourishment costs assigned to hurricane and storm damage reduction, plus 100% of periodic nourishment costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits;
- b. For so long as the project remains authorized, operate, maintain, and repair the completed project, or functional portion of the project, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and state laws and regulations, and any specific directions prescribed by the Federal Government;
- c. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsor, now or hereafter, owns or controls for access to the project for the purpose of inspecting, operating, maintaining, repairing, replacing, rehabilitating, or completing the project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the Federal Government shall relieve the non-federal sponsor of responsibility to meet the non-federal sponsor's obligations, or to preclude the Federal Government from pursuing any other remedy at law or equity to ensure faithful performance;

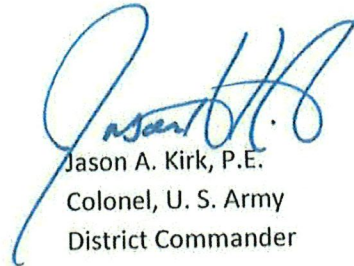
CHAPTER 7.0 Recommendation

- j. Comply with all applicable Federal and state laws and regulations, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600 7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army," and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141- 3148 and 40 U.S.C. 3701 – 3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*);
- k. Provide the non-federal share of that portion of the costs of data recovery activities associated with historic preservation that are in excess of 1% of the total amount authorized to be appropriated for the project in accordance with the cost sharing provisions of the agreement;
- l. Participate in and comply with applicable Federal floodplain management and flood insurance programs;
- m. Do not use Federal funds to meet the non-federal sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized;
- n. Prescribe and enforce regulations to prevent obstruction of or encroachment on the project that would reduce the level of protection it affords or that would hinder future periodic nourishment and/or the operation and maintenance of the project;
- o. Not less than once each year inform affected interests of the extent of protection afforded by the project;
- p. Publicize floodplain information in the area concerned, provide this information to zoning and other regulatory agencies for their use in preventing unwise future development in the floodplain, and adopt such regulations as may be necessary to prevent unwise future development and to ensure compatibility with protection levels provided by the project;
- q. For so long as the project remains authorized, the non-federal sponsor shall ensure continued conditions of public ownership and use of the shore upon which the amount of Federal participation is based;
- r. Provide and maintain necessary access roads, parking areas, and other public use facilities, open and available to all on equal terms;



CHAPTER 7.0 Recommendation

determination of the Federal interest in cost sharing, Federal participation was limited to areas where public beach access and adequate parking are available. For shoreline reaches farther than ¼ mile from public access with adequate parking, Federal participation was not provided. The maximum Federal participation allowable for each land use category is applied for cost sharing. I therefore conclude that there is reasonable public availability of the project beaches in all areas where Federal participation is provided.



Jason A. Kirk, P.E.  
Colonel, U. S. Army  
District Commander

THIS PAGE INTENTIONALLY LEFT BLANK

# CHAPTER 8

## List of Preparers

## 8 LIST OF PREPARERS\*

### 8.1 PREPARERS

This Feasibility Study with integrated Draft Environmental Assessment was prepared by the following U.S. Army Corps of Engineers personnel:

Matt Schrader, P.E.

Coastal Engineer

Aubree G. Hershoin, Ph.D.

Ecologist

Dan Hughes, Ph.D.

Archeologist

### 8.2 REVIEWERS

This report was reviewed by the following personnel:

Paul DeMarco

Biologist

Brandon Burch

Project Manager

THIS PAGE INTENTIONALLY LEFT BLANK

CHAPTER 9  
References and Index

## 9 REFERENCES AND INDEX\*

### 9.1 REFERENCES

- Atlantic States Marine Fisheries Commission. 2016. Summer Flounder: Life History. Available online at <http://www.asmfc.org/species/summer-flounder>.
- Carrier, J.C. and Luer, C.A., 1990. Growth rates in the nurse shark, *Ginglymostoma cirratum*. *Copeia*, pp.686-692.
- Castro, J.I. 1983. The sharks of North American waters. Texas A&M University Press, College Station: 180pp.
- Christensen, T.K., Clausager, I. & Petersen, I.K. 2003. Base-line investigations of birds in relation to an offshore wind farm at Horns Rev, and results from the year of construction. NERI Report.
- Compagno, L.J.V. 1984. FAO Species Catalog Vol.4, Part 1 and 2: Sharks of the world: An annotated and illustrated catalogue of shark species known to date. FAO Fish. Synop. 125. FAO, Rome, Italy
- Cook, A.S.C.P. and N.H.K. Burton. 2010. A review of the potential impacts of marine aggregate extraction on seabirds. Marine Environment Protection Fund Project 09/P130. Marine Aggregate Levy Sustainability Fund. Available online at [http://www.bto.org/sites/default/files/shared\\_documents/publications/research-reports/2010/rr563.pdf](http://www.bto.org/sites/default/files/shared_documents/publications/research-reports/2010/rr563.pdf).
- Dickerson, C., Reine, K.J., and Clarke, D.G. 2001. Characterization of underwater sounds produced by bucket dredging operations, DOER Technical Notes Collection (ERDC TND0ER-E14), U.S. Army Engineer Research and Development Center, Vicksburg, MS. [www.wes.army.mil/el/dots/doer](http://www.wes.army.mil/el/dots/doer).
- Driggers III, W.B., Ingram Jr, G.W., Grace, M.A., Gledhill, C.T., Henwood, T.A., Horton, C.N. and Jones, C.M., 2008. Popping areas and mortality rates of young tiger sharks *Galeocerdo cuvier* in the western North Atlantic Ocean. *Aquatic Biology*, 2(2), pp.161-170.
- Duncan, K.M., A.P. Martin, B.W. Bowen, and H.G. De Couet. 2006. Global phylogeography of the scalloped hammerhead shark (*Sphyrna lewini*). *Molecular Ecology* 15(8):2239-2251.
- Essink, Karel. 1999. Ecological effects of dumping of dredged sediments; options for management. *Journal of Coastal Conservation* 5: 69-80.
- Foster, Emmett R., Darren L. Spurgeon, and Jenny Cheng. 2000. Shoreline Change Rate Estimates: St. Johns County, June 2000. Florida Department of Environmental Protection, Office of Beaches and Coastal Systems. Report No. BCS-00-03. Available online at <ftp://ftp.dep.state.fl.us/pub/water/beaches/HSSD/reports/stjsre.pdf>.

- NMFS. 2006. Final Consolidated Atlantic Highly Migratory Species Fishery Management Plan. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, Silver Spring, MD. Public Document. pp. 1600.
- NOAA, 1991. Regional biological opinion for Southeastern hopper dredging. November 15, 1991 (revised August 25, 1995, and September 5, 1997). Available online at [http://sero.nmfs.noaa.gov/protected\\_resources/section\\_7/freq\\_biop/index.html](http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/index.html).
- NOAA, 2015. Water Temperature Table of the Southern Atlantic Coast. Accessed online on November 13, 2015 at [https://www.nodc.noaa.gov/dsdt/cwtg/all\\_meanT.html](https://www.nodc.noaa.gov/dsdt/cwtg/all_meanT.html).
- Pratt, H.L., Jr., and J.C. Carrier. 2001. A review of elasmobranch reproductive behavior with a case study on the nurse shark, *Ginglymostoma cirratum*. *Environmental Biology of Fishes* 60:157-188.
- Rogers, Cory M., Kristine A. Jacobson, and Mark Gravens. 2009. Beach-fx User's Manual: Version 1.0 Report No. ERDC/CHL SR-09-6. Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory 3909 Halls Ferry Road, Vicksburg, MS 39180-6199. 262 pages. Available online at <http://acwc.sdp.sirsi.net/client/search/asset/1000110>.
- Skomal, G.B., 2007. Shark nursery areas in the coastal waters of Massachusetts. In *American Fisheries Society Symposium* (Vol. 50, p. 17). American Fisheries Society.
- Skov, H. and J. Durinck. 2001. Seabird attraction to fishing vessels is a local process. *Marine Ecology Progress Series*, 214: 289-298.
- SAFMC (South Atlantic Fishery Management Council). 1998. Final Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region. Including a Final Environmental Impact Statement/Supplemental Environmental Impact Statement, Initial Regulatory Flexibility Analysis, Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement. South Atlantic Fishery Management Council, Charleston, S.C. 136 pages.
- Tasker, M. L., P. Hope-Jones, T. Dixon, and A. Wallis. 1986. Seabirds associated with oil production platforms in the North Sea. *Ringling and Migration*, 7: 7-14.
- Thaxter, C.B., Wanless, S., Daunt, F., Harris, M.P., Benvenuti, S., Watanuki, Y., Gremillet, D. & Hamer, K. C. 2010. Influence of wing loading on the trade-off between pursuit-diving and flight in Common Guillemots and Razorbills. *Journal of Experimental Biology*, 213, 1018-1025.
- U.S. Climate Data. 2015. Average Monthly Climate, Jacksonville Beach – Florida. Accessed online on November 13, 2015 at <http://www.usclimatedata.com/climate/florida/united-states/3179>.

## 9.2 INDEX

---

### —A—

Air Quality, 2-51, 5-10  
 Alternatives, 3-6, 3-29  
 Artificial Reef, 3-11

---

### —B—

Backfill, 3-10  
 Benefit, 3-4, 3-30  
 Borrow Area, 5-20  
 Breakwaters, 3-11

---

### —C—

County, 3-8, 3-11, 5-10

---

### —D—

dredge, 5-10  
 dredging, 5-10  
 Dunes, 3-12

---

### —E—

Economics, 4, 6-9  
 Emissions, 5-10  
 Environmental Justice, 6-8  
 environmental operating principles, 6-1  
 Erosion, 2, 2-1, 2-37, 3-2, 3-9, 3-10, 3-11, 3-12  
 Executive Orders  
     E.O. 12898, Environmental Justice, 6-8

---

### —F—

Federal, 1-8, 1-11, 2-1, 3-2, 3-4, 3-5, 3-6, 3-7, 3-9, 3-30  
 Federal Water Project Recreation Act, 6-5  
 Flood Plain, 3-9

---

### —G—

Groins, 3-10

---

### —H—

Habitat, 3-3  
 Hardbottom, 3-2, 3-10, 3-11

---

### —I—

Impact, 3-6, 3-10  
 Irrecoverable, 5-20  
 Irreversible, 5-20

---

### —L—

Land Use, 3-8  
 Location, 3-9

---

### —M—

Migratory Bird Treaty Act and Migratory Bird Conservation  
 Act, 6-6  
 Mitigate, 3-6

---

### —N—

National Environmental Policy Act, 4, 3-6  
 Nesting, 2-37, 3-4  
 No Action Alternative, 2-9, 2-11, 2-12, 2-13, 2-14, 2-15, 2-  
 16, 2-17, 2-19, 2-29, 2-31, 2-32, 2-37, 2-38, 2-39, 2-40, 2-  
 46, 2-49, 2-50, 2-51, 2-52, 2-55, 2-56, 2-59  
 Nourishment, 3-10, 3-11

---

### —O—

Offshore, 3-11, 3-12

Back cover  
fold-out



ST. JOHNS COUNTY COASTAL STORM RISK MANAGEMENT PROJECT  
 South Ponte Vedra Beach, Vilano Point, and Summer Haven Reaches  
 DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT





DEPARTMENT OF THE ARMY  
CHIEF OF ENGINEERS  
2600 ARMY PENTAGON  
WASHINGTON, DC 20310-2600

AUG 08 2017

DAEN

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on coastal storm risk management at St. Johns County, Florida. It is accompanied by the report of the district and division engineers. This report is an interim response to House Resolution 2646 adopted June 21, 2000 by the Committee on Transportation and Infrastructure of the United States House of Representatives. The resolution requested the Secretary of the Army, acting through the Chief of Engineers, *"to survey the shores of St. Johns County, Florida, with particular reference to the advisability of providing beach erosion control works in the area north of St. Augustine Inlet, the shoreline in the vicinity of Matanzas Inlet, and adjacent shorelines, as may be necessary in the interest of hurricane protection, storm damage reduction, beach erosion control, and other related purposes."* Pre-construction engineering and design activities for the project will continue under the authority cited above.

2. The reporting officers recommend a project that will contribute to economic efficiency for providing coastal storm risk management. Based on an evaluation of alternative plan costs and economic benefits the recommended plan is the National Economic Development (NED) plan. The non-federal sponsor, St. Johns County, supports the NED plan.

a. The recommended plan includes beach and dune nourishment within the Vilano Beach reach and a small portion of the South Ponte Vedra Beach reach. The design includes construction of a 60-foot equilibrated berm extension from the +8.0 foot 1988 North Atlantic Vertical Datum contour between the R monuments R103.5 and R116.5 along 2.6 miles of shoreline. The project template will include a dune feature that reflects the average 2015 dune position. Tapers of a maximum length of one thousand feet will extend from the northern and southern ends of the berm extension, connecting the extension to the existing shoreline. The addition of tapers results in sand placement from R102.5 to R117.5 along 3 miles of shoreline.

b. Initial construction will require approximately 1,310,000 cubic yards of sand, and each periodic nourishment event will require approximately 866,000 cubic yards. The periodic nourishment interval is expected to be approximately 12 years, equaling an estimated 3 periodic nourishment events in addition to initial construction over the 50-year period of federal participation.

DAEN

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

4. Based on a 2.875 percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$2,031,000. All project costs are allocated to the authorized purpose of coastal storm risk management. The selected plan would reduce average annual coastal storm damages by approximately \$1,961,000. The equivalent average annual benefits, inclusive of recreation benefits, are estimated to be \$2,653,000 with net average annual benefits of \$622,000. The benefit to cost ratio is approximately 1.3 to 1. The project would reduce coastal damages including reduction of damage to a key piece of critical infrastructure, State Road (SR) A1A. In addition to functioning as a hurricane evacuation route, SR A1A also serves as a primary post storm emergency response and recovery route for the area. Thus, protection of A1A could potentially reduce loss of life pre- and post hurricane. The project would also establish at least 3.2 acres of beach habitat that will provide suitable nesting habitat for federally threatened and endangered species such as loggerhead, green, Kemp's ridley, hawksbill, and leatherback sea turtles and piping plover and rufa red knot shorebirds along approximately 3 miles of shoreline.

5. Risk and uncertainty has been explicitly factored into the economic analysis of this project. A statistical risk based model, Beach-fx, was used in this study to formulate and evaluate the project in a life-cycle approach. Beach-fx integrates the engineering and economic analyses and incorporates uncertainty in both physical parameters and environmental forcing, which enables quantification of risk with respect to project evolution and economic costs and benefits of project implementation. The application of Beach-fx in this study is to estimate future without project damages and quantify the damages prevented by various storm damage reduction alternatives for St. Johns County over the 50 year project life. The project is intended to address erosion and prevent damages to structures and infrastructure; it is not intended to, nor will it, reduce the risk to loss of life during major storm events. Loss of life can only be prevented by residents and visitors following the local evacuation plans that are already in place. These residual risks have been communicated to the residents of St. Johns County.

6. In accordance with the Corps Engineering Regulation (ER 1100-2-8162) on sea level change, the study performed a sensitivity analysis to evaluate the effects that different rates of sea level change could have on the recommended plan. The NED plan was formulated using the historical or low rate of sea level change. Beach-fx was used to model the performance of the NED plan for what the ER defines as intermediate and high rates of sea level rise. The benefits of the project increase significantly in the intermediate and high sea level rise scenarios, but the costs also increase. Thus, the project performance (in terms of the benefit-cost ratio) is relatively constant throughout the three scenarios. As both costs and benefits are increasing, the net benefits actually increase with increasing rates of sea-level rise. Overall, these results suggest that the NED plan is both effective and robust in all three simulated sea level rise scenarios. Adaptive management will be used including adjusting the timing of periodic nourishments and project volume requirements based on monitoring reports to compensate for any significant accelerated sea level rise beyond the historical or low rate should it become necessary.

7. In accordance with the Corps Engineering Circular (EC 1165-2-214) on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and

DAEN

SUBJECT: St. Johns County, Florida - South Ponte Vedra Beach, Vilano Beach, and Summer Haven Reaches - Coastal Storm Risk Management Project

Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601-4655) and the regulations contained in 49 CFR Part 24.;

3) Pay, during construction, any additional amounts necessary to make its contribution equal to 35% of initial project costs assigned to hurricane and storm damage reduction, plus 100% of initial project costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits; and 50% of periodic nourishment costs assigned to hurricane and storm damage reduction, plus 100% of periodic nourishment costs assigned to protecting undeveloped private lands and other private shores which do not provide public benefits;

b. Operate, maintain, and repair the completed project, or functional portion of the project, at no cost to the federal government, in a manner compatible with the project's authorized purposes and in accordance with applicable federal laws and regulations, and any specific directions prescribed by the federal government;

c. Hold and save the United States free from all damages arising from the initial construction, periodic nourishment, operation, maintenance, repair, replacement, and rehabilitation of the projects, except for damages due to the fault or negligence of the United States or its contractors;

d. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended, 42 U.S.C. 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the federal government determines to be required for the initial construction, periodic nourishment, operation, and maintenance of the project. However, for lands that the federal government determines to be subject to the navigation servitude, only the federal government shall perform such investigations unless the federal government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction;

e. Assume, as between the federal government and the non-federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the federal government determines to be necessary for the initial construction, periodic nourishment, operation, or maintenance of the project;

f. Agree, as between the federal government and the non-federal sponsor, that the non-federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, and repair the project in a manner that will not cause liability to arise under CERCLA;

PROJECT PARTNERSHIP AGREEMENT  
BETWEEN  
THE DEPARTMENT OF THE ARMY  
AND  
ST. JOHNS COUNTY, FLORIDA  
FOR  
THE ST. JOHNS COUNTY, FLORIDA  
COASTAL STORM RISK MANAGEMENT PROJECT (SOUTH PONTE VEDRA BEACH  
AND VILANO BEACH REACHES)

THIS AGREEMENT is entered into this 23<sup>rd</sup> day of April, 2019, by and between the Department of the Army (hereinafter the "Government"), represented by the District Commander for Jacksonville District and the St. Johns County, Florida (hereinafter the "Non-Federal Sponsor"), represented by the Chair of its Board of County Commissioners.

WITNESSETH, THAT:

WHEREAS, construction of the St. Johns County Coastal Storm Risk Management Project (South Ponte Vedra Beach and Vilano Beach Reaches) at St. Johns County, Florida (hereinafter the "Project", as defined in Article I.A. of this Agreement) was authorized by Section 1401(3) of the Water Resources Development Act of 2018, Public Law 115-270;

WHEREAS, Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2213), specifies the cost-sharing requirements applicable to the Project;

WHEREAS, to the extent that appropriations provided under the Construction heading, Title IV, Division B of the Bipartisan Budget Act of 2018, Public Law 115-123 enacted February 9, 2018 (hereinafter "BBA 2018"), are available and used to undertake construction of the Project, the Government is authorized to finance the non-Federal cash contributions required for initial construction of the Project, currently estimated at \$2,260,954, in accordance with the provisions of Section 103(k) of the Water Resources Development Act of 1986 (33 U.S.C. 2213(k)), with the interest rate for deferred payments determined in accordance with Section 106 of the Water Resources Development Act of 1986 (33 U.S.C. 2216);

WHEREAS, the provisions of Section 902 of the Water Resources Development Act of 1986, as amended, do not apply to the funds provided in BBA 2018 that will be used for initial construction of the Project;

WHEREAS, 33 U.S.C. 701h authorizes the Government to undertake, at the Non-Federal Sponsor's full expense, additional work while the Government is carrying out the Project; and

WHEREAS, the Government and the Non-Federal Sponsor have the full authority and capability to perform in accordance with the terms of this Agreement and acknowledge that

equivalent facility may include the alteration, lowering, raising, or replacement and attendant demolition of the affected facility or part thereof.

F. The term "placement area improvements" means the improvements required on real property interests to enable the ancillary placement of material that has been dredged or excavated during construction, operation, and maintenance of the Project, including, but not limited to, retaining dikes, wasteweirs, bulkheads, embankments, monitoring features, stilling basins, and de-watering pumps and pipes.

G. The term "functional portion thereof" means a portion of the Project that has been completed and that can function independently, as determined in writing by the District Commander for Jacksonville District (hereinafter the "District Commander"), although the remainder of the Project is not yet complete.

H. The term "in-kind contributions" means those materials or services provided by the Non-Federal Sponsor that are identified as being integral to the Project by the Division Commander for South Atlantic Division (hereinafter the "Division Commander"). To be integral to the Project, the material or service must be part of the work that the Government would otherwise have undertaken for design and construction of the Project. The in-kind contributions also include any investigations performed by the Non-Federal Sponsor to identify the existence and extent of any hazardous substances that may exist in, on, or under real property interests required for the Project.

I. The term "betterment" means a difference in construction of an element of the Project that results from the application of standards that the Government determines exceed those that the Government would otherwise apply to construction of that element.

J. The term "fiscal year" means one year beginning on October 1<sup>st</sup> and ending on September 30<sup>th</sup> of the following year.

K. The term "additional work" means items of work related to, but not cost shared as a part of, the Project that the Government will undertake on the Non-Federal Sponsor's behalf while the Government is carrying out the Project, with the Non-Federal Sponsor responsible for all costs and any liabilities associated with such work.

L. The term "Maximum Cost Limit" means the statutory limitation on the total cost of periodic nourishment for the Project, as determined by the Government in accordance with Section 902 of the Water Resources Development Act of 1986, as amended, and Government regulations issued thereto.

## ARTICLE II - OBLIGATIONS OF THE PARTIES

A. In accordance with Federal laws, regulations, and policies, the Government shall design and construct the Project, with initial construction undertaken using BBA 2018 funds to

above, the Government shall determine the estimated amount of funds required from the Non-Federal Sponsor for the then-current fiscal year.

a. No later than 120 calendar days after receipt of notification from the Government, the Non-Federal Sponsor shall provide the full amount of such funds to the Government in accordance with Article VI.C. For construction costs allocated to beach improvements with exclusively private benefits and improvements and other work located within the Coastal Barrier Resources System that the Government has determined are ineligible for Federal financial participation, the Non-Federal Sponsor, in accordance with Article VI.D., must provide funds sufficient to cover the costs of such work in advance of the Government performing the work.

b. No later than July 1<sup>st</sup> prior to each subsequent fiscal year during a cycle of periodic nourishment, the Government shall provide the Non-Federal Sponsor with a written estimate of the amount of funds required from the Non-Federal Sponsor during that fiscal year to meet its cost share. Not later than October 1<sup>st</sup> or, if October 1<sup>st</sup> falls on a Saturday or Sunday, the next business day thereafter, prior to that fiscal year, the Non-Federal Sponsor shall provide the full amount of such required funds to the Government in accordance with Article VI.C.

C. To the extent practicable and in accordance with Federal law, regulations, and policies, the Government shall afford the Non-Federal Sponsor the opportunity to review and comment on solicitations for contracts, including relevant plans and specifications, prior to the Government's issuance of such solicitations; proposed contract modifications, including change orders; and contract claims prior to resolution thereof. Ultimately, the contents of solicitations, award of contracts, execution of contract modifications, and resolution of contract claims shall be exclusively within the control of the Government.

D. The Government, as it determines necessary, shall undertake actions associated with historic preservation, including, but not limited to, the identification and treatment of historic properties as those properties are defined in the National Historic Preservation Act (NHPA) of 1966, as amended. All costs incurred by the Government for such work (including the mitigation of adverse effects other than data recovery) shall be included in construction costs and shared in accordance with the provisions of this Agreement. If historic properties are discovered during construction and the effect(s) of construction are determined to be adverse, strategies shall be developed to avoid, minimize or mitigate these adverse effects. In accordance with 54 U.S.C. 312507, up to 1 percent of the total amount authorized to be appropriated for the Project may be applied toward data recovery of historic properties and such costs shall be borne entirely by the Government. In the event that costs associated with data recovery of historic properties exceed 1 percent of the total amount authorized to be appropriated for the Project, in accordance with 54 U.S.C. 312508, the Government will seek a waiver from the 1 percent limitation under 54 U.S.C. 312507 and upon receiving the waiver, will proceed with data recovery at full federal expense. Nothing in this Agreement shall limit or otherwise prevent the Non-Federal Sponsor from voluntarily contributing costs associated with data recovery that exceed 1 percent.

E. When the District Commander determines that initial construction of the Project, or a functional portion thereof, is complete, within 30 calendar days of such determination, the

interests to preserve the level of coastal storm risk reduction provided by such work. The Non-Federal Sponsor shall provide an information copy of the plan to the Government.

J. The Non-Federal Sponsor shall publicize floodplain information in the area concerned and shall provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with the Project.

K. The Non-Federal Sponsor shall prevent obstructions or encroachments on the Project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) that might reduce the level of coastal storm risk reduction the Project affords, hinder operation and maintenance of the Project, or interfere with the Project's proper function.

L. For shores, other than Federal shores, protected pursuant to this Agreement using Federal funds, the Non-Federal Sponsor shall ensure the continued public use of such shores compatible with the authorized purpose of the Project.

M. The Non-Federal Sponsor shall provide and maintain necessary access roads, parking areas, and other associated public use facilities, open and available to all on equal terms, as described in the Decision Document.

N. The Non-Federal Sponsor shall not use Federal program funds to meet any of its obligations under this Agreement unless the Federal agency providing the funds verifies in writing that the funds are authorized to be used for the Project. Federal program funds are those funds provided by a Federal agency, plus any non-Federal contribution required as a matching share therefor.

O. In carrying out its obligations under this Agreement, the Non-Federal Sponsor shall comply with all the requirements of applicable Federal laws and implementing regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964 (P.L. 88-352), as amended (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; the Age Discrimination Act of 1975 (42 U.S.C. 6102); and the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Army Regulation 600-7 issued pursuant thereto.

P. In addition to the ongoing, regular discussions of the parties in the delivery of the Project, the Government and the Non-Federal Sponsor may establish a Project Coordination Team to discuss significant issues or actions. The Government's costs for participation on the Project Coordination Team shall not be included in construction costs that are cost shared but shall be included in calculating the Maximum Cost Limit. The Non-Federal Sponsor's costs for participation on the Project Coordination Team shall not be included in construction costs that are cost shared and shall be paid solely by the Non-Federal Sponsor without reimbursement or credit by the Government.

Q. The Non-Federal Sponsor may request in writing that the Government perform betterments or additional work on behalf of the Non-Federal Sponsor. Each request shall be subject to review and written approval by the Division Commander. If the Government agrees to

provide the Non-Federal Sponsor with general written descriptions, including maps as appropriate, of such relocations and shall provide the Non-Federal Sponsor with a written notice to proceed with such relocations. The Non-Federal Sponsor shall perform or ensure the performance of these relocations in accordance with the Government's construction schedule for the Project.

D. To the maximum extent practicable, not later than 30 calendar days after the Government provides to the Non-Federal Sponsor written descriptions and maps of the real property interests, placement area improvements, and relocations required for construction, operation, and maintenance of the Project, the Non-Federal Sponsor may request in writing that the Government acquire all or specified portions of such real property interests, construct placement area improvements, or perform the necessary relocations. If the Government agrees to such a request, the Non-Federal Sponsor, in accordance with Article VI.D., must provide funds sufficient to cover the costs of the acquisitions, placement area improvements, or relocations in advance of the Government performing the work. The Government shall acquire the real property interests, construct the placement area improvements, and perform the relocations, applying Federal laws, policies, and procedures. The Government shall acquire real property interests in the name of the Non-Federal Sponsor except, if acquired by eminent domain, the Government shall convey all of its right, title and interest to the Non-Federal Sponsor by quitclaim deed or deeds. The Non-Federal Sponsor shall accept delivery of such deed or deeds. The Government's providing real property interests, placement area improvements, or performing relocations on behalf of the Non-Federal Sponsor does not alter the Non-Federal Sponsor's responsibility under Article IV for the costs of any cleanup and response related thereto.

E. As required by Sections 210 and 305 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4630 and 4655), and Section 24.4 of the Uniform Regulations contained in 49 C.F.R. Part 24, the Non-Federal Sponsor assures that (1) fair and reasonable relocation payments and assistance shall be provided to or for displaced persons, as are required to be provided by a Federal agency under Sections 4622, 4623 and 4624 of Title 42 of the U.S. Code; (2) relocation assistance programs offering the services described in Section 4625 of Title 42 of the U.S. Code shall be provided to such displaced persons; (3) within a reasonable period of time prior to displacement, comparable replacement dwellings will be available to displaced persons in accordance with Section 4625(c)(3) of Title 42 of the U.S. Code; (4) in acquiring real property, the Non-Federal Sponsor will be guided, to the greatest extent practicable under State law, by the land acquisition policies in Section 4651 and the provision of Section 4652 of Title 42 of the U.S. Code; and (5) property owners will be paid or reimbursed for necessary expenses as specified in Sections 4653 and 4654 of Title 42 of the U.S. Code.

#### ARTICLE IV - HAZARDOUS SUBSTANCES

A. The Non-Federal Sponsor shall be responsible for undertaking any investigations to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (hereinafter



ARTICLE V - CREDIT FOR REAL PROPERTY INTERESTS, PLACEMENT AREA  
IMPROVEMENTS, RELOCATIONS, AND IN-KIND CONTRIBUTIONS

A. The Government shall include in construction costs, and credit towards the Non-Federal Sponsor's share of such costs, the value of Non-Federal Sponsor provided real property interests (except interests in lands subject to shore erosion that are publicly owned on the effective date of this Agreement or, if required for in-kind contributions covered by an in-kind Memorandum of Understanding (hereinafter "In-Kind MOU"), that were publicly owned on the effective date of the In-Kind MOU), placement area improvements, and relocations, and the costs of in-kind contributions determined by the Government to be required for the Project. However, for initial construction of the Project, only costs incurred by the Non-Federal Sponsor to acquire real property interests from private owners, to construct placement area improvement, to perform relocations, and to provide in-kind contributions are eligible for credit.

B. To the maximum extent practicable, no later than 3 months after it provides the Government with authorization for entry onto a real property interest or pays compensation to the owner, whichever occurs later, the Non-Federal Sponsor shall provide the Government with documents sufficient to determine the amount of credit to be provided for the real property interest in accordance with paragraphs C.1. of this Article. To the maximum extent practicable, no less frequently than on a quarterly basis, the Non-Federal Sponsor shall provide the Government with documentation sufficient for the Government to determine the amount of credit to be provided for other creditable items in accordance with paragraph C. of this Article.

C. The Government and the Non-Federal Sponsor agree that the amount of costs eligible for credit that are allocated by the Government to construction costs shall be determined and credited in accordance with the following procedures, requirements, and conditions. Such costs shall be subject to audit in accordance with Article X.B. to determine reasonableness, allocability, and allowability of costs.

1. Real Property Interests.

a. General Procedure. For initial construction of the Project, only costs associated with real property interests acquired from private owners after the effective date of this Agreement are eligible for credit, unless such real property interests acquired from private owners were required for in-kind contributions covered by an In-Kind MOU. The Non-Federal Sponsor shall obtain, for each creditable real property interest (except interests in lands subject to shore erosion that are publicly owned on the effective date of this Agreement), an appraisal of the fair market value of such interest that is prepared by a qualified appraiser who is acceptable to the parties. Subject to valid jurisdictional exceptions, the appraisal shall conform to the Uniform Standards of Professional Appraisal Practice. The appraisal must be prepared in accordance with the applicable rules of just compensation, as specified by the Government. For crediting purposes, appraisals of interests in lands subject to shore erosion acquired from private parties after the effective date of this Agreement must consider special benefits in accordance with the Uniform Appraisal Standards for Federal Land Acquisition (2016) (hereinafter "Uniform Appraisal Standards").

(2) For interests in lands subject to shore erosion, the Government will credit the amount of the court award or stipulated settlement only to the extent that the court award or stipulated settlement considered special benefits in accordance with the Uniform Appraisal Standards. If the court award or stipulated settlement did not consider special benefits, fair market value for crediting purposes shall be limited to the amount determined by an appraisal that considers special benefits.

c. Waiver of Appraisal. Except as required by paragraph C.1.b. of this Article, the Government may waive the requirement for an appraisal pursuant to this paragraph if, in accordance with 49 C.F.R. Section 24.102(c)(2):

(1) the owner is donating the real property interest to the Non-Federal Sponsor and releases the Non-Federal Sponsor in writing from its obligation to appraise the real property interest, and the Non-Federal Sponsor submits to the Government a copy of the owner's written release; or

(2) the Non-Federal Sponsor determines that an appraisal is unnecessary because the valuation problem is uncomplicated and the anticipated value of the real property interest proposed for acquisition is estimated at \$25,000 or less, based on a review of available data. When the Non-Federal Sponsor determines that an appraisal is unnecessary, the Non-Federal Sponsor shall prepare the written waiver valuation required by 49 C.F.R. Section 24.102(c)(2) and submit a copy thereof to the Government for approval. When the anticipated value of the real property interest exceeds \$10,000, the Non-Federal Sponsor must offer the owner the option of having the Non-Federal Sponsor appraise the real property interest.

d. Incidental Costs. The Government shall include in construction costs and credit towards the Non-Federal Sponsor's share of such costs, the incidental costs, documented to the satisfaction of the Government, that the Non-Federal Sponsor incurred in acquiring any real property interests required pursuant to Article III for the Project after the effective date of this Agreement, unless such incidental costs were required for in-kind contributions covered by an In-Kind MOU. For initial construction of the Project, only incidental costs for acquiring real property interests from private owners are eligible for credit. Such incidental costs shall include closing and title costs, appraisal costs, survey costs, attorney's fees, plat maps, mapping costs, actual amounts expended for payment of any relocation assistance benefits provided in accordance with Article III.E., and other payments by the Non-Federal Sponsor for items that are generally recognized as compensable, and required to be paid, by applicable state law due to the acquisition of a real property interest pursuant to Article III.

2. Placement Area Improvements. The Government shall include in construction costs and credit towards the Non-Federal Sponsor's share of such costs, the value of placement area improvements required for the Project. The value shall be equivalent to the costs, documented to the satisfaction of the Government, that the Non-Federal Sponsor incurred to provide any placement area improvements required for the Project. Only placement area improvements provided after the effective date of this Agreement are eligible for credit, unless such placement area improvements were required for in-kind contributions covered by an In-

credit is afforded; for the value of in-kind contributions obtained at no cost to the Non-Federal Sponsor; for any in-kind contributions performed prior to the effective date of this Agreement unless covered by an In-Kind MOU between the Government and Non-Federal Sponsor; or for costs that exceed the Government's estimate of the cost for such in-kind contributions if they had been provided by the Government.

5. Compliance with Federal Labor Laws. Any credit afforded under the terms of this Agreement is subject to satisfactory compliance with applicable Federal labor laws covering non-Federal construction, including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (labor standards originally enacted as the Davis-Bacon Act, the Contract Work Hours and Safety Standards Act, and the Copeland Anti-Kickback Act), and credit may be withheld, in whole or in part, as a result of the Non-Federal Sponsor's failure to comply with its obligations under these laws.

D. Notwithstanding any other provision of this Agreement, the Non-Federal Sponsor shall not be entitled to credit for real property interests that were previously provided as an item of local cooperation for another Federal project, that are required for beach improvements with exclusively private benefits or improvements or other work located within the Coastal Barrier Resources System that the Government has determined are ineligible for Federal financial participation, or real property interests for initial construction of the Project (other than those acquired through relocations) that are owned or controlled by public entities.

#### ARTICLE VI – PAYMENT OF FUNDS

A. As of the effective date of this Agreement, total construction costs are projected to be \$144,695,000 with the Government's share of such costs projected to be \$27,013,000 and the Non-Federal Sponsor's share of such costs projected to be \$117,682,000. Construction costs allocated to coastal storm risk management for initial construction are projected to be \$26,452,000, with the Government's share of such costs projected to be \$6,084,000 and the Non-Federal Sponsor's share of such costs projected to be \$20,368,000, which includes creditable real property interests, relocations, and placement area improvements projected to be \$1,028,280, creditable in-kind contributions projected to be \$0, and the amount of funds required to meet its cost share projected to be \$19,339,720. Construction costs allocated to coastal storm risk management for periodic nourishment are projected to be \$118,243,000, with the Government's share of such costs projected to be \$20,929,000, and the Non-Federal Sponsor's share of such costs projected to be \$97,314,000. Construction costs allocated to beach improvements with exclusively private benefits are projected to be \$12,787,028 for initial construction and \$57,159,251 for periodic nourishment. Construction costs allocated to improvements or other work located within the Coastal Barrier Resources System that the Government has determined are ineligible for Federal financial participation are projected to be \$4,291,738 for initial construction and \$19,184,484 for periodic nourishment. Costs for betterments are projected to be \$0. These amounts are estimates only that are subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Non-Federal Sponsor.

4. The Government shall recalculate the annual installments at five-year intervals by amortizing the outstanding portion of the principal amount over the remaining portion of the payment period using an interest rate determined in accordance with Section 106 of the Water Resources Development Act of 1986. The Government shall notify the Non-Federal Sponsor in writing of the recalculated annual installments. The last installment shall be adjusted upward or downward to assure payment of all the indebtedness.

5. The Non-Federal Sponsor shall pay the first installment no later than 30 calendar days after the date of the Government's notification pursuant to paragraph B.3. of this Article, and each annual installment thereafter on the anniversary date of such notification, by delivering a check payable to "FAO, USAED, Jacksonville (K3)" to the District Commander or providing an Electronic Funds Transfer in accordance with procedures established by the Government. The Non-Federal Sponsor, in its sole discretion, may prepay the principal amount, in whole or in part, at any time without penalty.

C. Payment of Funds for Each Cycle of Periodic Nourishment.

1. While undertaking periodic nourishment, the Government shall provide the Non-Federal Sponsor with quarterly reports setting forth the estimated construction costs and the Government's and Non-Federal Sponsor's estimated shares of such costs; costs incurred by the Government, using both Federal and Non-Federal Sponsor funds, to date; the amount of funds provided by the Non-Federal Sponsor to date; the estimated amount of any creditable real property interests, placement area improvements, and relocations; the estimated amount of any creditable in-kind contributions; and the estimated amount of funds required from the Non-Federal Sponsor during the upcoming fiscal year.

2. For each cycle of periodic nourishment, the Non-Federal Sponsor shall provide the funds required to meet its share of construction costs allocated to coastal storm risk management by delivering a check payable to "FAO, USAED, Jacksonville (K3)" to the District Commander, or verifying to the satisfaction of the Government that the Non-Federal Sponsor has deposited such required funds in an escrow or other account acceptable to the Government, with interest accruing to the Non-Federal Sponsor, or by providing an Electronic Funds Transfer of such required funds in accordance with procedures established by the Government.

3. The Government shall draw from the funds provided by the Non-Federal Sponsor to cover the non-Federal share of construction costs allocated to coastal storm risk management as those costs are incurred. If the Government determines at any time that additional funds are needed from the Non-Federal Sponsor to cover the Non-Federal Sponsor's required share of such construction costs, the Government shall provide the Non-Federal Sponsor with written notice of the amount of additional funds required. Within 120 calendar days from receipt of such notice, the Non-Federal Sponsor shall provide the Government with the full amount of such additional required funds.

4. Upon completion of each cycle of periodic nourishment, including resolution of all relevant claims and appeals and eminent domain proceedings, the Government shall

D. In the event of termination, the parties shall conclude their activities relating to construction of the Project. To provide for this eventuality, the Government may reserve a percentage of available funds as a contingency to pay the costs of termination, including any costs of resolution of real property acquisition, resolution of contract claims, and resolution of contract modifications.

E. Any suspension or termination shall not relieve the parties of liability for any obligation incurred. Any delinquent payment owed by the Non-Federal Sponsor pursuant to this Agreement shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13 week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3 month period if the period of delinquency exceeds 3 months.

#### ARTICLE VIII - HOLD AND SAVE

The Non-Federal Sponsor shall hold and save the Government free from all damages arising from design, construction, operation, maintenance, repair, rehabilitation, and replacement of the Project, except for damages due to the fault or negligence of the Government or its contractors.

#### ARTICLE IX - DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to the parties. Each party shall pay an equal share of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

#### ARTICLE X - MAINTENANCE OF RECORDS AND AUDITS

A. The parties shall develop procedures for the maintenance by the Non-Federal Sponsor of books, records, documents, or other evidence pertaining to costs and expenses for a minimum of three years after the final accounting. The Non-Federal Sponsor shall assure that such materials are reasonably available for examination, audit, or reproduction by the Government.

B. The Government may conduct, or arrange for the conduct of, audits of the Project. Government audits shall be conducted in accordance with applicable Government cost principles and regulations. The Government's costs of audits shall not be included in construction costs that are cost shared but shall be included in calculating the Maximum Cost Limit.

ARTICLE XIII - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

ARTICLE XIV - THIRD PARTY RIGHTS, BENEFITS, OR LIABILITIES

Nothing in this Agreement is intended, nor may be construed, to create any rights, confer any benefits, or relieve any liability, of any kind whatsoever in any third person not a party to this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Commander.

DEPARTMENT OF THE ARMY

ST. JOHNS COUNTY BOARD OF COUNTY COMMISSIONERS

BY: 

Andrew D. Kelly  
Colonel, U.S. Army

BY: 

Paul M. Waldron  
Chair

DATE: 4/23/19

DATE: 4/23/19

## CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.



Paul M. Waldron, Chair  
St. Johns County Board of County Commissioners

DATE: 4/23/17

“WHEREAS, based on authorizing legislation and long-standing policy, the Corps may only undertake coastal storm risk management projects that serve the public interest and where the beaches involved are open to all on equal terms in a manner compatible with the authorized purpose of the Project; and”.

2. Replace Article II.L. with the following:

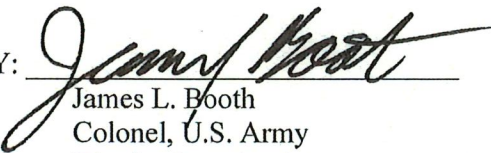
“L. For shores, other than Federal shores, protected pursuant to this Agreement using Federal Funds, the Non-Federal Sponsor shall ensure the public use of, and access to, such shores by all on equal terms in a manner compatible with the authorized purpose of the Project.”

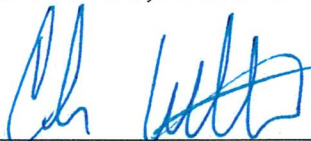
3. All other terms and conditions of this Agreement remain unchanged.

IN WITNESS WHEREOF, the Parties hereto have executed this Amendment Number 1, which shall become effective upon the date it is signed by the District Commander.

DEPARTMENT OF THE ARMY

ST. JOHNS COUNTY, FLORIDA

BY:   
James L. Booth  
Colonel, U.S. Army  
District Commander

BY:   
Christian Whitehurst  
Chair  
Board of County Commissioners

DATE: 16 MAY 23

DATE: 5-2-23



CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.



\_\_\_\_\_  
Christian Whitehurst  
Chair  
St. Johns County Board of County Commissioners

DATE: 5-2-23



# CRITICALLY ERODED BEACHES IN FLORIDA

## August 2024

### TABLE OF CONTENTS

<b>Introduction</b>	<b>1</b>
<b>Historical Critical Erosion Designations</b>	<b>1</b>
<b>Discussion</b>	<b>6</b>
Nassau County	20
Duval County	22
St. Johns County	24
Flagler County	26
Volusia County	28
Brevard County	30
Indian River County	32
St. Lucie County	34
Martin County	36
Palm Beach County	38
Broward County	41
Miami-Dade County	43
Monroe County	45
Escambia County	48
Santa Rosa County	50
Okaloosa County	52
Walton County	54
Bay County	56
Gulf County	58
Franklin County	60
Wakulla County	62
Jefferson, Taylor and Dixie Counties	64
Levy County	66
Citrus, Hernando and Pasco Counties	68

## **Introduction**

In 1986, pursuant to sections 161.101 and 161.161, Florida Statutes (F.S.), the Florida Department of Environmental Protection (department) was charged with the responsibility to identify those beaches of the state which are critically eroding and to develop and maintain a comprehensive long-term management plan for their restoration. The long-term management plan has several components that the department implements including the “Critically Eroded Beaches Report and the Strategic Beach Management Plan”.

The department, pursuant to rule 62B-36.002(5), Florida Administrative Code (F.A.C.), defines “critically eroded shoreline” as, “a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost. Critically eroded shorelines may also include peripheral segments or gaps between identified critically eroded areas which, although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects.”

This critical erosion report provides an inventory of Florida’s erosion areas on the 825 miles of sandy beaches fronting the Atlantic Ocean, Straits of Florida, Gulf of Mexico and the roughly 66 coastal barrier tidal inlets. This report is periodically updated to include additions and deletions. When planning for future initiatives beyond the date of this report’s publication, readers may wish to visit the [department’s webpage](#) to ensure use of the most up-to-date information.

Many of the designated critically eroded beaches have been restored through the placement of beach and dune fill material. The shorelines where these beach restoration projects have taken place have improved compared to their pre-project condition when they were designated as being critically eroded. Although these beach management projects and their subsequent maintenance have mitigated the original critical erosion conditions, these shorelines retain their critical erosion designation in order to retain their state of Florida funding eligibility for long term management and beach project maintenance and monitoring. Roughly half of the designated critically eroded beaches are currently managed. Many areas have significant historic or contemporary erosion conditions, yet the erosion processes do not currently threaten public or private interests. These areas are therefore designated as non-critically eroded beaches and require close monitoring in case the conditions become critical.

## **Historical Critical Erosion Designations**

In 1989, the first list of erosion areas was developed based upon an abbreviated definition of “critical erosion.” That list included 217.6 miles of critical erosion and another 114.8 miles of non-critical erosion statewide. The erosion areas list was revised in 1990 to include minor changes for Nassau, Martin and Gulf counties, plus more significant changes for Monroe County as a result of a more detailed study of the Florida Keys beaches conducted during 1989. To see the older critically eroded beaches reports, view [OCULUS folder](#), (use the “Public Login” tab to enter site).

On the Atlantic coast, the combined impact of Hurricanes Frances and Jeanne resulted in significant increases in the amount of critically eroded beach in Flagler (2.3 miles), Volusia (5.4 miles), Brevard (11.5 miles), Indian River (6.6 miles), St. Lucie (3.7 miles) and Martin (1.6 miles) counties, along with minor increases in St. Johns (0.2 mile) and Palm Beach (0.3 mile) counties. On the northern Gulf of Mexico coast, Hurricane Ivan resulted in the addition of critically eroded beach segments in Escambia (1.2 miles), Santa Rosa (0.7 mile), Okaloosa (2.8 miles), Walton (5.1 miles) and Gulf (0.5 mile) counties. A public beach in Citrus County was also added (0.2 mile).

The 2005 hurricane season was a record-breaking season with 27 named storms. Florida was impacted by Hurricanes Dennis, Katrina, Ophelia, Rita and Wilma, and Tropical Storms Arlene and Tammy. The cumulative impact of these storms exacerbated erosion conditions in south and northwest Florida. The 2006 updated list added 20.2 miles (roughly a 5.5 percent increase) to the statewide total of critically eroded beaches, and 0.2 mile (2.4 percent increase) to the total of critically eroded inlet shorelines. In south Florida, 2.5 miles were added in Monroe County and 3.1 miles were added in Collier County due to the impacts of Hurricanes Rita and Wilma. In Northwest Florida, following the impacts of Hurricanes Dennis, Katrina and Rita, critically eroded segments were added in Okaloosa (1.6 miles), Walton (2.4 miles), Gulf (2.4 miles) and Franklin (7.4 miles) counties. Continued investigations in southwest Florida resulted in the addition of 0.8 mile of critically eroded beach in Pinellas County and 0.2 mile of critically eroded inlet shoreline in Manatee County.

A mild tropical storm season in 2006 led to few additions for the 2007 updated listing. An eroded segment of South Ponte Vedra (2.0 miles) was added in St. Johns County, as well as small beach and inlet segments in Lee County at Boca Grande. Another segment was added to Escambia County on Perdido Key (0.9 mile).

Although there was another relatively mild tropical storm season in 2007, with only Tropical Storms Andrea, Barry and Noel affecting Florida beaches, persistent northeasters cumulatively exacerbated erosion conditions at a few hotspots along the Atlantic coast. Due to these storm effects, small shoreline segments at Painters Hill in Flagler County (0.3 mile) and Lantana Municipal Beach in Palm Beach County (0.1 mile) were added to the 2008 updated listing. At the north end of Manatee County, the shoreline of Passage Key (0.3 mile) was also added to the 2008 updated listing. Segments on Perdido Key in Escambia County (4.0 miles), St. Joseph Peninsula in Gulf County (1.7 miles) and Alligator Point in Franklin County (0.8 mile) were added for the design integrity of adjacent beach management projects. An updated study of Manasota Key resulted in the addition of a 1.5-mile segment in Sarasota County. Another updated study in Lee County included a non-critically eroded segment on North Captiva Island and a 0.8-mile critically eroded segment on Big Hickory Island.

In 2008, Tropical Storm Fay affected predominantly the Atlantic shoreline, and the Gulf coast received the fringe impacts of Hurricanes Gustav and Ike. Small critical erosion areas were added for Nassau and Palm Beach counties. Small segments of Walton County were designated as critical for the design integrity of adjacent beach management projects. Because the Alligator Point to Lighthouse Point beach restoration project did not go forward in Franklin County, small segments were removed from the critically eroded list. The designation for the critically eroded north end of Anna Maria Island changed from an inlet shoreline to a gulf beach. Studies in 2010 identified minor segments of critically eroded areas in Sarasota County (0.8 mile) and Collier County (0.4 mile). Due to another quiet tropical storm season for Florida's beaches in 2010, no

In 2020 and 2021, monitoring reports, studies and survey data indicated that critical erosion has expanded in a southerly direction on Casey Key in Sarasota County (0.6 mile) and new segments were added in Volusia County (1.2 mile) and Broward County (0.6 mile). A new segment of critically eroded inlet shoreline was added in Bay County (0.4 mile) adjacent to Gator Lake. Additional measurements were made in the Florida Keys with GIS maps to provide more precise distances resulting in greater lengths for the existing critically eroded areas (1.2 mile).

No changes were made in the updated Critically Eroded Beaches Report of 2022. Due to erosion caused by Hurricanes Ian and Nicole (2022), additional critical erosion areas were added to the 2023 critical erosion report in St. Johns County (0.8 mile), Volusia County (5.0 miles) and Lee County (0.4 mile). Both Volusia County (0.9 mile) and St. Johns County (7.6 miles) had non-critical erosion segments added into the 2023 report. Due to eastward erosion progression along St. George Island (0.6 mile) in Franklin County and new information on critical wildlife habitat being threatened (0.2 mile) along Gomez Key in Levy County, two erosion segments have been added into the 2024 report. One segment (0.2) in Pasco County was delisted in 2024 at Hudson Beach due to coastal armoring of the beach. The 2024 list includes 432.8 miles of critically eroded beach, 9.1 miles of critically eroded inlet shoreline, 96.5 miles of non-critically eroded beach and 3.2 miles of non-critically eroded inlet shoreline statewide, as shown in Figure 1.



**Figure 1.** Statewide areas of critically and non-critically eroded shoreline [Graphic from [ROSSI](#) database]. View an [interactive map](#) with aerial imagery showing R monuments and the critical erosion areas.

**Table 1.** Locations of critically eroded beach and inlet shoreline, and non-critically eroded beach and inlet shoreline, in Florida east coast counties, as of August 2024.

County	Eroding Shoreline Location (by R monument or inlet name)	Erosion Condition	Critically Eroded Beach (miles)	Non-Critically Eroded Beach (miles)	Critically Eroded Inlet (miles)	Non-Critically Eroded Inlet (miles)
Nassau	St. Marys River	Critical Inlet Shoreline	0	0	2.5	0
Nassau	R9 – R33	Critical	4.4	0	0	0
Nassau	R60 – R80	Critical	3.3	0	0	0
<b>Nassau</b>	<b>Total Eroding Shoreline</b>		<b>7.7</b>	<b>0</b>	<b>2.5</b>	<b>0</b>
Duval	Big Talbot Island, Nassau Sound	Non-Critical Inlet Shoreline	0	0	0	2.0
Duval	R21 – R23	Critical	0.3	0	0	0
Duval	R23 – A1A	Critical Inlet Shoreline	0	0	0.7	0
Duval	V501 – R80	Critical	10.1	0	0	0
<b>Duval</b>	<b>Total Eroding Shoreline</b>		<b>10.4</b>	<b>0</b>	<b>0.7</b>	<b>2.0</b>
St. Johns	R26 – R31	Critical	0.9	0	0	0
St. Johns	R76 – R117.5	Critical	8.2	0	0	0
St. Johns	R123 – R128	Critical	1.0	0	0	0
St. Johns	R132 – R152	Critical	3.8	0	0	0
St. Johns	R152-R192	Non-Critical	0	7.6	0	0
St. Johns	R192 – R196	Critical	0.8	0	0	0
St. Johns	R197 – R209	Critical	2.4	0	0	0
<b>St. Johns</b>	<b>Total Eroding Shoreline</b>		<b>17.1</b>	<b>7.6</b>	<b>0</b>	<b>0</b>
Flagler	R1 – R4	Critical	0.6	0	0	0

County	Eroding Shoreline Location (by R monument or inlet name)	Erosion Condition	Critically Eroded Beach (miles)	Non-Critically Eroded Beach (miles)	Critically Eroded Inlet (miles)	Non-Critically Eroded Inlet (miles)
<b>Indian River</b>	<b>Total Eroding Shoreline</b>		<b>15.7</b>	<b>0</b>	<b>0</b>	<b>0</b>
St. Lucie	R34 – R46	Critical	2.3	0	0	0
St. Lucie	R46 – R80	Non-Critical	0	6.4	0	0
St. Lucie	R80 – R90.3	Critical	1.9	0	0	0
St. Lucie	R90.3 – R98	Non-Critical	0	1.5	0	0
St. Lucie	R98 – R115+1000	Critical	3.4	0	0	0
<b>St. Lucie</b>	<b>Total Eroding Shoreline</b>		<b>7.6</b>	<b>7.9</b>	<b>0</b>	<b>0</b>
Martin	R1 – R40	Critical	6.7	0	0	0
Martin	R45 – R111	Critical	11.5	0	0	0
Martin	R126 – R127.4	Critical	0.2	0	0	0
<b>Martin</b>	<b>Total Eroding Shoreline</b>		<b>18.4</b>	<b>0</b>	<b>0</b>	<b>0</b>
Palm Beach	R1 – R10	Critical	1.5	0	0	0
Palm Beach	North and South Shore, Jupiter Inlet	Critical Inlet Shoreline	0	0	0.8	0
Palm Beach	R12 – R38	Critical	5.0	0	0	0
Palm Beach	R38 – R40	Non-Critical	0	0.4	0	0
Palm Beach	R58 – R60.5	Non-Critical	0	0.5	0	0
Palm Beach	R60.5 – R69	Critical	1.7	0	0	0
Palm Beach	R76 – R128	Critical	10.9	0	0	0
Palm Beach	R128.8 – R145.8	Critical	3.3	0	0	0
Palm Beach	R152 – R168	Critical	3.3	0	0	0

**Table 2.** Locations of critically eroded beach and inlet shoreline, and non-critically eroded beach and inlet shoreline, in Florida counties on the west coast, as of August 2024.

County	Eroding Shoreline Location (by R monument or inlet name)	Erosion Condition	Critically Eroded Beach (miles)	Non-Critically Eroded Beach (miles)	Critically Eroded Inlet (miles)	Non-Critically Eroded Inlet (miles)
Escambia	R19 – R34	Critical	3.0	0	0	0
Escambia	R34 – R65	Non-Critical	0	5.9	0	0
Escambia	R79 – R107	Non-Critical	0	5.3	0	0
Escambia	R107 – R151	Critical	8.2	0	0	0
<b>Escambia</b>	<b>Total Eroding Shoreline</b>		<b>11.2</b>	<b>11.2</b>	<b>0</b>	<b>0</b>
Santa Rosa	R192.5 – R213.5	Critical	4.1	0	0	0
<b>Santa Rosa</b>	<b>Total Eroding Shoreline</b>		<b>4.1</b>	<b>0</b>	<b>0</b>	<b>0</b>
Okaloosa	R1 – R15	Critical	2.8	0	0	0
Okaloosa	Norriego Point	Critical Inlet Shoreline	0	0	0.8	0
Okaloosa	R17 – R25.5	Critical	1.6	0	0	0
Okaloosa	R39 – R50	Critical	2.1	0	0	0
<b>Okaloosa</b>	<b>Total Eroding Shoreline</b>		<b>6.5</b>	<b>0</b>	<b>0.8</b>	<b>0</b>
Walton	R1 – R23.6	Critical	5.2	0	0	0
Walton	R41 – R64	Critical	4.5	0	0	0
Walton	R67 – R72	Critical	1.0	0	0	0
Walton	R78 – R98	Critical	3.9	0	0	0
Walton	R105.5 – R127.4	Critical	4.2	0	0	0



County	Eroding Shoreline Location (by R monument or inlet name)	Erosion Condition	Critically Eroded Beach (miles)	Non-Critically Eroded Beach (miles)	Critically Eroded Inlet (miles)	Non-Critically Eroded Inlet (miles)
Franklin	R34 – R51	Non-Critical	0	3.3	0	0
Franklin	Sikes Cut, East and West Shores	Non-Critical Inlet Shoreline	0	0	0	0.5
Franklin	R52 – R63.0	Critical	2.3	0	0	0
Franklin	R63.0 – R69	Non-Critical	0	1.3	0	0
Franklin	R106 – R128.5	Critical	4.5	0	0	0
Franklin	R128.5 – R147	Non-Critical	0	3.8	0	0
Franklin	R154 – R168	Non-Critical	0	2.6	0	0
Franklin	R168 – R187.2	Critical	3.6	0	0	0
Franklin	R194 – R196	Non-Critical	0	0.4	0	0
Franklin	R210 – R216	Critical	1.1	0	0	0
Franklin	R220 – R222	Critical	0.4	0	0	0
Franklin	R222 – R232	Non-Critical	0	2.1	0	0
<b>Franklin</b>	<b>Total Eroding Shoreline</b>		<b>13.6</b>	<b>16.2</b>	<b>0</b>	<b>0.5</b>
Wakulla	Mashes Sands, South	Critical	0.3	0	0	0
Wakulla	Mashes Sands, North	Non-Critical	0	0.4	0	0
Wakulla	Shell Point	Critical	1.0	0	0	0
<b>Wakulla</b>	<b>Total Eroding Shoreline</b>		<b>1.3</b>	<b>0.4</b>	<b>0</b>	<b>0</b>
Taylor	Dekle Beach	Critical	0.2	0	0	0
<b>Taylor</b>	<b>Total Eroding Shoreline</b>		<b>0.2</b>	<b>0</b>	<b>0</b>	<b>0</b>

County	Eroding Shoreline Location (by R monument or inlet name)	Erosion Condition	Critically Eroded Beach (miles)	Non-Critically Eroded Beach (miles)	Critically Eroded Inlet (miles)	Non-Critically Eroded Inlet (miles)
Pinellas	R47 – R49	Critical Inlet Shoreline	0	0	0.5	0
Pinellas	R56 – R115.4	Critical	11.3	0	0	0
Pinellas	R126 – R143	Critical	3.5	0	0	0
Pinellas	R144 – R166	Critical	4.1	0	0	0
Pinellas	North Bounces Key	Non-Critical	0	1.4	0	0
Pinellas	South Bounces Key	Non-Critical	0	2.2	0	0
Pinellas	R176 – R182	Critical	1.1	0	0	0
<b>Pinellas</b>	<b>Total Eroding Shoreline</b>		<b>21.4</b>	<b>4.4</b>	<b>0.5</b>	<b>0</b>
Hillsborough	Egmont Key	Critical	1.6	0	0	0
<b>Hillsborough</b>	<b>Total Eroding Shoreline</b>		<b>1.6</b>	<b>0</b>	<b>0</b>	<b>0</b>
Manatee	V1 – V2	Critical	0.3	0	0	0
Manatee	Pier – R41.3	Critical	7.9	0	0	0
Manatee	R42 – R67.3	Critical	4.8	0	0	0
<b>Manatee</b>	<b>Total Eroding Shoreline</b>		<b>13.0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Sarasota	R1 – R29	Critical	5.4	0	0	0
Sarasota	R31, east 1500'	Critical Inlet Shoreline	0	0	0.3	0
Sarasota	R31 – R44.5	Critical	2.4	0	0	0
Sarasota	R44A – R45	Critical Inlet Shoreline	0	0	0.8	0
Sarasota	R46 – R48.4	Critical	0.4	0	0	0
Sarasota	R64 - R77	Critical	2.4	0	0	0

County	Eroding Shoreline Location (by R monument or inlet name)	Erosion Condition	Critically Eroded Beach (miles)	Non-Critically Eroded Beach (miles)	Critically Eroded Inlet (miles)	Non-Critically Eroded Inlet (miles)
Lee	R109 – R118	Critical	1.7	0	0	0
Lee	R129 – R135	Critical	1.3	0	0	0
Lee	R175(-.4) – R200	Critical	5.0	0	0	0
Lee	R203 – R207	Critical	0.8	0	0	0
Lee	R211 – R213	Non-Critical Inlet Shoreline	0	0	0	0.3
Lee	R214 – R222	Critical	1.5	0	0	0
Lee	R222	Non-Critical Inlet Shoreline	0	0	0	0.1
Lee	R222.7 – R225.9	Critical	0.8	0	0	0
Lee	R226 – R230.4	Critical	0.9	0	0	0
<b>Lee</b>	<b>Total Eroding Shoreline</b>		<b>22.8</b>	<b>5.3</b>	<b>0.6</b>	<b>0.4</b>
Collier	R14 – R16.3	Critical	0.4	0	0	0
Collier	R16.8 – R17.3	Critical	0.1	0	0	0
Collier	R22.3 – R30.5	Critical	1.6	0	0	0
Collier	R42 – R57.5	Critical	3.0	0	0	0
Collier	R57.8 – R89	Critical	5.6	0	0	0
Collier	R90 – R111	Non-Critical	0	3.9	0	0
Collier	Sea Oat Island	Non-Critical	0	0.9	0	0
Collier	H3 – H11	Critical Inlet Shoreline	0	0	0.8	0
Collier	R134.5 – R139	Critical	0.8	0	0	0
Collier	R143 – R148	Critical	0.9	0	0	0

County	Eroding Shoreline Location (by R monument)	Erosion Condition	Critically Eroded Beach (miles)	Non-Critically Eroded Beach (miles)
Monroe	Key West	Critical	3.6	0
Monroe	Simonton Beach	Critical	0.02	0
Monroe	Fort Zachary Taylor	Critical	0.3	0
<b>Monroe</b>	<b>Total Florida Keys Eroding Shoreline</b>	<b>Critical</b>	<b>15.0</b>	<b>0</b>

**Table 4.** Summary of Statewide critically eroded beach and inlet shoreline, and non-critically eroded beach and inlet shoreline, in Florida counties on the east coast, west coast and Florida Keys, as of August 2024.

Coastal Erosion Location (by R monument)	Critically Eroded Beach (miles)	Non-Critically Eroded Beach (miles)	Critically Eroded Inlet (miles)	Non-Critically Eroded Inlet (miles)
East Coast	225.9	32.4	4.6	2.3
West Coast	191.9	64.1	4.5	0.9
Florida Keys	15.0	0	N/A	N/A
<b>Total Coastal Erosion</b>	<b>432.8</b>	<b>96.5</b>	<b>9.1</b>	<b>3.2</b>

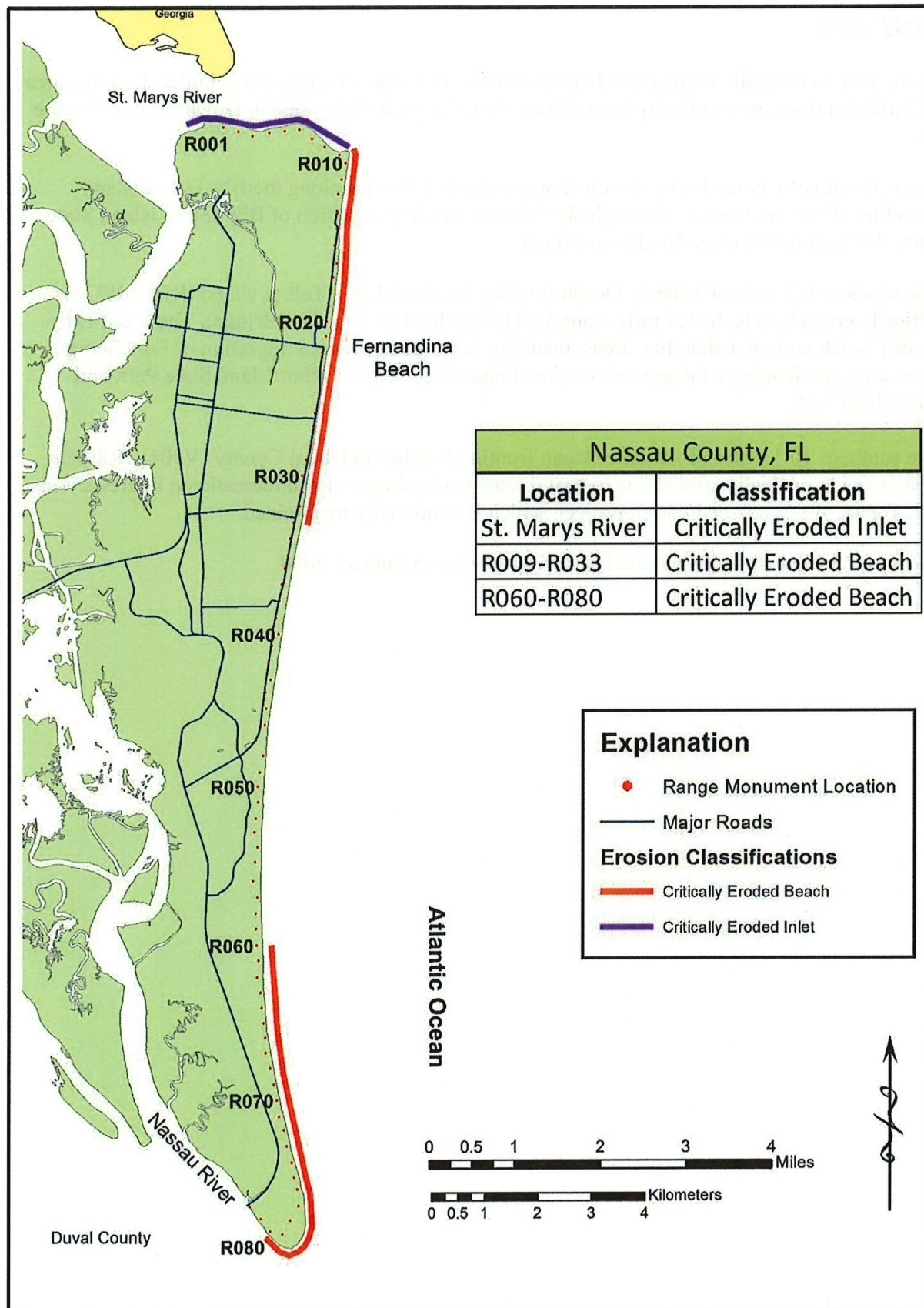


Figure 2. Critically eroded shoreline within Nassau County.

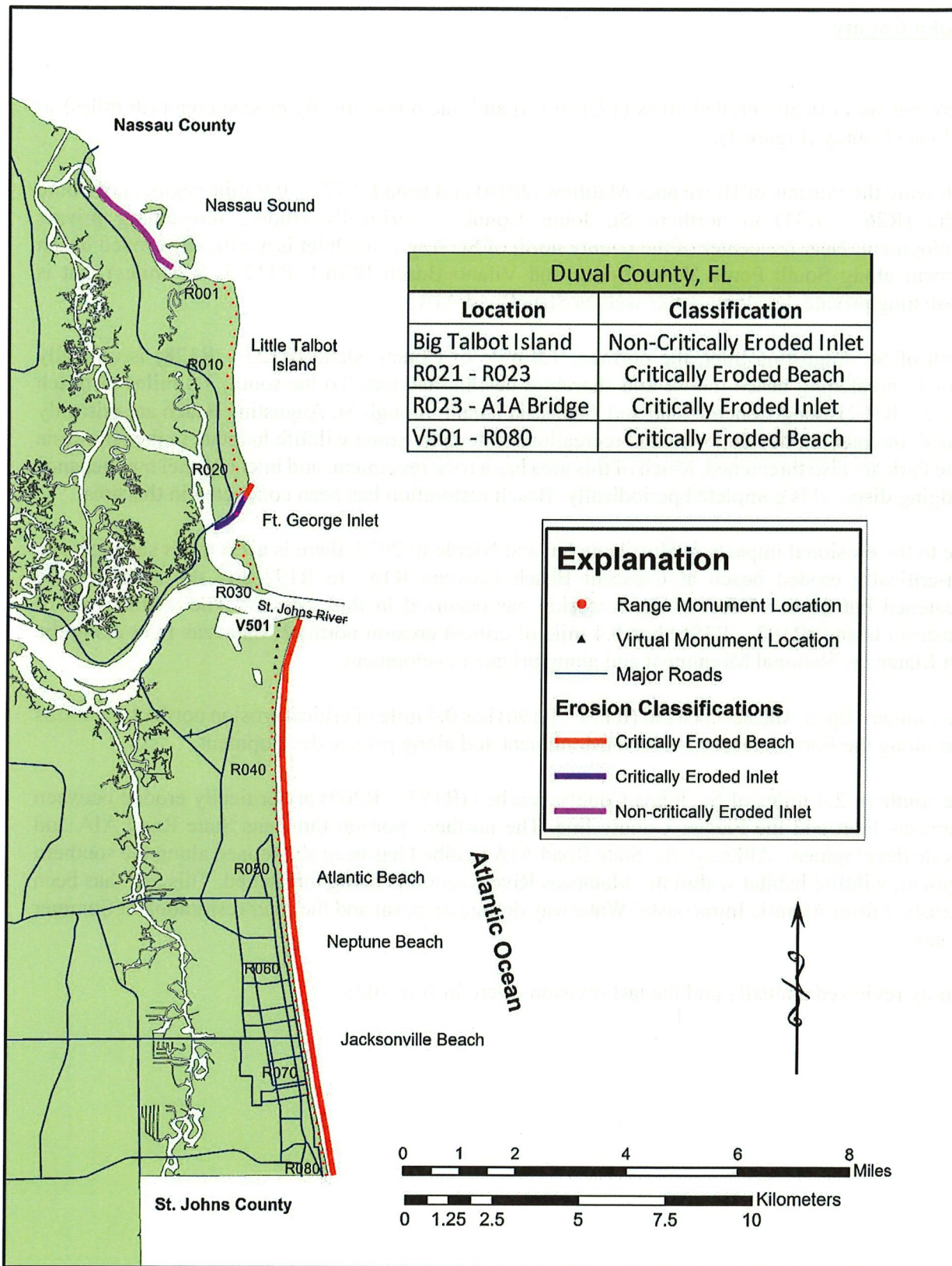


Figure 3. Critically eroded shoreline within Duval County.

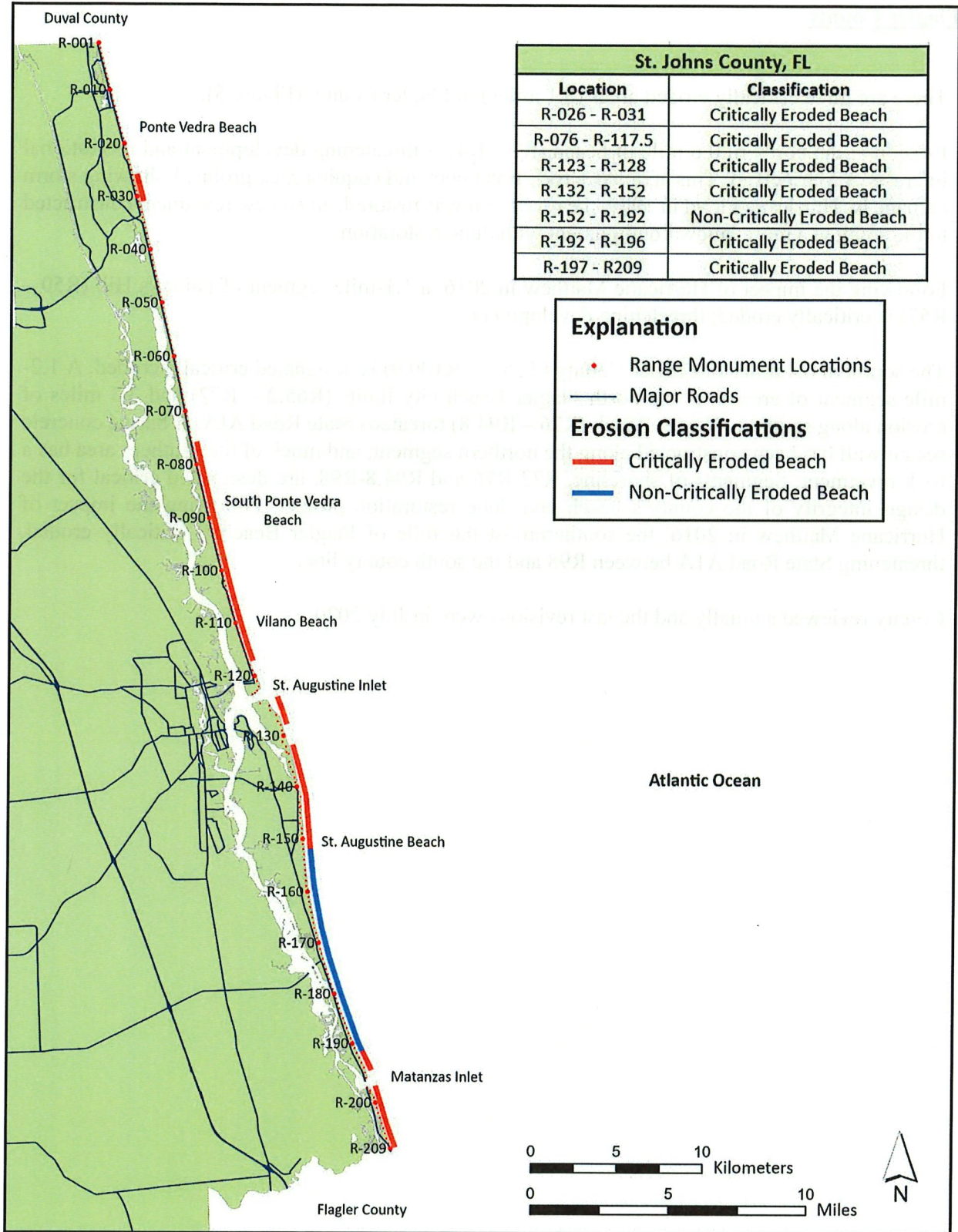
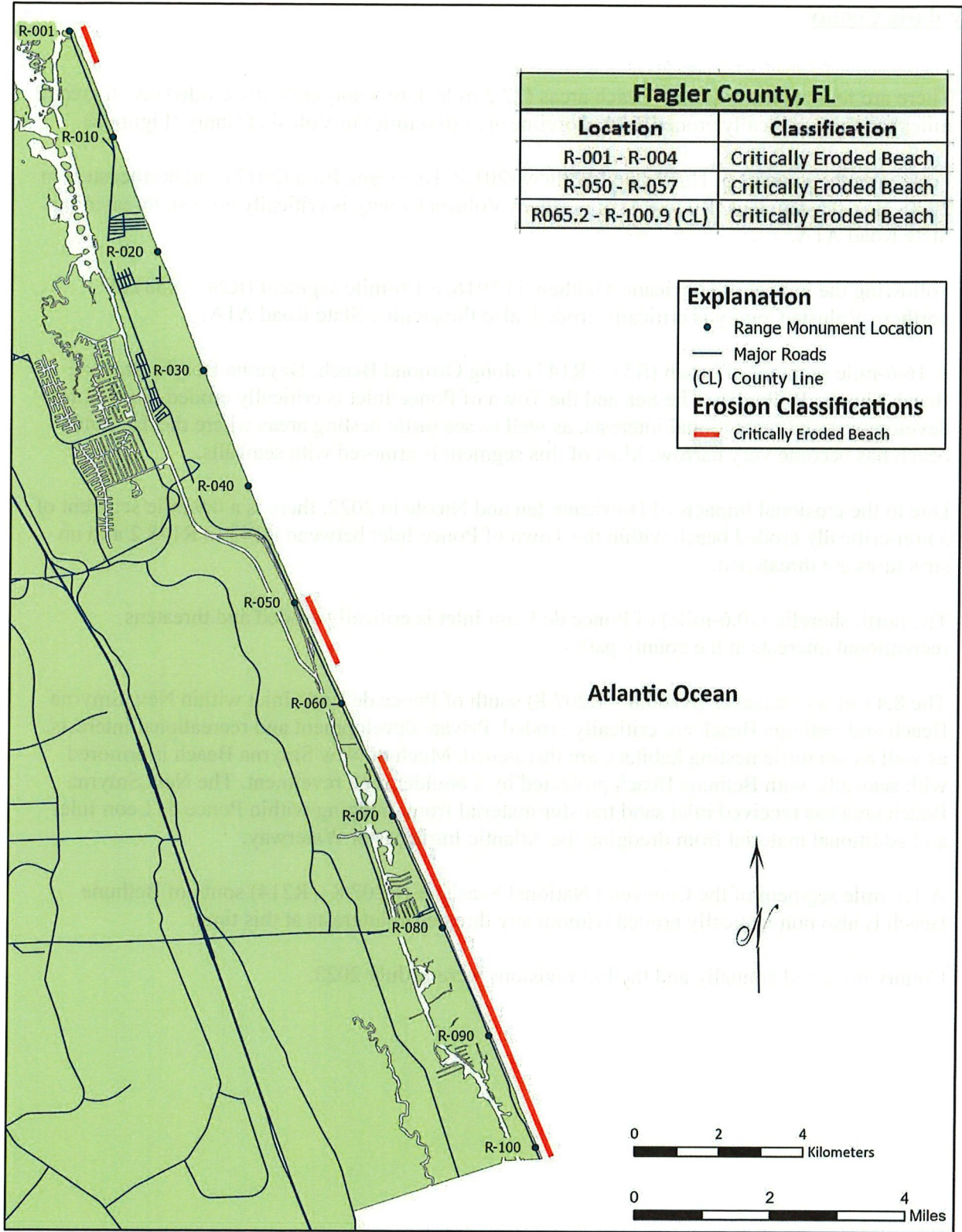


Figure 4. Critically eroded shoreline within St. Johns County.



**Figure 5.** Critically eroded shoreline within Flagler County.



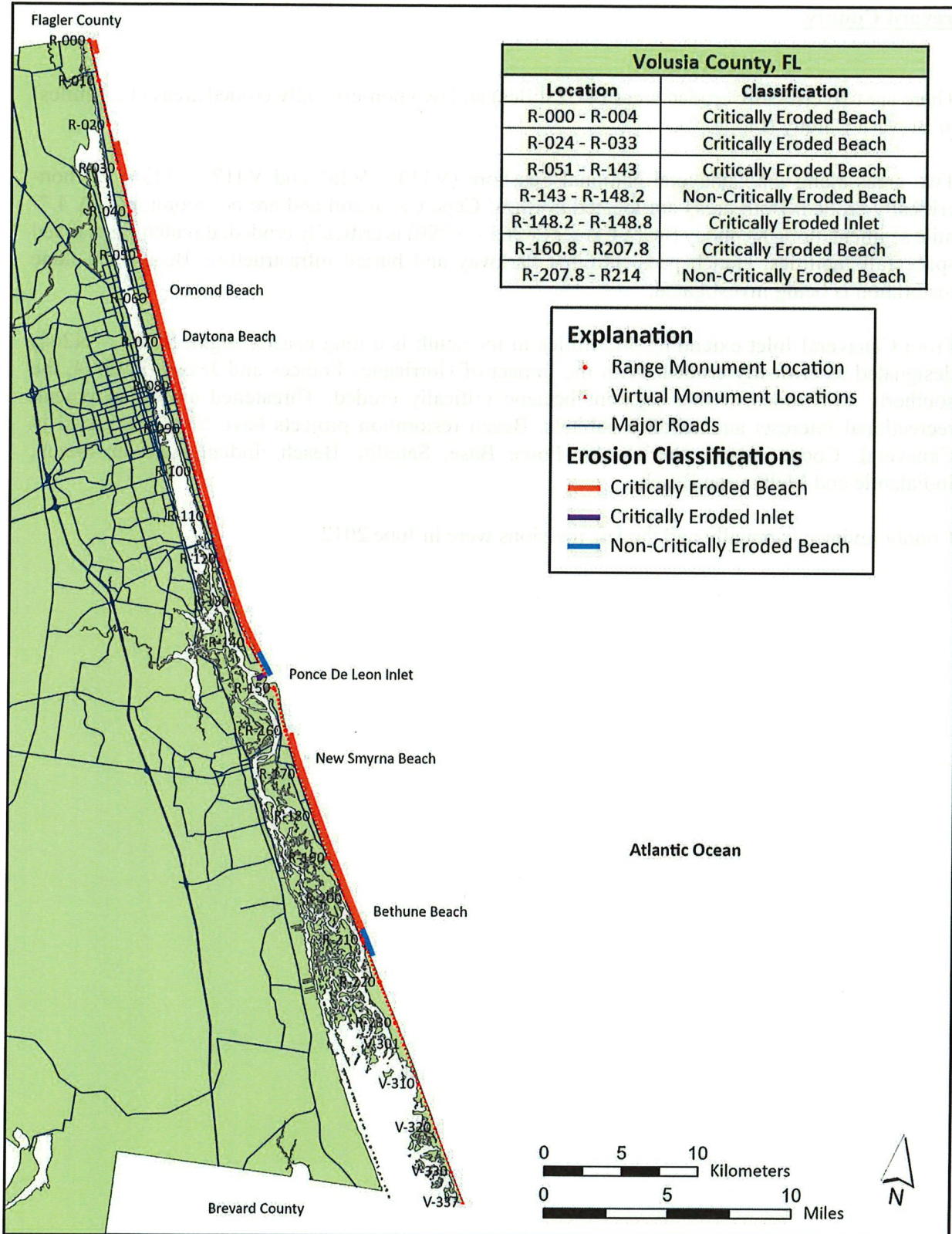


Figure 6. Critically eroded shoreline within Volusia County.

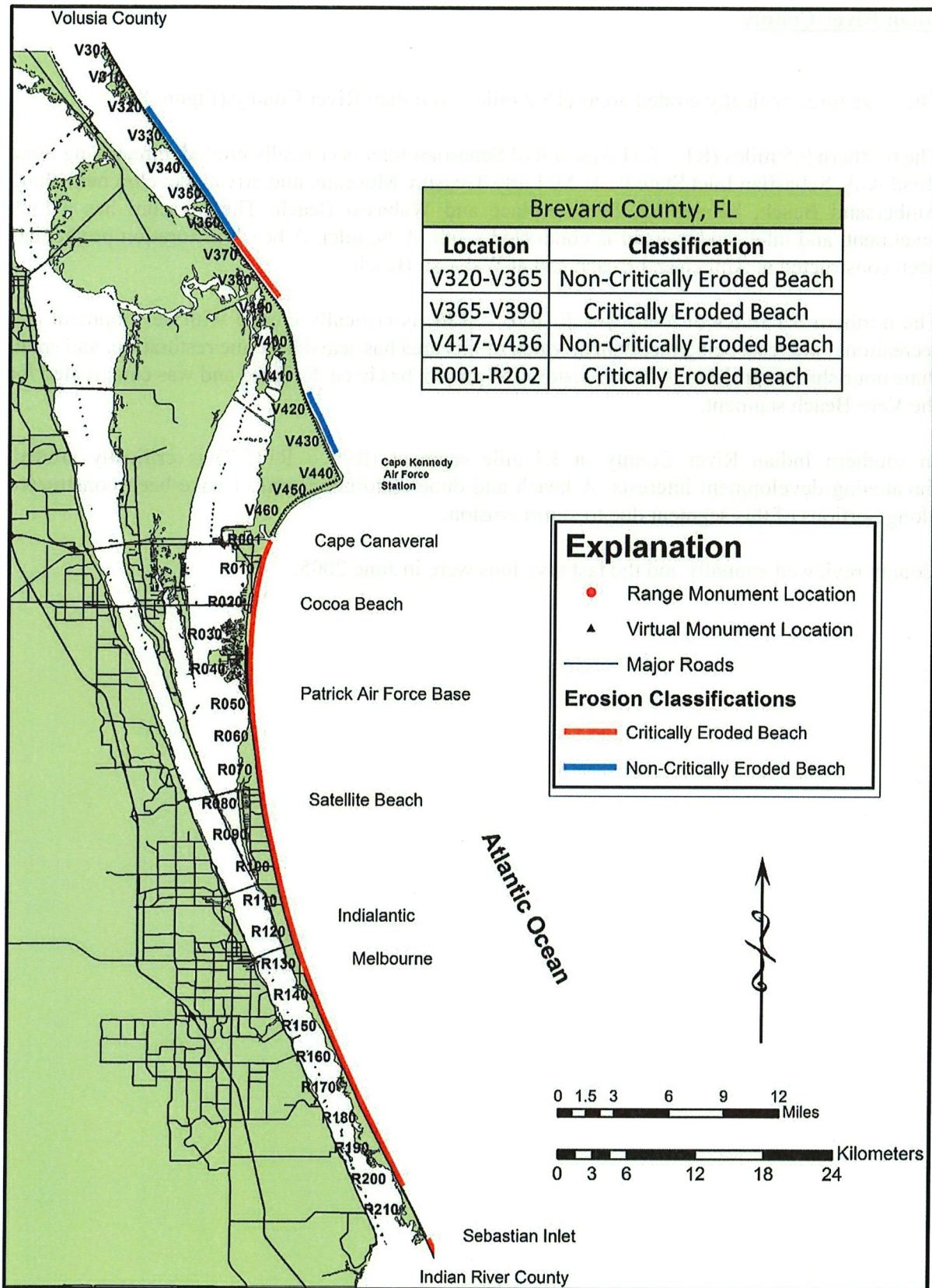


Figure 7. Critically eroded shoreline within Brevard County.

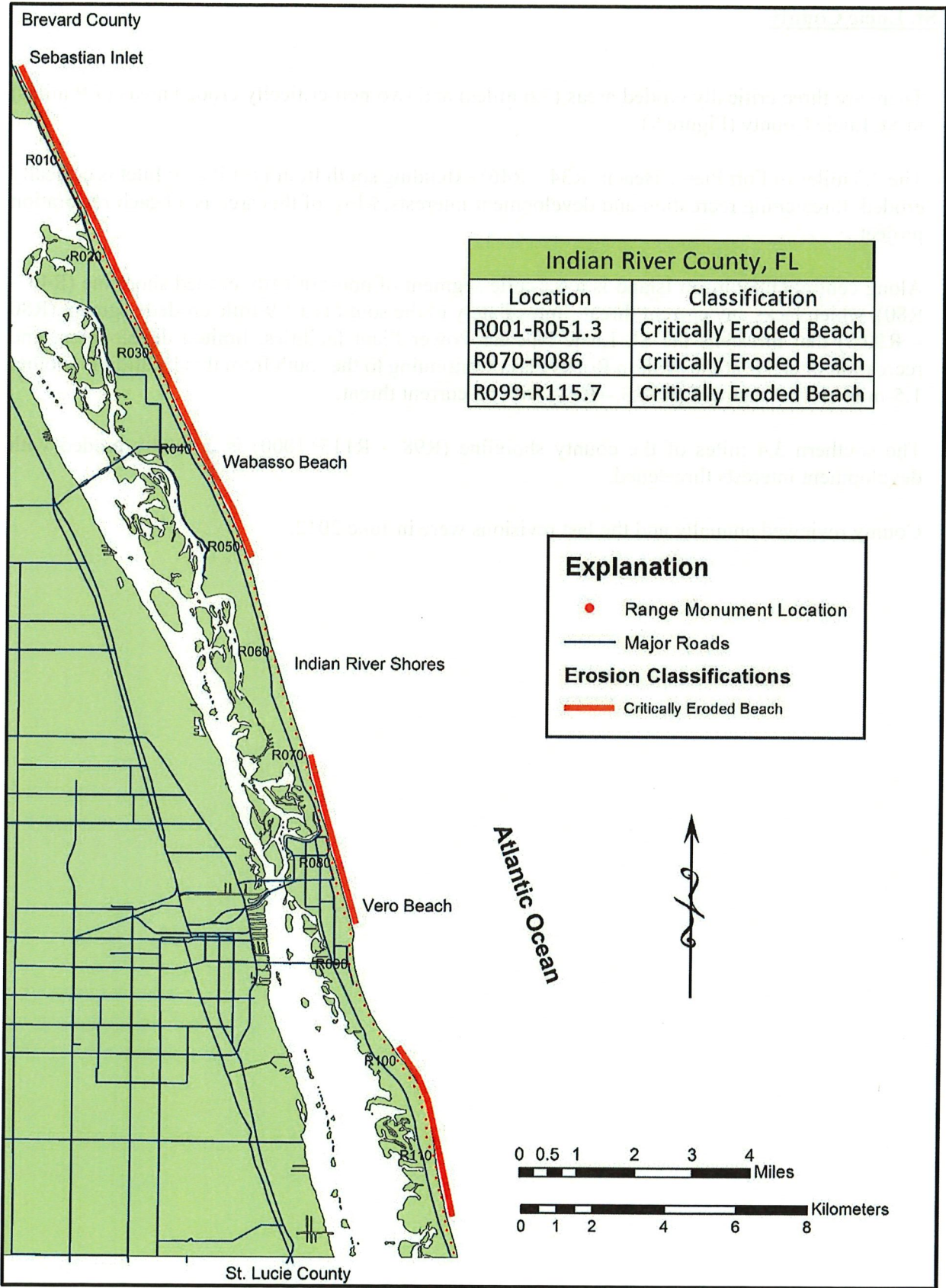


Figure 8. Critically eroded shoreline within Indian River County.

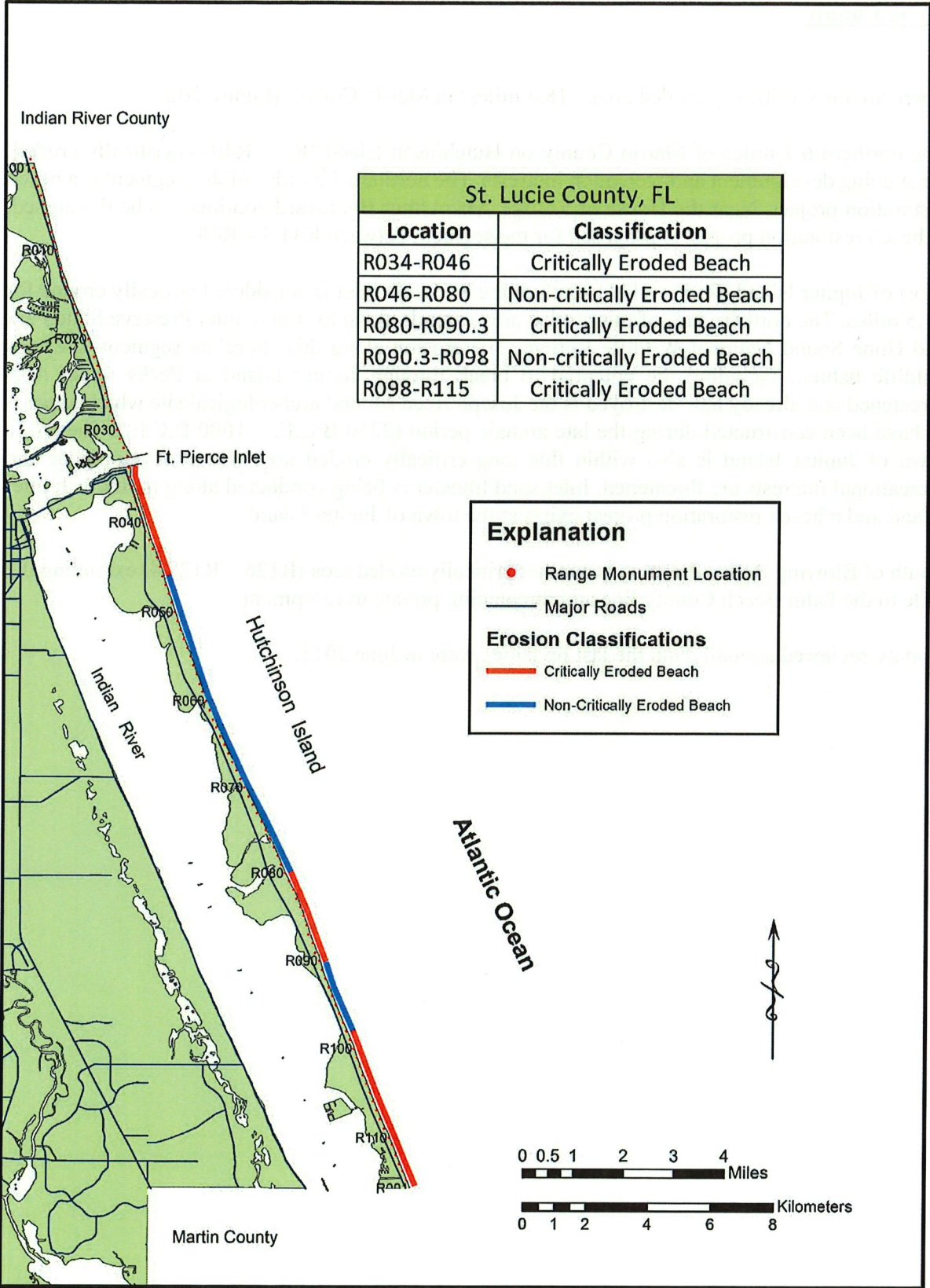


Figure 9. Critically eroded shoreline within St. Lucie County.

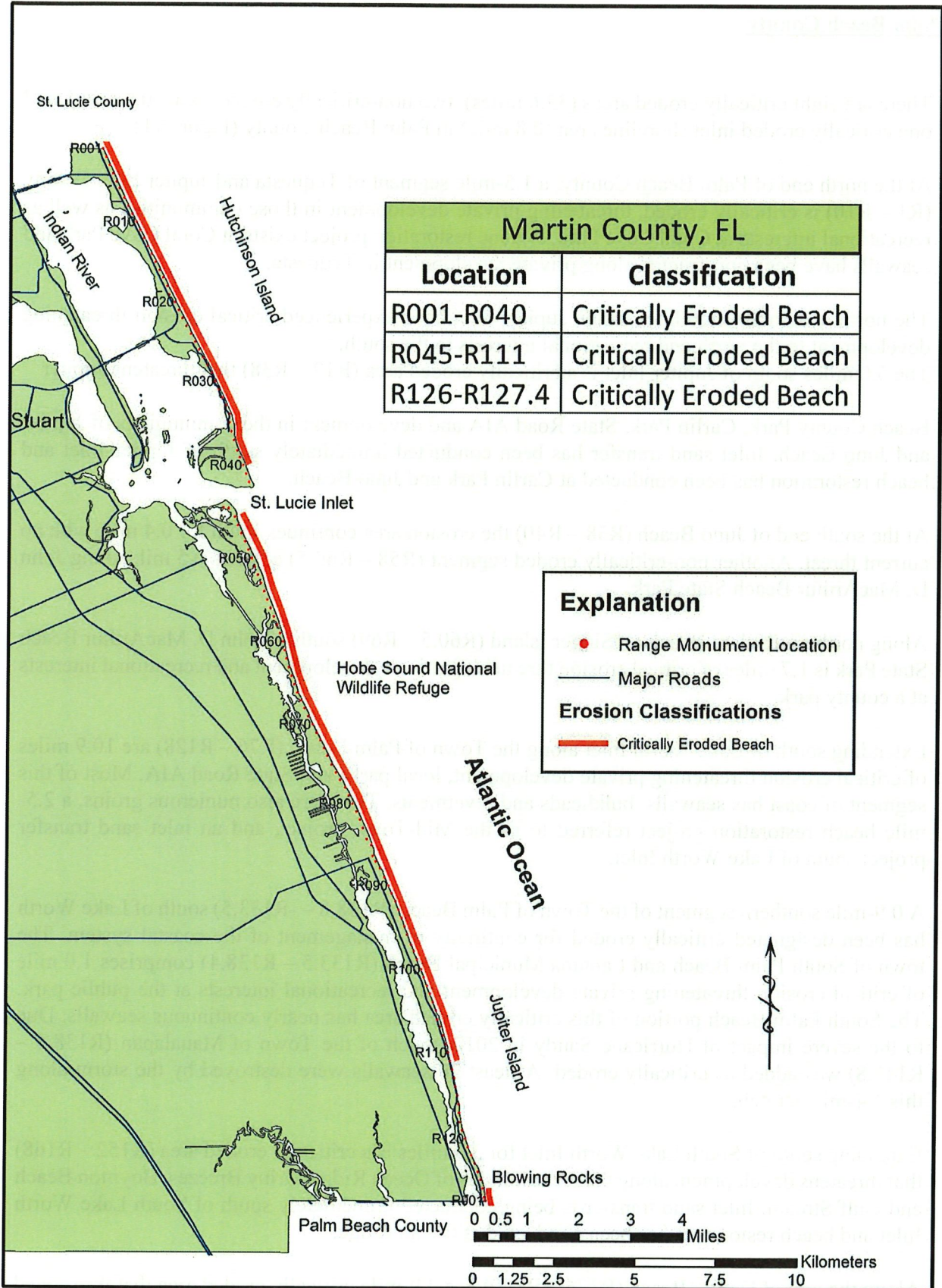


Figure 10. Critically eroded shoreline within Martin County.

project.

The city of Boca Raton at the south end of Palm Beach County has critical erosion (R204 – R227.9) extending 5.0 miles to the Broward County line, which threatens recreation interests at Spanish River Park, Red Reef Park, and South Inlet Park, as well as State Road A1A and private development. Beach restoration has been constructed throughout Boca Raton, and inlet sand transfer and seawalls exist south of Boca Raton Inlet.

County reviewed annually and the last revisions were in June 2014.

## **Broward County**

Nearly all of Broward County is critically eroded (Figure 12). Three critical erosion areas (21.9 total miles) are specifically identified.

The south end of Deerfield Beach and the entire town of Hillsboro Beach along northern Broward County is a 3.8-mile long critically eroded area (R3 – R23). Private development is threatened throughout this area between R4.5 and R23. The segment between R3 and R4.5 is designated critical for the design integrity of a beach restoration project that extends southward to R12 in Hillsboro Beach. Fill placement between R3 and R4.5 is needed as a feeder beach to provide enough sand to maintain the project design in northern Hillsboro Beach. Some seawalls exist in Hillsboro Beach, and a boulder mound and groin project exist in Deerfield Beach.

South of Hillsboro Inlet and extending for 10.0 miles along Pompano Beach, Sea Ranch Lakes, Lauderdale-by-the-Sea and Fort Lauderdale, is a continuous critically eroded area (R25 – R77) that threatens development and recreational interests including State Road A1A. A beach restoration project has been constructed at Pompano Beach and inlet sand transfer is ongoing immediately south of Hillsboro Inlet. Numerous bulkheads and retaining walls also exist along this stretch of coast. Beach restoration is being conducted throughout this area.

Along the southern 8.1 miles of Broward County south of the entrance to Port Everglades south jetty is a critically eroded area (R85.9 – R128) that threatens recreational interests at Von D. Mizell-Eula Johnson State Park and development and recreational interests along the communities of Dania, Hollywood and Hallandale. Beach restoration projects are ongoing at Von D. Mizell-Eula Johnson State Park, Hollywood and Hallandale. Seawalls also exist along the private development.

County reviewed annually and the last revisions were in July 2021.

## **Miami-Dade County**

Most of Miami-Dade County's barrier island coast north of Cape Florida is critically eroded (Figure 13). The erosion is identified by three critically eroded areas (17.0 miles), two non-critically eroded areas (1.4 miles) and one non-critically eroded inlet shoreline area (0.3 mile).

The northern 5.1 miles of Miami-Dade County (R1 – R26.7) has critical erosion threatening development along Golden Beach, Sunny Isles and recreational interests at Haulover Park. This stretch of coast has a beach restoration project along Sunny Isles and Haulover Park.

Between Bakers Haulover Inlet and Government Cut (R27 – R74.4) are 9.4 miles of critical erosion, which threaten development and recreational interests along Bal Harbour, Surfside and Miami Beach. This reach is a beach restoration project.

The northern end of Virginia Key along the south shoreline of Norris Cut (0.3 mile) has non-critical inlet shoreline erosion. The southern 0.8-mile of beach on Virginia Key (R84 – R88) is also non-critically eroded.

The northern end of Key Biscayne (R89 – R92) has 0.6 mile of non-critical erosion, and the southern half of Key Biscayne (R101 – R113) has 2.5 miles of critical erosion. The critically eroded area threatens development in the village of Key Biscayne and recreational interests at Bill Baggs Cape Florida State Park. This segment is a beach restoration project.

County reviewed annually and the last revisions were in March 1999.



## Monroe County

There are 13 critically eroded beach areas (15.0 miles) along the Florida Keys fronting on the Straits of Florida and Gulf of Mexico between Key Largo and Key West (Figure 14). The distal sand keys west of Key West including Woman Key, Boca Grande Key, Marquesas Keys and Tortugas Keys also have beach erosion conditions that have not been adequately studied for inclusion in this report. Also not included at this time are the mainland beaches of Key McLaughlin and Cape Sable that front on the Gulf of Mexico. These beaches sustained severe erosion conditions due to Hurricane Wilma in 2005.

There are no identified erosion problem areas in the upper keys, but there are six in the middle keys. A 1.4-mile segment of Lower Matecumbe Key (Islamorada) is critically eroded, threatening recreational interests, private development and U.S. Highway 1 along Sea Oats Beach (from approximately 130 feet southwest of V345 to the groin that is approximately 1,900 feet southwest of V346). A 2.1-mile segment of Long Key is critically eroded, threatening recreational interests at the Long Key State Park and private development (4,750 feet northeast of V353 to V354). Another 0.3-mile segment on Little Crawl Key is critically eroded, threatening recreation interests at Curry Hammock State Park (V363, from inlet lagoon area to 400 feet southwest past the park road). The Curry Hammock segment is a beach restoration project.

All 1.5 miles of Coco Plum Beach are critically eroded, threatening private development, wildlife habitats and recreation interests along a Monroe County Park (approximately 5,130 feet northeast of V365 to 2,180 feet southwest of V365). The 0.9-mile segment along the south shoreline of Key Colony Beach is critically eroded, threatening private development (approximately 2,630 feet northeast of V366 to 1,630 feet southwest of V366). At Sombrero Beach on Vaca Key, a 0.5-mile segment of beach at Monroe County's public park is critically eroded (between the groin or 1,060 feet west of V371 to 1,580 feet east of V372 or of the western end of Sombrero Beach Road). This segment is a beach restoration project.

The lower keys have significantly more erosion than the upper or middle keys as calcium carbonate sand beaches become more frequent, although are still limited. Little Duck Key (0.2 mile) is a critically eroded Monroe County Park (between V381 to 1,120 feet southwest of V381). The sandy island of Bahia Honda Key has three erosion areas. Within Bahia Honda State Park, Calusa Beach (the eastern segment between V383 and 500 feet northeast of V384), Loggerhead Beach (a western segment between 500 feet northeast of V384 to 4,350 feet southwest of V384) fronting on the Straits of Florida and a stretch of Sandspur Beach at the east end of Bahia Honda Key have 2.2 miles of critically eroded shoreline that is 1,700 feet southeast of V385 and fronting the Straits of Florida, threatening recreational interests as well as the park road and park development. A terminal groin and nourishment have been constructed at Calusa Beach, and a revetment has been constructed along much of the threatened section of the park road.

Following the impact of Hurricane Irma, Long Beach on Big Pine Key is a 1.1-mile segment of critically eroded beach (between 4,200 feet southwest of V388 to 9,200 feet southwest of V388). Further west is a 0.9-mile segment of critically eroded public beach on Boca Chica Key (between 7,500 feet south-southeast of V406 or 500 feet southwest of inlet and 7,900 feet south-southeast of V407 or at edge of inlet lagoon) along Boca Chica Road. Boca Chica Beach is a Monroe County Park where recreational beach and the park road were lost during Hurricanes Rita and Wilma in 2005.

Nearly the entire south coast of the island of Key West is critically eroded extending for 3.6 miles (V411

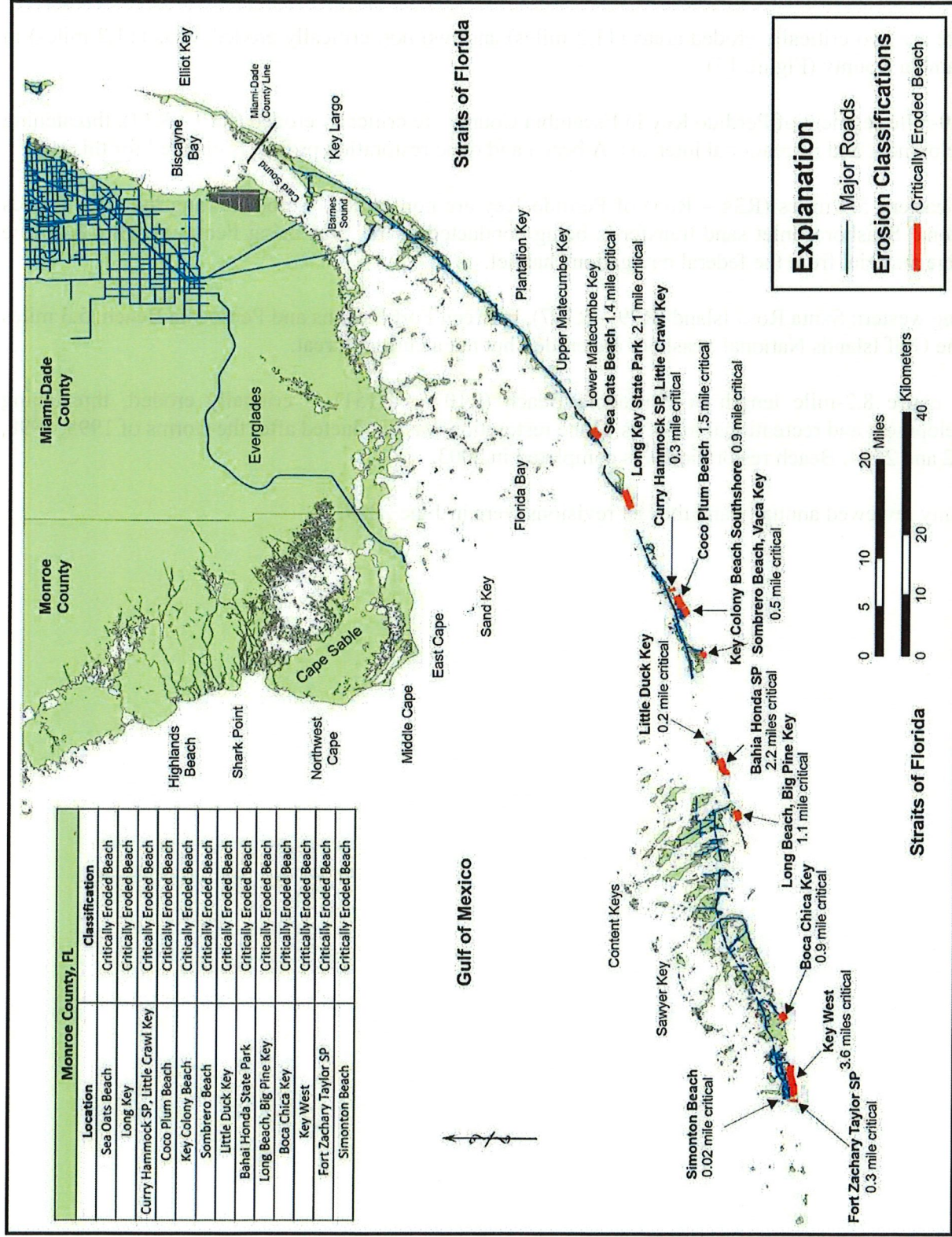


Figure 14. Critically eroded shoreline within Monroe County – Florida Keys, see Map Direct to zoom into the Florida Keys.

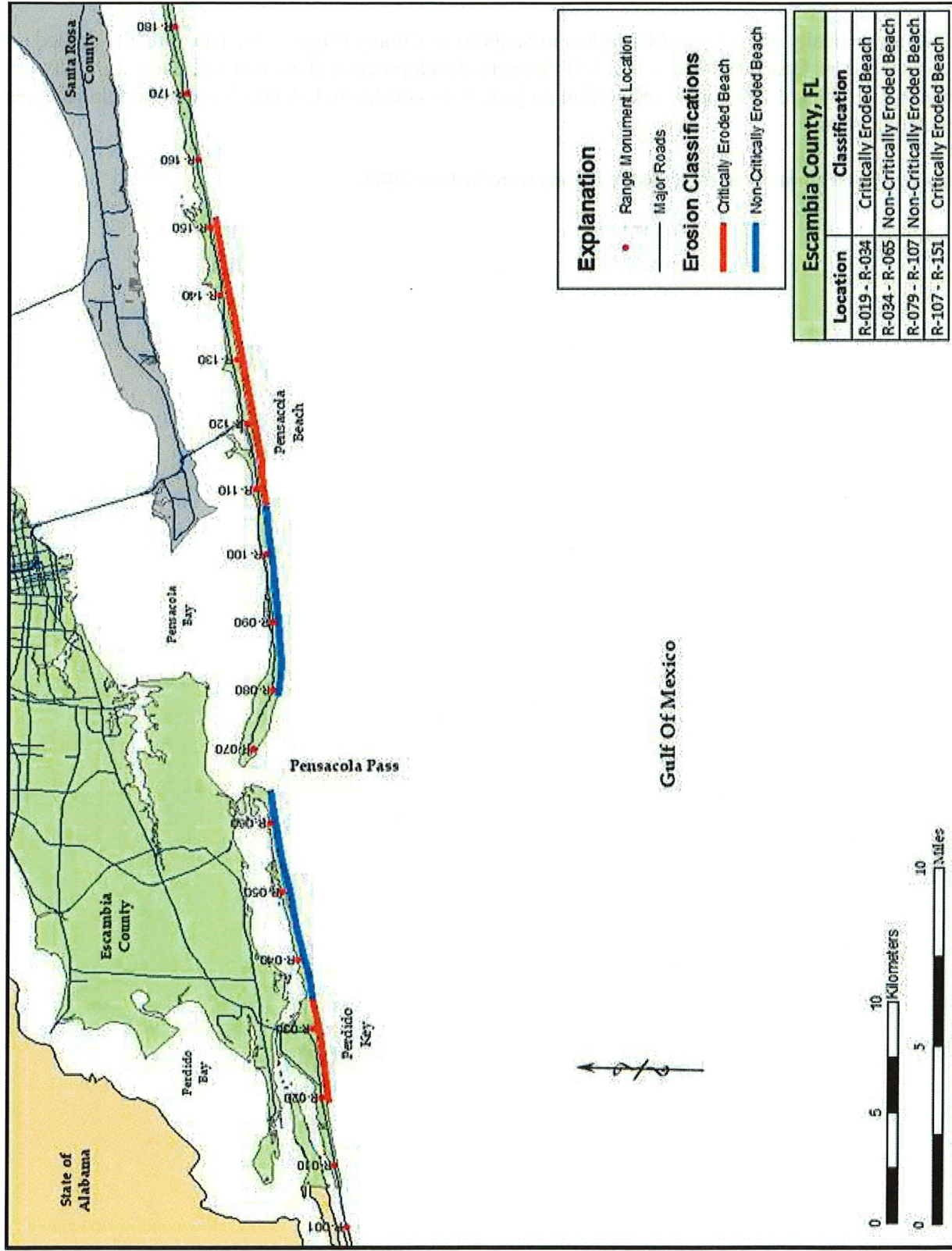


Figure 15. Critically eroded shoreline within Escambia County.

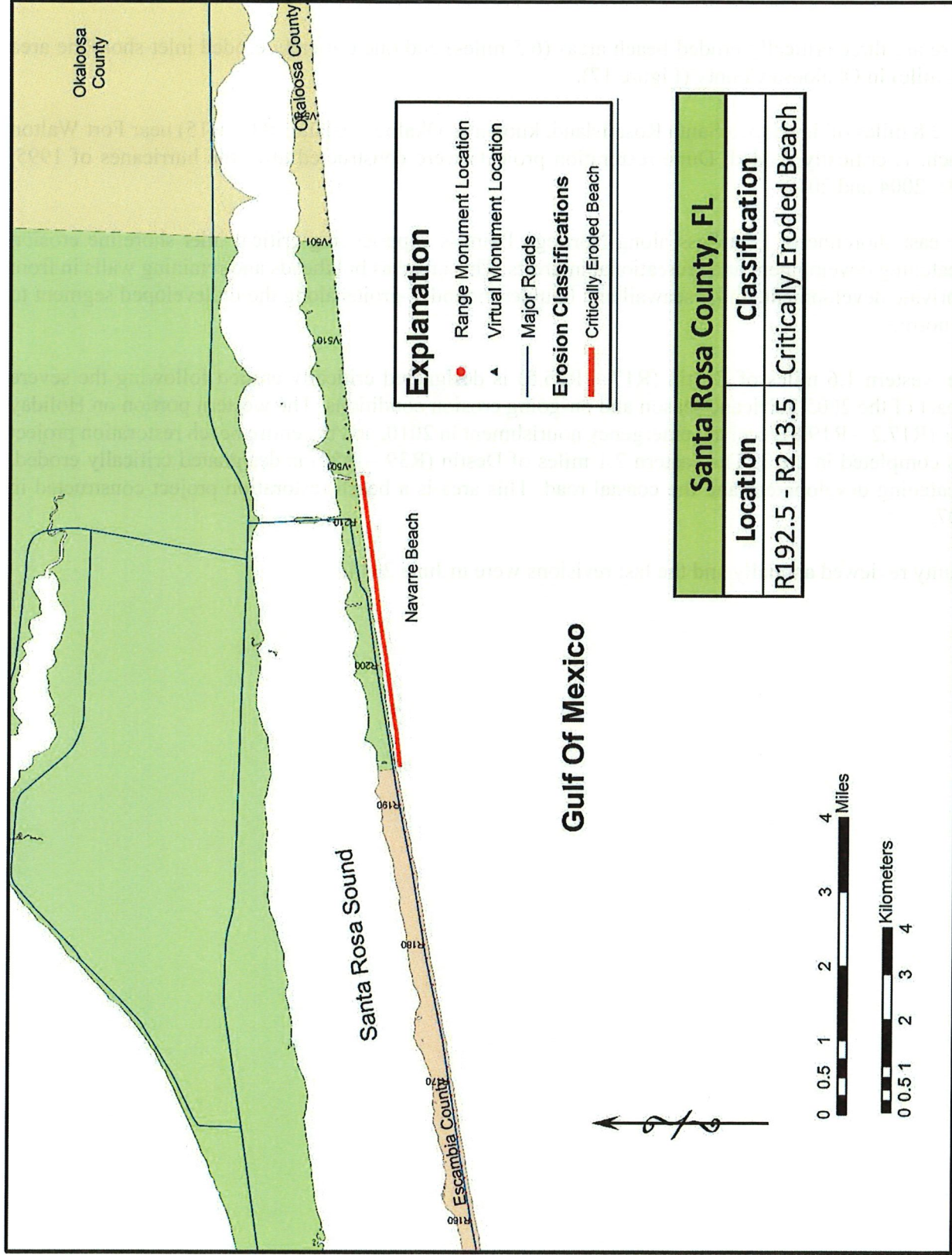


Figure 16. Critically eroded shoreline within Santa Rosa County.

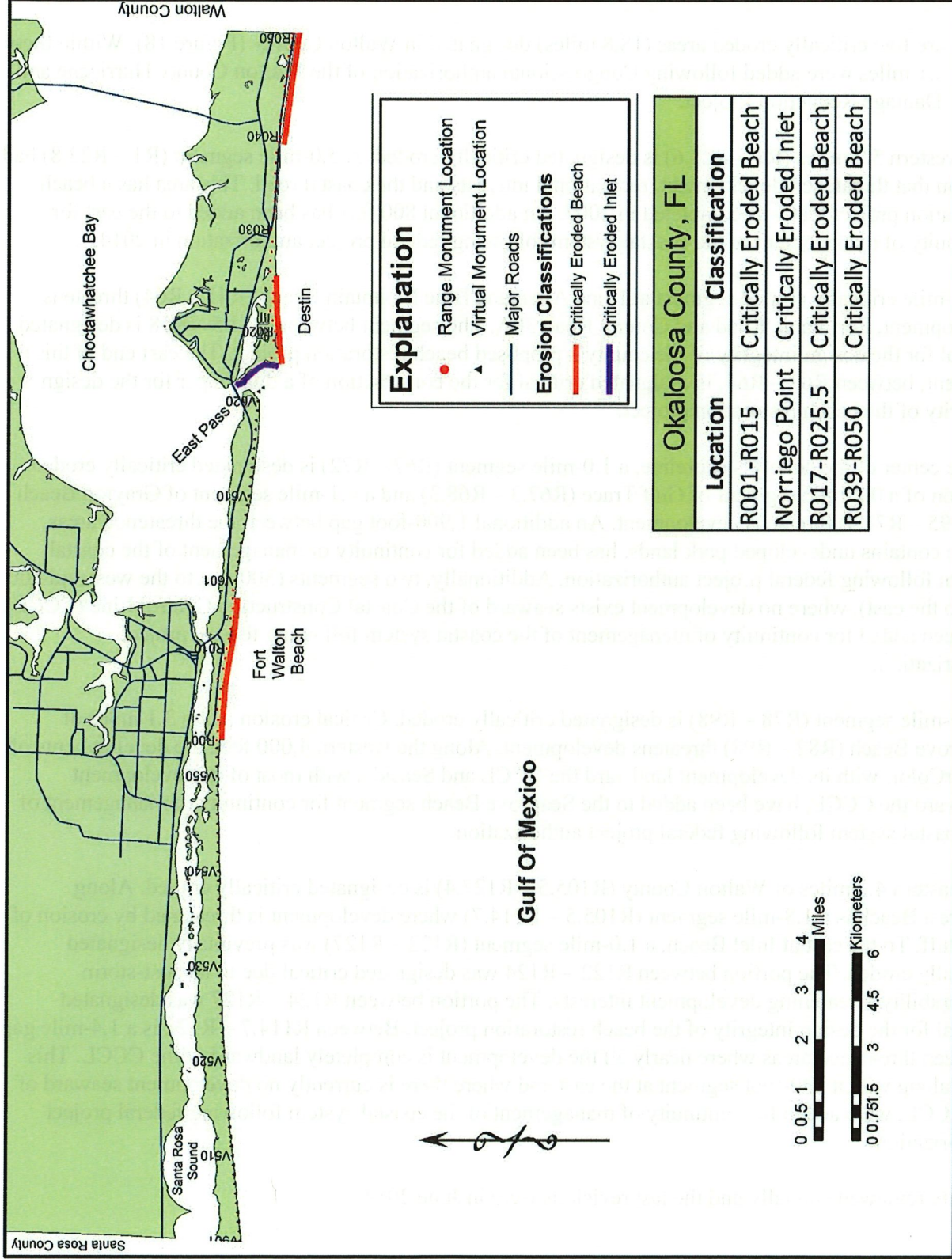


Figure 17. Critically eroded shoreline within Okaloosa County.

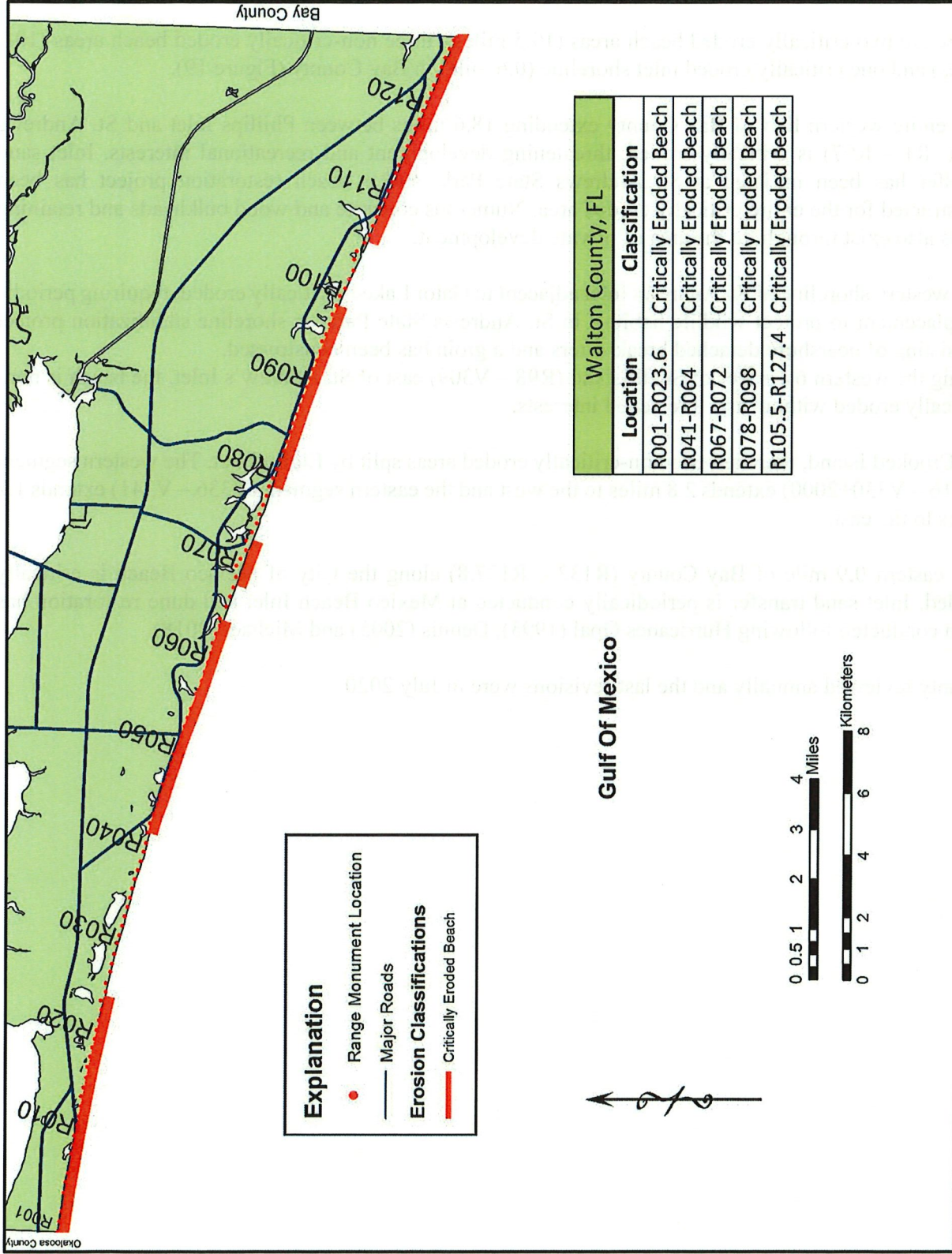


Figure 18. Critically eroded shoreline within Walton County.

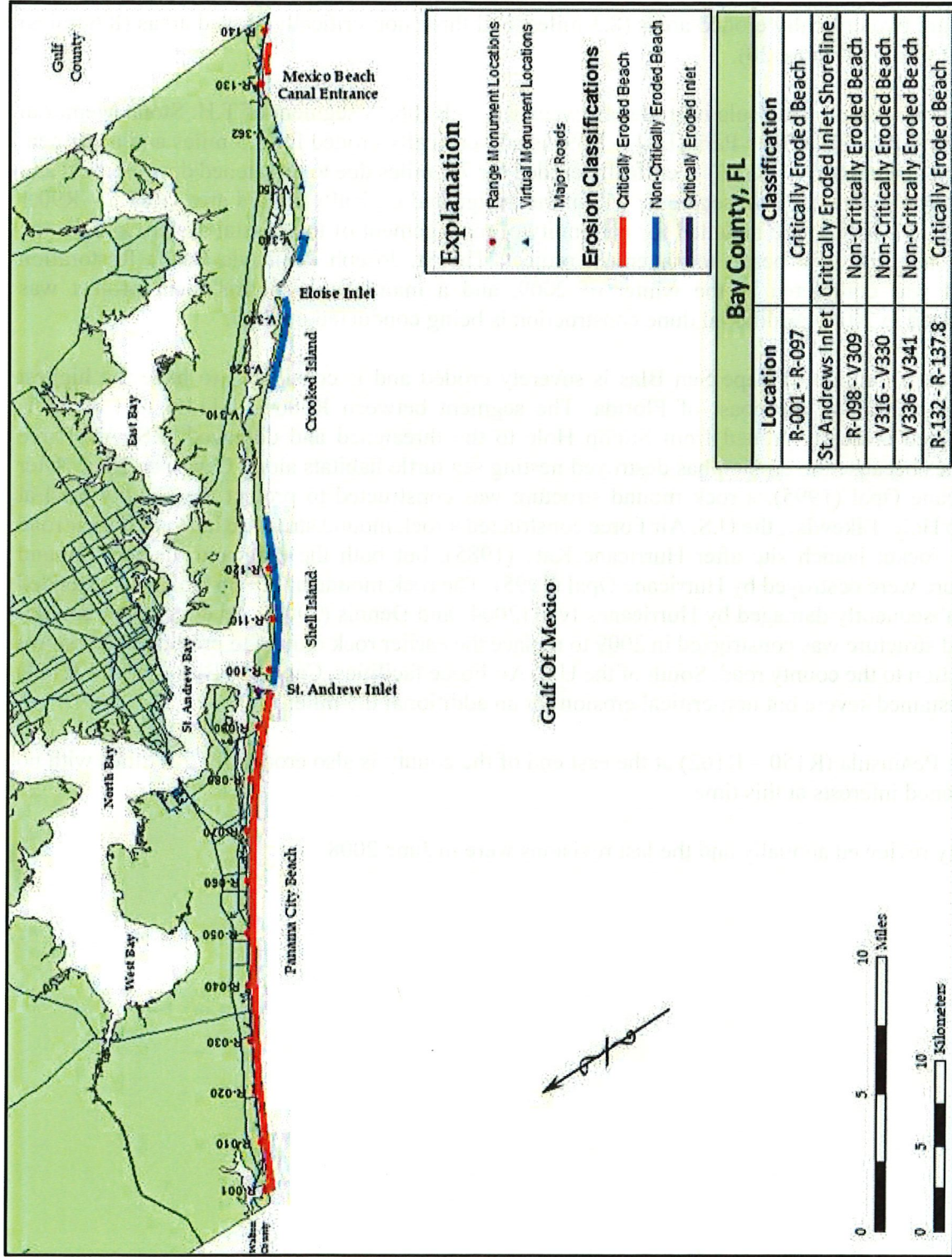


Figure 19. Critically eroded shoreline within Bay County.

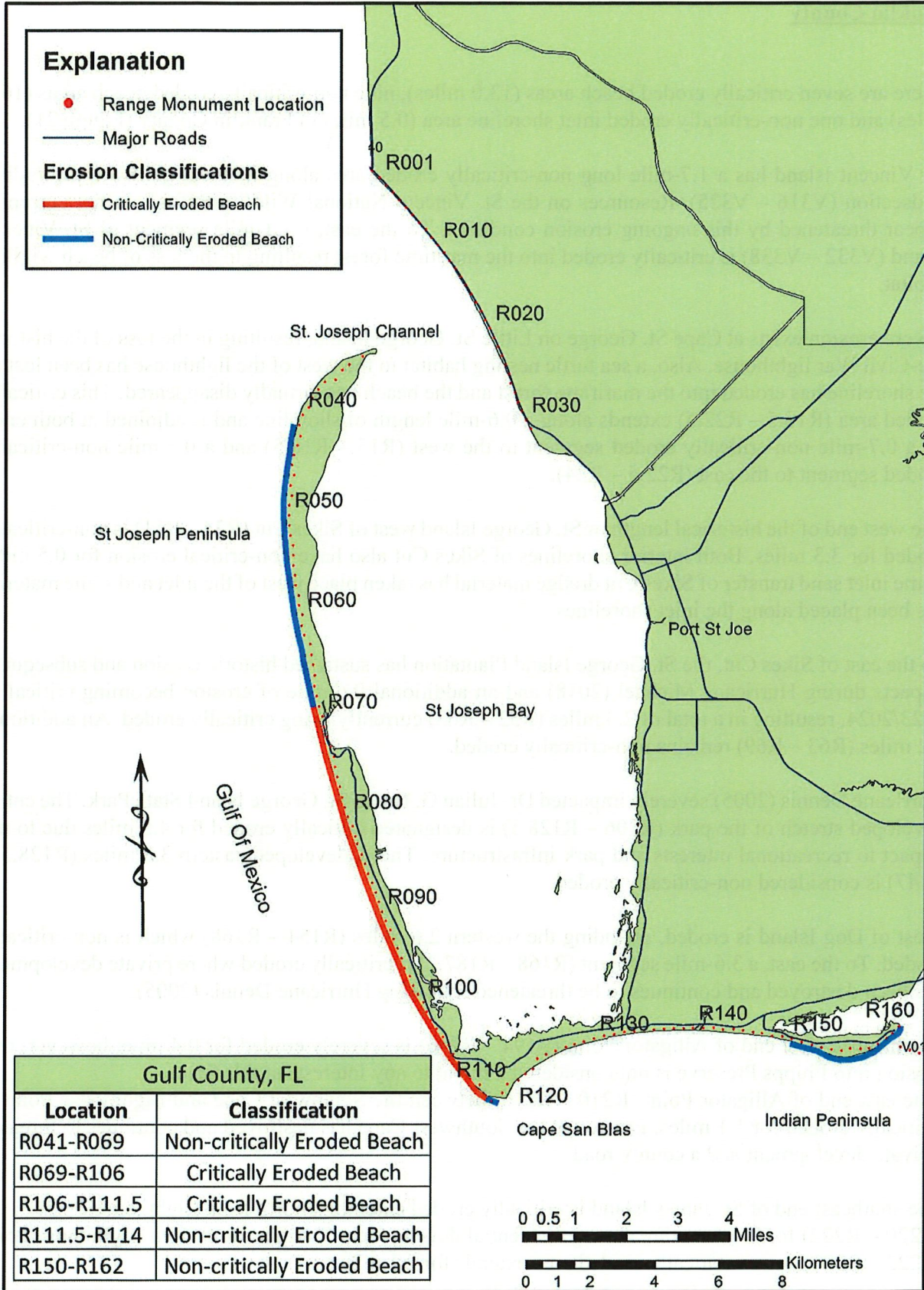


Figure 20. Critically eroded shoreline within Gulf County.



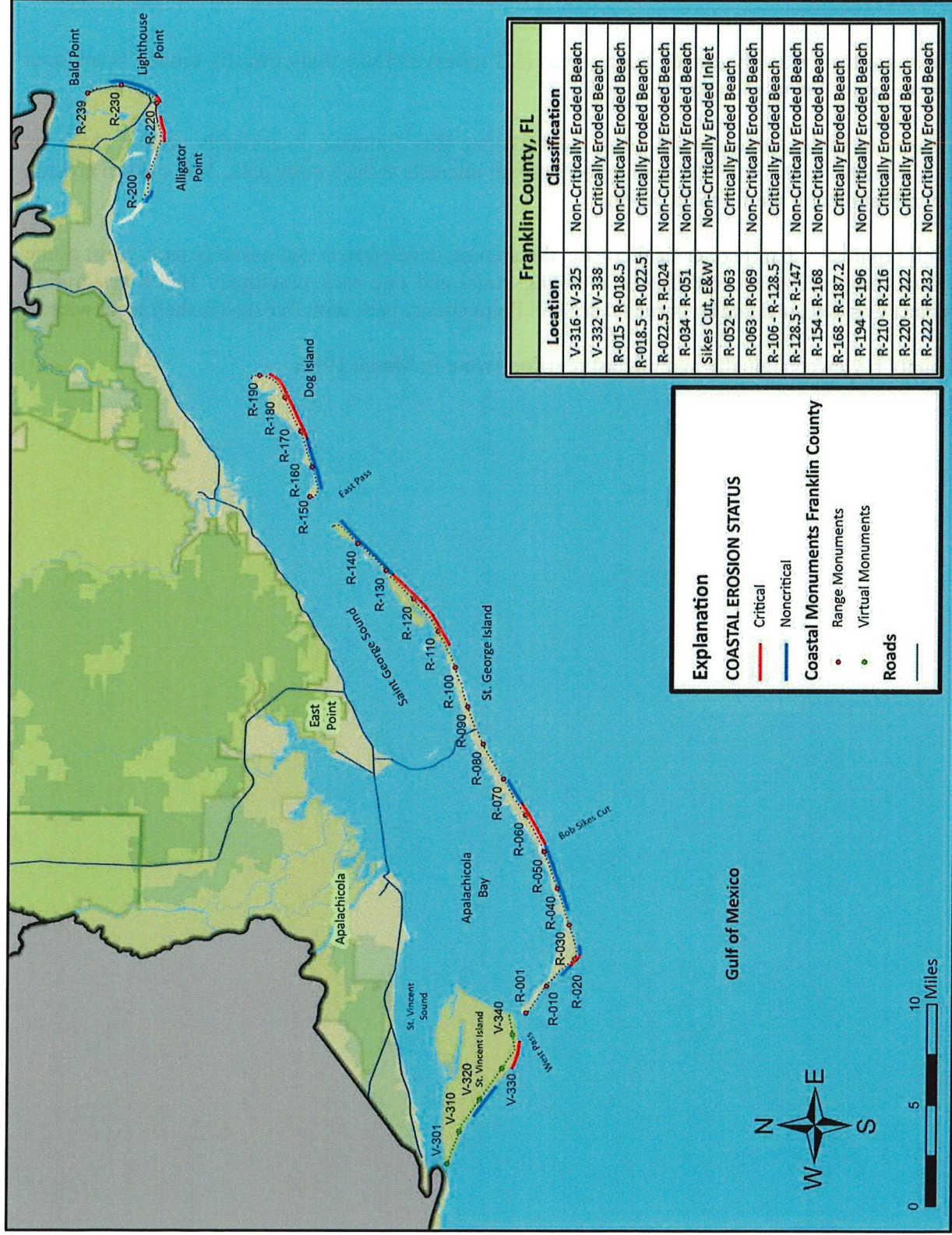


Figure 21. Critically eroded shoreline within Franklin County.

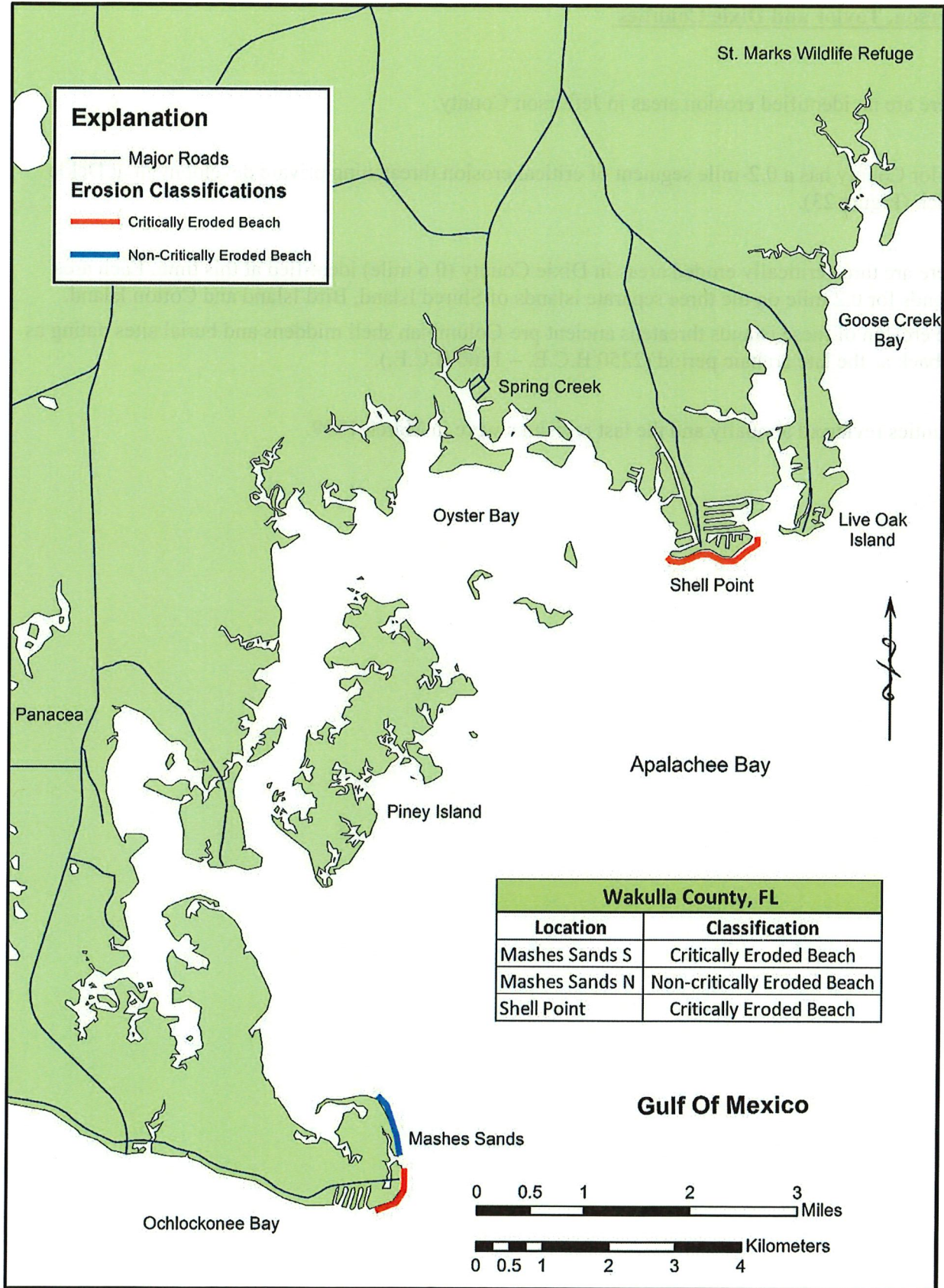


Figure 22. Critically eroded shoreline within Wakulla County.



Figure 23. Critically eroded shoreline within Dixie and Taylor Counties.

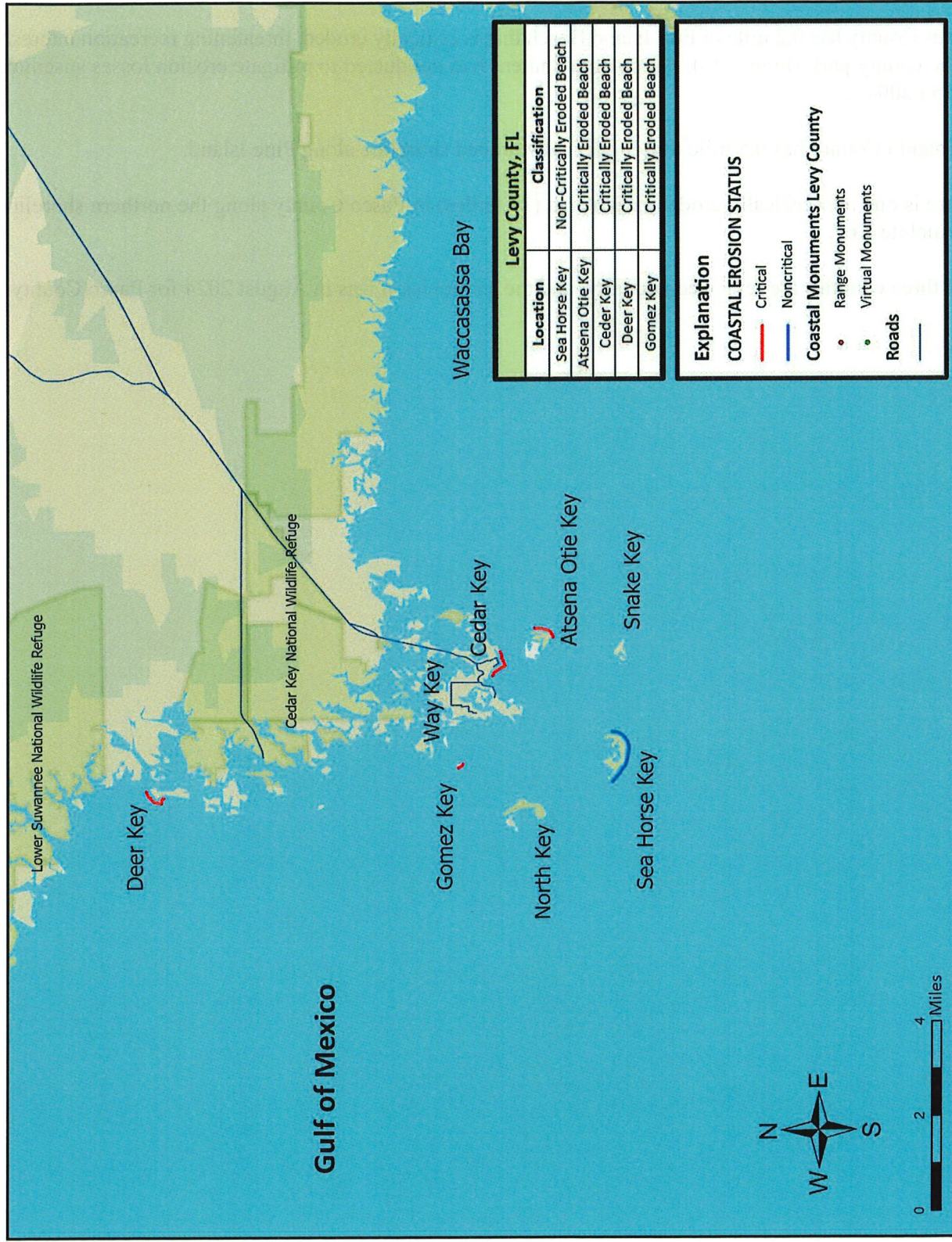


Figure 24. Critically eroded shoreline within Levy County.

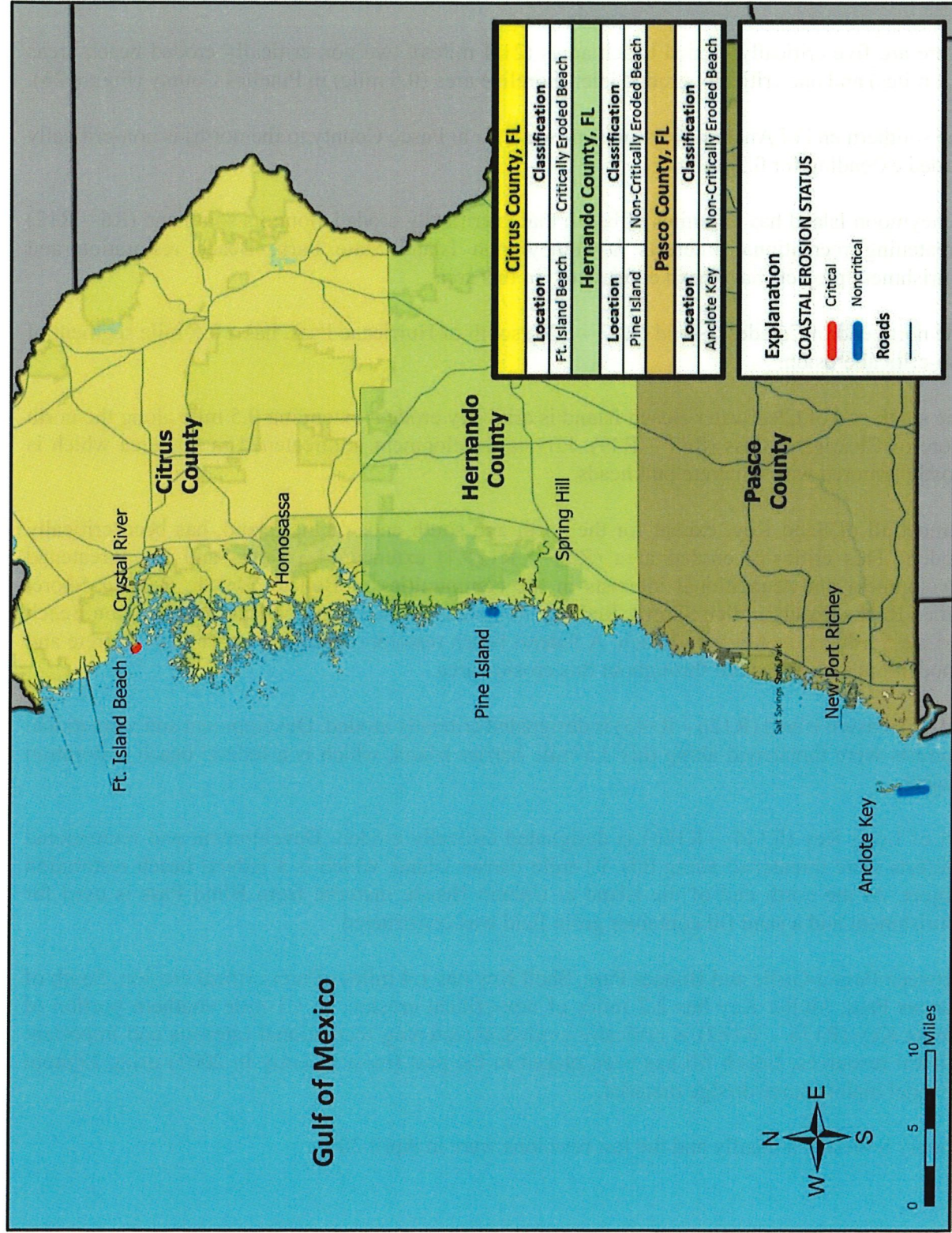


Figure 25. Critically eroded shoreline within Citrus, Hernando and Pasco Counties.

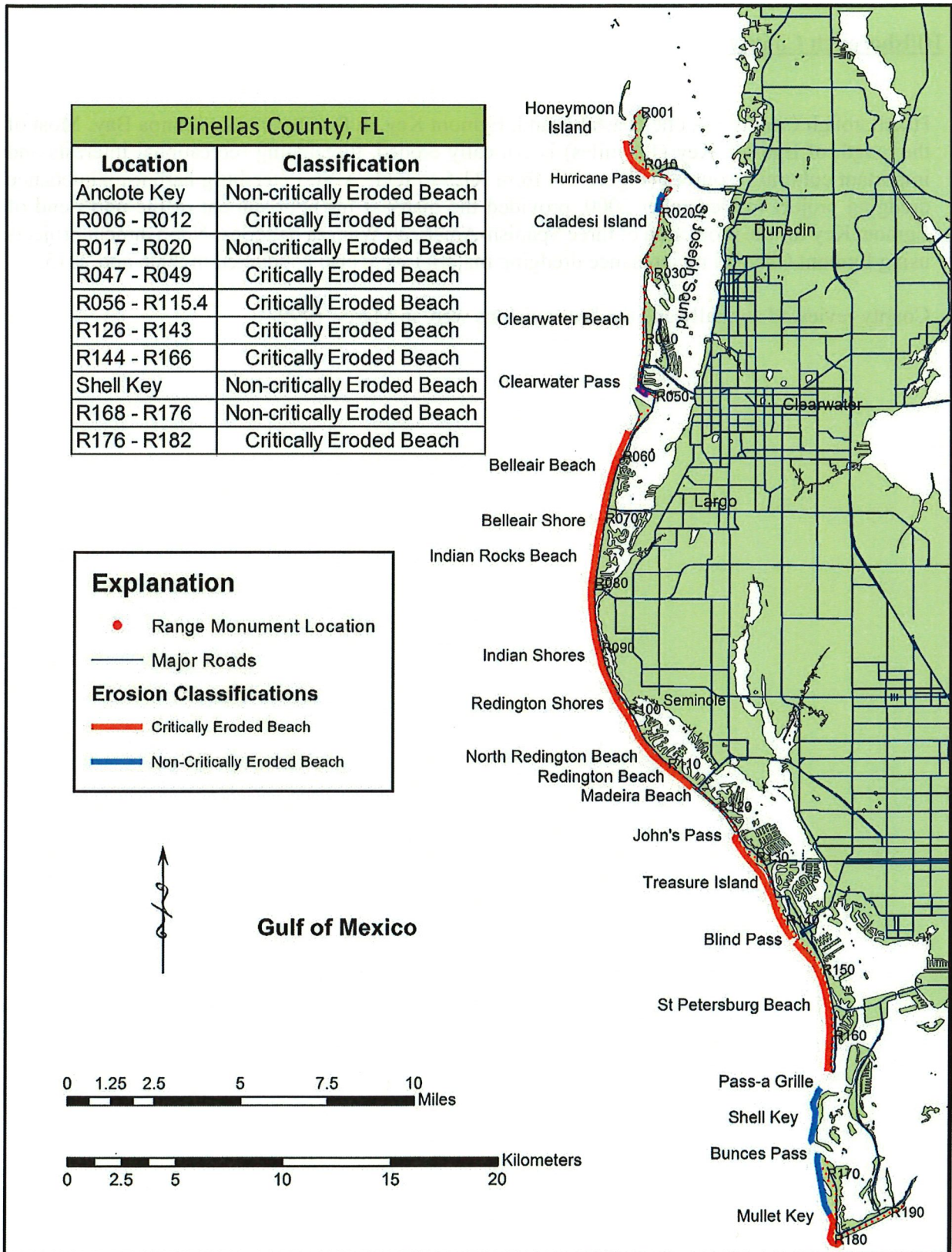


Figure 26. Critically eroded shoreline within Pinellas County.

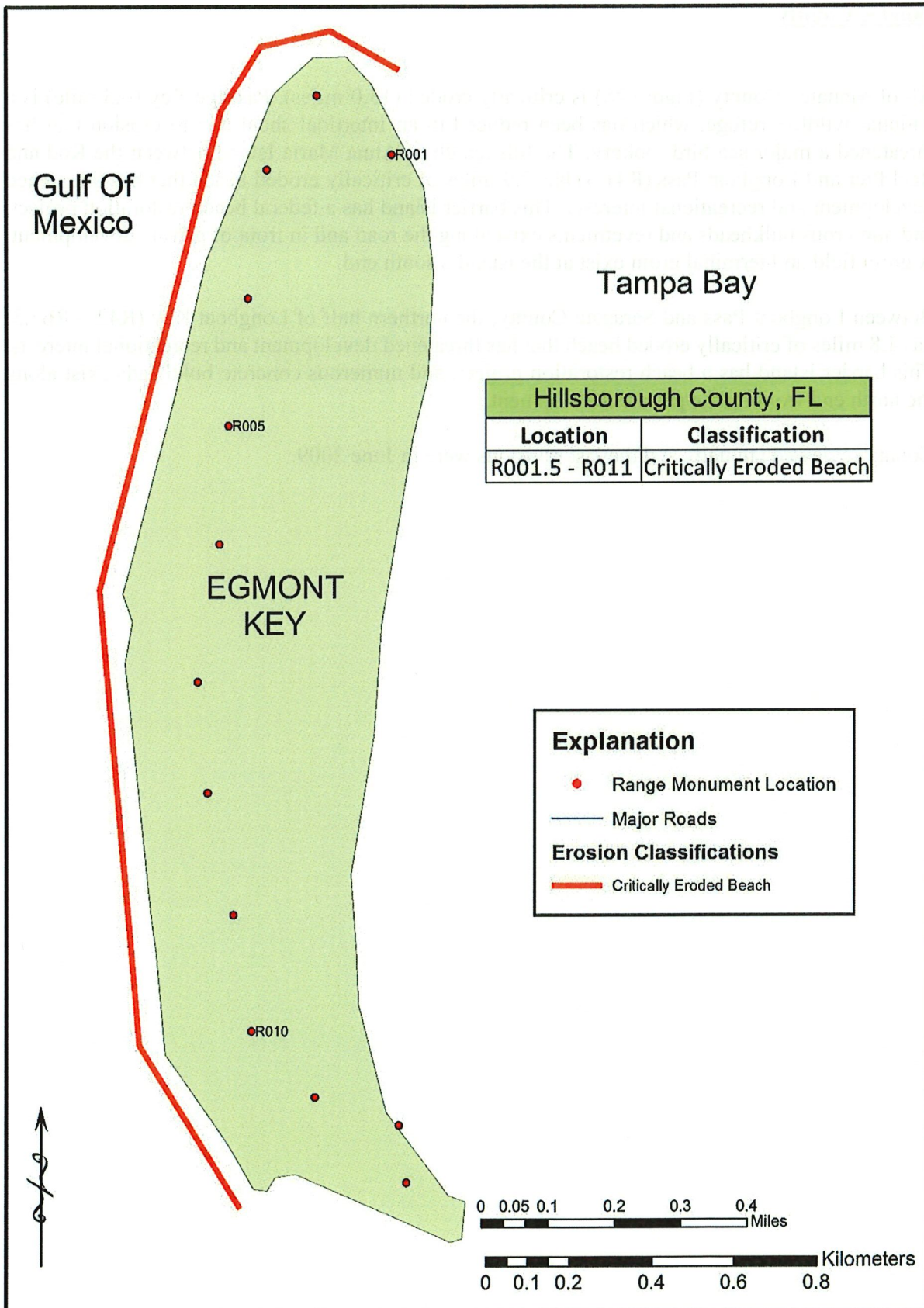


Figure 27. Critically eroded shoreline within Hillsborough County.

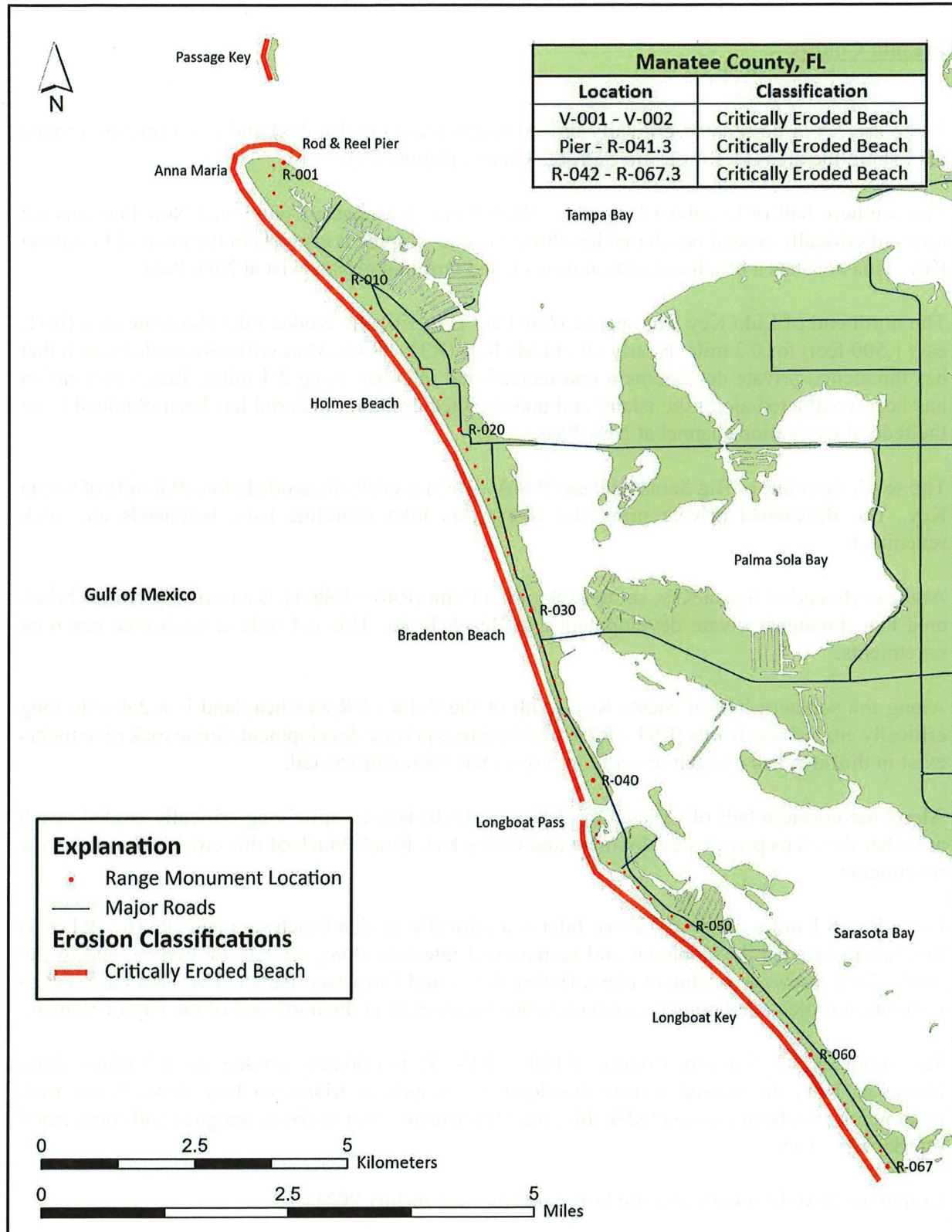


Figure 28. Critically eroded shoreline within Manatee County.



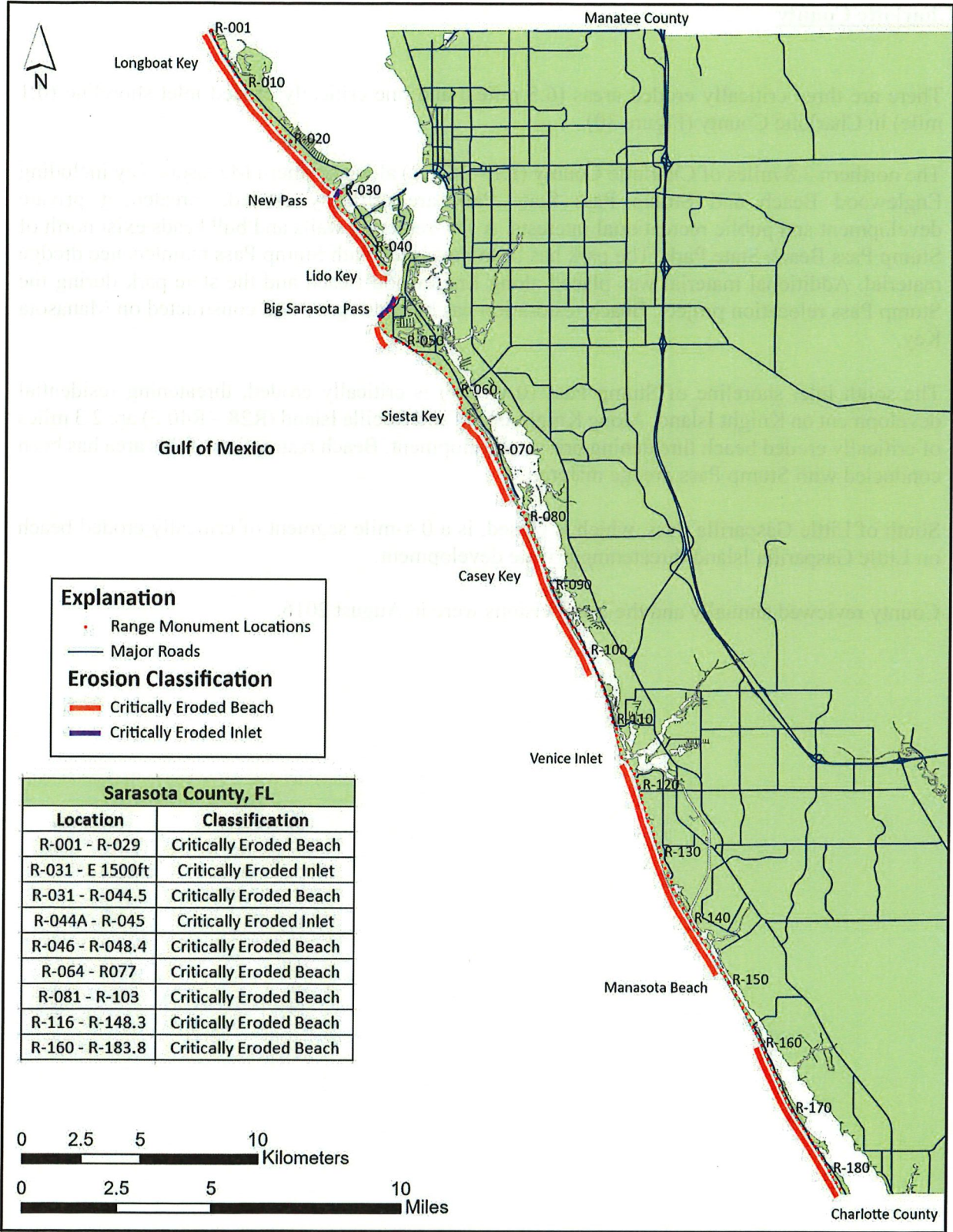


Figure 29. Critically eroded shoreline within Sarasota County.

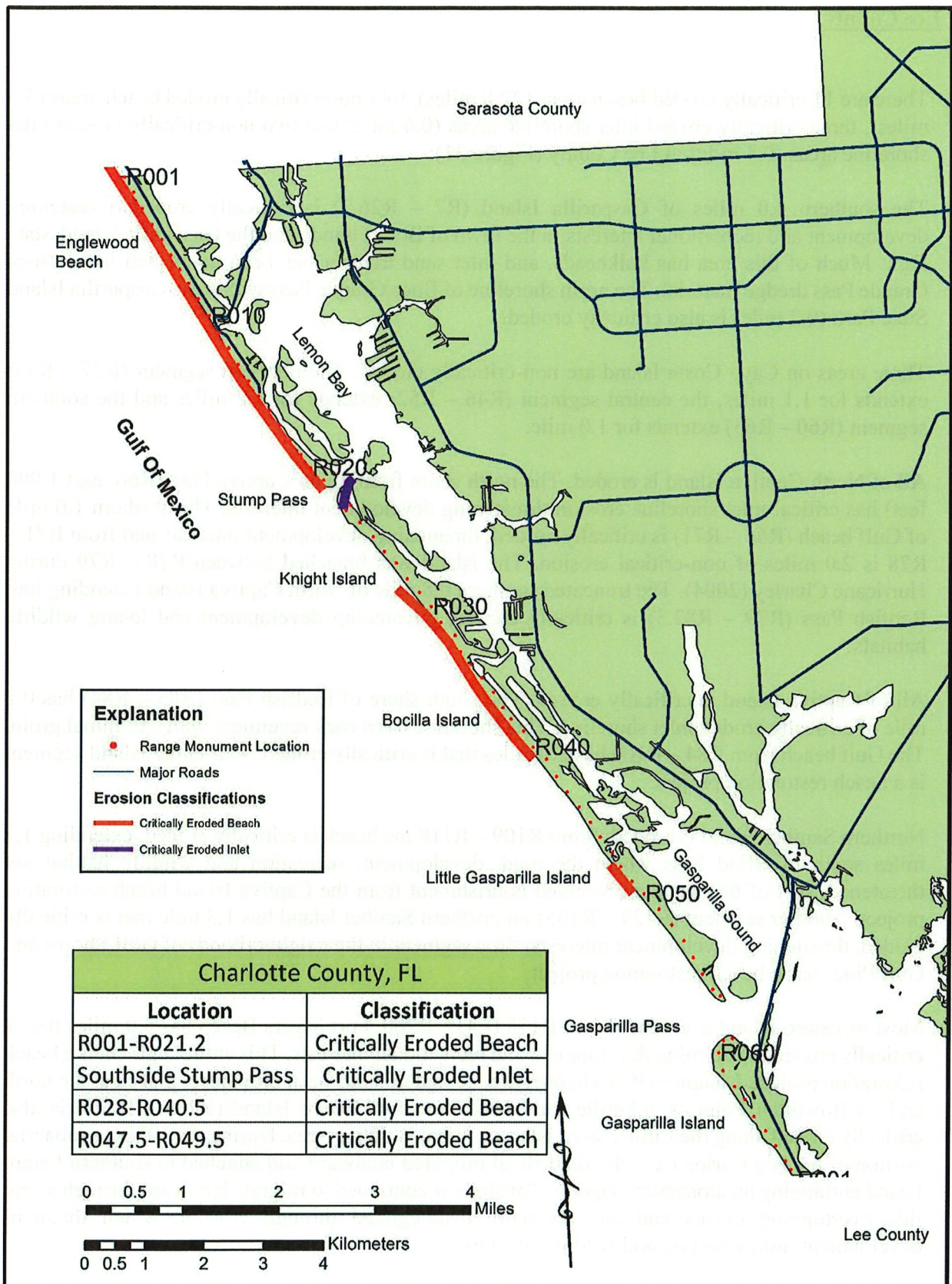


Figure 30. Critically eroded shoreline within Charlotte County.

– R222 has 1.5 miles that is critically eroded, threatening recreational interests and wildlife habitat in Lovers Key State Park. A beach restoration project was constructed in 2004. The south shore of Lovers Key (R222) fronting on New Pass also has 0.1 mile of non-critically eroded inlet shoreline.

Between New Pass and Big Hickory Pass, Big Hickory Island (R222.7 – R225.9) has 0.8 mile that is critically eroded where wildlife habitat and recreation has been lost. South of Big Hickory Pass, Little Hickory Island (R226 – R230) has 0.9 mile of critically eroded beach threatening development interests in Bonita Beach. This area has a beach restoration project with bulkheads and two terminal groins at the north end.

County reviewed annually and the last revisions were in July 2023.

## **Collier County**

There are nine critically eroded beach areas (15.5 miles), three non-critically eroded beach areas (5.1 miles) and one critically eroded inlet shoreline area (0.8 mile) in Collier County (Figure 32).

In northern Collier County, a 0.4-mile beach segment north of Wiggins Pass (R14 – R16.3) is critically eroded, threatening sea turtle and gopher tortoise habitats. A 0.1-mile segment south of Wiggins Pass (R16.8 – R17.3) is critically eroded, threatening recreation interests and sea turtle nesting habitats. A 1.6-mile beach segment (R22.3 – R30.5) is critically eroded, threatening development interests in Vanderbilt Beach. This area has a beach restoration project and numerous bulkheads.

The city of Naples has two segments that are critically eroded, threatening development interests north and south of Doctors Pass. North of Doctors Pass (R42 – R57.5) is a 3.0-mile critically eroded segment with the northern 1.7 miles included for the design integrity of the beach restoration project. Between Doctors Pass and Gordon Pass (R57.8 – R89) is a 5.6-mile critically eroded segment. These areas of Naples have continuous beach restoration projects. Numerous bulkheads and revetments also exist throughout Naples. Groins exist north of Gordon Pass.

South of Gordon Pass (R90 – R111) is a 3.9-mile stretch that is non-critically eroded along the northern half of Keewaydin Island. Between Little Marco Pass and Capri Pass, Sea Oat Island has 0.9 mile of beach that is non-critically eroded.

Marco Island has three areas that are critically eroded, threatening development interests. Along Hideaway Beach, the north shore of Marco Island (H3 – H11) fronting on Big Marco Pass has 0.8 mile of inlet shoreline that is critically eroded. The central Gulf beach of Marco Island (R134.5 – R139) has 0.8 mile that is critically eroded and the southern stretch of beach (R143 – R148) has 0.9 mile that is critically eroded. All three critically eroded areas on Marco Island have beach restoration projects, and the northern segment also has a rock groin field along Hideaway Beach.

Erosion on the two southern barrier islands in Collier County has progressed into the backshore mangrove forest, resulting in the loss of beach wildlife habitat. Following Hurricane Wilma (2005), a 1.6-mile segment of Kice Island (V323 – V331.4) is critically eroded. South of Morgan Pass, Morgan Island has a 1.5-mile segment (V333.8 – V341.8) that is critically eroded and a 0.3-mile segment (V341.8 – V343.5) that is non-critically eroded.

County reviewed annually and the last revisions were in July 2020.