UFL/COEL-87/018

FLORIDA'S WEST COAST INLETS

SHORELINE EFFECTS AND RECOMMENDED ACTION

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December, 1987

Submitted To:

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Department of Natural Resources

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REPORT DOCUMENTATION PAGE

1. Report No.	2.	3. Recipient's Accession No.

4. Title and Subtitle	5. Report Date
Florida's West Coast Inlets Shoreline Effects and Recommended Action	December 1987 6.
7. Author(s) R. G. Dean M. P. O'Brien	8. Performing Organization Report No. UFL/COEL-87-018
9. Performing Organization Name and Address Coastal and Oceanographic Engineering Department University of Florida 336 Weil Hall Gainesville, FL 32611	10. Project/Task/Work Unit No. 11. Contract or Grant No. C4348
12. Sponsoring Organization Name and Address Division of Beaches and Shores Department of Natural Resources 3900 Commonwealth Boulevard Tallahassee, FL 32399	13. Type of Report Final 14.

15. Supplementary Notes

16. Abstract

This report responds to the 1986 Beaches Bill which, in recognition of the potential deleterious impact on Florida's beaches of inlets modified for navigation, mandated a study of those inlets with identification of recommended action to reduce the impacts. This report addresses West Coast inlets; East Coast inlets are the subject of a companion report.

There are 37 inlets along that portion of Florida's West Coast commencing from Pensacola Bay Entrance to Caxambas Pass at the south end of Marco Island. Compared to those on the East Coast, most West Coast inlets have not had the deleterious effects on the adjacent beaches, yet all modified inlets without proper management have the potential of impacting unfavorably on the adjacent shorelines. Moreover, at present there is interest in opening three West Coast entrances which either have been open in the past (Midnight Pass) or which have opened occasionally (Navarre Pass and Entrance to Phillips Lake).

A review of inlets in their natural condition demonstrates the presence of a shallow broad outer bar across which the longshore transport occurs. These shallow and shifting bar features were unsuitable for navigation which in many cases has led to the deepening of the channels and fixing with one or two jetty structures. Inlets

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17. Originator's Key Words	18. Availability Statement
Bypassing Entrances Inlets	

19. U. S. Security Classif. of the Report	20. U. S. Security Classif. of This Page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	100	

in this modified state along with inappropriate maintenance practices have the potential of placing great erosional stress along the adjacent beaches. Moreover, channel dredging can reduce wave sheltering of the shoreline by ebb tidal shoals and alter the equilibrium of the affected shoreline segments. The ultimate in poor sand management practice is the placement of good quality beach sand in water depths too great for the sand to reenter the longshore system under natural forces; depths of 12 ft. or less are considered appropriate for Florida in order to maintain the sand in the system.

With the interference of the nearshore sediment transport processes by inlets modified for navigation, if the adjacent beaches are to be stabilized there must be an active monitoring program with commitment to placement of dredged material of beach quality on shoreline segments of documented need. Several East Coast inlets have such transfer facilities; however, the quantities of sand transferred should be increased. Although an evolution and improvement in the technical capability to manage sand resources in the vicinity of inlets is expected, an adequate capability exists today and a concerted program should be made to commence a scheduled implementation of this capability at those entrances causing greatest erosional stress on the adjacent shorelines.

A brief summary review for each of the 37 West Coast inlets is presented including: a scaled aerial photograph, brief historical information, several items related to sediment losses at each inlet and special characteristics relevant to State responsibilities. For each inlet, where appropriate, the above information is utilized to develop a recommended action.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

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ACKNOWLEDGEMENTS

Much of the data presented in this report were assembled by Professor A. C. Hine, Mr. D. L. Mearns, Professor R. A. Davis, Jr. and Mr. M. Bland of the University of South Florida under contract with the Division of Beaches and Shores. That contract resulted in the University of South Florida report "Impact of Florida's Gulf Coast Inlets on the Coastal Sand Budget". Captain J. N. Marino, formerly of the University of Florida, participated in the early stages of the present study in organizing much of the data contained in the inlet summary forms. The contributions of Ms. Lethie Penquite of the Division of Beaches and Shores in assembling and preparing the photographs for the inlet summary forms is greatly appreciated. Ms. Cynthia Vey provided her usual expert manuscript preparation including typing and checking.

FLORIDA'S WEST COAST INLETS
SHORELINE EFFECTS AND RECOMMENDED ACTION

INTRODUCTION

At present, there are 37 inlets and channel entrances along Florida's West Coast between the Florida-Alabama boundary and the southern end of Marco Island. These inlets serve as navigational entrances and passageways for renewal of water to the bays and lagoons behind the barrier islands. Many of these inlets have been stabilized for navigational purposes by dredging and/or construction of jetties. In their natural state, due to shallow and shifting outer bars, most entrances were unsuited for the navigational roles they now provide. In some cases, the deepening of the channels, the construction of jetties for channel maintenance and the dredging to maintain channel depth have had severe deleterious effects on the adjacent shorelines. The effects are due primarily to the deprivation of the adjacent shorelines of the supply of sand received in their natural conditions. Clearly, if these entrances are to serve navigation without causing severe downdrift effects, the supply of sand that has been interrupted by these entrances must be reinstated. At present there is interest in opening three inlets on Florida's West Coast: Midnight Pass, Navarre Pass and the entrance to Phillips Lake. The purpose of this report is to provide a very brief historical review and assessment of the effects of West Coast entrances on the adjacent shorelines and based on the available information, to develop recommendations for remedial measures. This report is a companion document to the report "FLORIDA'S EAST COAST INLETS - SHORELINE EFFECTS AND RECOMMENDED ACTION".

WEST COAST INLETS IN THEIR NATURAL STATE

Under natural conditions, the West Coast inlets differed both in number and in character from those currently present. These entrances and their associated shoals achieved long-term equilibrium with the sandy transport processes.

The natural longshore sand transport quantities and directions along the West Coast are highly variable. In the Panhandle area, the transport is toward the west and fairly large in magnitude, on the order of 200,000 cubic yards per year. Along the South West Coast, in the vicinity of Venice, the

transport appears to be fairly consistently directed toward the south at approximately 70,000 cubic yards per year. Along the remainder of the West Coast, the transport is quite variable both in direction and magnitude and depends substantially on the orientation of the shoreline which can vary significantly. For example, Sand Key in Pinellas County is 14 miles long and extends from Johns Pass on the south to Clearwater Pass on the north. At the north end, the transport is to the north at approximately 70,000 cubic yards per year and at the south end, the transport is toward the south at about 50,000 cubic yards per year.

A feature which distinguishes portions of Florida's West Coast from the East Coast is the generally weaker waves. On the East Coast, these waves tend to limit more effectively the magnitudes and forms of the sand bodies jetted seaward by the ebb tidal currents at inlets. These sand bodies, called ebb tidal shoals, tend to be crescentic features in the presence of the higher waves on the East Coast and exhibit near-symmetry relative to the inlet axis. In the presence of the West Coast milder wave activity, these sand bodies achieve greater volumes and can be much more irregular in shape and variable in time, depending primarily on the tidal currents, the direction of sand transport and the stage of evolution of the ebb tidal shoal. These shoals can cause sheltering of adjacent island tips from wave action and thus act as sand traps, resulting in the accretion of the island tips and an associated erosion at the island centers, see Figure 1. In some cases the shoal will eventually be driven shoreward causing the shoreline to accrete initially and later erode. It is possible that under natural conditions, the cycle could result in a breakthrough and formation of a new, more efficient inlet near the island center, the closure of the two original inlets and then a long-term repetition of this cycle (Figure 1c). Longboat Key is an example of a barrier island which is eroding near the center with dominant shoals at Longboat Pass to the north and New Pass to the south. In some cases, the ebb tidal shoals can store tremendous quantities of sand. Dean and Walton (1975) have estimated that the Boca Grande Pass shoals contain in excess of 200 million cubic yards of sand.

In their natural state, inlets will achieve a long-term equilibrium with the natural sand supply and processes. This "equilibrium" may include fairly severe fluctuations of the shoreline as the ebb tidal shoals wax and wane or

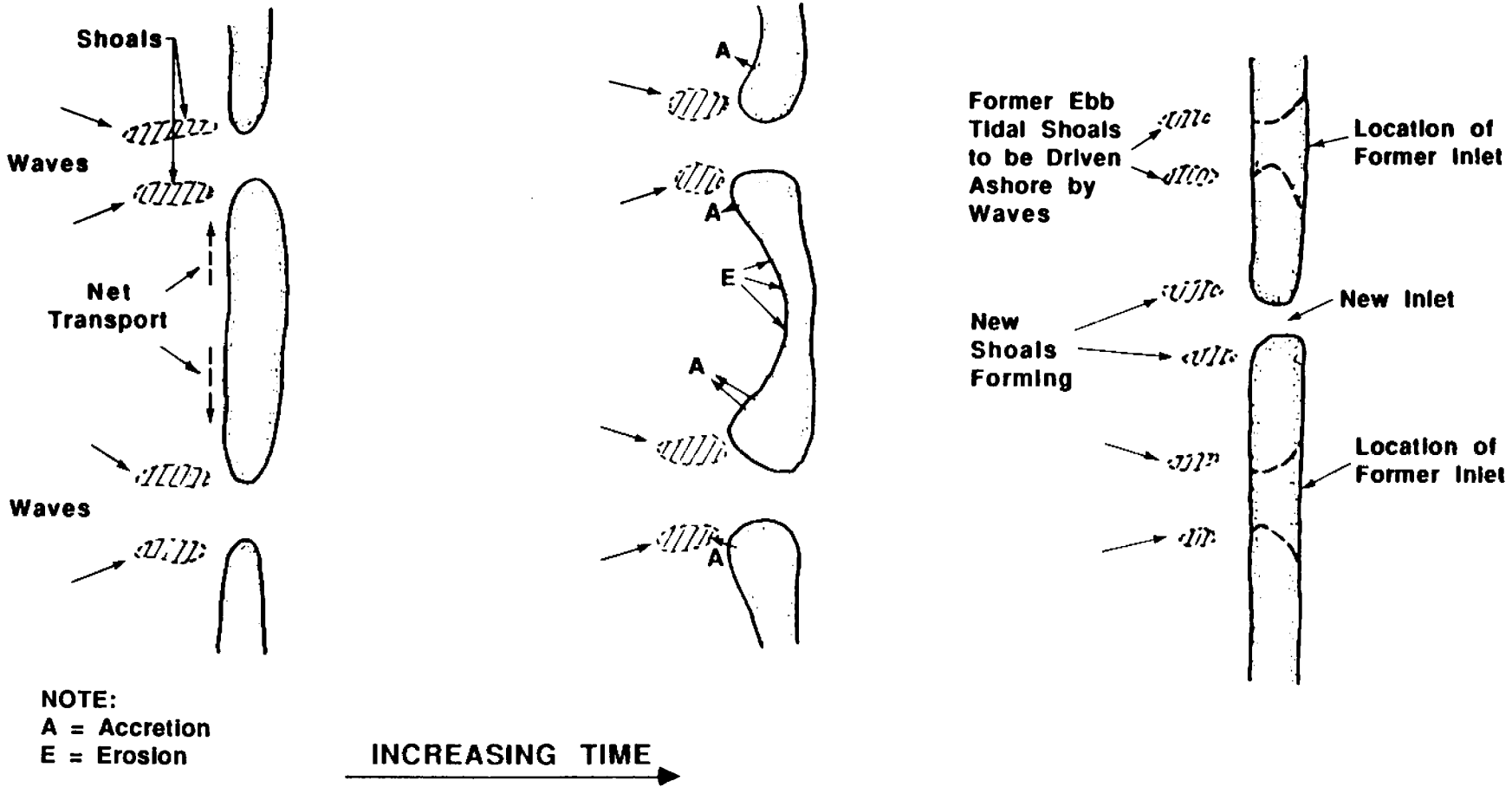


Figure 1. Effects of Ebb Tidal Shoals Causing Wave Sheltering, Accretion Adjacent to Inlets, Erosion Near Island Center and Possible Breakthrough. Low Wave Conditions.

as the channel migrates through the bar to achieve transfer of the longshore transport. The ocean bar, its connection to the adjacent shorelines and the adjacent shorelines have been termed by coastal geologists as a "sand sharing system". It is important to recognize that the form and geometry of this sand sharing system play a vital role in maintaining the continuity of longshore sand transport processes along the West Coast. In areas of substantial longshore sand transport, the broad shallow ocean bars function as "sand bridges" across which the sediment transport occurred from the updrift to downdrift beaches. The interference with or geometric modification of this sand sharing system, particularly the ebb tidal shoal, can cause substantial interruption of the sediment supply to the adjacent shorelines.

WEST COAST INLETS IN THEIR MODIFIED STATE

Entrances, constructed or modified for navigational purposes, differ from natural inlets in four respects: (1) the entrance channels are deeper, (2) jetties are generally present, (3) periodic dredging may be required to maintain the design channel depth, and (4) the channel alignment is fixed. The effects of each of these differences are discussed below. Dean (1987) presents a more detailed discussion of the effects of modified inlets on adjacent shorelines and recommended measures for improvement.

Deeper Entrance Channels

As noted previously, to accommodate the longshore sediment transport, inlets in their natural state included shallow ocean bars and these shallow, broad bars functioned as "bridges" for sediment transport around the inlets. Even if the net longshore sediment transport were non-existent (zero), the bar would exist and be part of the equilibrium sand sharing system. A dredged channel deeper than the natural shallow depth over the bar interrupts this system. The system responds by attempting to rebuild the bridge through deposition. If no attempts are made to maintain the channel depth, the channel will fill, approaching the natural depth after which the transport processes will resume. It is important to recognize that if a quantity of sediment is removed from the sand sharing system by dredging the navigational channel; and if the channel is allowed to fill, the fill volume will result in the adjacent beaches suffering a volumetric deficit consistent with that

required to fill the channel. In a more likely case, dredging is carried out to maintain the channel at the desired depth. If this dredged sediment is not reintroduced into the system at the proper location(s), erosion will occur at these locations. Particularly with respect to West Coast inlets, a deeper channel will result in less wave sheltering and thus greater wave attack on portions of the shoreline and associated erosion at these locations.

Effects of Jetties

The purposes of jetties at navigational entrances are twofold. First, the jetties are designed to prevent or reduce the amount of sand which would enter a channel, primarily in the more active nearshore region. Secondly, as the origin of the term suggests, jetties are intended to "jet" sand that would otherwise tend to be deposited within the region of natural sediment motion including the outer bar to water depths in excess of that desired for navigation. This explains the rule of thumb that jetties should be constructed out to the desired navigational depth. On shorelines with substantial longshore sediment transport magnitudes, jetties can cause adverse effects to the downdrift beaches simply by impounding sand which must be manifested as downdrift erosion. The aforementioned jetting of material an additional distance offshore such that it no longer is part of the sand sharing system results in a loss to the nearshore system in general and adjacent shorelines in particular.

Channel Maintenance Dredging

Sand dredged from navigational channels to maintain their depths, if not placed at the appropriate locations on the adjacent beaches, will cause a deficit of sediment to be manifested as erosion. In the simplest case of a unidirectional sediment transport and in which only the net transport enters the channel, obviously placement of the dredged material on the downdrift beaches is appropriate. In more realistic cases, the proper placement location may be determined best by monitoring the adjacent shorelines to determine need. A modified inlet may result in the transport and deposition in an inlet channel of substantially greater quantities than the net longshore sediment transport. The legacy of offshore placement in deep water of large quantities of beach quality sand dredged from inlets has caused a serious

erosional stress on Florida's east and West Coast beaches. As shown in Tables I and II, recent records document that substantial amounts of West Coast entrance dredge material are still being placed in water too deep for return to and benefit of Florida's beaches. Table I summarizes the results for the period 1976-1986, for the four channels under the jurisdiction of the Mobile District of the Corps of Engineers. For the material disposition that can be accounted for, an average of 37% (192,400 yd^3/yr) has been placed in water too deep to return to the shoreline. Table II presents a similar summary for the eight West Coast entrances under the jurisdiction of the Jacksonville District of the Corps of Engineers. For the material disposition and quality that can be accounted for definitely, 33% (230,400 yd^3/yr) has been placed in water depths too great to return to shore. Although it is encouraging that substantial quantities of sand are being returned to the shoreline, the loss of more than an average of 400,000 cubic yards per year can still cause substantial shoreline erosion. To compensate for this loss through beach nourishment would cost in excess of $3,000,000 per year and it is doubtful if comparable quality sand could be located for this price. Tables I and II also demonstrate the need to better document the quality of material dredged and the placement locations.

Fixed Channel Alignment

Although the character of channel alignment differs for modified and natural channels, the fixed alignment per se is not responsible for adverse effects to adjacent shorelines. It is the previously discussed measures that are taken to maintain the alignment that cause these adverse shoreline effects.

Summary of Modified Channel Effects

In summary, there are two types of potential adverse effects that a modified channel entrance can have on adjacent beaches: (1) a distribution effect, i.e. accretion in one location and corresponding erosion in another, and (2) a net erosion. Jetty impoundment is an example of the former in which the volumetric increase of sand on the updrift side of the inlet is balanced (in volume) by a corresponding erosion on the downdrift side. In this case, there is no net loss of sand to the system. The offshore deposition of

TABLE I

SUMMARY OF ANNUALIZED (1976-1986) QUANTITIES AND PERCENTAGES
FOR PLACEMENT OF BEACH QUALITY SAND
(Federally Maintained West Coast Inlets: Pensacola-Carrabelle)

Inlet	Amount Dredged (yd^3/yr)	Amount Placed on Beach/Upland (yd^3/yr)	Amount Placed Offshore (yd^3/yr)	Depth of Placement (ft.)
Pensacola Channel	373,700	218,200 (0%)	155,500 (100%)	30+
East Pass[1] (Destin)	86,100	19,700 (23%)	9,200 (11%)	30+
St. Andrews Bay	78,000	50,300 (64%)	27,700 (36%)	30+
Sikes Cut[2]	35,700	35,700 (100%)	0 (0%)	-
Totals[3]	572,800	323,900 (63%)[4]	192,400 (37%)	

REMARKS: [1]57,700 yd^3/yr have disposal areas which are unaccounted for.

[2]Records indicate material has been placed in erosional areas at landward ends of jetties.

[3]Data taken from "Impact of Florida's Gulf Coast Inlets on the Coastal Sand Budget," Hine et al., 1986.

[4]Percentages based on quantities placed in known areas, i.e. a total of 516,300 cubic yards per year.

TABLE II

SUMMARY OF ANNUALIZED (1980-1985) QUANTITIES AND PERCENTAGES
FOR PLACEMENT OF BEACH QUALITY SAND
(Federally Maintained West Coast Inlets: Hurricane-Caxambas)

Inlet	Amount Dredged (yd^3/yr)	Amount Placed on Beach/Upland (yd^3/yr)	Amount Placed Offshore (yd^3/yr)	Depth of Placement (ft.)
Johns Pass	38,500	38,500 (100%)	0 (0%)	-
Blind Pass (Pinellas)	141,700	141,700 (100%)	0 (0%)	-
Tampa Harbor[1]	2,489,000	0 (0%)	2,489,000 (100%)	16-19
Longboat Pass	55,000	55,000 (100%)	0 (0%)	-
New Pass (Sarasota)	71,700	71,700 (100%)	0 (0%)	-
Boca Grande (Charlotte Harbor)	266,400	36,000 (14%)	230,400 (86%)	40
San Carlos Bay (Ft. Myers Beach)	56,200	56,200 (100%)	0 (0%)	-
Gordon Pass	72,600	72,600 (100%)	0 (0%)	-
Totals[2,3]	3,191,100	471,700 (15%)	2,719,400 (85%)	

REMARKS: [1]Average of 6,261,700 yd^3/yr of sand, shell and silts were dredged, 3,772,700 yd^3/yr of that was disposed of within Tampa Bay. Percentage of sand vs silt in remaining 2,489,000 yd^3/yr is unknown.

[2]Data taken from COE Jacksonville District, 2 May 86, printout.

[3]Totals exclusive of Tampa: 702,100 yd^3/yr; 471,700 yd^3/yr (67%); 230,400 yd^3/yr (33%).

dredged sand or the jetting of sand to water depths greater than those of the sand sharing system will result in a net and permanent loss to the nearshore system. Although both of these types of effects are serious, the net loss of sand to the nearshore system is more detrimental and will appear as a net erosion of the shoreline.

A COMMENT ON SAND MANAGEMENT CAPABILITIES AND PRESENT EFFORTS

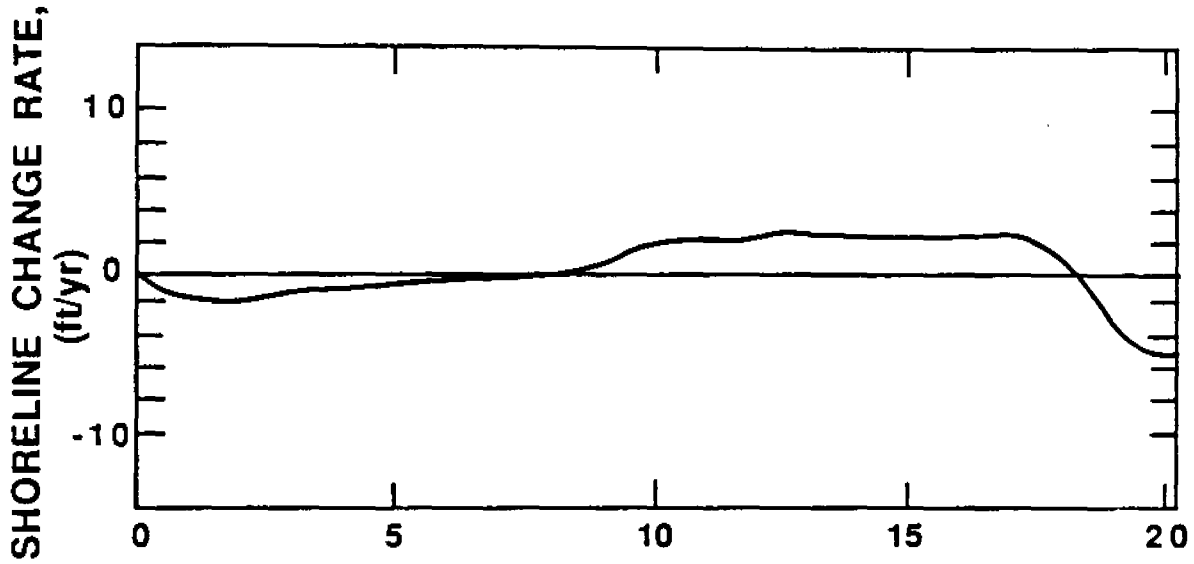
From the preceding discussion, it is clear that generally improved sand management practices will be required at entrances if the adverse effects on adjacent shorelines are to be reduced. Undoubtedly, considerable innovation must be accomplished to minimize costs and maximize future efficiency. The need for development of improved capabilities should not serve as a reason to delay implementation of needed management practices as both the need and an adequate (albeit imperfect) capability exist.

There are no established continuous programs of sand bypassing on Florida's West Coast similar to those on the East Coast. The two entrances causing greatest downdrift effects are the St. Andrews Bay Entrance Channel and Venice Inlet. For other modified entrances, monitoring of the adjacent shorelines should be conducted and beach quality sand derived from channel dredging should be placed on those shorelines where monitoring has documented the need. All beach quality material dredged should be returned to the active beach system.

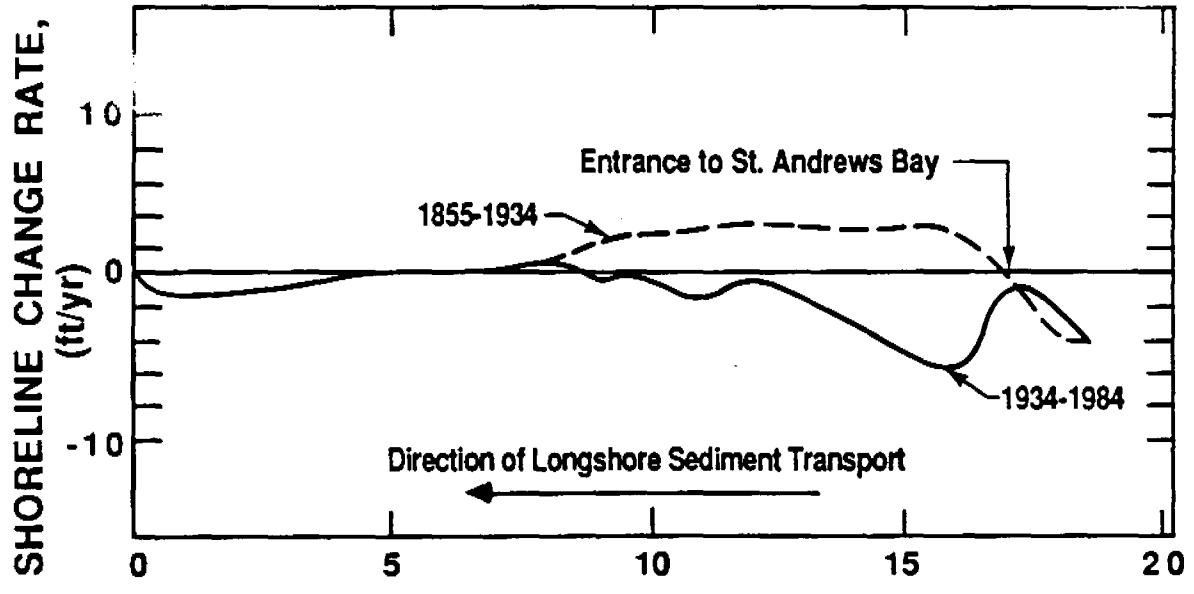
A CASE STUDY - ENTRANCE TO ST. ANDREWS BAY

This entrance is an example of very severe effects to the downdrift shoreline. Additionally the entrance is relatively young (constructed in 1934) and the shoreline impact has been documented rather completely.

The entrance to St. Andrews Bay is an artificial entrance and was cut and lined with two jetties in 1934. Prior to this time, navigation was through East Pass around the eastern end of the barrier island. Shoreline change data are available as presented in Figure 2 for the intervals 1855-1934 (79 years) before the entrance was cut and 1934-1984 (50 years) after the entrance was cut. Figure 2 presents the average shoreline change rates over a shoreline segment of approximately 20 miles. Prior to the entrance, portions of the shoreline were eroding; however, accretion was predominant with an average



a)Shoreline Change Rates Prior to Cutting Entrance to St. Andrews Bay, 1855-1934 (79 Years).



b)Comparison of Shoreline Change Rates Prior to Cutting Entrance to St. Andrews Bay, 1855-1934 (79 Years) and Subsequent to Cutting Entrance, 1934-1984 (50 Years).

Figure 2. Effect of Cutting Entrance to St. Andrews Bay in 1934 on Downdrift Shoreline (Shoreline Change Results Provided by J. H. Balsillie).

accretion rate of approximately 1 ft/yr. Immediately west (downdrift) of the entrance location, the shoreline was accreting at approximately 3 ft/yr. For the 20 year period after cutting the entrance, the erosion was dramatic downdrift of the entrance. The maximum erosion was approximately 7 ft/yr, tapering to the natural changes some nine miles west of the entrance. Erosion over this 50 year interval amounted to a maximum of 350 ft. in an area that was accreting prior to cutting of the entrance channel. Using conventional rules of thumb, the erosion depicted in Figure 2 is equivalent to 13 million cubic yards. Much of the material dredged from this entrance (9 million cubic yards) has been disposed of in deep water and an ebb tidal shoal of 2.8 million cubic yards has developed since the entrance was cut. Since 1972, some of the maintenance material has been placed on the downdrift (west) shoreline. It is believed that the large quantities of maintenance dredging required are due in part to the permeable jetties which allow sand to leak through from the adjacent beaches to the entrance channel. This possibility should be evaluated and if found to be significant, the jetties should be sand-tightened to prevent further losses. Also, all future dredging of beach quality sand should be placed on the downdrift shoreline.

INFORMATION AND RECOMMENDATION SUMMARY

This section presents for each inlet information and recommendations in a two-page summary form. The order of presentation of the inlets is from west to east to south commencing with Pensacola Bay Entrance to the west to Caxambas Pass at the south end of Marco Island. Figure 3 presents the locations of the 37 West Coast entrances summarized in this report. The items presented for each entrance and some background as to their relevance is discussed briefly below.

Photograph - A scaled aerial photograph is presented to illustrate the character of the inlet including modifications if present. In some cases, the relative effects of the entrance on the downdrift and updrift shorelines are evident.

Brief Historical Information - Provides background, including whether inlet is natural or constructed and the timing of modifications.

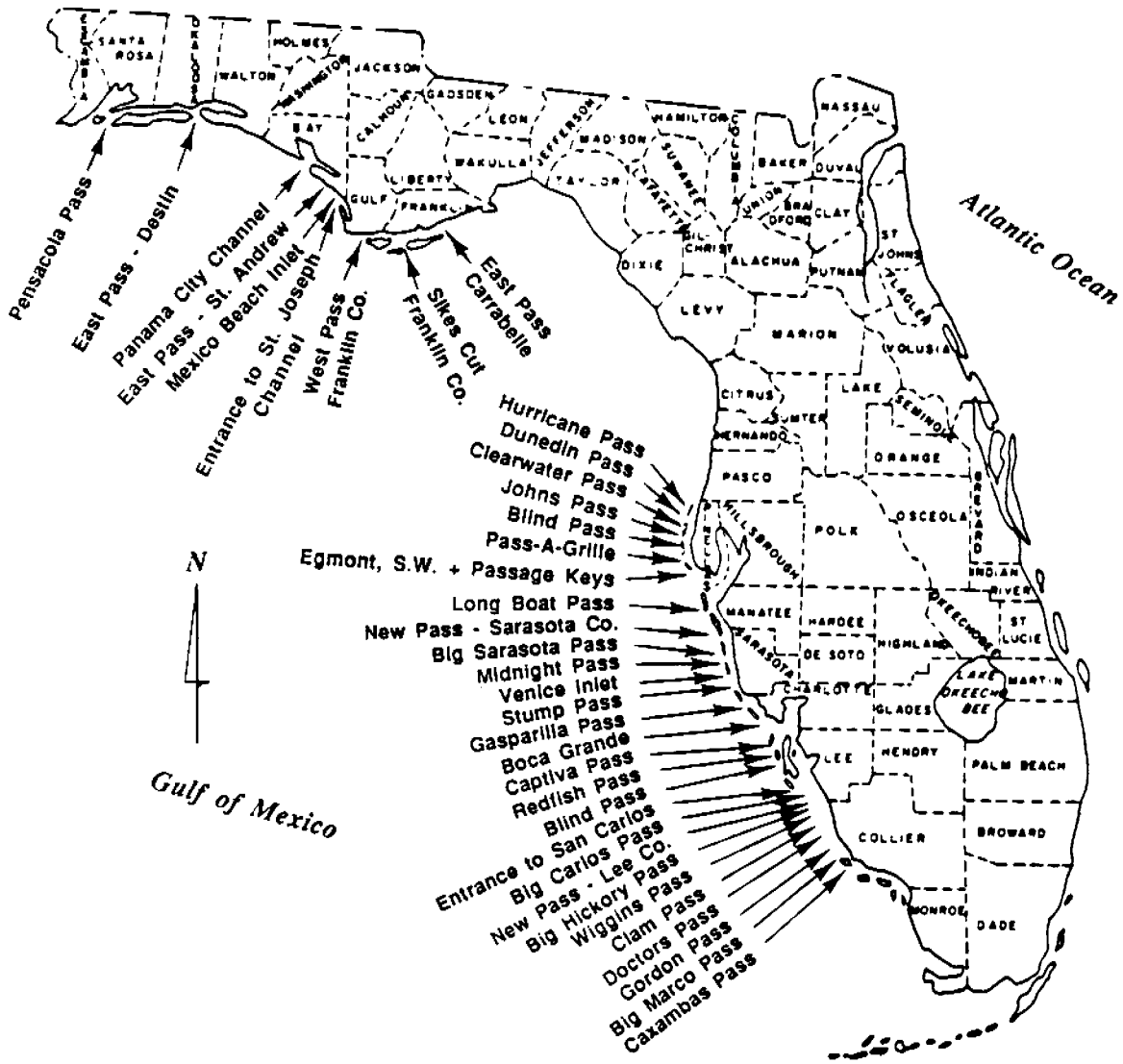


Figure 3. Locations of West Coast Inlets

Sediment Balance - Several items are presented relevant to adjacent shoreline stability. Increases in volumes of sand in the ebb tidal shoal generally represent good quality sand removed from the beach system and in most cases sand suitable for shoreline nourishment.

Net littoral transport rates provide a measure of the net amount of sand moving under natural action along the shoreline. Where inlet modifications have altered the system through channel deepening, jetty construction, etc. to a degree that natural transport is interrupted, it is this quantity that must be transferred by engineering measures to ensure stability of the downdrift shoreline. The estimates of net longshore sediment transport indicated "Walton" were developed by T. L. Walton (1973) based on observations of wave characteristics made by ships at sea.

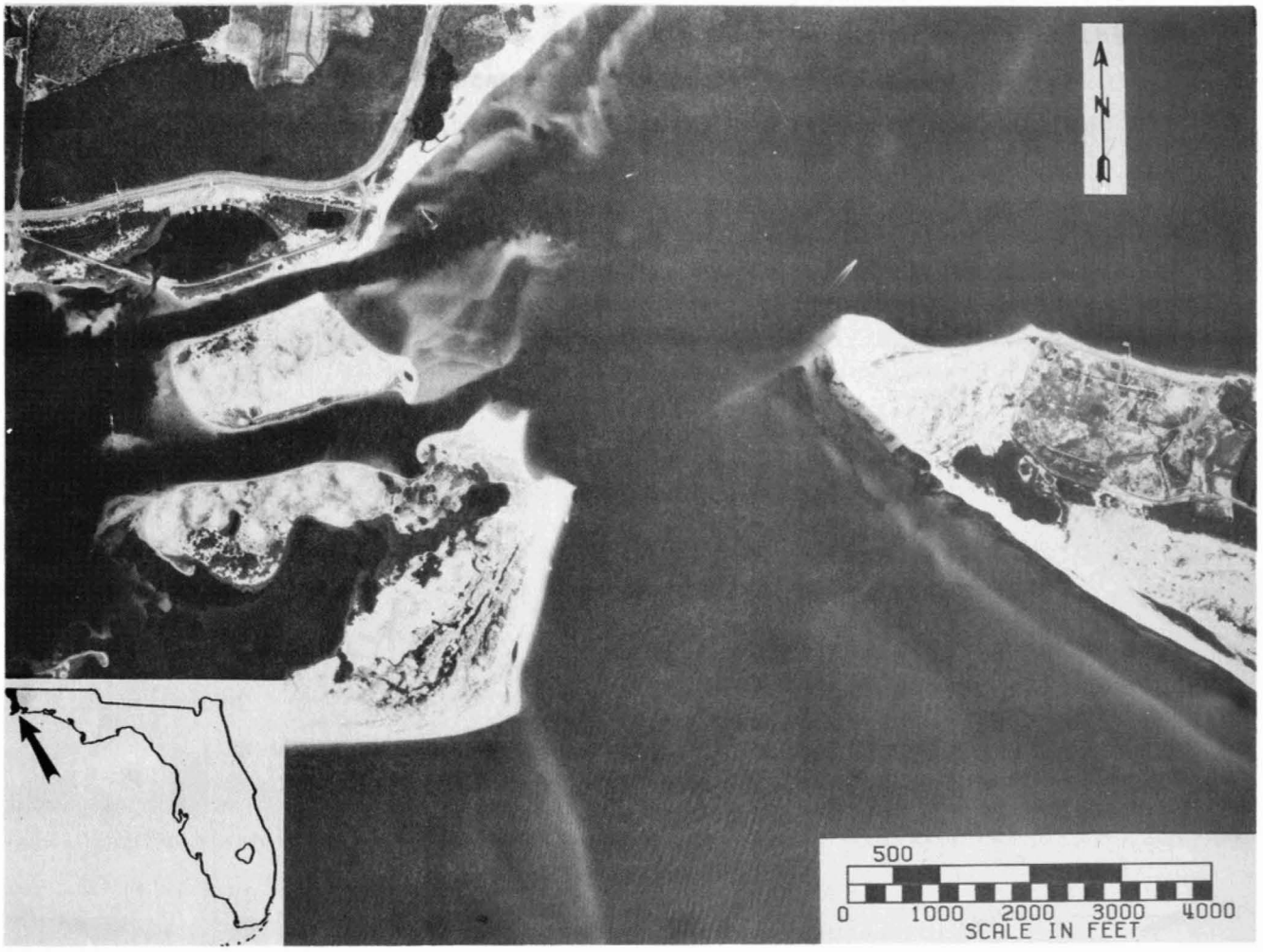
Shoreline volume changes provide a measure of the impact of the entrance on the adjacent shoreline. The usual pattern in areas of large net longshore sediment transport is accretion updrift of the entrance and erosion of the downdrift shorelines. However, if the updrift jetties allow sand to drift through them, it is possible that the updrift shorelines will accrete at lower rates than the net longshore transport, or in the limiting case, erosion of the updrift shorelines can occur.

Brief Dredging History - Provides information relevant to adjacent shoreline impact. In particular good quality sand disposed in deep water usually represents sand from the longshore transport system and therefore will result, on a per unit volume basis, in erosion of the adjacent shoreline(s).

Special Characteristics Relevant to the State Responsibilities - Identifies those technical, operational or jurisdictional features that are relevant to the State's responsibility to providing maximum stability of the beach resource.

Recommended Action - All available information is synthesized into concise recommendations which are in accord with requirements of the 1986 Beaches Bill. Because of the importance of these recommendations, they are highlighted inside a rectangular enclosure.

PENSACOLA PASS



(Date of Photography: September 22, 1985)

Brief Historical Information

- Natural entrance.
- Federal navigation project since 1881.
- Channel 800 ft. wide and 37 ft. deep.
- Channel schedule to be deepened to 48 ft. within next two years.

PENSACOLA PASS

Sediment Balance

Ebb shoal:

1984 Caucus shoal	12 million cubic yards
Middle ground	3.7 million cubic yards
East bank	2.4 million cubic yards

Net littoral transport rate:

240,000 cubic yards per year (Westward)
300,000 cubic yards per year (Westward-Walton)

Shoreline volume changes, 1877-1984:

+4.3 million cubic yards over 1,750 ft. east of inlet
+1.7 million cubic yards over 1,000 ft. west of inlet

Brief Dredging History

Total dredged volume, 1883-1985:	35.6 million cubic yards
Dumped at sea	28.7 million cubic yards
Placed on beach or upland (Santa Rosa Island)	6.9 million cubic yards
Maintenance dredging 1976-1985	
Amount dredged	4.1 million cubic yards
Placed on Perdido Key	2.4 million cubic yards

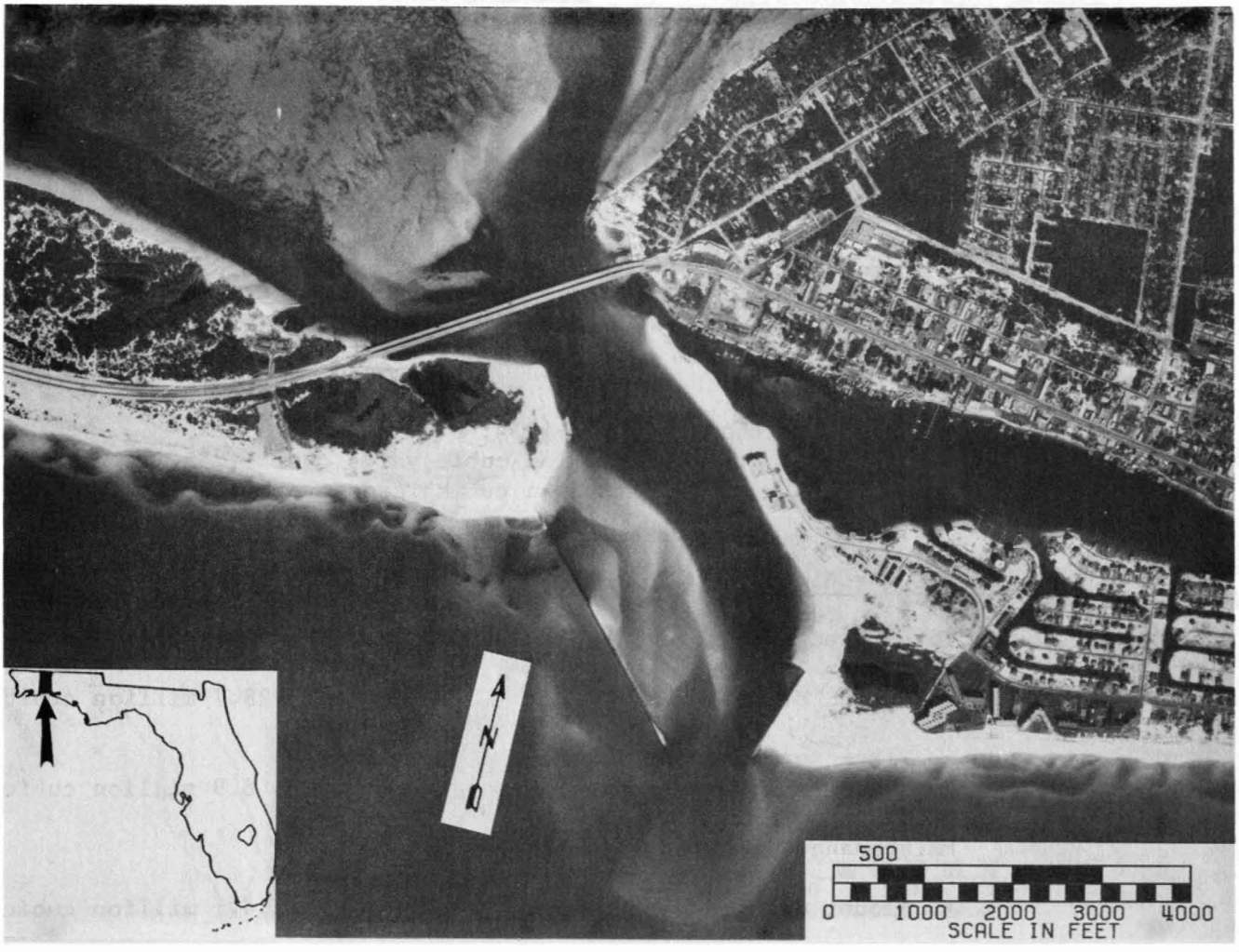
Special Considerations Relevant to State Responsibilities

- In conjunction with designation of Pensacola Bay as homeport for the aircraft carrier, Kitty Hawk, construction excavation of more than 6 million cubic yards of beach quality sand is planned within the next two years.

Recommended Action

- Monitor beaches east (Santa Rosa Island) and west (Perdido Key) to determine effects of dredging at Pensacola Pass.
- Place as much beach quality sand available from construction and maintenance dredging on Santa Rosa Island and Perdido Key as required to maintain beaches there.

EAST PASS (DESTIN HARBOR)



(Date of Photography: February 8, 1985)

Brief Historical Information

- Breach through eastern end of Santa Rosa Island formed new East Pass in 1928.
- Old East Pass closed naturally in 1938.
- Twin jetties completed in 1969.

EAST PASS (DESTIN HARBOR)

Sediment Balance

Ebb shoal: 1877-1984 +8.2 million cubic yards

Flood shoal: 1905-1984 18.3 million cubic yards

Net littoral transport rate:
270,000 cubic yards per year (Westward-Walton)

Shoreline volume changes, 1877-1981:
+1.74 million cubic yards over 6,700 ft. east of inlet
-8.54 million cubic yards over 14,200 ft. west of inlet

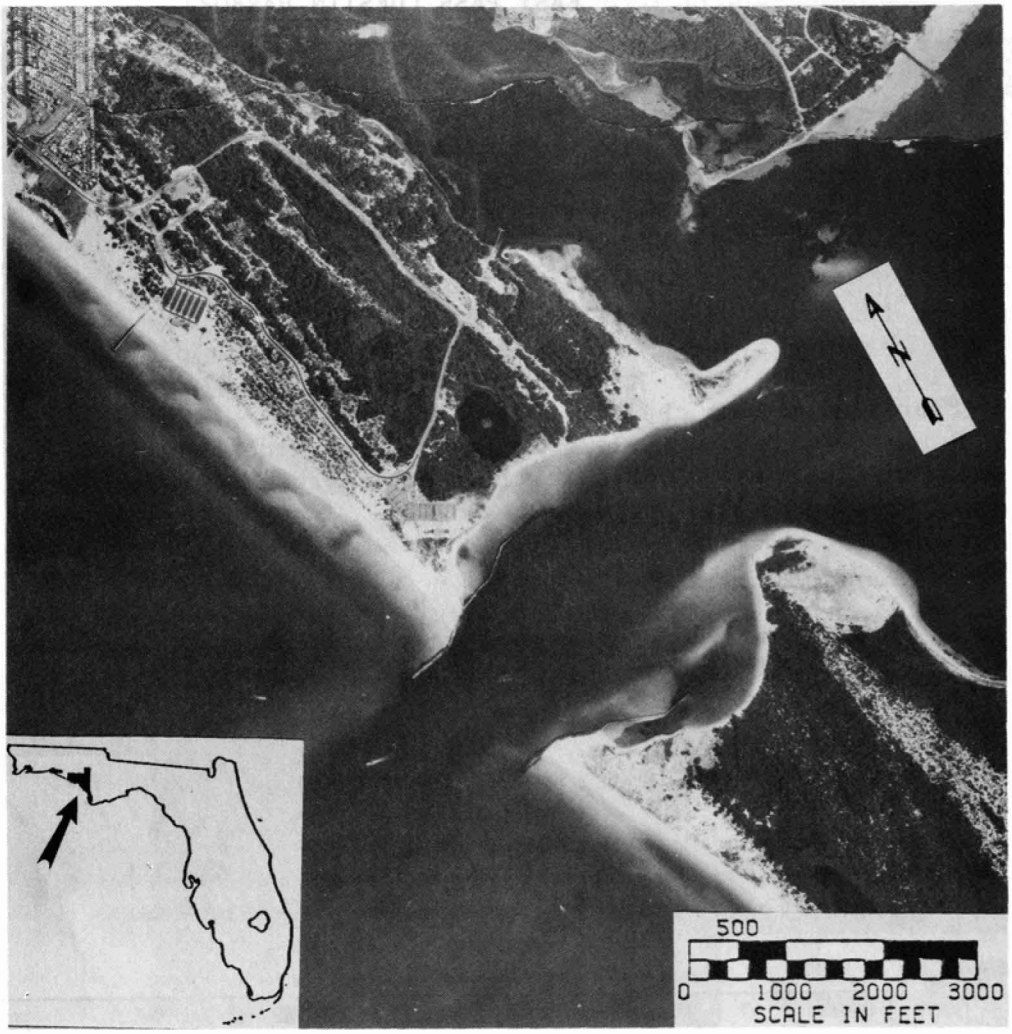
Brief Dredging History

- From 1931-1984, total dredged volume: 4.4 million cubic yards of which 2.1 million cubic yards were placed nearshore and 1.3 million cubic yards were used for dike construction or placed on beach.

Recommended Action

- Place dredged material on the west beach (Santa Rosa Island).

ST. ANDREWS BAY ENTRANCE CHANNEL (PANAMA CITY)



(Date of Photography: September 23, 1983)

Brief Historical Information

- Entrance dredged in 1934.
- Two jetties constructed in 1934.
- Present channel authorized to 42 ft. depth.

Sediment Balance

Ebb shoal: 1882-1983 — 2.8 million cubic yards

Net littoral transport rates:
110,000 cubic yards per year (Westward-Walton)

Shoreline volume changes:
1882-1983: +1.1 million cubic yards over 5,400 ft. east of inlet
1934-1984: -13 million cubic yards over 10 miles west of inlet

ST. ANDREWS BAY ENTRANCE CHANNEL (PANAMA CITY)

Brief Dredging History

- Since entrance construction, in 1934, in excess of 9 million cubic yards of maintenance dredging material has been disposed of in deep water (42 ft.). An additional 3.8 million cubic yards has been placed on the beaches.

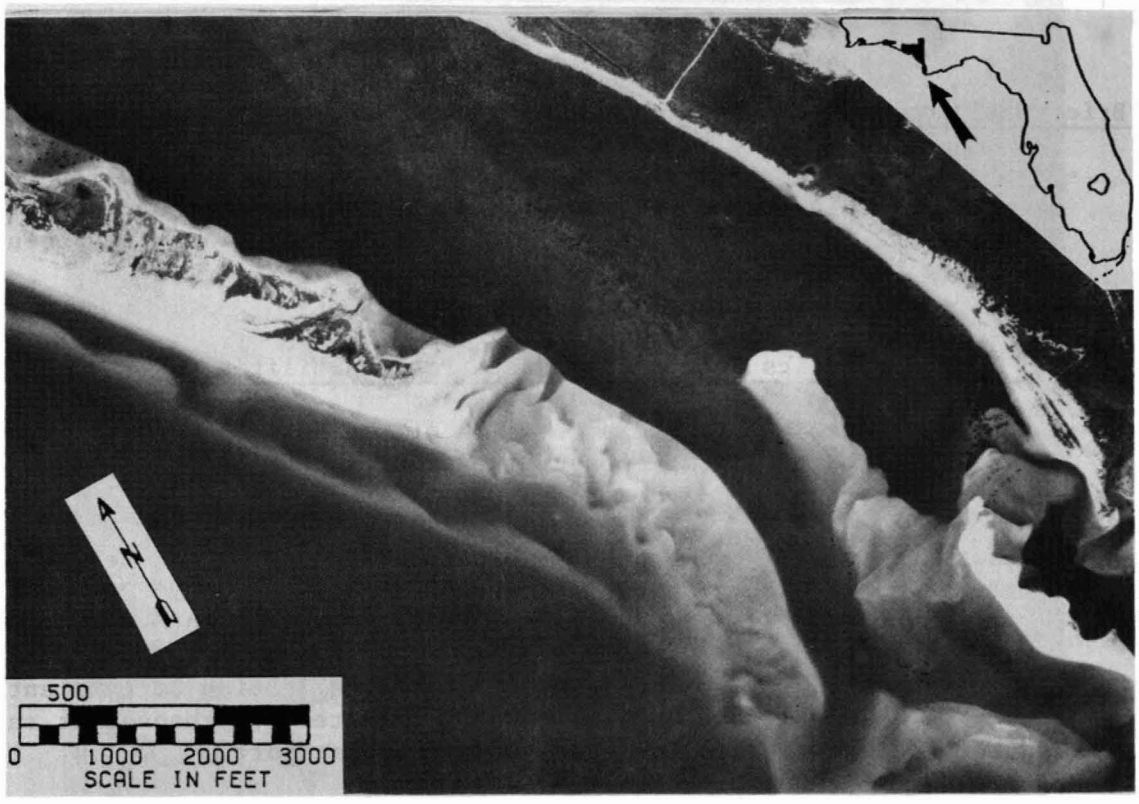
Special Characteristics Relevant to State Responsibilities

- This entrance has caused an erosion of the downdrift (west) shoreline of approximately 13 million cubic yards, extending some eleven miles to the west.
- Starting in 1972, some of the maintenance dredging has been placed on the downdrift shoreline. In the period 1976-1986, 128,000 cubic yards per year was dredged and all was placed on the beach.
- The available information suggests that the jetties at this entrance may be quite permeable allowing sand to enter the channel at rates greater than the net longshore sediment transport.

Recommended Action

- Evaluate whether the permeability of the jetties is detrimental to the stability of the adjacent beaches. If so, sand tighten jetties.
- Continue to place all maintenance dredging on the downdrift shoreline. The placement area should serve as a feeder beach to the downdrift shoreline.
- To partially compensate for the net loss of approximately 13 million cubic yards since inlet construction, develop plans to place at least 7 million cubic yards of sand at selected locations within the downdrift segment of approximately seven miles.

ST. ANDREWS BAY (EAST PASS)



(Date of Photography: September 23, 1983)

Brief Historical Information

- Natural inlet. First channel to St. Andrews Bay.
- Maintenance by Corps of Engineers discontinued, in 1934.

Sediment Balance

Ebb shoal:
1882 - 29.1 million cubic yards

Net littoral transport rate:
150,000 cubic yards per year (Westward-Walton)

Shoreline volume changes, 1882-1983:
+3.7 million cubic yards over 4,000 ft. west of inlet

Area in state of rapid change

ST. ANDREWS BAY (EAST PASS)

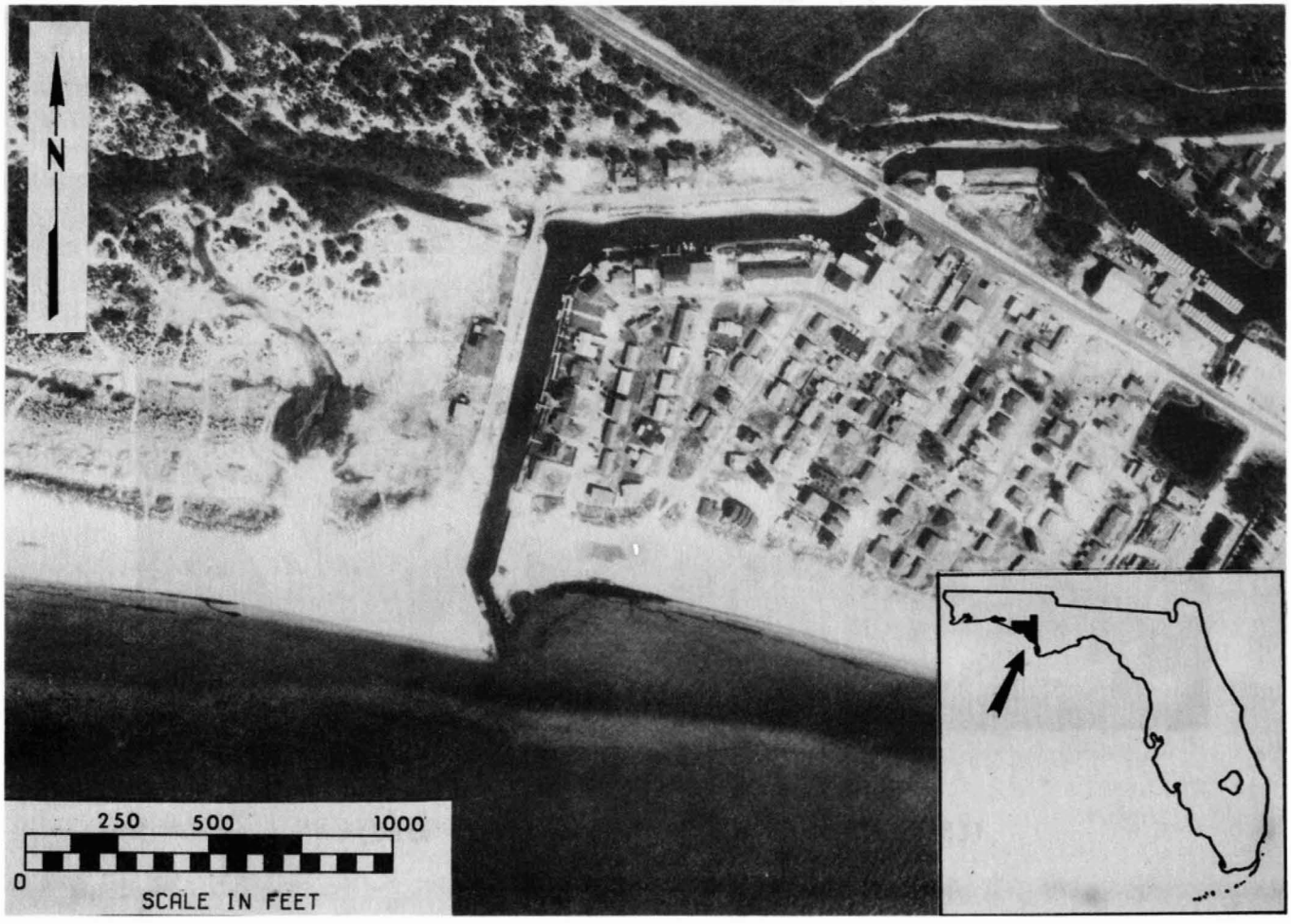
Brief Dredging History

- From 1911-1934, total dredged volume was 6.1 million cubic yards. Dredging dumped in open water.

Recommended Action

- If channel is dredged, place material on the west beach.

MEXICO BEACH INLET



(Date of Photography: October 20, 1986)

Brief Historical Information

- Originally a small creek draining a low marshy area.
- Stabilized with short jetties when interior lowland was developed into a canal system in the 1940's to 1950's.
- West jetty 150 ft. long, east jetty 130 ft. long.
- West jetty extends 100 ft. farther offshore than east jetty.
- Channel dimensions: 4 ft. deep by 60 ft. wide.

MEXICO BEACH INLET

Sediment Balance

Ebb shoal: Small

Flood shoal: Insignificant

Net littoral transport rates:
140,000 cubic yards per year (Eastward-Walton)

Shoreline volume changes:
Poorly documented, although a substantial erosional stress on the downdrift (eastern) beach is evident. Wind-blown sand over west jetty and bulkhead are substantial.

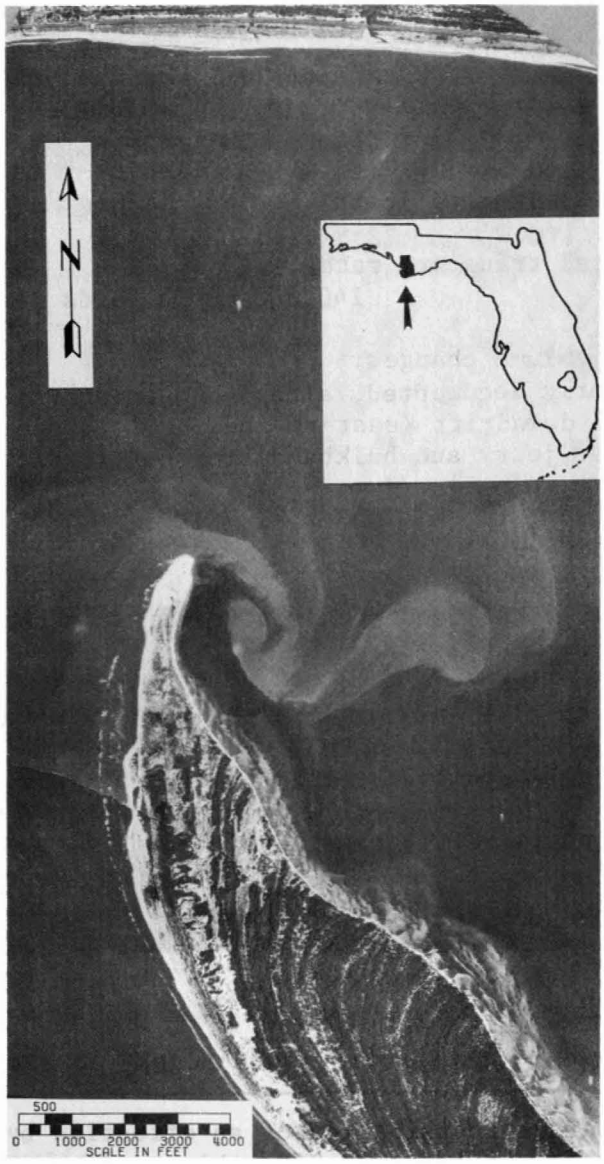
Brief Dredging History

- Sand transfer has been required to maintain channel navigable by small craft.
- From 1971 to 1975, a drag line was used to maintain channel open.
- From 1973-1974 and 1976, jet pump systems were used to bypass sand.
- Bypassed quantities by drag line and jet pump are not known.
- At present (1987), a small floating dredge is being used for bypassing.

Recommended Action

- Encourage installation of an effective bypassing system to transfer at least 40,000 cubic yards per year.

ENTRANCE CHANNEL TO ST. JOSEPH BAY (PORT ST. JOE)



(Date of Photography: November 21, 1983)

Brief Historical Information

- Federal navigation project authorized for channel 300 to 500 feet wide and 35 to 37 ft. deep, from St. Joseph Bay to Gulf plus a silting basin.

ENTRANCE CHANNEL TO ST. JOSEPH BAY (PORT ST. JOE)

Sediment Balance

Ebb shoal:
1984 - 145.0 million cubic yards

Net littoral transport rate:
175,000 cubic yards per year (Eastward-Walton)

Sediment transport locally variable due to the unusual configuration of its locality.

Shoreline volume changes, 1882-1984:
+13.4 million cubic yards over 4,500 ft. east of inlet

Point St. Joe has grown approximately 4,000 ft. in the period of study; involving 13 million cubic yards.

Brief Dredging History

- Approximately 12.4 million cubic yards have been dredged from this channel and silting basin.
- Until 1970, all material dredged was disposed in the Gulf. In 1970 and 1973, 1,150,000 cubic yards placed on Point St. Joe. In 1981, 332,000 cubic yards disposed in the bay.

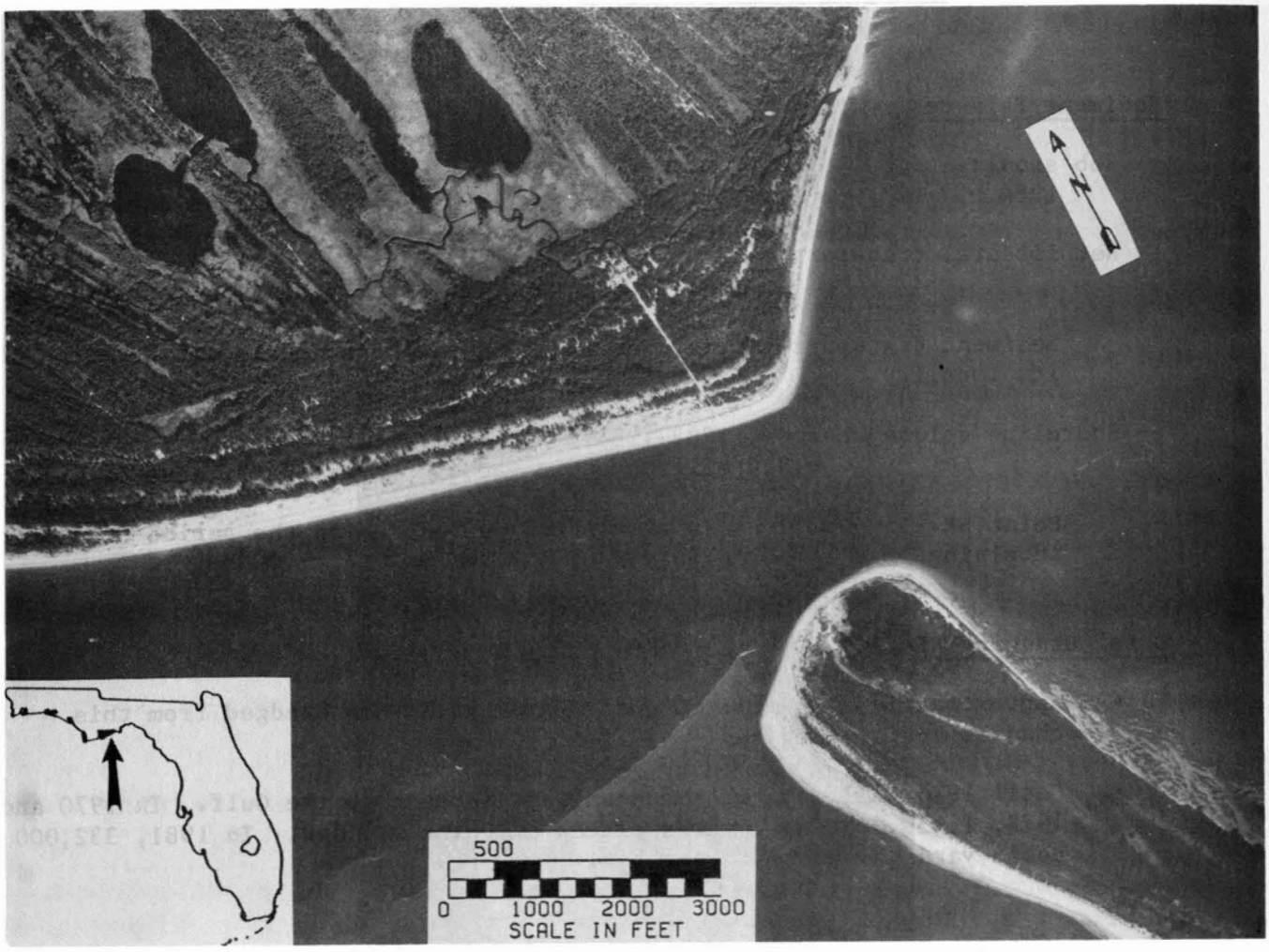
Special Characteristics Relevant to State Responsibilities

- A portion of the present channel runs very close to St. Joe Spit. Naturally this is one of the areas of greatest shoaling. Dredging and removal of this material increases erosion on St. Joe Spit.

Recommended Action

- Examine the possibility of relocating a portion of the navigational channel to the northeast to reduce erosion of St. Joe Spit.

WEST PASS



(Date of Photography: December 8, 1984)

Brief Historical Information

- Maintenance discontinued, Sikes Cut became the navigation channel in 1948.

Sediment Balance

Ebb shoal:
1984 - 62.0 million cubic yards

Net littoral transport rate:
115,000 cubic yards per year (Westward-Walton)

Shoreline volume changes, 1882-1984:
+0.8 million cubic yards over 1,000 ft. east of inlet
+0.7 million cubic yards over 1,500 ft. west of inlet

WEST PASS

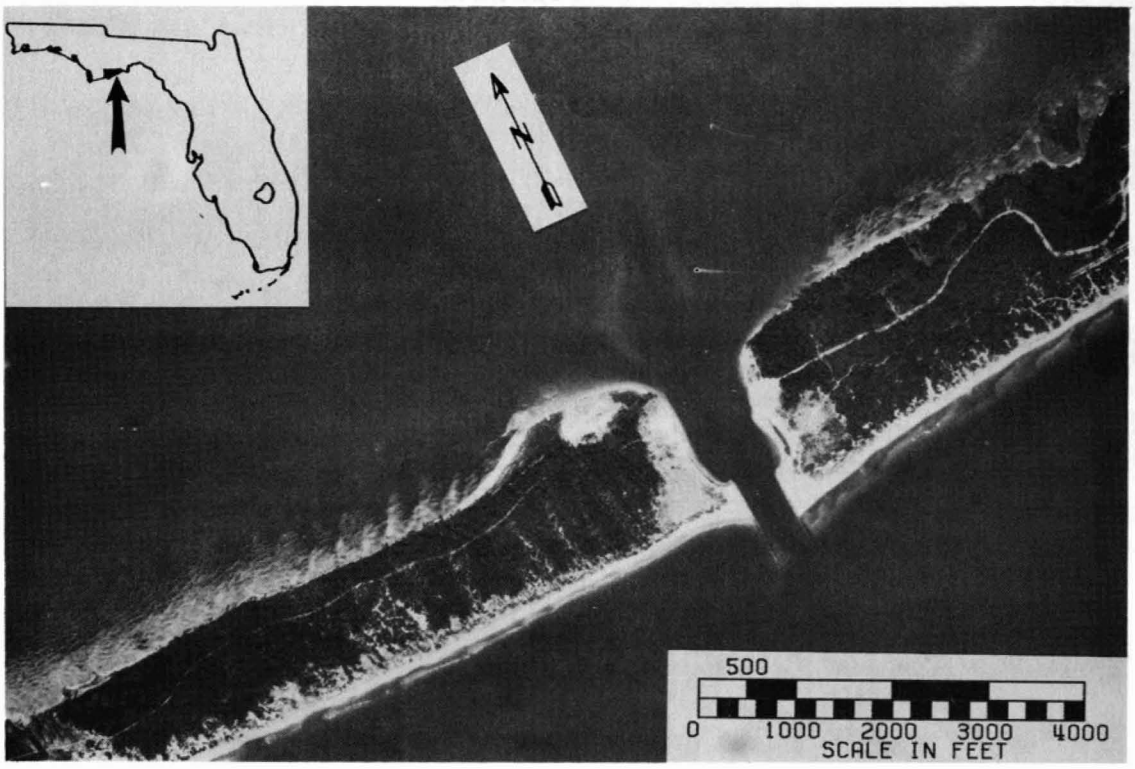
Brief Dredging History

- Between 1900 and 1948, 466,000 cubic yards dredged and disposed offshore.

Recommended Action

- If pass is dredged in future, place material on adjacent beaches.

SIKES CUT



(Date of Photography: December 8, 1984)

Brief Historical Information

- Channel cut through St. George Island by local interests, in 1954.
- Two jetties built by Corps of Engineers in 1956 to stabilize channel 200 ft. by 10 ft. in 1956.

Sediment Balance

Ebb shoal:
1970 - 0.6 million cubic yards

Net littoral transport rate:
175,000 cubic yards per year (Westward-Walton)

Shoreline volume changes, 1882-1980:
-0.1 million cubic yards over 1,800 ft. east of inlet

Brief Dredging History

- From 1956-1986, 885,000 cubic yards disposed in bay or Gulf, 393,000 to eroded areas at landward termini of jetties, none to beach.

SIKES CUT

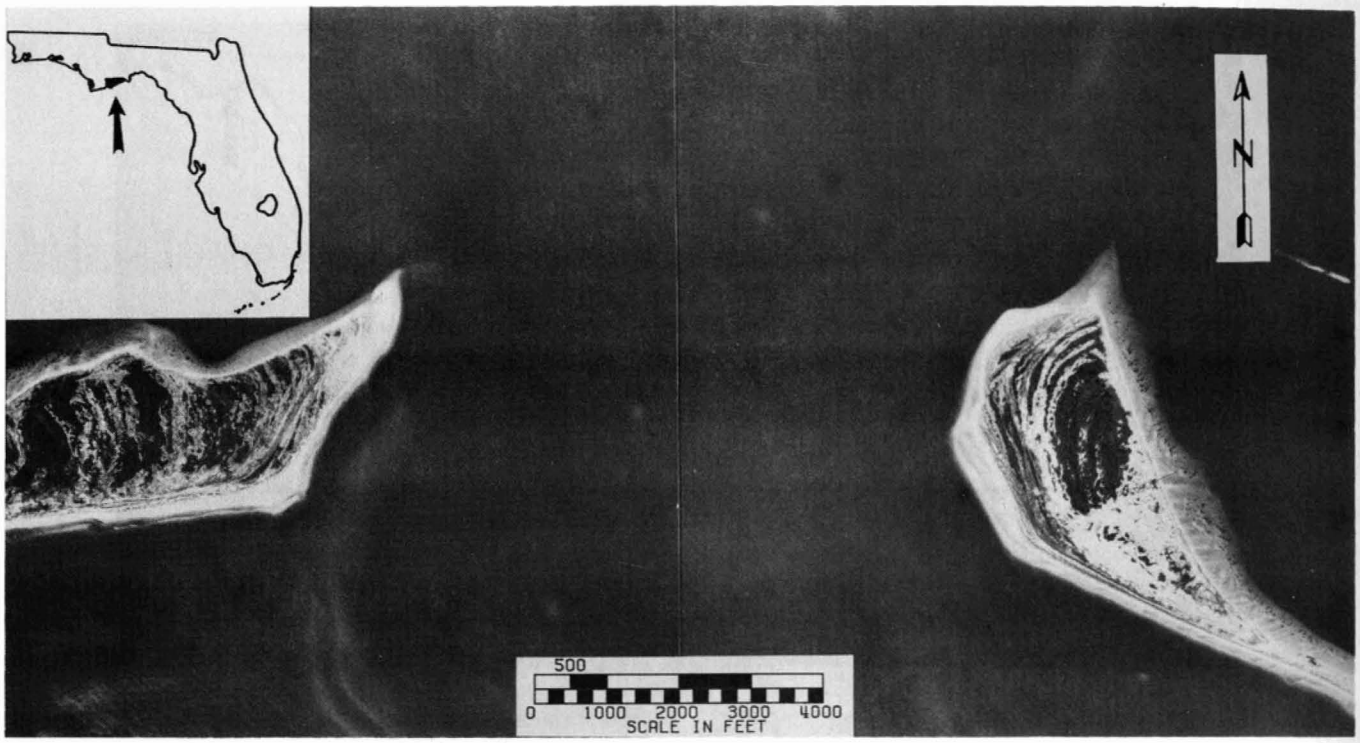
Special Characteristics Relevant to State Responsiblities

- State Park at west end of St. George Island.

Recommended Action

- Place all dredged material on west beach or at landward termini of jetties if needed to prevent flanking.

EAST PASS (CARRABELLE HARBOR)



(Date of Photography: December 7, 1984)

Brief Historical Information

- Natural inlet.
- Federal navigation project; channel dimensions: 200 ft. by 12 ft.

Sediment Balance

Ebb Shoal:
1984 - 42.1 million cubic yards

Net littoral transport rate:
175,000 cubic yards per year (Westward-Walton)

Shoreline volume changes, 1882-1984:
+3.9 million cubic yards over 3,500 ft. east of inlet
+6.0 million cubic yards over 7,500 ft. west of inlet

Brief Dredging History

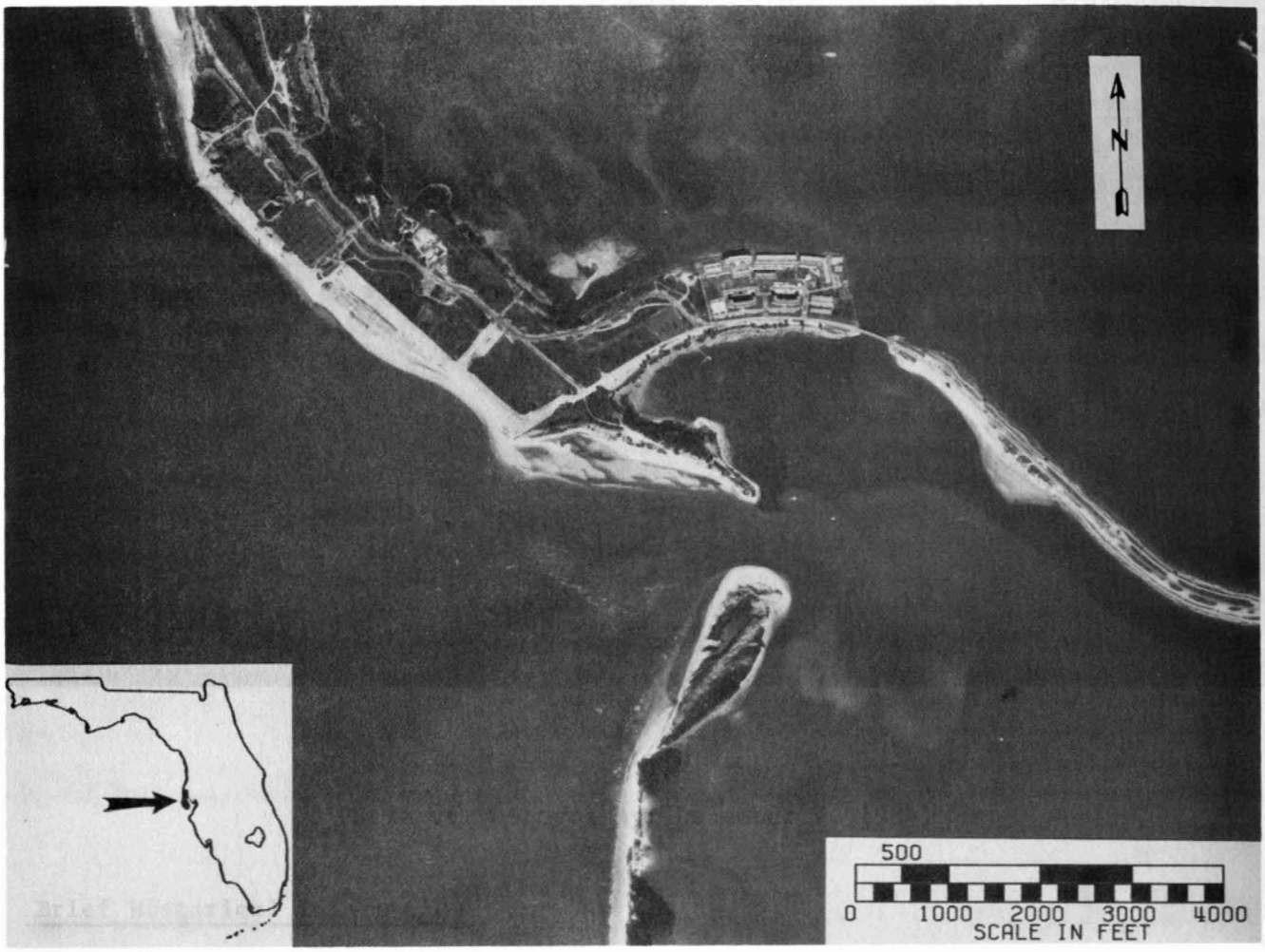
- From 1905 to 1963, one million cubic yards disposed offshore.

EAST PASS (CARRABELLE HARBOR)

Recommended Action

- If this channel is dredged, place spoil on the east beach.

HURRICANE PASS



(Date of Photography: February 7, 1984)

Brief Historical Information

- Pass breached by hurricane in 1921.
- Clearwater Causeway constructed between 1923-26.
- Honeymoon Causeway constructed between 1900-63.
- Dredging and filling began for Island Estates Development in 1958.
- In 1970, rip-rap placed on north side to stablize south end of Honeymoon Island.
- Pass not maintained federally or locally; channel: 1,800 ft. wide by 6 ft. deep.

HURRICANE PASS

Sediment Balance

Ebb shoal: 1984 - 0.1 million cubic yards

Flood shoal: 1926 - 2.6 million cubic yards

Net littoral transport rate:
75,000 cubic yards per year (Southward-Walton)

Brief Dredging History

- Total 1.14 million cubic yards, all placed on beach or upland.

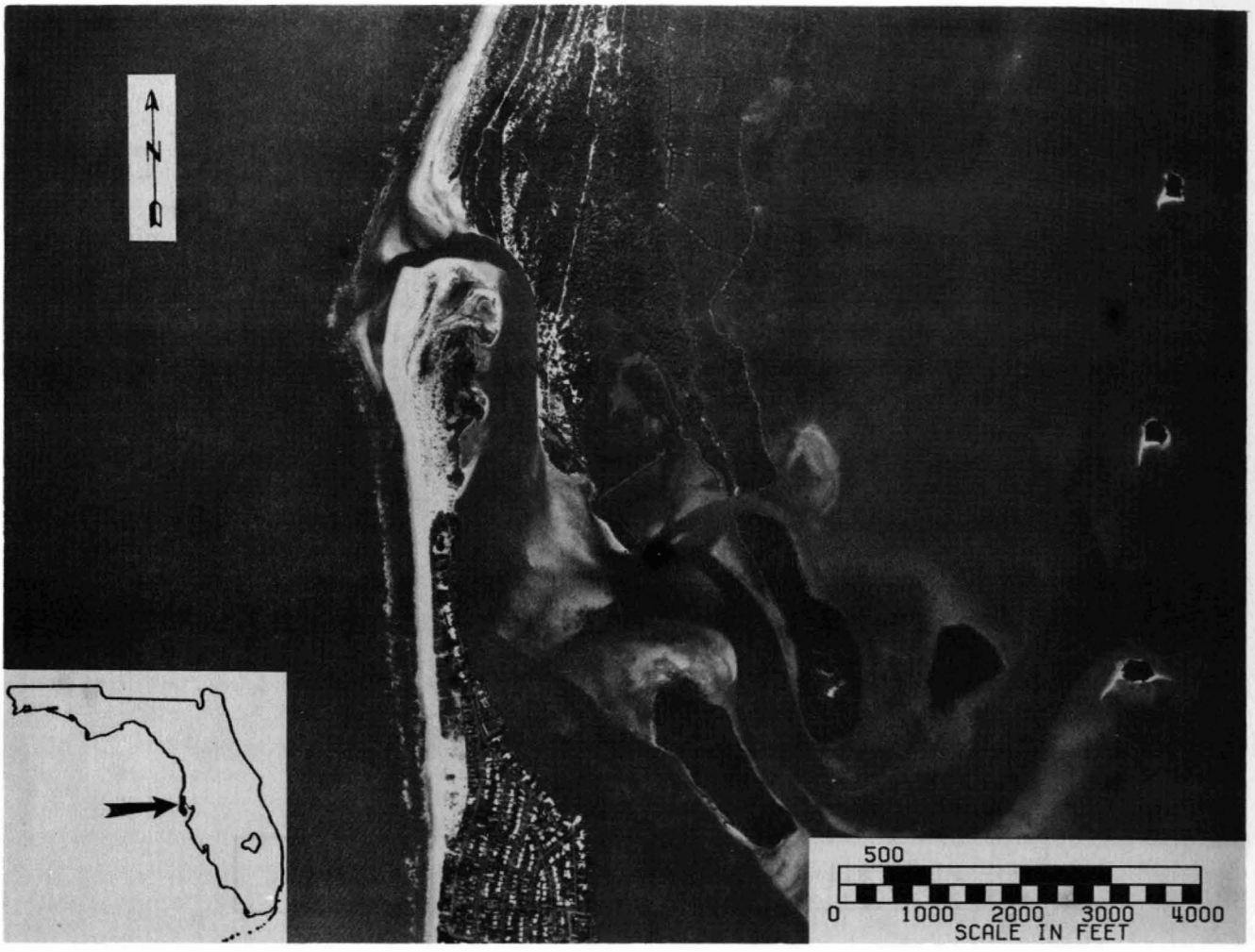
Special Characteristics Relevant to State Responsibilities

- Honeymoon Island to the north of Hurricane Pass is a State park and the south end of this island is eroding.

Recommended Action

- Place all dredged material on the north beach.

DUNEDIN PASS (BIG PASS)



(Date of Photography: February 7, 1984)

Brief Historical Information

- From 1883-1921, Big Pass was the predominant influence on Clearwater Bay-St. Joseph Sound area.
- Hurricane Pass formed by storm diverted flow from Big Pass in 1921.
- Clearwater Causeway constructed between 1925-26.
- Dredging for Island Estates Development started in 1958.
- Honeymoon Island Causeway constructed between 1960-63.
- Jetty construction at north end of Sand Key in 1974.
- Not Federally or locally maintained; channel dimensions: 1,800 ft. wide by 6 ft. deep.

DUNEDIN PASS (BIG PASS)

Sediment Balance

Ebb shoal: 1984 - 4.8 million cubic yards

Flood shoal: 1957 - 2.4 million cubic yards

Net littoral transport rate:
100,000 cubic yards per year (Southward-Walton)

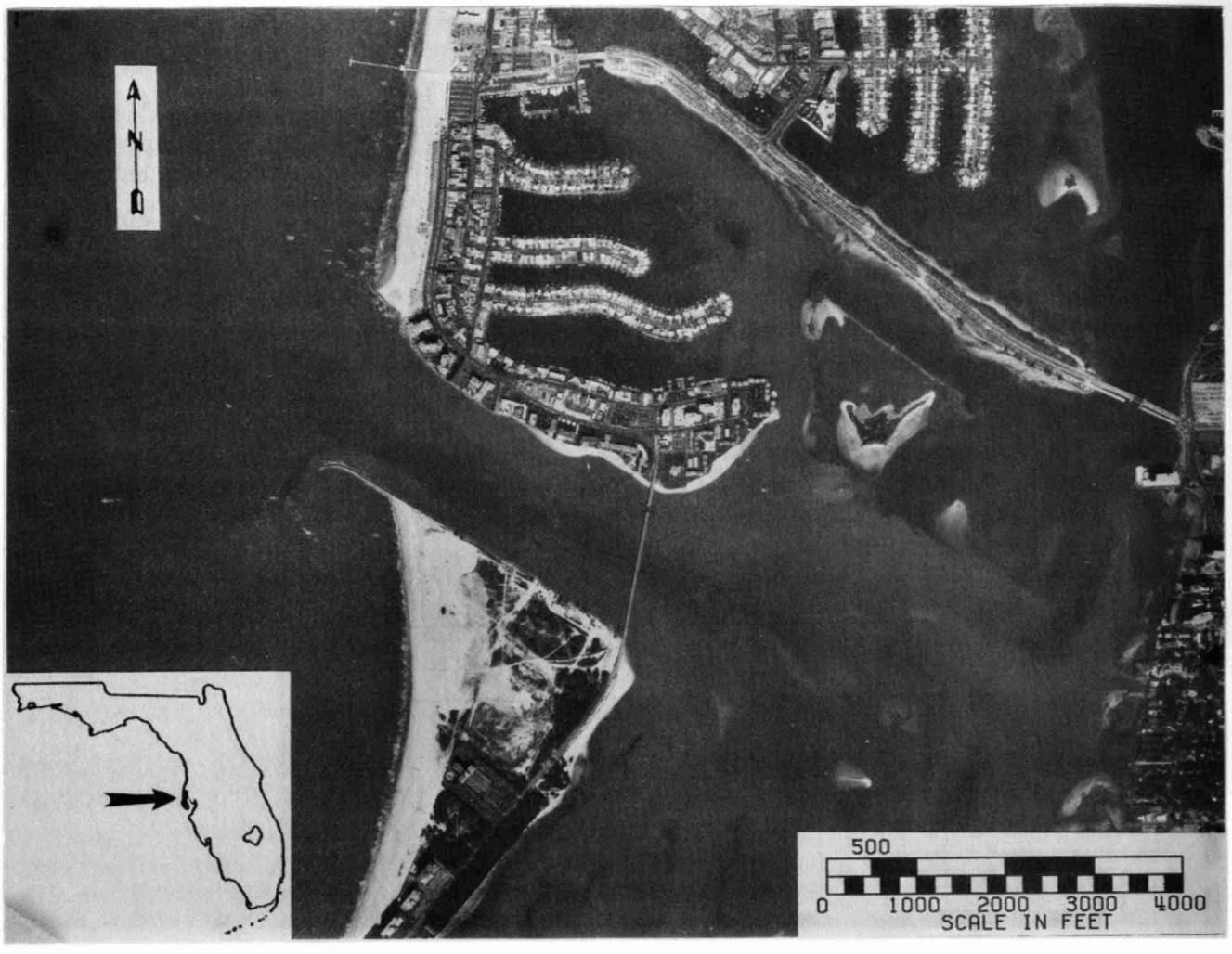
Brief Dredging History

- Volumes unknown.

Recommended Action

- Place dredged material on the north beach.

CLEARWATER PASS



(Date of Photography: February 7, 1984)

Brief Historical Information

- Natural inlet.
- Construction of causeways: Clearwater, 1925; Honeymoon, 1964.
- Became Federal navigation project in 1960; channel 150 ft. wide by 10 ft. deep.
- Construction of jetties: south, 1975; north, 1981.
- City of Clearwater purchased a dredge and began dredging in the pass.
- Deauthorized as a Federal project in 1983.

CLEARWATER PASS

Sediment Balance

Ebb shoal:
1984 - 7.0 million cubic yards

Flood shoal:
1957 - 0.9 million cubic yards

Net littoral transport rate: highly variable (Estimates encompass wide range)

100,000 cubic yards per year (Southward-Walton)
76,000 cubic yards per year (Northward)
38,000 to 76,000 cubic yards per year (Southward)

Shoreline volume changes, 1950-1985:
+1.8 million cubic yards over 4,750 ft. north of inlet
+2.6 million cubic yards over 6,600 ft. south of inlet

Causeways may have altered the effective tidal prism and the sedimentary regime

Brief Dredging History

- Sand Key and Clearwater Beach have received 1,602,600 cubic yards of dredged material since 1950.
- Corps of Engineers maintenance dredging:
  1960 - 1977
  321,000 cubic yards disposed in Gulf or Bay
  312,000 cubic yards to north end of Sand Key
  1980 - 1985
  970,000 cubic yards on Sand Key and Clearwater Beach
- A total of 1.3 million cubic yards has been placed on the beach.

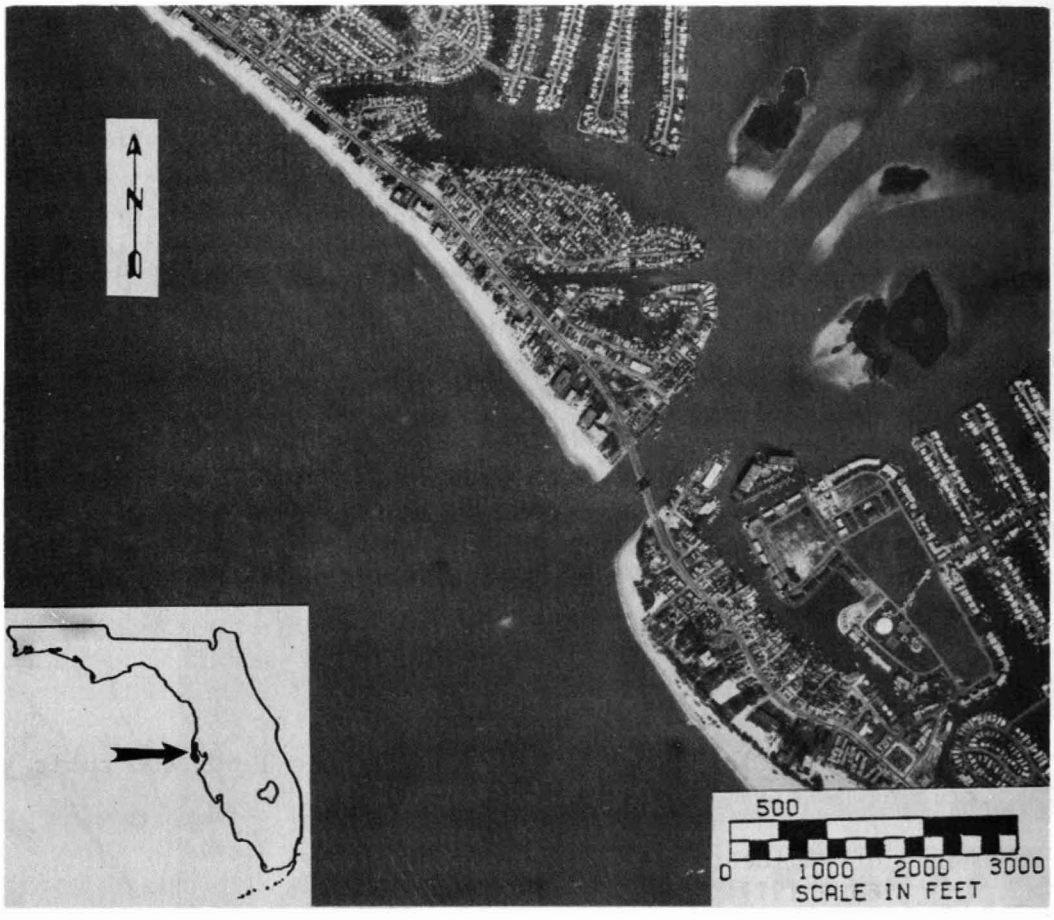
Special Characteristics Relevant to State's Responsibilities

- Federal project discontinued.
- City of Clearwater maintains channel by dredging.

Recommended Action

- Continue placing dredged sand on the beach to the north and to eroding areas on Sand Key to the South.

JOHNS PASS



(Date of Photography: February 7, 1984)

Brief Historical Information

- Blind Pass and Johns Pass connect Boca Ciega Bay to the Gulf of Mexico.
- Johns Pass formed by a hurricane in 1848; became a Federal project in 1964.
- North jetty 460 ft. long built in 1962; south bank reveted 920 ft. in 1966.

JOHNS PASS

Sediment Balance

Ebb shoal:
1984 - 5.0 million cubic yards

Flood shoal:
1976 - 0.5 million cubic yards

Net littoral transport rate:
50,000 cubic yards per year (Southward-Walton)

Changes in Blind Pass have affected the flow area, tidal prism and sedimentary regime of Johns Pass

Ebb shoal has been used as a borrow area for several beach nourishment projects.

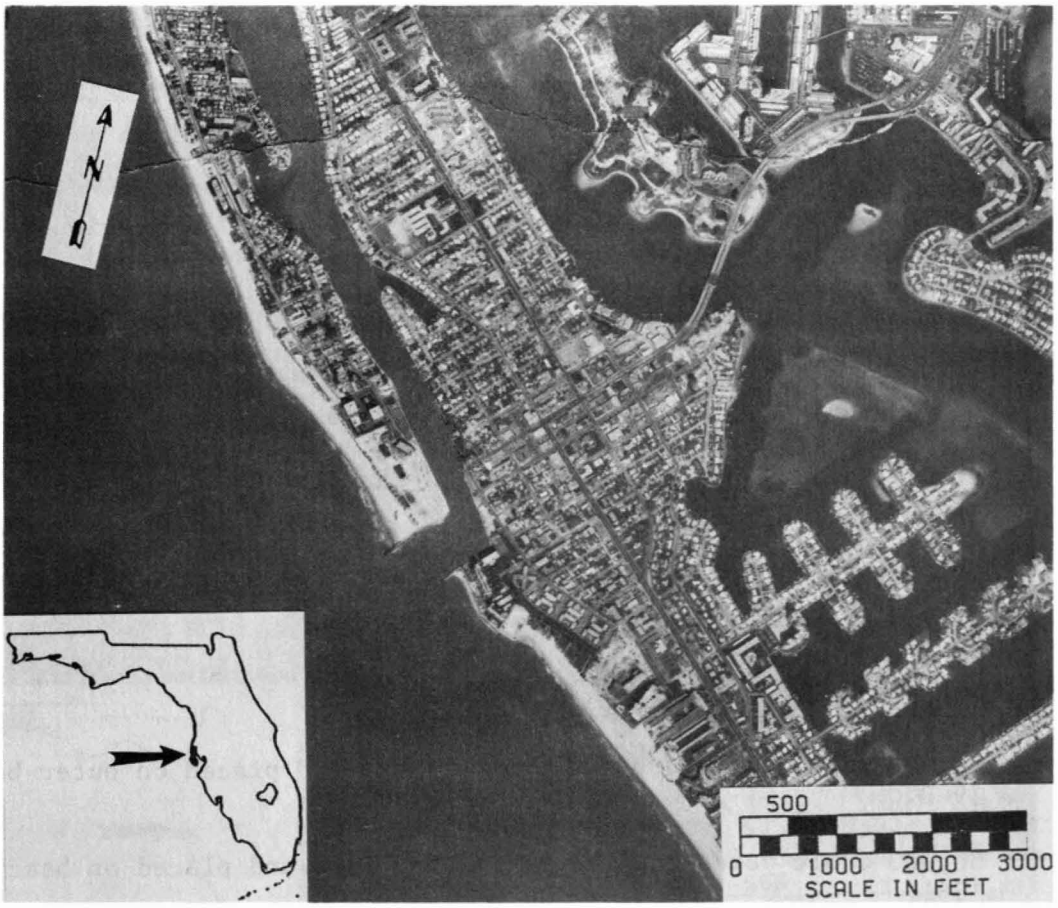
Brief Dredging History

- 94,000 cubic yards dredged from channel and placed on outer bar in 1960.
- 30,000 cubic yards dredged from Johns Pass and placed on beach north in 1961.
- 78,000 cubic yards dredged from channel and placed offshore in 1966.
- 231,000 cubic yards dredged and placed on Treasure Island from 1979 to 1983.

Recommended Action

- Continue placing dredged material on the adjacent beaches in accordance with documented erosion areas.

BLIND PASS (PINELLAS COUNTY)



(Date of Photography: February 7, 1984)

Brief Historical Information

- Johns Pass and Blind Pass both connect Boca Ciega Bay to the Gulf of Mexico.
- Low jetty built on north side, in 1937.
- Jetty built on south side, 425 ft. long, in 1962.
- South jetty extended in 1986.
- Not a Federal project, but designated as a borrow area for beach replenishment.

Sediment Balance

Ebb shoal:
1984 - 1.7 million cubic yards

Net littoral transport rate:
50,000 cubic yards per year (Southward-Walton)

BLIND PASS (PINELLAS COUNTY)

Brief Dredging History

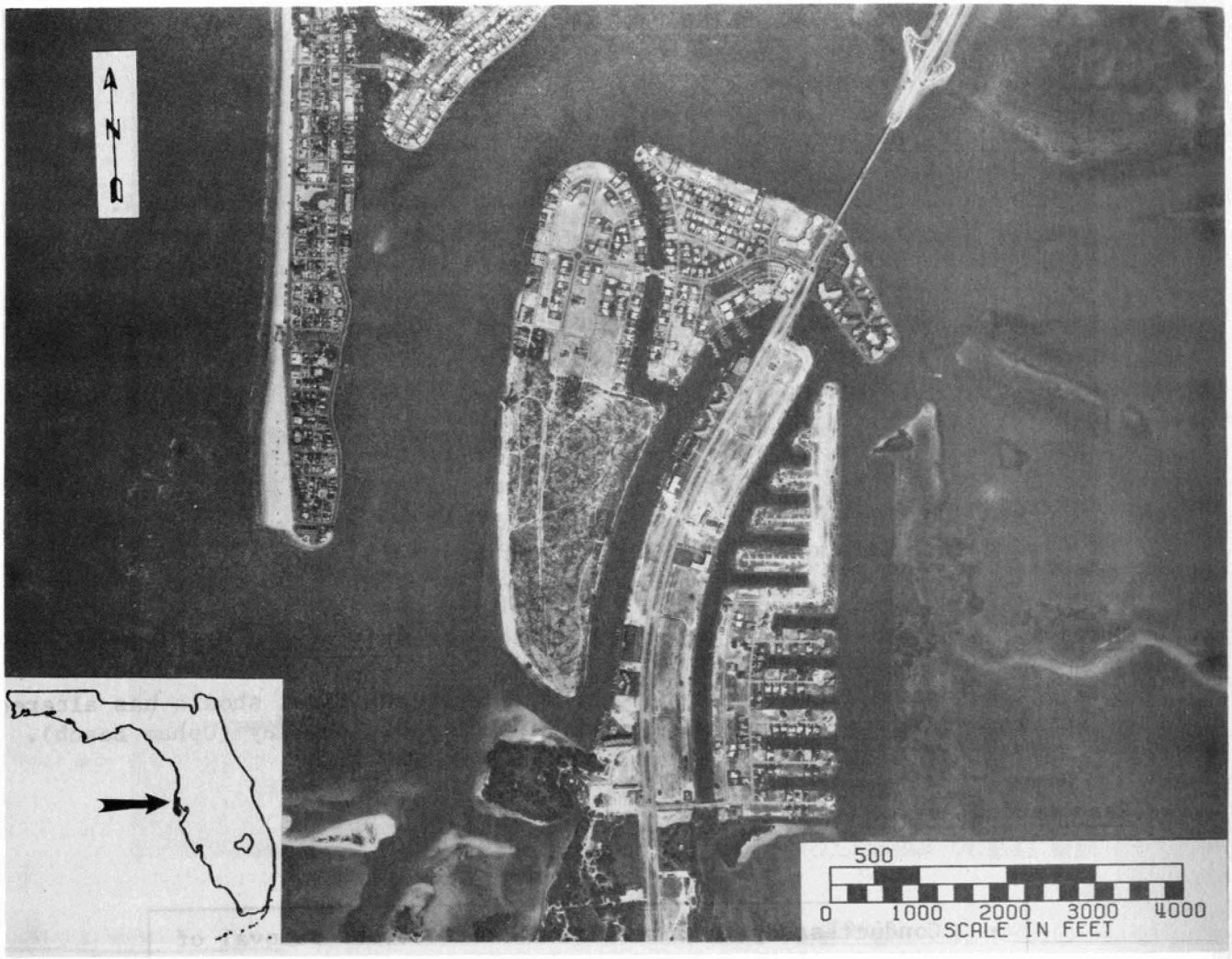
- 10,000 cubic yards dredged and placed on Sunset Beach in 1964.
- 100,000 cubic yards dredged and placed on Treasure Island in 1969. This material was too fine for use as beach replenishment.
- 550,000 cubic yards dredged offshore and placed on Treasure Island in 1972 and 1976.
- 75,000 cubic yards dredged from Blind Pass and used for beach fill in 1975.
- 950,000 cubic yards to be removed from Blind Pass and placed on Treasure Island and Long Key in 1986 (planned).

Special Characteristics Relevant to State Responsibilities

- The partial removal of the once extensive ebb tidal shoals has altered the equilibrium planform of the north end of Long Key (Upham Beach).

Recommended Action

- Conduct study to determine the effects of removal of additional material from the ebb tide shoals on the adjacent beaches.



(Date of Photography: February 7, 1984)

Brief Historical Information

- Pass-A-Grille has two entrances, separated by Shell Key. Between 1926 and 1948, Shell Key, between these entrances, migrated 1,800 ft. northward and was reduced substantially in volume.
- Jetty built on south tip of Long Key in 1959; extended in 1962.
- Federal navigation project authorized in 1964.
- Jetty rehabilitated in 1984.
- In 1986, north channel 3,400 ft. wide by 14 ft. deep; south channel (Bunces) 1,200 ft. wide by 18 ft. deep.
- No Federal or other maintenance at this time.

PASS-A-GRILLE AND BUNCES PASS

Sediment Balance

Ebb shoal:
1979 - 43.0 million cubic yards

Net littoral transport rate:
100,000 cubic yards per year (Southward-Walton)

Dredging Record

- 160,000 cubic yards dredged from Pass-A-Grille channel and deposited offshore, in 1960. No other dredging.
- Bunces Pass has not been dredged.

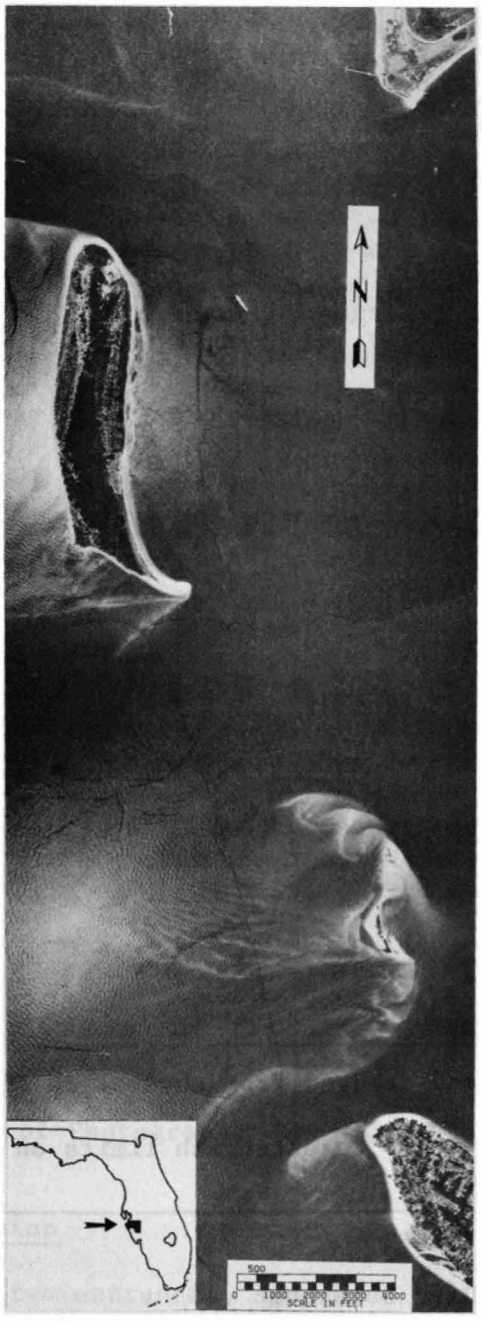
Special Characteristics Relevant to State Responsibilities

- The sand in the ebb tidal shoal is ideal for beach nourishment.
- Removal of excessive amounts of ebb tidal shoal sand could jeopardize the stability of adjacent shorelines.

Recommended Action

- Place sand dredged from channel on adjacent beaches.
- Conduct study to establish limits on removal of ebb tidal shoal sand.

TAMPA BAY ENTRANCE



Brief Historical Information

- Available surveys date from 1877.
- Federal navigation project.
- There are three channels: Egmont. Main shipping channel. Maintained by Corps of Engineers. Width 4,200 ft., depth 48 ft. Southwest. Width 4,900 ft., depth 21 ft. Not maintained. Passage Key. Width 1,500 ft., depth 17 ft. Not maintained.

TAMPA BAY ENTRANCE

Sediment Balance

Ebb shoal (3 channels):

1979 -	401.0 million cubic yards
1885 -	350.0 million cubic yards

Net littoral transport rate: variable but predominantly southward

110,000 cubic yards per year (Southward-Walton)

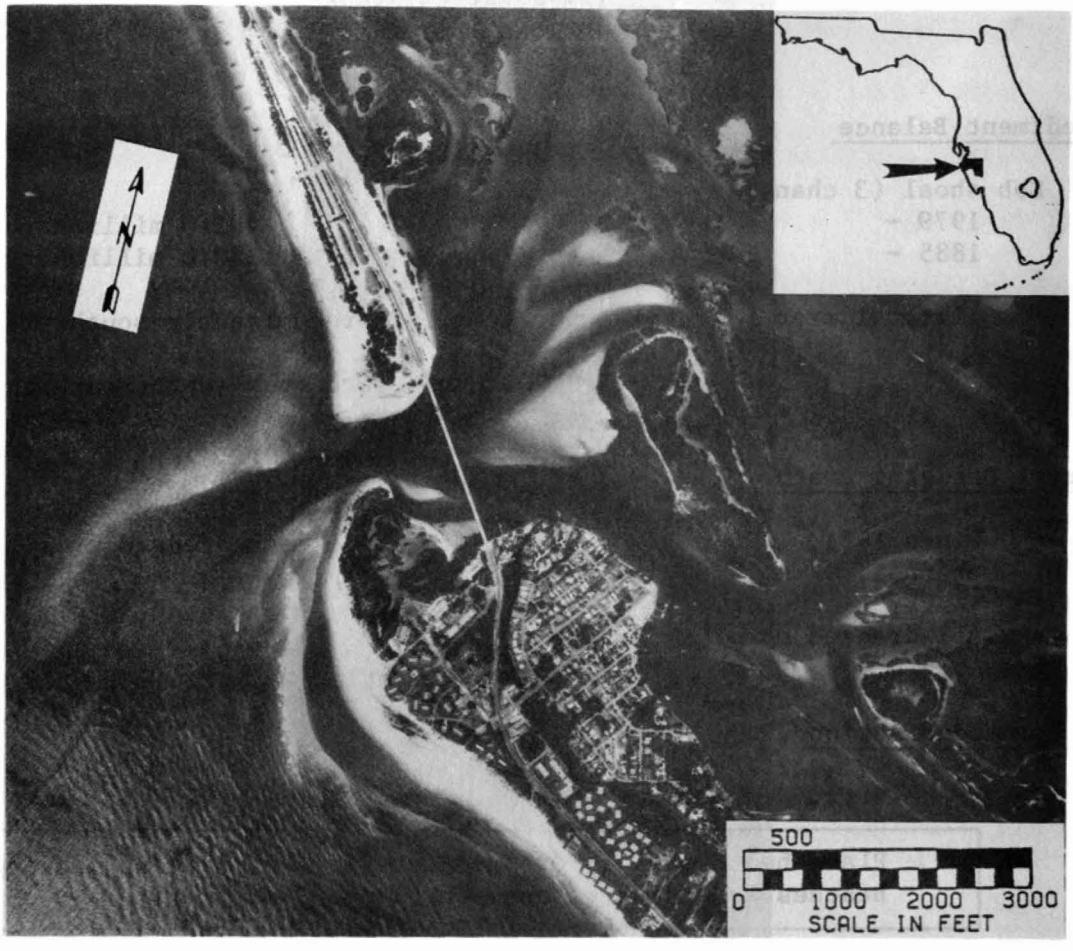
Brief Dredging History

- Since 1951, 13.5 million cubic yards have been dredged from the Egmont channel.
- All dredged material has been placed in the Gulf.

Recommended Action

- Place beach quality dredged material on adjacent eroding beaches according to documented need.

LONGBOAT PASS



(Date of Photography: April 25, 1986)

Brief Historical Information

- Longboat Pass separates Anna Maria Island (north) from Longboat Key (south).
- Surveys since 1876 show many changes in the location of this inlet and the two adjacent islands.
- Longboat Pass became a Federal project in 1977.
- Width, 750 ft.; depth, 11 ft.

LONGBOAT PASS

Sediment Balance

Ebb shoal:
1982 - 8.1 million cubic yards

Flood shoal:
1951 - 1.5 million cubic yards

Net littoral transport rate:
60,000 cubic yards per year (Southward-Walton)

Shoreline volume changes, 1946-1985:
+3.9 million cubic yards over 9,000 ft. north of inlet
-0.5 million cubic yards over 9,700 ft. south of inlet

Brief Dredging History

- 304,000 cubic yards dredged and placed on north end of Longboat Key and south end of Anna Maria Key in 1977.
- 200,000 cubic yards dredged and placed on adjacent islands in 1982.
- 148,000 cubic yards dredged and placed on Anna Maria Key in 1985.

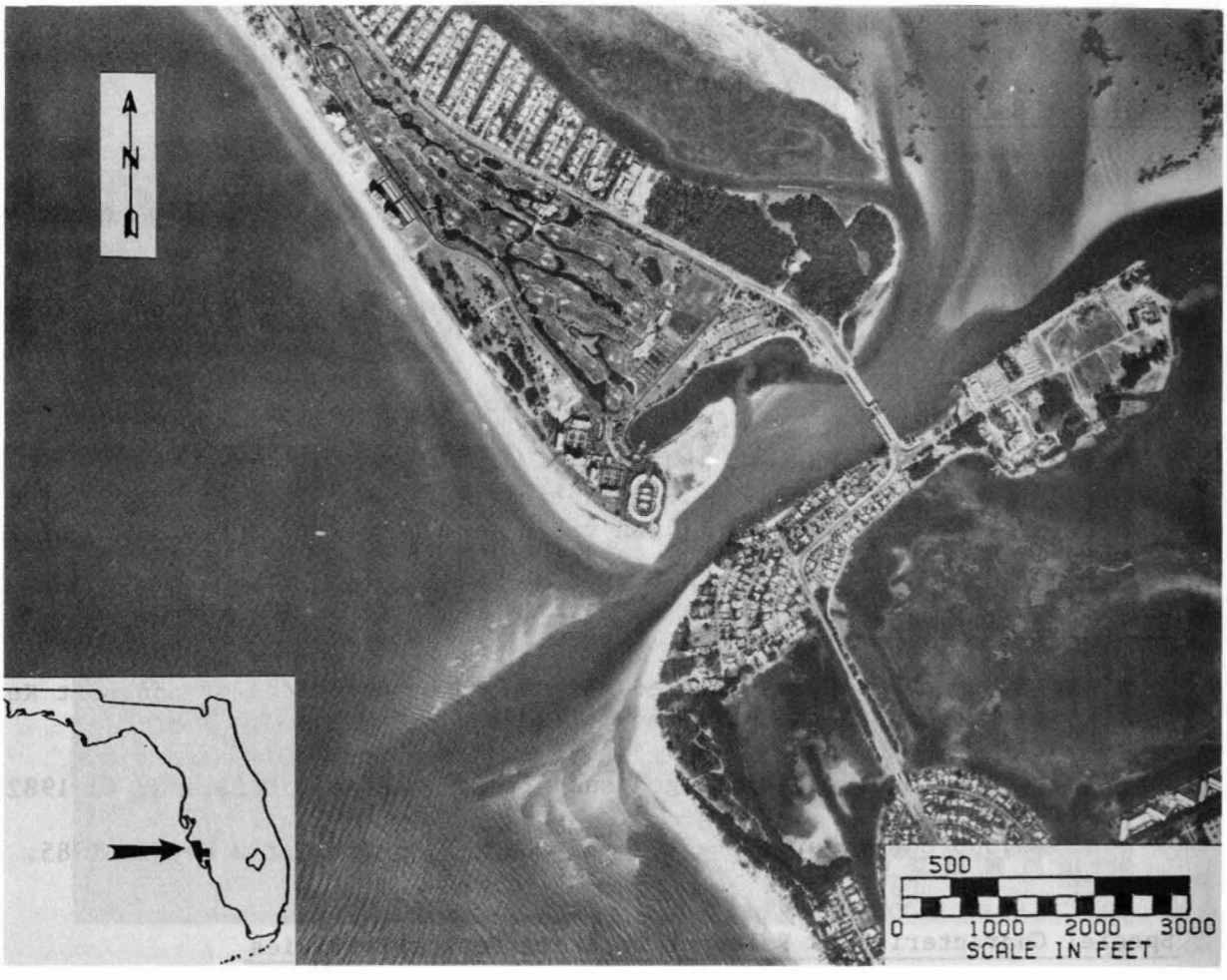
Special Characteristics Relevant to State Responsibilities

- The area immediately south of Longboat Pass was badly eroded in the mid 1970's. Beach nourishment projects have now alleviated the erosion in the immediate vicinity of the pass (Whitney Beach), but severe erosion persists farther south.

Recommended Action

- Continue practice of placing dredged material on the adjacent beaches on the basis of documented erosion.

NEW PASS (SARASOTA)



(Date of Photography: January 15, 1986)

Brief Historical Information

- New Pass separates Longboat Key (north) and Lido Key (south).
- Became a Federal navigation project in 1964 with planned dimensions of 450 ft. by 15 ft.

NEW PASS (SARASOTA)

Sediment Balance

Ebb shoal:
1982 - 4.4 million cubic yards

Flood shoal:
1951 - 6.2 million cubic yards

Net littoral transport rate:
60,000 cubic yards per year (Southward-Walton)

Shoreline volume changes, 1883-1956:
+0.5 million cubic yards over 4,000 ft. north of inlet
+0.5 million cubic yards over 6,000 ft. south of inlet

Brief Dredging History

- 124,000 cubic yards dredged and placed on North Lido Key beach in 1964.
- 246,000 cubic yards dredged and placed on Central Lido Key beach in 1974.
- 400,000 cubic yards dredged and placed on Central Lido Key beach in 1977.
- 185,000 cubic yards dredged and placed on Lido Key and Longboat Key beaches in 1982.
- 239,000 cubic yards dredged and placed on Lido Key beach in 1985.

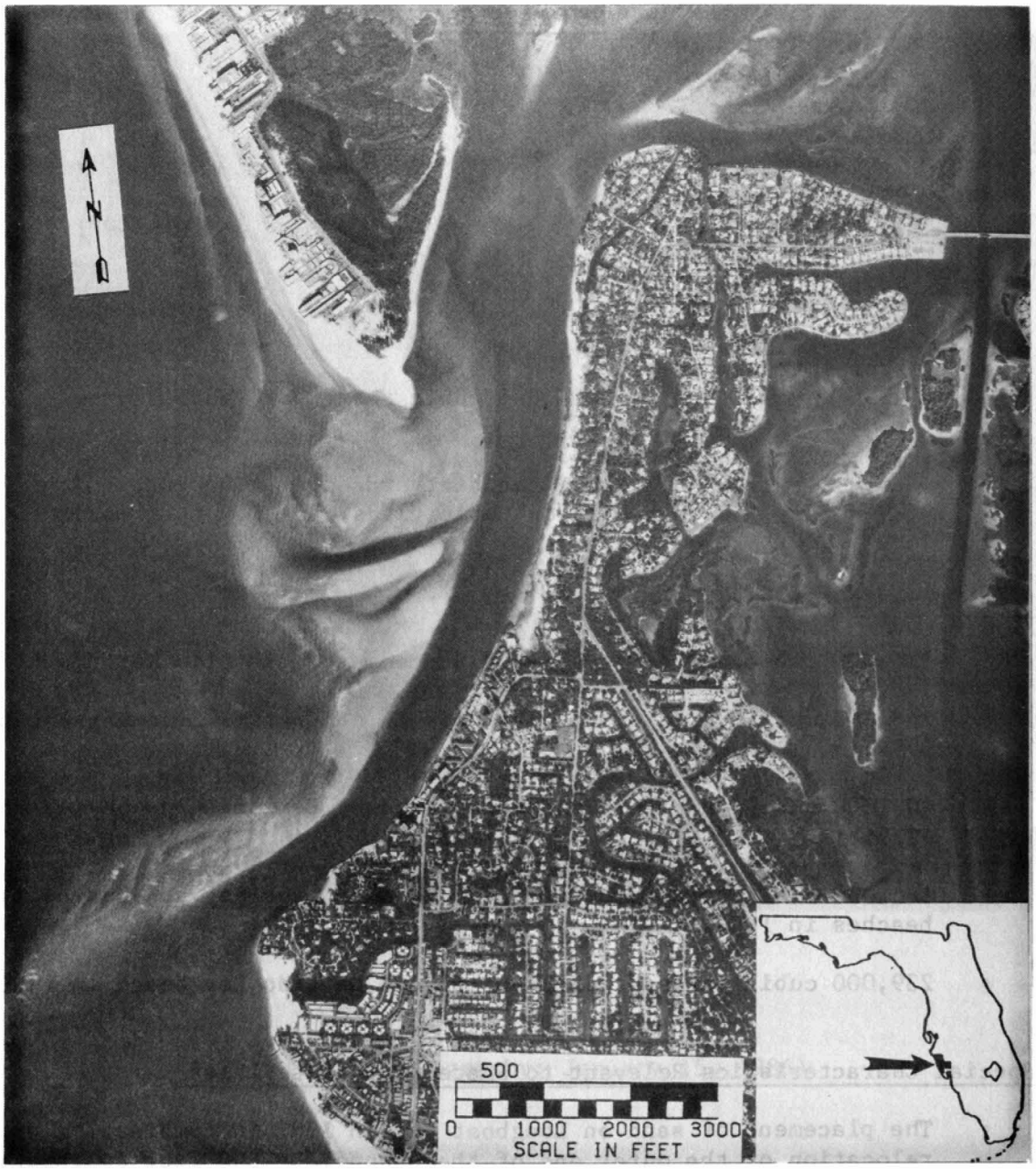
Special Characteristics Relevant to State Responsibilities

- The placement of sand on Longboat Key in 1982 in combination with a relocation of the outer end of the channel by 300 feet southward appear to have caused severe erosion of the south bank of New Pass.

Recommended Action

- Continue practice of placing dredged material on the south beach.
- Develop a plan for placement of dredged material that will enhance stability of channel and adjacent beaches.

BIG SARASOTA PASS



(Date of Photography: January 15, 1986)

Brief Historical Information

- Big Sarasota Pass separates Lido Key (north) from Siesta Key (south).
- No dredging to date.
- Adjacent south shoreline has been hardened.
- Not maintained by either Federal or local agencies.

BIG SARASOTA PASS

Sediment Balance

Ebb shoal:
1982 - 13.6 million cubic yards

Flood shoal:
1984 - 7.1 million cubic yards

Net littoral transport rate: variable in direction and net annual volume

60,000 cubic yards per year (Southward-Walton)

Brief Dredging History

- No dredging to date.

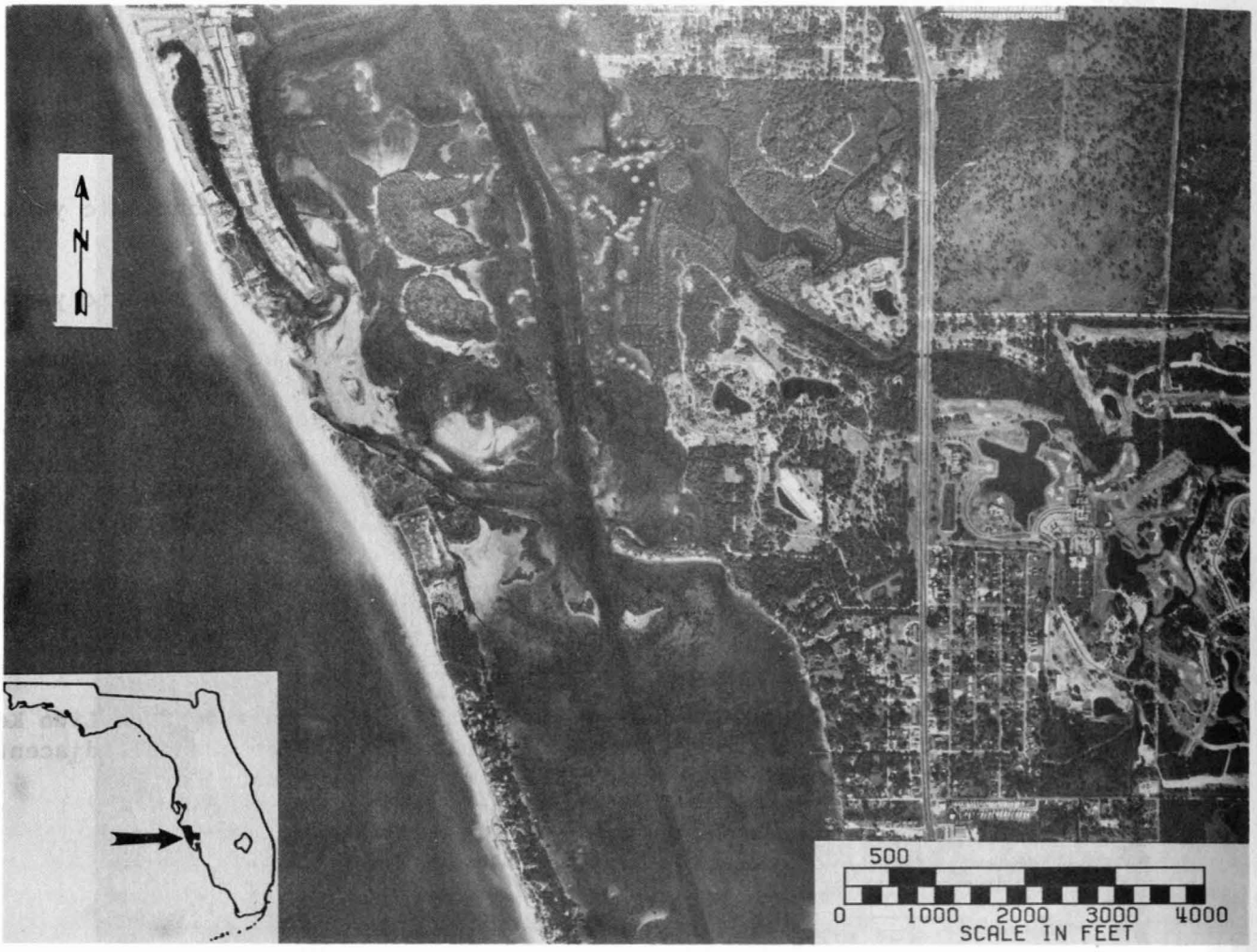
Special Characteristics Relevant to State Responsibilities

- Sand transport southward has caused a large shoal to grow from Lido Key toward Siesta Key. This shoal has resulted in a deep channel adjacent to and an erosional tendency on the north end of Siesta Key.

Recommended Action

- Monitor adjacent beaches by surveys. If pass is dredged, place material on Siesta Key.

MIDNIGHT PASS



(Date of Photography: January 15, 1986)

Brief Historical Information

- Surveys show that by 1888, Midnight Pass had migrated several miles north to Point of Rocks on Siesta Key.
- In 1921, severe hurricane opened new inlet south of old position and both inlets remained open for a time.
- In 1924, old inlet at Point of Rocks closed naturally.
- In 1960, dredging of Intracoastal Waterway altered tidal flow and channels.
- In 1983, channel very narrow and shallow. Homeowners obtained permission to dredge new channel; this channel closed the day after opening completed.
- Midnight Pass has been closed since 1983.

MIDNIGHT PASS

Sediment Balance

Ebb shoal:
1982 - 0.6 million cubic yards

Flood shoal:
1957 - 1.3 million cubic yards

Net littoral transport rate: variable in direction and annual rate

70,000 cubic yards per year (Southward-Walton)

Brief Dredging History

- There has been no appreciable dredging to date.

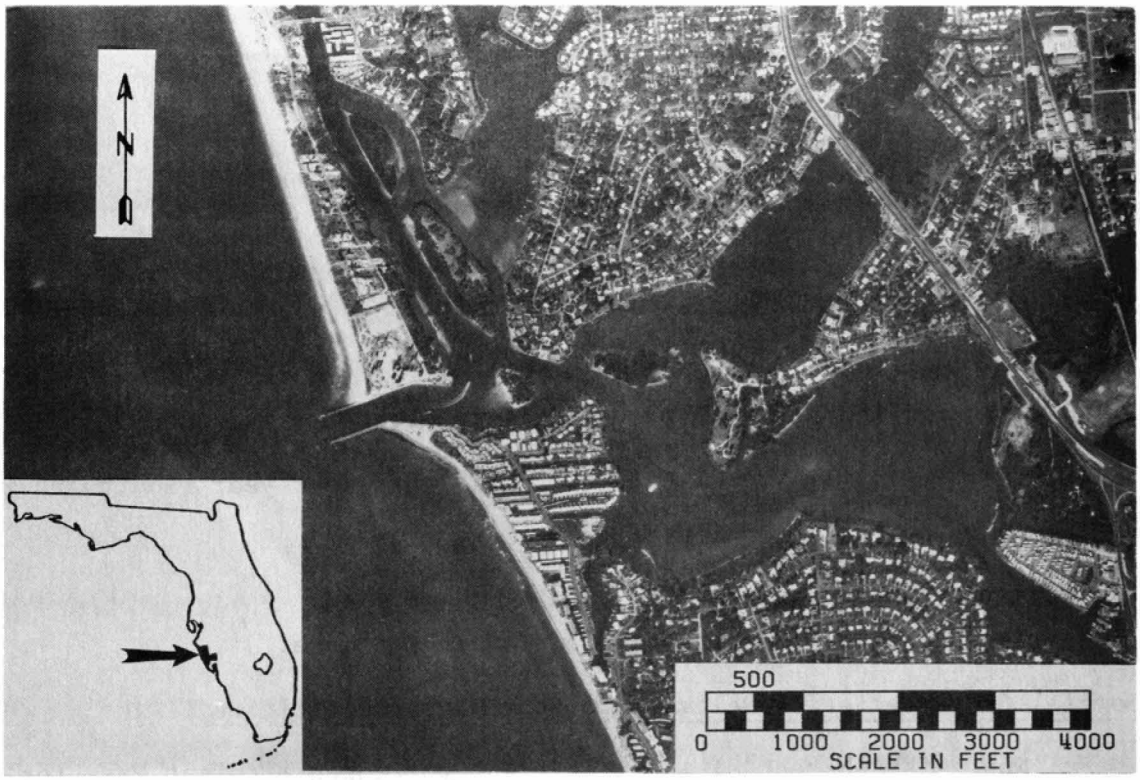
Special Characteristics Relevant to State Responsibilities

- There is substantial local interest to reopen Midnight Pass for navigation and improvement of water quality in Little Sarasota Bay.

Recommended Action

- Monitor changes in adjacent beaches by surveys.
- If a decision is made to reopen pass, require provisions to monitor and ensure stability of adjacent beaches.

VENICE INLET



(Date of Photography: December 20, 1985)

Brief Historical Information

- Venice Inlet is a natural channel originally known as Casey's Pass; separates Casey's Key (north) and Manasota Key (south).
- Between 1937-1938, Corps of Engineers constructed twin jetties and dredged a channel 100 ft. by 9 ft.
- In 1983, jetties repaired.
- Maintenance by Corps of Engineers.

Sediment Balance

Ebb shoal:
1982 - 0.4 million cubic yards

Net littoral transport rate :
70,000 cubic yards per year (Southward-Walton)

Shoreline Volume changes, 1883-1956:
+0.2 million cubic yards over 1,350 ft. north of inlet
+0.1 million cubic yards over 2,350 ft. south of inlet

Commencing about one-half mile south, the inlet has caused severe erosion.

VENICE INLET

Brief Dredging History

- Between 1937-1938, initial dredging of 70,000 cubic yards used as backfill of bulkheads.
- In 1964, 22,000 cubic yards dredged; 19,000 cubic yards to Venice Beach.

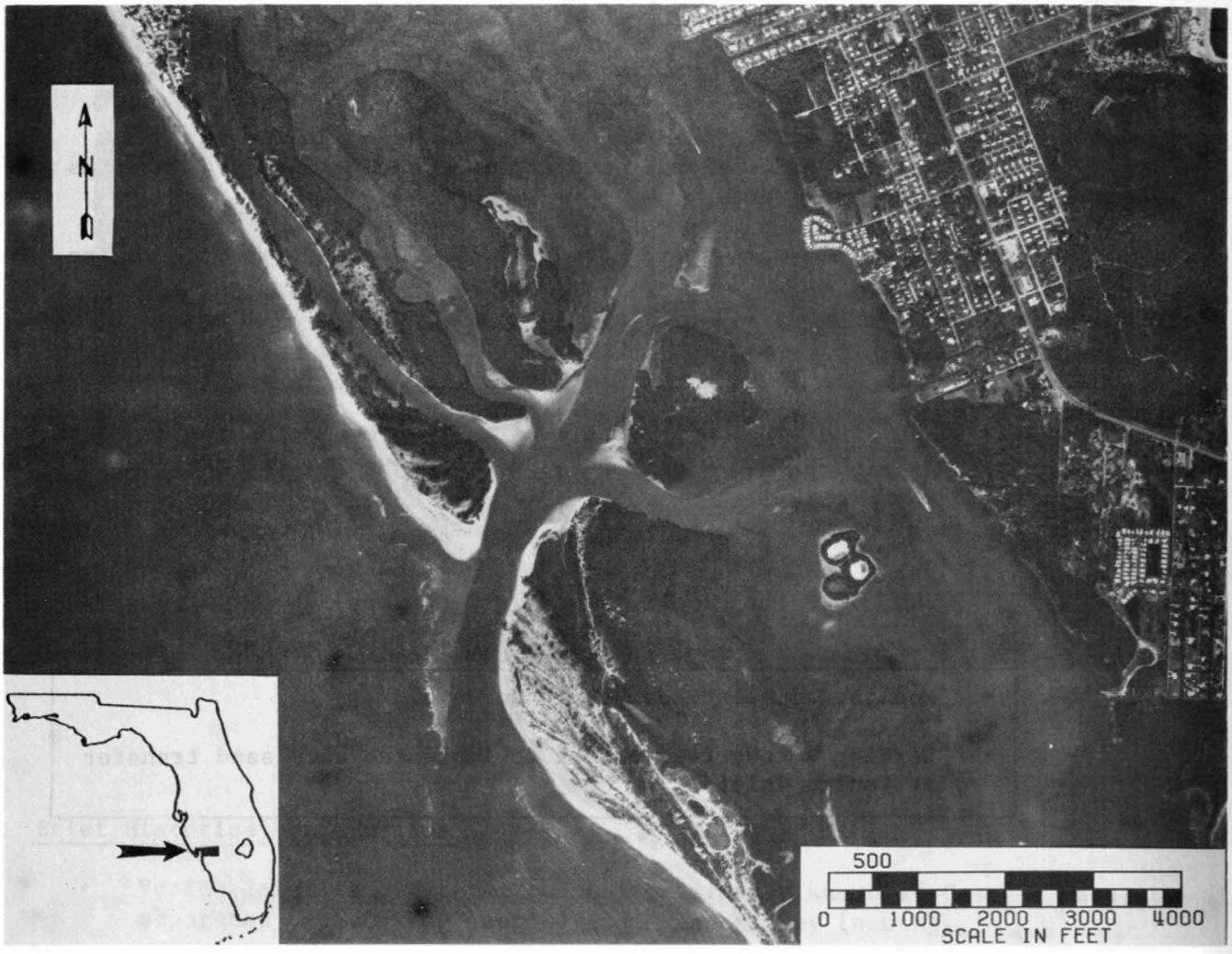
Special Characteristics Relevant to State Responsibilities

- Venice Inlet has caused severe erosion to the beaches to the south. A road has been abandoned and portions of a sewage treatment facility are jeopardized.

Recommended Action

- Monitor adjacent beaches in surveys.
- Develop a concerted effort to implement some sand transfer at Venice Inlet.

STUMP PASS



(Date of Photography: December 7, 1985)

Brief Historical Information

- Stump Pass separates Manasota Key (north) from Knight Island (south).
- Inlet natural until 1980, when it was dredged by Charlotte County to provide a channel 150 ft. by 10 ft.
- Not a Federal navigation project.

Sediment Balance

Ebb shoal:
Substantial in volume; however, no reliable data available

Net littoral transport rate:
40,000 cubic yards per year (Southward-Walton)

STUMP PASS

Brief Dredging History

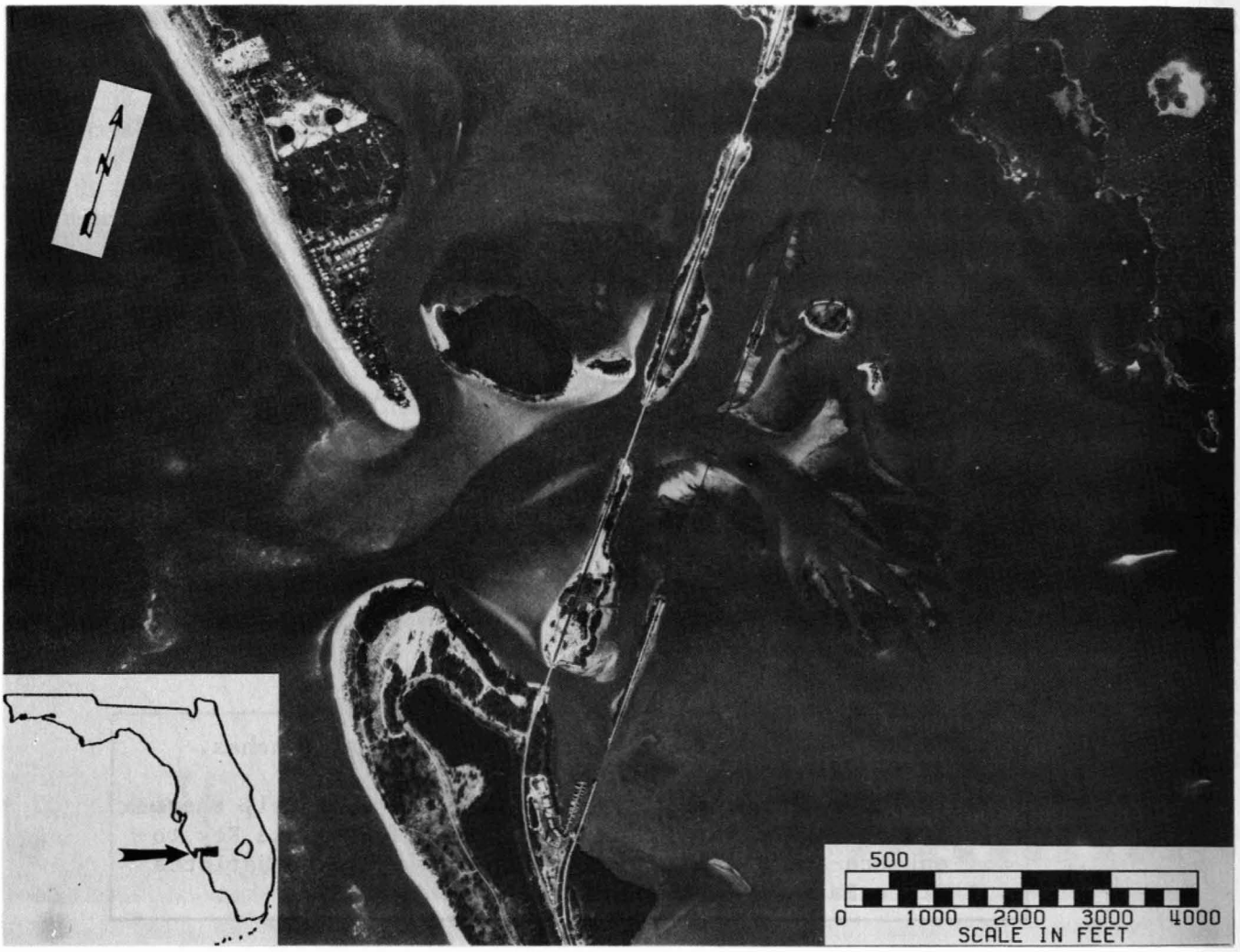
- In 1980, 140,000 cubic yards dredged and placed on beach at Port Charlotte State Park.
- Not Federally maintained. Charlotte County has requested a permit for dredging.

Special Characteristics Relevant to State Responsibilities

- Port Charlotte State Park is badly eroded and sand placed on beach tends to be drawn back into inlet.
- The stability of the park beaches would be enhanced considerably by the presence of a relatively short terminal structure at the south end of Manasota Key.

Recommended Action

- Place any dredged material on the adjacent beaches.
- Consider the possibility of placing a relatively short terminal structure at the south end of Manasota Key to enhance the stability of the beaches of Port Charlotte State Park.



(Date of Photography: December 7, 1985)

Brief Historical Information

- There has not been any dredging or modification due to construction works to date.
- The pass is approximately 1,800 ft. wide and 13 ft. deep.
- No significant erosion has been recorded updrift or downdrift of the pass.

GASPARILLA PASS

Sediment Balance

Ebb shoal:

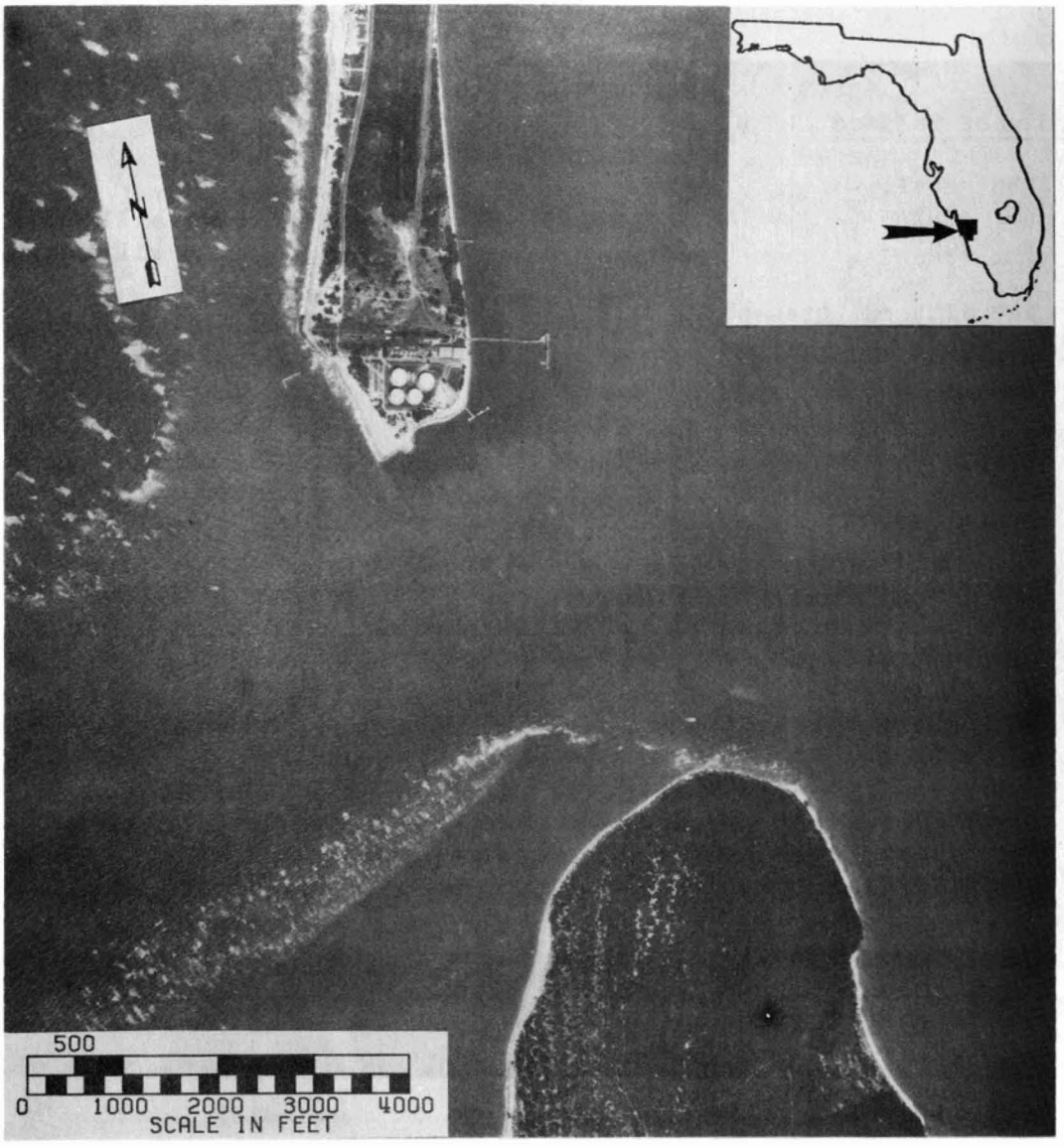
1982 -	3.5 million cubic yards
1951 -	2.4 million cubic yards

Net littoral transport rate:

100,000 cubic yards per year (Southward-Walton)

Recommended Action

- No action recommended unless modification of channel or beaches is proposed.



(Date of Photography: February 25, 1986)

Brief Historical Information

- Boca Grande separates Gasparilla Island from Cayo Costa.
- Until 1912, a stable natural inlet with a depth of 19 ft.
- In 1924, channel dredged to 24 ft; in 1927, to 27 ft; and in 1937, to 30 ft.
- Present Federal project, 3,000 ft. wide by 32 ft. deep.
- From 1930 to 1970, the southwest tip of Gasparilla Island eroded more than 1,500 ft.
- Small terminal structure constructed at south end of Gasparilla Island in early 1970's. Has been effective in reducing erosion to the north.

BOCA GRANDE PASS

Sediment Balance

Ebb shoal:
1985 - 160 million cubic yards

Net littoral transport rate:
110,000 cubic yards per year (Southward-Walton)

Shoreline volume changes, 1909-1985:
-17.5 million cubic yards over 17,000 ft. north of inlet
+17.6 million cubic yards over 22,000 ft. south of inlet

Brief Dredging History

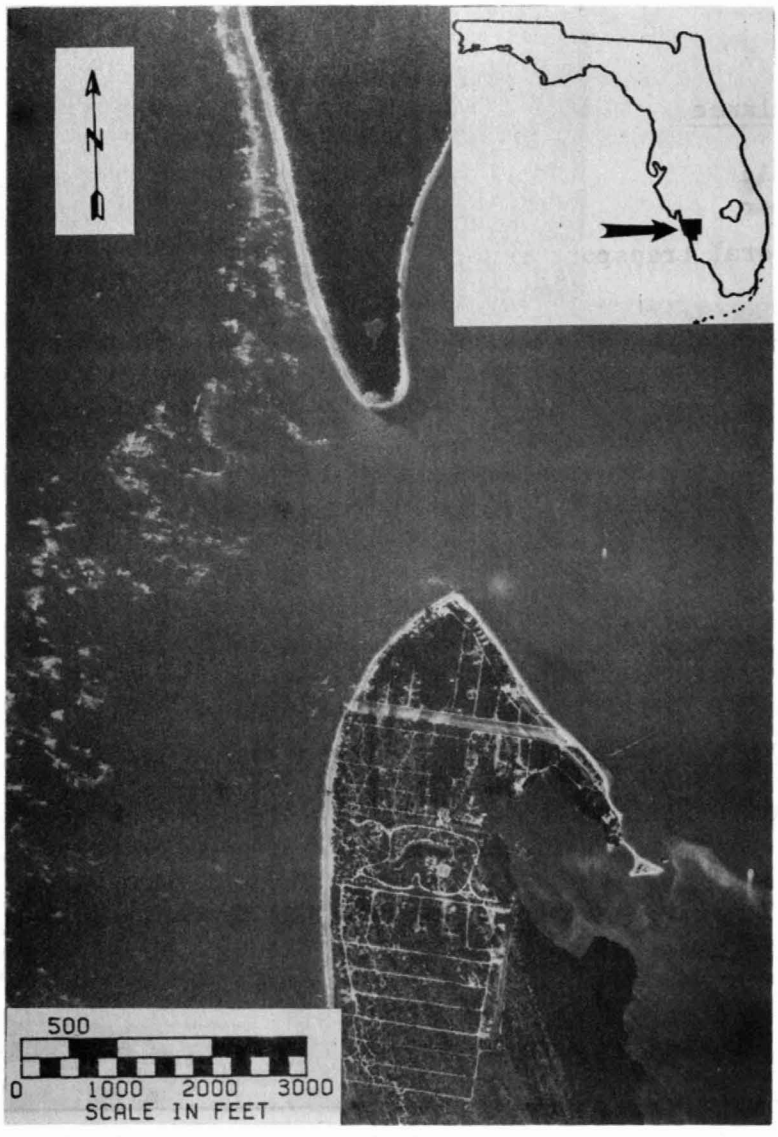
- From 1912 to 1984, 8.8 million cubic yards dredged.
- All dredged material dumped at sea except 264,000 cubic yards placed in 1981 on Gasparilla Island.

Special Characteristics Relevant to State Responsibilities

- The modifications (deepening) of this entrance have placed great erosional stress on Gasparilla Island to the north.
- Sand dredged for channel maintenance is believed to be beach quality.

Recommended Action

- Develop plans to place sand economically on eroding beaches to the north.



(Date of Photography: February 25, 1986)

Brief Historical Information

- Captiva Pass separates Cayo Costa from North Captiva Island.
- Not Federally or locally maintained.
- Channel 2,400 ft. wide by 15 ft. deep with no structures.

CAPTIVA PASS

Sediment Balance

Ebb shoal:
1982 - 12.0 million cubic yards

Flood shoal:
1958 - 2.7 million cubic yards

Net littoral transport rate:
100,000 cubic yards per year (Southward-Walton)

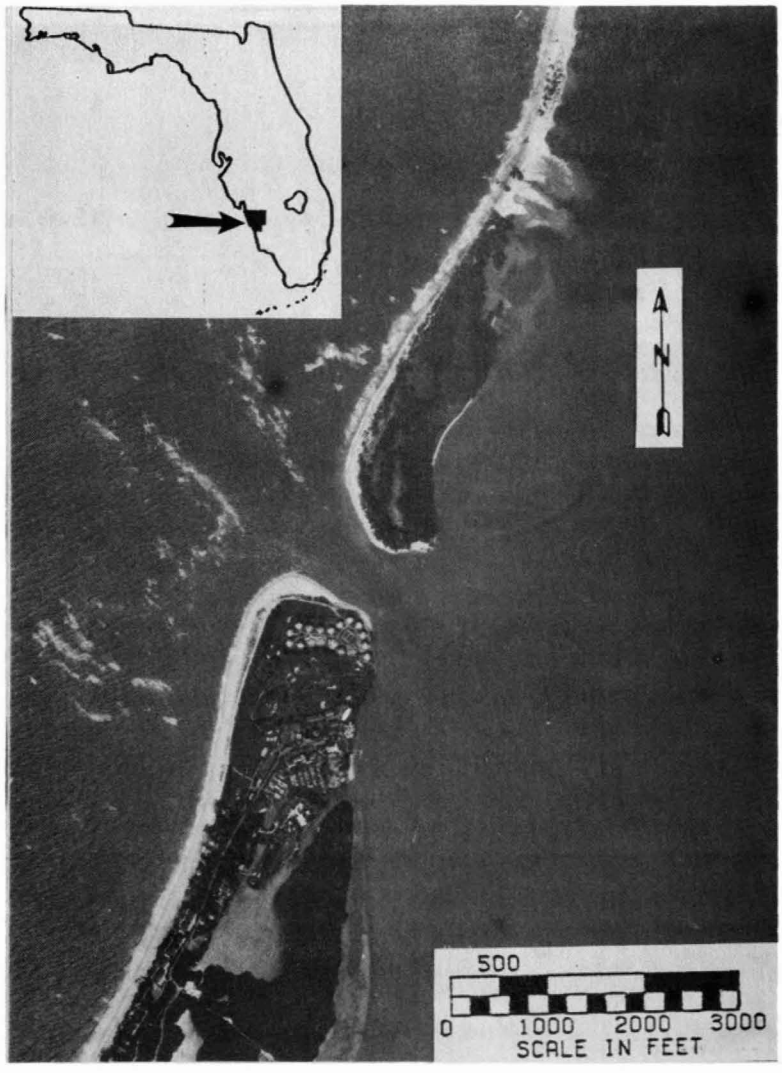
Brief Dredging History

- None

Recommended Action

- Monitor adjacent beaches by surveys. If there is dredging, place material on the south beach.

REDFISH PASS



(Date of Photography: February 25, 1986)

Brief Historical Information

- Redfish Pass separates North Captiva Island from Captiva Island. Formed by a severe hurricane in 1926.
- This pass has not been dredged or altered.
- Some limestone rip-rap has been placed at north end of Capitiva Island.
- No provision for Federal or local maintenance.
- A short terminal structure was constructed on the north end of Captiva Island in conjunction with the 1981 beach restoration project.

REDFISH PASS

Sediment Balance

Ebb shoal:
1982 - 2.8 million cubic yards

Flood shoal:
1958 - 2.6 million cubic yards

Net littoral transport rate: variable in direction and probably small

100,000 cubic yards per year (Southward-Walton)

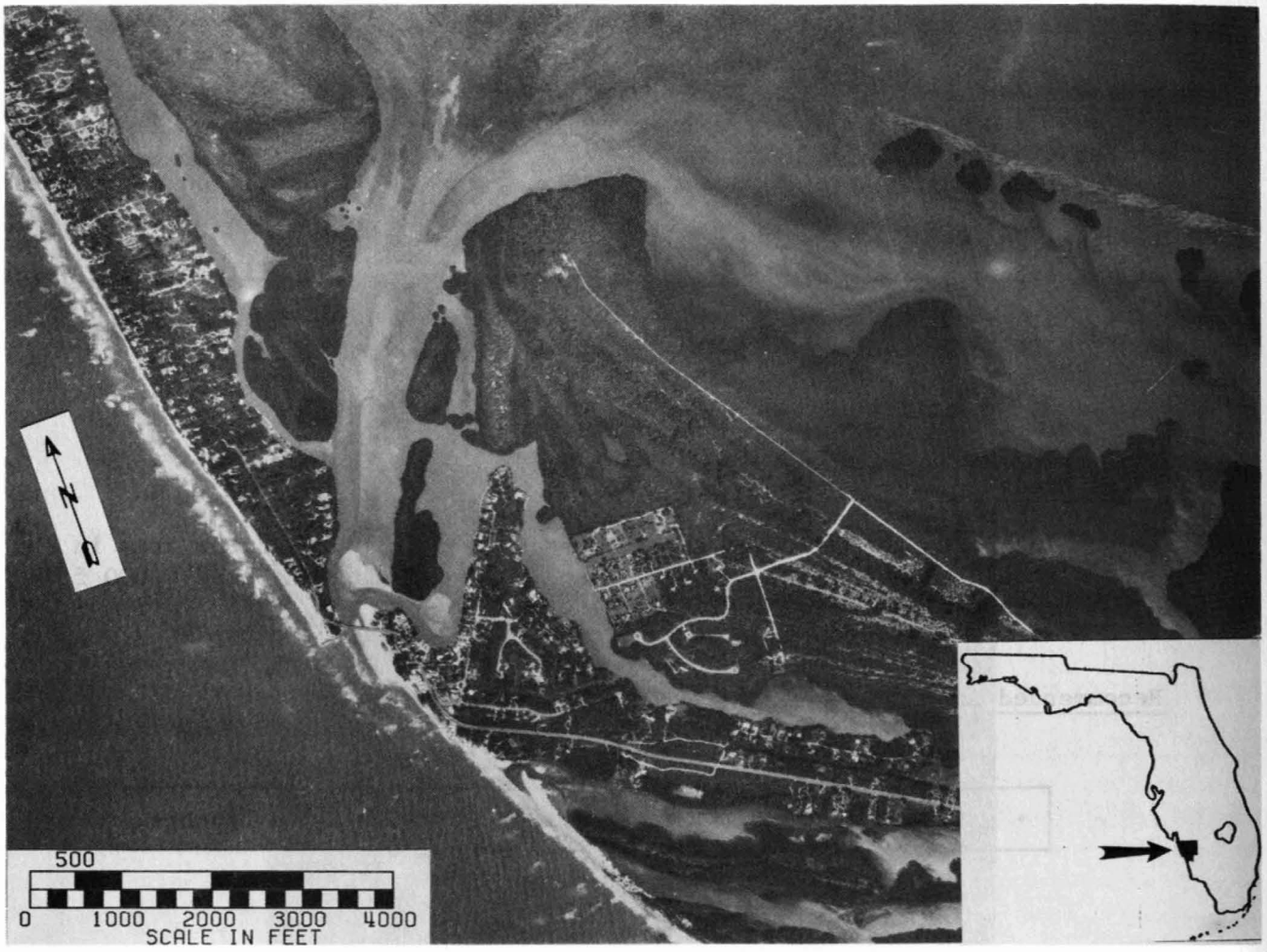
Brief Dredging History

- In 1981, 765,000 cubic yards dredged from offshore borrow area in ebb shoal and placed on Captiva Island over a beach length of 4,000 ft. extending south from Redfish Pass.

Recommended Action

- Place any dredged channel material on adjacent beaches.

BLIND PASS (LEE COUNTY)



(Date of Photography: February 25, 1986)

Brief Historical Information

- Blind Pass separates Captiva Island (north) from Sanibel Island. It is not Federally or locally maintained. The pass has no dredging history. Blind Pass now (December 1987) closed.

- Blind Pass was opened by Hurricane Agnes in 1972 and a small terminal structure was constructed on the north side by the Department of Transportation to protect a bridge abutment.

BLIND PASS (LEE COUNTY)

Sediment Balance

Ebb shoal: insignificant

Flood shoal:
1979 - 4.0 million cubic yards

Net littoral transport rate:
110,000 cubic yards per year (Southward-Walton)

1859 to 1944 - 2,000 ft. of progradation of southern tip of Captiva Island. North end of Sanibel Island gained considerable area by the migration of this entrance.

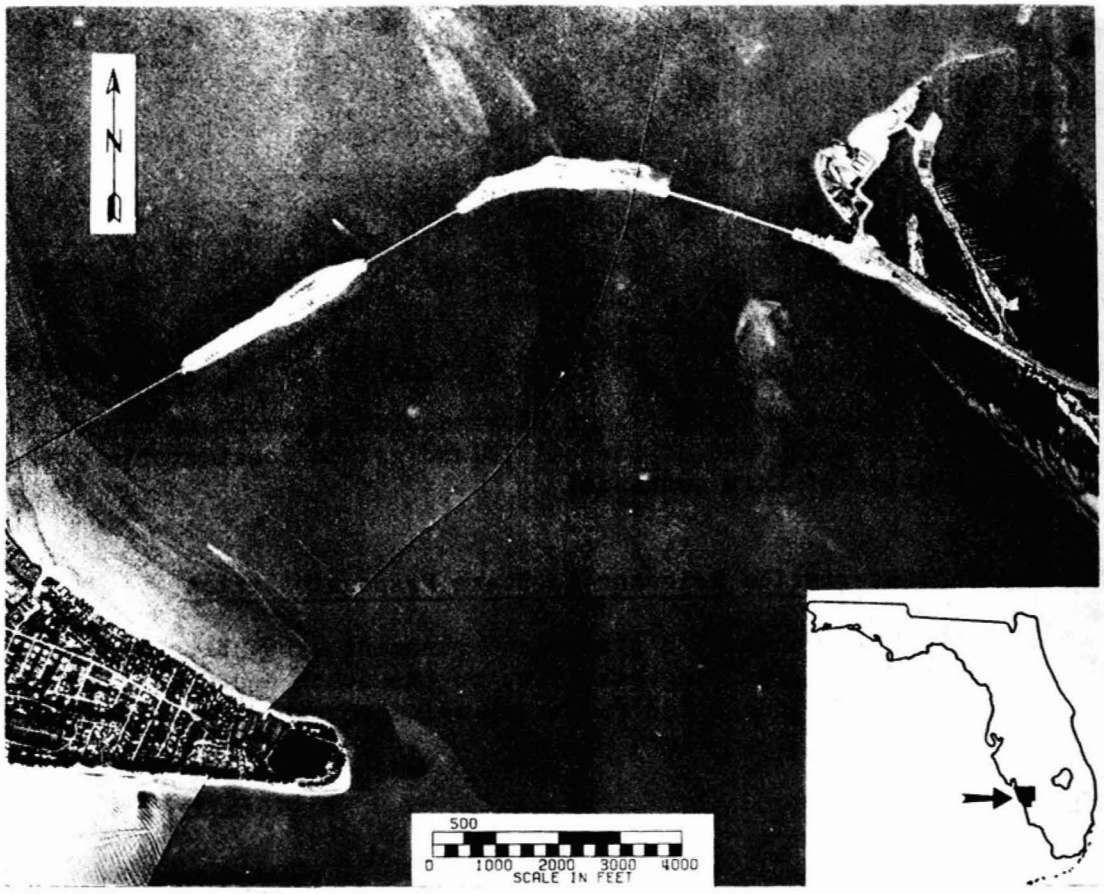
Special Characteristics Relevant to State Responsibilities

- In conjunction with a planned nourishment of Captiva Island, there is interest in providing stability to the south end of the fill through extension of the Blind Pass terminal structure or by other means.

Recommended Action

- Give consideration to one or more adjustable structures at the north end of Turner Beach to provide stability to Captiva Island beach restoration project, thereby reducing potential for affecting Sanibel Island.

SAN CARLOS BAY ENTRANCE



(Date of Photography: February 25, 1986)

Brief Historical Information

- Entrance separates Sanibel Island (north) from Ft. Meyer's Beach (south).
- Not maintained Federally or locally.
- Channel dimensions: 17,500 ft. wide by 12-18 ft. deep.

Sediment Balance

Ebb shoal:
1982 - 26.1 million cubic yards

Net littoral transport rate:
35,000 cubic yards per year (Northward-Walton)

SAN CARLOS BAY ENTRANCE

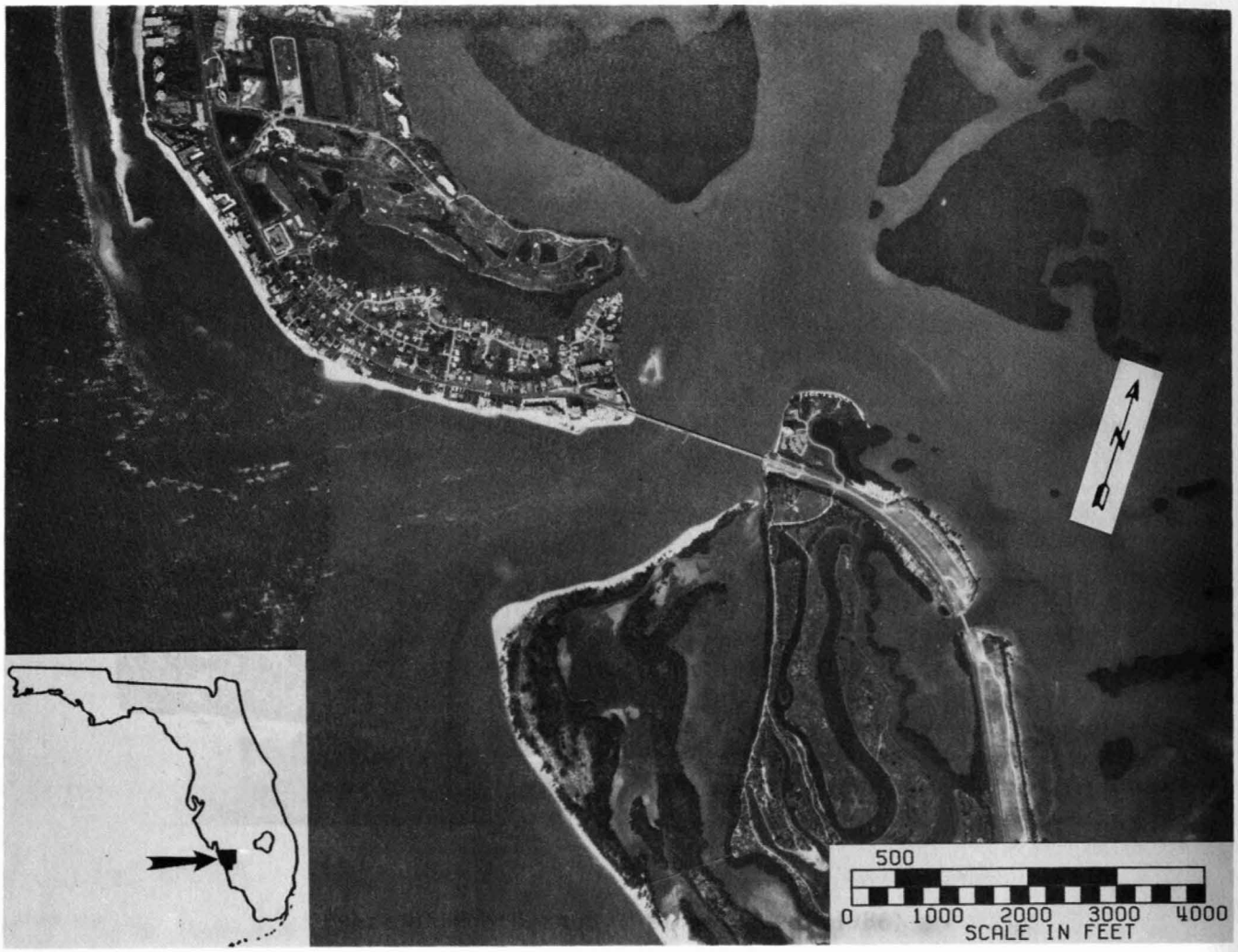
Brief Dredging History

- Between 1980 and 1985, 56,000 cubic yards placed on Ft. Myers Beach.

Recommended Action

- If channel is dredged, place material on the south beach.

BIG CARLOS PASS



(Date of Photography: February 25, 1986)

Brief Historical Information

- This pass has remained unchanged during the last century.
- There has been no dredging or construction of training works (jetties).
- Channel dimensions: 1,500 ft. by 11 ft.
- In 1963, tidal prism increased when several small inlets to the south were closed by construction of a causeway.
- Not Federally or locally maintained.

BIG CARLOS PASS

Sediment Balance

Ebb shoal:
1982 - 8.0 million cubic yards

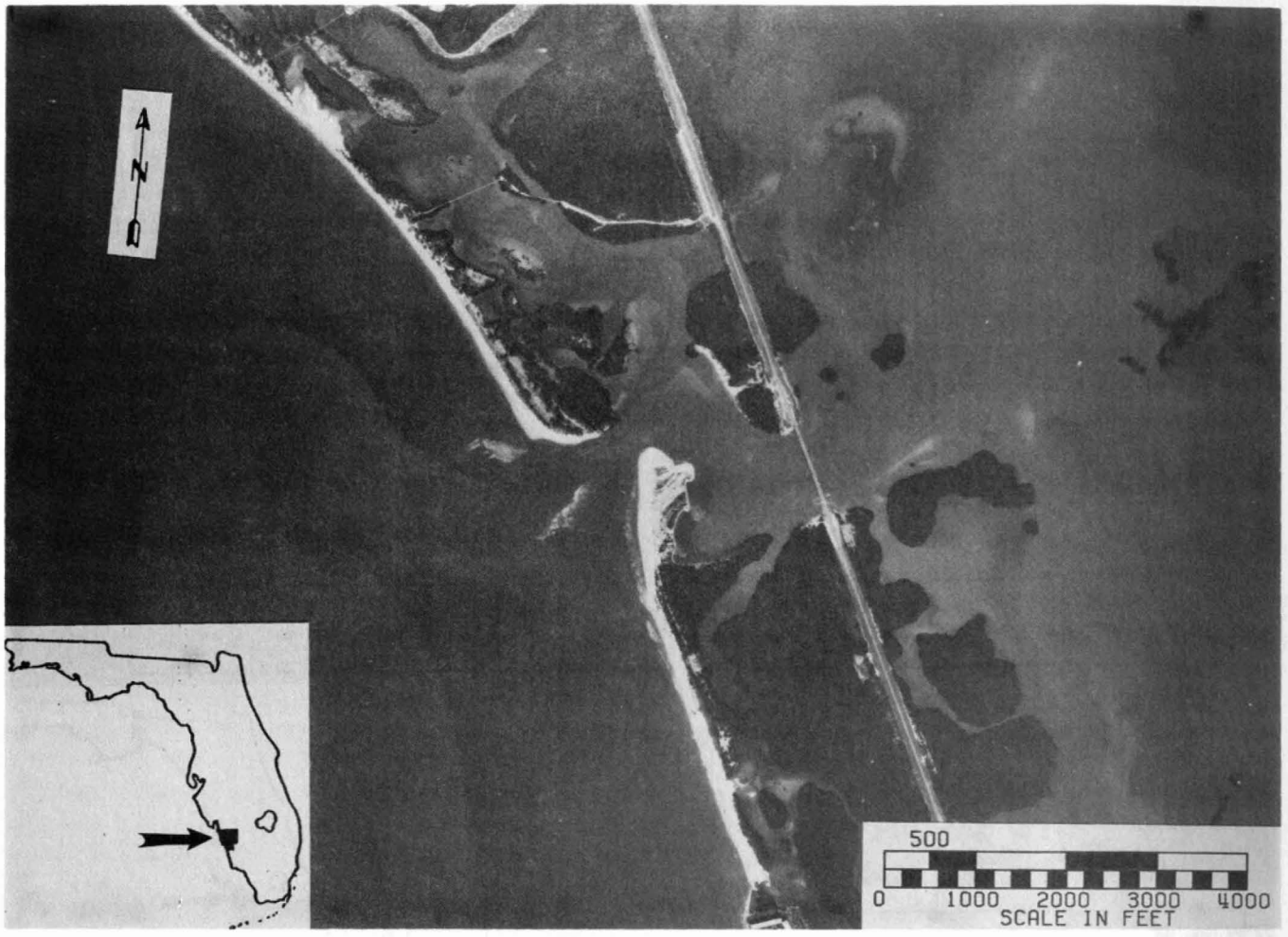
Flood shoal:
1979 - 4.2 million cubic yards

Net littoral transport rate:
55,000 cubic yards per year (Southward-Walton)

Recommended Action

- If this pass is dredged, place dredged material on the south beach.

NEW PASS (LEE COUNTY)



(Date of Photography: December 25, 1986)

Brief Historical Information

- From 1963 to 1965, construction of a causeway between Fort Meyers and Bonita Beach caused closure of several small inlets between Big Carlos Pass and New Pass and increased the tidal prism of the two adjacent inlets.
- There has been no dredging or construction of training works (jetties).
- Not a Federal navigation project.
- Channel dimensions: 1,350 ft. wide by 7 ft. deep.

NEW PASS (LEE COUNTY)

Sediment Balance

Ebb shoal:
1982 - 0.4 million cubic yards

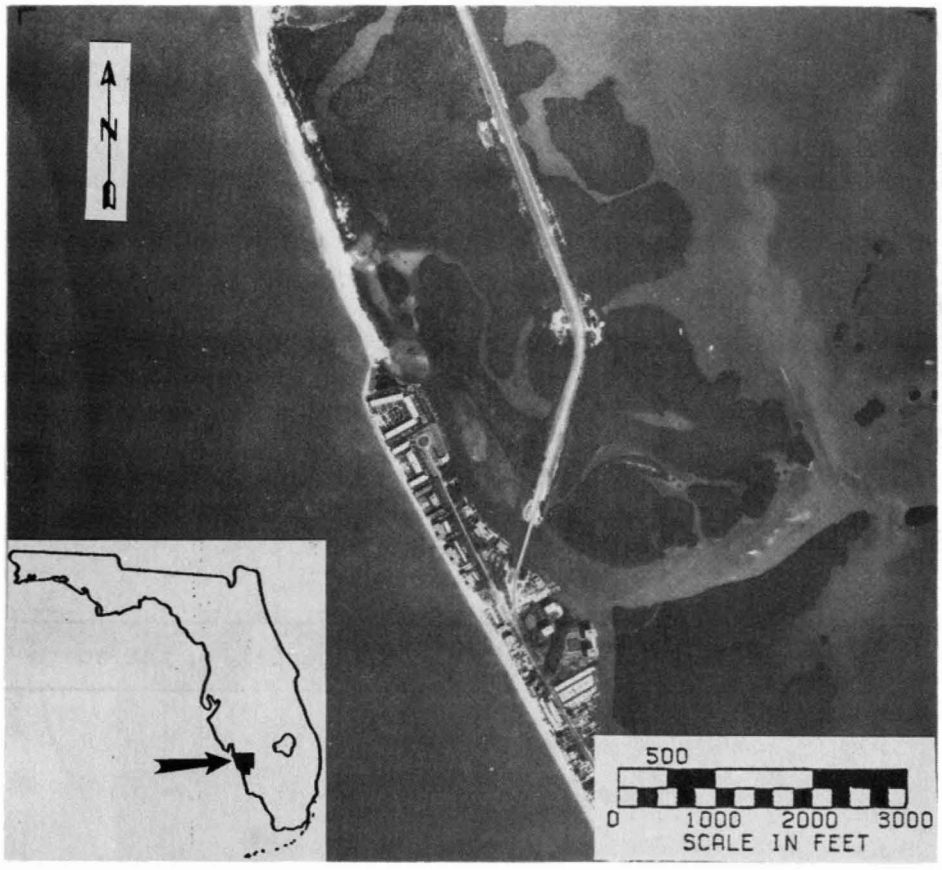
Flood shoal:
1953 - 0.3 million cubic yards

Net littoral transport rate:
55,000 cubic yards per year (Southward-Walton)

Recommended Action

- If channel is dredged, place material on the south beach.

BIG HICKORY PASS



(Date of Photography: December 25, 1986)

Brief Historical Information

- Big Hickory Pass is not open at this time.
- Pass is not maintained Federally or locally.
- Pass closed and re-opened by dragline in 1976.
- Pass closed again in 1979.

Sediment Balance

Ebb shoal: insignificant

Flood shoal:
1953 - 0.7 million cubic yards

Net littoral transport rate:
55,000 cubic yards per year (Southward-Walton)

BIG HICKORY PASS

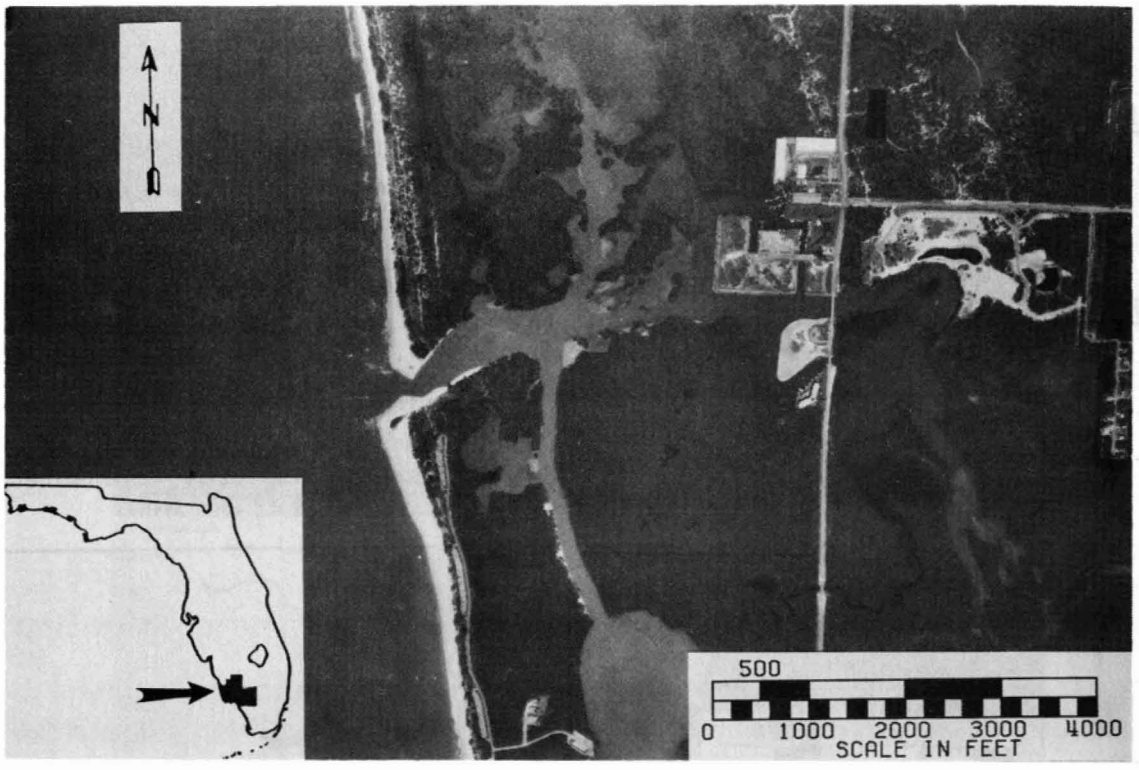
Brief Dredging History

- Pass opened by dragline in 1976. Unknown volume of material placed on south beach.

Recommended Action

- If a decision is made to reopen pass, conduct a study of prior history to establish appropriate measures to ensure stability of adjacent beaches.

WIGGINS PASS



(Date of Photography: December 14, 1985)

Brief Historical Information

- Prior to 1952, pass experienced frequent closures and was not navigable throughout most of the year.
- In 1952, changes in connecting channels increased the tidal prism by 50 percent; this change caused throat area to increase and closures were eliminated.
- Tidal prism further increased in the period 1960 to 1970; ebb shoal well-developed by 1974 and navigable channel was migrating.
- In 1983, pass dredged, channel dimensions: 200 ft. wide by 8 ft. deep.
- Pass is not Federally or locally maintained.

Sediment Balance

Ebb shoal:
1982 - 0.8 million cubic yards

Flood shoal:
1952 - 0.1 million cubic yards

Net littoral transport rate:
85,000 cubic yards per year (Southward-Walton)

WIGGINS PASS

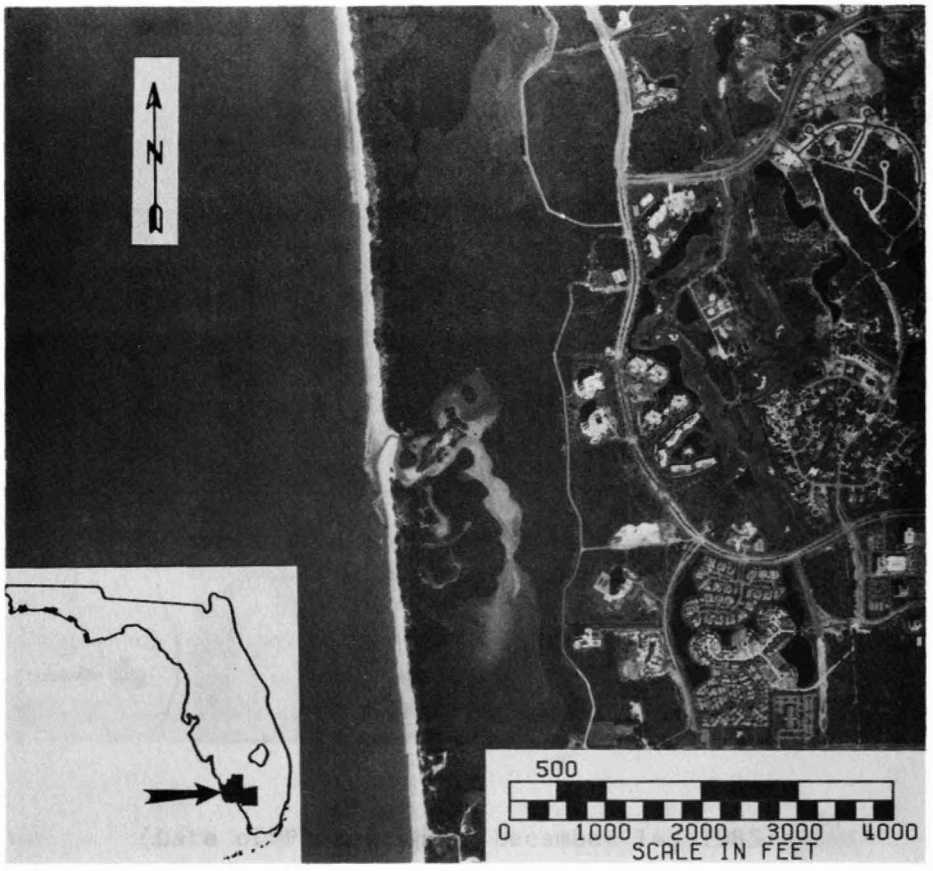
Brief Dredging History

- In 1983, 48,000 cubic yards dredged and placed on adjacent state park beach.

Recommended Action

- Place dredged material of beach quality on adjacent beaches according to documented erosional areas.

CLAM PASS



(Date of Photography: December 14, 1985)

Brief Historical Information

- Clam Pass is a very small, shallow natural pass.
- Not maintained Federally or locally.
- Between 1954 and 1970, migrated almost 600 ft. north.
- Closed naturally in 1976 and in 1981; re-opened each time by dragline.
- Channel 100 ft. wide by 4 ft. deep.

Sediment Balance

Ebb shoal: insignificant

Net littoral transport rate:
85,000 cubic yards per year (Southward-Walton)

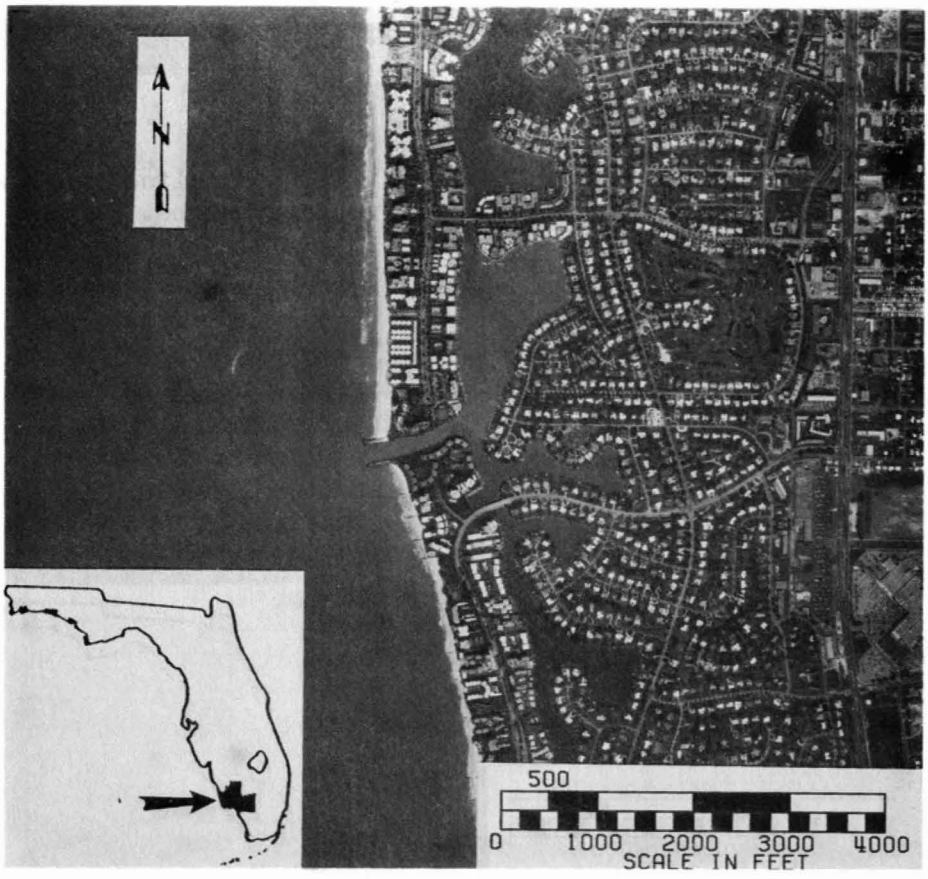
CLAM PLASS

Brief Dredging History

- When pass was opened in 1976 and 1981 by dragline, sand was placed on south beach; but quantities were not documented.

Recommended Action

- Continue to place material removed from the channel on the south beach.



(Date of Photography: December 14, 1985)

Brief Historical Information

- In the years around 1960, the pass tidal prism was enlarged.
- From 1959-60, pass straightened and jetties constructed. Rock removed from channel in late 1960's.
- In 1984, pass dredged to remove shoals; channel 150 ft. wide by 4-6 ft. deep.

Sediment Balance

Ebb shoal: insignificant

Net littoral transport rate:
85,000 cubic yards per year (Southward-Walton)

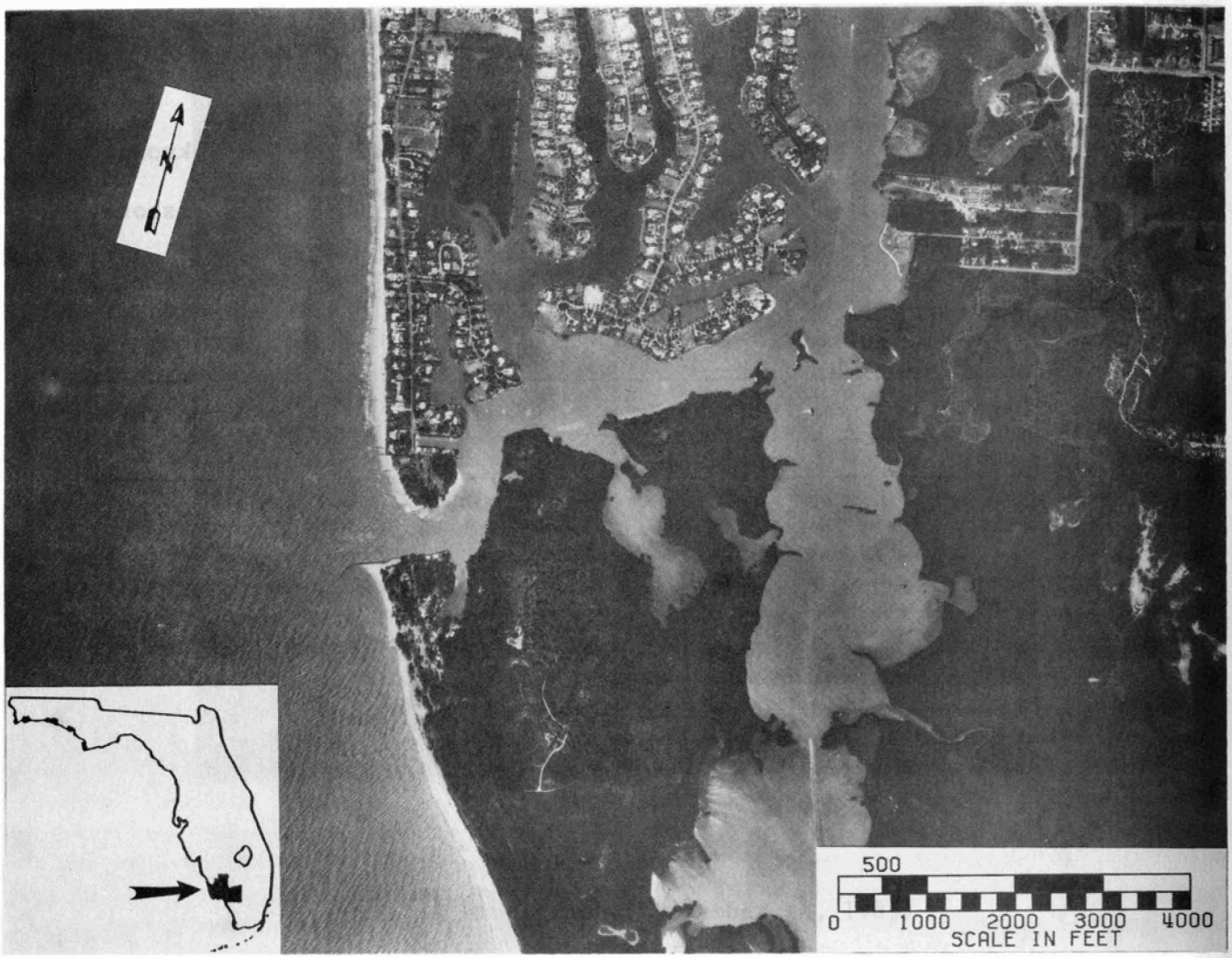
DOCTORS PASS

Brief Dredging History

- Pass dredged twice in 1960s; amount of material removed unknown.
- In 1984, 13,000 cubic yards dredged; material deposited offshore.

Recommended Action

- Beach compatible dredged material should be placed on the south beach.



(Date of Photography: December 14, 1985)

Brief Historical Information

- Gordon Pass separates Naples Beach (north) from Keewaydin Island (south).
- Gordon Pass became a Federal navigation project in 1963.
- Channel dimensions: 540 ft. wide by 8 ft. deep.
- South jetty constructed in 1969.

GORDON PASS

Sediment Balance

Ebb shoal:
1982 - 0.6 million cubic yards

Flood shoal:
1952 - 0.1 million cubic yards

Net littoral transport rate:
70,000 cubic yards per year (Southward-Walton)

Shoreline volume changes, 1961-1985:
+1.0 million cubic yards over 3,900 ft. north of inlet
Little change over 3,600 ft. south of inlet

Brief Dredging History

- Between 1963 and 1985, dredging from the channel amounted to 1,100,000 cubic yards; dredged material placed on Keewaydin Island to the south.

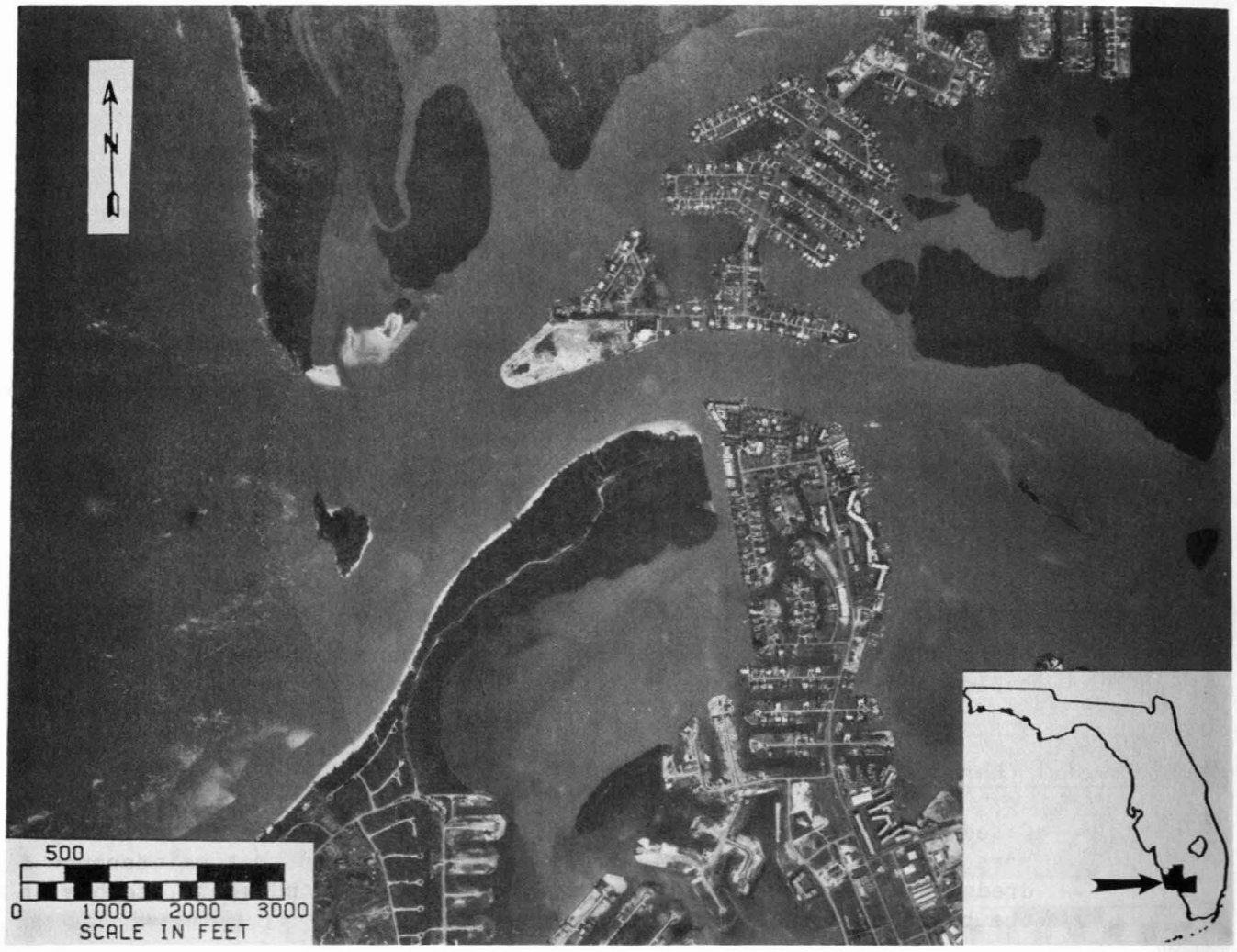
Special Characteristics Relevant to State Responsibilities

- Based on shoreline change history, it appears that the channel traps more than the net longshore sediment transport and that maintenance dredging material should be placed both on north and south beaches on the basis of documented erosion.

Recommended Action

- Conduct monitoring of adjacent beaches before and after each maintenance dredging to determine proper apportionment for placement of beach quality sand.

BIG MARCO PASS



(Date of Photography: December 14, 1985)

Brief Historical Information

- Big Marco Pass is a natural inlet which has not been dredged or modified.
- Channel dimensions: 1,140 ft. wide by 10 ft. deep.

Sediment Balance

Ebb shoal:
1982 - 15.3 million cubic yards

Flood shoal:
1952 - 3.4 million cubic yards

Net littoral transport rate:
70,000 cubic yards per year (Southward-Walton)

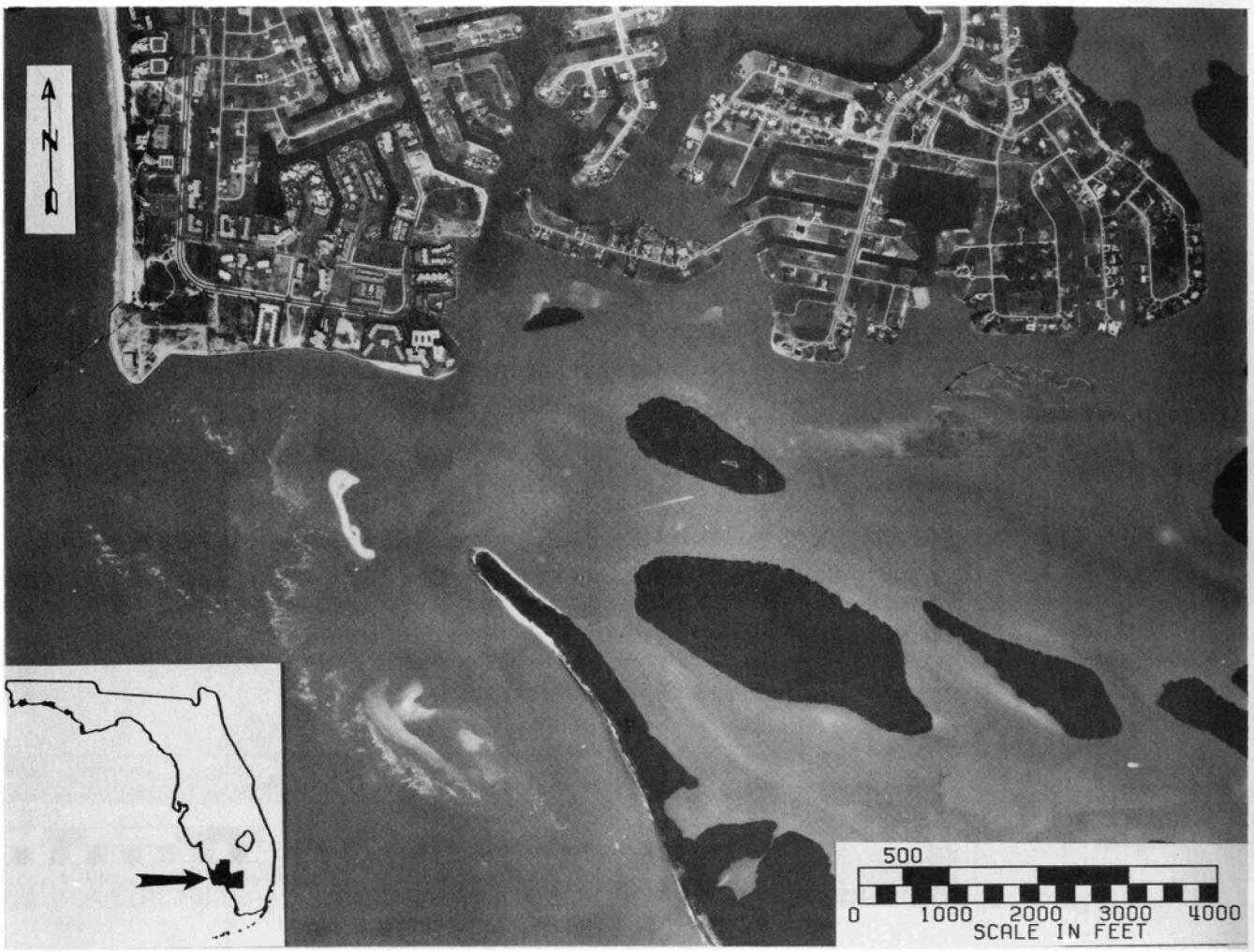
BIG MARCO PASS

Brief Dredging History

- None

Recommended Action

- No action recommended, except to monitor adjacent beaches to obtain a better understanding of the system for background in the possible eventuality of interest in modification.



(Date of Photography: December 14, 1985)

Brief Historical Information

- Prior to 1952, pass was stable with no changes occurring in configuration.
- Between 1967 and 1976, portions of the Marco Island shoreline retreated up to 330 ft.
- Pass not Federally or locally maintained.

CAXAMBAS PASS

Sediment Balance

Ebb shoal: poorly defined due to shifting hydrography

Flood shoal: 0.3 million cubic yards

Net littoral transport rate:
55,000 cubic yards per year (Southward-Walton)

Shoreline volume changes, 1958-1985:
+0.2 million cubic yards over 7,200 ft. north of inlet
+5.9 million cubic yards over 8,100 ft. south of inlet

Brief Dredging History

- In 1982, 320,000 cubic yards dredged from the ebb tidal delta and used to nourish the south end of Marco Island.

Recommended Action

- Place any available beach quality dredged material on Marco Island beach in areas of documented erosion.

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