



ALTERING LAND AND WATER FOR COASTAL DEVELOPMENT: VENICE, FLORIDA

The Venice area is a microcosm of the entire Gulf Intracoastal Waterway region in Southwest Florida, in which multiple interests — striving to develop shorefront real estate, to create new land from formerly pristine estuarine and shore ecosystems and to increase and improve the navigable waterways — have propelled coastal development in many profound ways. The area between the Albee Bridge (north) and Hatchett Creek Bridge (south), including Lyons Bay, Dona Bay, Roberts Bay and those freshwater streams extending east and north, has been selected to illustrate the effects of land drainage and waterway construction policies — both latent and direct — on waterfront and bay water uses (Map 1).

Physical Geography

The Venice-area estuary comprises three interconnected shallow bays — Lyons, Dona and Roberts — separated from the Gulf of Mexico by a barrier island (Casey Key). There is a semi-diurnal (two times per day) tidal exchange with the Gulf of Mexico through Venice Inlet (historically named Casey's Pass). The Gulf Intracoastal Waterway, originally dredged in the early 1900s and widened and deepened in 1965, aids in maintaining salinity levels in the estuary.

Freshwater discharge by low-gradient, short coastal streams is an important aspect of the hydrological regimen of two of the bays. Shakett Creek (formerly Salt Creek) flows into Dona Bay; Curry Creek is a tributary of Roberts Bay. Lyons Bay has no freshwater streams.

The surrounding upland has a low elevation (about four to five feet above mean low water) and is underlain by limestone. Many seasonal wet depressions reflect a high water table and an absence of — or poorly developed — surface drainage. Rainfall averages about 53 inches per year, concentrated in the May-October wet season.

Historically, during the wet period the surrounding low, swampy land was inundated and surface water flowed in meandering streams or sloughs that linked the many seasonal wet depressions. In the pre-development era, Knight's Slough extended from the head of Curry Creek off Roberts Bay east to the Myakka River, while Cowpen Slough linked Salt Creek and Dona Bay with freshwater drainage from Sarasota County's northern lands. The area was covered with pine, scattered patches of water oak and numerous small swamps. The bay shoreline was an extensive growth of mangroves and marsh.

Lyons, Dona and Roberts bays are very shallow, with numerous oyster bars projecting from their bottoms. Physical land barriers built into the bays affect tidal exchange; those barriers include deposition of spoil on Turner Key at the mouth of Lyons Bay and land filling for highway and railroad causeways in Dona and Roberts bays. These manmade features impede freshwater discharge and encourage lowered salinity levels during the rainy season.

The net effect of these constrictions — both natural and manmade — is to create a "stilling basin," an ideal settling condition for suspended solids that are transported by Cowpen Slough and Curry and Shakett creeks, especially during heavy rainfall periods. Low salinity and suspended solids may preclude growth of desirable seagrasses. Algae forms of vegetation predominate; their growth is fostered by the input of nutrients from septic tanks of waterfront homes as well as by stormwater runoff from roads and lawns.

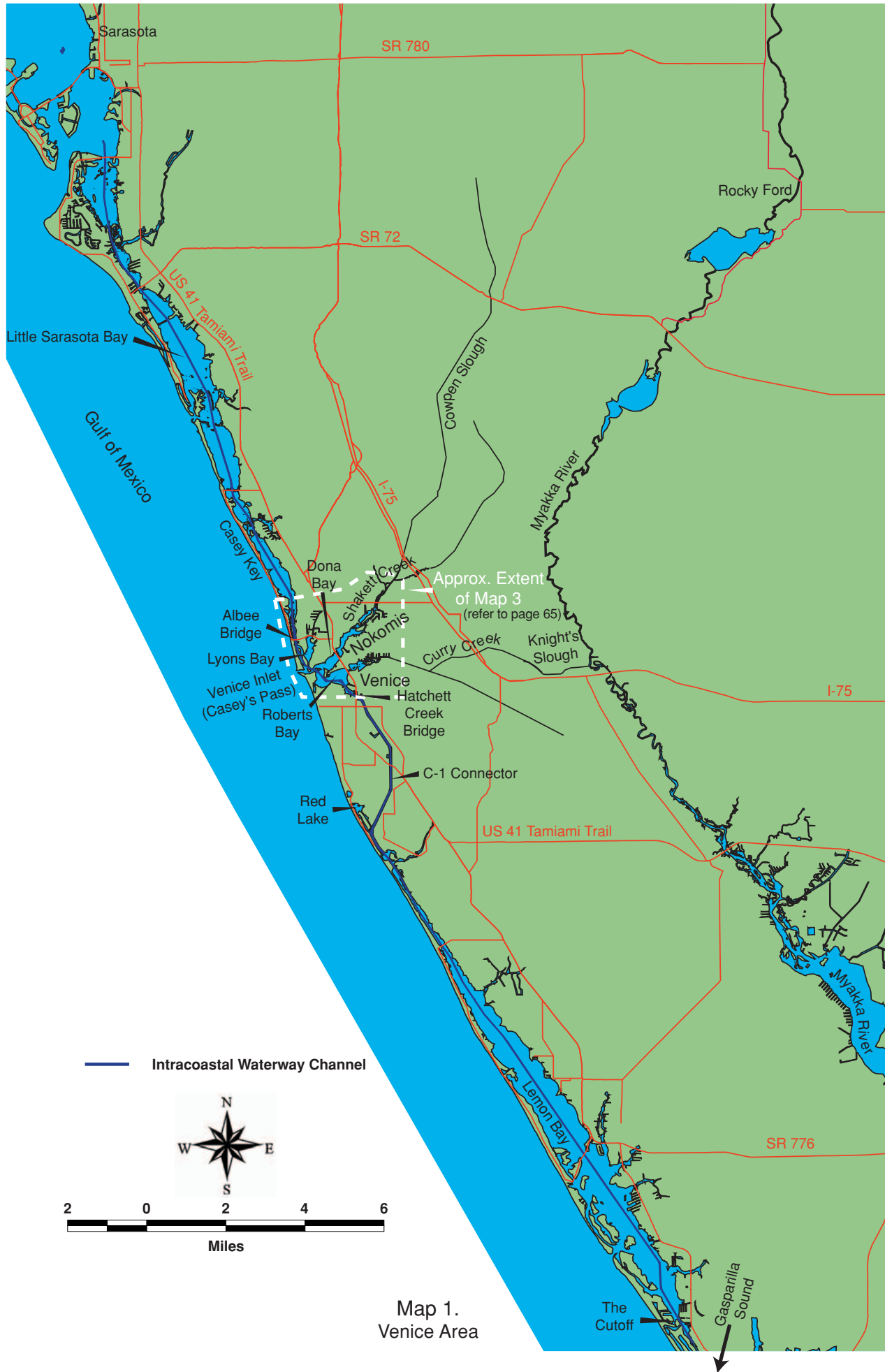
Another effect of restricted water flow in these bays, related to lowered salinity levels, is the fact that the rate of deposition of silt is increased. This silt increase comes about because of a process called flocculation, in which small particles carried in tidal waters tend to clump and settle at the freshwater/saltwater interface.



Venice Jetty Park.



Venice fishing pier.



Map 1.
Venice Area

Land Reclamation or Waterway Navigation?

The development history of the Sarasota Bay system is a record of competing and conflicting interests, some wanting to control flooding by upland drainage and others striving to build a protected inland waterway for either pleasure boating or commercial use.

Settlers who established Nokomis and Venice in the late 1800s had a strong interest in finding relief from flooding during the rainy season. They recognized the low-lying areas adjacent to the sloughs as potentially rich farm and pasture lands, but these lands were too wet to cultivate or utilize for cattle grazing except in occasional abnormally dry years.

When the Intracoastal Waterway was dredged between Sarasota and Venice in the early 1900s, local community leaders in Venice began seeking ways to achieve construction of the “missing link” in the waterway south to Charlotte Harbor. Settlers also wanted reclamation of swamp land for agricultural development. They convinced the federal government to examine the engineering feasibility and economic justification for such a multipurpose project in 1915.

Two routes were considered: Knight’s Slough, between Roberts Bay and the Myakka River at a point about 19 miles above the river’s mouth, and Cowpen Slough by way of Salt Creek (Shakett) to Dona Bay and to the upper Myakka River above Rocky Ford (Map 1).

The Knight’s Slough connection at that time was navigable by small boats during the wet season. Little Sarasota Bay had an available depth of about 3 feet at mean low water, and somewhat less at extreme low tide. In Dona Bay and Roberts Bay, where depths were considerably less, it was determined that dredging would have to be done to connect with the southern terminus of the Intracoastal Waterway at Casey’s Pass. The Myakka River between Knight’s Slough and the river mouth had a least-reported depth of 2.5 feet at low water on one broad sand flat and 3 feet on several other bars. The river above the point where the Cowpen Slough would strike it had only a small low-water discharge, which ceased altogether in the dry season.

The 1915 federal study concluded that the proposed waterway had nothing to recommend it either as a highway for commerce or as a pleasure boat route. Dredging also did not meet engineering and cost feasibility tests of combining, into a single project, navigation improvement while ameliorating flood conditions. The proposed Knight’s Slough improved navigation route would be of no value for drainage and reclamation of lands subject to overflow; Cowpen Slough, while serving the purpose of drainage and reclamation, would be cost-prohibitive and useless for commerce and navigation, federal officials determined.

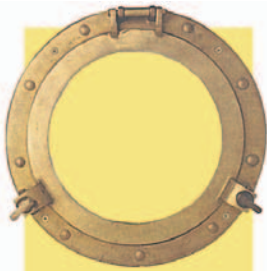
The proposed Cowpen Slough route would reach the upper Myakka Valley, but without extensive and costly improvement of the river itself — involving locks and dams and regulating works for the storage of water — both the river and the proposed connection with the bays would be non-navigable for most of the year. For several months the route would have no water at all except in detached pools and in the tide-level portion.

Curry Creek’s history after 1915 is one of repeated attempts by local landowners to divert surface flooding by diking and ditching the land. The Curry and Knight families may have constructed small-scale drainage improvements during the subsequent decade. The Brotherhood of Locomotive Engineers, which purchased extensive land holdings in Venice and east to the Myakka River, engaged in large-scale land reclamation projects in the mid-1920s. In the late 1950s, the Blackburn family may have constructed a shallow ditch and dike along the route of an old drainage ditch that emptied into Curry Creek and Roberts Bay.

Shakett Creek received more direct public attention because of the encroaching urbanization from Sarasota within the area adjoining Cowpen Slough. The region had developed into an important farming and grazing economy during the 1940s. A small-scale system of large drainage ditches was constructed during that period. In the early 1960s, a flood-control plan was established to accommodate urban development, protect the vegetable-producing area and provide adequate drainage for pasture lands lying along the stream channel. A major feature of the plan was replacing the natural meandering slough with a straight, box-cut channel and rechannelizing the drainage ditches at the lower reaches. The net effects increased the drainage area of Shakett Creek and increased freshwater runoff from its watershed under storm conditions, approximately doubling the carrying capacity of the channel and its discharge into Dona Bay. The maximum discharge occurs about once in four years. Construction of engineering structures upstream of Shakett Creek has had a decided effect on the natural ecology of this estuary (see Physical Geography).

Surface-water drainage and land reclamation along Knight’s Slough and Cowpen Slough have contributed to altering the coastal landscapes downstream along Curry Creek and Shakett Creek. However, neither Curry nor Shakett Creek evolved into the connector link between Venice and Charlotte Harbor for the Intracoastal Waterway system. That link was achieved in 1967 by completion of the alternate route, a five-mile connector channel from Roberts Bay to Red Lake, along with dredging the length of Lemon Bay through “The Cut-off” to Gasparilla Sound.

A porthole is a round window in a ship’s side, fitted with glass and metal covers.



Sea-level rise will be a continually important issue, not only for beach erosion but also for eastward migration of the shoreline. Although estimates vary widely, some indicate that the sea level in the Gulf of Mexico and bay could rise between three and five feet during the next 100 years, altering the boundaries of Sarasota Bay and changing the lifestyles of area residents.

Changes on the Waterways and Along the Waterfront

The Intracoastal Waterway has had a profound effect on coastal development in Venice. At the beginning of the 20th century, it provided an all-weather “inland” water route to Sarasota. As Venice became the southern terminus of this waterway, its location justified stabilizing the inlet at Casey’s Pass (Venice Inlet today) to assure access to the Gulf of Mexico. The natural pass was dredged around 1925, but this measure proved to be a temporary solution (Photo 1). Construction of the jettied Venice

- A. Roberts Bay
- B. Dona Bay
- C. Original ICW Channel
- D. Turner Key
- E. Bird Island
- F. Casey’s Pass
- G. Nokomis



Photo 1.

Aerial view of Casey’s Pass, looking east from the Gulf of Mexico, around 1925 (Source: Edward Ral)

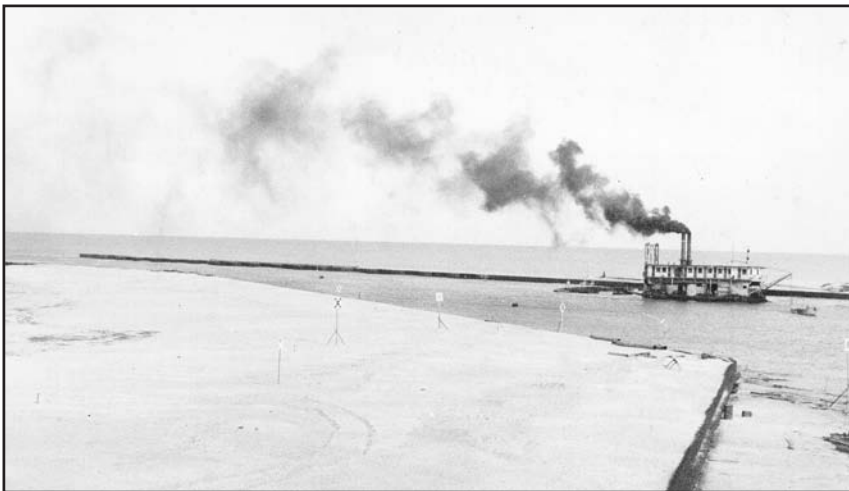


Photo 2.

Dredging of Venice Inlet upon completion of jetty construction, around 1937 (Source: Eugene Maier)

Inlet was completed in 1938 (Photo 2). Prior to World War II, the waterfront north and south of the jetties retained a natural appearance with a vegetation-lined shoreline. The original road from downtown Venice to the south bank of the inlet bridged the mouth of Pelican Cove near present-day Higel Park (Photo 3).

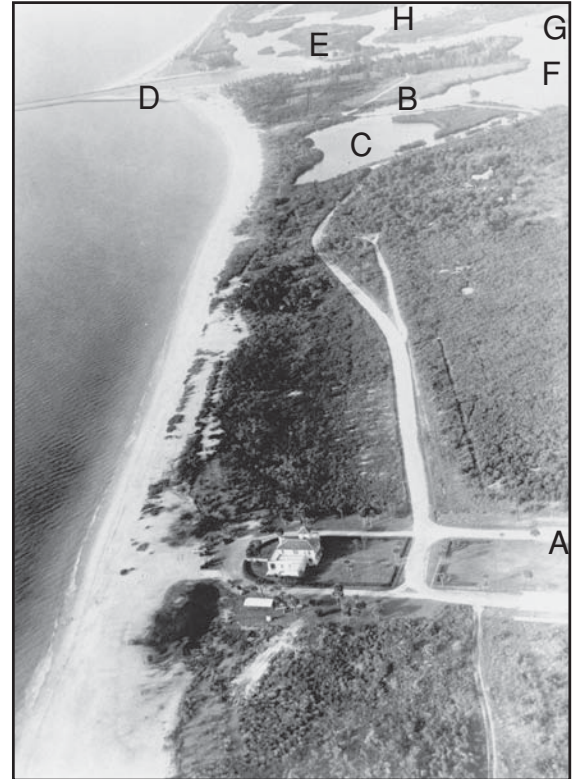


Photo 3.

Aerial view looking north toward Venice Inlet, around 1940, showing road from Venice Avenue to Inlet Circle, with bridge across Pelican Cove

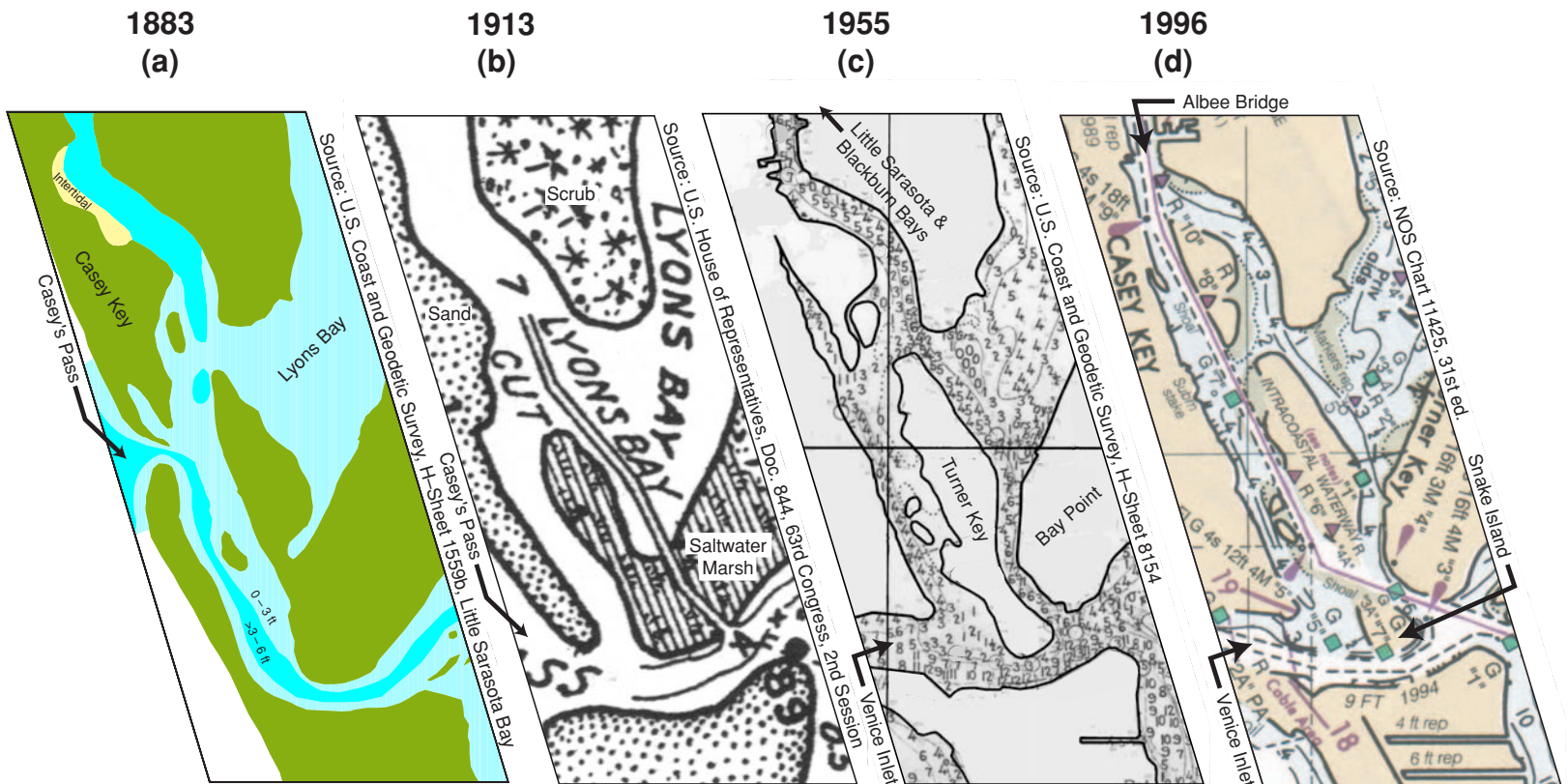
- A. Venice Avenue
- B. Inlet Circle
- C. Pelican Cove
- D. Venice Inlet
- E. Turner Key
- F. Roberts Bay
- G. Dona Bay
- H. Lyons Bay

The area between the Albee Bridge and the Inlet shows some of the most dramatic changes caused by nature and humans in Venice. Map 2 illustrates (a) conditions before coastal development in 1883; (b) the alignment of the original Intracoastal Waterway in 1913; (c) the coastline and water depths before the modern Intracoastal Waterway was dredged in 1955; and (d) waterway conditions in 1996.

In 1883 (Map 2a), Casey's Pass was located a short distance north of the present inlet and opposite Lyons Bay. Deep-water access from the Pass was limited to the south channel and Roberts Bay (depths shoaled northward to less than 3 feet between the Pass and Little Sarasota Bay). By 1913 (Map 2b), Casey's Pass had migrated south to the location of the present inlet. The Lyons Bay Cut represents the original Intracoastal Waterway alignment prior to 1913, which effectively created an island later known as Turner Key (Photo 4). Saltwater marsh covered this island and the adjoining peninsula (called Bay Point today). Waterway conditions in 1955 (Map 2c) show a 5-foot controlling depth in the original

Intracoastal Waterway south from the Albee Bridge and east of Turner Key to Roberts Bay. That channel was abandoned in 1965 when the route was widened to 75 feet and deepened to 9 feet (Map 2d); the new channel shortened and straightened the alignment, creating one island north of Turner Key and another, Snake Island, south of Bay Point. While the former Intracoastal Waterway east of Turner Key was protected from currents on the gulf side of the Inlet, the present channel is exposed to these currents and chronically shoals where the mouth of Lyons Bay meets the waterway and Venice Inlet (Photo 5).

Landside development pressures began to impact bay habitats in the early decades of the 20th century (Map 3). Bridge foundations and causeways were built across Dona Bay and Roberts Bay, in 1912 for the railroad extension from Fruitville Junction to Venice and in 1921 when the Tamiami Trail (U.S. 41) was extended through Venice. This highway was four-laned in the 1950s, and the causeways were further widened. These structures obstruct natural freshwater discharge from Shakett and Curry Creeks and restrict saltwater inputs from the Gulf of Mexico.



Note: Depths are shown to the nearest foot; bathymetry for the 1883 and 1913 maps is relative to mean low water

Map 2.

Waterway and Waterfront Changes from 1883 to 1996 between the Albee Bridge and Venice Inlet

Photo 4.
Aerial view south
of Venice Inlet,
around 1940,
showing spoil
placement on
Turner Key from
ICW dredging of
original channel

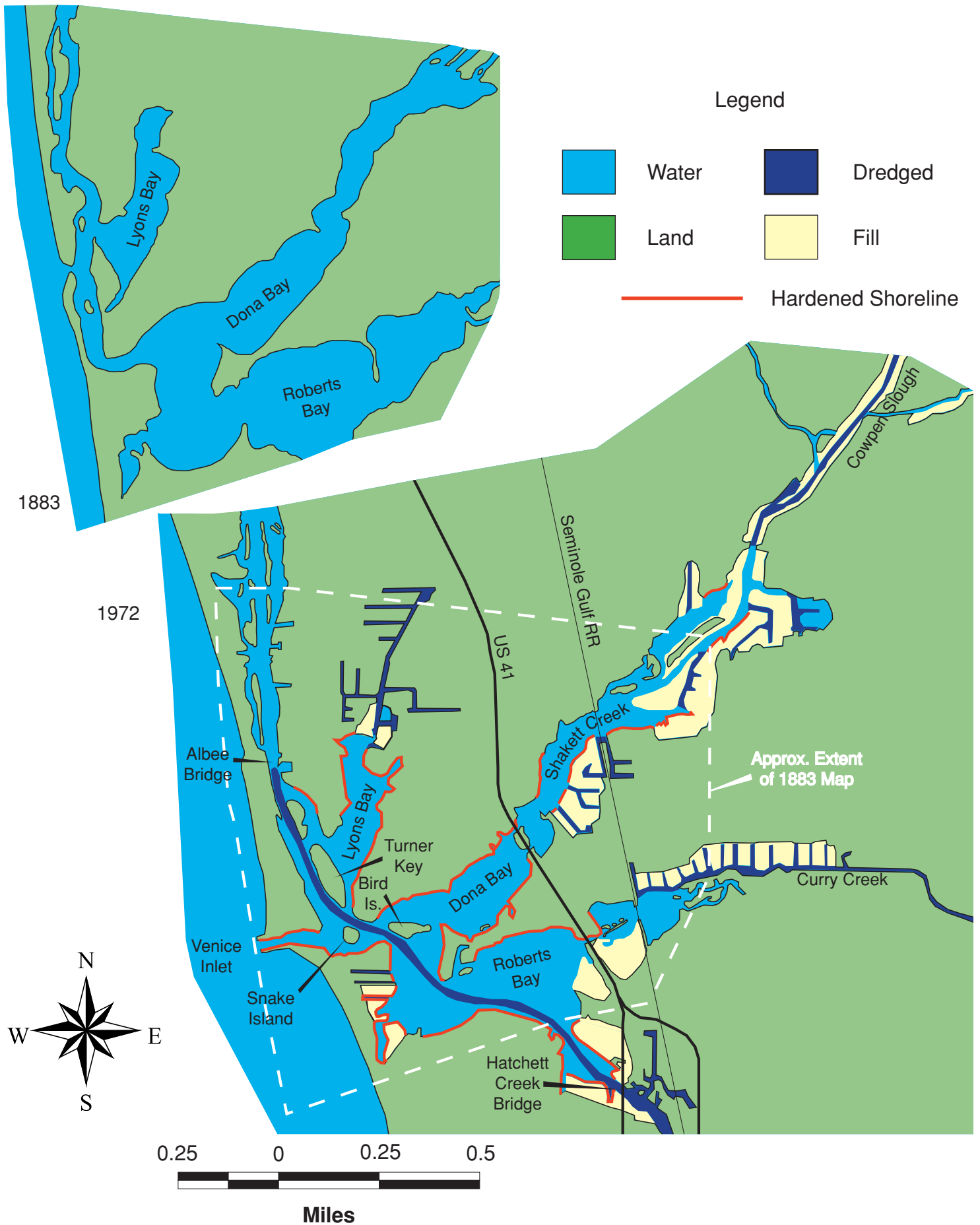
- A. Turner Key
- B. Bay Point
- C. Pelican Cove
- D. Bird Island
- E. Original ICW
Channel
- F. Venice Inlet
- G. Venice



Photo 5.
Aerial view south
of Venice Inlet,
around 1990,
showing new and
original (relict)
ICW channel

- A. Turner Key
- B. Bay Point
- C. Pelican Cove
- D. Bird Island
- E. Original ICW
Channel
- F. Venice Inlet
- G. Venice
- H. Present ICW
Channel
- I. Snake Island





Map 3.
 Shoreline Changes from 1883 to 1972 between the Albee Bridge
 and Hatchett Creek Bridge, Venice

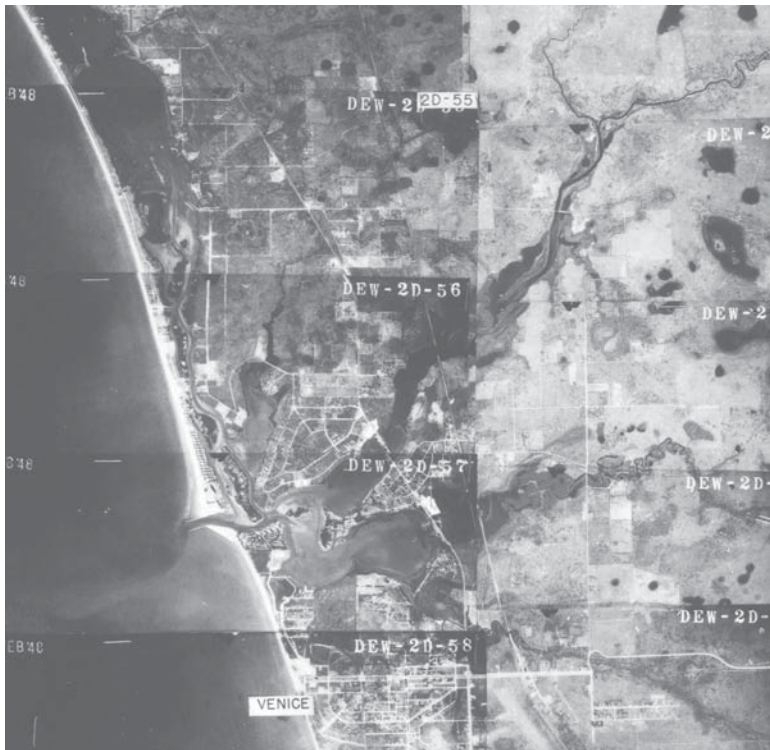


Photo 6.
Black-and-white aerial photo mosaic of Venice showing
1948 land use



Photo 7.
Color infrared aerial orthophotographs of Venice showing
1995 land use

The shoreline in 1948 was almost pristine, with only a few homes or farms found along the waterfront (Photo 6). Significant land-use changes occurred along the bays and creeks in the 1950s and 1960s. Mangroves and other filtering, biologically active waterfront fringe plants were replaced by seawalls and other manmade structures; residential canals and waterfront homesites replaced marshes, while shallow estuarine areas were dredged to provide landfill for waterfront parcels. By the early 1960s almost the entire shoreline of the estuary had been seawalled between the Albee Bridge and Hatchett Creek Bridge (Map 3). Most waterfront homes in the area were built by 1970. During the 1960s the Venice population doubled from 3,444 to 6,648; since then, the city has grown to 18,500 and the uplands have undergone intense urbanization (Photo 7).

Epilogue

Venice represents the extreme case of altering land and water for coastal development within the 55-mile reach of the Sarasota Bay system. More than 80 percent of the bay water area has changed in the area between the Albee and Hatchett Creek bridges — either by shoaling or deepening by nature or humans — within the past century (see *Historical Development of the Gulf Intracoastal Waterway*).

These changes were caused by the desire to reclaim uplands and control drainage during the wet season as well as by a desire to provide navigable waterways for commerce and recreation. The dike-and-ditch policies of private developers and public agencies (local, regional, state and federal) have had an effect on water quality in the estuary. Channelizing Cowpen Slough has doubled the carrying capacity of Shakett Creek and its freshwater discharge into Dona Bay. Had a similar project been carried out on Knight's Slough, with a connection to the Myakka River, comparable effects would be occurring today on Curry Creek and Roberts Bay.

Public-works projects such as road and waterway construction have changed the shape of the shoreline and the boating geography of the region.

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2. Published Government Reports

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_____, 1955, Little Sarasota and Blackburn Bays, Venice Inlet to Midnight Pass, Hydrographic (H), 1: 10,000 scale, Register No. 8154.

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6. Other Sources

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Numerous species of waterfowl are found throughout the Sarasota Bay area. Of note are cormorants, several species of herons and egrets, brown pelicans, ibises, ospreys, several varieties of gulls and terns, the bald eagle, wintering ducks, wood stork, roseate spoonbill, and the endangered scrub jay, to name a few.

