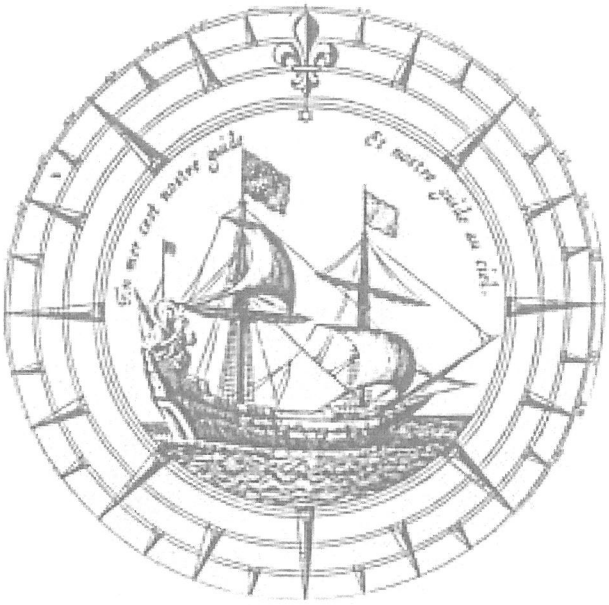

But the pull of the Mangrove Coast is not its history, for neither the historians nor its own people have laid claim or put great value on its past. Its attractions lie in its intangibles: the gleam of the white sand, the softness of southwest winds, pink and turquoise sunsets, and the abiding simplicity of its people. In some curious way, the coast has managed to retain a simplicity in standards and outlook that seems to date back to the early days of the century or, perhaps, instinctively to reach forward into the decades ahead of us all.

—The Mangrove Coast
Karl A. Bickel
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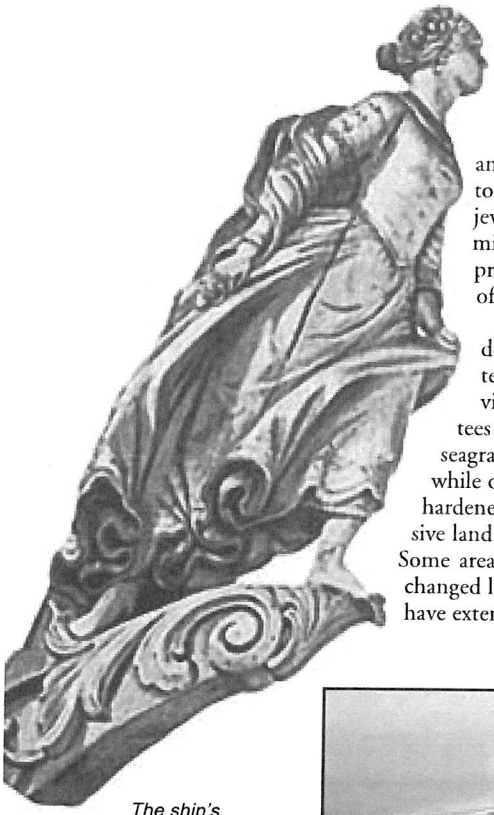
INTRODUCTION



The ship's figurehead is a statue or carving decorating the bow of a ship.

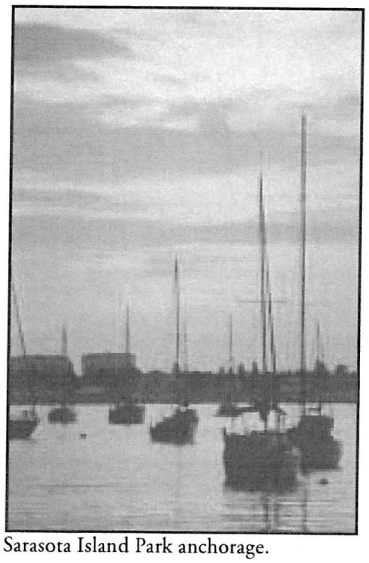
The Sarasota Bay system — barrier islands and estuaries from Anna Maria Sound south to Lemon Bay — is perhaps the most precious jewel of the southwest Florida coast. This 56-mile stretch of Gulf of Mexico coastline comprises a generally narrow and shallow string of bays, estuaries, lagoons, inlets and islands.

In some areas the human population densely occupies the shore and even the water; in others, the original occupants — most visibly shorebirds, fish, dolphins and manatees — are often sighted. Some areas have lush seagrass meadows and thriving mangrove islands, while others have barren bay bottoms and shores hardened by seawalls protecting fabulously expensive land that did not even exist mere decades ago. Some areas have shorelines and channels that have changed little in the past 100 years, and others now have extensive waterways created by man.

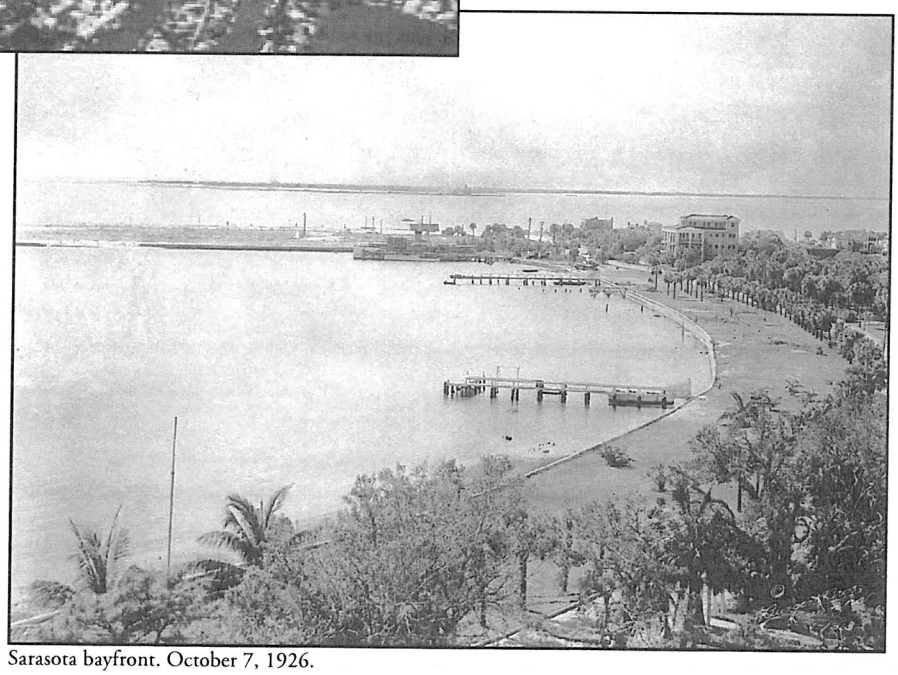
The Gulf Intracoastal Waterway (ICW) provides direct passage through the entire Sarasota Bay system, linking natural deep water sections through a series of manmade channels, canals and cuts. The ICW was originally intended to facilitate commercial shipping to and along the southwest Florida coast and to join the region with the rest of the intracoastal network that now stretches from Maine to Texas. Today, however, the vast majority of the Gulf ICW's functionality is devoted to recreational activities: power boating, sailing, fishing, water skiing, kayaking and canoeing.

When the U.S. Army Corps of Engineers began dredging in 1890 what would eventually become the ICW, they would hardly have imagined the ultimate extent of the task they had commenced. Alterations to the waterway continue today from Tampa Bay to Gasparilla Sound. The channel, which once hopscotched from one bay to another along sparsely populated mainland shores and virtually deserted barrier islands, punctuated by shallows, oyster bars, mangrove thickets and other barriers originally impassable, would eventually form a continuously navigable waterway for sizable vessels. The ICW's development paralleled — and contributed to — a population boom that remains one of the most vigorous in the United States. Shallow parts of the estuary bottom were dredged and redeposited to enlarge existing islands or create new islets and in many cases covering bay habitats. This newly created shoreline ultimately became highly valued waterfront home sites for thousands of people. At the same time, it altered the environmental characteristics of the estuary, where the fresh water from the land mixes with the saltwater from the sea.

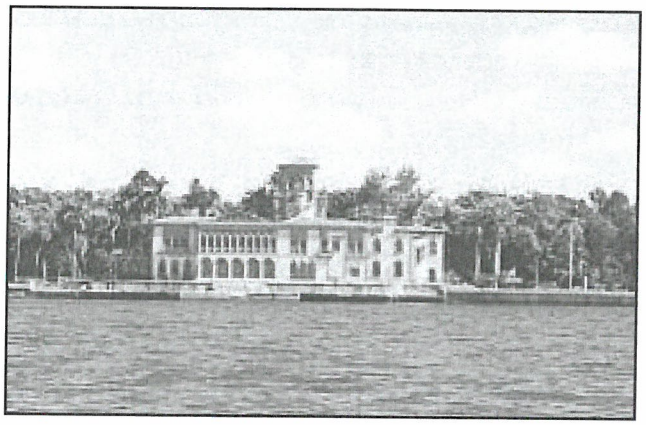
Aerial views of Sarasota Bay.



Sarasota Island Park anchorage.



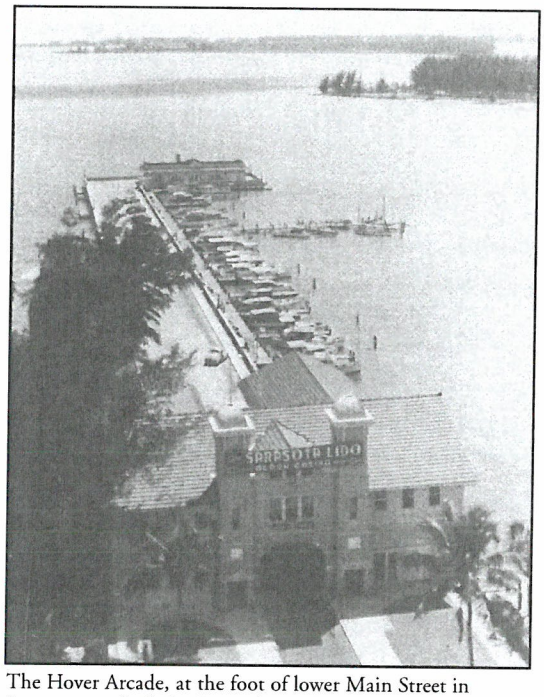
Sarasota bayfront. October 7, 1926.



Ca'd'Zan. John and Mable Ringling winter home.

Some of most compelling attractions of the region are the bays and beaches. Sailors find the large, deep reaches of Big Sarasota Bay a perfect "lake" for afternoon regattas. Cruising mariners have safe anchorages scattered throughout the region, and fine waterfront amenities abound. Fishermen wade or boat to thousands of secret holes where they catch redfish, trout, snook, tarpon and many other species. Water skiers slalom in the protected areas near City Island or Skiers Island. The area near Long Bar Point in Big Sarasota Bay is ideal for canoeing and kayaking, and the winding shore of North Casey Key and the nearby Neville Marine Preserve offer some of the nation's best birding.

From the vantage of the shore or a boat on the waters of the Sarasota Bay system, the dawn sun peeks through the trees on the mainland. During the day, the high buildings of Sarasota, seaside Venice and other urban areas glint kaleidoscopically. Sunsets on the sparkling Gulf of Mexico rival those anywhere on earth. Boaters and shore residents appreciate the beauty of the system, but also see the effects of man's presence from waterfront development. They have expressed a desire for further insights into the region and for a means to share these insights with each other and with visitors.

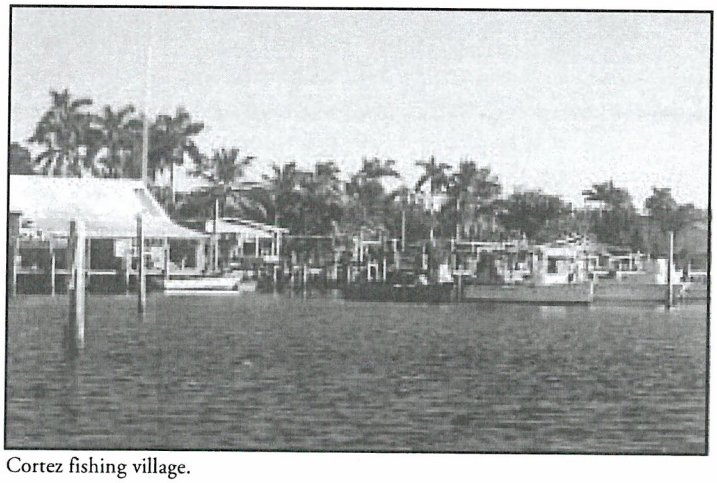


The Hover Arcade, at the foot of lower Main Street in Sarasota, was built by Dr. Walter Hover and two of his brothers in 1913. It was later purchased by the city and housed City Hall. When Sarasota County was created in 1921, the arcade served temporarily as the courthouse. It was destroyed in the late 1960s.

This book and the pocket guide and map, "Sarasota Bay Blueways: Recreational Opportunities around the Bay" provide a window to the past and present Sarasota Bay system. Historical maps and photographs illustrate the changes occurring from the "pre-development" period of the late 1800s to today. The historical development of the ICW is explored, from the first major dredging effort in 1890 to the major residence and business developments of the 1960s and 1970s to the beach renourishment projects of today. Prominent features of the Sarasota Bay system from Anna Maria Island to Lemon Bay are described in words, pictures and maps.

A chapter is devoted to inlets, their dynamics and their importance to the bay system. Distances between these passes that link the bays and Gulf are provided from the mariner's perspective, as well as to offer a better understanding of the vital role inlets play in the estuarine environment.

A "snapshot" of land-based coastal development and its importance to the bay system uses the city of Venice as an example. With more than 80 percent of the bay water area having changed (deepened, shoaled, disappeared, etc.) in its vicinity, Venice represents the extreme case of altering land and water for shoreline growth.



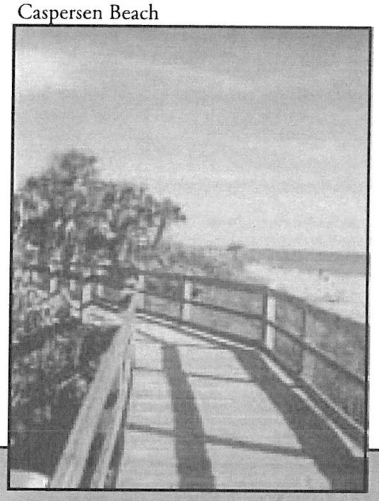
Cortez fishing village.

Beachcombers on Anna Maria Island in the early 1900s.

A juxtaposition of development practices other than Venice is provided in the working waterfront of the village of Cortez. This area, homesteaded in the 1880s by a group of fishermen originally from North Carolina, has changed little in the past 100 years, and many of the village's homes, shops and fish houses are included in the U.S. Registry of Historic Places.

Nautical charts are important tools mariners use to safely reach unfamiliar destinations and to find the way home. Charting Sarasota Bay describes historical and modern means of determining water depths and locations of coastal landmarks. How marvelous today's hand-held Global Positioning Systems and solid state electronic depth sounders are, compared to the need for almost 7,000 "pole soundings" of Sarasota Bay depths in order to compile a hydrographic chart in earlier times!

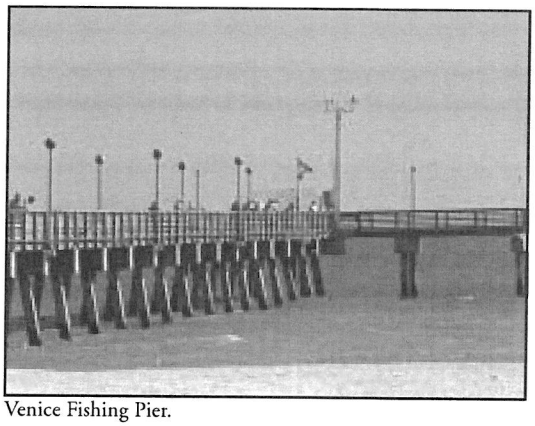
Caspersen Beach



Anna Maria Pier and cottages in 1924. Stretching nearly 800 feet into Tampa Bay, the pier also served as a walkway for the two adjacent "cottages." The two cottages later fell into disrepair and were torn down prior to the piers being rebuilt in the 1930s.

The importance of seagrass beds and mangroves is also discussed, and the potential seagrass coverage of 1890s Sarasota Bay is illustrated for comparison with actual distribution today. A map also provides a look at areas of seagrass that have suffered damage, largely from propeller scarring.

The Sarasota Bay system of tomorrow? Through the efforts of federal, state, regional and local authorities, as well as private interests, the Sarasota Bay system is changing. The days of rampant waterfront growth through massive dredge and fill projects have come to a halt. Today, we focus on improving the quality of the bay while maintaining a delicate balance among shore development, waterway use and environmental integrity. We have learned that our actions on the land and water affect bay resources; to our regret, we see that the effects are usually adverse. A growing awareness exists among the area's residents that Paradise could easily be lost without a widespread feeling of stewardship and continuing efforts to restore and maintain the bay. Shorefront zoning changes and regional waterway management systems are being implemented to foster sustainable use, with the ultimate goal of attaining that balance where nature and people can coexist far into the future.



Venice Fishing Pier.

This is the first in a series of publications that will cover the waterways of southwest Florida. Other publications, produced by the West Coast Inland Navigation District and the Florida Sea Grant Program, will explore adjoining waterways. These publications are in support of the State of Florida's Blueways initiative, which is a program to encourage stewardship of the state's recreational waterways.

HISTORICAL DEVELOPMENT OF THE GULF INTRACOASTAL WATERWAY

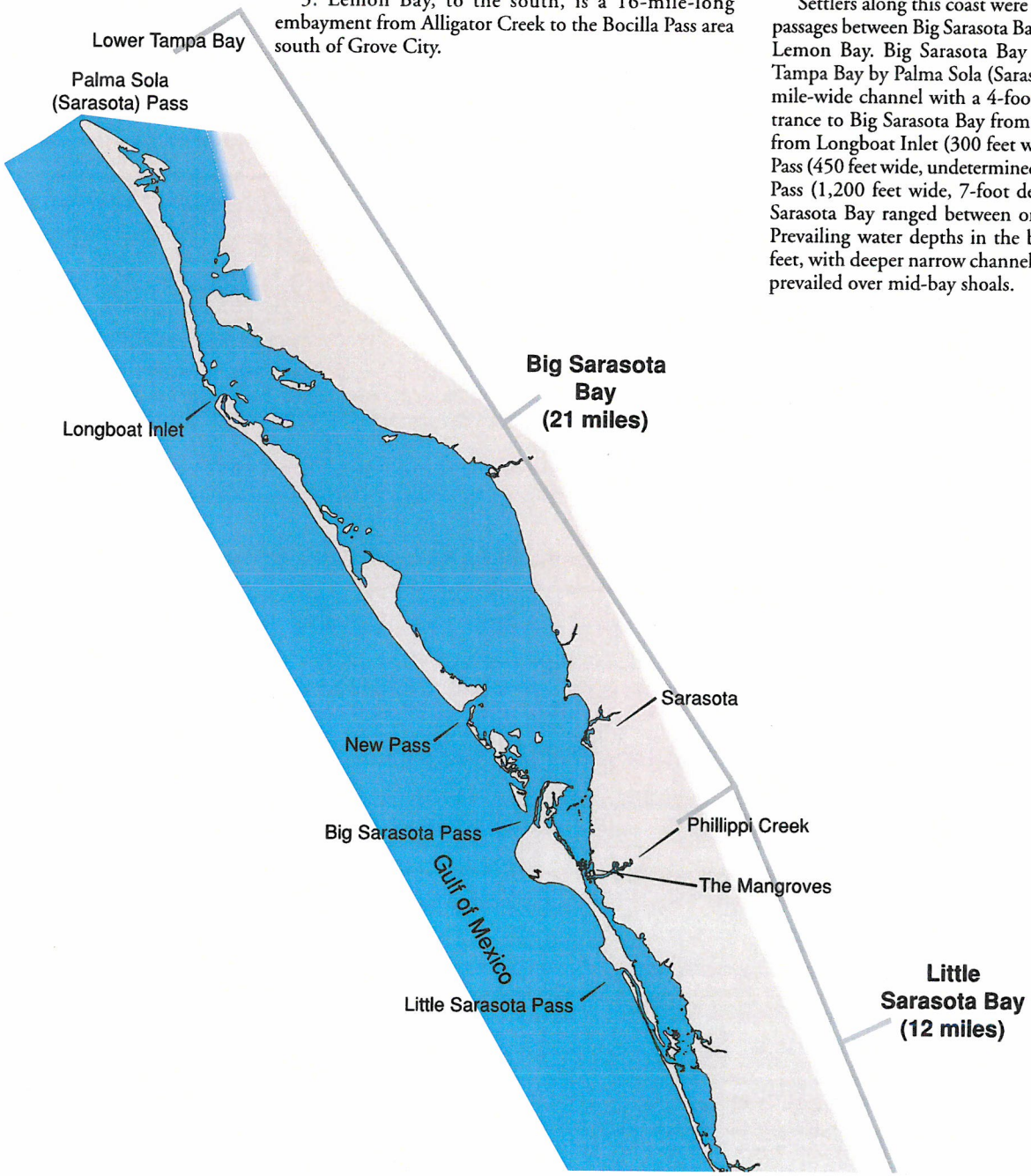
The Boating Geography of Southwest Florida Before Coastal Development

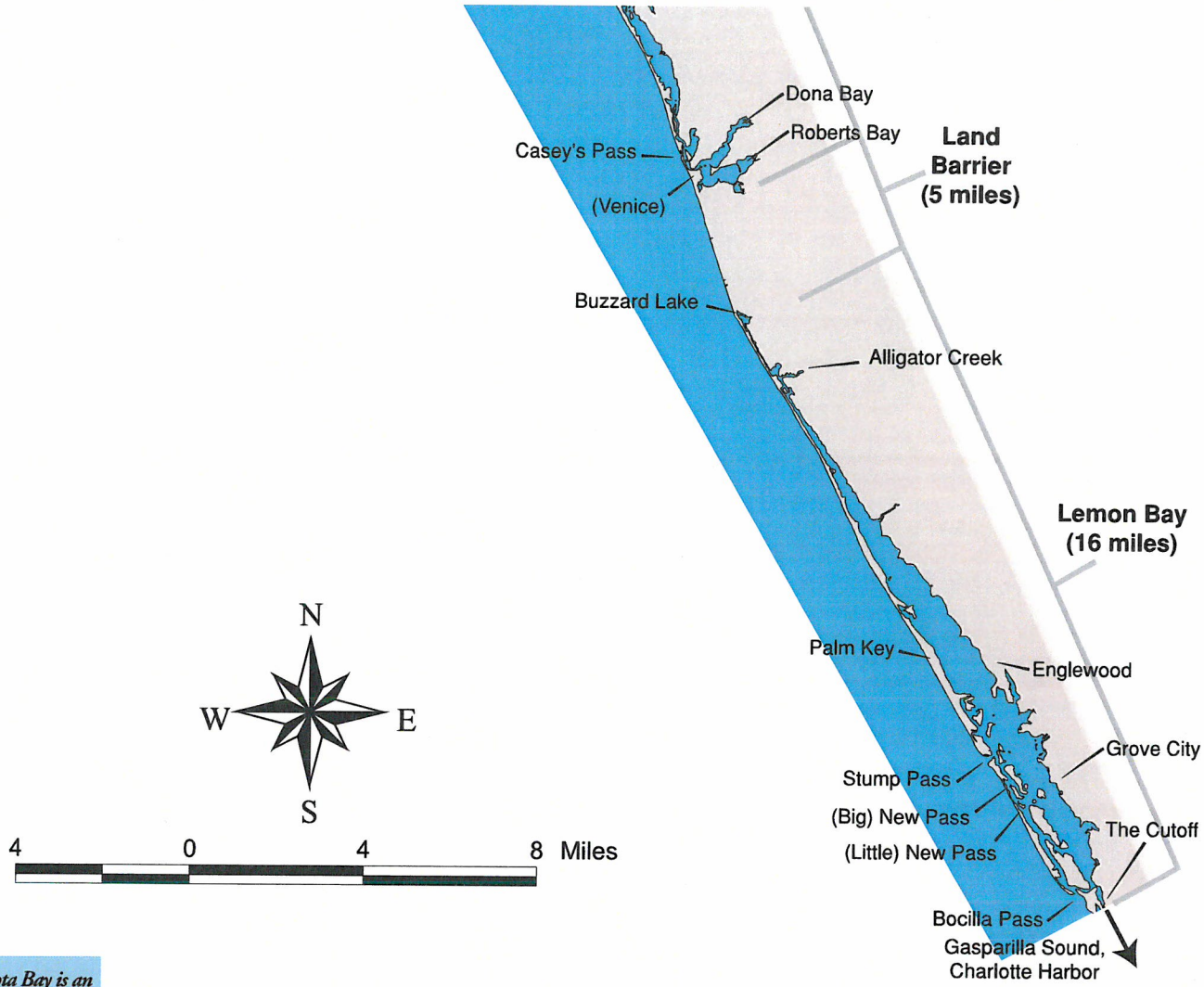
One must go back in time to 1890 to regain a sense of the pre-development state of the waterway we refer to as the Sarasota Bay system. At that time, this 54-mile reach of the coast, from lower Tampa Bay to Gasparilla Sound, enclosed three separate inland bays of varying navigability (Map 1):

1. Big Sarasota Bay, on the north, is 21 miles long and stretches from Palma Sola (Sarasota) Pass at the mouth of lower Tampa Bay to Phillippi Creek (south of Sarasota);
2. Little Sarasota Bay, in the middle, is 12 miles long and ranges from Phillippi Creek to Roberts Bay (present-day Venice);
3. Lemon Bay, to the south, is a 16-mile-long embayment from Alligator Creek to the Bocilla Pass area south of Grove City.

Each of these bays historically was separated from the others through a series of natural barriers. Boat traffic between Big and Little Sarasota Bays was impeded by "The Mangroves," a cluster of islands at the mouth of Phillippi Creek. The only means of traverse was a crooked, narrow channel barely 50 feet wide and 0.3 mile long that was mostly obstructed by mangroves. The channel was non-navigable at low water. No inside waterway passage existed between Little Sarasota and Lemon Bays. A five-mile land barrier existed from Roberts Bay just below Casey's Pass to Alligator Creek, which was the head of navigation of northern Lemon Bay.

Settlers along this coast were forced to sail the outside passages between Big Sarasota Bay, Little Sarasota Bay and Lemon Bay. Big Sarasota Bay could be entered from Tampa Bay by Palma Sola (Sarasota) Pass, a natural half-mile-wide channel with a 4-foot controlling depth. Entrance to Big Sarasota Bay from the Gulf of Mexico was from Longboat Inlet (300 feet wide, 5-foot depth), New Pass (450 feet wide, undetermined depth) and Big Sarasota Pass (1,200 feet wide, 7-foot depth). The width of Big Sarasota Bay ranged between one-half and three miles. Prevailing water depths in the bay were from six to 10 feet, with deeper narrow channels near the passes; six feet prevailed over mid-bay shoals.





Map 1.
Boating Geography Before Coastal Development

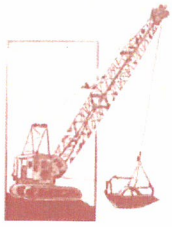
Sarasota Bay is an estuary — "a semi-enclosed body of water which has free connection with the open sea and within which seawater is measurably diluted by freshwater from land drainage." Estuaries are among the most productive of all the earth's systems: more than 80 percent of all fish and shellfish use estuaries either as a primary habitat or as spawning or nursery grounds.

Mariners entered Little Sarasota Bay from the Gulf either by Little Sarasota Pass (90 feet wide, 5-foot depth) or Casey's Pass (90 feet wide, 3-foot depth). These passes were subject to changes both in location and depth, and were entirely closed for short periods. The bay's width ranged from 300 feet to three-quarters of a mile. Depths in Little Sarasota Bay were from 4 to 8 feet, but shoals 1 to 2 feet deep created numerous obstructions. Little Sarasota Bay in the south broadened into two small bays, which extended in an easterly direction. To the west was Dona Bay, to the east Roberts Bay. Dona had a depth of about 5 feet and Roberts from 2 to 5 feet.

Lemon Bay — a long, narrow bay ranging from 200 feet to one mile wide — was separated from the Gulf at its upper end by a long peninsula (Palm Key, also called Palm Ridge), and at its lower end by a range of keys from 50 feet to one mile wide. Passage between the bay and Gulf was available at Stump Pass, 10 miles south of Alligator Creek (controlling depth from 4 to 7 feet), and at [Big] New Pass, a half-mile south of Stump Pass (depth of 7 to 10 feet). Periodically other inlets would be breached, such as at [Little] New Pass, 2.5 miles from the south end of the bay (2.5-foot depth), and at Bocilla Pass (4-foot depth). Within Lemon Bay, depths ranged from 0.5 to 15 feet. A three-foot draft could be carried from New Pass north to about 2.75 miles above Englewood; from there northward to Buzzard Lake (today named Red Lake) depths gradually shoaled to 1 foot. The southern portion of the bay was also very shallow.

The channel connecting Lemon Bay with Gasparilla Sound to the south was an effective barrier to navigation. This one-mile-long channel, between 40 and 250 feet wide and which dried at low water, was known as "The Cut-off." An alternate connector route, sometimes available depending on prevailing inlet openings and closings, could be followed by using relict inlet channels leading to and from old Bocilla Pass north to Lemon Bay and south to Gasparilla Sound. Only light-draft vessels drawing less than four feet made the trip from Tampa to Sarasota.

These were the general conditions that prevailed before changes were made by the U.S. Army Corps of Engineers with navigation improvements as the principal goal.



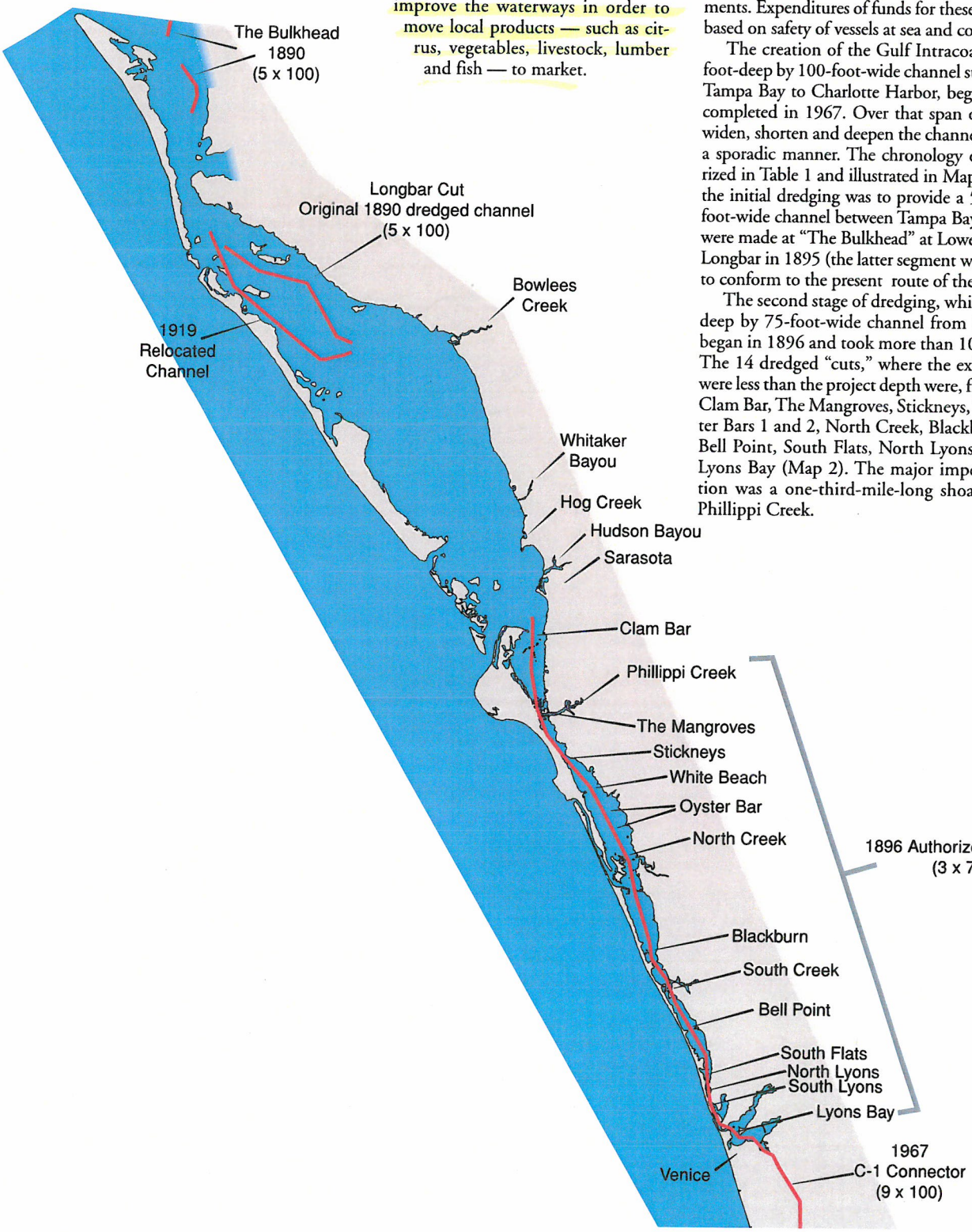
Dredging History of the Gulf Intracoastal Waterway

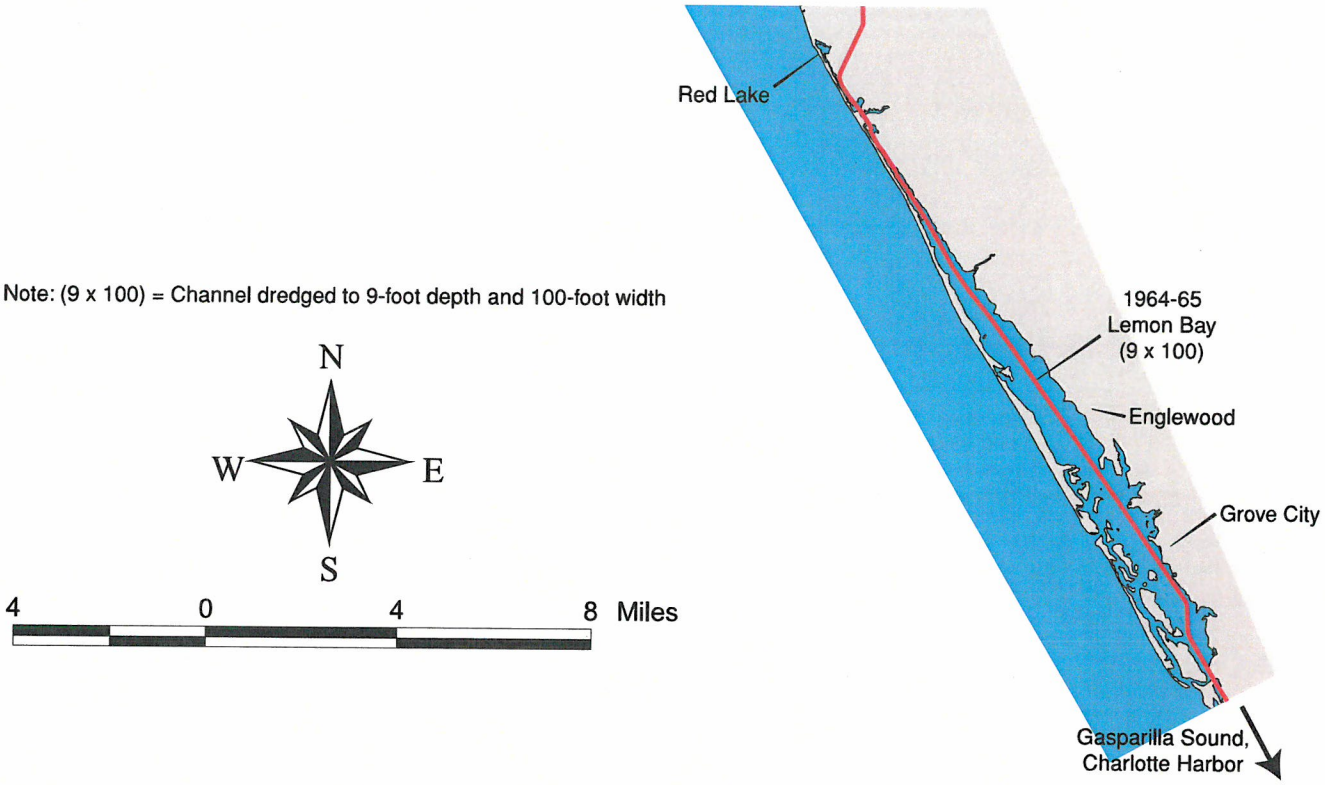
The region's settlers recognized the advantages afforded by an inland navigation route in sheltered waters that could provide safe passage to light-draft vessels unable to withstand the battering of the open Gulf of Mexico. Such an inside passage between Tampa Bay and Charlotte Harbor did not exist during the pre-development period in the late 1800s. As coastal settlements were established, the transport of goods and services became a high priority. Local communities requested assistance from the federal government to improve the waterways in order to move local products — such as citrus, vegetables, livestock, lumber and fish — to market.

The hydrographic charts produced by the U.S. Coast and Geodetic Survey in 1883 provide an invaluable baseline of information on waterway conditions in southwest Florida. The U.S. Army Corps of Engineers was assigned responsibility for surveying and improving waterways judged to have national importance through the General Survey Act of 1824 and the Rivers and Harbors Act of 1878. In 1889 the Corps undertook the first in a series of detailed field studies to determine the engineering feasibility and economic justification for waterway improvements. Expenditures of funds for these improvements were based on safety of vessels at sea and commerce.

The creation of the Gulf Intracoastal Waterway, a 9-foot-deep by 100-foot-wide channel stretching from lower Tampa Bay to Charlotte Harbor, began in 1895 and was completed in 1967. Over that span of time, dredging to widen, shorten and deepen the channel was undertaken in a sporadic manner. The chronology of events is summarized in Table 1 and illustrated in Map 2. The objective of the initial dredging was to provide a 5-foot-deep by 100-foot-wide channel between Tampa Bay and Sarasota. Cuts were made at "The Bulkhead" at Lower Tampa Bay and at Longbar in 1895 (the latter segment was realigned in 1919 to conform to the present route of the waterway).

The second stage of dredging, which created a 3-foot-deep by 75-foot-wide channel from Sarasota to Venice, began in 1896 and took more than 10 years to complete. The 14 dredged "cuts," where the existing water depths were less than the project depth were, from north to south, Clam Bar, The Mangroves, Stickneys, White Beach, Oyster Bars 1 and 2, North Creek, Blackburn, South Creek, Bell Point, South Flats, North Lyons, South Lyons and Lyons Bay (Map 2). The major impediment to navigation was a one-third-mile-long shoal at the mouth of Phillippi Creek.





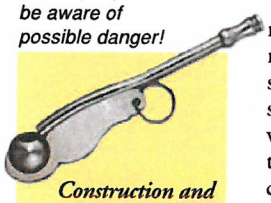
Map 2.
Dredging History of the Gulf Intracoastal Waterway

Historical Synopsis of the Gulf Intracoastal Waterway in Southwest Florida	
1895	First federal intracoastal navigation project in southwest Florida; Congress appropriated $5,000 for dredging a 5-foot-deep by 100-foot-wide channel to run south from Tampa Bay to Sarasota Bay.
1896	Modification of initial Sarasota Bay project extended an improved channel 3 feet deep by 75 feet wide south to Casey's Pass.
1907	Project extended further to Venice.
1917	By this year, two-thirds of the 3,841 tons (brick, canned goods, groceries, cement, corn, feed, fertilizer, fish, flour, grain and hay, ice, lumber, refined oils, shingles and miscellaneous merchandise) transported on this waterway moved between Sarasota and Tampa.
1919	Congress provided for a relocated 7-foot-deep channel above Sarasota.
1939	Board of Engineers for Rivers and Harbors recommended an intracoastal project, 9 feet deep by 100 feet wide, reaching from the Caloosahatchee River (Ft. Myers) north to the Anclote River (Tarpon Springs). World War II delayed funding until 1945
1945	Congress authorizes and funds a deepened and widened Gulf Intracoastal Waterway.
1948	Modifying legislation revised cost-sharing arrangements between the federal government and local interests; alternate route studied.
1959	Terms of local compliance resolved.
1960	Dredging begins on C-1 alternate route, five-mile alternate passageway inland of the city of Venice, connecting Lemon Bay with the original route north of Venice to Sarasota.
1962	Channel deepened (9 feet deep by 100 feet wide): dredge begins at "The Bulkhead" (lower Tampa Bay) and works southward, completes improvements to Venice in 1965.
1964	Channel improvement of Intracoastal Waterway begins in Gasparilla Sound; dredge completes 9-foot-deep by 100-foot-wide channel through Lemon Bay to Red Lake by 1965.
1967	Dredging is completed on the C-1 route between Red Lake and Roberts Bay.

Table 1.

Aerial photo of Intracoastal Waterway. Sister Keys, Sarasota.

Aboard ship, the boatswain (aka "bosun") is responsible for the hull, rigging and anchors. When he blows his whistle, sailors jump to be aware of possible danger!



Construction and maintenance of canals and channels permanently displace natural wetlands. Continued spoil disposal prolongs and extends shoreline-wetland loses. Spoils placed in wetlands also promote invasive species of trees. Channels can reverse local currents and change salinity and flushing in small bays.

All dredging was done by the U.S. steam snagboat and dredge "Suwanee," a shallow-draft, square-bowed scow 100 feet long, with a 24-foot beam and four-foot draft. Although under-powered, she was suited to her task. The "Suwanee" was put together inexpensively as an experiment in creating a general-purpose vessel for the varied minor works performed on bays and smaller rivers. Her suction dredges discharged the raised slurry upon the bay's shore through pipes swung perpendicular to her sides, while the "Suwanee's" derrick provided the lifting power to raise rocks and snags from the bay bottom. The ship's complement included a 10-man crew which operated the snagboat, a launch, float boat and two rowboats.

By just before World War I, a 5-foot-deep by 100-foot-wide maintained channel stretched from lower Tampa Bay to Sarasota, and a 3-foot-deep by 75-foot-wide channel existed from Sarasota to Venice. The Corps of Engineers surveyed Lemon Bay in 1899 but determined insufficient economic justification for dredging the southern inland waterway sector to Gasparilla Sound.

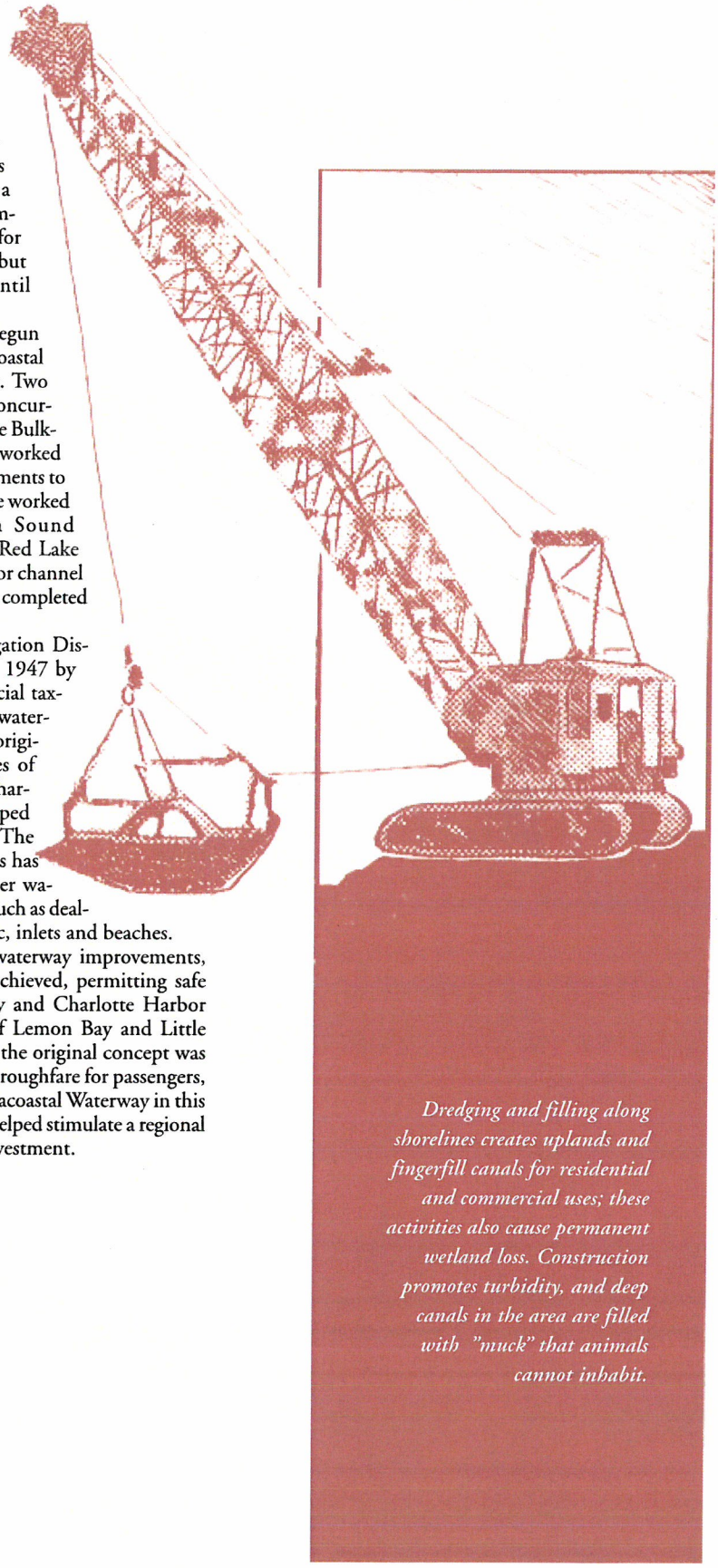
Initial channel improvements in Big Sarasota Bay before the turn of the century permitted an increase in steamer traffic to three sailings per week between Sarasota and Tampa. Small sailboats acted as feeders for the steamer line between Sarasota, Osprey, Venice and intermediate points. In the early 1900s, Englewood and Grove City were relegated to weekly sloop sailings that brought in supplies. By 1910, daily sailings were underway from Sarasota to Tampa. By the closing years of World War I, channel improvements had been completed between Sarasota and Venice; several boats operated regularly, probably 100 launches ran at irregular intervals and two regular boat lines carried freight and passengers. The auxiliary sloop "Phantom" made a regular weekly trip between Tampa and Osprey, and a gasoline launch made three trips weekly between Sarasota and Osprey with intermediate stops.

Except for stabilizing the inlet at Venice, very few additional waterway improvements were made during the period between the World Wars. The Board of Engineers for Rivers and Harbors did recommend a 9-foot-deep by 100-foot-wide improved Intracoastal Waterway for the Florida west coast in 1939, but funds were not authorized until 1945.

A second dredging period, begun in 1962, created the Gulf Intracoastal Waterway as it presently exists. Two dredges and crews operated concurrently. One dredge began at "The Bulkhead" at South Tampa Bay and worked southward to complete improvements to Venice in 1965; the other dredge worked northward from Gasparilla Sound through Lemon Bay, reaching Red Lake by 1965. The five-mile connector channel linking Red Lake and Venice was completed in 1967.

A West Coast Inland Navigation District (WCIND) was created in 1947 by the Florida Legislature as a special taxing authority to maintain the waterway right of way. The WCIND originally encompassed the counties of Pinellas, Manatee, Sarasota, Charlotte and Lee, but Pinellas dropped out of the District in the 1970s. The District's mandate over the years has been broadened to include other waterway management functions, such as dealing with anchorages, boat traffic, inlets and beaches.

After 75 years of sporadic waterway improvements, an inland passage was finally achieved, permitting safe navigation between Tampa Bay and Charlotte Harbor through the sheltered waters of Lemon Bay and Little and Big Sarasota Bays. Though the original concept was to create a commercial water thoroughfare for passengers, goods and services, the Gulf Intracoastal Waterway in this region of southwest Florida has helped stimulate a regional transportation infrastructure investment.

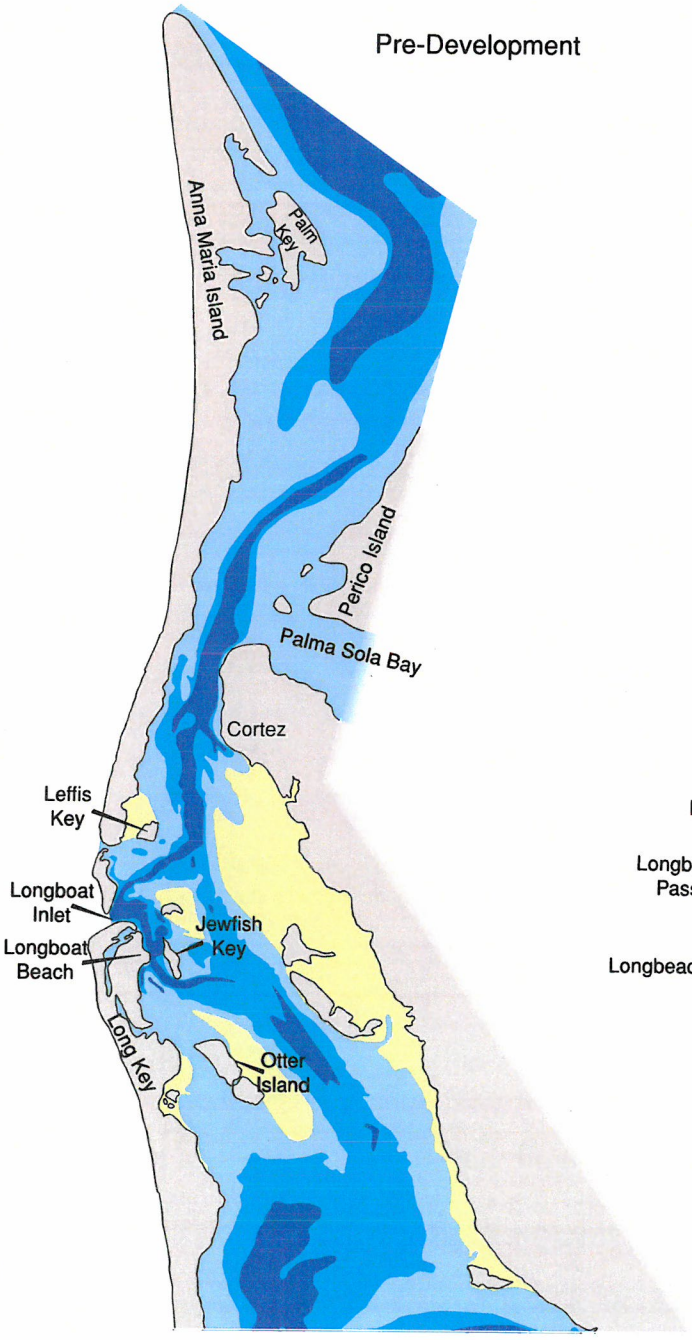


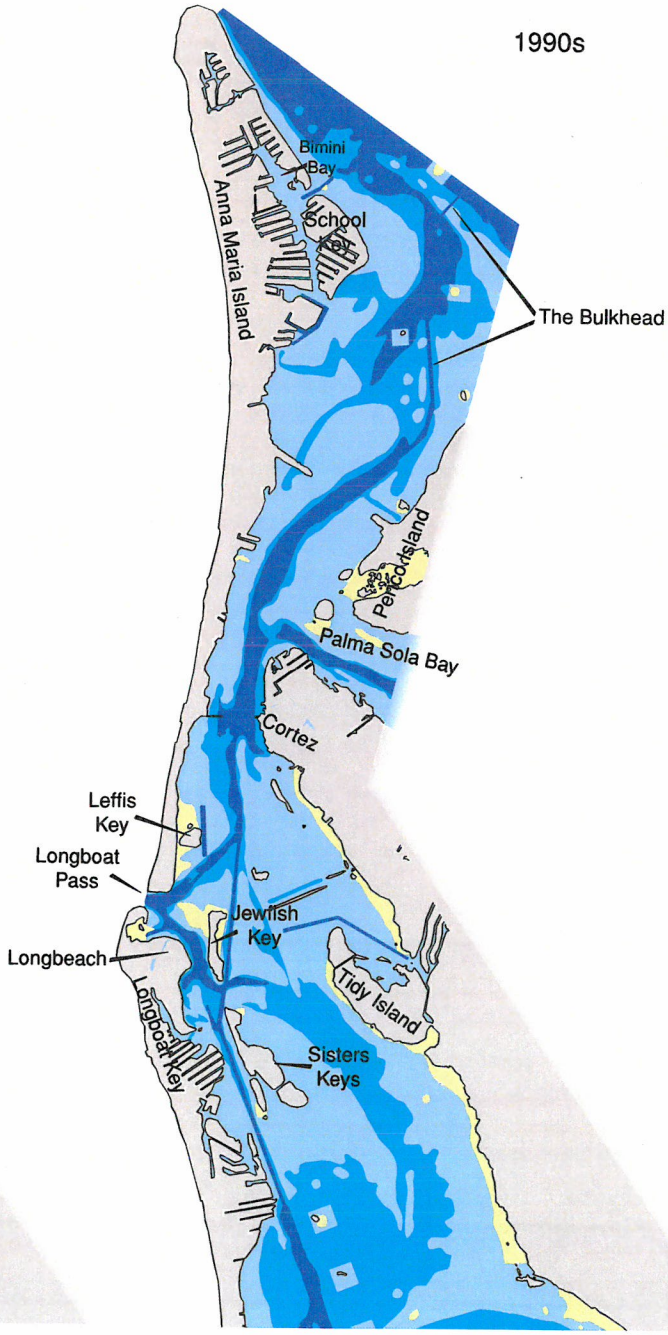
Dredging and filling along shorelines creates uplands and fingerfill canals for residential and commercial uses; these activities also cause permanent wetland loss. Construction promotes turbidity, and deep canals in the area are filled with "muck" that animals cannot inhabit.

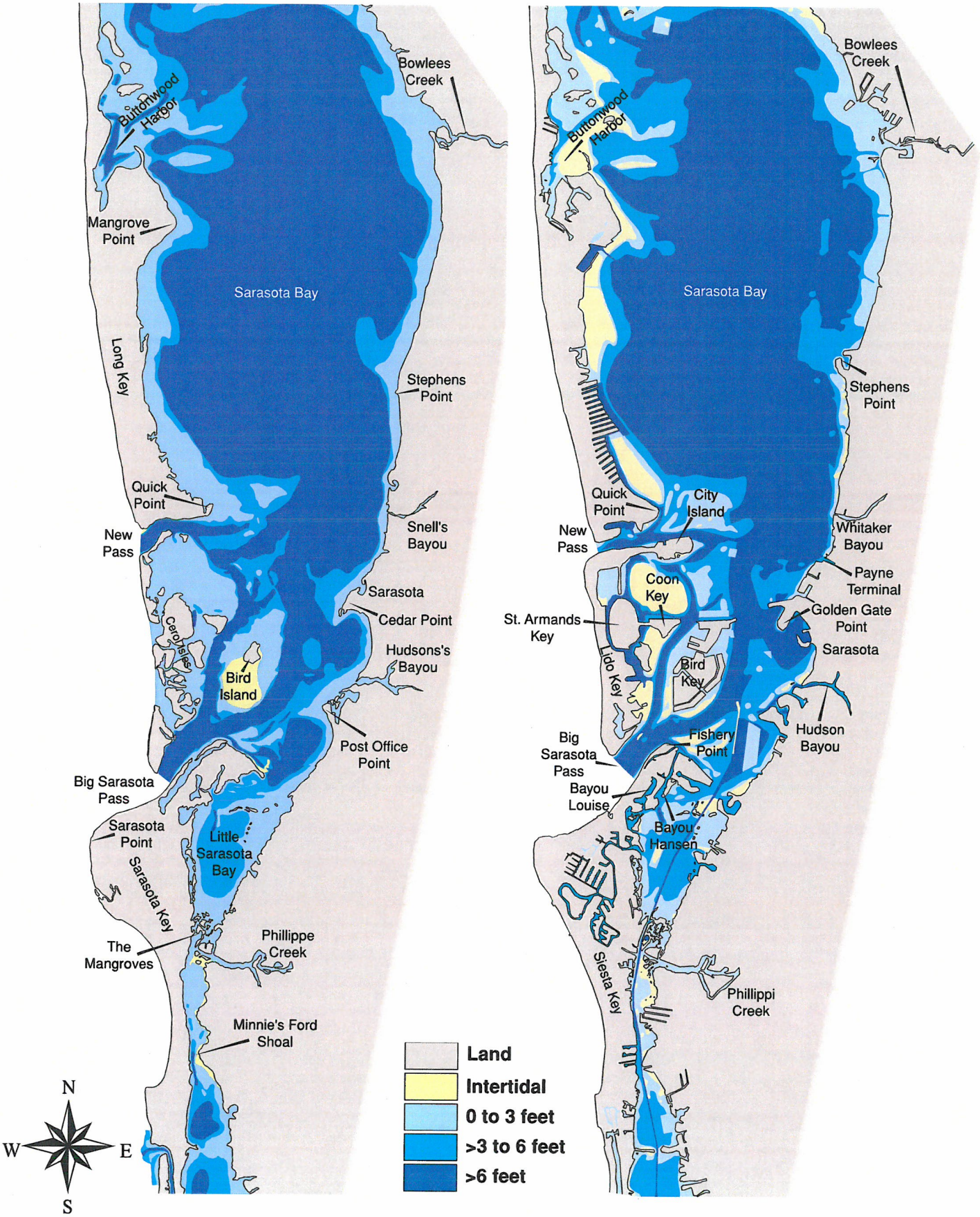
Dredging of Access Channels and Residential Canal Development

As the main intracoastal waterway channel was improved to connect lower Tampa Bay and Sarasota, little time was wasted before local land-development interests learned that dredging could create valuable waterfront home sites. Earliest dredge-and-fill work occurred in the pre-World War I years on the mainland in Sarasota, on Phillippi Creek, from Post Office Point to Hudson Bayou, Cedar Point, Stephens Point and on north Sarasota (Siesta) Key at Bayou Louise and Bayou Hansen (Map 3).

A second phase of activity, during the land boom of the 1920s, was associated with Calvin Payne and John Ringling, who transformed the barrier islands between Big Sarasota Pass and New Pass. Payne had the channel at New Pass dredged, creating City Island in the process; the deep-water harbor on the mainland (due east of the pass) was created to accommodate Sarasota's growing marine industry. Known as Payne's Terminal, this facility has housed boat construction and maintenance yards, provided fuel sales and served the boating public for decades.

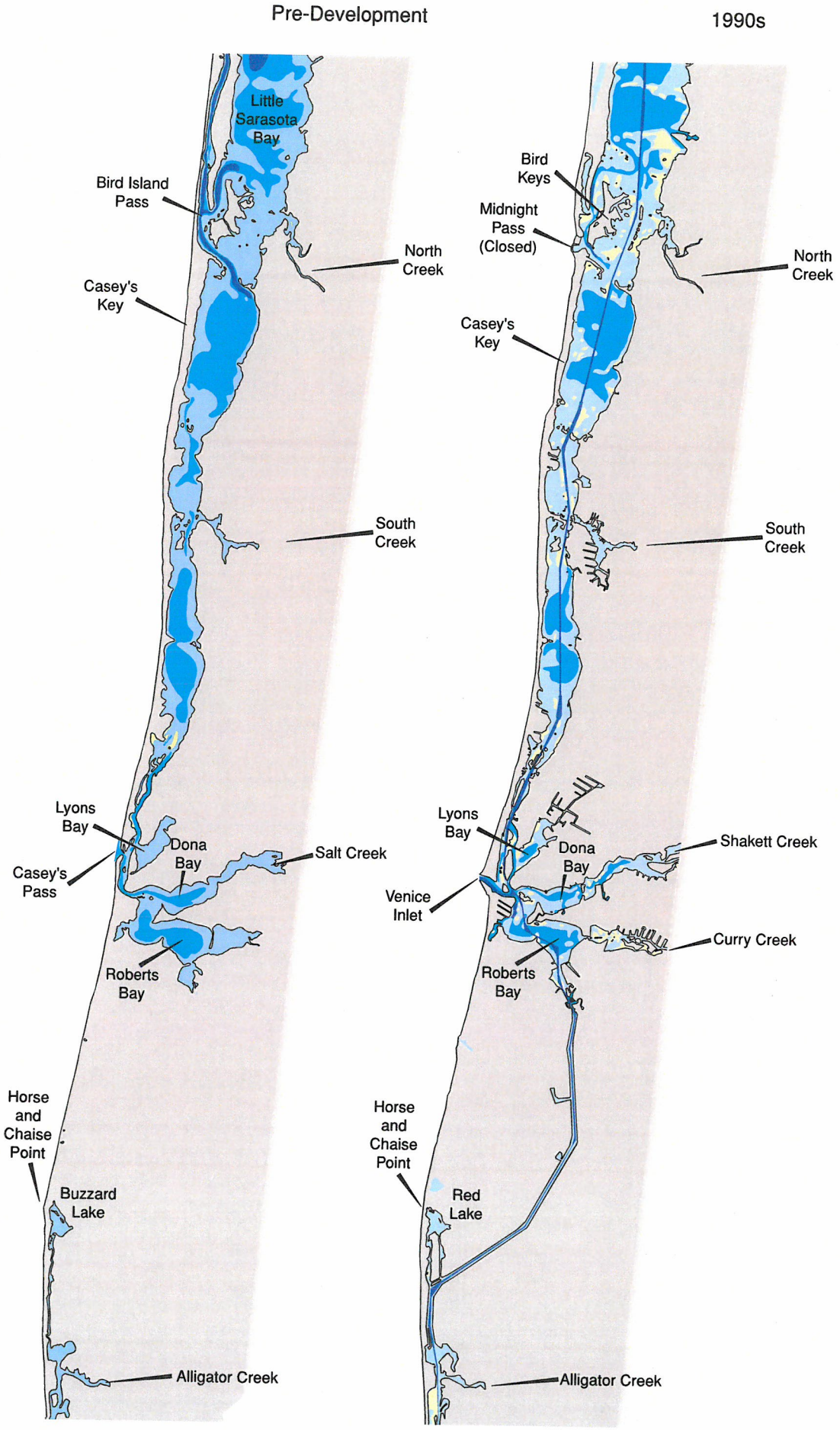


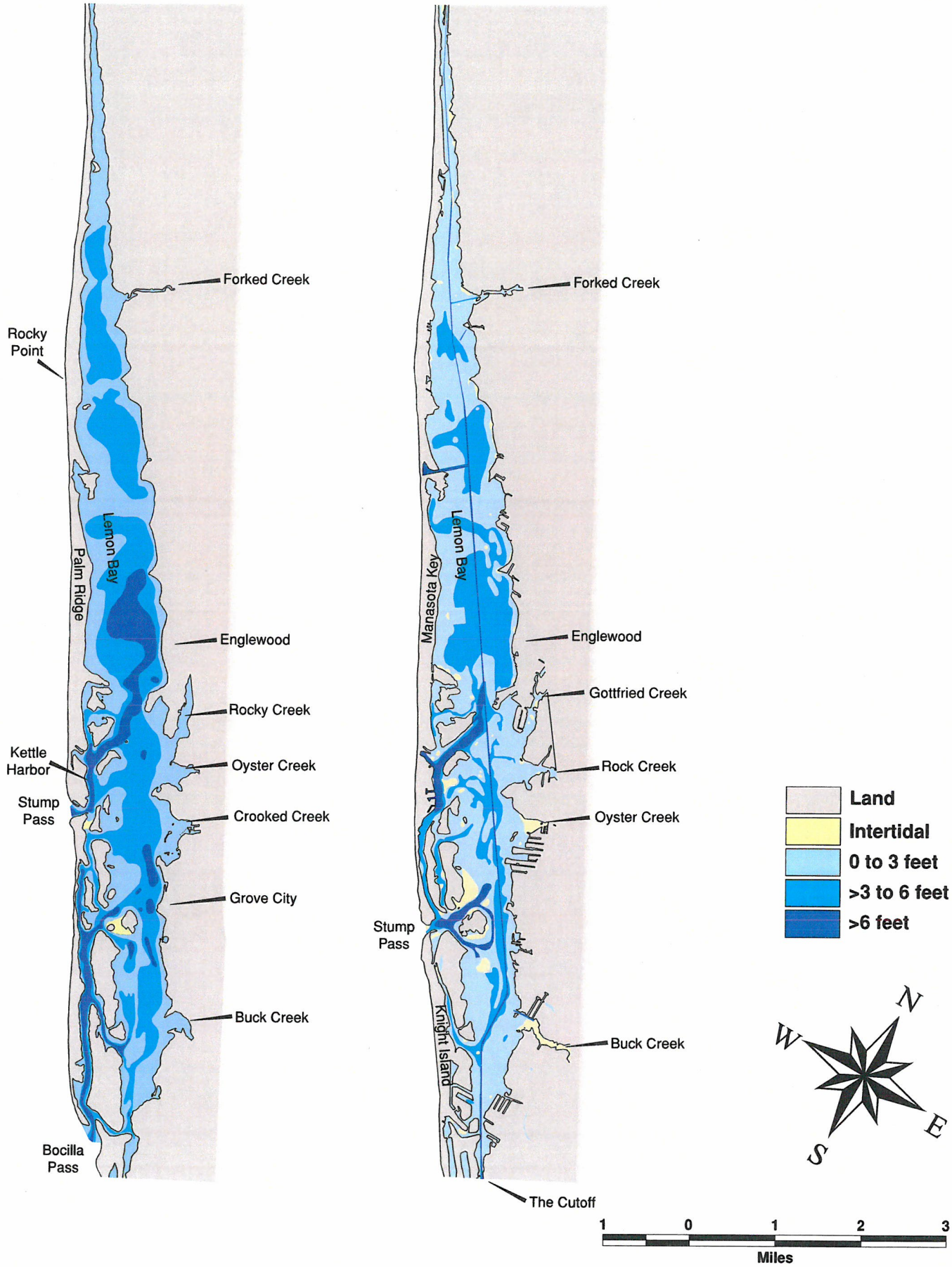




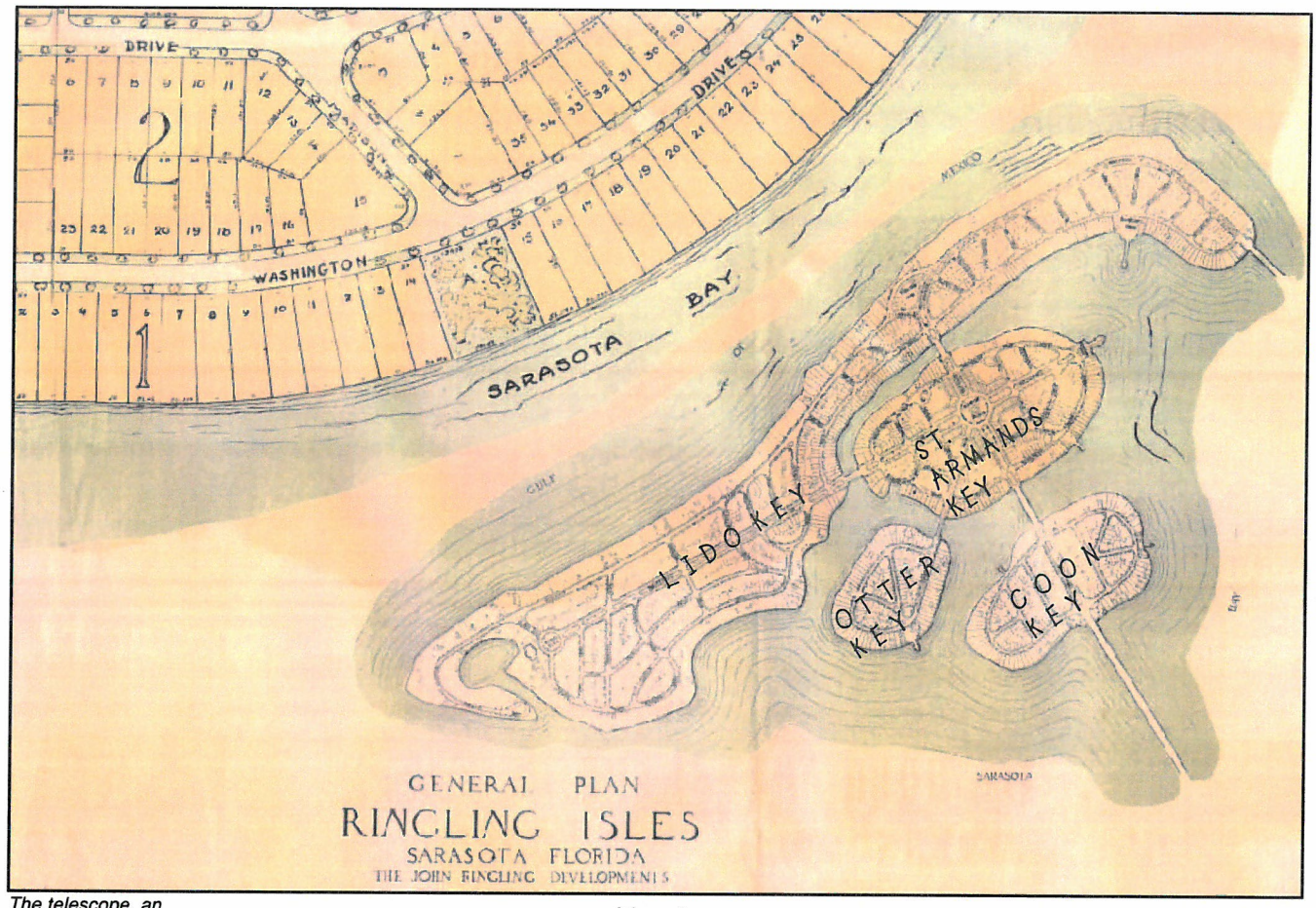
Note: The Pre-Development map shows the spelling of the historic names of the Sarasota Bay system.

Map 3.
Waterway Conditions for the Pre-Development (1890) and Contemporary (1990) Periods
(Map 3 continued on pages 18 and 19)


Pre-Development
Little Sarasota Bay
Bird Island Pass
North Creek
Casey's Key
South Creek
Lyons Bay
Dona Bay
Salt Creek
Casey's Pass
Roberts Bay
Horse and Chaise Point
Buzzard Lake
Alligator Creek
1990s
Bird Keys
Midnight Pass (Closed)
North Creek
Casey's Key
South Creek
Lyons Bay
Shakett Creek
Dona Bay
Venice Inlet
Curry Creek
Roberts Bay
Horse and Chaise Point
Red Lake
Alligator Creek



Map 3.
Waterway Conditions for the
Pre-Development (1890) and Contemporary (1990) Periods
(Map 3 continued from pages 16 and 17)



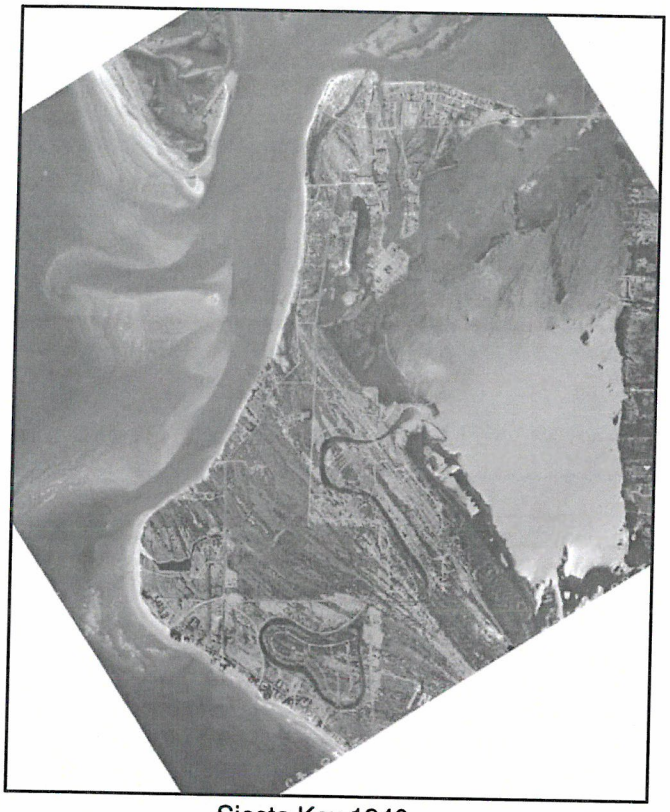
Map 4.
Ringling Isles Development Plan

The telescope, an instrument used for observation of distant objects.

A conflict exists between access and habitat. On one side of the issue is the increasing population in the Sarassota Bay area, and the increasing demand for more access points so more people can use the bay and beach. On the other side is the importance of protecting and preserving the natural resources of the region, which are threatened by this increased use.

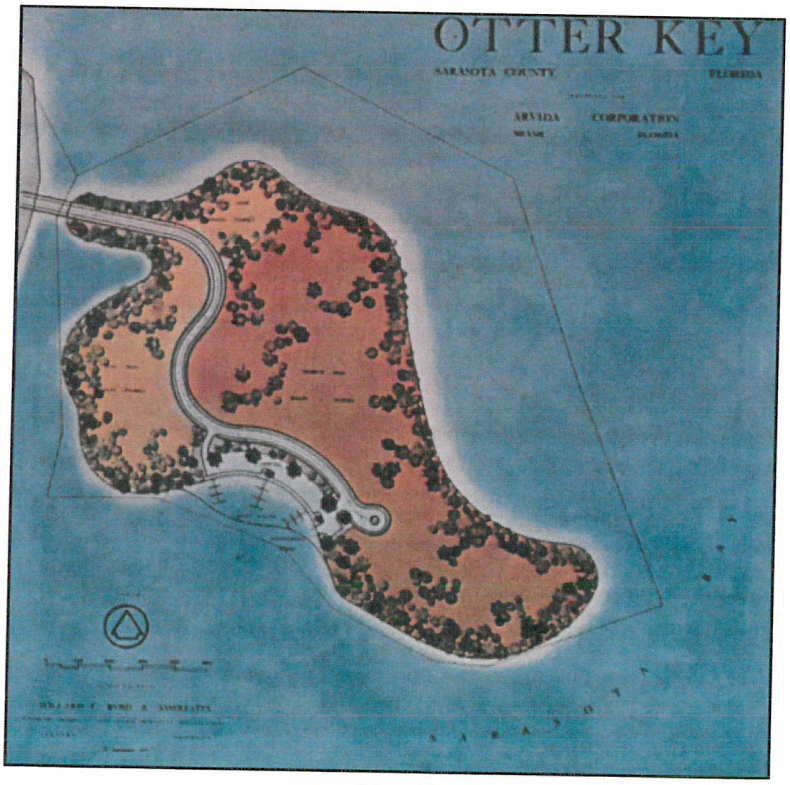
Lido Key and St. Armands Key illustrate some of the most dramatic changes resulting from dredge-and-fill activities in the Sarasota area. Those keys, as such, did not exist 100 years ago; instead, a loose group of small islets called the Cerol Isles were west of the mainland. During the 1920s, Ringling converted Lido Key into a continuous island, and in 1925 he built a causeway from the mainland to serve it. A feeder causeway was extended to Bird Key, and the first ambitious island home was built there in 1914. Ringling and partner Owen Burns dredged channels and filled land as part of the proposed Ringling Isles development (Map 4). For a time, they operated a dredge from Otter Key; the wrecked remains of the vessel's boilers are a popular fish haven today.

Ringling's dream failed in the real estate crash of 1929, but the boat channels adjoining the filled land on Lido, St. Armands, Otter and Coon Keys have left an indelible imprint of land and water changes. Dredged potholes and back-and-fill scars can be detected on the Sarasota Bay bottom to this day.



Siesta Key 1940

Siesta Key 1995



Map 5.
Proposed Development of Otter Key, 1971

The third, and by far the most extensive, phase of residential canal development, began in 1945 after World War II, accelerating in the 1950s and 1960s. Grand Canal, a 10-mile-long waterway system on Siesta Key, was created early in this period. Dredging on Curry Creek by the U.S. 41 bridge began in the 1940s as well. In the early and mid-1950s canal construction in the Grove City area was underway, and north Longboat Key was being dredged. Bimini Bay on north Anna Maria Island was deepened in the early 1960s, and the canal community of Key Royale transformed the former School Key. By 1969, work on the South Creek and Grand Canal (Siesta Key) systems appears to have been completed.

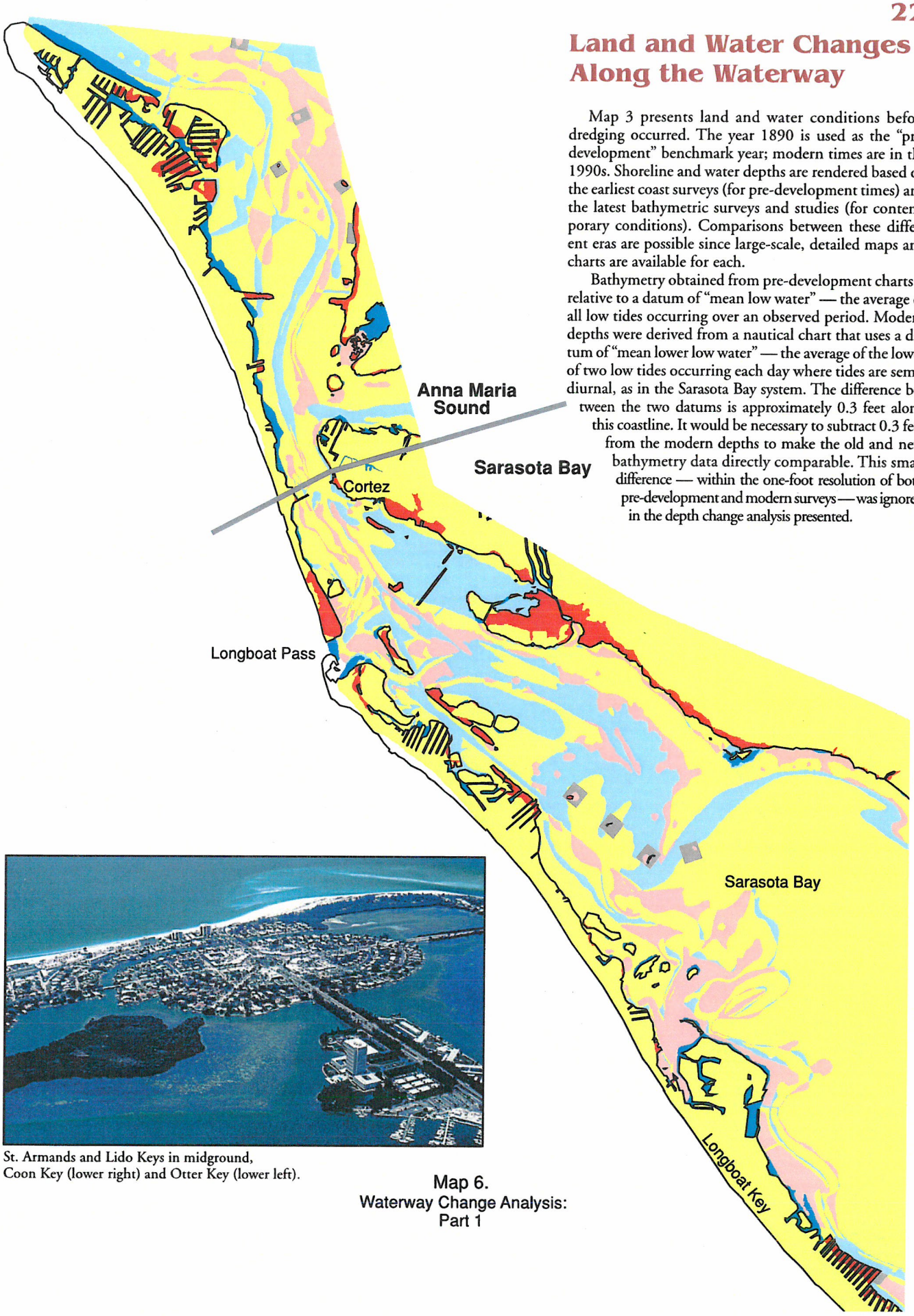
A major residential waterfront development of the 1960s was financed by the Arvida Corporation, which purchased the southern half of Longboat Key, most of Lido and all of Bird, Otter and Coon Keys from the Ringling estate for $13.5 million. Bird Key was transformed into a waterfront community with five miles of interconnected canals; eight miles of residential canals and basins were dredged on south Longboat Key. In 1971, Arvida proposed an exclusive development on Otter Key (Map 5), but that effort failed and Sarasota County in 1974 purchased the land, including South Lido, and created a public park there. Otter Key has been left undisturbed.

By the early 1970s, public concern about this form of dredge-and-fill coastal development prompted legislation to control dredging and protect the environment. In 1972, Congress enacted the Clean Water Act, which effectively put a halt to dredge-and-fill activities and alteration of bay habitat. However, by that time approximately 26 percent of mangroves and 92 percent of salt marsh had been lost in the Sarasota Bay system.

Land and Water Changes Along the Waterway

Map 3 presents land and water conditions before dredging occurred. The year 1890 is used as the "pre-development" benchmark year; modern times are in the 1990s. Shoreline and water depths are rendered based on the earliest coast surveys (for pre-development times) and the latest bathymetric surveys and studies (for contemporary conditions). Comparisons between these different eras are possible since large-scale, detailed maps and charts are available for each.

Bathymetry obtained from pre-development charts is relative to a datum of "mean low water" — the average of all low tides occurring over an observed period. Modern depths were derived from a nautical chart that uses a datum of "mean lower low water" — the average of the lower of two low tides occurring each day where tides are semi-diurnal, as in the Sarasota Bay system. The difference between the two datums is approximately 0.3 feet along this coastline. It would be necessary to subtract 0.3 feet from the modern depths to make the old and new bathymetry data directly comparable. This small difference — within the one-foot resolution of both pre-development and modern surveys — was ignored in the depth change analysis presented.



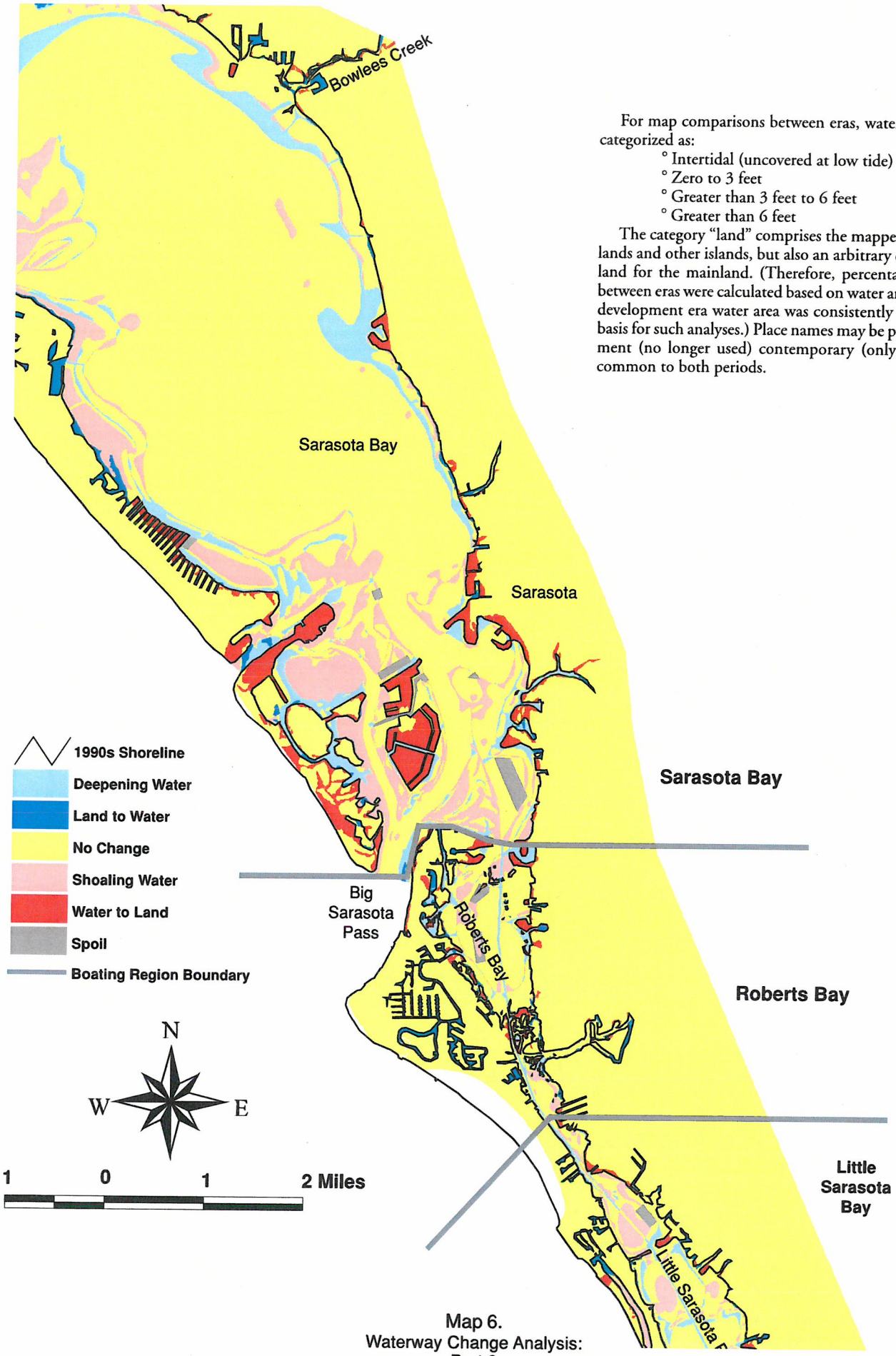
St. Armands and Lido Keys in midground, Coon Key (lower right) and Otter Key (lower left).

Map 6.
Waterway Change Analysis:
Part 1

For map comparisons between eras, water depths are categorized as:

- Intertidal (uncovered at low tide)
- Zero to 3 feet
- Greater than 3 feet to 6 feet
- Greater than 6 feet

The category "land" comprises the mapped barrier islands and other islands, but also an arbitrary distance inland for the mainland. (Therefore, percentage changes between eras were calculated based on water area; the pre-development era water area was consistently used as the basis for such analyses.) Place names may be pre-development (no longer used) contemporary (only today), or common to both periods.



Map 6.
Waterway Change Analysis:
Part 2

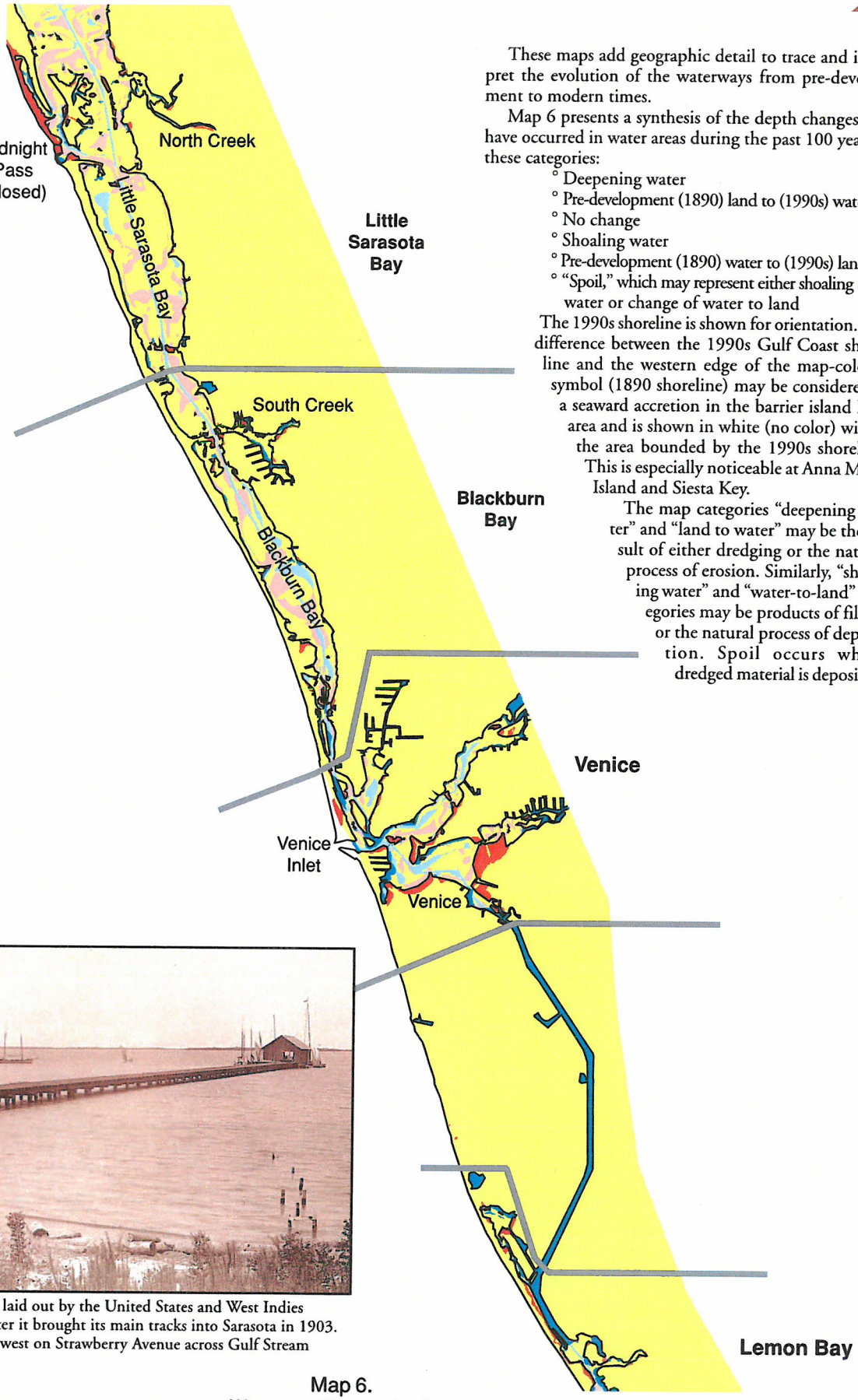
These maps add geographic detail to trace and interpret the evolution of the waterways from pre-development to modern times.

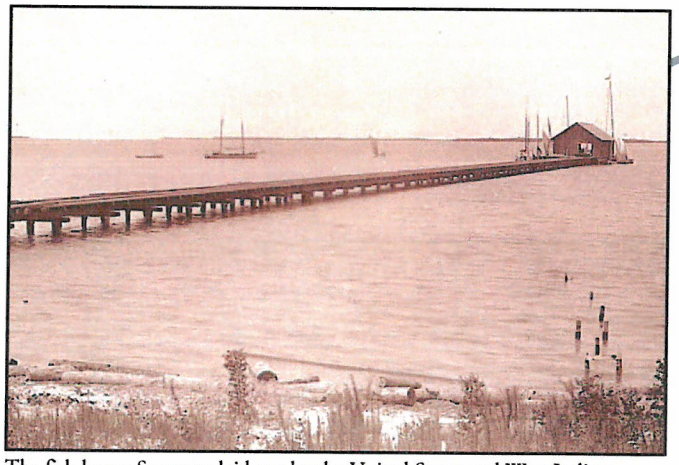
Map 6 presents a synthesis of the depth changes that have occurred in water areas during the past 100 years in these categories:

- Deepening water
- Pre-development (1890) land to (1990s) water
- No change
- Shoaling water
- Pre-development (1890) water to (1990s) land
- "Spoil," which may represent either shoaling of water or change of water to land

The 1990s shoreline is shown for orientation. The difference between the 1990s Gulf Coast shoreline and the western edge of the map-colored symbol (1890 shoreline) may be considered as a seaward accretion in the barrier island land area and is shown in white (no color) within the area bounded by the 1990s shoreline. This is especially noticeable at Anna Maria Island and Siesta Key.

The map categories "deepening water" and "land to water" may be the result of either dredging or the natural process of erosion. Similarly, "shoaling water" and "water-to-land" categories may be products of filling or the natural process of deposition. Spoil occurs where dredged material is deposited.



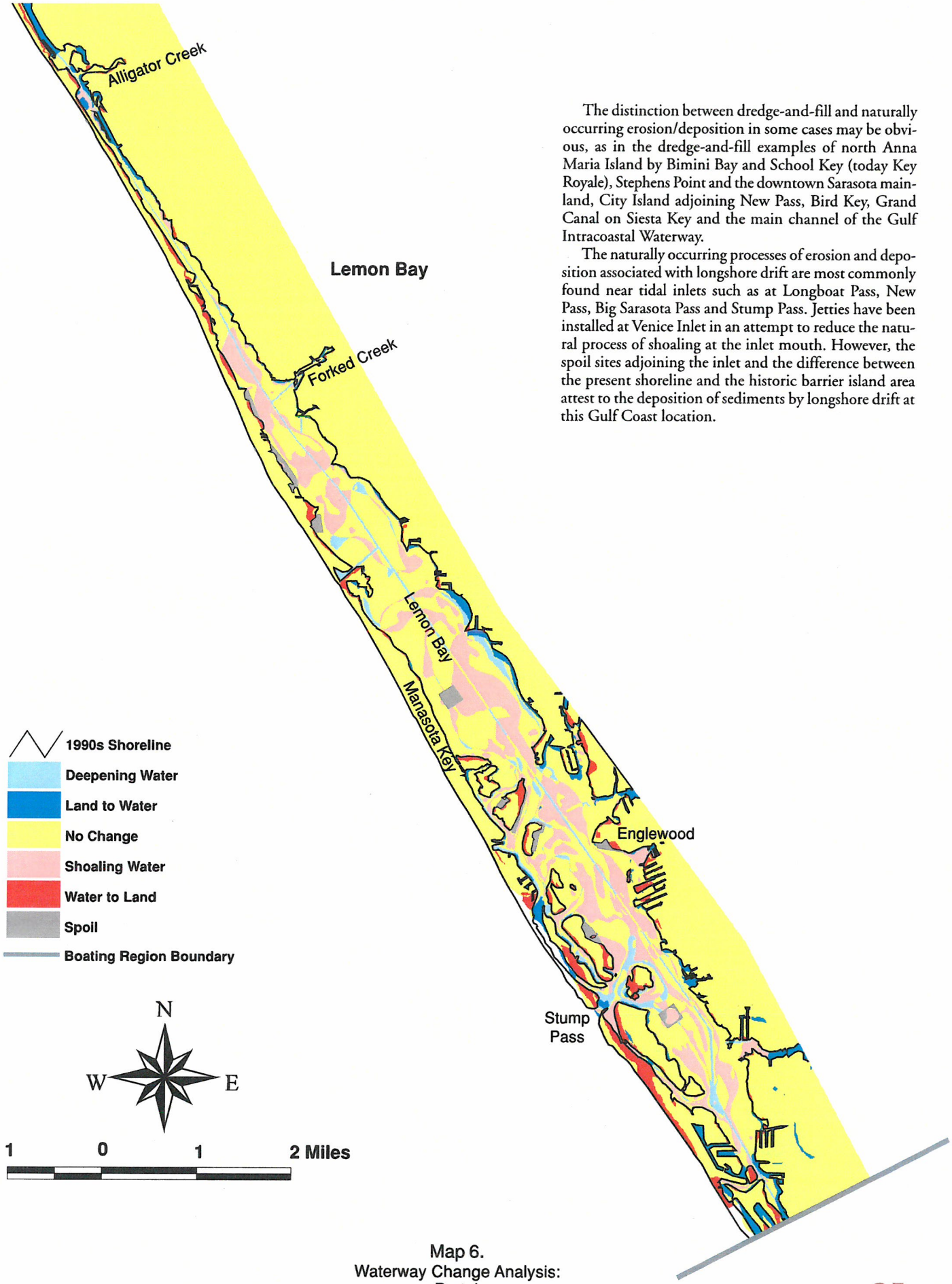


The fish house Spur was laid out by the United States and West Indies Railroad immediately after it brought its main tracks into Sarasota in 1903. The Spur was put down west on Strawberry Avenue across Gulf Stream Avenue out onto a dock.

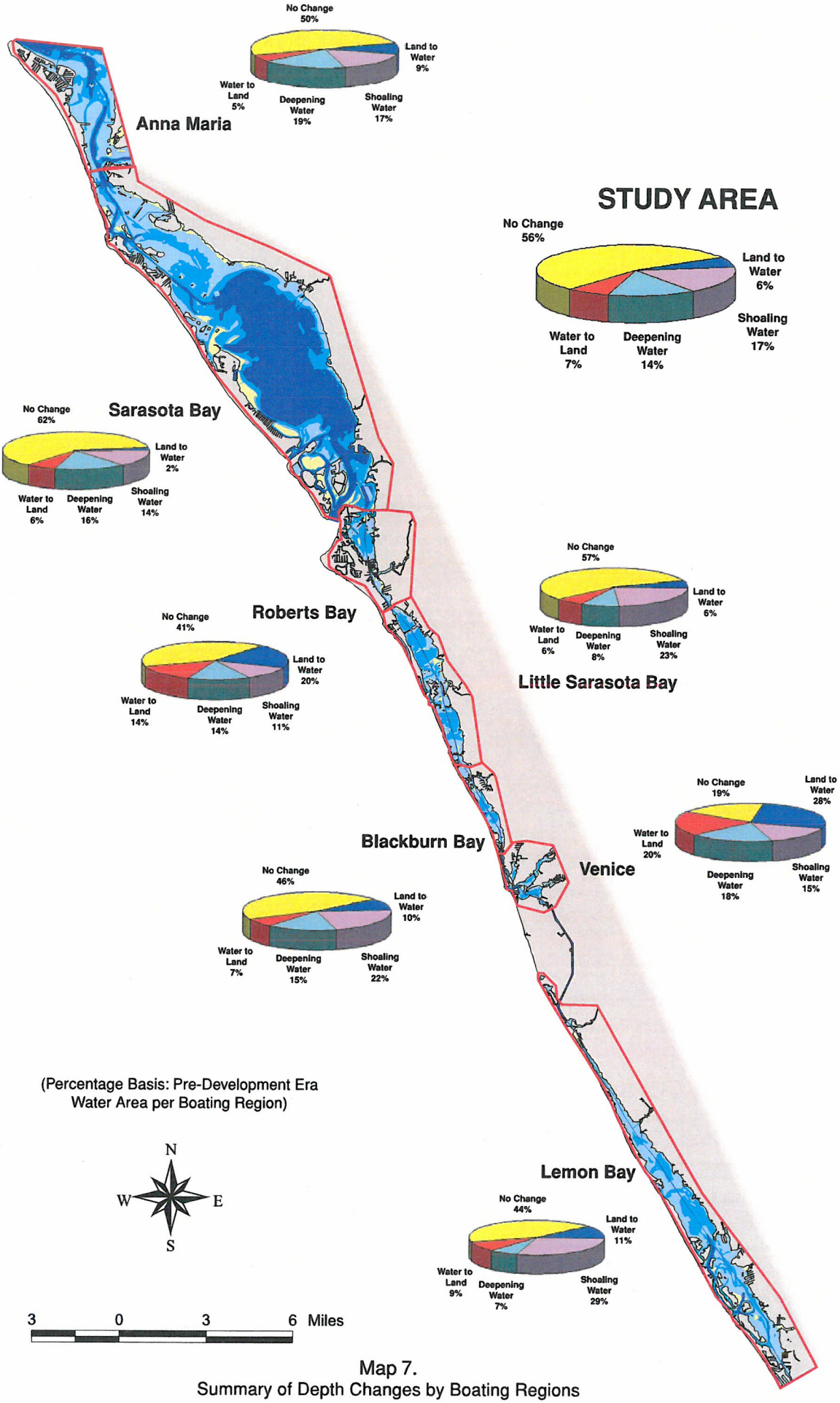
Map 6.
Waterway Change Analysis.
Part 3

The distinction between dredge-and-fill and naturally occurring erosion/deposition in some cases may be obvious, as in the dredge-and-fill examples of north Anna Maria Island by Bimini Bay and School Key (today Key Royale), Stephens Point and the downtown Sarasota mainland, City Island adjoining New Pass, Bird Key, Grand Canal on Siesta Key and the main channel of the Gulf Intracoastal Waterway.

The naturally occurring processes of erosion and deposition associated with longshore drift are most commonly found near tidal inlets such as at Longboat Pass, New Pass, Big Sarasota Pass and Stump Pass. Jetties have been installed at Venice Inlet in an attempt to reduce the natural process of shoaling at the inlet mouth. However, the spoil sites adjoining the inlet and the difference between the present shoreline and the historic barrier island area attest to the deposition of sediments by longshore drift at this Gulf Coast location.



Map 6.
Waterway Change Analysis:
Part 4



Map 7.
Summary of Depth Changes by Boating Regions

Summary of Relative Changes in Water Depths Between 1890 and 1990.		
Region	**No Change (%)**	**Change (%)**
Anna Maria	50	50
Sarasota Bay	62	38
Roberts Bay	41	59
Little Sarasota Bay	57	43
Blackburn Bay	46	54
Venice*	19	81
Lemon Bay	45	55
Entire Region	56	44
*Excludes C-1 canal		

Table 2.

Map 7 summarizes relative (percentage) depth changes from the pre-development 1890s era to the 1990s for the entire region. Boating areas identified are Anna Maria Sound, Big Sarasota Bay, Roberts Bay, Little Sarasota Bay, Blackburn Bay, Venice and Lemon Bay. Table 2 shows the following overall trends. More of the water area (56 percent) has not changed in depth than has changed (44 percent).

Big Sarasota Bay (from Cortez Bridge on the north to Siesta Key Bridge to the south) and Little Sarasota Bay (Stickney Point Bridge at the north to Blackburn Point Bridge on the south) show the least change, largely because of the large bay areas where depths have remained the same. On the other hand, the most dramatic changes in the Sarasota Bay system have occurred in the Venice area (Albee Bridge on the north to Hatchett Creek Bridge to the south). There, 81 percent of the water area has been transformed by deepening, shoaling or the creation of land by fill or natural deposition.

The other boating regions follow the same overall trend. Where changes have occurred, the predominant processes in the boating regions have been through deepening of water, found in Anna Maria Sound, Big Sarasota Bay and Roberts Bay. Changes spurred by shoaling of water have occurred in the Roberts Bay, Little Sarasota Bay, Blackburn Bay and Lemon Bay; water-to-land transformation has taken place in the Venice area.

Sarasota bayfront. October 7, 1926.

Land Use and Land Cover Changes Along the Shoreline

A sparsely settled coastline greeted late-19th-century mariners nearing southwest Florida and what is today the Sarasota Bay system. Windswept dunes and beach vegetation such as sea oats and seagrapes covered the western shores of the barrier islands off the coast. Much of the barrier islands' eastern shore was fringed with mangrove, with shrub and brush land vegetation covering the islands' interior.

The Bay Island Hotel, built in 1912 adjacent to Hansen's Bayou. The Bay Island Hotel was one of the area's finest.

The mainland was largely covered with pine forest, but land along the bayside had been mostly homesteaded in small individual holdings (Map 8, Table 3). Sawmills were situated on Whitaker Bayou and later at Englewood; settlements had developed at Sarasota and Osprey. As the inland waterway was improved and road and rail connections established, the local economy expanded with citrus and vegetable production, lumber, naval stores and fisheries products. By 1900, Cortez was a fishing village of 150 people; Sarasota and vicinity had a population of 3,000 and were becoming a health and tourist resort, while 150 people lived at Englewood and another 80 at Grove City.

A striking difference is apparent between the predevelopment waterfront use of 1890 and that of the bayside and barrier islands in the 1990s. The most dramatic change visible on Map 8 is the phenomenal urban development. Table 4 summarizes the major changes in mangrove and salt marsh, two land-cover categories of special interest to boaters. The significant reduction in their distribution has implications for more than boating enjoyment, since these ecological niches are rich nursery habitats for many species of marine and bird life. Although the decrease in mangrove area has been ameliorated by the appearance of new colonies in spoil areas, a significant net loss still exists. Similarly, the considerable decline in salt marsh area has not been offset by the creation of new suitable areas, and its relative loss is considerably greater.

Homesteads and Boat Landings During the Pre-WWI Era

Anna Maria Island	Cortez	Longboat Key	Sarasota (Mainland)						Siesta (Sarasota) Key
			North of Bowlees Creek	Bowlees Creek to Cedar Point	Cedar Point to The Mangroves	The Mangroves to North Creek	North Creek to South Creek	South Creek to Roberts Bay	
Ilexhurst	Gulfview	Shore Acres White's Wharf Bean's Wharf Corey's Wharf Bishop's Wharf Wallace Lodge Olives's Wharf	Spang Crowley Madsen Heiser	Riggin Dr. Dunham Bass Washington Grant Whitaker	E.W. Blair Willard Bidwell Greer Albee Butler Anderson Jones Hanson Jeffcott	Drumright Robinson Peterson Marsh Clower Brown	Webb Webb Jr. Griffith Huckleberry Camp Blackburn	Bacon Blackburn Jr. Lyons Jesse Knight Higel Roberts	Costello Bickford

Table 3.

Prominent Features of the Boating Waterfront

These features, identified on Map 8, are described below from north to south.

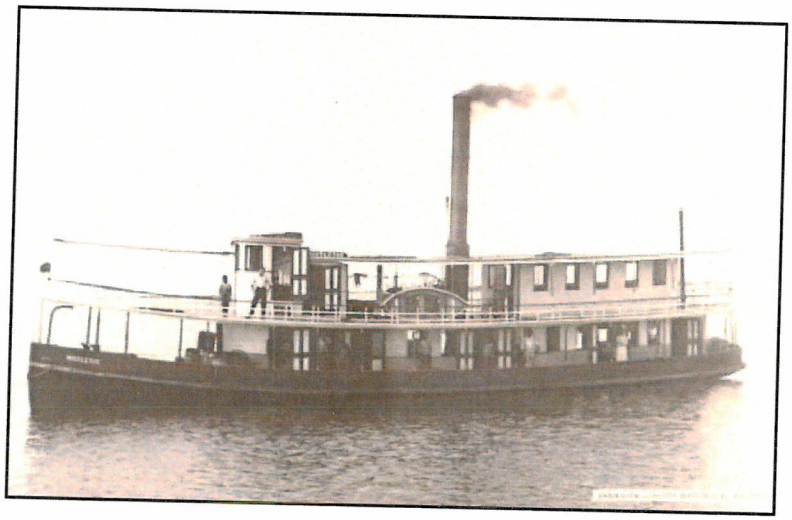
1. Anna Maria Island is bounded on the north by Tampa Bay, on the east by Anna Maria Sound, on the south by Longboat Pass and on the west by the Gulf of Mexico. The island was homesteaded in the late 1880s and is today comprised of three municipalities: Anna Maria City, Holmes Beach and Bradenton Beach. Most of the western shore was the focus of a beach renourishment effort in 1993, while the eastern shore received major dredge-and-fill activities and canalization in the 1950s and 1960s.

2. Longboat Key is a barrier island bounded on the north by Longboat Pass, on the east by Sarasota Bay, on the south by New Pass and on the west by the Gulf. Homesteading took place in the northern part of the key in the late 1890s at an area known today as Longbeach Village. The eastern shore has been heavily dredged and filled through creation of canals, while the western beaches have been the recipient of two beach renourishment efforts since 1991.

3. The village of Cortez was founded in the late 1880s by a group of families from North Carolina. The village on the banks of northern Sarasota Bay was once one of the busiest commercial fishing locations on Florida's Gulf Coast. For more about Cortez, see the section devoted to the village elsewhere in this publication.

4. Palma Sola Pass was the first channel improvement made by the federal government to the intracoastal waterway in 1895. "The Bulkhead," a name originally applied to this improvement, also refers to another dredged cut a half-mile to the north, which was opened in the 1920s to shorten and straighten the approach from south Tampa Bay. The deepening of this pass provided shallow draft commercial vessels with access from Tampa to Sarasota. The steamer "Mistletoe," owned by John Savarese of Tampa, in 1895 provided the first scheduled transportation service for the Sarasota Bay area.

The steamer "Mistletoe, " owned by John Savarese, was the first scheduled transportation to serve the Sarasota Bay area, beginning in 1895.



5. Manatee Avenue Bridge. The bridge, completed in 1957, was originally a toll bridge linking Holmes Beach to Perico Island and the mainland. After tolls were removed in the late 1960s, the bascule structure provided free access to the island. Florida Department of Transportation officials began discussing replacing the current bridge in 1988. In 1992, after receiving approval by regional transportation planners, plans were more-or-less finalized for a new, $13.8-million bridge. The replacement bridge would have had a road bed about 78 feet above the water and would have been longer and wider than the current, with a fixed span in lieu of a draw.

Residents of Anna Maria Island objected to the larger bridge's height, ambience and impact on the environment. They challenged the DOT in court and through an administrative hearing process and, in 1998, were able to have the big bridge deleted from the DOT workplan.

DOT now plans to rehabilitate the current bridge in 1999.

6. Cortez Bridge. The first Cortez Bridge was a wooden-decked structure, built in 1921, that was the lone link between the mainland at Cortez and Anna Maria Island at Bradenton Beach. In 1957, the bridge was replaced by a concrete, bascule structure with tolls collected at its western end. The old bridge was partially demolished and used as a fishing pier; due to safety concerns, however, it was eventually demolished in 1978 and replaced with a 660-foot fishing pier, the current Bradenton Beach City Pier.

In 1988, the Florida Department of Transportation announced plans to replace the bridge with a high, fixed-span bridge similar to the one proposed at Manatee Avenue. Residents of Cortez and Bradenton Beach opposed the structure. DOT officials changed plans and rehabilitated the current bridge in 1996.

7. Longboat Pass Bridge, first built in 1927, washed away in a surge tide during the March 1932 storm. The pass had no bridge connection between 1932 and 1958, when the present structure was completed. The current bridge is scheduled to be renovated by the Florida Department of Transportation in 2003-04.

8. Jewfish Key today is one bay island situated off the area of Longboat Key called Longbeach; however, Jewfish comprised two islands 100 years ago. These islands were joined as a result of naturally occurring longshore deposition as well as dredging in the 1920s, which realigned the improved channel of the Intracoastal Waterway to a position along the island's eastern shore. The island is now home to a dozen single-family homes.

9. Sister Keys, formerly Otter Island, has been built-up along its western edge with "spoil" material dredged from the Intracoastal Waterway. Mangrove habitat is found on the natural Otter Island portion, while exotic species such as Australian pine (casurina) cover the spoil upland site. Sister Keys is currently a wildlife preserve owned by the Town of Longboat Key.

Mangrove and Saltwater Marsh Area Bordering the Sarasota Bay System: Pre-Development Era and 1990s

	Pre-Development*	1990s**	Change
Mangrove	4.2 sq. mi.	3.1 sq. mi.	26-percent decrease
Salt marsh	1.8 sq. mi.	0.15 sq. mi.	92-percent decrease

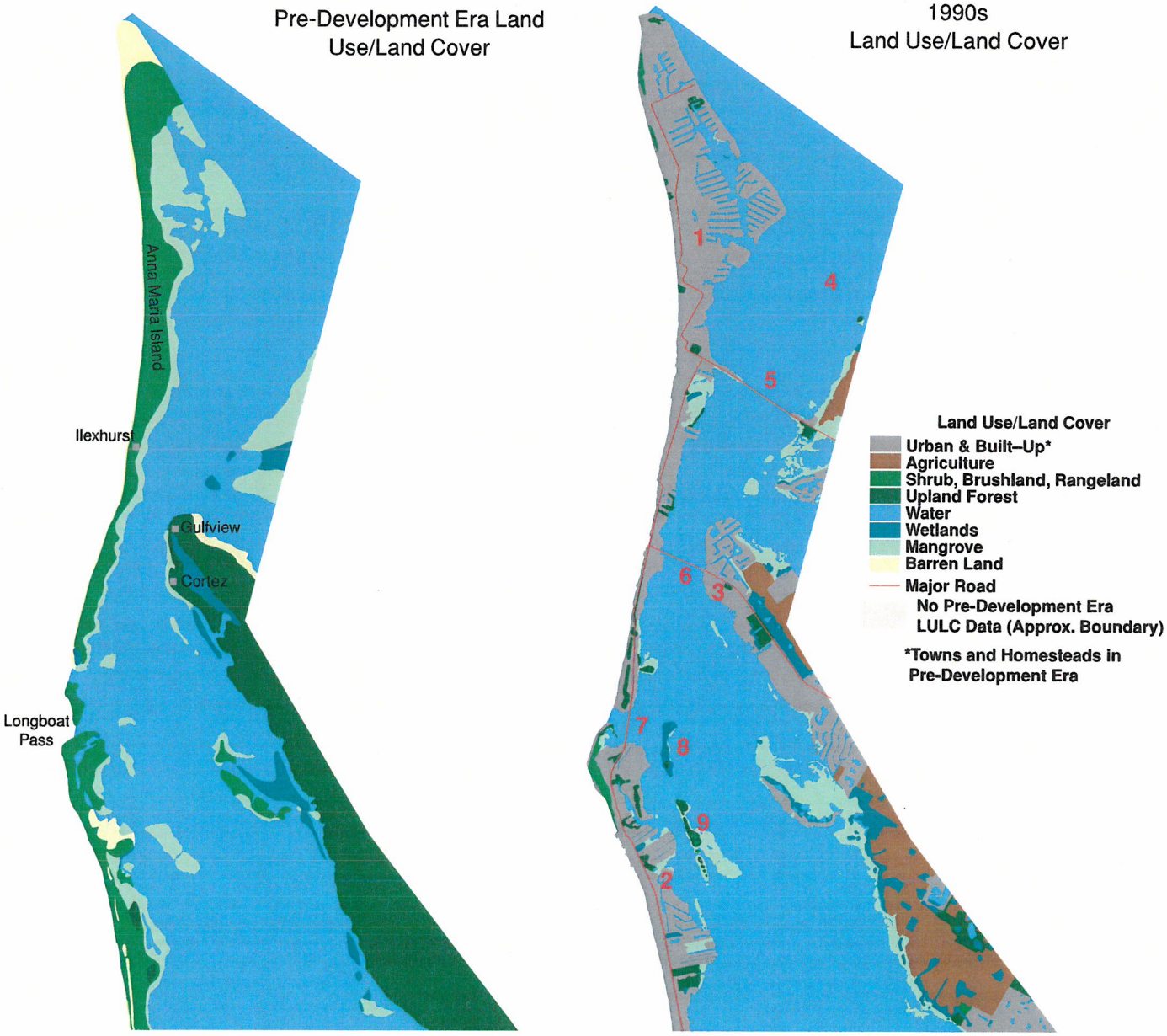
Sources:
*U.S. Coast and Geodetic Survey, T-Sheets No. 1517a, 1517b, 1518a, 1518b
**Southwest Florida Water Management District, 1994

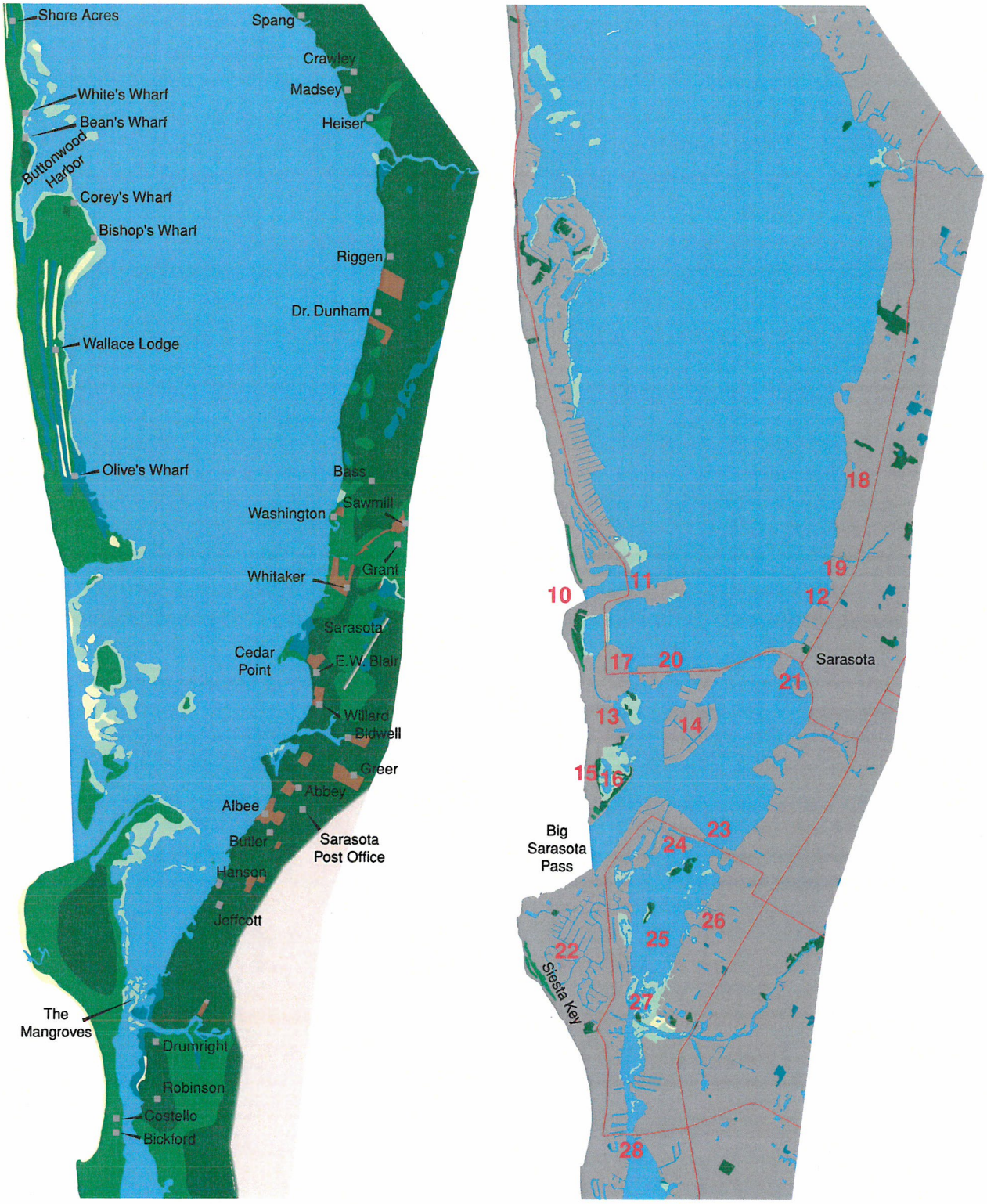
TABLE 4.

10. New Pass is believed to have been created by the hurricane of 1848 and named by pioneer William Whitaker. A channel was dredged in the 1920s from New Pass to Payne Terminal. Although the channel quickly filled in, the spoil removed during the dredging created City Island.

The following excerpts from historical documents tell the story of the dredging of New Pass.

"Sarasotans were not satisfied with a seven-foot-deep channel into New Pass and decided a deep-water channel was needed for the city to really expand. In a special election Jan. 12, 1926, Sarasotans agreed to sell the municipal power plant to Florida Power & Light for $1 million. The proceeds went to R.A. Perry of United Dredging Co. of Tampa, to dredge a 10-foot channel through New Pass to Payne Terminal, now Centennial Park, at 10th Street."





MAP 8.
Land Use and Land Cover Changes:
Part 1

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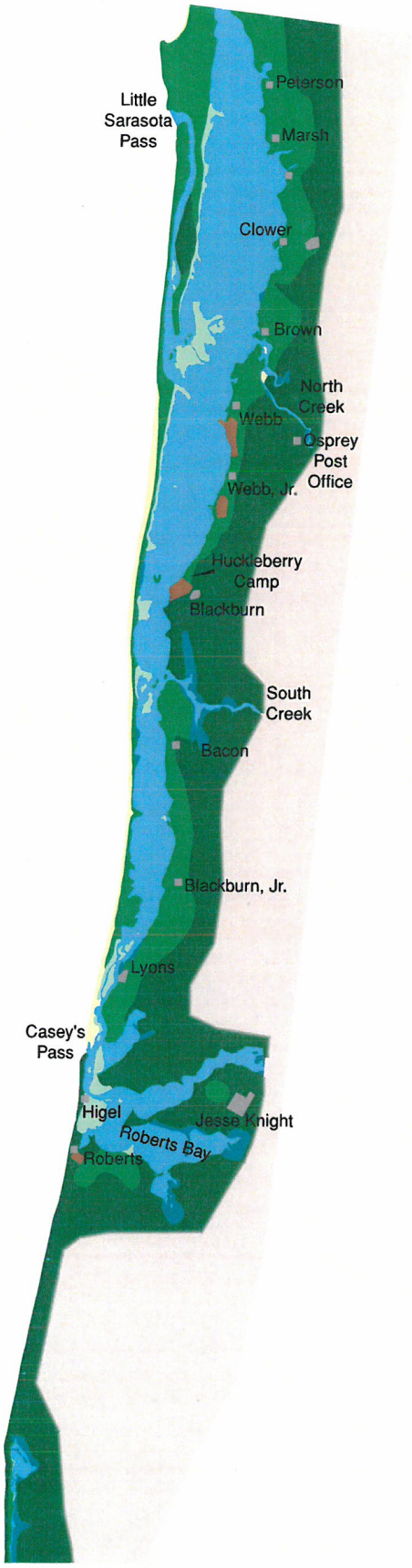
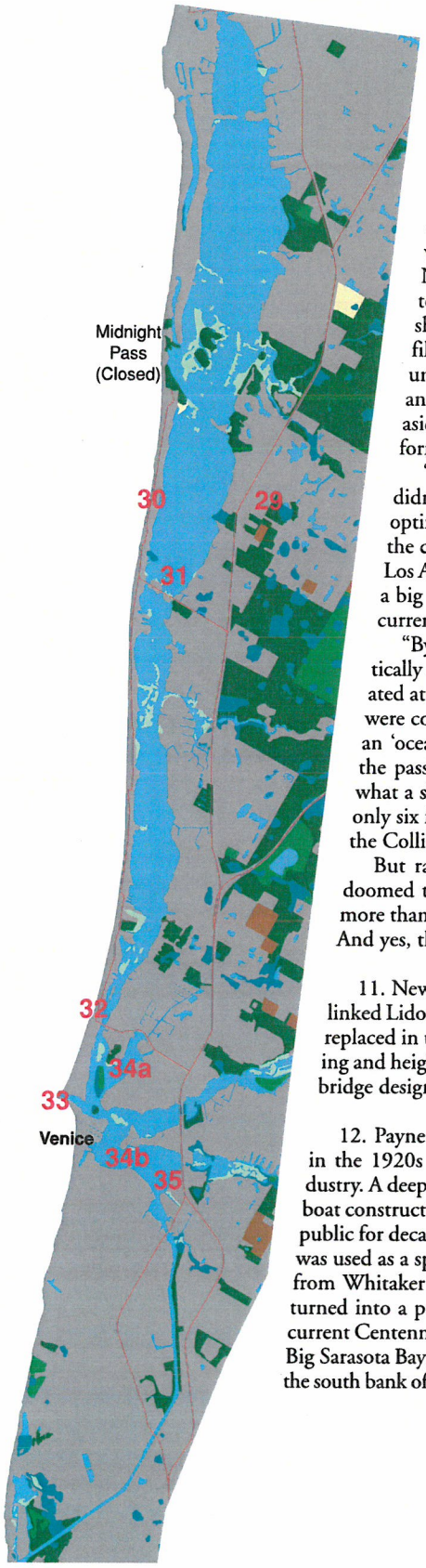
Pre-Development Era Land Use/
Land Cover



1990s
Land Use/Land Cover



As the old *Sarasota Times* reported: "A huge dredge, with a capacity of 1,000 cubic yards an hour, is digging a channel through New Pass. Within eight months Sarasota will have one of the finest deep-water ports on the Gulf of Mexico. The city then will be in a position to bid for some of the big steamship business of companies operating vessels to all parts of the world."

From the book *Story of Sarasota*: "The harbor expert who drafted plans for the port, and advocated the New Pass entrance, was Col. J.M. Braxton of Jacksonville. Old-timers who knew the coast and were familiar with Gulf currents warned Braxton time and again that the New Pass entrance and channel eastward to the mainland were impractical — that shifting sands, carried by currents, would fill up the pass and harbor as sure as fate unless long jetties were built into the Gulf and Bay. Braxton brushed their arguments aside — who were they to argue with him, a former government engineer?

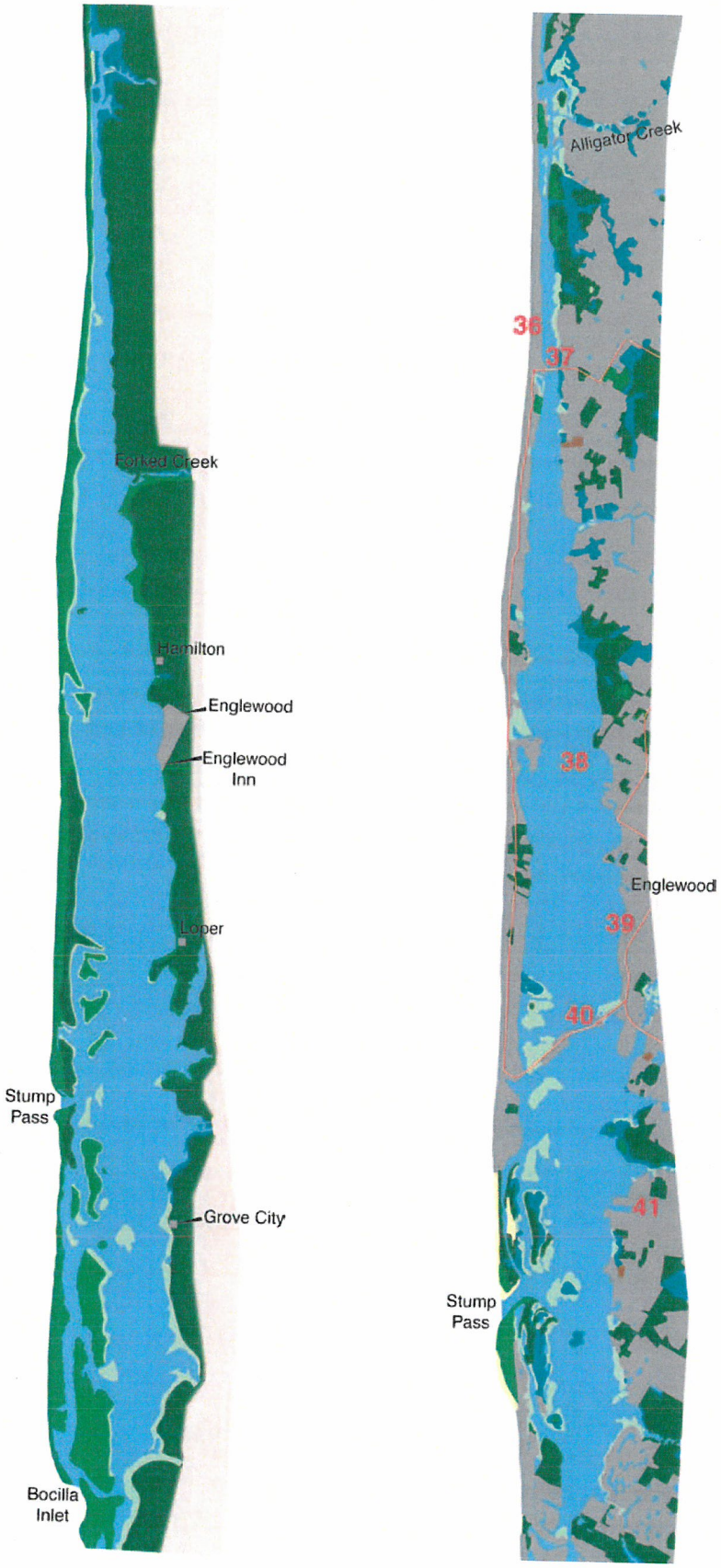
"The logic of the old-timers' reasoning didn't change the minds of the starry-eyed optimists, mostly newcomers, who then ruled the city. They envisioned Sarasota as another Los Angeles — and they were determined that a big league harbor must be built, willy-nilly, currents or no currents.

"By autumn of 1926, the dredging was practically completed, a 58-acre 'city island' was created at the east end of New Pass and bulkheads were constructed. On Friday, March 18, 1927, an 'ocean-going' ship crept cautiously through the pass and anchored at Payne Terminal. But what a ship! It was only 100 feet long and drew only six feet of water: the 'City of Everglades,' of the Collier Line."

But railroads, trucks and the silted channel doomed the $1-million deep-water port, and no more than 50 tons of freight ever came through it. And yes, the pass did eventually fill in with sand.

11. New Pass Bridge was first built in 1927 and linked Lido Shores to Longboat Key. The bridge was replaced in the 1980s after years of debate on its siting and height. The current bridge is a bascule drawbridge design with a center clearance of 23 feet.

12. Payne Terminal was created by Calvin Payne in the 1920s to accommodate Sarasota's marine industry. A deep-water harbor, fuel sales and facilities for boat construction and maintenance served the boating public for decades. The area at 10th Street and U.S. 41 was used as a spoil site in the 1960s, when silt dredged from Whitaker Bayou was placed there. The area was turned into a public boat ramp in the mid-1980. The current Centennial Park provides deepwater passage into Big Sarasota Bay; a U.S. Coast Guard Auxiliary station on the south bank of the boat basin offers boating instruction.



13. Lido Key was created in the 1920s from fill dredged around the former Cerol Isles, as discussed elsewhere in this chapter. Several homes were built on St. Armands, a bathing pavilion was built on Lido in 1940 and construction of a hotel, the Ritz-Carlton, was begun on Longboat Key.

14. Bird Key originally was a small island on which the first home was built in 1914. John Ringling dredged and filled an extension of the island northward in 1926 to connect to the causeway he built from the mainland to Lido Key. The present Bird Key development was dredged to its present size in 1959.

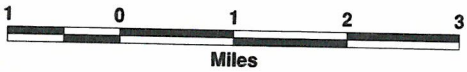
15. South Lido was homesteaded by Otto Schmidt Zoldan (Otto Smith) in the early 1900s. He operated a motor-launch charter business and advertised locally to "... take a trip to the Gulf in the launch 'Ada,' reasonable rates for parties to any part of the bay." Newspaper accounts confirm that passengers "... chartered the launch 'Ada,' with Captain Otto Smith in command, and were soon speeding down Sarasota Bay." This prime location changed ownership several times, in the process being held by the Ringling family and Arvida Corporation (responsible for developments on Bird Key and Longboat Key during the 1960s and 1970s). In 1974, Sarasota County purchased the land and created South Lido Park.

16. South Lido Park contains 100 acres bordered by the Gulf of Mexico, Sarasota Bay and Big Sarasota Pass. Goals established for this park are to provide, protect and maintain a high-quality, environmentally sensitive area and open space that serves passive recreational needs of county residents and visitors. The park has a number of pristine habitats, now becoming extremely limited elsewhere in the Sarasota area. Brushy Bayou, in the center of the park, is a unique estuarine environment of exceptional diversity; the presence of certain species of marine life reflects its healthy ecosystem. Park users may enjoy bathing in the Gulf and Big Pass, picnicking in the wooded areas and hiking, bird watching and canoeing in the Brushy Bayou area.

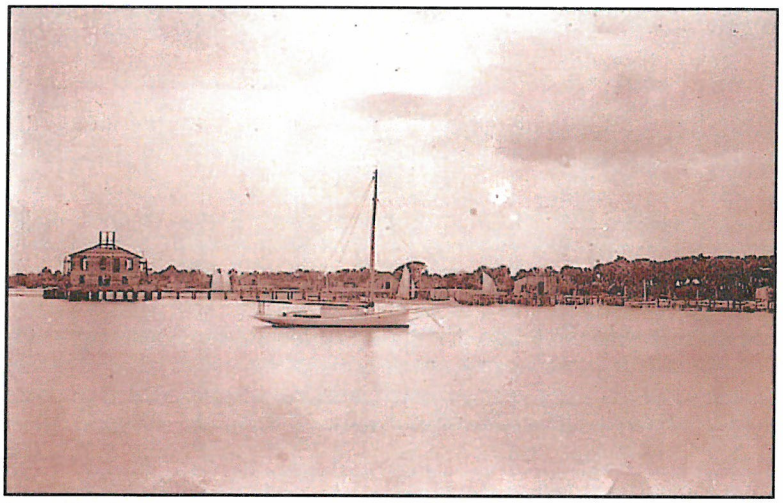
Land Use/Land Cover

- Urban & Built–Up*
- Agriculture
- Shrub, Brushland, Rangeland
- Upland Forest
- Water
- Wetlands
- Mangrove
- Barren Land
- Major Road
- No Pre-Development Era LULC Data (Approx. Boundary)

*Towns and Homesteads in Pre-Development Era



MAP 8.
Land Use and Land Cover Changes: Part 2



Sarasota bayfront. Golden Gate Point, Cedar Point and Sunset Park, 1895.

17. St. Armands Key was named for the island's pioneer resident, Charles A. St. Amand, who gained title to the island in 1893. The island was purchased by John Ringling in the 1920s along with property on Longboat, Lido and Bird Keys.

18. Indian Beach was platted in 1891 and named for the abundance of Indian mound remnants in the area.

19. Yellow Bluffs, a prominent yellow limestone bluff when Sarasota's first pioneers, William Whitaker and Hamlin Snell settled in 1843, can still be seen today.

20. The Ringling Causeway was completed on January 1, 1926, to link John Ringling's island development with the mainland. Ringling himself was the first to cross the 8,300-foot span that linked Cedar Point (now Golden Gate Point) to Bird Key. Ringling donated the bridge to the City of Sarasota in June 1927. The bridge fell into disrepair, and the current bridge was built in 1959.

Florida Department of Transportation officials proposed replacing the four-lane, bascule bridge linking Sarasota with Bird Key with a high, fixed-span structure in the early 1990s. The decision on bridge replacement was still pending in 1999.

21. Marina Jack occupies the site of Sarasota's Main Street dock, built in 1886 by a group of Scottish immigrants. The steamers and sailing vessels that docked here provided Sarasota's primary transportation link to the outside world. The original wooden dock was replaced by one made of concrete in 1912; this became Sarasota's City Pier. The Marina Jack facility, originally called Marina Mar, was completed in 1965. The boat docks at Marina Jack have expanded several times in the past 30 years, and a renovation of the restaurant was completed in 1998.

22. Siesta Key was known by several names in the 1800s, including Clam Island, Muscle Island, Little Sarasota Key and Sarasota Key. The name "Siesta" was assigned to the island's northern tip in 1907 by developer Harry L. Higel. Higel's Siesta development boasted tropical surroundings, bathing beaches, excellent fishing, a large hotel and a post office. Over the years the name Siesta was applied to the entire island.

23. The current Siesta Key Bridge replaced one built in the 1920s, which in turn replaced the original "Bay Bridge" built in 1917. The Bay Bridge was the first bridge linking the mainland to a barrier island in the Sarasota area.

24. Bay Island is separated from Siesta Key by a man-made canal, Hansen Bayou. The Bay Island Hotel, built here in 1912, was one of the area's finest.

25. Roberts Bay is named for Captain Lewis Roberts, who was among the earliest residents of Siesta Key. He built the first hotel on the island and later was a partner in Harry Higel's Siesta development.

26. The Field Club was originally the estate of Stanley Field, founder of the Field Museum of Natural History in Chicago. He used the estate as a winter residence from 1927 until 1957, when it was converted to a private boating club. The Field Club today also has tennis courts and a restaurant.

27. "The Mangroves" and "The Narrows" are two names given to the part of Sarasota Bay where in pioneer days it was possible to walk to Siesta, or Sarasota Key from the mainland. To those on foot it was a blessing, but to boaters it was a curse, as it was impossible to navigate the bay at low tide, forcing early boaters to take a long detour in the open Gulf. After several attempts to open a channel through "The Narrows," a navigational passage became a reality in the early 1900s, allowing travel between Roberts Bay and Little Sarasota Bay.

28. Stickney Point Bridge was named for Uncle Ben Stickney, an early resident whose home was located south of the current bridge on the bayfront of Siesta Key. Stickney arrived in Sarasota in 1894 and managed Sarasota's finest hotel, the DeSoto. He later moved to the key, where his home and grounds became the scene of numerous community picnics. The first Stickney Point Bridge was installed in 1926; the present pair of two-lane bridges was opened to the public in 1968.

29. The name "Osprey" was chosen by John Webb, an early settler, for this community's first post office.

30. Casey Key was named in honor of Captain John Casey, a significant figure in bringing the Seminole Indian Wars to a close.

31. Blackburn Point Bridge is named after the Blackburn family, this area's pioneers. John S. and his sons, Benjamin Franklin and George Washington Blackburn, owned considerable bayfront acreage in this area. The bridge, installed in 1926, is the only remaining swing bridge on Florida's west coast.

32. Albee Road Bridge was named to honor a noted surgeon, Dr. Fred Albee, who was responsible for the large-scale development of Nokomis and Venice during the 1920s. In 1922, a private toll bridge was constructed to link the Treasure Island subdivision on Casey Key to the mainland. The present bridge was built in 1963.

It was a wild and beautiful land along the west coast of what would become Florida, and it beckoned early man with its lush landscape and warm sun. Prehistoric people surveyed the land from their mounds and left their unnamed history in the earth itself. When the Spaniards appeared on the new world horizon, they found a native people who were fiercely independent and not easily conquered. It was a trait that characterized the men and women who would follow in centuries to come.

—Edge of Wilderness: A Settlement History of Manatee River and Sarasota Bay 1528-1885
Janet Snyder Matthews
© 1983

33. Venice Inlet is situated south of the former Casey Pass. The federal government created the Venice Jetties in 1937 to maintain this navigational link to the Gulf of Mexico.

34. Lyons Bay (a) and Roberts Bay (b) were named after early pioneers of Venice, who settled here in the 1870s.

35. Eagle Point Club was originally owned by leading Sarasota resident and developer Bertha Potter Palmer. She acquired the club property in 1916 and designed the land to meet the needs of potential real estate investors. In 1923 the property changed hands when it was acquired by Cornelius and Kingsbury Curtis, who added two residences. Guests came to vacation during the winter, enjoying horseback riding, golf, hunting and sailing. When the Curtis family heirs sold the property to Glenn Goodman and Danny Overstreet in 1989, Eagle Point was the oldest continuously operated resort in Sarasota County. Today, the property's 24 acres retain much of the flavor of early 20th-century coastal Florida. The original heart-of-pine clubhouse and surrounding cottages have been restored and are listed in the National Resister of Historic Places. The property is being developed to accommodate 50 homes that feature deep water boat dockage, tennis courts and cypress fencing to ensure privacy.

36. Manasota Key takes its name from the old community of Manasota on the mainland. When residential lot sales failed, Manasota became a timbering community that thrived in the early 1900s. The key, originally called "Palm Ridge," was the scene of many Englewood community picnics.

37. Manasota Key Bridge was originally a wooden bridge built by Sarasota County in 1926. The present bridge was built in 1965.

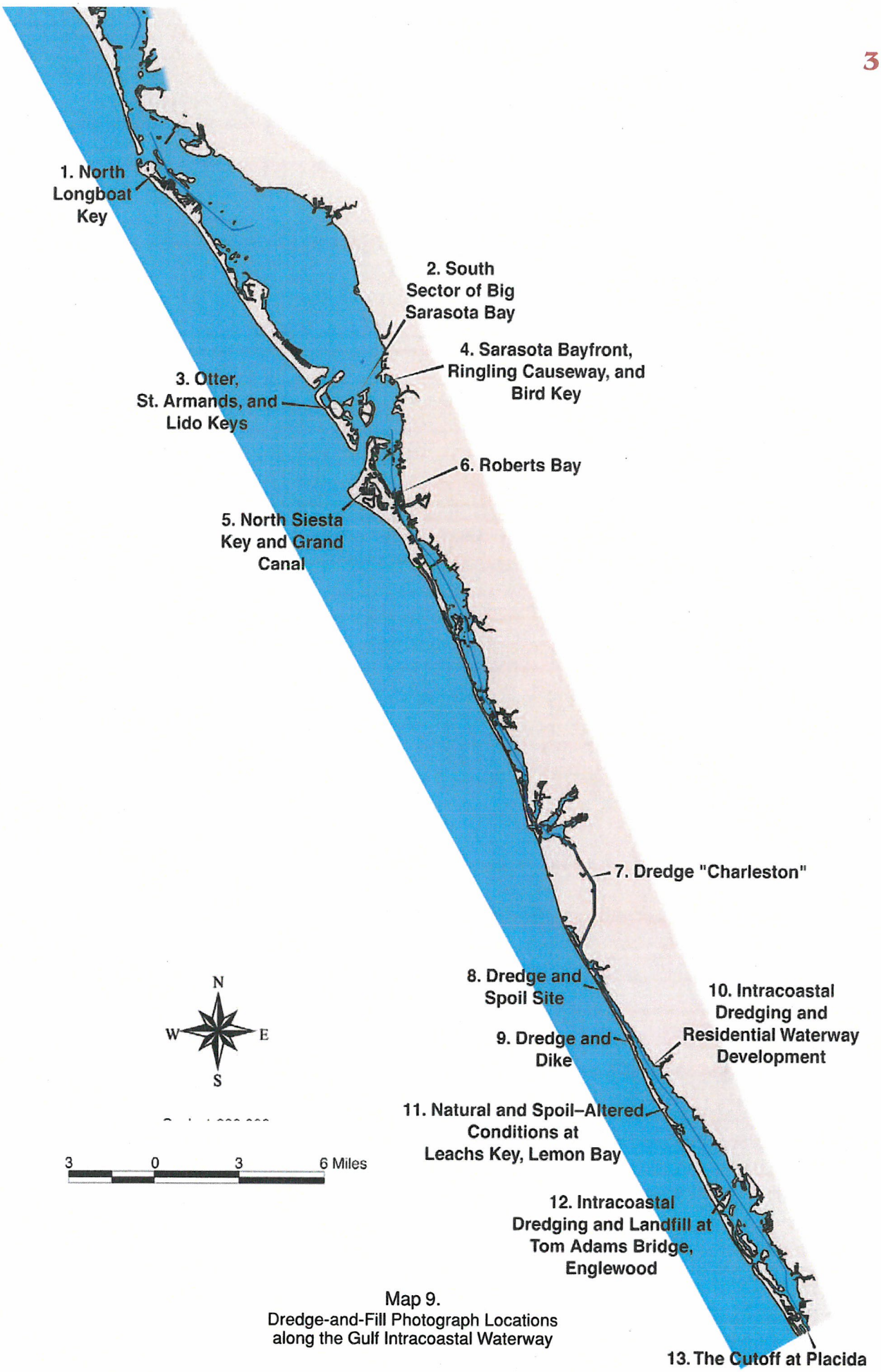
38. Lemon Bay appears on maps as early as 1883, yet the origin of its name is unclear. Some say early settlers had lemon groves along the shore; one account credits the abundance of lemon sharks in the bay in the early days for how the area received its name.

39. Englewood was settled in the 1870s, yet was not named until 1897, when a town site was developed by the Nichols brothers of Englewood, Ill. Englewood's chief industry in the pre-development period was fishing.

40. Tom Adams Bridge links Englewood with Manasota Key. The current bridge was built in the 1960s.

41. Grove City, established in the 1880s, attracted nationwide attention in 1893 through promotional exhibits at the Columbia Exposition in Chicago. The community boasted a large hotel and sought to attract the attention of wealthy sportsmen.

The Whitaker family



Map 9.
Dredge-and-Fill Photograph Locations along the Gulf Intracoastal Waterway

Figure 1. 1998 Aerial view of North Longboat Key

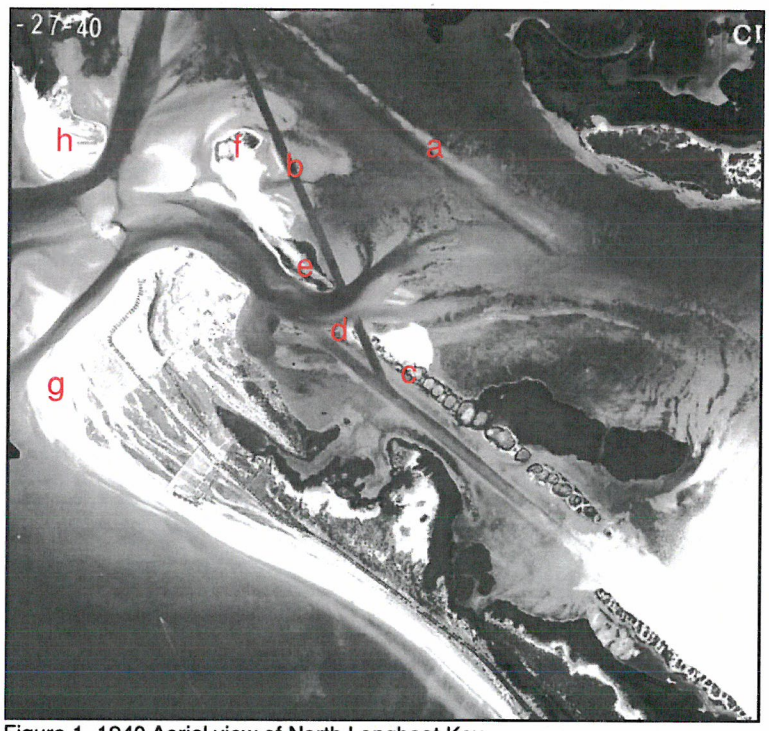


Figure 1. 1940 Aerial view of North Longboat Key

Photographic Record of Waterway Changes

1. North Longboat Key. Aerials show 1998 (color) and 1940 (black-and-white) conditions. These photographs illustrate both naturally occurring and human-induced changes in the waterways. Longbar Cut (a), dredged five feet deep by 100 feet wide by the U.S. Army Corps of Engineers in 1890, is still clearly visible in 1940, but more diffuse today. The present channel (b), dredged in 1919 to nine feet by 100 feet wide, shows as a strikingly demarcated dark-tone (deep water) zone in 1940. The dredged material, called spoil (c), was placed sidecast and parallel to the channel, creating a linear northwest-southeast trending extension to Sister Keys, where upland exotic vegetation, such as Australian pine, is now the predominant cover.

The dredging, both at Longbar Cut and along the relocated Intracoastal Waterway channel, removed seagrass habitat. A side channel at (d), which served to connect Longboat Inlet channel to the ICW in the early 1900s, has shoaled and no longer exists. Jewfish Key (e) and Picket Key (f), which appear on 19th-century charts, remained as individual islands in 1940, although a build up of sediment was taking place (white tone in photo), in part due to the islands' location by the inlet and to nearby dredging. Today, these islands are one feature (ef). The striking changes in the size and shape of the north end of Longboat Key (g) and the south end of Bradenton Beach (h) are due to erosion and deposition of sediments at Longboat Inlet. The south end of Bradenton Beach also was artificially filled to provide a foundation for the bridge at Longboat Inlet. Beach renourishment commenced in 1992-93 along much of the Bradenton Beach-Holmes Beach shore.

Figure 2. 1920s condition of the south sector of Big Sarasota Bay

2. South sector of Big Sarasota Bay. The high, oblique black-and-white aerial illustrates late-1920s conditions. Bird Key (a), midground, was originally a small island (Map 3, Pre-development Conditions). John Ringling dredged and filled an extension of the island (b) northward in 1926 to connect to the causeway (c) he built from the mainland to Coon Key (d) and Lido Key (e). A dredged channel (f) provided nearshore access for the one residence on Bird Key. The extensive seagrass area, locally referred to as the "Middle Ground" (g), was an important sport fishing locale. Big Sarasota Pass (h) is in the background.

In Sarasota Bay, seagrass dwellers generally inhabit an area from the water's edge at low tide to, in some cases, as deep as seven feet. This area is home to the four common seagrass varieties and the more than 170 species of fish that inhabit the bay. Seagrasses also provide some of the oxygen required by much of the bay's marine life.

Figure 3A. 1920s Otter Key, St. Armands and Lido Key

Figure 3B. 1948

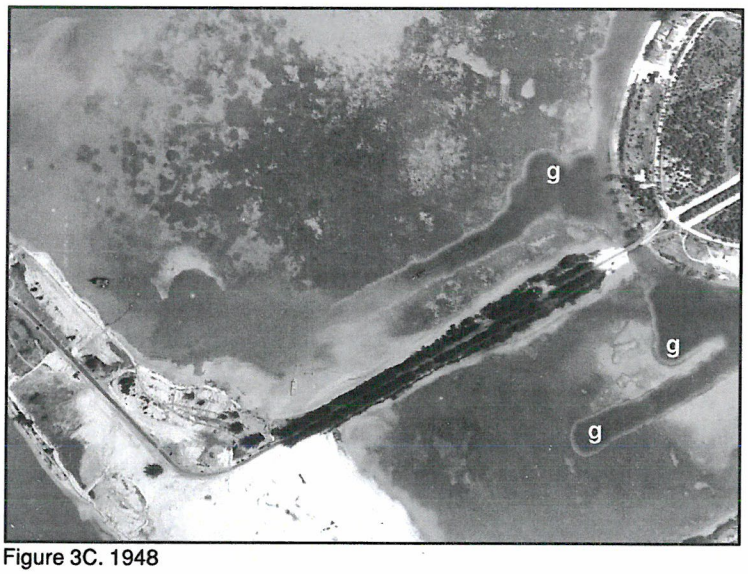


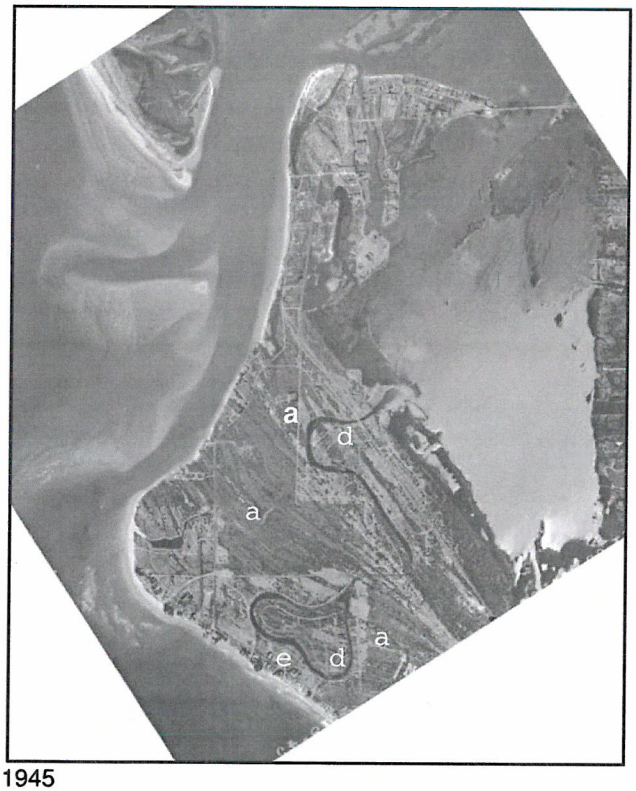
Figure 3C. 1948

3. Otter Key, St. Armands and Lido Key: Late-1920s dredge-and-fill and land clearance. Figure 3A is a high, oblique black-and-white aerial taken during the same period as the one of South Big Sarasota Bay (Figure 2 on previous page). St. Armands (a) is under development (smoke from land clearance). New Pass (b) has been dredged and the spoil, side-cast from the dredge, has formed City Island (c). A causeway (d) has been built from dredging the bay bottom along the north shore of St. Armands. The dredge used by the developers, John Ringling and Owen Burns, is moored off the south shore of Otter Key (e). The entire area between Otter Key and Lido Key (f) has been dredged to create fill for waterfront development. Figures 3B and 3C are vertical black-and-white aerial enlargements, taken in 1948, which show remnant dredged scars (g) in the bay bottom.

Figure 4. 1960 aerial of Sarasota Bayfront, Ringling Causeway and Bird Key

4. Sarasota Bayfront, Ringling Causeway and Bird Key. High, oblique black-and-white aerial photography taken in June 1960. Bird Key (a), midground, was filled to its present size in 1959 by dredging the bay bottom. The new Ringling Causeway Bridge (b) was opened in 1959. The Sarasota bayfront (c) was dredged and filled and U.S. 41 was re-routed along the shoreline. This photo predates Island Park and Marina Jack.

5. North Siesta Key and Grand Canal. Aerials show 1995 (color) and 1945 (black-and-white) conditions. Beach ridges (a) are clearly visible on the 1945 photo; they mark former beach deposits along the Gulf shore. The Gulf Intracoastal Waterway (b), marked by the dark tone and parallel white border areas in 1995, did not exist in 1945. Shoreline residential developments (c), the product of dredge-and-fill, were created after 1945. The creation of the Grand Canal, an extensive waterfront canal community on Siesta Key (d), had begun in 1945; the feeder canal and inner loop had been dredged, but work was still progressing at the mouth and apparently no water connection had yet been excavated to deep water. Residential development on Siesta Key in 1945 (e) was limited to scattered beach cottages along the Gulf shore.



1945

1995

Figure 5. North Siesta Key and Grand Canal

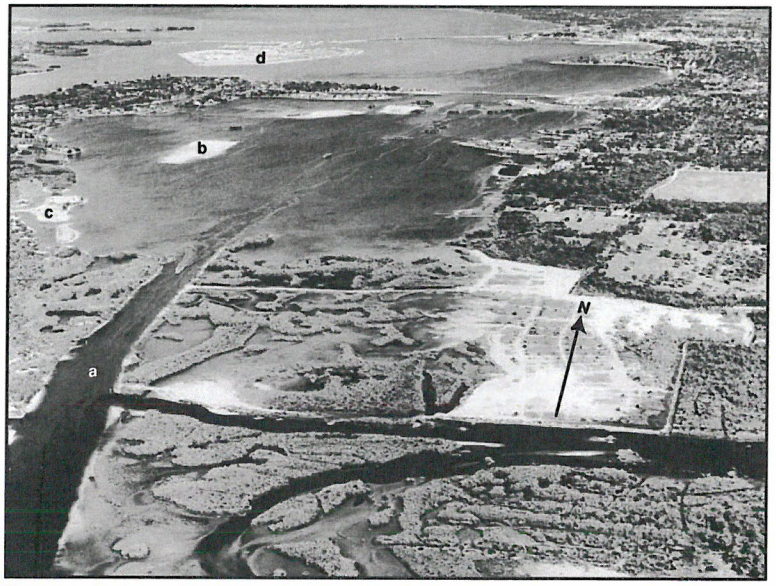


Figure 6. Roberts Bay

6. Roberts Bay. Low, oblique black-and-white aerial shows 1962-65 conditions. Phillippi Creek is in the foreground. The 9-foot-deep by 100-foot-wide Gulf Intracoastal Waterway has cut through "The Mangroves" (a), a tidal delta deposit where the creek flowed out into Roberts Bay. Spoil, consisting of bay bottom sediments dredged along the waterway, has been deposited at mid-bay locations (b). Landfill on Siesta Key (c) was for residential development. Bird Key is under construction (d) in the background.

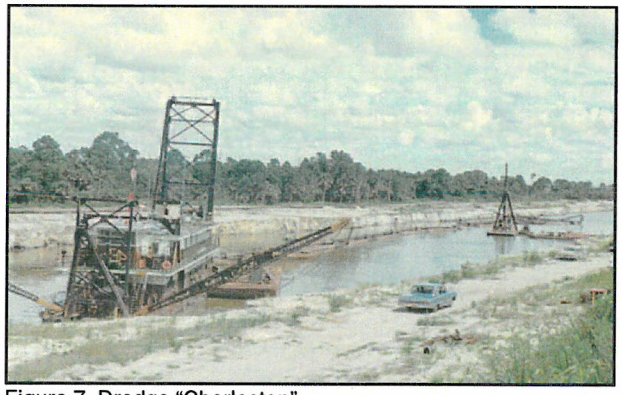


Figure 7. Dredge "Charleston"

7. Dredge "Charleston." This equipment was used beginning in August 1966 to excavate the C-1 connector canal, which linked the Gulf Intracoastal Waterway at Roberts Bay (Venice) with Red Lake at the north end of Lemon Bay.

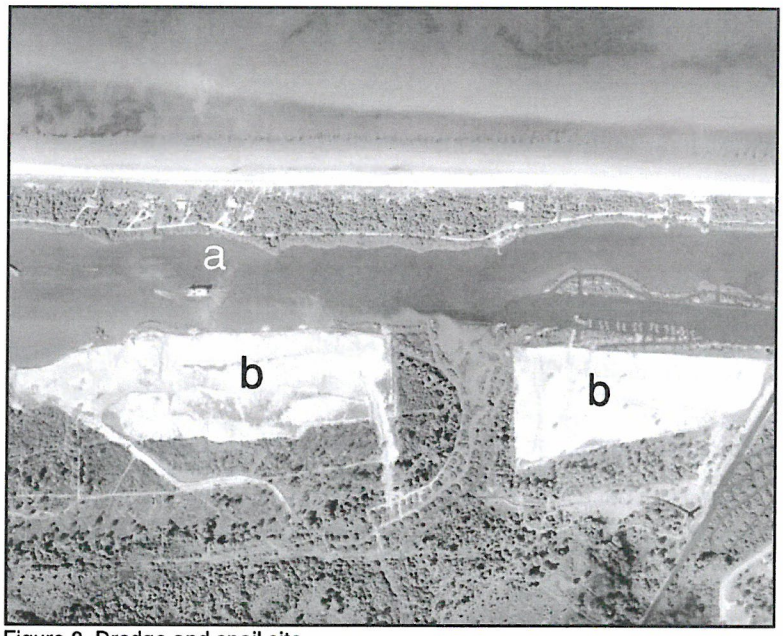


Figure 8. Dredge and spoil site

8. Dredge and spoil site. Near-vertical aerial view south of Alligator Creek, Lemon Bay, 1965. Dredge (a) is operating in the long, narrow waterway separating the mainland from Manasota Key. Suction dredge is transferring slurry by pipeline to upland sites (b).

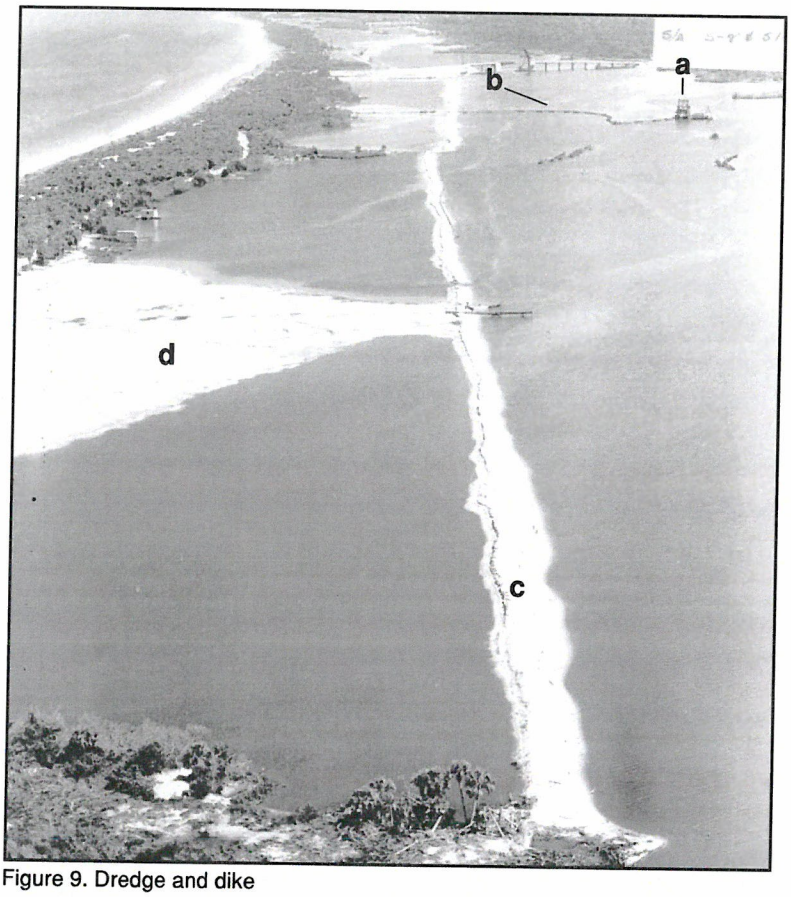


Figure 9. Dredge and dike

9. Dredge and dike. Low, oblique aerial view north from Manasota Beach, taken circa 1964-65. Manasota Key Bridge is in the midground. This photo shows dredge (a), pipeline (b), dike or containment wall (c) and back-filled/spoil (d). This phase of dredging the Intracoastal Waterway, with the use of back-filling land along the shoreline, differed from the early dredging where spoil was side-cast in strips or islands parallel to the route taken by the dredge.

Figure 10. Intracoastal dredging and waterway development

10. Intracoastal dredging and residential waterway development. Near-vertical aerial shows a location at the junction of the Intracoastal Waterway and Forked Creek (bottom of photo), north Lemon Bay, 1964-65. A diked area (a) for containing spoil (b) from the dredging of the ICW is along the bayfront of Manasota Key (formerly Palm Ridge). A residential canal (c), constructed near the mouth of Forked Creek, occupies a natural drainage channel (d). Only a few waterfront homes have been built; the photo shows many empty lots.

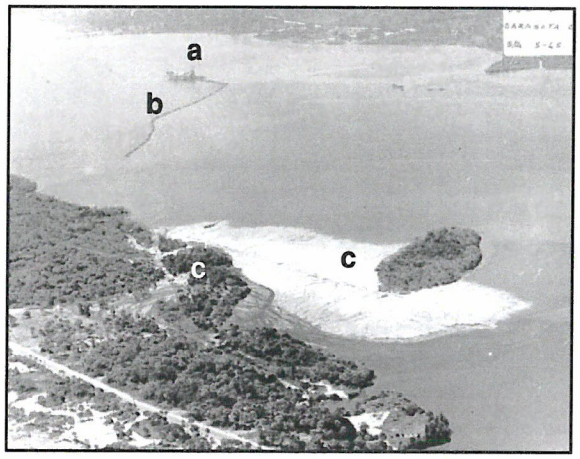


Figure 11. Natural and spoil-altered conditions at Leachs Key, Lemon Bay

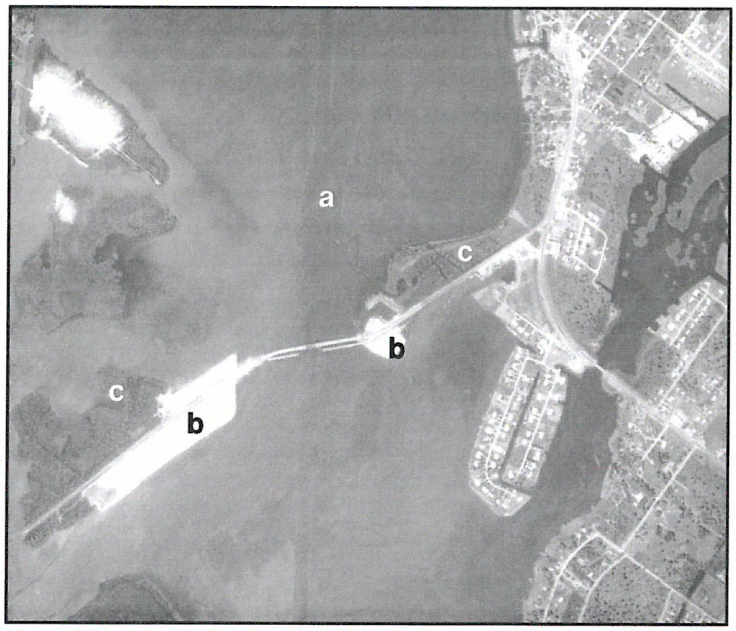


Figure 12.
Intracoastal dredging and landfill at Tom Adams Bridge, Englewood

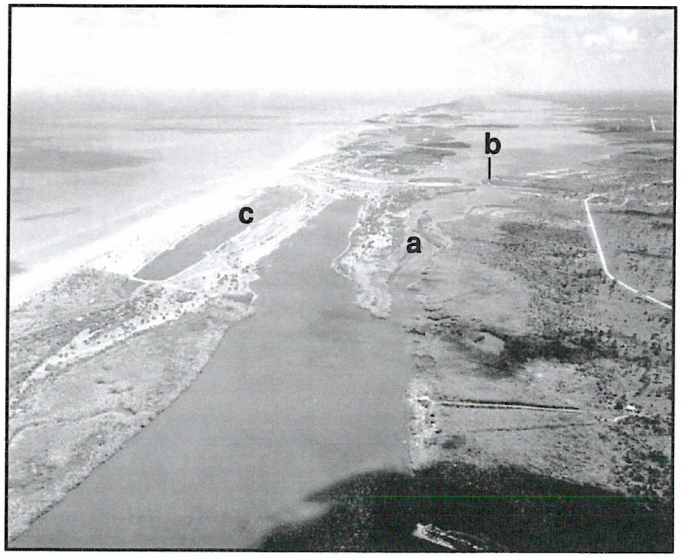


Figure 13. "The Cutoff" at Placida

11. Natural and spoil-altered conditions at Leachs Key, Lemon Bay. Low, oblique aerials, taken in 1965, show the effects of spoil deposition on shallow water and intertidal habitats. The aerial at left is of the site before spoil deposition occurred. In the photo at right, the dredge (a) is operating in the Intracoastal Waterway channel, using a floating pipeline (b) to transport the slurry to a waterfront site where deposition is filling in the area between Leachs Key and Manasota Key (c).

12. Intracoastal dredging and landfill at Tom Adams Bridge, Englewood. The Intracoastal Waterway (a) was dredged through extensive seagrass beds, and spoil was deposited on several mid-bay islands. The causeway (b) connecting the mainland with Englewood Beach is built on spoil landfill. Wetlands have been ditched (c) for drainage and mosquito control.

13. "The Cutoff" at Placida. This high, oblique aerial shows waterway conditions before dredging occurred. The Cutoff (a), about one mile long, bared at low water. Access to Don Pedro Island from the mainland was at point (b), approximately the location of the present-day car ferry. A relict channel (c) from Bocilla Pass has been diked and land clearance is underway.

Epilogue

The past 100 years witnessed the creation of a navigable waterway system in the Sarasota Bay region. The Gulf Intracoastal Waterway, designed to improve coastal navigation for safety and commerce, served as a catalyst to spark shorefront land development. Access channels were dredged, bayfront property was filled and finger canals and basins were cut to extend available waterfront for residential purposes.

Today, the area includes the 45-mile-long ICW arterial, some 75 miles of collector (access) channels and 180 miles of residential canals and basins. The inland waterway has helped transform the region's physical landscape and local economy in many ways.

References
(in chronological order)

1. Published Government Reports

U.S. House of Representatives, 1889, "Survey of Sarasota Bay, Florida (With Reports Upon the Preliminary Examination and Survey of Sarasota Bay, Florida)," 51st Congress, 1st Session, Ex. Doc. No. 61, seven pages text, three maps (1:24,000 scale, approximate): 1. Palma Sola Pass; 2. Sarasota Bay, Fla. Long Bar; 3. Sarasota Bay, Fla. Post Office Point to Casey's Pass).

U.S. House of Representatives, 1900, "Examination and Survey of Inside Passage Through Sarasota Bay to Lemon Bay, Florida (With a Letter from the Chief of Engineers, Reports of Examination and Survey of Inside Passage Through Sarasota Bay to Lemon Bay, Florida)," 56th Congress, 1st Session, Doc. No. 377, 12 pages text, one map (1:15,000 scale): Map of Lemon Bay, Florida, from New Pass to Red Lake).

U.S. House of Representatives, 1903, "Gasparilla Sound and Lemon Bay, Florida, (With a Letter from the Chief of Engineers, Report of Examination of Gasparilla Sound and Lemon Bay, Florida)," 58th Congress, 2nd Session, Doc. No. 191, five pages.

U.S. House of Representatives, 1910, "Sarasota Bay, Florida (With a Letter from the Chief of Engineers, Reports on Examination and Survey of Sarasota Bay, Florida, from Tampa Bay to Venice, Thence Through Casey's Pass to Lemon Bay, and Thence to Gasparilla Sound)," 61st Congress, 2nd Session, Doc. No. 849, 12 pages.

U.S. House of Representatives, 1913, "Lemon Bay, Fla. (With a Letter from the Chief of Engineers, Reports on Preliminary Examination of Lemon Bay, Fla., to Gasparilla Sound)," 63rd Congress, 1st Session, Doc. No. 247, seven pages.

U.S. House of Representatives, 1914, "Sarasota Bay, Fla., Including Little Sarasota Bay and Big Sarasota Pass (With a Letter from the Chief of Engineers, Reports on Preliminary Examination and Survey of Sarasota Bay, Fla., Including Little Sarasota Bay and Big Sarasota Pass)," 63rd Congress, 2nd Session, Doc. No. 844, 16 pages, one map (1:45,000 scale, approximate): Sarasota Bay, Florida, Tampa Bay to Venice.

U.S. House of Representatives, 1918, "Little Sarasota Bay, Fla. (With a Letter from the Chief of Engineers, Report on Preliminary Examination of Little Sarasota Bay, Fla., from Sarasota Bay to Venice)," 65th Congress, 2nd Session, Doc. No. 1002, eight pages.

U.S. House of Representatives, 1939, "Intracoastal Waterway from Caloosahatchee River to Withlacoochee River, Fla. (Letter from the Chief of Engineers, United States Army, Dated June 14, 1939, Submitting a Report, Together with Accompanying Papers and an Illustration, on a Preliminary Examination and Survey of, and Review of Reports on, Intracoastal Waterway from Caloosahatchee River to Withlacoochee River, Fla., and Channel in Little Sarasota Bay, Fla., Between Sarasota and Venice, and Channel Through Casey's Pass, Fla., Authorized by the River and Harbor Act Approved August 30, 1935, and Requested by Resolution of the Committee on Rivers and Harbors, House of Representatives, Adopted May 18, 1934)," 76th Congress, 1st Session, Doc. No. 371, 27 pages, one index map (1:250,000 scale), Survey Intracoastal Waterway, Caloosahatchee River to Withlacoochee River, Florida (Index Sheet); 24 project maps (1:20,000 scale); five profile sheets (1:10,000 h.i, 1:100 v.i.).

U.S. Senate, 1929, "Inland and Coastal Waterways of Florida (Report of the Florida Inland and Coastal Waterways Association, Relative to the Waterways in Florida Improved by the United States, Waterways Improved by Non-federal Agencies, Waterways Unimproved, and the Potential Artificial Waterways Connecting Natural Waterway Systems)," 71st Congress, 1st Session, Doc. No. 14, 96 pages, one map (1:1,000,000 scale, approximate): Map Showing Existing and Potential Waterways in the State of Florida.

Alperin, Lynn M., 1983, "History of the Gulf Intracoastal Waterway," Navigation History, National Waterways Study NWS-83-9, U.S. Army Engineer Water Resources Support Center, Institute for Water Resources, U.S. Government Printing, Office, Washington, D.C.

2. Unpublished Government Reports

Report of Monthly Operations for Improving Sarasota Bay, various months for 1890 -1907, U.S. Engineer Office, Tampa, Fla.

Tri-Monthly Report of Operations of the U.S. Snagboat "Suwanee," various for 1902 operating in Little Sarasota Bay, submitted by Capt. O.N. Bie, Sarasota, Fla.

n.a., 1986, Historical Places Along the Intracoastal Waterway in Sarasota County, Sarasota County Historical Archives.

n.a., n.d., County's History, Sarasota County Historical Archives.

3. Other Reports

Buker, George E., n.d., Sun, Sand and Water: A History of the Jacksonville District U.S. Army Corps of Engineers, 1821-1975, no publisher cited.

n.a., 1970, Shoreline Analysis of the City of Sarasota, Smally, Wellford & Nalven Consulting Engineers, Sarasota, Fla.

n.a., n.d., Explore Sarasota County's History.

McCarthy, John, n.d., South Lido.

4. Government Charts (Compilation [Smooth] Sheets)

U.S. Coast and Geodetic Survey, 1875, Palmasola Bay and Pass, Terraceia and McGill's Bay, and Bishop's Harbor, hydrographic (H) sheet, 1:20,000 scale, Register No. 1272.

_____, 1876, Long Boat Inlet and Bar (To accompany chart of Sarasota Bay, Gulf of Mexico, Inshore Soundings), hydrographic (H) sheet, 1:4,000 scale, Register No. 1314b.

_____, 1883, Sarasota Bay, Florida, topographic (T) sheet, 1:20,000 scale, Register No. 1517a.

_____, 1883, Little Sarasota Bay, Florida, topographic (T) sheet, 1:20,000 scale, Register No. 1517b.

_____, 1883, Lemon Bay, Florida (Stump Pass to Roberts Bay), topographic (T) sheet, 1:20,000 scale, Register No. 1518a.

_____, 1883, Lemon Bay, Florida (Bocilla Inlet to Stump Pass), topographic (T) sheet, 1:20,000 scale, Register No. 1518b.

_____, 1883, Sarasota Bay, Florida, hydrographic (H) sheet, 1:20,000 scale, Register No. 1559a.

_____, 1883, Little Sarasota, Bay, Florida, hydrographic (H) sheet, 1:20,000 scale, Register No. 1559b.

_____, 1884, Lemon Bay: Bocilla Inlet to Stump Pass, Florida, hydrographic (H) sheet, 1:20,000 scale, Register No. 1595a.

_____, 1883, Sarasota Bay, Florida (East Shore), topographic (T) sheet, 1:20,000 scale, Register No. 1653.

5. Letters

Stephen M. Sparkman, Florida Representative, U.S. House of Representatives Committee on Rivers and Harbors, to Major F. R. Shunk, U.S. Army Corps of Engineers, Jacksonville, Tampa, Fla., June 7, 1905, states that people interested in improvement of Sarasota Bay are insistent that the dredge "Florida" begin work there at once.

L.J. Knight, citizen of Venice, Fla., to Senator Taliaferro, December 8, 1905, requesting additional appropriations for the purpose of opening up and making navigable both Big and Little Sarasota Bays.

L.J. Knight, citizen of Venice, Fla., to W. H. Caldwell, U.S. Engineer Office, Tampa, Fla., May 4, 1906, on behalf of citizens of Venice and Laurel, requesting additional appropriations to extend dredging south of Osprey to Casey's Pass and Venice.

George Higel, grower and shipper of citrus and early vegetables at Venice, Fla., to W. H. Caldwell, U.S. Engineer Office, Tampa, Fla., July 26, 1907, concerning the dredging at South Creek Flats.

George Higel, grower and shipper of citrus and early vegetables at Venice, Fla., to W.H. Caldwell, U. S. Engineer Office, Tampa, Fla., August 5, 1907, providing local knowledge about bay bottom sediments and shoals between Blackburn Point and Venice.

Harry L. Higel, president of the Sarasota, Osprey and Venice Transportation Co., to W.H. Caldwell, U.S. Engineer Office, Tampa, Fla., November 26, 1907, requesting that the dredge "Suwanee" widen the cut at The Mangroves.

6. Newspaper Articles

_____, 1913, "Reclaiming Waste Places: Dredges Busy Transforming Water Front, Government Surveyors in Port," *The Sarasota Times*, August 21, pp. 1-2.

_____, 1914, "Dredging Out Hudson Bayou: Yacht Basin for Harboring Boats with a Channel to Deep Water," *The Sarasota Times*, July 9, p.1.

7. Other Sources

James Armstrong, former executive director, West Coast Inland Navigation District, Manasota Key

Evan Brown, information specialist, West Coast Inland Navigation District, Venice

Gary Comp and staff, Natural Resources Department, Sarasota County

Ernest Estevez, Mote Marine Laboratory, Sarasota

Donald Fore, U.S. Army Corps of Engineers, Jacksonville

Diana Harris, former president, Lemon Bay Historical Society

Ralph Hunter, Longboat Key Historical Society, Longboat Key

Robert Jorgensen, Holmes Beach Canal Commission, Anna Maria Island

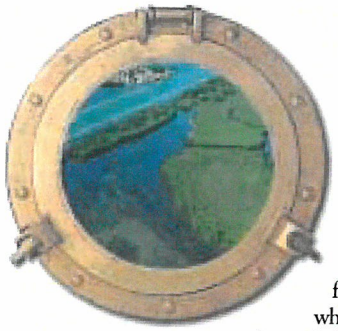
Dorothy Korwek, Venice Archives, Venice

John McCarthy, Parks and Recreation Department, Sarasota County

John Morrill, Division of Natural Sciences, New College of the University of South Florida, Sarasota

Ann Shank, Historical Archives, Sarasota County

Miss Florida hopefuls pose in front of the Lido Casino in 1967. This was the site of many beauty pageants.



INLET DYNAMICS

Tidal inlets — Floridians sometimes call them passes — are highly dynamic and visible features of Southwest Florida's geography. Inlets provide strategic points of entry and egress between the Gulf of Mexico and the inland waterways, but can be intimidating to navigate because of their shifting nature, strong ebb and flood currents and wave action — including breakers, which may extend clear across the inlet mouth even in a buoyed channel.

Waves propagating into an opposing current experience an increase in height and a decrease in length, resulting in steeper waves that are more difficult to navigate. Offshore shoals continually shift because of the moving beach sand, and it is sometimes not feasible to keep buoys in the best water. Local boaters, under such conditions, often leave the buoyed channel guided by their knowledge of local conditions and of the dynamic history of inlet development, which enables them to pick the best depth and avoid uncharted obstructions.

An understanding of why inlets develop their distinctive forms, coupled with a knowledge of inlet history, is a are useful tool that can aid the eco-tourist mariner to fathom the behavior and navigable condition of inlets.

Table 1.
Route Distances
Between Inlets

a. Gulf of Mexico (Outside) Route to Inlet (Sea Buoy) Entrance (Distances in Statute Miles)

Pass/Inlet	Longboat	New	Big Sarasota	Venice	Stump
Longboat		11.3	15.3	28.0	46.0
New	11.3		4.0	16.7	34.7
Big Sarasota	15.3	4.0		12.7	30.7
Venice	28.0	16.7	12.7		18.0
Stump	46.0	34.7	30.7	18.0	

b. Intracoastal Waterway (Inside) Route to Inlet Access Channel (Distances in Statute Miles)

Pass/Inlet	Longboat	New	Big Sarasota	Venice	Stump
Longboat		11.6	13.6	28.6	45.9
New	11.6		2.0	17.0	34.3
Big Sarasota	13.6	2.0		15.0	32.3
Venice	28.6	17.0	15.0		17.3
Stump	45.9	34.3	32.3	17.3	

c. Inlet and Access Channels From Gulf to Intracoastal (Distances in Statute Miles)

Pass/Inlet	Inlet Channel	ICW Access	Total
Longboat	1.3	1.0	2.3
New	0.87	2.0	2.7
Big Sarasota	3.3	1.7	5.0
Venice	0.3	0.2	0.5
Stump	1.5	0.8	2.3

d. Outside Route, including Runs from and to the ICW (Distances in Statute Miles)

Pass/Inlet	Longboat	New	Big Sarasota	Venice	Stump
Longboat		16.3	22.6	30.8	50.6
New	16.3		11.7	19.9	39.7
Big Sarasota	22.6	11.7		18.2	38.0
Venice	30.8	19.9	18.2		20.8
Stump	50.6	39.7	38.0	20.8	

Inlet Locations and Status

Five inlets are currently used by boaters to transit between Gulf and bay waters in the Sarasota Bay system: Longboat Pass, New Pass, Big Sarasota Pass, Venice Inlet and Stump Pass (Map 1). Distances for traversing the outside (Gulf of Mexico) and inside (Intracoastal Waterway) routes, and the intervening inlet access channels, are given in Table 1 (a-d). Outside route distances for mariners are slightly longer, but travel time under favorable conditions is usually less, especially for high-performance cruisers. Cruising sailboats often choose the outside route to catch a better breeze and to avoid bridges with restricted openings.

Longboat Pass, New Pass and Venice Inlet are federally maintained waterways between the Sarasota Bay system and the Gulf. They are periodically surveyed and, when shoaling occurs to a point where actual depths are less than the designed project depths, are dredged by the U.S. Army Corps of Engineers in cooperation with the West Coast Inland Navigation District (WCIND). Big Sarasota Pass and Stump Pass are not federally designated inlets, although Stump Pass was dredged by the WCIND in 1998.

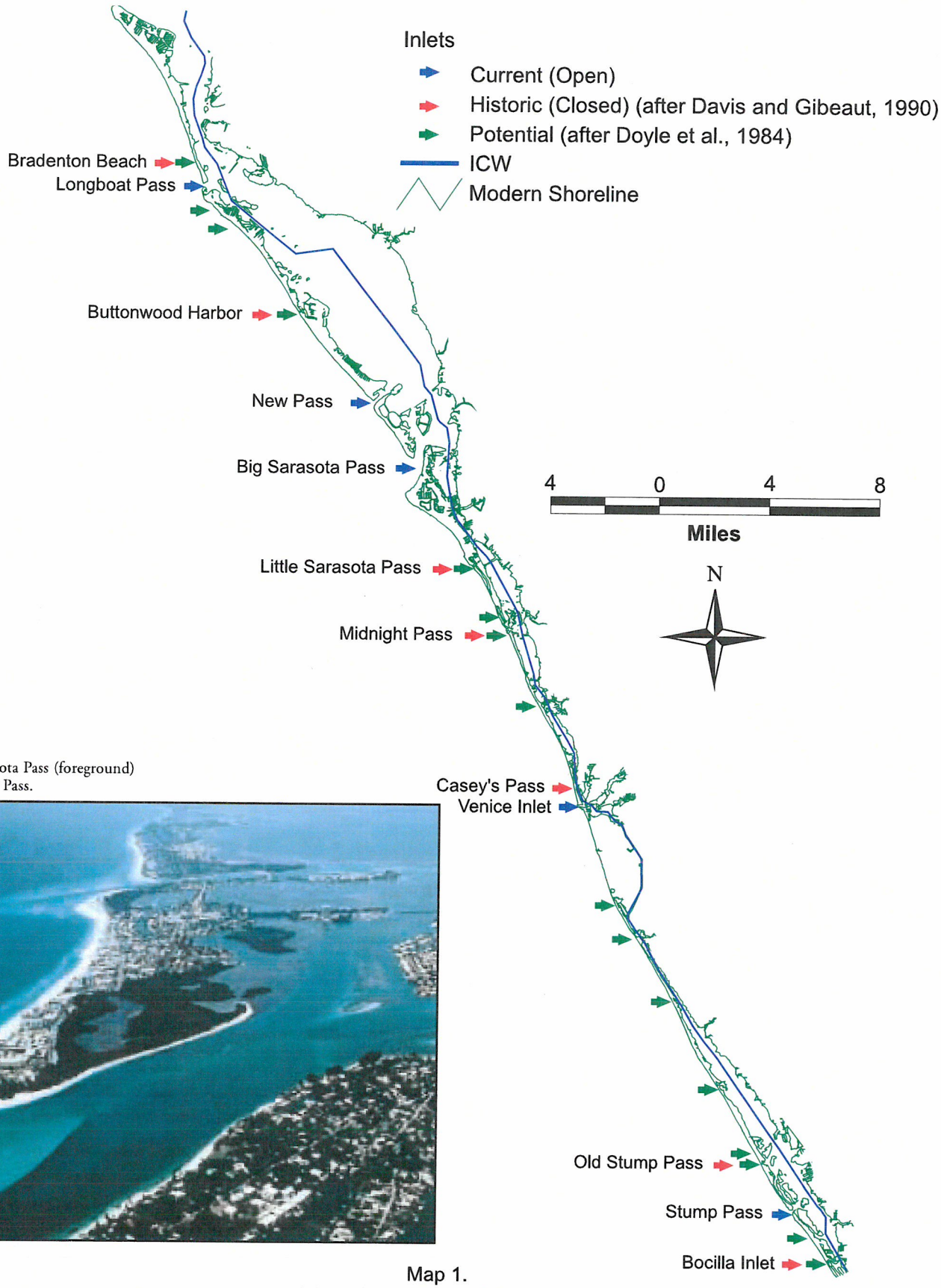
The U.S. Coast Guard maintains aids to navigation at all the inlets except Stump Pass, which as of the summer of 1998 was unmarked on the Gulf side.

Two inlets — Longboat Pass and New Pass — have single-span lift bridges situated near the inlet mouths. The bridge at Longboat opens on demand for boaters from 6 a.m. to 6 p.m. and afterwards on three hours' notice. The New Pass bridge has restricted openings for boaters from 7 a.m. to 6 p.m. on the hour and every 20 minutes.

Six inlets have closed during the past century on this reach of the Florida coast: Bradenton Beach, Little Sarasota Pass, Midnight Pass, Casey's Pass, [Old] Stump Pass and Bocilla Inlet (Map 1). Another historic inlet probably existed at Buttonwood Harbor prior to 1883.

Both current and historic inlets have formed, closed and reopened over their life spans, due to natural processes as well as human intervention. Such events directly affect the amount of water flowing through an inlet during a tidal cycle, referred to as a tidal prism. Dredging inlet "A" can rob some of the tidal prism from inlet "B," situated several miles down the coast. Similarly, the tidal prism of an inlet may be affected by changing the area of the bay adjacent to it; an inlet may close due to an abundance of sediment and strong longshore drift coupled with a small tidal prism.

Considerable debate continues regarding the effects of the dredging and filling of mangrove and marsh environments along bay margins on decreasing the tidal prism and the related closing of inlets. Little disagreement exists, however, about the potential for storm overwash of the barrier islands and the creation of new inlets. Sixteen sites along this stretch of the coast are particularly vulnerable to storm overwash (Map 1). These locations are prone to overwash because of the narrow width of the barrier island, low elevation and orientation to storm-wave attack.



Big Sarasota Pass (foreground) and New Pass.

Map 1.
Inlets of the Sarasota Bay System

Inlet Features

Inlets are natural or manmade channels connecting the coastal Gulf to estuaries with strong tide-induced currents that build up supplies of sand, called shoals, just inside or adjacent to their channels. Inlets may close, open, migrate or stabilize in response to changes in sediment supply, wave climate, tidal regime and back-bay filling or dredging. Changes in inlets occur at different time scales, ranging from hours during severe storm events to decades or even centuries.

For the mariner running the inlet, the most recognizable feature is the steep groundswell that builds up across the inlet mouth, caused by resistance created by the sea bottom where offshore swells run into shoal water. Figure 1 is a perspective drawing of tide-generated and wave-generated transport features in a representative inlet system. The transport of sediment along the beach face, referred to as longshore drift, occurs on the Gulf side of barrier islands and is depicted to be moving from top to bottom. Figure 2 shows the elements of an inlet system; some features may or may not be present or well-developed in all inlets.

Sand is deposited as shoals just inside and outside the inlet because of the reduction in current speed in these areas. Ebb-tidal deltas occur at the seaward margin — outside — of the inlet and retreat or bend in response to the interaction between incoming waves and ebb tides. Large inlets, such as Big Sarasota Pass, build extensive, visible, ebb-tidal deltas. Sediment sources include material washed out from the bay, material eroded from the main ebb channel and longshore drift. Longshore drift is sand that moves up and down the coast between the beach and the outer edge of the breaker zone due to waves approaching the shore at an angle.

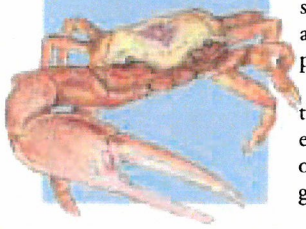
Material brought out on the ebb tide is deposited on the swash platform. The breaking waves that the mariner experiences at the inlet entrance are a dominant feature on swash platforms and help to create swash bars. Marginal channels may develop along the ends of barrier islands where incoming (flood) tidal flow is reinforced by wave-generated currents; the swash channel at Boca Grande is a good example of this phenomenon. From boat-deck level, these channel features appear to have the smoothest water surface and absence of breakers and, under favorable weather, may offer the mariner an alternative shorter route through the inlet.

Spits occur in areas with a high rate of sediment transport alongshore and a small tidal prism; spit growth eventually may restrict tidal flow in the main channel and cause downdrift migration or closure of the inlet. Migration of barrier island spits along this reach of the Florida coast is southward, in the direction of net longshore transport. The build-up of Englewood Beach on south Manasota Key adjoining Stump Pass illustrates this process.

Flood (incoming) tide transports sediment landward through the inlet via the main channel, producing a similar shallow-water, delta-like feature on the bay side of the pass. The interplay of ebb and flood tides on this bayside delta creates spits and spill-over lobes where ebb currents run strong. However, flood-tidal deltas are less prone to change than ebb-tidal deltas along this reach of the coast. Over time, they become stabilized by seagrasses and mangroves; they serve as nurseries for juvenile fish and are important fishing grounds.

Flood-tidal deltas, because of their bayside location, have been subjected to heavy land-development pressure. Much of the New Pass flood delta is covered by City Island; that of Big Sarasota Pass is occupied by Bird Key. Natural and improved (dredged) flood channels are marked with aids to navigation. The bayside flood channels may carry additional signage advising the mariner to avoid wandering outside the channel and on to the flood-tidal delta, where propeller scarring of sensitive bay bottom habitat may occur.

The intertidal community is one of Sarasota Bay's most biologically productive. This fringe area is a mix of land and water, where creatures of the land and water most often converge. The mangrove trees found here serve as home for birds, and the jutting prop roots of the red mangrove offer shelter to small fish and shellfish.



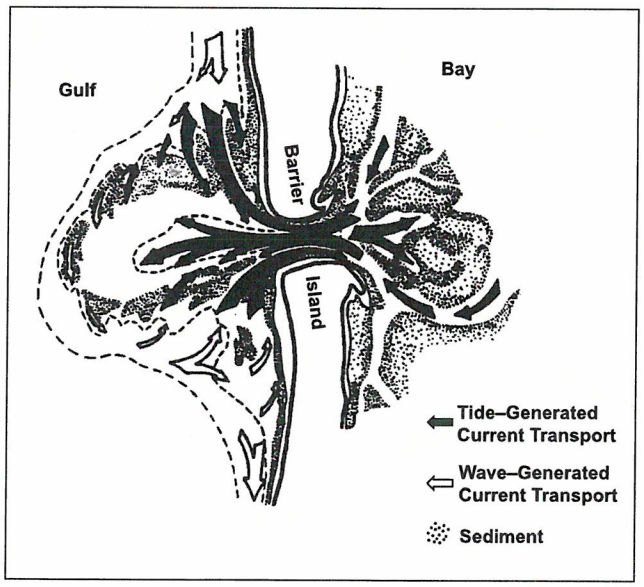


Figure 1.
Tide-Generated and Wave-Generated Transport Features in a Representative Inlet System (from Smith, 1984)

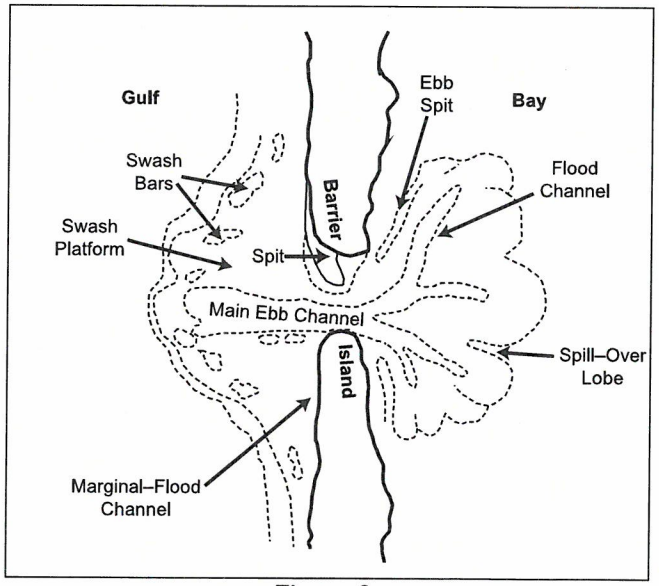


Figure 2.
Tidal Inlet Features (from Smith, 1984)

Types of Inlets

Tidal and wave energies determine the form of seaward flowing ebb-tidal deltas. The varying mix of these two forces determines the movement and deposition of sediments. The character of an inlet — its shape, dynamics, navigability — may change over time as the inlet adjusts to changes in the way tides and waves interact. Since Southwest Florida is a low-wave-energy coastline and the mean tidal range is relatively small (two feet), a delicate balance exists between tide- and wave-dominated conditions. A slight decrease in tidal prism (e.g., due to bayside filling) may cause a change from tide-dominated to wave-dominated conditions in inlets. Likewise, a change in wave energy due to sediment accumulation and spit development along the beach face may cause development of an offset alignment to the ebb delta.

In addition to these natural forces, shoreline engineering through the construction of groins, jetties and bulkheads — features designed to stabilize the shoreline by holding beach sand in one place — can dramatically alter the supply of sediment and the course of development and shape of an inlet. Another factor leading to inlet alteration is beach renourishment activities, which can contribute to pass shoaling through sand transport via longshore drift.

The drawings in Figure 3 depict four types of inlets found in Southwest Florida, based on the shape of ebb-tidal deltas: tide-dominated, wave-dominated, mixed-energy with straight shape and mixed-energy with offset shape. The Gulf is to the left side of the diagram and the bay is to the right, as in Figures 1 and 2.

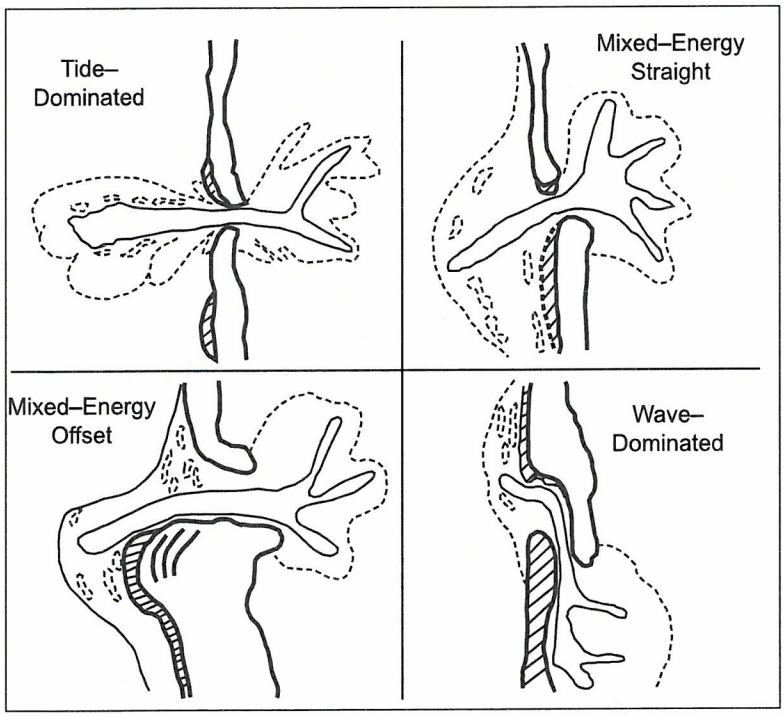


Figure 3.
Inlet Types Along the Southwest Florida Coast
(from Davis Jr. and Gibeaut, 1990)

The signature feature of tide-dominated inlets is a well-defined main ebb channel with deposits of beach sand on adjacent Gulf shores. Longboat Pass and Venice Inlet fall under this category; these inlets have relatively stable ebb-tidal deltas. Mariners should exercise caution in approaching tide-dominated inlets from the Gulf under ebb-tidal conditions, because maximum ebb current velocities are considerably higher than currents at flood stage at these locations. A combination of strong on-shore winds and peak ebb tide can be especially hazardous because of the amplitude and steepness of the waves. Furthermore, the Longboat Pass entrance channel is over one statute mile long, and a lift bridge must be negotiated within the throat of the main ebb channel, an area where currents are particularly strong. Venice Inlet is jettied and, while passage through this entrance channel is less than 0.5 statute miles, currents and eddies adjacent to the rock revetments make for potentially precarious conditions.

Wave-dominated inlets are very unstable and prone to migration. As wave-dominated inlets migrate along the coastline, their main channel is lengthened and becomes hydraulically inefficient for tidal exchange. Sometimes referred to as "wild inlets," no such passes currently exist in the Sarasota Bay system, but historically such an inlet existed at Little Sarasota Pass in 1883. Wave-dominated inlets are susceptible to closure by the formation of new, more hydraulically efficient inlets, formed when storms breach spits on the updrift side. Such an event occurred when Little Sarasota Pass closed and Midnight Pass formed during the hurricane of 1921.

Mixed-energy inlets have ebb-tidal (outside) deltas shaped by a combination of tidal and wave forces. Their maximum ebb- and flood-tidal current velocities tend to be equal, with a lower magnitude than those of other inlet types. The main ebb channel may shift its location as a result of drifting beach sediment.

Where longshore drift is pronounced, a channel offset may occur. New Pass is an example of a mixed-energy inlet with a straight ebb-delta shape. Its main ebb channel is periodically dredged on an alignment perpendicular to the shore (east-west heading). Net longshore drift, from north to south, builds a shoal over the swash platform. When this occurs, the best water for boaters is usually found along the marginal flood channel, which follows the north end of Lido Key into the throat of the main ebb channel.

Big Sarasota Pass and Stump Pass are mixed-energy systems with offset alignments. The approach from the Gulf to the main ebb channel at Big Sarasota Pass is from the south off the north end of Siesta Key. Once inshore of the swash bar shoals, the channel parallels the curved north shore of Siesta Key. Stump Pass was dredged in 1998 to offset the deposition of sediment southward from Englewood Beach. This is an unmarked channel and should be approached from the Gulf with extreme caution.

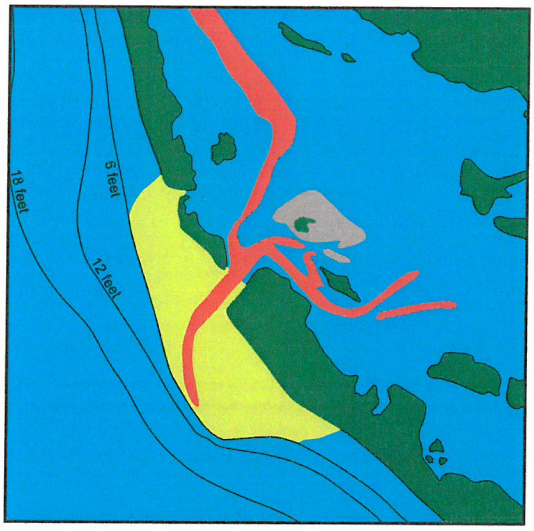
Historical Changes

Changes in inlets are revealed by historic charts and aerial photographs that provide an indelible image of the location and shape of these highly dynamic, visible features of the region's boating geography. The following section offers a description of these changes as seen through a selection of maps that recreate antecedent inlet features plus contemporary aerial photographs illustrating current conditions.

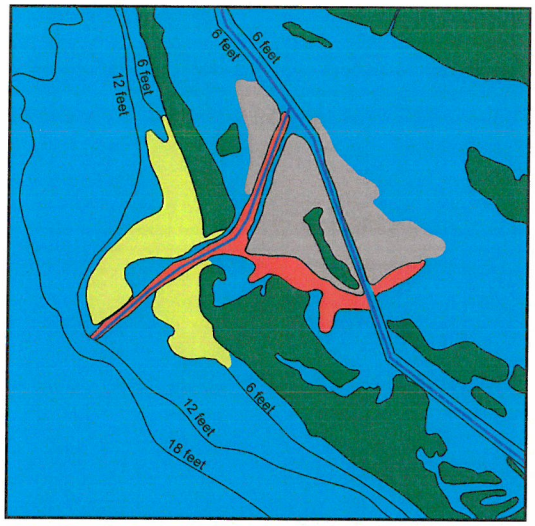
Longboat Pass

Pre-development conditions in Longboat Pass (Map 2) are shown by the 1883 map, in which the inlet ebb-tidal delta appears to have a mixed-energy offset form. Flood channels on the bay side are extensive north and south of the inlet; storm overwash may have created the small inlet approximately 0.5 mi. to the north. In the 1977 map, the inlet has a similar shape and is in approximately the same location. The channel has been dredged: on the bay side it follows the natural flood course, but on the Gulf side it cuts directly across the swash platform. A recurved spit (Beer Can Island or Greer's Island) has developed at the north end of Longboat Key and is a popular destination for weekend boaters. The flood (bayside) tidal delta is extensive, and the Intracoastal Waterway has been dredged through the shoal. The 1995 aerial view shows present conditions at Longboat Pass. Note the dredged access channel (a) leading from the Intracoastal Waterway to the inlet. An alternate route (b) follows the southerly natural flood channel, but requires running close and parallel to the bridge, which can be hazardous under ebb tide conditions. Two popular anchorages are adjacent to the (b) route. The flood-tidal delta is also a popular boating destination on weekends and holidays.

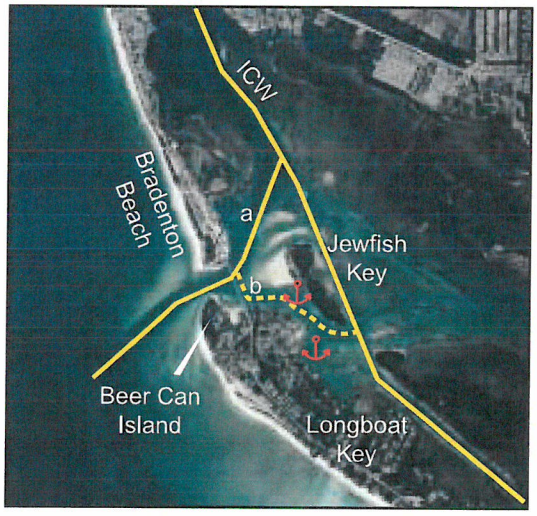
1883

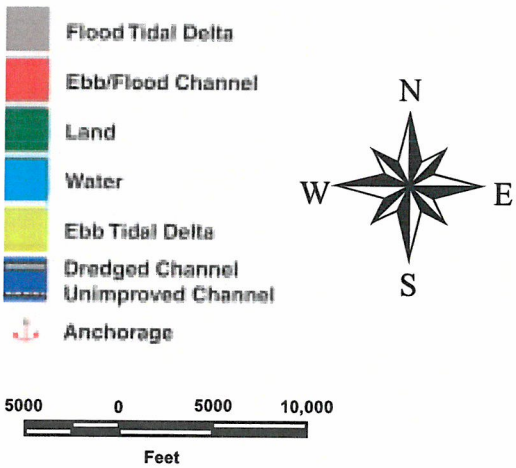


1977



1995



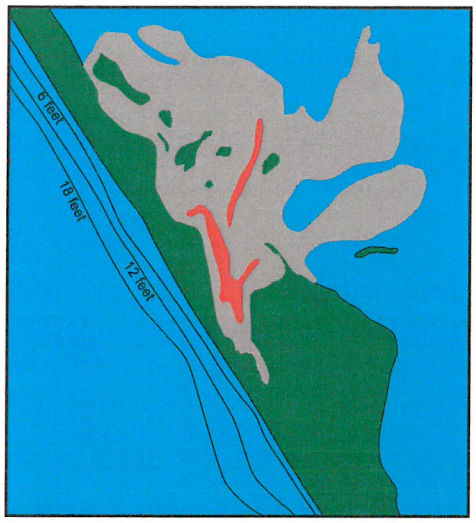


Longboat Pass
Map 2.

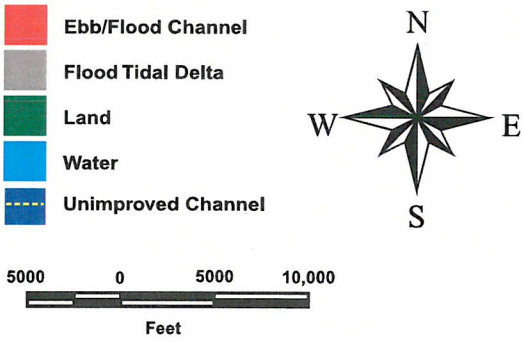
Buttonwood Harbor

Buttonwood Harbor (Map 3) on Longboat Key retains many bayside features of a historic antecedent inlet. The flood-tidal delta is one of the largest of all the inlets along the Sarasota Bay system. Extensive beds of seagrass cover this feature, a prime recreational fishing area in Big Sarasota Bay. The access channel from the Bay to Buttonwood Harbor follows the relict flood channel. The barrier island at this location is prone to beach erosion, storm wave attack and potential breaching, and is one of the narrowest points on the key.

1883

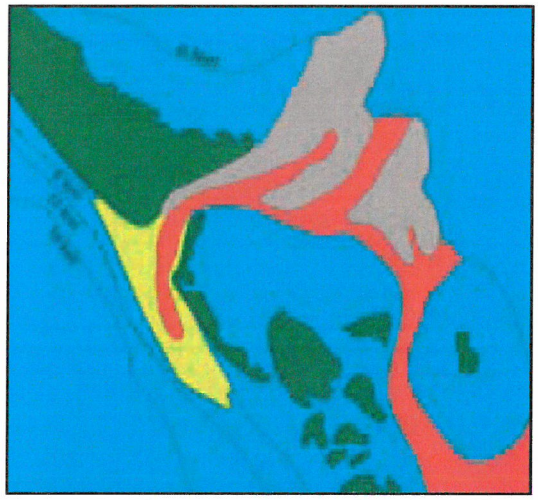


1995

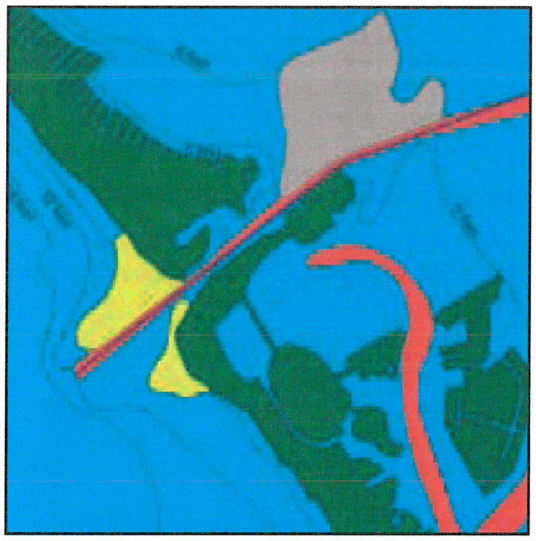


Buttonwood Harbor
Map 3.

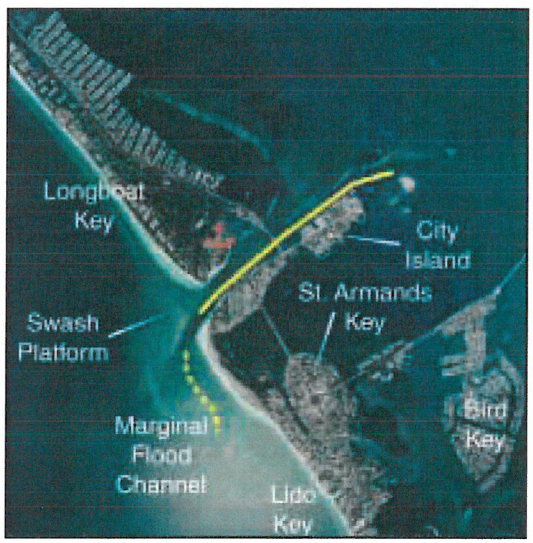
1883

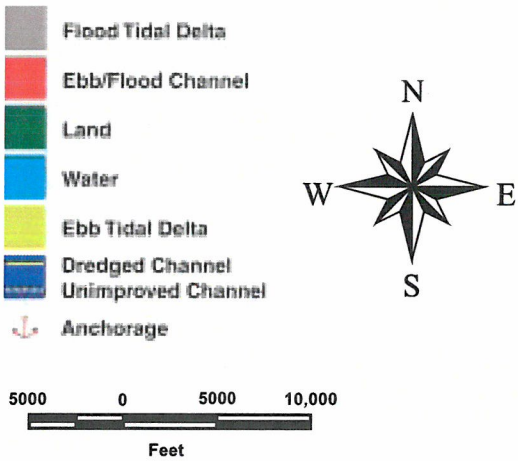


1977



1998



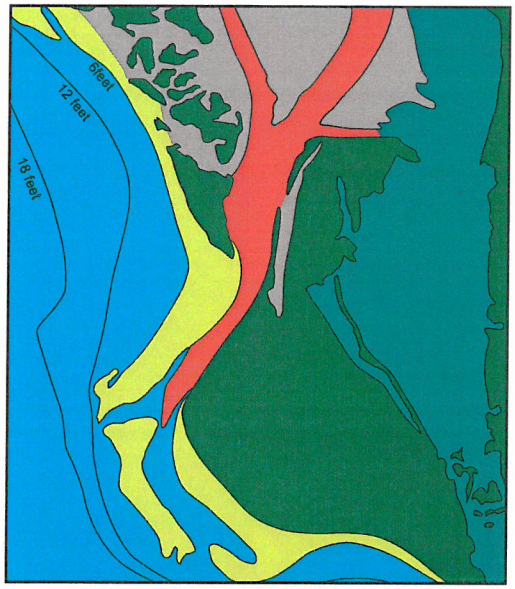


New Pass
Map 4.

New Pass

New Pass (Map 4) was well developed in 1883. A comparison with the 1977 map shows substantial changes to the Lido Key barrier island and to the bayside flood delta and channel features due to dredge-and-fill development in the 1920s. The flood delta area has been reduced substantially by creating City Island and, as a result, one can surmise that a similar reduction has occurred in seagrass habitat. Tidal exchange also has been reduced: before development (1883 conditions), the flood channels were linked between New Pass and Big Sarasota Pass, and overwash from the Gulf to the Bay probably occurred between the islets south of Lido Key. The inlet has been dredged since 1926. The 1998 aerial shows the effects of longshore drift from Longboat Key and sediment accumulation on the swash platform. The marginal flood channel that parallels the north Lido shore is used under these conditions by boaters with local knowledge. An anchorage, popular with weekend recreational boaters, is situated inside the recurved spit on the south end of Longboat Key.

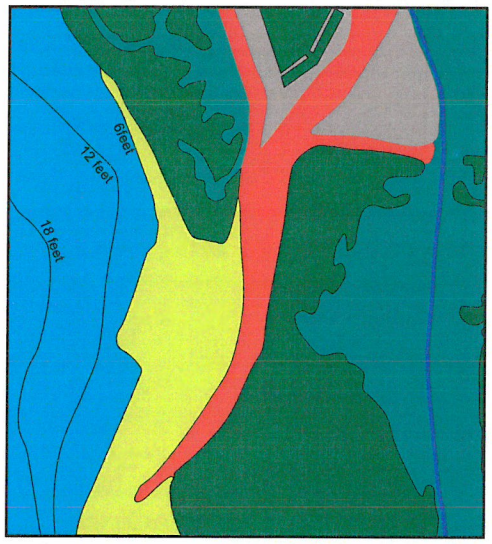
1883



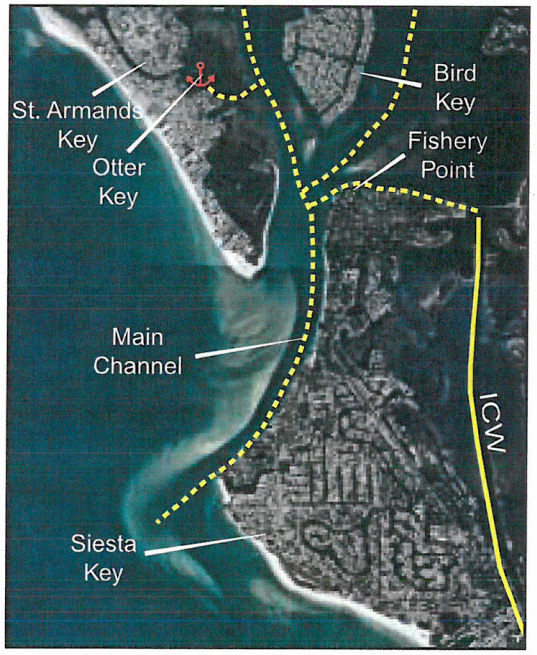
Big Sarasota Pass

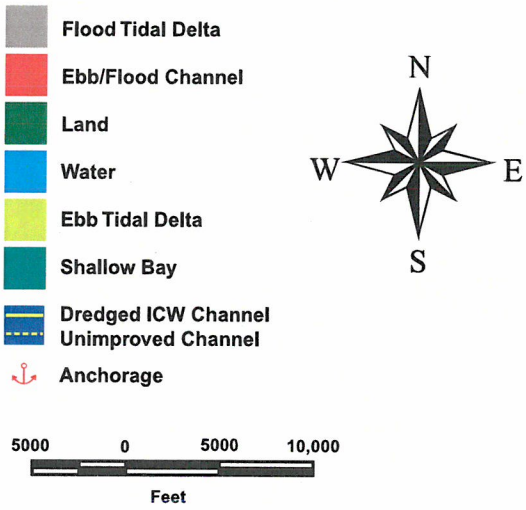
Big Sarasota Pass (Map 5) on the Gulf side retains much of its pre-development (1883) form with a large ebb-tidal delta and large main channel. It is on the bayside, where large changes are manifest (1977) due to extensive dredge and fill that has dramatically reduced the flood-tidal delta at Lido and Bird keys. In the early 1900s, these areas were expansive seagrass habitats and popular sportfishing locales. Land development on Lido Key occurred in the 1920s and on Bird Key in the 1960s (1977 map). The 1995 aerial shows the presentday swash platform and current extent of the southward trending sediment drift. The northwest shore of Siesta Key has been bulkheaded, which has stabilized the position of the main channel. There are three natural flood-channel tributaries: northwest leading to the Sarasota Yacht Club (SYC), northeast to the Intracoastal Waterway and the City of Sarasota and east around Fishery Point and along the north shore of Siesta Key to the Siesta Key Bridge and the Intracoastal Waterway. A pocket anchorage behind Otter Key is reached off the SYC flood channel.

1977



1995



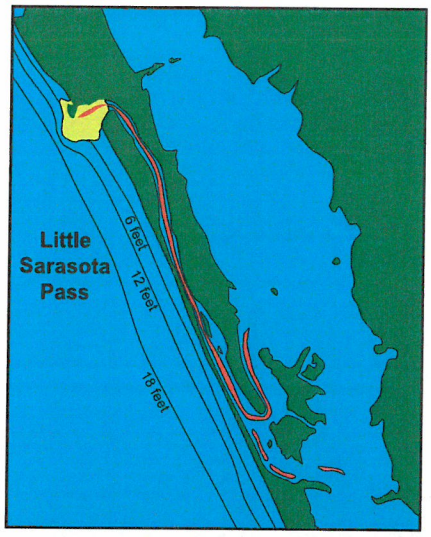


Big Sarasota Pass
Map 5.

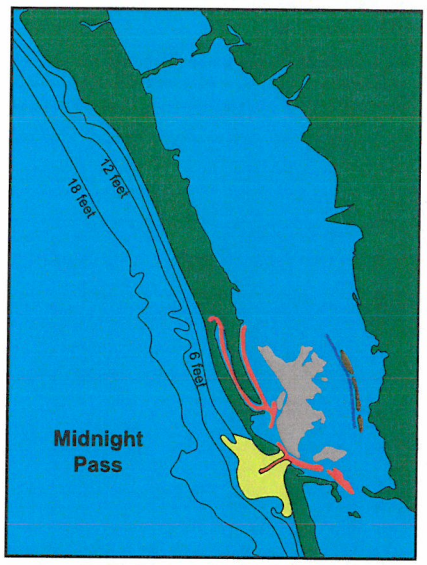
Little Sarasota Pass and Midnight Pass

Little Sarasota Pass and Midnight Pass (Map 6) are closed inlets. Little Sarasota Pass on Siesta Key ceased to exist when the hurricane of 1921 created Midnight Pass, which in turn was closed in 1984 by bulldozers. Blind Pass is another former inlet. Heron Lagoon (1995 aerial) is a remnant flood channel of Little Sarasota Pass, which is an enclosed water body. Another portion of the old flood channel (1955 map) is a navigable arm of Little Sarasota Bay (1995 aerial). The flood delta is large and upland vegetation is present on Bird Keys, also called the Jim Neville Marine Preserves, a marine park and bird sanctuary. Neville Preserve, which received extensive spoil during the dredging of the Intracoastal Waterway, is inhabited mostly by exotic plant species, inhibiting its use by birds and other Bay life. The aerial shows the course of the ICW, which was widened and deepened in 1963-64; the 1955 map shows the spot dredging and spoil placement from the earlier 1900s waterway improvement. The bay side of these historic inlets is important for its recreational fisheries and bird rookeries, habitats that owe their existence to antecedent inlet conditions.

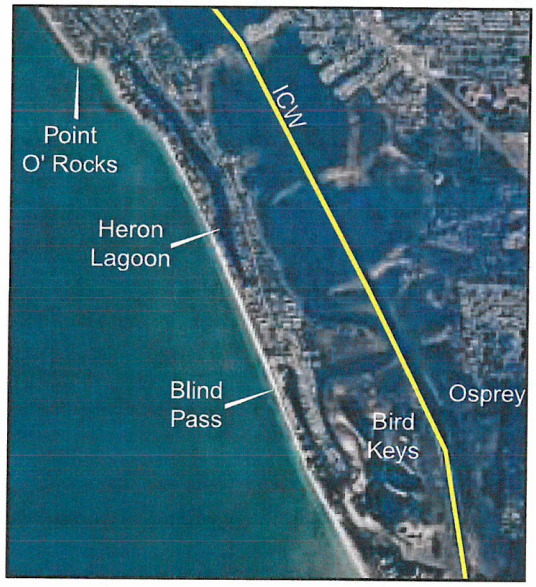
1883

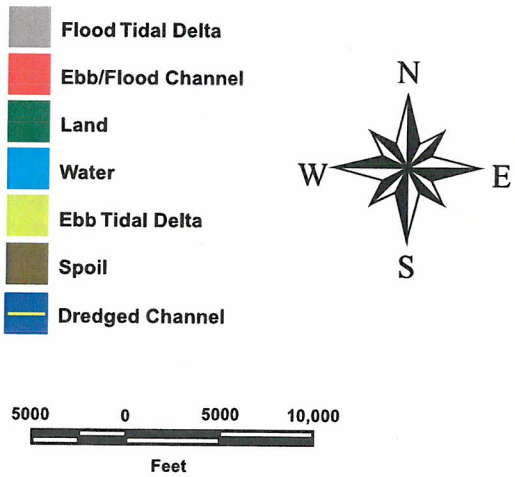


1955



1995



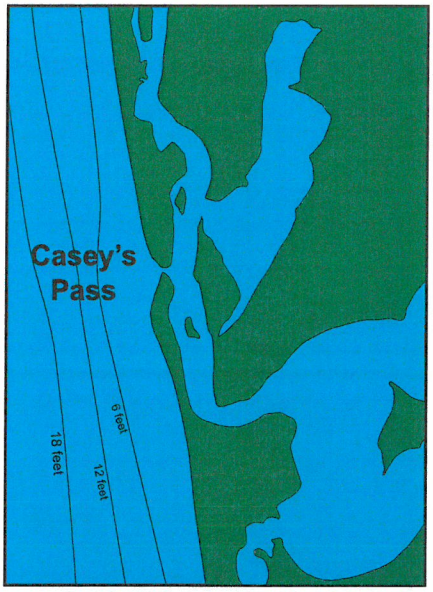


Little Sarasota and Midnight Passes
Map 6.

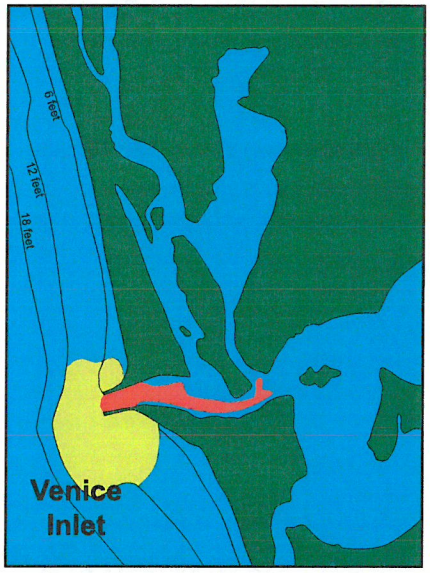
Casey's Pass (Venice Inlet)

Casey's Pass and Venice Inlet (Map 7) are situated midway along the Sarasota Bay system. Casey's Pass was an unimproved inlet that provided access between the Gulf and Lyons, Dona and Roberts bays. It was susceptible to repeated closing and reopening over its history as it migrated up and down the coast. In 1883, Casey's Pass was about a quarter-mile north of its present location. The pass was jettied in 1937; since 1945 it has been maintained by the U.S. Army Corps of Engineers, and is commonly referred to today as Venice Inlet. It is navigable under most conditions because of the straight, short channel. The Intracoastal Waterway (1998) runs between Turner Key and Casey Key before turning east by Snake Island and south into Roberts Bay. Ebb currents run strong between Turner Key and Snake Island, and a shoal has built up between Snake Island and the southern end of Casey Key. The north shore of Venice has been bulkheaded; the main channel follows close to this shoreline. A small anchorage in southwestern Roberts Bay, adjacent to the Venice Yacht Club, can be approached either from the north along the bulkheaded eastern shore of Venice or by the yacht club channel from Roberts Bay.

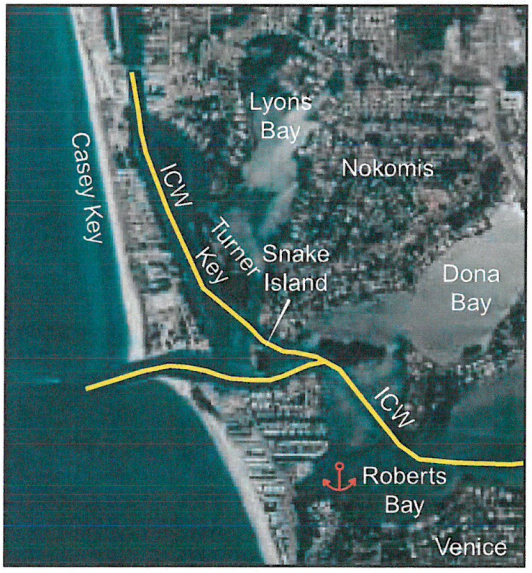
1883

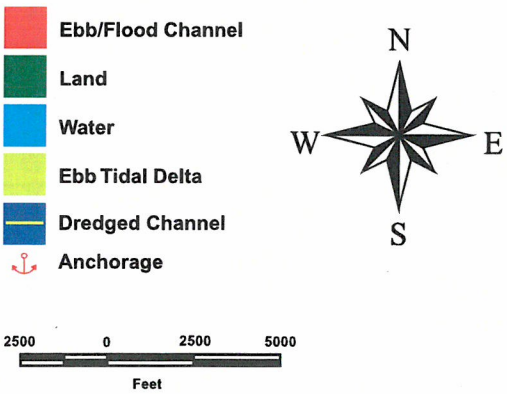


1955



1998



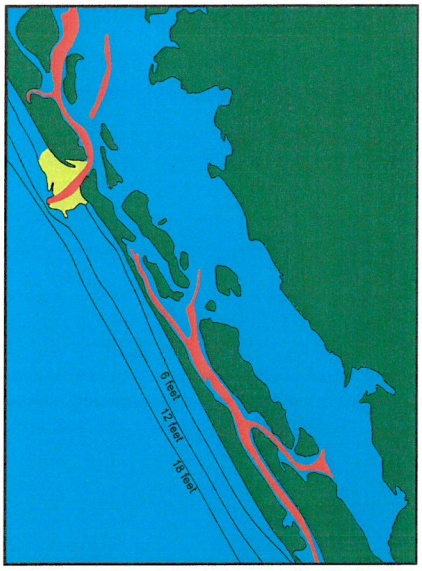


Casey's Pass and Venice Inlet
Map 7.

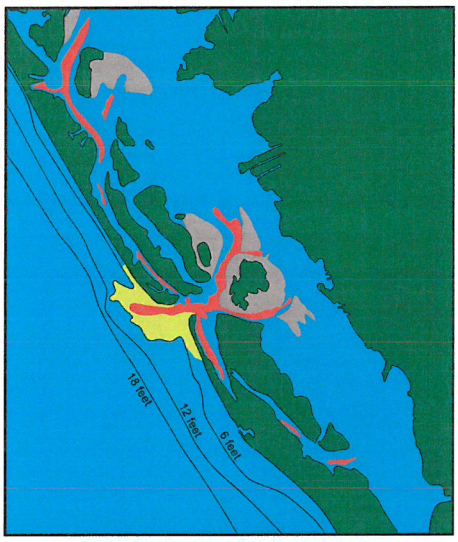
Stump Pass

Stump Pass (Maps 8 and 9) is probably one of the most dynamic inlets in Southwest Florida. Evidence exists on the bay side of a former inlet location, which today is a popular recreational anchorage, approximately two miles north of the present inlet. Several flood-tidal deltas in Lemon Bay near the inlet have been stabilized over the years and are covered with extensive seagrasses. Some of the deltaic deposits have become intertidal and are vegetated with mangroves. Lemon Bay, for these reasons, is a prime recreational fishing locale in the Sarasota Bay system. Several anchorages are near the present inlet: one between Peterson Island and Englewood Beach, the other between Grove City Key and Thornton Key. The 1998 aerial shows the significant southerly longshore drift that was closing off the inlet and prompted the recent dredging.*

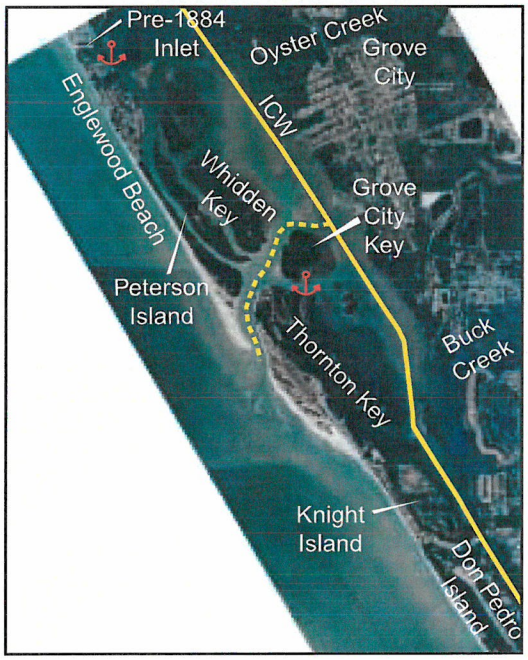
1884



1956



1998



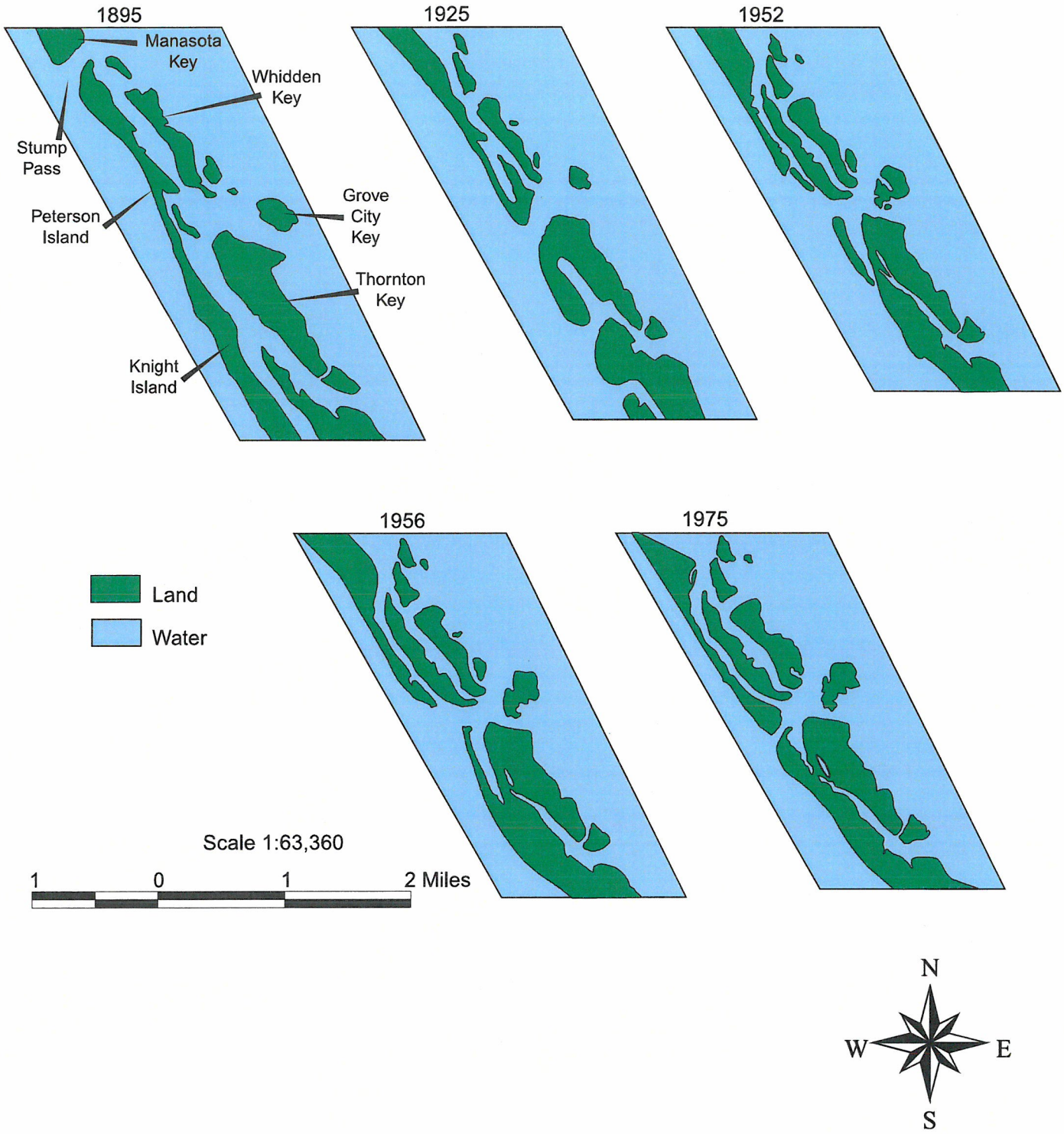
Flood Tidal Delta
Ebb/Flood Channel
Land
Water
Ebb Tidal Delta
Dredged Channel
Unimproved Channel
Anchorage

*Photo predates latest dredging

N
W E
S

5000 0 5000 10,000
Feet

Stump Pass
Map 8.



Map 9.
Historical Changes at Stump Pass

Epilogue

The Sarasota Bay inlet system has experienced many changes in its location, shape and dynamics during the past 100 years. These changes have affected mariners' ability to enter and leave inland waters and make passages in the Gulf of Mexico. Natural processes and human intervention have influenced the evolution of these inlets.

Notwithstanding the history of change, mariners can use this knowledge of inlet history and understanding of the inlet forms and features to determine their behavior and navigable condition. While the focus of concern for safe navigation often is on the Gulf side, it is important to remember that the bay sides of inlets, particularly their flood tidal deltas, play a significant role in the creation of important recreational fisheries and bird rookery habitats.

References
(in chronological order)

1. Published Reports

Hine, A.C.; R.A. Davis; D.L. Mearns; and M. Bland, 1986, Impact of Florida's Gulf Coast Inlets on the Coastal Sand Budget, University of South Florida, Report to the Florida Department of Natural Resources, St. Petersburg, 128 pp.

Davis, Jr., R.A., and J.C. Gibeaut, 1990, Historical Morphodynamics of Inlets in Florida: Models for Coastal Zone Planning, Sea Grant Technical Paper 55, Florida Sea Grant, Gainesville.

2. Books

Hayes, M.O., 1979, "Barrier island morphology as a function of tidal and wave regime," in *Barrier Islands from the Gulf of St. Lawrence to the Gulf of Mexico*, S.P. Leatherman, ed., Academic Press, New York, 1-27.

Doyle, L.J.; D.C. Sharma; A.C. Hine; O.H. Pilkey, Jr.; W.J. Neal; O.M. Pilkey, Sr.; D. Martin; and D.F. Belknap, 1984, *Living with the West Florida Shore*, Duke University Press, Durham, N.C.

Smith, D., 1984, "The hydrology and geomorphology of tidal basins," in *The Closure of Tidal Basins*, W. van Aslst, ed., Delft University Press, 85-109.

3. Student Thesis

Reynolds, W., 1976, "Botanical, Geological and Sociological Factors Affecting the Management of the Barrier Islands Adjacent to Stump Pass," New College Environmental Studies Program, unpublished honors thesis, Sarasota, 117 pp.

4. Government Charts (Compilation [Smooth] Sheets)

U.S. Coast and Geodetic Survey, 1883, Sarasota Bay, Florida, hydrographic (H) sheet, 1:20,000 scale, Register No. 1559a

_____, 1883, Little Sarasota, Bay, Florida, hydrographic (H) sheet, 1:20,000 scale, Register No. 1559b.

_____, 1884, Lemon Bay: Bocilla Inlet to Stump Pass, Florida, hydrographic (H) sheet, 1:20,000 scale, Register No. 1595a.